CALIFORNIA COASTAL COMMISSION
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Item W 15c

Filed:	February 26, 2002
49th Day:	April 16, 2002
180th Day:	August 25, 2002
Staff:	ALB-LB
Staff Report:	March 21, 2002
Hearing Date:	April 9-12, 2002
Commission Action:	

STAFF REPORT: REGULAR CALENDAR

APPLICATION NUMBER: 5-01-067

APPLICANT: County of Orange, Public Facilities and Resources Department

AGENT: Vincent Rosales, Design Division Manager

PROJECT LOCATION: Segunda Deshecha Canada Channel (Facility No. MO2) from 500 feet downstream of I-5 Freeway to El Camino Real, City of San Clemente (Orange County)

PROJECT DESCRIPTION: Partial removal of an existing concrete trapezoidal channel and construction of a new concrete rectangular channel with water quality enhancements.

LOCAL APPROVALS RECEIVED: Adoption of *Negative Declaration No. IP 00-164 for Segunda Deshecha Canada Channel (MO2)* by County of Orange on January 15, 2001 and adoption of Resolution No. 01-31 by the City of San Clemente Planning Commission

SUBSTANTIVE FILE DOCUMENTS: City of San Clemente Certified Land Use Plan (LUP); *Geotechnical Investigation, Proposed Channel Replacement, Segunda Deshecha Canada Flood Control Channel, San Clemente, CA* dated August 2000 prepared by Bing Yen & Associates, Inc.

SUMMARY OF STAFF RECOMMENDATION:

The County of Orange proposes improvements to an existing concrete storm water channel located in the northern portion of the City of San Clemente. The proposed improvements will increase the capacity of the deteriorated channel and will include measures to improve water quality. The major issues of this staff report include flood and geologic hazard, water quality, and public access. Polluted runoff has the potential to affect the public's use and enjoyment of the beach. The channel will continue to outlet into the Pacific Ocean at North Beach, a popular public beach. Therefore, the proposed water quality improvement measures are an integral part of the proposed channel reconstruction project.

Staff recommends **APPROVAL** of the proposed development subject to four (4) special conditions which require 1) conformance of the final design and construction plans to the geotechnical reports; 2) submittal of an Erosion, Sediment and Chemical Control Plan (ESCCP); 3) submittal of a Water Quality Management Plan (WQMP); and 4) maintenance of public access during construction.

EXHIBITS:

1. Vicinity Map
2. Location Map
3. Coastal Zone Boundary Map
4. Public Access Points Map
5. Project Plans (Partial)
6. Photos of Existing Channel
7. Example of Proposed BMP
8. Correspondence from City of San Clemente

STAFF RECOMMENDATION:

Staff recommends that the Commission **APPROVE** the permit application with special conditions.

MOTION:

I move that the Commission approve Coastal Development Permit #5-01-067 pursuant to the staff recommendation.

STAFF RECOMMENDATION OF APPROVAL:

Staff recommends a **YES** vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

RESOLUTION TO APPROVE THE PERMIT:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

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 the 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. Conformance of Design and Construction Plans to Geotechnical Reports

A. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT,** the applicant shall submit, for the review and approval of the Executive Director, evidence that an appropriately licensed professional has reviewed and approved all final design and construction plans and certified that the final plans incorporate all of the recommendations contained in the engineering geologic reports entitled *Geotechnical Investigation, Proposed Channel Replacement, Segunda Deshecha Canada Flood Control Channel, San Clemente, CA* dated August 2000 prepared by Bing Yen & Associates, Inc. for the project site.

B. The applicant shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. Proposed changes to the approved final plans shall not occur without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is required.

2. Erosion, Sediment, and Chemical Control Plan

A. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicant shall provide, for the review and approval of the Executive Director, an Erosion, Sediment, and Chemical Control Plan (ESCCP) to minimize, to the maximum extent practicable, erosion, sedimentation, and the release of pollutants to receiving waters during and after construction.

The ESCCP shall provide for controlling the amount of runoff and its ability to carry sediment and pollutants by diverting incoming flows and impeding internally generated flows, as well as retaining sediment that is picked up on the project site through the use of sediment-capturing devices. The ESCCP shall include provisions for minimizing to the maximum extent practicable the dispersion of dust, cement waste, and construction materials.

The ESCCP shall also minimize to the maximum extent practicable the application, generation, and migration of toxic substances or other pollutants, and ensure the proper storage and disposal of toxic substances and construction-related materials. The Erosion, Sediment, and Chemical Control Plan shall incorporate the Best Management Practices (BMPs) and other specifications as listed below.

Grading

1) The ESCCP shall delineate the areas to be disturbed by grading or construction activities including any temporary access roads, trenches, staging areas, and stockpile areas.
2) Any undisturbed natural areas on the site shall be clearly demarcated on the project site with fencing or survey flags.

3) Clearing and grading activities shall be timed to avoid the rainy season (October 15 through April 15).
4) If any work does occur during the rainy season, the applicant shall install or construct BMPs appropriate to achieve the above-stated goals of the ESCCP. Such measures shall include, but are not limited to, temporary sediment basins (including debris basins, desilting basins or silt traps); temporary drains and swales; sand bag barriers; silt fencing; stabilization of any stockpiled fill, disturbed slopes, and cut and fill slopes with geofabric covers or other appropriate cover; and installation of geotextiles or mats on all disturbed areas.
5) If grading or site preparation should cease for a period of more than 30 days, the same BMPs as listed in Special Condition 3 shall apply. These BMPs shall be monitored and maintained at least on a weekly basis until grading or construction operations resume.
6) The applicant shall minimize the area of bare soil exposed at one time (phased grading) and clear only areas essential for construction.
7) Construction entrances shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.
8) Wind-born dust shall be controlled through the installation of wind barriers such as hay bales and/or sprinkling, and any other appropriate BMP.

Runoff Control and Conveyance

9) Nuisance flows shall be diverted and conveyed around the project area to prevent erosion, sedimentation, and pollutant transport.

Chemical and Debris Control

10) All construction material shall be covered, enclosed, and shall not be stored in contact with the ground surface. All materials shall be stored as far away from any storm drain inlet or waterway as possible.
11) All debris generated on the construction site shall be disposed in the proper trash or recycling receptacle at the end of every construction day.
12) Construction entrances shall be fitted with appropriate BMPs to prevent tracking of sediment and mud.
13) Cement shall not be disposed of in the watercourse. No hardened cement except as shown on the site plans shall be left in the watercourse.
14) The applicant shall ensure no vehicles or machinery shall be parked or stored in Segunda Deshecha Canada Channel.
15) Excess fill shall not be disposed of in the Coastal Zone unless authorized through either an amendment to this coastal development permit or a new coastal development permit.
16) The ESCCP shall outline the appropriate BMPs to 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 flood control channel and storm drain inlets as possible.
17) The applicant shall develop and implement spill prevention and control measures.
18) The applicant shall 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 location not subject to runoff and more than 50 feet away from a stormdrain, open ditch or surface water.
19) The applicant shall provide adequate disposal facilities for solid waste, including excess concrete produced during construction.

B. The applicant shall undertake development in accordance with the final ESCCP approved by the Executive Director. No proposed changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is required. The applicant shall be fully responsible for advising construction personnel of the requirements of the Erosion, Sediment, and Chemical Control Plan.

3. Post-Construction Water Quality Management Plan

A. **PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the applicants shall provide, for the review and approval of the Executive Director, a Water Quality Management Plan (WQMP) to minimize, to the maximum extent practicable, the contribution of pollutants to coastal waters through the Segunda Deshecha Canada Channel. The WQMP shall include, but is not limited to, a trash boom, a rubber dam drop structure, and sediment berms, as described in the application for Coastal Development Permit.

The WQMP shall also indicate how this development will integrate with city-wide source control efforts for polluted runoff as needed to comply with the Orange County Municipal Storm Water Permit.

The WQMP shall outline a monitoring and maintenance program for all structural BMPs. Maintenance shall be done as specified by the manufacturer. The BMPs shall be inspected, at a minimum, just before the onset of the rainy season (October 15) and once per month during the rainy season.

B. The applicant shall undertake development in accordance with the final WQMP approved by the Executive Director. No proposed changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is required. The applicant shall be fully responsible for advising construction personnel of the requirements of the Water Quality Management Plan.

4. Maintenance of Public Access

The construction activities authorized pursuant to Coastal Development Permit No. 5-01-067 shall minimize impacts to public access to San Clemente's beaches during the peak use 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.

PRIOR TO COMMENCEMENT OF CONSTRUCTION, the applicant shall submit, for review and approval by the Executive Director, a Public Access Maintenance Plan, which shall be in effect during the peak use season. The Plan shall incorporate the following provisions:

1) At least one lane shall remain open in each direction along El Camino Real and Avenida Pico during the hours of 7:00 a.m. and 7:00 p.m on weekdays. All lanes shall remain open on weekends.

2) Construction staging areas and employee parking shall not displace public beach and recreational parking at the North Beach parking lot. A map shall be included that depicts employee parking areas and staging areas.

IV. FINDINGS AND DECLARATIONS:

The Commission hereby finds and declares:

A. PROJECT LOCATION, DESCRIPTION AND BACKGROUND

Project Location
The project limits extend from the upstream side of El Camino Real to approximately 500 feet downstream of the I-5 freeway near Calle de Industrias within the northern portion of the City of San Clemente, Orange County (Exhibits 1 & 2). The total length of the project is approximately 4,000 feet. Approximately 600 linear feet of the project extends inland of the Coastal Zone Boundary (Exhibit 3). The nearest public access to the coast is available approximately 250 feet southwest of the seawardmost extent of the project site via an at-grade railroad crossing at North Beach (Exhibit 4).

Project Description
The applicant proposes major improvements to the Segunda Deshecha Canada Channel (Facility No. MO2), a hydraulically deficient and dilapidated concrete storm water channel located within a developed portion of San Clemente. Currently, the channel provides only ~60% of the 100-year storm protection. The channel improvements will provide 100-year storm protection. Specifically, the project involves replacement of the existing concrete trapezoidal channel with a 20.7-foot wide by 10-foot high single-barrel box culvert between El Camino Real and Avenida Pico for a length of 400 feet (Exhibit 5). Upstream of Avenida Pico, an 18-foot wide reinforced concrete open rectangular channel will be constructed to the upstream terminus of the project, approximately 500 feet downstream of the I-5 freeway. Channel wall heights will vary between 9 and 15 feet. A maintenance path and/or maintenance road will be constructed adjacent to the channel within the existing right of way. The width of the right-of-way varies between 41 and 46.5 feet.

Construction of the proposed project will require approximately 8,300 cubic yards of excavation, 27,300 cubic yards of backfill and 6,900 cubic yards of reinforced concrete. Existing concrete removed during the contractor's operation will be property disposed of outside the coastal zone. Excavation, shoring and backfill will be in accordance with the geotechnical report prepared by Bing Yen & Associates, Inc. Geotechnical issues will be discussed in Section B (Hazards) of the current staff report.

The applicant has also incorporated water quality enhancements into the proposed channel design. These include: debris removal with a trash boom, establishment of a limited soft-bottom habitat and installation of a removable barricade/dam to prevent hazardous materials from reaching the ocean in the event of a spill. The Segunda Deshecha Cananda Channel outlets at North Beach. As such, polluted runoff and/or hazardous materials entering the ocean would adversely affect marine resources and beach access. The proposed enhancements will be described further in Section C (Water Quality).

The project will commence in late Spring/early Summer 2002 and continue for approximately nine months. Potential impacts to public access during construction will be discussed in Section D (Public Access).

Project Background/Existing Conditions
The existing concrete trapezoidal channel was constructed in 1963 and varies in base width from 12 to 16 feet with a depth of 9.5 feet. Photos of the existing channel are provided in Exhibit 6. According to the applicant, the channel is hydraulically deficient and capable of conveying only ~60% of the 100-year design flow. The channel cannot be enlarged laterally, as a variety of industrial, commercial and residential development directly abuts the channel right-of-way. There

are also some surrounding areas with earthen side slopes outside of the right-of-way that extend as much as 50 feet above the existing channel's concrete slope. Along the southern bank of the channel, approximately 400 linear feet of the surrounding property is at the same elevation as the top of the existing channel.

The channel crosses beneath two roads within this segment of the Segunda Deshecha Channel—one at Avenida Pico and the other at Calles de Los Molinos. The crossing under Avenida Pico consists of a 10' wide x 10' high double-barrel box culvert. The crossing at Calle de los Molinos consists of a 10' wide x 8' high double barrel box culvert. No improvements to the two box culvert crossings are proposed.

During the 1993 rainy season, significant rainfall caused several segments of the existing concrete channel, adjacent earthen slopes, and adjacent walls to fail. Overtopping occurred upstream of El Camino Real, causing the destruction of a hotel as the ensuing flows continued downstream. Repairs to the channel were made in the summer of 1993. A Federal Emergency Management Agency (FEMA) Damage Survey Report was written in 1993 for additional repairs to the seriously damaged segment upstream of El Camino Real. In 1995, after another series of storms, the County submitted an application to FEMA's Hazard Mitigation Grant Program. The FEMA grant was approved for the construction of ultimate 100-year discharge improvements for the 4,000-foot long stretch between El Camino Real and approximately 500 feet downstream of the I-5 freeway. Construction of the proposed project will be funded 75-percent by the FEMA Hazard Mitigation Grant Program and the remaining share by the Orange County Flood Control District (OCFCD) and the City of San Clemente.

The proposed project is intended to increase storm drain system capacity and correct previous design deficiencies, thereby preventing future damage from flooding. Hazards will be discussed in Section B. The proposed project will also include measures to improve water quality. Water quality issues will be discussed further in Section C of the current staff report and public access will be discussed in Section D.

Jurisdiction

Approximately 3,500 linear feet of the proposed 4,000-foot long channel reconstruction project lies within the Coastal Zone in the City of San Clemente. The City of San Clemente does not have a certified Local Coastal Program. As such, the Commission retains coastal development permit jurisdiction in the City of San Clemente pursuant to Section 30600 of the Coastal Act. The inlandmost portion of the project extends inland of the Coastal Zone Boundary. However, because the project is being undertaken using federal funding (FEMA's Hazard Mitigation Grant Program), a Consistency Determination from the Commission is also required. Additionally, the applicant must obtain approval from the City of San Clemente, a US Army Corps of Engineers (USACOE) 404 permit, a Department of Fish and Game (DFG) 1601 Streambed Alteration Agreement and a Regional Water Quality Control Board (RWQCB) 401 Certification. At the time of this staff report, the applicant has obtained approval from the local government, the Department of Fish and Game and the Regional Water Quality Control Board. US Army Corps of Engineers approval is pending a Consistency Determination.

B. HAZARDS

Section 30253 of the Coastal Act states in relevant part:

New development shall:

(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

The proposed project consists of reconstruction of an existing storm water channel within the flood control right-of-way. Construction of the proposed project will require approximately 8,300 cubic yards of excavation, 27,300 cubic yards of backfill and 6,900 cubic yards of reinforced concrete. Existing concrete removed during the contractor's operation will be properly disposed of outside the coastal zone.

A geotechnical investigation was prepared by Bing Yen & Associates dated August 2000. In preparing the report, the geotechnical consultant *"reviewed available geotechnical data, studied historic aerial photographs, secured site access, performed drilling, sampling and CPT soundings, installed standpipe piezometer and slope inclinometers, performed laboratory testing, conducted engineering analysis, participated with County staff."* The purpose of the investigation was to develop geotechnical parameters for design alternatives and safe and cost effective construction methods for the channel replacement.

The consultant found that the materials beneath the channel consist of fill, alluvium, terrace deposits, and bedrock of the Capistrano Formation. In general, the consistency of the materials beneath the channel is soft or loose in the upper 5 to 10 feet, then improve with depth. The geotechnical investigation states that groundwater was generally encountered at elevations near the invert and *"in some cases, slight artesian conditions are known to exist beneath the channel."*

As described in the report, special measures will be required to stabilize temporary slopes for construction of the new channel due to existing soil conditions, adjacent structures, and the required widening of the channel base. Various alternatives are offered in the geotechnical report, including soils nails, soil anchors and soldier piles with tiebacks.

The geotechnical consultant concluded that the proposed development is feasible from a geotechnical point of view, provided the recommendations presented in their reports are fully implemented in the design and construction of the project. The Geotechnical Investigation of the Segunda Deshecha Channel prepared by Bing Yen & Associates provides recommendations for the channel replacement project that include,

> *"...removing the existing concrete, including cut off wall, within the excavation footprint, providing a continuous drain system consisting of gravel, drain pipe, and filter fabric beneath and around the base of the channel. Dewatering during construction will be important aspects of temporary slope stability and constructability. Recommendations for lowering groundwater in the channel using shallow dewatering wells have been provided. Localized sump pumping may also be required. To mitigate rutting and heaving of saturated materials beneath the channel bottom, and to provide separation between these sediments and the gravel drain material, we recommend that the excavated channel bottom be underlain with a synthetic filter fabric material. Above the backdrain on the side of the channel, we recommend that a relatively impervious zone of backfill be placed to prevent infiltration from the ground surface. We recommend providing positive drainage of surface runoff toward the channel. Details of these recommendations are provided in the report."*

To affirm that the proposed development will assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area and to assure that risks to life and property are minimized, the Commission finds that the applicant shall, as a condition of approval, incorporate the geologist's recommendations into the final design and construction plans of the proposed project. Special Condition No. 1

requires the applicant to submit plans that show evidence of conformance with all geotechnical recommendations.

As conditioned for conformance with recommendations contained in the geotechnical report, the Commission finds that the proposed project is consistent with Section 30253 of the Coastal Act.

C. WATER QUALITY

Section 30230 of the Coastal Act states, in pertinent part:

> *Marine resources shall be maintained, enhanced, and where feasible, restored.*

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30232 of the Coastal Act states, in pertinent part:

> *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials.*

The proposed project involves improvements to an existing concrete channel running through a developed portion of San Clemente. The channel outlets at North Beach. Run-off from urban development into the storm drain system is commonly polluted with petroleum hydrocarbons including oil and grease from vehicles; heavy metals; synthetic organic chemicals including paint and cleaners; soap and dirt from washing vehicles and hardscape areas; dirt and vegetation from yard and common area maintenance; litter; fertilizers, herbicides, and pesticides; and bacteria and pathogens from animal waste. The discharge of these pollutants to coastal waters can cause: eutrophication and anoxic conditions resulting in fish kills and diseases and the alteration of aquatic habitat, including adverse changes to species composition and size; excess nutrients causing algae blooms and sedimentation increasing turbidity which both reduce the penetration of sunlight needed by aquatic vegetation which provide food and cover for aquatic species; disruptions to the reproductive cycle of aquatic species; and acute and sublethal toxicity in marine organisms leading to adverse changes in reproduction and feeding behavior. These impacts can reduce the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes and reduce optimum populations of marine organisms and have adverse impacts on human health. The applicant has provided a description of both construction and post-construction Best Management Practices (BMPs) that will be employed to protect and enhance marine resources.

Construction Impacts to Water Quality

As described previously, the project involves reconstruction of an existing storm water channel leading to the ocean. Construction impacts have the potential to negatively affect water quality. Storage or placement of construction materials, debris, or waste in a location which may be discharged into coastal waters would result in adverse impacts upon the marine environment that would reduce the biological productivity of coastal waters. For instance, construction debris

entering coastal waters may cover and displace soft bottom habitat. In addition, sediment discharged to coastal waters may cause turbidity which can shade and reduce the productivity of eelgrass beds and foraging avian and marine species ability to see food in the water column.

The applicant states that *"construction runoff will be monitored for erosion, sediment, storm water and non-storm water discharges and discharges off-site."* Additionally, the Negative Declaration for the proposed project states that temporary discharges of sediments and toxins into surface waters that could occur during construction will be mitigated through the imposition of conditions contained in the *"Standard Specification for Public Works Construction, the project-specific 'Plans and Special Provisions for Construction,' the general NPDES dewatering permit issued by the California Regional Water Quality Control Board, the general NPDES Permit for Construction Activities issued by the California Water Resources Board and the Areawide Urban Stormwater Run-off Permit for Orange County issued by the California Regional Water Quality Control Board."* While these measures can mitigate potential impacts to water quality, additional project-specific detail is required prior to issuance of the coastal development permit.

To further lessen the potential for pollutants and/or debris to appear on the sandy beach or enter coastal waters, the Commission imposes the following special condition related to construction-related impacts on water quality. Special Condition No. 2 requires the submittal of an Erosion, Sediment, and Chemical Control Plan (ESCCP) to minimize, to the maximum extent practicable, erosion, sedimentation, and the release of pollutants to receiving waters during and after construction. The ESCCP shall provide for controlling the amount of runoff and its ability to carry sediment and pollutants by diverting incoming flows and impeding internally generated flows, as well as retaining sediment that is picked up on the project site through the use of sediment-capturing devices. The ESCCP shall include provisions for minimizing, to the maximum extent practicable, the dispersion of dust, cement waste, and construction materials. The ESCCP shall also minimize, to the maximum extent practicable, the application, generation, and migration of toxic substances or other pollutants, and ensure the proper storage and disposal of toxic substances and construction-related materials. The ESCCP shall incorporate Best Management Practices (BMPs) and other recommended specifications for grading, runoff control and conveyance, and chemical and debris control.

Post Construction Impacts to Water Quality

Compliance with the specifications outlined in the Erosion, Sediment, and Chemical Control Plan discussed above will mitigate temporary water quality impacts during construction. However, they do not address potential impacts from post-construction run-off. Since the project proposes reconstruction of an existing channel, the project presents an opportunity to improve the quality of water entering the ocean from the Segunda Deshecha Channel through new design features. The applicant was asked by Commission staff to evaluate measures that could be included to improve water quality. Such measures could include the creation of soft bottom habitat, use of detention basins, filtering of inlets, etc.

County staff has provided an "alternatives analysis" to the proposed project design that includes the soft bottom alternative and has described various water quality enhancement measures to be included in the current project. The proposed project includes several post-construction Best Management Practices (BMPs) intended to improve the water quality of runoff entering the ocean via the Segunda Deshecha Channel. They include:

1. Remove debris associated with the "first flush":

   A trash boom will be installed downstream of Calle de Los Molinos. The device will be constructed of Styrofoam covered with vinyl-coated canvas. A galvanized steel cable located between the two channel walls will suspend the boom. A two-foot deep "skirt" will

be suspended below the boom to prevent objects from washing beneath it. (See Exhibit 7 for manufacturers brochure and photos.) After flood runoff in the channel subsides, maintenance crews will remove the trapped debris. During the non-storm season, debris will be periodically removed. According to the applicant, the device is very effective in removing floatable debris such as vegetation, litter and pathogenic microbes attached to such debris. The device is currently in use in numerous channels in Orange County, as well as the City of Los Angeles, Los Angeles, Ventura, San Diego and Alameda Counties and has shown to be very effective in removing floatable pollutants.

2. Establish a limited "soft-bottom" habitat in the proposed channel:

   Sediment retention bumps will be constructed to trap sediment. This concept will provide a substrate for wetland plants and animals during periods of low flow. As described by the applicant, the trapped sediment will also contribute in the removal of pathogenic microbes or other pollutants by screening them out of the runoff.

3. Installation of removable barricade/dam:

   Slots in the channel invert and walls downstream of Avenida Pico will be constructed to provide a secure point to install removable barricades to dam the flow in the channel (when necessary) to prevent hazardous materials or sewage spills from reaching the ocean. The barricade materials will be stored adjacent to the channel for quick access and installation when needed for these purposes. Portable pumps will be used to remove the contaminated water for treatment and disposal.

In addition to the water quality enhancements discussed above, the applicant is working with the City of San Clemente to incorporate a drop inlet feature that would facilitate future construction of a water quality enhancement project developed by the City of San Clemente. The City has submitted correspondence that addresses the drop inlet feature, the water quality enhancement project alternatives and the treatment of pollutants (Exhibit 8). As discussed in their letter, various water quality project concepts have been developed for the Segunda Deshecha Channel. The concepts include *"vortex separation technology along with high-rate disinfection and are sized to treat dry-weather runoff or all or a portion of wet-weather 'first-flush' storm flows."* The selected water quality device would then be sited within the drop inlet structure. The City Council has not yet directed City staff to implement such a structural treatment project. Nonetheless, the County is incorporating the drop inlet feature in the current project plans to avoid channel modifications and *"avert throw-away costs of removing a section of the channel at a later time during the construction of the water treatment unit."* If and when the City is ready to move forward with implementation of a structural runoff treatment facility within the channel, the City would be required to obtain a separate coastal development permit.

The post-construction BMPs proposed by the applicant will serve to minimize the contribution of pollutants to coastal waters through the Segunda Deshecha Canada Channel. To ensure that the water quality enhancement proposed by the applicant are properly implemented and maintained, the Commission imposed Special Condition No. 3. Special Condition No. 3 requires the submittal of a Water Quality Management Plan (WQMP), for the review and approval of the Executive Director, prior to issuance of the permit. The WQMP shall include, but is not limited to, a trash boom, a rubber dam drop structure, and sediment berms, as described in the application for Coastal Development Permit. The WQMP shall also indicate how this development will integrate with city-wide source control efforts for polluted runoff as needed to comply with the Orange County Municipal Storm Water Permit. The WQMP shall outline a monitoring and maintenance program for all structural BMPs. Maintenance shall be done as specified by the manufacturer. The BMPs

shall be inspected, at a minimum, just before the onset of the rainy season (October 15) and once per month during the rainy season.

Alternatives
The County evaluated several alternatives to the proposed project, including a concrete trapezoidal channel, a covered channel, offline retarding, online retarding and a soft bottom channel. The applicant notes that throughout the planning phase, they explored alternatives that would minimize disturbance to the geotechnically sensitive adjacent side slopes. The concrete trapezoidal channel (currently in place) was determined to be undersized for protecting adjoining properties during a 100-year storm and is only capable of conveying 60% of the design discharge. A covered channel alternative was estimated to cost $8 million, which rendered it economically prohibitive. The offline retarding concept requires flat topography adjacent to the channel in order to enable diversion over a side weir and into a side basin. The applicant states that the deeply incised channel rendered this concept incompatible. Online retarding was explored upstream of the I-5 freeway, inland of the Coastal Zone. According to the applicant, to achieve proper retarding, the pond depth required is in excess of 25 feet. Substantial land acquisition would be required, as well as significant flood control improvement to the upstream system. This alternative was deemed "impractical" by the applicant. A soft bottom channel was also explored and rejected due to limitation in permissible velocities, hydraulic considerations and cost. According to the applicant, velocities in soft bottom channels greater than 5 to 6 feet per second may cause extensive erosion to the soft bottom and side slopes, potentially undermining structures adjacent to the channel. Due to the steepness of the existing and proposed channel, velocities exceed 30 feet per second in some reaches. (Supporting hydraulic data for the existing trapezoidal channel provided by PFRD.) The applicant claims that to flatten the slope of the channel and reduce the velocities to allowable soft bottom standards, construction of extensive concrete grade stabilizers and the acquisition of private and public property would be required. Additionally, the road crossings at Avenida Pico and Calle do Los Molinos would have to be replaced. Lastly, the County asserts that the cost to construct a soft bottom channel is prohibitive. Costs would include the relocation of several businesses and residences located next to the channel, reconstruction of the street crossings and associated road construction, utility relocations and the channel construction. As such, the County found the soft bottom alternative to be infeasible in this instance.

The Commission notes that project cost is not a Coastal Act issue. However, the construction constraints and complications associated with property acquisition are acknowledged. The Commission's water quality analyst for the South Coast District has reviewed the project as proposed by the County and determined the water quality "enhancements" to be consistent with the marine protection and water quality policies of the Coastal Act if appropriately implemented and maintained. Therefore, the applicant's proposed alternative is allowable as conditioned.

Conclusion
Only as conditioned for submittal of an Erosion and Sediment and Chemical Control Plan and a Water Quality Management Plan does the Commission find that the proposed development is consistent with Sections 30230, 30231 and 30232 of the Coastal Act.

