APPENDIX F: DRAIN MAINTENANCE HANDBOOK

STORMWATER FIELD SERVICES RFP

Drain Maintenance Handbook



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1 Scope of Work

Storm water discharges at the Port of Stockton (Port) are covered under a Municipal Separate Storm Sewer System (MS4) storm water permit (Permit). The Permit specifies waste discharge requirements and a Monitoring and Reporting Program (MRP) for the Port's facility-wide storm water discharges from the MS4 and for Non-Storm Water discharges. Federal regulations (40 CFR §122.26(d)(2)(iv)) require that a storm water management program (SWMP) be implemented during the term of the Permit. The Port's SWMP describes the management and legal structure put in place to implement the Port's storm water program. Drain maintenance represents one part of the municipal element of the SWMP. The Port's Environmental Department inspects and maintains MS4 drain inlets, manholes, and channels in accordance with the SWMP/Drain Maintenance Handbook.

This handbook will address the following items:

- A routine preventative maintenance program for BMPs installed in or around drain inlets and channels;
- A pre-wet season cleaning of drain inlets and storm water conveyance pipes and channels, which includes a prioritization of maintenance items based on accumulation of waste, recent analytical results, and industrial activities and pollutant sources in the area of the drains;
- Record keeping of cleaning and overall waste removed;
- Proper disposal of waste removed pursuant to applicable laws; and
- Measures to minimize waste discharges during storm sewer maintenance and cleaning activities.

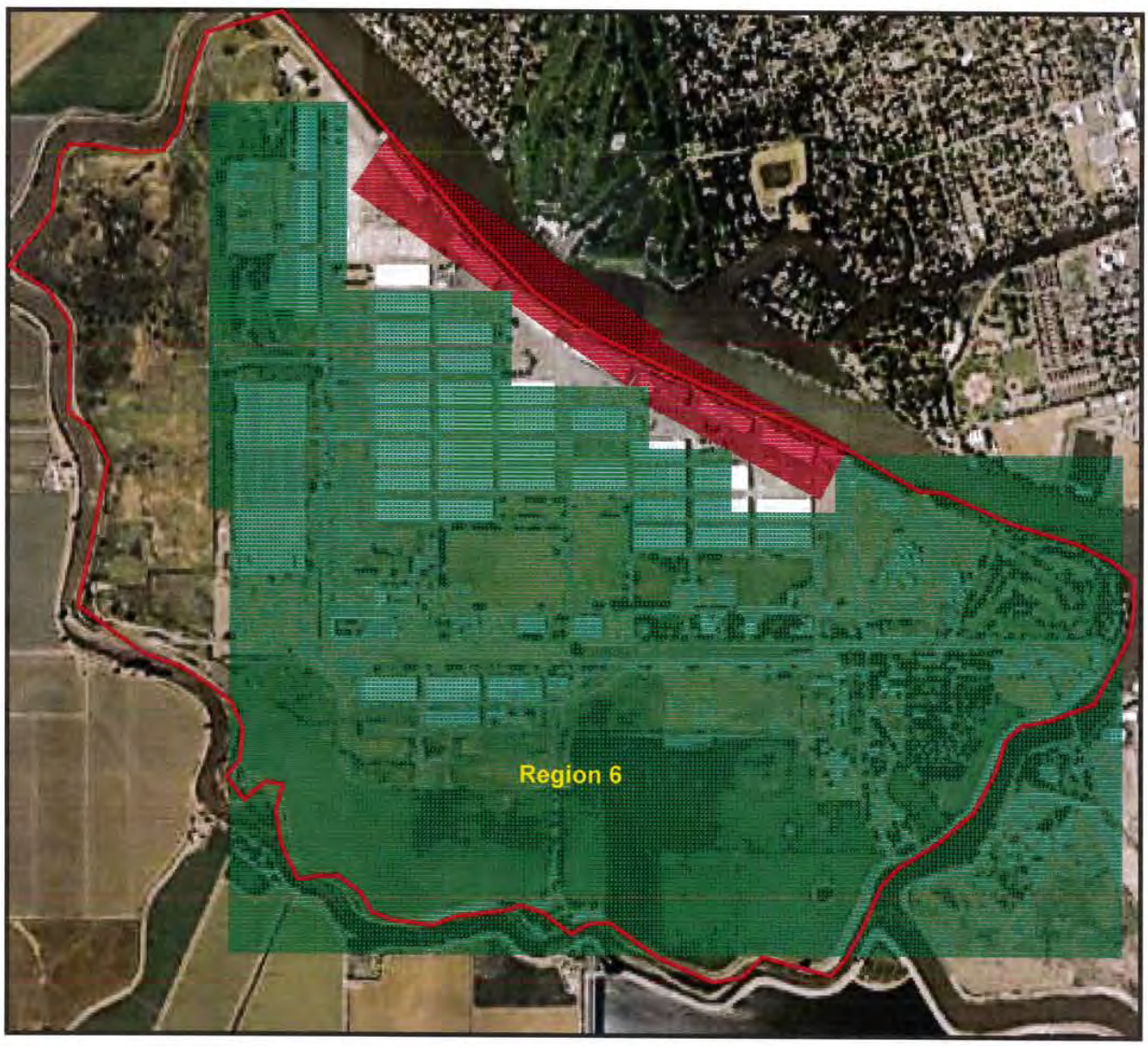
2 Division of Work

East Complex: The East Complex is divided into five regions -Regions 1 through 5.



West Complex: The West Complex is all contained within one region (Region 6), which is then divided into secure and unsecure areas.

- Secure area (Red Section) near the docks
- Unsecured area out to Port Expressway (Green Section)



3 Drain Identification

3.1 The Port has labeled every known Port storm water inlet, as required by their MS4 Permit. The drains are individually and uniquely numbered. The drain locations have been mapped and entered into the Port's Maintenance Database, which is used for preventive drain maintenance. Refer to **Appendix H and Appendix I** to obtain the specific drain maintenance schedule and the BMP implementation plan for each drain. Some information on drains within the Port may not be available in the database because many of the drains at the Port are maintained by the individual tenants.

3.2 Labels are applied to the surface around the drain using an epoxy.

3.3 Once the label is applied, the drain number is recorded, and the electronic drain database is updated with the new drain number. Periodically, the labels may need to be replaced due to heavy vehicle or equipment traffic, which causes wear and tear.

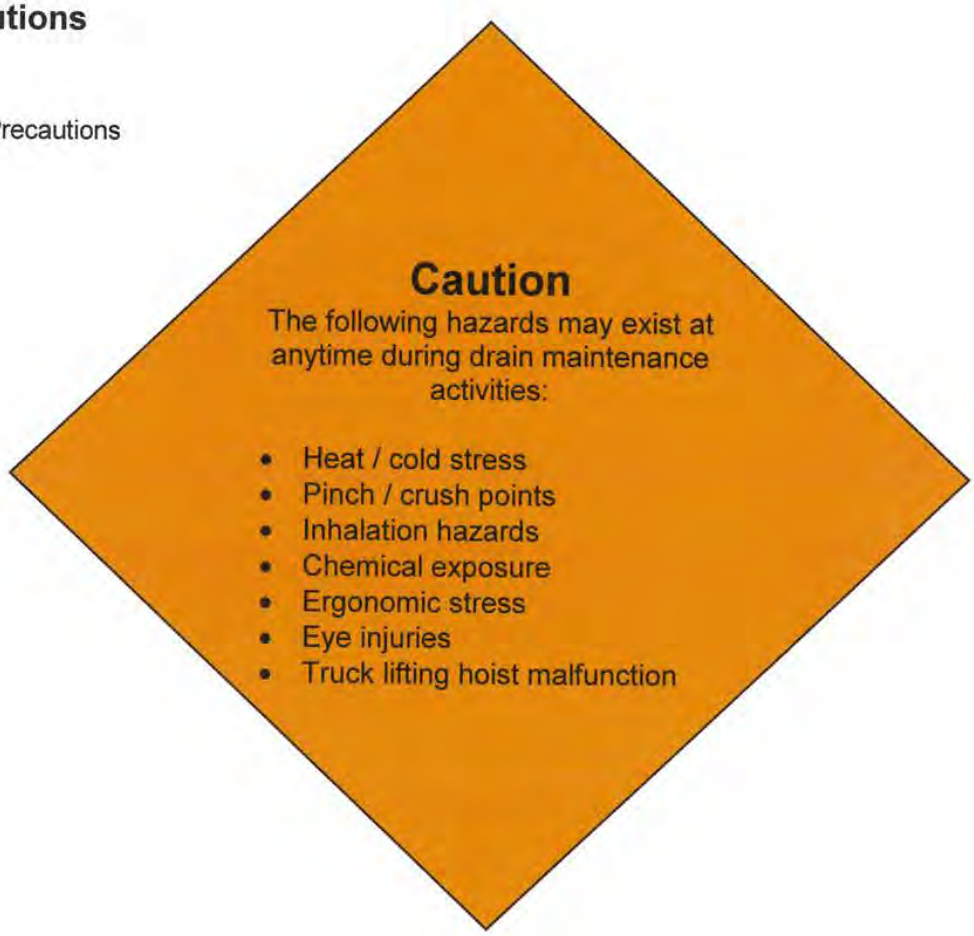
3.4 Worn or missing labels are replaced with new labels.

3.5 Whenever a drain label is discovered missing, damaged, or illegible, it is replaced with a new label and the drain is relabeled on the storm drain map with the number of the new label. If the replacement number differs from the original assigned number, the electronic drain database is updated with the newly assigned number.



4 Safety Precautions

4.1.1 Safety Precautions



4.1.1.1 **Proper Personal Protective Equipment (PPE)** should be worn and in place prior to commencing drain maintenance activities.

Required PPE for drain maintenance activities:

- Gloves (select proper type for work being done)
  - Leather Work Gloves (For working around pinch, puncture, and crush hazards)
  - Form Fitting Work Gloves (For protection during general cleaning activities)
  - Nitrile gloves (General cleaning when liquid is present)
  - Chemical Resistant Gloves (In case of a discovered release to the conveyance system)
- Steel Toed Work Boots
- Safety Eye Glasses (ANSI Z87.1-2003)
- Reflective, brightly colored Safety Vest

4.1.1.2 A minimum of 2 persons must be utilized to perform drain maintenance activities.

4.1.1.3 Contact the Environmental Department before physically entering a drain sump or vault because this is considered a **confined space entry**.

Confined Space Entry

Confined space entry must not be performed without previous approval from the Environmental Department. Prior to any approved confined space entry, safety and atmosphere monitoring equipment must be in place and properly utilized.

5 Type 1 Drain Inlets and Servicing Procedures

5.1 **Type 1 Drains** – These drains are small enough to be manually removed with a drain hook (Refer to **Appendix B**)

5.2 Drains types are identified by the drain removal technique. Each drain type requires specific tools and equipment to successfully access drain inlets and perform maintenance activities. Proper safety protocols should be followed while performing all drain maintenance.

5.2.1 The following are the items needed to perform maintenance at Type 1 Drains:

- Extra drain bags (kept in sample room)
- Large drain hook
- Bucket
- Shovel
- Scraper
- Whisk broom
- Dust pan
- Push Broom
- Truck and trailer with attached magnet
- Hand-push magnet

5.2.2 Servicing Procedure

5.2.2.1 Sweep debris from edge of drain so debris does not drop into drain.

5.2.2.2 If drain has bag insert in it, place feet on corners of the insert, or have co-worker stand on corners.



5.2.2.3 Place drain hook in drain grate and pull up with legs (keep your back upright and lift with your legs, not with your back). If grate is stuck, hammering against the edge of the drain cover may be required to loosen drain.



5.2.2.4 Place drain hook into drain slot, making sure hook is pulling against drain bottom. Once again, pull using your legs, leaving your back straight. Make sure you are not bending at the waist. Wearing gloves is recommended.

Note: Pulling drain without securing the drain insert may result in the insert falling down into the drainage pipe.



Note: Drains may be stuck. Strike drain hook up against bottom of drain. Make sure you are wearing leather gloves and safety glasses.

5.2.2.5 Pull drain lid completely off of the inlet, so cleanup can be done without any interference.



5.2.2.6 Sweep around edge of drain, catching all debris. Scrape the edges, removing all rust scale. Use a large dust pan to catch debris.

5.2.2.7 Remove the drain insert. Empty the contents of the drain insert into a 5-gallon bucket. Measure and log contents and amount of debris removed.



Documenting Removed Drain Material:

All material collected in and around the drain should be placed a 5-gallon bucket to gauge the amount of material collected. The current state of the material should be noted (Dry, Damp, Wet, or Wet Organic Material). Estimate the amount of gallons in the 5-gallon bucket. Refer to **Appendix C** of this document for estimated weights of each material type. Record total weight collected, along with the drain number.

5.2.2.8 Vacuum or scoop the contents from bottom of drain and add debris to 5-gallon bucket.

5.2.2.9 Place debris from 5-gallon bucket into the barrel located in the back of truck.



5.2.2.10 Sweep area 10 feet in diameter around drain, and collect swept debris into a dust pan. Do not sweep debris back into the drain!

5.2.2.11 Deposit the refuse into a 5-gallon bucket. Measure and log contents and amount removed. (See appendix C)

5.2.2.12 Return the cleaned insert into drain. Make sure it is centered and there is an equal amount of fabric around drain. If the insert is damaged or overly worn, replace with a new one. Document when a new insert is installed.

5.2.2.13 Before replacing the drain grate, have one person replace the drain bag insert and hold it in place with their feet.

5.2.2.14 Carefully lower the drain grate back on over the insert.





5.2.3 Wet Conditions

5.2.3.1 Apply the appropriate drain access method to the drain type to be accessed.

5.2.3.2 Remove drain insert (if applicable).

5.2.3.3 If possible, remove water in the drainage sump by using the wet/dry vacuum to purge.



5.2.3.4 Use a shovel or custom debris scoop to remove built up sediment and debris.

5.2.3.5 Clear out the sediment from the removed drain insert.

5.2.3.6 Quantify and record the amount of debris and sediment removed from the drain and insert.

6 Type 2, 3, and 4 Drain Inlets and Servicing Procedures

6.1 **Type 2 Drains** – These drains have large grates that must be removed using a truck with a hoist (Refer to **Appendix B**)

6.2 Drains types are identified by the removal technique. Each drain type requires specific tools and equipment to successfully access drain inlets and perform maintenance activities. Proper safety protocols should be followed while performing drain maintenance.

6.2.1 The following are the items needed to perform maintenance at Type 2 Drains:

- Extra drain bags (kept in sample room)
- Pickup with crane
- Bucket
- Shovel
- Scraper
- Whisk broom
- Dust pan
- Push broom
- 2-bungee cords
- Wet / dry vacuum
- Generator
- Drain gamble
- Truck and trailer with attached magnet
- Hand-push magnet

6.2.2 Servicing Procedure

6.2.2.1 Position the truck hoist over drain location.

6.2.2.2 Place orange traffic cones in street for safety and traffic control.



6.2.2.3 Place bungee cords stretching from opposite corners of the drain insert.

Note: Placing a bungee cord in each corner of the insert keeps the insert from falling into the drain inlet.

6.2.2.4 Lower the hook from the crane on the truck.



6.2.2.5 Place the drain gamble on hook.

6.2.2.6 Place two hooks made from steel into the drain and then attach to the gamble.

6.2.2.7 Crank the crane winch tight.







6.2.2.8 Using the orange jack handle, pump up the crane actuator. (Make sure jack release is tight.)

6.2.2.9 Elevate the hydraulic jack until pressure is applied to drain without lifting drain base out of the pavement.



6.2.2.10 If drain does not lift out, take small sledgehammer and hit all four corners while applying slight lifting pressure from the crane.

6.2.2.11 Keep lifting until the drain grate and insert can be swung to the side, and high or wide enough to retrieve insert.



6.2.2.12 Remove the drain insert. Empty the contents into the 5-gallon bucket. Measure and log the contents and amount of debris removed from the drain. Place debris into barrel in back of truck.

6.2.2.13 Sweep area 10 feet in diameter around drain into a dust pan.

6.2.2.14 Pour the debris collected from the surrounding surfaces into 5-gallon bucket.

6.2.2.15 Measure and log contents and amount of debris removed.



6.2.2.16 Vacuum or scoop the contents from bottom of drain.

6.2.2.17 Place cleaned insert under drain lid.

6.2.2.18 Ensure the grate is centered and there is an equal amount of fabric around drain.



6.2.2.19 Place bungee cords across the drain grate and attach to each corner of the drain insert.

6.2.2.20 Push the crane back over drain hole. Ensure the drain area is clear of equipment, hands, and feet.

6.2.2.21 Place the small side of handle on the jack.

6.2.2.22 Turn jack bleeder very slowly to lower the drain grate back into place. Co-worker should guide drain lid into place using a foot to balance it.



6.2.2.23 Once placed, step on top to settle the drain grate back into place.

NOTE: If the drain grate does not settle back into the drain inlet, hit the corners with a small sledge hammer.

6.3 **Type 3 Drains** – Drains removed using Bottle Jacks and a Lifting Bar (Refer to **Appendix B**)

6.4 Drains types are identified by the removal technique. Each drain type requires specific tools and equipment to successfully access drain inlets and perform maintenance activities. Proper safety protocols should be followed while performing drain maintenance.

6.4.1 The following are the items needed to perform maintenance at Type 3 Drains:

- Extra drain bags (kept in sample room)
- Bucket
- Shovel
- Scraper
- Whisk broom
- Dust pan
- Push broom
- 2-Bungee cords
- Wet / dry vacuum
- Drain scoop
- Lifting bar
- 2 hydraulic lifting jacks
- 2 small chains - 18" with chain hooks
- 2 lift bar jack cradles
- Truck and trailer with attached magnet
- Hand-push magnet

6.4.2 Servicing Procedure

6.4.2.1 Place the lifting beam across the drain.

6.4.2.2 Place 2 hydraulic jacks on the edge of the drain insert.

6.4.2.3 Lower chains through the grate and grab lowered chain with the hook.

6.4.2.4 Place cradles on top of jacks

6.4.2.5 Place bar stock on top of cradles.

6.4.2.6 Place bungee cords across the drain grate and attach to each corner of the drain insert.





6.4.2.7 Raise both hydraulic jacks evenly.

6.4.2.8 If the grate is stuck, strike drain grate with sledgehammer on each corner to jar the grate loose.

NOTE: Re-adjusting chains is common. Be cautious, chains have been known to break. All safety protection should be taken seriously.



6.4.2.9 Remove the drain insert. Empty the contents into the 5-gallon bucket. Measure and log contents and amount of debris removed from the drain. Place debris into barrel in back of truck.

6.4.2.10 Sweep area 10 feet in diameter around drain and collect debris in dust pan.

6.4.2.11 Scoop the debris collected from the surrounding surfaces and pour into 5-gallon bucket.

6.4.2.12 Measure and log contents and amount of removed debris.

6.4.2.13 Vacuum or scoop the contents from bottom of drain and add debris to 5-gallon bucket. Place contents of bucket into the barrel in the back of the truck.

6.4.2.14 Place cleaned insert under drain lid.

6.4.2.15 Ensure the grate is centered and there is an equal amount of fabric around drain.

6.4.2.16 Place bungee cords across the drain grate and attach to each corner of the drain insert.



6.4.2.17 Push the crane back over drain hole. Ensure the drain area is clear of equipment, hands, and feet.

6.4.2.18 Place the small side of the handle on jack.

6.4.2.19 Turn jack bleeder very slowly to lower drain grate in place. A co-worker should guide the drain lid into place; using a foot to balance it.

6.4.2.20 Step on top to settle drain into place.

NOTE: If the drain grate does not settle back into the drain inlet, hit the corners with a small sledge hammer.

6.5 **Type 4 Drains** – Truck with hoist (Refer to Appendix B)

6.6 Drains Types are identified by the removal technique. Each drain type requires specific tools and equipment to successfully access drain inlets and perform maintenance activities. Proper safety protocol should be followed while performing drain maintenance.

6.6.1 The following are the items needed to perform maintenance at Type 4 Drains:

- Extra drain bags (kept in sample room)
- Bucket
- Shovel
- Scraper
- Whisk broom
- Dust pan
- Push broom
- 2-Bungee cords
- Wet / dry vacuum
- Drain scoop
- Lifting bar
- 2 hydraulic lifting jacks
- 2 small chains - 18" with chain hooks
- 2 lift bar jack cradles
- Truck and trailer with attached magnet
- Hand-push magnet

6.6.2 Servicing Procedure



6.6.2.1 Direct the driver to back the truck with the crane over the drain.

6.6.2.2 Place orange traffic cones in street for traffic control before starting work.



6.6.2.3 Lower the hook from crane on truck to the center of the drain grate.

6.6.2.4 Place the drain gamble on hook.

6.6.2.5 Place two hooks made from rebar into drain and attach hooks to gamble.

6.6.2.6 If the drain is equipped with a drain insert bag, use bungee cords to keep the bag attached to the grate while being removed and installed.A

6.6.2.7 Crank winch on crane tight.

6.6.2.8 Use the orange jack handle, to elevate crane.

6.6.2.9 Pump the hydraulic jack, until pressure is applied to drain, without lifting drain base out of the pavement.



6.6.2.10 Raise grate until it can be swung to the side.



6.6.2.11 Inspect stainless steel pan and the rubber plug.

6.6.2.12 Sweep or vacuum the debris from the stainless steel pan.



6.6.2.13 Sweep debris into dust pan, being careful to not allow any debris to drop in the drain.

6.6.2.14 Place the debris into barrel in back of truck.



6.6.2.15 Sweep area 10 feet in diameter around drain.

6.6.2.16 Scoop the debris collected from the surrounding surface into 5-gallon bucket.

6.6.2.17 Measure and log contents and amount of debris removed.



6.6.2.18 Push the crane back over drain hole. Ensure the drain area is clear of equipment, hands, and feet.

6.6.2.19 Place the small side of handle onto jack. Turn jack bleeder very slowly to lower drain grate in place. Co-worker should guide drain lid into place using a foot to balance it.

6.6.2.20 Step on top drain to settle into place.

NOTE: If the drain grate does not settle back into the drain inlet, hit the corners with a small sledge hammer until the drain seats.

6.6.3 Wet Conditions



6.6.3.1 Apply the appropriate drain access method to the drain type to be accessed.

6.6.3.2 Remove drain insert (if applicable).

6.6.3.3 If possible, remove water in the drainage sump by using the wet/dry vacuum to purge.

6.6.3.4 Use a shovel or custom debris scoop to remove built up sediment and debris.

6.6.3.5 Clear out the sediment from the removed drain insert.

6.6.3.6 Quantify and record the amount of debris and sediment removed from the drain and insert.

7 Cleaning and Maintaining Channels/Ditches

7.1 Trash and debris should be removed from the Port's ditches and channels on a periodic basis, and should also be removed prior to a forecasted storm. The refuse removed should be quantified and disposed of properly. Dumped material, such as tires, batteries, liquids, or other potentially hazardous wastes, should be disposed of and handled properly.

Note: If hazardous materials are discovered, contact the Environmental Department for further instructions.

8 Removal of Magnetic Metals

During dry weather periods, after all above maintenance steps have been performed, drains will be cleaned with a magnet in order to remove as much metals (Fe, Ni, and Co) as possible. Field crew should organize metal removal work into daily tasks. Tasks that are performed will be documented to confirm that all storm drain areas have been cleaned.



8.1 Attach magnet trailer to back of truck.

8.2 Drive to drain area of concern.

8.3 At drain area, lower magnets close enough to the ground to be able to pick up metals.

8.4 Choose starting point for that daily task. Drive trailer over drains. Truck routes will depend on locations of drains.

8.5 Continue to check if metals have fully covered the surface of the magnet because this would hinder the effectiveness of the magnet. If magnet is fully covered, park truck and scrape metals off the magnet and into a bucket. Document volumes of metals collected from each drain area.



8.6 Once the area immediately around the drains has been cleaned, continue to repeat this process until all areas within 50 to 100 feet away from the drains have been cleaned. If time permits, an area up to 100 feet away from the drains is preferred.

8.7 Use hand-pulled magnet to clean areas not accessible by the larger magnet trailer.

8.8 After cleaning has been completed for that day, store all removed metals in a metal recycle bin until they are sent away.

8.9 File field sheets from cleaning activities for later reference.

9 Drain Cleaning

The Port's drains require maintenance at different intervals, and in varying situations and conditions. Maintenance performed will also vary in intensity and frequency. Prior to the "wet season," the Port conducts an intensive drain line cleaning campaign. Street sweepers and vacuum trucks are utilized to clear surface pollutants and to clear sediment, metals, and debris from the drain lines. A similar method is used if a spill or release occurs. (See Appendix D) The only difference would be that the discharging party, if other than the Port, is usually responsible for the cleanup action. In the event that a spill or release occurs during maintenance, downstream drain lines should be plugged and the residual water from the cleaning should be recovered and not allowed to discharge into the MS4.

10 Replacing Sampling Tube Devices



10.1 Remove drain grate and insert (if applicable) as described above for the drain type.

10.2 Remove the old drain tube and brace.

10.3 Pull tubing from conduit and replace (if necessary).

Note: Sample tubing should be replaced at the start of the storm season.

10.4 Inspect the conduit and brace for any damage or wear, and replace if necessary.

10.5 Reinstall the device ensuring the conduit is facing the influent water piping to the drainage sump.

11 Cutting out stuck drains



11.1 If a drain does not lift out of the drain seat relatively easily using any of the four methods, the drain grate may be stuck and need to be cut out.

Warning: Excessive force will pull the drain seat out of the surface and may buckle and damage the surface around the drain.



11.2 Secure a gas-powered concrete saw with a metal cutting abrasive blade.

11.3 Place a rubber mat(s) over the drain to protect the drain form metal cuttings.

11.4 Ensure proper PPE is implemented prior to any cutting operations.

11.5 Clear away any combustible material from the area and have a fire extinguisher present.

11.6 Cut around the drain grate and seat as much as necessary.

11.7 Utilize the lifting bar and jacks, by placing the jacks on the edge of the seat and applying force.

11.8 While applying force with the jacks, use the small sledgehammer to dislodge the drain grate.

11.9 Vacuum up the saw cuttings and carefully remove the rubber mat, ensuring that cuttings do not enter the drain.



12 BMP/Maintenance Supplies Procurement

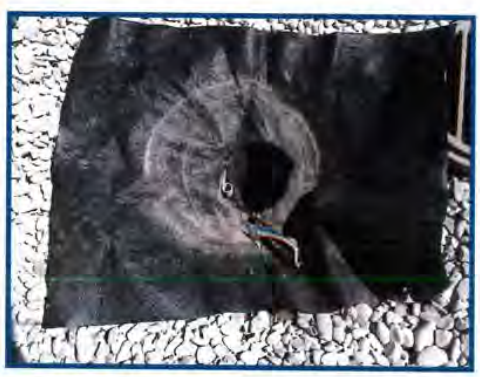
12.1 If additional or replacement parts are needed for any drain, insert, sampling devices, or maintenance need, contact the Environmental Department for procurement of additional supplies or parts for BMPs or maintenance activities.

13 Replacing BMPs

The Port uses various types of BMPs in and around storm drains. The BMPs serve as a form of pollution prevention. The BMPs are selected for each drainage area based upon the type of pollutants in the immediate area. Some drains may have a series of BMPs, while others may have only one. These BMPs require regular maintenance or replacement throughout the storm water year. The following describes a few common types of BMPs in place at the Port and the servicing requirements for these BMPs. (See Appendix C)

13.1 Drain Insert Bags

13.1.1 Upon pulling an insert bag from a drain, inspect the bag for deterioration or significant pollutant staining. Replace the insert with a new bag if deterioration or substantial staining is found.



13.2 Rock Filter Bags

13.2.1 Remove the rock bag from the drain.

13.2.2 Inspect the bag for sediment saturation, and bag degradation.

Note: Replace the rock bag if the bag is in poor condition.

13.2.3 Take the bag to the wash rack on the East Complex and wash out the sediment that has accumulated inside the bag.

Note: All washing activities should take place at the wash rack as the sediment within the rock bag likely contains pollutants. Allow time for the rock bags to completely drain all excess liquid to the wash pad.

13.2.4 Place cleaned rock bag back at the original drain.

13.3 Drain Stabilization Rock



13.3.1 Annually inspect drains that are surrounded with sediment stabilization rock.

Note: Drains with stabilization rock in high traffic areas may need to be inspected more frequently.

13.3.2 Capture fugitive rocks that have scattered outside of the intended stabilized area.

13.3.3 Add additional rock as needed.

Note: Do not use smaller rock than the standard size of 3"-5" inch ballast rock.

14 Maintaining Check Dams at the South Ditch

Check dams are permanent block structures filled with concrete. Rock is placed upstream and downstream from the check dam to collect sediment and solids. The rock is typically changed out every other year.







15 Transplanting Bio-Filtration Areas

In addition to the check dams, transplanted tules and native vegetation can also provide a mechanism for slowing water and acting as a natural bio-filter. The tules and vegetation filter out sediment, heavy material, and debris. Recent analytical data suggest that the Port's check dam/ bio-filtration combination greatly improves water quality when water passes through each segment. The tules need to be regularly maintained in order to be effective and allow adequate growth.

15.1 Transplant tules by positioning them in front and to the rear of check dams.

15.2 When the water level in the ditch is at a low level, dig out small sections in one gallon root ball size.



15.3 Plant the tules approximately 1 foot apart.

15.4 Ensure 10 to 15 plants are transplanted at the front and rear of the check dams.

NOTE: The root ball will multiply many times before next storm season.

16 Documentation Drain Maintenance

Documentation of collected drain material is a crucial step in the drain maintenance process. The Port is required to document the maintenance frequencies, material removed, and maintenance observations and compile the documentation into a database. The Port has developed a checklist to aid drain maintenance personnel in completing a thorough documentation of drain cleaning activities.

16.1 Fill in the date, time, and drain number of the current drain cleanout.

16.2 Enter the name of the person(s) performing the drain maintenance.

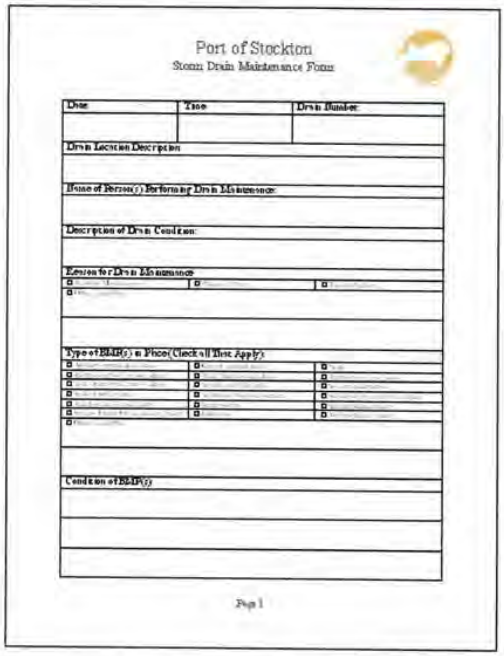
16.3 Provide a description of the drain condition and check the box for the reason for maintenance.

16.4 Check off the BMPs in use in and around the drain.

16.5 Record the condition of the BMPs and specify whether any were replaced.

16.6 On the back side of the maintenance form, enter the volume of the material removed using the appropriate unit of measure.

16.7 Record the description of the material removed, including the drain contents and the state of the material in the drain. (e.g., damp solids, dry solids, liquid, etc.)



Port of Stockton
Storm Drain Maintenance Form

Date	Time	Drain Number

Drain Location Description

Name of Person(s) Performing Drain Maintenance

Description of Drain Condition

Reason for Drain Maintenance

Type of BMP(s) in Place (Check all That Apply)

Condition of BMP(s)

Page 1

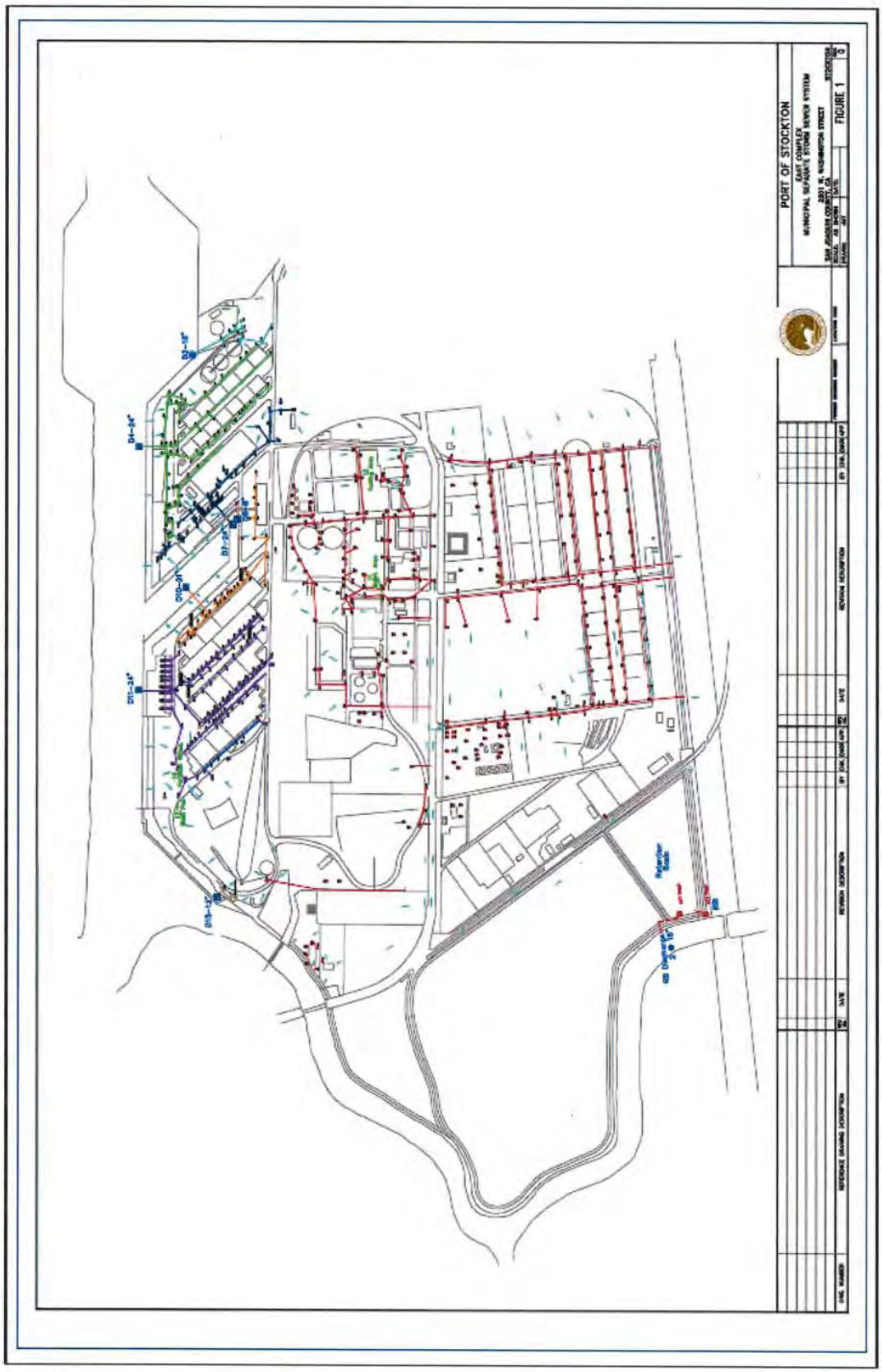
16.8 Finally note any work performed and add any additional comments.

16.9 Turn in the completed Drain Maintenance Forms to the Environmental Department on a daily basis.

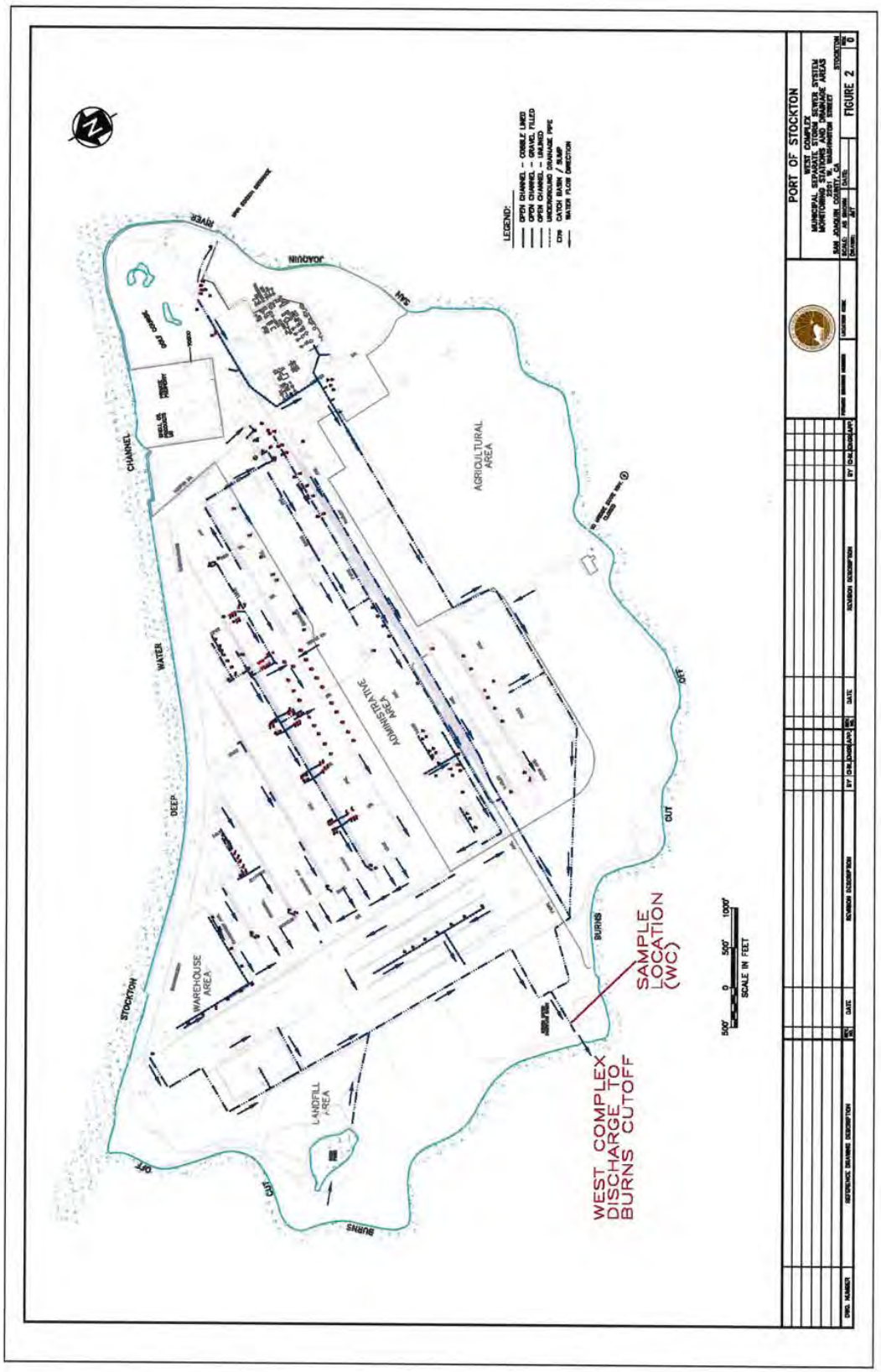
Appendix A

Port Area Maps

PORT OF STOCKTON – EAST COMPLEX



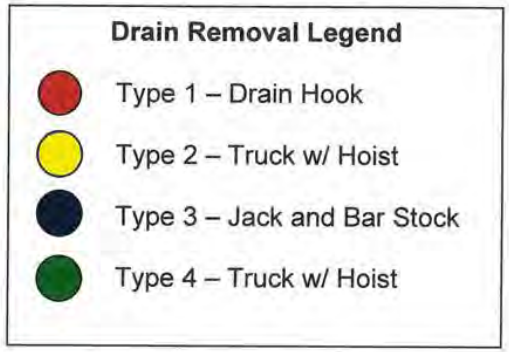
Port of Stockton – West Complex



Appendix B

Drain Location Maps

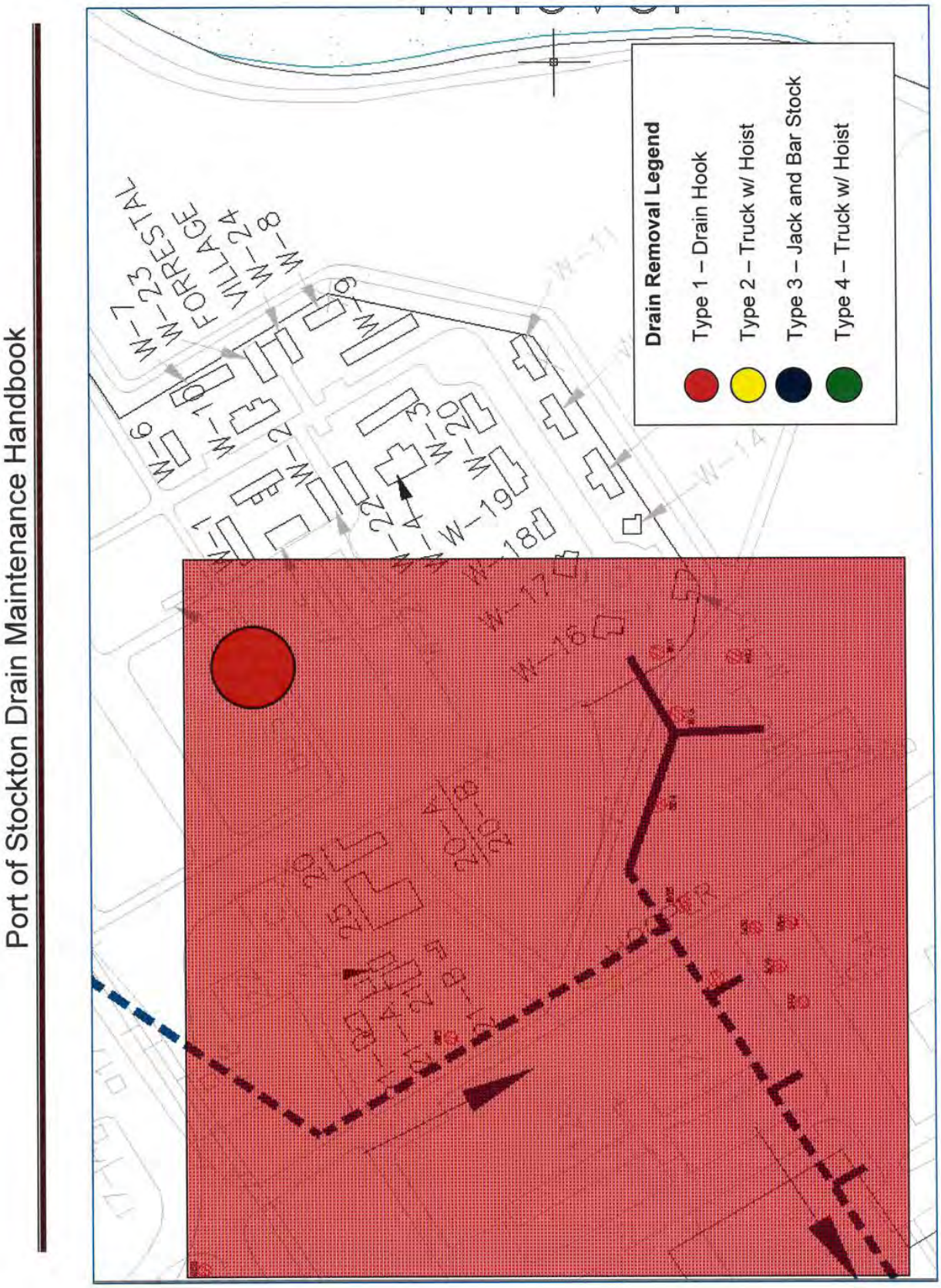
Note: In the following drain maps, each drain is identified by a colored circle (Red, Yellow, Blue, or Green). Each color identifies the type of tool required to remove each drain lid.



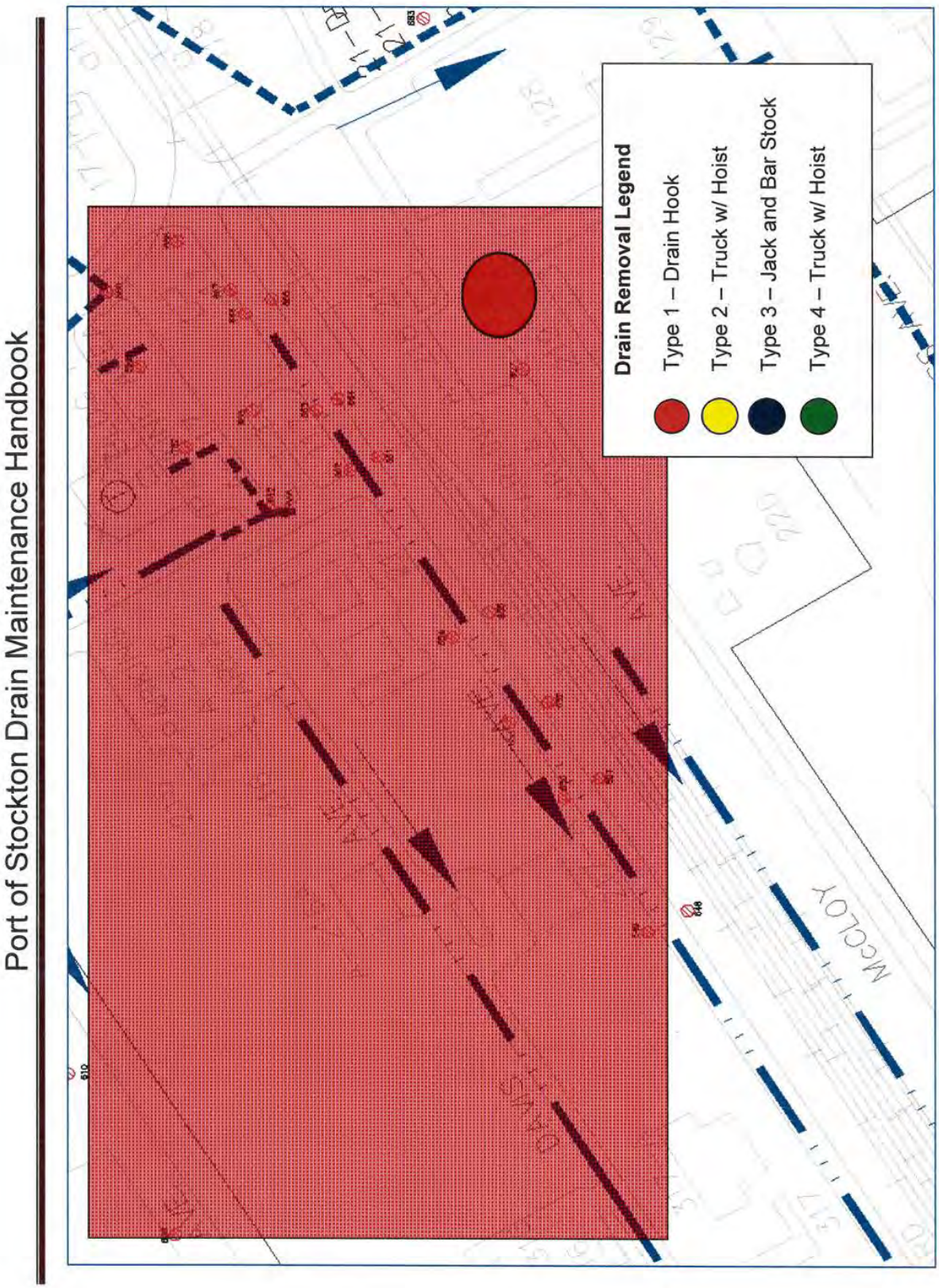
The 'Drain Maintenance Schedule' can be found in **Appendix F**.

