

CALIFORNIA COASTAL COMMISSION

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49th Day: May 28, 2003
Staff: ALB-LB **AB**
Staff Report: December 18, 2003
Hearing Date: January 14-16, 2004
Commission Action: Approved with Conditions

**Th 10a****STAFF REPORT: REVISED FINDINGS**

LOCAL GOVERNMENT: County of Orange EXCERPT FROM PACKET COPY

LOCAL DECISION: Approval with Conditions

APPEAL NUMBER: A-5-NPC-03-141

APPLICANT: California Department of Transportation (Caltrans)

AGENT: Chris Flynn, Environmental Planner

PROJECT LOCATION: Within the right-of-way on both sides of State Route 1 (Pacific Coast Highway) between Los Trancos Creek and Muddy Creek in the Crystal Cove area of the Newport Coast Planned Community, Orange County

PROJECT DESCRIPTION: Appeal of County of Orange approval of construction of stormwater drainage improvements, including new pipes, inlets and the creation of biofiltration swales adjacent to Pacific Coast Highway.

APPELLANTS: Orange County Coastkeeper, Coastal Commissioners Toni Iseman and Sara Wan

DATE OF COMMISSION ACTION: August 7, 2003

COMMISSIONERS ON PREVAILING SIDE: Commissioners Hart, Iseman, Kruer, Curtis, Nava, Potter, Wan, Woolley and Chairman Reilly.

SUMMARY OF STAFF RECOMMENDATION:

Staff recommends that the Commission adopt the following revised findings in support of the Commission's action of August 7, 2003 approving the proposed drainage improvements pursuant to nine (9) special conditions requiring: 1) submittal of a consolidated Construction Best Management Practices Plan; 2) submittal of a consolidated Water Quality Management Plan (WQMP); 3) a commitment to evaluate full treatment of runoff; 4) submittal of a monitoring plan to evaluate the effectiveness of the project; 5) submittal of an inspection plan and restoration agreement for abandoned drainage facilities; 6) timing of maintenance activities to avoid biological resources; 7) staging to avoid biological resources; 8) timing of maintenance activities to avoid public access impacts; and 9) submittal of an archeological monitoring plan.

EXECUTIVE SUMMARY:

At a public hearing on May 6, 2003, the Commission determined that a substantial issue existed with respect to the local government's approval of the proposed development on the grounds that the locally approved development does not conform to the County of Orange Newport Coast certified Local Coastal Program (LCP) and the Chapter 3 public access policies of the Coastal Act. More specifically, the Commission found that the locally approved coastal development permit and the appeal thereof raised a substantial issue of consistency with the environmentally sensitive habitat area (ESHA) policies of the certified LCP, as it would allow an unspecified amount of untreated runoff from Pacific Coast Highway to enter the Crystal Cove Area of Special Biological Significance (ASBS). This issue has since been resolved, as will be explained in the staff report. In addition, the locally approved permit was found to raise a substantial issue of consistency with the Chapter 3 public access policies of the Coastal Act due to the fact that polluted runoff entering the ocean potentially results in beach closures, thereby adversely affecting the public's ability to access and utilize coastal resources.

At a public hearing on August 7, 2003, the Commission approved De Novo Permit No. A-5-NPC-03-141 subject to nine (9) special conditions. Commission staff recommended approval pursuant to seven (7) special conditions. Objections were raised by one of the appellants (OC CoastKeeper) and others regarding 1) acceptance of the applicant's proposal to only treat a portion of the runoff, and 2) the lack of monitoring to determine the effectiveness of the proposed treatment effort. The Commission added a condition requiring Caltrans to work with State Parks to study the feasibility for full treatment (Special Condition 3), as discussed on pages 17-18. The Commission added a monitoring condition (Special Condition 4), as discussed on pages 19-20. The Commission also modified the condition affecting abandoned storm drain facilities to require the restoration plan be implemented as soon as practicable, but no longer than five (5) years from the date of Commission action (Special Condition 5), as discussed on page 22.

SUBSTANTIVE FILE DOCUMENTS:

1. Record for Local Coastal Development Permit No. PA02-0112
2. County of Orange Newport Coast Certified Local Coastal Program
3. Crystal Cove State Park Certified Public Works Plan
4. Caltrans Statewide Storm Water Quality Practice Guidelines (May 2003)
5. Caltrans Storm Water Quality Handbooks (March 2003)

EXHIBITS:

1. Vicinity Map
2. Location Map
3. Project Plans
4. CASQA Vegetated Swale Data
5. Caltrans Seed Mix List
6. Caltrans Maintenance Guidelines for Bioswales
7. Caltrans Graphics Depicting Runoff Direction and Treatment Percentage
8. Letter from RWQCB dated September 27, 2002
9. Applicable Newport Coast LCP Policies

I. MOTION AND RESOLUTION:

MOTION: *I move that the Commission adopt the revised findings in support of the Commission's action on August 7, 2003 concerning A-5-NPC-03-141.*

STAFF RECOMMENDATION OF APPROVAL:

Staff recommends a **YES** vote on the motion. Passage of this motion will result in the adoption of revised findings as set forth in this staff report. The motion requires a majority vote of the members from the prevailing side present at the August 7, 2003 hearing, with at least three of the prevailing members voting. Only those Commissioners on the prevailing side of the Commission's action are eligible to vote on the revised findings.

RESOLUTION TO ADOPT REVISED FINDINGS:

The Commission hereby adopts the findings set forth below for approving A-5-NPC-03-141 on the ground that the findings support the Commission's decision made on August 7, 2003 and accurately reflect the reasons for it.

II. STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date this permit is reported to the Commission. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of permit.
5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS:

1. Protection of Water Quality – During Construction

A. AT LEAST THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF

CONSTRUCTION, the applicant shall submit, for the review and approval of the Executive Director, a consolidated Construction Best Management Practices Plan for the project site, prepared by a licensed professional, and shall incorporate erosion, sediment, and chemical control Best Management Practices (BMPs) designed to minimize to the maximum extent practicable the adverse impacts associated with construction to receiving waters. The plan shall include the following requirements:

- (i) No construction materials, debris, or waste shall be placed or stored in a manner where it may be subject to wave, wind, rain, or tidal erosion and dispersion.
- (ii) Any and all debris resulting from construction and demolition activities shall be removed from the project site within 24 hours of completion of demolition and construction. Construction and demolition debris and sediment shall be removed from work areas each day that construction or demolition occurs to prevent the accumulation of sediment and other debris that could be discharged into coastal waters. All demolition/construction debris and other waste materials removed from the project site shall be disposed of or recycled in compliance with all local, state and federal regulations. No debris shall be placed in coastal waters. If a disposal site is located in the coastal zone, the site must have a coastal development permit allowing debris disposal or an amendment to this permit shall be required before disposal can take place.
- (iii) Erosion control/sedimentation Best Management Practices (BMPs) shall be used to control dust and sedimentation impacts to coastal waters during construction activities. BMPs shall include, but are not limited to: placement of sand bags around drainage inlets to prevent runoff/sediment transport into the storm drain system and Pacific Ocean.
- (iv) All construction materials, excluding lumber, shall be covered and enclosed on all sides, and kept as far away from a storm drain inlet and receiving waters as possible.
- (v) A copy of the Storm Water Pollution Prevention Plan (SWPPP) and any amendments thereto, prepared in accordance with the Caltrans SWPPP/WPCP Preparation Manual dated March 1, 2003.

B. The required Construction Best Management Practices Plan for the project site shall also include the following BMPs designed to prevent spillage and/or runoff

of construction and demolition-related materials, sediment, or contaminants associated with construction activity. The applicant shall:

- (i) Develop and implement spill prevention and control measures and shall ensure the proper handling, storage, and application of petroleum products and other construction materials. These shall include a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent any spillage of gasoline or related petroleum products or contact with runoff. It shall be located as far away from the receiving waters and storm drain inlets as possible.
 - (ii) Maintain and wash equipment and machinery in confined areas specifically designed to control runoff. Thinners or solvents shall not be discharged into sanitary or storm sewer systems. Washout from concrete trucks shall be disposed of at a controlled location, more than fifty feet away from a storm drain, open ditch or surface waters. Any residual cement on the ground shall be removed and properly disposed.
 - (iii) Provide and maintain adequate disposal facilities for solid waste, including excess concrete, produced during construction.
 - (iv) Provide and maintain temporary sediment basins (including debris basins, desilting basins or silt traps), temporary drains and swales, sand bag barriers, wind barriers such as solid board fence, snow fences or hay bales, and silt fencing.
 - (v) Stabilize any stockpiled fill with geofabric covers or other appropriate cover, and close and stabilize open trenches as soon as possible.
 - (vi) Implement the approved Construction Best Management Practices Plan on the project sites prior to and concurrent with the construction operations. The BMPs shall be maintained throughout the development process.
- C. The Construction Best Management Practices Plan approved by the Executive Director pursuant to this condition shall be attached to all final construction plans. The permittee shall undertake the approved development in accordance with the approved Construction Best Management Practices Plan. Any proposed changes to the approved Construction Best Management Practices Plan shall be reported to the Executive Director in order to determine if the proposed change shall require a permit amendment pursuant to the requirements of the Coastal Act and the California Code of Regulations. No changes to the approved plan shall occur without a Commission-approved permit amendment unless the Executive Director determines that no amendment is required.

2. Protection of Water Quality – Project Design & Post Construction

PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a consolidated Water Quality Management Plan (WQMP) for the post-construction project site, prepared by a licensed water quality professional, and, as proposed by the applicant, shall incorporate structural and non-structural Best Management Practices (BMPs) into the WQMP designed to reduce the pollutant load of, and minimize any increases in volume and velocity of, storm water leaving the developed site. The plan shall be in substantial conformance with the aspect(s) of the submitted project plans in which it states that approximately 61% of runoff leaving Pacific Coast Highway between Los Trancos Creek and Muddy Creek shall be treated (by directing it to structural BMPs designed in accordance with paragraph A(i), below) prior to discharge. The plan shall also be in substantial conformance with the following requirements:

A. Water Quality Management Plan

- (i) As proposed by the applicant, post-construction structural BMPs (or suites of BMPs) should be designed to treat, infiltrate or filter the amount of storm water runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs.
- (ii) As proposed by the applicant, runoff from the highway shall be collected and directed through an appropriate structural BMP or system of BMPs. The filter elements shall be designed to: 1) trap sediment, particulates and other solids, and 2) remove or mitigate contaminants through filtration and/or biological uptake. The drainage system shall also be designed to convey and discharge runoff in excess of this standard from the site in a non-erosive manner.
- (iii) As proposed by the applicant, the applicant shall regularly collect and remove litter and debris from the highway in order to prevent dispersal of pollutants that might collect on the highway surface.

B. Inspection and Maintenance

The Water Quality Management Plan (WQMP) shall include inspection and maintenance provisions in substantial conformance with the following requirements:

- (i) All BMPs shall be operated, inspected and maintained for the life of the project. For the first three years following completion of project construction, all structural BMPs shall be inspected, and where

necessary, cleaned and repaired, at the following minimum frequencies 1) prior to October 15th each year; 2) following the first storm event with a magnitude of 0.5 inch or greater, and, as necessary, following other significant storm events between October 15th and April 15th of each year (significant storm events are those with a magnitude greater than or equal to that of the post-construction structural BMP design storm, as specified in Condition 2 (A) (i)) and, 3) at the end of the wet season (April 15th). After the first three years following completion of project construction and inspection as specified herein, the permittee shall submit to the Executive Director, for review and approval, a maintenance report including the field observation data, record of cleaning and repair activities, conclusions and a recommended permanent schedule of inspection and maintenance of the BMPs approved in this coastal development permit, which will, upon approval, become part of the WQMP. The recommended permanent schedule of inspection and maintenance shall not become effective until the permittee obtains a permit amendment or a new permit from the Commission unless the Executive Director determines that a permit amendment or new permit is not necessary.

- (ii) Debris and other water pollutants removed from structural BMP(s) during clean-out shall be contained and disposed of in a proper manner.
- (iii) It is the applicant's responsibility to maintain the drainage system and the associated structures and BMPs according to manufacturer's specification.

C. The permittee shall undertake and maintain the approved development in accordance with the WQMP approved by the Executive Director pursuant to this condition. Any proposed changes to the approved WQMP shall be reported to the Executive Director in order to determine if the proposed change shall require a permit amendment pursuant to the requirements of the Coastal Act and the California Code of Regulations. No changes to the approved WQMP shall occur without a Commission-approved amendment unless the Executive Director determines that no amendment is required.

3. Treatment

A. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicant shall submit, for the review and approval of the Executive Director, a written commitment to prepare a report, in consultation with the California State Parks Department, evaluating the feasibility of full treatment of runoff entering Muddy Creek from Pacific Coast Highway in the project area, meaning that 100 percent of that runoff would be sent through a treatment facility/BMP. The analysis shall evaluate the following: potential for creation of a bioswale area on the seaward side of the highway (taking into

consideration biological and archaeological constraints); installation of filtration devices; and other feasible options. The analysis shall identify a preferred alternative. The analysis and preferred alternative shall be submitted as a proposed addition to the WQMP designed pursuant to Special Condition 2, for the review and approval of the Executive Director within three (3) years of the date of Commission action.

- B. If the proposed alternative will result in full treatment of the runoff entering Muddy Creek from Pacific Coast Highway in the project area, and the Executive Director approves the proposal and concludes that no amendment is required, the proposal shall be incorporated into the WQMP designed pursuant to Special Condition 2 and implemented in accordance with the provisions of that condition. If the proposal will not result in "full treatment" and/or the Executive Director concludes that an amendment is needed to implement the proposal, the applicant shall submit a subsequent coastal development permit or amendment application to carry out the identified treatment effort. The applicant shall implement the approved plan.

4. Monitoring

- A. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicant shall submit, for the review and approval of the Executive Director, a monitoring plan to evaluate the effectiveness of the proposed improvement project at removing pollutants from road runoff prior to discharge into Muddy Canyon or Los Trancos Canyon Creeks. The plan shall include the following:
- (i) Testing for oil, petroleum based hydrocarbons, benzene, toluene, xylene, methylbenzene, gasoline additives and other pollutants associated with highway runoff;
 - (ii) Monitoring at Muddy Creek until such time as all runoff that enters Muddy Creek is fully treated and no less than three (3) years;
 - (iii) Monitoring at Los Trancos Creek for three (3) years; and
 - (iv) If the monitoring results show that the system is not working, the applicant must return to the Commission with a plan on how to remediate.
- B. The permittee shall undertake and maintain the approved development in accordance with the monitoring plan approved by the Executive Director pursuant to this condition. Any proposed changes to the approved plan shall be reported to the Executive Director in order to determine if the proposed change shall require a permit amendment pursuant to the requirements of the Coastal Act and the California Code of Regulations. No changes to the approved plan shall occur without a Commission-approved amendment unless the Executive Director determines that no amendment is required.

5. Abandoned Facilities Inspection/Maintenance Plan and Restoration Agreement

A. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicant shall submit, for the review and approval of the Executive Director, in consultation with the California State Parks Department:

- (i) A plan for inspection and maintenance of all abandoned Caltrans storm drain facilities located seaward of Pacific Coast Highway at Crystal Cove State Park between Los Trancos Creek and Muddy Creek. The plan shall include the following:
 - A schedule for periodic inspection of the abandoned facilities and surrounding outlet areas to determine their condition; and
 - An outline for maintenance activities to be implemented if facilities are causing adverse impacts such as erosion or slope instability. Maintenance may include debris removal and rock retrieval.
- (ii) A written commitment from the permittee to carry out future restoration of the area occupied by abandoned Caltrans storm drain facilities located seaward of Pacific Coast Highway at Crystal Cove State Park between Los Trancos Creek and Muddy Creek. The commitment shall require the permittee to prepare a written analysis and develop an implementation schedule for restoration of each outlet area to pre-existing (prior to installation of the outlet) conditions. Restoration may consist of removal of riprap and revegetation with native species appropriate to each site. The analysis shall evaluate the following: potential for removal and off-site disposal of abandoned drainage facilities where feasible based on geotechnical and biological constraints; native revegetation of the outlet sites; monitoring plan to ensure proper plant establishment; and staging for restoration activities. The written commitment shall be subject to the review and approval of the Executive Director and shall be submitted prior to issuance of the permit. The analysis and restoration schedule shall be submitted, for the review and approval of the Executive Director, prior to submittal of a subsequent coastal development permit application to carry out the identified restoration effort. The restoration plan shall be implemented as soon as practicable, but no longer than five (5) years from the date of Commission approval of A-5-NPC-03-141.

B. The permittee shall undertake development in accordance with the approved final plan and agreement. Any proposed changes to the approved final plan or agreement shall be reported to the Executive Director. No changes to the approved final plan or agreement shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

6. Timing--Biological Resources

As proposed by the applicant, to avoid adverse impacts to the California gnatcatcher, construction and maintenance activities associated with the water quality improvements authorized pursuant to A-5-NPC-03-141 shall not occur on the seaward side of Pacific Coast Highway between Los Trancos Creek and Muddy Creek during the gnatcatcher nesting season (April 15 through September 1).

7. Staging--Biological Resources

As proposed by the applicant, to avoid adverse impacts to sensitive species and habitat areas, staging and parking for the water quality improvements authorized pursuant to A-5-NPC-03-141 shall be located within existing developed or non-native, ornamentally landscaped areas. No equipment, materials or vehicles shall be stored within native habitat areas.

8. Public Access

As proposed by the applicant, to avoid adverse impacts on public access and recreational use of area beaches resulting from Pacific Coast Highway lane closures, all project operations associated with construction of the water quality improvements authorized pursuant to A-5-NPC-03-141 shall be prohibited during the "peak use" beach season, defined as the period starting the day before the Memorial Day weekend and ending the day after the Labor Day weekend of any year. During the off-peak season (the remainder of the year), the following restrictions shall apply:

- At least one lane shall remain open in each direction along Pacific Coast Highway during the hours of 7:00 a.m. and 7:00 p.m on weekdays;
- At least two lanes shall remain open in each direction on weekends; and
- Construction staging areas and employee parking shall not displace public beach and recreational parking on weekends.

9. Area of Potential Archaeological Significance

- A. The applicant shall comply with all recommendations and mitigation measures contained in the Historical Property Survey Report prepared for the project by Caltrans dated June 2003.
- B. Prior to commencement of construction, the applicant shall submit to the Executive Director for review and approval a supplementary Archaeological Treatment Plan that includes provisions and methods for:

- i. monitoring by an archaeological monitor(s) qualified by the California Office of Historic Preservation (OHP) standards and Native American monitor(s) with documented ancestral ties to the area appointed consistent with the standards of the Native American Heritage Commission (NAHC);
- ii. evaluating the nature and significance of archaeological resources/cultural deposits that might be discovered during construction, and
- iii. avoiding to the maximum extent practicable impacts to archaeological resources/cultural deposits that are evaluated as significant and minimizing and mitigating unavoidable project impacts to those resources (methods for avoidance may include, but are not limited to, project redesign, capping, and placing cultural resource areas in open space).

This supplementary archaeological plan shall have been approved by the State Historic Preservation Officer (SHPO), and evidence of the SHPO's review and approval shall be submitted to the Executive Director along with the plan. The applicant shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

- C. If an area of archaeological resources/cultural deposits is discovered during the course of the project, all construction activity shall cease within 20 meters (65 feet) of the find, or within a larger area as specified by the archaeological monitor(s) in consultation with the Native American monitor(s), and shall not recommence except as provided in subsection E of this condition.
- D. Upon discovery of archaeological resources/cultural deposits, the applicant shall consult with the Executive Director regarding the significance of the find, based on the archaeological monitor's recommendation, and shall implement the approved Archaeological Treatment Plan contingency actions described in subsection B. If the Executive Director disagrees with the archaeological monitor's recommendation regarding significance, the Executive Director and the applicant will consult with the SHPO. The final determination of significance shall be made by the Executive Director.
- E. The applicant may recommence construction following implementation of appropriate measures as specified in the Archaeological Treatment Plan and determination by the Executive Director that any changes to the proposed development are de minimus in nature and scope. If the Executive Director determines that proposed changes to the proposed development in connection with the discovery of the archaeological resource(s) are not de minimus, construction in the vicinity of the archaeological resource(s) may not recommence until after an amendment to this permit is approved by the Commission.

IV. FINDINGS AND DECLARATIONS:

The Commission hereby finds and declares:

A. Project Location, Description, and Background

1. Project Location

The project site is located within the right-of-way along both sides of State Route 1 (Pacific Coast Highway) between Los Trancos Creek and Muddy Creek in the Crystal Cove area of the Newport Coast Planned Community, Orange County (Exhibits 1 and 2). Within the subject area, the Newport Coast Planned Community is located immediately inland of Pacific Coast Highway and Crystal Cove State Beach is located immediately seaward.

2. Project Description

The California Department of Transportation (Caltrans) was granted a permit by the County of Orange for drainage improvements within the right-of-way along both sides of Pacific Coast Highway (PCH). Project plans are included as Exhibit 3. The proposed drainage improvements are intended to comply with the Regional Water Quality Control Board's Cease and Desist Order (CDO) 00-87, which requires the elimination of direct discharge of waste into the Crystal Cove ASBS. The project includes abandonment of existing storm drain facilities that drain directly to Crystal Cove State Park and construction of new storm drain facilities that collect and convey runoff to Los Trancos Creek and Muddy Creek. Within the roadway width, the abandoned pipes will be slurry sealed. However, beyond the roadway (within the boundary of the State Park) the pipes and associated energy dissipaters will be left in place.

The project includes the installation of new inlets and 600mm (1.97 ft.) drainage pipes along both sides of the roadway and the creation of bioswales along the northeast (inland) side of PCH. A "bioswale" is described by the applicant as a 2.4 meter (7.9 feet) wide "shallow, grass lined, flat bottomed channel that conveys storm water at moderate slopes to allow pollutant removal from highway storm water runoff." The bioswales are proposed for areas between Muddy Creek and Reef Point Drive, between Reef Point Drive and Crystal Heights Drive, and between Crystal Heights Drive and Los Trancos Creek. No bioswales are to be constructed on the seaward side of PCH. Due to the slope of the roadway, almost all surface runoff leaving PCH upcoast of Crystal Heights Drive will drain to the bioswales along the inland side of the highway. Downcoast of Crystal Heights Drive, approximately half of the runoff from PCH will drain to the inland side of the highway and half will drain to the seaward side. The runoff from the seaward side of PCH (downcoast of Crystal Heights Drive) will be piped to the inland side of PCH and discharged into Muddy Creek. Curb openings will be constructed at 50 meter (164 foot) intervals and each bioswale will be a minimum 30 meters (98.4 feet) in length. A native seed mix will be used to establish vegetation within the bioswale areas. Construction will occur between Fall 2003 and Spring 2004, during the off-peak beach use season. In

accordance with Caltrans requirements, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared by the contractor prior to commencement of construction.

After consideration of various alternatives to satisfy the CDO requirement, Caltrans concluded that the proposed bioswale design on the inland side of the highway would provide treatment of runoff to the Maximum Extent Practicable (MEP), while avoiding impacts to potential environmentally sensitive habitat areas (ESHA) at Crystal Cove State Park. The applicant considered the creation of bioswales on the seaward side of the highway, but determined that coastal sage scrub would be adversely impacted as a result. The applicant also evaluated structural alternatives, such as installation of a Continuous Deflection System (CDS) unit or catch basin filter inserts. These options were dismissed, as they could not accommodate flooding. Due to public safety concerns, Pacific Coast Highway cannot be subject to flooding hazards.

3. Background

The County of Orange Planning Commission approved Local Coastal Development Permit No. PA02-0112 on March 13, 2003. Within ten working days of receipt of the notices of final action, two Coastal Commissioners and Orange County Coastkeeper appealed the approval on the grounds that the approved project does not conform to the requirements of the Newport Coast certified Local Coastal Program and the public access policies of the Coastal Act. At its hearing of May 6, 2003, the Commission determined that the local government's approval of the proposed development raised a substantial issue of consistency with the Newport Coast certified Local Coastal Program and the public access policies of the Coastal Act. The major issues addressed in the Substantial Issue staff report were water quality and public access.

B. Adoption of Substantial Issue Findings

The findings and declarations set forth in the substantial issue staff report (including Sections III and IV, as well as Section II) are herein incorporated by reference. The substantial issue staff report discusses several issues raised by the appellants that staff recommended did not raise a substantial issue regarding consistency of the project with the certified LCP. The citations to Sections 30230 and 30231 of the Coastal Act do not constitute valid grounds for appeal because those policies were not incorporated into the certified LCP and are not considered public access policies.

C. Standard of Review

The action currently before the Commission is the de novo portion of the appeal. The Commission's finding of Substantial Issue invalidated the locally issued coastal permit. Pursuant to Section 30604(b) of the Coastal Act, the Commission's standard of review for the proposed development is the certified Local Coastal Program (LCP). Pursuant to Section 30604(c), the proposed project is also subject to the Chapter 3 public access and recreation policies of the Coastal Act due to impacts occurring seaward of Pacific Coast Highway, the first public road, via Los Trancos Creek and Muddy Creek. Runoff from the

project site will be discharged to these creeks, thereby resulting in potential impacts on the public's access and recreational opportunities. Additionally, pursuant to Section 30605, a portion of the proposed project is subject to review under the certified Crystal Cove Public Works Plan (PWP). Due to their location within Crystal Cove State Park, the abandonment of drainage facilities must be evaluated in accordance with the PWP.

The Crystal Cove PWP was approved by the Commission on May 20, 1982 and recently amended on June 11, 2003. When a proposed project is contained in sufficient detail in a certified public works plan, the coastal development permit process is superceded by the public works process. If a project is not included in the certified public works plan, then a coastal development permit from the Commission is required. The Commission finds that the proposed project (abandonment of drainage facilities) was not previously contemplated and is therefore not contained in the PWP. As such, the Coastal Act will serve as the standard of review for the portion of the proposed project that is occurring within the State Park, with the Crystal Cove Certified PWP serving as guidance.

