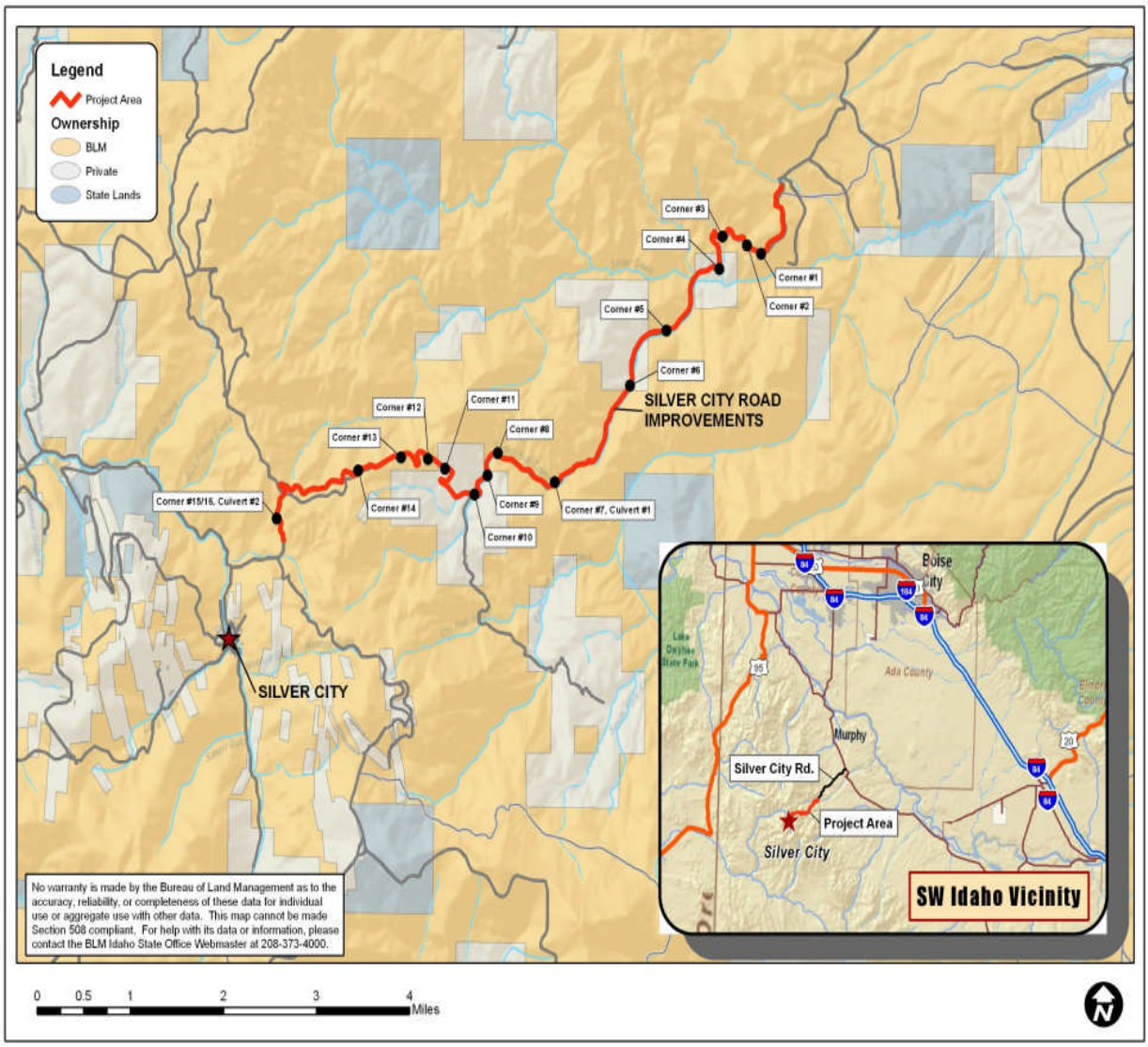
Proposed Silver City Road Enhancements

Site Specific Project Descriptions

The proposed project would: re-grade and enhance the road surface stability with crushed rock on approximately one total mile of road, which would be broken up into multiple locations over the entire distance; widen 16 corners through slope cuts or corner fills; and replace three damaged or insufficient culverts (Map 1). Construction would take approximately four weeks and beginning after the decision has been signed in early June. Proposed road closures associated with construction activity would limit access via this route between 8 AM and 6 PM Monday through Thursday, with a daily one-hour (noon to 1 PM) opening. A detailed description of the construction activity and photo of each site, general construction guidelines, and engineered cross section of each site is found below.