The BMP Implementation Plan for each drain can be found in **Appendix G**.

Port of Stockton Drain Maintenance Handbook

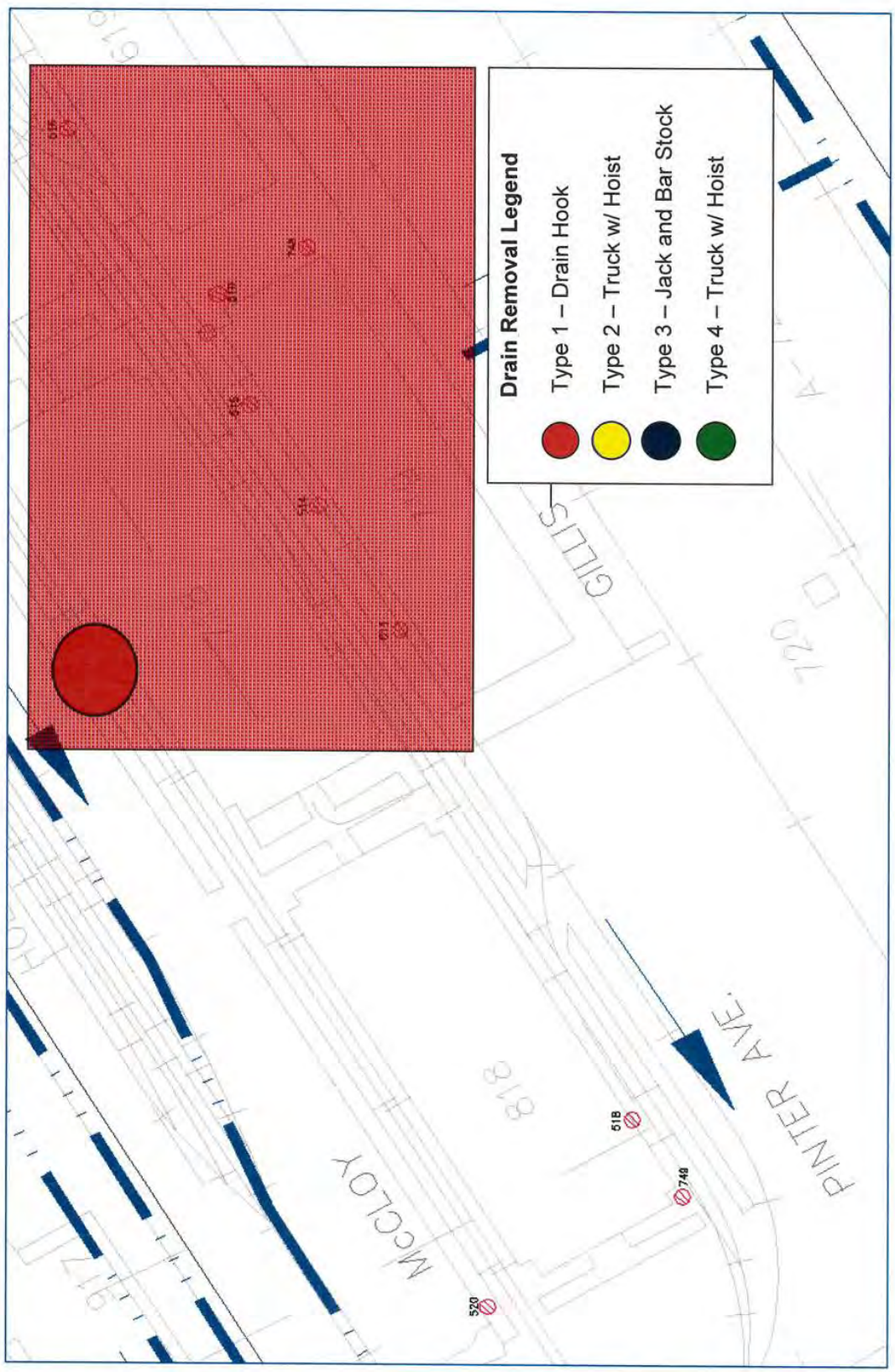

Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist
W–7
W–23
W–FORESTAL
W–FORGE
VILLAGE
W–24
W–8
W–9
W–10
W–1
W–2
W–3
W–20
W–19
W–18
W–17
W–16
W–11
W–14

Port of Stockton Drain Maintenance Handbook

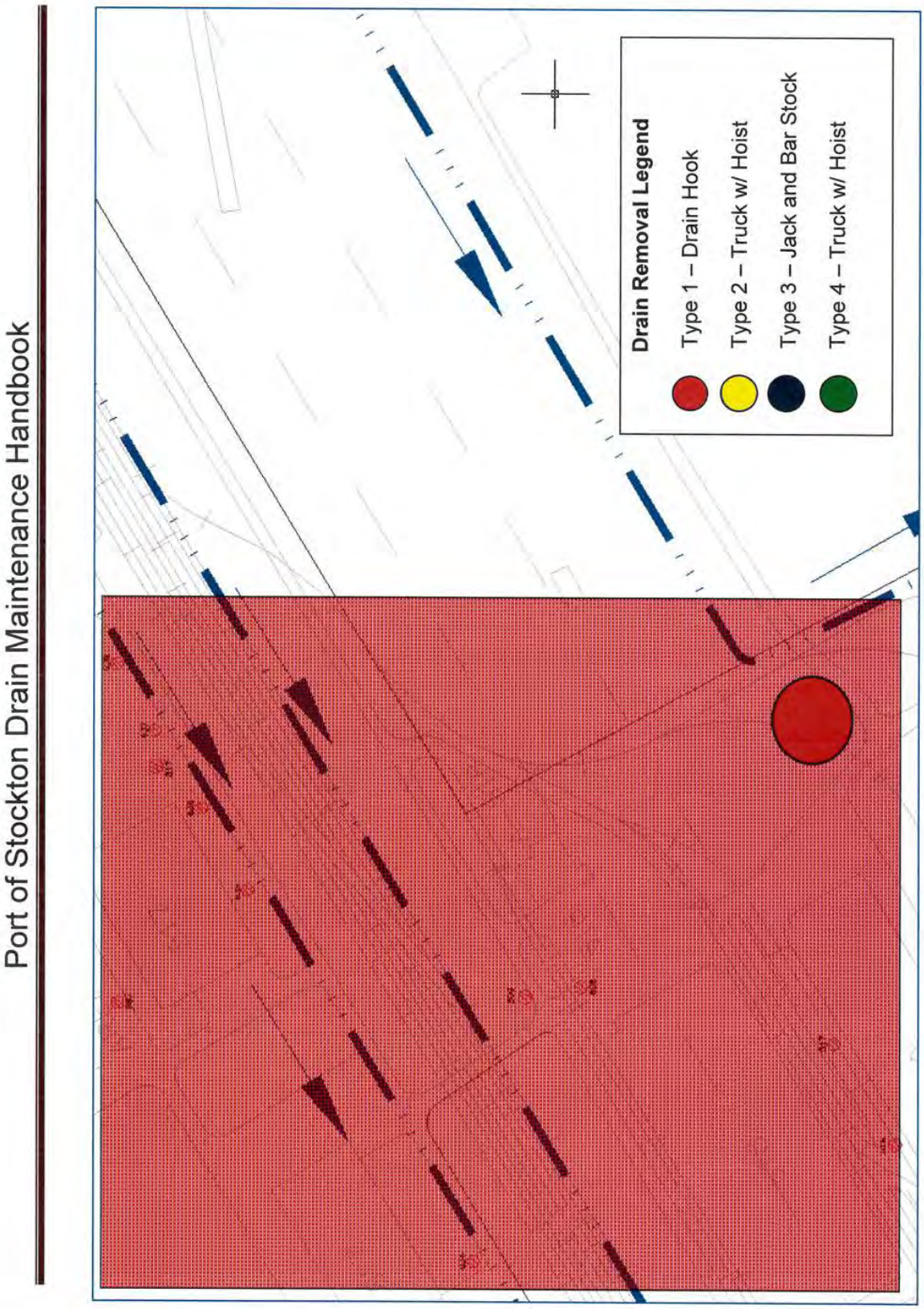

Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist
McCLOY

Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook



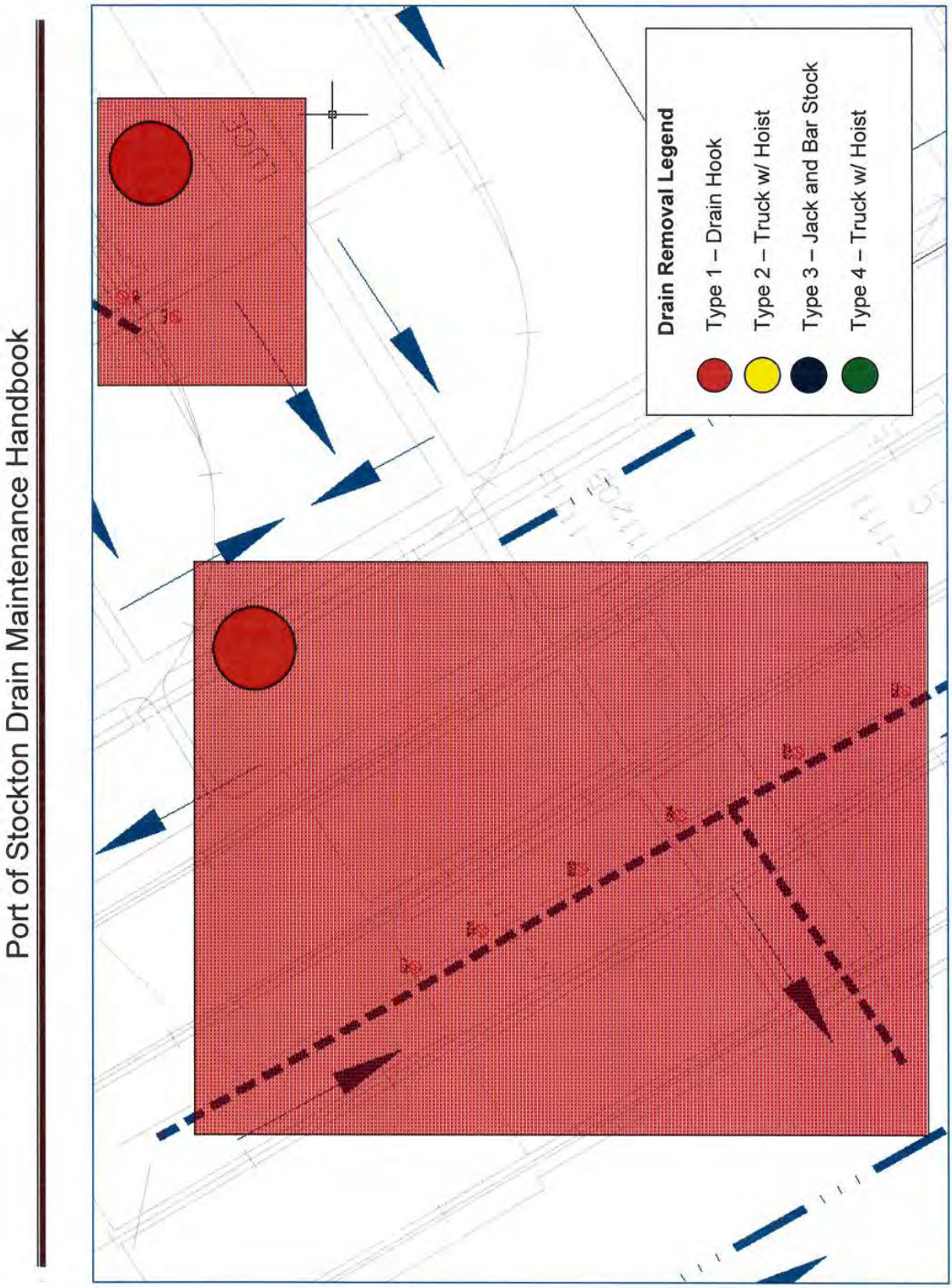
Port of Stockton Drain Maintenance Handbook


Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist

Port of Stockton Drain Maintenance Handbook


Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist
ADMINIS
AREA
AVE.
617
DAVIS
AVE.
618
617
518

Port of Stockton Drain Maintenance Handbook


Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist

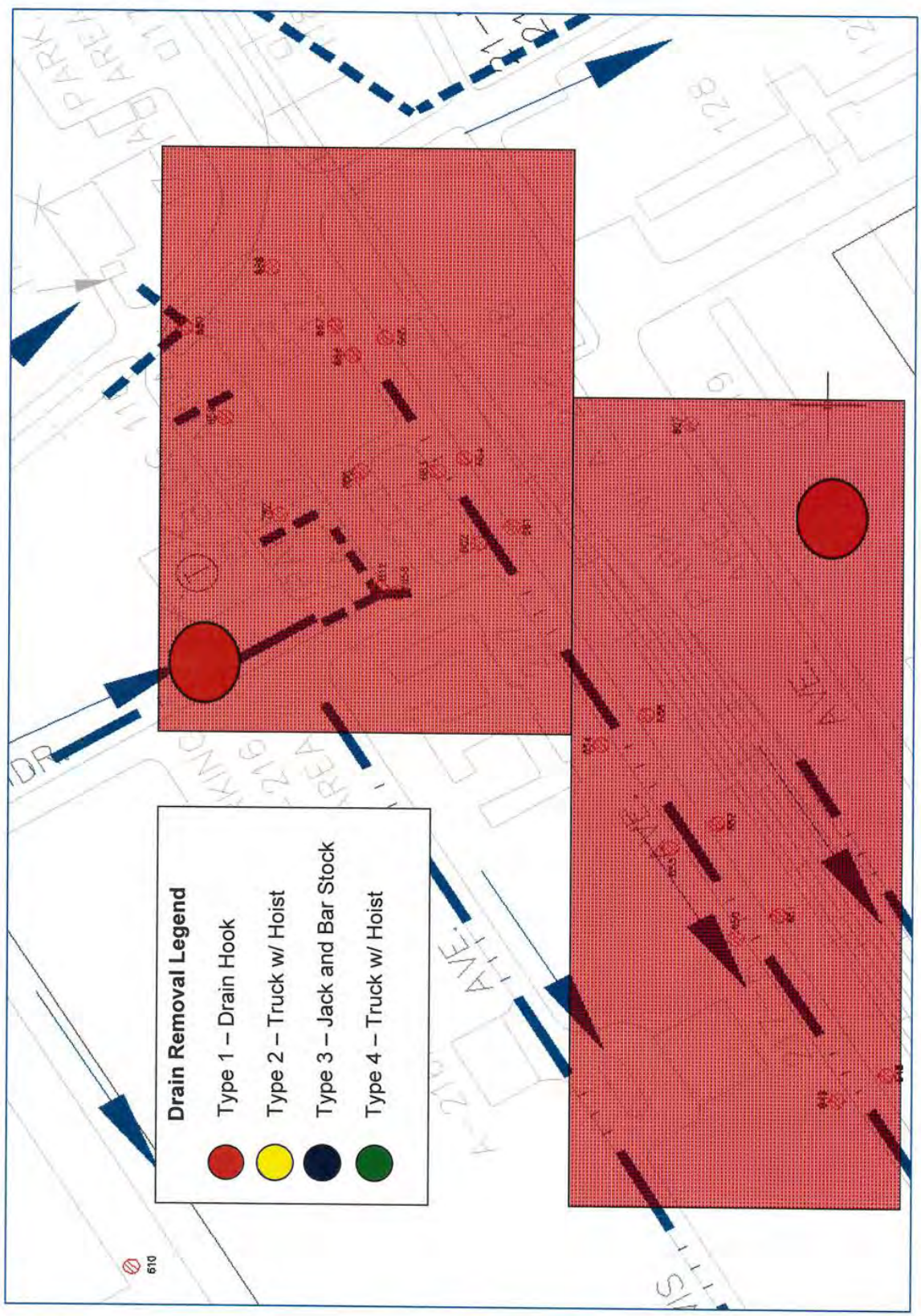
Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook



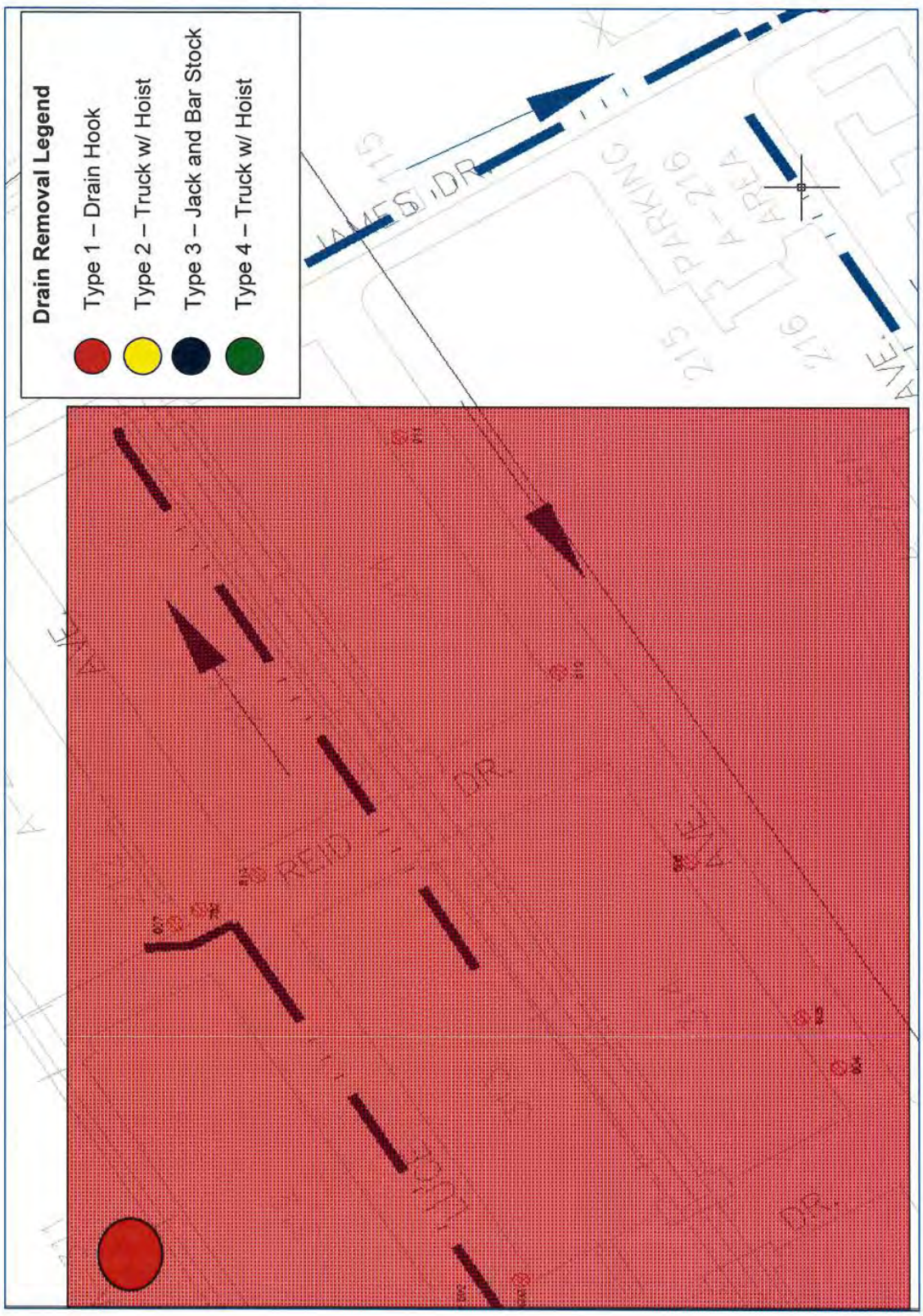
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Port of Stockton Drain Maintenance Handbook

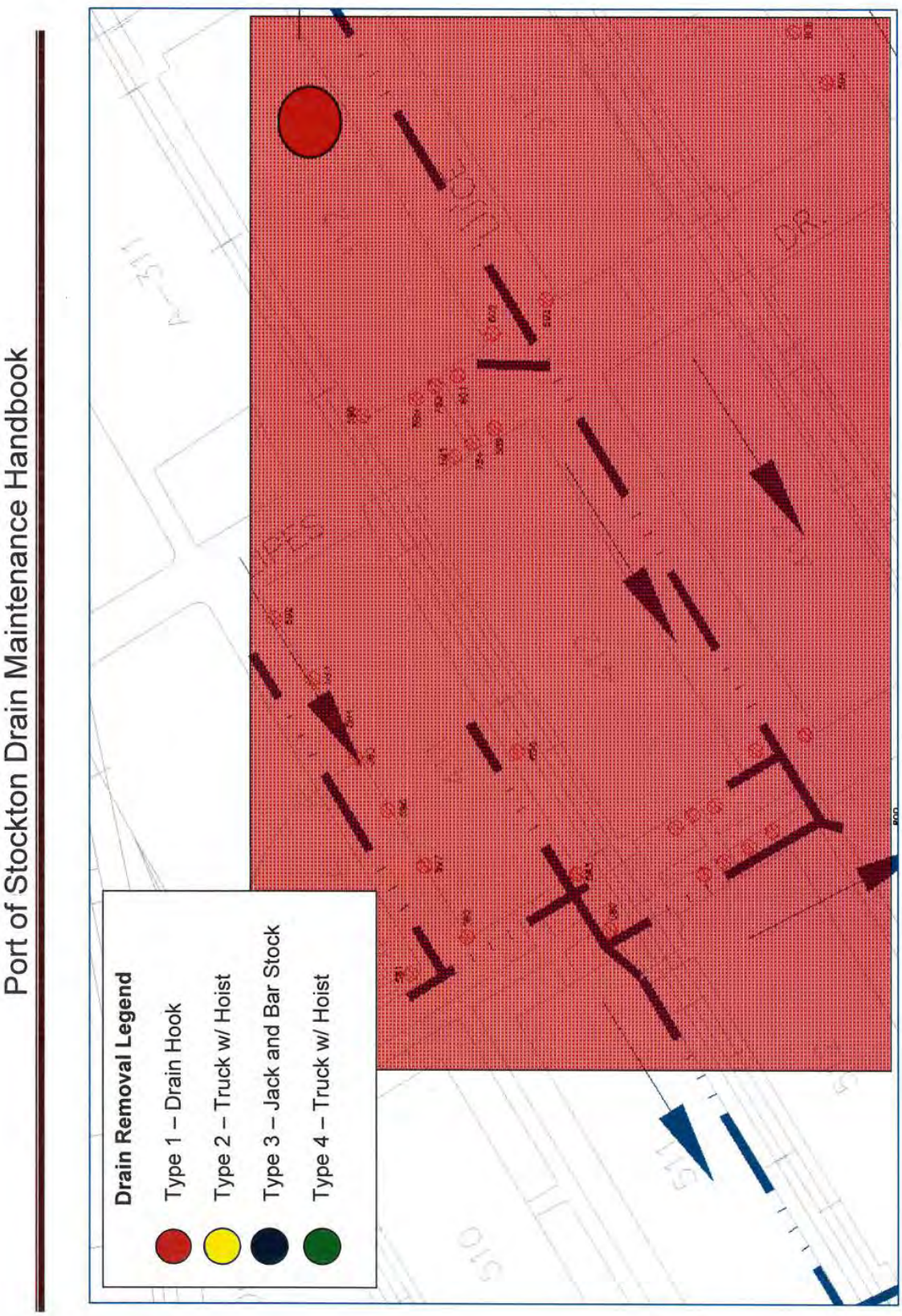


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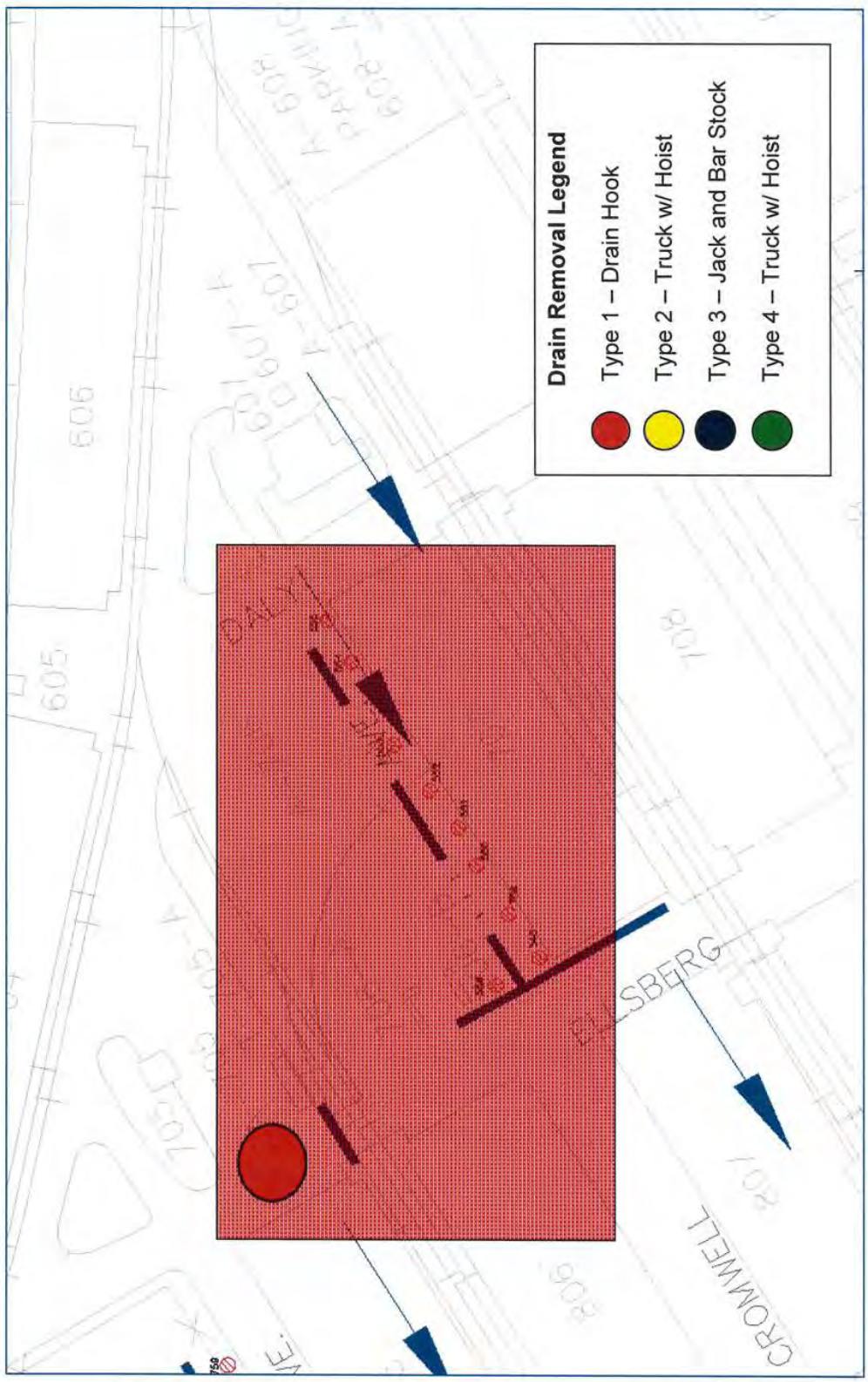


Port of Stockton Drain Maintenance Handbook


Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist

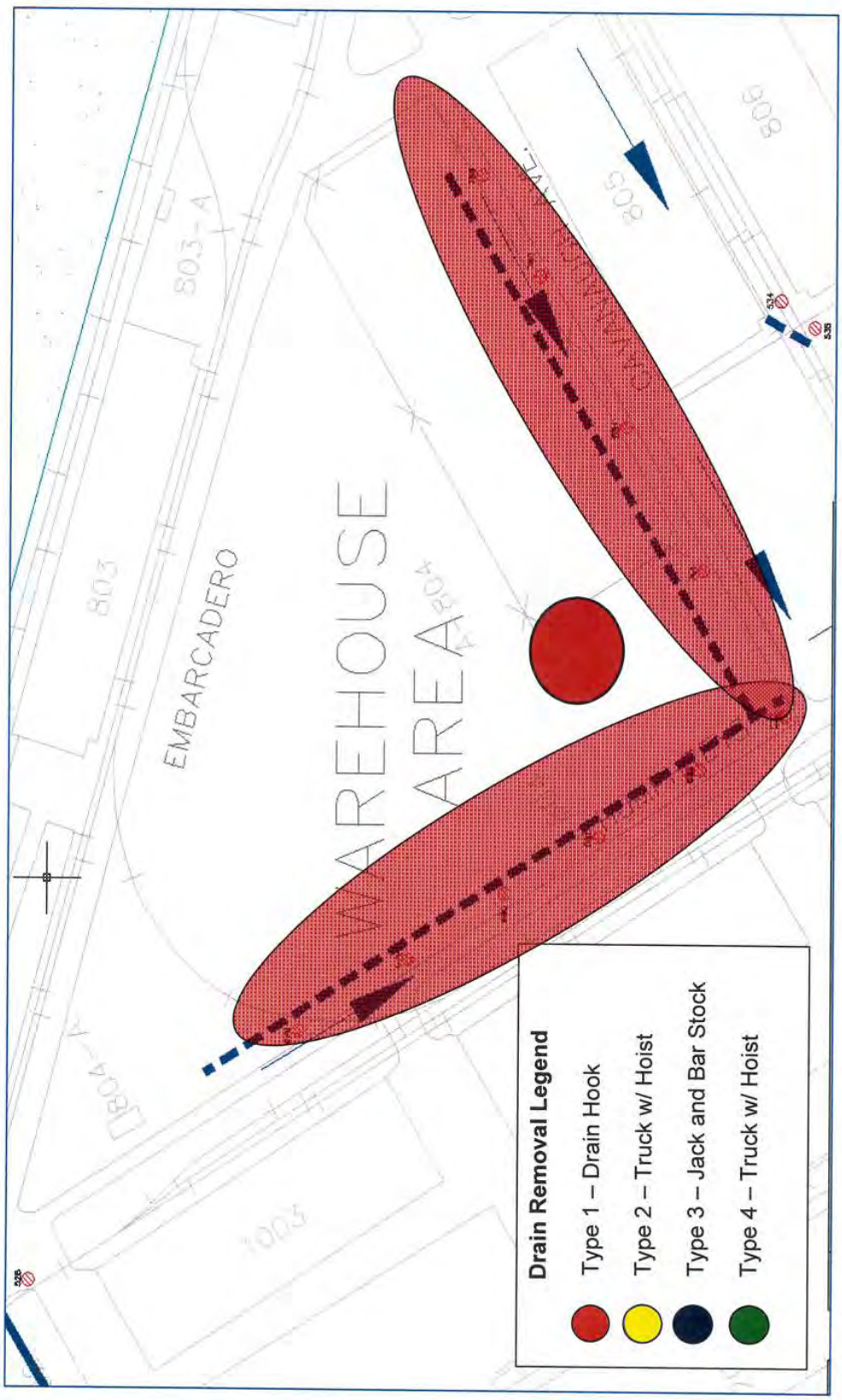
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Port of Stockton Drain Maintenance Handbook

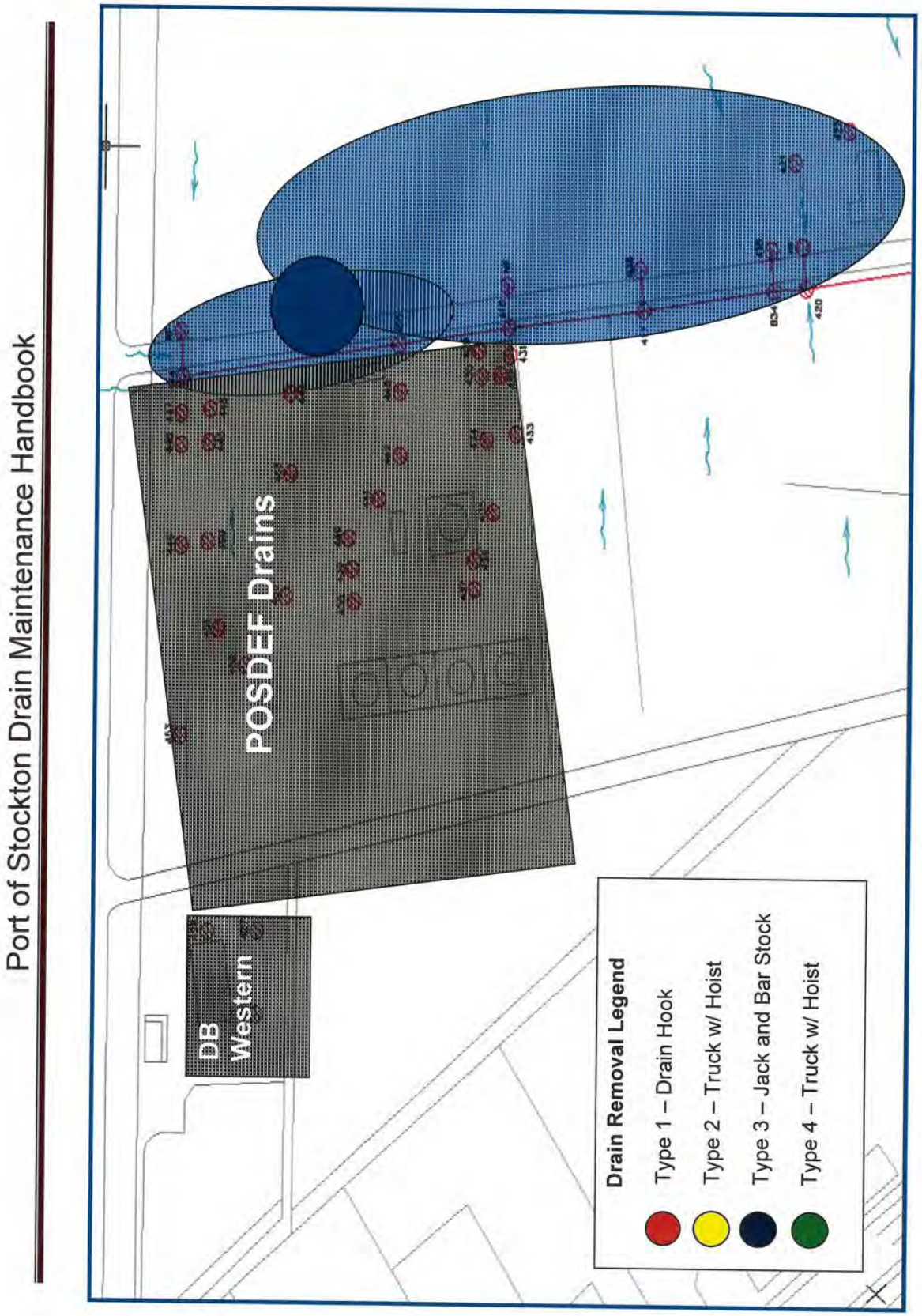


Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook

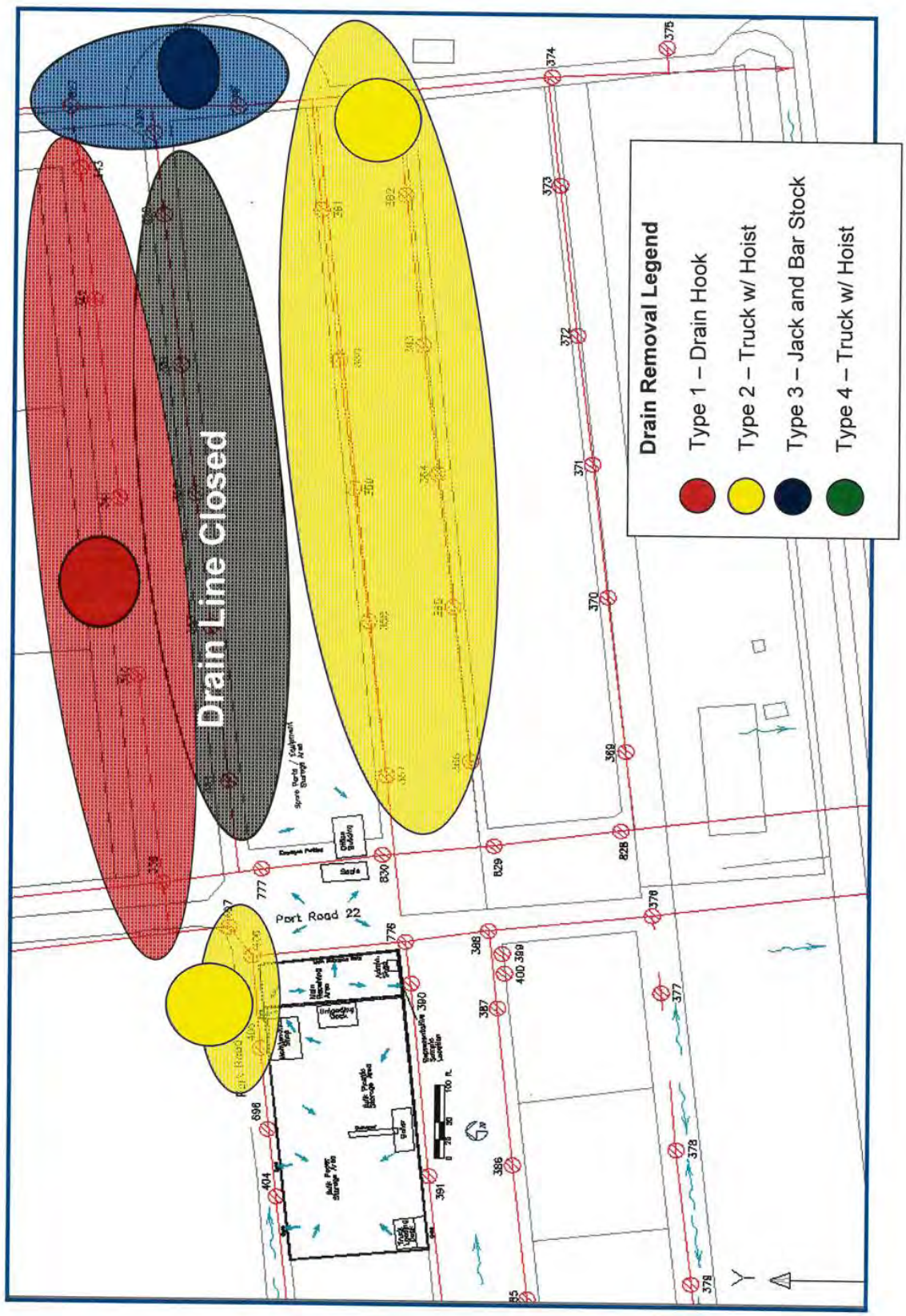


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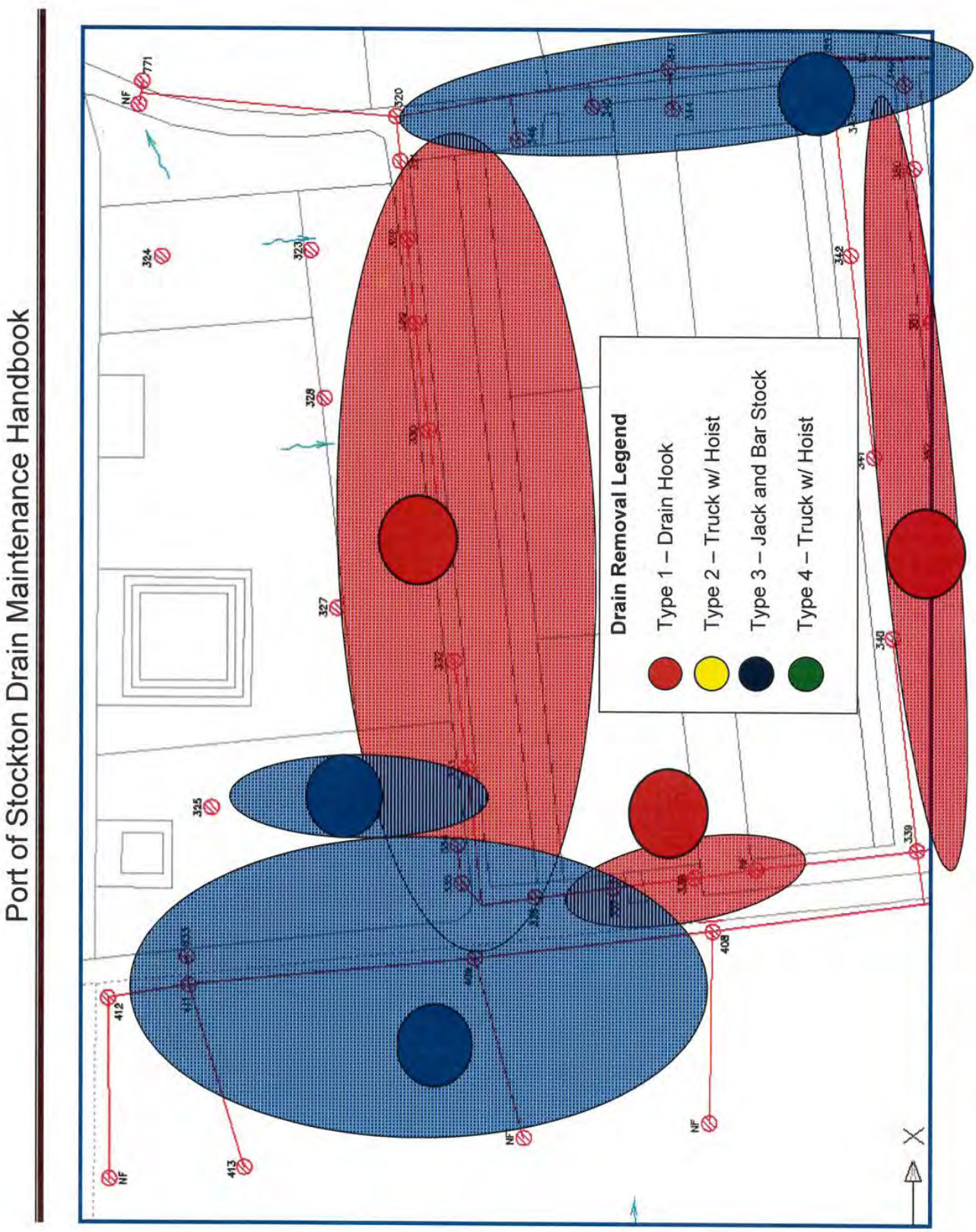

Port of Stockton Drain Maintenance Handbook
POSDEF Drains
DB Western
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist

Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook

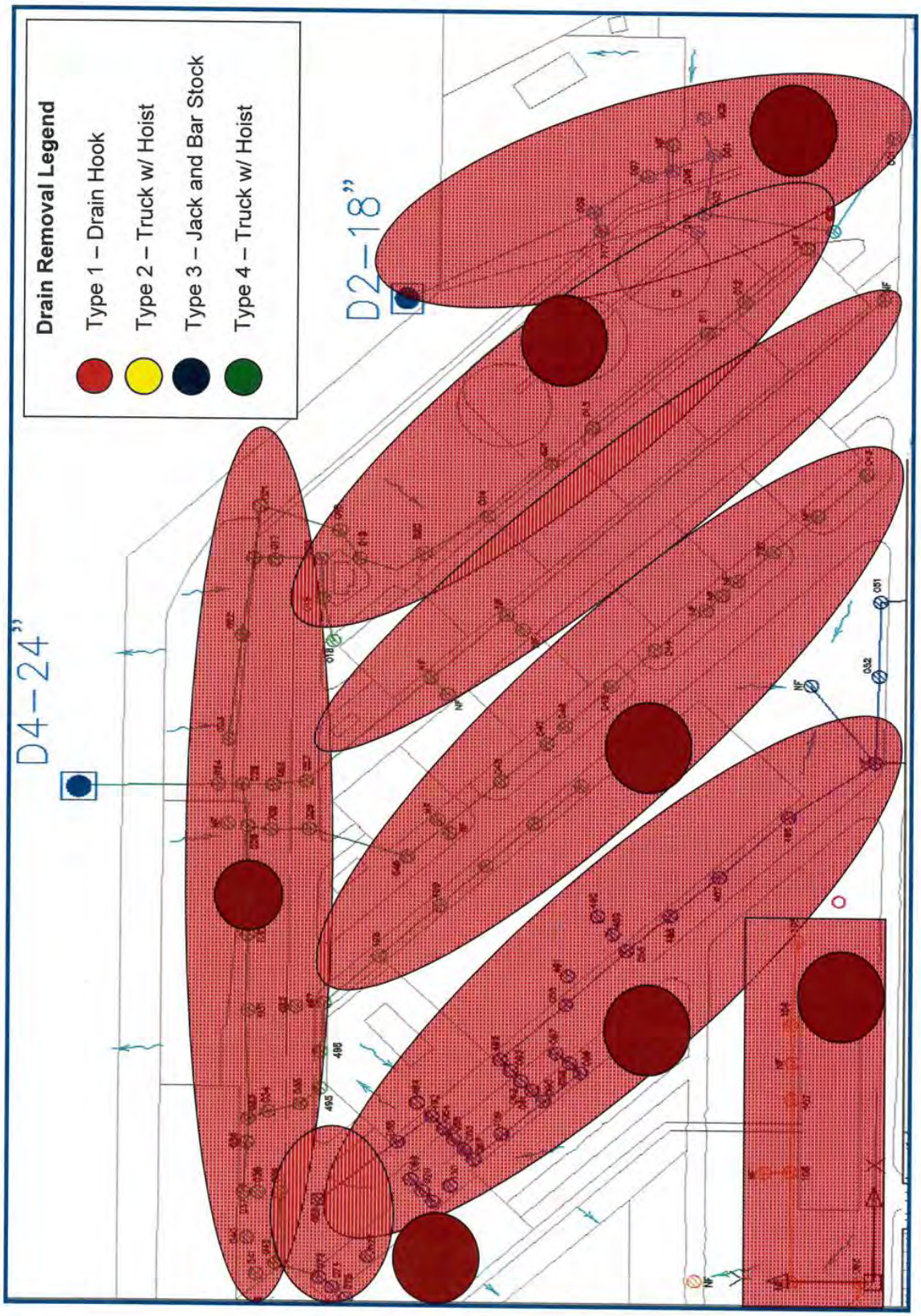


Port of Stockton Drain Maintenance Handbook

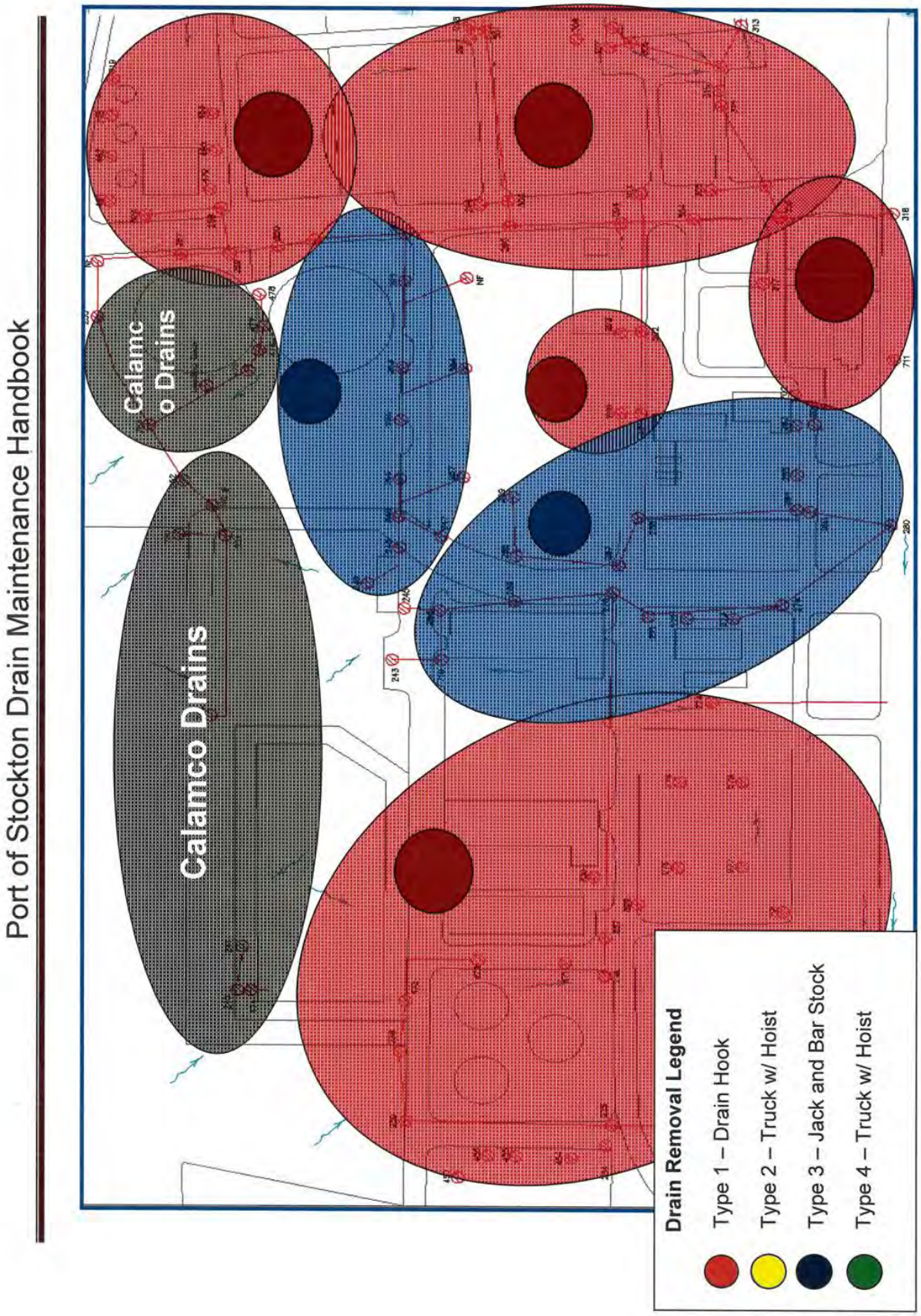

Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist
771
320
324
323
328
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325
342
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339
408
412
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NF