D. PUBLIC ACCESS

Section 30212(a)(2) of the Coastal Act states:

> *(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:*
>
> > *(l) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,*

(2) adequate access exists nearby

Section 30213 states, in pertinent part,

> *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided.*

Parking in North Beach is discussed in Chapter 2 (Area Description) of the LUP as follows:

> *An off-street parking lot with metered parking, as well as on-street metered and non-metered spaces are available at North Beach. There are approximately 350 parking spaces available at this location, consisting of 250 metered off-street and 100 metered on-street spaces.*
>
> *North Beach is the location of the City's Metrolink train station. The Metrolink station shares 150 parking spaces with beach and recreational parking. Approximately 100 spaces are reserved for recreational and beach parking only.*

The project involves major improvements to the Segunda Deshecha Canada Channel. The channel outlets into the Pacific Ocean at North Beach, a popular public beach in San Clemente. Polluted runoff has the potential to affect the public's use and enjoyment of the beach. Therefore, the proposed water quality improvement measures are an integral part of the proposed project. The special conditions imposed in Section C (Water Quality) address potential impacts to marine resources and the County's proposed enhancements to improve water quality. As previously conditioned, the Commission finds that the project contains mitigation measures which minimize potential adverse impacts to public access and recreation that may be caused by polluted runoff carried in the storm drain system.

In addition to potential impacts to public access caused by polluted runoff, the proposed channel reconstruction project has the potential to affect public access during construction. The proposed project is located between two major beach access routes, El Camino Real and Avenida Pico within the northern portion of San Clemente (Exhibits 1 & 2). The proposed development is not located between the sea and the first public road, but is located as close as one block (approximately 250 feet) from the ocean at its southwestern terminus. The nearest vertical public beach access is available at North Beach (Exhibit 4). Access at North Beach is available via an at-grade railroad crossing adjacent to the public parking lot.

While the project involves construction near primary beach access routes, the applicant has stated that the proposed activities will not obstruct public access, as the work will be carried out within the flood control right-of-way and will not hinder continued public use of Avenida Pico or El Camino Real. During construction, workers will park in designated areas and not in the designated beach and recreational spaces at the North Beach parking lot. Equipment will be stored in an appropriate off-street location within the right-of-way where possible. In addition, the contractor will secure approvals from the City of San Clemente and the County of Orange for proposed access points, hauling routes, staging areas and traffic control plans.

Although the applicant intends to minimize impacts to coastal access during construction, the proposed project will take approximately nine months to complete. As such, construction will occur during the peak beach use season, typically defined as Memorial Day weekend to Labor Day weekend. To guarantee that public access is maintained during this peak beach use season, the Commission imposes Special Condition No. 4. Special Condition No. 4 requires the applicant to submit a Public Access Maintenance Plan prior to commencement of construction that outlines the access points, hauling routes, staging areas and traffic control plans as approved by the City and

County. Maps of the staging areas and employee parking must also be submitted. The special condition requires that the plan incorporate the following provisions during the peak beach use season: 1) at least one lane shall remain open in either direction along El Camino Real and Avenida Pico, and 2) staging activities and/or employee parking shall not displace public beach and recreational parking at the North Beach parking lot.

Only as conditioned for maintenance of public access along public roadways and as previously conditioned for water quality BMPs does the Commission find the proposed development consistent with Section 30212 and 30213 of the Coastal Act.

E. GROWTH INDUCEMENT

Section 30254 of the Coastal Act states, in relevant part:

> *New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division…*

The proposed project is an upgrade to an existing under-capacity and deteriorated storm drain system that serves the northern portion of the City of San Clemente. The County's Negative Declaration for the improvement project states that the proposed channel improvements will not increase the development potential of the area served by the proposed improvements. The project is located within a fully developed area of the City, seaward of the I-5 Freeway. Increasing the capacity of the storm water system will not be pivotal to increasing development density within the portion of the service area located within the Coastal Zone. Therefore, the Commission finds the proposed development will not be growth-inducing and is consistent with Section 30254 of the Coastal Act.

F. LOCAL COASTAL PROGRAM

Section 30604(a) of the Coastal Act provides that the Commission shall issue a coastal permit only if the project will not prejudice the ability of the local government having jurisdiction to prepare a Local Coastal Program which conforms with Chapter 3 policies of the Coastal Act. The Commission certified the Land Use Plan (LUP) for the City of San Clemente on May 11, 1988, and certified an amendment approved in October 1995. On April 10, 1998, the Commission certified with suggested modifications the Implementation Plan (IP) portion of the Local Coastal Program. The suggested modifications expired on October 10, 1998. The City re-submitted on June 3, 1999, but withdrew the submittal on October 5, 2000. Therefore, the Commission retains coastal development permit jurisdiction in the City of San Clemente.

As conditioned, the proposed development is consistent with the policies contained in the certified Land Use Plan regarding public access. Therefore, approval of the proposed development will not prejudice the City's ability to prepare a Local Coastal Program for San Clemente that is consistent with the Chapter 3 policies of the Coastal Act as required by Section 30604(a).

G. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Section 13096 of the Commission's regulations requires Commission approval of coastal development permit applications to be supported by a finding showing the application, 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.

As explained in the findings set forth above in this staff report, all feasible mitigation measures have been adopted to avoid or reduce any significant adverse effects the project may have on the environment. Mitigation measures, in the form of special conditions, require 1) conformance of the final design and construction plans to the geotechnical reports; 2) submittal of an Erosion, Sediment and Chemical Control Plan (ESCCP); 3) submittal of a Water Quality Management Plan (WQMP); and 4) maintenance of public access during construction. In addition, the Commission finds that there are no other feasible alternatives available that would avoid or substantially reduce any significant adverse effects the project may have on the environment. Therefore, the proposed project, as conditioned, is consistent with the applicable requirements of CEQA.

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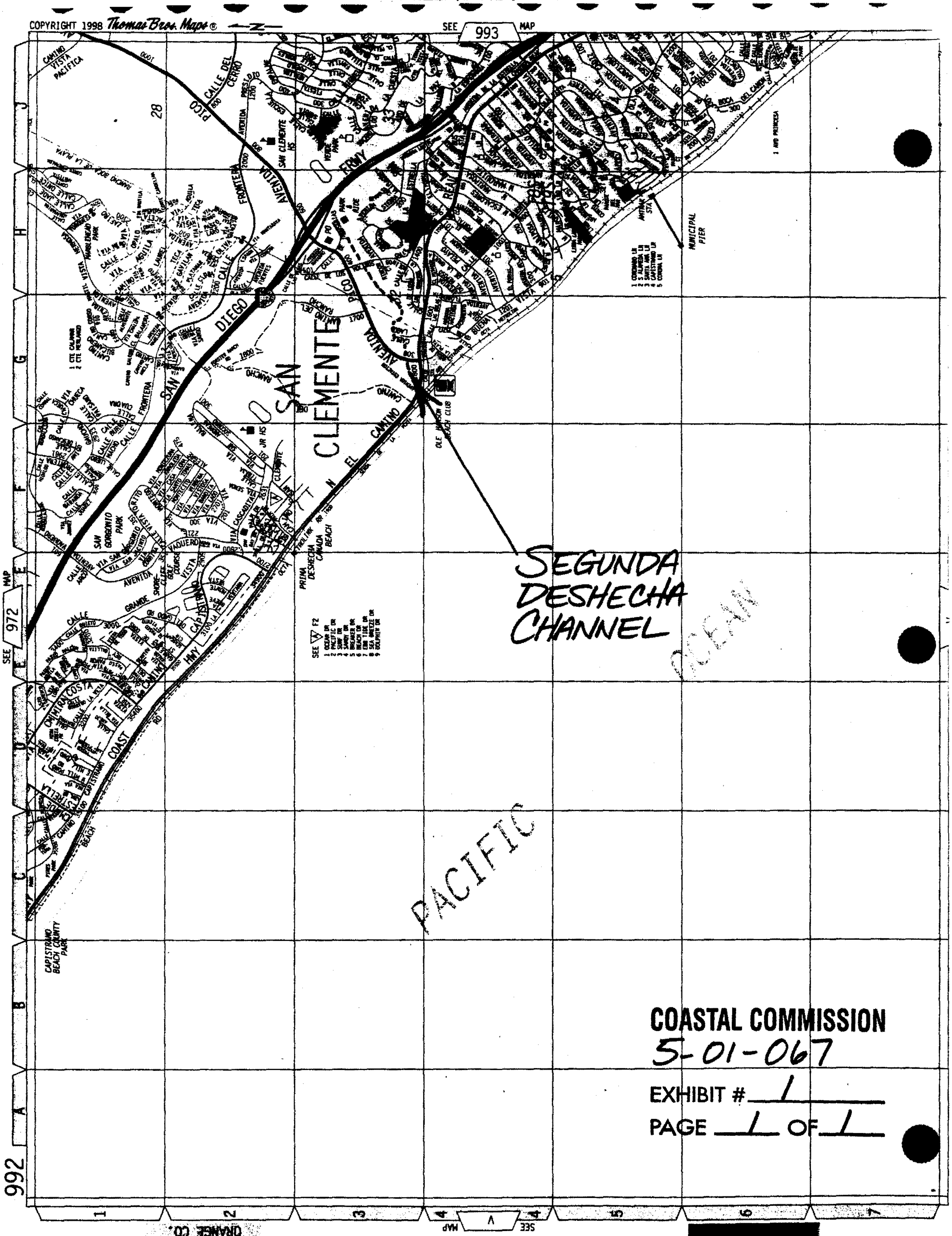
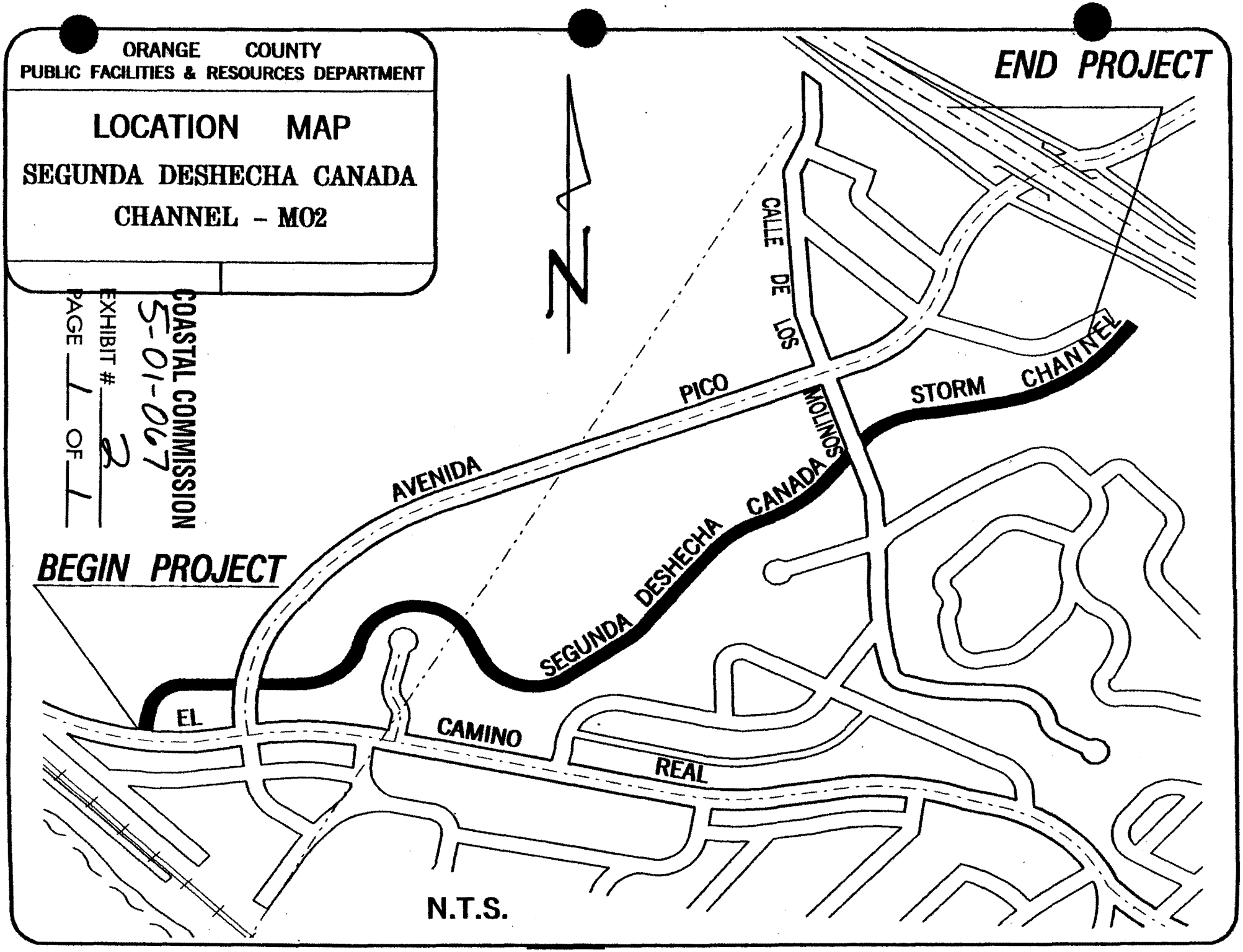


COASTAL COMMISSION
5-01-067
EXHIBIT # 1
PAGE 1 OF 1

[redacted]


ORANGE COUNTY
PUBLIC FACILITIES & RESOURCES DEPARTMENT
LOCATION MAP
SEGUNDA DESHECHA CANADA
CHANNEL - M02
COASTAL COMMISSION
5-01-067
EXHIBIT # 2
PAGE 1 OF 1
END PROJECT
BEGIN PROJECT
N
CALLE DE LOS MOLINOS
PICO
AVENIDA
STORM CHANNEL
SEGUNDA DESHECHA CANADA
EL CAMINO REAL
N.T.S.

MAP 1 COASTAL ZONE BOUNDARY MAP

COASTAL COMMISSION
5-01-067
EXHIBIT # 3
PAGE 1 OF 1

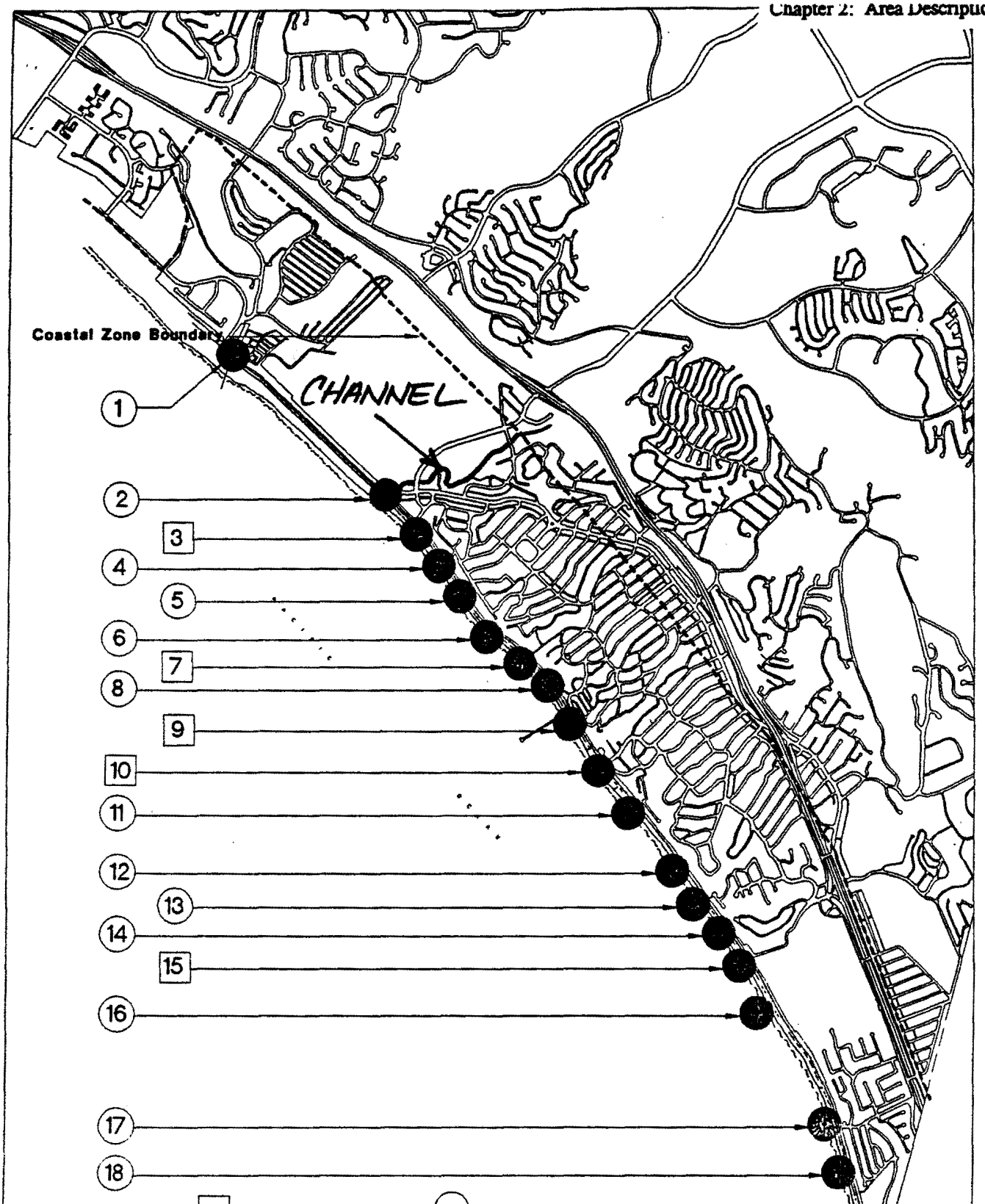
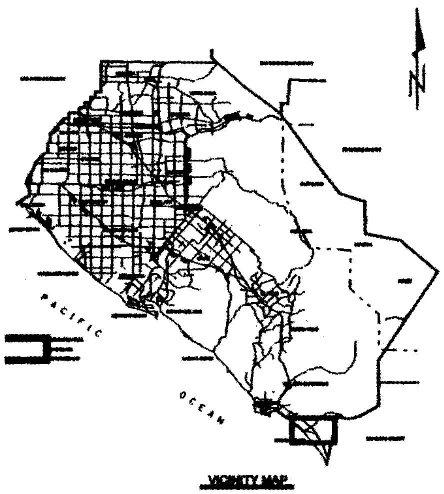
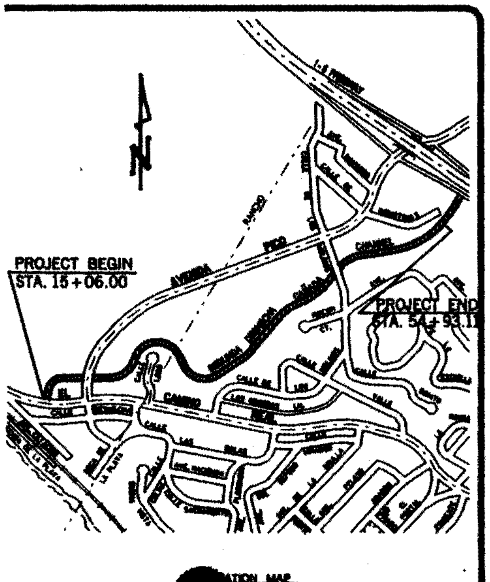


FIGURE 2-5

CITY OF SAN CLEMENTE
COASTAL ACCESS POINTS





ORANGE COUNTY

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

SANTA ANA, CALIFORNIA

VICKI L. WILSON, DIRECTOR

PLANS FOR CONSTRUCTION OF

SEGUNDA DESHECHA CAÑADA CHANNEL

FACILITY No. M02

FROM

STA. 15+06.00 TO STA. 54+93.11

MAY 2002

FUNDED AND MAINTAINED BY: ORANGE COUNTY FLOOD CONTROL DISTRICT

INDEX OF SHEETS

UTILITY OWNER	PHONE NO.	CONTACT
SAN DIEGO GAS & ELECTRIC CO.	(949)361-8047	PATTI GOOD
THE GAS COMPANY	(714)634-3186	JOHN PAPACS
PACIFIC BELL		DOUG BLASINGHAM
COX COMMUNICATIONS	(949)546-2813	STEVE DEMORA
SOUTH COAST WATER DISTRICT OF ORANGE COUNTY	(949)499-4666	MICHAEL DUNBAR
CITY OF SAN CLEMENTE - UTILITIES DIVISION	(949)361-8120	BILL CAMERON
AT&T OSP ENGINEERING	(909)776-8914	RUBEN MARTINEZ

BENCH MARK:

O.C.S. BENCHMARK [illegible] ELEV. = [illegible]
O.C.S. BENCHMARK [illegible] ELEV. = [illegible]

NGVD 1929
(1976 O.C.S. ADJUSTMENT)

BASIS OF BEARINGS:

THE BASIS OF BEARING HEREON IS THE GRID INVERSE BETWEEN O.C.S. GPS CONTROL STATION [illegible] AND O.C.S. GPS STATION [illegible], BEING N [illegible] E.

COORDINATES SHOWN ARE BASED ON THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, ZONE VI, 1983 NORTH AMERICA DATUM, [illegible] EPOCH [illegible] ADJUSTMENT)

DISTANCES SHOWN ARE GROUND. MULTIPLY GROUND DISTANCES BY [illegible] TO OBTAIN GRID DISTANCES.

APPROVALS		
APPROVED:	CITY OF SAN CLEMENTE	DATE

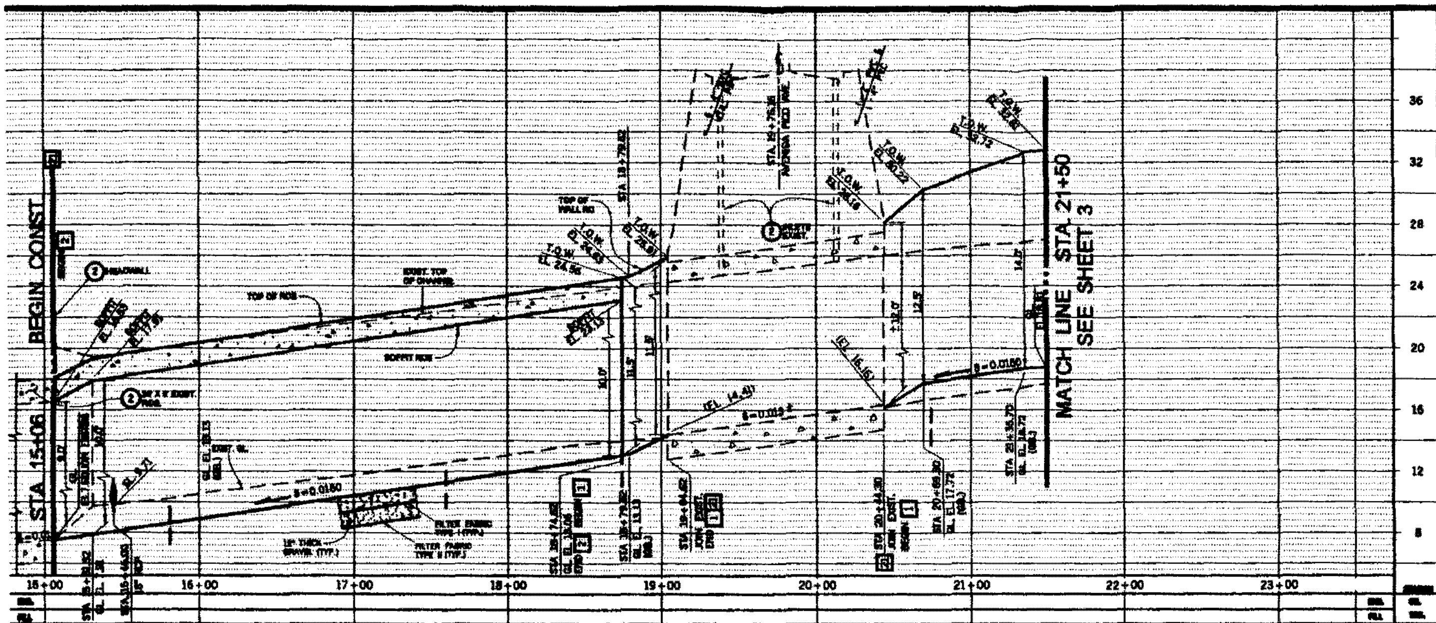
PUBLIC FACILITIES & RESOURCES DEPARTMENT		
SUBMITTED:	FLOOD CONTROL DESIGN CHIEF	DATE
RECOMMENDED:	DESIGN DIVISION MANAGER	DATE
APPROVED:	CHIEF [illegible]	DATE

NO.	DESCRIPTION	SHT.	APPROVED	DATE

REVISIONS

W. O. NO. EF07351
DWG. NO. M02-101-4

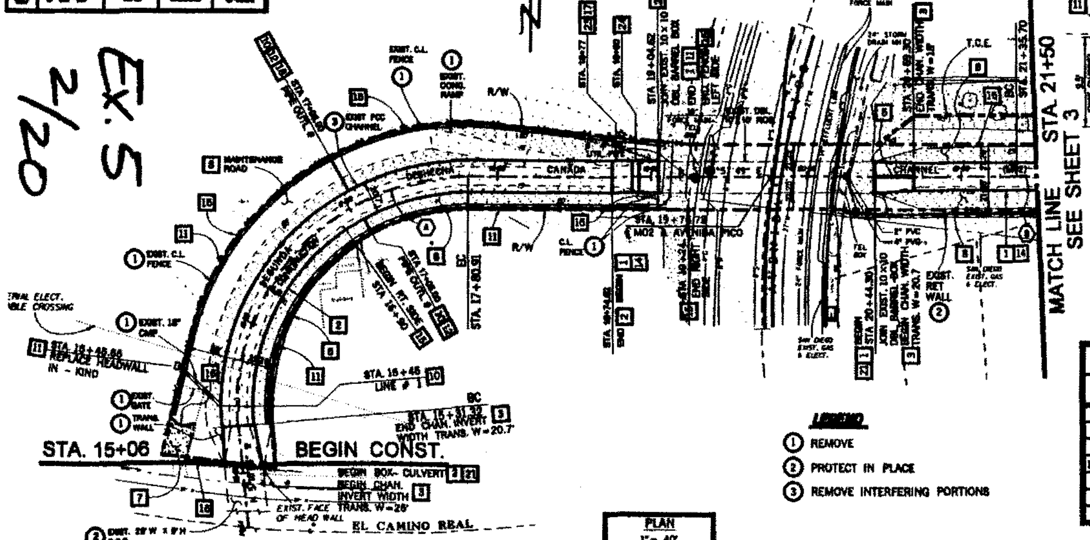
SHE[illegible] OF 29



PROFILE
HORIZ. 1" = 40'
VERT. 1" = 4'

CURVE DATA				
	Δ	R	L	T
A	[illegible]	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]	[illegible]

Ex. 5
2/20

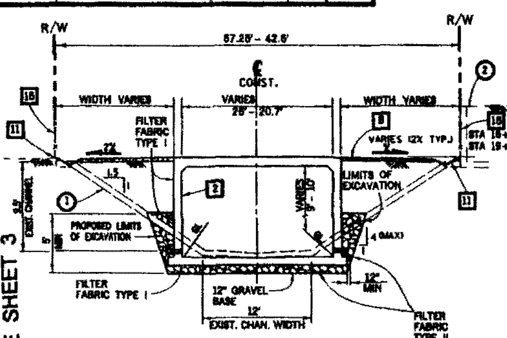


PLAN
1" = 40'

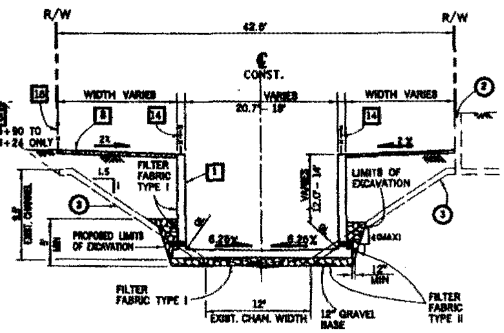
LEGEND
1. REMOVE
2. PROTECT IN PLACE
3. REMOVE INTERFERING PORTIONS

CONSTRUCTION NOTES

1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN AND PROFILE SHEETS, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS AND PFRD STD. PLAN 1803.
2. CONSTRUCT REINFORCED CONCRETE BOX-CULVERT PER PLAN AND PROFILE, SHEETS, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS AND PFRD STD. PLAN 1803,
3. CONSTRUCT CHANNEL INVERT TRANSITION PER PLAN AND PROFILE SHEETS.
5. CONSTRUCT DEBRIS NOSE AT AVENIDA PICO AND CALLE DE LOS MOLINOS PER PLAN AND DETAILS SHEET 8 AND PFRD STD. PLAN 1324.
7. CONSTRUCT PCC MAINTENANCE ROAD APPROACH WITH 0.5' PCC/NS PER PLANS, DETAILS SHEETS 9, 10 AND 11 AND SPECIAL PROVISIONS.
8. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/NS, WIDTH PER PLAN AND PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
9. CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1331.
10. CONSTRUCT SIDE INLET PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
11. CONSTRUCT MODIFIED 6" VEE-DITCH PER PLAN AND PROFILE SHEETS AND DETAILS SHEETS 18 AND 19 AND PFRD STD. PLAN 1332.
12. CONSTRUCT INLET AND HEADWALL PER PLAN AND PROFILE SHEETS AND DETAILS SHEET 19.
14. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN AND PROFILE SHEETS AND PFRD STD. PLAN 1413.
15. INSTALL 5' CHAIN LINK FENCE PER PLAN AND PROFILE SHEETS, TYPICAL SECTION, DETAILS AND PFRD STD. PLAN 600-0-OC.
16. INSTALL 5' HIGH CHAIN LINK DOUBLE SWING GATE, WIDTH PER PLANS AND DETAILS SHEETS 9, 10 AND 11 AND PFRD STD. PLAN 600-0-OC.
17. INSTALL 5' HIGH AND 4' WIDE CHAIN LINK GATE PER PLANS AND DETAILS SHEET AND PFRD STD. PLAN 600-0-OC.
18. INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402. PLAN AND PROFILE SHEETS AND DETAILS SHEET 19 AND AS DIRECTED BY THE ENGINEER.
21. CONSTRUCT CHANNEL JOIN PER DETAILS SHEET __
23. INSTALL CHANNEL ACCESS STEPS PER PFRD STD. PLAN 1507.
24. CONSTRUCT DROP INLET PER DETAILS SHEET G1 AND SPECIAL PROVISIONS SECTION G.



