

### *Wet concrete recycling*

Builders often order a little more ready mixed concrete than they actually need, so it is common for concrete trucks to have wet concrete remaining in their drum after a delivery. This unused concrete can be returned to the ready mixed plant and either (1) used to pour precast concrete products (e.g., highway barriers, retaining wall blocks, riprap), (2) used to pave the ready mixed plant's yard, (3) washed into a reclaimer, or (4) dumped on an impervious surface and allowed to harden, so it can be crushed and recycled as aggregate. Unused wet concrete should not be dumped on bare ground to harden at construction sites because this can contribute to ground water and surface water contamination.

## Washout Containers

Different types of washout containers are available for collecting, retaining, and recycling the washwater and solids from washing down mixed truck chutes and pump truck hoppers at construction sites.

### *Chute washout box*

A chute washout box is mounted on the back of the ready mixed truck. If the truck has three chutes, the following procedure is used to perform the washout from the top down: (1) after the pour is completed, the driver attaches the extension chute to the washout box, (2) the driver then rotates the main chute over the extension chute (Fig. 7) and washes down the hopper first then the main chute, (3) finally the driver washes down the flop down chute and last the extension chute hanging on the box. All washwater and solids are captured in the box.



Figure 7. Chute washout box

### *Chute washout bucket and pump*

After delivering ready mixed concrete and scraping the last of the customer's concrete down the chute, the driver hangs a washout bucket shown in Figure 8 (see red arrow) on the end of the truck's chute and secures the hose to insure no leaks. The

driver then washes down the chute into the bucket to remove any cementitious material before it hardens. After washing out the chute, the driver pumps (yellow arrow points to the pump) the washwater, sand, and other fine solids from the bucket up into the truck's drum to be returned to the ready mixed plant, where it can be washed into a reclaimer. A removable screen at the bottom of the washout bucket prevents course aggregate from entering the pump. This course aggregate can also be returned to the plant and added to the coarse aggregate pile to be reused. All the materials are recycled.



Figure 8. Chute washout bucket and pump

### *Hay bale and plastic washout pit*

A washout pit made with hay bales and a plastic lining is shown in Figure 9. Such pits can be dug into the ground or built above grade. The plastic lining should be free of tears or holes that would allow the washwater to escape (Fig. 10). After the pit is used to wash down the chutes of multiple ready mixed trucks and the washwater has evaporated or has been vacuumed off, the remaining hardened solids can be broken up and removed from the pit. This process may damage the hay bales and plastic lining. If damage occurs, the pit will need to be repaired and relined with new plastic. When the hardened solids are removed, they may be bound up with the plastic lining and have to be sent to a landfill, rather than recycled. Recyclers usually accept only unmixed material. If the pit is going to be emptied and repaired more than a few times, the hay bales and plastic will be generating additional solid waste. Ready mixed concrete



Figure 9. Hay bale and plastic washout pit



Figure 10. Leaking washout pit that has not been well maintained



## Stormwater Best Management Practice: Concrete Washout

trucks can use hay bale washout pits, but concrete pump trucks have a low hanging hopper in the back that may prevent their being washed out into bale-lined pits.

### Vinyl washout container



Figure 11. Vinyl washout pit with filter bag

The vinyl washout container (Fig. 11) is portable, reusable, and easier to install than a hay bale washout pit. The biodegradable filter bag (Fig. 12) assists in

extracting the concrete solids and prolongs the life of the vinyl container. When the bag is lifted, the water is filtered out and the remaining concrete solids and the bag can be disposed of together in a landfill, or the hardened concrete can be delivered to a recycler. After the solids have been removed several times and the container is full of washwater, the washwater can be allowed to evaporate, so the container can be reused. The washwater can be removed more quickly by placing another filter bag in the container and spreading water gelling granules evenly across the water. In about five minutes, the water in the filter bag will turn into a gel that can be removed with the bag. Then the gel and filter bag can be disposed of together.



