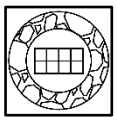
Final Draft of Standard

Formatted/Clean Version



6.54 ROCK RING DROP INLET PROTECTION

Definition

A ring shaped rock dam that prevents sediment and other debris from getting into a drop inlet. The rock dam has a built-in sediment storage area around the outside perimeter of the structure.

Purpose

To prevent sediment and other debris from entering a storm drain.

Conditions Where Practice Applies

To be used at drop inlets with large drainage areas or at drop inlets that receive high velocity water flows, possibly from many directions. Sediment is captured in an excavated depression surrounding the inlet. This practice should not be used alone when drainage area exceeds 1 acre. This practice must not divert water away from the storm drain.

Design Criteria

Place measure at least 30 feet away from vehicular traffic. This inlet protection can be modified to protect one side of the inlet if only one side receives flow.

Stone —A minimum 12-inches wide level area set 4 inches below the drop inlet crest will add protection against the entrance of material. Structural stone should be NCDOT Class B riprap with 2:1 side slope, and a minimum crest width of 18 inches. The height of the stone should be from 2 to 3.5 feet. The outside face of the riprap should be covered in a 12-inch thick layer of NCDOT #5 or #57 stone. Wire mesh with 1/4-inch openings may be placed over the drain grating but must be inspected frequently to avoid blockage by trash.

The top elevation of the stone structure must be at least 12 inches lower than the ground elevation downslope from the inlet.

It is important that all stormwater flow over the structure into the storm drain, and not past the structure. Temporary diking below the structure may be necessary to prevent bypass flow. Material may be excavated from inside the sediment pool for this purpose.