TYPICAL SECTION
STA. 15+06 TO STA. 15+31.32 W=28'-20.7'
STA 15+31.32 TO STA 19+04.62 W=20.7'
N.T.S.



TYPICAL SECTION
STA 20+44.30 TO STA 20+69.30 W=20.7'-18'
STA 20+69.30 TO STA 21+50 W=18'
N.T.S.

1/2 0 1 2
3 inches on original drawing

HYDRAULIC DATA

Station to Station	Q (cfs)	b (Ft)	z	S	n = 0.014 dn (Ft)	n = 0.014 V (Ft/s)	F	Do (Ft)
15+06.00 TO 15+31.32	4300	28 - 20.7	0.0	0.018	6.3 TO 6.7	32.3 TO 31.0	2.5 - 2.1	9.0 TO 10.0
15+31.32 TO 18+79.62	4300	20.7	0.0	0.018	6.7 TO 7.0	31.0 TO 29.8	2.1 - 2.0	10.0 TO 11.0
18+79.62 TO 19+04.62	4300	20.7	0.0	± 0.05	7.0 TO 7.7	29.8 TO 27.8	2.0 - 1.78	11.0
19+04.62 TO 20.44.30 (CULVERT)	4300	20.7	0.0	± 0.013	7.7 TO 7.2	27.8 TO 28.6	1.78 - 1.9	9.7
20+44.00 TO 20+69.30	4300	20.7 - 18.0	0.0	± 0.06	7.2 TO 9.6	29.0 TO 26.0	1.9 - 1.4	11.0 TO 12.1
20+69.30 TO 21+35.70	4300	18.0	0.0	0.018	9.6 TO 10.2	25.0 TO 23.4	1.4 - 1.3	12.1
21+35.70 TO 21+50.00	4300	18.0	0.0	0.006	10.2	23.4	1.3	12.1

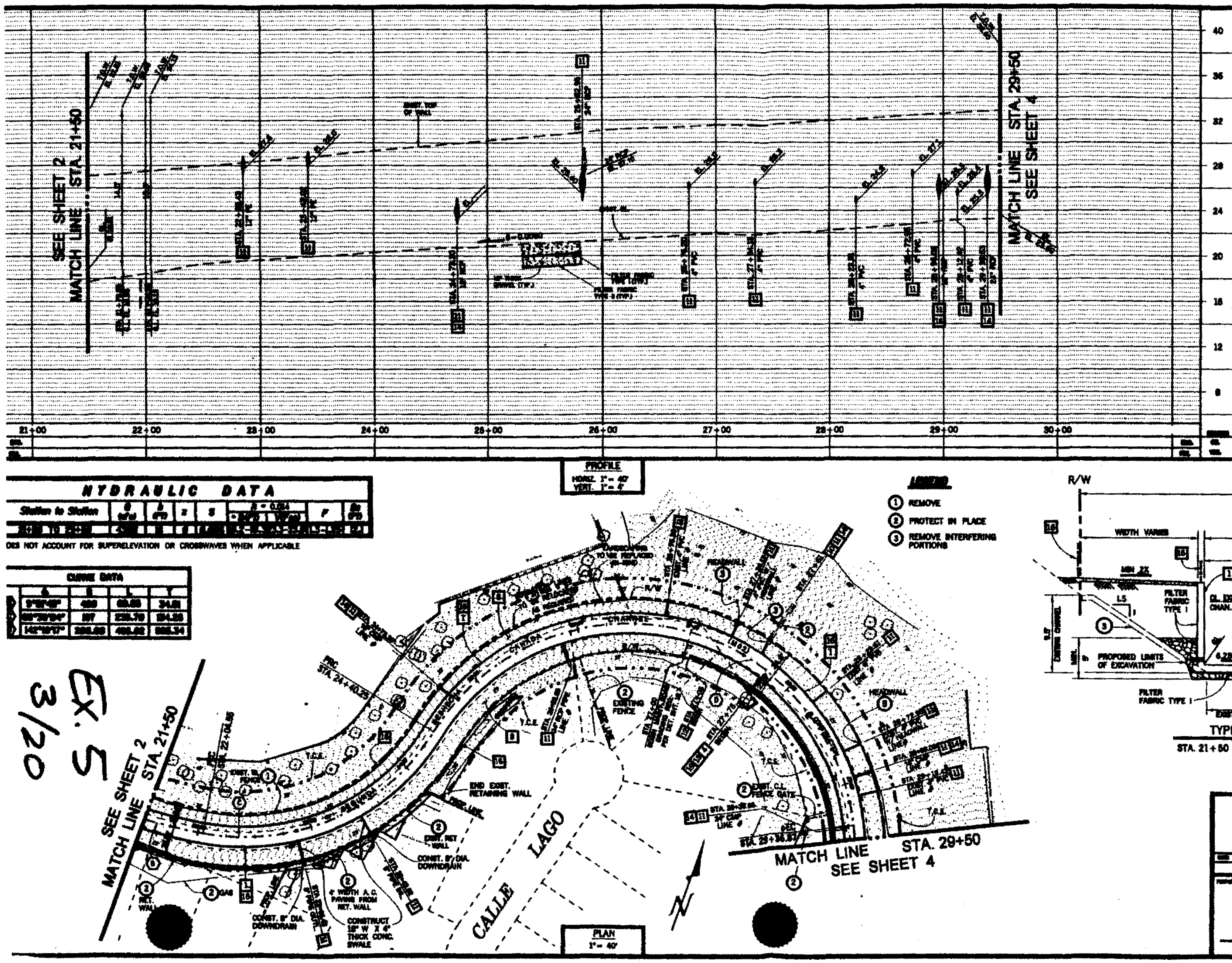
REVISIONS

ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

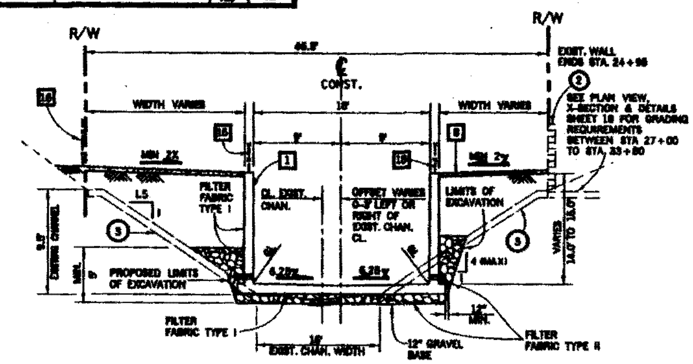
PLAN & PROFILE
STA 15+06 TO STA 21+50

SHEET 2 OF 7



CONSTRUCTION NOTES

1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
4. CONSTRUCT REINFORCED MASONRY RETAINING WALL PER PFRD STD. PLAN 619-0-OC MODIFIED HEREIN PER PLAN & PROFILE, TYPICAL SECTION AND DETAILS SHEET 16.
8. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/HB, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
10. CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1331.
11. CONSTRUCT SIDE INLET PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
12. CONSTRUCT MODIFIED 5' VEE-DITCH PER PLAN & PROFILE SHEETS AND DETAILS SHEETS 18 & 19 AND PFRD STD. PLAN 1332.
13. CONSTRUCT INLET & HEADWALL PER PLAN & PROFILE SHEETS AND DETAILS SHEET 19.
14. CONSTRUCT R.C. COLLAR PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 & PFRD STD. PLAN 1317.
15. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
16. INSTALL 6' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
19. INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402, PLAN & PROFILE SHEETS AND DETAILS SHEET 19 AND AS DIRECTED BY THE ENGINEER.



TYPICAL SECTION

STA. 21+50 TO STA. 29+50 W=18'

3 inches on original drawing

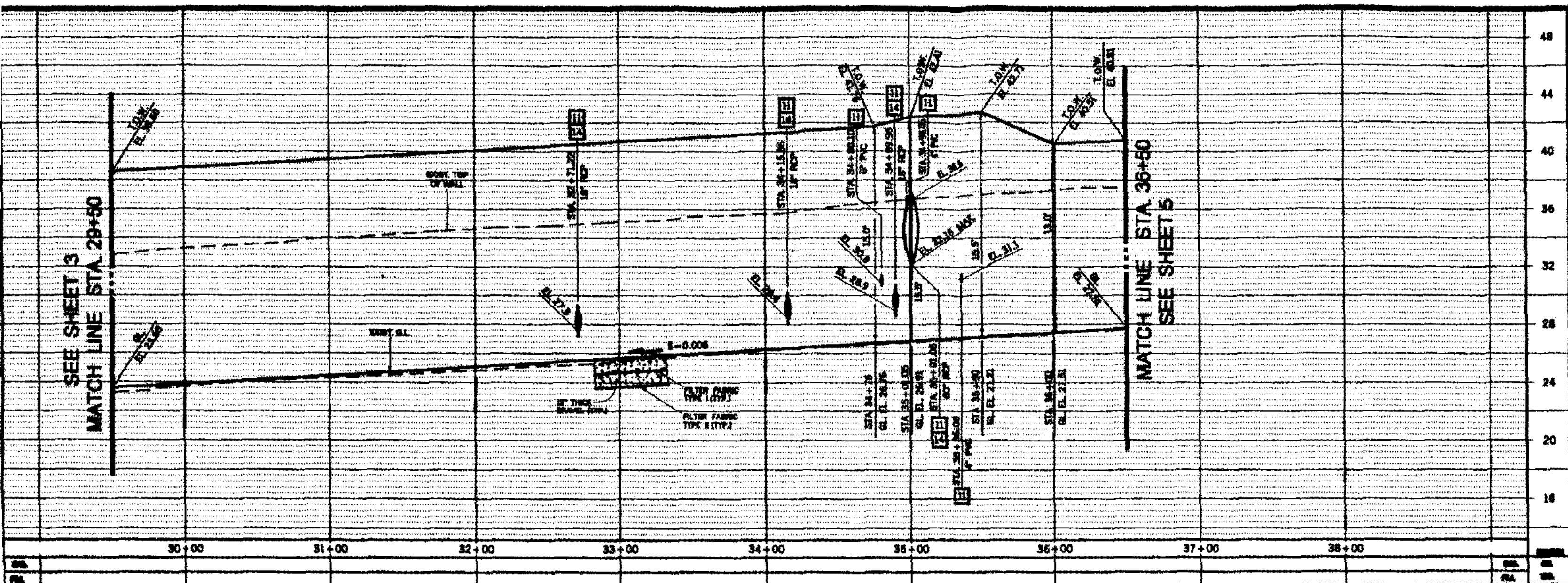
SEGUNDA DESHECHA CAÑADA CHANNEL

PLAN & PROFILE

STA 21+50 TO STA 29+50

3 OF 7

Ex. 5
3/20



CONSTRUCTION NOTES

1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
4. CONSTRUCT REINFORCED MASONRY RETAINING WALL PER PFRD STD. PLAN 618-0-OC MODIFIED HEREIN PER PLANS & PROFILE, TYPICAL SECTION AND DETAILS SHEET 16.
8. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/NS, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
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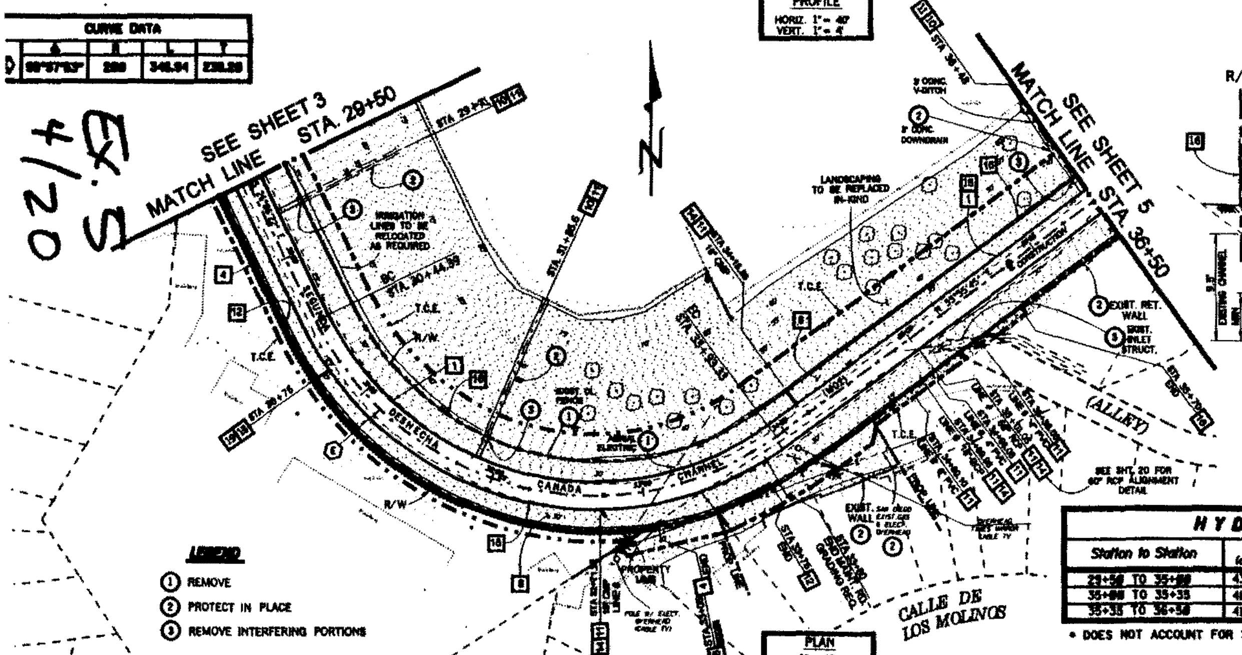
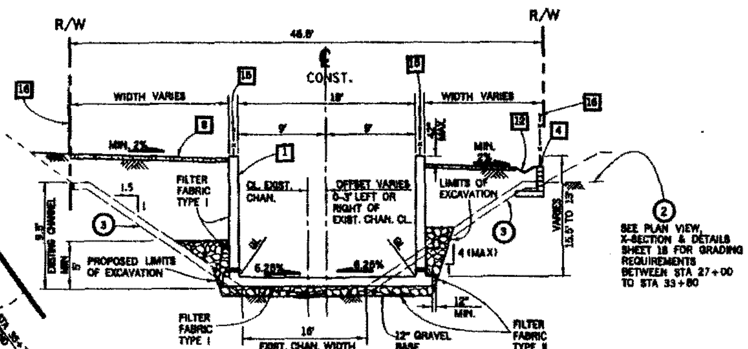
15. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
16. INSTALL 8' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
19. INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402, PLAN & PROFILE SHEETS AND DETAILS SHEET 19 AND AS DIRECTED BY THE ENGINEER.



LEGEND

1. REMOVE
2. PROTECT IN PLACE
3. REMOVE INTERFERING PORTIONS



TYPICAL SECTION

STA 29+50 TO STA 36+50 W=18'

½ 0 1 2
3 inches on original drawing

HYDRAULIC DATA								
Station to Station	Q (cfs)	b (Ft)	z	S	n = 0.014 * D(Ft)	n = 0.014 V(Fps)	F	Dc (Ft)
29+50 TO 35+00	[illegible]	18	[illegible]	[illegible]	7.3-12.1	23.8-19.7	[illegible]	12.1
35+00 TO 35+35	[illegible]	18	[illegible]	0.006	14.3-14.6	15.7-15.9	0.7	11.7
35+35 TO 36+50	[illegible]	18	[illegible]	0.006	9.5	24.0	1.4	11.7

* DOES NOT ACCOUNT FOR SUPERELEVATION OR CROSSWAVES WHEN APPLICABLE

REVISIONS

ORANGE COUNTY

SEGUNDA DESHECHA CAÑADA CHANNEL

OCFCD FACILITY - M02

PLAN & PROFILE

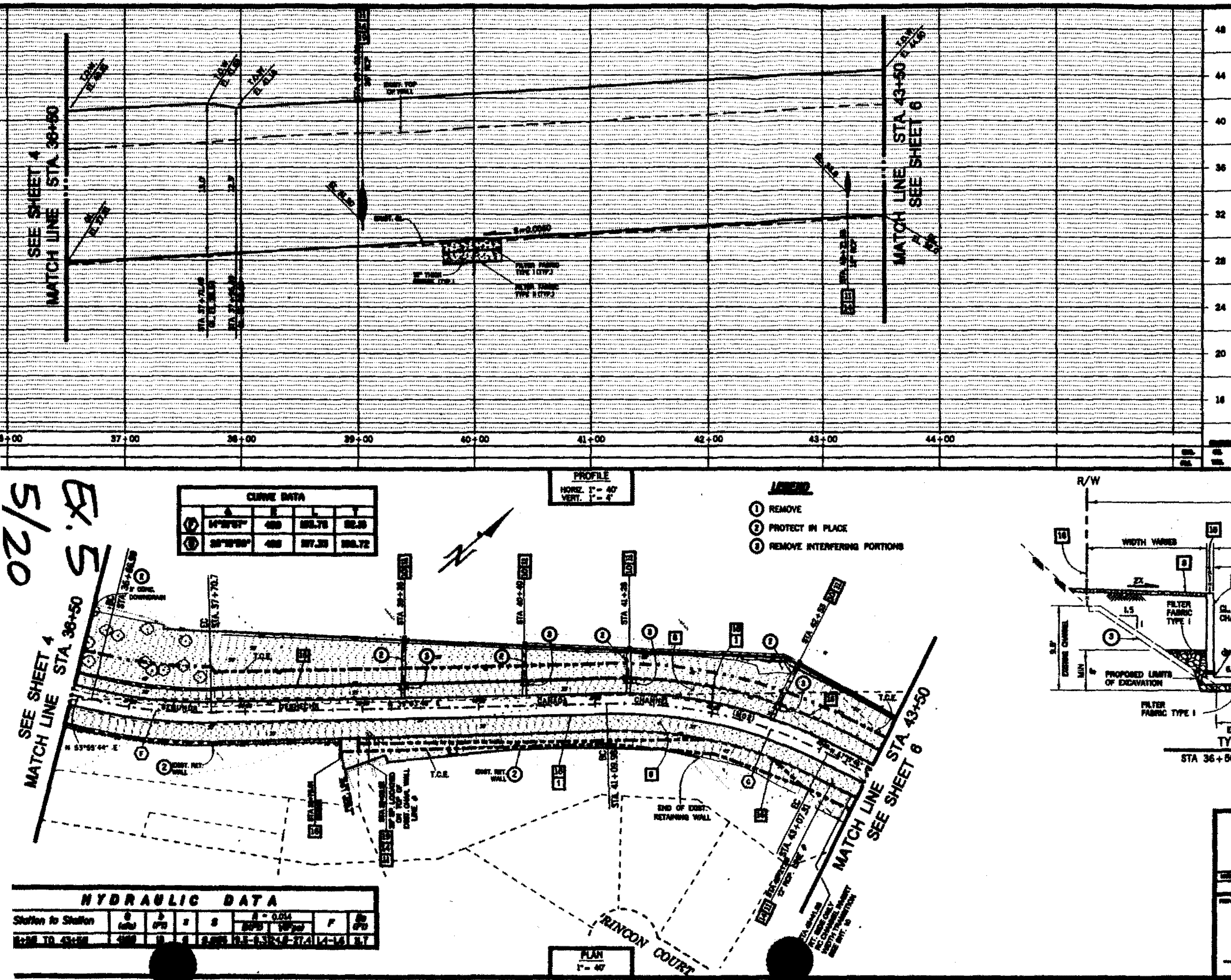
STA 29+50 TO STA 36+50

M02-101-4

SHEET 4 OF ?

CONSTRUCTION NOTES

1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
6. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/NS, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
10. CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1331.
11. CONSTRUCT SIDE INLET PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
14. CONSTRUCT R.C. COLLAR PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 & PFRD STD. PLAN 1317.
16. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
18. INSTALL 6' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
19. INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402, PLAN & PROFILE SHEETS AND DETAILS SHEET 19 AND AS DIRECTED BY THE ENGINEER.



PROFILE
HORIZ. 1" = 40'
VERT. 1" = 4'

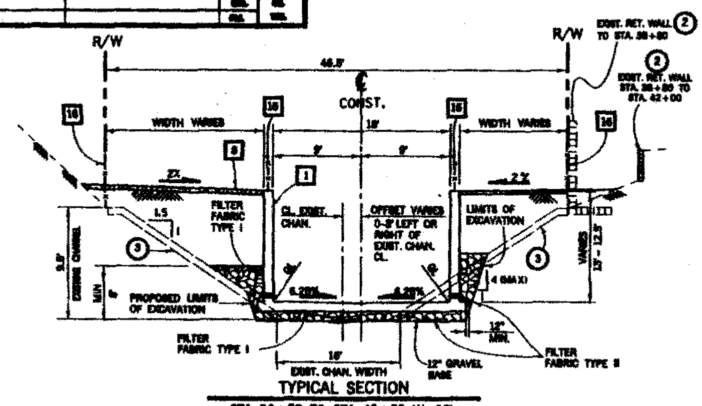
PLAN
1" = 40'

LEGEND

① REMOVE
② PROTECT IN PLACE
③ REMOVE INTERFERING PORTIONS

CURVE DATA				
	Δ	R	L	T
⑦	[illegible]	400	[illegible]	[illegible]
⑧	[illegible]	400	[illegible]	[illegible]

HYDRAULIC DATA								
Station to Station	Q (cfs)	b (ft)	z	S	n = 0.014		F	Bo (ft)
[illegible] TO 43+50	4000	18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



TYPICAL SECTION
STA 36+50 TO STA 43+50, W=18'

2 inches on original drawing

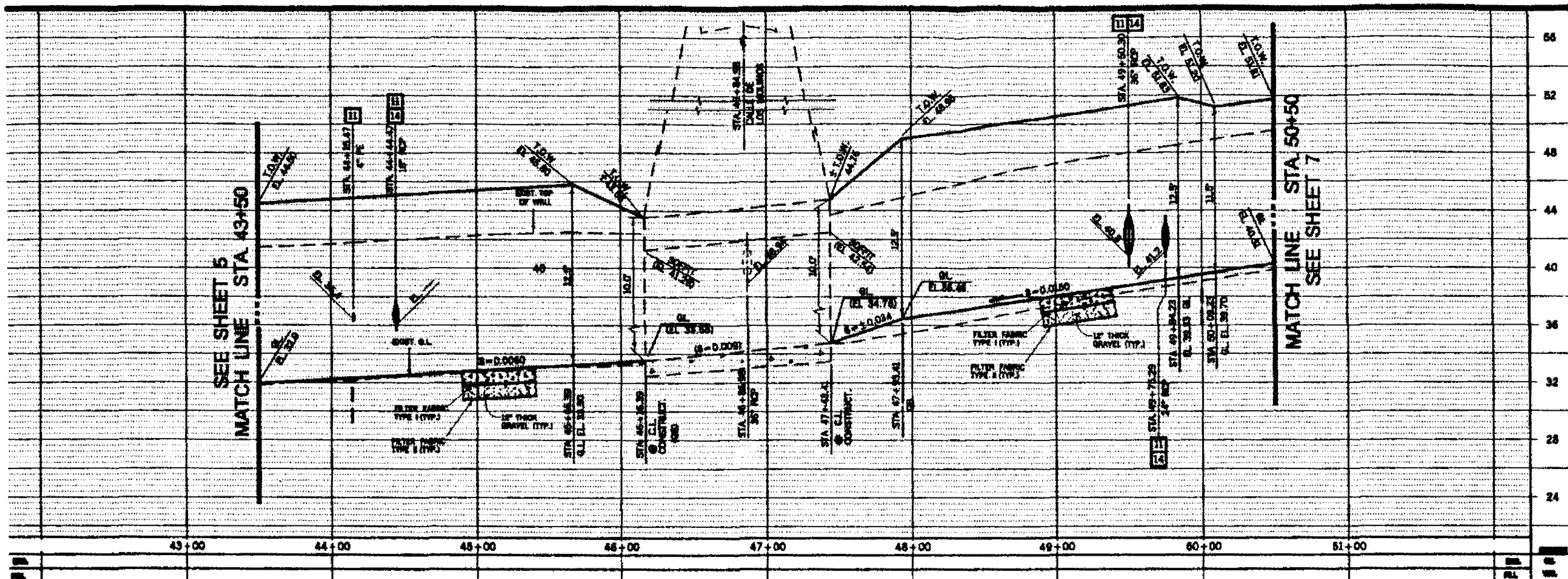
REVISIONS

SEGUNDA DESHECHA CAÑADA CHANNEL

PLAN & PROFILE
STA 36+50 TO STA 43+50

5 OF 7

Ex. 5
5/20



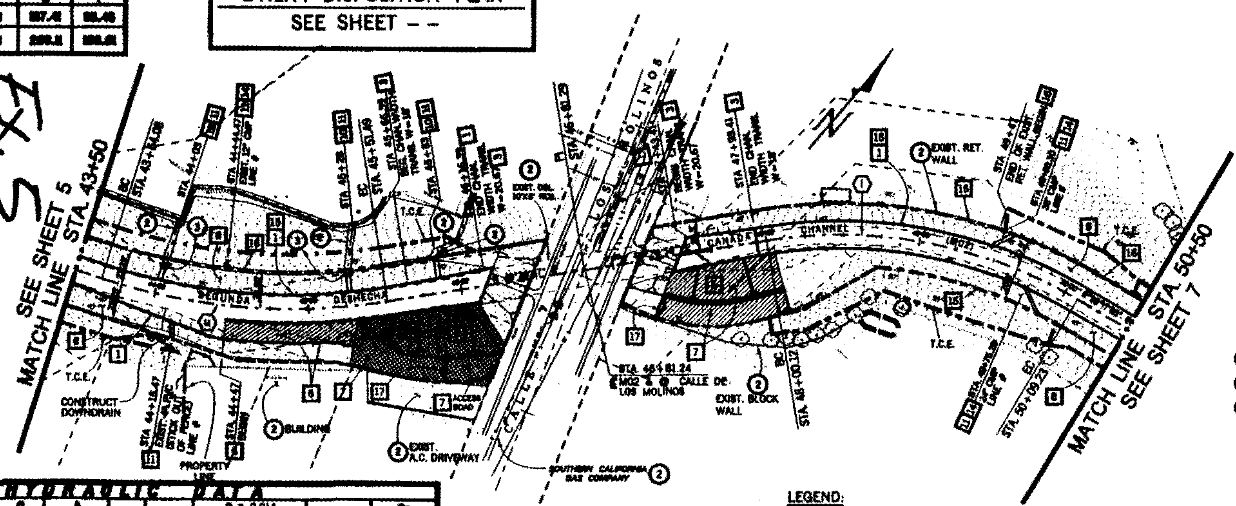
PROFILE
HORIZ. 1"= 40'
VERT. 1"= 4'

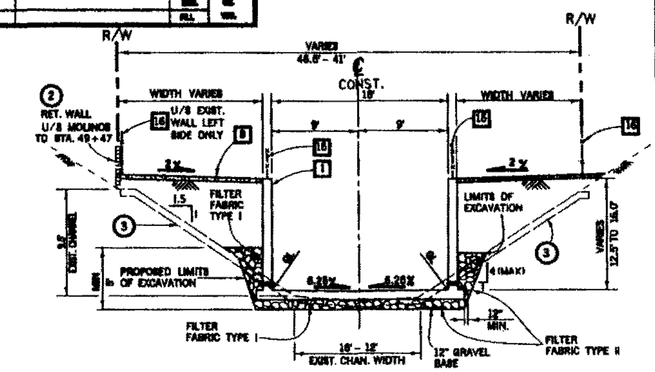
CONSTRUCTION NOTES

1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
3. CONSTRUCT CHANNEL INVERT WIDTH TRANSITION PER PLAN & PROFILE SHEETS.
5. CONSTRUCT DEBRIS NOSE AT AVENIDA PICO AND CALLE DE LOS MOLINOS PER PLAN AND DETAILS SHEET 8 AND PFRD STD. PLAN 1324.
6. CONSTRUCT CHANNEL ACCESS RAMP D/S OF CALLE DE LOS MOLINOS PER PLAN & PROFILE AND DETAILS SHEETS 10 AND 12.
7. CONSTRUCT PCC MAINTENANCE ROAD APPROACH WITH 0.5' PCC/NS PER PLANS, DETAILS SHEETS 9, 10 & 11 AND SPECIAL PROVISIONS.
8. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB NS, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
10. CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1331.
11. CONSTRUCT SIDE INLET PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
14. CONSTRUCT R.C. COLLAR PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 & PFRD STD. PLAN 1317.
15. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
16. INSTALL 8' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
17. INSTALL 8' HIGH CHAIN LINK DOUBLE SWING GATE, WIDTH PER PLANS AND DETAILS SHEETS 9, 10 & 11 AND PFRD STD. PLAN 600-0-OC.

