EROSION CONTROL FACILITIES

The contractor shall install the erosion control facilities, as shown in these plans, prior to disturbing the site or clearing areas for roads, utilities or house construction. The erosion control facilities shall be removed only after the threat of erosion or generating silt – laden runoff is past.

Theodore W. Gunning
DEVELOPER'S APPROVAL

3-31-95
DATE

CONSTRUCTION NOTES

1. All items of construction shall be completed in accordance with the 1991 Standard Specifications for Road, Bridge, and Municipal Construction as promulgated jointly by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA); the 1992 Spokane County Standards for Road and Sewer Construction; and all amendments hereto.

2. Any conflicting utilities shall be relocated prior to construction of road and drainage facilities.

3. Install Spokane County Standard Wheelchair Ramps where shown on the plan.

4. Curb data is to front face of curb for type "B" curb and to back of curb for type "R" curb.

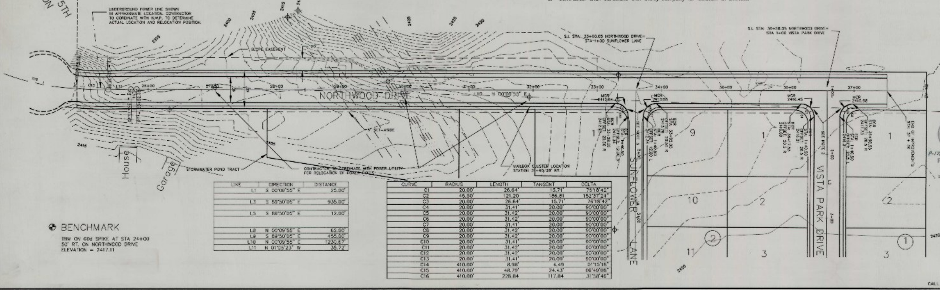
5. Contractor shall cordinate with utility company for location of utilities.

GRAPHIC SCALE
(IN FEET)
1 inch = 50 ft.

LEGEND

OVERHEAD POWER LINE

POWER POLE



LINE	DIRECTION	DISTANCE
L1	S 00°09'55" E	25.00'
L3	S 89°50'05" E	935.00'
L5	S 89°50'05" E	12.00'
L8	N 00°09'55" E	62.00'
L9	S 89°50'05" E	455.00'
L10	N 00°09'55" E	1230.67'
L11	N 01°05'23" W	35.72'

CURVE	RADIUS	LENGTH	TANGENT	DELTA
C1	20.00'	26.64'	15.71'	76°18'42"
C2	46.50'	121.20	186.81	152°37'24"
C3	20.00'	26.64'	15.71'	76°18'42"
C4	20.00'	31.41'	20.00'	90°00'00"
C5	20.00'	31.42'	20.00'	90°00'00"
C6	20.00'	31.42'	20.00'	90°00'00"
C7	20.00'	31.41'	20.00'	90°00'00"
C8	20.00'	31.42'	20.00'	90°00'00"
C9	20.00'	31.42'	20.00'	90°00'00"
C10	20.00'	31.41'	20.00'	90°00'00"
C11	20.00'	31.42'	20.00'	90°00'00"
C12	20.00'	31.42'	20.00'	90°00'00"
C13	20.00'	31.41'	20.00'	90°00'00"
C14	410.00'	8.98'	4.49	01°15'18"
C15	410.00'	48.79'	24.43'	06°49'05"
C16	410.00'	226.84	117.84	31°58'46"