Map 1. Project Map.

Corners 1, 2, 3, 4, 5 and 6

Key Issues

The slopes on the left side of the roadway are steep slope. The shoulders are soft and unstable; it will not allow use of the full width of the road by vehicle traffic. These are blind corners.

Proposed Improvement

Expand the roadway driving surface by 12 feet for 100 feet. Enlarge borrow ditch. Road will be kept insloped to use the existing drainage facilities. Due to the rocky condition of the material, the cut slopes can be kept steep, 1:1 to minimize disturbance.

Proposed Action

Area will be grubbed and unsuitable material will be removed. The excavated material will be stockpiled onsite. The material will be ran through a portable jaw crusher and hauled to the area around corner #7.

Erosion Control Measures

Straw waddles will be placed on the outer shoulder of the road. The catch basins for the existing culverts will be enlarged. Straw bales will be placed in the draws on the downstream side of the culverts.

Estimated Quantity of Material

Approximately 500 cubic yards of material per corner, for a total of 3,000 cubic yards.

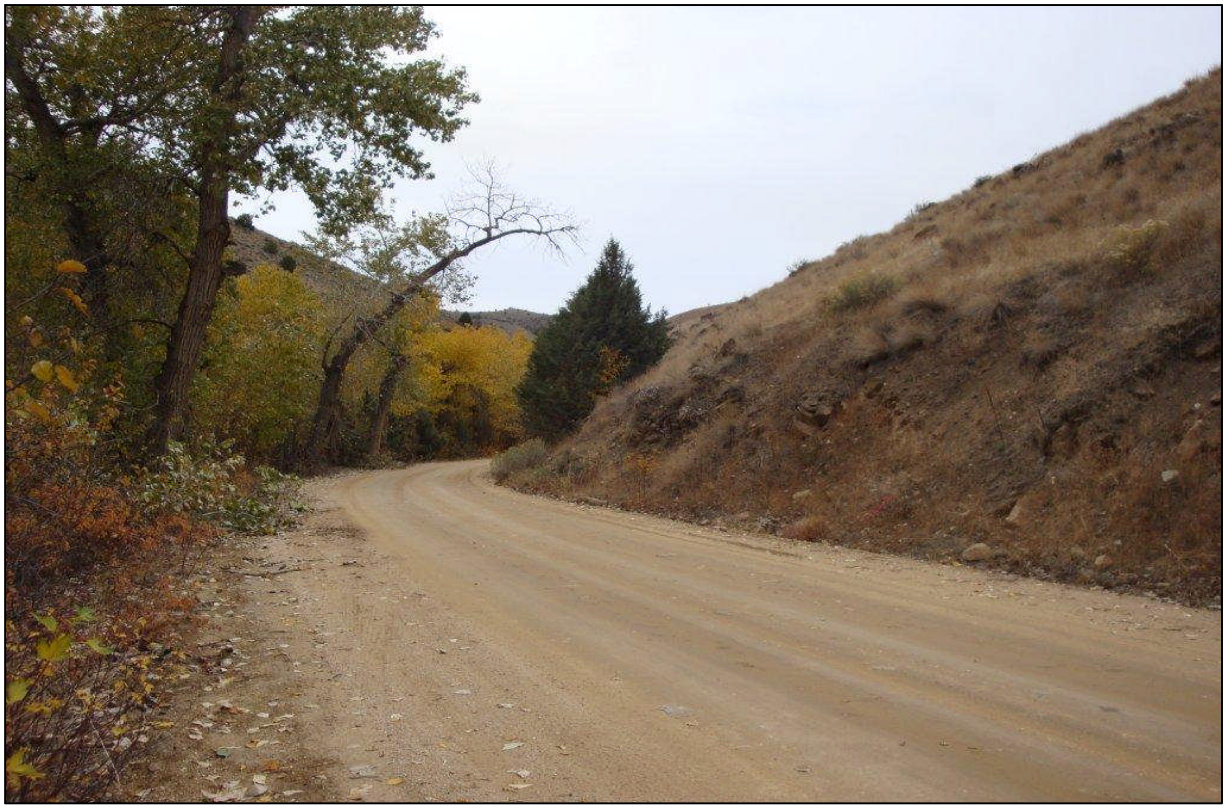
Corner 1

Corner 2

Corner 3

Corner 4

Corner 5



Corner 6

Corner 7, Culverts 1 and 2

Key Issues

The existing culverts are narrow. This is a sharp S turn. The existing material is not suitable for all weather driving.

Proposed Improvement

Extend the culverts in both directions. Widen the roadway 16 feet. This is also the point where the material on the roadway is unsuitable for all weather driving. Use the crushed material from the corner widening to improve the driving surface. Surface improvements would start at this point (43 degrees 2' 15.533N, 116 degrees 39' 51.311W), going upstream approx. 2,000' and downstream approx. 3,280'. Material would be placed 1' thick and the width of the existing driving surface.

Proposed Action

Area would be cleared and grubbed. A limited amount of brush will be removed. Existing culvert size is adequate, additional culverts will be installed. Suitable on site material will be used for sub-grade. Sub-grade will be compacted. The crushed material from the culvert widening will be hauled, placed and compacted on the existing driving surface.

Erosion Control Measures

Straw waddles will be placed along the creek the entire distance of the resurfacing project. The existing catch basins will be enlarged. Straw bales will be placed at suitable downstream locations.

Estimated Quantity of Material

Approx. 60-feet of culvert will be installed.

Approx. 250 cubic yards of sub-grade fill material.

Approx. 4,600 cubic yards of material will be hauled from the corner widening areas to resurface the roadway.

Corner 7

Corner 8

Key Issues

The creek is on the immediate left shoulder of the road. The shoulder is soft. This is a blind corner.

Proposed Improvement

Widen the roadway 15 feet. Extend the existing culvert approximately 18 feet. The existing culvert will not be replaced. Deepen the upstream borrow ditch. After the overburden is removed, there is likely rock. The slope can be kept steep 1:1 to reduce disturbance.