Figure 12. Extracting the concrete solids or gelled washwater

### Metal washout container

The metal roll-off bin (Fig. 13) is designed to securely contain concrete washwater and solids and is portable and reusable. It also has a ramp that allows concrete pump trucks to wash out their hoppers (Fig. 14). Roll-off providers offer recycling services, such as, picking up the roll-off bins after the washwater has evaporated and the solids have hardened, replacing them with empty washout bins, and delivering the hardened concrete to a recycler (Fig. 15), rather than a landfill. Some providers will vacuum off the washwater, treat it to remove metals and reduce the pH, deliver it to a wastewater treatment plant for additional treatment and



Figure 13. Mixer truck being washed out into a roll-off bin

subsequent discharge to a surface water. Everything is recycled or treated sufficiently to be returned to a natural surface water.



Figure 14. Pump truck using the ramp to wash out into a roll-off bin



Figure 15. Delivering hardened concrete to a recycler

Another metal, portable, washout container, which has a rain cover to prevent overflowing, is shown in Figure 16. It is accompanied by an onsite washwater treatment unit, which reduces the pH and uses a forced weir tank system to remove the coarse aggregate, fine aggregate, and cement fines. The washwater can then be reused at the construction site to wash out other mixer truck chutes and equipment. The solids are allowed to harden together and can be taken to a concrete recycler (Fig. 17) to be crushed and used as road base or aggregate for making precast products, such as retaining wall blocks. All materials are recycled.



Figure 16. Washout container with a rain cover and onsite washwater treatment



Figure 17. Delivering hardened concrete to a recycler

## Siting Washout Facilities

Concrete washout facilities, such as washout pits and vinyl or metal washout containers, should be placed in locations that provide convenient access to concrete trucks, preferably near the area where concrete is being poured. However they



should not be placed within 50 feet of storm drains, open ditches, or waterbodies. Appropriate gravel or rock should cover approaches to concrete washout facilities when they are located on undeveloped property. On large sites with extensive concrete work, washouts should be placed at multiple locations for ease of use by ready mixed truck drivers. If the washout facility is not within view from the pour location, signage will be needed to direct the truck drivers.

### Operating and Inspecting Washout Facilities

Concrete washout facilities should be inspected daily and after heavy rains to check for leaks, identify any plastic linings and sidewalls have been damaged by construction activities, and determine whether they have been filled to over 75 percent capacity. When the washout container is filled to over 75 percent of its capacity, the washwater should be vacuumed off or allowed to evaporate to avoid overflows. Then when the remaining cementitious solids have hardened, they should be removed and recycled. Damages to the container should be repaired promptly. Before heavy rains, the washout container's liquid level should be lowered or the container should be covered to avoid an overflow during the rain storm.

### Educating Concrete Subcontractors

The construction site superintendent should make ready mixed truck drivers aware of washout facility locations and be watchful for improper dumping of cementitious material. In addition, concrete washout requirements should be included in contracts with concrete delivery companies.

### Reference

NRMCA 2009. Environmental Management in the Ready Mixed Concrete Industry. 2PEMRM, 1st edition. By Gary M. Mullins. Silver Springs, MD: National Ready Mixed Concrete Association.

### Websites and Videos

Construction Materials Recycling Association  
[www.concreterecycling.org](http://www.concreterecycling.org)

National Ready Mixed Concrete Association  
[www.nrmca.org](http://www.nrmca.org)

National Ready Mixed Concrete Research and Education Foundation  
[www.rmc-foundation.org](http://www.rmc-foundation.org)

Additional information and videos on concrete washout containers and systems can be found by a web search for "concrete washout."

### Photograph Credits

Figures 1, 2. Mark Jenkins, Concrete Washout Systems, Inc.

Figure 3. Mark Shaw, Ultra Tech International, Inc.

Figure 4. Mark Jenkins, Concrete Washout Systems, Inc.