BENCHMARK

TBM ON 60d SPIKE AT STA 24+00
50' RT. ON NORTHWOOD DRIVE
ELEVATION = 2417.11

APPROVED FOR CONSTRUCTION
SPOKANE COUNTY ENG.
BY Dana Frantz, P.E.
4-14-1995

P-1729A

PERMIT REQUIRED!
NOTIFY THE PERMIT ENGINEER
456-3600
24 HRS. PRIOR TO CONSTRUCTION

CALL BEFORE YOU DIG 456-8000

DRAWN BY: JS/JGL
CHECKED BY:
DATE: 3/6/95
SCALE: AS SHOWN

EXPIRES 1/23/96

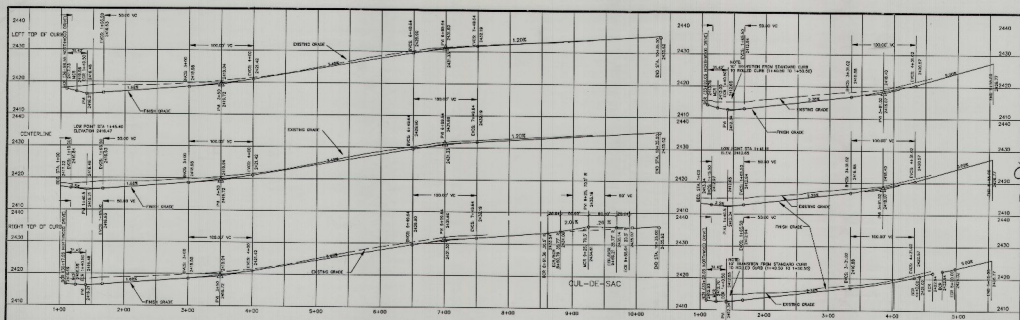
METRO ENGINEERING

Northwood Properties, Inc

Pheasant Run/ Northwood Drive
Street Improvements

SHEET
1 OF 10
STREET

1729 A



LINE	DIRECTION	DISTANCE
L1	S.00°00'00" W	300.00'
L2	S.89°59'56" E	500.00'
L3	S.89°59'56" E	12.00'
L4	N.00°00'33" E	60.00'
L5	S.89°59'33" E	440.00'
L6	N.00°00'33" E	1192.50'
L7	N.00°00'33" E	59.00'

CURVE	RADIUS	LENGTH	TANGENT	DELTA
C1	20.00'	28.64'	15.75'	82°06'44"
C2	45.00'	121.00'	188.85'	153°37'33"
C3	20.00'	31.41'	20.00'	90°00'00"
C4	20.00'	31.41'	20.00'	90°00'00"
C5	20.00'	31.42'	20.00'	90°00'00"
C6	20.00'	31.42'	20.00'	90°00'00"
C7	20.00'	31.42'	20.00'	90°00'00"
C8	20.00'	31.42'	20.00'	90°00'00"
C9	20.00'	31.42'	20.00'	90°00'00"
C10	20.00'	31.42'	20.00'	90°00'00"
C11	20.00'	31.42'	20.00'	90°00'00"
C12	20.00'	31.42'	20.00'	90°00'00"
C13	20.00'	31.41'	20.00'	90°00'00"
C14	410.00'	9.69'	4.85'	01°21'18"
C15	410.00'	13.55'	6.77'	01°53'42"

CONSTRUCTION NOTES

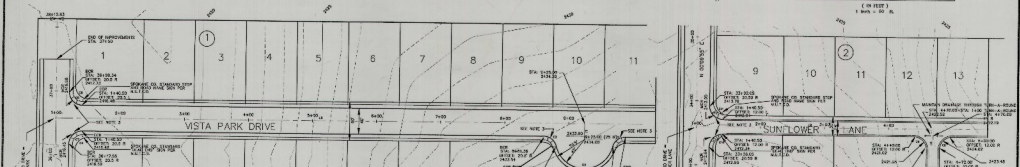
1. All items of construction shall be completed in accordance with the 1992 Standard Specifications for Road, Bridge, and Municipal Construction as prepared by and adopted by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA); the 1992 Spokane County Standards for Road and Sewer Construction; and all amendments hereto.
2. Any conflicting utilities shall be relocated prior to construction of road and drainage facilities.
3. Install Spokane County Standard Wheelchair Ramps where shown on the plan.
4. All curb data is for back of curb.
5. Contractor shall coordinate with utility companies for utility locations.