CURVE DATA			
Δ	R	L	T
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

UTILITY DISPOSITION PLAN
SEE SHEET - -





TYPICAL SECTION

STA. 43+50 TO STA. 45+66.39, W=18'
STA 45+66.39 TO STA 46+16.39, W=18' - 20.67'
STA 47+43.41 TO STA 47+93.41, W=20.67' - 18'
STA 47+93.41 TO STA 50+50, W=18'

LEGEND

1. REMOVE
2. PROTECT IN PLACE
3. REMOVE INTERFERING PORTIONS

HYDRAULIC DATA								
Station to Station	Q (cfs)	b (FT)	z	S	n = 0.014 D(FT)	V(FPS)	F	Do (FT)
... TO 45+66.39	[illegible]	18	[illegible]	[illegible]	6.3-6.8	27.4-28.8	1.6-1.8	11.7
...39 TO 46+16.39	[illegible]	18-20.67	[illegible]	[illegible]	6.6-6.3	28.8-31.3	1.8-2.2	11.7-18.7
...39 TO 47+43.41	[illegible]	20.67	[illegible]	[illegible]	6.3-6.1	31.3-33.3	2.2-2.4	[illegible]
...41 TO 47+93.41	[illegible]	20.67-18	[illegible]	[illegible]	6.1-7.2	33.3-31.5	2.4-2.1	[illegible]
...41 TO 50+50	[illegible]	18	[illegible]	[illegible]	7.2-7.4	31.5-30.2	2.1-2.0	11.7

LEGEND:
- STRUC. CONCRETE RAMP
- MISC. CONCRETE

PLAN
1"= 40'

3 inches on original drawing

REVISIONS

ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

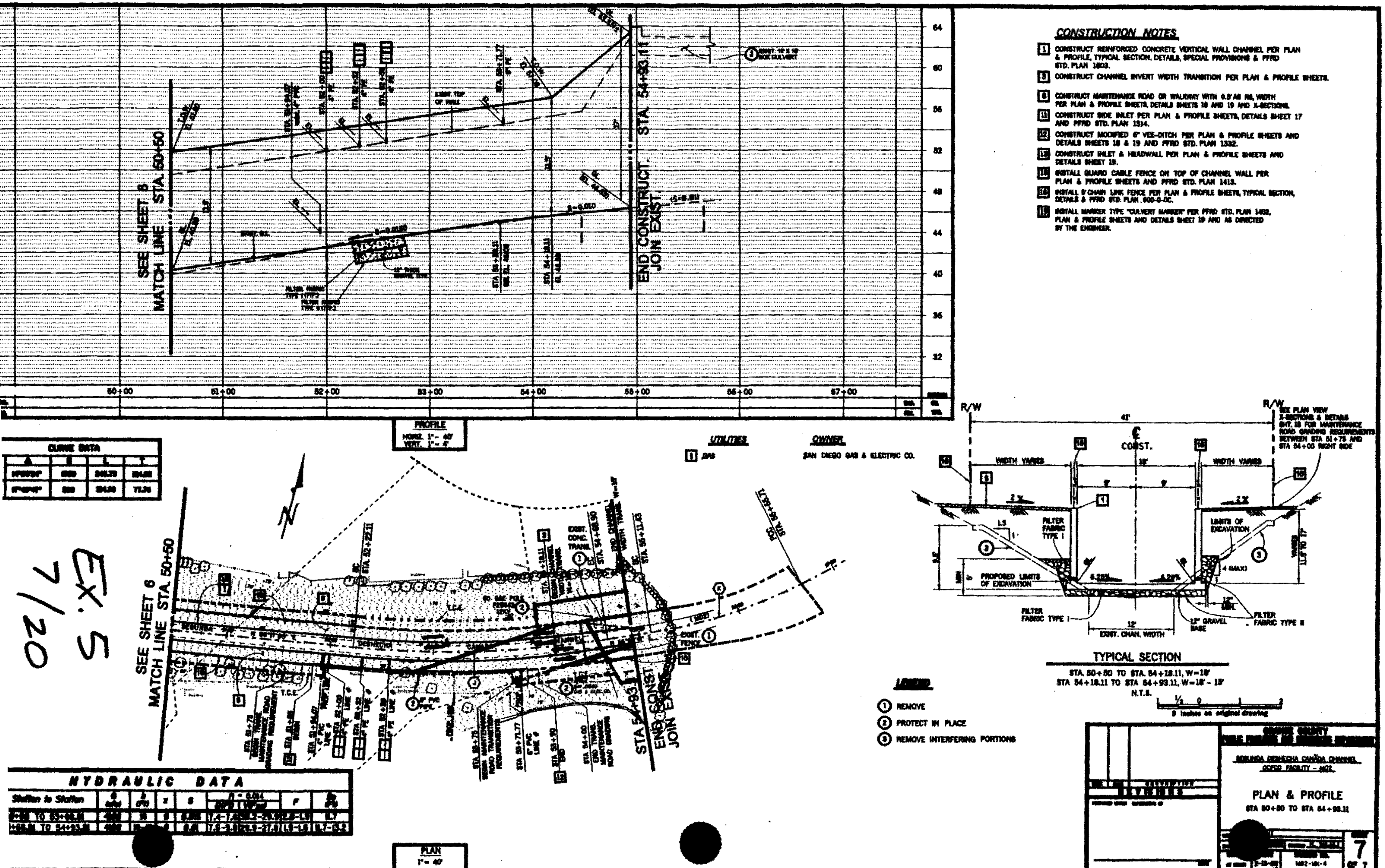
PLAN & PROFILE

STA 43+50 TO STA 50+50

2-13-92

SHEET 6 OF 7

Exp. 6/20


CONSTRUCTION NOTES
1 CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
3 CONSTRUCT CHANNEL INVERT WIDTH TRANSITION PER PLAN & PROFILE SHEETS.
6 CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB NS, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
11 CONSTRUCT SIDE INLET PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
12 CONSTRUCT MODIFIED 6" VEE-DITCH PER PLAN & PROFILE SHEETS AND DETAILS SHEETS 18 & 19 AND PFRD STD. PLAN 1332.
13 CONSTRUCT INLET & HEADWALL PER PLAN & PROFILE SHEETS AND DETAILS SHEET 19.
15 INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
16 INSTALL 5' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
19 INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402, PLAN & PROFILE SHEETS AND DETAILS SHEET 19 AND AS DIRECTED BY THE ENGINEER.
SEE SHEET 6
MATCH LINE STA. 50+50
END CONSTRUCT. STA. 54+93.11
JOIN EXIST.
PROFILE
HORIZ. 1" = 40'
VERT. 1" = 4'
UTILITIES
1 GAS
OWNER
SAN DIEGO GAS & ELECTRIC CO.
CURVE DATA
TYPICAL SECTION
STA. 50+50 TO STA. 54+18.11, W=18'
STA 54+18.11 TO STA 54+93.11, W=18' - 19'
N.T.S.
R/W
41'
CONST.
WIDTH VARIES
18'
2 %
FILTER FABRIC TYPE I
LIMITS OF EXCAVATION
PROPOSED LIMITS OF EXCAVATION
12" GRAVEL BASE
FILTER FABRIC TYPE II
12'
EXIST. CHAN. WIDTH
LEGEND
1 REMOVE
2 PROTECT IN PLACE
3 REMOVE INTERFERING PORTIONS
HYDRAULIC DATA
PLAN
1" = 40'
PLAN & PROFILE
STA 50+50 TO STA 54+93.11
7
OF 7

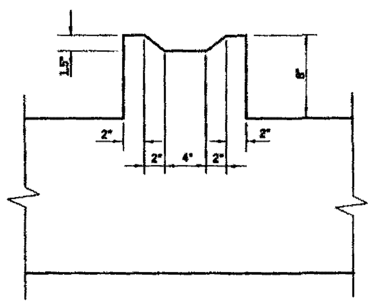
Ex. 5
7/20

CONSTRUCTION NOTES

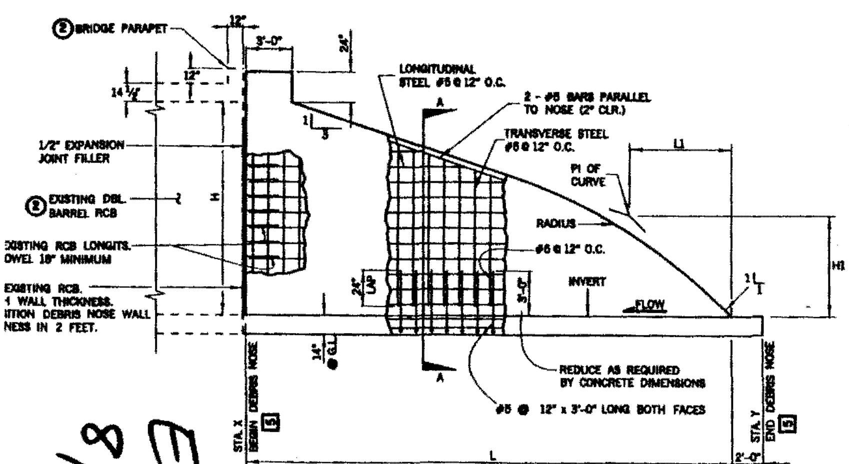
[5] CONSTRUCT DEBRIS NOSE AT AVENIDA PICO AND CALLE DE LOS MOLINOS PER PLAN AND DETAILS SHEET 8 AND PFRD STD. PLAN 1324.

	AVENIDA PICO	CALLE DE LOS MOLINOS
STATION X	20+44.30	47+43.41
STATION Y	20+69.30	47+65.91
RADIUS	25 FT	20 FT
H	9.75 FT	8.00 FT
H1	4.2 FT	3.25 FT
L	23 FT	20.50 FT
L1	4.2 FT	3.25 FT

DEBRIS NOSE DIMENSION SCHEDULE

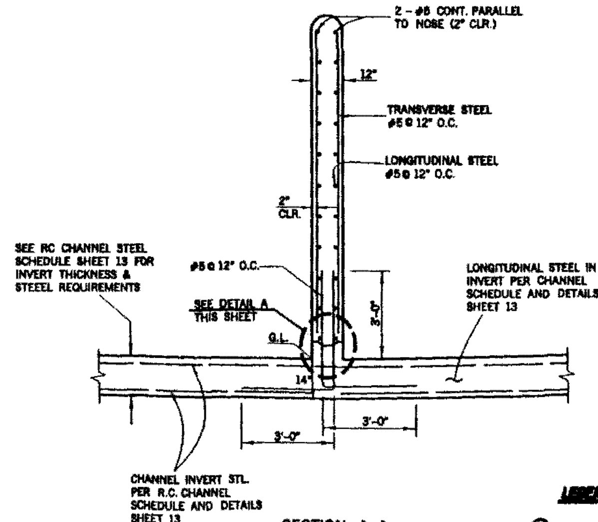


DETAIL A
KEYWAY
SCALE: 1"=1/2"



PROFILE
SCALE: N.T.S.

DEBRIS NOSE



SECTION A-A
SCALE: 1"=2'

LEGEND

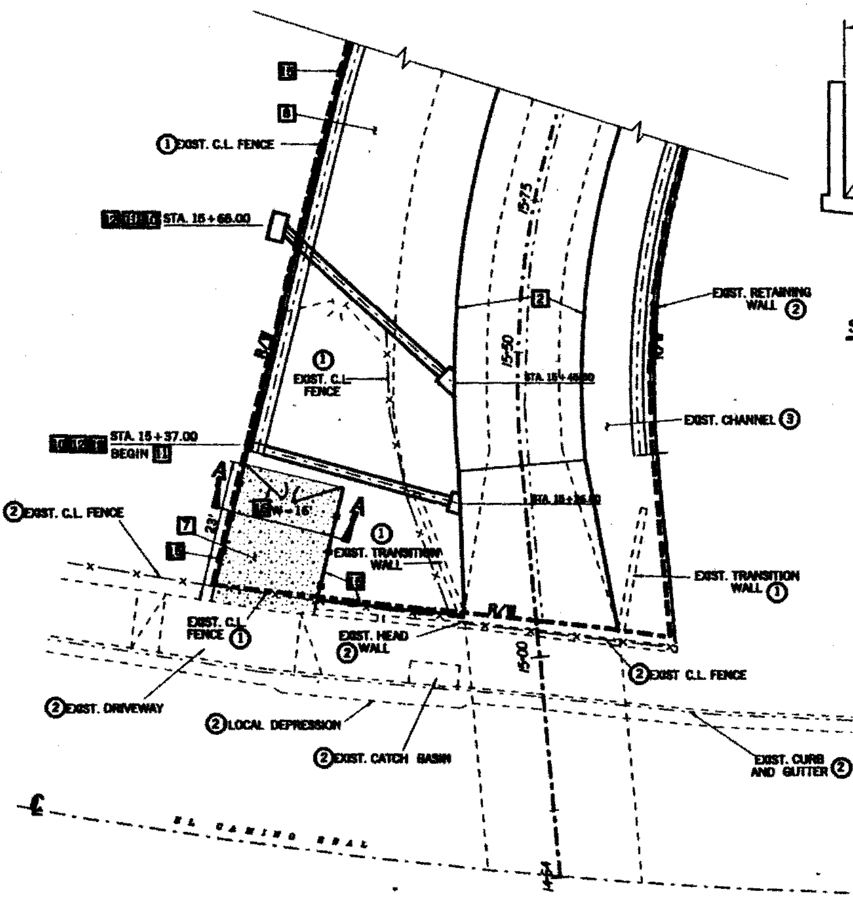
2 PROTECT IN PLACE

3 inches on original drawing

EX. 5
8/20

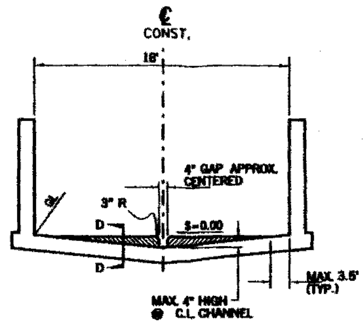
ORANGE COUNTY PUBLIC FACILITIES AND RESOURCES DEPARTMENT	
SEGUNDA DESHECHA CAÑADA CHANNEL OCFCD FACILITY NO. M02	
DEBRIS NOSE DETAILS AT AVE. PICO AND CALLE DE LOS MOLINOS	
J. VOLZ	R. CAIT
DATE 12-10-01	DRAWING NO. M02-101-4
SHEET 8 OF 29	

REVISIONS



EL CAMINO REAL DRIVEWAY/MAINTENANCE ROAD ACCESS DETAIL

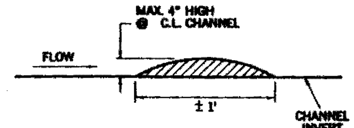
SCALE: 1" = 10'



SEDIMENT RETENTION BUMPS

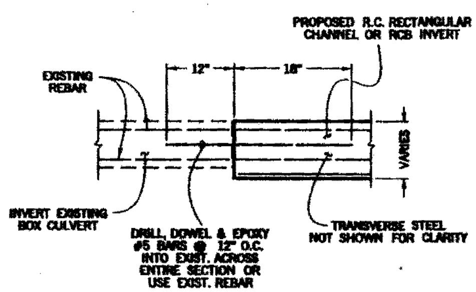
TYPICAL SECTION

N.T.S.



SECTION D–D

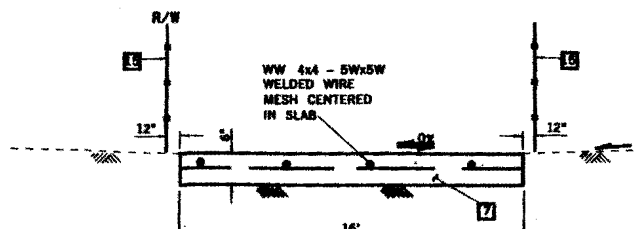
N.T.S.



INVERT JOIN DETAILS

N.T.S.

(STA. 15+05.00, STA. 19+04.62, STA. 20+44.30, STA. 46+16.39, STA. 47+43.41, STA. 54+93.11)



SECTION A–A

N.T.S.

CONSTRUCTION NOTES

- [2] CONSTRUCTION REINFORCED CONCRETE BOX-CULVER PER PLANS AND PROFILE SHEETS, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS AND PFRD STD. PLAN 1803.
- [3] CONSTRUCTION CHANNEL INVERT TRANSITION PER PLAN AND PROFILE SHEETS.
- [7] CONSTRUCT PCC MAINTENANCE ROAD APPROACH WITH 0.5' PCCNS PER PLANS, DETAILS SHEETS 9, 10 AND 11 AND SPECIAL PROVISIONS.
- [8] CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' ABNS, WIDTH PER PLAN AND PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
- [10] CONSTRUCT SIDE INLET PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
- [11] CONSTRUCT MODIFIED 6" VEE-DITCH PER PLAN AND PROFILE SHEETS 18 AND 19 AND PFRD STD. PLAN 1332.
- [12] CONSTRUCT INLET AND HEADWALL PER PLAN AND PROFILE SHEETS AND DETAILS SHEET 19.
- [15] INSTALL 6' CHAIN LINK FENCE PER PLAN AND PROFILE SHEETS, TYPICAL SECTION, DETAILS AND PFRD STD. PLAN 600-0-OC.
- [16] INSTALL 5' HIGH CHAIN LINK DOUBLE SWING GATE, WIDTH PER PLANS AND DETAILS SHEETS 9, 10 AND 11 AND PFRD STD. PLAN 600-0-OC.
- [18] INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402, PLAN AND PROFILE SHEETS AND DETAILS SHEET 19 AND AS DIRECTED BY THE ENGINEER.

*LOCATION OF SEDIMENT RETENTION BUMPS
STA. 21+40.00
STA. 24+40.00
STA. 27+40.00
STA. 30+40.00
STA. 33+40.00
STA. 36+40.00
STA. 39+40.00
STA. 42+40.00
STA. 45+40.00
STA. 48+00.00
STA. 51+00.00
STA. 53+50.00

NOTE: 1) WATER SPREADING BUMPS POURED MONOLITHIC WITH INVERT SLAB

*2) PLACE SEDIMENT RETENTION BUMPS UPSTREAM OF CONSTRUCTION JOINTS WHEN POSSIBLE 300' SPACING

LEGEND

① REMOVE

② PROTECT

③ REMOVE INTERFERING PORTIONS

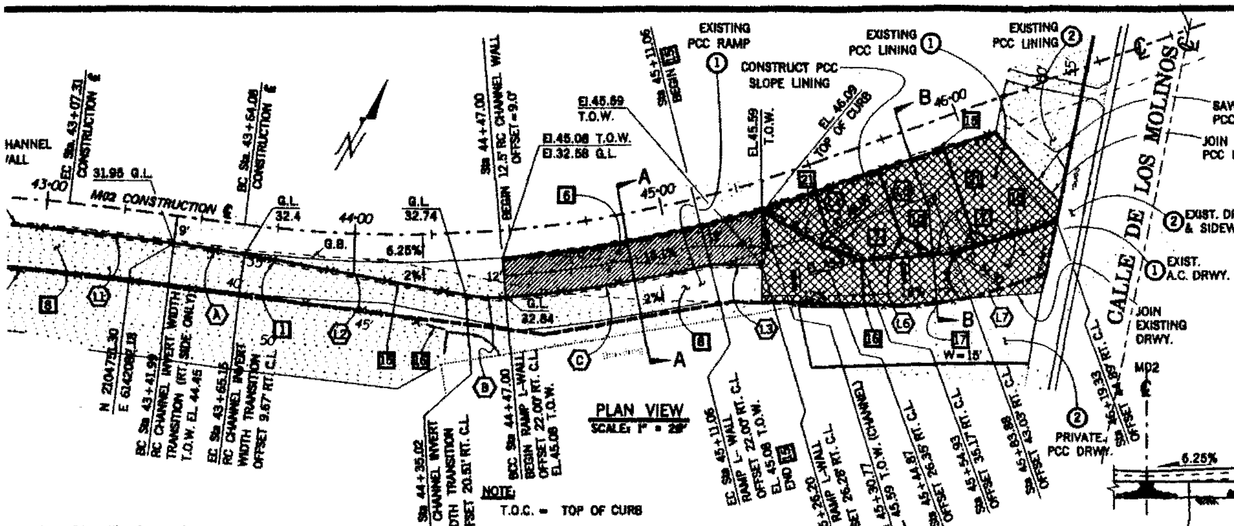
Ex. 5
9/20

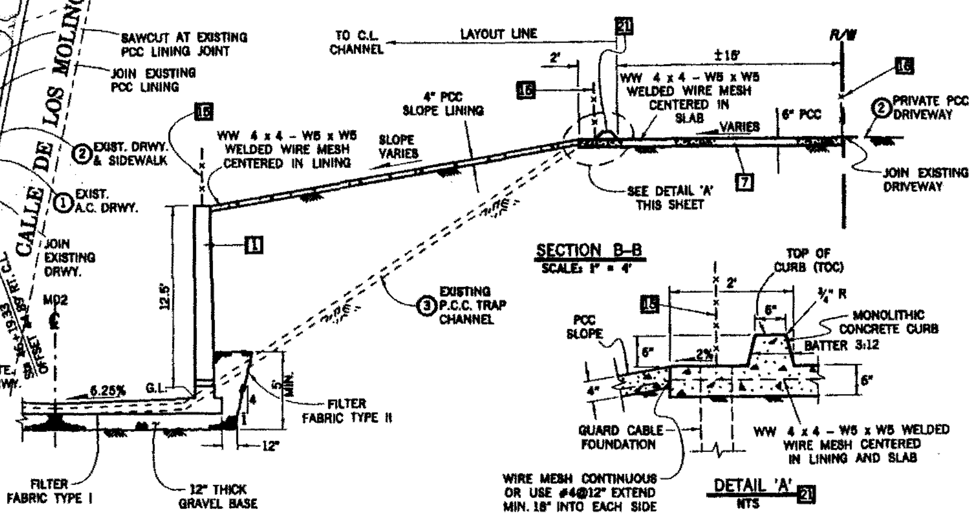
ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

EL CAMINO REAL ACCESS DETAILS

REVISIONS

SHEET 9





CONSTRUCTION NOTES

1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
6. CONSTRUCT CHANNEL ACCESS RAMP D/S OF CALLE DE LOS MOLINOS PER PLAN & PROFILE AND DETAILS SHEETS 10 AND 12.
7. CONSTRUCT PCC MAINTENANCE ROAD APPROACH WITH 0.5' PCC/NS PER PLANS, DETAILS SHEETS 9, 10 & 11 AND SPECIAL PROVISIONS.
8. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/NS, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
15. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
16. INSTALL 6' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
17. INSTALL 6' HIGH CHAIN LINK DOUBLE SWING GATE, WIDTH PER PLANS AND DETAILS SHEETS 9, 10 & 11 AND PFRD STD. PLAN 600-0-OC.
21. CONSTRUCT 6" PCC CURB PER PFRD STD. PLAN 120-0, A3-6, AND MODIFIED HEREIN BY DETAIL 'A' SHEET 10.