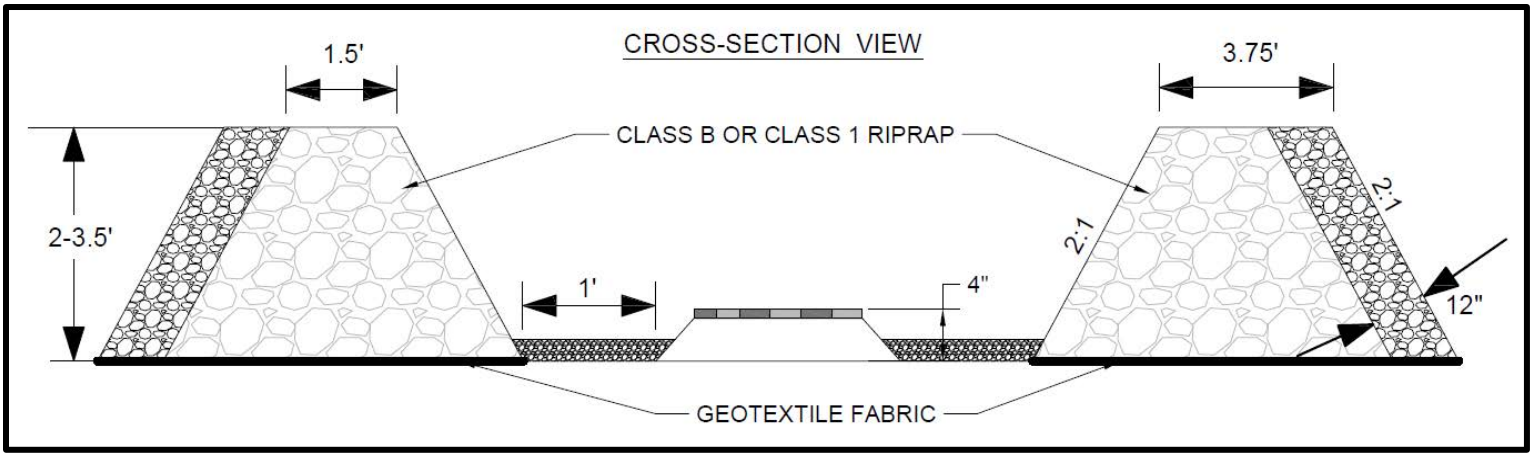


Figure 6.54a *Rock Ring Drop Inlet Protection Cross-Section View.*

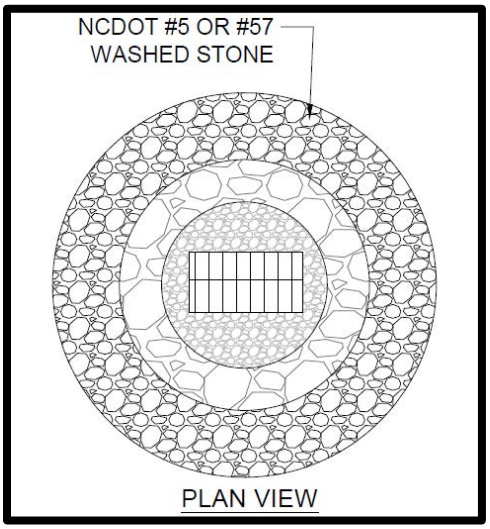


Figure 6.54b *Rock Ring Drop Inlet Protection Plan View.*

Construction Specifications

1. Clear the area of all debris that might hinder excavation and disposal of spoil.
2. Grade shallow depression uniformly towards the inlet with side slopes no greater than 2:1. Grade a 12-inches wide level area set 4 inches below the area adjacent to the inlet.
3. Provide a layer of geotextile around the ring prior to applying stone. Install the Class B or Class I riprap in a circle around the inlet. The minimum crest width of the riprap should be 18 inches, with a minimum bottom width of 7.5 feet. The minimum height of the stone is 2 feet.
4. The outside face of the riprap is then lined with 12 inches of NCDOT #5 or #57 washed stone.

5. Areas of bare soil between the stone ring and inlet should be provided with instant ground cover, which may include rolled erosion control products, woven geotextile, or stone.

Maintenance

Inspect rock ring inlet protection at least weekly and after each significant (1 inch or greater) rainfall event and perform any necessary repair immediately. To provide satisfactory inlet protection efficiency, remove sediment from the sediment pool area when the volume is decreased by half. This will help provide adequate storage volume for the next rain. Place the sediment that is removed in the designated disposal area. If that is not feasible the excavated material should be stabilized by the end of the working day.

Take care not to damage or undercut the structure during sediment removal. Remove debris from the inlet and replace stone as needed. If the inlet was covered with wire mesh the mesh should be cleaned of debris. When the contributing drainage area has been adequately stabilized, remove all materials and dispose of sediment properly. Bring the disturbed area to the grade of the drop inlet. Smooth and compact as needed. Appropriately stabilize all bare areas around the inlet with ground cover.

References

North Carolina Department of Transportation
Standard Specifications for Roads and Structures

CTC Edits to Original Standard

Practice Standards and Specifications

6.54 Rock ~~Doughnut~~Ring Inlet Protection (temporary)

Definition

A ring~~doughnut~~ shaped rock dam that prevents sediment and other debris from getting into a drop inlet. The rock dam has a built-in sediment storage area around the outside perimeter of the structure.

Purpose

To prevent sediment and other debris from entering a storm drain.

Conditions Where Practice Applies

To be used at drop inlets with large drainage areas or at drop inlets that receive high velocity water flows, possibly from many directions. Sediment is captured in an excavated depression surrounding the inlet. This practice should not be used alone ~~W~~when drainage area exceeds 1 acre~~., additional measures are necessary~~. This practice must not divert water away from the storm drain.

Design Criteria

Place measure at least 30 feet away from vehicular traffic. This inlet protection can be modified to protect one side of the inlet if only one side receives flow.

Stone —A minimum 12-inches~~foot~~ wide level area set 4 inches below the drop inlet crest will add protection against the entrance of material. Structural stone should be NC DOT Class B riprap with 2:1 side slope, and a minimum crest width of 18 inches. The height of the stone should be from 2 to 3.5 feet. The outside face of the riprap should be covered in a 12-inch thick layer of NC DOT #5 or #57 ~~washed~~ stone. Wire mesh with 1/4~~2~~-inch openings may be placed over the drain grating but must be inspected frequently to avoid blockage by trash. **The top elevation** of the stone structure must be at least 12 inches lower than the ground elevation downslope from the inlet. **It is important that all stormwater flow over the structure into the storm drain, and not past the structure.** Temporary diking below the structure may be necessary to prevent bypass flow. Material may be excavated from inside the sediment pool for this purpose ~~(Practice 6.52, *Block and Gravel Inlet Protection*)~~.

Construction Specifications

1. Clear the area of all debris that might hinder excavation and disposal of spoil.
2. Grade shallow depression uniformly towards the inlet with side slopes no greater than 2:1. Grade a 12-inches~~1-foot~~ wide level area set 4 inches below the area adjacent to the inlet.
3. **Provide a layer of geotextile around the ring prior to applying stone.~~beneath the area to receive stone.~~** Install the Class B or Class I riprap in a circle around the inlet. The minimum crest width of the riprap should be 18 inches, with a minimum bottom width of 7.5 feet. The minimum height of the stone is 2 feet.
4. The outside face of the riprap is then lined with 12 inches of NC DOT #5 or #57 washed stone.
5. Areas of bare soil between the stone ring and inlet should be provided with instant ground cover, which may include rolled erosion control products, woven geotextile, or stone.

Maintenance

Inspect rock ring~~doughnut~~ inlet protection at least weekly and after each significant (1½ inch or greater) rainfall event and perform any necessary repair immediately. To provide satisfactory inlet protection efficiency, remove sediment from the sediment pool area when the volume is decreased by half. This will help provide adequate storage volume for the next rain. ~~Stabilize excavated material appropriately. The sediment removed should be located and stabilized in a proper disposal area away from the inlet. If that is not feasible, the excavated material should be stabilized by the end of the working day.~~ Place the sediment that is removed in the designated disposal area.~~The sediment removed should be stabilized and located outside of the drainage area.~~ If that is not feasible the excavated material should be stabilized by the end of the working day.