BENCHMARK

TBM ON KEN SPICE AT STA 24+00
20' NE OF NORTHWOOD DRIVE
ELEVATION = 2417.11

DEVELOPER'S APPROVAL 2-21-95
DATE

APPROVED FOR
PERMIT REQUIRED!
NO WORK TO BE DONE
IN THIS PHASE TO CONSTRUCTION



DRAWN BY: JE
CHECKED BY:
DATE: 2/7/95
SCALE: AS SHOWN

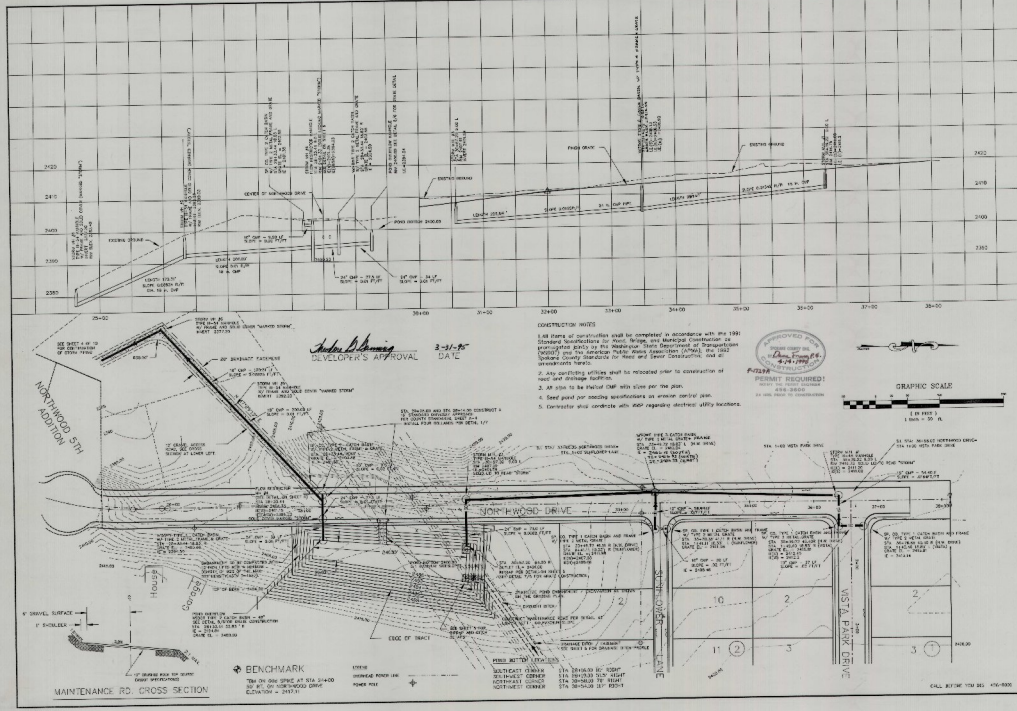
PROJECT ENGINEER: METRO ENGINEERING
OWNER: Northwood Properties, Inc

Pheasant Run
Vista Park / Sunflower Lane
Street Improvements

SHEET 2 OF 10
STREET

L-P1334-N-2.1-R

1724A



DRAWN BY: JS/GL
CHECKED BY:
DATE: 1/25/95
SCALE: AS SHOWN

PROJECT NO. 76

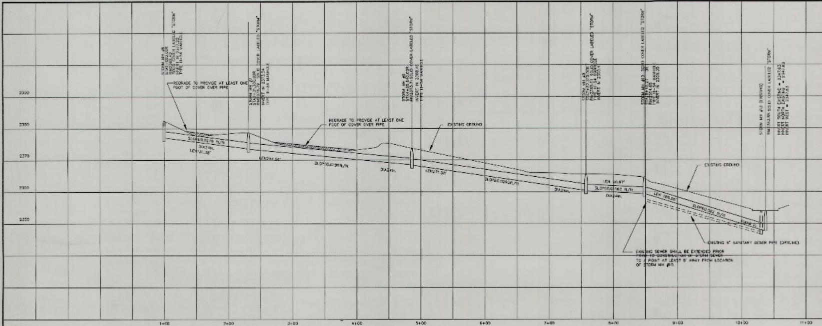
FILENAME: 1/25/95 PE
DRAWING NO. 6-95

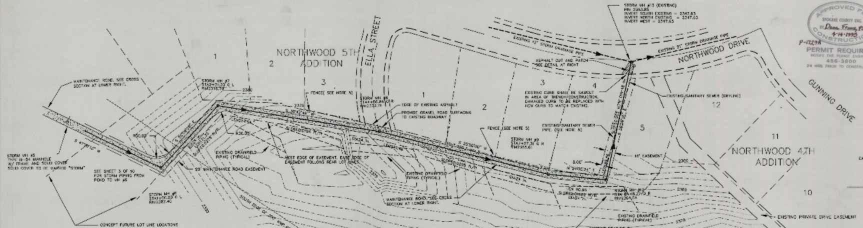
CLIENT: METRO ENGINEERING
Northwood Properties, Inc

Pheasant Run/Northwood Drive
Storm Sewer

SHEET
3 OF 10
DRAINAGE

1728A





CONSTRUCTION NOTES

1. All items of construction shall be completed in accordance with the 1991 Standard Specifications for Road, Bridge, and Municipal Construction as promulgated jointly by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA); the 1992 Spokane County Standards for Road and Sewer Construction; and all amendments hereto.

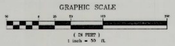
2. Any conflicting utilities shall be relocated prior to construction of road and drainage facilities.