LINE DATA TABLE

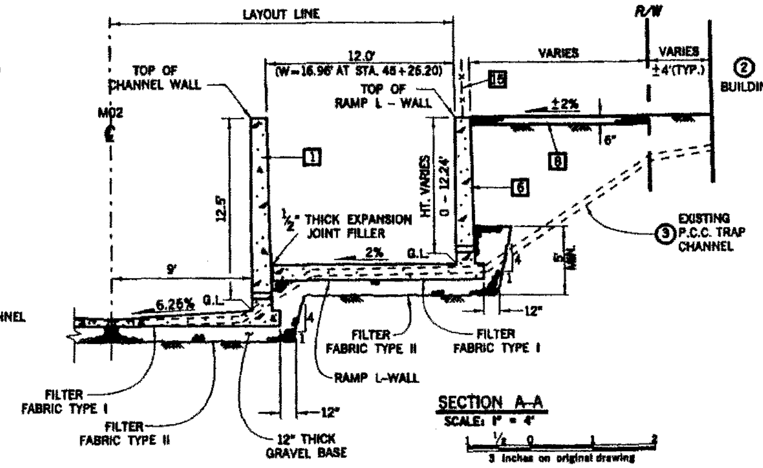
	BEARING	DISTANCE
L1	N 67°18'48.80" E	34.68'
L2	N 78°30'03.48" E	73.22'
L3	N 88°08'03.90" E	18.61'
L4	S 88°33'47.28" E	22.81'
L5	N 88°41'05.77" E	13.78'
L6	N 55°41'15.88" E	38.88'
L7	N 43°29'31.38" E	35.58'

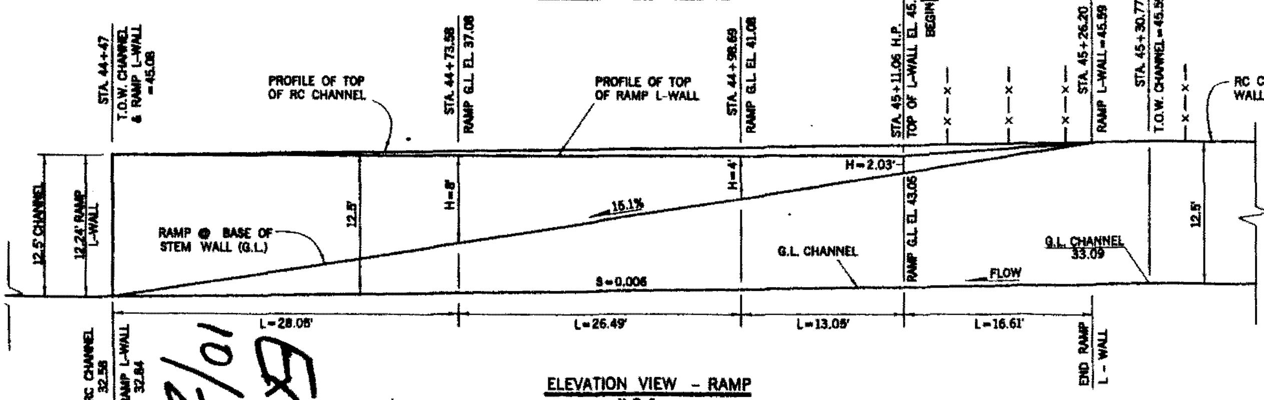
CURVE DATA TABLE

	Δ	R	L	T
A	3°16'19.80"	408.88	23.19	11.60
B	15°11'38.27"	48.88	12.73	6.48
C	9°10'38.82"	422.88	67.59	33.87

LEGEND:

- STRUC. CONCRETE RAMP
- MISC. CONCRETE





NOTE:
STATIONS INDICATED ARE MEASURED RADIALLY FROM CENTERLINE OF CHANNEL CONSTRUCTION. ACTUAL LENGTHS OF RAMP L-WALL ARE INDICATED ON ELEVATION VIEW THIS SHEET

10/20

Ex.5

LEGEND

1. REMOVE
2. PROTECT IN PLACE
3. REMOVE INTERFERING PORTIONS

ORANGE COUNTY

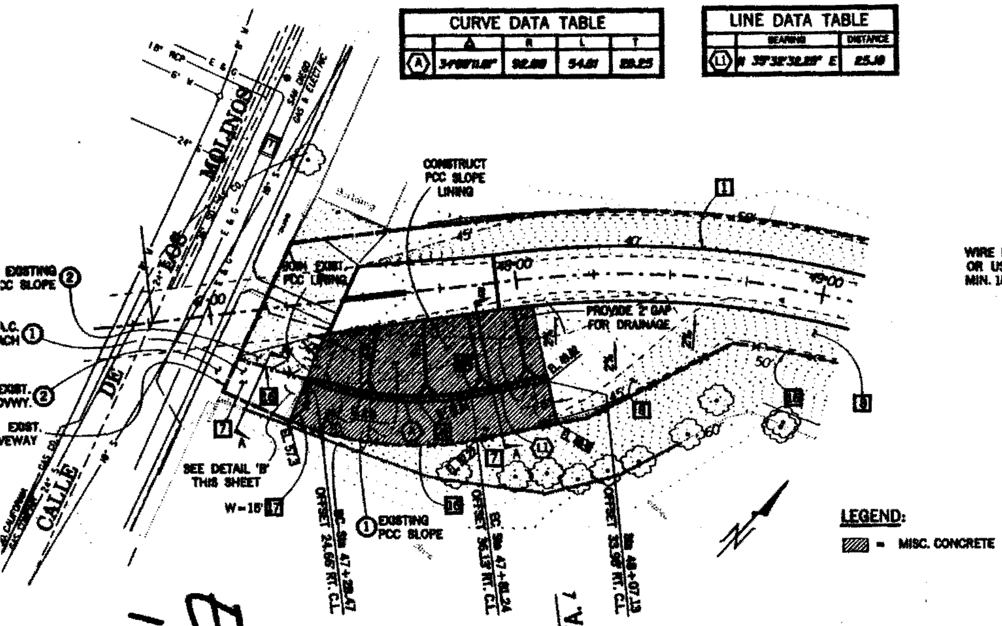
SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

D/S MOLINOS CHANNEL ACCESS AND RAMP DETAILS

R. GAUT
M. MAJAJ
12-11-91
M02-101-4
SHEET 10 OF 29

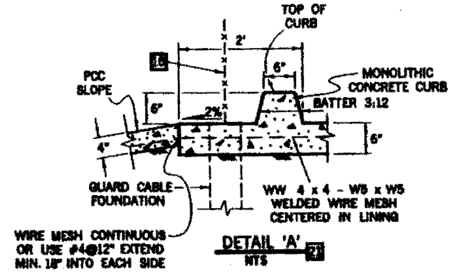
CURVE DATA TABLE				
	Δ	R	L	T
(A)	34°00'11.6"	92.00	54.61	28.25

LINE DATA TABLE		
	BEARING	DISTANCE
(L1)	N 35°32'32.25" E	25.10



PLAN VIEW
SCALE: 1" = 20'

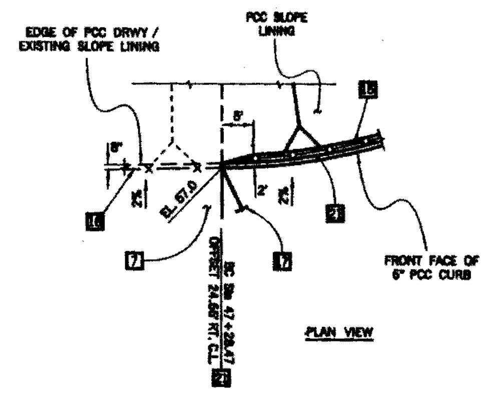
Ex. 5
11/20



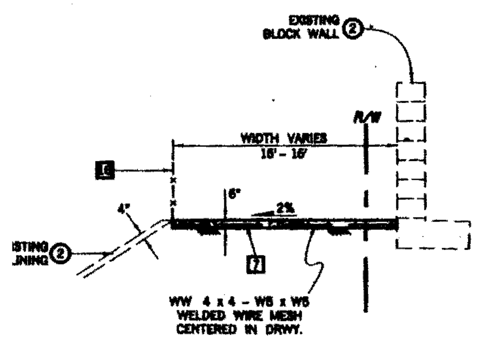
DETAIL 'A'
NTS

CONSTRUCTION NOTES

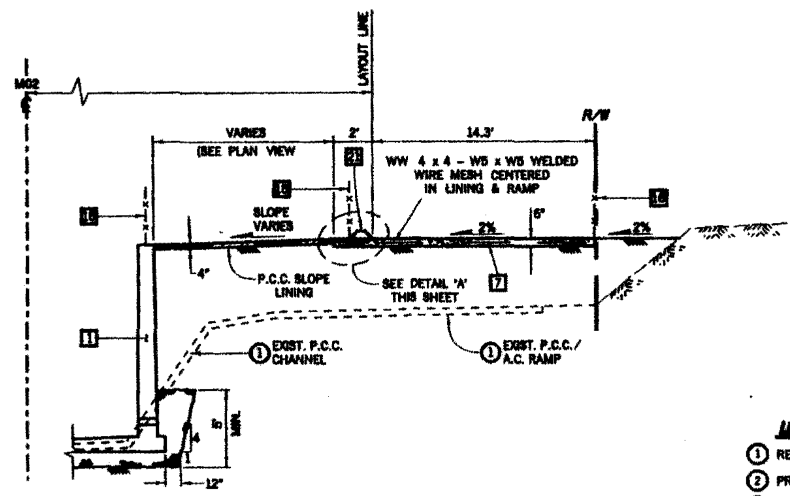
1. CONSTRUCT REINFORCED CONCRETE VERTICAL WALL CHANNEL PER PLAN & PROFILE, TYPICAL SECTION, DETAILS, SPECIAL PROVISIONS & PFRD STD. PLAN 1803.
7. CONSTRUCT PCC MAINTENANCE ROAD APPROACH WITH 0.5' PCC NS/PER PLANS, DETAILS SHEETS 9, 10 & 11 AND SPECIAL PROVISIONS.
8. CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/NS, WIDTH PER PLAN & PROFILE SHEETS, DETAILS SHEETS 18 AND 19 AND X-SECTIONS.
15. INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN & PROFILE SHEETS AND PFRD STD. PLAN 1413.
16. INSTALL 5' CHAIN LINK FENCE PER PLAN & PROFILE SHEETS, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.
17. INSTALL 5' HIGH CHAIN LINK DOUBLE SWING GATE, WIDTH PER PLANS AND DETAILS SHEETS 9, 10 & 11 AND PFRD STD. PLAN 600-0-OC.
21. CONSTRUCT 6" PCC CURB PER PFRD STD. PLAN 120-0, A3-6, AND MODIFIED HEREON BY DETAIL 'A' SHEET 10.



DETAIL 'B'
N T S



SECTION A-A
N T S



SECTION B-B
N. T. S.

LEGEND

1. REMOVE
2. PROTECT IN PLACE
3. REMOVE INTERFERING PORTIONS

3 inches on original drawing

REVISIONS

ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

U/S MOLINOS MAINTENANCE ROAD ACCESS & DETAIL

DRAWING NO. M02-101-4

SHEET 11 OF 26

REINFORCED CONCRETE RAMP

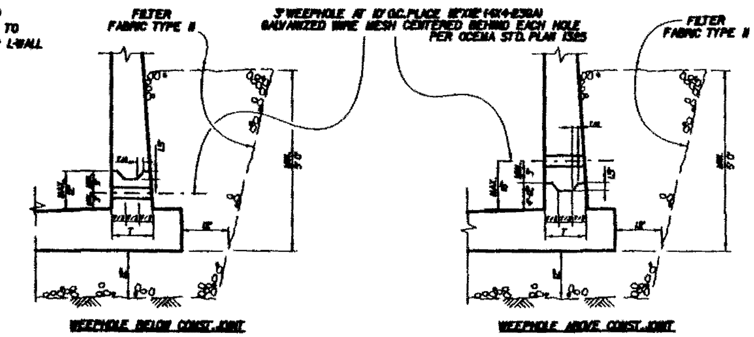
SECTION DATA										QUANTITIES		REINFORCEMENT STEEL SCHEDULE																											
STATION LIMITS	SIZE				THICKNESS (INCHES)					CONCRETE	STEEL	B1			B2			B3			B4			B5			B6			B7		B8		B9		LONGITUDINAL BARS ** (#4@12")		
FROM TO	H (FT)	L (FT)	M (FT)	N (FT)	T	T1	T2	T3	C	CU.YDS/ LIN.FT	LBS/ LIN.FT	BAR NO. & SPACING	VERT. LENGTH	HORIZ. LENGTH	BAR NO. & SPACING	VERT. LENGTH	HORIZ. LENGTH	BAR NO. & SPACING	VERT. LENGTH	HORIZ. LENGTH	BAR NO. & SPACING	VERT. LENGTH	HORIZ. LENGTH	BAR NO. & SPACING	VERT. LENGTH	HORIZ. LENGTH	BAR NO. & SPACING	VERT. LENGTH	HORIZ. LENGTH	BAR NO. & SPACING	HORIZ. LENGTH	BAR NO. & SPACING	HORIZ. LENGTH	BAR NO. & SPACING	HORIZ. LENGTH	TOTAL NUMBER	WALL	SLAB
47.00 to 44+73.58	12.84 to 8.0	12.0	0.02 to 4.0	12.48 to 8.40	14"	12"	13"	12"	12"	1.06 to 0.90	180.5 to 87.6	#4 @ 12"	13' 1" TO 8' 10"	12' 9.5"	#5 @ 12"	7' 0" TO 5' 11"	6' 11"	#6 @ 12"	4' 0"	3' 11"	#4 @ 12"	13' 1" TO 8' 10"	1' 9.5"	#4 @ 12"	7' 0" TO 5' 11"	1' 9.5"	#4 @ 12"	4' 0"	1' 9.5"	#4 @ 12"	13' 10"	#4 @ 12"	7' 11"	#5 @ 12"	4' 11"	56 TO 48	25 TO 18	30
73.58 to 44+98.69	8.0 to 4.0	12.0	4.0 to 7.35	8.40 to 4.55	12"	12"	12"	12"	12"	0.88 to 0.73	75.1 to 53.1	#4 @ 12"	8' 8" TO 4' 8"	12' 8.5"	#5 @ 12"	3' 11" TO 2' 8"	3' 10"	—	—	—	#4 @ 12"	8' 8" TO 4' 8"	1' 8.5"	—	—	—	—	—	—	#4 @ 12"	13' 9"	#4 @ 12"	7' 10"	—	—	48 TO 40	18 TO 10	30
98.69 to 45+11.06	4.0 to 2.03	12.0	7.35 to 9.85	4.55 to 2.65	12"	12"	12"	12"	6"	0.71 to 0.64	50.1 to 35.9	#4 @ 12"	4' 8" TO 2' 9.5"	12' 8.5"	—	—	—	—	—	—	#4 @ 12"	4' 8" TO 2' 9.5"	1' 2.5"	—	—	—	—	—	—	#4 @ 12"	13' 3"	—	—	—	—	40 TO 36	10 TO 6	30
11.06 to 45+26.20	2.03 to 0.0	12.0 to 15.98	9.85 to 12.50	2.65 to 0.0	12"	12"	12"	12"	6"	0.64 to 0.80	45.9 to 59.05	#4 @ 12"	2' 9.5" TO 0' 0"	12' 8.5" TO * 16' 2.5"	—	—	—	—	—	—	#4 @ 12"	2' 9.5" TO 0' 0"	1' 2.5" TO 0' 0"	—	—	—	—	—	—	#4 @ 12"	13' 3" TO 16' 2.5"	—	—	—	—	36 TO 30	6 TO 0	30 TO 40

** - LONGITUDINAL BARS IN HEEL AND "KEY BARS" AT I/S OF WALL AND INVERT ARE COUNTED AS PART OF THE SLAB

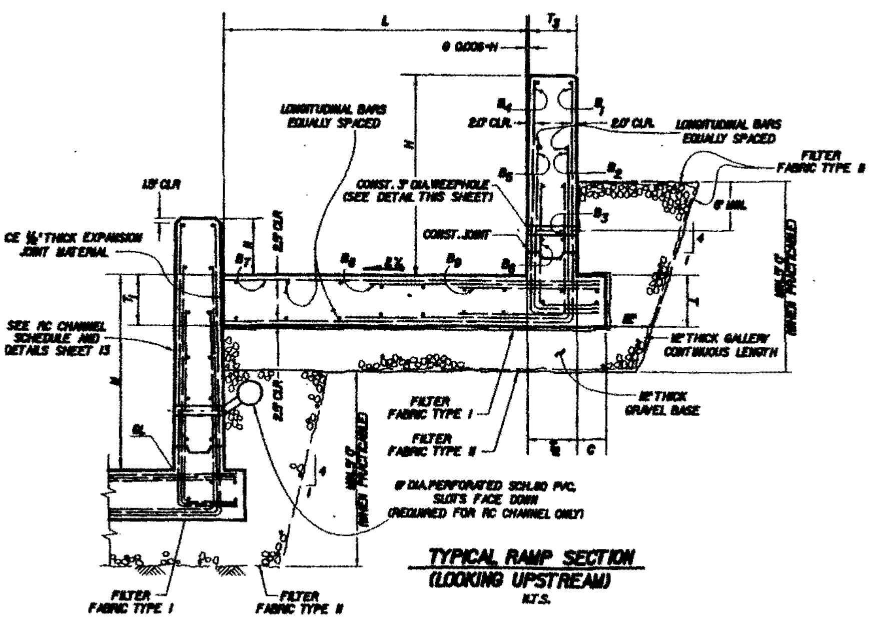
NOTES:

1. STATION LIMITS INDICATED IN SCHEDULE ARE MEASURED RADIALLY FROM CENTERLINE OF CHANNEL CONSTRUCTION TO INSIDE FACE OF RAMP L-WALL. ACTUAL LENGTH OF RAMP L-WALL IS INDICATED ON RAMP DETAIL SHEET 10.
2. AT H=0.0' EXTEND HORIZONTAL B1 BARS INTO HEEL
3. BARS SHALL VARY LINEARLY WHERE HEIGHT AND WIDTH VARY FROM STATION TO STATION.

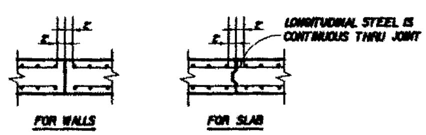
Ex. 5
12/20



LONGITUDINAL CONST. JOINT AND WEEPHOLE DETAIL



TYPICAL RAMP SECTION
(LOOKING UPSTREAM)
N.T.S.



TRANSVERSE CONST. JOINT DETAIL
N.T.S.

NOTES:

1. CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIALLY) TO THE CENTERLINE OF THE WALL.
2. JOINT FINISH FOR CHANNEL FACE SHALL BE CHAMFERED 0.5" ON WALLS AND ROUNDED WITH EDGER TOOL ON INVERT.
3. TRANSVERSE CONST. JOINTS SHALL NOT BE PLACED WITHIN 30' OF INLETS.
4. TRANSVERSE CONST. JOINTS IN WALLS & SLABS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED. TRANSVERSE CONST. JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION OF RAMP L-WALL.
5. THE LONGITUDINAL & TRANSVESE REINFORCING STEEL SHALL TERMINATE 2" FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON DETAIL.
6. EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE ROUNDED OR BEVELED.
7. NO SPLICES IN TRANSVERSE STEEL REINFORCEMENT WILL BE PERMITTED OTHER THAN THOSE SHOWN ON THE DRAWING WITHOUT APPROVAL OF ENGINEER. NO MORE THAN TWO SPLICES WILL BE PERMITTED IN ANY LONGITUDINAL BAR BETWEEN TRANSVERSE JOINTS. SPLICES SHALL BE STAGGERED.
8. TRANSVERSE STEEL SHALL BE LAPPED 45 BAR DIAMETERS AT SPLICES. LONGITUDINAL STEEL SHALL BE LAPPED 30 BAR DIAMETERS AT SPLICES. LAP LENGTH SHALL BE BASED ON THE LARGER BAR DIAMETER.
9. TRANSVERSE JOINTS SHALL BE SPACED NOT TO EXCEED 30' NOR BE LESS THAN 10', MEASURED ALONG THE CENTERLINE OF CONSTRUCTION, EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS.
10. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, IN CURVED SECTIONS, THE MAXIMUM SPACING OF BARS SHALL NOT EXCEED THAT SHOWN ON THE TYPICAL SECTIONS. STEEL SHALL BE PLACED RADIALLY FROM THE MAX. SPACING.
11. AT THE BEGINNING AND ENDING OF ALL POURS, A COMPLETE CURTAIN OF REINFORCEMENT COMPOSED OF B1, B4 & B7 BARS SHALL BE PLACED 3" FROM TRANSVERSE CONST. JOINT.
12. ELEVATION OF WEEPHOLE ABOVE INVERT SHALL BE UNIFORM THROUGH ENTIRE REACH OF PROJECT.
13. RAMP INVERT SURFACE SHALL BE GIVEN A TRANSVERSE RAKED FINISH.
14. BURY BARS MAY BE USED AT CONTRACTOR'S OWN EXPENSE

RAMP L-WALL DESIGN DATA

Loads:

External - 40 psf EFP plus 350 psf Surcharge
(100 psf + 250 psf for H20-44 Loads)
Internal - 40 psf EFP
f'_c = 3250 psi
f_c = 1460 psi
f_s = 24,000 psi
n = 8.8

3 Inches on original drawing

REVISIONS

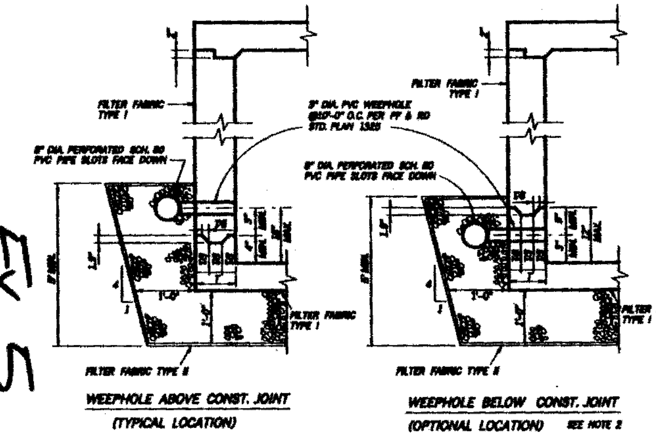
ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTME[NT]

SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY No. M02

RAMP STEEL SCHEDULE

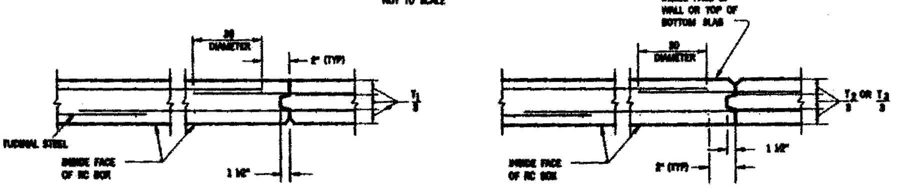
R. CAUT
N. MAJAJ
DATE 12-13-01
DRAWING NO. M02-101-4
OF 2

EX. 5



CONSTRUCTION JOINT AND DRAINAGE DETAILS

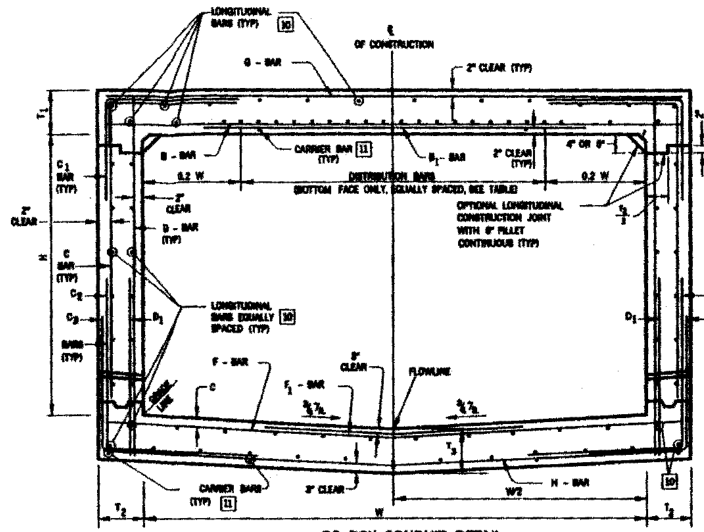
NOT TO SCALE



TRANVERSE CONSTRUCTION JOINT DETAILS

(SEE PFRD STD. PLAN 1250 FOR TRANSVERSE JOINT DETAILS)

NOT TO SCALE



RC BOX CONDUIT DETAIL

NOT TO SCALE

RC BOX CONDUIT LOCATION

RC BOX SECTION NUMBER	STATION LIMITS FROM	STATION LIMITS TO	RC BOX SECTION NUMBER	STATION LIMITS FROM	STATION LIMITS TO
1	18+06.00	18+31.00	*3	18+74.62	19+04.62
2	18+31.00	18+74.62			

NOTE:

*1. SECTION 3, STA. 18+74.62 TO STA. 19+04.62, HAS NO TOP SLAB. CONSTRUCT AS RC OPEN CHANNEL. IF IN THE FUTURE IT IS DETERMINED THAT THE CHANNEL SHOULD BE COVERED, THE STRUCTURAL DESIGN WAS BASED ON A OPEN CHANNEL AND RCB WITH A MAXIMUM COVER OF 1.5'.

2. LENGTH OF C,C2, C3 AND D BARS MUST BE ADJUSTED IF THIS OPTION IS USED.

RC BOX CONDUIT TABLE

SECTION NUMBER			1	2	SEE NOTE 1 *3
LIVE LOAD 9			HS20-44	HS20-44	HS20-44
MAX. DESIGN COVER			0' TO 3'-0"	0' TO 3'-0"	0' TO 1.5'
WIDTH		W	VARIES 20' TO 20.7'	20.7'	20.7'
HEIGHT		H	VARIES 9' TO 10'	10'	11.5'
THICKNESS GROUPED	TOP SLAB	T_1	18"	16"	—
	SIDE WALL	T_2	17"	14"	13"
	BOTTOM SLAB	T_3	17"	16"	13"
STEEL CLEARANCE INVERT		C	3"	3"	3"
B BARS	BAR NO. & SPACING		#6 @ 12"	#6 @ 12"	—
	LENGTH		VARIES 27'-7" TO 28'-4"	22'-10"	—
B_1 BARS	BAR NO. & SPACING		#7 @ 6"	#6 @ 12"	—
	LENGTH		14'-8"	12'-8"	—
C BARS	BAR NO. & SPACING		#7 @ 12"	#6 @ 12"	#6 @ 12"
	HORIZONTAL LENGTH		9'-4"	7'-8"	—
	VERTICAL LENGTH		VARIES 9'-12" TO 12'-8"	10'-10"	11'-0"
C_1 BARS	BAR NO. & SPACING		#6 @ 12"	#7 @ 12"	#6 @ 12"
	HORIZONTAL LENGTH		4'-7"	3'-8"	—
	VERTICAL LENGTH		VARIES 9'-12" TO 11'-4"	10'-10"	8'-0"
C_2 BARS	BAR NO. & SPACING		#7 @ 12"	#6 @ 12"	#6 @ 12"
	HORIZONTAL LENGTH		9'-4"	7'-8"	7'-4"
	VERTICAL LENGTH		8'-0"	8'-0"	7'-11"
C_3 BARS	BAR NO. & SPACING		#6 @ 12"	#6 @ 12"	#7 @ 12"
	HORIZONTAL LENGTH		4'-10"	3'-7"	8'-0"
	VERTICAL LENGTH		4'-0"	3'-4"	8'-8"
D BARS	BAR NO. & SPACING		#4 @ 18"	#4 @ 18"	#6 @ 12"
	LENGTH		VARIES 11'-10" TO 12'-8"	12'-8"	12'-8"
D_1 BARS	BAR NO. & SPACING		—	—	#6 @ 12"
	VERTICAL LENGTH		—	—	8'-8"
F BARS	BAR NO. & SPACING		#6 @ 12"	#6 @ 12"	#6 @ 12"
	LENGTH		VARIES 27'-7" TO 28'-4"	22'-10"	22'-6"
F_1 BARS	BAR NO. & SPACING		#7 @ 6"	#6 @ 12"	#6 @ 12"
	LENGTH		13'-10"	13'-2"	8'-4"
G BARS	BAR NO. & SPACING		#6 @ 12"	#5 @ 12"	—
	LENGTH		13'-8"	10'-8"	—
H BARS	BAR NO. & SPACING		#6 @ 12"	#6 @ 12"	#6 @ 12"
	LENGTH		12'-8"	10'-8"	22'-8"
DISTRIBUTION BARS	BAR NO.		#4	#4	—
	NUMBER OF BARS		VARIES 16 TO 18	15	—
NUMBER OF #4 LONGITUDINAL BARS	TOP SLAB		VARIES 36 TO 33	33	—
	BOTTOM SLAB		VARIES 36 TO 33	33	33
	SIDE WALLS		24	24	28
TOTAL #4 BARS (DISTRIBUTION AND LONGITUDINAL)			VARIES 116 TO 106	106	61
QUANTITIES					
CONCRETE CU. YDS./LIN. FT.			VARIES 4.0 TO 3.69	3.18	1.88
STEEL LBS /LIN. FT.			VARIES 860.5 TO 860.8	438.4	307.1

1/2 0 1 2

3 inches on original drawing

STRUCTURAL NOTES

ADDITIONAL NOTES FOR BOX SECTIONS

1. LONGITUDINAL STEEL SHALL BE CONTINUOUS AND EXTEND THROUGH ALL CONSTRUCTION JOINTS
2. UNLESS OTHERWISE SHOWN IN THE DRAWINGS, TRANSVERSE JOINT KEYWAYS ON BOTH SLABS AND WALLS, AS DETAILED, SHALL BE PLACED AT THE END OF EACH POUR, BUT THE SPACING THEREOF SHALL NOT EXCEED 60 FEET OR BE LESS OR BE LESS THAN 10 FEET. ALL CONSTRUCTION JOINTS IN BOTTOM SLAB, TOP SLAB, AND SIDE WALLS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED. TRANSVERSE CONSTRUCTION JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION.
3. UNLESS OTHERWISE SHOWN ON THE DETAILS, IN CURVED SECTIONS TRANSVERSE BARS SHALL BE PLACED RADIAL TO CENTERLINE WITH SPACING NOT TO EXCEED THAT SHOWN ON SCHEDULE. STRAIGHT BARS AND L-BARS IN WALLS SHALL BE SPACED AS SHOWN ON THE TYPICAL SECTIONS, WITH THE SPACING MEASURED BETWEEN THE VERTICAL LEGS OF BARS.
4. AT THE BEGINNING AND ENDING OF ALL POURS, A CURTAIN OF REINFORCEMENT COMPOSED OF B, C, C2, D, F, G, AND H BARS SHALL BE PLACED THREE INCHES FROM THE TRANSVERSE CONSTRUCTION JOINT. MAINTAIN 1.5" CLEARANCE FROM KEY OF CONSTRUCTION JOINT.
5. THE VERTICAL WALL STEEL IN THE INTERIOR FACE OF WALLS MAY BE SPLICED AT THE CONSTRUCTION JOINT AT THE BASE OF THE WALL. THE SPLICE SHALL BE 45 BAR DIAMETERS IN LENGTH.
6. IN ALL SECTIONS LAP C AND C2 BARS. THE VERTICAL LENGTH OF C AND C2 BARS HAS BEEN CALCULATED FOR A TWELVE INCH STARTER WALL. CONTRACTOR SHALL MAINTAIN A 45 BAR DIAMETER LAP BETWEEN THE TWO BARS. THE LAPS SHALL BE BASED ON THE SMALLER BAR.
7. CONCRETE QUANTITIES ARE BASED ON A SIX-BY-SIX INCH FILLET AND THE STEEL QUANTITIES DO NOT INCLUDE ANY OPTIONAL SPLICES.
8. INVERT FINISH: CHANNEL INVERT SURFACE SHALL BE GIVEN A STEEL TROWEL FINISH.
9. CONSTRUCTION LOADING IN EXCESS OF DESIGN DEAD AND LIVE LOADS HAS NOT BEEN CONSIDERED IN THE STRUCTURAL DESIGN. PROTECTION OF THE STRUCTURE FOR CONSTRUCTION LOADS WHICH EXCEED THE SPECIFIED DEAD AND LIVE LOADS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE DESIGN, INSTALLATION, REMOVAL AND COST OF TEMPORARY SHORING, EMPLOYED TO SUSTAIN CONSTRUCTION LOADING SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
10. TWO LONGITUDINAL BARS SHALL BE PLACED AT EACH CORNER LOCATION AS SHOWN ON THE DETAIL. THE REMAINING LONGITUDINAL BARS SHALL BE EQUALLY SPACED BETWEEN THE CORNER BARS WITH A MAXIMUM SPACING OF 18" IN EACH FACE OF THE SLABS AND WALLS, AND NEED NOT CORRESPOND TO THE NUMBER OR LOCATION SHOWN ON THE DETAIL. SEE THE TABLE FOR LONGITUDINAL BAR TOTALS.
11. PROVIDE CARRIER BARS AS REQUIRED TO FACILITATE PLACEMENT OF THE TRANSVERSE REINFORCEMENT.