Proposed Action

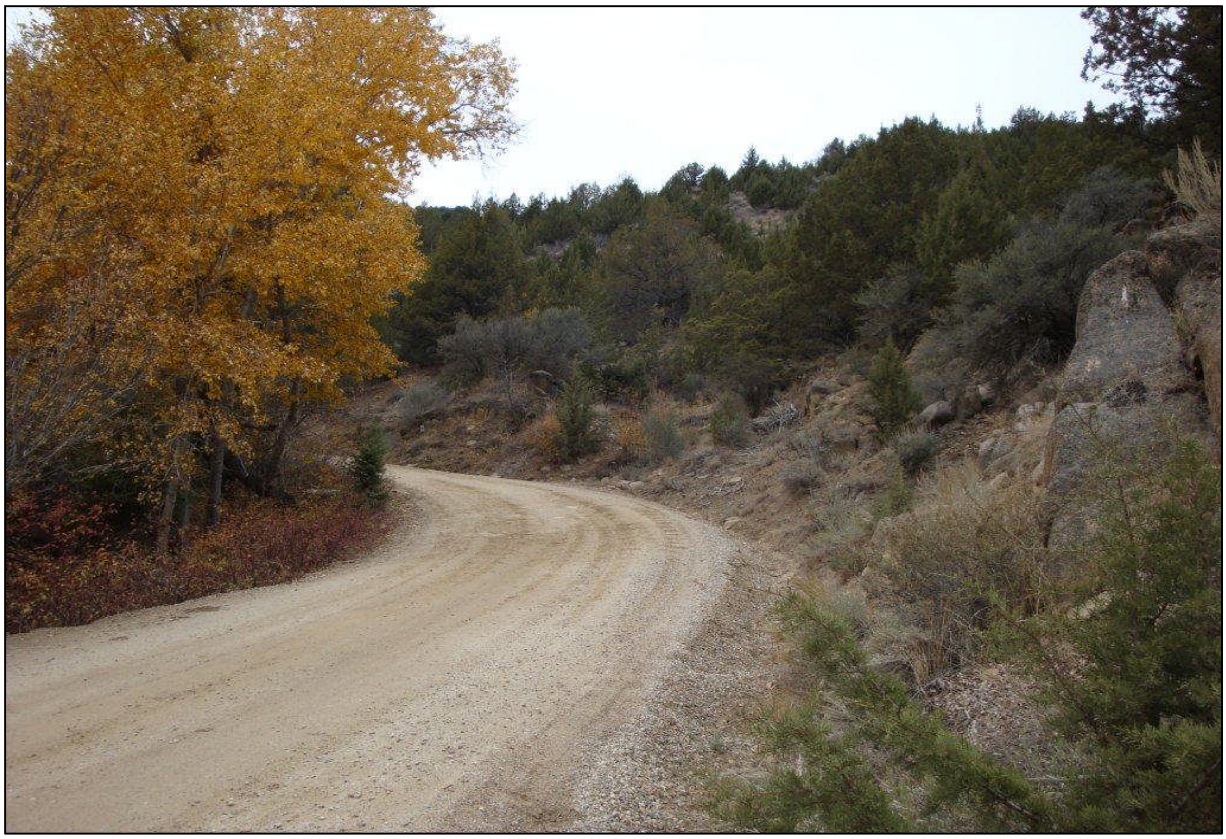
Grub and remove unsuitable fill material. The material will be excavated and stockpiled onsite. Due to rocky conditions, drilling and shooting could be required. Material will be loaded and hauled to corner #7 for sub-grade material.

Erosion Control Measures

Straw waddles will be placed along the creek, the entire length of the excavation. Road will be insloped toward the borrow ditch. Straw bales will be installed in the borrow ditch.

Estimated Quantity of Material

Approx. 250 yards.



Corner 8

Corners 9 and 10

Key Issues

Narrow road and blind corner. Soft shoulder does not allow full use of the roadway. Creek is close to shoulder.

Proposed Improvement

Widen driving surface by 15 feet for 100 feet. Enlarge borrow ditch. Road will be kept insloped to prevent sediment from entering the creek and use existing drainage structures. Due to the existing solid rock conditions, the slopes will be kept steep 1:1 to avoid disturbance.