3. All pipe to be Helical CMP with sizes per the plan.

4. Contractor shall cordinate with WWP regarding electrical utility locations.

5. Contractor shall obtain any construction easements for construction outside of the existing drainage easement. Any private property (fences, landscaping, etc.) damage by the construction shall be replaced with to original or an improved condition.

6. An existing 8 inch sanitary sewer pipe was constructed along the common lot line between lot 4 and lot 5. This line is generally directly below the storm sewer. Prior to construction of storm sewer the sanitary sewer line should be extended to a point at least 8 feet from the proposed location of the storm manhole #10. Contractor shall cordinate with the Spokane Co. utility department regarding this extension for applicable permits that need to be obtained.



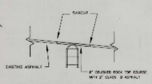
BENCHMARK

TBM ON 60d SPIKE AT STA 24+00
50' RT. ON NORTHWOOD DRIVE
ELEVATION = 2417.11

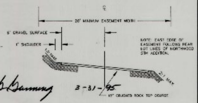
APPROVED FOR CONSTRUCTION
SPOKANE COUNTY ENG.
BY Dana Franz, P.E.
4-14-1995

P-1729A

PERMIT REQUIRED!
NOTIFY THE PERMIT ENGINEER
456-3600
24 HRS. PRIOR TO CONSTRUCTION



ASPHALT CUT AND PATCH



Theodore S. Gunning 3-31-95

MAINTENANCE RD. CROSS SECTION

JERRY D. STORHAUG, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER, 3/30/95
EXPIRES 1/?/96

DRAWN BY: JS
CHECKED BY:
DATE: 3/6/95
SCALE: AS SHOWN

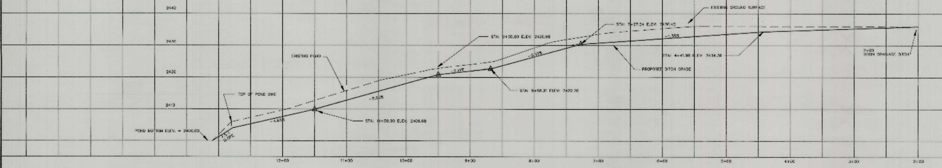
METRO ENGINEERING
Northwood Properties, Inc

Pheasant Run/Northwood Drive
Storm Sewer

SHEET
4 OF 10
DRAINAGE

CP 1729A-BV-4.TIF

1729 A



CONSTRUCTION NOTES

1. All items of construction shall be completed in accordance with the 1991 Standard Specifications for Road, Bridge, and Municipal Construction as promulgated jointly by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA); the 1992 Spokane County Standards for Road and Sewer Construction; and all amendments hereto.

2. Any conflicting utilities shall be relocated prior to construction of road and drainage facilities.

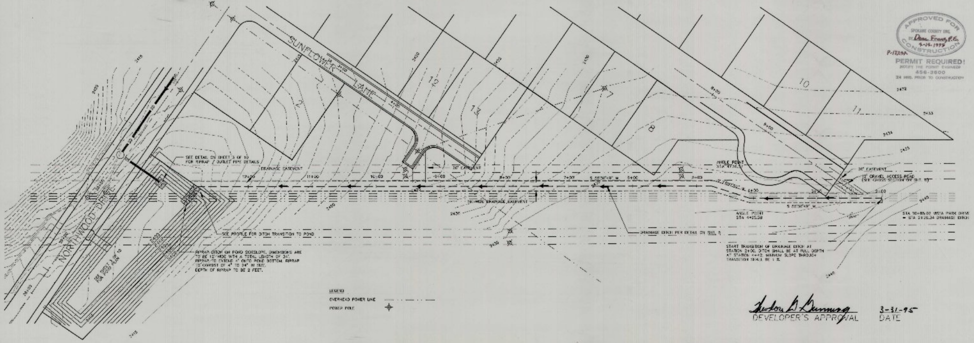
3. The contractor shall cordinate with WWP regarding electrical utility locations.

BENCHMARK

TBM ON 60d SPIKE AT STA 24+00
50' RT. ON NORTHWOOD DRIVE
ELEVATION = 2417.11

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.