GENERAL

1. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 1.5" CLEAR UNLESS OTHERWISE SHOWN.
2. CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIALLY) TO CENTERLINE OF CONDUIT ON THE PLAN EXCEPT AS OTHERWISE SHOWN.
3. LONGITUDINAL STEEL SHALL BE LAPPED 30 BAR DIAMETERS AT SPLICES. TRANSVERSE STEEL SHALL BE LAPPED 45 BAR DIAMETERS AT SPLICES.
4. TRANSVERSE CONSTRUCTION JOINTS SHALL NOT BE PLACED WITHIN 4 FEET OF MANHOLE OR JUNCTION STRUCTURE OPENINGS.
5. THE TRANSVERSE REINFORCING STEEL SHALL TERMINATE ONE AND ONE-HALF INCHES FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON THE STRUCTURAL DETAILS.
6. EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE ROUNDED, BEVELED, OR CHAMFERED.
7. NO SPLICES IN TRANSVERSE STEEL REINFORCEMENT WILL BE PERMITTED OTHER THAN SHOWN ON THE DRAWING WITHOUT APPROVAL OF ENGINEER. NO MORE THAN TWO SPLICES WILL BE PERMITTED IN ANY LONGITUDINAL BAR BETWEEN TRANSVERSE JOINTS. SPLICES SHALL BE STAGGERED, AND STAGGERS SHALL NOT BE IN THE SAME PLANE.
8. ELEVATION OF WEEPHOLES ABOVE INVERT SHALL BE UNIFORM THROUGH ENTIRE REACH OF PROJECT.
9. BURY BARS MAY BE USED AT CONTRACTORS OWN EXPENSE.

ESIGN CRITERIA

I+06 TO STA. 19+04.62)

OAD

44 unless otherwise noted.

LOAD

load per Marston's formula w=110 pcf
-0.150
outside width of box plus 3 feet
earth 30 EFP per foot of depth
of concrete 150 p c f

AL LATERAL (OPEN CHANNEL)

+74.62 to Sta. 19+04.62 only)
FP Plus H20 - 44 Plus 100 PSF
EFP Uniform Load

AL LATERAL (OPEN CHANNEL)

+74.62 to Sta. 19+04.62 only)
40 PSF EFP

ABLE STRESSES

psi at 28 days
psi
psi

nd bond stresses per A.C.I. 318-63

SEGUNDA DESHECHA CAÑADA CHANNEL

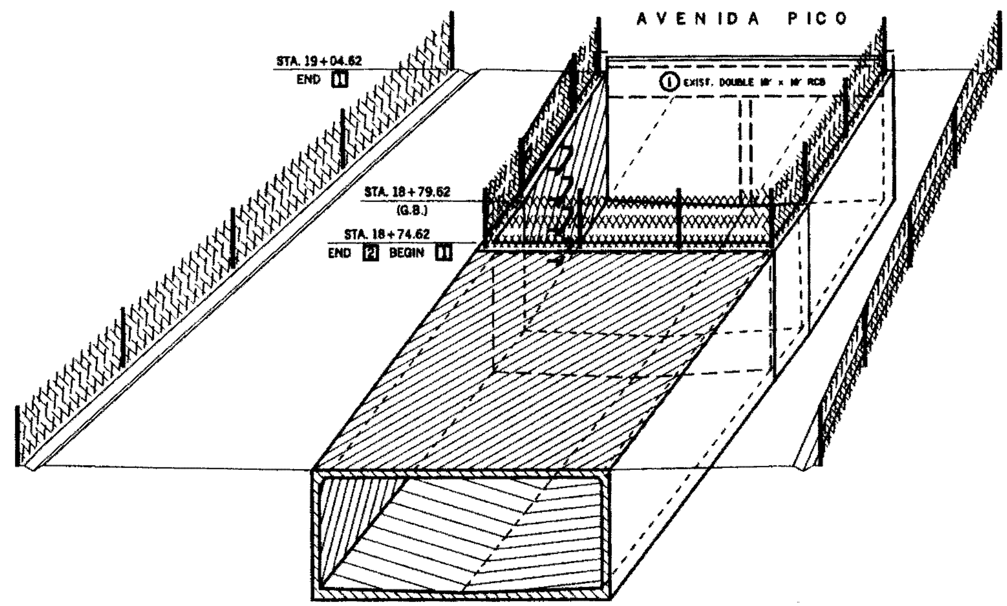
OCFCD FACILITY - M02

RCB STEEL SCHEDULE

STA. 18+06 TO STA. 19+04.62

M02-101-4

14 OF 7



ISOMETRIC DOWNSTREAM VIEW FROM AVENIDA PICO LOOKING UPSTREAM
N.T.S.

3 inches on original drawing

REVISIONS

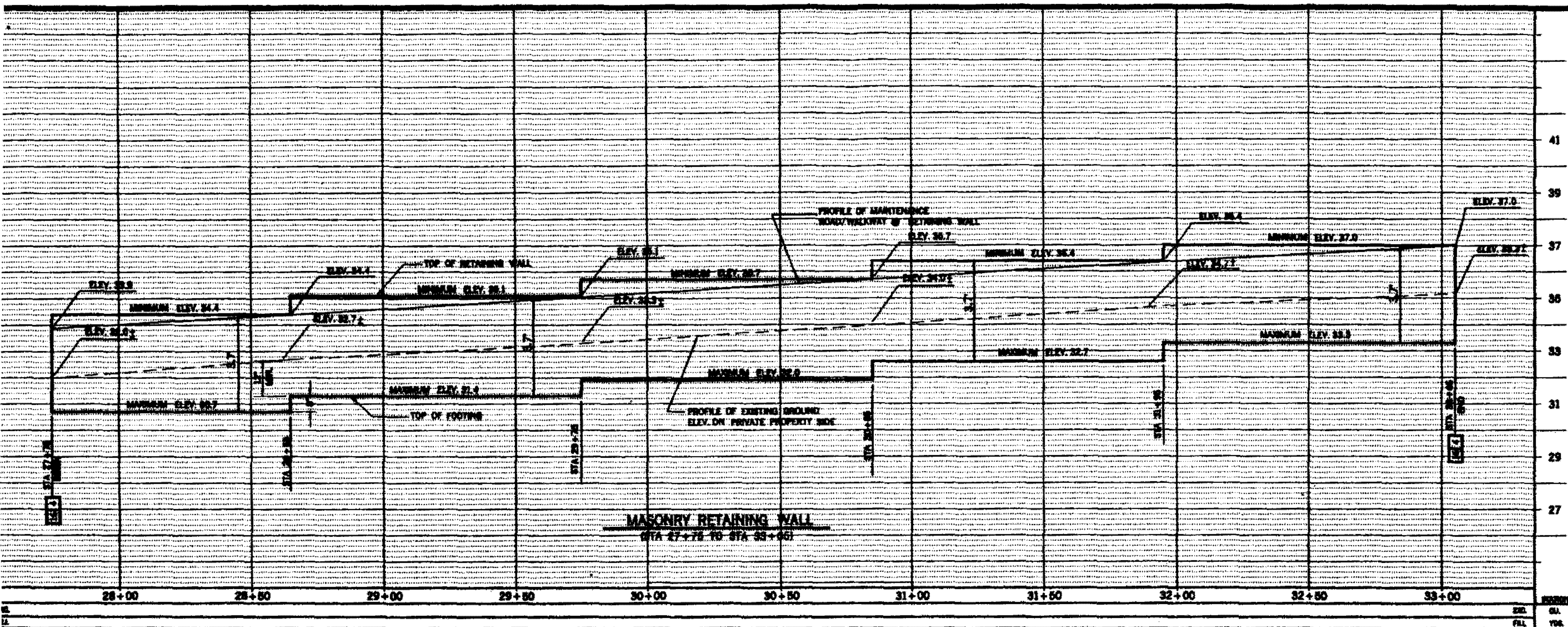
ORANGE COUNTY

SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

ISOMETRIC VIEW
RCB /OPEN CHANNEL
STA. 18+74.62 TO STA. 19+04.62

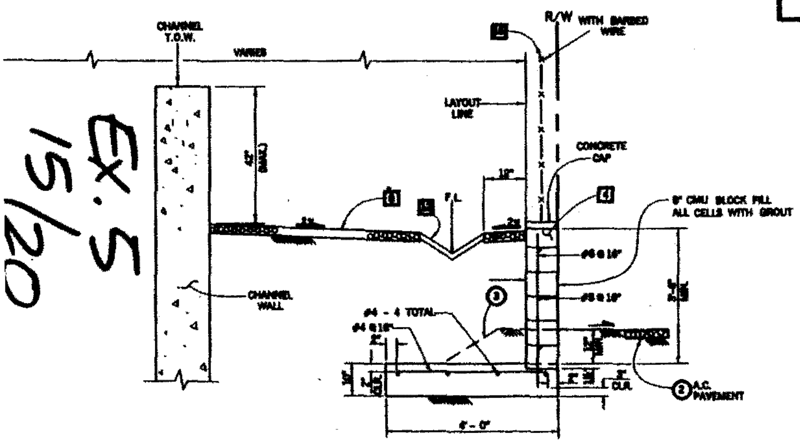
15
OF 7

Ex. 5
14/20



MASONRY RETAINING WALL
(STA 27+75 TO STA 33+06)

PROFILE
HORIZ. 1"= 20'
VERT. 1"= 2'



TYPICAL SECTION MASONRY RETAINING WALL
(STA 27+75 TO STA 33+06)
N.T.S.

Ex. 5
15/20

LEGEND

(2) PROTECT IN PLACE
(3) REMOVE INTERFERING PORTIONS

CONSTRUCTION NOTES

[4] CONSTRUCT REINFORCED MASONRY RETAINING WALL PER PFRD STD. PLAN 616-0-OC MODIFIED HEREON PER PLAN & PROFILE, TYPICAL SECTION AND DETAILS SHEET 12.

[8] CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/NS, WIDTH PER PLANS & DETAILS SHEET.

[32] CONSTRUCT MODIFIED 6" VEE-DITCH PER PLAN, DETAILS SHEET # AND PFRD STD. PLAN 1332.

[16] INSTALL 6' CHAIN LINK FENCE PER PLAN, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-OC-OC.

3 Inches on original drawing

ORANGE COUNTY
PUBLIC FACILITIES & RESOURCES DEPARTMENT

SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

REVISIONS

RETAINING WALL DETAIL
STA 27+75 TO STA 33+06

M02-101-4

SHEET 16 OF 7

SIDE INLETS & JUNCTION STRUCTURE DATA TABLE

[CHA]NNEL [STAT]IONING	LINE NO.	ITEMS *A	B	C	*L	ELEV. "S"	D_1	D-LOAD	REMARKS (Looking Upstream)
-45.00	1	45°	18" CMP	2'-6" MIN.	± 37'	9.71	18" RCP	2,000	LEFT SIDE CHANNEL CONSTRUCT HEADWALL
-85.43	2	90°	8" SP	N/A	± 18'	27.6	12" PE	N/A	RIGHT SIDE CHANNEL PIPE PROT. OUT OF RET. WALL
-42.02	3	90°	8" SP	N/A	± 18'	28.0	12" PE	N/A	RIGHT SIDE CHANNEL PIPE PROT. OUT OF RET. WALL
+73.30	4	90°	18" CMP	1'-0"	± 2'	DETERMINED IN FIELD	18" RCP	2,000	LEFT SIDE CHANNEL
+82.95	5	45°	24" RCP	3'-0"	± 5'	26.40	24" RCP	1,750	RIGHT SIDE CHANNEL
+76.20	6	90°	4" PVC	N/A	± 12'	28.0	4" PVC	N/A	LEFT SIDE CHANNEL
+34.13	7	90°	4" PVC	N/A	± 14'	28.3	4" PVC	N/A	LEFT SIDE (CONCRETE ENCASED)
+23.51	8	90°	4" PVC	N/A	± 2'	24.8	4" PVC	N/A	LEFT SIDE CHANNEL
+72.95	9	90°	4" PVC	N/A	± 18'	27.1	4" PVC	N/A	LEFT SIDE (CONCRETE ENCASED)
+96.06	10	90°	18" CMP	1'-6" MIN.	± 6'	25.3	18" RCP	2,000	LEFT SIDE CHANNEL
+12.42	11	90°	4" PVC	N/A	± 8'	25.4	4" PVC	N/A	LEFT SIDE CHANNEL
+38.53	12	45°	24" CMP	3'-6" MIN.	± 10'	25.5	24" RCP	1,750	RIGHT SIDE CHANNEL
+71.22	13	45°	18" CMP	2'-6" MIN.	± 18'	27.5	18" RCP	2,000	RIGHT SIDE CHANNEL CONNECT AT R/W
+15.36	14	90°	18" CMP	1'-6" MIN.	± 2'	28.4	18" RCP	2,000	LEFT SIDE CHANNEL
+80.10	15	90°	6" PVC	N/A	± 18'	30.8	6" PVC	N/A	RIGHT SIDE CHANNEL
+89.96	16	45°	18" RCP	2'-6"	± 23'	28.9	18" RCP	2,000	RIGHT SIDE CHANNEL
+98.06	17	90°	4" PVC	N/A	± 18'	38.5	4" PVC	N/A	RIGHT SIDE CHANNEL
+01.05	18	30°	60" RCP	12'-6"	34' 4"	32.15 MAX.	60" RCP	1,400	SEE NOTE NO. 7 BELOW
+36.06	19	90°	4" PVC	N/A	± 17'	31.1	4" PVC	N/A	RIGHT SIDE CHANNEL
+03.92	20	45°	36" SP	4'-0"	± 21'	31.30	36" RCP	1,500	SEE NOTE NO. 8 BELOW
+21.68	21	90°	12" RCP	2'-6"	± 13'	33.8	18" RCP	2,000	RIGHT SIDE CHANNEL
+15.47	22	90°	4" PVC	N/A	± 15'	38.4	4" PE	N/A	RIGHT SIDE CHANNEL
+44.47	23	90°	12" CMP				18" RCP		LEFT SIDE (CONCRETE ENCASED)
+50.30	24	45°	36" CMP	4'-0"	± 10'	40.8	36" RCP	1,500	LEFT SIDE CHANNEL TO R/W
+75.29	25	45°	24" CMP	3'-0"	± 10'	41.2	24" RCP	1,750	RIGHT SIDE CHANNEL TO R/W
+94.07	26		4" PVC						
+00.00	27	90°	4" ROOFDRAIN	N/A	± 11'	DETERMINED IN FIELD	4" PE	N/A	RIGHT SIDE CHANNEL
+32.00	28	90°	4" ROOFDRAIN	N/A	± 11'	DETERMINED IN FIELD	4" PE	N/A	RIGHT SIDE CHANNEL
+58.00	29	90°	4" ROOFDRAIN	N/A	± 11'	DETERMINED IN FIELD	4" PE	N/A	RIGHT SIDE CHANNEL
+71.77	30	45°	6" PVC	N/A	± 11'	DETERMINED IN FIELD	6" PE	N/A	RIGHT SIDE CHANNEL

[P]OLYETHYLENE PIPE
[C]LAY PIPE
[S]TEEL PIPE
[P]OLYVINYL CHLORIDE

SEE PHOTOGRAPHS OF EXISTING INLETS IN SPECIFICATIONS SECTION F

10/20
EX 5

[N]OTES:

[EL]EVATIONS AND LENGTHS ARE APPROXIMATE - EXACT MEASUREMENT SHALL BE DETERMINED IN THE FIELD

[...]" SHALL BE 90° OR OTHERWISE DETERMINED IN FIELD.

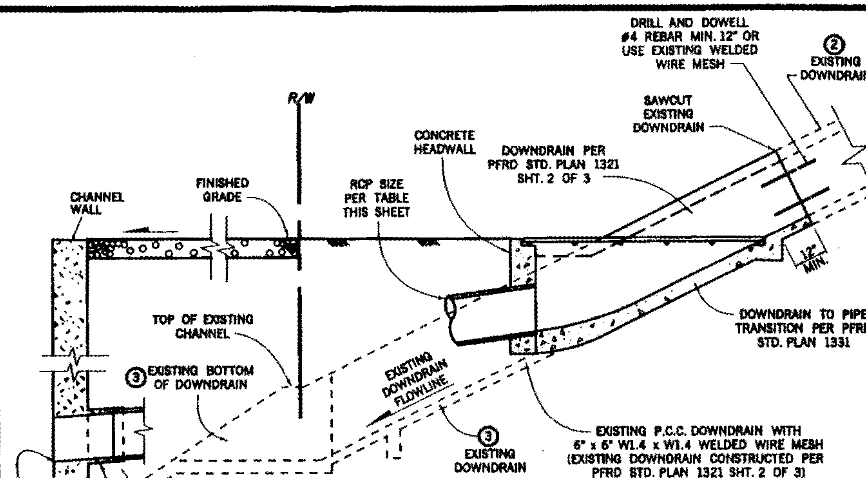
[IN] AREAS WHERE SHORING IS REQUIRED TO SUPPORT THE EXCAVATED CUT SLOPE, THE RCP AND COLLAR [NE]ED ONLY EXTEND TO THE LIMITS OF THE CUT SLOPE, WHEN PRACTICABLE. OTHERWISE, THE RCP & [CO]LLAR SHALL EXTEND TO THE R/W. HOWEVER, FULL OR PARTIAL REMOVAL OF P.C.C. TRAP. CHANNEL AND [AD]DITIONAL EXCAVATION MAY BE REQUIRED IN ORDER TO CONSTRUCT THE DRAINAGE INLETS.

[ON]LY PIPES 18" AND LARGER REQUIRE JUNCTION STRUCTURE.

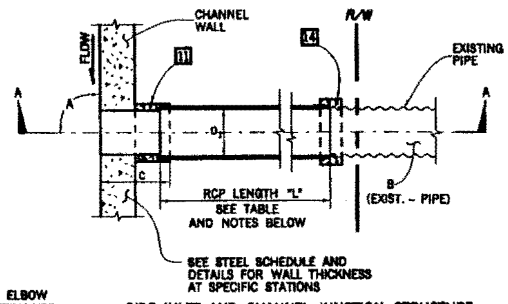
[...]" LENGTH OF PIPE IS A DISTANCE DETERMINED BY A HORIZONTAL PROJECTION.

[RI]GHT SIDE OF CHANNEL. CUT PIPE BACK TO R/W & BEYOND AS NECESSARY TO CONSTRUCT [C]OLLAR & MINIMIZE ENCROACHMENT ON TO SURFACE OF MAINTENANCE ROAD

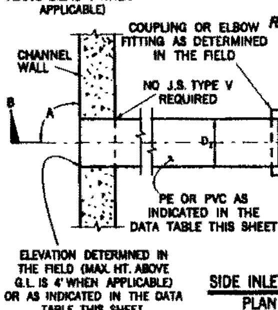
[RI]GHT SIDE OF CHANNEL. CONCRETE COLLAR REQUIRED ONLY IF END OF THE EXISTING 60" RCP [IS] DAMAGED SO THAT A WATER TIGHT SEAL CAN NOT BE ACHIEVED OR IF THE DEFLECTION ANGLE [IS] SUCH THAT A COLLAR IS REQUIRED. SEE SHEET 20 FOR 60" RCP ALIGNMENT DETAIL.



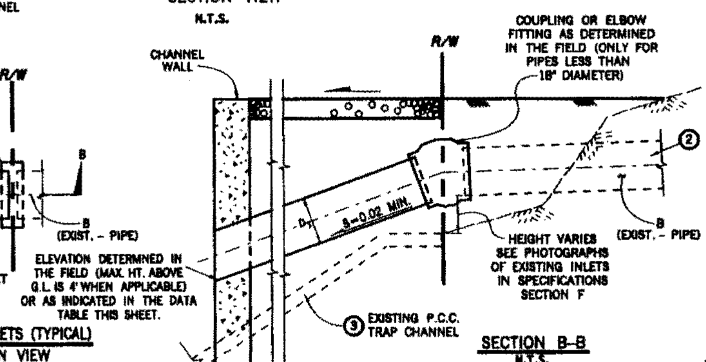
DOWNDRAIN TO PIPE TRANSITION
SECTION VIEW
N.T.S.



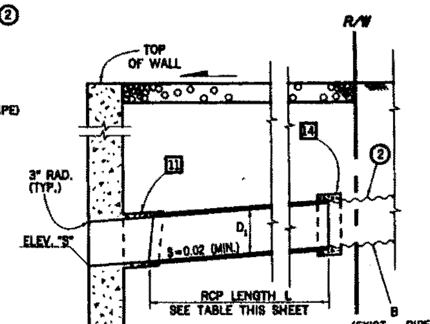
SIDE INLET AND CHANNEL JUNCTION STRUCTURE
PLAN VIEW
N.T.S.
(LINES 1, 4, 5, 10, 12, 13, 14, 16, 18, 20, 21, 23, 24 & 25)



SIDE INLETS (TYPICAL)
PLAN VIEW
N.T.S.
(LINES 2, 3, 6, 7, 8, 9, 11, 15, 17, 19, 22, 26, 27, 28, 29)



SECTION B-B
N.T.S.



SECTION A-A
N.T.S.

CONSTRUCTION NOTES

[10] CONSTRUCT DOWNDRAIN TO PIPE TRANSITION PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1331.
[11] CONSTRUCT SIDE INLET PER PLAN & PROFILE SHEETS, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.
[14] CONSTRUCT R.C. COLLAR PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 & PFRD STD. PLAN 1317.

DOWNDRAIN TO PIPE TRANSITION TABLE

STATION	RCP SIZE	D - LOAD	*L	EXISTING DOWNDRAIN WIDTH
27+61	18"	2,000	± 25'	36"
31+85.6	18"	2,000	± 25'	36"
38+48	18"	2,000	± 18'	36"
39+36	18"	2,000	± 18'	36"
40+40	18"	2,000	± 18'	36"
41+28	18"	2,000	± 18'	36"
42+53	18"	2,000	± 18'	36"
44+03	18"	2,000	± 18'	12"
45+28	18"	2,000	± 18'	12"
45+83	18"	2,000	± 16'	12"

*NOTES:
1. LENGTHS ARE APPROXIMATE - EXACT MEASUREMENT SHALL BE DETERMINED IN THE FIELD.
2. FULL OR PARTIAL REMOVAL OF P.C.C. TRAP CHANNEL AND ADDITIONAL EXCAVATIONS MAY BE REQUIRED IN ORDER TO CONSTRUCT THE DOWNDRAIN TO PIPE TRANSITION AND ASSOCIATED INLET STRUCTURES.

LEGEND

(2) PROTECT IN PLACE
(3) REMOVE INTERFERING PORTIONS

1/2 0 1 2
3 inches on original drawing

REVISIONS

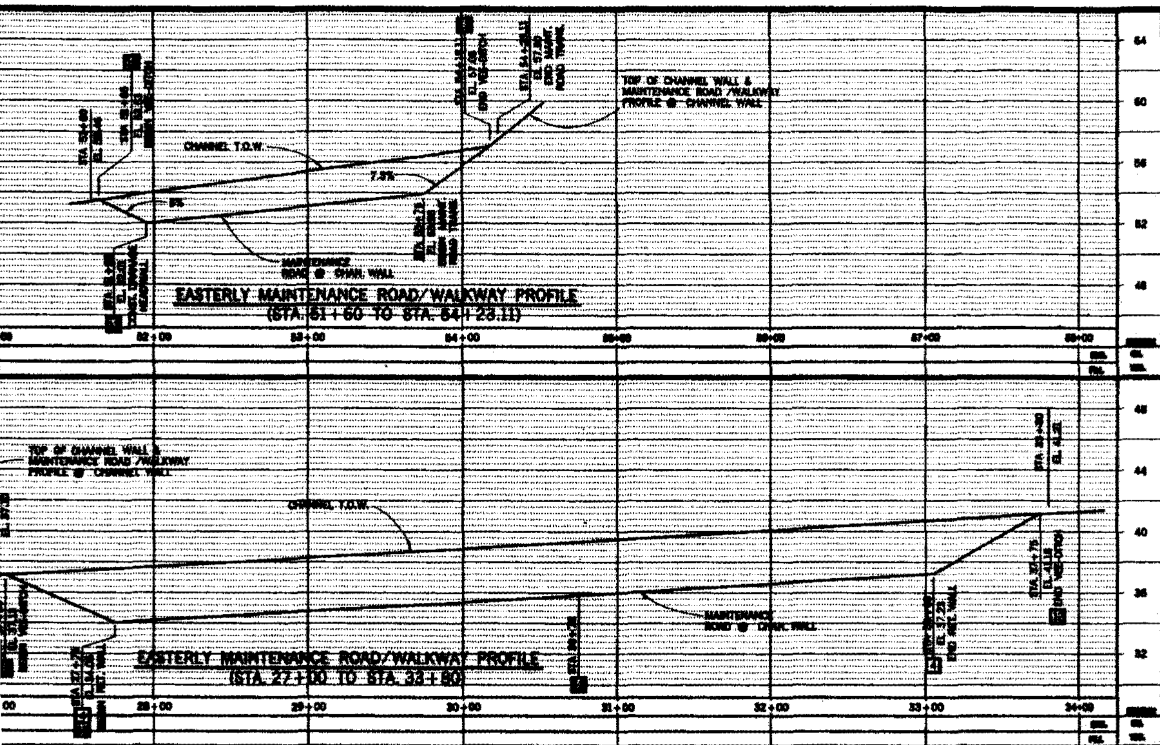
ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

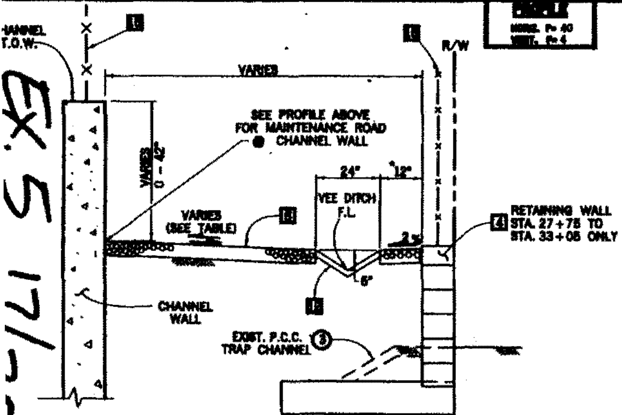
SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

SIDE INLETS AND DOWNDRAIN DETAILS

R. CAUY
H. MAJAJ

DATE 12-14-01
DRAWING NO. M02-101-4
SHEET 17 OF 29





* NOTE: THE 12" DISTANCE IS BETWEEN THE EDGE OF VEE-DITCH AND THE RETAINING WALL OR RIGHT OF WAY WHERE NO RETAINING WALL IS CONSTRUCTED

EASTERLY MAINTENANCE ROAD /WALKWAY DETAILS
(STA 27+00 TO STA 33+80)
N.T.S.

