# Alameda CTC – RSEP

## Oakland Crossings

WATER QUALITY AND DRAINAGE MEMO

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## Contents



## Tables

# EXECUTIVE SUMMARY

This drainage memo has been prepared support environmental review under CEQA and NEPA. This drainage memo will analyze the drainage conditions for each crossing with respect to water quality requirements and peak runoff impacts. Based upon the location of the projects, the disturbed area for construction, and the governing agency requirements we have determined the following:

1. The project does not violate water quality standards or waste discharge requirements
2. The project does not substantially decrease surface or groundwater quality
3. The project does not interfere or impede groundwater recharge or management
4. The project does not alter the existing drainage pattern
5. The project does not result in substantial erosion or siltation
6. The project does not substantially increase the rate or amount of surface runoff
7. The project does not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff
8. The project does not impede or redirect flood flows
9. The project does not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan
10. The project is not located within a wetland as designated by the Department of Fish and Wildlife.
11. The project is located within FEMA Floodzone X, which has a flooding depth of less than 1 ft.
12. The project is not located within a Coastal Tsunami Zone.

Each crossing project is subject to the following requirements and recommendations:

A. Conformance with Alameda County Stormwater Quality Best Managements Practices (BMPs) for site design requirements for Small Projects. Refer to Section 2.3, Table 8 for requirements.
B. Existing and Proposed Drainage inlets to be marked “No Dumping – Drains to Bay” within project limits.
C. Stormwater quality post construction treatment measures are not required based upon the proposed construction.
D. No improvements to the drainage conveyance system (inlets and underground pipe) are required based upon the proposed construction.
E. Stormwater Pollution Preventions Plans (SWPPP) are not required because each site disturbs less than 1 acre. Recommendations for BMPs during construction are listed in Section 2.5.

# 1.0 PROJECT SETTING AND EXISTING CONDITIONS

## 1.1 PROJECT LOCATION AND DESCRIPTION

The project site consists of four existing at-grade rail crossings in the southwestern portion of the city of Oakland, in Alameda County, California. Alameda County Transportation Commission (Alameda CTC) is the lead agency under the California Environmental Quality Act (CEQA). The crossings are along Union Pacific Railroad (UPRR) tracks where UPRR tracks intersect with local streets. Each of the crossings is listed in **Table 1** below, noting the jurisdiction and local street intersections listed from north to south and by city. The Map ID number corresponds to crossing locations shown on **Figure 1 in Attachment G**. See Attachment B for proposed improvements at each crossing.

## 1.2 LOCATION DATA

**Table 1:** Location Data

| Jurisdiction | Intersection | Map ID |
|---|---|---|
| Oakland | 29th Avenue | 8 |
| Oakland | Fruitvale Avenue | 9 |
| Oakland | 37th Avenue | 10 |
| Oakland | 50th Avenue | 12 |

## 1.3 EXISTING SITE FEATURES

**Table 2**. Existing Conditions

| Intersection | Description |
|---|---|
| 29th Avenue | 29th Avenue extends in a northeast direction through this crossing with two lanes of travel in each direction. Latitude High School is located immediately to the east. Continuous sidewalks extend along 29th Avenue on each side. There are single-arm gates in each direction of traffic. |
| Fruitvale Avenue | Fruitvale Avenue extends in a northeast direction through this crossing with two lanes of travel in each direction. Parking lots are located immediately north of this crossing, with vacant parcels to the south. Continuous sidewalks extend along Fruitvale Avenue on each side with Class II bicycle lanes striped on both sides. There are single-arm gates in each direction of traffic. |
| 37th Avenue | 37th Avenue extends in a northeast direction through this crossing with one lane of travel in each direction. Landscaping associated with Interstate 880 (Nimitz Freeway) is located south of the crossing. Sidewalks are present north of the UPRR tracks along 37th Avenue, but no pedestrian facilities extend across the tracks. There are single-arm gates in each direction of traffic. |
| 50th Avenue | 50th Avenue extends in a northeast direction through this crossing with one lane of travel in each direction. Sidewalks are present south of the UPRR tracks along 50th Avenue, but no pedestrian facilities extend across the tracks. There are single-arm gates in each direction of traffic. |