Proposed Action

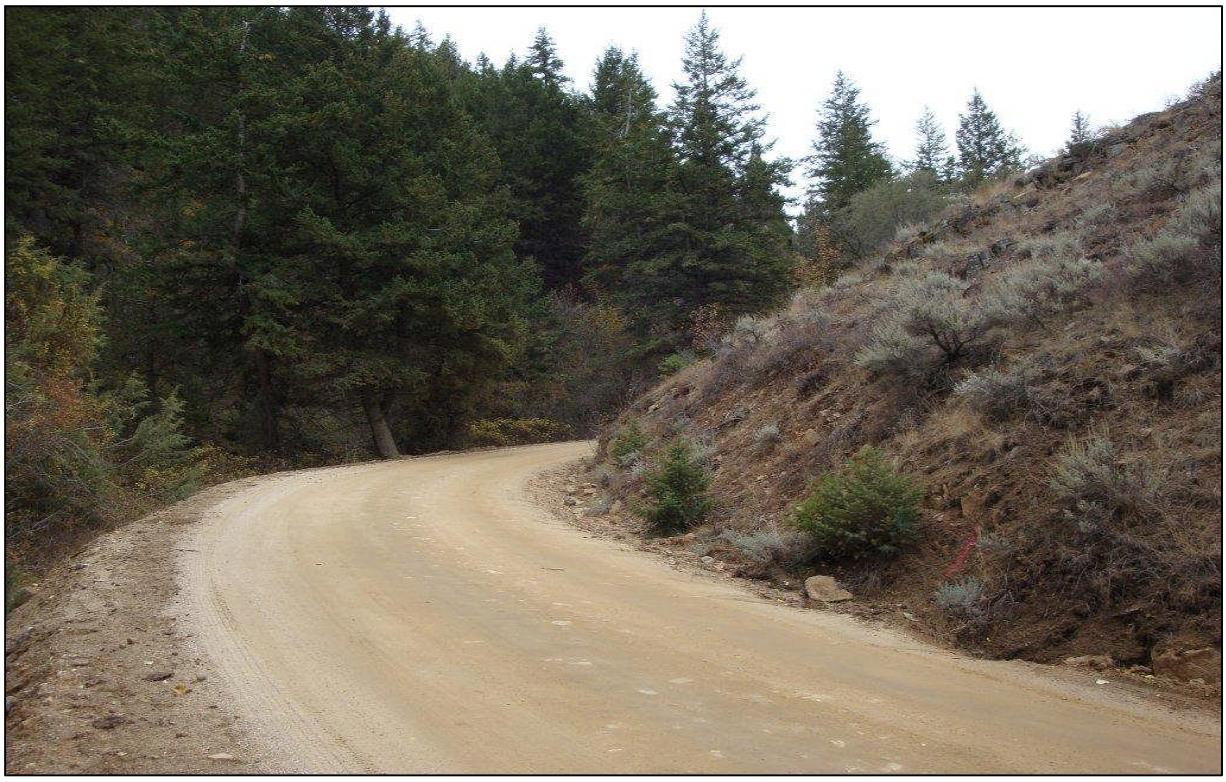
Area will be grubbed and unsuitable fill material removed. This area will almost surely have to be drilled and shot. Material will then be crushed and hauled to area to be resurfaced.

Erosion Control Measures

Straw waddles will be placed on the outer shoulder of the road. The existing catch basins will be enlarged. Straw bales will be placed downstream of the existing culverts to prevent sediment from entering the creek.

Estimated Quantity of Material

Approx. 800 cubic yards per location for a total of 1,600 cubic yards.



Corner 9

Corner 10

Corners 11 and 12

Key Issues

Blind corner and the road is narrow. The outside shoulder is soft, which prevents use of the entire driving surface.

Proposed Improvement

Widen driving surface to 15 feet wide for 100 feet. Enlarge borrow ditch, borrow ditch is almost none existent due to the rock. Road will be kept insloped to use the existing drainage facilities and prevent erosion.

Proposed Action

The existing slope is very gradual. A cut and fill procedure would be used in this location. The sub-grade on the fill side would be grubbed, leveled, and compacted. Fill material would be carried from the cut area, placed and compacted. Cut will likely be solid rock and need to be drilled and shot.

Erosion Control Measures

Straw waddles will be placed at the toe of the fill slope before construction. After the fill is complete straw waddles will be placed on the fill slope to keep the fill from raveling. Existing settling basins will be expanded. Straw bales will be placed in the drainages below the culverts to prevent sediment from entering the stream.

Estimated Quantity of Material

Approx. 1,000 cubic yards of material total.

Corner 11

Corner 12

Corner 13

Key Issues

Narrow road, blind corner, soft shoulder that prevents use of entire driving surface.

Proposed Improvement

Widen driving surface by 15 feet for 100 feet. Keep road insloped to prevent fill slope from raveling and use existing drainage structures.

Proposed Action

Material would be cut from the right side of the road. This material would not be sufficient for the needed fill. Additional fill material would be imported from turn 14. Area to be filled would be grubbed, leveled and compacted. The rock on the left side of the road would be left undisturbed.

Erosion Control Measures

Straw waddles would be placed at the toe of the fill area. After the fill is completes additional straw waddles would be placed on the slope to keep the new fill from raveling. Straw bales would be placed in the draw below the fill area to prevent sediment from escaping the immediate area.

Estimated Quantity of Material

200 cubic yards of material from the adjoining cut area.

800 cubic yards of fill material from corner 14.