D. Consistency with Coastal Act Policies and Newport Coast Certified LCP

Coastal Act Section 30210 states,

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Coastal Act Section 30220 states,

Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Coastal Act Section 30240(b) states,

Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The Newport Coast certified LCP designates the coastal waters, streams, wetlands and estuaries as environmentally sensitive habitat areas (ESHA). The definition of ESHA is found in Section I-3 Resource Conservation and Management Policies and reads as follows: "For purposes of Section 30107.5 of the Coastal Act, natural drainage courses designated . . . on the USGS 7-minute series map, Laguna Beach Quadrangle, . . . (hereafter referred to as "USGS Drainage Courses), coastal waters, wetlands, and estuaries are classified as "Environmentally Sensitive Habitat Areas" (ESHAs)." The LCP

recognizes that the habitat value of various streams, and along the length of individual streams, is not equal. The coastal waters also have a different habitat value. For this reason, four categories of ESHA were established in the Newport Coast LCP to denote the differing habitat values. The streams are designated either Category "A", "B", or "D" and the coastal waters are Category "C" ESHA. The current project involves potential impacts to ESHA Category C, which includes coastal waters. The protection of the ESHA Category C directly impacts public access and recreation.

Newport Coast LCP page I-2.5 states,

c. ESHA Category C:

The coastal waters along The Newport Coast—ESHA Category C—have been designated as both a Marine Life Refuge and an Area of Special Biological Significance. They contain near shore reefs, rocky intertidal areas and kelp beds, and are located primarily within Crystal Cove State Park. The State Department of Parks and Recreation will be responsible for providing protection for tidepools and other marine resources from park users.

Protection of water quality is provided by the Runoff Policies.

The Newport Coast certified LCP contains general "Runoff Policies" relating to peak flood discharge rates and erosion control. The LCP also contains policies relating to Erosion, Sediment and Grading. With respect to erosion and urban runoff control associated with the protection of marine water quality in particular, the LCP states the following:

Marine water quality will be protected by directing runoff to natural drainage courses such as Los Trancos Canyon, Buck Gully, and Muddy Canyon....and by means of erosion control techniques to slow runoff so that habitat areas are protected from flows significantly in excess of natural rates of flow. Additional control of non-point sources will be implemented if necessary to comply with State, regional, and County standards.

The LCP contains the following policies relating to erosion and sedimentation during construction:

Areas of disturbed soil shall be reseeded and covered with vegetation; mulches may be used to cover ground areas temporarily, other mechanical or vegetative techniques to control erosion may be used where necessary. Native and/or appropriate non-native plant material selected for vegetation shall be consistent with LCP Subsection I-3-L-6.

Temporary mechanical means of controlling sedimentation such as hay bakes, earth berms and/or sand-bagging around the site, may be used as part of an overall Erosion Control Plan, subject to County approval.

The full text of the Newport Coast LCP Runoff, Erosion, Sediment and Grading policies is provided as Exhibit 9.

Newport Coast LCP page I-3.21 states,

CATEGORY "C" ENVIRONMENTALLY SENSITIVE HABITAT AREA POLICIES

The protection of water quality in marine resource areas is subject to the authority of the State Water Resources Control Board. Protection of water quality is provided by the LCP Runoff Policies and will be reviewed by the Regional Water Quality Control Board in conjunction with subsequent coastal development permits and related environmental impact reports (EIR's).

A water quality monitoring program shall be submitted to the Regional Water Quality Control Board prior to initial implementing approvals for the golf course, for the purpose of monitoring runoff entering the ocean as well as the riparian corridors. Copies of the results of the monitoring program shall be forwarded to the Regional Water Quality Control Board and the County of Orange on a regular basis for their review to determine whether corrective action is required pursuant to the authority of said agencies.

Use and application of chemicals on the golf course and other landscape areas shall be limited to those approved by State, County, and Federal agencies. The landowner shall be responsible for notifying tenants and/or prospective initial purchasers of this requirement.

1. Effectiveness of Treatment

The project approved by the County of Orange contained no specific information regarding how various pollutants will be treated. The applicant has since provided additional information regarding the effectiveness of the treatment proposed. For comparative purposes, Caltrans provided information regarding the performance of six bioswales pilot tested for three wet seasons in southern California. As demonstrated in the pilot projects, 76% to 89% of the heavy metals (total dissolved copper, lead and zinc) were removed by the bioswales. The applicant also submitted the California Stormwater Quality Association Stormwater Best Management Practice Handbook—New Development and Redevelopment, which provides a BMP fact sheet for vegetated swales (Exhibit 4). The fact sheet provides additional bioswale performance information data that is consistent with the Caltrans data for removal of metals and total suspended solids (TSS) in their pilot projects. The Caltrans examples demonstrated that the bioswales decreased the concentrations of total petroleum hydrocarbons (TPH) Oil and TPH Diesel by 51% and 69%, respectively. However, according to the applicant, no conclusions were drawn on general TPH removal performance because the samples were collected using the grab method, which may not produce representative results. According to Caltrans, *"the actual*

TPH removal rates were significantly higher than the actual concentration reduction rates because approximately 47% of the runoff infiltrated. The low influent concentrations (mean EMCs= <0.05mg/L to 3.5 mg/L) were not surprising because oil/grease concentration from highway runoff are typically around 10mg/L or less." The applicant has indicated that the proposed bioswales will be able to treat, infiltrate or filter the amount of storm water runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs.

One of the appellants (OC CoastKeeper) maintains that more can be done to effectively treat a greater amount of runoff within the project area. For example, according to the appellant, vaults with media filters could be installed along the inland side of the highway to filter runoff prior to discharge into the creeks. As described on page 10, the applicant considered various alternative treatment methods, including installation of a CDS unit and media filters. However, due to flooding concerns, these alternatives were rejected. The opportunity to create bioswales on the seaward side of PCH was also rejected as it may impact coastal sage scrub (CSS) habitat. However, that alternative, as well as others, should be analyzed more carefully, as discussed in the subsequent section.

At the time of Substantial Issue, it was unclear what specific plant mix the applicant proposed for use within the bioswales. The applicant has since provided a list of drought-tolerant native grasses that grow best during the winter and spring seasons in Southern California (Exhibit 5). The applicant intends to hydroseed the site between December and February. According to the applicant, if the seed mix is planted immediately prior to a storm, proper vegetation establishment will take approximately three months.

2. Quantity and Type of Runoff Treated

Based on information in the administrative record, the quantity of stormwater and non-stormwater runoff that would be treated in the biofiltration swales was unclear. According to information since provided by the applicant, approximately 61% of runoff from this segment of Pacific Coast Highway (between Los Trancos Creek and Muddy Creek) will be treated as part of the proposed project (Exhibit 7). Although this is not 100% treatment, it is a vast improvement over what currently exists. The applicant states that the remaining 39% of runoff cannot be treated because there is insufficient area to construct a bioswale on the seaward side of PCH, without impacting CSS habitat outside of their right-of-way.

However, the applicant has not submitted sufficient evidence that the feasibility of full treatment has been evaluated. The Commission imposes Special Condition 3, which requires the applicant to prepare a report, in consultation with the California State Parks Department, evaluating the feasibility of full treatment of runoff entering Muddy Creek from Pacific Coast Highway in the project area, meaning that 100 percent of that runoff would be sent through a treatment facility/BMP. The analysis must evaluate the following: potential for creation of a bioswale area on the seaward side of the highway (taking into consideration biological and archaeological constraints); installation of filtration devices; and other feasible options. The analysis must identify a preferred alternative. The

analysis and preferred alternative must be submitted as a proposed addition to the WQMP designed pursuant to Special Condition 2, for the review and approval of the Executive Director within three (3) years of the date of Commission action. If the proposed alternative will result in full treatment of the runoff entering Muddy Creek from Pacific Coast Highway in the project area, and the Executive Director approves the proposal and concludes that no amendment is required, the proposal must be incorporated into the WQMP designed pursuant to Special Condition 2 and implemented in accordance with the provisions of that condition. If the proposal will not result in "full treatment" and/or the Executive Director concludes that an amendment is needed to implement the proposal, the applicant must submit a subsequent coastal development permit or amendment application to carry out the identified treatment effort. The condition requires the applicant to implement the approved plan. As conditioned, the feasibility of full treatment will be fully evaluated and the maximum amount of treatment will occur at the project site.

Not only must the proposed project treat the greatest quantity of runoff feasible, it must also treat specific pollutants effectively. According to the State Water Resource Control Board's Federal Clean Water Act Section 303(d) List, the pollutants of concern in this area are fecal coliform and total coliform, not pollutants typically associated with runoff from highways, such as oil and grease. Pathogenic organisms, such as those whose presence is indicated by the presence of coliform bacteria, are not expected to be associated with the highway runoff because they are a bacteria associated with animal and human waste. Common sources of pathogens are livestock and pet feces carried by runoff into storm drains, and faulty septic systems. All highway runoff entering the bioswales will be stormwater runoff. No nuisance flows (such as irrigation) will enter the drainage inlets within the project area. As such, if coliform contamination of the beaches downcoast of Los Trancos and Muddy Creek occurs, it is likely due to the other sources of pollution, not the roadway. Nonetheless, the potential for roadway pollutants to adversely affect the beaches is present. Only through monitoring can the effectiveness of the proposed treatment be determined. Monitoring will be discussed in Section 4 on the following page.

3. Maintenance

The approved project will result in the collection and conveyance of polluted runoff in newly created drainage facilities, including multiple inlets and bioswales. However, at the time of local approval, no information was provided regarding cleaning and maintenance of the drainage facilities, particularly the bioswales. Although infiltration is anticipated, some pollutants and debris may collect and pond within the swale areas. An on-going cleaning and maintenance program must be implemented to assure that pollutants are removed and are not discharged into the creeks, and ultimately the ocean. The applicant intends to follow the guidelines set forth in the Caltrans Maintenance Manual. Appendix B of the Caltrans Statewide Storm Water Management Plan and Section 2 of the Caltrans Statewide Storm Water Quality Practice Guidelines provide a complete list of maintenance and operational best management practices that Caltrans intends to employ. The applicant has also submitted detailed information regarding maintenance operations specific to bioswales (Exhibit 6). According to the Caltrans Guidelines for Maintenance of BMPs, including Vegetated Treatment Systems (bioswales), the sites will be inspected a

minimum of twice a year. Greater maintenance frequencies may be required depending on the particular site and level of traffic. Inlet inspection will occur annually. Caltrans District staff has indicated that maintenance of the proposed water quality improvements at the Crystal Cove site will occur more frequently. Special Condition 2 requires the applicant to maintain the facilities according to the final WQMP approved by the Executive Director to ensure that the improvements are carried out as proposed, in compliance with the Runoff policies of the LCP.

4. Monitoring

At the Substantial Issue stage, concerns were raised regarding monitoring of runoff from Pacific Coast Highway. No monitoring was proposed or required as part of the locally approved project. Appellants asserted that monitoring is necessary to evaluate the effectiveness of the proposed BMPs and the quality of the water entering Los Trancos and Muddy Creek.

The Irvine Community Development Company (ICDC) operates monitoring stations at Los Trancos Creek and Muddy Creek to monitor runoff from Planning Area 3A of the Newport Coast Planned Community (required as a condition of approval of Commission issued permit #A-5-IRC-99-301). The ICDC has expressed concern that the redirection of PCH runoff resulting from the proposed project will affect the sampling results at the Los Trancos monitoring station. As such, the ICDC may request to relocate the monitoring station upstream. If relocation is proposed that involves development or is inconsistent with ICDC's existing permit, a subsequent permit or amendment will be required. Consideration of such a permit or amendment will acknowledge the impacts of the current Caltrans work.

Caltrans maintains that monitoring is not necessary in the current project because monitoring would not provide any new, relevant information beyond that collected at other bioswale sites in Southern California. The runoff characteristics provided by Caltrans show typical highway runoff that can be expected with the traffic volumes along this segment of Pacific Coast Highway. Based on runoff data provided, the type and quantity of pollutants anticipated to be found in the highway runoff differ from pollutants associated with beach closures. As stated previously, the pollutants of concern in this area are fecal coliform and total coliform, which are not expected to be found in highway runoff.

Pollutants contained in runoff from residential developments are generally not the same as those associated with highway runoff. Pollutants typically contained in highway runoff have not contributed to beach contamination and/or closure in the subject area. According to information provided by the applicant, the County of Orange Health Care Agency and Sanitation District have been testing the coastal waters for the past 30 years. The County runs tests to determine if bacteria are present and to identify the possible presence of disease causing organisms. The County Health Care Agency reviews the data to determine if there is an indication of contamination in the ocean waters and furthermore to advise the public regarding beach closures. According to information provided by the County of Orange Health Agency on their website, there were no reports of beach

closures within the proposed project area in the past 3 years. The information indicates that there were no beach closures while Caltrans was directly discharging runoff to the Area of Special Biological Significance (ASBS). Although the project is expected to only improve existing conditions, monitoring is considered necessary to gauge the results of the proposed project.

As such, the Commission imposes Special Condition 4. Special Condition 4 requires the applicant to submit a monitoring plan to evaluate the effectiveness of the proposed improvement project at removing pollutants from road runoff prior to discharge into Muddy Canyon or Los Trancos Canyon Creeks. The plan shall include the following: testing for oil, petroleum based hydrocarbons, benzene, toluene, xylene, methylbenzene, gasoline additives and other pollutants associated with highway runoff; monitoring at Muddy Creek until such time as all runoff that enters Muddy Creek is fully treated and no less than three (3) years; monitoring at Los Trancos Creek for three (3) years; and if the monitoring results show that the system is not working, the applicant must return to the Commission with a plan on how to remediate.

5. Conformance with CDO

The project was proposed in response to Cease and Desist Order 00-87 issued by the Regional Water Quality Control Board on November 16, 2000. The CDO requires the elimination of direct discharge into the Crystal Cove ASBS. In a letter dated September 27, 2002 (see Exhibit 8), the Regional Board states that *"it appears that the Caltrans Action Plan, submitted on May 14, 2002, when fully implemented in accordance with the schedule specified in the CDO will satisfy the requirements set forth in the CDO."* At the time the Commission found Substantial Issue, it was unclear if the project approved by the Water Board was the same as the project approved by the County. Caltrans has since provided evidence that the project approved by the County is *"essentially the same project which was submitted and approved by the RWQCB although the design has advanced since the time of the Board submittal."*

The Water Board letter indicates that Caltrans' discharge point to Los Trancos Creek will be upstream of the 'low flow diversion' structure which currently diverts non-storm water flows from Los Trancos Creek to a nearby Orange County Sanitation District sewer trunk line that flows to their treatment plant where the water is treated and disposed. Nowhere in the County's administrative record did it indicate that low flows would be diverted. Caltrans now states *"[t]he existing low flow diversion system at the end of pipe at the Los Trancos Creek outfall was constructed by the Irvine Community Development Company for their plan of action to comply with the same Cease and Desist Order."* Because the applicant is not responsible for the low flow diversion system, they are not relying on its effectiveness to satisfy their requirements under the CDO. Nonetheless, Caltrans will benefit from the presence of the year round low storm water flow diversion system at Los Trancos.

The Water Board letter states *"the majority of low flows (non-storm water discharges) leaving Pacific Coast Highway in this area will be directed to a 'biofiltration swale' prior to*

discharge to Los Trancos and Muddy Canyon Creeks.” However, it was unclear at the Substantial Issue phase how the Water Board determined that a “majority” would be directed to the bioswales. Based on the written information and project plans included in the County’s record, there was no way to determine the precise quantity of runoff entering the bioswales. The Commission has since received additional information regarding the amount of runoff directed to the bioswales. As described under subsection D (2) above, the bioswales will capture and treat approximately 61% of runoff. This represents an improvement over current conditions and satisfies the Water Board’s CDO requirements.

6. Conclusion Regarding Substantial Issue Concerns

In all, the water quality measures proposed by the applicant are consistent with the regulations governing the project as described above and respond to the concerns raised at the Substantial Issue hearing. If constructed and maintained pursuant to the plans submitted by the applicant, the proposed bioswales will effectively treat a majority of runoff from Pacific Coast Highway between Los Trancos and Muddy Creek. Over recent months, the applicant has submitted a multitude of drawings, maps, calculations, case studies, and various technical documents, including the Caltrans Statewide Storm Water Quality Practice Guidelines (May 2003) and the Caltrans Storm Water Quality Handbooks (March 2003) to describe their proposed BMPs, maintenance information, SWPPP guidelines and other pertinent information. Many of the submittal documents contain general information regarding Caltrans protocol. Some site-specific information has also been provided to supplement the procedural guidance documents. While the information is comprehensive and responds to the concerns raised at the Substantial Issue hearing, a more concise Construction Plan and WQMP document must be prepared in order to provide additional clarity and to facilitate compliance. The applicant must submit a consolidated document to outline the proposed site-specific construction and post-construction water quality measures.

To ensure that construction is carried out in conformance with the protocols and guidelines referenced throughout the applicant’s submittal, the Commission imposes Special Condition 1. Special Condition 1 requires the applicant to submit a consolidated Construction Best Management Practices Plan for the project site. The Construction Best Management Practices Plan for the project site must be prepared by a licensed professional, and shall incorporate erosion, sediment, and chemical control Best Management Practices (BMPs) designed to minimize to the maximum extent practicable the adverse impacts associated with construction to receiving waters in order to make the project comply with the Runoff, Erosion, Sediment and Grading policies of the certified LCP.

To ensure that the project is operated and maintained in conformance with the protocols and guidelines referenced throughout the applicant’s submittal, the Commission imposes Special Condition 2. Special Condition 2 requires the applicant to submit a consolidated Water Quality Management Plan (WQMP) for the post-construction project site. The WQMP must be prepared by a licensed water quality professional, and shall incorporate structural and non-structural Best Management Practices (BMPs) designed to minimize

any increases in volume and velocity of storm water leaving the developed site in order to make the project comply with the Runoff, Erosion, Sediment and Grading policies of the certified LCP.

7. Issues Not Raised at Time of Substantial Issue Hearing

Inspection and Restoration of State Parks Property

The project involves the abandonment of drainage facilities located beyond the highway right-of-way on State Parks property at Crystal Cove State Beach. The outlet areas to be abandoned contain concrete headwalls and erosion control devices (e.g. riprap) on the bluffs above the beach. State Parks and Caltrans have initiated discussions regarding removal of these outlet devices and restoration of the sites. At this time, an agreement has not been reached regarding timing and/or method of removal and restoration. Caltrans indicates that the restoration project cannot be accommodated as part of the currently proposed water quality improvement effort due to timing constraints of the CDO. The sites of the outlets to be abandoned are sloping areas containing coastal sage scrub habitat, a potential ESHA. Caltrans has indicated that use of heavy equipment to fully remove the drainage facilities would disturb ESHA and potentially de-stabilize the slope. As such, careful consideration of the method of removal and/or site restoration would be necessary. The Commission would have the opportunity to review any proposed restoration effort through a future specific project request or coastal development permit.

However, until such time as a restoration effort is undertaken, proper inspection and monitoring of the facilities is necessary. For example, if the abandoned pipes were to fall into disrepair (i.e. become cracked, caved in, etc.), they could convey water to the slope, thereby causing erosion at the mouth of the outlet points. Additionally, the riprap boulders may become dislodged, requiring removal or restacking. The Commission imposes Special Condition 5, which requires the applicant to submit an interim inspection and maintenance plan for the areas where Caltrans storm drains have been abandoned seaward of the highway at Crystal Cove State Park. The plan shall include a schedule for periodic inspection of the abandoned facilities and surrounding outlet areas and a response outline for maintenance and/or repair activities to be implemented if facilities are causing adverse impacts.

To memorialize Caltrans' offer to evaluate restoration of the sites of the abandoned drainage facilities, Special Condition 5 requires the applicant to submit a restoration agreement in consultation with State Parks prior to issuance of the permit. Restoration shall consist of removal of riprap and revegetation with native species appropriate to each site. Restoration efforts must be carried out as soon as practicable, but not longer than five years of the date of Commission approval of A-5-NPC-03-141. As conditioned for interim inspection and maintenance and future restoration, the Commission finds the project consistent with Section 30240(b) of the Coastal Act.

Timing of Construction to Avoid Gnatcatcher

The proposed project will occur adjacent to coastal sage scrub habitat located along the seaward side of Pacific Coast Highway. This area is known to support California

gnatcatchers and may be considered an Environmentally Sensitive Habitat Areas (ESHA). Furthermore, this area is adjacent to a State Park. The Commission recently certified the Crystal Cove Public Works Plan (PWP) with a condition that requires ESHA to be protected against any significant disruption of habitat values, and only uses dependent on those resources can be allowed within those areas. To minimize any potential impacts to the potential ESHA, Caltrans proposes to schedule construction activities before and after the California gnatcatcher breeding season. To ensure that construction and maintenance activities do not adversely affect sensitive habitat areas, the Commission imposes Special Condition 6, which requires the applicant to comply with specific timing requirements, as proposed, to avoid the gnatcatcher breeding and nesting season (April 15—September 1).

The Commission finds the proposed development, as conditioned for appropriate timing, consistent with Section 30240 (b) of the Coastal Act.

Construction Staging

Construction storage and staging must be carried out in a manner that assures that native habitat areas are protected. As such, the Commission imposes Special Condition 7, which requires the applicant to store all equipment and vehicles in a previously developed or non-native landscaped location, consistent with the plans submitted.

The Commission finds the proposed development, as conditioned for appropriate construction staging, consistent with Section 30240 (b) of the Coastal Act.

Timing of Construction to Avoid Public Access Impacts

As described previously, the proposed project consists of water quality improvements that will ultimately provide a public benefit for residents and visitors. Construction impacts, such as obstruction of lateral vehicular access to the shoreline with road or lane closures, can affect the public's ability to access the beach, in conflict with Section 30210 of the Coastal Act. Construction related impacts can be partially alleviated by limiting construction work to the off-peak season (fall to early spring) when beach use by the public is typically low. With this in mind, Caltrans intends to carry out construction activities before and after the popular summer beach use season. Caltrans has also indicated that beach access will not be affected during construction, as only one lane (of the three traveling in each direction) will be closed during construction. To ensure that the proposed maintenance activities minimize impacts to continued public access, the Commission imposes Special Condition 8. The condition prohibits work that results in lane closures during the peak beach use period, as defined in the special condition. The Commission finds the proposed development, as conditioned, consistent with the public access policies of the Coastal Act.

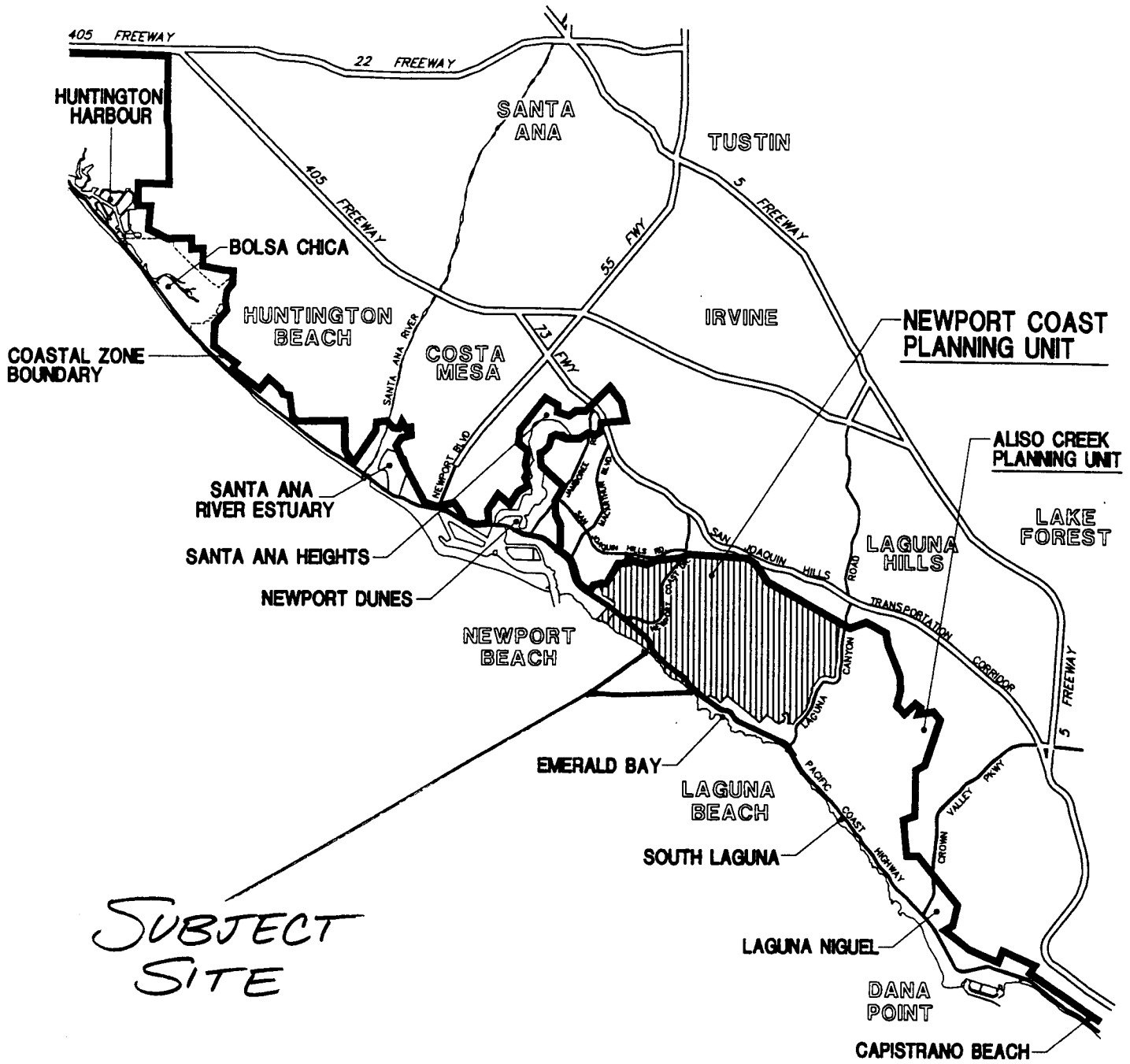
Cultural Resources

According to a Historical Property Survey Report (HPSR) prepared by Caltrans, the site of the proposed work is within the vicinity of three previously identified archaeological sites. The HPSR requires a monitor on-site during construction. To ensure that cultural resources are not adversely impacted by the proposed work, the Commission imposes Special Condition 9. Special Condition 9 requires the applicant to submit for the review and approval of the Executive Director an archeological monitoring plan prepared by a qualified professional. As conditioned, the Commission finds the project consistent with the Archaeological and Paleontological Policies of the Certified LCP.