Figure 5. Christopher Crouch, CCI Consulting

Figure 6. William Turley, Construction Materials Recycling Association

Figure 7. Brad Burke, Innovative Concrete Solutions, LLC

Figure 8. Ron Lankester, Enviroguard

Figures 9, 10. Mark Jenkins, Concrete Washout Systems, Inc.

Figures 11, 12. Tom Card, RTC Supply

Figures 13, 14, 15. Mark Jenkins, Concrete Washout Systems, Inc.

Figures 16, 17. Rick Abney Sr., Waste Crete Systems, LLP

#### Disclaimer

Please note that EPA has provided external links because they provide additional information that may be useful or interesting. EPA cannot attest to the accuracy of non-EPA information provided by these third-party websites and does not endorse any non-government organizations or their products or services.



# Concrete Washout Area

## Best Management Practice

from Ecology's Water Quality Program

**Reminder:** The Construction Stormwater General Permit does not allow operators to discharge concrete wash water to waterways, storm drains or groundwater. Operators must manage and contain this water to prevent spills, leaks or discharges.

**Description:** Concrete wash water is generated from washing out ready-mix trucks, drums and pumps; it also includes the water from rinsing off chutes, equipment, and concrete truck exteriors. Concrete wash water is toxic to fish and aquatic life and can contaminate drinking water supplies. Improper disposal can clog storm drain pipes and cause flooding. Operators must prevent concrete wash water from entering waterways, storm drains and groundwater. If possible, all concrete waste and wash water should be returned with each concrete truck for disposal at the concrete batch plant. If this is not possible, operators can install an on-site **concrete washout area**. This best management practice can prevent water pollution and comply with state and federal laws.

**Education for Concrete Contractors:** The success of your on-site concrete washout area depends on whether or not concrete truck drivers use your designated concrete washout areas. Bring attention to the designated washout area with signs, and provide careful oversight to prevent improper dumping of concrete wash water. Operators should ensure that concrete contracts include requirements that concrete truck drivers use designated concrete washout areas.

### Types of Concrete Washout Areas

**Prefabricated washout containers:** A growing number of companies offer sturdy, prefabricated concrete washout containers that are delivered to the site. Some services provide the containers alone without providing maintenance and disposal of materials, while other companies offer complete service that includes delivery of containers and regular pickups of solid and liquid waste materials. The prefabricated containers resist damage and protect against spills and leaks. Full-service option relieves the site superintendent of the burden of disposing of materials. Some companies offer prefabricated washout containers with ramps to accommodate concrete pump trucks.

**Self-installed concrete washouts:** You can also build your own concrete washout facility - although self-installed structures are much less reliable than prefabricated containers and are prone to leaks.

- **Below-grade washouts** will prevent breaches and reduce the likelihood of spills and contaminated stormwater runoff.
- **Above-grade washouts** must be carefully sized, inspected and maintained to prevent leaks and spills.

### Sizing Self-Installed Concrete Washout Areas

Refer to [Ecology BMP C154](#) for detailed design standards. You must size your washouts to handle solids, wash water, and rainfall to prevent overflow.





- Approximately 7 gallons of wash water are used to wash one truck chute.
- Approximately 50 gallons are used to wash out the hopper of a concrete pump truck.

**Below-grade washouts** on must be sized to contain all liquid and solid waste you expect to generate in between cleanout periods. On larger sites, the pit should be at least 10 feet wide by 10 feet long and accommodate a minimum 12 inch freeboard (safety margin) in the sizing calculations. Line the pit with plastic sheeting of at least 10-mil thickness that has no holes or tears to prevent leaching of liquids into the ground.

**Above-grade washouts** on larger sites must be at least 10 feet wide by 10 feet long and sized to contain all liquid and solid waste you expect to generate in between cleanout periods. Washouts at smaller sites can be smaller according to the expected capacity needed. Include a minimum of 12 inch freeboard in the sizing calculations. You can make the structures from staked straw bales or sandbags double- or triple-lined with plastic sheeting of at least 10-mil thickness that has no holes or tears.