CONCRETE VEE-DITCH & GRADING REQUIREMENTS TABLE (EASTERLY SIDE)

STATION	CHANNEL TOW ELEV.	ELEV. MAINT. ROAD @ CHAN. WALL	F.L. VEE DITCH	ELEV. MAINT. ROAD @ R/W OR RET. WALL	SLOPE MAINT. ROAD BET. CHAN. WALL & VEE DITCH	REMARKS
27+00	37.10	37.10	N.A.	37.6	2% (TOWARD CHANNEL)	BEGIN TRANS.
27+05	37.13	37.13	36.63	37.2	0%	BEGIN V-DITCH
27+25	37.25	36.25	35.53	35.6	2% (TOWARD VEE DITCH)	
27+50	37.40	35.15	34.43	35.0	2% (TOWARD VEE DITCH)	
27+75	37.55	34.05	33.33	33.9	2% (TOWARD VEE DITCH)	END TRANSITION, BEGIN RET. WALL CONST. MODIFIED DRAINAGE HEADWALL
30+75	39.35	35.88	35.16	35.7	2% (TOWARD VEE DITCH)	CONST. DRAINAGE HEADWALL
33+05	40.73	37.23	36.48	37.0	2% (TOWARD VEE DITCH)	END RET. WALL BEGIN TRANSITION
33+25	40.85	38.39	37.88	38.4	2% (TOWARD VEE DITCH)	DAYLIGHT BEYOND RIGHT OF WAY
33+50	41.03	39.75	39.02	39.1	2% (TOWARD VEE DITCH)	DAYLIGHT BEYOND RIGHT OF WAY
33+75	41.18	41.18	40.68	40.7	0%	END V-DITCH
33+80	41.21	41.21	N.A.	41.6	2% (TOWARD CHANNEL)	END TRANS.

CONSTRUCTION NOTES

[4] CONSTRUCT REINFORCED MASONRY RETAINING WALL PER PFRD STD. PLAN 615-0-OC MODIFIED HEREIN PER PLAN & PROFILE, TYPICAL SECTION AND DETAILS SHEET 12.

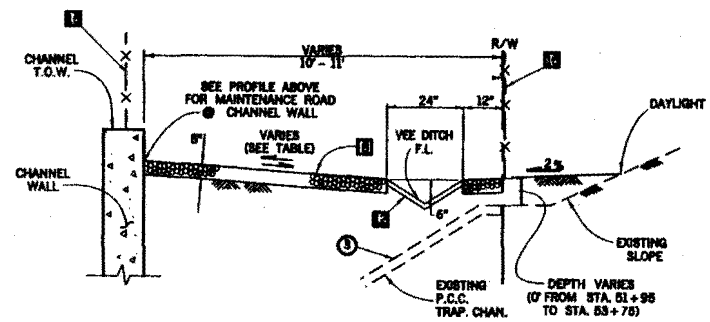
[8] CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.5' AB/ NS, WIDTH PER PLANS & DETAILS SHEET.

[12] CONSTRUCT, MODIFIED 6" VEE-DITCH PER PLAN, DETAIL SHEETS 18 & 19 AND PFRD STD. PLAN 1332.

[13] CONSTRUCT INLET & HEADWALL PER PLAN AND DETAILS SHEET 19.

[15] INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN, TYPICAL SECTION & PFRD STD. PLAN 1413.

[16] INSTALL 6' CHAIN LINK FENCE PER PLAN, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.



EASTERLY MAINTENANCE ROAD /WALKWAY DETAILS
(STA. 51+60 TO STA. 54+23.11)
N.T.S.

CONCRETE VEE-DITCH & GRADING REQUIREMENTS TABLE (EASTERLY SIDE)

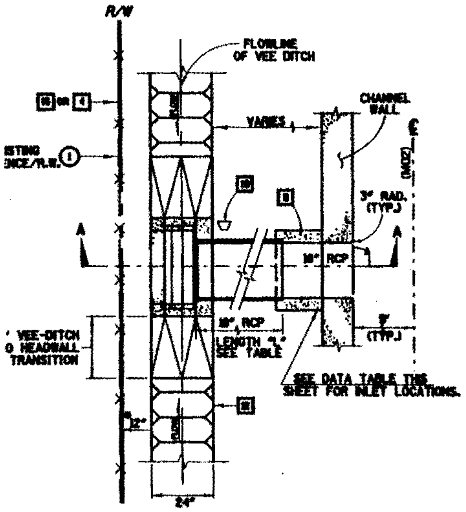
STATION	CHANNEL TOW ELEV.	ELEV. MAINT. ROAD @ CHAN. WALL	F.L. VEE DITCH	ELEV. MAINT. ROAD @ R/W OR DAYLIGHT	SLOPE MAINT. ROAD BET. CHAN. WALL & VEE DITCH	REMARKS
51+60	53.46	53.46	N/A	53.6	2% (TOWARD CHANNEL)	BEG. MAINT. ROAD TRANS
51+66	53.53	53.53	53.03	53.5	0%	BEGIN V-DITCH
51+95	53.99	52.01	51.35 (SUMP)	51.9	2% (TOWARD VEE DITCH)	END MAINT. ROAD TRANS./CONST. DRAINAGE HEADWALL
53+75	56.43	53.93	53.23	53.8	2% (TOWARD VEE DITCH)	BEG. MAINT. ROAD TRANS
54+18.11	57.08	57.08	56.58	56.6	0%	END V-DITCH
54+23.11	57.50	57.50	N/A	57.9	2% (TOWARD CHANNEL)	END MAINT. ROAD TRANS

3 inches on original drawing

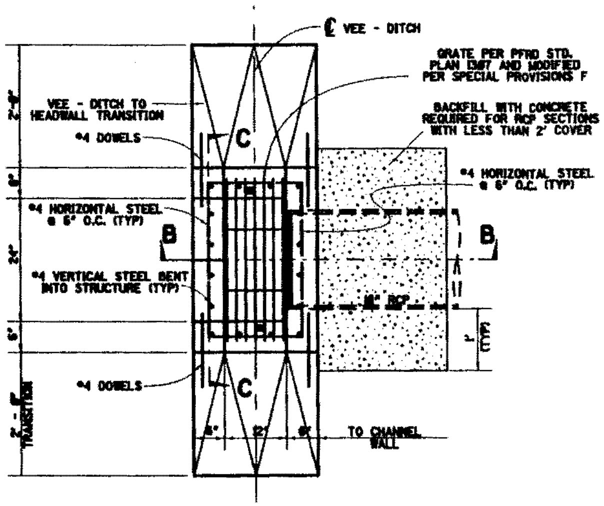
LEGEND

② PROTECT IN PLACE
③ REMOVE INTERFERING PORTIONS

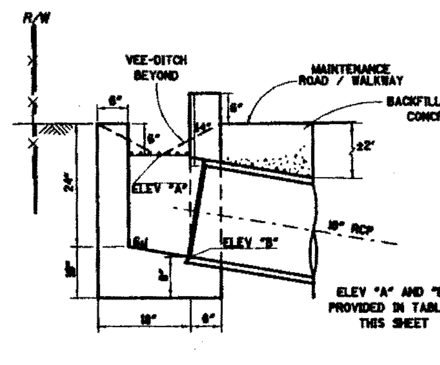
ORANGE COUNTY
SEGUNDA DESHECHA CAÑADA CHANNEL
MAINTENANCE ROAD/WALKWAY PROFILE, TYPICAL SECTIONS & GRADING REQUIREMENTS
(STA. 27+00 TO STA. 33+80 & STA. 51+60 TO STA. 54+23.11)
M02-101-4
18
OF 7



DRAINAGE DETAIL
PLAN
SCALE: 1"=2'



HEADWALL DETAIL
PLAN
SCALE: 1"=1'



HEADWALL DETAIL SECTION B-B
SCALE 1"=1'

CONSTRUCTION NOTES

4 CONSTRUCT REINFORCED MASONRY RETAINING WALL PER PFRD STD. PLAN 618-0-OC MODIFIED HEREIN PER PLAN & PROFILE, TYPICAL SECTION AND DETAILS SHEET 12.

8 CONSTRUCT MAINTENANCE ROAD OR WALKWAY WITH 0.8' AB/NS, WIDTH PER PLANS & DETAILS SHEET 18.

11 CONSTRUCT SIDE INLET PER PLAN, PROFILE, DETAILS SHEET 17 AND PFRD STD. PLAN 1314.

12 CONSTRUCT, MODIFIED 6" VEE-DITCH PER PLAN, DETAIL SHEETS 18 & 19 AND PFRD STD. PLAN 1332.

13 CONSTRUCT INLET & HEADWALL PER PLAN AND DETAILS SHEET 19.

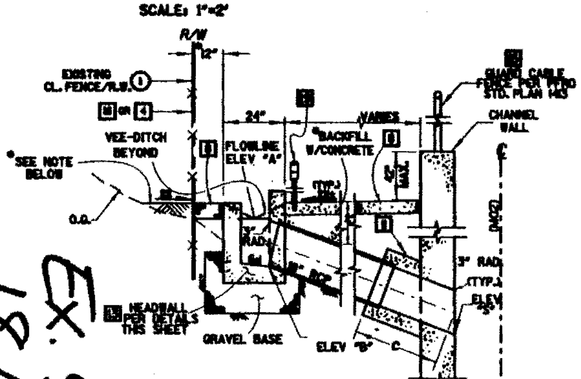
16 INSTALL GUARD CABLE FENCE ON TOP OF CHANNEL WALL PER PLAN, TYPICAL SECTION & PFRD STD. PLAN 1413.

18 INSTALL 8' CHAIN LINK FENCE PER PLAN, TYPICAL SECTION, DETAILS & PFRD STD. PLAN 600-0-OC.

19 INSTALL MARKER TYPE "CULVERT MARKER" PER PFRD STD. PLAN 1402, SHEET 19 AND AS DIRECTED BY THE ENGINEER.

LEGEND

(1) REMOVE

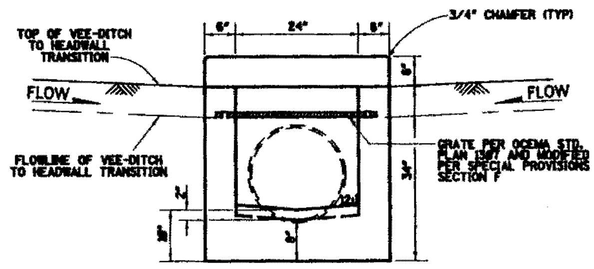


DRAINAGE DETAIL
SECTION A-A
NTS

*NOTES:

1) CONCRETE BACKFILL REQUIRED FOR RCP SECTION WITH LESS THAN 2' COVER
2) SEE MAINTENANCE ROAD/WALKWAY PROFILE, TYPICAL SECTIONS GRADING REQUIREMENTS SHEET 18.
3) FROM STA. 27+05 TO 33+75, THE DISTANCE BETWEEN THE R/W AND EDGE OF VEE-DITCH OR HEADWALL IS 20'. THIS IS DUE TO THE RETAINING WALL. SEE SHEET 18.
4) IN AREAS WHERE DRAINAGE INLETS ARE REQUIRED, FULL OR PARTIAL REMOVAL OF P.C.C. TRAP. CHANNEL AND ADDITIONAL EXCAVATION MAY BE REQUIRED IN ORDER TO CONSTRUCT THE DRAINAGE INLET.

EX. 5
18/20

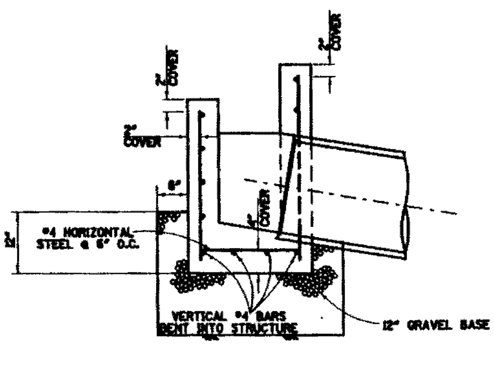


HEADWALL DETAIL SECTION C-C
PLAN
SCALE: 1"=1'

MAINTENANCE ROAD/WALKWAY DRAINAGE & JUNCTION STRUCTURE DATA TABLE							
CHANNEL STATIONING	*ITEMS						
	A	C	L	ELEV."A"	ELEV."B"	ELEV."S"	D-LOAD
17+05							
17+05							
27+75	90°	3'-0"	8.2'	33.33	31.66	26.66	2000
30+75	90°	3'-0"	4.7'	35.18	33.51	27.36	2000
62+00	90°	3'-0"	5.4'	51.33	49.66	45.67	2000

*NOTES:

1. ELEVATIONS AND LENGTHS ARE APPROXIMATE - EXACT MEASUREMENT SHALL BE DETERMINED IN THE FIELD.



HEADWALL DETAIL
SCALE 1"=1'

REVISIONS

ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

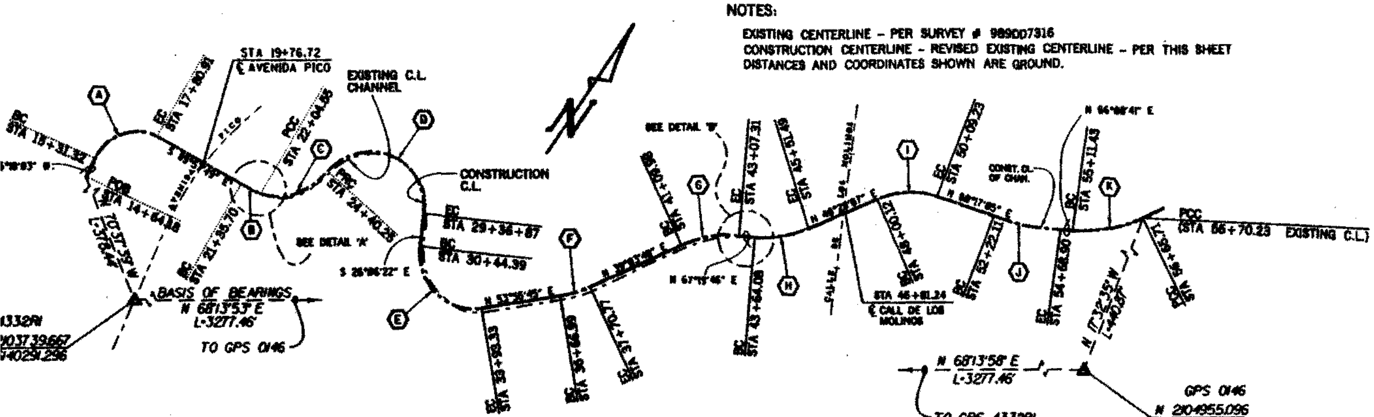
SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

MAINTENANCE ROAD/WALKWAY DRAINAGE AND DRAINAGE HEADWALL STRUCTURE DETAILS

DATE 10-31-01
DRAWING NO. M02-101-4
SHEET 19 OF 29

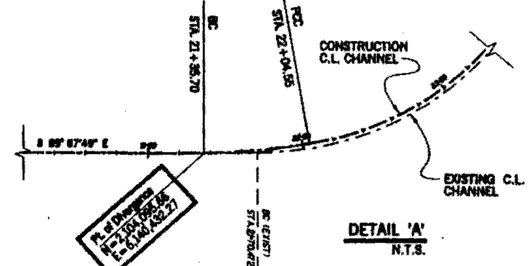
NOTES:

EXISTING CENTERLINE - PER SURVEY # 989007316
CONSTRUCTION CENTERLINE - REVISED EXISTING CENTERLINE - PER THIS SHEET
DISTANCES AND COORDINATES SHOWN ARE GROUND.



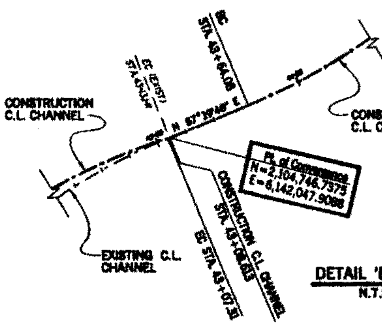
CONSTRUCTION CENTERLINE ALIGNMENT AND SURVEY TIES

N.T.S.



DETAIL 'A'

N.T.S.

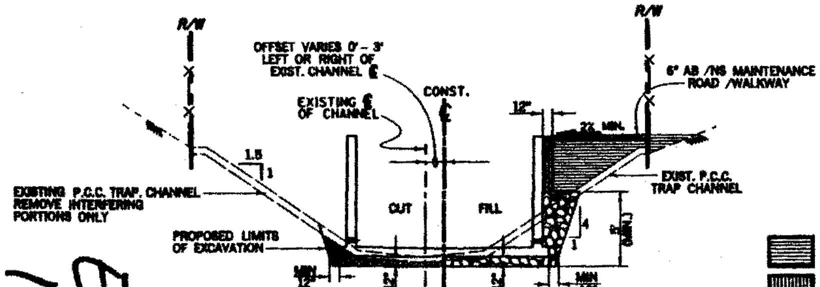


DETAIL 'B'

N.T.S.

	Δ	R	L	T
A	[illegible]	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]	[illegible]
E	[illegible]	[illegible]	[illegible]	[illegible]
F	[illegible]	[illegible]	[illegible]	[illegible]
G	[illegible]	[illegible]	107.33	106.72
H	[illegible]	[illegible]	[illegible]	[illegible]
I	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	77.76

CURVE DATA (CONSTRUCTION CENTERLINE)

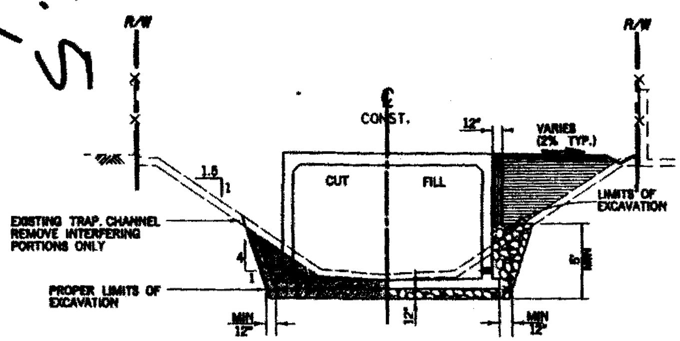


RECTANGULAR CHANNEL STRUCTURE

N.T.S.

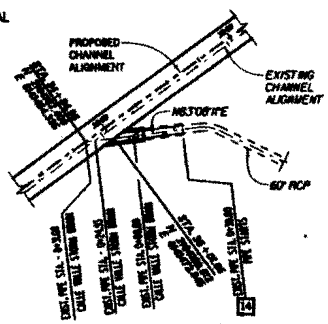
LEGEND

- UNCLASSIFIED FILL (SELECT BACKFILL)
- STRUCTURE BACKFILL (SELECT BACKFILL)
- UNCLASSIFIED EXCAVATION
- GRAVEL BASE MATERIAL
- AGGREGATE BASE



RCB STRUCTURE

N.T.S.



ALIGNMENT DETAIL FOR 60" RCP

SCALE: 1" = 40'

CONSTRUCTION NOTES

14 CONSTRUCT R.C. COLLAR PER PLAN AND PROFILE SHEETS, DETAILS SHEET 17 & PFRD STD. PLAN 1317.

Ex. 5
19/20

ORANGE COUNTY
PUBLIC FACILITIES AND RESOURCES DEPARTMENT

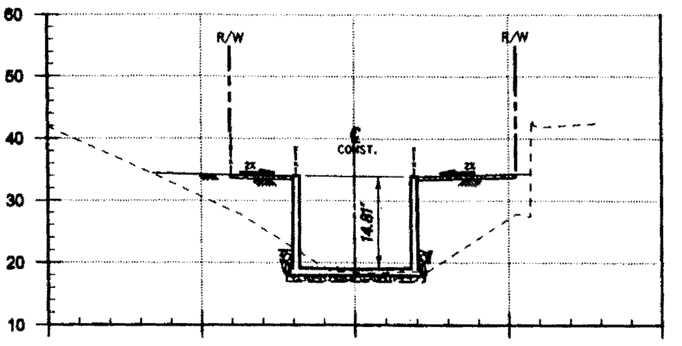
SEGUNDA DESHECHA CAÑADA CHANNEL
OCFCD FACILITY - M02

PAYLINES & SURVEY TIES

REVISIONS

M02-101-4

20 OF ?



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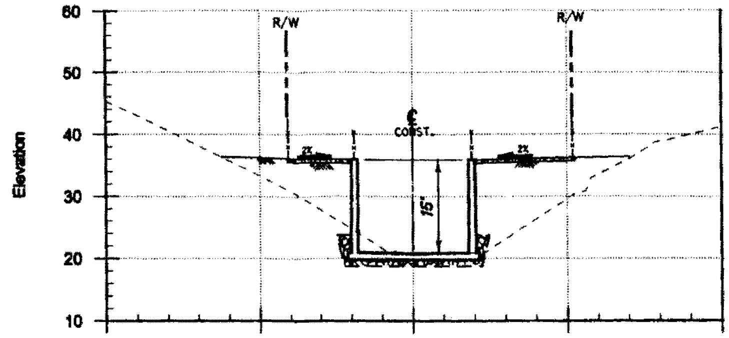
Area Fill: 261.07

22+00.00

Volume Cut: 163.4
Volume Fill: 871.36



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Area Fill: 273.22

25+00.00

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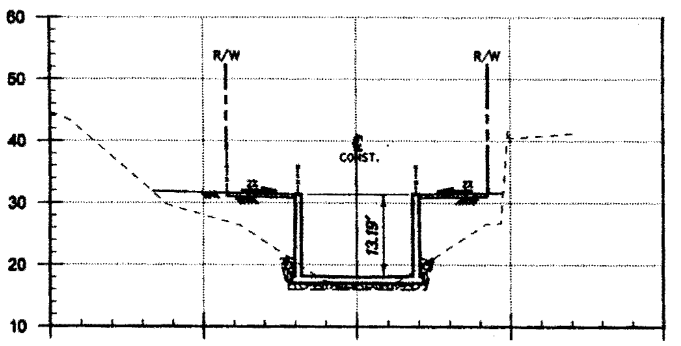

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21+00.00

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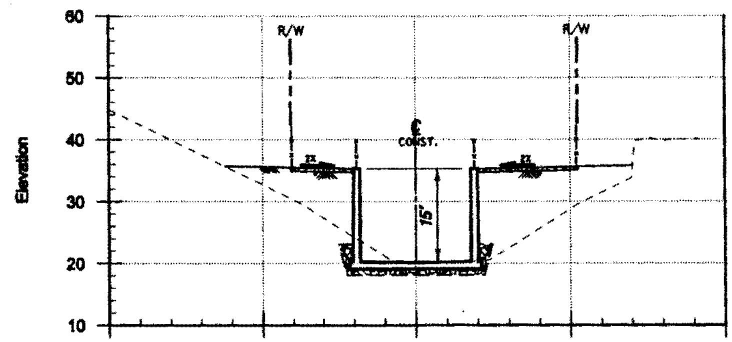

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24+00.00

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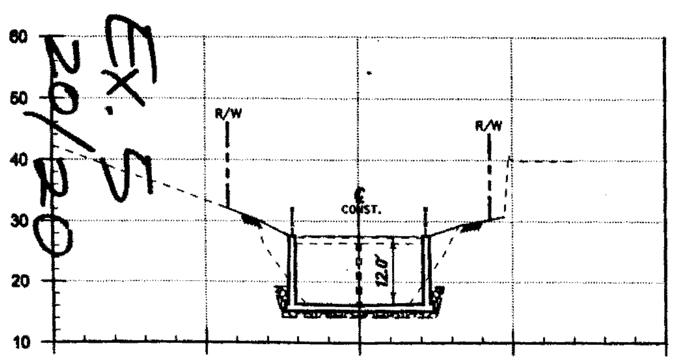

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20+44.31

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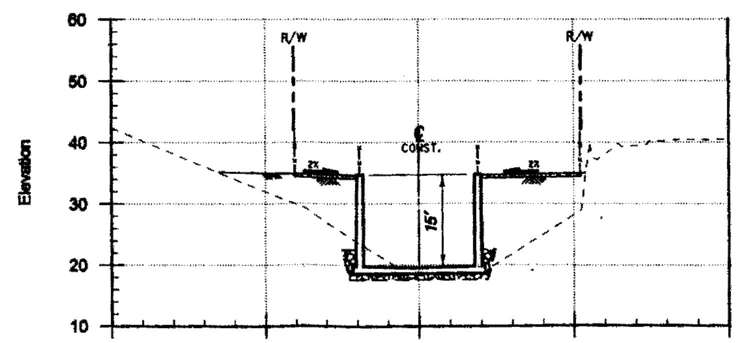
Volume Fill: 0.00



Area Cut: 62.6
Area Fill: 251.10

23+00.00

Volume Cut: 200.7
Volume Fill: 985.50

SCALE: 1" = 10' VERTICAL & HORIZONTAL

VOLUME CUT (cy) = UNCLASSIFIED EXCAVATION

VOLUME FILL (cy) = UNCLASSIFIED FILL

1 ½ 0 1 2

3 inches on original drawing

ORANGE COUNTY

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

SEGUNDA DESHECHA CANADA CHANNEL

OCFCD FACILITY NO. M02

CROSS SECTIONS

STA 20+44.31 TO STA 25+00.00

REVISIONS

R. GAUT

J. VOLZ

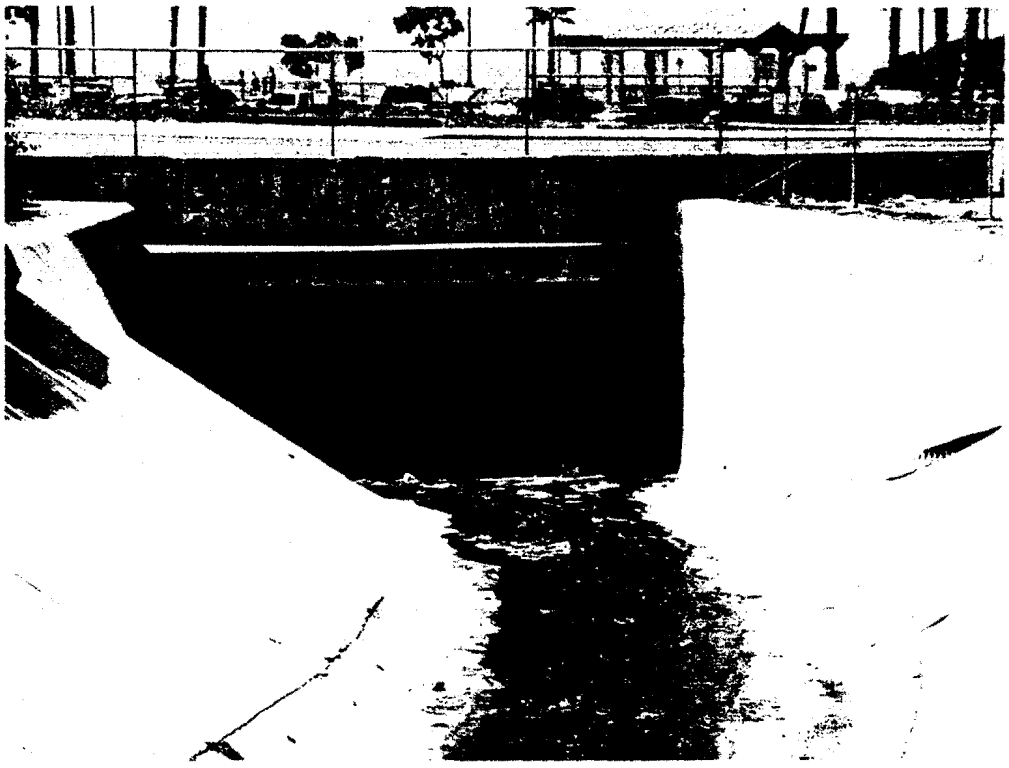
12-20-96

M02-101-4

21

OF 32

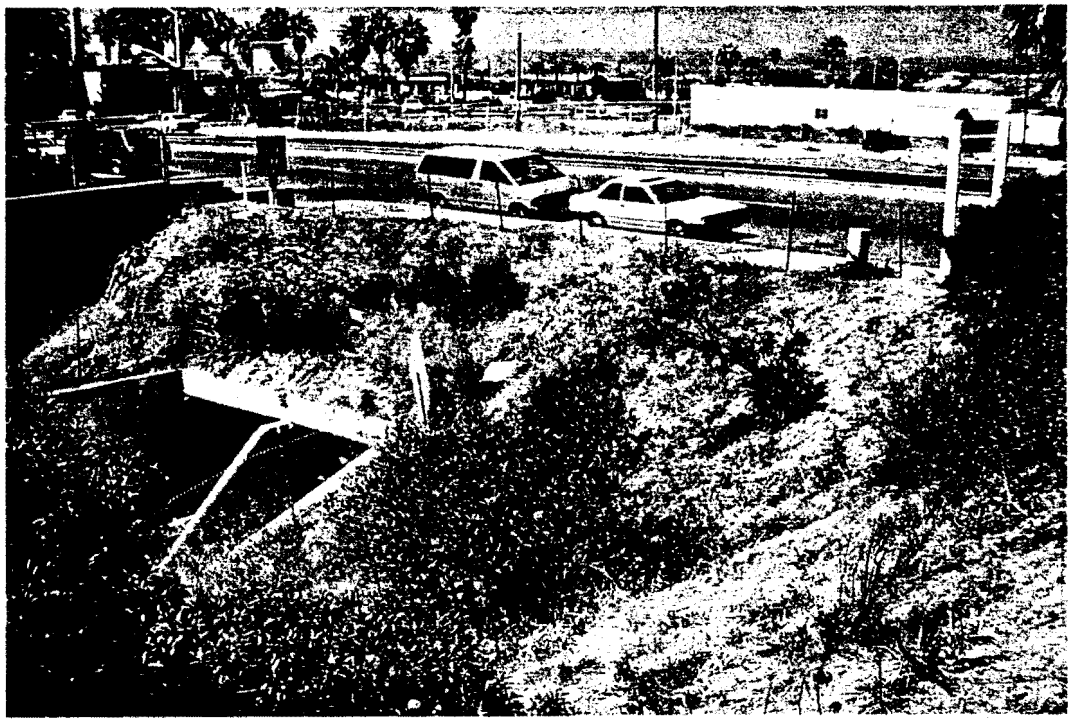
Upstream El Camino Real looking downstream