G. California Environmental Quality Act

Section 13096 of the Commission's Code of Regulations requires Commission approval of coastal development permit applications to be supported by a finding showing the permit, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.

The Commission incorporates its findings on conformity with LCP policies at this point as if set forth in full. For the reasons described in the Commission findings above, the proposed project, as conditioned, will not cause significant adverse impacts to the environment. Specifically, the Commission has required mitigation measures to enable the Commission to find the proposed project, as conditioned, consistent with the biological resources and water quality policies of the certified LCP. There are no feasible alternatives or mitigation measures available which would substantially lessen any significant adverse impact which the activity might have on the environment. Therefore, the Commission finds that the proposed project can be found consistent with the requirements of the Coastal Act to conform to CEQA.



SUBJECT SITE

COASTAL COMMISSION
 A-5-NPC-03-141

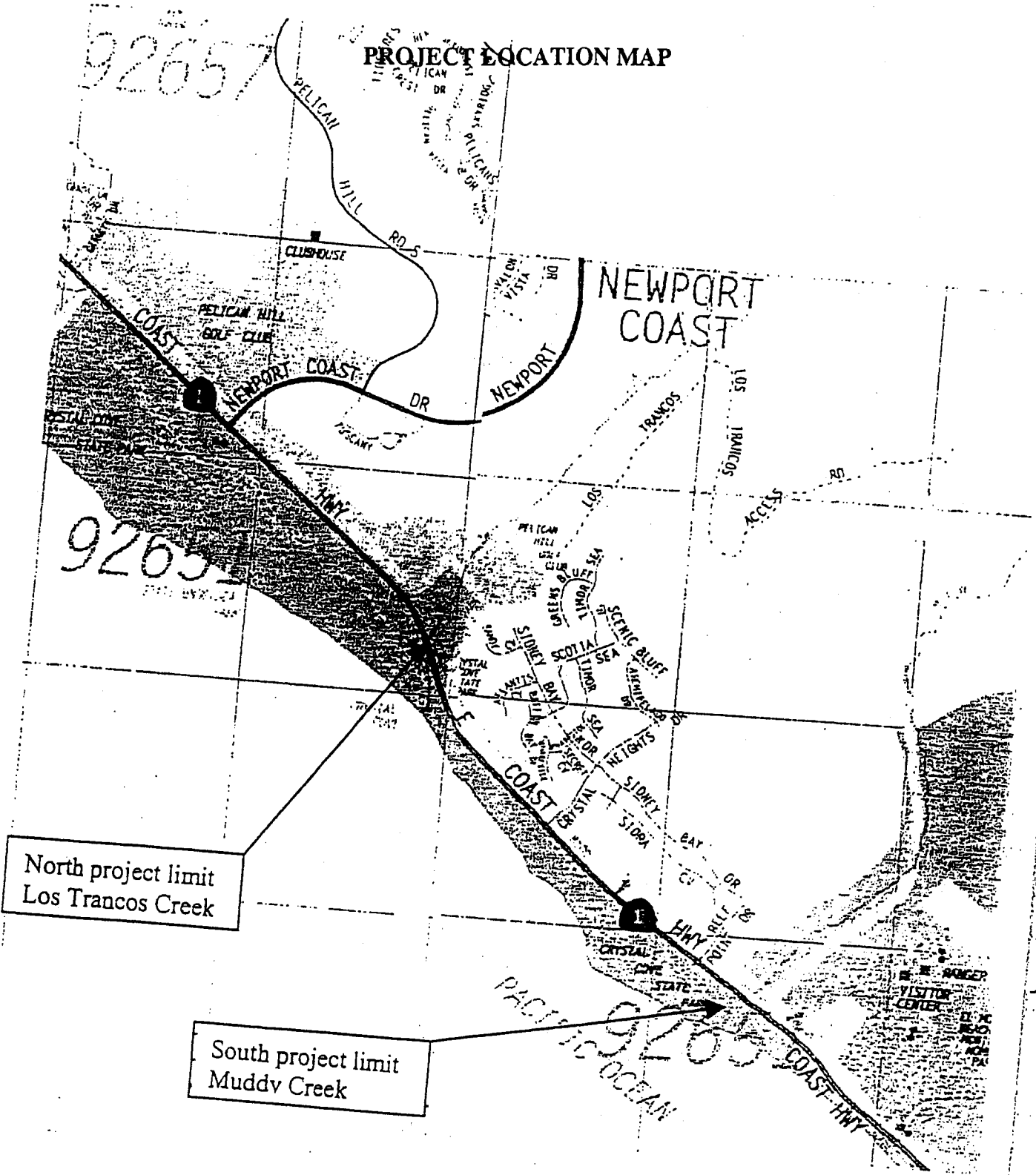
EXHIBIT # 1
 PAGE 1 OF 1

LOCATION MAP - Second Amendment
The Newport Coast Local Coastal Program

Exhibit A
 NOT TO SCALE
 December 3, 1986

LOCATION MAP

PROJECT LOCATION MAP



North project limit
Los Trancos Creek

South project limit
Muddy Creek

COASTAL COMMISSION
A-5-NPC-03-141

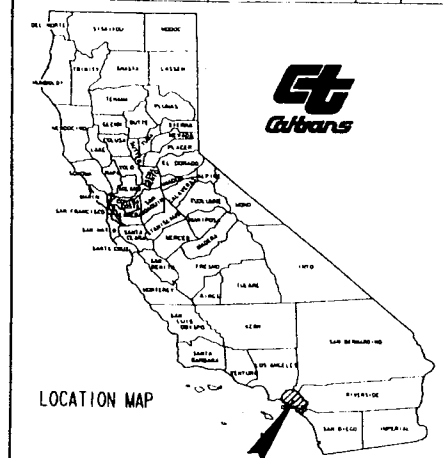
EXHIBIT # 2

PAGE 1 OF 1

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 PROJECT PLANS FOR CONSTRUCTION ON
 STATE HIGHWAY
 IN ORANGE COUNTY
 NEAR LAGUNA BEACH FROM 1.03 KM SOUTH
 TO 0.68 KM NORTH OF CRYSTAL HEIGHTS DRIVE

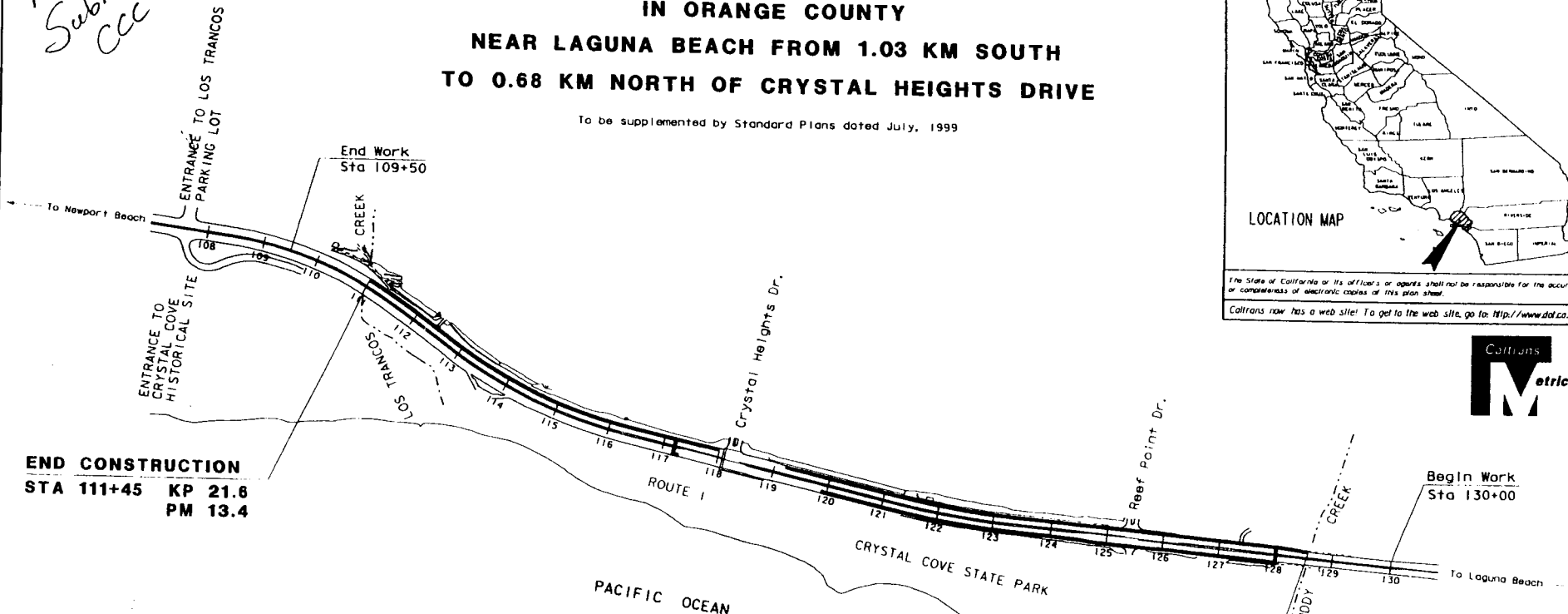
To be supplemented by Standard Plans dated July, 1999

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
12	Ora	1	19.8 / 21.6		



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As Submitted to CCC on 5/12/03



END CONSTRUCTION
 STA 111+45 KP 21.8
 PM 13.4

BEGIN CONSTRUCTION
 STA 128+56 KP 19.8
 PM 12.3

Begin Work
 Sta 130+00

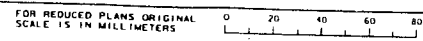
RECEIVED
 South Coast Region
 MAY 15 2003

CALIFORNIA
 COASTAL COMMISSION

Julio Ramirez 12/4/02
 Project Engineer Date
 Registered Civil Engineer
 February 15, 2003
 Plans Approval Date



Contract No. OC3804



USERNAME: ***.***.***
 BGN FILE: ***.***.***.***

CU 12273 EA OC3801

PROJECT: OC 12273-01 PROJECT NUMBER: 0101
 J. RAMIREZ N. YOUSEF

CALIFORNIA COASTAL COMMISSION
 A-5-NPC-03-141
 EXHIBIT # 3
 PAGE 1 OF 23

DATE PLOTTED: 13 FEB 2003 11:11 AM
 08-29-02

ABBREVIATION:
 ESA - ENVIRONMENTAL SENSITIVE AREA
 GCP - GRATED CONCRETE PIPE
 GLD - GRATED LINED DRAIN
 OS - OPEN CURB INLET WITH SIDE OPENING
 S - STANDARD JOINT

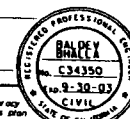
CURVE DATA

NO.	RADIUS	DELTA	TANGENT	LENGTH	BC	EC
1	840.07 m	06° 37' 32"	48.63 m	97.20 m	15.20 m LT 113+00.51 "A" LINE	15.20 m LT 113+99.49 "A" LINE



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER



PLANS APPROVAL DATE

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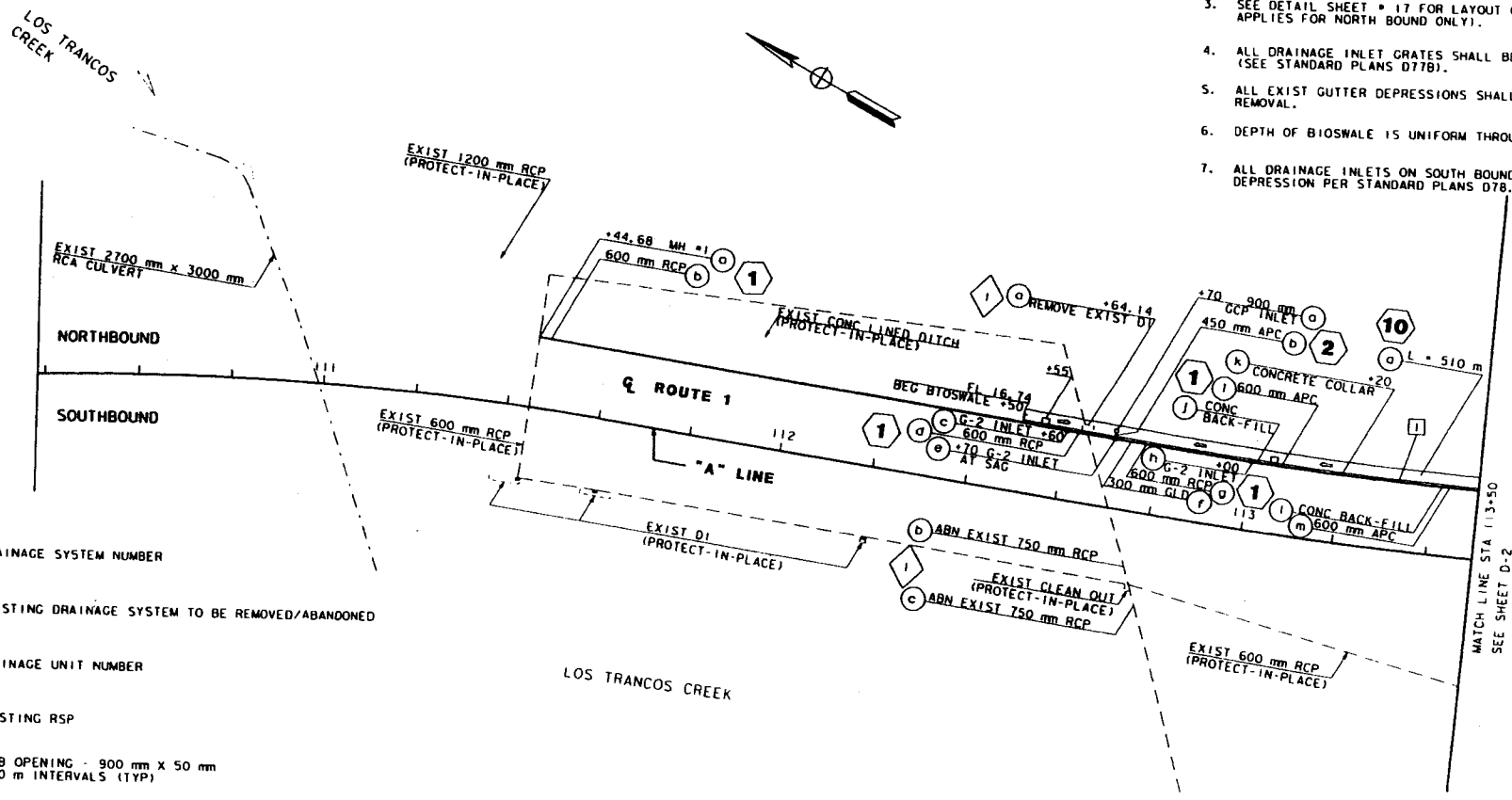
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CONSTRUCTION NOTES:

1. SALVAGE ALL MH COVERS FOR ALL DRAINAGE INLETS TO BE REMOVED.
2. ALL OUTLET PIPES OF AN ABANDONED DRAINAGE INLET MUST BE PLUGGED.
3. SEE DETAIL SHEET # 17 FOR LAYOUT OF G-2 / GT-3 INLET(S) (NOTE: APPLIES FOR NORTH BOUND ONLY).
4. ALL DRAINAGE INLET GRATES SHALL BE BICYCLE PROOF TYPE, 600-12X (SEE STANDARD PLANS D77B).
5. ALL EXIST GUTTER DEPRESSIONS SHALL BE REMOVED ALONG WITH GUTTER REMOVAL.
6. DEPTH OF BIOSWALE IS UNIFORM THROUGHOUT THE PROJECT (D = 0.3 m).
7. ALL DRAINAGE INLETS ON SOUTH BOUND SHALL HAVE 50 mm GUTTER DEPRESSION PER STANDARD PLANS D7B.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
 PROJECT ENGINEER
BALDEV BHALLA
 HYDRAULICS
 DATE REVISIONS BY DATE REVISIONS BY

- LEGEND:
- (x) DRAINAGE SYSTEM NUMBER
 - (x) EXISTING DRAINAGE SYSTEM TO BE REMOVED/ABANDONED
 - (x) DRAINAGE UNIT NUMBER
 - (S) EXISTING RSP
 - (□) CURB OPENING - 900 mm x 50 mm @ 50 m INTERVALS (TYP)
 - (→) DIRECTION OF FLOW
 - (x) CURVE DATA



THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

FOR REDUCED PLANS ORIGINAL 0 20 40 60 80

DRAINAGE PLAN
SCALE 1:500

D-1

2/23
EX. 3

DESIGNED BY
CHECKED BY

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CHECKED BY

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CHECKED BY

CURVE DATA

NO.	RADIUS	DELTA	TANGENT	LENGTH	BC	EC
1	840.07 m	06° 37' 32"	48.63 m	97.20 m	15.20 m LT 113+00.51 "A" LINE	15.20 m LT 113+99.49 "A" LINE
2	840.07 m	03° 16' 53"	24.06 m	48.20 m	15.20 m LT 114+00.51 "A" LINE	15.20 m LT 114+49.49 "A" LINE
3	840.07 m	00° 36' 06"	04.41 m	08.90 m	15.20 m LT 114+50.51 "A" LINE	15.20 m LT 114+59.49 "A" LINE
4	840.07 m	02° 36' 41"	19.15 m	38.30 m	15.20 m LT 114+60.51 "A" LINE	15.20 m LT 114+99.49 "A" LINE
5	840.07 m	06° 37' 54"	48.67 m	97.30 m	15.20 m LT 115+00.51 "A" LINE	15.20 m LT 115+99.50 "A" LINE
6	840.07 m	01° 58' 11"	14.44 m	28.90 m	15.20 m LT 116+00.52 "A" LINE	15.20 m LT 116+29.92 "A" LINE



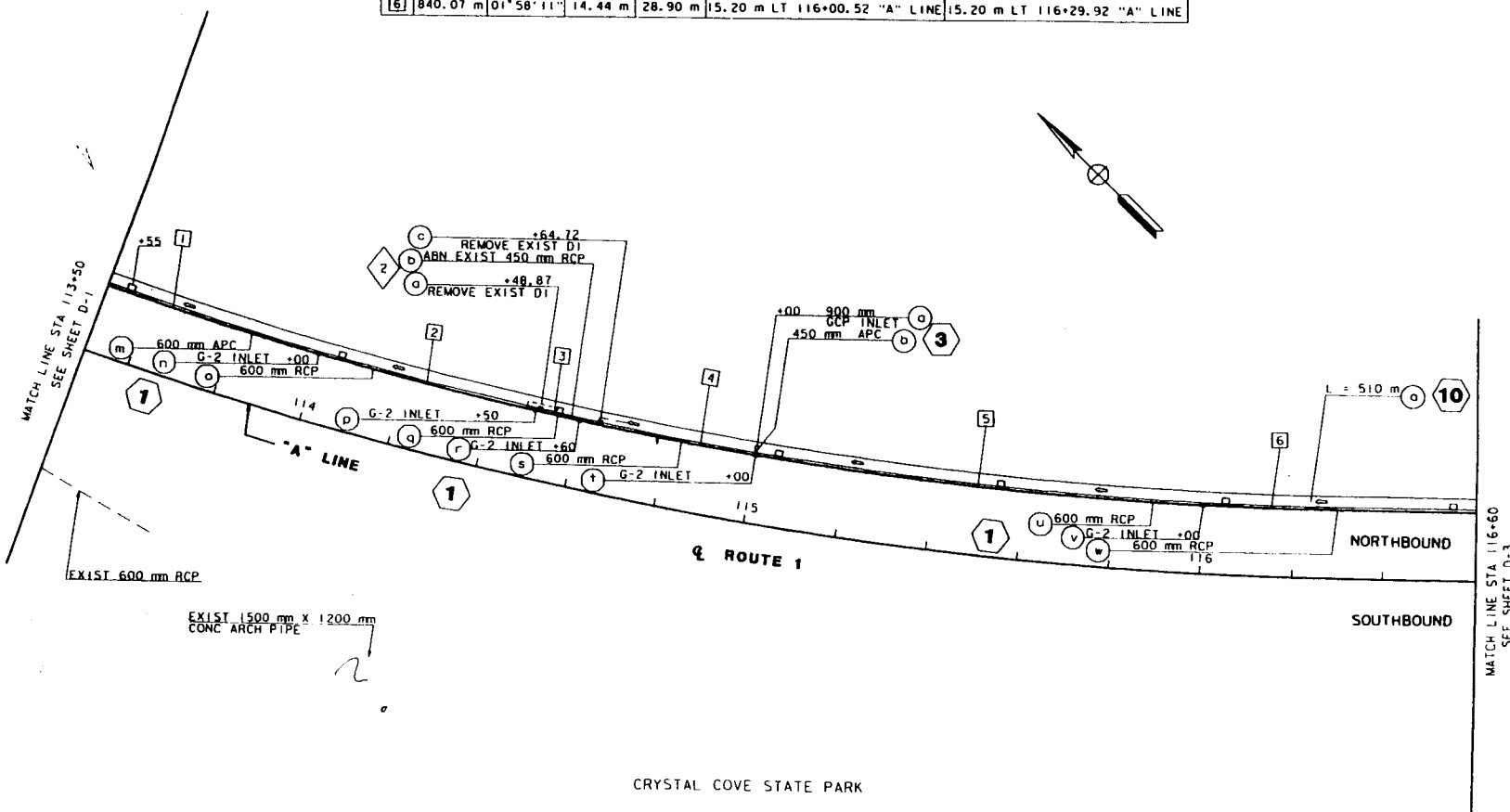
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

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THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY
ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DRAINAGE PLAN
SCALE 1:500

FOR REDUCED PLANS ORIGINAL 0 20 40 60 80

EX. 3
3/23

DESIGNED BY
CHECKED BY

REVISOR
DATE

BALDEV BHALLA

HYDRAULICS

Corbans



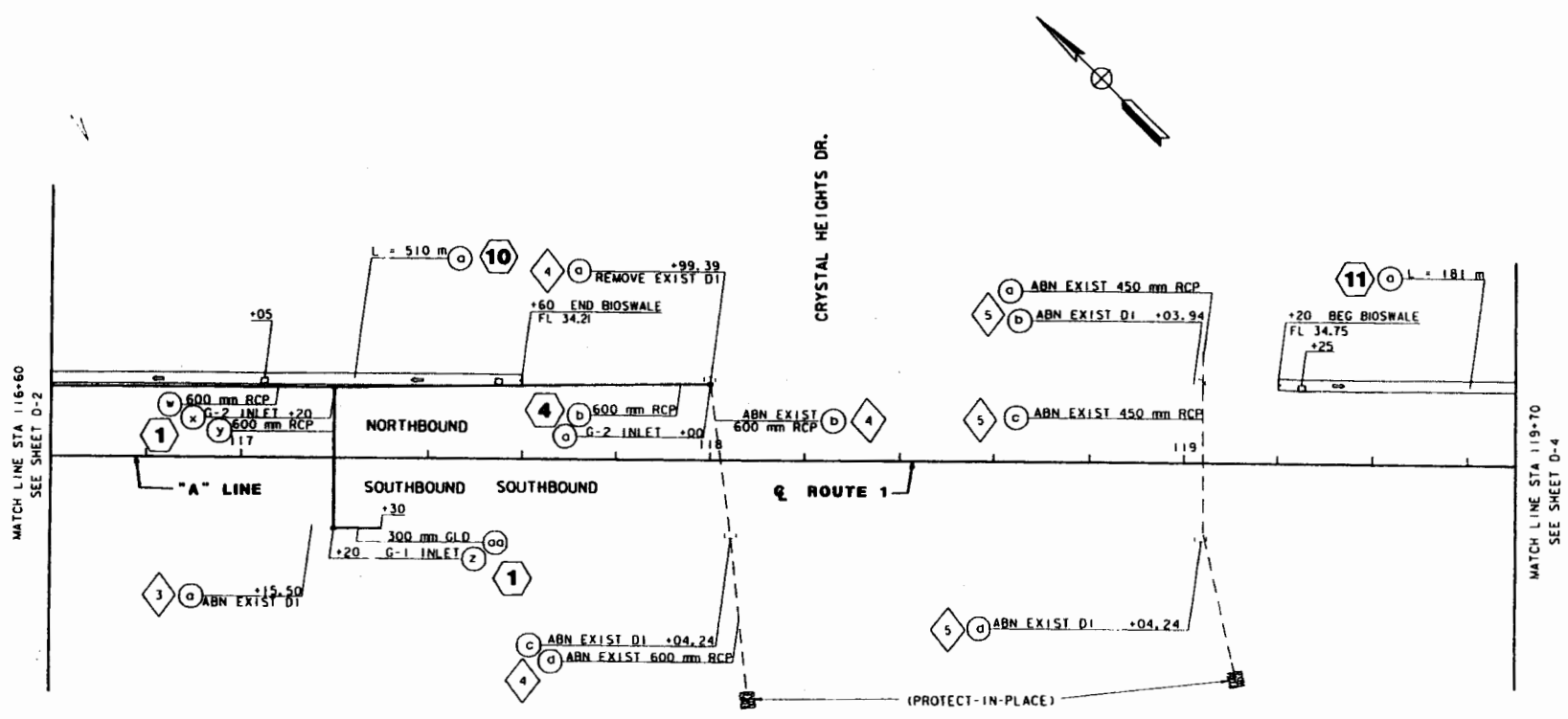
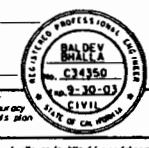
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