Port of Stockton Drain Maintenance Handbook

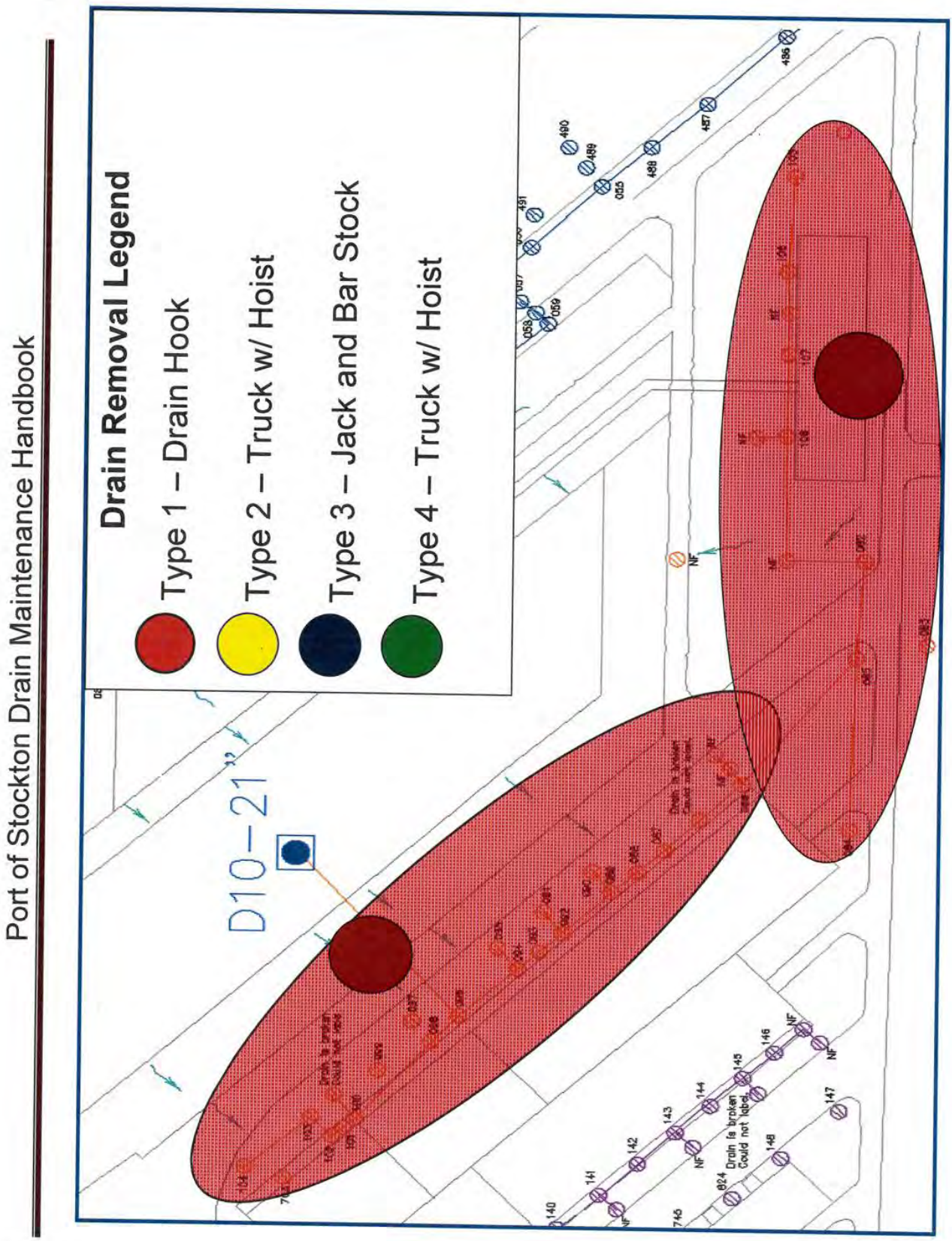
Port of Stockton Drain Maintenance Handbook



Port of Stockton Drain Maintenance Handbook

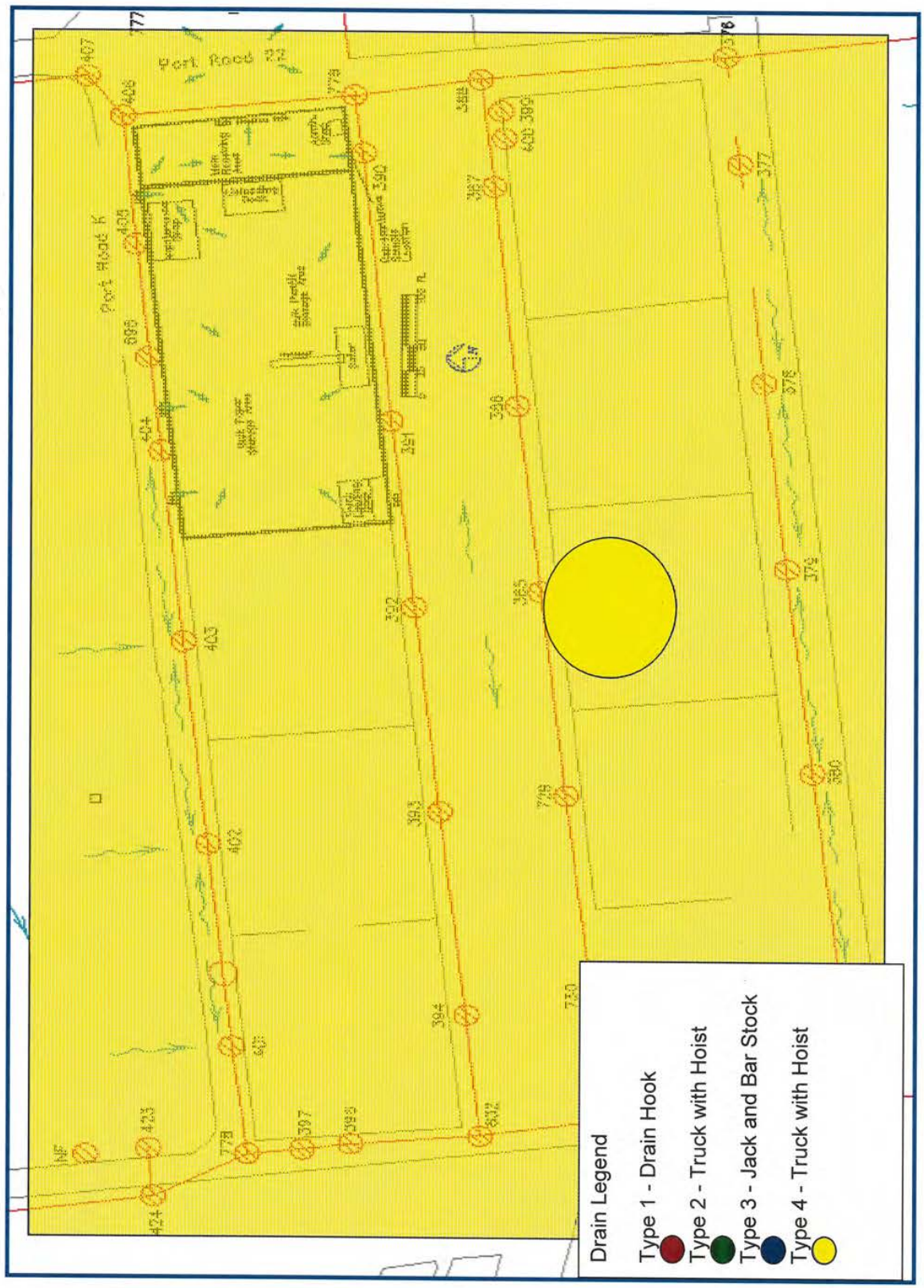

Port of Stockton Drain Maintenance Handbook
Calamco Drains
Calamc
o Drains
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist

Port of Stockton Drain Maintenance Handbook


Port of Stockton Drain Maintenance Handbook
Drain Removal Legend
Type 1 – Drain Hook
Type 2 – Truck w/ Hoist
Type 3 – Jack and Bar Stock
Type 4 – Truck w/ Hoist
D10-21
Drain is broken Could not label
NF

Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook



Port of Stockton Drain Maintenance Handbook

Appendix C

Drain Material Weights and Measurements

Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook

Port of Stockton
Drain Maintenance Materials Weights and Examples
June 21, 2011

Dry Sediment
14.5 lbs per gallon



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Damp Sediment
15 lbs per gallon



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Wet sediment
17 lbs per gallon



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Port of Stockton Drain Maintenance Handbook

Dry organic material
5 lbs per gallon

Examples of this material include leaves, twigs, small amount of dirt, etc.

Wet organic material
12.5 lbs per gallon



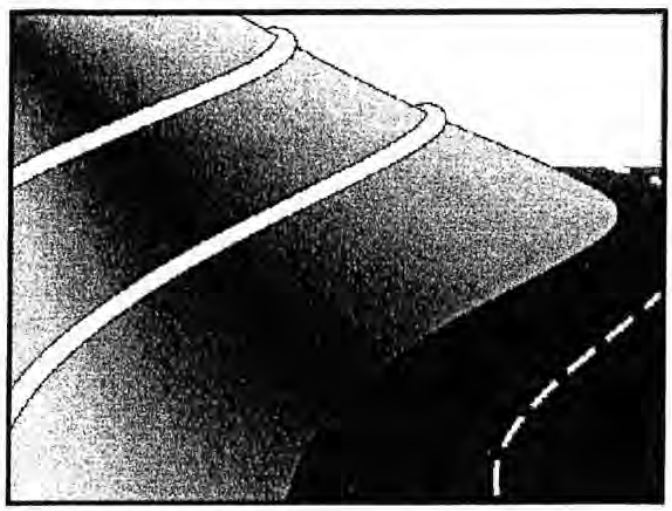
Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook

Appendix D

BMP Cut Sheets

Fiber Rolls SE-5



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

A fiber roll consists of straw, flax, or other similar materials bound into a tight tubular roll. When fiber rolls are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, fiber rolls can also reduce erosion.

Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow
- At the end of a downward slope where it transitions to a steeper slope
- Along the perimeter of a project
- As check dams in unlined ditches
- Down-slope of exposed soil areas
- Around temporary stockpiles

Limitations

- Fiber rolls are not effective unless trenched

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier
SE-9 Straw Bale Barrier

- Fiber rolls at the toe of slopes greater than 5:1 (H:V) should be a minimum of 20 in. diameter or installations achieving the same protection (i.e. stacked smaller diameter fiber rolls, etc.).
- Difficult to move once saturated.
- If not properly staked and trenched in, fiber rolls could be transported by high flows.
- Fiber rolls have a very limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.

Implementation

Fiber Roll Materials

- Fiber rolls should be either prefabricated rolls or rolled tubes of erosion control blanket.

Assembly of Field Rolled Fiber Roll

- Roll length of erosion control blanket into a tube of minimum 8 in. diameter.
- Bind roll at each end and every 4 ft along length of roll with jute-type twine.

Installation

- Locate fiber rolls on level contours spaced as follows:
  - Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
  - Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).
  - Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).
- Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.
- Stake fiber rolls into a 2 to 4 in. deep trench with a width equal to the diameter of the fiber roll.
  - Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.
  - Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.
- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

Removal

- Fiber rolls are typically left in place.

Fiber Rolls SE-5

- If fiber rolls are removed, collect and dispose of sediment accumulation, and fill and compact holes, trenches, depressions or any other ground disturbance to blend with adjacent ground.

Costs

Material costs for fiber rolls range from $20 - $30 per 25 ft roll.

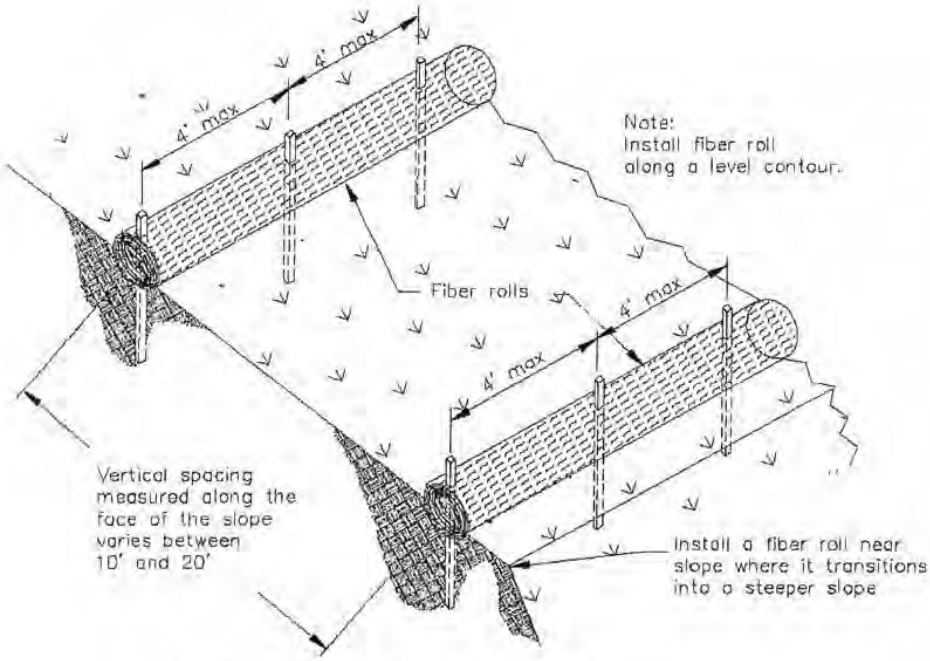
Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground surface. Sediment removed during maintenance may be incorporated into earthwork on the site of disposed at an appropriate location.
- If fiber rolls are used for erosion control, such as in a mini check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.

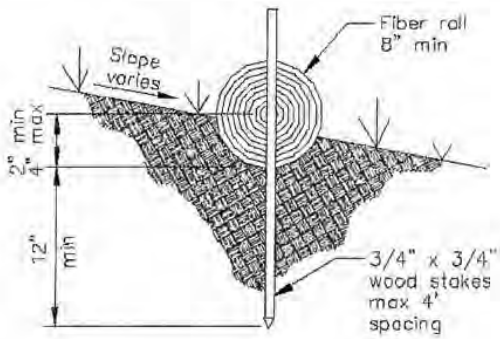
References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

SE-5 Fiber Rolls

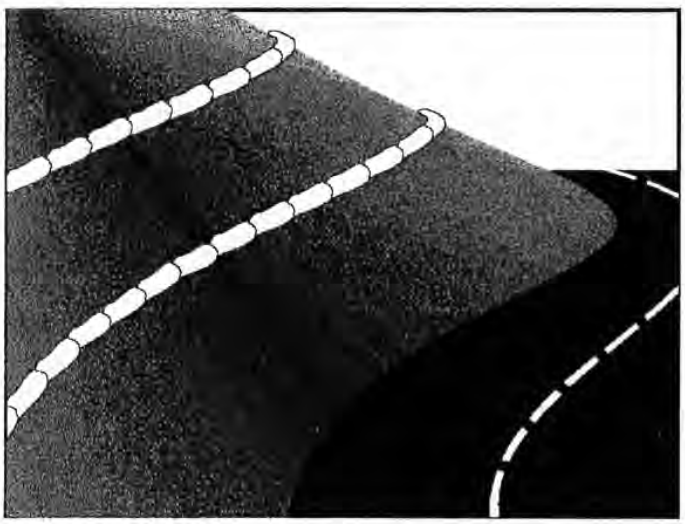


TYPICAL FIBER ROLL INSTALLATION
N.T.S.



ENTRENCHMENT DETAIL
N.T.S.

Gravel Bag Berm SE-6



Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flows, preventing erosion.

Suitable Applications

Gravel bag berms may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:

Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-5 Fiber Roll
SE-8 Sandbag Barrier
SE-9 Straw Bale Barrier

SE-6 Gravel Bag Berm

- Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow
- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

- Gravel berms may be difficult to remove.
- Removal problems limit their usefulness in landscaped areas.
- Gravel bag berm may not be appropriate for drainage areas greater than 5 acres.
- Runoff will pond upstream of the filter, possibly causing flooding if sufficient space does not exist.
- Degraded gravel bags may rupture when removed, spilling contents.
- Installation can be labor intensive.
- Berms may have limited durability for long-term projects.
- When used to detain concentrated flows, maintenance requirements increase.

Implementation

General

A gravel bag berm consists of a row of open graded gravel–filled bags placed on a level contour. When appropriately placed, a gravel bag berm intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. The open graded gravel in the bags is porous, which allows the ponded runoff to flow slowly through the bags, releasing the runoff as sheet flows. Gravel bag berms also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils. Gravel bag berms are similar to sand bag barriers, but are more porous.

Design and Layout

- Locate gravel bag berms on level contours.
  - Slopes between 20:1 and 2:1 (H:V): Gravel bags should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the slope toe.
  - Slopes 2:1 (H:V) or steeper: Gravel bags should be placed at a maximum interval of 25 ft (a closer spacing is more effective), with the first row placed the slope toe.
- Turn the ends of the gravel bag barriers up slope to prevent runoff from going around the berm.
- Allow sufficient space up slope from the gravel bag berm to allow ponding, and to provide room for sediment storage.

Gravel Bag Berm SE-6

- For installation near the toe of the slope, consider moving the gravel bag barriers away from the slope toe to facilitate cleaning. To prevent flows behind the barrier, bags can be placed perpendicular to a berm to serve as cross barriers.
- Drainage area should not exceed 5 acres.
- In Non-Traffic Areas:
  - Height = 18 in. maximum
  - Top width = 24 in. minimum for three or more layer construction
  - Top width = 12 in. minimum for one or two layer construction
  - Side slopes = 2:1 or flatter
- In Construction Traffic Areas:
  - Height = 12 in. maximum
  - Top width = 24 in. minimum for three or more layer construction.
  - Top width = 12 in. minimum for one or two layer construction.
  - Side slopes = 2:1 or flatter.
- Butt ends of bags tightly
- On multiple row, or multiple layer construction, overlapp butt joints of adjacent row and row beneath.
- Use a pyramid approach when stacking bags.

Materials

- ***Bag Material:*** Bags should be woven polypropylene, polyethylene or polyamide fabric or burlap, minimum unit weight of 4 ounces/yd^2, Mullen burst strength exceeding 300 lb/in^2 in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355.
- ***Bag Size:*** Each gravel-filled bag should have a length of 18 in., width of 12 in., thickness of 3 in., and mass of approximately 33 lbs. Bag dimensions are nominal, and may vary based on locally available materials.
- ***Fill Material:*** Fill material should be 0.5 to 1 in. Class 2 aggregate base, clean and free from clay, organic matter, and other deleterious material, or other suitable open graded, non-cohesive, porous gravel.

Costs

Gravel filter: Expensive, since off-site materials, hand construction, and demolition/removal are usually required. Material costs for gravel bags are average of $2.50 per empty gravel bag. Gravel costs range from $20-$35 per yd^3.

SE-6 Gravel Bag Berm

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Gravel bags exposed to sunlight will need to be replaced every two to three months due to degrading of the bags.
- Reshape or replace gravel bags as needed.
- Repair washouts or other damage as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove gravel bag berms when no longer needed. Remove sediment accumulation and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

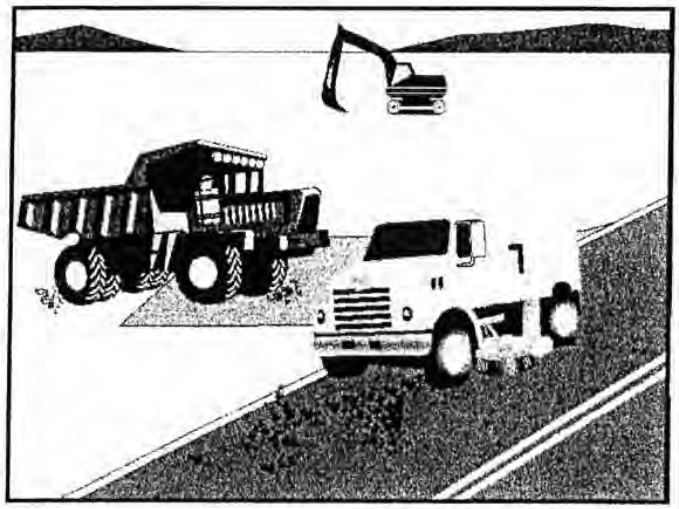
References

Handbook of Steel Drainage and Highway Construction, American Iron and Steel Institute, 1983.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Pollution Plan Handbook, First Edition, State of California, Department of Transportation Division of New Technology, Materials and Research, October 1992.

Street Sweeping and Vacuuming SE-7



Objectives

EC	Erosion Control	
SE	Sediment Control	☒
TR	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

SE-7 Street Sweeping and Vacuuming

- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from $58/hour (3 yd^3 hopper) to $88/hour (9 yd^3 hopper), plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent dumping.

Inspection and Maintenance

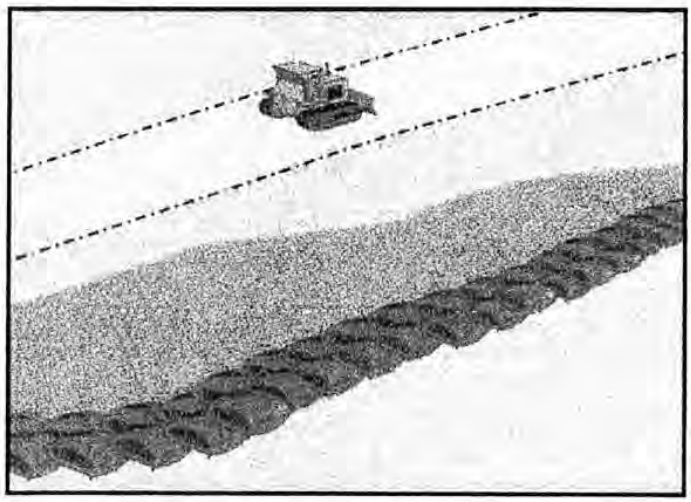
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Labor Surcharge and Equipment Rental Rates, State of California Department of Transportation (Caltrans), April 1, 2002 – March 31, 2003.

Sandbag Barrier SE-8



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept sheet flows. Sandbag barriers pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:

  Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-9 Straw Bale Barrier

SE-8 Sandbag Barrier

- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

- It is necessary to limit the drainage area upstream of the barrier to 5 acres.
- Degraded sandbags may rupture when removed, spilling sand.
- Installation can be labor intensive.
- Barriers may have limited durability for long-term projects.
- When used to detain concentrated flows, maintenance requirements increase.
- Burlap should not be used for sandbags.

Implementation

General

A sandbag barrier consists of a row of sand-filled bags placed on a level contour. When appropriately placed, a sandbag barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. While the sand-filled bags are porous, the fine sand tends to quickly plug with sediment, limiting the rate of flow through the barrier. If a porous barrier is desired, consider SE-1, Silt Fence, SE-5, Fiber Rolls, SE-6, Gravel Bag Berms, or SE-9, Straw Bale Barriers. Sandbag barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets which erode rills, and ultimately gullies, into disturbed, sloped soils. Sandbag barriers are similar to ground bag berms, but less porous.

Design and Layout

- Locate sandbag barriers on a level contour.
  - Slopes between 20:1 and 2:1 (H:V): Sandbags should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the slope toe.
  - Slopes 2:1 (H:V) or steeper: Sandbags should be placed at a maximum interval of 25 ft (a closer spacing is more effective), with the first row placed near the slope toe.
- Turn the ends of the sandbag barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sandbags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 5 acres.

Sandbag Barrier SE-8

- Stack sandbags at least three bags high.
- Butt ends of bags tightly.
- Overlapp butt joints of row beneath with each successive row.
- Use a pyramid approach when stacking bags.
- In non-traffic areas
  - Height = 18 in. maximum
  - Top width = 24 in. minimum for three or more layer construction
  - Side slope = 2:1 or flatter
- In construction traffic areas
  - Height = 12 in. maximum
  - Top width = 24 in. minimum for three or more layer construction.
  - Side slopes = 2:1 or flatter.

Materials

- ***Sandbag Material:*** Sandbag should be woven polypropylene, polyethylene or polyamide fabric, minimum unit weight of 4 ounces/yd^2, Mullen burst strength exceeding 300 lb/in^2 in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. Use of burlap may not acceptable in some jurisdictions.
- ***Sandbag Size:*** Each sand-filled bag should have a length of 18 in., width of 12 in., thickness of 3 in., and mass of approximately 33 lbs. Bag dimensions are nominal, and may vary based on locally available materials.
- ***Fill Material:*** All sandbag fill material should be non-cohesive, Class 1 or Class 2 permeable material free from clay and deleterious material.

Costs

Sandbag barriers are more costly, but typically have a longer useful life than other barriers. Empty sandbags cost $0.25 - $0.75. Average cost of fill material is $8 per yd^3. Pre-filled sandbags are more expensive at $1.50 - $2.00 per bag.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Sandbags exposed to sunlight will need to be replaced every two to three months due to degradation of the bags.
- Reshape or replace sandbags as needed.

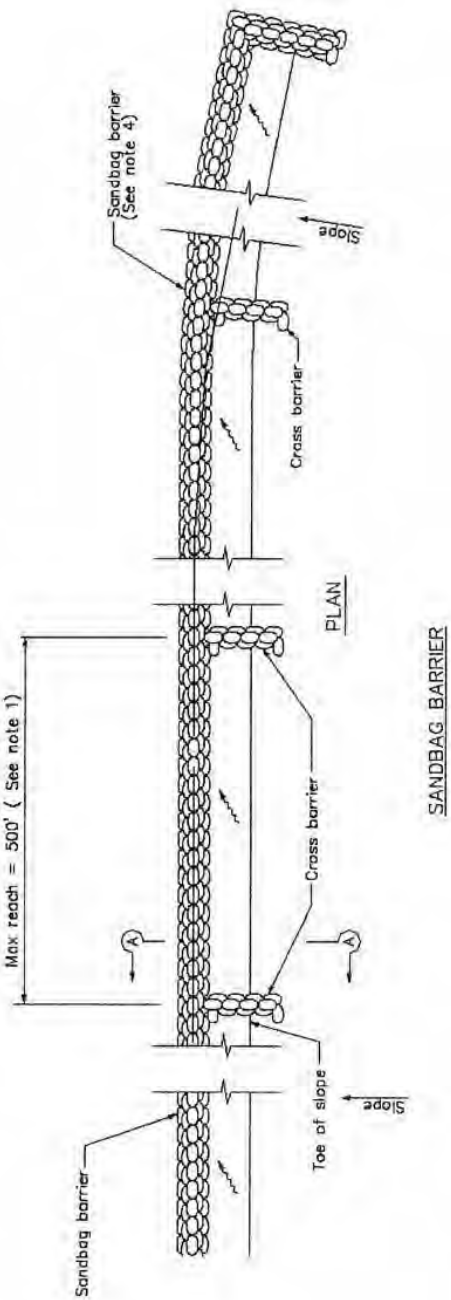
SE-8 Sandbag Barrier

- Repair washouts or other damage as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove sandbags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Sandbag Barrier SE-8

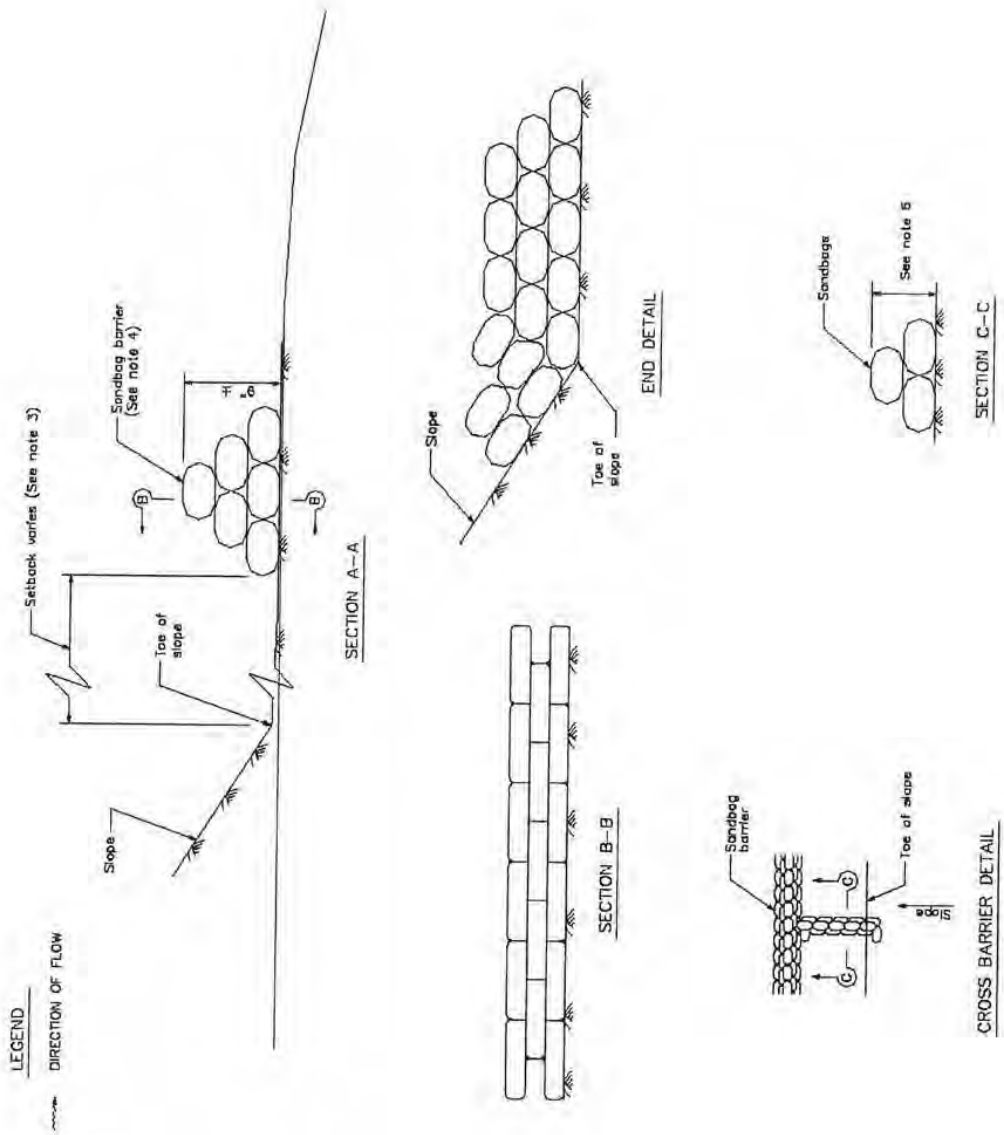


SANDBAG BARRIER

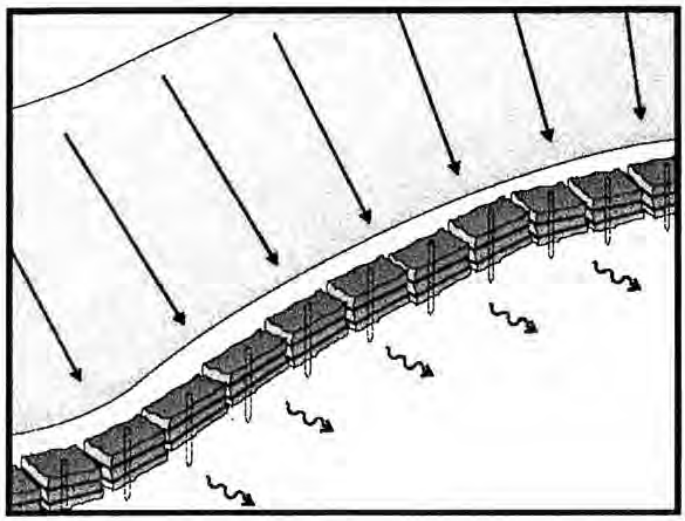
NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. Place sandbags tightly.
3. Dimension may vary to fit field condition.
4. Sandbag barrier shall be a minimum of 3 bags high.
5. The end of the barrier shall be turned up slope.
6. Cross barriers shall be a min of 1/2 and a max of 2/3 the height of the linear barrier.
7. Sandbag rows and layers shall be staggered to eliminate gaps.

SE-8 Sandbag Barrier



Straw Bale Barrier SE-9



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier

Description and Purpose

A straw bale barrier is a series of straw bales placed on a level contour to intercept sheet flows. Straw bale barriers pond sheet- flow runoff, allowing sediment to settle out.

Suitable Applications

Straw bale barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

SE-9 Straw Bale Barrier

- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

Straw bale barriers:

- Are not to be used for extended periods of time because they tend to rot and fall apart
- Are suitable only for sheet flow on slopes of 10 % or flatter
- Are not appropriate for large drainage areas, limit to one acre or less
- May require constant maintenance due to rotting
- Are not recommended for concentrated flow, inlet protection, channel flow, and live streams
- Cannot be made of bale bindings of jute or cotton
- Require labor-intensive installation and maintenance
- Cannot be used on paved surfaces
- Should not to be used for drain inlet protection
- Should not be used on lined ditches
- May introduce undesirable non-native plants to the area

Implementation

General

A straw bale barrier consists of a row of straw bales placed on a level contour. When appropriately placed, a straw bale barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. Straw bale barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils.

Straw bale barriers have not been as effective as expected due to improper use. These barriers have been placed in streams and drainage ways where runoff volumes and velocities have caused the barriers to wash out. In addition, failure to stake and entrench the straw bale has allowed undercutting and end flow. Use of straw bale barriers in accordance with this BMP should produce acceptable results.

Design and Layout

- Locate straw bale barriers on a level contour.
  - Slopes up to 10:1 (H:V): Straw bales should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the toe of slope.
  - Slopes greater than 10:1 (H:V): Not recommended.

Straw Bale Barrier SE-9

- Turn the ends of the straw bale barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sand bags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 1 acre, or 0.25 acre per 100 ft of barrier.
- Maximum flow path to the barrier should be limited to 100 ft.
- Straw bale barriers should consist of two parallel rows.
  - Butt ends of bales tightly
  - Stagger butt joints between front and back row
  - Each row of bales must be trenched in and firmly staked
- Straw bale barriers are limited in height to one bale laid on its side.
- Anchor bales with either two wood stakes or four bars driven through the bale and into the soil. Drive the first stake towards the butt joint with the adjacent bale to force the bales together.
- See attached figure for installation details.

Materials

- ***Straw Bale Size:*** Each straw bale should be a minimum of 14 in. wide, 18 in. in height, 36 in. in length and should have a minimum mass of 50 lbs. The straw bale should be composed entirely of vegetative matter, except for the binding material.
- ***Bale Bindings:*** Bales should be bound by steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding should not be used. Baling wire should be a minimum diameter of 14 gauge. Nylon or polypropylene string should be approximately 12 gauge in diameter with a breaking strength of 80 lbs force.
- ***Stakes:*** Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement should be equal to a #4 designation or greater. End protection should be provided for any exposed bar reinforcement.

Costs

Straw bales cost $5 - $7 each. Adequate labor should be budgeted for installation and maintenance.

SE-9 Straw Bale Barrier

Inspection and Maintenance

Maintenance

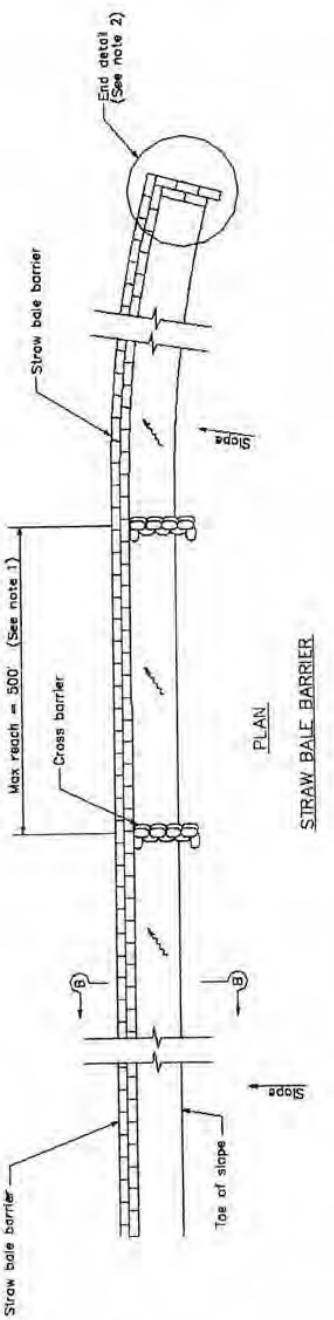
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Straw bales degrade, especially when exposed to moisture. Rotting bales will need to be replaced on a regular basis.
- Replace or repair damaged bales as needed.
- Repair washouts or other damages as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove straw bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Straw Bale Barrier

SE-9



PLAN

STRAW BALE BARRIER

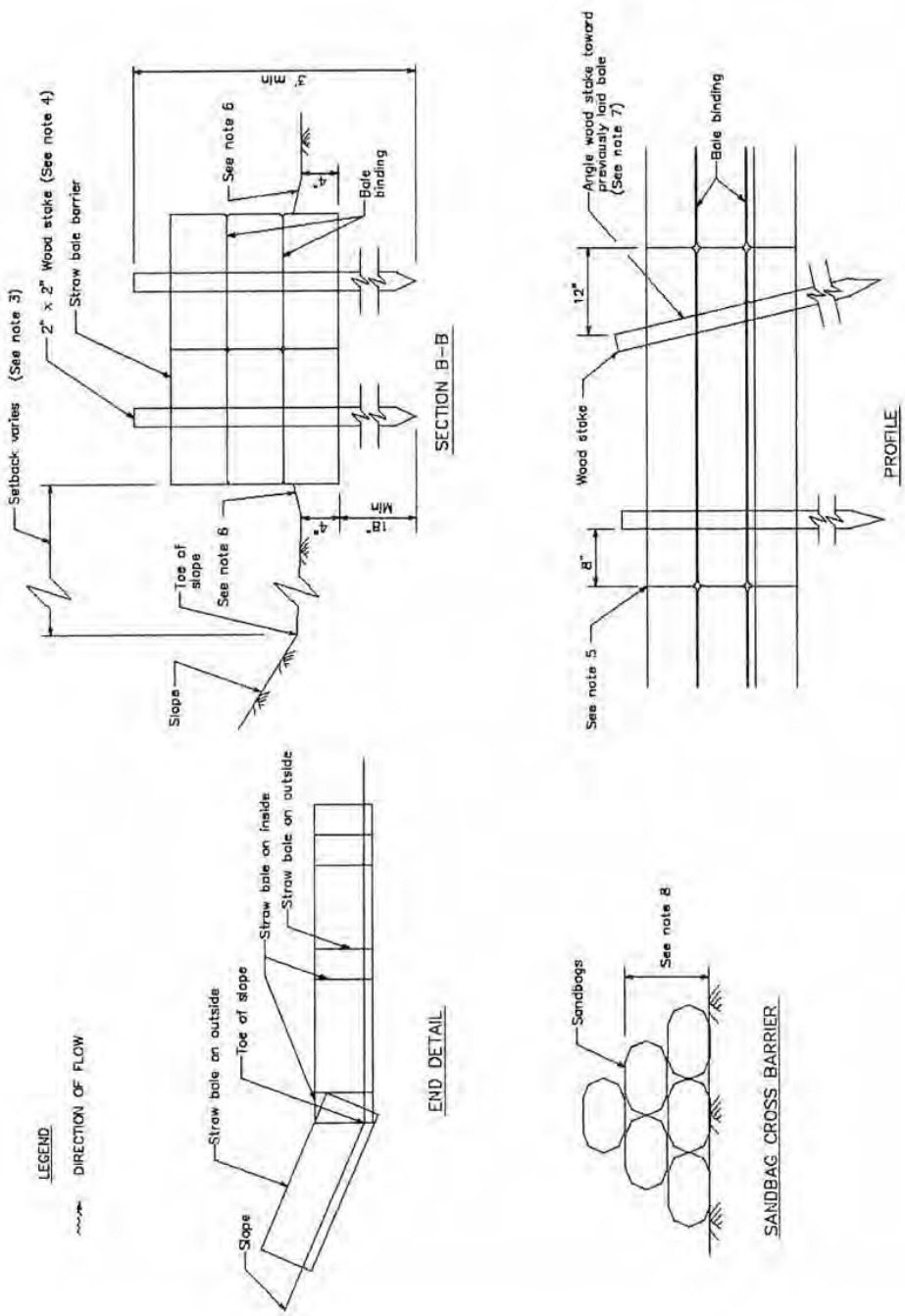
LEGEND

DIRECTION OF FLOW

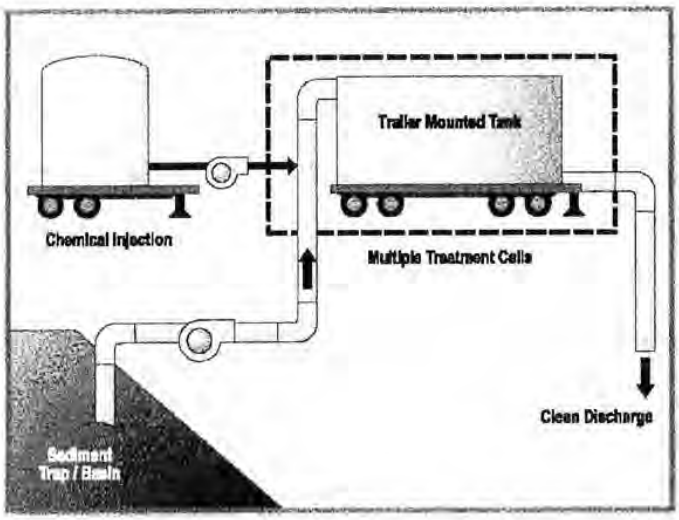
NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The end of barrier shall be turned up slope.
3. Dimension may vary to fit field condition.
4. Stake dimensions are nominal.
5. Place straw bales tightly together.
6. Tamp embedment spoils against sides of installed bales.
7. Drive angled wood stake before vertical stake to ensure tight abutment to adjacent bale.
8. Sandbag cross barriers should be a min of 1/2 and a max of 2/3 the height of the linear barrier.
9. Sandbag rows and layers should be offset to eliminate gaps.

SE-9 Straw Bale Barrier



Chemical Treatment SE-11



Objectives

EC	Erosion Control
SE	Sediment Control
TR	Tracking Control
WE	Wind Erosion Control
NS	Non-Stormwater Management Control
WM	Waste Management and Materials Pollution Control

Legend:
☑ Primary Objective
☒ Secondary Objective

Description and Purpose

Chemical treatment includes the application of chemicals to stormwater to aid in the reduction of turbidity caused by fine suspended sediment.

Suitable Applications

Chemical treatment can reliably provide exceptional reductions of turbidity and associated pollutants and should be considered where turbid discharges to sensitive wastes cannot be avoided using other BMPs. Typically, chemical use is limited to waters with numeric turbidity standards.

Limitations

The use of chemical treatment must have the advanced approval of the Regional Water Quality Control Board.

- Chemical Treatment of stormwater is relatively new and unproven technology in California.
- BMP has not been used often in California
- Petroleum based polymers should not be used
- Requires sediment basin or trailer mounted unit for chemical application
- Batch treatment required, flow through continuous treatment not allowed
- Requires large area

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

SE-11 Chemical Treatment

- Limited discharge rates depending on receiving water body
- Labor intensive operation and maintenance
- Requires monitoring for non-visible pollutants

Implementation

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Chemical treatment may be used to reduce the turbidity of stormwater runoff. Very high turbidities can be reduced to levels comparable to what is found in streams during dry weather.

Criteria for Chemical Treatment Product Use

Chemically treated stormwater discharged from construction sites must be non-toxic to aquatic organisms. The following protocol should be used to evaluate chemicals proposed for stormwater treatment at construction sites. Authorization to use a chemical in the field based on this protocol does not relieve the applicant from responsibility for meeting all discharge and receiving water criteria applicable to a site.

- Treatment chemicals must be approved by EPA for potable water use.
- Petroleum-based polymers are prohibited.
- Prior to authorization for field use, jar tests should be conducted to demonstrate that turbidity reduction necessary to meet the receiving water criteria could be achieved. Test conditions, including but not limited to raw water quality and jar test procedures, should be indicative of field conditions. Although these small-scale tests cannot be expected to reproduce performance under field conditions, they are indicative of treatment capability.
- Prior to authorization for field use, the chemically treated stormwater should be tested for aquatic toxicity. Applicable state or local Whole Effluent Toxicity Testing and Limits, should be used. Testing should use stormwater from the construction site at which the treatment chemical is proposed for use or a water solution using soil from the proposed site.
- The proposed maximum dosage should be at least a factor of five lower than the no observed effects concentration (NOEC).
- The approval of a proposed treatment chemical should be conditional, subject to full-scale bioassay monitoring of treated stormwater at the construction site where the proposed treatment chemical is to be used.
- Treatment chemicals that have already passed the above testing protocol do not need to be reevaluated. Contact the RWQCB for a list of treatment chemicals that may be approved for use.

Treatment System Design Considerations

The design and operation of a chemical treatment system should take into consideration the factors that determine optimum, cost-effective performance. It may not be possible to fully

incorporate all of the classic concepts into the design because of practical limitations at construction sites. Nonetheless, it is important to recognize the following:

- The right chemical must be used at the right dosage. A dosage that is either too low or too high will not produce the lowest turbidity. There is an optimum dosage rate. This is a situation where the adage "adding more is always better" is not the case.
- The coagulant must be mixed rapidly into the water to insure proper dispersion.
- Experience has found that sufficient flocculation occurs in the pipe leading from the point of chemical addition to the settling or sediment basin.
- Since the volume of the basin is a determinant in the amount of energy per unit volume, the size of the energy input system can be too small relative to the volume of the basin.
- Care must be taken in the design of the withdrawal system to minimize outflow velocities and to prevent floc discharge. The discharge should be directed through a physical filter such as vegetated swale that would catch any unintended floc discharge.
- A pH-adjusting chemical should be added into the sediment basin to control pH. Experience shows that the most common problem is low pH.