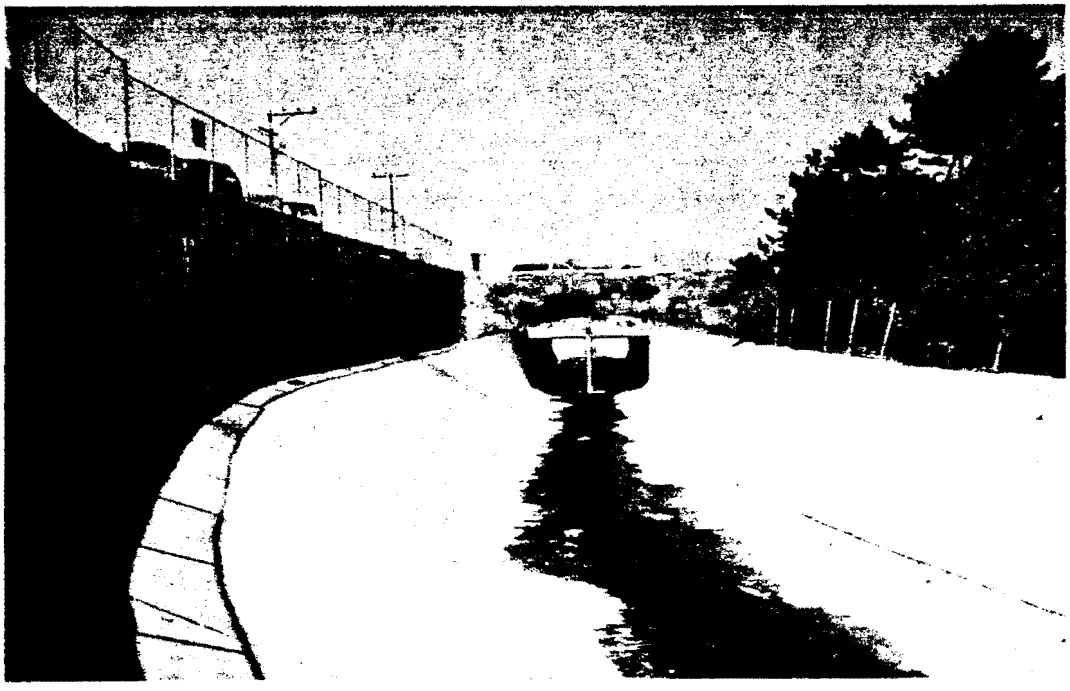
Downstream Avenida Pico looking upstream

View from above

Upstream Avenida Pico looking downstream



Upstream Avenida Pico looking downstream



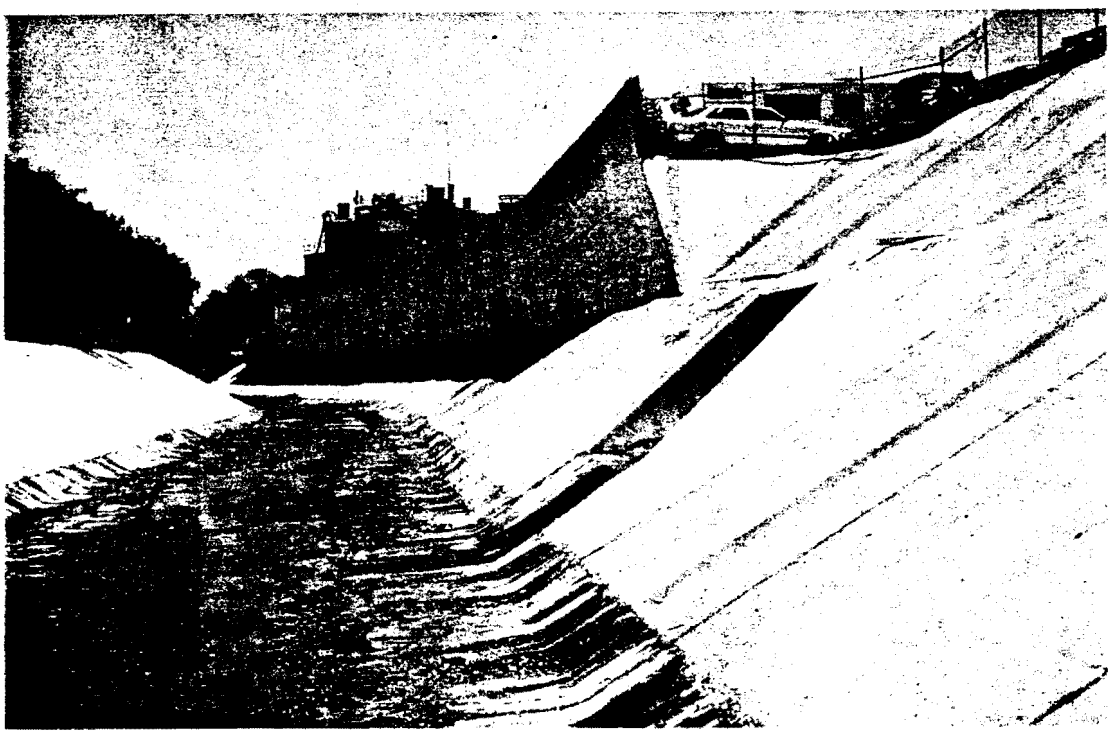
Ex. 6
2/6

400 feet Upstream Avenida Pico looking upstream –City's water treatment plant in background

Approximately 1000 feet upstream of Avenida Pico looking downstream – View of commercial development

Ex. 6
3/6

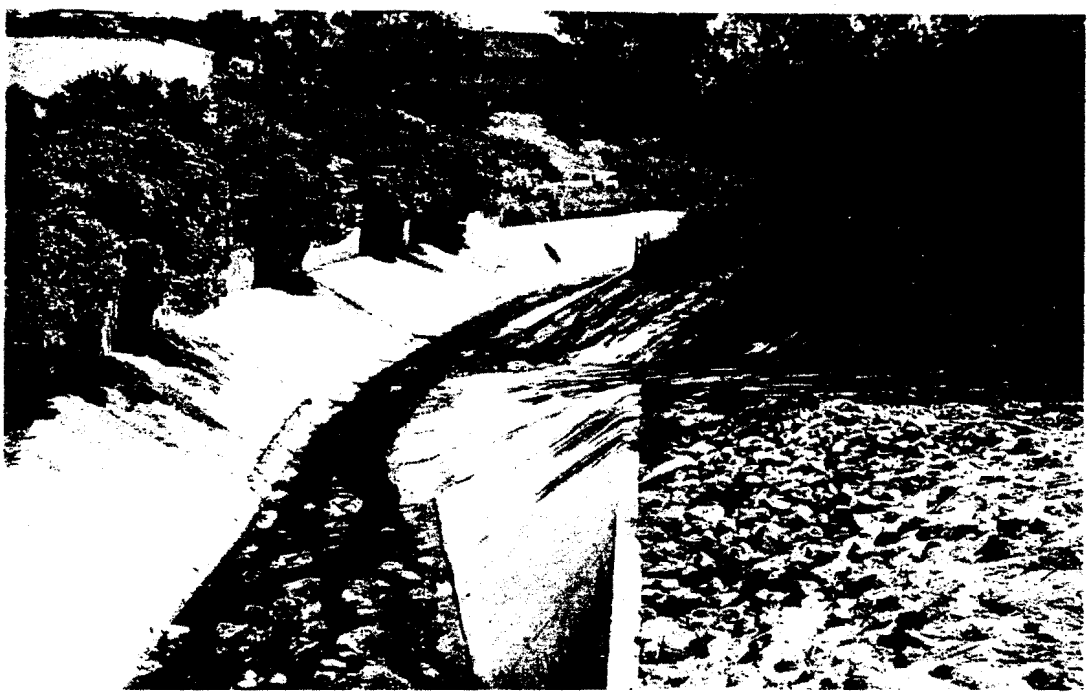
1000 feet downstream of Calle de Los Molinos looking upstream



View from Calle de Los Molinos looking downstream

Ex. 6
4/6

View from Calle de Los Molinos looking upstream

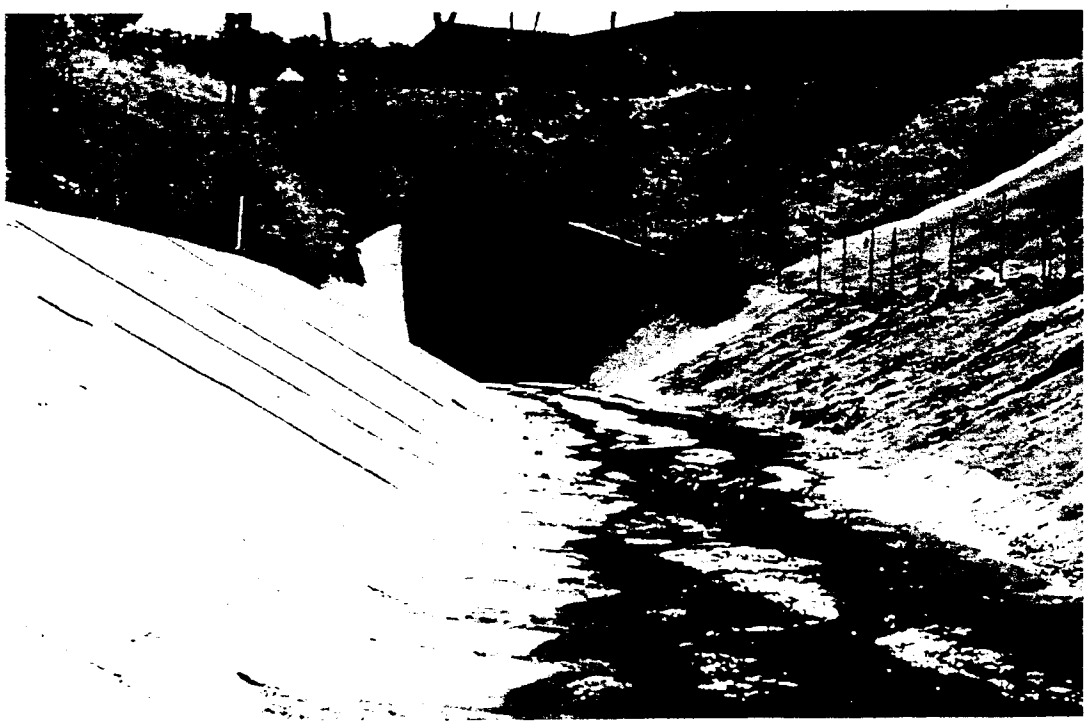


Immediately upstream of Calle de Los Molinos looking downstream

Ex. C
5/6

500 feet upstream of Calle de Los Molinos near end of project - looking downstream

Immediately downstream of 15'x15' box culvert at commercial center – Upstream terminus of project



Ex. 6
6/6

KEPNER PLASTICS FABRICATORS, INC.

3131 Lomita Boulevard, Torrance California USA 90505-5158
TEL: (310) 325-3162 FAX: (310) 326-8560
e-mail: larry@kepnerplastics.com
Web Page: http://www.kepnerplastics.com

SeaCurtain
Pollution Control Products

Debris Barriers

Kepner Plastics Fabricators, Inc. has been a leader in the oil pollution control industry for over 30 years. As a major manufacturer of oil booms, skimmers, collapsible tanks and related products Kepner has a reputation for producing innovative high quality products. Kepner Plastics was the largest supplier of oil containment booms during the Exxon Valdez oil spill in Alaska.

Utilizing the experiences gained during three decades of manufacturing environmental protection products, Kepner Plastics developed the **SeaCurtain Debris Barrier.**

When installed properly, the debris barrier is a practical, cost effective method of controlling and containing a high percentage of the trash and other debris which collects in storm channels, streams and other tributaries. During rainy periods these secondary waterways dump tons of trash into mainstream channels which can eventually make their way to environmentally sensitive areas.

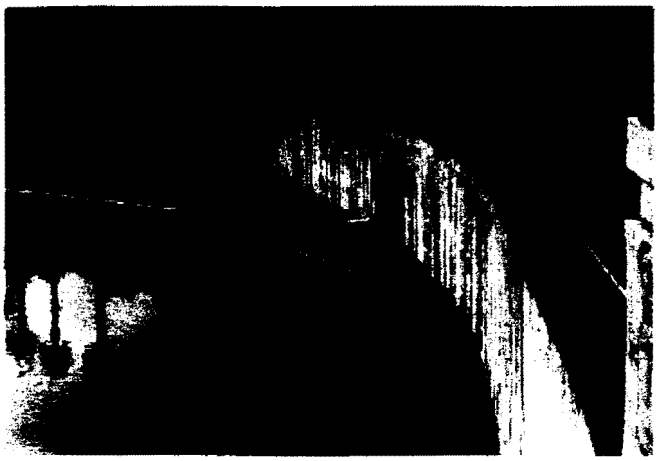
SeaCurtain Debris Barriers are designed to divert and contain the flow of debris to areas best suited for prompt cleanup. By placing Debris Barriers at strategic locations, a large portion of the plastic bottles, styrofoam, paper and other trash do not reach protected wetlands, marshes, lakes or the ocean.

To date, SeaCurtain **Debris Barriers have been used effectively throughout California** by both Public Works and Beaches & Harbor Departments in Orange, San Diego, Los Angeles, Ventura and Alameda Counties.

The SeaCurtain Debris Barrier can be viewed on our web page at **www.kepnerplastics.com**

KEPNER PLASTICS FABRICATORS, INC.

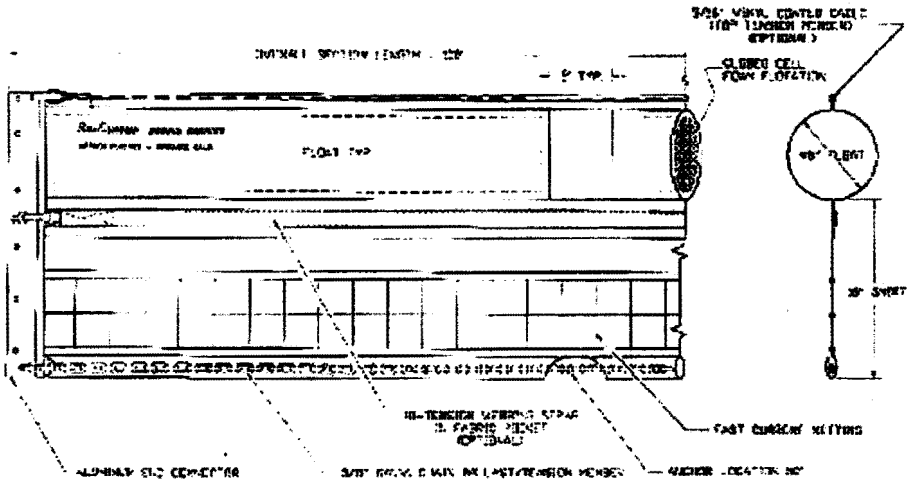
SEACURTAIN™ DEBRIS BARRIER



PROVEN EFFECTIVE FOR DEBRIS COLLECTION IN:

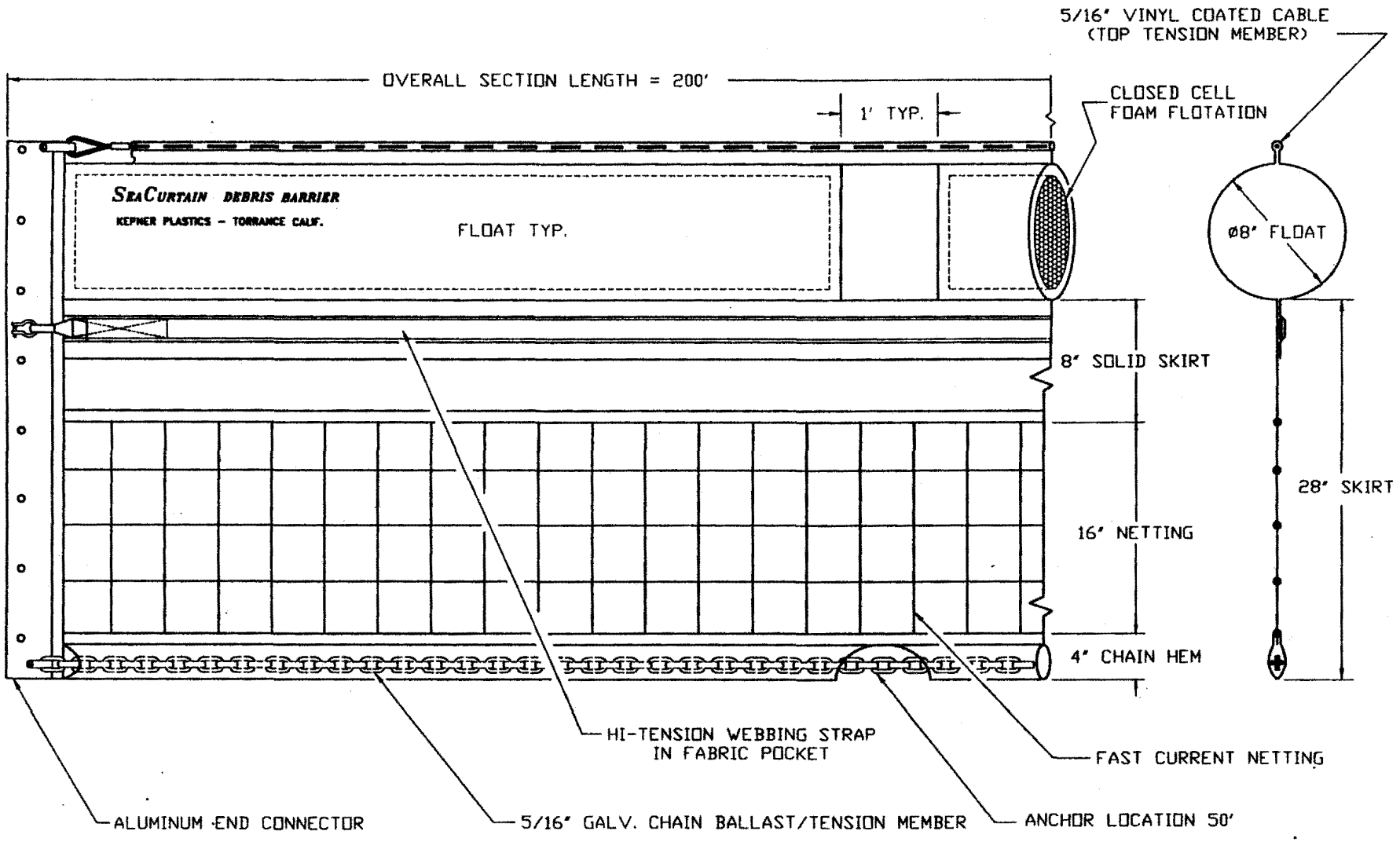
- STORM CHANNELS
- WILDLIFE AREAS
- RIVERS & STREAMS

- LONG LASTING
- COST EFFECTIVE
- HEAVY-DUTY



3131 LOMITA BLVD • TORRANCE, CALIFORNIA 90505-6168 • USA • TEL. (310) 325-3182 • FAX: (310) 328-8860

Ex. 7
2/3



Ex. 7
3/3

KEPNER PLASTICS FABRICATORS, INC.					W.O. #
SEACURTAIN DEBRIS BARRIER					
MODEL #BPHDTN82808REFU					
BY	DATE	APPR	DAT	D DWG #	REV.
AMM	11/19/98			STACITY111698	0

City of San Clemente
Engineering Division
William E. Cameron, City Engineer
Phone: (949) 361-6120 Fax: (949) 361-8316
CameronW@San-Clemente.org

February 20, 2002

Ron Gaut
County of Orange
PFRD - Flood Control Design
300 N. Flower Street, Room 509
Santa Ana, CA 92703

Subject: City Conceptual Water Quality Improvement Projects for the Segunda Deshecha (M02) Channel

Dear Mr. Gaut:

This letter is in response to your request for more information on the City's conceptual water quality improvement projects for the M02 channel.

Description

Three water quality project concepts have been developed for the M02 channel, each of which would be located near the mouth of the M02 channel (refer to attached figure). The concepts consist of vortex separation technology along with high-rate disinfection and are sized to treat dry-weather runoff or all or a portion of wet-weather "first-flush" storm flows. The general treatment process is as follows:

- Runoff is diverted into the facility through the drop inlet structure, which would not impede flow within the channel.
- Runoff flow would then pass through an EPA swirl concentrator to remove suspended sediment, other non-dissolved pollutants associated with fine sediment and floatables such as trash/debris and oils/grease. These pollutants would be stored in sump tanks for periodic removal and disposal. Note that the conceptual projects have been developed to allow bypassing of larger-grained sediment (typically beneficial for beach sand nourishment) normally associated with flows greater than first-flush flows.
- Treated flow from the swirl concentrator would then pass through a disinfection contact chamber to remove bacteria. Chlorination/dechlorination is the recommended disinfection alternative because it offers the most economical bacteria reduction process when treating high runoff volumes from large drainage areas. However, the City is currently investigating additional technologies such as ultraviolet light and/or ozonation which might be used instead of chlorination for dry-weather flows.
- After the disinfection contact chamber, treated runoff flow would be returned to the channel.

Cost

Capital costs for the conceptual M02 treatment projects are estimated from $340,000 for the dry-weather facility up to $3.2 million for the "full-scale" (most of first-flush) facility. Annual operation and maintenance costs are likewise estimated from $86,000 up to $162,000.

Implementation Timeline

As you might be aware, a new regional NPDES stormwater permit that was just adopted requires the City to implement source control measures such as public education, water quality monitoring and inspection/enforcement (although additional measures such as structural treatment projects are not necessarily precluded). Thus, the City will direct its efforts toward the required source control measures, but may also supplement these efforts with structural projects such as the concept identified for the M02 channel. However, the City Council has not yet directed which structural projects identified in the City's Urban Runoff Management Plan should be implemented. If and when the City is ready to move forward with implementation of a structural runoff treatment facility on the M02 channel, the City would obtain a coastal development permit as a separate applicant.

Sincerely,

William E. Cameron
City Engineer

CC: Tom Bonigut, Senior Civil Engineer

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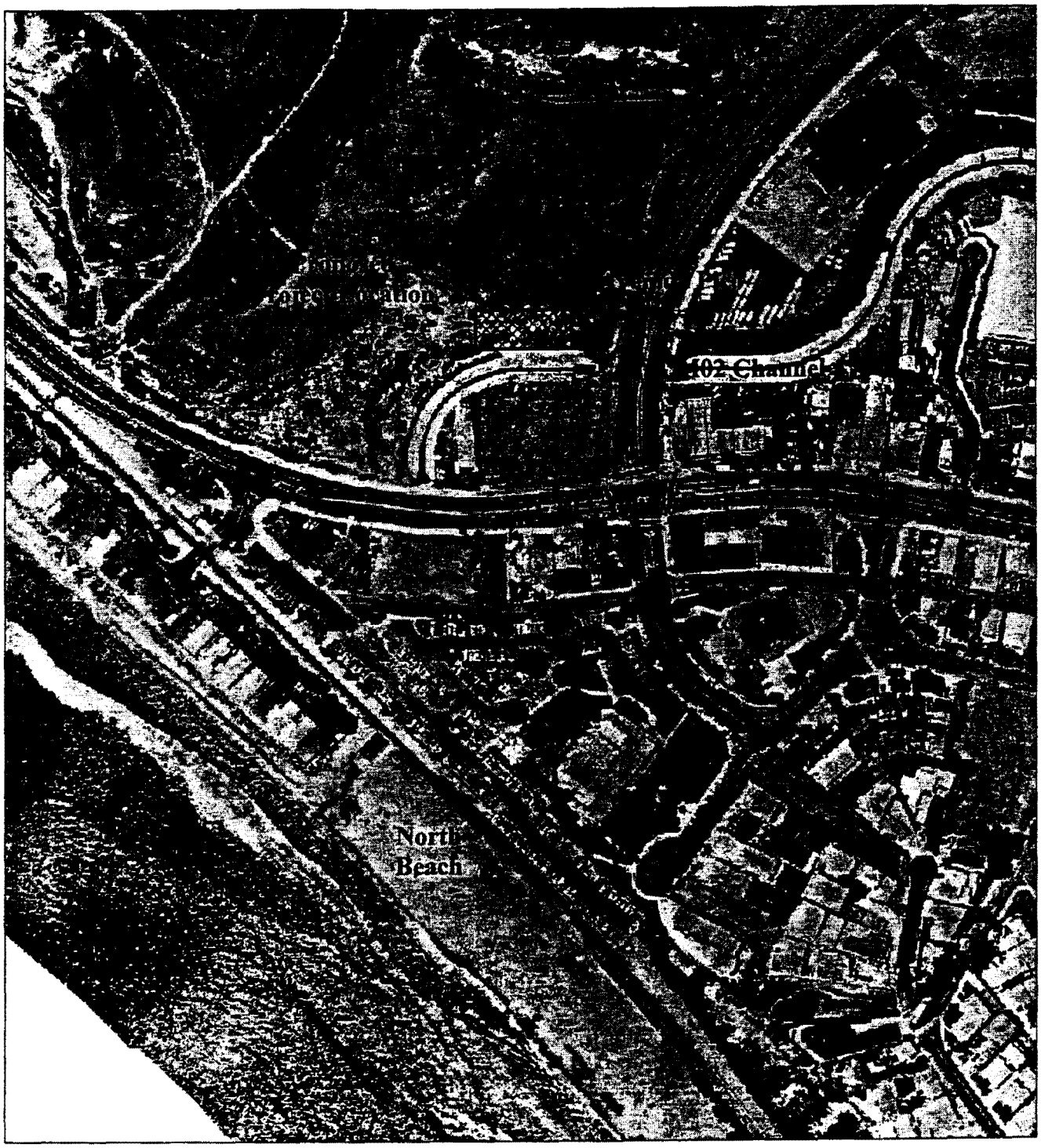
Ex. 8
2/3



N

General Location
M02 Channel Water Quality
Conceptual Projects

Ex. 8 3/3