### **Placement of Concrete Washout Areas**

You should not place concrete washout facilities within 50 feet of storm drains, open ditches, or water bodies. Consider multiple areas based upon demand for storage capacity. Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured. If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (Stabilized Construction Entrance). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.

### **Operation**

**Inspection:** Check all concrete washout facilities daily to determine if they have been filled to 75% capacity. The facility needs to be cleaned or changed when 75% full. Inspect self-installed washouts daily to ensure that plastic linings are intact and sidewalls have not been damaged by construction activities. If contractors have washed out chutes or hoppers in other unapproved locations, you may need to provide more education, install additional signage, or place additional washouts in more convenient locations.

**Material Removal:** If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner. Do not discharge liquids to waterways, storm drains or directly onto ground. Do not use sanitary sewer without local approval. Remove liquids or cover the structures before predicted storms to prevent overflows.

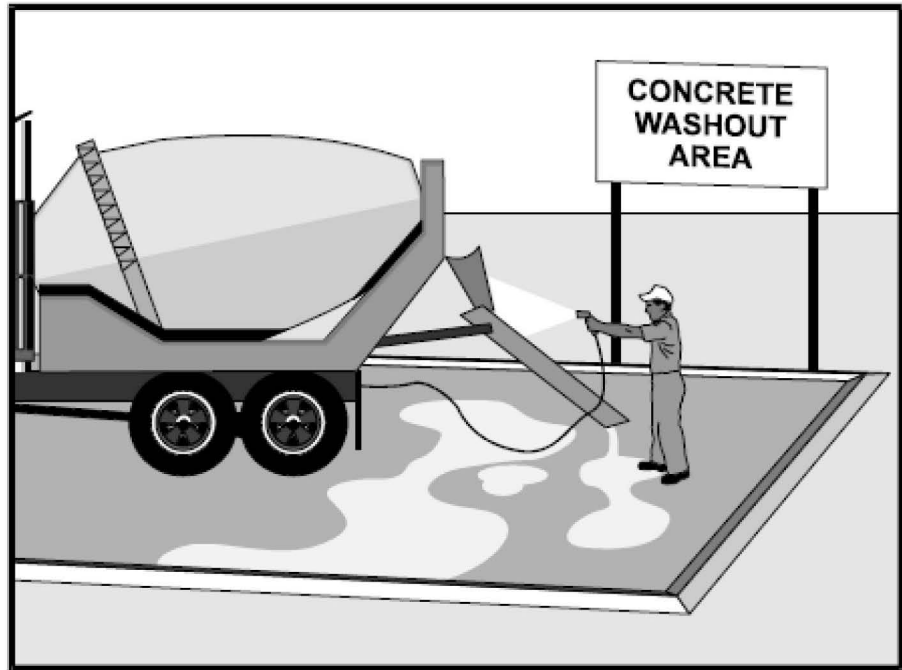
You can remove hardened concrete whole or you can break it up first, depending on the type of equipment available at your site. You can then reuse the concrete onsite or haul it away for disposal or recycling.

When you remove materials from the concrete washout, inspect for signs of weakening or damage, and rebuild structure or make necessary repairs. Install a new plastic liner after every cleaning.

## Concrete Washout Area

### *Purpose*

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, or performing onsite washout in a designated area to prevent pollutants from entering surface waters or groundwater.



### *Conditions of Use*

Concrete washout area best management practices are implemented on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout offsite (ready mix plant, etc.).
- Concrete trucks, pumpers, or other concrete coated equipment are washed onsite.

### *Design and Installation Specifications*

#### **Implementation**

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

- Perform washout of concrete trucks offsite or in designated concrete washout areas only.
- Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated concrete washout areas.

- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
  - Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
  - If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
  - Self-installed above-grade structures should only be used if excavation is not practical.

