

Environmental Quality Incentives Program

2013 EQIP Signup

Minnesota Supplement for:
Practice Standard 410 – **Grade Stabilization Structure**

Supplemental Criteria

1. Upland Treatment is required. **See General Provision 8.**
2. Embankment Dam Rehabilitation practice is to be used when an existing embankment structure is reconstructed to restore the original function.

Scenarios

Fabric Reinforced Vegetated Chute

A chute structure constructed of a fabric reinforced vegetated channel. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards.

Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a channel area that is 12 feet wide and 30 feet in length (360 square feet). The unit of payment measurement is defined as the square footage of the chute channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Concrete Block or Rock Chute

A chute structure constructed of a rock riprap, precast concrete block or cable concrete. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a channel area that is 12 feet wide and 60 feet in length (720 square feet). The unit of payment measurement is defined as the square footage of the chute channel including inlet and outlet sections. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Culvert Outlet Protection MN TR3

A rock outlet structure constructed using riprap below a culvert outlet designed according to MN TR3. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost

estimate is based upon a 3' culvert requiring a 1' deep x 6'wide x 9'long rock basin. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Plunge pool (Design Note 6)

A rock outlet structure constructed using riprap below a culvert outlet designed according to Design note 6. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a 18" outlet requiring a 3' deep basin with a 3'wide x 3'long bottom. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Timber Toewall

A Straight Drop structure constructed using treated posts and planks. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon an 16 foot weir length and 2 foot drop. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Aluminum, Steel or concrete toe wall

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft. The unit of payment measurement is defined as each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Concrete Block Weir

A Straight Drop structure composed of concrete blocks used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a drop structure with a drop of 4ft and weir length of 10ft. The unit of payment measurement is defined as each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Drop Inlet to Culvert

A Box Drop structure composed of reinforced concrete used to stabilize the grade just upstream of a culvert. The structure's purpose is to control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a concrete wall structure with a drop of 4ft and weir length of 12ft. The unit of payment measurement is defined as each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Side Inlet Structure - Drainage Area 0 to 80 Acres

A side inlet structure with a drainage area of less than 80 acres. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 200 cubic yards, and 20 feet of 12" 16 gauge CMP pipe with a hood inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Side Inlet Structure - Drainage Area 80 to 250 Acres

A side inlet structure with a drainage area of greater than 80 acres but less than 250 acres. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 400 cubic yards, and 20 feet of 30" 16 gauge CMP pipe with a hood inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Side Inlet Structure - Drainage Area Greater Than 250 Acres

A side inlet structure with a drainage area of greater than 250 acres. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 1000 cubic yards, and 20 feet of 48" 14 gauge CMP pipe with a hood inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam - Drainage Area 0 to 10 Acres

An earthen embankment dam with a drainage area of less than 10 acres. Assessment shows anti-seep collars or sand diaphragm are needed for seepage control. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 800 cubic yards, and 60 feet of pipe 6" PVC pipe with a hood inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam - Drainage Area 10.1 to 20 Acres

An earthen embankment dam with a drainage area of 10.1 to 20 acres, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 1,200 cubic yards, 80 feet of 10" PVC pipe with a hood inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam - Drainage Area 20.1 to 80 Acres

An earthen embankment dam with a drainage area of 20.1 to 80 acres, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 1,800 cubic yards, 90 feet of 12" PVC pipe with a hood inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam - Drainage Area 80.1 to 250 Acres

An earthen embankment dam with a drainage area of 80.1 to 250 acres, sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2500 cubic yards, 80 feet of 24" CMP pipe with 30" riser, and 17 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam - Drainage Area > 250 Acres

An earthen embankment dam with a drainage area of more than 250 acres, sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 3500 cubic yards, 100 feet of 36" CMP pipe with 48" riser, and 35 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam Rehab - Drainage Area 0 to 20 Acres

A previously built earthen embankment dam with a drainage area of less than 20 acres, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Previously installed structure has had pipe or embankment failure and is in need of pipe replacement. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon removing the existing pipe and replacing with a typical amount of earthfill of 500 cubic yards, 80 feet of 10" PVC pipe with a hood inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam Rehab - Drainage Area 20.1 to 80 Acres

A previously built earthen embankment dam with a drainage area of 20.1 to 80 acres, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Previously installed structure has had pipe or embankment failure and is in need of pipe replacement. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon removing the existing pipe and replacing with a typical amount of earthfill of 700 cubic yards, 90 feet of 12" PVC pipe with a hood inlet, and 4 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam Rehab - Drainage Area 80.1 to 250 Acres

A previously built earthen embankment dam with a drainage area of 80.1 to 250 acres, sand diaphragm, and excavated plunge pool basin. Previously installed structure has had pipe or embankment failure and is in need of pipe replacement. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to

control gully erosion. Cost estimate is based upon removing the existing pipe and replacing with a typical amount of earthfill of 1000 cubic yards, 80 feet of 24" CMP pipe with a 30" riser, and 17 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Embankment Dam Rehab - Drainage Area > 250 Acres

A previously built earthen embankment dam with a drainage area of more than 250 acres, sand diaphragm, and excavated plunge pool basin. Previously installed structure has had pipe or embankment failure and is in need of pipe replacement. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon removing the existing pipe and replacing with a typical amount of earthfill of 1200 cubic yards, 100 feet of 36" CMP pipe with a 48" riser, and 35 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.