FOR REDUCED PLANS ORIGINAL 0 20 40 60 80

DRAINAGE PLAN
SCALE 1:500

D-3

EX. 3
4/23

DATE REVISIONS BY DATE REVISIONS BY
 CALCULATED BY DESIGNED BY CHECKED BY
 PROJECT ENGINEER
BALDEV BHALLA
 HYDRAULICS
 STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
 Caltrans

CURVE DATA

NO.	RADIUS	DELTA	TANGENT	LENGTH	BC	EC
7	508.81 m	04° 13' 28"	55.65 m	111.25 m	5.23 m LT 121+27.13 "A" LINE	15.23 m LT 122+39.50 "A" LINE
8	508.81 m	02° 38' 47"	28.22 m	56.50 m	5.23 m LT 122+40.50 "A" LINE	15.23 m LT 122+97.50 "A" LINE
9	540.18 m	00° 27' 51"	06.24 m	12.50 m	16.14 m RT 121+27.13 "A" LINE	16.14 m RT 121+39.53 "A" LINE
10	540.18 m	03° 20' 37"	44.95 m	89.90 m	16.14 m RT 121+40.53 "A" LINE	16.14 m RT 122+29.47 "A" LINE
11	540.18 m	03° 59' 07"	53.59 m	107.20 m	16.14 m RT 122+30.53 "A" LINE	15.19 m RT 123+36.54 "A" LINE



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

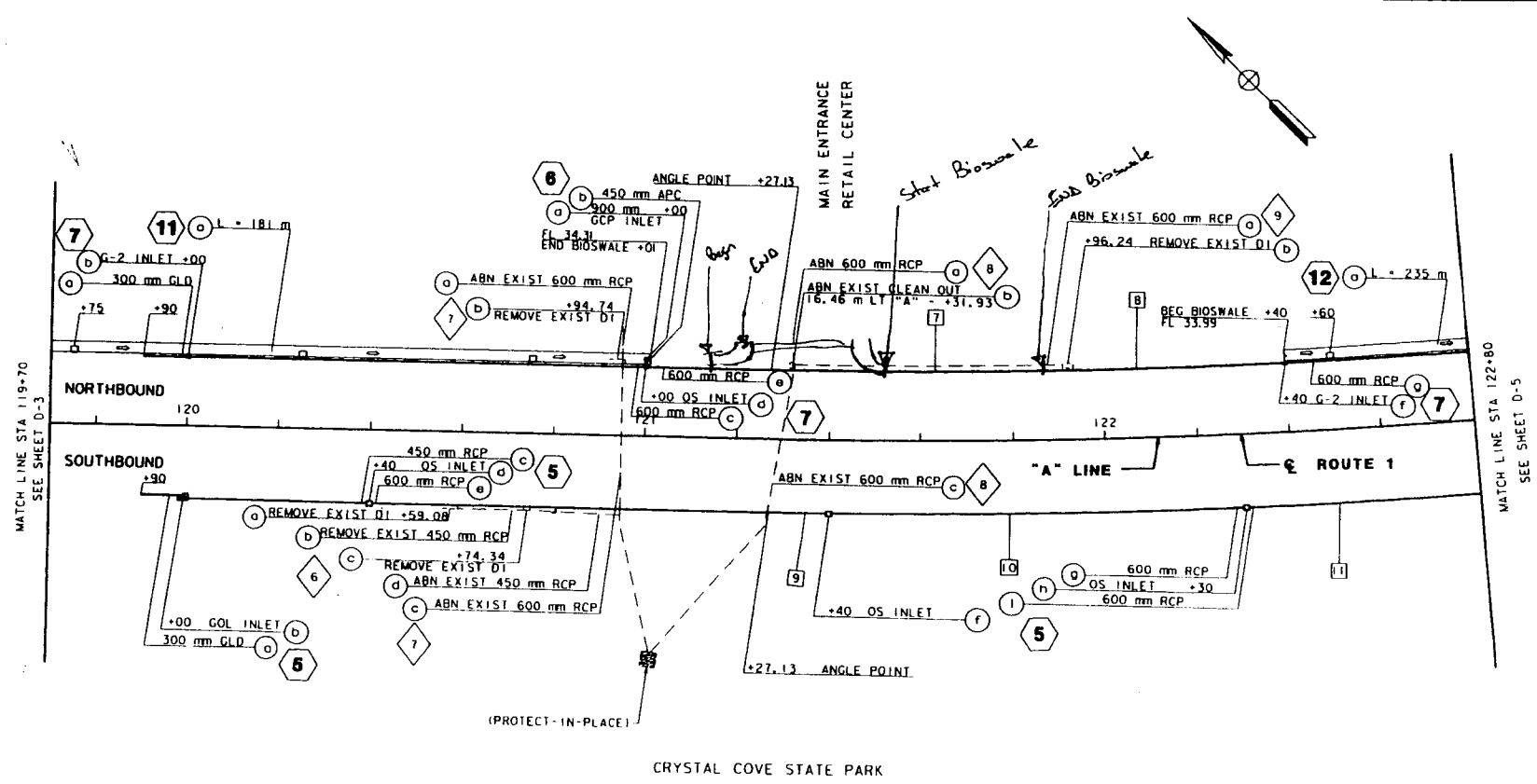
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REG. LICENSE PROFESSIONAL ENGINEER
BALDEV BHALLA
 No. C34350
 Exp. 2-30-05
 CIVIL
 STATE OF CALIFORNIA

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EX. 3
 5/23

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ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DRAINAGE PLAN
 SCALE 1:500

FOR REDUCED PLANS ORIGINAL 0 20 40 60 80

D-4

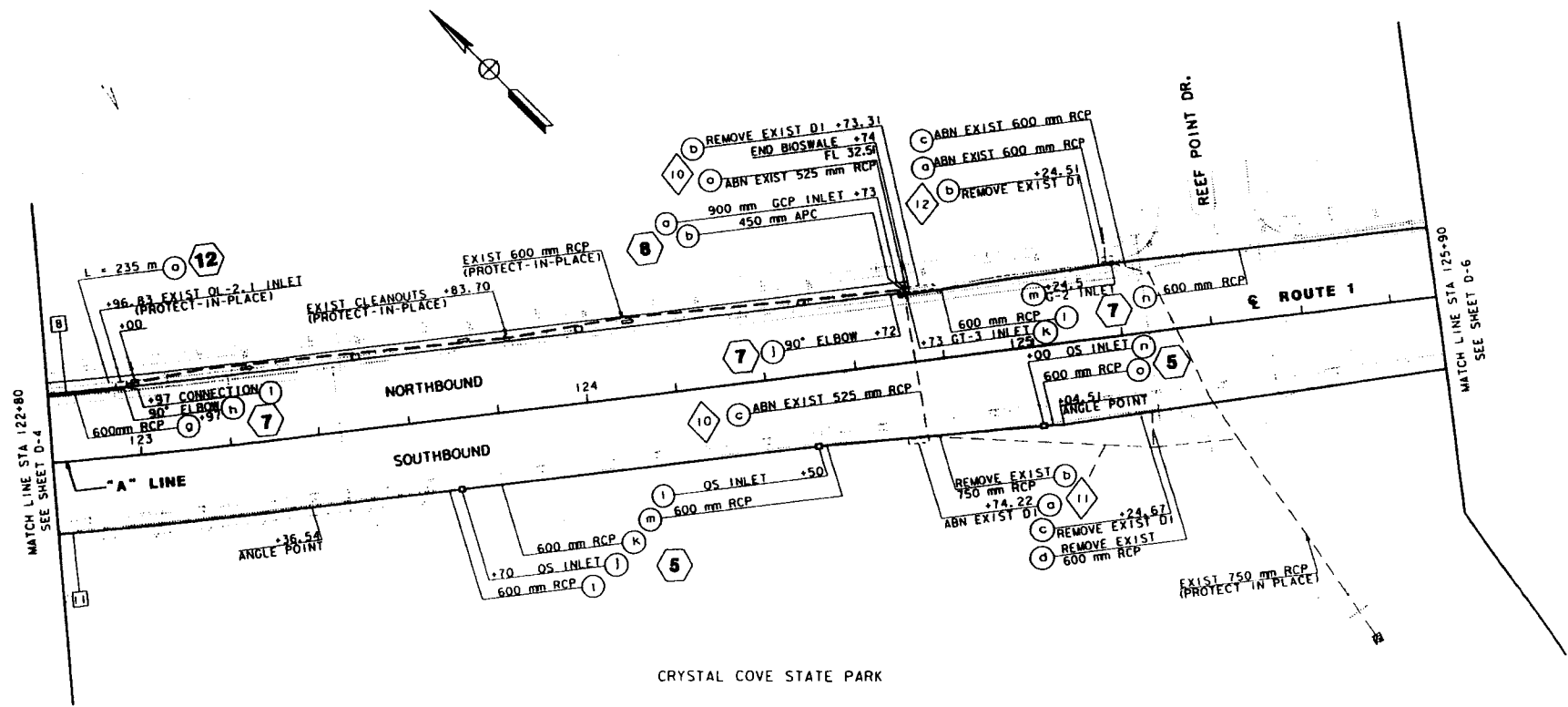
PROJECT ENGINEER: **BALDEV BHALLA**
 CALCULATED/DESIGNED BY: **BALDEV BHALLA**
 CHECKED BY: _____
 REVISIONS: _____
 DATE: _____
 REVISOR: _____
 DATE: _____



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER
BALDEV BHALLA
 C34350
 (08-30-03)
 CIVIL
 STATE OF CALIFORNIA

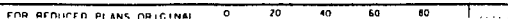
PLANS APPROVAL DATE: _____
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EX. 3
 6/23

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN



DRAINAGE PLAN
SCALE 1:500

D-5

CHECKED BY

BALDEV BHALLA

HYDRAULICS

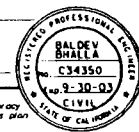
Caltrans

EX. 3
7/23



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

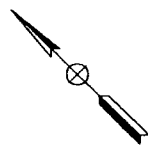
REGISTERED CIVIL ENGINEER



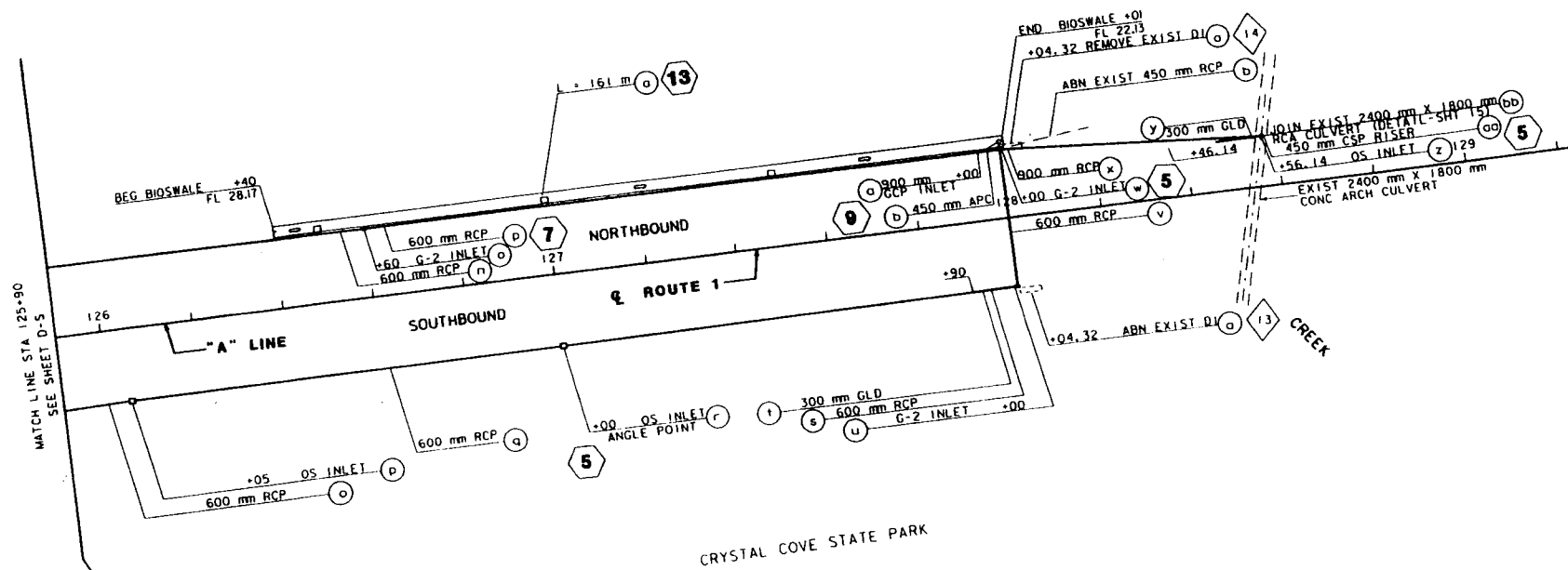
PLANS APPROVAL DATE

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MUDDY



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DRAINAGE PLAN
SCALE 1:500

D-6



DIST	COUNTY	ROUTE	PLAN NUMBER	TOTAL PROJECT	SHEETS
12	ORA	1		19.5 / 21.6	

REGISTERED CIVIL ENGINEER

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DATE REVISED
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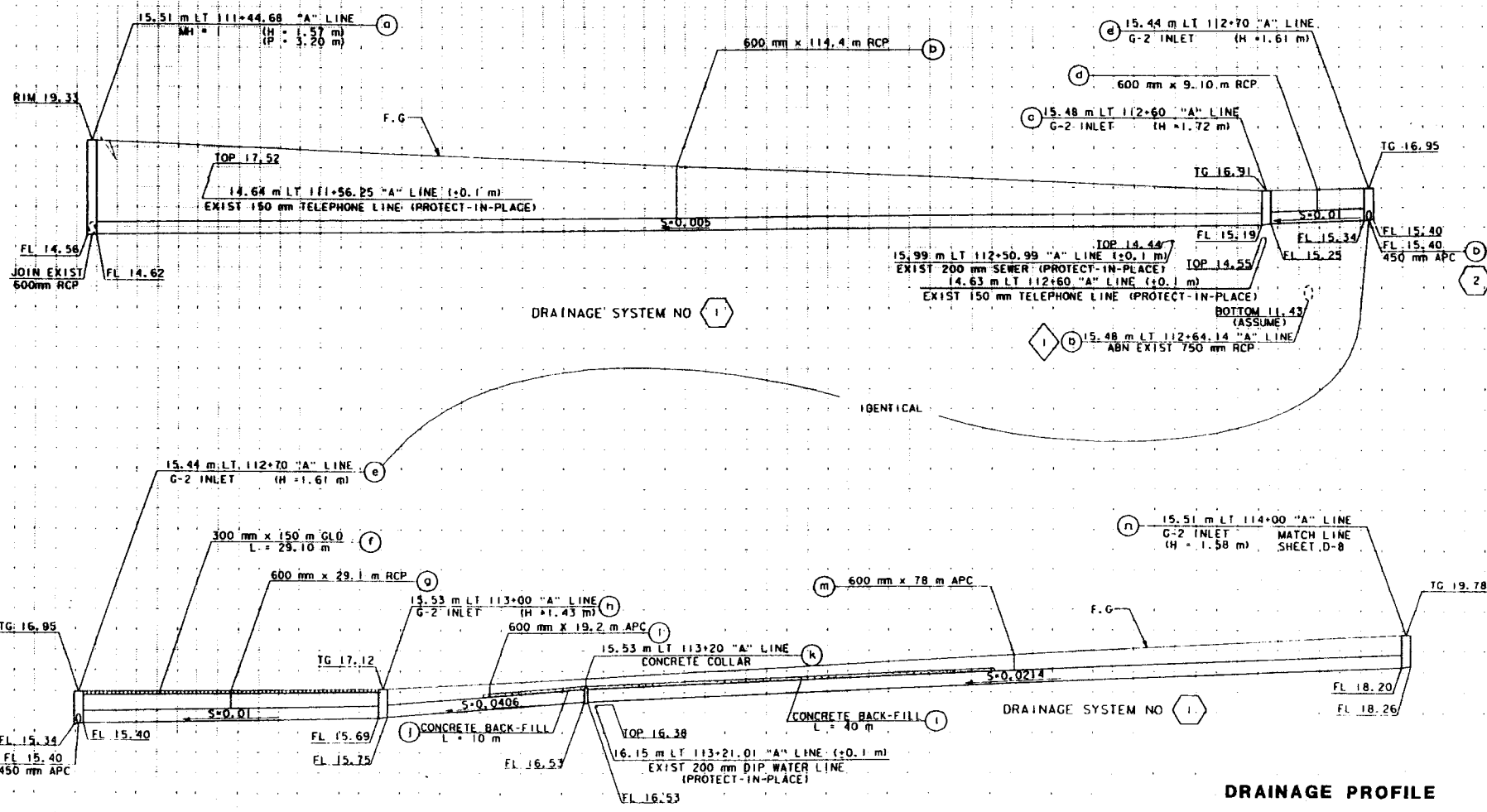
BALDEV BHALLA

HYDRAULICS

Station
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DRAINAGE PROFILE

SCALE: Horiz 1:200
Ver 1:100

D-7

8/23
EX. 3

HYDRALICS

BALDEV BHALLA
REGISTERED CIVIL ENGINEER
No. C-31350
Exp. 22-03-03
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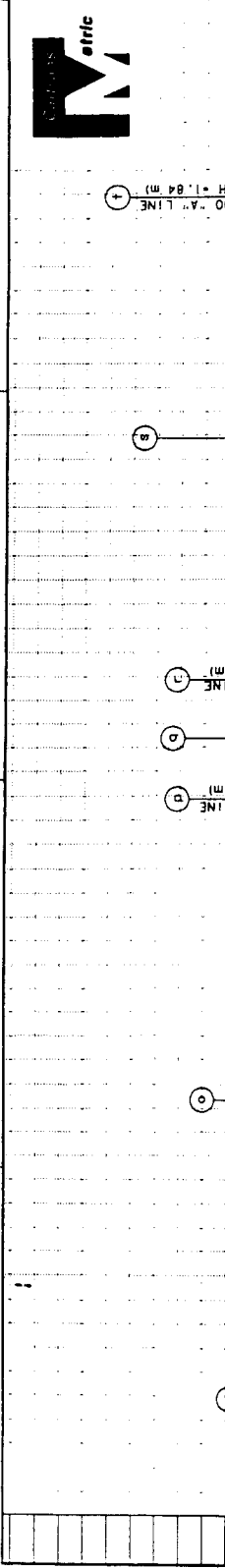
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

CONFIRMATION HAS A COPY SENT TO THE WEBSITE FOR THE HYDRA/MS/MS/MS/MS/MS

QUARTER POST SHEET TOTAL
TOTAL PROJECT NO. 19.5 / 21.6
SHEET NO. 1

DIST. COUNTY ROUTE
12 ORA 1



Station	18	19	20	21	22	23	24	25	26	27	28	29	30
FL	18.26	18.26	20.26	20.82	20.89	22.06	22.89	22.88	24.72	24.72	22.94	23.00	28.00
TG	19.78	19.78	20.26	20.82	20.89	22.06	22.89	22.88	24.72	24.72	22.94	23.00	28.00
INLET	G-2	G-2	G-2	G-2	G-2	G-2	G-2	G-2	G-2	G-2	G-2	G-2	G-2
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													
LINE	114+00	114+50	114+50	114+50	114+50	114+50	114+50	114+50	115+00	115+00	115+00	116+00	116+00
APC													
RCP		48.2 m	8.9 m	97.3 m	38.3 m								
APC													

DRAINAGE PROFILE
SCALE: HORIZ 1:200
VERT 1:100

ALL DIMENSIONS ARE IN METERS
UNLESS OTHERWISE SHOWN

D-8

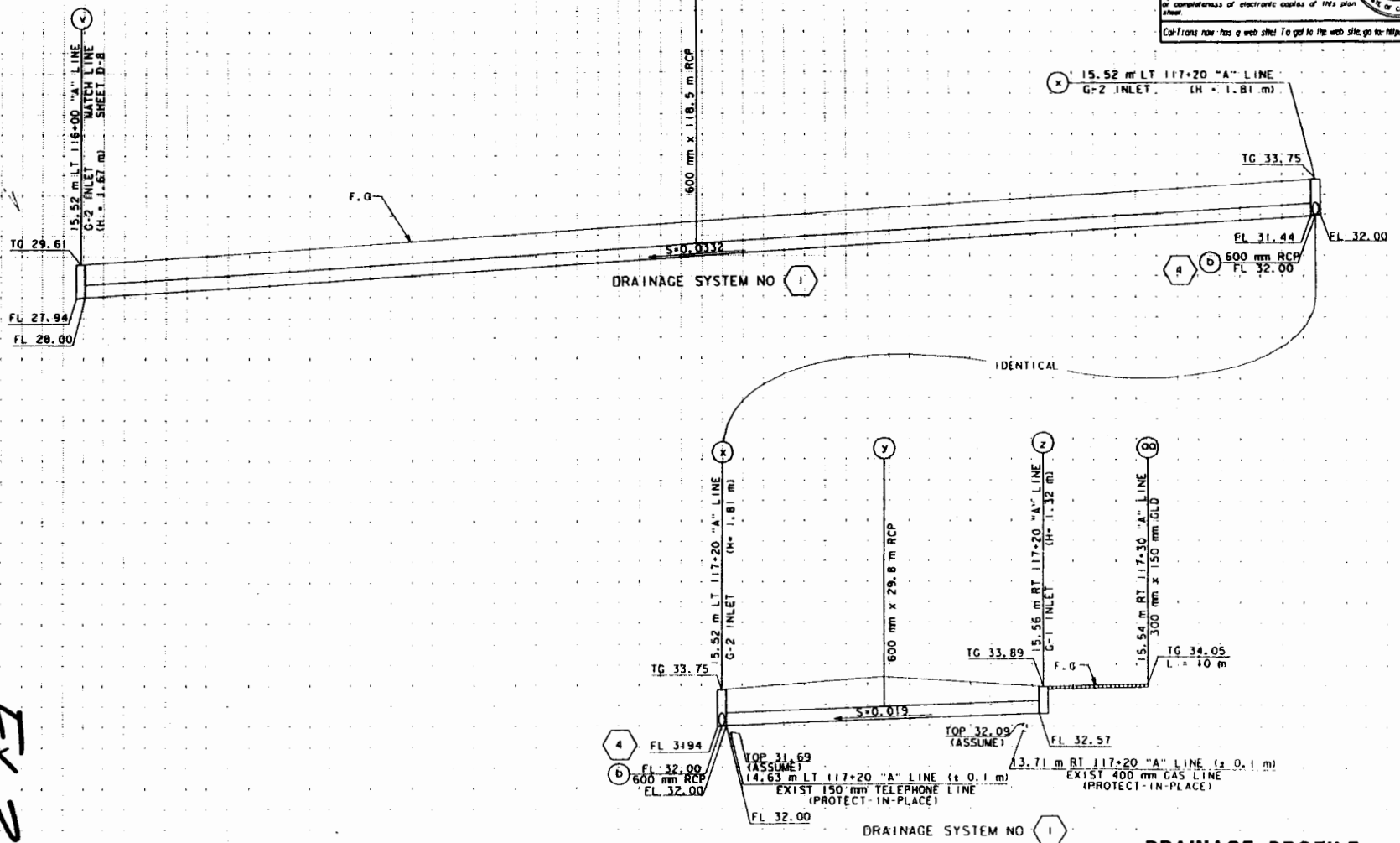
EX. 3
9/23

DESIGNED BY	HYDRALICS
CHECKED BY	BALDEV BHALLA
DATE REVISED	
REVISIONS	

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EX. 3
10/23

Station
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ft



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
12	ORA	I	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER

BALDEV BHALLA

C34350

9-30-03

CIVIL

STATE OF CALIFORNIA

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DRAINAGE PROFILE

SCALE: Hor 1:200
Ver 1:100



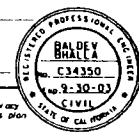
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

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DESIGNED BY
CHECKED BY
DATE REVISED BY