### **Education**

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.
- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for contractor's superintendent or Certified Erosion and Sediment Control Person to oversee and enforce concrete waste management procedures.
- A sign should be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

### **Contracts**

- Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

### **Location and Placement**

- Locate washout area at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.
- Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (Use Stabilized Construction Entrance). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The number of facilities you install should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, washouts should be placed in multiple locations for ease of use by concrete truck drivers.

### **Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures:**

- Temporary concrete washout facilities shall be located a minimum of 50 ft from sensitive areas including storm drain inlets, open drainage facilities, and watercourses.
- Concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
  - Approximately 7 gallons of wash water are used to wash one truck chute.
  - Approximately 50 gallons are used to wash out the hopper of a concrete pump truck
- Washout of concrete trucks shall be performed in designated areas only.
- 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 applicable solid waste regulations. Dispose of hardened concrete on a regular basis.
- Temporary Above-Grade Concrete Washout Facility
  - 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 minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
  - Straw bales and staking materials shall conform to the provisions in Section 209 of the NYSDOT Standard Specifications
  - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Temporary Below-Grade Concrete Washout Facility
  - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
  - Lath and flagging should be commercial type.
  - Plastic lining material shall be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears,



or other defects that compromise the impermeability of the material.

- Liner seams shall be installed in accordance with manufacturers' recommendations.
- Soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

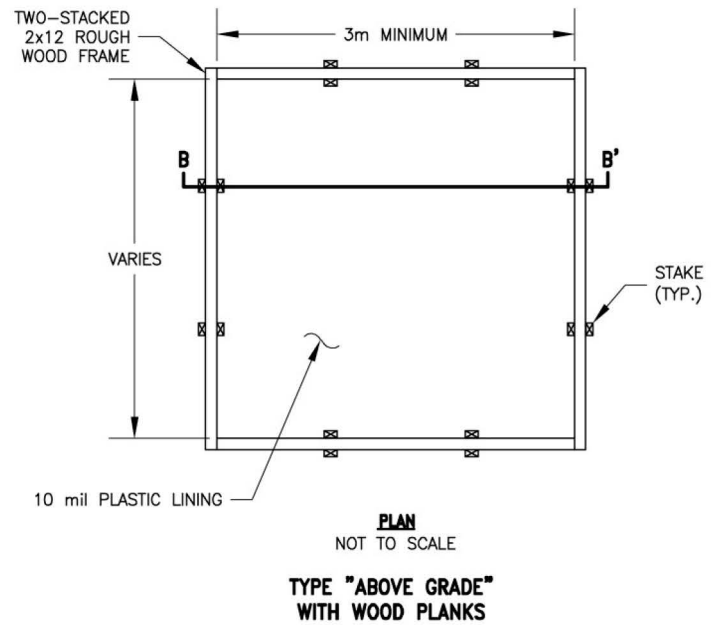
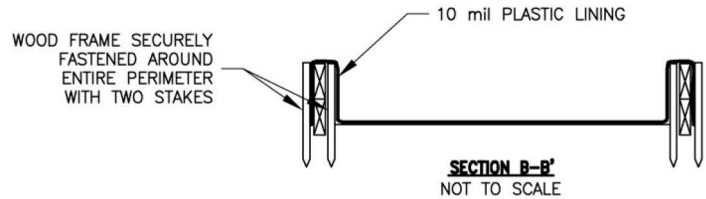
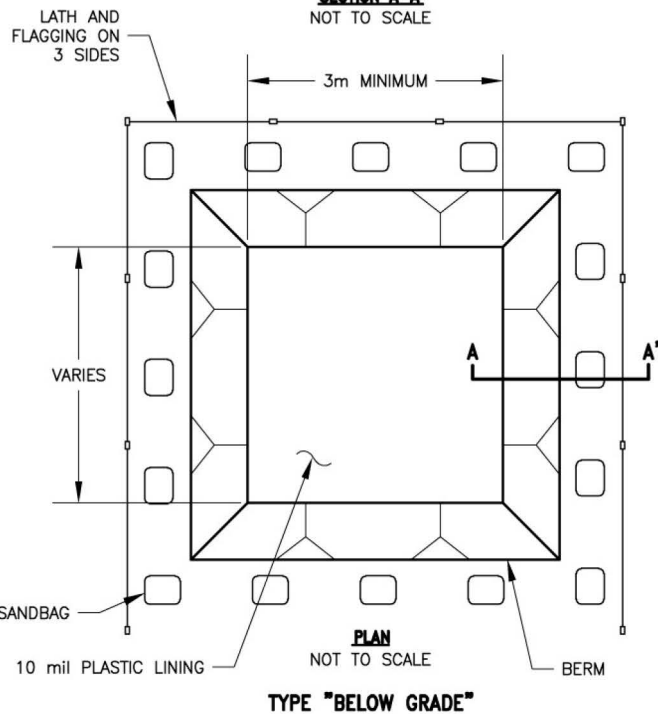
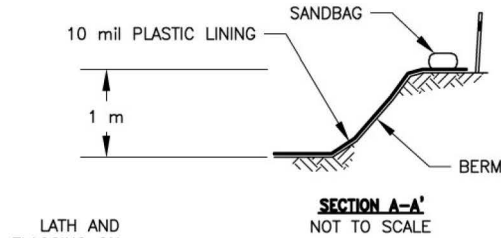
### **Inspection and Maintenance**