LEGEND
OVERHEAD POWER LINE
POWER POLE

APPROVED FOR CONSTRUCTION
SPOKANE COUNTY ENG.
Dean Franz, P.E.
4-14-1995
P-1729A
PERMIT REQUIRED!
NOTIFY THE PERMIT ENGINEER
456-3600
24 HRS. PRIOR TO CONSTRUCTION

DEVELOPER'S APPROVAL 3-31-95
DATE

DRAWN BY: JS
CHECKED BY:
DATE: 1/25/95
SCALE: AS SHOWN

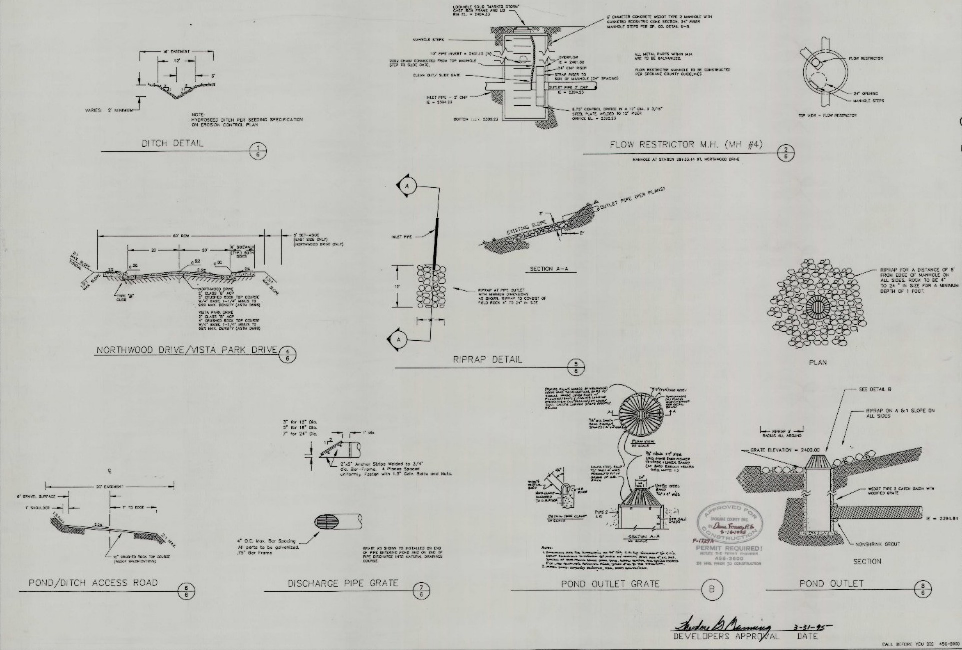
METRO ENGINEERING
Northwood Properties, Inc

Pheasant Run
Drainage Ditch

SHEET
5 OF 10
DRAINAGE

LP1729A-PP-5.TIF

1729 A



DRAWN BY: JS/JGL
CHECKED BY:
DATE: 10/25/94
SCALE: AS SHOWN

REVISED 1/18/95

METRO ENGINEERING

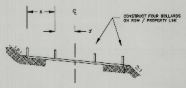
Northwood Properties, Inc

Pheasant Run
Street / Drainage Detail Sheet

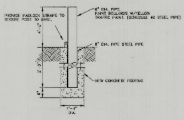
SHEET
6 OF 10
DETAILS

1729 A

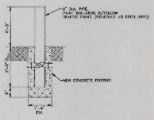
CP 1729A-DRAIN-1.TIF



SECTION VIEW

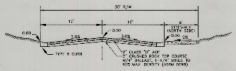


INTERIOR BOLLARD (REMOVABLE)



EXTERIOR BOLLARD(FIXED)

BOLLARD DETAIL 1/7



SUNFLOWER LANE 2/7

Andrew B. Denning 3-31-95
DEVELOPERS APPROVAL DATE

APPROVED FOR CONSTRUCTION
Denver County Inc.
Dept. Engineering
4-11-1995
P-17204
PERMIT REQUIRED!
NOTIFY THE PERMIT DIVISION
456-3600
24 HRS. PRIOR TO CONSTRUCTION

CALL BEFORE YOU DIG 456-3600

DRAWN BY: AJG
CHECKED BY:
DATE: 10/28/94
SCALE: AS SHOWN

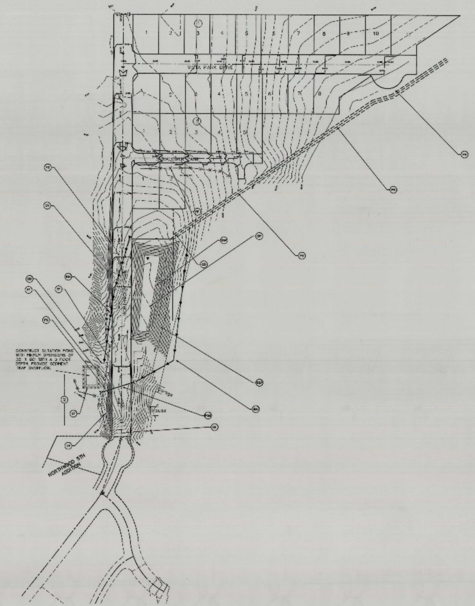
METRO ENGINEERING
Northwood Properties, Inc