Treatment System Design

Chemical treatment systems should be designed as batch treatment systems using either ponds or portable trailer-mounted tanks. Flow-through continuous treatment systems are not allowed at this time.

A chemical treatment system consists of the stormwater collection system (either temporary diversion or the permanent site drainage system), a sediment basin or sediment trap, pumps, a chemical feed system, treatment cells, and interconnecting piping.

The treatment system should use a minimum of two lined treatment cells. Multiple treatment cells allow for clarification of treated water while other cells are being filled or emptied. Treatment cells may be basins, traps or tanks. Portable tanks may also be suitable for some sites.

The following equipment should be located in an operation shed:

- The chemical injector
- Secondary contaminant for acid, caustic, buffering compound, and treatment chemical
- Emergency shower and eyewash
- Monitoring equipment which consists of a pH meter and a turbidimeter

Sizing Criteria

The combination of the sediment basin or other holding area and treatment capacity should be large enough to treat stormwater during multiple day storm events. See SE-2, Sediment Basin, for design criteria. Bypass should be provided around the chemical treatment system to

accommodate extreme storm events. Runoff volume should be calculated using the Rational Method. Primary settling should be encouraged in the sediment basin/storage pond. A forebay with access for maintenance may be beneficial.

There are two opposing considerations in sizing the treatment cells. A larger cell is able to treat a larger volume of water each time a batch is processed. However, the larger the cell the longer the time required to empty the cell. A larger cell may also be less effective at flocculation and therefore require a longer settling time. The simplest approach to sizing the treatment cell is to multiply the allowable discharge flow rate times the desired drawdown time. A 4-hour drawdown time allows one batch per cell per 8-hour work period, given 1 hour of flocculation followed by 2 hours of settling.

The permissible discharge rate governed by potential downstream effect can be used to calculate the recommended size of the treatment cells. The following discharge flow rate limits apply absent any local requirements:

- If the discharge is direct or indirect to a stream, the discharge flow rate should not exceed 50 percent of the peak flow rate for all events between the 2-year and the 10-year, 24-hour event.
- If discharge is occuring during a storm event equal to or greater than the 10-year storm the allowable discharge rate is the peak flow rate of the 10-year, 24-hour event.
- Discharge to a stream should not increase the stream flow rate by more than 10 percent.
- If the discharge is directly to a lake or major receiving water there is no discharge flow limit.
- If the discharge is to a municipal storm drainage system, the allowable discharge rate may be limited by the capacity of the public system. It may be necessary to clean the municipal storm drainage system prior to the start of the discharge to prevent scouring solids from the drainage system.
- Runoff rates may be calculated using the Rational Method, unless another method is required by the local flood control agency or agency that issued the grading permit.

Costs

Costs for chemical treatment may be significant due to equipment required and cost of chemicals. The cost is offset by the ability to reduce some use of other onsite erosion control BMPs and the reuse of equipment (e.g., pumps and dosing equipment). The incremental cost is generally less than 1% of the total construction costs.

Inspection and Maintenance

Chemical treatment systems must be operated and maintained by individuals with expertise in their use. Chemical treatment systems should be monitored continuously while in use.

The following monitoring should be conducted. Test results should be recorded on a daily log kept on site.

Chemical Treatment SE-11

Operational Monitoring

- pH conductivity (as a surrogate for alkalinity), turbidity, and temperature of the untreated stormwater
- Total volume treated and discharged
- Discharge time and flow rate
- Type and amount of chemical used for pH adjustment
- Amount of polymer used for treatment
- Settling time

Compliance Monitoring

- pH and turbidity of the treated stormwater
- pH and turbidity of the receiving water

Bio-monitoring

Treated stormwater should be tested for acute (lethal) toxicity. Bioassays should be conducted by a laboratory accredited by the State of California. **The performance standard for acute toxicity is no statistically significant difference in survival between the control and 100 percent chemically treated stormwater.**

Acute toxicity tests should be conducted with the following species and protocols:

- Fathead minnow, Pimephales promelas (96 hour static-renewal test, method: EPA/600/4-90/027F). Rainbow trout, Oncorhynchus mykiss (96 hour static-renewal test, method: EPA/600/4-90/027F) may be used as a substitute for fathead minnow.
- Daphnid, Ceriodaphnia dubia, Daphnia pulex, or Daphnia magna (48 hour static test, method: EPA/600/4-90/027F).

All toxicity tests should meet quality assurance criteria and test conditions in the most recent versions of the EPA test method.

Bioassays should be performed on the first five batches and on every tenth batch thereafter or as otherwise approved by the RWQCB. Failure to meet the performance standard should be immediately reported to the RWQCB.

Discharge Compliance:

Prior to discharge, each batch of treated stormwater must be sampled and tested for compliance with pH and turbidity limits. These limits may be established by the water quality standards or a site-specific discharge permit. Sampling and testing for other pollutants may also be necessary at some sites. Turbidity must be within 5 NTUs of the background turbidity. Background is measured in the receiving water, upstream from the treatment process discharge point. pH must be within the range of 6.5 to 8.5 standard units and not cause a change in the pH of the receiving water of more than 0.2 standard units. It is often

possible to discharge treated stormwater that has a lower turbidity than the receiving water and that matches the pH.

Treated stormwater samples and measurements should be taken from the discharge pipe or another location representative of the nature of the treated stormwater discharge. Samples used for determining compliance with the water quality standards in the receiving water should not be taken from the treatment pond to decanting. Compliance with the water quality standards is determined in the receiving water.

Operator Training:
Each contractor who intends to use chemical treatment should be trained by an experienced contractor on an active site for at least 40 hours.

Standard BMPs:
Erosion and sediment control BMPs should be implemented throughout the site to prevent erosion and discharge of sediment.

Sediment Removal and Disposal

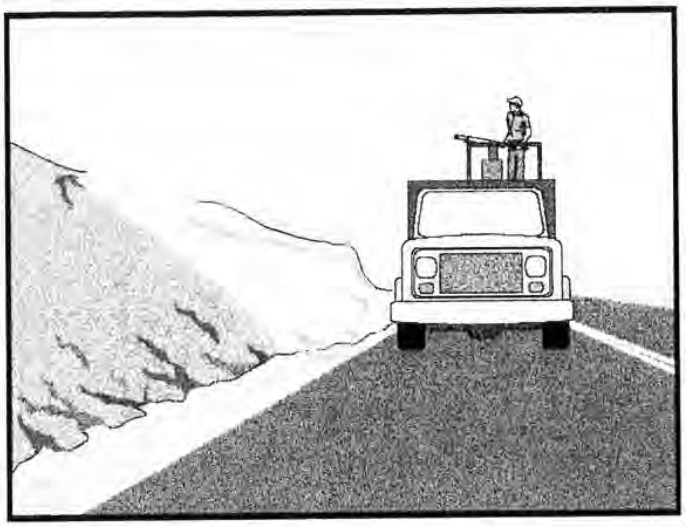
- Sediment should be removed from the storage or treatment cells as necessary. Typically, sediment removal is required at least once during a wet season and at the decommissioning of the cells. Sediment remaining in the cells between batches may enhance the settling process and reduce the required chemical dosage.
- Sediment may be incorporated into the site away from drainages.

References

Stormwater Management Manual for Western Washington, Volume II – Construction Stormwater Pollution Prevention, Washington State Department of Ecology, August 2001.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Straw Mulch EC-6



Objectives

EC	Erosion Control	☑
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-3 Hydraulic Mulch
EC-4 Hydroseeding
EC-5 Soil Binders
EC-7 Geotextiles and Mats
EC-8 Wood Mulching

Description and Purpose

Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil with a studded roller or anchoring it with a tackifier stabilizing emulsion. Straw mulch protects the soil surface from the impact of rain drops, preventing soil particles from becoming dislodged.

Suitable Applications

Straw mulch is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established. Straw mulch is typically used for erosion control on disturbed areas until soils can be prepared for permanent vegetation. Straw mulch is also used in combination with temporary and/or permanent seeding strategies to enhance plant establishment.

Limitations

- Availability of straw and straw blowing equipment may be limited just prior to the rainy season and prior to storms due to high demand.
- There is a potential for introduction of weed seed and unwanted plant material.
- When straw blowers are used to apply straw mulch, the treatment areas must be within 150 ft of a road or surface capable of supporting trucks.
- Straw mulch applied by hand is more time intensive and potentially costly.

EC-6 Straw Mulch

- Wind may limit application of straw and blow straw into undesired locations.
- May have to be removed prior to permanent seeding or prior to further earthwork.
- "Punching" of straw does not work in sandy soils, necessitating the use of tackifiers.

Implementation

- Straw shall be derived from wheat, rice, or barley. Where required by the plans, specifications, permits, or environmental documents, native grass straw shall be used.
- A tackifier is the preferred method for anchoring straw mulch to the soil on slopes.
- Crimping, punch roller-type rollers, or track walking may also be used to incorporate straw mulch into the soil on slopes. Track walking shall only be used where other methods are impractical.
- Avoid placing straw onto roads, sidewalks, drainage channels, sound walls, existing vegetation, etc.
- Straw mulch with tackifier shall not be applied during or immediately before rainfall.
- In San Diego, use of straw near wood framed home construction has been frowned on by the Fire Marshall

Application Procedures

- Apply straw at a minimum rate of 4,000 lb/acre, either by machine or by hand distribution.
- Roughen embankments and fill rills before placing the straw mulch by rolling with a crimping or punching type roller or by track walking.
- Evenly distribute straw mulch on the soil surface.
- Anchor straw mulch to the soil surface by "punching" it into the soil mechanically (incorporating). Alternatively, use a tackifier to adhere straw fibers.
- Methods for holding the straw mulch in place depend upon the slope steepness, accessibility, soil conditions, and longevity.
  - On small areas, a spade or shovel can be used to punch in straw mulch.
  - On slopes with soils that are stable enough and of sufficient gradient to safely support construction equipment without contributing to compaction and instability problems, straw can be "punched" into the ground using a knife blade roller or a straight bladed coulter, known commercially as a "crimper".
  - On small areas and/or steep slopes, straw can also be held in place using plastic netting or jute. The netting shall be held in place using 11 gauge wire staples, geotextile pins or wooden stakes as described in EC-7, Geotextiles and Mats.
  - A tackifier acts to glue the straw fibers together and to the soil surface. The tackifier shall be selected based on longevity and ability to hold the fibers in place. A tackifier is

Straw Mulch EC-6

typically applied at a rate of 125 lb/acre. In windy conditions, the rates are typically 180 lb/acre.

Costs

Average annual cost for installation and maintenance (3-4 months useful life) is $2,500 per acre. Application by hand is more time intensive and potentially costly.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Areas where erosion is evident should be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.
- The key consideration in inspection and maintenance is that the straw needs to last long enough to achieve erosion control objectives.
- Maintain an unbroken, temporary mulched ground cover while disturbed soil areas are inactive. Repair any damaged ground cover and re-mulch exposed areas.
- Reapplication of straw mulch and tackifier may be required to maintain effective soil stabilization over disturbed areas and slopes.

References

Controlling Erosion of Construction Sites, Agricultural Information Bulletin #347, U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service – SCS).

Guides for Erosion and Sediment Control in California, USDA Soils Conservation Service, January 1991.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

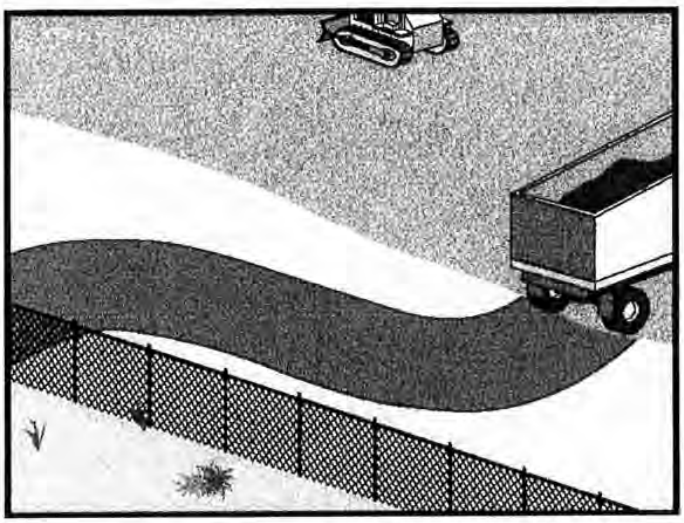
Soil Erosion by Water, Agricultural Information Bulletin #513, U.S. Department of Agriculture, Soil Conservation Service.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Stabilized Construction Roadway TC-2



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion and control dust.

Suitable Applications

This BMP should be applied for the following conditions:

- Temporary Construction Traffic:
  - Phased construction projects and offsite road access
  - Construction during wet weather
- Construction roadways and detour roads:
  - Where mud tracking is a problem during wet weather
  - Where dust is a problem during dry weather
  - Adjacent to water bodies
  - Where poor soils are encountered

Limitations

- The roadway must be removed or paved when construction is complete.

TC-2 Stabilized Construction Roadway

- Certain chemical stabilization methods may cause stormwater or soil pollution and should not be used. See WE-1, Wind Erosion Control.
- Management of construction traffic is subject to air quality control measures. Contact the local air quality management agency.
- Materials will likely need to be removed prior to final project grading and stabilization.
- Use of this BMP may not be applicable to very short duration projects.

Implementation

General

Areas that are graded for construction vehicle transport and parking purposes are especially susceptible to erosion and dust. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires that generate significant quantities of sediment that may pollute nearby streams or be transported offsite on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Efficient construction road stabilization not only reduces onsite erosion but also can significantly speed onsite work, avoid instances of immobilized machinery and delivery vehicles, and generally improve site efficiency and working conditions during adverse weather

Installation/Application Criteria

Permanent roads and parking areas should be paved as soon as possible after grading. As an alternative where construction will be phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems. Temporary gravel roadway should be considered during the rainy season and on slopes greater than 5%.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible. Slope should not exceed 15%. Roadways should be carefully graded to drain transversely. Provide drainage swales on each side of the roadway in the case of a crowned section or one side in the case of a super elevated section. Simple gravel berms without a trench can also be used.

Installed inlets should be protected to prevent sediment laden water from entering the storm sewer system (SE-10, Storm Drain Inlet Protection). In addition, the following criteria should be considered.

- Road should follow topographic contours to reduce erosion of the roadway.
- The roadway slope should not exceed 15%.
- Chemical stabilizers or water are usually required on gravel or dirt roads to prevent dust (WE-1, Wind Erosion Control).
- Properly grade roadway to prevent runoff from leaving the construction site.
- Design stabilized access to support heaviest vehicles and equipment that will use it.

Stabilized Construction Roadway TC-2

- Stabilize roadway using aggregate, asphalt concrete, or concrete based on longevity, required performance, and site conditions. The use of cold mix asphalt or asphalt concrete (AC) grindings for stabilized construction roadway is not allowed.
- Coordinate materials with those used for stabilized construction entrance/exit points.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, impact weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep all temporary roadway ditches clear.
- When no longer required, remove stabilized construction roadway and re-grade and repair slopes.
- Periodically apply additional aggregate on gravel roads.
- Active dirt construction roads are commonly watered three or more times per day during the dry season.

Costs

Gravel construction roads are moderately expensive, but cost is often balanced by reductions in construction delay. No additional costs for dust control on construction roads should be required above that needed to meet local air quality requirements.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

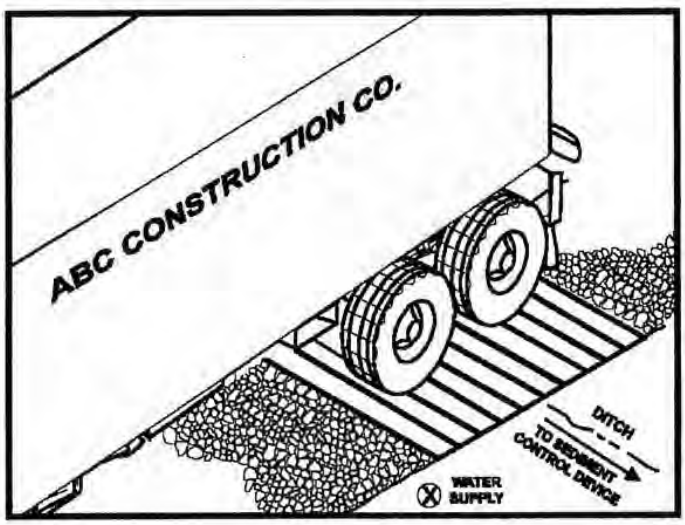
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

TC-2 Stabilized Construction Roadway

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Entrance/Outlet Tire Wash TC-3



Objectives

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit

Description and Purpose

A tire wash is an area located at stabilized construction access points to remove sediment from tires and under carriages and to prevent sediment from being transported onto public roadways.

Suitable Applications

Tire washes may be used on construction sites where dirt and mud tracking onto public roads by construction vehicles may occur.

Limitations

- The tire wash requires a supply of wash water.
- A turnout or doublewide exit is required to avoid having entering vehicles drive through the wash area.
- Do not use where wet tire trucks leaving the site leave the road dangerously slick.

Implementation

- Incorporate with a stabilized construction entrance/exit. See TC-1, Stabilized Construction Entrance/Exit.
- Construct on level ground when possible, on a pad of coarse aggregate greater than 3 in. but smaller than 6 in. A geotextile fabric should be placed below the aggregate.
- Wash rack should be designed and constructed/manufactured for anticipated traffic loads.

TC-3 Entrance/Outlet Tire Wash

- Provide a drainage ditch that will convey the runoff from the wash area to a sediment trapping device. The drainage ditch should be of sufficient grade, width, and depth to carry the wash runoff.
- Use hoses with automatic shutoff nozzles to prevent hoses from being left on.
- Require that all employees, subcontractors, and others that leave the site with mud caked tires and undercarriages to use the wash facility.
- Implement SC-7, Street Sweeping and Vacuuming, as needed.

Costs

Costs are low for installation of wash rack.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Remove accumulated sediment in wash rack and/or sediment trap to maintain system performance.
- Inspect routinely for damage and repair as needed.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

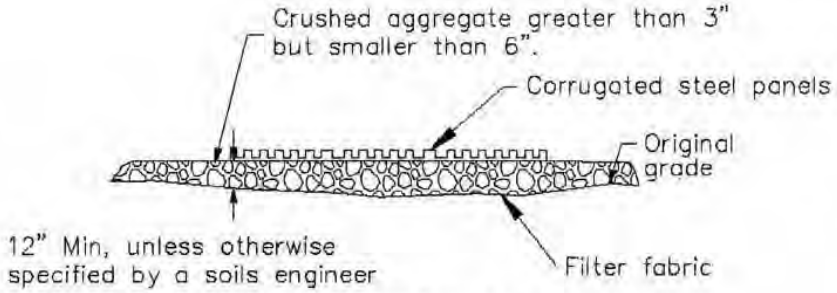
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Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

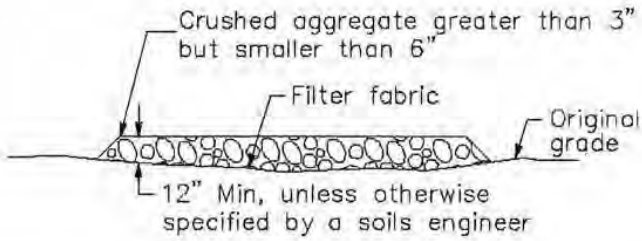
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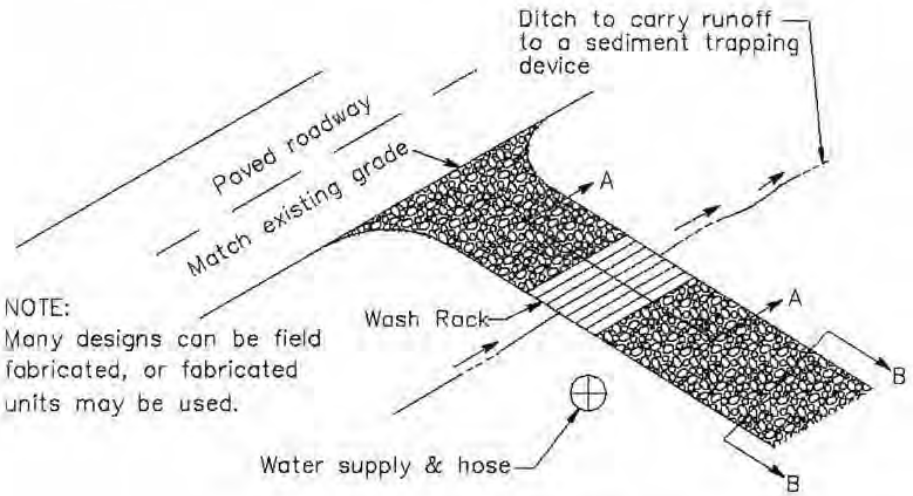
Entrance/Outlet Tire Wash TC-3



SECTION A–A
NOT TO SCALE



SECTION B–B
NTS



TYPICAL TIRE WASH
NOT TO SCALE

Stockpile Management WM-3



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Stockpile Management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other materials.

Limitations

None identified.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

- Locate stockpiles a minimum of 50 ft away from concentrated flows of stormwater, drainage courses, and inlets.
- Protect all stockpiles from stormwater runon using a temporary perimeter sediment barrier such as berms, dikes, fiber rolls, silt fences, sandbag, gravel bags, or straw bale barriers.

WM-3 Stockpile Management

- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

Soil stockpiles

- During the rainy season, soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- During the non-rainy season, soil stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- During the rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier at all times.
- During the non-rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of "cold mix"

- During the rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material at all times.
- During the non-rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Stockpiles/Storage of pressure treated wood with copper, chromium, and arsenic or ammonical, copper, zinc, and arsenate

- During the rainy season, treated wood should be covered with plastic or comparable material at all times.
- During the non-rainy season, treated wood should be covered with plastic or comparable material at all times and cold mix stockpiles should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Protection of Active Stockpiles

Active stockpiles of the identified materials should be protected further as follows:

- All stockpiles should be protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Stockpile Management WM-3

Costs

All of the above are low cost measures

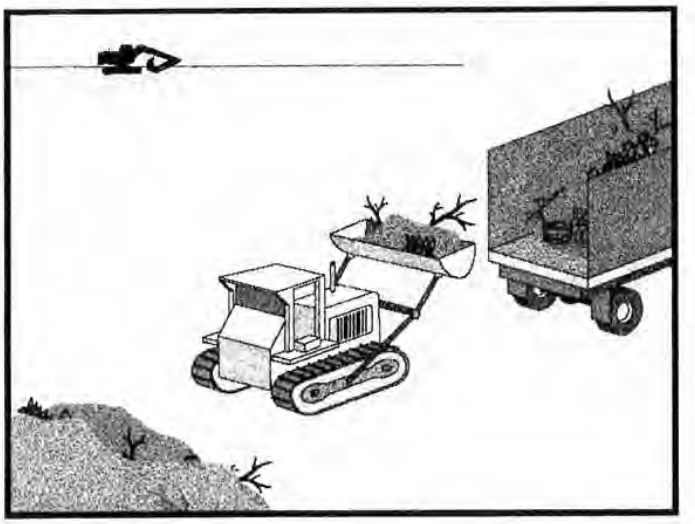
Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Solid Waste Management WM-5



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

WM-5 Solid Waste Management

- Highway planting wastes, including vegetative material, plant containers, and packaging materials

Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste
- Educate employees and subcontractors on solid waste storage and disposal procedures.

Solid Waste Management WM-5

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection, Storage, and Disposal

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runon should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.

WM-5 Solid Waste Management

- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

References

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Contaminated Soil Management WM-7



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the plans, specifications, and

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Contaminated Soil Management WM-7

SWPPP. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil highlight the need for contractors to confirm a site assessment is completed before earth moving begins.

The following steps will help reduce stormwater pollution from contaminated soil:

- Conduct thorough, pre-construction inspections of the site and review documents related to the site. If inspection or reviews indicated presence of contaminated soils, develop a plan before starting work.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills. Contaminated soil can be expensive to treat and dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- The contractor may further identify contaminated soils by investigating:
  - Past site uses and activities
  - Detected or undetected spills and leaks
  - Acid or alkaline solutions from exposed soil or rock formations high in acid or alkaline forming elements
  - Contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
  - Suspected soils should be tested at a certified laboratory.

Education

- Have employees and subcontractors complete a safety training program which meets 29 CFR 1910.120 and 8 CCR 5192 covering the potential hazards as identified, prior to performing any excavation work at the locations containing material classified as hazardous.
- Educate employees and subcontractors in identification of contaminated soil and on contaminated soil handling and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).

Handling Procedures for Material with Aerially Deposited Lead (ADL)

- Materials from areas designated as containing (ADL) may, if allowed by the contract special provisions, be excavated, transported, and used in the construction of embankments and/or backfill.
- Excavation, transportation, and placement operations should result in no visible dust.
- Caution should be exercised to prevent spillage of lead containing material during transport.

Contaminated Soil Management WM-7

- Quality should be monitored during excavation of soils contaminated with lead.

Handling Procedures for Contaminated Soils

- Minimize onsite storage. Contaminated soil should be disposed of properly in accordance with all applicable regulations. All hazardous waste storage will comply with the requirements in Title 22, CCR, Sections 66265.250 to 66265.260.
- Test suspected soils at an approved certified laboratory.
- Work with the local regulatory agencies to develop options for treatment or disposal if the soil is contaminated.
- Avoid temporary stockpiling of contaminated soils or hazardous material.
- Take the following precautions if temporary stockpiling is necessary:
  - Cover the stockpile with plastic sheeting or tarps.
  - Install a berm around the stockpile to prevent runoff from leaving the area.
  - Do not stockpile in or near storm drains or watercourses.
- Remove contaminated material and hazardous material on exteriors of transport vehicles and place either into the current transport vehicle or into the excavation prior to the vehicle leaving the exclusion zone.
- Monitor the air quality continuously during excavation operations at all locations containing hazardous material.
- Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the contaminated material and the hazardous material.
- Collect water from decontamination procedures and treat or dispose of it at an appropriate disposal site.
- Collect non-reusable protective equipment, once used by any personnel, and dispose of at an appropriate disposal site.
- Install temporary security fence to surround and secure the exclusion zone. Remove fencing when no longer needed.
- Excavate, transport, and dispose of contaminated material and hazardous material in accordance with the rules and regulations of the following agencies (the specifications of these agencies supersede the procedures outlined in this BMP):
  - United States Department of Transportation (USDOT)
  - United States Environmental Protection Agency (USEPA)
  - California Environmental Protection Agency (CAL-EPA)

Contaminated Soil Management WM-7

- California Division of Occupation Safety and Health Administration (CAL-OSHA)
- Local regulatory agencies

Procedures for Underground Storage Tank Removals

- Prior to commencing tank removal operations, obtain the required underground storage tank removal permits and approval from the federal, state, and local agencies that have jurisdiction over such work.
- To determine if it contains hazardous substances, arrange to have tested, any liquid or sludge found in the underground tank prior to its removal.
- Following the tank removal, take soil samples beneath the excavated tank and perform analysis as required by the local agency representative(s).
- The underground storage tank, any liquid or sludge found within the tank, and all contaminated substances and hazardous substances removed during the tank removal and transported to disposal facilities permitted to accept such waste.

Water Control

- All necessary precautions and preventive measures should be taken to prevent the flow of water, including ground water, from mixing with hazardous substances or underground storage tank excavations. Such preventative measures may consist of, but are not limited to, berms, cofferdams, grout curtains, freeze walls, and seal course concrete or any combination thereof.
- If water does enter an excavation and becomes contaminated, such water, when necessary to proceed with the work, should be discharged to clean, closed top, watertight transportable holding tanks, treated, and disposed of in accordance with federal, state, and local laws.

Costs

Prevention of leaks and spills is inexpensive. Treatment or disposal of contaminated soil can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Arrange for contractor's Water Pollution Control Manager, foreman, and/or construction supervisor to monitor onsite contaminated soil storage and disposal procedures.
- Monitor air quality continuously during excavation operations at all locations containing hazardous material.
- Coordinate contaminated soils and hazardous substances/waste management with the appropriate federal, state, and local agencies.

Contaminated Soil Management WM-7

- Implement WM-4, Spill Prevention and Control, to prevent leaks and spills as much as possible.

References

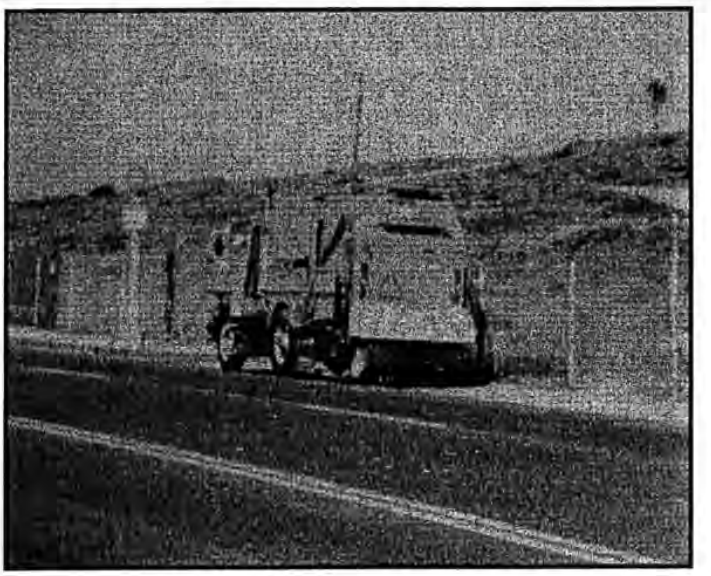
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Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

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Road and Street Maintenance SC-70



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Streets, roads, and highways are significant sources of pollutants in stormwater discharges, and operation and maintenance (O&M) practices, if not conducted properly, can contribute to the problem. Stormwater pollution from roadway and bridge maintenance should be addressed on a site-specific basis. Use of the procedures outlined below, that address street sweeping and repair, bridge and structure maintenance, and unpaved roads will reduce pollutants in stormwater.

Approach

Pollution Prevention

- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal)
- Recycle paint and other materials whenever possible.
- Enlist the help of citizens to keep yard waste, used oil, and other wastes out of the gutter.

Suggested Protocols

Street Sweeping and Cleaning

- Maintain a consistent sweeping schedule. Provide minimum monthly sweeping of curbed streets.
- Perform street cleaning during dry weather if possible.

SC-70 Road and Street Maintenance

- Avoid wet cleaning or flushing of street, and utilize dry methods where possible.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc. For example:
  - Increase the sweeping frequency for streets with high pollutant loadings, especially in high traffic and industrial areas.
  - Increase the sweeping frequency just before the wet season to remove sediments accumulated during the summer.
  - Increase the sweeping frequency for streets in special problem areas such as special events, high litter or erosion zones.
- Maintain cleaning equipment in good working condition and purchase replacement equipment as needed. Old sweepers should be replaced with new technologically advanced sweepers (preferably regenerative air sweepers) that maximize pollutant removal.
- Operate sweepers at manufacturer requested optimal speed levels to increase effectiveness.
- To increase sweeping effectiveness consider the following:
  - Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
  - Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
  - Develop and distribute flyers notifying residents of street sweeping schedules.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- If available use vacuum or regenerative air sweepers in the high sediment and trash areas (typically industrial/commercial).
- Keep accurate logs of the number of curb-miles swept and the amount of waste collected.
- Dispose of street sweeping debris and dirt at a landfill.
- Do not store swept material along the side of the street or near a storm drain inlet.
- Keep debris storage to a minimum during the wet season or make sure debris piles are contained (e.g. by berming the area) or covered (e.g. with tarps or permanent covers).

Street Repair and Maintenance

Pavement marking

- Schedule pavement marking activities for dry weather.

Road and Street Maintenance SC-70

- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Provide drop cloths and drip pans in paint mixing areas.
- Properly maintain application equipment.
- Street sweep thermoplastic grindings. Yellow thermoplastic grindings may require special handling as they may contain lead.
- Paints containing lead or tributyltin are considered a hazardous waste and must be disposed of properly.
- Use water based paints whenever possible. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer.
- Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Concrete installation and repair

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place san bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- When making saw cuts in pavement, use as little water as possible and perform during dry weather. Cover each storm drain inlet completely with filter fabric or plastic during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site. Alternatively, a small onsite vacuum may be used to pick up the slurry as this will prohibit slurry from reaching storm drain inlets.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

SC-70 Road and Street Maintenance

Patching, resurfacing, and surface sealing

- Schedule patching, resurfacing and surface sealing for dry weather.
- Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.
- Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.
- Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and maintenance holes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from covered maintenance holes and storm drain inlets when the job is complete.
- Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for clean up and proper disposal of excess materials.
- Use only as much water as necessary for dust control, to avoid runoff.
- Sweep, never hose down streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Equipment cleaning maintenance and storage

- Inspect equipment daily and repair any leaks. Place drip pans or absorbent materials under heavy equipment when not in use.
- Perform major equipment repairs at the corporation yard, when practical.
- If refueling or repairing vehicles and equipment must be done onsite, use a location away from storm drain inlets and watercourses.
- Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mud jacking equipment at the end of each day. Clean in a sink or other area (e.g. vehicle wash area) that is connected to the sanitary sewer.

Bridge and Structure Maintenance

Paint and Paint Removal

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Do not transfer or load paint near storm drain inlets or watercourses.

- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint container.
- Plug nearby storm drain inlets prior to starting painting where there is significant risk of a spill reaching storm drains. Remove plugs when job is completed.
- If sand blasting is used to remove paint, cover nearby storm drain inlets prior to starting work.
- Perform work on a maintenance traveler or platform, or use suspended netting or tarps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters if the bridge crosses a watercourse. If sanding, use a sander with a vacuum filter bag.
- Capture all clean-up water, and dispose of properly.
- Recycle paint when possible (e.g. paint may be used for graffiti removal activities). Dispose of unused paint at an appropriate household hazardous waste facility.

Graffiti Removal

- Schedule graffiti removal activities for dry weather.
- Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.
- When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal above.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If such an area is not available, filter runoff through an appropriate filtering device (e.g. filter fabric) to keep sand, particles, and debris out of storm drains.
- If a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump wash water to the sanitary sewer.
- Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

Repair Work

- Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.
- Thoroughly clean up the job site when the repair work is completed.
- When cleaning guardrails or fences follow the appropriate surface cleaning methods (depending on the type of surface) outlined in SC-71 Plaza & Sidewalk Cleaning fact sheet.

SC-70 Road and Street Maintenance

- If painting is conducted, follow the painting and paint removal procedures above.
- If graffiti removal is conducted, follow the graffiti removal procedures above.
- If construction takes place, see the Construction Activity BMP Handbook.
- Recycle materials whenever possible.

Unpaved Roads and Trails

- Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes.
- For roadside areas with exposed soils, the most cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils in place while the vegetation is establishing. Native vegetation should be used if possible.
- If vegetation cannot be established immediately, apply temporary erosion control mats/blankets; a comma straw, or gravel as appropriate.
- If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags, or hay bales staked in place.

Non-Stormwater Discharges

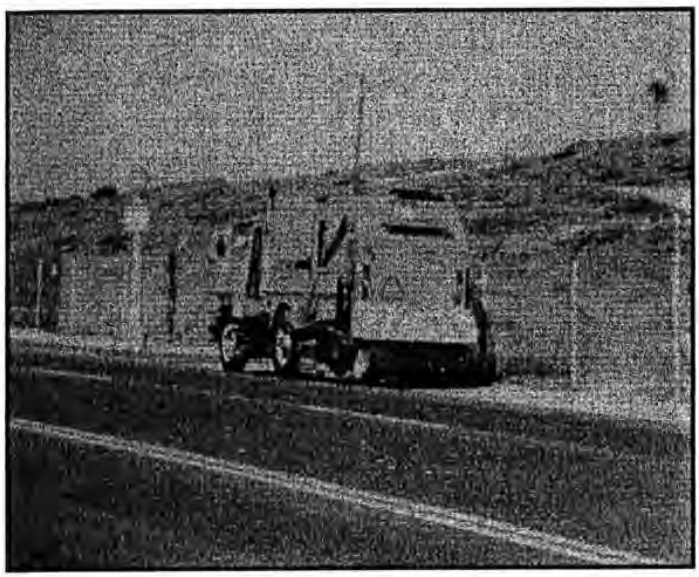
Field crews should be aware of non-stormwater discharges as part of their ongoing street maintenance efforts.

- Refer to SC-10 Non-Stormwater Discharges
- Identify location, time and estimated quantity of discharges.
- Notify appropriate personnel.

Training

- Train employees regarding proper street sweeping operation and street repair and maintenance.
- Instruct employees and subcontractors to ensure that measures to reduce the stormwater impacts of roadway/bridge maintenance are being followed.
- Require engineering staff and/or consulting A/E firms to address stormwater quality in new bridge designs or existing bridge retrofits.
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- Train employees on proper spill containment and clean up, and in identifying non-stormwater discharges.

Road and Street Maintenance SC-70



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Road and Street Maintenance SC-70

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Non-Stormwater Discharges

Field crews should be aware of non-stormwater discharges as part of their ongoing street maintenance efforts.

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- Notify appropriate personnel.

Training

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- Use a training log or similar method to document training.
- Train employees on proper spill containment and clean up, and in identifying non-stormwater discharges.

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Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Densely populated areas or heavily used streets may require parking regulations to clear streets for cleaning.
- No currently available conventional sweeper is effective at removing oil and grease. Mechanical sweepers are not effective at removing finer sediments.
- Limitations may arise in the location of new bridges. The availability and cost of land and other economic and political factors may dictate where the placement of a new bridge will occur. Better design of the bridge to control runoff is required if it is being placed near sensitive waters.

Requirements

Costs

- The maintenance of local roads and bridges is already a consideration of most community public works or transportation departments. Therefore, the cost of pollutant reducing management practices will involve the training and equipment required to implement these new practices.
- The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a conventional street sweeper is between $60,000 and $120,000. Newer technologies might have prices approaching $180,000. The average useful life of a conventional sweeper is about four years, and programs must budget for equipment replacement. Sweeping frequencies will determine equipment life, so programs that sweep more often should expect to have a higher cost of replacement.
- A street sweeping program may require the following.
  - Sweeper operators, maintenance, supervisory, and administrative personnel are required.
  - Traffic control officers may be required to enforce parking restrictions.
  - Skillful design of cleaning routes is required for program to be productive.
  - Arrangements must be made for disposal of collected wastes.

SC-70 Road and Street Maintenance

- If investing in newer technologies, training for operators must be included in operation and maintenance budgets. Costs for public education are small, and mostly deal with the need to obey parking restrictions and litter control. Parking tickets are an effective reminder to obey parking rules, as well as being a source of revenue.

Maintenance

- Not applicable

Supplemental Information

Further Detail of the BMP

Street sweeping

There are advantages and disadvantages to the two common types of sweepers. The best choice depends on your specific conditions. Many communities find it useful to have a compliment of both types in their fleet.

Mechanical Broom Sweepers - More effective at picking up large debris and cleaning wet streets. Less costly to purchase and operate. Create more airborne dust.

Vacuum Sweepers - More effective at removing fine particles and associated heavy metals. Ineffective at cleaning wet streets. Noisier than mechanical broom sweepers which may restrict areas or times of operation. May require an advance vehicle to remove large debris.

Street Flushers - Not affected by biggest interference to cleaning, parked cars. May remove finer sediments, moving them toward the gutter and stormwater inlets. For this reason, flushing fell out of favor and is now used primarily after sweeping. Flushing may be effective for combined sewer systems. Presently street flushing is not allowed under most NPDES permits.

Cross-Media Transfer of Pollutants

The California Air Resources Board (ARB) has established state ambient air quality standards including a standard for respirable particulate matter (less than or equal to 10 microns in diameter, symbolized as PM10). In the effort to sweep up finer sediments to remove attached heavy metals, municipalities should be aware that fine dust, that cannot be captured by the sweeping equipment and becomes airborne, could lead to issues of worker and public safety.

Bridges

Bridges that carry vehicular traffic generate some of the more direct discharges of runoff to surface waters. Bridge scupper drains cause a direct discharge of stormwater into receiving waters and have been shown to carry relatively high concentrations of pollutants. Bridge maintenance also generates wastes that may be either directly deposited to the water below or carried to the receiving water by stormwater. The following steps will help reduce the stormwater impacts of bridge maintenance:

- Site new bridges so that significant adverse impacts to wetlands, sensitive areas, critical habitat, and riparian vegetation are minimized.

- Design new bridges to avoid the use of scupper drains and route runoff to land for treatment control. Existing scupper drains should be cleaned on a regular basis to avoid sediment/debris accumulation.
- Reduce the discharge of pollutants to surface waters during maintenance by using suspended traps, vacuums, or booms in the water to capture paint, rust, and paint removing agents. Many of these wastes may be hazardous. Properly dispose of this waste by referring to CA21 (Hazardous Waste Management) in the Construction Handbook.
- Train employees and subcontractors to reduce the discharge of wastes during bridge maintenance.

De-icing

- Do not over-apply deicing salt and sand, and routinely calibrate spreaders.
- Near reservoirs, restrict the application of deicing salt and redirect any runoff away from reservoirs.
- Consider using alternative deicing agents (less toxic, biodegradable, etc.).

References and Resources

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

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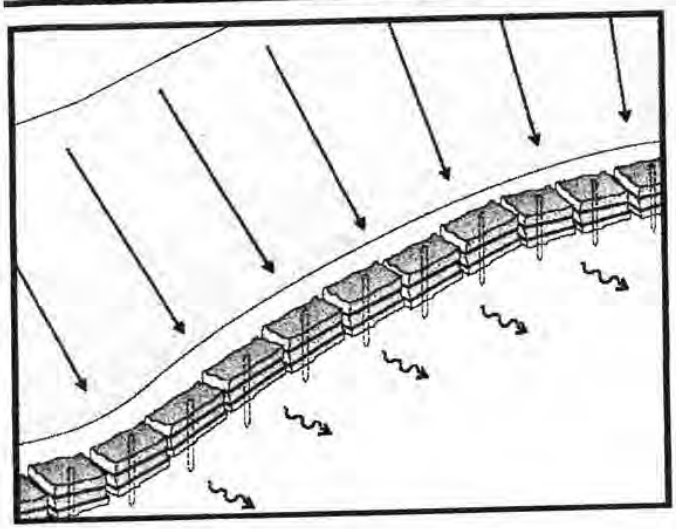
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United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Roadway and Bridge Maintenance. On-line
http://www.epa.gov/npdes/menuofbmps/poll_13.htm

Straw Bale Barrier

SE-9



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
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Metals	
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Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier

Description and Purpose

A straw bale barrier is a series of straw bales placed on a level contour to intercept sheet flows. Straw bale barriers pond sheet- flow runoff, allowing sediment to settle out.

Suitable Applications

Straw bale barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

SE-9 Straw Bale Barrier

- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

Straw bale barriers:

- Are not to be used for extended periods of time because they tend to rot and fall apart
- Are suitable only for sheet flow on slopes of 10 % or flatter
- Are not appropriate for large drainage areas, limit to one acre or less
- May require constant maintenance due to rotting
- Are not recommended for concentrated flow, inlet protection, channel flow, and live streams
- Cannot be made of bale bindings of jute or cotton
- Require labor-intensive installation and maintenance
- Cannot be used on paved surfaces
- Should not to be used for drain inlet protection
- Should not be used on lined ditches
- May introduce undesirable non-native plants to the area

Implementation

General

A straw bale barrier consists of a row of straw bales placed on a level contour. When appropriately placed, a straw bale barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. Straw bale barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils.

Straw bale barriers have not been as effective as expected due to improper use. These barriers have been placed in streams and drainage ways where runoff volumes and velocities have caused the barriers to wash out. In addition, failure to stake and entrench the straw bale has allowed undercutting and end flow. Use of straw bale barriers in accordance with this BMP should produce acceptable results.

Design and Layout

- Locate straw bale barriers on a level contour.
  - Slopes up to 10:1 (H:V): Straw bales should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the toe of slope.
  - Slopes greater than 10:1 (H:V): Not recommended.

Straw Bale Barrier SE-9

- Turn the ends of the straw bale barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sand bags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 1 acre, or 0.25 acre per 100 ft of barrier.
- Maximum flow path to the barrier should be limited to 100 ft.
- Straw bale barriers should consist of two parallel rows.
  - Butt ends of bales tightly
  - Stagger butt joints between front and back row
  - Each row of bales must be trenched in and firmly staked
- Straw bale barriers are limited in height to one bale laid on its side.
- Anchor bales with either two wood stakes or four bars driven through the bale and into the soil. Drive the first stake towards the butt joint with the adjacent bale to force the bales together.
- See attached figure for installation details.

Materials

- ***Straw Bale Size:*** Each straw bale should be a minimum of 14 in. wide, 18 in. in height, 36 in. in length and should have a minimum mass of 50 lbs. The straw bale should be composed entirely of vegetative matter, except for the binding material.
- ***Bale Bindings:*** Bales should be bound by steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding should not be used. Baling wire should be a minimum diameter of 14 gauge. Nylon or polypropylene string should be approximately 12 gauge in diameter with a breaking strength of 80 lbs force.
- ***Stakes:*** Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement should be equal to a #4 designation or greater. End protection should be provided for any exposed bar reinforcement.

Costs

Straw bales cost $5 - $7 each. Adequate labor should be budgeted for installation and maintenance.