Corner 13

Corner 14

Key Issues

Narrow road and blind corner. Very soft shoulder prevents the use of the entire driving surface. The left slope is too steep to use a cut and fill method

Proposed Improvement

Widen driving surface by 15feet for 100feet. Enlarge borrow ditch. Road would be insloped to prevent the existing fill from washing away. Due to rock conditions, cut slope can be kept steep 1:1 to minimize disturbance.

Proposed Action

Area will be cleared and grubbed and unsuitable material removed. This area will likely have to be drilled and shot. Material excavated will be hauled to corner 13 and used for fill.

Erosion Control Measures

Straw waddles will be placed on outside shoulder of the road. Existing catch basins will be enlarged. Straw bales will be placed below existing culverts.

Estimated Quantity of Material

Approx. 800 cubic yards of excavated material to be hauled to corner 13.

Corner 14

Corner 15

Key Issues

Blind corner, narrow road and very soft shoulder. The soft shoulders prevent use of the entire driving surface.

Proposed Improvement

Widen driving surface by 15 feet for 100 feet. Enlarge almost nonexistent borrow ditch. Inslope road to prevent wash outs and use existing catch basins. Material would be used for fill on Corner 16.

Proposed Action

Grubb and remove non suitable fill material. Material will need to be drilled and shot. Cut slope can be left steep 1:1 due to rock formation, to avoid unnecessary disturbance. Pack material across existing road and place for fill on corner 16.

Erosion Control Measures

Straw waddles will be placed on the outer shoulder of the road. The remainder of the erosion control will be used on corner 16.

Estimated Quantity of Material

Approx 800 cubic yards of fill material.

Corner 15

Corner 16 and Culvert 3

Key Issues

Roadway is very narrow. The shoulder is very soft. The road being outsloped is causing a washout problem over the existing culvert.

Proposed Improvement

Widen the existing driving surface by 20 feet for 150 feet. Inslope the roadway to prevent further washouts and use catch basins to reduce erosion. Enlarge barrow ditches.

Proposed Action

Remove existing culvert and discard. Replace with a larger diameter and longer culvert. Install new culvert properly with the slope of the existing hillside. Use fill from corner 15 and corner 16 to widen area over new culvert and road that continues downhill 150 feet. Install rock headwalls and outfalls with new culvert. Enlarge catch basin at head of new culvert. Grub, level and compact fill area. Load, place, level and compact fill material. Material in this area is rock and will have to drilled and shot.