Commented [LJ1]: Consider a more formal term

Commented [LJ2R1]: Rock Drop Inlet Protection

Commented [LJ3]: KY is 3:1

Commented [LJ4]: No diagram identified in other state ESC manual. We agree that showing fabric under the stone ring would be useful.

Commented [KP5]: Addresses DEMLR Comment#2

Commented [LJ6]: addressing comment #1

Commented [LJ7]: add in disposal of materials

Commented [LJ8]: check Donald's language around removing sediment being carried away.

Take care not to damage or undercut the structure during sediment removal. Remove debris from the inlet and replace stone as needed. If the inlet was covered with wire mesh the mesh should be cleaned of debris. When the contributing drainage area has been adequately stabilized, remove all materials and dispose of sediment properly. Bring the disturbed area to the grade of the drop inlet. Smooth and compact it as needed. Appropriately stabilize all bare areas around the inlet with ground cover.

References *Inlet protection*

~~6.52, Block and Gravel Inlet Protection~~ (Temporary)
North Carolina Department of Transportation
Erosion & Sedimentation Control Design and Construction Manual ~~Guidelines for Division Maintenance Operation, 2015~~1993.
6.54.2

6.54 Temporary Rock Doughnut Inlet Protection

1. To prevent sediment from entering pipe, provide type of material either of RECP or clean stone between down gradient base of doughnut and pipe inlet.
2. Diagram does not show fabric under stone doughnut. (6.55a, add a callout to diagram)
3. Indicate where or how to disposed of sediment.
4. Add note on how to dispose of excavated sediment.

Commented [LJ9]: (6.55a, add a callout to diagram)

DEMLR Comments to CTC Edits

Practice Standards and Specifications

6.54 Rock Ring Drop Inlet Protection (temporary)

Definition

A ring-shaped rock dam that prevents sediment and other debris from getting into a drop inlet. The rock dam has a built-in sediment storage area around the outside perimeter of the structure.

Purpose

To prevent sediment and other debris from entering a storm drain.

Conditions Where Practice Applies

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Design Criteria

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The top elevation of the stone structure must be at least 12 inches lower than the ground elevation downslope from the inlet. **It is important that all stormwater flow over the structure into the storm drain, and not past the structure.** Temporary diking below the structure may be necessary to prevent bypass flow. Material may be excavated from inside the sediment pool for this purpose.

Construction Specifications

1. Clear the area of all debris that might hinder excavation and disposal of spoil.

2. Grade shallow depression uniformly towards the inlet with side slopes no greater than 2:1. Grade a 12-inches wide level area set 4 inches below the area adjacent to the inlet.

3. Provide a layer of geotextile around the ring prior to applying stone. Install the NC DOT Class B riprap in a circle around the inlet. The minimum crest width of the riprap should be 18 inches, with a minimum bottom width of 7.5 feet. The minimum height of the stone is 2 feet.

4. The outside face of the riprap is then lined with 12 inches of NC DOT #5 or #57 washed stone.

5. Areas of bare soil between the stone ring and inlet should be provided with instant ground cover, which may include rolled erosion control products, woven geotextile, or stone.

Maintenance

Inspect rock ring inlet protection at least weekly and after each significant (1 inch or greater) rainfall event and perform any necessary repair immediately. To provide satisfactory inlet protection efficiency, remove sediment from the sediment pool area when the volume is decreased by one-half. This will help provide adequate storage volume for the next rain event. Place the sediment that is removed in the designated disposal area. If that is not feasible the excavated material should be stabilized by the end of the working day.

Commented [JC1]: Prefer block style full-justified format with title out to side just like original.

Commented [LJ2]: No diagram identified in other state ESC manual. We agree that showing fabric under the stone ring would be useful.

Commented [JC3R2]: Keeping schematic and showing fabric. See markup for one other dimension to show.

Commented [KP4]: Addresses DEMLR Comment#2

Commented [LJ5]: addressing comment #1

Take care not to damage or undercut the structure during sediment removal. Remove debris from the inlet and replace stone as needed. If the inlet was covered with wire mesh the mesh should be cleaned of debris. When the contributing drainage area has been adequately stabilized, remove all materials and dispose of sediment properly. Bring the disturbed area to the grade of the drop inlet. Smooth and compact it as needed. Appropriately stabilize all bare areas around the inlet with ground cover.

References

Inlet protection
6.52, Block and Gravel Inlet Protection (Temporary)

North Carolina Department of Transportation
Erosion & Sedimentation Control Design and Construction Manual
2015.