Pheasant Run
Street / Drainage Detail Sheet

SHEET
7 OF 10
DETAILS

LP17204-DRAIN-2.DWG

.724A



LEGEND

Existing Contours 1' Interval	- - - - - -
Proposed Contours 2' Interval	———
Mulching and Matting	(MU)
Preserving Natural Vegetation	(VC)
Buffer Zone	(BZ)
Permanent Seeding and Planting	(PS)
Stabilized Construction Entrance	(CE)
Pipe Slope Drains	(PS)
Surface Roughening	(SR)
Hydroseed	(SSR)
Interceptor Dike and Swale	(IDS)
Check Dams	(CD)
Outlet Protection	(OP)
Riprap	(RR)
Filter Fence	(FF)
Gravel Filter Berm	(GFB)
Sediment Trap	(ST)
Sediment Basin	(SB)

APPROVED FOR CONSTRUCTION
SPOKANE COUNTY ENG.
BY Dean Franz P.E. 4-14-1995
P-1729A
PERMIT REQUIRED!
NOTIFY THE PERMIT ENGINEER
456-3600
24 HRS. PRIOR TO CONSTRUCTION

Theodore G. Gunning 3-31-95

DRAWN BY: JS
CHECKED BY:
DATE: 10/25/94
SCALE: AS SHOWN

METRO ENGINEERING
Northwood Properties, Inc

Pheasant Run
Grading and Erosion Control

SHEET
8 OF 10
EROSION

LP1729A-GRAD-1.TIF

1729A

II-1.4.2 BMP E1.30: Buffer Zones

Code: (BZ) Symbol:

Definition and Purpose An undisturbed area or strip of natural vegetation or an established suitable planting that will provide a living filter to reduce soil erosion and runoff velocities.

Conditions Where Practice Applies

- Natural buffer zones are used along streams and other bodies of water that need protection from erosion and sedimentation. Vegetative buffer zones can be used to protect natural swales and incorporated into natural landscaping of an area.
- Leave all unstable steep slopes in natural vegetation.
- Fence or flag clearing limits and keep all equipment and construction debris out of the natural areas.
- Keep all excavations outside the dripline of trees and shrubs.
- Do not push debris or extra soil into the buffer zone area because it will cause damage from burying and smothering.

BUFFER ZONE (BZ)

II-1.4.1 BMP E1.10: Stabilized Construction Entrance and Tire Wash

Code: (CE) Symbol:

Definition A temporary stone-stabilized pad located at points of vehicular ingress and egress on a construction site.

Purpose

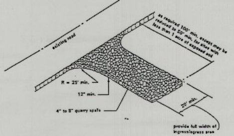
To reduce the amount of mud, dirt, rocks, etc. transported onto public roads by motor vehicles or runoff by constructing a stabilized pad of rock spalls at entrances to construction sites and washing of tires during egress.

Conditions Where Practice Applies

- Whenever traffic will be leaving a construction site and moving directly onto a public road or other paved areas.

Maintenance

- The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2-inch stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.



STABILIZED CONSTRUCTION ENTRANCE AND TIRE WASH (CE)

II-1.4.3 BMP E1.35: Permanent Seeding and Planting

Code: (PS) Symbol:

Definition The establishment of perennial vegetative cover on disturbed areas.

Purpose

To establish permanent vegetation (such as grasses, legumes and trees and shrubs) as rapidly as possible to prevent soil erosion by wind or water, and to improve wildlife habitat and site aesthetics.

To provide pollutant filtration (biofiltration) in vegetation-lined channels and to establish constructed wetlands as required (see BMP RW.10 in Chapter III-4 and RV.05 in Chapter III-6).

Conditions Where Practice Applies

- Graded, final graded or cleared areas where permanent vegetative cover is needed to stabilize the soil.
- Areas which will not be brought to final grade for a year or more.
- Vegetation-lined channels.
- Retention or detention ponds as required.