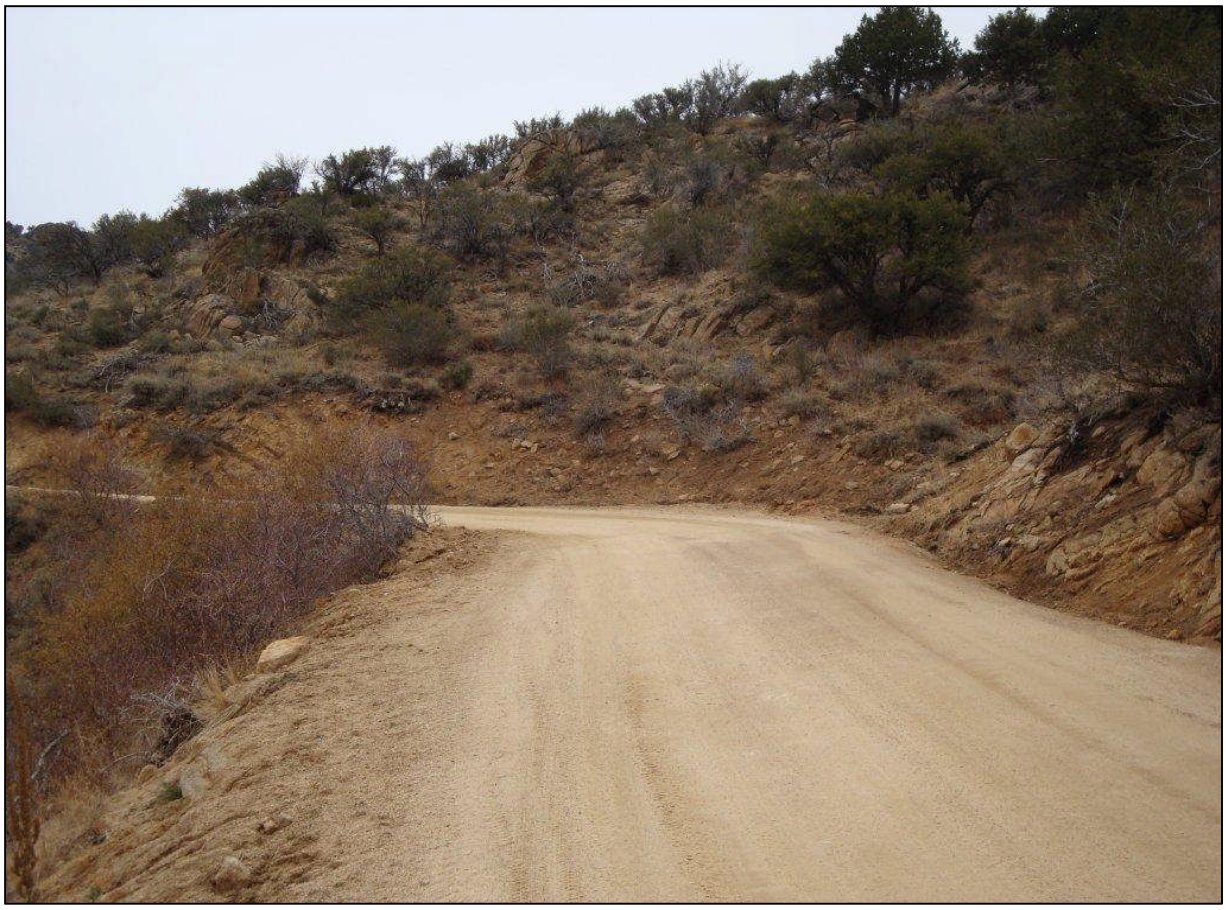
Erosion Control Measures

Straw waddles will be placed on the outer shoulder of the roadway in the cut areas. Straw waddles will be placed at the toe of the fill areas. Straw waddles will also be placed on the completed fill to prevent raveling. The catch basin for the new culvert will be enlarged. Straw bales will be placed on the downstream side of the new culvert. Straw bales will be placed at the next culvert downhill.

Estimated Quantity of Material

100 feet of 24-inch culvert.

Approximately 800 cubic yards of fill material



Corner 16

General Construction Notes

Estimated Construction Schedule

Work associated with the project would be done four (4) days per week, Monday through Thursday. There would be only limited construction activity associated with the road Friday through Sunday.

It is anticipate that project would be completed within four weeks. The proposed project would likely start at the lower section of the road (near corner 1) in early in the spring, dependent on conditions. It is estimated that corners 1 thru 13 would take approx. three (3) weeks and corners 13 through 16 would take only one week. The work on corners 1 thru 13 would take place before the annual opening of the road on Memorial Day Weekend. This would limit the impact on the public and homeowners, due to the fact the road is closed anyway.