DESIGNED BY
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DATE REVISED BY

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CHECKED BY
DATE REVISED BY

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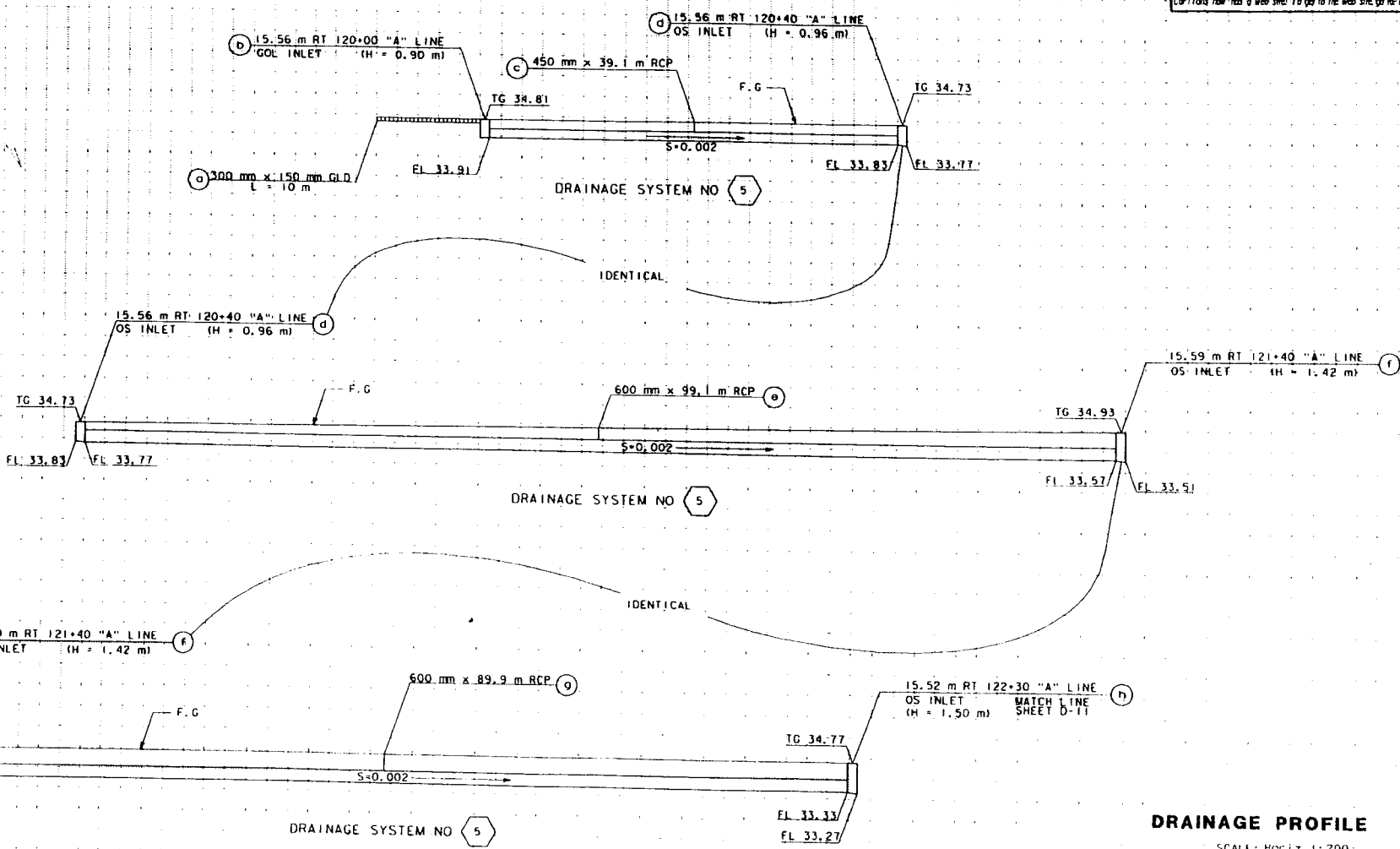
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ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DRAINAGE PROFILE
SCALE: Horiz 1:200
Vert 1:100

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11/23
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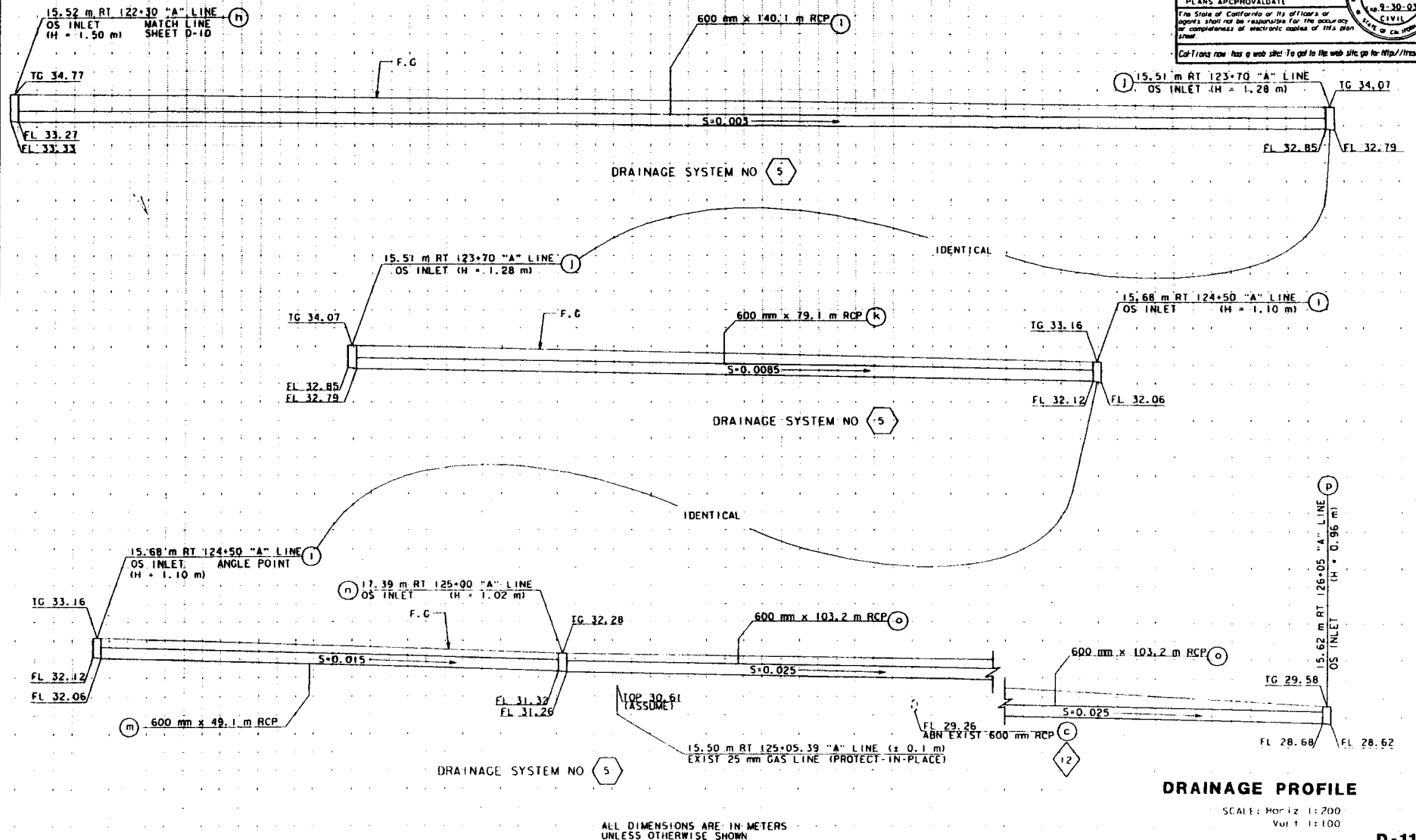
DIST	COUNTY	ROUTE	KILOMETER TOTAL PROJECT	POST SHEET No	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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DATE REVISED

CHECKED BY

BALDEV BHALLA

HYDRAULICS

DATE

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Station

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DRAINAGE PROFILE

12/23

Ex. 3

D-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
HYDRAULICS
BALDEV BHALLA
 PROJECT ENGINEER
 DATE REVISED BY _____ DATE REVISED BY _____
 DESIGNED BY _____ CHECKED BY _____
 CALCULATED BY _____



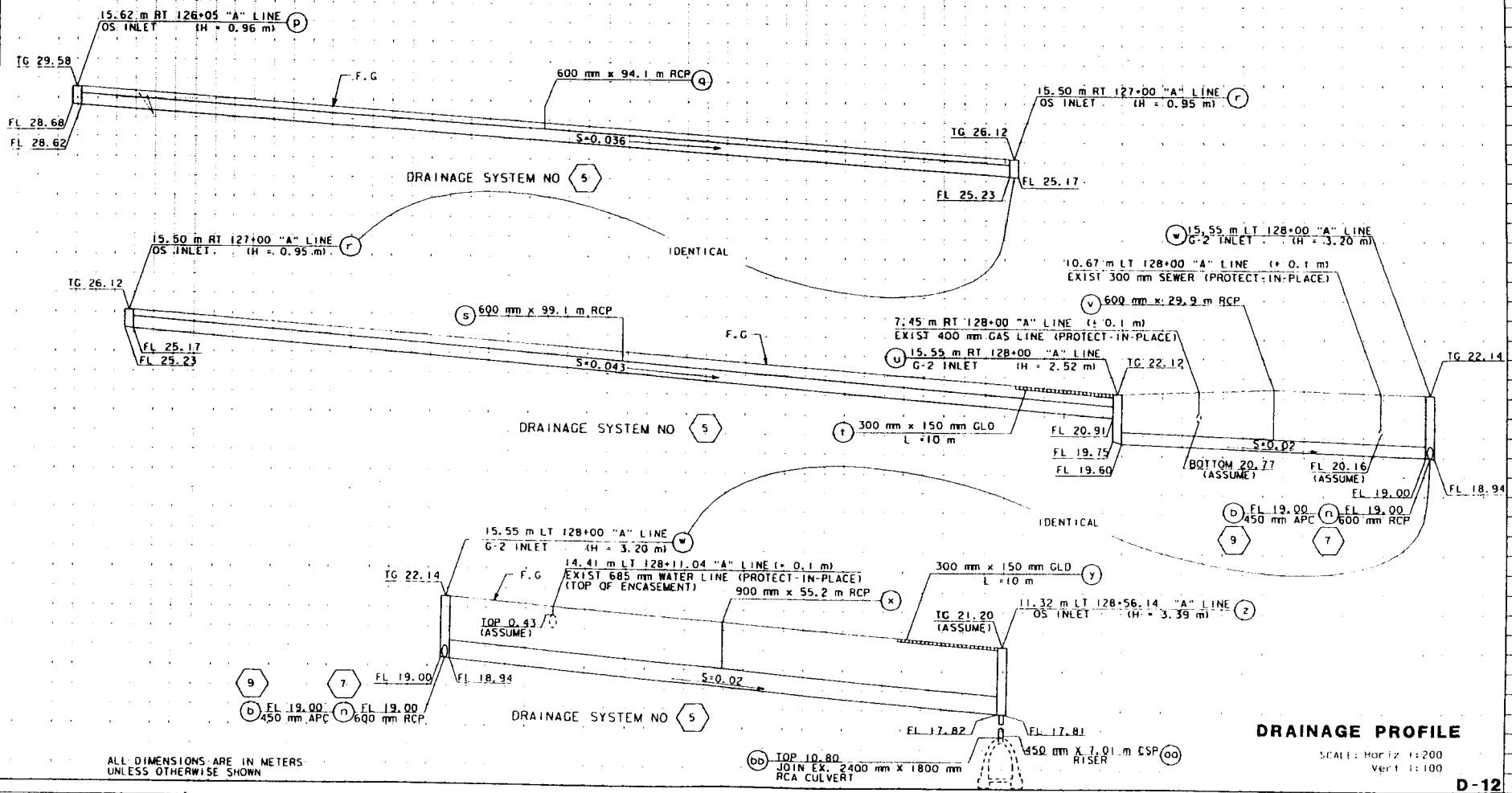
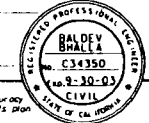
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE _____

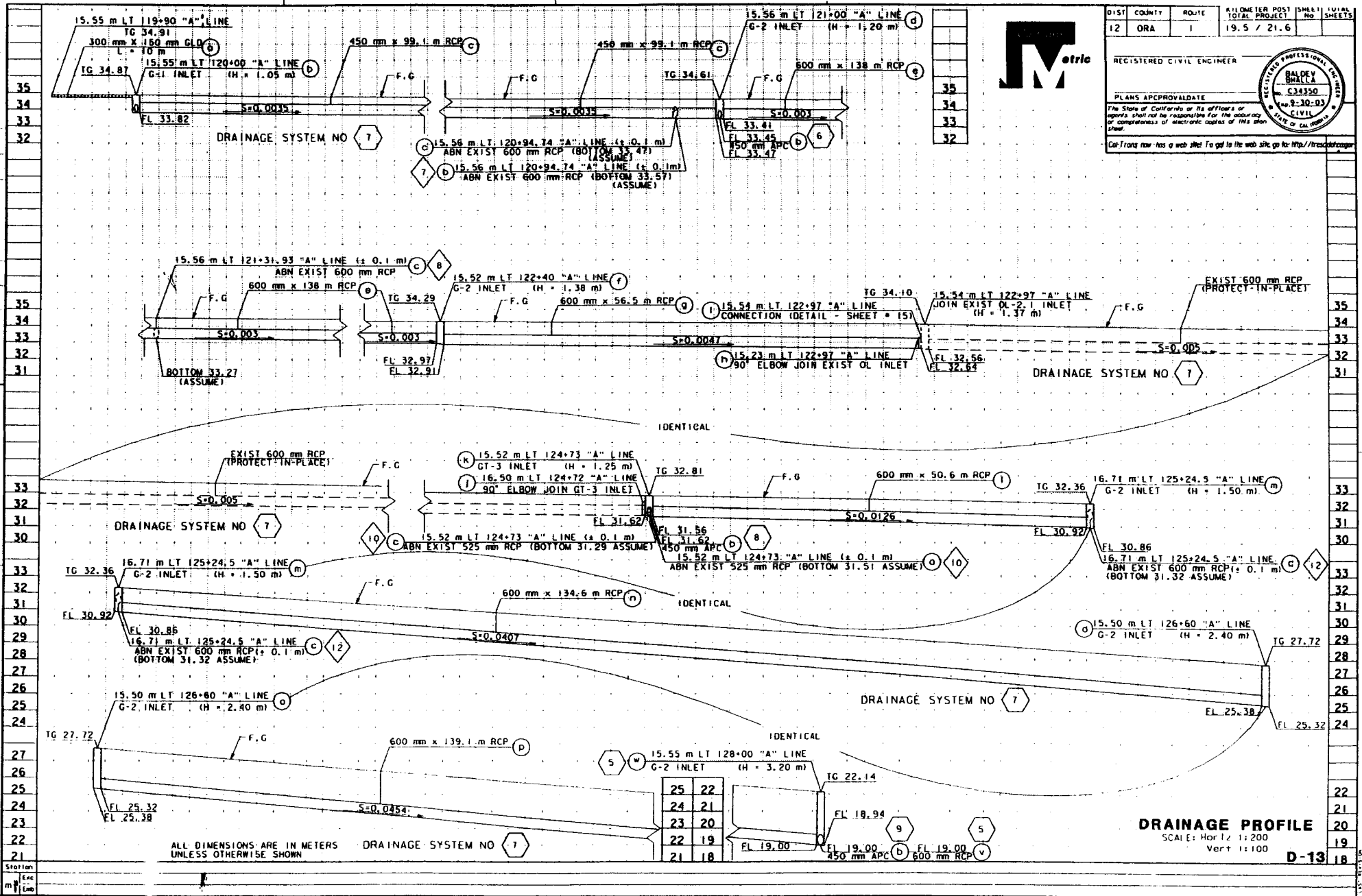
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13/23
 EX. 3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
HYDRAULICS
BALDEV BHALLA
 PROJECT ENGINEER
 CALCULATED/DESIGNED BY
 CHECKED BY
 DATE REVISIONS BY
 DATE REVISIONS BY



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER
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14/23
 5.3

FOR REPRODUCED PLANS ORIGINAL 0 20 40 60 80

PROJECT ENGINEER
 CALCULATED/DRAWN BY
 CHECKED BY
 DATE REVISIONS

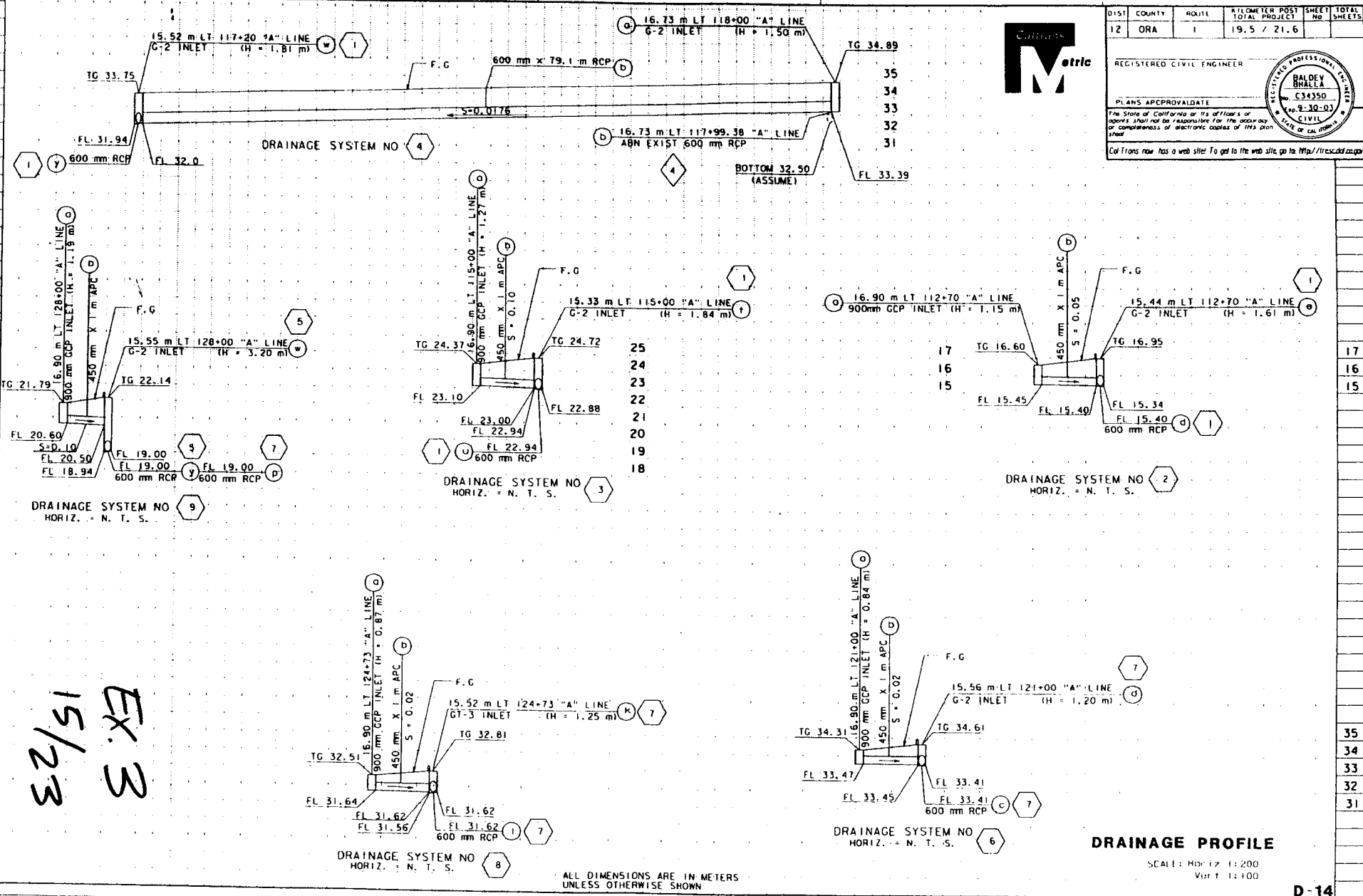
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BALDEV BHALLA

HYDRAULICS

Station
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 km

EX. 3
 15/23



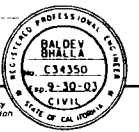
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12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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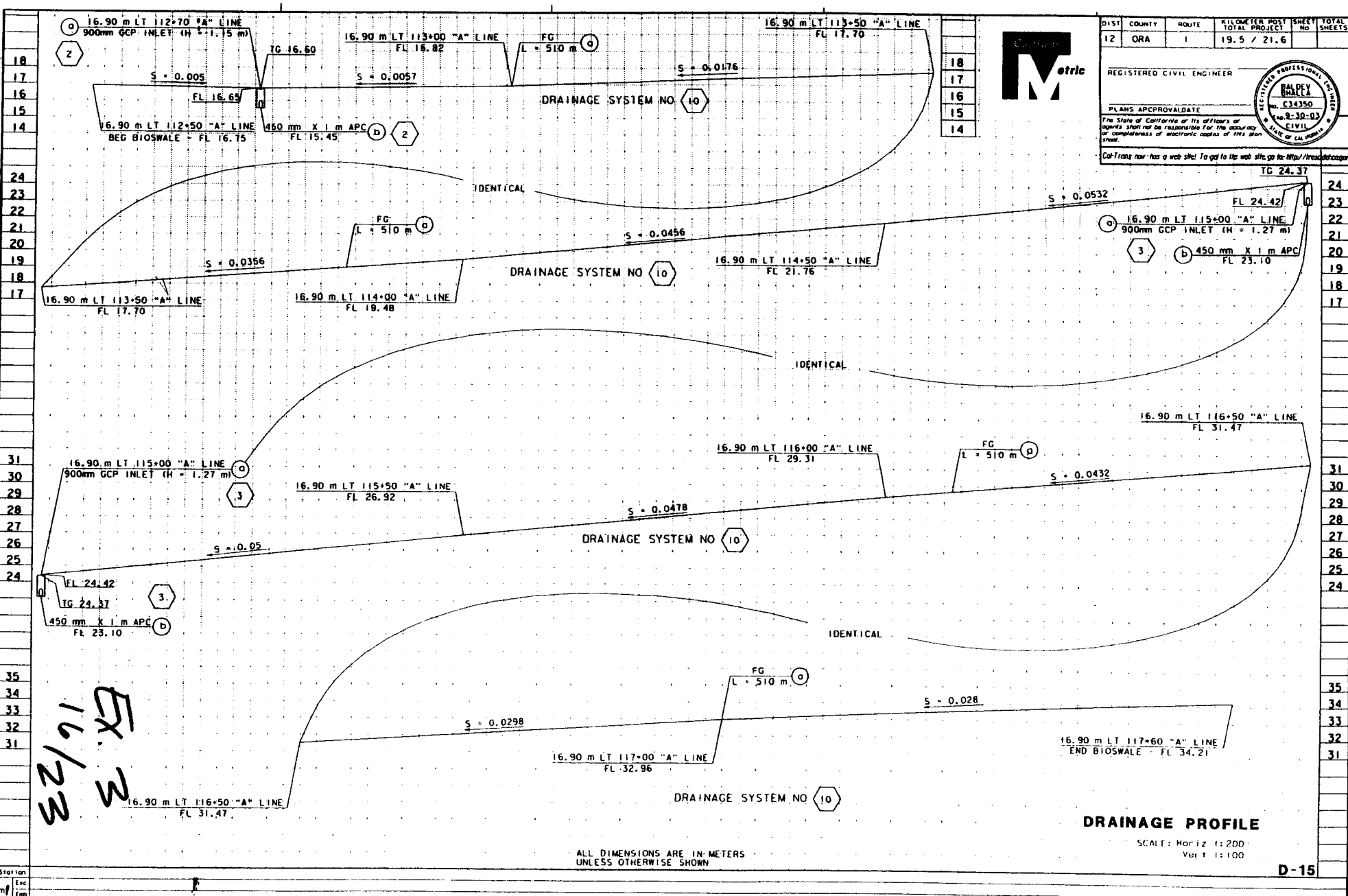
DRAINAGE PROFILE

SCALE: Horiz 1:200
 Vert 1:100

D-14

ALL DIMENSIONS ARE IN METERS
 UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Hydraulics
BALDEV BHALLA
 PROJECT ENGINEER
 DATE REVISIONS BY DATE REVISIONS BY
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 PROJECT ENGINEER
BALDEV BHALLA
 PROJECT ENGINEER
 DATE REVISIONS BY DATE REVISIONS BY
 CALCULATED/DESIGNED BY CHECKED BY



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

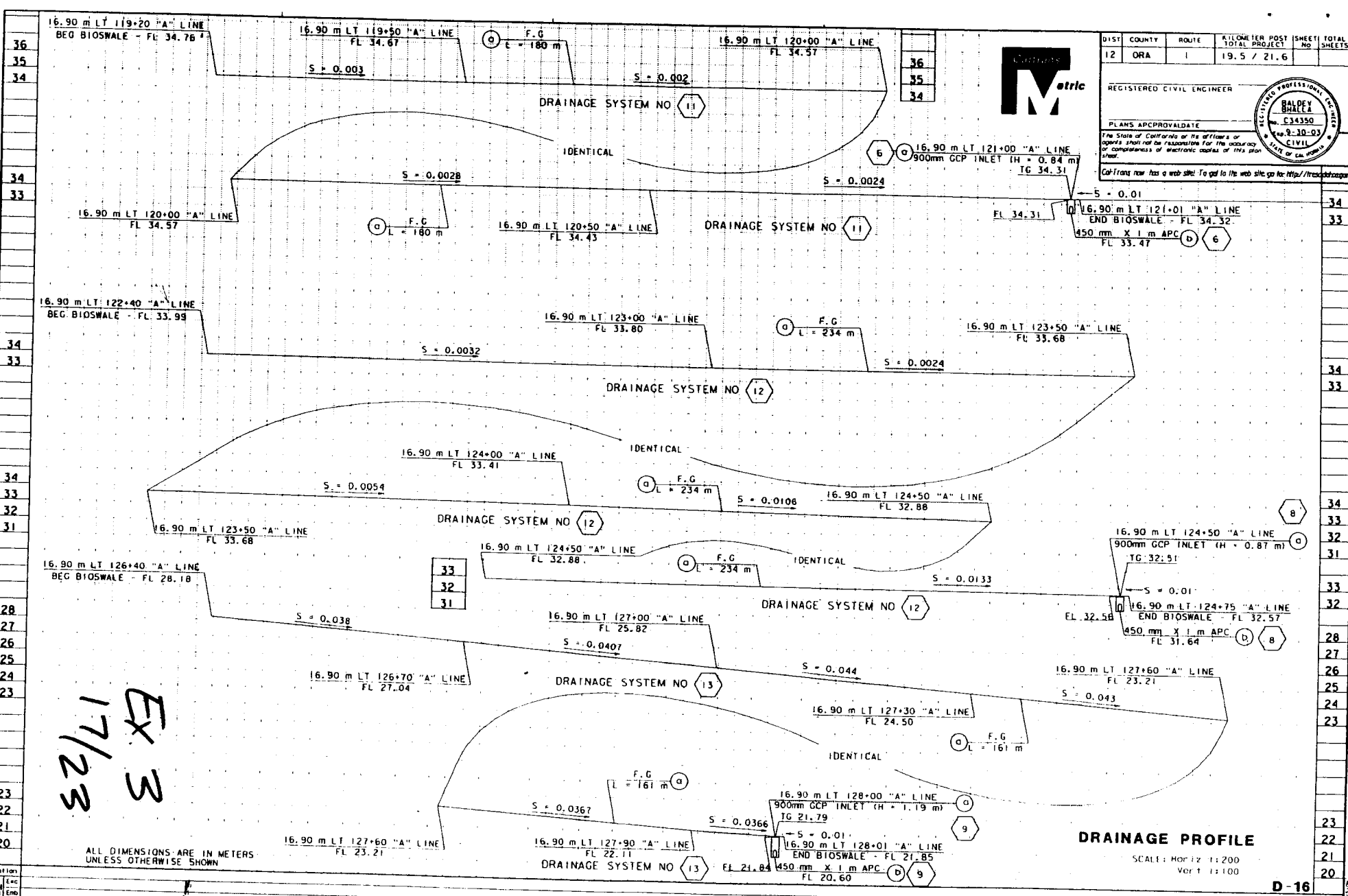
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REGISTERED PROFESSIONAL CIVIL ENGINEER
BALDEV BHALLA
 C34350
 No. R-30-03
 CIVIL
 STATE OF CALIFORNIA