SE-9 Straw Bale Barrier

Inspection and Maintenance

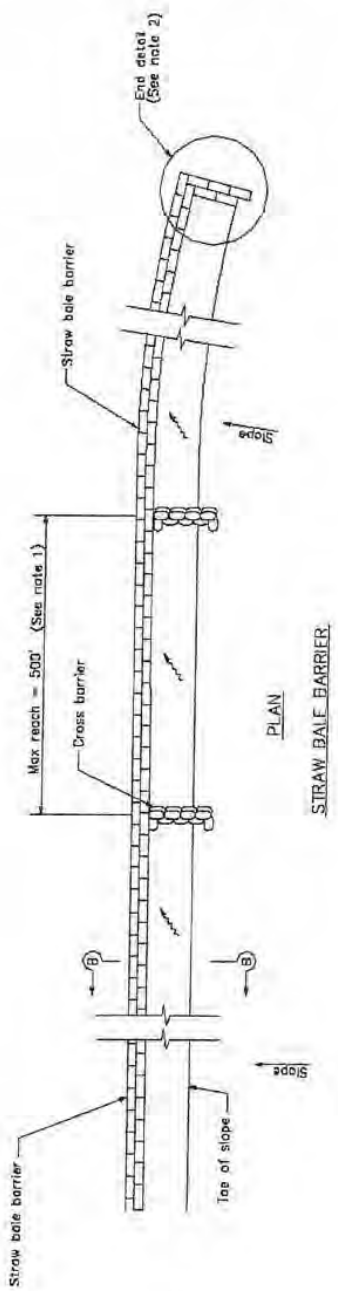
Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Straw bales degrade, especially when exposed to moisture. Rotting bales will need to be replaced on a regular basis.
- Replace or repair damaged bales as needed.
- Repair washouts or other damages as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove straw bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Straw Bale Barrier SE-9



PLAN

STRAW BALE BARRIER

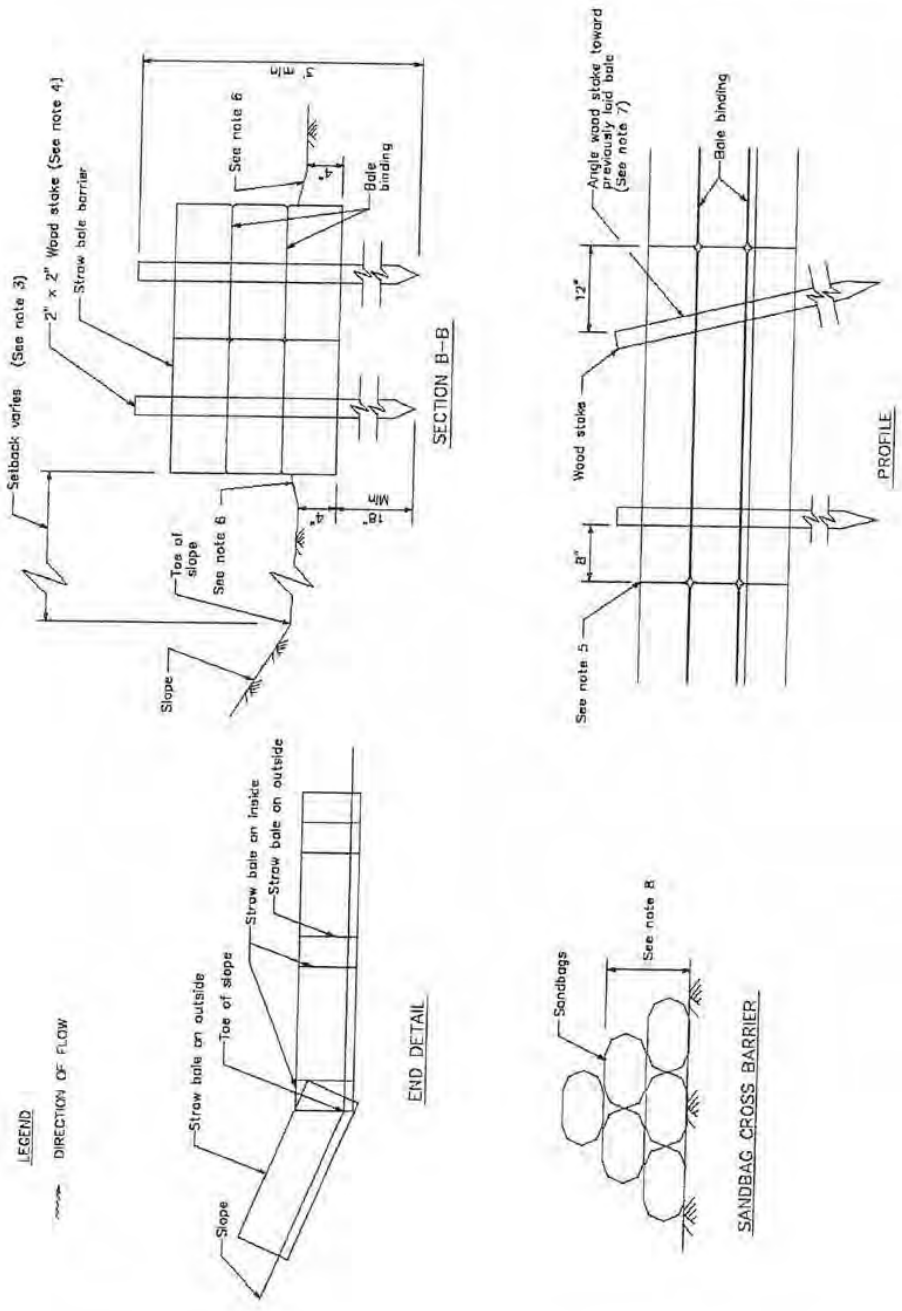
LEGEND

DIRECTION OF FLOW

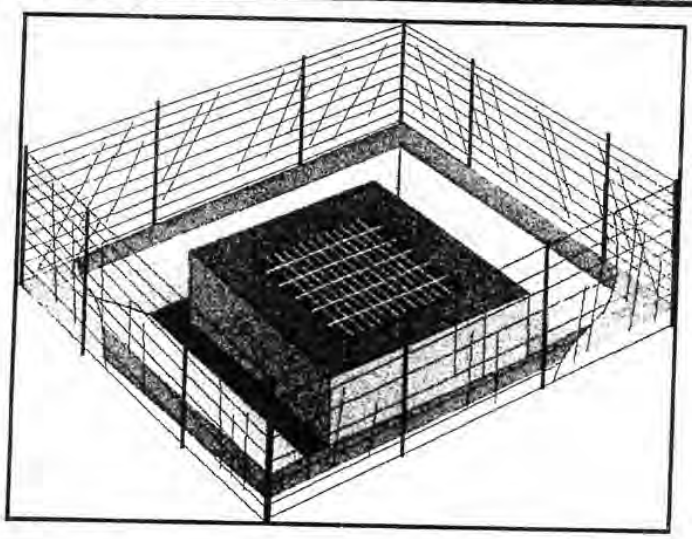
NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier. In no case shall the reach length exceed 500'.
2. The end of barrier shall be turned up slope.
3. Dimension may vary to fit field condition.
4. Stake dimensions are nominal.
5. Place straw bales tightly together.
6. Tamp embedment spoils against sides of installed bales.
7. Drive angled wood stake before vertical stake to ensure tight abutment to adjacent bale.
8. Sandbag cross barriers should be a min of 1/2 and a max of 2/3 the height of the linear barrier.
9. Sandbag rows and layers should be offset to eliminate gaps.

SE-9 Straw Bale Barrier



Storm Drain Inlet Protection SE-10



Objectives

EC	Erosion Control	
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier
SE-9 Straw Bale Barrier

Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction.

Suitable Applications

Every storm drain inlet receiving sediment-laden runoff should be protected.

Limitations

- Drainage area should not exceed 1 acre.
- Straw bales, while potentially effective, have not produced in practice satisfactory results, primarily due to improper installation.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Inlet protection usually requires other methods of temporary protection to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.
- Sediment removal may be difficult in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are

expected, use other onsite sediment trapping techniques in conjunction with inlet protection.

- Frequent maintenance is required.
- For drainage areas larger than 1 acre, runoff should be routed to a sediment-trapping device designed for larger flows. See BMPs SE-2, Sediment Basin, and SE-3, Sediment Traps.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected, and overflow capability is needed.

Implementation

General

Large amounts of sediment may enter the storm drain system when storm drains are installed before the upslope drainage area is stabilized, or where construction is adjacent to an existing storm drain. In cases of extreme sediment loading, the storm drain itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

Inlet control measures presented in this handbook should not be used for inlets draining more than one acre. Runoff from larger disturbed areas should be first routed through SE-2, Sediment Basin or SE-3, Sediment Trap. Different types of inlet protection are appropriate for different applications depending on site conditions and the type of inlet. Inlet protection methods not presented in this handbook should be approved by the local stormwater management agency.

Design and Layout

Identify existing and planned storm drain inlets that have the potential to receive sediment-laden surface runoff. Determine if storm drain inlet protection is needed and which method to use.

- Limit upstream drainage area to 1 acre maximum. For larger drainage areas, use SE-2, Sediment Basin, or SE-3, Sediment Trap, upstream of the inlet protection device.
- The key to successful and safe use of storm drain inlet protection devices is to know where runoff will pond or be diverted.
  - Determine the acceptable location and extent of ponding in the vicinity of the drain inlet. The acceptable location and extent of ponding will influence the type and design of the storm drain inlet protection device.
  - Determine the extent of potential runoff diversion caused by the storm drain inlet protection device. Runoff ponded by inlet protection devices may flow around the device and towards the next downstream inlet. In some cases, this is acceptable; in other cases, serious erosion or downstream property damage can be caused by these diversions. The possibility of runoff diversions will influence whether or not storm drain inlet protection is suitable; and, if suitable, the type and design of the device.
- The location and extent of ponding, and the extent of diversion, can usually be controlled through appropriate placement of the inlet protection device. In some cases, moving the

inlet protection device a short distance upstream of the actual inlet can provide more efficient sediment control, limit ponding to desired areas, and prevent or control diversions.

- Four types of inlet protection are presented below. However, it is recognized that other effective methods and proprietary devices exist and may be selected.
  - Filter Fabric Fence: Appropriate for drainage basins with less than a 5% slope, sheet flows, and flows under 0.5 cfs.
  - Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment (SE-3).
  - Gravel bag barrier: Used to create a small sediment trap upstream of inlets on sloped, paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.
  - Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.
- Select the appropriate type of inlet protection and design as referred to or as described in this fact sheet.
- Provide area around the inlet for water to pond without flooding structures and property.
- Grates and spaces around all inlets should be sealed to prevent seepage of sediment-laden water.
- Excavate sediment sumps (where needed) 1 to 2 ft with 2:1 side slopes around the inlet.

Installation

- ***DI Protection Type 1 - Filter Fabric Fence*** - The filter fabric fence (Type 1) protection is shown in the attached figure. Similar to constructing a silt fence; see BMP SE-1, Silt Fence. Do not place filter fabric underneath the inlet grate since the collected sediment may fall into the drain inlet when the fabric is removed or replaced.
  1. Excavate a trench approximately 6 in. wide and 6 in. deep along the line of the silt fence inlet protection device.
  2. Place 2 in. by 2 in. wooden stakes around the perimeter of the inlet a maximum of 3 ft apart and drive them at least 18 in. into the ground or 12 in. below the bottom of the trench. The stakes must be at least 48 in.
  3. Lay fabric along bottom of trench, up side of trench, and then up stakes. See SE-1, Silt Fence, for details. The maximum silt fence height around the inlet is 24 in.
  4. Staple the filter fabric (for materials and specifications, see SE-1, Silt Fence) to wooden stakes. Use heavy-duty wire staples at least 1 in. in length.
  5. Backfill the trench with gravel or compacted earth all the way around.
- ***DI Protection Type 2 - Excavated Drop Inlet Sediment Trap*** - The excavated drop inlet sediment trap (Type 2) is shown in the attached figures. Install filter fabric fence in

SE-10 Storm Drain Inlet Protection

accordance with DI Protection Type 1. Size excavated trap to provide a minimum storage capacity calculated at the rate 67 yd^3/acre of drainage area.

- ***DI Protection Type 3 - Gravel bag*** - The gravel bag barrier (Type 3) is shown in the figures. Flow from a severe storm should not overtop the curb. In areas of high clay and silts, use filter fabric and gravel as additional filter media. Construct gravel bags in accordance with SE-6, Gravel Bag Berm. Gravel bags should be used due to their high permeability.

  1. Use sand bag made of geotextile fabric (not burlap) and fill with 0.75 in. rock or 0.25 in. pea gravel.
  2. Construct on gently sloping street.
  3. Leave room upstream of barrier for water to pond and sediment to settle.
  4. Place several layers of sand bags – overlapping the bags and packing them tightly together.
  5. Leave gap of one bag on the top row to serve as a spillway. Flow from a severe storm (e.g., 10 year storm) should not overtop the curb.

- ***DI Protection Type 4 – Block and Gravel Filter*** - The block and gravel filter (Type 4) is shown in the figures. Block and gravel filters are suitable for curb inlets commonly used in residential, commercial, and industrial construction.

  1. Place hardware cloth or comparable wire mesh with 0.5 in. openings over the drop inlet so that the wire extends a minimum of 1 ft beyond each side of the inlet structure. If more than one strip is necessary, overlap the strips. Place filter fabric over the wire mesh.
  2. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, so that the open ends face outward, not upward. The ends of adjacent blocks should abut. The height of the barrier can be varied, depending on design needs, by stacking combinations of blocks that are 4 in., 8 in., and 12 in. wide. The row of blocks should be at least 12 in. but no greater than 24 in. high.
  3. Place wire mesh over the outside vertical face (open end) of the concrete blocks to prevent stone from being washed through the blocks. Use hardware cloth or comparable wire mesh with 0.5 in. opening.
  4. Pile washed stone against the wire mesh to the top of the blocks. Use 0.75 to 3 in.

Costs

- Average annual cost for installation and maintenance (one year useful life) is $200 per inlet.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.

Storm Drain Inlet Protection SE-10

- Filter Fabric Fences. If the fabric becomes clogged, torn, or degrades, it should be replaced. Make sure the stakes are securely driven in the ground and are in good shape (i.e., not bent, cracked, or splintered, and are reasonably perpendicular to the ground). Replace damaged stakes.

- Gravel Filters. If the gravel becomes clogged with sediment, it must be carefully removed from the inlet and either cleaned or replaced. Since cleaning gravel at a construction site may be difficult, consider using the sediment-laden stone as fill material and put fresh stone around the inlet. Inspect bags for holes, gashes, and snags, and replace bags as needed. Check gravel bags for proper arrangement and displacement.

- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site ore disposed at an appropriate location.

- Remove storm drain inlet protection once the drainage area is stabilized.

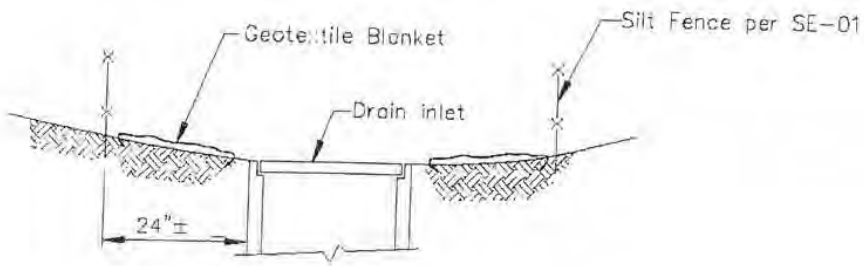
  - Clean and regrade area around the inlet and clean the inside of the storm drain inlet as it must be free of sediment and debris at the time of final inspection.

References

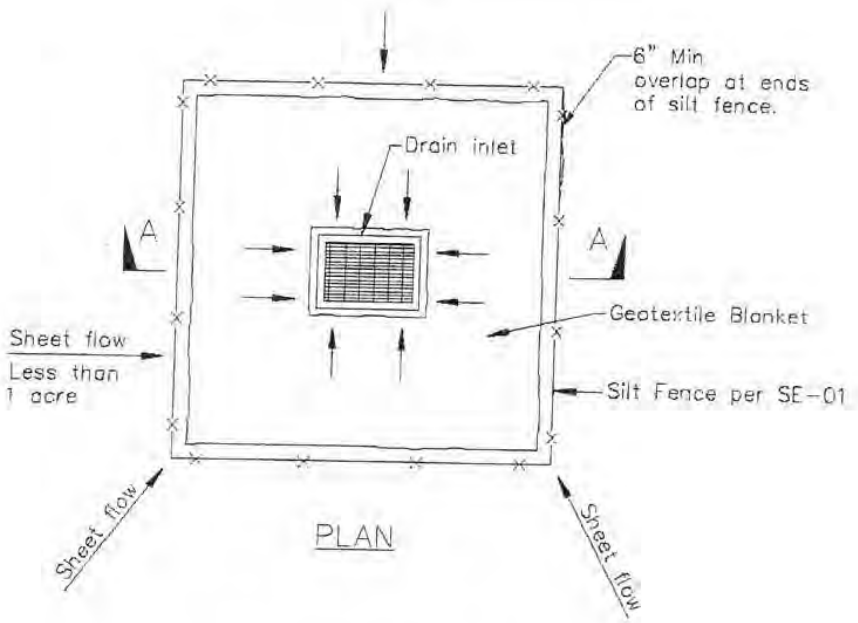
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SE-10 Storm Drain Inlet Protection



SECTION A-A



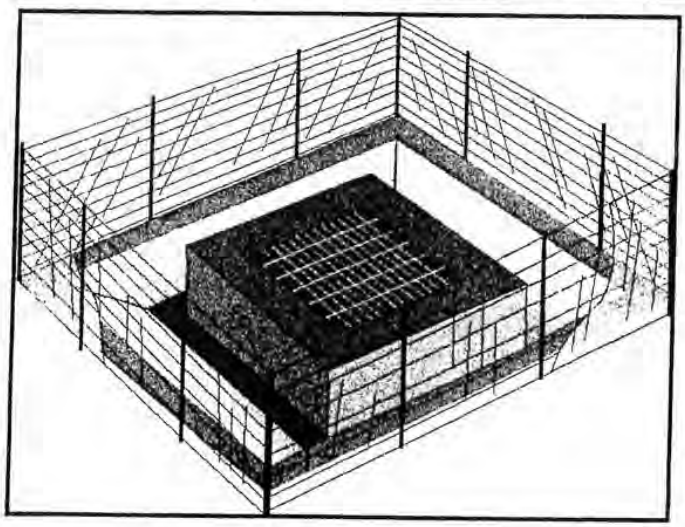
PLAN

DI PROTECTION TYPE 1
NOT TO SCALE

NOTES:

1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.

Storm Drain Inlet Protection SE-10



Objectives

EC	Erosion Control	
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-5 Fiber Rolls
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SE-8 Sandbag Barrier
SE-9 Straw Bale Barrier

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Storm drain inlet protection consists of a sediment filter or an impounding area around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction.

Suitable Applications

Every storm drain inlet receiving sediment-laden runoff should be protected.

Limitations

- Drainage area should not exceed 1 acre.
- Straw bales, while potentially effective, have not produced in practice satisfactory results, primarily due to improper installation.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Inlet protection usually requires other methods of temporary protection to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.
- Sediment removal may be difficult in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are

SE-10 Storm Drain Inlet Protection

expected, use other onsite sediment trapping techniques in conjunction with inlet protection.

- Frequent maintenance is required.
- For drainage areas larger than 1 acre, runoff should be routed to a sediment-trapping device designed for larger flows. See BMPs SE-2, Sediment Basin, and SE-3, Sediment Traps.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected, and overflow capability is needed.

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General

Large amounts of sediment may enter the storm drain system when storm drains are installed before the upslope drainage area is stabilized, or where construction is adjacent to an existing storm drain. In cases of extreme sediment loading, the storm drain itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

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- The key to successful and safe use of storm drain inlet protection devices is to know where runoff will pond or be diverted.
  - Determine the acceptable location and extent of ponding in the vicinity of the drain inlet. The acceptable location and extent of ponding will influence the type and design of the storm drain inlet protection device.
  - Determine the extent of potential runoff diversion caused by the storm drain inlet protection device. Runoff ponded by inlet protection devices may flow around the device and towards the next downstream inlet. In some cases, this is acceptable; in other cases, serious erosion or downstream property damage can be caused by these diversions. The possibility of runoff diversions will influence whether or not storm drain inlet protection is suitable; and, if suitable, the type and design of the device.
- The location and extent of ponding, and the extent of diversion, can usually be controlled through appropriate placement of the inlet protection device. In some cases, moving the

Storm Drain Inlet Protection SE-10

inlet protection device a short distance upstream of the actual inlet can provide more efficient sediment control, limit ponding to desired areas, and prevent or control diversions.

- Four types of inlet protection are presented below. However, it is recognized that other effective methods and proprietary devices exist and may be selected.
  - Filter Fabric Fence: Appropriate for drainage basins with less than a 5% slope, sheet flows, and flows under 0.5 cfs.
  - Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment (SE-3).
  - Gravel bag barrier: Used to create a small sediment trap upstream of inlets on sloped, paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.
  - Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.
- Select the appropriate type of inlet protection and design as referred to or as described in this fact sheet.
- Provide area around the inlet for water to pond without flooding structures and property.
- Grates and spaces around all inlets should be sealed to prevent seepage of sediment-laden water.
- Excavate sediment sumps (where needed) 1 to 2 ft with 2:1 side slopes around the inlet.

Installation

- ***DI Protection Type 1 - Filter Fabric Fence*** - The filter fabric fence (Type 1) protection is shown in the attached figure. Similar to constructing a silt fence; see BMP SE-1, Silt Fence. Do not place filter fabric underneath the inlet grate since the collected sediment may fall into the drain inlet when the fabric is removed or replaced.
  1. Excavate a trench approximately 6 in. wide and 6 in. deep along the line of the silt fence inlet protection device.
  2. Place 2 in. by 2 in. wooden stakes around the perimeter of the inlet a maximum of 3 ft apart and drive them at least 18 in. into the ground or 12 in. below the bottom of the trench. The stakes must be at least 48 in.
  3. Lay fabric along bottom of trench, up side of trench, and then up stakes. See SE-1, Silt Fence, for details. The maximum silt fence height around the inlet is 24 in.
  4. Staple the filter fabric (for materials and specifications, see SE-1, Silt Fence) to wooden stakes. Use heavy-duty wire staples at least 1 in. in length.
  5. Backfill the trench with gravel or compacted earth all the way around.
- ***DI Protection Type 2 - Excavated Drop Inlet Sediment Trap*** - The excavated drop inlet sediment trap (Type 2) is shown in the attached figures. Install filter fabric fence in

accordance with DI Protection Type 1. Size excavated trap to provide a minimum storage capacity calculated at the rate 67 yd^3/acre of drainage area.

- ***DI Protection Type 3 - Gravel bag*** - The gravel bag barrier (Type 3) is shown in the figures. Flow from a severe storm should not overtop the curb. In areas of high clay and silts, use filter fabric and gravel as additional filter media. Construct gravel bags in accordance with SE-6, Gravel Bag Berm. Gravel bags should be used due to their high permeability.

  1. Use sand bag made of geotextile fabric (not burlap) and fill with 0.75 in. rock or 0.25 in. pea gravel.
  2. Construct on gently sloping street.
  3. Leave room upstream of barrier for water to pond and sediment to settle.
  4. Place several layers of sand bags – overlapping the bags and packing them tightly together.
  5. Leave gap of one bag on the top row to serve as a spillway. Flow from a severe storm (e.g., 10 year storm) should not overtop the curb.

- ***DI Protection Type 4 – Block and Gravel Filter*** - The block and gravel filter (Type 4) is shown in the figures. Block and gravel filters are suitable for curb inlets commonly used in residential, commercial, and industrial construction.

  1. Place hardware cloth or comparable wire mesh with 0.5 in. openings over the drop inlet so that the wire extends a minimum of 1 ft beyond each side of the inlet structure. If more than one strip is necessary, overlap the strips. Place filter fabric over the wire mesh.
  2. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, so that the open ends face outward, not upward. The ends of adjacent blocks should abut. The height of the barrier can be varied, depending on design needs, by stacking combinations of blocks that are 4 in., 8 in., and 12 in. wide. The row of blocks should be at least 12 in. but no greater than 24 in. high.
  3. Place wire mesh over the outside vertical face (open end) of the concrete blocks to prevent stone from being washed through the blocks. Use hardware cloth or comparable wire mesh with 0.5 in. opening.
  4. Pile washed stone against the wire mesh to the top of the blocks. Use 0.75 to 3 in.

Costs

- Average annual cost for installation and maintenance (one year useful life) is $200 per inlet.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.

Storm Drain Inlet Protection SE-10

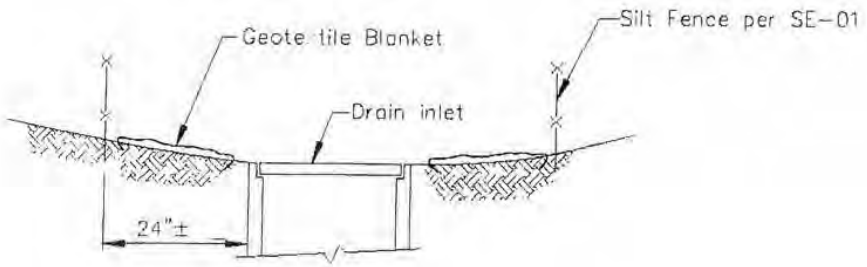
- Filter Fabric Fences. If the fabric becomes clogged, torn, or degrades, it should be replaced. Make sure the stakes are securely driven in the ground and are in good shape (i.e., not bent, cracked, or splintered, and are reasonably perpendicular to the ground). Replace damaged stakes.
- Gravel Filters. If the gravel becomes clogged with sediment, it must be carefully removed from the inlet and either cleaned or replaced. Since cleaning gravel at a construction site may be difficult, consider using the sediment-laden stone as fill material and put fresh stone around the inlet. Inspect bags for holes, gashes, and snags, and replace bags as needed. Check gravel bags for proper arrangement and displacement.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site ore disposed at an appropriate location.
- Remove storm drain inlet protection once the drainage area is stabilized.
  - Clean and regrade area around the inlet and clean the inside of the storm drain inlet as it must be free of sediment and debris at the time of final inspection.

References

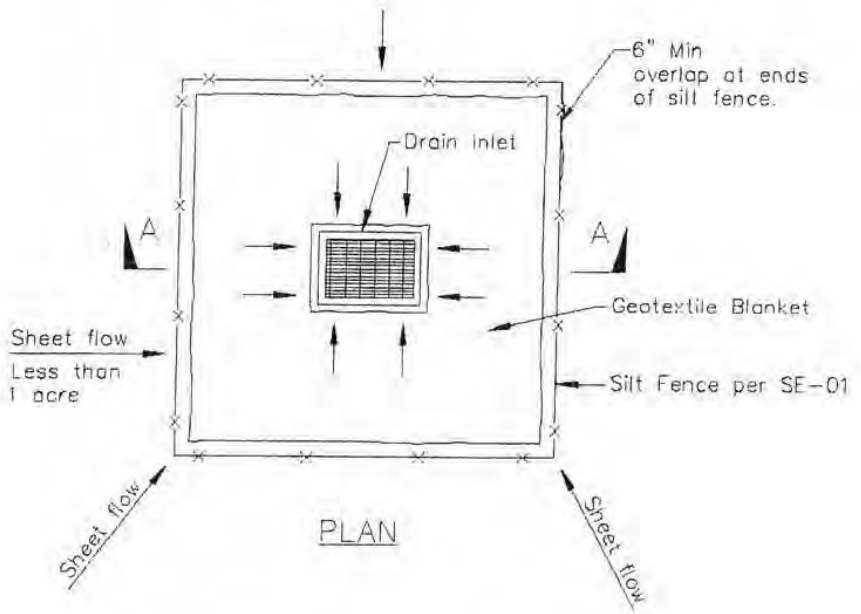
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SE-10 Storm Drain Inlet Protection



SECTION A-A



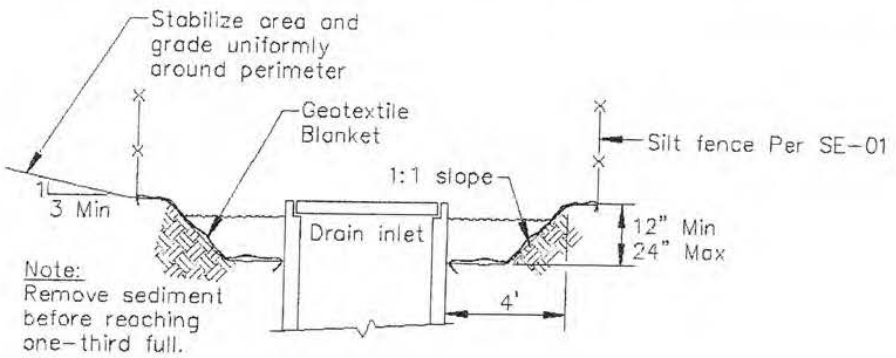
PLAN

DI PROTECTION TYPE 1
NOT TO SCALE

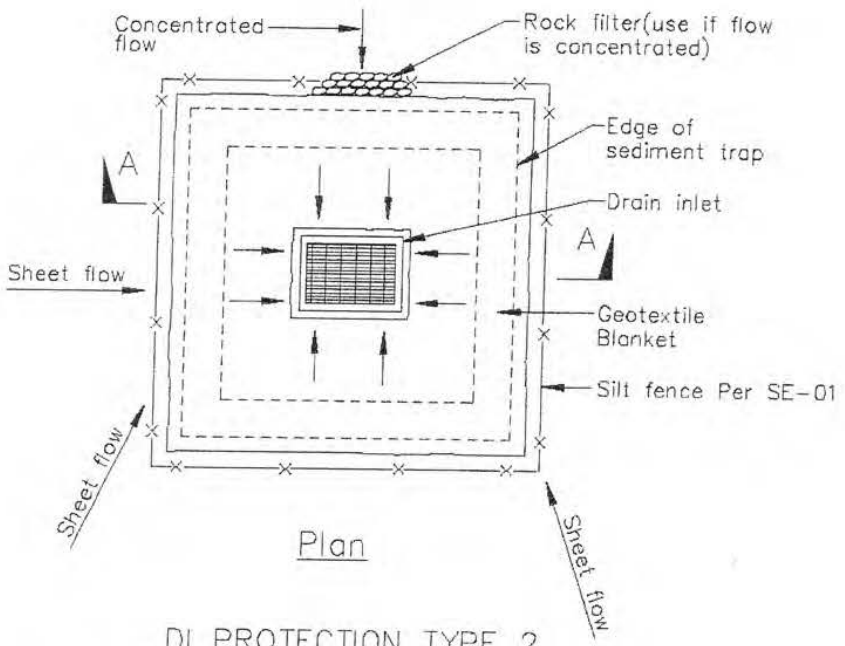
NOTES:

1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.

Storm Drain Inlet Protection SE-10



Section A-A

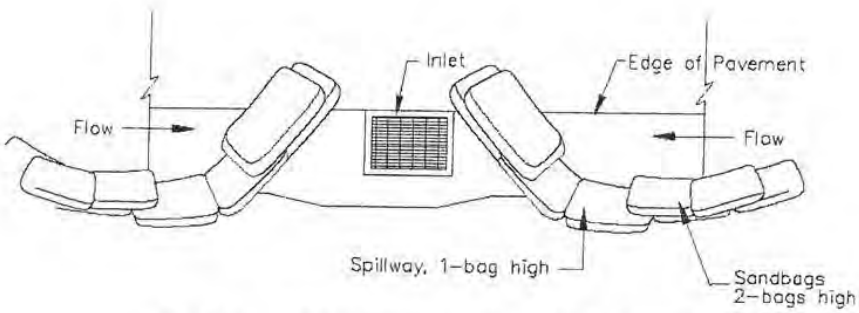


Plan

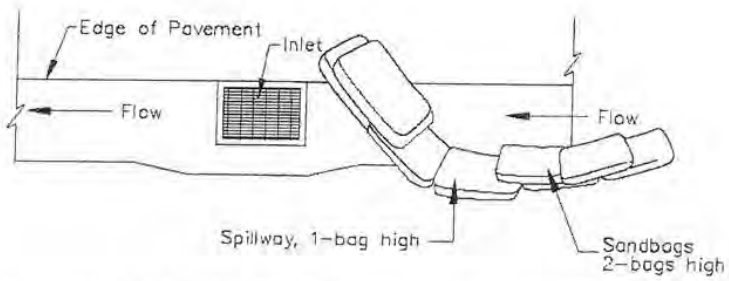
DI PROTECTION TYPE 2
NOT TO SCALE

Notes
1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.

SE-10 Storm Drain Inlet Protection



TYPICAL PROTECTION FOR INLET ON SUMP

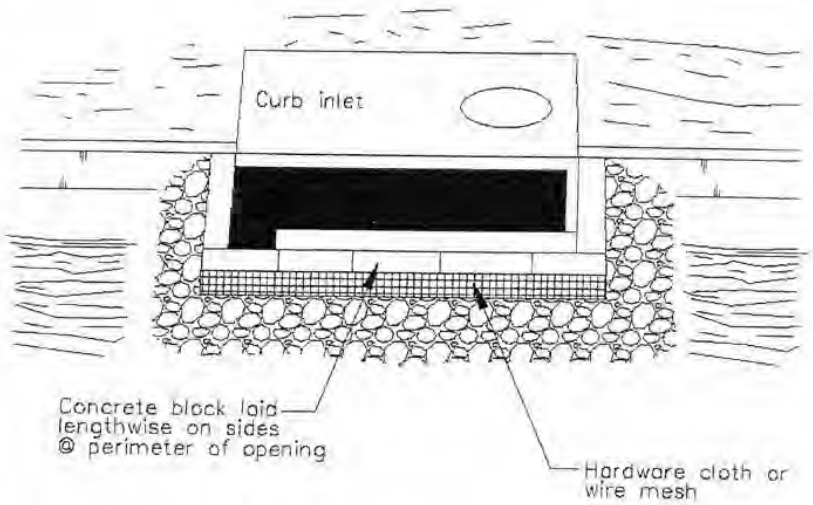


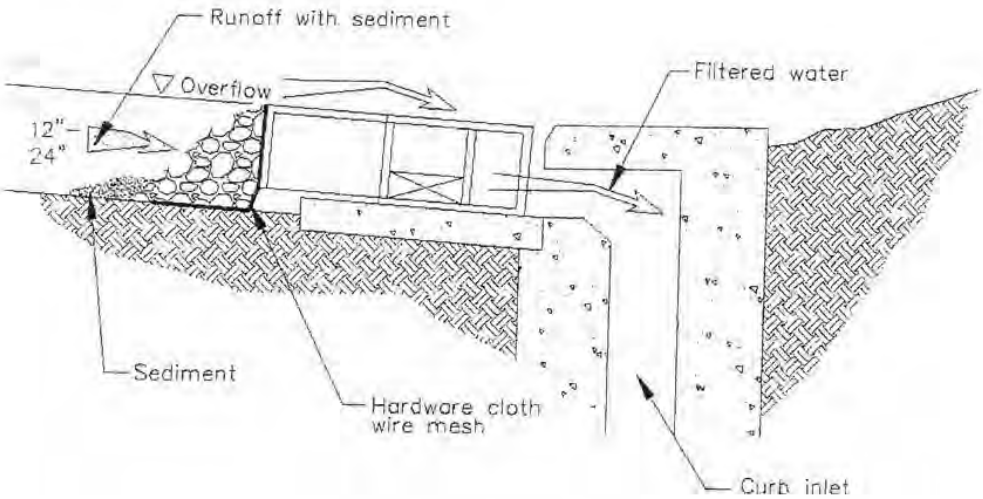
TYPICAL PROTECTION FOR INLET ON GRADE

NOTES:
1. Intended for short-term use.
2. Use to inhibit non-storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed
5. Not applicable in areas with high silts and clays without filter fabric.

DI PROTECTION TYPE 3
NOT TO SCALE

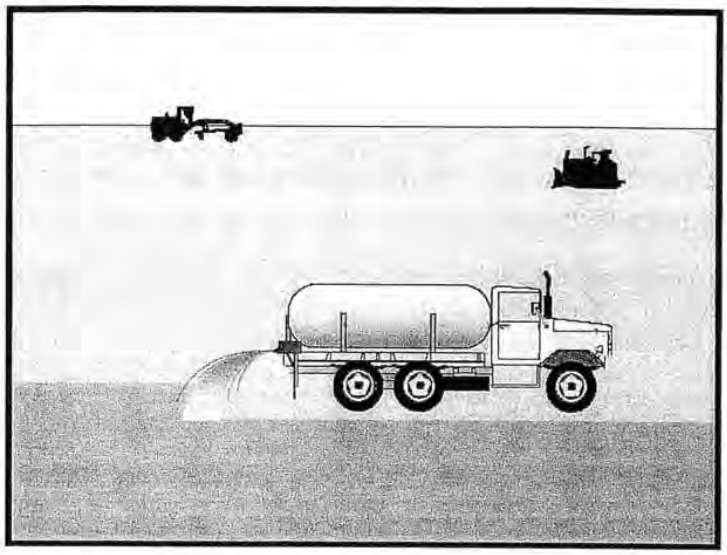
Storm Drain Inlet Protection SE-10





DI PROTECTION – TYPE 4
NOT TO SCALE

Wind Erosion Control WE-1



Objectives

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Wind erosion or dust control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

Suitable Applications

Wind erosion control BMPs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Sediment tracking onto paved roads
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Over watering may cause erosion.

WE-1 Wind Erosion Control

- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Effectiveness depends on soil, temperature, humidity, and wind velocity.
- Chemically treated sub grades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

Implementation

General

California's Mediterranean climate, with short wet seasons and long hot dry seasons, allows the soils to thoroughly dry out. During these dry seasons, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment.

Dust control, as a BMP, is a practice that is already in place for many construction activities. Los Angeles, the North Coast, and Sacramento, among others, have enacted dust control ordinances for construction activities that cause dust to be transported beyond the construction project property line.

Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). Approximately 90 percent of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and public health departments are in place in some regions within California.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Construction and Grading Permits: Require provisions for dust control plans.
- Opacity Emission Limits: Enforce compliance with California air pollution control laws.
- Increase Overall Enforcement Activities: Priority given to cases involving citizen complaints.
- Maintain Field Application Records: Require records of dust control measures from contractor;
- Stormwater Pollution Prevention Plan: (SWPPP): Integrate dust control measures into SWPPP.

Wind Erosion Control WE-1

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table shows dust control practices that can be applied to site conditions that cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time.

SITE CONDITION	DUST CONTROL PRACTICES								
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Silt Fences	Temporary Gravel Construction Entrances/Equipment Wash Down	Haul Truck Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X				X
Disturbed Areas Subject to Traffic			X	X	X		X		X
Material Stock Pile Stabilization			X	X		X			X
Demolition			X				X	X	
Clearing/ Excavation			X	X		X			X
Truck Traffic on Unpaved Roads			X	X	X		X	X	
Mud/Dirt Carry Out					X		X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (EC-1, Scheduling).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the project site.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.

WE-1 Wind Erosion Control

- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."
- Materials applied as temporary soil stabilizers and soil binders also generally provide wind erosion control benefits.
- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for wet suppression or chemical stabilization of exposed soils.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and vehicle wash down areas.
- Stabilize inactive construction sites using vegetation or chemical stabilization methods.
- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater.

Costs

Installation costs for water and chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Check areas protected to ensure coverage.
- Most dust control measures require frequent, often daily, or multiple times per day attention.

References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, 1992.

Wind Erosion Control WE-1

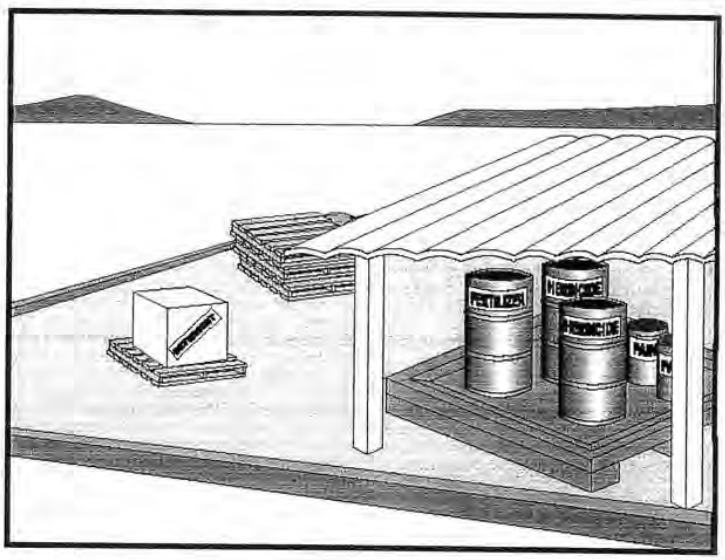
Caltrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Material Use

WM-2



Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ Primary Objective

☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

WM-2 Material Use

Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydro seeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted, or into a concrete washout pit or temporary sediment trap. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.

Material Use WM-2

- Require contractors to complete the "Report of Chemical Spray Forms" when spraying herbicides and pesticides.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two–week intervals in the non-rainy season to verify continued BMP implementation.
- Maintenance of this best management practice is minimal.
- Spot check employees and subcontractors throughout the job to ensure appropriate practices are being employed.

References

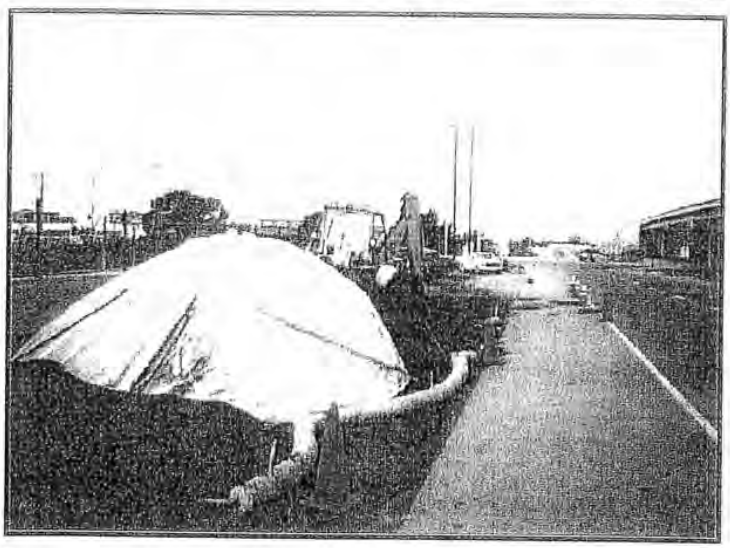
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Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Stockpile Management WM-3



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Description and Purpose

Stockpile Management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other materials.

Limitations

None identified.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

- Locate stockpiles a minimum of 50 ft away from concentrated flows of stormwater, drainage courses, and inlets.
- Protect all stockpiles from stormwater runon using a temporary perimeter sediment barrier such as berms, dikes, fiber rolls, silt fences, sandbag, gravel bags, or straw bale barriers.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

Soil stockpiles

- During the rainy season, soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- During the non-rainy season, soil stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- During the rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier at all times.
- During the non-rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of "cold mix"

- During the rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material at all times.
- During the non-rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Stockpiles/Storage of pressure treated wood with copper, chromium, and arsenic or ammonical, copper, zinc, and arsenate

- During the rainy season, treated wood should be covered with plastic or comparable material at all times.
- During the non-rainy season, treated wood should be covered with plastic or comparable material at all times and cold mix stockpiles should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Protection of Active Stockpiles

Active stockpiles of the identified materials should be protected further as follows:

- All stockpiles should be protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Stockpile Management WM-3

Costs

All of the above are low cost measures.

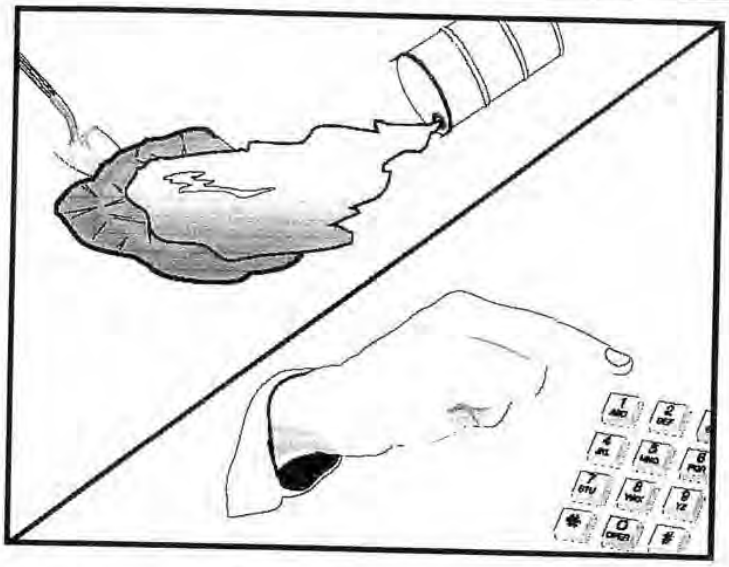
Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Spill Prevention and Control WM-4



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

Spill Prevention and Control WM-4

- Fuels
- Lubricants
- Other petroleum distillates

Limitations

- In some cases it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

Implementation

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.
- Do not bury or wash spills with water.

Spill Prevention and Control WM-4

- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

Spill Prevention and Control WM-4

- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

Reporting

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

Spill Prevention and Control WM-4

Vehicle and Equipment Maintenance

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Regularly inspect onsite vehicles and equipment for leaks and repair immediately
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur onsite, use designate areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Costs

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.

Spill Prevention and Control WM-4

- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

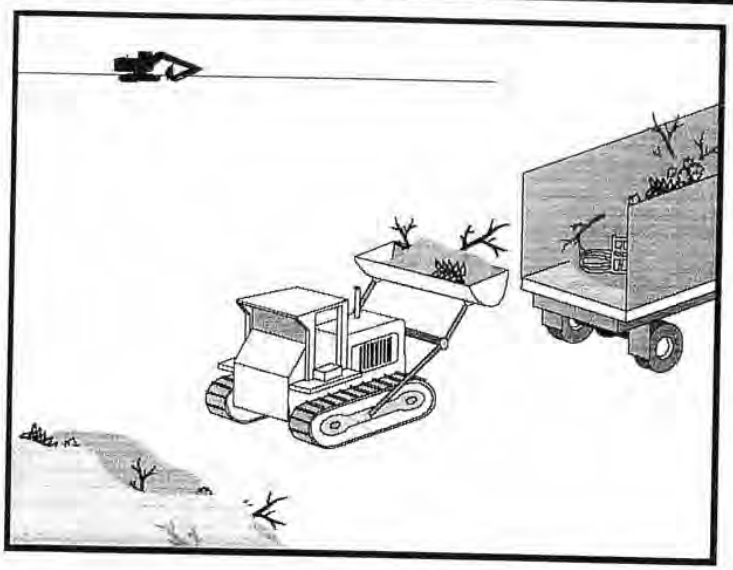
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Solid Waste Management WM-5



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

WM-5 Solid Waste Management

- Highway planting wastes, including vegetative material, plant containers, and packaging materials

Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

Solid Waste Management WM-5

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection, Storage, and Disposal

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runon should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.

WM-5 Solid Waste Management

- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

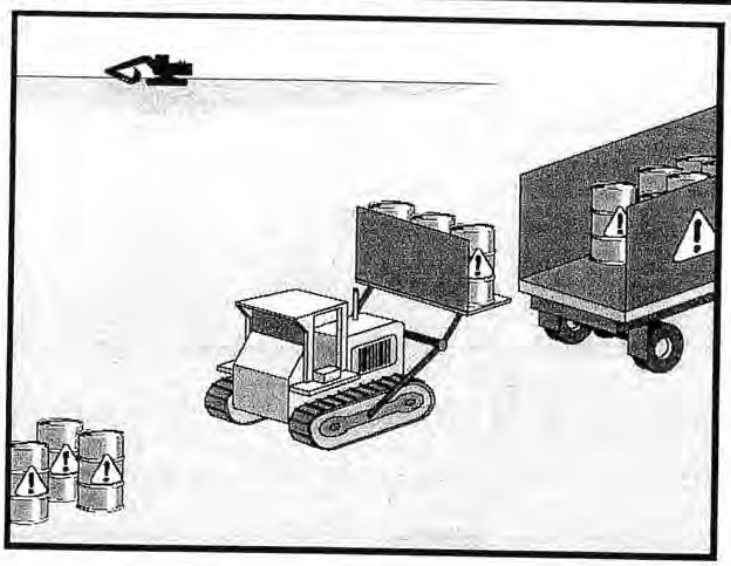
References

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Hazardous Waste Management WM-6



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Hazardous waste management practices are implemented on construction projects that generate waste from the use of:

- Petroleum Products
- Asphalt Products
- Concrete Curing Compounds
- Pesticides
- Palliatives
- Acids
- Septic Wastes
- Paints
- Stains
- Solvents
- Wood Preservatives
- Roofing Tar
- Any materials deemed a hazardous waste in California, Title 22 Division 4.5, or listed in 40 CFR Parts 110, 117, 261, or 302

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Hazardous Waste Management WM-6

In addition, sites with existing structures may contain wastes, which must be disposed of in accordance with federal, state, and local regulations. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints
- Asbestos
- PCBs (particularly in older transformers)

Limitations

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Nothing in this BMP relieves the contractor from responsibility for compliance with federal, state, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.
- This BMP does not cover aerially deposited lead (ADL) soils. For ADL soils refer to WM-7, Contaminated Soil Management.

Implementation

The following steps will help reduce stormwater pollution from hazardous wastes:

Material Use

- Wastes should be stored in sealed containers constructed of a suitable material and should be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179.
- All hazardous waste should be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.
- Waste containers should be stored in temporary containment facilities that should comply with the following requirements:
  - Temporary containment facility should provide for a spill containment volume equal to 1.5 times the volume of all containers able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest tank within its boundary, whichever is greater.
  - Temporary containment facility should be impervious to the materials stored there for a minimum contact time of 72 hours.
  - Temporary containment facilities should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be placed into drums after each rainfall. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. Non-hazardous liquids should be sent to an approved disposal site.
  - Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.

  - Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
  - Throughout the rainy season, temporary containment facilities should be covered during non-working days, and prior to rain events. Covered facilities may include use of plastic tarps for small facilities or constructed roofs with overhangs.
- Drums should not be overfilled and wastes should not be mixed.
- Unless watertight, containers of dry waste should be stored on pallets.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application. Allow time for infiltration and avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.
- Paint brushes and equipment for water and oil based paints should be cleaned within a contained area and should not be allowed to contaminate site soils, watercourses, or drainage systems. Waste paints, thinners, solvents, residues, and sludges that cannot be recycled or reused should be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths should be disposed of as solid waste.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and reuse thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.
- The following actions should be taken with respect to temporary contaminant:
  - Ensure that adequate hazardous waste storage volume is available.
  - Ensure that hazardous waste collection containers are conveniently located.
  - Designate hazardous waste storage areas onsite away from storm drains or watercourses and away from moving vehicles and equipment to prevent accidental spills.
  - Minimize production or generation of hazardous materials and hazardous waste on the job site.
  - Use containment berms in fueling and maintenance areas and where the potential for spills is high.
  - Segregate potentially hazardous waste from non-hazardous construction site debris.
  - Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.

Hazardous Waste Management WM-6

- Clearly label all hazardous waste containers with the waste being stored and the date of accumulation.
- Place hazardous waste containers in secondary containment.
- Do not allow potentially hazardous waste materials to accumulate on the ground.
- Do not mix wastes.
- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.

Waste Recycling Disposal

- Select designated hazardous waste collection areas onsite.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes, this can cause chemical reactions, making recycling impossible and complicating disposal.
- Recycle any useful materials such as used oil or water-based paint.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g., excess oil-based paint and sludge) is collected, removed, and disposed of only at authorized disposal areas.

Disposal Procedures

- Waste should be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility utilizing properly completed Uniform Hazardous Waste Manifest forms.
- A Department of Health Services certified laboratory should sample waste to determine the appropriate disposal facility.
- Properly dispose of rainwater in secondary containment that may have mixed with hazardous waste.
- Attention is directed to "Hazardous Material", "Contaminated Material", and "Aerially Deposited Lead" of the contract documents regarding the handling and disposal of hazardous materials.

Hazardous Waste Management WM-6

Education

- Educate employees and subcontractors on hazardous waste storage and disposal procedures.
- Educate employees and subcontractors on potential dangers to humans and the environment from hazardous wastes.
- Instruct employees and subcontractors on safety procedures for common construction site hazardous wastes.
- Instruct employees and subcontractors in identification of hazardous and solid waste.
- Hold regular meetings to discuss and reinforce hazardous waste management procedures (incorporate into regular safety meetings).
- The contractor's superintendent or representative should oversee and enforce proper hazardous waste management procedures and practices.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Hazardous waste should be regularly collected.
- A foreman or construction supervisor should monitor onsite hazardous waste storage and disposal procedures.
- Waste storage areas should be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.
- Hazardous spills should be cleaned up and reported in conformance with the applicable Material Safety Data Sheet (MSDS) and the instructions posted at the project site.

Hazardous Waste Management WM-6

- The National Response Center, at (800) 424-8802, should be notified of spills of federal reportable quantities in conformance with the requirements in 40 CFR parts 110, 117, and 302. Also notify the Governors Office of Emergency Services Warning Center at (916) 845-8911.
- A copy of the hazardous waste manifests should be provided.

References

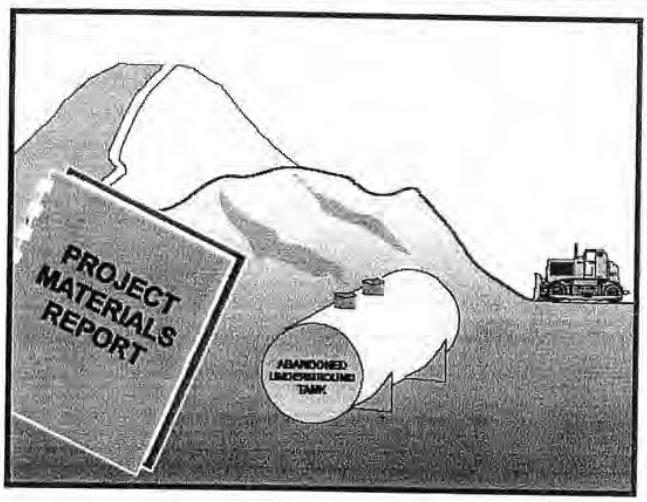
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Contaminated Soil Management WM-7



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the plans, specifications, and

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

CASQA
CALIFORNIA STORMWATER

Contaminated Soil Management WM-7

SWPPP. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil highlight the need for contractors to confirm a site assessment is completed before earth moving begins.

The following steps will help reduce stormwater pollution from contaminated soil:

- Conduct thorough, pre-construction inspections of the site and review documents related to the site. If inspection or reviews indicated presence of contaminated soils, develop a plan before starting work.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills. Contaminated soil can be expensive to treat and dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- The contractor may further identify contaminated soils by investigating:
  - Past site uses and activities
  - Detected or undetected spills and leaks
  - Acid or alkaline solutions from exposed soil or rock formations high in acid or alkaline forming elements
  - Contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
  - Suspected soils should be tested at a certified laboratory.

Education

- Have employees and subcontractors complete a safety training program which meets 29 CFR 1910.120 and 8 CCR 5192 covering the potential hazards as identified, prior to performing any excavation work at the locations containing material classified as hazardous.
- Educate employees and subcontractors in identification of contaminated soil and on contaminated soil handling and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).

Handling Procedures for Material with Aerially Deposited Lead (ADL)

- Materials from areas designated as containing (ADL) may, if allowed by the contract special provisions, be excavated, transported, and used in the construction of embankments and/or backfill.
- Excavation, transportation, and placement operations should result in no visible dust.
- Caution should be exercised to prevent spillage of lead containing material during transport.

Contaminated Soil Management WM-7

- Quality should be monitored during excavation of soils contaminated with lead.

Handling Procedures for Contaminated Soils

- Minimize onsite storage. Contaminated soil should be disposed of properly in accordance with all applicable regulations. All hazardous waste storage will comply with the requirements in Title 22, CCR, Sections 66265.250 to 66265.260.
- Test suspected soils at an approved certified laboratory.
- Work with the local regulatory agencies to develop options for treatment or disposal if the soil is contaminated.
- Avoid temporary stockpiling of contaminated soils or hazardous material.
- Take the following precautions if temporary stockpiling is necessary:
  - Cover the stockpile with plastic sheeting or tarps.
  - Install a berm around the stockpile to prevent runoff from leaving the area.
  - Do not stockpile in or near storm drains or watercourses.
- Remove contaminated material and hazardous material on exteriors of transport vehicles and place either into the current transport vehicle or into the excavation prior to the vehicle leaving the exclusion zone.
- Monitor the air quality continuously during excavation operations at all locations containing hazardous material.
- Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the contaminated material and the hazardous material.
- Collect water from decontamination procedures and treat or dispose of it at an appropriate disposal site.
- Collect non-reusable protective equipment, once used by any personnel, and dispose of at an appropriate disposal site.
- Install temporary security fence to surround and secure the exclusion zone. Remove fencing when no longer needed.
- Excavate, transport, and dispose of contaminated material and hazardous material in accordance with the rules and regulations of the following agencies (the specifications of these agencies supersede the procedures outlined in this BMP):
  - United States Department of Transportation (USDOT)
  - United States Environmental Protection Agency (USEPA)
  - California Environmental Protection Agency (CAL-EPA)

Contaminated Soil Management WM-7

- California Division of Occupation Safety and Health Administration (CAL-OSHA)
- Local regulatory agencies

Procedures for Underground Storage Tank Removals

- Prior to commencing tank removal operations, obtain the required underground storage tank removal permits and approval from the federal, state, and local agencies that have jurisdiction over such work.
- To determine if it contains hazardous substances, arrange to have tested, any liquid or sludge found in the underground tank prior to its removal.
- Following the tank removal, take soil samples beneath the excavated tank and perform analysis as required by the local agency representative(s).
- The underground storage tank, any liquid or sludge found within the tank, and all contaminated substances and hazardous substances removed during the tank removal and transported to disposal facilities permitted to accept such waste.

Water Control

- All necessary precautions and preventive measures should be taken to prevent the flow of water, including ground water, from mixing with hazardous substances or underground storage tank excavations. Such preventative measures may consist of, but are not limited to, berms, cofferdams, grout curtains, freeze walls, and seal course concrete or any combination thereof.
- If water does enter an excavation and becomes contaminated, such water, when necessary to proceed with the work, should be discharged to clean, closed top, watertight transportable holding tanks, treated, and disposed of in accordance with federal, state, and local laws.

Costs

Prevention of leaks and spills is inexpensive. Treatment or disposal of contaminated soil can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Arrange for contractor's Water Pollution Control Manager, foreman, and/or construction supervisor to monitor onsite contaminated soil storage and disposal procedures.
- Monitor air quality continuously during excavation operations at all locations containing hazardous material.
- Coordinate contaminated soils and hazardous substances/waste management with the appropriate federal, state, and local agencies.

Contaminated Soil Management WM-7

- Implement WM-4, Spill Prevention and Control, to prevent leaks and spills as much as possible.

References

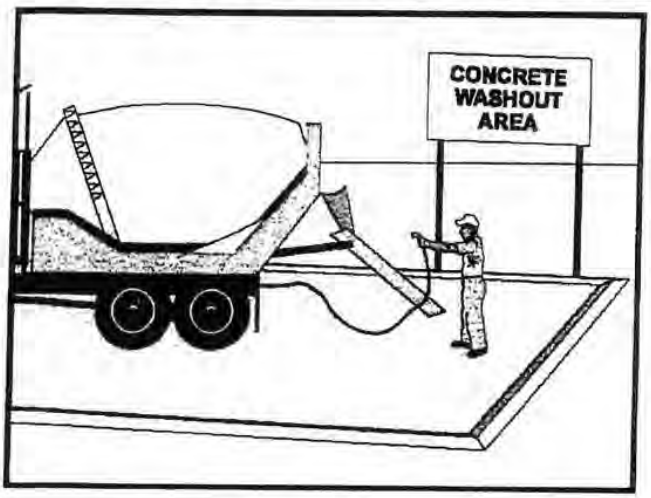
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Concrete Waste Management WM-8



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employee and subcontractors.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result form demolition activities
- Slurries containing portland cement concrete (PCC) or asphalt concrete (AC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition
- Concrete trucks and other concrete-coated equipment are washed onsite
- Mortar-mixing stations exist
- See also NS-8, Vehicle and Equipment Cleaning

Limitations

- Offsite washout of concrete wastes may not always be possible.

Concrete Waste Management WM-8

- Below grade concrete washout facilities are typical. Above grade facilities are used if excavation is not practical.
- A foreman or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.
- Saw-cut PCC slurry should not be allowed to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine. Saw cutting residue should not be allowed to flow across the pavement and should not be left on the surface of the pavement. See also NS-3, Paving and Grinding Operations; and WM-10, Liquid Waste Management.
- Slurry residue should be vacuumed and disposed in a temporary pit (as described in OnSite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below) and allowed to dry. Dispose of dry slurry residue in accordance with WM-5, Solid Waste Management.

Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures

- Temporary concrete washout facilities should be located a minimum of 50 ft from storm drain inlets, open drainage facilities, and watercourses. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
- Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Temporary washout facilities should have a temporary pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
- Washout of concrete trucks should be performed in designated areas only.
- Only concrete from mixer truck chutes should be washed into concrete wash out.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per WM-5, Solid Waste Management. Dispose of hardened concrete on a regular basis.
- Temporary Concrete Washout Facility (Type Above Grade)
  - Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and

Concrete Waste Management WM-8

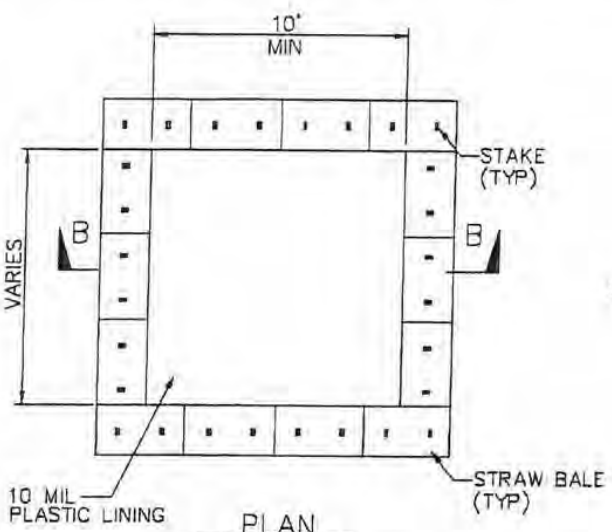
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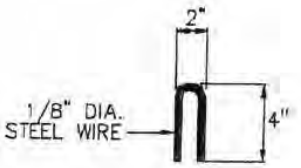
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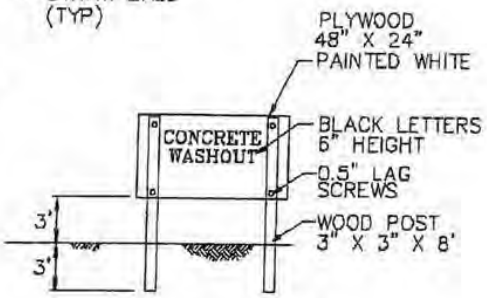
Concrete Waste Management WM-8



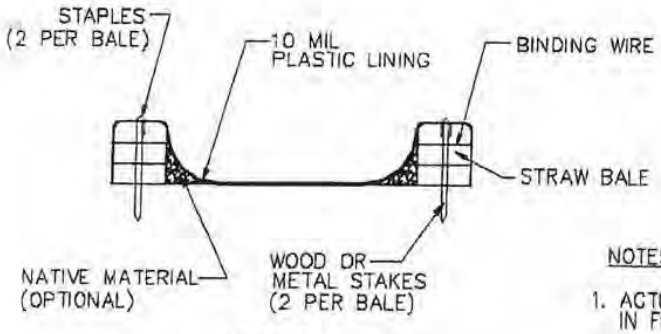
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"
WITH STRAW BALES



STAPLE DETAIL



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)

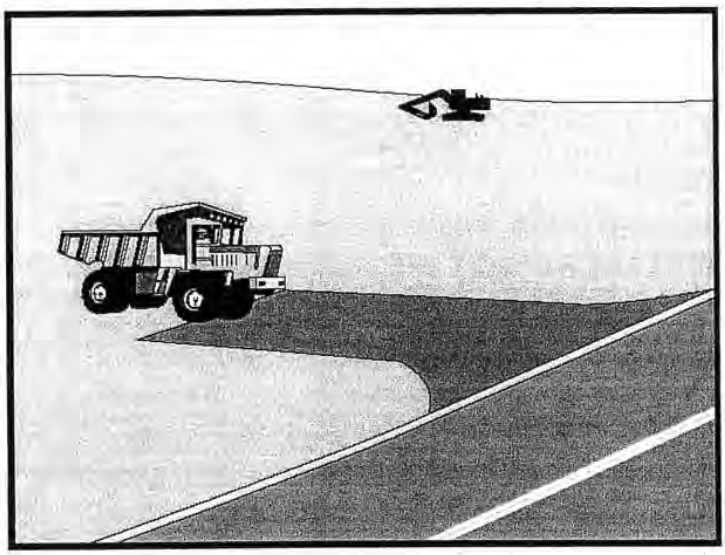


SECTION B-B
NOT TO SCALE

NOTES

1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

Stabilized Construction Entrance/Exit TC-1



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

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Stabilized Construction Entrance/Exit TC-1

Implementation

General

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft minimum, and 30 ft minimum width.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.

Stabilized Construction Entrance/Exit TC-1

- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from $1,200 to $4,800 each, averaging $2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from $1,200 - $6,000 each, averaging $3,600 per entrance.

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Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

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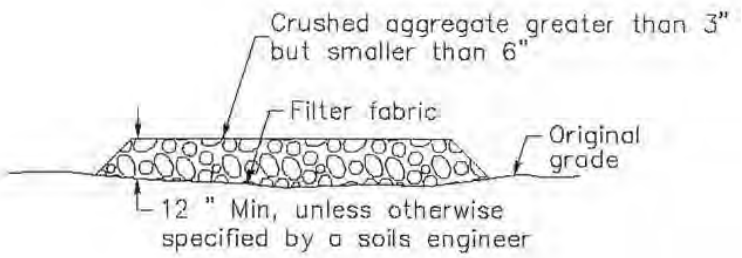
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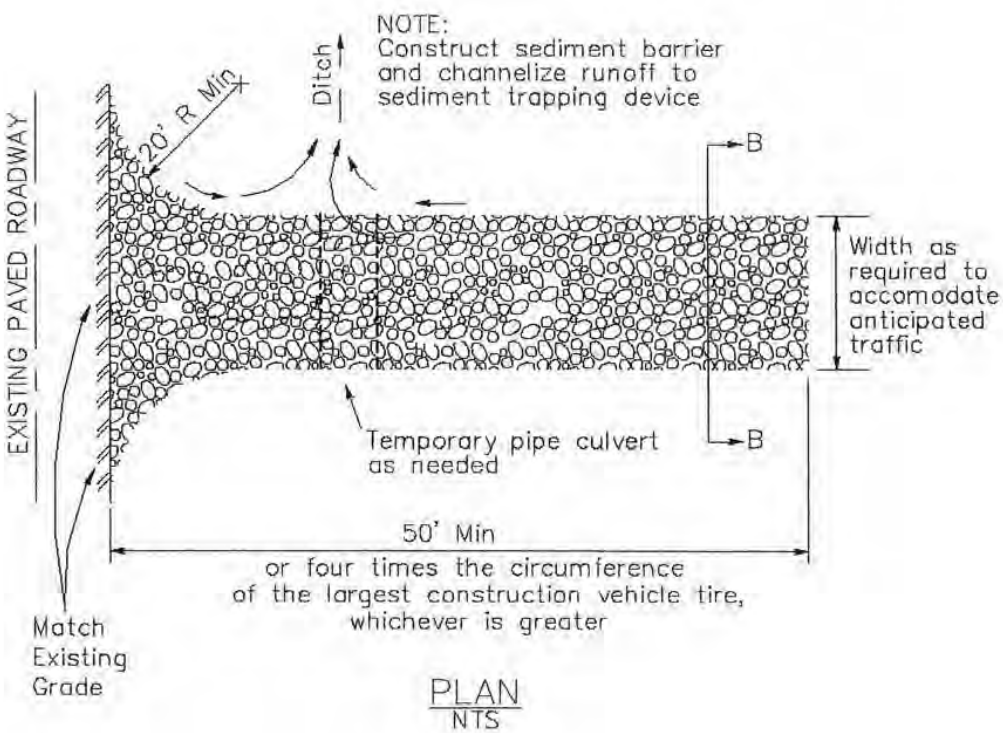
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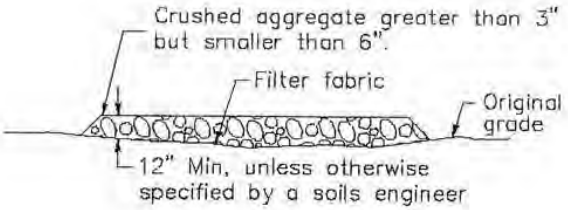


SECTION B–B
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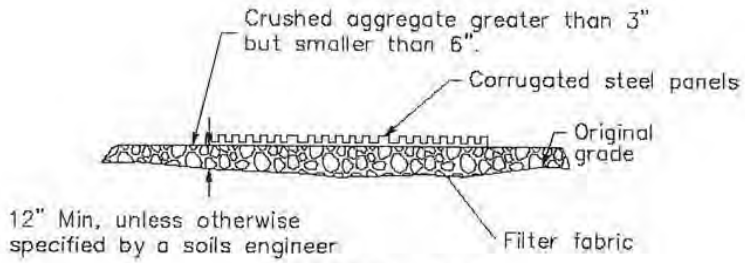


PLAN
NTS

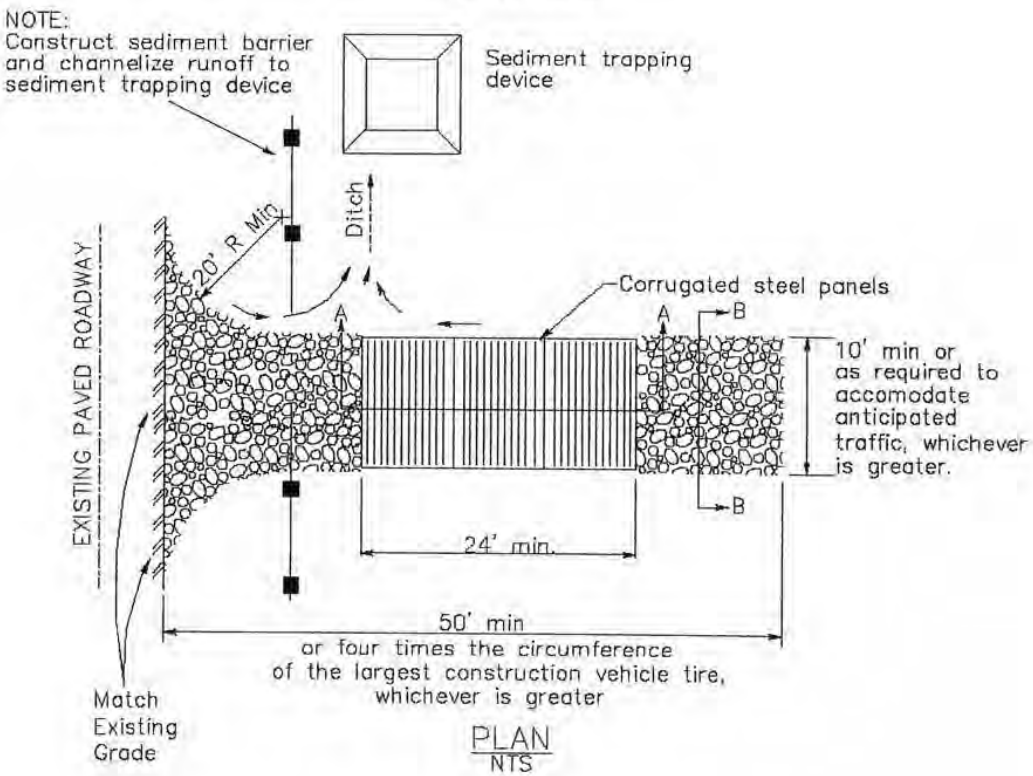
Stabilized Construction Entrance/Exit TC-1



SECTION B–B
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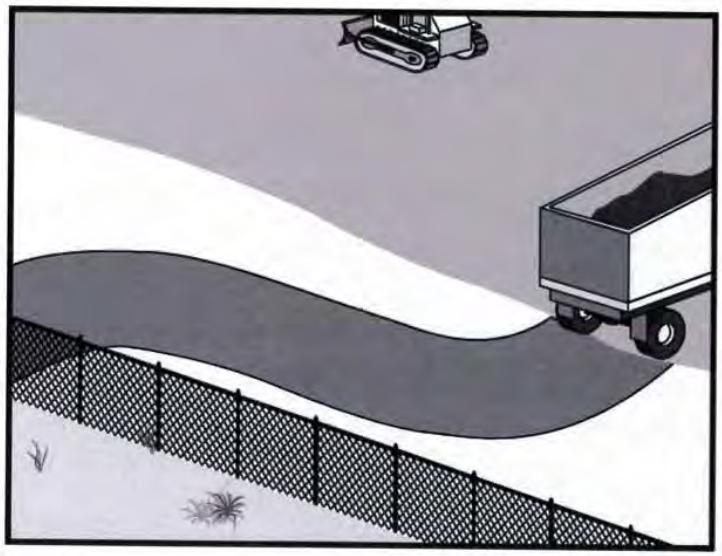


SECTION A–A
NOT TO SCALE



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Stabilized Construction Roadway TC-2



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion and control dust.

Suitable Applications

This BMP should be applied for the following conditions:

- Temporary Construction Traffic:
  - Phased construction projects and offsite road access
  - Construction during wet weather
- Construction roadways and detour roads:
  - Where mud tracking is a problem during wet weather
  - Where dust is a problem during dry weather
  - Adjacent to water bodies
  - Where poor soils are encountered

Limitations

- The roadway must be removed or paved when construction is complete.

TC-2 Stabilized Construction Roadway

- Certain chemical stabilization methods may cause stormwater or soil pollution and should not be used. See WE-1, Wind Erosion Control.
- Management of construction traffic is subject to air quality control measures. Contact the local air quality management agency.
- Materials will likely need to be removed prior to final project grading and stabilization.
- Use of this BMP may not be applicable to very short duration projects.

Implementation

General

Areas that are graded for construction vehicle transport and parking purposes are especially susceptible to erosion and dust. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires that generate significant quantities of sediment that may pollute nearby streams or be transported offsite on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Efficient construction road stabilization not only reduces onsite erosion but also can significantly speed onsite work, avoid instances of immobilized machinery and delivery vehicles, and generally improve site efficiency and working conditions during adverse weather

Installation/Application Criteria

Permanent roads and parking areas should be paved as soon as possible after grading. As an alternative where construction will be phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems. Temporary gravel roadway should be considered during the rainy season and on slopes greater than 5%.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible. Slope should not exceed 15%. Roadways should be carefully graded to drain transversely. Provide drainage swales on each side of the roadway in the case of a crowned section or one side in the case of a super elevated section. Simple gravel berms without a trench can also be used.

Installed inlets should be protected to prevent sediment laden water from entering the storm sewer system (SE-10, Storm Drain Inlet Protection). In addition, the following criteria should be considered.

- Road should follow topographic contours to reduce erosion of the roadway.
- The roadway slope should not exceed 15%.
- Chemical stabilizers or water are usually required on gravel or dirt roads to prevent dust (WE-1, Wind Erosion Control).
- Properly grade roadway to prevent runoff from leaving the construction site.
- Design stabilized access to support heaviest vehicles and equipment that will use it.

Stabilized Construction Roadway TC-2

- Stabilize roadway using aggregate, asphalt concrete, or concrete based on longevity, required performance, and site conditions. The use of cold mix asphalt or asphalt concrete (AC) grindings for stabilized construction roadway is not allowed.
- Coordinate materials with those used for stabilized construction entrance/exit points.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, impact weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep all temporary roadway ditches clear.
- When no longer required, remove stabilized construction roadway and re-grade and repair slopes.
- Periodically apply additional aggregate on gravel roads.
- Active dirt construction roads are commonly watered three or more times per day during the dry season.

Costs

Gravel construction roads are moderately expensive, but cost is often balanced by reductions in construction delay. No additional costs for dust control on construction roads should be required above that needed to meet local air quality requirements.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

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Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

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Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Dewatering Operations NS-2



Objectives

EC	Erosion Control	
SE	Sediment Control	☒
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation must be removed from a work location so that construction work may be accomplished.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (stormwater) from depressed areas at a construction site.

Limitations

- Site conditions will dictate design and use of dewatering operations.
- The controls discussed in this best management practice (BMP) address sediment only.
- The controls detailed in this BMP only allow for minimal settling time for sediment particles. Use only when site conditions restrict the use of the other control methods.
- Dewatering operations will require, and must comply with, applicable local permits.

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

SE-9: Straw Bale Barrier

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NS-2 Dewatering Operations

- Avoid dewatering discharges where possible by using the water for dust control, by infiltration, etc.

Implementation

- Dewatering non-stormwater cannot be discharged without prior notice to and approval from the Regional Water Quality Control Board (RWQCB) and local stormwater management agency. This includes stormwater that is co-mingled with groundwater or other non-stormwater sources. Once the discharge is allowed, appropriate BMPs must be implemented to ensure the discharge complies with all permit requirements and regional and watershed-specific requirements.
- RWQCB may require a separate NPDES permit prior to the dewatering discharge of non-stormwater. These permits will have specific testing, monitoring, and discharge requirements and can take significant time to obtain.
- The flow chart shown in Figure 1 should be utilized to guide dewatering operations.
- The owner will coordinate monitoring and permit compliance.
- Additional permits or permissions from other agencies may be required for dewatering cofferdams or diversions.
- Dewatering discharges must not cause erosion at the discharge point.

A variety of methods can be used to treat water during dewatering operations. Several devices are presented below and provide options to achieve sediment removal. The size of particles present in the sediment and Permit or receiving water limitations on sediment are key considerations for selecting sediment treatment option(s); in some cases, the use of multiple devices may be appropriate.

Sediment Basin (see also SE-2)

Description:

- A sediment basin is a temporary basin with a controlled release structure that is formed by excavation or construction of an embankment to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment basins are generally larger than Sediment Traps (SE-3).

Appropriate Applications:

- Effective for the removal of gravel, sand, silt, some metals that settle out with the sediment, and trash.

Implementation:

- Excavation and construction of related facilities is required.
- Temporary sediment basins must be fenced if safety is a concern.
- Outlet protection is required to prevent erosion at the outfall location.

Dewatering Operations NS-2

Maintenance:

- Maintenance is required for safety fencing, vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-half.

Sediment Trap (See also SE-3)

Description:

- A sediment trap is a temporary basin formed by excavation and/or construction of an earthen embankment across a waterway or low drainage area to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment traps are generally smaller than Sediment Basins (SE-2).

Appropriate Applications:

Effective for the removal of large and medium sized particles (sand and gravel) and some metals that settle out with the sediment.

Implementation:

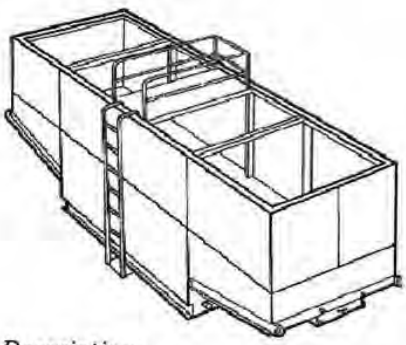
- Excavation and construction of related facilities is required.
- Trap inlets should be located to maximize the travel distance to the trap outlet.
- Use rock or vegetation to protect the trap outlets against erosion.

Maintenance:

- Maintenance is required for vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

NS-2 Dewatering Operations

Weir Tanks



Description:

- A weir tank separates water and waste by using weirs. The configuration of the weirs (over and under weirs) maximizes the residence time in the tank and determines the waste to be removed from the water, such as oil, grease, and sediments.

Appropriate Applications:

- The tank removes trash, some settleable solids (gravel, sand, and silt), some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal must be by licensed waste disposal company.

Dewatering Operations NS-2

Dewatering Tanks



Description:

- A dewatering tank removes debris and sediment. Flow enters the tank through the top, passes through a fabric filter, and is discharged through the bottom of the tank. The filter separates the solids from the liquids.

Appropriate Applications:

- The tank removes trash, gravel, sand, and silt, some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

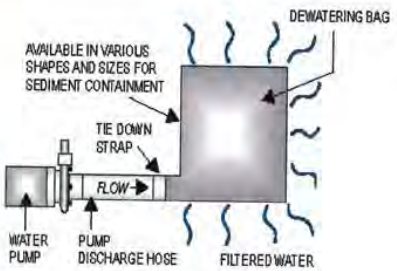
Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal must be by licensed waste disposal company.

NS-2 Dewatering Operations

Gravity Bag Filter





Description:

- A gravity bag filter, also referred to as a dewatering bag, is a square or rectangular bag made of non-woven geotextile fabric that collects sand, silt, and fines.

Appropriate Applications:

- Effective for the removal of sediments (gravel, sand, and silt). Some metals are removed with the sediment.

Implementation:

- Water is pumped into one side of the bag and seeps through the bottom and sides of the bag.
- A secondary barrier, such as a rock filter bed or straw/hay bale barrier, is placed beneath and beyond the edges of the bag to capture sediments that escape the bag.

Maintenance:

- Inspection of the flow conditions, bag condition, bag capacity, and the secondary barrier is required.
- Replace the bag when it no longer filters sediment or passes water at a reasonable rate.
- The bag is disposed of offsite.

Dewatering Operations NS-2

Sand Media Particulate Filter





Description:

- Water is treated by passing it through canisters filled with sand media. Generally, sand filters provide a final level of treatment. They are often used as a secondary or higher level of treatment after a significant amount of sediment and other pollutants have been removed using other methods.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, and silt and some metals, as well as the reduction of biochemical oxygen demand (BOD) and turbidity.
- Sand filters can be used for stand-alone treatment or in conjunction with bag and cartridge filtration if further treatment is required.
- Sand filters can also be used to provide additional treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filters require regular service to monitor and maintain the level of the sand media. If subjected to high loading rates, filters can plug quickly.
- Venders generally provide data on maximum head loss through the filter. The filter should be monitored daily while in use, and cleaned when head loss reaches target levels.
- If cleaned by backwashing, the backwash water may need to be hauled away for disposal, or returned to the upper end of the treatment train for another pass through the series of dewatering BMPs.

NS-2 Dewatering Operations

Pressurized Bag Filter





Description:

- A pressurized bag filter is a unit composed of single filter bags made from polyester felt material. The water filters through the unit and is discharged through a header. Vendors provide bag filters in a variety of configurations. Some units include a combination of bag filters and cartridge filters for enhanced contaminant removal.

Appropriate Applications:

- Effective for the removal of sediment (sand and silt) and some metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Oil absorbent bags are available for hydrocarbon removal.
- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filter bags require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Dewatering Operations NS-2

Cartridge Filter



Description:

- Cartridge filters provide a high degree of pollutant removal by utilizing a number of individual cartridges as part of a larger filtering unit. They are often used as a secondary or higher (polishing) level of treatment after a significant amount of sediment and other pollutants are removed. Units come with various cartridge configurations (for use in series with bag filters) or with a larger single cartridge filtration unit (with multiple filters within).

Appropriate Applications:

- Effective for the removal of sediment (sand, silt, and some clays) and metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Hydrocarbons can effectively be removed with special resin cartridges.
- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance.

Maintenance:

- The cartridges require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Costs

- Sediment controls are low to high cost measures depending on the dewatering system that is selected. Pressurized filters tend to be more expensive than gravity settling, but are often more effective. Simple tanks are generally rented on a long-term basis (one or more months) and can range from $360 per month for a 1,000 gallon tank to $2,660 per month for a 10,000 gallon tank. Mobilization and demobilization costs vary considerably.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.

NS-2 Dewatering Operations

- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Unit-specific maintenance requirements are included with the description of each unit.
- Sediment removed during the maintenance of a dewatering device may be either spread onsite and stabilized, or disposed of at a disposal site as approved by the owner.
- Sediment that is commingled with other pollutants must be disposed of in accordance with all applicable laws and regulations and as approved by the owner.

References

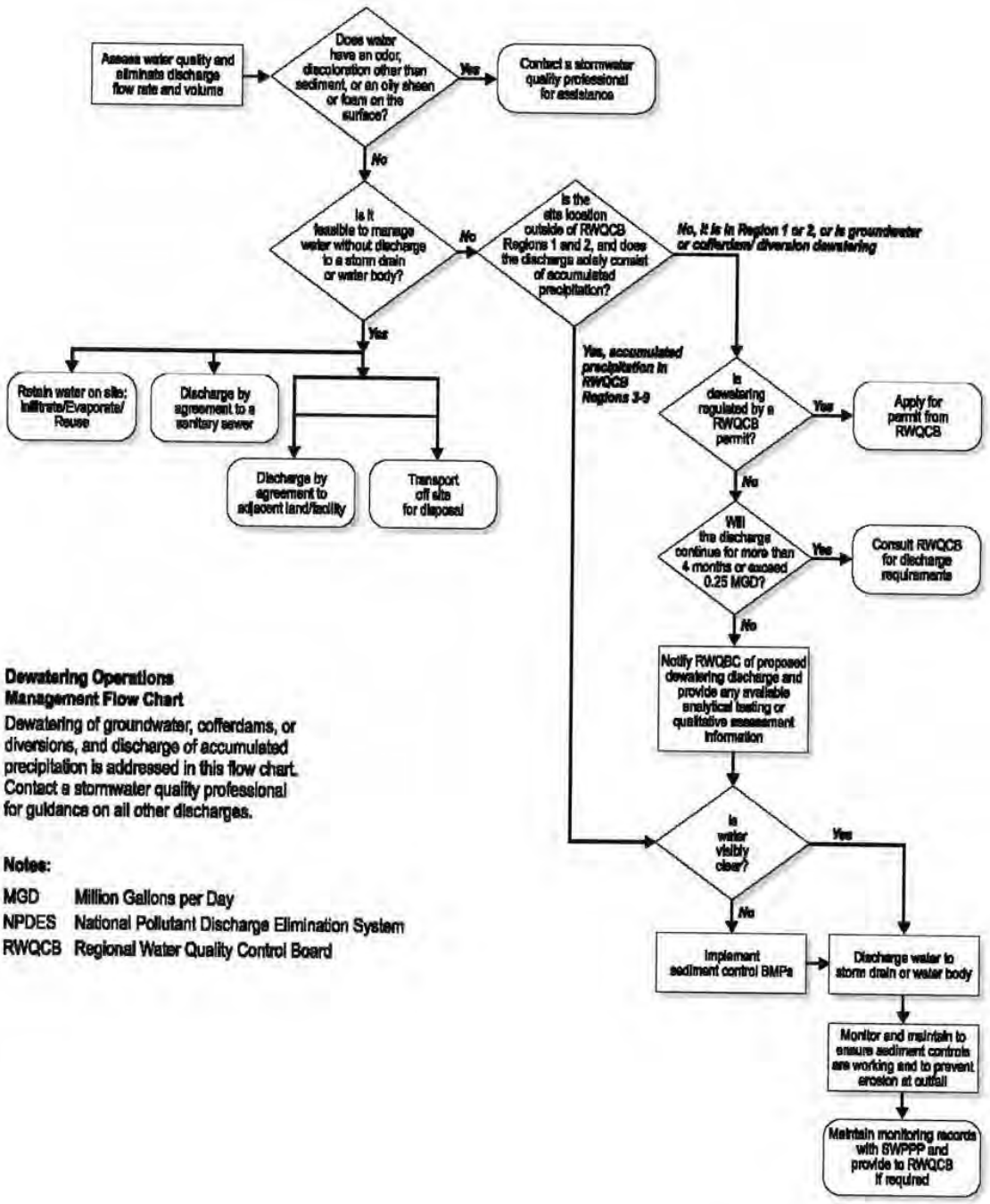
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Dewatering Operations NS-2



Dewatering Operations Management Flow Chart

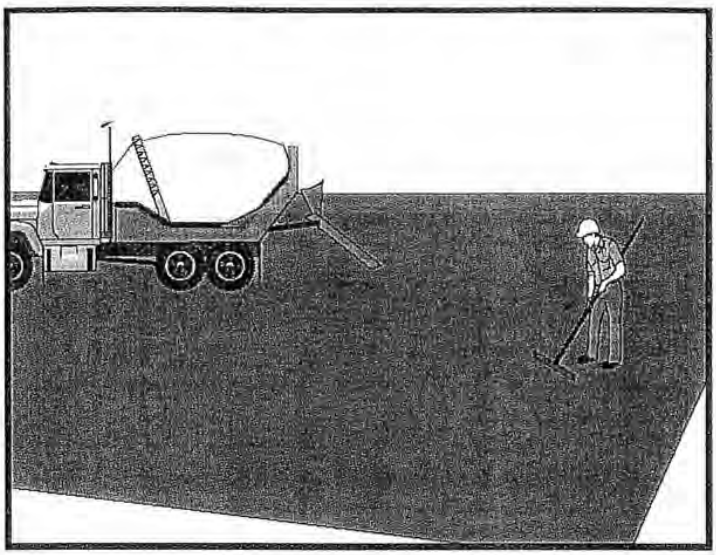
Dewatering of groundwater, cofferdams, or diversions, and discharge of accumulated precipitation is addressed in this flow chart. Contact a stormwater quality professional for guidance on all other discharges.

Notes:

MGD Million Gallons per Day
NPDES National Pollutant Discharge Elimination System
RWQCB Regional Water Quality Control Board

Figure 1
Operations Flow Chart

Paving and Grinding Operations NS-3



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☒

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

Suitable Applications

These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Finer solids are not effectively removed by filtration systems.
- Paving opportunities may be limited during wet weather.

Implementation

General

- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is in the forecast.
- Train employees and sub-contractors in pollution prevention and reduction.
- Store materials away from drainage courses to prevent stormwater runon (see WM-1, Material Delivery and Storage).

NS-3 Paving and Grinding Operations

- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or to trap and filter sediment.
- If paving involves an onsite mixing plant, follow the stormwater permitting requirements for industrial activities.
- Stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses. These materials should be stored consistent with WM-3, Stockpile Management.
- Disposal of PCC and AC waste should be in conformance with WM-8, Concrete Waste Management.

Saw Cutting, Grinding, and Pavement Removal

- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, uncompacted or loose AC, tack coats, equipment cleaners, or unrelated paving materials:
  - AC grindings, pieces, or chunks used in embankments or shoulder backing must not be allowed to enter any storm drains or watercourses. Install silt fence until structure is stabilized or permanent controls are in place. Examples of temporary perimeter controls can be found in EC-9, Earth Dikes and Drainage Swales; SE-1, Silt Fence; or SE-5, Fiber Rolls.
  - Collect and remove all broken asphalt and recycle when practical. Old or spilled asphalt must be recycled or disposed.
  - Any AC chunks and pieces used in embankments must be placed above the water table and covered by at least 1 ft of material.
- Do not allow saw-cut slurry to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine, should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. See also WM-8, Concrete Waste Management, and WM-10, Liquid Waste Management.
- Dig out activities should not be conducted in the rain.
- Collect dig out material by mechanical or manual methods. This material may be recycled for use as shoulder backing or base material.
- If dig out material cannot be recycled, transport the material back to an approved storage site.

Asphaltic Concrete Paving

- If paving involves asphaltic cement concrete, follow these steps:

Paving and Grinding Operations NS-3

- Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks. Vacuum or sweep loose sand and gravel and properly dispose of this waste by referring to WM-5, Solid Waste Management.
- Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

Portland Cement Concrete Paving

- Do not wash sweepings from exposed aggregate concrete into a storm drain system. Collect and return to aggregate base stockpile or dispose of properly.
- Allow aggregate rinse to settle. Then, either allow rinse water to dry in a temporary pit as described in WM-8, Concrete Waste Management, or pump the water to the sanitary sewer if allowed by the local wastewater authority.

Sealing Operations

- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate must not be allowed to enter any storm drain or water courses. Apply temporary perimeter controls until structure is stabilized.
- Drainage inlet structures and manholes should be covered with filter fabric during application of seal coat, tack coat, slurry seal, and fog seal.
- Seal coat, tack coat, slurry seal, or fog seal should not be applied if rainfall is predicted to occur during the application or curing period.

Paving Equipment

- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials rather than burying. See NS-10, Vehicle and Equipment Maintenance, WM-4, Spill Prevention and Control, and WM-10, Liquid Waste Management.
- Substances used to coat asphalt transport trucks, and asphalt spreading equipment should not contain soap and should be non-foaming and non-toxic.
- Use only non-toxic substances to coat asphalt transport trucks and asphalt spreading equipment.
- Paving equipment parked onsite should be parked over plastic to prevent soil contamination.
- Clean asphalt coated equipment offsite whenever possible. When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in WM-5, Solid Waste Management. Any cleaning onsite should follow NS-8, Vehicle and Equipment Cleaning.

NS-3 Paving and Grinding Operations

Thermoplastic Striping

- Thermoplastic striper and pre-heater equipment shutoff valves should be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering drain inlets, the stormwater drainage system, or watercourses.
- Pre-heaters should be filled carefully to prevent splashing or spilling of hot thermoplastic. Leave six inches of space at the top of the pre-heater container when filling thermoplastic to allow room for material to move when the vehicle is deadheaded.
- Do not pre-heat, transfer, or load thermoplastic near drain inlets or watercourses.
- Clean truck beds daily of loose debris and melted thermoplastic. When possible, recycle thermoplastic material.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near drain inlets, the stormwater drainage system, or watercourses.
- Melting tanks should be loaded with care and not filled to beyond six inches from the top to leave room for splashing when vehicle is deadheaded.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- On large-scale projects, use mechanical or manual methods to collect excess bituminous material from the roadway after removal of markers.

Costs

- All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep ample supplies of drip pans or absorbent materials onsite.
- Inspect and maintain machinery regularly to minimize leaks and drips.

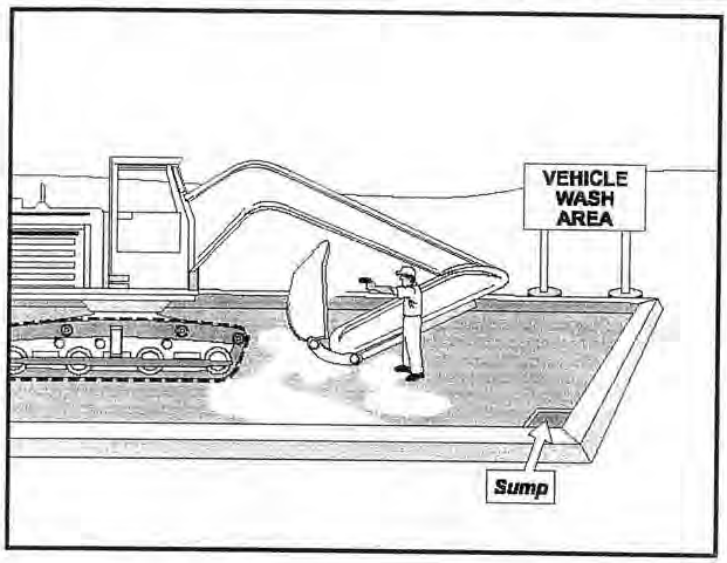
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Hot Mix Asphalt-Paving Handbook AC 150/5370-14, Appendix I, U.S. Army Corps of Engineers, July 1991.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Vehicle and Equipment Cleaning NS-8



Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TR-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

NS-8 Vehicle and Equipment Cleaning

- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried, and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runon and runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

Vehicle and Equipment Cleaning NS-8

Inspection and Maintenance

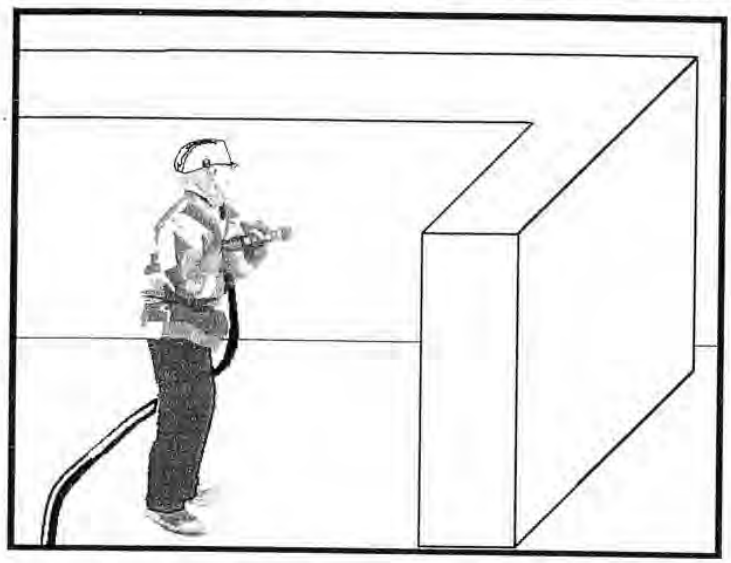
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.

Concrete Finishing NS-13



Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	☑

Potential Alternatives

None

Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.