## 1.4 TSUNAMI HAZARD ZONE

**Table 3:** Summary of Tsunami Hazard Zoning

| Jurisdiction | Intersection | Within a Tsunami Hazard Zone |
|---|---|---|
| Oakland | 29th Avenue | No |
| Oakland | Fruitvale Avenue | No |
| Oakland | 37th Avenue | No |
| Oakland | 50th Avenue | No |

## 1.5 EXISTING SOIL AND GROUNDWATER

Existing soil data was obtained from the National Resource Conservation Service (NRCS) Web Soil Survey. Groundwater depth data was obtained from EnviroStor, the Department of Toxic Substances Control's (DTSC) online data management system, and GeoTracker, the California State Water Resources Control Board's data management system (Appendix D and E). The groundwater depth is reported as measured below ground surface (bgs). Existing soil and groundwater conditions are described in **Table 4** below.

**Table 4**. Summary of Soil Data

| Intersection | NRCS Soil Classification | Groundwater Depth |
|---|---|---|
| 29th Avenue | 148 – Urban land-Clear Lake complex | 6 to 9-ft bgs |
| Fruitvale Avenue | 148 – Urban land-Clear Lake complex | 6 to 8-ft bgs |
| 37th Avenue | 148 – Urban land-Clear Lake complex | 6 to 8-ft bgs |
| 50th Avenue | 146 – Urban Land | 1 to 3-ft bgs |

# 2.0 POST-CONSTRUCTION STORMWATER

## 2.1 GROUND COVER COMPARISON

The volume and rate of stormwater runoff is directly related to groundcover. By directly comparing the change in impervious ground cover the potential hydrologic impact can be assessed. A 0.1cfs increase in runoff for a ten-year storm event would be generated by an increase of 1,500sf of impervious cover per drainage management area (DMA). The existing and proposed projects was divided into distinct DMA's for each inlet, none of which exceed the 1,500sf threshold. A comparison of pre-project to post-project conditions is summarized on the drainage exhibits in **Attachment A**.

## 2.2 POLLUTANTS OF CONCERN

Stormwater run-off naturally contains various constituents, however development and operational activities within developed areas typically increase contaminant concentrations to levels that impact water quality. The run-off can have detrimental effects on streams and rivers in the form of erosion and sedimentation which can harm water quality and wildlife habitat. The proposed project would repair and bring existing railroad crossing facilities up to current standard and would not substantially change hydraulic grade or capacity. The project would not result in operational changes for the railroad or roadways. Thus, no impacts to stormwater runoff quality is anticipated as compared to the existing condition.

**Table 6** lists typical pollutants of concern from the proposed project to be mitigated by measures discussed in Section 2.3 and Section 2.5.

**Table 6**. Potential Pollutants of Concern

| Pollutant | Impacts on Water Quality |
|---|---|
| **Sediment** | Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter. |
| **Bacteria and Viruses** | Bacteria and viruses are common contaminants of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming. |
| **Oil and Grease** | Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal. |
| **Metals** | Metals including lead, zinc, cadmium, copper, chromium, and nickel are commonly found in stormwater. Many of the artificial surfaces of the urban environment (e.g., galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern because they are toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies. |
| **Organics** | Organics may be found in stormwater in low concentrations. Often synthetic organic compounds (adhesives, cleaners, sealants, solvents, etc.) are widely applied and may be improperly stored and disposed. In addition, deliberate dumping of these chemicals into storm drains and inlets causes environmental harm to waterways. |
| **Pesticides** | Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about adverse effects of pesticides on the environment and human health. Accumulation of these |

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|---|---|
| | compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds. |
| **Gross Pollutants** | Gross Pollutants (trash, debris, and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes, and estuaries sometimes causing fish kills. |