- Inspect and verify that concrete washout BMPs are in place prior to the commencement of concrete work.
- During periods of concrete work, inspect daily to verify continued performance.
  - Check overall condition and performance.
  - Check remaining capacity (% full).
  - If using self-installed washout facilities, verify plastic liners are intact and sidewalls are not damaged.
  - If using prefabricated containers, check for leaks.
- Washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner.
  - Do not discharge liquid or slurry to waterways, storm drains or directly onto ground.
  - Do not use sanitary sewer without local approval.
  - Place a secure, non-collapsing, non-water collecting cover over the concrete washout facility prior to predicted wet weather to prevent accumulation and overflow of precipitation.
  - Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused onsite or hauled away for disposal or recycling.
- When you remove materials from the self-installed concrete washout, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

### **Removal of Temporary Concrete Washout Facilities**

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete, slurries and liquids shall be removed and properly disposed of.

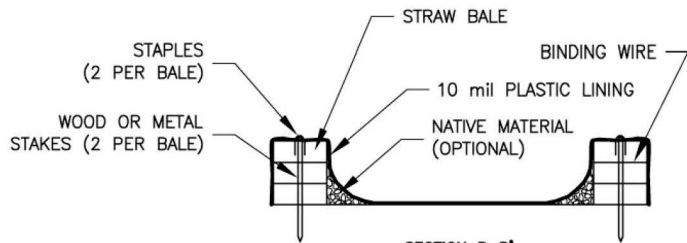
- Materials used to construct temporary concrete washout facilities shall be removed from the site of the work and disposed of or recycled.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled, repaired, and stabilized to prevent erosion.



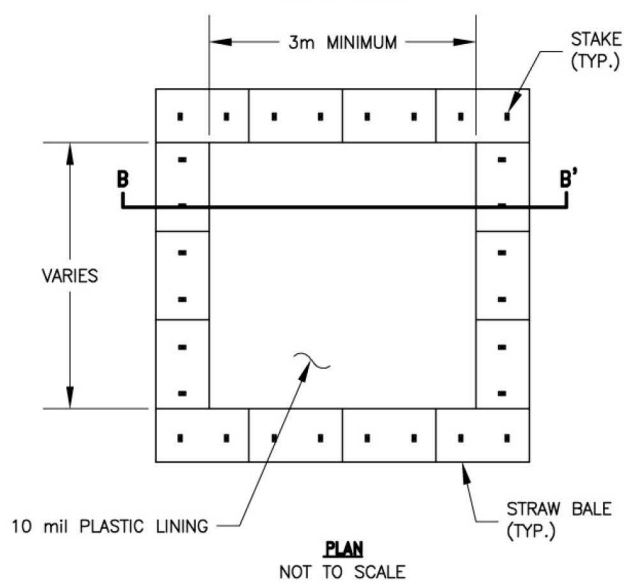
**NOTES:**

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE PAGE 6) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