Limitations

None identified.

Implementation

- Collect and properly dispose of water from high-pressure water blasting operations.
- Collect contaminated water from blasting operations at the top of slopes. Transport or dispose of contaminated water while using BMPs such as those for erosion control. Refer to EC-9, Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.

NS-13 Concrete Finishing

- Direct water from blasting operations away from inlets and watercourses to collection areas for infiltration or other means of removal (dewatering). Refer to NS-2 De-Watering Operations.
- Protect inlets during sandblasting operations. Refer to SE-10, Storm Drain Inlet Protection.
- Refer to WM-8, Concrete Waste Management for disposal of concrete based debris.
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- When blast residue contains a potentially hazardous waste, refer to WM-6, Hazardous Waste Management.

Costs

These measures are generally of low cost.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Sweep or vacuum up debris from sandblasting at the end of each shift.
- At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area.

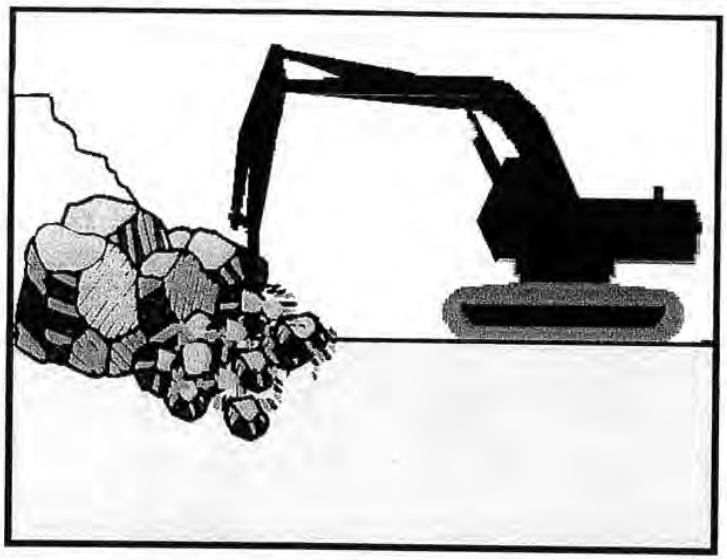
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Demolition Adjacent to Water NS-15



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Procedures to protect water bodies from debris and wastes associated with structure demolition or removal over or adjacent to watercourses.

Suitable Applications

Full bridge demolition and removal, partial bridge removal (barrier rail, edge of deck) associated with bridge widening projects, concrete channel removal, or any other structure removal that could potentially affect water quality.

Limitations

None identified.

Implementation

- Refer to NS-5, Clear Water Diversion, to direct water away from work areas.
- Use attachments on construction equipment such as backhoes to catch debris from small demolition operations.
- Use covers or platforms to collect debris.
- Platforms and covers are to be approved by the owner.
- Stockpile accumulated debris and waste generated during demolition away from watercourses and in accordance with WM-3, Stockpile Management.
- Ensure safe passage of wildlife, as necessary.

NS-15 Demolition Adjacent to Water

- Discharges to waterways shall be reported to the Regional Water Quality Control Board immediately upon discovery. A written discharge notification must follow within 7 days. Follow the spill reporting procedures in the SWPPP.
- For structures containing hazardous materials, i.e., lead paint or asbestos, refer to BMP WM-6, Hazardous Waste Management. For demolition work involving soil excavation around lead-painted structures, refer to WM-7, Contaminated Soil Management.

Costs

Cost may vary according to the combination of practices implemented.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Any debris-catching devices shall be emptied regularly. Collected debris shall be removed and stored away from the watercourse and protected from runon and runoff.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Port of Stockton Drain Maintenance Handbook

Appendix E

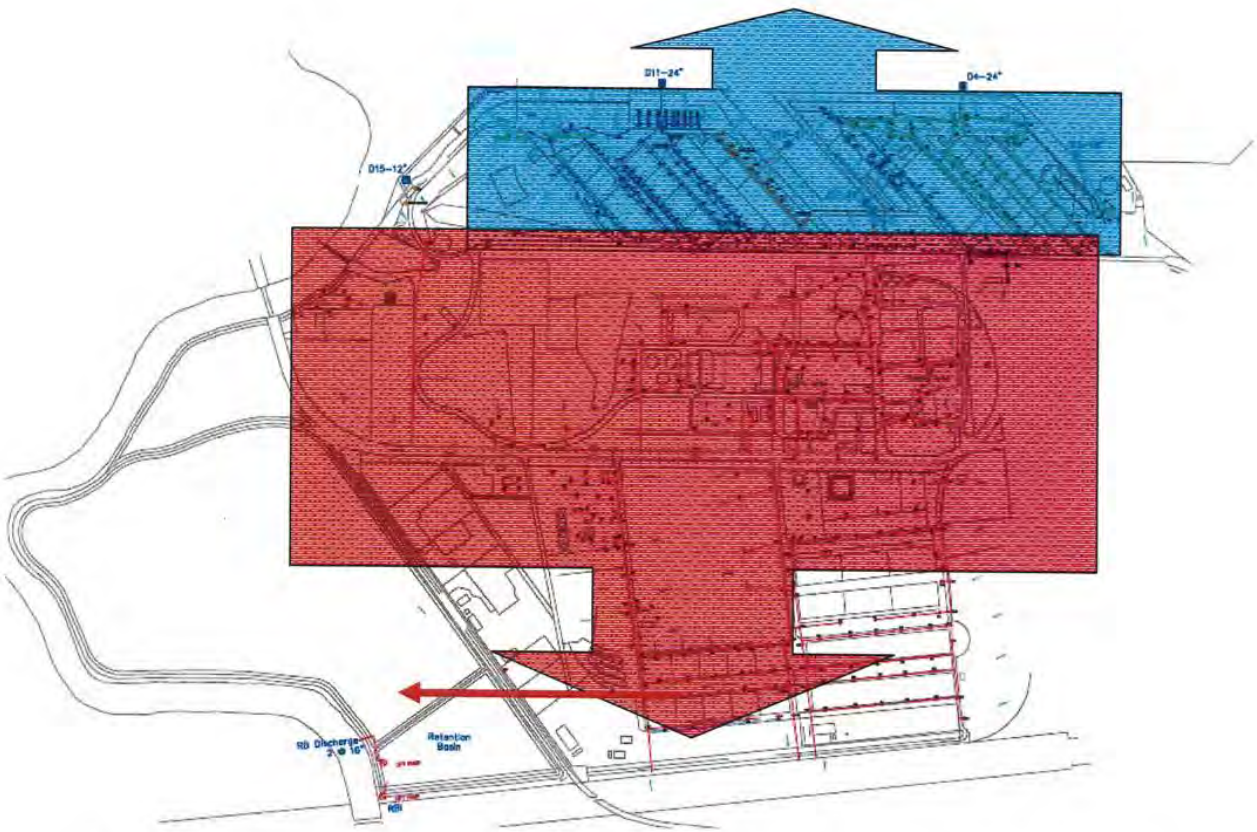
Spill Response Plan

Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook

Port of Stockton Emergency Spill Response Plan

Surface Flow Runoff Drainage Pattern



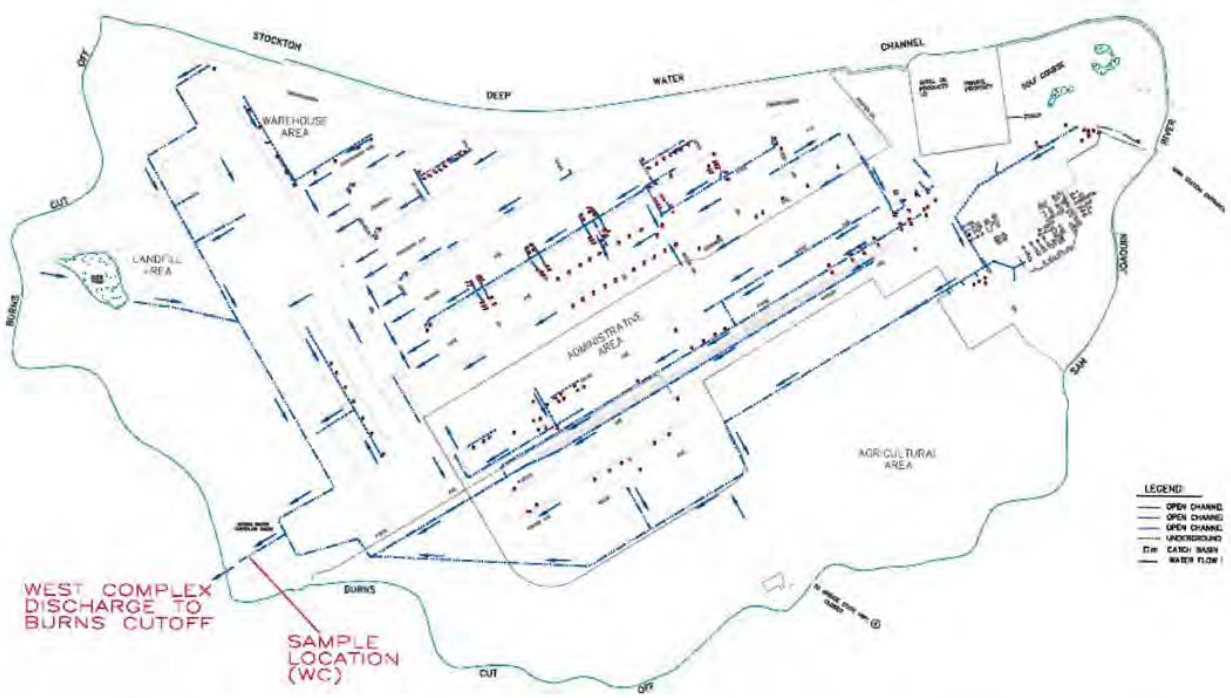
East Complex: The Port maintains and operates a retention basin in the southwest corner of the facility. The retention basin serves as a storm water control structure to moderate the flow and effects of storm water, but may also serve to capture any pollutant release prior to discharge into the San Joaquin River. The retention basin captures all flows into the storm drain system south of Road "A". Storm drain systems north of Road "A" flow into the Stockton Deep Water Channel. Thus, these areas north of Road "A" are higher priority for spill response in order to keep spills and other pollutant releases from reaching the Channel.

Releases of oil at the Port are typically contained and cleaned with portable spill response equipment located at various locations throughout the facility. If a release of oil is significant or undetected, a potential exists for the material to enter the storm drain system. In a worst case scenario, any release south of Road 'A' will flow to the drainage ditch and/or storm water retention pond where the release will be contained. Approximately 75% of the Port drains to the

retention basin, allowing spills to be contained and mitigated prior to release into the San Joaquin River. However, efforts should be made to contain all spills prior to reaching the MS4 and the retention basin whenever possible.

The Port maintains and operates this 12.75-acre retention basin with a capacity of approximately 140 acre-feet, including freeboard. The retention basin will capture all flows, including spills, within the storm drain system south of Road "A" and then within the retention basin system prior to release into the San Joaquin River. This feature allows the Port to respond to large magnitude spills without impacting the receiving water body.

Flows enter the retention basin via the Road "N" ditch, which extends along the southern border of the Port. Accumulated water must be pumped from the Road "N" ditch into the retention basin. If a large magnitude release occurs during dry weather, the Road "N" ditch will act as the primary collection basin of the spilled material. If the release occurs during a heavy rainfall, the capacity of the ditch may be exceeded, and the contaminated water may be pumped directly into the retention basin. Due to its size, the retention basin can reasonably be expected to contain all run-off in its catchment area without necessitating discharge.



West Complex: The entire West Complex's eastern, southern, and western perimeters of the island are bordered by levees. The overall direction of drainage takes place diagonally across the island from the northeast, and from the Embarcadero along the docks, to the south/southwest area of the West Complex. Consequently, all storm water is retained on the island unless removed by pumping. The West Complex's developed area has a drainage system that collects storm water through catch basins and conveys the storm water to existing culverts/pipes, primarily via open channel flow. At some locations, sediment traps have been

installed where storm water pipes exit into open trenches. Culverts and open channels route storm water to the southwest to the storm water overflow basin.

Spill Contingency Plans:

East Complex north of Port Road A:
If a spill or release takes place in the drainage area north of Port Road A, immediate action needs to be taken to contain or stop the flow before reaching a storm drain inlet or channel. This is considered the most vulnerable drainage area because all drains flow directly to the Deep Water Ship Channel. If, despite attempts to contain the spill before it reaches the MS4, a spill or release enters the drainage system, downstream drains must be blocked off to stop and contain the flow prior to reaching the water body. Once the downstream drain line is blocked off, start to address and halt the source if possible. Then, act to contain the spill or release area by securing the area so traffic or pedestrians do not track out the material when exiting the area. All Port Police, Maintenance, and Daily Rounds vehicles are equipped with spill kits and clean up equipment. Additional spill equipment and supplies are available through the Maintenance Department. Consult with the Environmental Department officials for appropriate cleanup measures.

East Complex south of Port Road A:
If a spill or release takes place in the drainage area south of Port road A, downstream drains should be sealed off in order to contain the release. If the spill or release reaches the "south ditch," booms and absorbent should be used down stream to contain the released material. If the spill/release occurs during the "wet season," notify the Maintenance Department of the spill or release in the "south ditch" and ensure the water is not pumped to the retention basin until the cleanup is complete. Consult with the Environmental Department officials for appropriate cleanup measures.

West Complex:
The West Complex's storm water drainage system is less likely to be impacted by a spill or release. This is due to the greater distance that any spilled material would have to travel to get to the West Complex pump station. If a spill or release occurs in the culverts east of the pump station's wetland area, booms and absorbent should be placed in the area downstream of the flow. If the flow reaches the pump station's wetland area, notify the Maintenance Department of the release. Request the pump station's pumps are shut off until the cleanup is complete. Consult with the Environmental Department officials for appropriate cleanup measures.

Port of Stockton Drain Maintenance Handbook

Appendix F

Drain Maintenance Training Video

Port of Stockton Drain Maintenance Handbook

Port of Stockton Drain Maintenance Handbook

Appendix G

Drain Maintenance Frequency

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
1	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lehigh Cement Co.
2	S/E corner of brick WHSE E in D-2 area	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
3	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lehigh Cement Co.
4	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes	As Needed	As Needed	As Needed	Maintained by Lehigh Cement Co.
5	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lehigh Cement Co.
6	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lehigh Cement Co.
9	D-2 outfall drain	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton and Lehigh Cement Co.
10	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lehigh Cement Co.
11	Next to brick WHSE E	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
12	Next to brick WHSE F	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
13	Next to brick WHSE D	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
14	Next to brick WHSE B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
15	Middle of Port Rd. 2 north side of Lehigh	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
16	Middle of Port Rd. 2 north side of Lehigh	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
17	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
18	North end of WHSE A	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
19	Next to small shed and Port Rd. B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
20	Next to small shed and Port Rd. B	3	1	East	Yes	Yes	As Needed	As Needed	As Needed	Maintained by Port of Stockton
21	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
22	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
23	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
24	In R/R tracks D-4 outfall drain	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
25	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
26	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
27	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
28	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
29	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
30	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
31	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
32	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
33	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
34	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
35	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
36	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
37	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
38	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
39	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
40	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
41	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
42	In R/R tracks to the W. of D-4 outfall	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
43	At S/W corner of brick WHSE M	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
44	In front of brick WHSE K	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
45	In front of brick WHSE J	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
46	In front of brick WHSE J	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
47	In front of brick WHSE J	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
48	In front of brick WHSE H	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
49	N/W corner of brick WHSE G	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
50	In middle of Port Rd. B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
51	Stream Guard Insert & Gravel Around Drain	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
52	N. side of Port Rd. A	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
53	S. side of Port Rd. A across Rd from drain #051	3	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
54	S. side of Port Rd. A in line with drain #53	3	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
55	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
56	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by CPC

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
57	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
58	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
59	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
60	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
61	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
62	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
63	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
64	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
65	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
66	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
67	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
68	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
69	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
70	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
71	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
72	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
73	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
74	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
75	W. side of Port Rd 4 in R/R tracks	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
76	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
77	In corner next to dock, at the end of both Port Rd 4 &	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
78	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
79	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
80	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
82	Corner of Port rd's A & 5	4	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
83	In R/R bed on S. side of Port rd. A	4	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
84	On N. side of Port rd A	4	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
90	Castle & Cook Cold Storage	4	2		Yes	As Needed	As Needed	As Needed	As Needed	WGR
91	Castle & Cook Cold Storage	4	2		Yes	As Needed	As Needed	As Needed	As Needed	WGR
95	Castle & Cook Cold Storage	4	2		Yes	As Needed	As Needed	As Needed	As Needed	WGR
96	Castle & Cook Cold Storage	4	2		Yes	As Needed	As Needed	As Needed	As Needed	WGR
97	Castle & Cook Cold Storage	4	2		Yes	As Needed	As Needed	As Needed	As Needed	WGR
99	Castle & Cook Cold Storage		2		Yes	As Needed	As Needed	As Needed	As Needed	WGR
105	Westway Terminal	4	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
106	Westway Terminal	4	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal
107	Westway Terminal	4	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal
108	Westway Terminal	4	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal
109	This drain has been deactivated.	3	1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal
110	This drain has been deactivated.	3	1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal
111	On S. side of Port rd B	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
112	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
113	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
114	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
115	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
116	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
117	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
118	On N. side of Port rd B in R/R tracks				Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
119	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
120	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
121	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
122	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
123	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
124	On N. side of Port rd B in tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
125	On N. side of Port rd B in tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
126	On N. side of Port rd B in tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
127	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
128	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
129	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
130	In middle of Port Rd. B		2	East	Yes	As Needed	Yes	As Needed	As Needed	WGR
131	In middle of Port Rd. B	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	WGR
132	Middle of Port rd B	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	WGR
141	Castle & Cook	5	2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Castle & Cook
142	Castle & Cook	5	2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Castle & Cook
143	Castle & Cook	5	2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Castle & Cook
144	Castle & Cook	5	2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Castle & Cook
145	Castle & Cook	5	2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Castle & Cook
146	Castle & Cook	5	2		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Castle & Cook
147	On corner of Port rd's A & 6	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
148	W. side of Port rd 6 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
152	W. side of Port rd 6 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
153	W. side of Port rd 6 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
154	W. side of Port rd 6 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
156	Corner of Port rd's 6 & B next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
157	Corner of WHSE on E. side of Port rd 7	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
158	Corner of WHSE on E. side of Port rd 7	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
159	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
160	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
161	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
162	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
163	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
164	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
165	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
166	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
167	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
168	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
169	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
170	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
171	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
172	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
173	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
174	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
175	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
176	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
177	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
178	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
179	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
180	E. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
181	Corner of WHSE & Port rd's A & 7	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
182	Corner of WHSE & Port rd's A & 7	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
183	S. side of Port rd A	5	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
184	S. side of Port rd A	5	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
185	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
186	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
187	W. side of Port rd 7	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
188	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
189	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
190	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
191	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
192	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
193	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
194	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
195	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
196	W. side ot Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
197	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
198	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
199	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
200	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
201	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
202	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
203	W. side of Port rd 7 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
204	N. side of Port rd A next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
205	Middle of Port rd 8	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
206	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
207	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
208	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
209	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
210	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
211	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
212	In middle of Port rd 8	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
213	W. side of Port rd 8	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
214	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
215	On E. side of Port rd 8 next to WHSE	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
216	Side of Port rd 8 & B	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
217	Middle of Port rd B	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
218	Middle of Port rd B	5	2	East	Yes	Yes	Yes	As Needed	As Needed	Maintained by Port of Stockton
221	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
222	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
224	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
225	On N. side ot Port rd B in R/R tracks	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
226	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
227	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
228	On N. side of Port rd B in R/R tracks	6	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
229	On N. side of Port rd B next to Port Maint. Shop (Sealed off, no flow)		2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
230	On Calamco's grounds (No Label)	6	3		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
231	Stork	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
232	Stork	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
233	N. side of Port rd F next to R/R tracks	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
234	N. side of Port rd F Next to Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
235	N. side of Port rd F Next to Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
236	Outside Calamco's main entrance gate	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
237	Outside Calamco's main entrance gate	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
238	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
239	On Calamco's grounds		3		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
240	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
241	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
242	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
243	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
245	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
246	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
247	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
248	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
249	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
250	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
251	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
252	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
253	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
254	On Calamco's grounds		3		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
255	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
257	On W. side of Port rd 13 across from Carry Transit	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
258	On E. side of Port rd 13 in front of Carry Transit	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
259	On W. side of Port rd 13 across from Carry Transit	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
260	On W. side of Port rd 13	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
261	On W. side of Port rd 13 @ corner	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
262	N. side of Port rd G	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
263	N. side of Port rd G	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
264	S. side of Port rd G	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
265	N. side of Port rd G	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
266	N. side of Port rd G	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
267	S. side of Port rd G	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
268	N/E Corner of Port maint shop	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
269	W. side of Port rd 14	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
270	Corner of Port rd 14 & F	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
271	Across Port rd F from #270	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
272	In parking lot of Deparment of Food & Ag.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
273	In parking lot of Deparment of Food & Ag.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
274	On W. side of Department of Food & Ag building	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
275	In large blacktop parking area S. of port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
276	In large blacktop parking area S. of port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
277	In large blacktop parking area S. of port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
278	In large blacktop parking area S. of port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
279	Corner of Port rd 14 & E	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
280	N. side of Washington Ave	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
281	Middle of Port rd E. near Trans Marine Bld	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
282	Middle of Port rd E. near Trans Marine Bld	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
283	S. side of Port rd E	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
284	N. side of Port rd E	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
285	N. side of Port rd E	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
286	S. side of Port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
287	Corner of Port rd's 14 & F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
288	E. side of Port rd 14	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
289	Middle of dirt lot, E. of Port rd 14	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
290	N. side of Port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
291	S. side of Port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
292	S. side of Port rd F	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
293	N. side of Port rd F	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
294	Corner of Port rd F & 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
295	W. side of Port rd 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
296	E. side of Port rd 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
297	N. side of Port rd O	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
298	N. side of Port rd O	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
299	In grass area next to Annex parking lot	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
300	In Annex parking lot	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
301	In middle of Port rd O	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
302	On corner of Port rd's 13 & O	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
303	E. side of Port rd 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
304	W. side of Port rd 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
305	E. side of Port rd 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
306	In parking lot to Port Admin bld.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
307	In parking lot to Port Admin bld.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
308	In grass area next to Admin bld parking lot	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
309	In gravel area next to Admin bld.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
310	In gravel area next to Admin bld.				Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
311	In E. parking lot behind Admin Bld.	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
312	In E. parking lot behind Admin Bld.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
313	On S. side of Port Admin bld	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
314	On N. side of first driveway to Admin bld	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
315	On N. side of first driveway to Admin bld	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
316	W. side of Port rd 13	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
317	N. side of Port rd E next to restaurant	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
318	N. side of Washington Ave	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
320	E. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
321	Best Logistics, W. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Best Logistics
322	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
323	Best Logistics	3	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
324	Best Logistics	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
325	Best Logistics	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
326	Best Logistics, E. side of Port rd 22 next to port water loader	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
327	Best Logistics	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
328	Best Logistics	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
329	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
330	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
331	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
332	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
333	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
334	Best Logistics in parking lot	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
335	Best Logistics in parking lot	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
336	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
337	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
338	Best Logistics next to WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
339	On E. side of Port rd 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
340	Best Logistics on S. side of WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
341	Best Logistics on S. side of WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
342	Best Logistics on S. side of WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
343	On W. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
344	In old Cost-Plus grounds on E. side of WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
345	On W. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
346	In old Cost-Plus grounds on E. side of WHSE	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Best Logistics
347	On E. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
349	On W. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
350	N. side on Sheedy's yard in middle of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
351	N. side on Sheedy's yard in middle of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
352	N. side on Sheedy's yard in middle of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
353	In middle of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton and Cencal
354	In middle of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton and Cencal
357	Next to R/R tracks on N. side of Port rd L	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
358	Next to R/R tracks on N. side of Port rd L	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
359	Next to R/R tracks on N. side of Port rd L	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
360	Next to R/R tracks on N. side of Port rd L, S. side of Sheedy's yard	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
361	Next to R/R tracks on N. side of Port rd L, S. side of Sheedy's yard	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
362	On N. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
363	On N. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
364	On N. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
365	On N. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
366	On N. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
369	On N. side of Port rd M	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
370	On N. side of Port rd M	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
371	On N. side of Port rd M	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
372	On N. side of Port rd M	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
373	On N. side of Port rd M	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
374	Middle of Port rd M & 21	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
375	In area to the East of the S. ditch	3	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
376	Middle of Port rd M to the W. of rd 21	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
377	Middle of Port rd M	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
378	Middle of Port rd M	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
379	Middle of Port rd M	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
380	Middle of Port rd M	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
381	Middle of Port rd M	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
385	On S. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
386	On S. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
387	On S. side of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
388	Corner of Port rd's L & 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
390	S. side of Cen-Cal's yard	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Cencal
391	S. side of Cen-Cal's yard @ loading ramp	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
392	S. side of Mac-Steels south yard	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
393	S. side of Mac-Steels south yard	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
394	S. side of Mac-Steels south yard	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
396	Middle of Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
397	Middle of Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
399	Corner of Port rd's L & 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
400	Corner of Port rd's L & 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
401	On S. side of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
402	On S. side of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
403	On S. side of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
404	On S. side of Port rd K	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
405	On S. side of Port rd K	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
406	On S. side of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
407	In Mac-Steel yard near Port rd 22	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Mac Steel
408	On W. side of Port rd 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
409	On W. side of Port rd 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
410	On E. side of Port rd 22		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
411	On W. side of Port rd 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
412	On W. side of Port rd 22 close to Washington Av.	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
413	In open field to the W. of Port rd 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
414	On W. side of Port rd 23 in front of Posdef plant	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
415	On W. side of Port rd 23 in front of Posdef plant	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
416	On W. side of Port rd 23 in front of Posdef plant office	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	WGR
417	On W. side of Port rd 23	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	WGR
418	In middle of Port rd 23 (Labeled as 734)	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	WGR

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
420	In middle of Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Mac Steel
421	In paved parking area of Mac-Steel (gravel area)	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Mac Steel
422	In paved parking area of Mac-Steel	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Mac Steel
423	On E. side of Port rd 23 next to rails on S. side of Mac-Streel	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Mac Steel
424	On W. side of Port rd 23 next to rail on S. side of Mac-Steel	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Mac Steel
425	On E. side of Navy drive in front of tank farm terminals		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
426	On BP grounds next to Washington Av & Stork rd	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by BP Arco
427	On BP grounds next to Washington Av & Stork rd	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by BP Arco
428	On BP grounds next to Washington Av & Stork rd	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by BP Arco
429	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
430	On Posdef grounds next to Port rd 23	3	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
431	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
432	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
433	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
434	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
435	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
436	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
437	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
438	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
439	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
440	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
441	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
442	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
443	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
444	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
445	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
446	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
447	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
448	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
449	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
450	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
451	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
452	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
453	On Posdef grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
454	On Posdef's N. grounds	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
455	On Posdef's N. grounds	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
456	On Posdef's N. grounds	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
457	On Posdef's N. grounds	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by POSDEF
458	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
459	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
460	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
461	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
462	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
463	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
464	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
465	On Martin Midstream grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by DTE
466	On Martin Midstream grounds next to Port rd 23	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by DTE
467	On H J Bakers Grounds	6	4	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by H. J. Baker
468	On H J Bakers Grounds	6	4	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by H. J. Baker
469	On Martin Midstream Grounds	3	4	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Martin Midstream
470	In R/R tracks next to Bay Sulfur	6	4	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
471	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
472	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
473	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
474	On Calamco's grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
475	In between cold storage domes	3	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
476	In between cold storage domes	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
477	In between cold storage domes	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco
478	In between cold storage domes	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Calamco

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
479	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
480	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
481	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
482	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
483	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
484	On S. side of Port Rd A in California Traction Yard	3	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
485	On S. side of Port Rd A in California Traction Yard	3	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
486	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
487	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
488	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
489	On California/Portland Cement Co. grounds	3	1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
490	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
491	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
492	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
493	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
494	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
495	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
496	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
497	On California/Portland Cement Co. grounds	3	1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
498	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
499	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
501	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
502	On California/Portland Cement Co. grounds	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
503	On California/Portland Cement Co. grounds		1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by CPC
505	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
506	On E. side of Port rd 23 in front of Recology grounds		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
507	On E. side of Port rd 23 in front of Recology grounds		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
508	N side of bldg 134	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
509	N side of bldg 134	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
510	N side of bldg 134	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
514	Pinter Ave. next to whse 719.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
515	Pinter Ave. next to whse 719.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
516	N side of bldg 619	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
517	N side of bldg 619	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
520		7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
521	Wyerhauser product yard (Covered by product)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Wyerhauser
522	Wyerhauser product yard	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Wyerhauser
523	Wyerhauser product yard	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Wyerhauser
524	Wyerhauser product yard	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Wyerhauser
525	N across fence from Wyerhauser product yard empty lot	7	6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Wyerhauser
526	N across fence from Wyerhauser product yard empty lot	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Wyerhauser
527	N across fence from Wyerhauser product yard empty lot	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Wyerhauser
528	NE corner of bldg. 1002 (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
531	N. side of Cavanaugh Ave. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
533	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
534	Between bldgs. 805 & 806 W. end	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
535	Across from 534	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
536	SW corner of bldg. 807	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
537	Drain has been paved over	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Drain has been paved over
538	SW corner of bldg 809	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
539	E side of bldg. 811	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
540	E side of bldg. 811	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
541	E side of bldg 812	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
542	E side of bldg 812	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
543		6	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
544	W side of bldg 712	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
545	W side of bldg 712	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
546	W side of bldg 712	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
547	W side of bldg 712	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
548	Cromwell Ave. next to whse 707 (Label Missing)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
550	Cromwell Ave. next to whse 707	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
551	Cromwell Ave. next to whse 707	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
552	Cromwell Ave. next to whse 707	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
553	Cromwell Ave. next to whse 707	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
554	Cromwell Ave. next to whse 707	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
555	Cromwell Ave. next to whse 707	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
556	Cromwell Ave. next to bld 706	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
557	E side of bldg. 711 on Daly	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
558	E side of bldg. 711 on Daly	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
559	E side of bldg. 712	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
560	W side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
561	W side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
562	W side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
563	W side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
564	W side of bldg. 611 on Daly	7	6		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
565	W side of bldg. 611 on Daly	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
567	E side of bldg 611	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
568	W side of bldg 511	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
570	W side of bldg 512	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
571	E side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
572	E side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
574	E side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
580	SE corner of bldg 511	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
581	Gilmore Ave. next to bld 410	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
582	Gilmore Ave. next to whse 411	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
583	SW corner of bldg 411	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
589	E side of bldg 412	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
591	On Lipes, E. end of bldg 412. (Broke Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
592	Gilmore Ave. next to whse 411 (Label Missing)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
593	Gilmore Ave. next to whse 411	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
594	Gilmore Ave. next to whse 411 (label Missing)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
595	Gilmore Ave. next to whse 411	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
596	Gilmore Ave. next to whse 411	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
597	Gilmore Ave. next to whse 411 (labeled as 689)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
598	NW corner of bldg 312 (No Tag)	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
599	W side of bldg 312	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
601	W side of bldg 312	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
602	SW corner of bldg 312 on Luce Ave	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
603	NW corner of bldg 313 on Luce Ave	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
604	Along S side of bldg 314	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
605	Along S side of bldg 314	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
606	Along S side of bldg 314	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton and Yara
607	SW corner of Bldg. 212 (No Tag)	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
610	South side of bldg 214	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton and Yara
611	South side of bldg 214	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
612	Paved over		6		Yes	As Needed	As Needed	As Needed	As Needed	Drain has been paved over
613	E side of bldg 612		6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
614	Paved over		6	West	Yes	As Needed	As Needed	As Needed	As Needed	Drain has been paved over
615	E side of bldg 812	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
616	W side of bldg 712	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
617	Parking lot by bldg. 916	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
619	Parking lot by bldg. 916	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
620	NE corner of bldg 917	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
621	NW corner of bldg 817	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
622	SW corner of bldg 817	7	6		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
623	S side of bldg 817	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
624	NE side of bldg 817	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
625	(No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
626	N side of bldg 717 on the road (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
627	N side of bldg 717 on the road	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
628	N side of bldg 717 on the road	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
629	N side of bldg 717 on the road	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
630	N side of bldg 717 on the road (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
631	N side of bldg 717 on the road	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
632	N side of bldg 717 on the road	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
633	Corner of Fyffe Ave & Ellsberg Dr.	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
634	N. side of Fyffe Ave. in front of bld 617	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
635	N. side of Fyffe Ave. in front of bld 517	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
636	N. side of Fyffe Ave. in front of bld 517	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
637	N. side of Fyffe Ave. near bld 517	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
638	N. side of Fyffe Ave. near bld 517	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
639	S. side of Fyffe Ave.		6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
640	S. side of Fyffe Ave.		6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
641	N. side of Fyffe Ave. near bld 517		6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
642	N. side of Fyffe Ave. near bld 217-A		6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
643	S. side of Fyffe Ave.		6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
644	S. side of Fyffe Ave.		6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
648	S. side of Fyffe Ave. across from drain #649	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
649	N. side of Fyffe Ave. near bld 217-A	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
650	N. side of Fyffe Ave. near bld 217-A	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
651	S. side of Fyffe Ave. across from drain #650	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
652	S. side of Fyffe Ave. across from drain #653	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
653	N. side of Fyffe Ave. near bld 217	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
654	N. side of Fyffe Ave. in front of bld 217	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
655	S. side of Fyffe Ave. across from drain #654	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
656	Between parking area A-117 and Bldg. 117	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
659	Inside parking lot A-117 (No Tag)	7	6		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
660	E side of parkin lot A-117	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
661	S. side of Fyffe Ave. across from drain #662	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
662	N. side of Fyffe Ave. at corner of Fyffe and James Dr.	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
663	N. side of Fyffe Ave. in front of firehouse	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
664	S. side of Fyffe Ave. across from drain #663	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
665	S. side of Fyffe Ave. across from drain #666	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
666	N. side of Fyffe Ave. near to bld 17	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
667	N. side of Fyffe Ave. near to bld 17	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
668	E of bldg. 17 in the grass (Completely grown over)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
669	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
670	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
672	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
673	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
674	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
675	Along S. side of rd leading to the golf course. (Labeled as 764)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
677	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
678	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
679	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
680	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
681	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
682	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
683	D-2 outfall area & Lehigh Cement Co.	2	6	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Lehigh Cement Co.
684	N side of bldg 134	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
685	Pinter Ave. next to whse 719. (Labeled as 811)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
686	Unknown	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Unknown
687	S side of parking area A-516 (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
688	NE corner of bldg 117	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
691	SW corner of bldg 414 on Edwards	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
696	On S. side of Port rd K	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
699	S. side of Port rd F near rd 15	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
700	N. side of Port rd F near rd 15	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
701	Corner of Washington and Port rd 15 next to drainage ditch	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
702	N. side of Port rd E		3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
704	W. side of Port rd 6 next to WHSE	5	2		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
708	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
709	In R/R tracks and D-4 area	3	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
710	N/W corner of Port maint shop	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
711	N. side of Washington Ave	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
715	W. side of Port rd 6 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
717	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Lehigh Cement Co.
718	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
719	On Carry Transit grounds	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Carry Transit
720	Out on dock 11	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
722	D-2 outfall area & Lehigh Cement Co.		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Lehigh Cement Co.
729	On N. side of Port rd L	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
730	On N. side of Port rd L	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
733	On E. side of Port rd 23 in front of A-Plus grounds		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
734	On W. side of Port rd 23		5		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
737	In front of brick WHSE L	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
738	On ADM's grounds next to Port rd. A		1		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Westway Terminal

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Drain Maintenance Frequency
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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
742	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
743	On N. side of Port rd B in R/R tracks	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
745	W. side of Port rd 6 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
747	Middle of Port rd A & B	6	2	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
748	SE side of bldg 719 (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
750	Parking lot by bldg. 916	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
751	Could not find				Yes	As Needed	As Needed	As Needed	As Needed	Could not find
752	SW corner of Bldg 212 (No Tag)	7	6		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
753	W side of bldg 312	7	6	West	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Yara
754	On Lipes, E. end of bldg 412	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
756	W side of bldg 512	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
757	Has been paved over	7	6		Yes	As Needed	As Needed	As Needed	As Needed	Has been paved over
758	Cromwell Ave. next to whse 707 (Label Missing)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
759	N. side of Cavanaugh Ave. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
760	N. side of Cavanaugh Ave. inside Fergusons facility grounds.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
761	S. side of Fergusons facility grounds. (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Ferguson
762	Inside parking lot A-117 (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
765	Pinter Ave. next to whse 719. (Label Missing)		6	West	Yes	As Needed	As Needed	As Needed	As Needed	WGR
768	Middle of Port rd B		6	West	Yes	As Needed	As Needed	As Needed	As Needed	WGR
769	Middle of Port rd B		6		Yes	As Needed	As Needed	As Needed	As Needed	WGR
771	E. side of Port rd 21, in front of Westway	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
776	S/E corner of Cen-Cal Recycle Business	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
777	Middle of Port rd K & 22	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
778	Middle of Port rd's 23 & K	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
780	Inside Lowe's compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
781	Inside Lowe's compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's

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Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
782	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
783	E side of bldg 612	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
784	NW side of bldg 613	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
785	NW side of bldg 613	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
786	NW side of bldg 613	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
787	N side of bldg. 613 on Luce Ave	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
788	N side of bldg. 613 on Luce Ave	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
794	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
795	Product covering drain	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Product covering drain
796	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
797	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
798	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
799	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's
800	Inside Lowes compound (No Tag)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Lowe's

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Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
801	Just to the west of the cul-de-sac (Missing Tag)		6	West	Yes	As Needed	As Needed	As Needed	As Needed	WGR
802	Forrestal Village		6		Yes	As Needed	As Needed	As Needed	As Needed	WGR
803	Forrestal Village (No flow)		6	West	Yes	As Needed	As Needed	As Needed	As Needed	No flow
804	Forrestal Village (No flow)		6	West	Yes	As Needed	As Needed	As Needed	As Needed	No flow
805	Forrestal Village (No flow)		6	West	Yes	As Needed	As Needed	As Needed	As Needed	No flow
807	On the street in front of bldg. 219	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
808	NW corner of bldg 518	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
809	SE corner of the Holding and Reconsignment Yard	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	WGR
810	NE side of bldg 719	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
811	S side of Bldg 214 (No Tag)	7	6		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
812	Between parking area A-117 and Bldg. 117	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
813	NW corner of Bldg 213 (No Tag)	7	6		Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
814	S side of bldg 414 on Edwards	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
815	W side of bldg 511	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
816	E side of bldg 611	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
817	N. side of Fyffe Ave. in dirt lot.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
818	Along S. side of rd leading to the golf course.	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
820	Next to brick WHSE B	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
821	Next to brick WHSE C	3	1	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
823	?????????????????????????????????? ???	5			Yes	As Needed	As Needed	As Needed	As Needed	WGR
824	W. side of Port Rd 6 next to WHSE	5	2	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
825	On E. side of Port rd 13 in front of Cargill	6	3	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
826	In E. parking lot behind Admin Bld.	6	3	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
827	On E. side of Port rd 21	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
828	Middle of Port rd 22 & M	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
829	Middle of Port rd 22 & L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
830	On E. side of Port rd 22 next to Cen-Cal office	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
831	Middle of Port rd L	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
832	Middle of Port rd 23 @ S/W corner of Mac-Steel S. yard	6	5	East	Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton and Mac Steel
834	In middle of Port rd 23	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton

Appendix 7
Drain Maintenance Frequency
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Maint Frequency - Annually Prior to wet season	Maint Frequency - Before storm event	Maint Frequency - After storm event	Maint Frequency - Monthly	Maint Frequency - Weekly	Maintainance Provided By
835	In middle of Port rd 23	6	5	East	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
844	RdG,cold stor		3		Yes	As Needed	Yes	As Needed	As Needed	Maintained by Port of Stockton
10000	Castle & Cook (New Drain)	4	1		Yes	As Needed	As Needed	As Needed	As Needed	New drain
10001	Castle & Cook (No Label)	4	1		Yes	As Needed	As Needed	As Needed	As Needed	New drain
10002	Castle & Cook (No Label)	4	1		Yes	As Needed	As Needed	As Needed	As Needed	New drain
10003	NW side of bldg 719 (Duplicate drain label located at 37.57.194/121.28.990)	7	6	West	Yes	As Needed	As Needed	As Needed	As Needed	Maintained by Port of Stockton
10004	East Port entry				Yes	As Needed	As Needed	As Needed	As Needed	New drain
10005	East Port entry				Yes	As Needed	As Needed	As Needed	As Needed	New drain
10006	East Port entry				Yes	As Needed	As Needed	As Needed	As Needed	New drain

Port of Stockton Drain Maintenance Handbook

Appendix H

Drain BMP Implementation Plan

Appendix H
BMP Implementation Plan
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Tenant Leased Property?*	Asphalt Surrounding Drain	Sealed with Plastic	Drain Insert	Gravel Around Drain	Railroad Gravel Around Drain	Rock Bags Around Drain	Straw Wattle	Rubber Mat Over Drain	Safe Drain	Screen Over the Grate	Screen Under Grate	Sediment Blocking Screen	Solid Metal Cover Over Drain	Stainless Drain Pan Insert	Oil/Sediment Insert	Yellow Jacket Insert	Routine Inspection & Maintenance	Other (describe):
1	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes		Yes				Yes										Yes	
2	S/E corner of brick WHSE E in D-2 area	2	1	East	Yes	Yes		Yes	Yes												Yes	Yes	
3	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes		Yes														Yes	
4	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes						Yes										Yes	REM Filter
5	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes		Yes				Yes										Yes	REM Filter
6	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes		Yes				Yes										Yes	REM Filter
9	D-2 outfall drain	2	1	East	Yes	Yes		Yes														Yes	REM Filter
10	D-2 outfall area & Lehigh Cement Co.	2	1	East	Yes	Yes		Yes				Yes										Yes	
11	Next to brick WHSE E	3	1	East		Yes		Yes														Yes	
12	Next to brick WHSE F	3	1	East		Yes		Yes														Yes	
13	Next to brick WHSE D	3	1	East				Yes		Yes												Yes	
14	Next to brick WHSE B	3	1	East				Yes		Yes												Yes	
15	Middle of Port Rd. 2 north side of Lehigh	3	1	East																		Yes	REM Filter
16	Middle of Port Rd. 2 north side of Lehigh	3	1	East																		Yes	REM Filter
17	In R/R tracks and D-4 area	3	1	East				Yes			Yes											Yes	
18	North end of WHSE A	3	1	East						Yes										Yes		Yes	
19	Next to small shed and Port Rd. B	3	1	East				Yes														Yes	
20	Next to small shed and Port Rd. B	3	1	East																		Yes	
21	In R/R tracks and D-4 area	3	1	East														Yes				Yes	
22	In R/R tracks and D-4 area	3	1	East				Yes	Yes				Yes									Yes	
23	In R/R tracks and D-4 area	3	1	East				Yes		Yes												Yes	
24	In R/R tracks D-4 outfall drain	3	1	East					Yes	Yes	Yes											Yes	
25	In R/R tracks and D-4 area	3	1	East			Yes	Yes	Yes													Yes	
26	In R/R tracks and D-4 area	3	1	East			Yes	Yes												Yes		Yes	
27	In R/R tracks and D-4 area	3	1	East			Yes	Yes												Yes		Yes	
28	In R/R tracks and D-4 area	3	1	East				Yes	Yes		Yes											Yes	
29	In R/R tracks and D-4 area	3	1	East			Yes	Yes	Yes											Yes		Yes	
30	In R/R tracks and D-4 area	3	1	East			Yes															Yes	
31	In R/R tracks and D-4 area	3	1	East			Yes	Yes														Yes	
32	In R/R tracks and D-4 area	3	1	East			Yes	Yes	Yes													Yes	
33	In R/R tracks to the W. of D-4 outfall	3	1	East			Yes	Yes														Yes	
34	In R/R tracks to the W. of D-4 outfall	3	1	East			Yes	Yes														Yes	
35	In R/R tracks to the W. of D-4 outfall	3	1	East			Yes	Yes														Yes	
36	In R/R tracks to the W. of D-4 outfall	3	1	East			Yes	Yes														Yes	
37	In R/R tracks to the W. of D-4 outfall	3	1	East																		Yes	
38	In R/R tracks to the W. of D-4 outfall	3	1	East										Yes								Yes	

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Appendix H
BMP Implementation Plan
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Tenant Leased Property?*	Asphalt Surrounding Drain	Sealed with Plastic	Drain Insert	Gravel Around Drain	Railroad Gravel Around Drain	Rock Bags Around Drain	Straw Wattle	Rubber Mat Over Drain	Safe Drain	Screen Over the Grate	Screen Under Grate	Sediment Blocking Screen	Solid Metal Cover Over Drain	Stainless Drain Pan Insert	Oil/Sediment Insert	Yellow Jacket Insert	Routine Inspection & Maintenance	Other (describe):
39	In R/R tracks to the W. of D-4 outfall	3	1	East			Yes															Yes	
40	In R/R tracks to the W. of D-4 outfall	3	1	East			Yes	Yes														Yes	
41	In R/R tracks to the W. of D-4 outfall	3	1	East					Yes									Yes				Yes	
42	In R/R tracks to the W. of D-4 outfall	3	1	East						Yes												Yes	
43	At S/W corner of brick WHSE M	3	1	East				Yes		Yes												Yes	
44	In front of brick WHSE K	3	1	East				Yes		Yes												Yes	
45	In front of brick WHSE J	3	1	East						Yes												Yes	
46	In front of brick WHSE J	3	1	East				Yes		Yes												Yes	
47	In front of brick WHSE J	3	1	East				Yes		Yes												Yes	
48	In front of brick WHSE H	3	1	East				Yes		Yes												Yes	
49	N/W corner of brick WHSE G	3	1	East						Yes												Yes	
50	In middle of Port Rd. B	3	1	East		Yes																Yes	
51	Stream Guard Insert & Gravel Around Drain	3	1	East				Yes	Yes													Yes	
52	N. side of Port Rd. A	3	1	East				Yes	Yes													Yes	
53	S. side of Port Rd. A across Rd from drain #051	3	3	East			Yes		Yes													Yes	
54	S. side of Port Rd. A in line with drain #53	3	3	East			Yes		Yes													Yes	
55	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East				Yes														Yes	
56	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East				Yes														Yes	
57	W. side of Port Rd 4 in R/R tracks	3	1	East					Yes												Yes	Yes	
58	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
59	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
60	W. side of Port Rd 4 in R/R tracks	3	1	East				Yes					Yes									Yes	
61	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
62	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
63	W. side of Port Rd 4 in R/R tracks	3	1	East				Yes	Yes	Yes												Yes	
64	W. side of Port Rd 4 in R/R tracks	3	1	East				Yes	Yes	Yes												Yes	
65	W. side of Port Rd 4 in R/R tracks	3	1	East				Yes		Yes												Yes	
66	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
67	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
68	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East				Yes	Yes													Yes	
69	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	

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70	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
71	W. side of Port Rd 4 in R/R tracks	3	1	East				Yes	Yes													Yes	
72	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
73	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
74	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
75	W. side of Port Rd 4 in R/R tracks	3	1	East						Yes												Yes	
76	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East		Yes																Yes	
77	In corner next to dock, at the end of both Port Rd 4 &	3	1	East																		Yes	Rubbled Seal - No Flow
78	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East		Yes					Yes											Yes	
79	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East									Yes									Yes	
80	In corner next to dock, at the end of both Port Rd 4 & B	3	1	East				Yes			Yes		Yes									Yes	
82	Corner of Port rd's A & 5	4	1	East				Yes	Yes	Yes												Yes	
83	In R/R bed on S. side of Port rd. A	4	3	East						Yes												Yes	
84	On N. side of Port rd A	4	2	East		Yes																Yes	
90	Castle & Cook Cold Storage	4	2		Yes		Yes				Yes											Yes	Castle & Cook maintains this drain.
91	Castle & Cook Cold Storage	4	2		Yes		Yes				Yes											Yes	Castle & Cook maintains this drain.
95	Castle & Cook Cold Storage	4	2		Yes		Yes				Yes											Yes	Castle & Cook maintains this drain.
96	Castle & Cook Cold Storage	4	2		Yes		Yes				Yes											Yes	Castle & Cook maintains this drain.