Proposed Road Closure

If road construction goes past Memorial Day Weekend, the proposed schedule for road closure associated with construction activity would be Monday through Thursday during these time periods;

- 8:AM close road
- 12:PM open road
- 1:PM close road
- 6:PM open road until 8:AM the next morning

Equipment List

- 85,000 LB. CRAWLER DOZER with RIPPER
- 26,000 LB. CRAWLER DOZER with RIPPER
- 70,000 LB. HYDRAULIC EXCAVATOR with THUMB
- 17,000 LB. HYDRAULIC EXCAVATOR with THUMB
- 4 YD. WHEEL LOADER
- 84” PADFOOT ROLLER
- 10 WHEEL DUMP TRUCKS
- 38,000 LB. MOTOR GRADER
- 24” X 36” MOBILE JAW CRUSHER
- 4,000 GAL. WATER TRUCK

*Blasting equipment would be used as needed and conducted by a blasting contractor.

Standard Procedures for Silver City Road Reconstruction and Maintenance

The following document is incorporated by reference into the Standard Procedures to be used during the reconstruction and maintenance of the Silver City road: "BMP Handbook, Best Management Practices for Idaho Rural Road Maintenance, Stacy Smith (2005), Idaho Technology Transfer Center, Federal Highway Administration, Idaho Department of Environmental Quality" and will be cited as "BMP Handbook".