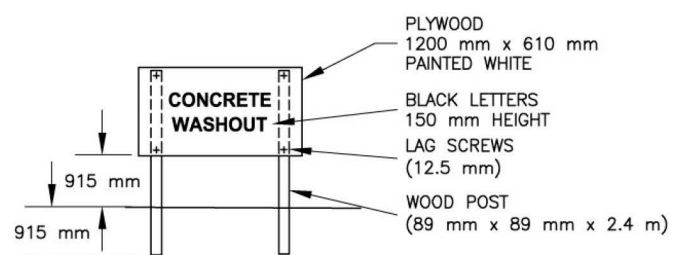




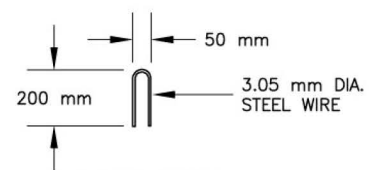
**SECTION B-B'**  
NOT TO SCALE



**TYPE "ABOVE GRADE"  
WITH STRAW BALES**



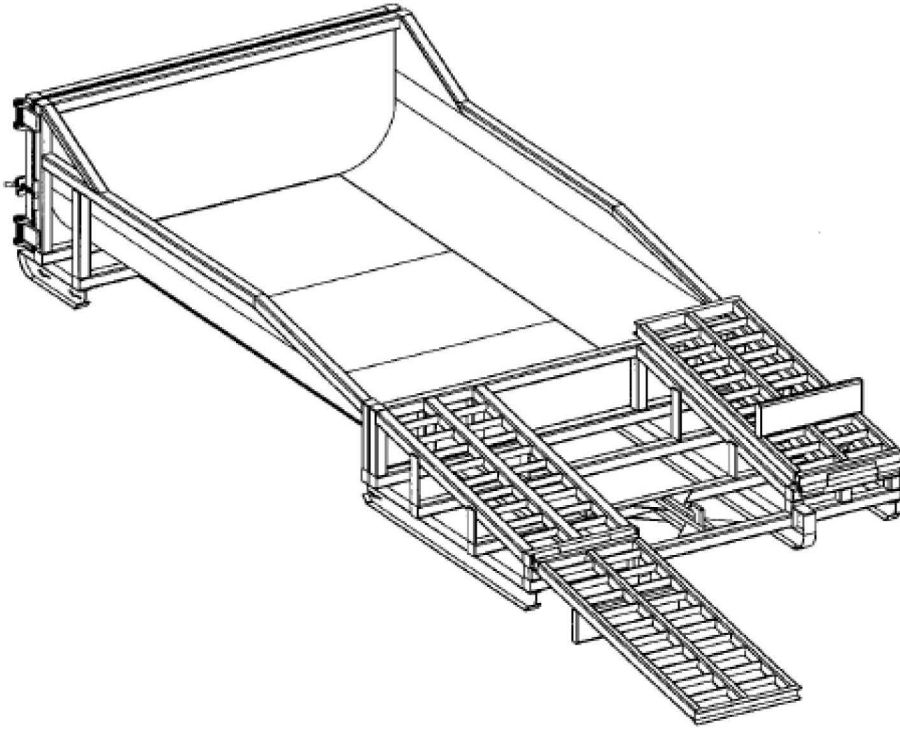
**CONCRETE WASHOUT  
SIGN DETAIL  
(OR EQUIVALENT)**



**STAPLE DETAIL**

**NOTES:**

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE FIG. 4-15) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



**Prefabricated Concrete Washout Container w/Ramp**



## **Appendix P**

### **Contractor Submitted and Approved Erosion and Sediment Control Narrative and Plans for Specific Operations and Project Time Schedule**