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Port of Stockton

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97	Castle & Cook Cold Storage	4	2		Yes		Yes				Yes											Yes	Castle & Cook maintains this drain.
99	Castle & Cook Cold Storage		2		Yes		Yes				Yes											Yes	Castle & Cook maintains this drain.
105	Westway Terminal	4	1	East	Yes				Yes				Yes									Yes	Drain is located on West Way Terminal grounds.
106	Westway Terminal	4	1	East	Yes				Yes				Yes									Yes	Drain is located on West Way Terminal grounds.
107	Westway Terminal	4	1	East	Yes	Yes			Yes													Yes	Drain is located on West Way Terminal grounds.
108	Westway Terminal	4	1	East	Yes				Yes				Yes									Yes	
109	This drain has been deactivated.	3	1																			Yes	This drain has been deactivated.
110	This drain has been deactivated.	3	1																			Yes	This drain has been deactivated.
111	On S. side of Port rd B	5	2	East					Yes			Yes										Yes	
112	On N. side of Port rd B in R/R tracks	5	2	East				Yes	Yes	Yes			Yes									Yes	
113	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
114	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
115	On N. side of Port rd B in R/R tracks	5	2	East		Yes		Yes	Yes	Yes			Yes									Yes	
116	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
117	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	

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BMP Implementation Plan
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Tenant Leased Property?*	Asphalt Surrounding Drain	Sealed with Plastic	Drain Insert	Gravel Around Drain	Railroad Gravel Around Drain	Rock Bags Around Drain	Straw Wattle	Rubber Mat Over Drain	Safe Drain	Screen Over the Grate	Screen Under Grate	Sediment Blocking Screen	Solid Metal Cover Over Drain	Stainless Drain Pan Insert	Oil/Sediment Insert	Yellow Jacket Insert	Routine Inspection & Maintenance	Other (describe):
118	On N. side of Port rd B in R/R tracks							Yes		Yes			Yes									Yes	
119	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
120	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
121	On N. side of Port rd B in R/R tracks	5	2	East				Yes	Yes	Yes												Yes	
122	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
123	On N. side of Port rd B in R/R tracks	5	2	East				Yes					Yes									Yes	
124	On N. side of Port rd B in tracks	5	2	East				Yes		Yes												Yes	
125	On N. side of Port rd B in tracks	5	2	East		Yes					Yes											Yes	
126	On N. side of Port rd B in tracks	5	2	East		Yes							Yes									Yes	
127	On N. side of Port rd B in R/R tracks	5	2	East				Yes		Yes												Yes	
128	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
129	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
130	In middle of Port Rd. B		2	East				Yes		Yes												Yes	
131	In middle of Port Rd. B	5	2	East		Yes		Yes		Yes	Yes	Yes	Yes									Yes	
132	Middle of Port rd B	5	2	East		Yes	Yes				Yes	Yes	Yes									Yes	
141	Castle & Cook	5	2		Yes																	Yes	
142	Castle & Cook	5	2		Yes																	Yes	
143	Castle & Cook	5	2		Yes																	Yes	
144	Castle & Cook	5	2		Yes																	Yes	
145	Castle & Cook	5	2		Yes																	Yes	
146	Castle & Cook	5	2		Yes																	Yes	
147	On corner of Port rd's A & 6	5	2	East		Yes																Yes	
148	W. side of Port rd 6 next to WHSE	5	2	East		Yes	Yes									Yes						Yes	
152	W. side of Port rd 6 next to WHSE	5	2	East		Yes	Yes															Yes	
153	W. side of Port rd 6 next to WHSE	5	2	East		Yes	Yes															Yes	
154	W. side of Port rd 6 next to WHSE	5	2	East		Yes	Yes															Yes	
156	Corner of Port rd's 6 & B next to WHSE	5	2	East			Yes															Yes	Lid sealed from bottom / no surface flow
157	Corner of WHSE on E. side of Port rd 7	5	2	East			Yes															Yes	
158	Corner of WHSE on E. side of Port rd 7	5	2	East			Yes															Yes	
159	E. side of Port rd 7 next to WHSE	5	2	East		Yes	Yes															Yes	
160	E. side of Port rd 7 next to WHSE	5	2	East			Yes		Yes													Yes	
161	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
162	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	

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BMP Implementation Plan
Port of Stockton

Drain	Location Description	Discharge Location	Region	Complex	Tenant Leased Property?*	Asphalt Surrounding Drain	Sealed with Plastic	Drain Insert	Gravel Around Drain	Railroad Gravel Around Drain	Rock Bags Around Drain	Straw Wattle	Rubber Mat Over Drain	Safe Drain	Screen Over the Grate	Screen Under Grate	Sediment Blocking Screen	Solid Metal Cover Over Drain	Stainless Drain Pan Insert	Oil/Sediment Insert	Yellow Jacket Insert	Routine Inspection & Maintenance	Other (describe):
163	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
164	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
165	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
166	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
167	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
168	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
169	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
170	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
171	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
172	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
173	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
174	E. side of Port rd 7 next to WHSE	5	2	East		Yes										Yes						Yes	
175	E. side of Port rd 7 next to WHSE	5	2	East			Yes		Yes													Yes	
176	E. side of Port rd 7 next to WHSE	5	2	East												Yes						Yes	
177	E. side of Port rd 7 next to WHSE	5	2	East												Yes						Yes	
178	E. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
179	E. side of Port rd 7 next to WHSE	5	2	East														Yes				Yes	
180	E. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
181	Corner of WHSE & Port rd's A & 7	5	2	East			Yes															Yes	
182	Corner of WHSE & Port rd's A & 7	5	2	East			Yes															Yes	
183	S. side of Port rd A	5	3	East																		Yes	No Flow - Non-Op
184	S. side of Port rd A	5	3	East														Yes				Yes	
185	W. side of Port rd 7 next to WHSE	5	2	East						Yes						Yes						Yes	
186	W. side of Port rd 7 next to WHSE	5	2	East												Yes						Yes	
187	W. side of Port rd 7	5	2	East												Yes						Yes	
188	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
189	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
190	W. side of Port rd 7 next to WHSE	5	2	East												Yes						Yes	
191	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
192	W. side of Port rd 7 next to WHSE	5	2	East												Yes						Yes	
193	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
194	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
195	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
196	W. side ot Port rd 7 next to WHSE	5	2	East			Yes											Yes				Yes	
197	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	

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Drain	Location Description	Discharge Location	Region	Complex	Tenant Leased Property?*	Asphalt Surrounding Drain	Sealed with Plastic	Drain Insert	Gravel Around Drain	Railroad Gravel Around Drain	Rock Bags Around Drain	Straw Wattle	Rubber Mat Over Drain	Safe Drain	Screen Over the Grate	Screen Under Grate	Sediment Blocking Screen	Solid Metal Cover Over Drain	Stainless Drain Pan Insert	Oil/Sediment Insert	Yellow Jacket Insert	Routine Inspection & Maintenance	Other (describe):
198	W. side of Port rd 7 next to WHSE	5	2	East			Yes															Yes	
199	W. side of Port rd 7 next to WHSE	5	2	East			Yes						Yes									Yes	
200	W. side of Port rd 7 next to WHSE	5	2	East			Yes						Yes									Yes	
201	W. side of Port rd 7 next to WHSE	5	2	East			Yes						Yes									Yes	
202	W. side of Port rd 7 next to WHSE	5	2	East			Yes						Yes									Yes	
203	W. side of Port rd 7 next to WHSE	5	2	East			Yes						Yes									Yes	
204	N. side of Port rd A next to WHSE	5	2	East			Yes															Yes	
205	Middle of Port rd 8	5	2	East																		Yes	Solid lid - No surface flow
206	On E. side of Port rd 8 next to WHSE	5	2	East			Yes															Yes	
207	On E. side of Port rd 8 next to WHSE	5	2	East			Yes															Yes	
208	On E. side of Port rd 8 next to WHSE	5	2	East																		Yes	Solid lid - No surface flow
209	On E. side of Port rd 8 next to WHSE	5	2	East															Yes			Yes	
210	On E. side of Port rd 8 next to WHSE	5	2	East										Yes								Yes	
211	On E. side of Port rd 8 next to WHSE	5	2	East										Yes								Yes	
212	In middle of Port rd 8	5	2	East																		Yes	Solid lid - No surface flow
213	W. side of Port rd 8	5	2	East														Yes				Yes	
214	On E. side of Port rd 8 next to WHSE	5	2	East														Yes				Yes	
215	On E. side of Port rd 8 next to WHSE	5	2	East										Yes								Yes	
216	Side of Port rd 8 & B	5	2	East										Yes								Yes	
217	Middle of Port rd B	5	2	East			Yes															Yes	
218	Middle of Port rd B	5	2	East			Yes															Yes	
221	On N. side of Port rd B in R/R tracks	5	2	East					Yes												Yes	Yes	
222	On N. side of Port rd B in R/R tracks	5	2	East									Yes									Yes	
224	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
225	On N. side ot Port rd B in R/R tracks	5	2	East									Yes									Yes	
226	On N. side of Port rd B in R/R tracks	5	2	East		Yes		Yes		Yes												Yes	
227	On N. side of Port rd B in R/R tracks	5	2	East		Yes							Yes									Yes	
228	On N. side of Port rd B in R/R tracks	6	2	East									Yes									Yes	

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229	On N. side of Port rd B next to Port Maint. Shop (Sealed off, no flow)		2			Yes	Yes															Yes	Sealed/rubber under grate
230	On Calamco's grounds (No Label)	6	3		Yes	Yes		Yes														Yes	
231	Stork	6	4	East			Yes															Yes	
232	Stork	6	4	East			Yes															Yes	
233	N. side of Port rd F next to R/R tracks	6	4	East																		Yes	Vegetation
234	N. side of Port rd F Next to Calamco's grounds	6	3	East		Yes			Yes	Yes												Yes	No Flow - Non-Op
235	N. side of Port rd F Next to Calamco's grounds	6	3	East		Yes			Yes	Yes												Yes	
236	Outside Calamco's main entrance gate	6	3	East			Yes	Yes	Yes	Yes												Yes	
237	Outside Calamco's main entrance gate	6	3	East			Yes	Yes	Yes	Yes												Yes	
238	On Calamco's grounds	6	3	East	Yes	Yes		Yes														Yes	
239	On Calamco's grounds		3		Yes						Yes											Yes	
240	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
241	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
242	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
243	On Calamco's grounds	6	3	East	Yes															Yes		Yes	
245	On Calamco's grounds	6	3	East	Yes															Yes		Yes	
246	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
247	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
248	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
249	On Calamco's grounds	6	3	East	Yes																	Yes	
250	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
251	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
252	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
253	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
254	On Calamco's grounds		3		Yes	Yes		Yes														Yes	
255	On Calamco's grounds	6	3	East	Yes																Yes	Yes	
257	On W. side of Port rd 13 across from Carry Transit	6	3	East		Yes	Yes															Yes	
258	On E. side of Port rd 13 in front of Carry Transit	6	3	East			Yes		Yes	Yes												Yes	
259	On W. side of Port rd 13 across from Carry Transit	6	3	East			Yes		Yes	Yes												Yes	

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260	On W. side of Port rd 13	6	3	East		Yes	Yes															Yes	
261	On W. side of Port rd 13 @ corner	6	3	East		Yes	Yes															Yes	
262	N. side of Port rd G	6	3	East				Yes	Yes	Yes												Yes	
263	N. side of Port rd G	6	3	East				Yes	Yes	Yes												Yes	
264	S. side of Port rd G	6	3	East				Yes	Yes	Yes												Yes	
265	N. side of Port rd G	6	3	East		Yes		Yes														Yes	
266	N. side of Port rd G	6	3	East		Yes		Yes														Yes	
267	S. side of Port rd G	6	3	East		Yes		Yes														Yes	
268	N/E Corner of Port maint shop	6	3	East		Yes		Yes												Yes		Yes	
269	W. side of Port rd 14	6	3	East				Yes	Yes	Yes					Yes							Yes	
270	Corner of Port rd 14 & F	6	3	East																		Yes	Decontaminator insert
271	Across Port rd F from #270	6	3	East	Yes			Yes														Yes	
272	In parking lot of Deparment of Food & Ag.	6	3	East	Yes	Yes																Yes	
273	In parking lot of Deparment of Food & Ag.	6	3	East	Yes	Yes																Yes	
274	On W. side of Department of Food & Ag building	6	3	East	Yes	Yes																Yes	
275	In large blacktop parking area S. of port rd F	6	3	East	Yes	Yes																Yes	
276	In large blacktop parking area S. of port rd F	6	3	East	Yes	Yes																Yes	
277	In large blacktop parking area S. of port rd F	6	3	East	Yes	Yes																Yes	
278	In large blacktop parking area S. of port rd F	6	3	East	Yes	Yes																Yes	
279	Corner of Port rd 14 & E	6	3	East		Yes		Yes														Yes	
280	N. side of Washington Ave	6	3	East				Yes	Yes	Yes												Yes	
281	Middle of Port rd E. near Trans Marine Bld	6	3	East		Yes																Yes	Quarterly swept/clean
282	Middle of Port rd E. near Trans Marine Bld	6	3	East		Yes																Yes	Quarterly swept/clean
283	S. side of Port rd E	6	3	East						Yes												Yes	
284	N. side of Port rd E	6	3	East						Yes												Yes	
285	N. side of Port rd E	6	3	East						Yes												Yes	
286	S. side of Port rd F	6	3	East						Yes												Yes	

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287	Corner of Port rd's 14 & F	6	3	East						Yes												Yes	
288	E. side of Port rd 14	6	3	East						Yes												Yes	
289	Middle of dirt lot, E. of Port rd 14	6	3	East					Yes	Yes						Yes						Yes	
290	N. side of Port rd F	6	3	East					Yes	Yes												Yes	
291	S. side of Port rd F	6	3	East		Yes																Yes	
292	S. side of Port rd F	6	3	East				Yes			Yes											Yes	
293	N. side of Port rd F	6	3	East					Yes	Yes												Yes	
294	Corner of Port rd F & 13	6	3	East		Yes																Yes	Quarterly swept/clean
295	W. side of Port rd 13	6	3	East		Yes																Yes	
296	E. side of Port rd 13	6	3	East		Yes																Yes	Daily Street Sweeper
297	N. side of Port rd O	6	3	East					Yes	Yes				Yes								Yes	
298	N. side of Port rd O	6	3	East		Yes			Yes		Yes								Yes			Yes	
299	In grass area next to Annex parking lot	6	3	East				Yes	Yes													Yes	
300	In Annex parking lot	6	3	East												Yes						Yes	
301	In middle of Port rd O	6	3	East		Yes								Yes			Yes					Yes	
302	On corner of Port rd's 13 & O	6	3	East		Yes																Yes	
303	E. side of Port rd 13	6	3	East		Yes																Yes	Daily Street Sweeper
304	W. side of Port rd 13	6	3	East		Yes																Yes	Daily Street Sweeper
305	E. side of Port rd 13	6	3	East		Yes																Yes	Daily Street Sweeper
306	In parking lot to Port Admin bld.	6	3	East		Yes																Yes	Daily Street Sweeper
307	In parking lot to Port Admin bld.	6	3	East																		Yes	
308	In grass area next to Admin bld parking lot	6	3	East																		Yes	Vegetation
309	In gravel area next to Admin bld.	6	3	East		Yes										Yes						Yes	
310	In gravel area next to Admin bld.					Yes		Yes														Yes	
311	In E. parking lot behind Admin Bld.	6	3	East		Yes			Yes													Yes	
312	In E. parking lot behind Admin Bld.	6	3	East					Yes													Yes	
313	On S. side of Port Admin bld	6	3	East					Yes													Yes	
314	On N. side of first driveway to Admin bld	6	3	East		Yes																Yes	Vegetation
315	On N. side of first driveway to Admin bld	6	3	East		Yes																Yes	Vegetation

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316	W. side of Port rd 13	6	3	East		Yes																Yes	Daily Street Sweeper
317	N. side of Port rd E next to restaurant	6	3	East		Yes																Yes	Vegetation
318	N. side of Washington Ave	6	3	East				Yes	Yes	Yes												Yes	
320	E. side of Port rd 21	6	5	East				Yes	Yes	Yes												Yes	
321	Best Logistics, W. side of Port rd 21	6	5	East		Yes		Yes														Yes	
322	Best Logistics next to WHSE	6	5	East				Yes														Yes	
323	Best Logistics	3	5	East		Yes		Yes														Yes	
324	Best Logistics	6	5	East		Yes		Yes														Yes	
325	Best Logistics	6	5	East				Yes			Yes											Yes	
326	Best Logistics, E. side of Port rd 22 next to port water loader	6	5	East				Yes		Yes			Yes									Yes	
327	Best Logistics	6	5	East	Yes			Yes	Yes		Yes											Yes	
328	Best Logistics	6	5	East	Yes			Yes	Yes		Yes											Yes	
329	Best Logistics next to WHSE	6	5	East	Yes	Yes		Yes														Yes	
330	Best Logistics next to WHSE	6	5	East	Yes	Yes		Yes														Yes	
331	Best Logistics next to WHSE	6	5	East	Yes	Yes		Yes														Yes	
332	Best Logistics next to WHSE	6	5	East	Yes	Yes		Yes														Yes	
333	Best Logistics next to WHSE	6	5	East	Yes	Yes		Yes														Yes	
334	Best Logistics in parking lot	6	5	East	Yes	Yes		Yes	Yes													Yes	
335	Best Logistics in parking lot	6	5	East	Yes	Yes		Yes														Yes	
336	Best Logistics next to WHSE	6	5	East	Yes			Yes														Yes	
337	Best Logistics next to WHSE	6	5	East	Yes			Yes														Yes	
338	Best Logistics next to WHSE	6	5	East	Yes	Yes		Yes														Yes	
339	On E. side of Port rd 22	6	5	East	Yes	Yes		Yes														Yes	
340	Best Logistics on S. side of WHSE	6	5	East	Yes	Yes		Yes														Yes	
341	Best Logistics on S. side of WHSE	6	5	East	Yes	Yes		Yes													Yes	Yes	
342	Best Logistics on S. side of WHSE	6	5	East	Yes	Yes		Yes													Yes	Yes	
343	On W. side of Port rd 21	6	5	East				Yes	Yes	Yes												Yes	
344	In old Cost-Plus grounds on E. side of WHSE	6	5	East				Yes			Yes											Yes	
345	On W. side of Port rd 21	6	5	East				Yes			Yes											Yes	
346	In old Cost-Plus grounds on E. side of WHSE	6	5	East				Yes														Yes	
347	On E. side of Port rd 21	6	5	East				Yes	Yes	Yes												Yes	
349	On W. side of Port rd 21	6	5	East				Yes		Yes												Yes	

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350	N. side on Sheedy's yard in middle of Port rd K	6	5	East																		Yes	
351	N. side on Sheedy's yard in middle of Port rd K	6	5	East																		Yes	
352	N. side on Sheedy's yard in middle of Port rd K	6	5	East																		Yes	
353	In middle of Port rd K	6	5	East				Yes	Yes			Yes	Yes									Yes	
354	In middle of Port rd K	6	5	East				Yes	Yes													Yes	
357	Next to R/R tracks on N. side of Port rd L	6	5	East					Yes													Yes	
358	Next to R/R tracks on N. side of Port rd L	6	5	East					Yes													Yes	
359	Next to R/R tracks on N. side of Port rd L	6	5	East					Yes													Yes	
360	Next to R/R tracks on N. side of Port rd L, S. side of Sheedy's yard	6	5	East																		Yes	
361	Next to R/R tracks on N. side of Port rd L, S. side of Sheedy's yard	6	5	East				Yes			Yes											Yes	
362	On N. side of Port rd L	6	5	East			Yes	Yes	Yes													Yes	
363	On N. side of Port rd L	6	5	East			Yes	Yes	Yes													Yes	
364	On N. side of Port rd L	6	5	East			Yes	Yes	Yes													Yes	
365	On N. side of Port rd L	6	5	East			Yes	Yes	Yes	Yes												Yes	
366	On N. side of Port rd L	6	5	East					Yes													Yes	
369	On N. side of Port rd M	6	5	East							Yes									Yes		Yes	
370	On N. side of Port rd M	6	5	East							Yes									Yes		Yes	
371	On N. side of Port rd M	6	5	East							Yes									Yes		Yes	Oil Boom
372	On N. side of Port rd M	6	5	East				Yes			Yes											Yes	Oil boom
373	On N. side of Port rd M	6	5	East				Yes			Yes											Yes	
374	Middle of Port rd M & 21	6	5	East				Yes														Yes	
375	In area to the East of the S. ditch	3	5	East					Yes	Yes												Yes	
376	Middle of Port rd M to the W. of rd 21	6	5	East				Yes	Yes	Yes												Yes	
377	Middle of Port rd M	6	5	East				Yes		Yes												Yes	
378	Middle of Port rd M	6	5	East				Yes		Yes												Yes	
379	Middle of Port rd M	6	5	East				Yes	Yes													Yes	
380	Middle of Port rd M	6	5	East		Yes		Yes														Yes	
381	Middle of Port rd M	6	5	East		Yes		Yes														Yes	
385	On S. side of Port rd L	6	5	East			Yes	Yes														Yes	
386	On S. side of Port rd L	6	5	East			Yes	Yes	Yes												Yes	Yes	
387	On S. side of Port rd L	6	5	East		Yes		Yes														Yes	

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388	Corner of Port rd's L & 22	6	5	East				Yes														Yes	
390	S. side of Cen-Cal's yard	6	5	East	Yes																	Yes	Decontamin ator filter
391	S. side of Cen-Cal's yard @ loading ramp	6	5	East	Yes		Yes	Yes	Yes													Yes	
392	S. side of Mac-Steels south yard	6	5	East	Yes			Yes	Yes	Yes												Yes	
393	S. side of Mac-Steels south yard	6	5	East	Yes			Yes	Yes	Yes												Yes	
394	S. side of Mac-Steels south yard	6	5	East	Yes			Yes	Yes	Yes												Yes	
396	Middle of Port rd 23	6	5	East				Yes														Yes	
397	Middle of Port rd 23	6	5	East				Yes														Yes	
399	Corner of Port rd's L & 22	6	5	East				Yes														Yes	
400	Corner of Port rd's L & 22	6	5	East				Yes														Yes	
401	On S. side of Port rd K	6	5	East				Yes														Yes	
402	On S. side of Port rd K	6	5	East				Yes														Yes	
403	On S. side of Port rd K	6	5	East				Yes														Yes	
404	On S. side of Port rd K	6	5	East				Yes														Yes	
405	On S. side of Port rd K	6	5	East																Yes		Yes	
406	On S. side of Port rd K	6	5	East				Yes														Yes	
407	In Mac-Steel yard near Port rd 22	6	5	East	Yes			Yes			Yes											Yes	
408	On W. side of Port rd 22	6	5	East				Yes			Yes											Yes	
409	On W. side of Port rd 22	6	5	East				Yes		Yes												Yes	
410	On E. side of Port rd 22		5					Yes	Yes	Yes												Yes	
411	On W. side of Port rd 22	6	5	East			Yes	Yes		Yes												Yes	
412	On W. side of Port rd 22 close to Washington Av.	6	5	East				Yes	Yes		Yes											Yes	
413	In open field to the W. of Port rd 22	6	5	East																		Yes	No Flow - Non-Op
414	On W. side of Port rd 23 in front of Posdef plant	6	5	East		Yes		Yes			Yes											Yes	
415	On W. side of Port rd 23 in front of Posdef plant	6	5	East		Yes		Yes			Yes											Yes	
416	On W. side of Port rd 23 in front of Posdef plant office	6	5	East		Yes		Yes														Yes	
417	On W. side of Port rd 23	6	5	East				Yes				Yes										Yes	
418	In middle of Port rd 23 (Labeled as 734)	6	5	East				Yes				Yes										Yes	
420	In middle of Port rd 23	6	5	East				Yes	Yes								Yes					Yes	

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421	In paved parking area of Mac-Steel (gravel area)	6	5	East	Yes			Yes			Yes						Yes					Yes	
422	In paved parking area of Mac-Steel	6	5	East	Yes						Yes									Yes		Yes	
423	On E. side of Port rd 23 next to rails on S. side of Mac-Streel	6	5	East				Yes	Yes	Yes	Yes						Yes					Yes	
424	On W. side of Port rd 23 next to rail on S. side of Mac-Steel	6	5	East				Yes	Yes	Yes	Yes						Yes					Yes	
425	On E. side of Navy drive in front of tank farm terminals		5																			Yes	Sealed Off
426	On BP grounds next to Washington Av & Stork rd	6	5	East				Yes														Yes	
427	On BP grounds next to Washington Av & Stork rd	6	5	East				Yes														Yes	
428	On BP grounds next to Washington Av & Stork rd	6	5	East				Yes														Yes	
429	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
430	On Posdef grounds next to Port rd 23	3	5	East	Yes			Yes														Yes	
431	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
432	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
433	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
434	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
435	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
436	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
437	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
438	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
439	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
440	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
441	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
442	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
443	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
444	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
445	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
446	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
447	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
448	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
449	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	

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Drain	Location Description	Discharge Location	Region	Complex	Tenant Leased Property?*	Asphalt Surrounding Drain	Sealed with Plastic	Drain Insert	Gravel Around Drain	Railroad Gravel Around Drain	Rock Bags Around Drain	Straw Wattle	Rubber Mat Over Drain	Safe Drain	Screen Over the Grate	Screen Under Grate	Sediment Blocking Screen	Solid Metal Cover Over Drain	Stainless Drain Pan Insert	Oil/Sediment Insert	Yellow Jacket Insert	Routine Inspection & Maintenance	Other (describe):
450	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
451	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
452	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
453	On Posdef grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
454	On Posdef's N. grounds	6	3	East	Yes																	Yes	Sealed, No Flow off site.
455	On Posdef's N. grounds	6	3	East	Yes																	Yes	Sealed, No Flow off site.
456	On Posdef's N. grounds	6	3	East	Yes																	Yes	Sealed, No Flow off site.
457	On Posdef's N. grounds	6	3	East	Yes																	Yes	Sealed, No Flow off site.
458	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op
459	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op
460	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op
461	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op
462	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op
463	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op
464	In WHSE area on E. side of Washington Ave right before crossing bridge to West Complex	6	4	East																		Yes	No Flow - Non-Op

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465	On Martin Midstream grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
466	On Martin Midstream grounds next to Port rd 23	6	5	East	Yes			Yes														Yes	
467	On H J Bakers Grounds	6	4	East	Yes			Yes														Yes	
468	On H J Bakers Grounds	6	4	East	Yes			Yes														Yes	
469	On Martin Midstream Grounds	3	4	East	Yes																	Yes	
470	In R/R tracks next to Bay Sulfur	6	4	East																		Yes	
471	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
472	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
473	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
474	On Calamco's grounds	6	3	East	Yes			Yes														Yes	
475	In between cold storage domes	3	3	East	Yes																Yes	Yes	
476	In between cold storage domes	6	3	East	Yes																Yes	Yes	
477	In between cold storage domes	6	3	East	Yes																Yes	Yes	
478	In between cold storage domes	6	3	East	Yes																Yes	Yes	
479	On Carry Transit grounds	6	3	East	Yes																	Yes	Plugged off at outfall
480	On Carry Transit grounds	6	3	East	Yes																	Yes	Plugged off at outfall
481	On Carry Transit grounds	6	3	East	Yes																	Yes	Plugged off at outfall
482	On Carry Transit grounds	6	3	East	Yes																	Yes	Plugged off at outfall
483	On Carry Transit grounds	6	3	East	Yes																	Yes	Plugged off at outfall
484	On S. side of Port Rd A in California Traction Yard	3	3	East					Yes													Yes	
485	On S. side of Port Rd A in California Traction Yard	3	3	East					Yes													Yes	
486	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East				Yes	Yes													Yes	
487	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East				Yes	Yes													Yes	
488	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1					Yes	Yes													Yes	

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489	On California/Portland Cement Co. grounds	3	1		Yes		Yes	Yes	Yes													Yes	
490	On California/Portland Cement Co. grounds	3	1	East	Yes		Yes	Yes														Yes	
491	On California/Portland Cement Co. grounds	3	1	East	Yes		Yes	Yes														Yes	
492	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East			Yes	Yes														Yes	
493	E. side of Port Rd 4 next to California/Portland Cement Co.	3	1	East		Yes	Yes	Yes														Yes	
494	On California/Portland Cement Co. grounds	3	1	East	Yes	Yes	Yes	Yes														Yes	
495	On California/Portland Cement Co. grounds	3	1	East	Yes			Yes	Yes													Yes	
496	On California/Portland Cement Co. grounds	3	1	East	Yes			Yes	Yes													Yes	
497	On California/Portland Cement Co. grounds	3	1		Yes			Yes	Yes													Yes	
498	On California/Portland Cement Co. grounds	3	1	East	Yes			Yes	Yes													Yes	
499	On California/Portland Cement Co. grounds	3	1	East	Yes			Yes	Yes													Yes	
501	On California/Portland Cement Co. grounds	3	1	East	Yes		Yes	Yes	Yes													Yes	
502	On California/Portland Cement Co. grounds	3	1	East	Yes		Yes	Yes	Yes													Yes	
503	On California/Portland Cement Co. grounds		1		Yes		Yes	Yes	Yes													Yes	
505	On N. side of Port rd B in R/R tracks	5	2	East				Yes	Yes													Yes	
506	On E. side of Port rd 23 in front of Recology grounds		5					Yes	Yes													Yes	Steel plate with holes
507	On E. side of Port rd 23 in front of Recology grounds		5					Yes				Yes										Yes	Steel plate with holes
508	N side of bldg 134	7	6	West					Yes													Yes	
509	N side of bldg 134	7	6	West					Yes													Yes	
510	N side of bldg 134	7	6	West					Yes													Yes	
514	Pinter Ave. next to whse 719.	7	6	West										Yes								Yes	

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515	Pinter Ave. next to whse 719.	7	6	West										Yes								Yes	
516	N side of bldg 619	7	6	West										Yes								Yes	
517	N side of bldg 619	7	6	West										Yes								Yes	
520	McCloy @ gate	7	6	West																		Yes	No Flow - Non-Op
521	Wyerhauser product yard (Covered by product)	7	6	West	Yes	Yes		Yes														Yes	
522	Wyerhauser product yard	7	6	West	Yes	Yes		Yes														Yes	
523	Wyerhauser product yard	7	6	West	Yes	Yes		Yes														Yes	
524	Wyerhauser product yard	7	6	West	Yes	Yes		Yes														Yes	
525	N across fence from Wyerhauser product yard empty lot	7	6			Yes		Yes														Yes	
526	N across fence from Wyerhauser product yard empty lot	7	6	West		Yes		Yes														Yes	
527	N across fence from Wyerhauser product yard empty lot	7	6	West		Yes		Yes														Yes	
528	NE corner of bldg. 1002 (No Tag)	7	6	West		Yes												Yes				Yes	
531	N. side of Cavanaugh Ave. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
533	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
534	Between bldgs. 805 & 806 W. end	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
535	Across from 534	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
536	SW corner of bldg. 807	7	6	West		Yes																Yes	Drains to leach line in rail bed.
537	Drain has been paved over	7	6	West		Yes																Yes	Drains to leach line in rail bed.
538	SW corner of bldg 809	7	6	West		Yes																Yes	Drains to leach line in rail bed.

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539	E side of bldg. 811	7	6	West		Yes		Yes														Yes	Drains to leach line in rail bed.
540	E side of bldg. 811	7	6	West		Yes																Yes	Drains to leach line in rail bed.
541	E side of bldg 812	7	6	West		Yes																Yes	Drains to leach line in rail bed.
542	E side of bldg 812	7	6	West		Yes																Yes	Drains to leach line in rail bed.
543		6	6	West		Yes																Yes	Drains to culvert with Bio-filtration
544	W side of bldg 712	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
545	W side of bldg 712	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
546	W side of bldg 712	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
547	W side of bldg 712	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
548	Cromwell Ave. next to whse 707 (Label Missing)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
550	Cromwell Ave. next to whse 707	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
551	Cromwell Ave. next to whse 707	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration

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552	Cromwell Ave. next to whse 707	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
553	Cromwell Ave. next to whse 707	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
554	Cromwell Ave. next to whse 707	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
555	Cromwell Ave. next to whse 707	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
556	Cromwell Ave. next to bld 706	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
557	E side of bldg. 711 on Daly	7	6	West		Yes																Yes	Drains to leach line in rail bed.
558	E side of bldg. 711 on Daly	7	6	West		Yes																Yes	Drains to leach line in rail bed.
559	E side of bldg. 712	7	6	West		Yes																Yes	Drains to leach line in rail bed.
560	W side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.
561	W side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.
562	W side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.
563	W side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.

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564	W side of bldg. 611 on Daly	7	6			Yes																Yes	Drains to leach line in rail bed.
565	W side of bldg. 611 on Daly	7	6	West		Yes																Yes	Drains to leach line in rail bed.
567	E side of bldg 611	7	6	West		Yes																Yes	Drains to leach line in rail bed.
568	W side of bldg 511	7	6	West		Yes																Yes	Drains to leach line in rail bed.
570	W side of bldg 512	7	6	West		Yes																Yes	Drains to leach line in rail bed.
571	E side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.
572	E side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.
574	E side of bldg 612	7	6	West		Yes																Yes	Drains to leach line in rail bed.
580	SE corner of bldg 511	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
581	Gilmore Ave. next to bld 410	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
582	Gilmore Ave. next to whse 411	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
583	SW corner of bldg 411	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration

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589	E side of bldg 412	7	6	West		Yes																Yes	Drains to leach line in rail bed.
591	On Lipes, E. end of bldg 412. (Broke Tag)	7	6	West		Yes																Yes	Drains to leach line in rail bed.
592	Gilmore Ave. next to whse 411 (Label Missing)	7	6	West		Yes																Yes	Drains to leach line in rail bed.
593	Gilmore Ave. next to whse 411	7	6	West		Yes																Yes	Drains to leach line in rail bed.
594	Gilmore Ave. next to whse 411 (label Missing)	7	6	West		Yes																Yes	Drains to leach line in rail bed.
595	Gilmore Ave. next to whse 411	7	6	West		Yes																Yes	Drains to leach line in rail bed.
596	Gilmore Ave. next to whse 411	7	6	West		Yes																Yes	Drains to leach line in rail bed.
597	Gilmore Ave. next to whse 411 (labeled as 689)	7	6	West		Yes																Yes	Drains to leach line in rail bed.
598	NW corner of bldg 312 (No Tag)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
599	W side of bldg 312	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
601	W side of bldg 312	7	6	West		Yes																Yes	Drains to leach line in rail bed.
602	SW corner of bldg 312 on Luce Ave	7	6	West		Yes																Yes	Drains to leach line in rail bed.

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603	NW corner of bldg 313 on Luce Ave	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
604	Along S side of bldg 314	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
605	Along S side of bldg 314	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
606	Along S side of bldg 314	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
607	SW corner of Bldg. 212 (No Tag)	7	6	West		Yes		Yes														Yes	
610	South side of bldg 214	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
611	South side of bldg 214	7	6	West		Yes	Yes															Yes	
612	Paved over		6			Yes																Yes	No Flow - Non-Op
613	E side of bldg 612		6	West		Yes																Yes	
614	Paved over		6	West																		Yes	No Flow - Non-Op
615	E side of bldg 812	7	6	West		Yes																Yes	Drains to leach line in rail bed.
616	W side of bldg 712	7	6	West		Yes																Yes	Drains to leach line in rail bed.
617	Parking lot by bldg. 916	7	6	West		Yes	Yes															Yes	
619	Parking lot by bldg. 916	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
620	NE corner of bldg 917	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration

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621	NW corner of bldg 817	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
622	SW corner of bldg 817	7	6			Yes																Yes	Drains to culvert with Bio-filtration
623	S side of bldg 817	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
624	NE side of bldg 817	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
625	(No Tag)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
626	N side of bldg 717 on the road (No Tag)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
627	N side of bldg 717 on the road	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
628	N side of bldg 717 on the road	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
629	N side of bldg 717 on the road	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
630	N side of bldg 717 on the road (No Tag)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
631	N side of bldg 717 on the road	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
632	N side of bldg 717 on the road	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration

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633	Corner of Fyffe Ave & Ellsberg Dr.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
634	N. side of Fyffe Ave. in front of bld 617	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
635	N. side of Fyffe Ave. in front of bld 517	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
636	N. side of Fyffe Ave. in front of bld 517	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
637	N. side of Fyffe Ave. near bld 517	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
638	N. side of Fyffe Ave. near bld 517	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
639	S. side of Fyffe Ave.		6			Yes																Yes	Drains to culvert with Bio-filtration
640	S. side of Fyffe Ave.		6			Yes																Yes	Drains to culvert with Bio-filtration
641	N. side of Fyffe Ave. near bld 517		6			Yes																Yes	Drains to culvert with Bio-filtration
642	N. side of Fyffe Ave. near bld 217-A		6			Yes																Yes	Drains to culvert with Bio-filtration
643	S. side of Fyffe Ave.		6			Yes																Yes	Drains to culvert with Bio-filtration
644	S. side of Fyffe Ave.		6			Yes																Yes	Drains to culvert with Bio-filtration

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648	S. side of Fyffe Ave. across from drain #649	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
649	N. side of Fyffe Ave. near bld 217-A	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
650	N. side of Fyffe Ave. near bld 217-A	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
651	S. side of Fyffe Ave. across from drain #650	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
652	S. side of Fyffe Ave. across from drain #653	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
653	N. side of Fyffe Ave. near bld 217	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
654	N. side of Fyffe Ave. in front of bld 217	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
655	S. side of Fyffe Ave. across from drain #654	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
656	Between parking area A-117 and Bldg. 117	7	6	West		Yes																Yes	
659	Inside parking lot A-117 (No Tag)	7	6			Yes																Yes	
660	E side of parkin lot A-117	7	6	West		Yes																Yes	
661	S. side of Fyffe Ave. across from drain #662	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
662	N. side of Fyffe Ave. at corner of Fyffe and James Dr.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
663	N. side of Fyffe Ave. in front of firehouse	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration

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664	S. side of Fyffe Ave. across from drain #663	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
665	S. side of Fyffe Ave. across from drain #666	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
666	N. side of Fyffe Ave. near to bld 17	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
667	N. side of Fyffe Ave. near to bld 17	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
668	E of bldg. 17 in the grass (Completely grown over)	7	6	West		Yes																Yes	No Flow - Non-Op
669	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
670	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
672	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
673	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
674	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
675	Along S. side of rd leading to the golf course. (Labeled as 764)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
677	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
678	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	

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679	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
680	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
681	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	Yes	Yes	Yes														Yes	
682	E. side of Humphreys Dr. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
683	D-2 outfall area & Lehigh Cement Co.	2	6	East	Yes	Yes	Yes	Yes														Yes	REM filter
684	N side of bldg 134	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
685	Pinter Ave. next to whse 719. (Labeled as 811)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
686	Unknown	7	6	West																		Yes	Drains to culvert with Bio-filtration
687	S side of parking area A-516 (No Tag)	7	6	West																		Yes	Drains to culvert with Bio-filtration
688	NE corner of bldg 117	7	6	West																		Yes	Drains to culvert with Bio-filtration
691	SW corner of bldg 414 on Edwards	7	6	West																		Yes	Drains to culvert with Bio-filtration
696	On S. side of Port rd K	6	5	East				Yes														Yes	
699	S. side of Port rd F near rd 15	6	3	East		Yes			Yes													Yes	
700	N. side of Port rd F near rd 15	6	3	East		Yes			Yes													Yes	
701	Corner of Washington and Port rd 15 next to drainage ditch	6	3	East		Yes			Yes													Yes	
702	N. side of Port rd E		3	East		Yes																Yes	
704	W. side of Port rd 6 next to WHSE	5	2				Yes															Yes	
708	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration

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709	In R/R tracks and D-4 area	3	1	East			Yes		Yes											Yes		Yes	
710	N/W corner of Port maint shop	6	3	East			Yes															Yes	
711	N. side of Washington Ave	6	3	East				Yes	Yes													Yes	
715	W. side of Port rd 6 next to WHSE	5	2	East			Yes															Yes	
717	D-2 outfall area & Lehigh Cement Co.	2	1	East				Yes														Yes	
718	On Carry Transit grounds	6	3	East	Yes																	Yes	Outfall plugged off
719	On Carry Transit grounds	6	3	East	Yes																	Yes	Outfall plugged off
720	Out on dock 11	5	2	East			Yes				Yes	Yes										Yes	
722	D-2 outfall area & Lehigh Cement Co.		5		Yes			Yes														Yes	
729	On N. side of Port rd L	6	5	East			Yes	Yes														Yes	
730	On N. side of Port rd L	6	5	East			Yes	Yes									Yes				Yes	Yes	
733	On E. side of Port rd 23 in front of A-Plus grounds		5					Yes				Yes										Yes	
734	On W. side of Port rd 23		5					Yes				Yes										Yes	
737	In front of brick WHSE L	3	1	East						Yes											Yes	Yes	
738	On ADM's grounds next to Port rd. A		1		Yes				Yes				Yes									Yes	
742	On N. side of Port rd B in R/R tracks	5	2	East				Yes	Yes													Yes	
743	On N. side of Port rd B in R/R tracks	5	2	East				Yes	Yes													Yes	
745	W. side of Port rd 6 next to WHSE	5	2	East			Yes															Yes	
747	Middle of Port rd A & B	6	2	East		Yes				Yes												Yes	
748	SE side of bldg 719 (No Tag)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
750	Parking lot by bldg. 916	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
751	Could not find																					Yes	Paved over No Flow
752	SW corner of Bldg 212 (No Tag)	7	6			Yes		Yes														Yes	
753	W side of bldg 312	7	6	West		Yes																Yes	Drains to leach line in rail bed.
754	On Lipes, E. end of bldg 412	7	6	West		Yes																Yes	Drains to leach line in rail bed.

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756	W side of bldg 512	7	6	West		Yes																Yes	Sump installed
757	Has been paved over	7	6																			Yes	Paved over No Flow
758	Cromwell Ave. next to whse 707 (Label Missing)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
759	N. side of Cavanaugh Ave. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
760	N. side of Cavanaugh Ave. inside Fergusons facility grounds.	7	6	West	Yes	Yes																Yes	
761	S. side of Fergusons facility grounds. (No Tag)	7	6	West	Yes	Yes																Yes	
762	Inside parking lot A-117 (No Tag)	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
765	Pinter Ave. next to whse 719. (Label Missing)		6	West		Yes																Yes	Drains to culvert with Bio-filtration
768	Middle of Port rd B		6	West		Yes	Yes															Yes	
769	Middle of Port rd B		6			Yes																Yes	Drains to culvert with Bio-filtration
771	E. side of Port rd 21, in front of Westway	6	5	East				Yes	Yes	Yes												Yes	
776	S/E corner of Cen-Cal Recycle Business	6	5	East	Yes	Yes																Yes	Decontamin ator filter
777	Middle of Port rd K & 22	6	5	East		Yes		Yes														Yes	
778	Middle of Port rd's 23 & K	6	5	East		Yes		Yes														Yes	
780	Inside Lowe's compound (No Tag)	7	6	West	Yes																	Yes	Storm receptor vault
781	Inside Lowe's compound (No Tag)	7	6	West	Yes	Yes																Yes	Storm receptor vault
782	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	Storm receptor vault

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783	E side of bldg 612	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
784	NW side of bldg 613	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
785	NW side of bldg 613	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
786	NW side of bldg 613	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
787	N side of bldg. 613 on Luce Ave	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
788	N side of bldg. 613 on Luce Ave	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
794	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	
795	Product covering drain	7	6	West		Yes																Yes	
796	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	Storm receptor vault
797	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	Storm receptor vault
798	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	
799	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	
800	Inside Lowes compound (No Tag)	7	6	West	Yes	Yes																Yes	
801	Just to the west of the cul-de-sac (Missing Tag)		6	West																		Yes	No Flow - Non-Op
802	Forrestal Village		6																			Yes	No Flow - Non-Op
803	Forrestal Village (No flow)		6	West																		Yes	No Flow - Non-Op
804	Forrestal Village (No flow)		6	West																		Yes	No Flow - Non-Op

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805	Forrestal Village (No flow)		6	West																		Yes	No Flow - Non-Op
807	On the street in front of bldg. 219	7	6	West																		Yes	Drains to culvert with Bio-filtration
808	NW corner of bldg 518	7	6	West																		Yes	Drains to culvert with Bio-filtration
809	SE corner of the Holding and Reconsignment Yard	7	6	West																		Yes	Drains to culvert with Bio-filtration
810	NE side of bldg 719	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
811	S side of Bldg 214 (No Tag)	7	6			Yes																Yes	Drains to culvert with Bio-filtration
812	Between parking area A-117 and Bldg. 117	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
813	NW corner of Bldg 213 (No Tag)	7	6			Yes																Yes	Drains to leach line in rail bed.
814	S side of bldg 414 on Edwards	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
815	W side of bldg 511	7	6	West		Yes																Yes	Drains to leach line in rail bed.
816	E side of bldg 611	7	6	West		Yes																Yes	Drains to leach line in rail bed.
817	N. side of Fyffe Ave. in dirt lot.	7	6	West					Yes													Yes	
818	Along S. side of rd leading to the golf course.	7	6	West		Yes																Yes	Drains to culvert with Bio-filtration
820	Next to brick WHSE B	3	1	East				Yes		Yes												Yes	

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821	Next to brick WHSE C	3	1	East				Yes		Yes												Yes	
824	W. side of Port Rd 6 next to WHSE	5	2	East		Yes										Yes						Yes	
825	On E. side of Port rd 13 in front of Cargill	6	3	East			Yes			Yes												Yes	
826	In E. parking lot behind Admin Bld.	6	3	East				Yes														Yes	
827	On E. side of Port rd 21	6	5	East				Yes	Yes	Yes												Yes	
828	Middle of Port rd 22 & M	6	5	East				Yes														Yes	
829	Middle of Port rd 22 & L	6	5	East				Yes														Yes	
830	On E. side of Port rd 22 next to Cen-Cal office	6	5	East				Yes											Yes			Yes	
831	Middle of Port rd L	6	5	East				Yes									Yes					Yes	
832	Middle of Port rd 23 @ S/W corner of Mac-Steel S. yard	6	5	East				Yes														Yes	
834	In middle of Port rd 23	6	5	East				Yes				Yes										Yes	
835	In middle of Port rd 23	6	5	East				Yes				Yes										Yes	
844	RdG,cold stor		3			Yes		Yes	Yes													Yes	
10000	Castle & Cook (New Drain)	4	1		Yes			Yes	Yes													Yes	
10001	Castle & Cook (No Label)	4	1		Yes			Yes	Yes													Yes	
10002	Castle & Cook (No Label)	4	1		Yes			Yes	Yes													Yes	
10003	NW side of bldg 719 (Duplicate drain label located at 37.57.194/121.28.990)	7	6	West																		Yes	Drains to culvert with Bio-filtration
10004	East Port entry							Yes														Yes	
10005	East Port entry							Yes														Yes	
10006	East Port entry							Yes														Yes	
																						Yes	

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