Provide fresh, clean new crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species and percentages as follows:

20 percent Elka Perennial Rye

20 percent Durar Hard Fescue

45 percent Cover Sheep/Fescue

15 percent reubens Canadian Bluegrass

Provide mixture composed of grass seed and fertilizer in percentages as follows:

Grass seed mixture: 90 lbs. per acre
Fertilizer: 16:16:16 timed release composition, 300 lbs. per acre

All seeding of slopes shall be done in accordance with WSDOT Standard Specifications

Permanent seeding shall occur between the dates of August 15 to November 15. Any areas that are not seeded and are exposed for more than 30 days shall have a straw mulch(1.2 Tons / acre) applied. Mulch shall be anchored into the soil by disking or other methods as approved by the Spokane Co. Road Department. Mulching operations shall be per WSDOT specifications section 8-01.3(5).

PERMANENT SEEDING (PS)

II-5.7.6 BMP E2.35: Surface Roughening

Code: (SR) Symbol:

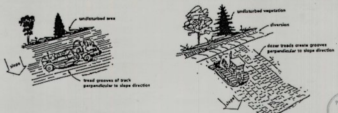
Definition Provision of a rough soil surface with horizontal depressions created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.

Purpose

To aid in establishment of vegetative cover, reduce runoff velocity, increase infiltration, and provide for sediment trapping.

Conditions Where Practice Applies

- All slopes steeper than 3:1, and greater than 5 vertical feet, require surface roughening; either stair-step grading, grooving, furrowing, or tracking if they are to be stabilized with vegetation.



SURFACE ROUGHENING (SR)

SPECIFICATIONS

All areas disturbed as part of the pond construction shall have vegetation reestablished by Hydroseeding within the following specifications.

Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species and percentages by weight as follows:

Siberian Wheatgrass	7 lbs./acre
Sheep Fescue	2 lbs./acre
Sherman Big Blue	1 lbs./acre

Apply "Soil Guard" by Weyerhaeuser at a rate of 3,000 lbs./acre. Seed and fertilizer to be added to Soil Guard and applied in a single application. Apply seed mixture as a component of the Soil Guard application at the above specified rate/acre.

All seeding of slopes shall be done in accordance with the W.S.D.O.T. 1991 specifications . Section 8-01.

BIOENGINEERING OF STEEP SLOPES (SSP)

II-5.4.1 BMP E1.25: Preserving Natural Vegetation

Code: (VEG) Symbol:

Definition Minimizing exposed soils and consequent erosion by clearing only where construction will occur.

Purpose

To reduce erosion by preserving natural vegetation wherever practicable.

Condition Where Practice Applies

- Natural vegetation should be preserved on steep slopes, near perennial and intermittent watercourses or swales, and on building sites in wooded areas.

PRESERVE NATURAL VEGETATION (VG)

II-5.7.4 BMP E2.25: Pipe Slope Drains

Code: (PSD) Symbol:

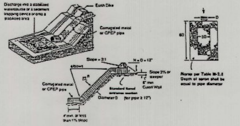
Definition A pipe extending from the top to the bottom of a cut or fill slope and discharging into a stabilized water course or a sediment trapping device or onto a stabilization area.

Purpose

To carry concentrated runoff down steep slopes without causing gullies, channel erosion, or saturation of slide-prone soils.

Conditions Where Practice Applies

- Where a temporary (or permanent) measure is needed for conveying runoff down a slope without causing erosion.



PIPE SLOPE DRAIN (PSD)

APPROVED FOR CONSTRUCTION
SPOKANE COUNTY ENG.
P-1729A
PERMIT REQUIRED!
NOTIFY THE PERMIT ENGINEER
456-3600
24 HRS. PRIOR TO CONSTRUCTION

Theodore G Dunning 3-31-95

PRELIMINARY

METRO ENGINEERING

Northwood Properties, Inc

Pheasant Run
Grading and Erosion Control

SHEET 9 OF 10

DETAILS

1729A

V1-6.7.12 ESC 01.04: Interceptor Dike and Swale

Code: (DS) Symbol:

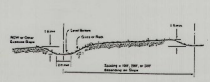
Definition: A ridge of compacted soil or a swale with vegetative lining located at the top or base of a sloping disturbed area.

Purpose

To intercept water runoff from drainage areas above unprotected slopes and divert it to a stabilized outlet.

Conditions Where Practice Applies

- Where the volume and velocity of runoff flow mapped or disturbed slopes must be controlled to prevent erosion. Interceptor dikes and swales are designed to reduce the volume of water reaching the disturbed area by intercepting runoff flow above (figure V1-6.12a.b). When it is placed horizontally across a disturbed area, it reduces the velocity of runoff flowing down the slope by reducing the distance that the runoff can flow directly downhill.