Source: CASQA BMP Handbook, 2003

**Table 7**. Receiving Water Body Pollutant Impacts

| Intersection | Receiving Water Body | Pollutant Impacts |
|---|---|---|
| 29th Avenue | Sausal Creek – Frontal San Francisco Bay (Oakland Inner Harbor, Fruitvale Site, Part of SF Bay, Lower) | Chlordane, Ddt, Dieldrin, Dioxin, Furan Compounds, Mercury, Non-Native Aquatic Plants, Pcbs in Sediment, Selenium, Toxicity |
| Fruitvale Avenue | Sausal Creek – Frontal San Francisco Bay (Oakland Inner Harbor, Fruitvale Site, Part of SF Bay, Lower) | Chlordane, Ddt, Dieldrin, Dioxin, Furan Compounds, Mercury, Non-Native Aquatic Plants, Pcbs in Sediment, Selenium, Toxicity |
| 37th Avenue | Sausal Creek – Frontal San Francisco Bay (Oakland Inner Harbor, Fruitvale Site, Part of SF Bay, Lower) | Chlordane, Ddt, Dieldrin, Dioxin, Furan Compounds, Mercury, Non-Native Aquatic Plants, Pcbs in Sediment, Selenium, Toxicity |
| 50th Avenue | Sausal Creek – Frontal San Francisco Bay (San Francisco Bay Central) | Chlordane, DDT, Dieldrin, Dioxin Compounds, Furan Compounds, Mercury, PCBs, Selenium, Non-Native Aquatic Plants, Trash |

## 2.3 WATER QUALITY MANAGEMENT

The City of Oakland is a permittee under the Municipal Regional Permit (MRP) issued by the Regional Water Quality Control Board. Provision C3.i of the MRP sets requirements for addressing post construction stormwater runoff for certain development and redevelopment projects. Provision C.3.i defines small projects as those which create or replace at least 2,500sf but less than 10,000sf of impervious surface. The proposed rail crossings that fall into the classification of a small site are required to implement one of the following Best Management Practices (BMPs):

1. Direct runoff from sidewalks and walkways onto vegetated areas
2. Direct runoff from driveways onto vegetated areas

3. Construct sidewalks and walkways with permeable surfaces.
4. Construct bike lanes and driveways with permeable surfaces

**Table 8**. Summary of Post Construction Stormwater Quality Requirements

| Intersection | Disturbed Area (sf) | Proposed Impervious Surface (sq-ft) (Replaced or New) | Post-Construction Stormwater Quality Requirements |
|---|---|---|---|
| 29th Avenue | 4,545 | 4,257 | Implement one or more of the small site design measures |
| Fruitvale Avenue | 2,727 | 2,727 | Implement one or more of the small site design measures |
| 37th Avenue | 5,752 | 4,989 | Implement one or more of the small site design measures |
| 50th Avenue | 3,846 | 3,204 | Implement one or more of the small site design measures |

## 2.4 HYDROMODIFICATION MANAGEMENT

Hydromodification is the change in the timing, peak discharge, and volume of run-off from a site due to land development. When a site is developed, the impervious surfaces no longer allow rainwater to infiltrate into the native soils, which then becomes run-off. The additional run-off can add to the erosive level of flows in creeks and rivers.

These sites are each disturbing less than an acre of land. Therefore, no additional hydromodification management is necessary.

## 2.5 APPLICABLE BMP'S

To avoid erosion and siltation due to construction, Design Engineer should consider implementing the following BMP's during construction:

- EC-1 Scheduling
- NS-3 Paving and Grinding Operations
- NS-8 Vehicle and Equipment Cleaning
- NS-9 Vehicle and Equipment Fueling
- NS-10 Vehicle and Equipment Maintenance
- NS-12 Concrete Curing
- NS-13 Concrete Finishing
- SE-1 Silt Fence
- SE-5 Fiber Rolls
- SE-7 Street Sweeping and Vacuuming
- SE-8 Sandbag Barrier
- SE-10 Storm Drain Inlet Protection
- WE-1 Wind Erosion Control
- WM-1 Material Delivery and Storage
- WM-2 Material Use

- WM-3 Stockpile Management
- WM-4 Spill Prevention and Control
- WM-5 Solid Waste Management
- WM-8 Concrete Waste Management

# 3.0 REFERENCES


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# APPENDIX

**Attachment A** – Drainage Exhibits

**Attachment B** – Wetland Mapper

**Attachment C** – FEMA Firmette Maps

**Attachment D** – Web Soil Survey Maps

**Attachment E** – Groundwater Data

**Attachment F** – Tsunami Hazard Zone Map

**Attachment G** – Crossing Locations