EX. 3
 16/23

DESIGNED BY
 CHECKED BY
 BALDEV BHALLA
 HYDRAULICS
 G. Carrans



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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DRAINAGE PROFILE
 SCALE: Horiz 1:200
 Vert 1:100

D-16

EX 3
 17/23

ALL DIMENSIONS ARE IN METERS
 UNLESS OTHERWISE SHOWN

FOR REPRODUCED PLANS ORIGINAL 0 20 40 60 80

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CHECKED BY
DATE REVISED

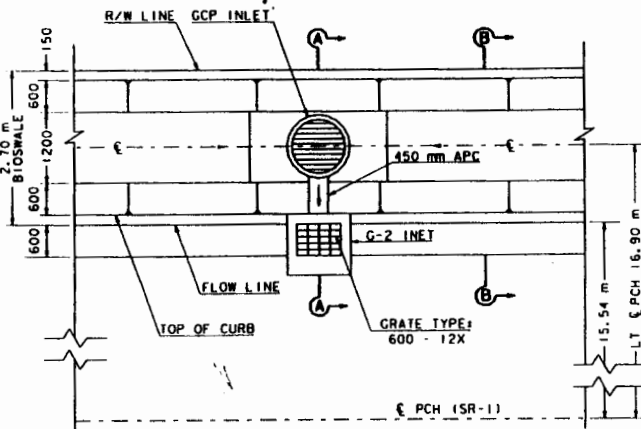
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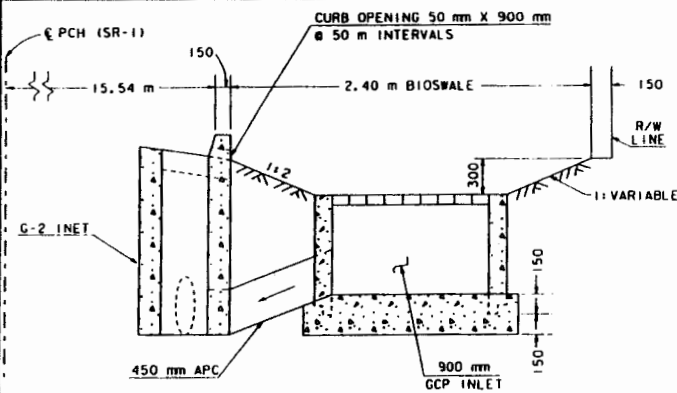
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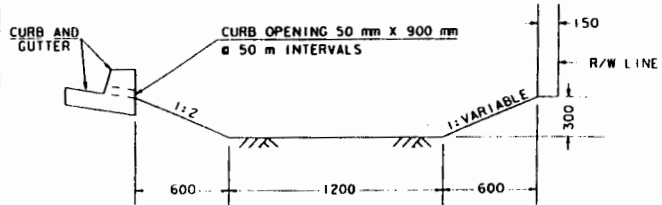
BIOSWALE DETAIL



PLAN



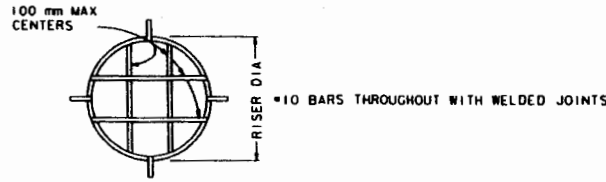
SECTION A-A



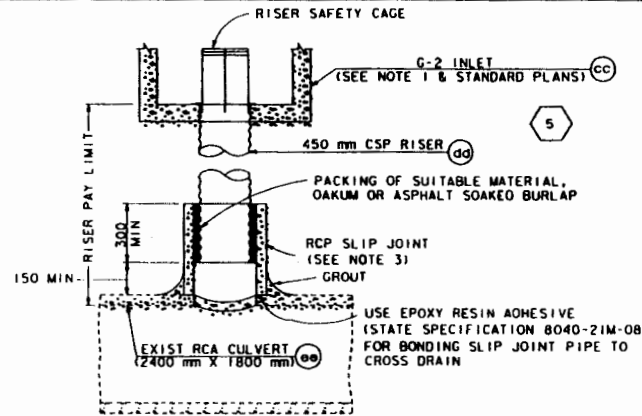
SECTION B-B

CSP RISER DETAILS

CONNECTION FOR DRAINAGE INLET TO EXIST RCA CULVERT

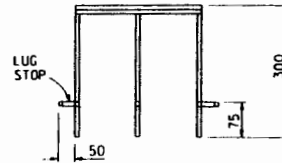


PLAN



ELEVATION

RISER SAFETY CAGE DETAIL



ELEVATION

NOTES:

- STRUCTURE AT TOP OF RISER MAY BE ANY STANDARD DRAINAGE INLET OR PIPE INLET.
- GALVANIZING: SEE STANDARD SPECIFICATIONS OR SPECIAL PROVISION.
- DIAMETER OF SLIP JOINT TO BE 75 mm GREATER THAN DIAMETER OF RISER.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

FOR REFERRED PLANS ORIGINAL 0 20 40 60 80



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
12	ORA	1	19.5 / 21.6		

REGISTERED CIVIL ENGINEER

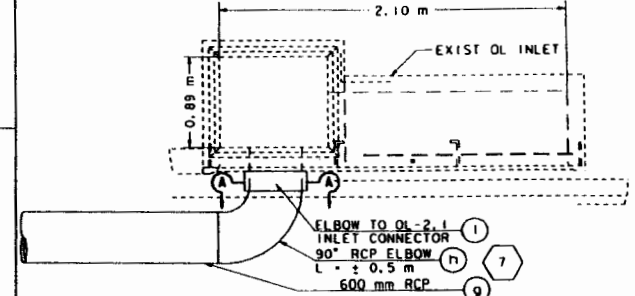
PLANS APPROVAL DATE

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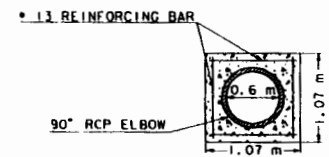
Caltrans now has a web site! To get to the web site, go to: <http://www.dot.ca.gov>



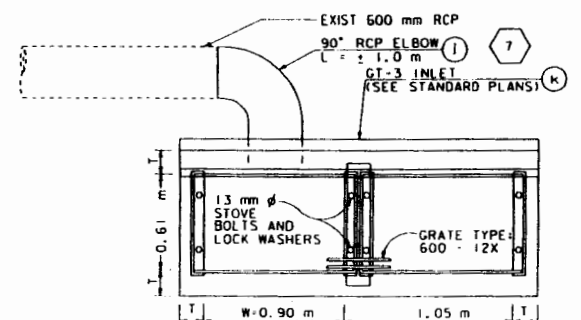
ELBOW CONNECTION DETAILS



PLAN



SECTION A-A



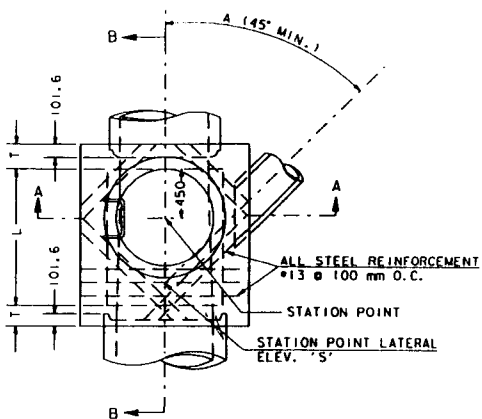
PLAN

DRAINAGE DETAILS

NO SCALE

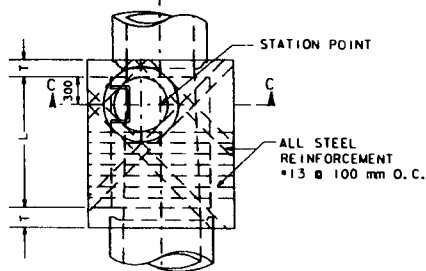
18/23
EX. 3

MANHOLE NO 1 DETAILS



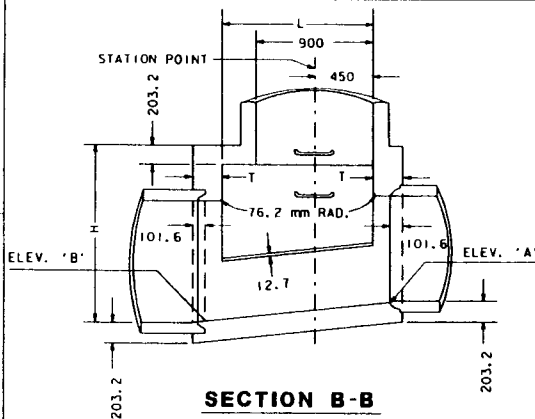
PLAN

(SHAFT NOT SHOWN)

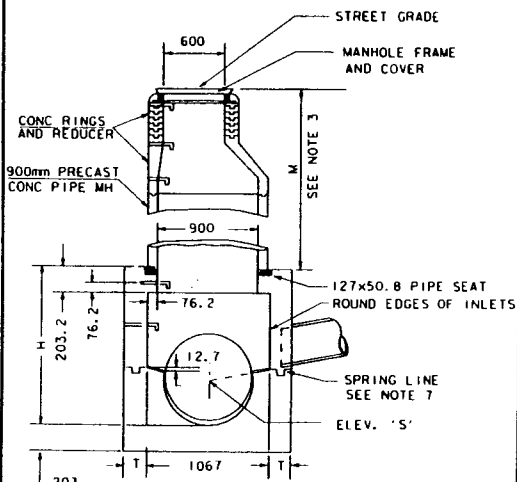


DETAIL N

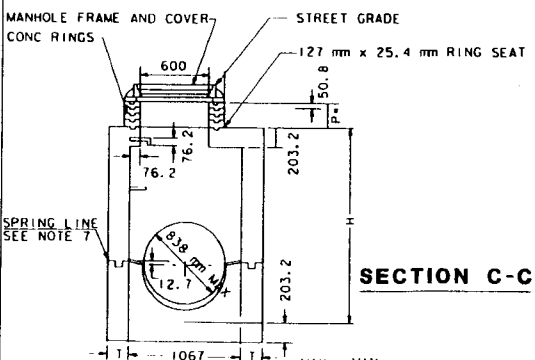
(SHAFT NOT SHOWN)



SECTION B-B



SECTION A-A



SECTION C-C

	MAX	MIN
FOR PAVED STREETS	279	216
FOR UNPAVED STREETS	406	381



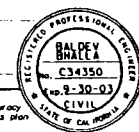
12	ORA	1	19.5 / 21.6
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REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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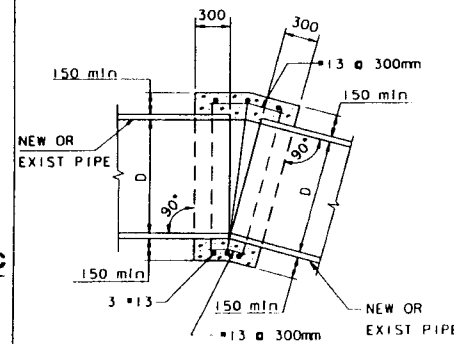


NOTES

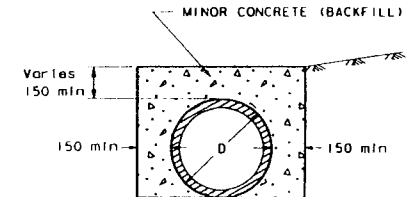
- HEIGHT H (SEC. A-A AND SEC. B-B) SHALL BE NOT LESS THAN 1460 mm, BUT MAY BE INCREASED PROVIDED THAT THE VALUE OF M SHALL BE NOT LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SEC. C-C) SEE NOTE 4.
- LENGTH L SHALL BE 1200 mm UNLESS OTHERWISE SHOWN ON DRAINAGE PLAN.
- SHAFT SHALL BE CONSTRUCTED AS PER SEC. C-C AND DETAIL N WHEN DEPTH M FROM STREET GRADE TO TOP OF BOX IS LESS THAN 870 mm FOR PAVED STREETS OR 1060 mm FOR UNPAVED STREETS.
- DEPTH P MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 150 mm WHEN LARGER VALUES OF P WOULD REDUCE H (IN SEC. C-C) TO 1060 mm OR LESS.
- T SHALL BE 200 mm FOR VALUES OF H UP TO AND INCLUDING 2440 mm. T SHALL BE 254 mm FOR H OVER 2440 mm.
- UNLESS OTHERWISE SHOWN, STEPS SHALL BE PLACED 305mm ON CENTERS. THE LOWEST STEP SHALL BE NOT MORE THAN 406 mm ABOVE THE EDGE AT SIDE OF MANHOLE FLOOR.
- BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY.
- REINFORCING STEEL SHALL BE 38 mm CLEAR FROM FACE OF CONCRETE
- FLOOR OF MANHOLE SHALL BE STEEL-TROWELED TO SPRING LINE.
- RINGS, REDUCER, AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN 1:2 CEMENT MORTAR AND NEATLY PAINTED OR WIPED INSIDE THE SHAFT.
- MANHOLE FRAME AND COVER PER STANDARD PLAN B7-11 DETAIL U45.
- STEP DETAIL PER STANDARD PLAN D72 AND D75.
- UNLESS DENOTED OTHERWISE, ALL DIMENSIONS FOR MEASUREMENT OF LENGTH SHOWN ON THIS PLAN ARE IN MILLIMETERS.

MANHOLE NO.1 DATA

DRAINAGE SYSTEM NO.	UNIT	MH TYPE	H (m)	L (m)	M or P (m)	ELEV "S"	ELEV "A"	ELEV "B"
1	a	1	1.57	1.2	3.20	14.61	14.56	14.51



CONCRETE COLLAR DETAIL



MINOR CONCRETE (BACKFILL)

DRAINAGE DETAILS

NO SCALE

D-18

DESIGNED BY: BALDEV BHALLA
CHECKED BY:

BALDEV BHALLA

HYDRAULICS

19/23

DATE REVISIED BY
 DATE REVISIED BY
 PROJECT ENGINEER
BALDEV BHALLA
 DESIGNED BY
 CHECKED BY
 DATE REVISIED BY

REGISTERED CIVIL ENGINEER
 BALDEV BHALLA
 No. 334350
 No. 2-20-03
 CIVIL
 The State of Colorado on this day has approved the accuracy of the work of the above named engineer in accordance with the provisions of the Public Health Act of 1908.
 REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE
 19.5 / 21.6
 TOTAL SHEETS
 12
 PROJECT NO.
 19.5 / 21.6
 ROUTE
 DIST. COUNTY
 Orto

STATION

DESCRIPTION

MAXIMUM COVER

HEIGHT OF INLET ("H") (N)

PIPE JOINT CLASSIFICATION

PIPE MANHOLE

GRADED LINE DRAIN (GLD) 300 mm X 150 mm

DRAINAGE SYSTEM NO.	DRAINAGE UNIT	DRAINAGE PLAN SHEET NO.	STATION	DESCRIPTION	MAXIMUM COVER	HEIGHT OF INLET ("H") (N)	PIPE JOINT CLASSIFICATION	PIPE MANHOLE	GRADED LINE DRAIN (GLD) 300 mm X 150 mm	STEEL PIPE RISER (3.50 mm THICK)	450 mm BITUMINOUS COATED CORRUGATED	900 mm PRECAST CONCRETE PIPE INLET (GCP)	MINOR CONCRETE (BACKFILL)	DITCH EXCAVATION (BIOSMALE)	REINFORCED CONCRETE PIPE (RCP)	ALTERNATIVE PIPE CULVERTS (APC)	6.4 mm CHECKERED PLATE COVER & FRAME (N)	FRAME & GRATE (900R) (N)	FRAME & GRATE (600-12X) (N)	MANHOLE FRAME & COVER (N)	MISCELLANEOUS IRON AND STEEL	MINOR CONCRETE (MINOR STRUCTURES)	DRAINAGE PLAN SHEET NO.	DRAINAGE UNIT	DRAINAGE SYSTEM NO.	
1	D	D-1	15.51 m LT STA 111+44.68	MANHOLE # 1	3.20	1.57	S	3.20																		1
2	D	D-1	15.51 m LT STA 111+44.68 TO 15.48 m LT STA 112+60	600 mm RCP	4.10	1.57	S								114.4	600 mm						2.39	D-1	D	2	
3	D	D-1	15.48 m LT STA 112+60	G-2 INLET	1.04	1.72	S								9.1	600 mm						2.12	D-1	D	3	
4	D	D-1	15.44 m LT STA 112+70	G-2 INLET	1.61	1.61	S								29.1	600 mm						2.01	D-1	D	4	
5	D	D-1	15.44 m LT STA 112+70 TO 15.53 m LT STA 113+00	GRADED LINE DRAIN	0.93	0.93	S		29.1						29.1	450 mm						1.83	D-1	D	5	
6	D	D-1	15.44 m LT STA 112+70 TO 15.53 m LT STA 113+00	600 mm RCP	0.75	1.43	S								19.2	600 mm						0.54	D-1	D	6	
7	D	D-1	15.53 m LT STA 113+00 TO 15.51 m LT STA 113+20	G-2 INLET	0.95	1.58	S								78	450 mm						1.98	D-2	D	7	
8	D	D-1	15.53 m LT STA 113+00 TO 15.53 m LT STA 113+60	CONC. BACKFILL	0.95	1.58	S								48.2	600 mm						2.20	D-2	D	8	
9	D	D-1	15.53 m LT STA 113+00 TO 15.51 m LT STA 114+00	CONC. COLLAR	0.90	1.80	S								8.9	600 mm						2.17	D-2	D	9	
10	D	D-1	15.51 m LT STA 114+00 TO 15.56 m LT STA 114+50	CONC. BACKFILL	1.12	1.80	S								38.3	600 mm						2.24	D-2	D	10	
11	D	D-2	15.56 m LT STA 114+50 TO 15.56 m LT STA 114+60	G-2 INLET	1.09	1.77	S								97.3	600 mm						2.07	D-2	D	11	
12	D	D-2	15.56 m LT STA 114+60 TO 15.53 m LT STA 115+00	G-2 INLET	1.16	1.84	S								118.5	600 mm						2.21	D-2	D	12	
13	D	D-2	15.53 m LT STA 115+00 TO 15.52 m LT STA 116+00	G-2 INLET	0.99	1.67	S								29.8	600 mm						1.73	D-3	D	13	
14	D	D-2	15.52 m LT STA 116+00 TO 15.51 m LT STA 117+20	G-2 INLET	1.33	1.81	S								97.2	600 mm						2.49	D-3	D	14	
15	D	D-2	15.51 m LT STA 117+20 TO 15.56 m RT STA 117+20	G-2 INLET	1.32	1.81	S								49.6	600 mm						2.39	D-3	D	15	
16	D	D-2	15.56 m RT STA 117+20 TO 15.54 m RT STA 117+40	GRADED LINE DRAIN	10.0	1.32	S	10.0							20	450 mm						23.49	D-3	D	16	
17	00	00							39.1						49.6	900 mm						23.49	00	00	17	
SHEET TOTAL																										

THIS PLAN ACCURATE FOR DRAINAGE ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

FOR REFERRED PLANS ORIGINAL

INDICATES NOT A SEPARATE PAY ITEM. FOR INFORMATION ONLY

20/23

EX B

DRAINAGE QUANTITIES

D-19

STATE OF CALIFORNIA · DEPARTMENT OF TRANSPORTATION
Caltrans
PROJECT ENGINEER
BALDEV BHALLA
HYDRAULICS
 CALCULATED/DESIGNED BY
 CHECKED BY
 DATE REVISED BY
 DATE REVISED



DIST: 12 COUNTY: Ora HIGHWAY: 1 PROJECT MILEPOST: 19.5 / 21.6 SHEET NO: TOTAL SHEETS: 1

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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DRAINAGE QUANTITIES

LINE NO.	DRAINAGE SYSTEM NO.	DRAINAGE UNIT	DRAINAGE PLAN SHEET NO.	MINOR CONCRETE (MINOR STRUCTURES)	MISCELLANEOUS IRON AND STEEL	MANHOLE FRAME & COVER (IN)	FRAME & GRATE (600-12X) (IN)	FRAME & GRATE (900R) (IN)	6.4 mm CHECKERED PLATE COVER & FRAME (IN)	450 mm ALTERNATE PIPE COLLECTOR'S APC	600 mm	450 mm	600 mm	900 mm	1.5m EXCAVATION & DSWALE	1.5m CONC. BACKFILL	900 mm PRECAST CONCRETE PIPE INLET (GCP)	450 mm BUBBLY CORRUGATED STEEL PIPE 1.50 mm THICK	GRATED LINE DRAIN (GLD) 300 mm X 150 mm	900 mm PRECAST CONCRETE PIPE MANHOLE	PIPE JOINT CLASSIFICATION	HEIGHT OF INLET (H) (IN)	MAXIMUM COVER	DESCRIPTION	STATION	DRAINAGE PLAN SHEET NO.	DRAINAGE UNIT	DRAINAGE SYSTEM NO.	
2		D-1	0.50	107													1.15				S	1.15		900 mm GCP INLET	16.90 m LT STA 112+70	D-1	a	2	
3		D-2	0.50	107													1.27				S	1.27	1.08	450 mm APC	16.90 m LT STA 112+70 TO 15.44 m LT STA 112+70	D-2	a	3	
4		D-3	1.90	108																	S	1.50		900 mm GCP INLET	16.90 m LT STA 115+00	D-3	a	4	
5		D-4	0.50	107													0.84				S	1.13	0.67	450 mm APC	16.90 m LT STA 115+00 TO 15.33 m LT STA 115+00	D-4	a	6	
6		D-4	0.78	108																	S	1.50		G-2 INLET	16.73 m LT STA 118+00	D-3	a	4	
7			1.60	108																	S	1.13	0.84	600 mm RCP	16.73 m LT STA 118+00 TO 15.51 m LT STA 117+20	D-4	a	6	
8			1.79	108																	S	0.84	0.67	900 mm GCP INLET	16.90 m LT STA 121+00	D-4	a	6	
9		D-5	0.30																		S	1.05		450 mm APC	16.90 m LT STA 121+00 TO 15.56 m LT STA 121+00	D-4	a	7	
10			1.58	288																	S	0.67		GRATED LINE DRAIN	15.57 m LT STA 119+90 TO 15.56 m LT STA 120+00	D-4	a	7	
11			1.90	108																	S	1.20		G-1 INLET	15.55 m LT STA 120+00	D-5	a	8	
12			2.80	108																	S	1.38		450 mm RCP	15.55 m LT STA 120+00 TO 15.56 m LT STA 121+00	D-5	a	8	
13		D-6	0.50	107																	S	0.86		G-2 INLET	15.54 m LT STA 121+00	D-5	a	8	
SHEET TOTAL			15.15	1471																									

(N) INDICATES NOT A SEPARATE PAY ITEM. FOR INFORMATION ONLY.