INTERCEPTOR DIKE AND SWALE

DS

V1-6.7.13 ESC 01.05: Check Dams

Code: (CD) Symbol:

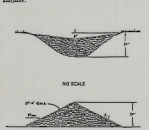
Definition: Small dams constructed across a swale or drainage ditch.

Purpose

To reduce the velocity of concentrated flows, reducing erosion of the swale or ditch, and to also water velocity or allow retention of sediments.

Conditions Where Practice Applies

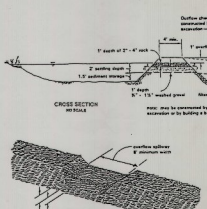
- Where temporary channels or permanent channels are not yet vegetated, channel lining is needed and, therefore, velocity checks are required.
- In small open channels which drain 10 acres or less. No check dam may be placed in streams (unless approved by the State Departments of Fisheries or Wildlife as appropriate). Other permits may also be necessary.
- Check dams in association with sumps work more effectively at slowing flow and retaining sediment.



B. Rock Check Dam

CHECK DAM

CD



SEDIMENT TRAP

ST

V1-6.7.11 ESC 01.04: Riprap

Code: (RR) Symbol:

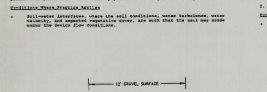
Definition: A permanent, erosion-resistant ground cover of large, loose, angular stone.

Purpose

To slow the velocity of concentrated runoff or to stabilize slopes with seepage problems and/or inadequate soils by placement of large, loose, angular stone.

Conditions Where Practice Applies

- Soil-water interfaces, where the soil conditions, water turbulence, water velocity and/or seepage pressure cause, are such that the soil may erode using the design flow conditions.



RIPRAP PROTECTION

RR

V1-6.8.1 ESC 01.06: Filter Fence

Code: (F) Symbol:

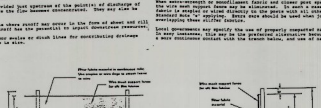
Definition: A temporary sediment barrier consisting of a filter fabric attached to posts and stapled to supporting posts and wire mesh. The filter fence is constructed by placing a portable filter fabric with a rigid wire fence backing where necessary for support.

Purpose

1. To intercept and detain small amounts of sediment under sheet flow conditions and to provide a temporary stabilization operations in order to prevent sediment from leaving the site.
2. To decrease the velocity of sheet flows.

Conditions Where Practice Applies

- Filter fences must be provided just upstream of the periphery of discharge of runoff from a site, before the first downstream encumbrance. They may also be used:
  1. Below disturbed areas where runoff may occur in the form of sheet and rill erosion; wherever runoff has the potential to impact downstream resources;
  2. Perpendicular to minor swales or shallow lines for constricting drainage areas up to one acre in size.



FILTER FENCE

F

The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6 inch overlap, and then only securely fastened to the post.

Posts shall be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 20 inches (where physically possible).

A trench shall be excavated approximately 6 inches wide and 12 inches deep along the line of posts and upslope from the barrier. The trench shall be constructed to follow the contour.

When silt film fiber fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 4 inches and shall not extend more than 30 inches above the original ground surface.

Silt film fiber fabric shall be wired to the fence, and 20 inches of the material shall extend into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter cloth shall not be stapled to existing trees. Other types of fabric may be stapled to the fence.

When extra-strength or monofilament fabric and closer post spacing are used, the wire mesh support fence may be eliminated on request if the filter fabric is stapled or wired directly to the fence with all other provisions of Standard Note "a" applying. Extra care should be used when joining or overlapping these filter fabrics.

Local governments may specify the use of properly compacted native material, if it is available, to be placed on the upslope alignment between the soil items a and b above instead of the trench below, and use of native materials

GRAVEL FILTER BERM

FB

Gordon B. Bunning 3-31-95

APPROVED FOR
KING COUNTY USE
By Date
6-9-1995
PERMIT REQUIRED!
SAFETY AND SURVEY CHANGES
MUST BE SUBMITTED
TO KING COUNTY
FOR APPROVAL PRIOR TO CONSTRUCTION

REVISED BY:
DATE:
DATE: MONTH/DAY/YEAR
SCALE: AS SHOWN

PRELIMINARY

DESIGN: METRO ENGINEERING
OWNER: Northwood Properties, Inc

Pheasant Run
Grading and Erosion Control

SHEET
10 of 10
DETAILS

1729A