THIS PLAN ACCURATE FOR DRAINAGE ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DRAINAGE QUANTITIES

EX. 3
21/23

DATE REVISIONS
 DATE REVISSED
 CALCULATED/DESIGNED BY
 CHECKED BY
 PROJECT ENGINEER
 BALDEV BHALLA
 HYDRAULICS
 SECTION CHIEF OF HYDRAULICS
 STATE OF CALIFORNIA

DRAINAGE QUANTITIES FOR REMOVAL / ABANDON



DIST	COUNTY	ROUTE	KILOMETER TOTAL PROJECT	POST PROJECT	SHEET No	TOTAL SHEETS
12	Ora	1	19.5 / 21.6			

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PLANS APPROVAL DATE

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DRAINAGE SYSTEM NO.	DRAINAGE UNIT	DRAINAGE PLAN SHEET NO.	REMOVE INLET	REMOVE CULVERT	ABANDON CULVERT	ABANDON INLET / CLEANOUT	SAND BACKFILL	DESCRIPTION	STATION	DRAINAGE PLAN SHEET NO.	DRAINAGE UNIT	DRAINAGE SYSTEM NO.
			FA	FB	FA	FA						
1	a	D-1						REMOVE INLET	15.54 m LT STA 112+64.14	D-1	a	1
	b						5.40	ABANDON 750 mm RCP	15.54 m LT STA 112+64.14 TO 15.77 m RT STA 112+78.37		b	
	c							ABANDON 750 mm RCP	15.77 m RT STA 112+78.37 TO EXIST CREEK		c	
2	a	D-2						REMOVE INLET	15.54 m LT STA 114+48.87	D-2	a	2
	b						2.50	ABANDON 450 mm RCP	15.54 m LT STA 114+48.87 TO 15.54 m LT STA 114+64.72		b	
	c							REMOVE INLET	15.54 m LT STA 114+64.72		c	
3	a	D-3						ABANDON INLET	15.54 m RT STA 117+15.50	D-3	a	3
	b							REMOVE INLET	16.76 m LT STA 117+99.39		b	
4	a	D-3						ABANDON 600 mm RCP	16.76 m LT STA 117+99.39 TO 16.76 m RT STA 118+04.56	D-3	a	4
	b						9.30	ABANDON INLET	16.76 m RT STA 118+04.56		b	
	c							ABANDON 600 mm RCP	16.76 m RT STA 118+04.56 TO 49.68 m RT STA 118+08.23		c	
5	a	D-3						ABANDON 450 mm RCP	24.08 m LT STA 119+03.94 TO 16.76 m LT STA 119+03.94	D-3	a	5
	b						1.20	ABANDON INLET	16.76 m LT STA 119+03.94		b	
	c							ABANDON 450 mm RCP	16.76 m LT STA 119+03.94 TO 15.54 m RT STA 119+04.24		c	
6	a	D-4						ABANDON INLET	15.54 m RT STA 119+04.24	D-4	a	6
	b							REMOVE 450 mm RCP	15.54 m RT STA 120+59.08 TO 15.54 m RT STA 120+74.34		b	
	c							REMOVE INLET	15.54 m RT STA 120+74.34		c	
7	a	D-4						ABANDON 450 mm RCP	15.54 m RT STA 120+74.34 TO 16.15 m RT STA 120+94.74	D-4	a	7
	b						3.30	ABANDON 600 mm RCP	15.54 m RT STA 120+94.74 TO 16.15 m RT STA 120+94.74		b	
	c						2.24	REMOVE INLET	24.08 m LT STA 120+94.74 TO 15.54 m LT STA 120+94.74		c	
8	a	D-4						ABANDON 600 mm RCP	15.54 m LT STA 120+94.74 TO 16.15 m RT STA 120+94.74	D-4	a	8
	b						9.00	ABANDON 600 mm RCP	24.08 m LT STA 121+31.93 TO 16.46 m LT STA 121+31.93		b	
	c						2.10	ABANDON CLEANOUT	16.46 m LT STA 121+31.93		c	
9	a	D-4						ABANDON 600 mm RCP	16.46 m LT STA 121+31.93 TO 17.68 m RT STA 121+26.75	D-4	a	9
	b						9.14	REMOVE INLET	15.54 m LT STA 121+96.24		b	
	c						17.58	ABANDON 525 mm RCP	24.08 m LT STA 124+73.31 TO 15.54 m LT STA 124+73.31		c	
10	a	D-5						REMOVE INLET	15.54 m LT STA 124+73.31	D-5	a	10
	b						1.20	ABANDON 525 mm RCP	15.54 m LT STA 124+73.31 TO 17.37 m LT STA 124+74.22		b	
11	a	D-5						ABANDON INLET	17.37 m RT STA 124+74.22 TO 19.51.10 m RT STA 124+84	D-5	a	11
	b						6.50	REMOVE 750 mm RCP	17.37 m RT STA 124+74.22 TO 19.51.10 m RT STA 124+84		b	
	c							REMOVE INLET	17.37 m RT STA 125+24.67		c	
	d							REMOVE 600 mm RCP	17.37 m RT STA 125+24.67 TO 25.91 m RT STA 125+24.21		d	
12	a	D-5						ABANDON 600 mm RCP	24.08 m LT STA 125+24.51 TO 16.76.10 m LT STA 125+24.51	D-5	a	12
	b						1.00	REMOVE INLET	16.76 m LT STA 125+24.51		b	
	c						1.07	ABANDON 600 mm RCP	16.76 m LT STA 125+24.51 TO 13.11 m LT STA 125+26.95		c	
13	a	D-6						ABANDON INLET	16.15 m RT STA 128+04.32	D-6	a	13
	b						2.40	REMOVE INLET	16.15 m LT STA 128+04.32		b	
	c							ABANDON 450 mm RCP	16.15 m LT STA 128+04.32 TO 17.68 m LT STA 128+19.56		c	
GRAND TOTAL			12	3	18	7	78.83					

THIS PLAN ACCURATE FOR DRAINAGE ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DRAINAGE QUANTITIES
D-22

FOR REDUCED PLANS ORIGINAL 0 20 40 60 80

EX. 3
 23/23



Design Considerations

- Tributary Area
- Area Required
- Slope
- Water Availability

Description

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 through filtering by the vegetation in the channel, filtering through a 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 stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems.

California Experience

Caltrans constructed and monitored six vegetated swales in southern California. These swales were generally effective in reducing the volume and mass of pollutants in runoff. Even in the areas where the annual rainfall was only about 10 inches/yr, the vegetation did not require additional irrigation. One factor that strongly affected performance was the presence of large numbers of gophers at most of the sites. The gophers created earthen mounds, destroyed vegetation, and generally reduced the effectiveness of the controls for TSS reduction.

Advantages

- If properly designed, vegetated, and operated, swales can serve as an aesthetic, potentially inexpensive urban development or roadway drainage conveyance measure with significant collateral water quality benefits.

Targeted Constituents

- | | |
|------------------|---|
| ✓ Sediment | ▲ |
| ✓ Nutrients | ● |
| ✓ Trash | ● |
| ✓ Metals | ▲ |
| ✓ Bacteria | ● |
| ✓ Oil and Grease | ▲ |
| ✓ Organics | ▲ |

Legend (Removal Effectiveness)

- | | |
|----------|--------|
| ● Low | ■ High |
| ▲ Medium | |



- Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible.

Limitations

- Can be difficult to avoid channelization.
- May not be appropriate for industrial sites or locations where spills may occur
- Grassed swales cannot treat a very large drainage area. Large areas may be divided and treated using multiple swales.
- A thick vegetative cover is needed for these practices to function properly.
- They are impractical in areas with steep topography.
- They are not effective and may even erode when flow velocities are high, if the grass cover is not properly maintained.
- In some places, their use is restricted by law: many local municipalities require curb and gutter systems in residential areas.
- Swales are more susceptible to failure if not properly maintained than other treatment BMPs.

Design and Sizing Guidelines

- Flow rate based design determined by local requirements or sized so that 85% of the annual runoff volume is discharged at less than the design rainfall intensity.
- Swale should be designed so that the water level does not exceed 2/3rds the height of the grass or 4 inches, whichever is less, at the design treatment rate.
- Longitudinal slopes should not exceed 2.5%
- Trapezoidal channels are normally recommended but other configurations, such as parabolic, can also provide substantial water quality improvement and may be easier to mow than designs with sharp breaks in slope.
- Swales constructed in cut are preferred, or in fill areas that are far enough from an adjacent slope to minimize the potential for gopher damage. Do not use side slopes constructed of fill, which are prone to structural damage by gophers and other burrowing animals.
- A diverse selection of low growing, plants that thrive under the specific site, climatic, and watering conditions should be specified. Vegetation whose growing season corresponds to the wet season are preferred. Drought tolerant vegetation should be considered especially for swales that are not part of a regularly irrigated landscaped area.
- The width of the swale should be determined using Manning's Equation using a value of 0.25 for Manning's n.

Construction/Inspection Considerations

- Include directions in the specifications for use of appropriate fertilizer and soil amendments based on soil properties determined through testing and compared to the needs of the vegetation requirements.
- Install swales at the time of the year when there is a reasonable chance of successful establishment without irrigation; however, it is recognized that rainfall in a given year may not be sufficient and temporary irrigation may be used.
- If sod tiles must be used, they should be placed so that there are no gaps between the tiles; stagger the ends of the tiles to prevent the formation of channels along the swale or strip.
- Use a roller on the sod to ensure that no air pockets form between the sod and the soil.
- Where seeds are used, erosion controls will be necessary to protect seeds for at least 75 days after the first rainfall of the season.

Performance

The literature suggests that vegetated swales represent a practical and potentially effective technique for controlling urban runoff quality. While limited quantitative performance data exists for vegetated swales, it is known that check dams, slight slopes, permeable soils, dense grass cover, increased contact time, and small storm events all contribute to successful pollutant removal by the swale system. Factors decreasing the effectiveness of swales include compacted soils, short runoff contact time, large storm events, frozen ground, short grass heights, steep slopes, and high runoff velocities and discharge rates.

Conventional vegetated swale designs have achieved mixed results in removing particulate pollutants. A study performed by the Nationwide Urban Runoff Program (NURP) monitored three grass swales in the Washington, D.C., area and found no significant improvement in urban runoff quality for the pollutants analyzed. However, the weak performance of these swales was attributed to the high flow velocities in the swales, soil compaction, steep slopes, and short grass height.

Another project in Durham, NC, monitored the performance of a carefully designed artificial swale that received runoff from a commercial parking lot. The project tracked 11 storms and concluded that particulate concentrations of heavy metals (Cu, Pb, Zn, and Cd) were reduced by approximately 50 percent. However, the swale proved largely ineffective for removing soluble nutrients.

The effectiveness of vegetated swales can be enhanced by adding check dams at approximately 17 meter (50 foot) increments along their length (See Figure 1). These dams maximize the retention time within the swale, decrease flow velocities, and promote particulate settling. Finally, the incorporation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.

Only 9 studies have been conducted on all grassed channels designed for water quality (Table 1). The data suggest relatively high removal rates for some pollutants, but negative removals for some bacteria, and fair performance for phosphorus.

EX. 4
3/13

Table 1 Grassed swale pollutant removal efficiency data

Study	Removal Efficiencies (% Removal)						Type
	TSS	TP	TN	NO ₃	Metals	Bacteria	
Caltrans 2002	77	8	67	66	83-90	33	dry swales
Goldberg 1993	67.8	4.5	-	31.4	42-62	-100	grassed channel
Seattle Metro and Washington Department of Ecology 1992	60	45	-	25	2-16	-25	grassed channel
Seattle Metro and Washington Department of Ecology, 1992	83	29	-	25	46-73	-25	grassed channel
Wang et al., 1981	80	-	-	-	70-80	-	dry swale
Dorman et al., 1989	98	18	-	45	37-81	-	dry swale
Harper, 1988	87	83	84	80	88-90	-	dry swale
Kercher et al., 1983	99	99	99	99	99	-	dry swale
Harper, 1988	81	17	40	52	37-69	-	wet swale
Koon, 1995	67	39	-	9	35 to 6	-	wet swale

While it is difficult to distinguish between different designs based on the small amount of available data, grassed channels generally have poorer removal rates than wet and dry swales, although some swales appear to export soluble phosphorus (Harper, 1988; Koon, 1995). It is not clear why swales export bacteria. One explanation is that bacteria thrive in the warm swale soils.

Siting Criteria

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system (Schueler et al., 1992). In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5%. Use of natural topographic lows is encouraged and natural drainage courses should be regarded as significant local resources to be kept in use (Young et al., 1996).

Selection Criteria (NCTCOG, 1993)

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

EX. 4
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The topography of the site should permit the design of a channel with appropriate slope and cross-sectional area. Site topography may also dictate a need for additional structural controls. Recommendations for longitudinal slopes range between 2 and 6 percent. Flatter slopes can be used, if sufficient to provide adequate conveyance. Steep slopes increase flow velocity, decrease detention time, and may require energy dissipating and grade check. Steep slopes also can be managed using a series of check dams to terrace the swale and reduce the slope to within acceptable limits. The use of check dams with swales also promotes infiltration.

Additional Design Guidelines

Most of the design guidelines adopted for swale design specify a minimum hydraulic residence time of 9 minutes. This criterion is based on the results of a single study conducted in Seattle, Washington (Seattle Metro and Washington Department of Ecology, 1992), and is not well supported. Analysis of the data collected in that study indicates that pollutant removal at a residence time of 5 minutes was not significantly different, although there is more variability in that data. Therefore, additional research in the design criteria for swales is needed. Substantial pollutant removal has also been observed for vegetated controls designed solely for conveyance (Barrett et al, 1998); consequently, some flexibility in the design is warranted.

Many design guidelines recommend that grass be frequently mowed to maintain dense coverage near the ground surface. Recent research (Colwell et al., 2000) has shown mowing frequency or grass height has little or no effect on pollutant removal.

Summary of Design Recommendations

- 1) The swale should have a length that provides a minimum hydraulic residence time of at least 10 minutes. The maximum bottom width should not exceed 10 feet unless a dividing berm is provided. The depth of flow should not exceed 2/3rds the height of the grass at the peak of the water quality design storm intensity. The channel slope should not exceed 2.5%.
- 2) A design grass height of 6 inches is recommended.
- 3) Regardless of the recommended detention time, the swale should be not less than 100 feet in length.
- 4) The width of the swale should be determined using Manning's Equation, at the peak of the design storm, using a Manning's n of 0.25.
- 5) The swale can be sized as both a treatment facility for the design storm and as a conveyance system to pass the peak hydraulic flows of the 100-year storm if it is located "on-line." The side slopes should be no steeper than 3:1 (H:V).
- 6) Roadside ditches should be regarded as significant potential swale/buffer strip sites and should be utilized for this purpose whenever possible. If flow is to be introduced through curb cuts, place pavement slightly above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.
- 7) Swales must be vegetated in order to provide adequate treatment of runoff. It is important to maximize water contact with vegetation and the soil surface. For general purposes, select fine, close-growing, water-resistant grasses. If possible, divert runoff (other than necessary irrigation) during the period of vegetation

EX. 4
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establishment. Where runoff diversion is not possible, cover graded and seeded areas with suitable erosion control materials.

Maintenance

The useful life of a vegetated swale system is directly proportional to its maintenance frequency. If properly designed and regularly maintained, vegetated swales can last indefinitely. The maintenance objectives for vegetated swale systems include keeping up the hydraulic and removal efficiency of the channel and maintaining a dense, healthy grass cover.

Maintenance activities should include periodic mowing (with grass never cut shorter than the design flow depth), weed control, watering during drought conditions, reseeding of bare areas, and clearing of debris and blockages. Cuttings should be removed from the channel and disposed in a local composting facility. Accumulated sediment should also be removed manually to avoid concentrated flows in the swale. The application of fertilizers and pesticides should be minimal.

Another aspect of a good maintenance plan is repairing damaged areas within a channel. For example, if the channel develops ruts or holes, it should be repaired utilizing a suitable soil that is properly tamped and seeded. The grass cover should be thick; if it is not, reseed as necessary. Any standing water removed during the maintenance operation must be disposed to a sanitary sewer at an approved discharge location. Residuals (e.g., silt, grass cuttings) must be disposed in accordance with local or State requirements. Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover. Typical maintenance activities are summarized below:

- Inspect swales at least twice annually for erosion, damage to vegetation, and sediment and debris accumulation preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the swale is ready for winter. However, additional inspection after periods of heavy runoff is desirable. The swale should be checked for debris and litter, and areas of sediment accumulation.
- Grass height and mowing frequency may not have a large impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.
- Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.
- Sediment accumulating near culverts and in channels should be removed when it builds up to 75 mm (3 in.) at any spot, or covers vegetation.
- Regularly inspect swales for pools of standing water. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g. debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained

EX. 4
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Cost

Construction Cost

Little data is available to estimate the difference in cost between various swale designs. One study (SWRPC, 1991) estimated the construction cost of grassed channels at approximately \$0.25 per ft². This price does not include design costs or contingencies. Brown and Schueler (1997) estimate these costs at approximately 32 percent of construction costs for most stormwater management practices. For swales, however, these costs would probably be significantly higher since the construction costs are so low compared with other practices. A more realistic estimate would be a total cost of approximately \$0.50 per ft², which compares favorably with other stormwater management practices.

Table 2 Swale Cost Estimate (SEWRPC, 1991)

Component	Unit	Extent	Unit Cost			Total Cost		
			Low	Moderate	High	Low	Moderate	High
	Swale	1	\$107	\$274	\$441	\$107	\$274	
	Acre	0.5	\$2,200	\$3,800	\$5,400	\$1,100	\$1,900	\$2,700
	Acre	0.25	\$3,800	\$5,200	\$6,800	\$950	\$1,300	\$1,650
	Yd ³	372	\$2.10	\$3.70	\$5.30	\$781	\$1,376	\$1,972
	Yd ²	1,210	\$0.20	\$0.35	\$0.50	\$242	\$424	\$605
Site Development								
Salvaged Topsoil	Yd ²	1,210	\$0.40	\$1.00	\$1.60	\$484	\$1,210	\$1,936
Seed, and Mulch ¹	Yd ²	1,210	\$1.20	\$2.40	\$3.60	\$1,452	\$2,904	\$4,356
	--	--	--	--	--	\$5,116	\$8,388	
Contingencies	Swale	1	25%	25%	25%	\$1,279	\$2,347	
Total	--	--	--	--	--	\$8,395	\$11,735	\$17,076

Source: (SEWRPC, 1991)

- Note: Mobilization/demobilization refers to the organization and planning involved in establishing a vegetative swale.
- ^a Swale has a bottom width of 1.0 foot, a top width of 10 feet with 1:3 side slopes, and a 1,000-foot length.
- ^b Area cleared = (top width + 10 feet) x swale length.
- ^c Area grubbed = (top width x swale length).
- ^d Volume excavated = (0.67 x top width x swale depth) x swale length (parabolic cross-section).
- ^e Area tilled = (top width + $\frac{8(\text{swale depth}^2)}{3(\text{top width})}$) x swale length (parabolic cross-section).
- ^f Area seeded = area cleared x 0.5.
- ^g Area sodded = area cleared x 0.5.

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Vegetated Swale

TC-30

Table 3 Estimated Maintenance Costs (SEWRPC, 1991)

Component	Unit Cost	Swale Size (Depth and Top Width)		Comment
		1.5 Foot Depth, One-Foot Bottom Width, 10-Foot Top Width	3-Foot Depth, 3-Foot Bottom Width, 21-Foot Top Width	
Lawn Mowing	\$0.85 / 1,000 ft ² /mowing	\$0.14 / linear foot	\$0.21 / linear foot	Lawn maintenance area=(top width + 10 feet) x length. Mow eight times per year
General Lawn Care	\$9.00 / 1,000 ft ² / year	\$0.18 / linear foot	\$0.28 / linear foot	Lawn maintenance area = (top width + 10 feet) x length
Swale Debris and Litter Removal	\$0.10 / linear foot / year	\$0.10 / linear foot	\$0.10 / linear foot	
Grass Reseeding with Mulch and Fertilizer	\$0.30 / yd ²	\$0.01 / linear foot	\$0.01 / linear foot	Area revegetated equals 1% of lawn maintenance area per year
Program Administration and Swale Inspection	\$0.15 / linear foot / year, plus \$25 / inspection	\$0.15 / linear foot	\$0.15 / linear foot	inspect four times per year
Total	--	\$0.68 / linear foot	\$0.75 / linear foot	--

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Maintenance Cost

Caltrans (2002) estimated the expected annual maintenance cost for a swale with a tributary area of approximately 2 ha at approximately \$2,700. Since almost all maintenance consists of mowing, the cost is fundamentally a function of the mowing frequency. Unit costs developed by SEWRPC are shown in Table 3. In many cases vegetated channels would be used to convey runoff and would require periodic mowing as well, so there may be little additional cost for the water quality component. Since essentially all the activities are related to vegetation management, no special training is required for maintenance personnel.

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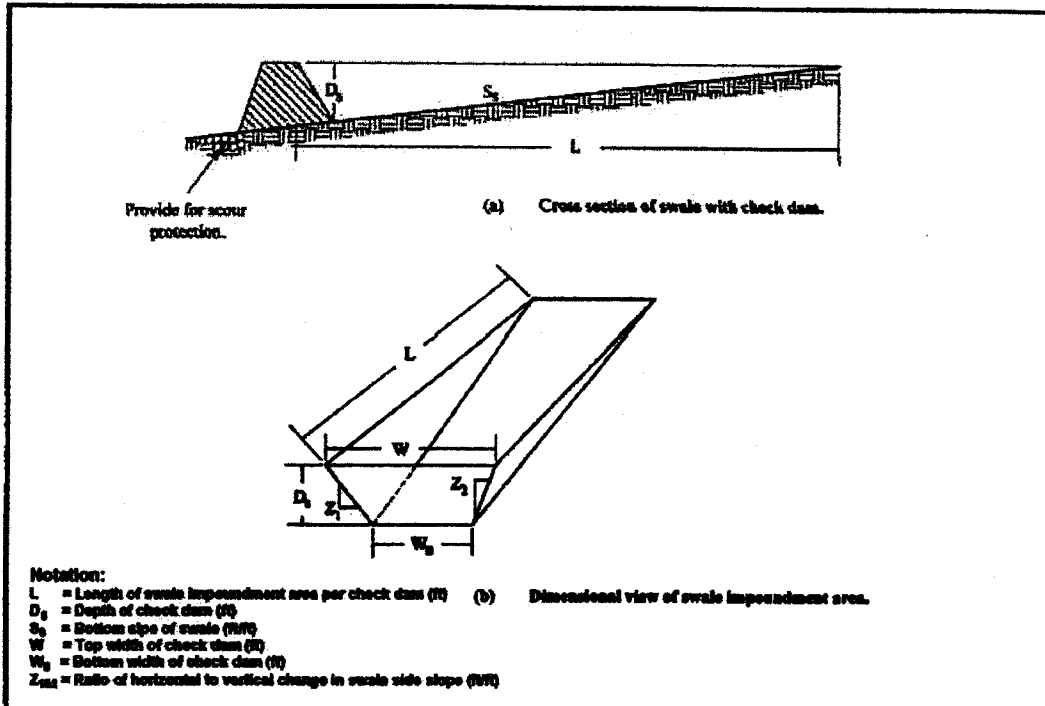
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EX. 4
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EX. 4
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Proposed Seed mix for Caltrans Crystal Cove Drainage Project, EA 0C3800 approved by Caltrans Biologists 09/26/02:

CRYSTAL COVE SEED MIX

Zina Dean, Director Native & Reclamation Seed Division
 Stover Seed Company
 e-mail: seed_queen@email.msn.com
 Tel: 661-269-5901 (home office)
 Cell: 661-435-0778
 Fax: 661-269-5902

INOCULATED SEED:

Botanical Name / Common Name	Min. % Germ PLS	Kg/Ha
<i>Lupinus bicolor</i> / Pigmy-Leaved Lupine	40	3.00

NON-INOCULATED SEED:

Botanical Name / Common Name	Min. % Germ PLS	Kg/Ha
<i>Beschampsia elongata</i> / Slender Hairgrass	40	5.00
<i>Eschscholzia californica</i> / California Poppy	35	1.50
<i>Hordeum brachyantherum</i> / Salt Meadow Barley	30	6.00
<i>Muhlenbergia microperma</i> / Littleseed Muhly	20	2.00
<i>Trifolium gracilentum</i> / Pinpoint Clover	40	4.00

SLURRY MIX:

Product Name	Application Rate/Acre
Cel-Fiber Recycled Fiber Mulch	2000
Tri-C 6-2-4 Fertilizer	300
Environ-Mend Organic Binder	150

Thank you Jonelle. Please call me if you have any questions.

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SECTION TWO

Guidelines - Maintenance BMP

**TABLE 2-13: FAMILY - C5
DRAINAGE DITCH AND CHANNEL MAINTENANCE**

Subtask	Potential Source of Pollutants	Potential Pollutant of Concern	BMP Options (Section Number)
General			Baseline Storm Water Drainage Facilities Inspection and Cleaning (2.17.1) Illegal Spill Discharge Control (2.17.4) Illicit Connection Detection, Reporting and Removal (2.17.3) Scheduling and Planning (2.3)
Equipment Operation	Leaks Spills Cleaning	Sediment Fuel Hydraulic Fluid Oil	Vehicle and Equipment Fueling (2.12.1) Vehicle and Equipment Maintenance (2.12.2)
Cleaning Operation (backhoe, excavator and loader)	Disturbed Soil Leaks Litter	Sediment Hydraulic Fluid Litter and Debris	Check Dam (2.4.5) Clear-Water Diversion (2.7) Fiber Rolls (2.4.4) Hydroseeding/Handseeding (2.6.3) Liquid Waste Management (2.10.6) Sandbag or Gravel Bag Barrier (2.4.2) Straw Bale Barrier (2.4.3)
Headwall or Apron Repair or Replacement	Removed Material Mixing	Concrete	Concrete Waste Management (2.10.7)
Stockpiling and Disposal	Removed Material	Sediment	Contaminated Soil Management (2.10.4) Solid Waste Management (2.10.2) Tire Inspection and Sediment Removal (2.9.1)
Import Fill	Spill	Sediment	Compaction (2.6.5) Hydroseeding/Handseeding (2.6.3) Material Use (2.11.2)

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SECTION TWO

Guidelines - Maintenance BMP

**TABLE 2-14: FAMILY – C6
DRAIN AND CULVERT MAINTENANCE**

Subtask	Potential Source of Pollutants	Potential Pollutant of Concern	BMP Options (Section Number)
General			Illegal Spill Discharge Control (2.17.4) Illicit Connection Detection, Reporting and Removal (2.17.3) Scheduling and Planning (2.3)
Equipment Operation	Leaks Spills Cleaning	Sediment Fuel Hydraulic Fluid Oil	Vehicle and Equipment Fueling (2.12.1) Vehicle and Equipment Maintenance (2.12.2)
Portable Toilet	Spills Leaks	Sewage	Sanitary/Septic Waste Management (2.10.5)
Cleaning Operation (backhoe and Vactor™)	Disturbed Soil Leaks Excess Water Litter	Sediment Hydraulic Fluid Non-Storm Water Litter and Debris	Baseline Storm Water Drainage Facilities Inspection and Cleaning (2.17.1) Compaction (2.6.5) Enhanced Storm Drain Inlet Inspection and Cleaning Program ¹ (2.17.2) Fiber Rolls (2.4.4) Hydroseeding/Handseeding (2.6.3) Liquid Waste Management (2.10.6) Sandbag or Gravel Bag Barrier (2.4.2) Straw Bale Barrier (2.4.3) Water Conservation Practices (2.14)
Headwall or Apron Repair or Replacement	Removed Material Mixing	Concrete	Concrete Waste Management (2.10.7) Solid Waste Management (2.10.2)
Stockpile and Disposal	Sediment In Runoff	Sediment	Contaminated Soil Management (2.10.4) Solid Waste Management (2.10.2) Tire Inspection and Sediment Removal (2.9.1)

¹ SEE BMP DESCRIPTION TO DETERMINE WHETHER THE ACTIVITY IS IN AN AREA WHERE THIS BMP APPLIES.

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SECTION TWO

Guidelines - Maintenance BMP

**TABLE 2-17: FAMILY - D4
LITTER AND DEBRIS REMOVAL**

Subtask	Potential Source of Pollutants	Potential Pollutant of Concern	BMP Options (Section Number)
General			Anti-Litter Signs (2.18.2) Illegal Spill Discharge Control (2.17.4) Illicit Connection Detection, Reporting and Removal (2.17.3) Scheduling and Planning (2.3)
Portable Toilet	Leaks Spills	Sewage	Sanitary/Septic Waste Management (2.10.5)
Equipment Operation	Leaks Spills Cleaning	Sediment Fuel Hydraulic Fluid Oil	Vehicle and Equipment Fueling (2.12.1) Vehicle and Equipment Maintenance (2.12.2)
Manual Collection, Sweeping and Vacuuming	Spills Leaks Litter Excess Water	Litter and Debris Non-Storm Water	Litter and Debris (2.18.1) Sweeping and Vacuuming (2.23) Water Conservation Practices (2.14)
Consolidation and Disposal	Spills	Litter and Debris	Solid Waste Management (2.10.2)

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SECTION TWO

Guidelines - Maintenance BMP

TABLE 2-22: FAMILY - E1c
LANDSCAPED MECHANICAL VEGETATION CONTROL/MOWING

Subtask	Potential Source of Pollutants	Potential Pollutant of Concern	BMP Options (Section Number)
General			Illegal Spill Discharge Control (2.17.4) Illicit Connection Detection, Reporting and Removal (2.17.3) Scheduling and Planning (2.3)
Equipment Operation	Leaks Spills Cleaning	Sediment Fuel Hydraulic Fluid Oil	Vehicle and Equipment Fueling (2.12.1) Vehicle and Equipment Maintenance (2.12.2)
Mowing	Mowed Vegetation	Clippings	Solid Waste Management (2.10.2) Spill Prevention and Control (2.10.1)

EX. 6
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496 2.5.2 Ditches, Berms, Dikes and Swales**497 Description:**

498 Ditches, berms, dikes and swales are temporary or permanent measures used to intercept
499 and direct surface runoff to an overside/slope drain or stabilized watercourse.

500 Appropriate Applications:

501 Ditches, berms, dikes and swales may be implemented for the following purposes:

- 502 • To convey flow around maintenance activities;
- 503 • To divert flow away from maintenance stockpiles;
- 504 • At the top of slopes to divert run-on from adjacent slopes and areas;
- 505 • At bottom and mid-slope locations to intercept sheet flow and convey concentrated
506 flows;
- 507 • At other locations to convey runoff to overside/drains, stabilized watercourses, storm
508 water drainage system inlets (catch basins), pipes and channels;
- 509 • To intercept runoff from paved surfaces; and
- 510 • Along roadways and facilities subject to flood drainage.

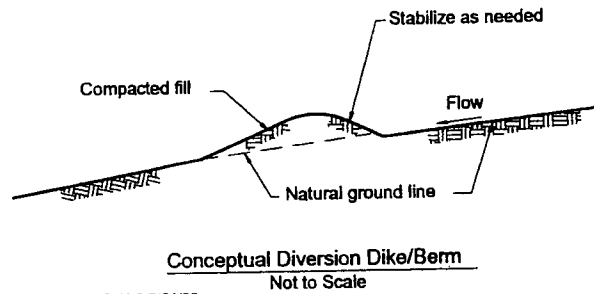
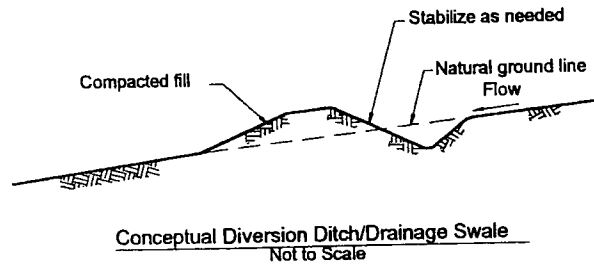
511 Implementation:

- 512 • Evaluate risks due to erosion, overtopping, flow backups or washout.
- 513 • Consider outlet protection where localized scour is anticipated.
- 514 • Examine the site for run-on from off-site sources.
- 515 • Conveyances should be lined if high flow velocity is anticipated. Consider use of
516 riprap, engineering fabric, asphalt concrete or concrete.
- 517 • Conceptual ditches, berms, dikes and swales are shown in Figure 2-6.

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SECTION TWO

Guidelines - Maintenance BMPs (Category IA)



Fig_3-1.DWG JAC 7/24/00

Figure 2-6
Conceptual Ditches, Berms, Dikes and Swales

EX. 6
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540 2.6 SOIL STABILIZATION

541 Disturbed soil areas should be inspected and evaluated for soil stabilization/revegetation to
542 reduce erosion. At the completion of maintenance activities, disturbed soil areas should be
543 stabilized. Stabilization is also required for Minor Slides and Slipouts Cleanup/Repair. Follow-
544 up inspections should be performed to ensure that soil stabilization was successfully
545 implemented.

546 Soil stabilization consists of preparing the soil surface and applying one of the following BMPs,
547 or combination thereof, to disturbed soil areas or erodible slopes:

- 548 • Section 2.6.1 Wood Mulch;
- 549 • Section 2.6.2 Hydraulic Mulch;
- 550 • Section 2.6.3 Hydroseeding/Handseeding;
- 551 • Section 2.6.4 Straw Mulch;
- 552 • Section 2.6.5 Compaction

553 In some instances, disturbed soil areas may contain seed that will naturally germinate under the
554 right conditions. Maintenance staff may elect to allow natural germination to occur, but these
555 areas must be inspected and otherwise repaired if vegetation does not sprout. Temporary
556 sediment control BMPs will need to be implemented to avoid erosion from these areas while the
557 vegetation is being established.

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1210 **2.17 DRAINAGE FACILITIES**

1211 These BMPs address the maintenance of drainage facilities to reduce the potential for pollutant
1212 discharge. Drainage Facilities BMPs include Baseline Storm Water Drainage Facilities
1213 Inspection and Cleaning (Section 2.17.1), Enhanced Storm Drain Inlet Inspection and Cleaning
1214 Program (Section 2.17.2), Illicit Connection Detection, Reporting and Removal (Section 2.17.3)
1215 and Illegal Spill Discharge Control (Section 2.17.4).

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SECTION TWO

Guidelines - Maintenance BMPs (Category IA)

1216 **2.17.1 Baseline Storm Water Drainage Facilities Inspection and Cleaning**

1217 Description:

1218 Culverts, ditches, gutters, underdrains, horizontal drains and downdrains require
1219 inspection and cleaning to prevent flooding and to provide for sufficient hydraulic
1220 capacity.

1221 Appropriate Applications:

1222 These procedures are applicable to maintenance personnel who conduct storm water
1223 drainage system facilities inspection and cleaning. BMP implementation will depend on
1224 traffic, weather, available resources, safety conditions and access to storm water drainage
1225 systems.

1226 Implementation:

- 1227 • Inspect culverts, ditches, gutters, underdrains, horizontal drains, downdrains and
1228 outlets annually and as needed during the winter season to determine if cleaning is
1229 required or if damage has occurred.
- 1230 • Clean culverts to maintain sufficient hydraulic capacity of the culvert.
- 1231 • Inspect ditches and gutters to maintain sufficient hydraulic capacity. Schedule
1232 routine ditch-cleaning activities designed to maintain sufficient hydraulic capacity of
1233 ditches prior to the rainy season.
- 1234 • When cleaning drainage ditches below cut slopes or steep slopes, avoid cutting the
1235 toe of the slope. This can also prevent damage to the ditch.
- 1236 • Water used and the material generated during drainage facility cleaning should be
1237 collected and managed per the requirements of the Section 2.10.2 Solid Waste
1238 Management and Section 2.10.6 Liquid Waste Management BMPs.
- 1239 • Where waterways are affected, coordinate maintenance activities with the appropriate
1240 regulatory agency.
- 1241 • The Maintenance Supervisors in charge of the activity will provide Vactor™
1242 operators with written instructions identifying pre-approved decanting sites.
- 1243 • Maintenance Supervisors will work with the District Maintenance Storm Water
1244 Coordinator in establishing approved decanting sites for Vactor™ waste.

1296 **2.18 LITTER AND DEBRIS REMOVAL**

1297 Litter and debris removal consists of removing and properly disposing of litter and implementing
1298 procedures to discourage littering to reduce the discharge of potential pollutants. Litter and
1299 Debris Removal BMPs include Litter and Debris (Section 2.18.1) and Anti-Litter Signs (Section
1300 2.18.2).

EX. 4
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SECTION TWO

Guidelines - Maintenance BMPs (Category IA)

1301 2.18.1 Litter and Debris

1302 Description:

1303 These measures are intended to reduce the discharge of litter to storm water drainage
1304 systems or watercourses.

1305 Appropriate Applications:

1306 This BMP should be implemented on a site-specific basis whenever litter and debris
1307 removal activities are performed. The frequency of removal is dependent on the
1308 availability of resources, safety considerations and rate of accumulation.

1309 Implementation:

- 1310 • Remove litter and debris from drainage grates, trash racks and ditch lines to reduce
1311 discharge to the storm water drainage systems and watercourses.
- 1312 • Secure or cover transported materials, equipment and supplies to and from
1313 maintenance activity sites to prevent spillage to the roadway.

SECTION TWO

Guidelines - Maintenance BMPs (Category IA)

1314 2.18.2 Anti-Litter Signs

1315 Description:

1316 Caltrans conducts a signage program that warns against dumping and littering (e.g., "No
1317 Dumping" and "\$1,000 Fine for Littering"). These signs are placed along highways
1318 where littering violations are frequent. The purpose of this program is to discourage
1319 littering by educating motorists about the fine for littering.

1320 The Care for California Program displays signs showing an image of trash being placed
1321 into a garbage can. These signs encourage positive behavior.

1322 Appropriate Applications:

1323 Anti-litter signs may be placed:

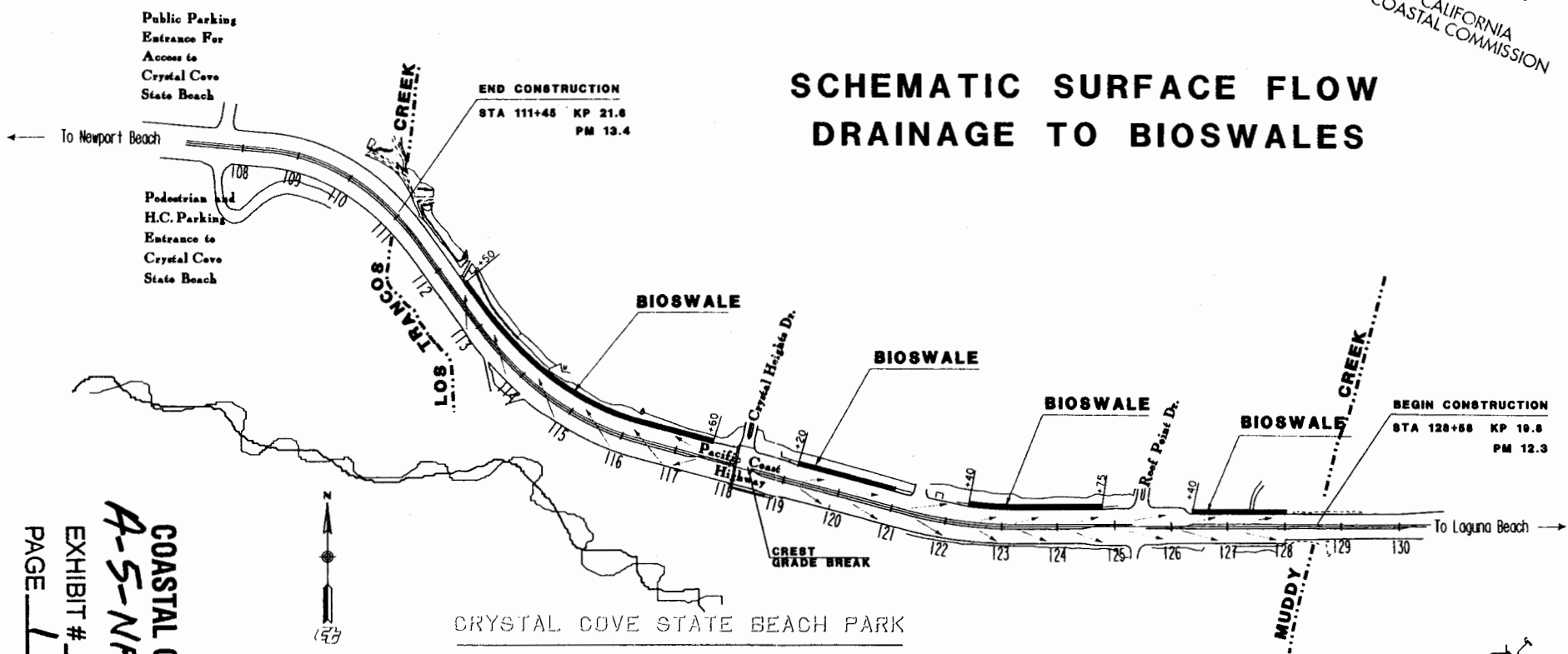
- 1324 • Along corridors that receive an unsightly amount of litter.
- 1325 • Along freeways, safety roadside rest areas, vista points and park-and-ride facilities.

1326 Implementation:

1327 Maintenance Supervisors travel highways in their assigned section to observe overall
1328 conditions and assess the need for litter removal and installation of anti-litter signs. Anti-
1329 litter signs can be requested when litter removal becomes a concern.

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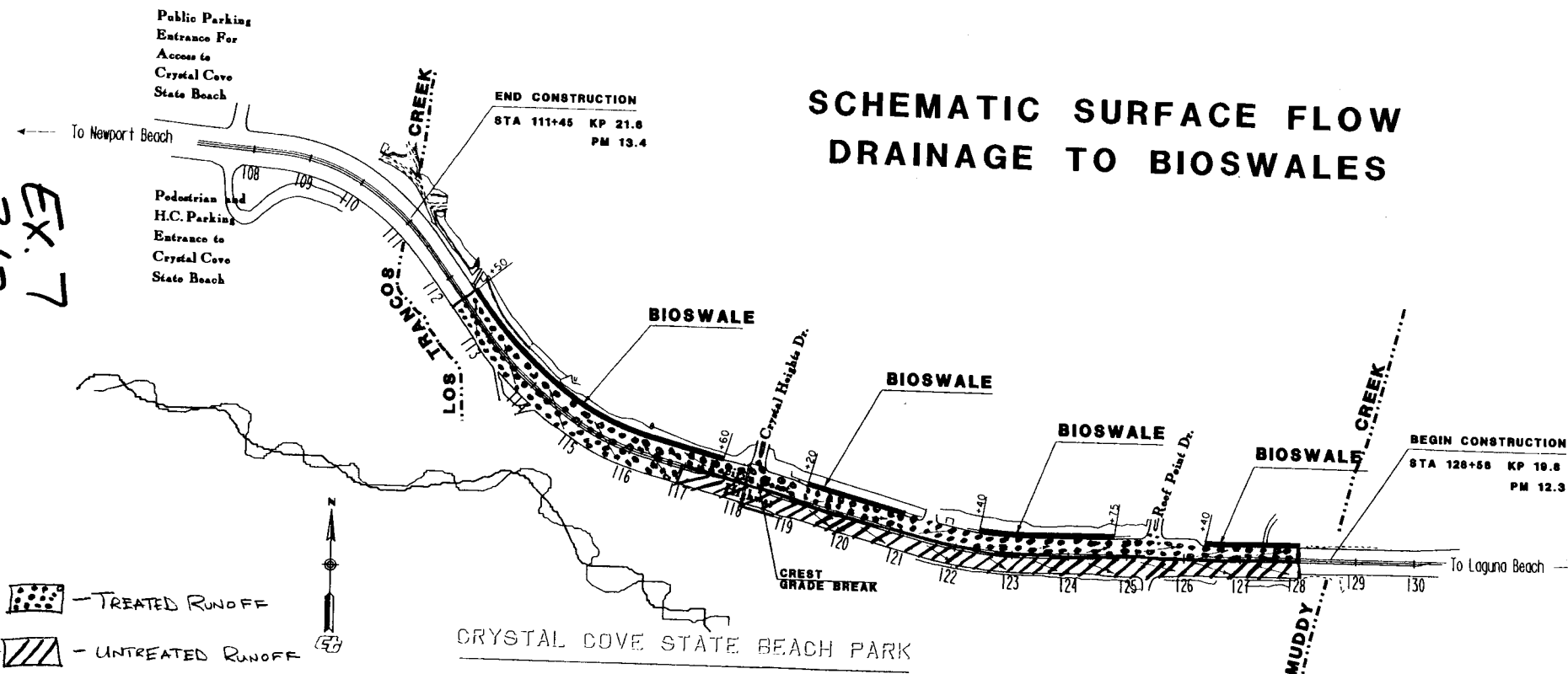
SCHEMATIC SURFACE FLOW DRAINAGE TO BIOSWALES



COASTAL COMMISSION
 EXHIBIT # 7
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SCHEMATIC SURFACE FLOW DRAINAGE TO BIOSWALES

EX. 7
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- TREATED RUNOFF
- UNTREATED RUNOFF

CRYSTAL COVE STATE BEACH PARK

% OF RUNOFF TREATED

	- 25501.5 m ² ≈ 61%
	- 16272 m ² ≈ 39%
TOTAL AREA = 41773.5 m ²	



California Regional Water Quality - Santa Ana Region

Winston H. Hickox
Secretary for
Environmental
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb8>
3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (909) 782-4130 - FAX (909) 781-6288

Gray Davis
Governor

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.swrcb.ca.gov/rwqcb8.

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South Coast Region

APR 15 2003

CALIFORNIA
COASTAL COMMISSION

September 27, 2002

Cindy Quon, District Director
Caltrans District 12
3337 Michelson Drive, Suite 380
Irvine, CA 92612

Cease and Desist Order No. 00-87 for Direct Discharges to Crystal Cove, Orange County

Dear Ms. Quon:

On November 16, 2000, the Regional Board adopted Cease and Desist Order (CDO) No. 00-87 that required The Irvine Company, the California Department of Transportation (Caltrans), and the California Department of Parks and Recreation to cease and desist from discharging or threatening to discharge wastes directly to Crystal Cove, part of the Irvine Coast Area of Special Biological Significance. The State Water Resources Control Board amended this CDO by Order No WQ-2001-08. In response to this CDO, on May 14, 2002, Caltrans submitted Caltrans' Plan of Action to eliminate all direct discharges from its properties and facilities into Crystal Cove.

We have completed our review of Caltrans' Plan of Action. Based on our understanding of the plan, all direct discharges of surface runoff from Caltrans-owned storm drain systems will be eliminated from the Crystal Cove area south of Los Trancos Creek and north of Muddy Canyon Creek. Further, it is our understanding that the majority of low flows (non-storm water discharges) leaving Pacific Coast Highway in this area, will be directed to a "biofiltration swale" prior to discharge to Los Trancos and Muddy Canyon Creeks. Finally it is our understanding that Caltrans' discharge point to Los Trancos Creek will be upstream of the "low flow diversion" structure which currently diverts non-storm water flows from Los Trancos Creek to a nearby trunk line for Orange County Sanitation District for treatment and disposal.

Based on the above, it appears that the Caltrans' Action Plan, submitted on May 14, 2002, when fully implemented in accordance with the schedule specified in the CDO will satisfy the requirements set forth in the CDO.

California Environmental Protection Agency



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Ms. Quon

-2-

September 27, 2002

If you have any questions, you may call Mark Smythe at (909) 782-4998, Bob Whitaker at (909) 782-4993 or myself at (909) 782- 3284.

Sincerely,

K. J. Thibeault

for Gerard J. Thibeault
Executive Officer

- cc: Grace Piña-Garrett - California Department of Transportation, District 12
- Roberta Rand Marshall - The Irvine Company
- Richard Rozzelle - California Department of Parks and Recreation
- Jorge Leon - State Water Resources Control Board, Office of the Chief Counsel
- Garry Brown - Orange County Coast Keeper
- Bob Caustin - Defend the Bay

California Environmental Protection Agency



Ex. 8
2/2

I. EROSION POLICIES

The Erosion Policies which follow provide the framework for the preparation of a "Master Drainage and Runoff Management Plan". This Plan shall be submitted to the County of Orange for review and approval concurrent with the first Coastal Development Permit application as required by LCP Subsection II-3-B-11¹.

1. Post-development erosion rates shall approximate the natural or existing rate before development.
2. Areas of disturbed soil shall be reseeded and covered with vegetation; mulches may be used to cover ground areas temporarily; other mechanical or vegetative techniques to control erosion may be used where necessary. Native and/or appropriate non-native plant material selected for vegetation shall be consistent with LCP Subsection I-3-L-6.
3. Erosion control devices shall be installed in coordination with clearing, grubbing, and grading of upstream construction; the Grading Plan shall describe the location and timing for the installation of such devices and shall describe the parties responsible for repair and maintenance of such devices.
4. Erosion control measures for grading and construction done during the period from April 15 to October 15 will be implemented by October 15 and maintained as necessary through April 15. For grading and construction commencing in the period from October 15 to April 15, erosion control measures will be implemented in conjunction with the project in a manner consistent with the County of Orange Grading Code. Erosion control measures for areas not affected by grading and construction are not required.
5. Where new recreational trails are planned in open space areas, they will be located and constructed to minimize erosion.

¹ A Master Drainage and Runoff Management Plan was approved by the County of Orange in December, 1989. Amendments will be prepared for all future development projects located outside the Master Plan.

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J. SEDIMENT POLICIES

The Sediment Policies which follow provide the framework for the preparation of a "Master Drainage and Runoff Management Plan". This Plan shall be submitted to the County of Orange for review and approval concurrent with the first Coastal Development Permit application as required by LCP Subsection II-3-B-11¹.

1. Required sediment basins (e.g., debris basins, desilting basins, and/or silt traps) shall be installed in conjunction with the initial grading operations and maintained through the development/construction process to remove sediment from runoff.
2. To prevent sedimentation of off-site areas, on-site vegetation shall be maintained where feasible. Vegetation shall be replanted from seed/hydroseed to help control sedimentation where necessary. Native and/or appropriate non-native plant material selected for vegetation shall be consistent with LCP Subsection I-3-L-6.
3. Temporary mechanical means of controlling sedimentation such as hay bales, earth berms and/or sand-bagging around the site, may be used as part of an overall Erosion Control Plan, subject to County approval.
4. Sediment movement in the natural channels shall not be significantly changed in order to maintain stable channel sections and to maintain the present level of beach sand replenishment.
5. Sediment catch basins and other erosion control devices shall be designed, constructed and maintained in accordance with the County of Orange Grading Code.

¹

A Master Drainage and Runoff Management Plan was approved by the County of Orange in December, 1989. Amendments will be prepared for all future development projects located outside the area covered by this Master Plan.

K. RUNOFF POLICIES

The Runoff Policies which follow provide the framework for the preparation of a "Master Drainage and Runoff Management Plan". This Plan shall be submitted to the County of Orange for review and approval concurrent with the first Coastal Development Permit application as required by LCP Subsection II-3-B-11¹.

1. Peak flood discharge rates of storm water flows in the major streams shall not exceed the peak rates of storm water runoff from the area in its natural or undeveloped state, unless it can be demonstrated that an increase in the discharge of no more than 10% of the natural peak rate will not significantly affect the natural erosion/beach sand replenishment process.
2. Drainage facilities shall be designed and constructed in accordance with the County of Orange Flood Control District Design Manual.
3. Storm runoff water shall be directed to storm drains or suitable water courses to prevent surface runoff from damaging faces of cut and fill slopes.
4. Adequate maintenance of retention basins shall be assured as a precondition to the issuance of grading permits.
5. Natural drainageways will be rip-rapped or otherwise stabilized below drainage and culvert discharge points in accordance with County of Orange policies.
6. Runoff from development will be conveyed to a natural drainageway or drainage structure with sufficient capacity to accept the discharge.

¹ A Master Drainage and Runoff Management Plan was approved by the County of Orange in December, 1989. Amendments will be prepared for all future development projects located outside the area covered by this Master Plan.

L. GRADING POLICIES

1. Prior to implementation level development approvals (i.e., tentative tract, site plan, etc.), the applicant shall submit soils engineering and geologic (if appropriate due to slope conditions) studies as necessary to the Manager, County of Orange EMA Development Services Division (DSD). These reports will assess potential soil related constraints and hazards such as slope instability, settlement, liquefaction, or related secondary seismic impacts as determined appropriate by the DSD Manager. All reports shall recommend appropriate mitigation measures and be completed in the manner specified in the County of Orange Grading Manual and State/County Subdivision Ordinance. Pursuant to the Orange County Grading Code, the permit applicant shall provide a schedule showing when each stage and element of the project will be completed, including estimated starting and completion dates, hours of operation, days of week of operation, and the total area of soil surface to be disturbed during each stage of construction.
2. Grading allowed between October 15 and April 15 shall be subject to the Erosion, Sediment, Runoff, and Grading Policies herein and the provisions of the County of Orange Grading Code.
3. Temporary stabilization techniques may be used on areas which will be redisturbed during future construction. Permanent stabilization techniques must be used in all other areas.
4. Disposal of earthen materials removed during any development operations shall be as follows:
 - a. Top soil for later use in revegetation shall be stockpiled on the site in previously designated areas approved by the permit-issuing authority. Runoff from the stockpiled area shall be controlled to prevent erosion.
 - b. Other earthen material shall be disposed at locations approved by the permit issuing authority.
 - c. Except for necessary drainage improvements and/or erosion control modifications, no materials shall be placed within the 100 year flood-plain of coastal waters and/or streams.