Road Shape- Where possible, the road crown will be approximately 4%. (USDOT, 2000). The BMP Handbook recommends 3 - 5% and other slopes as shown below.

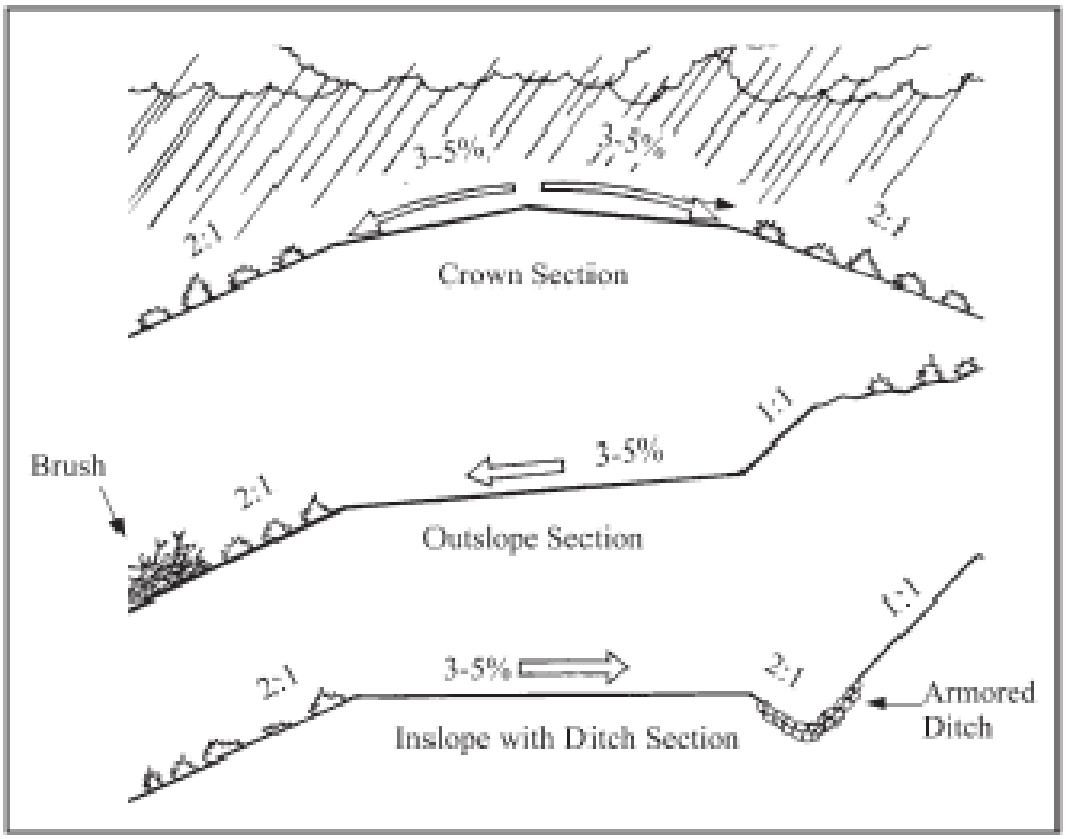
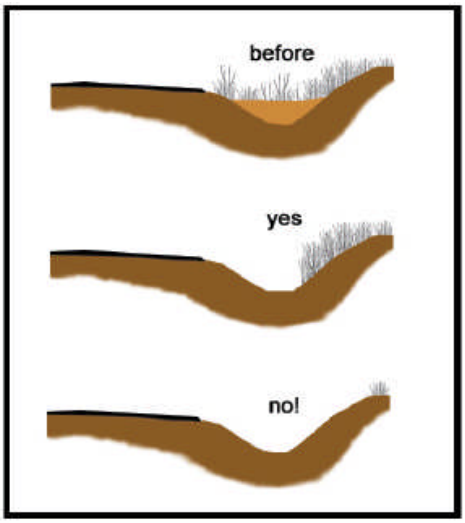
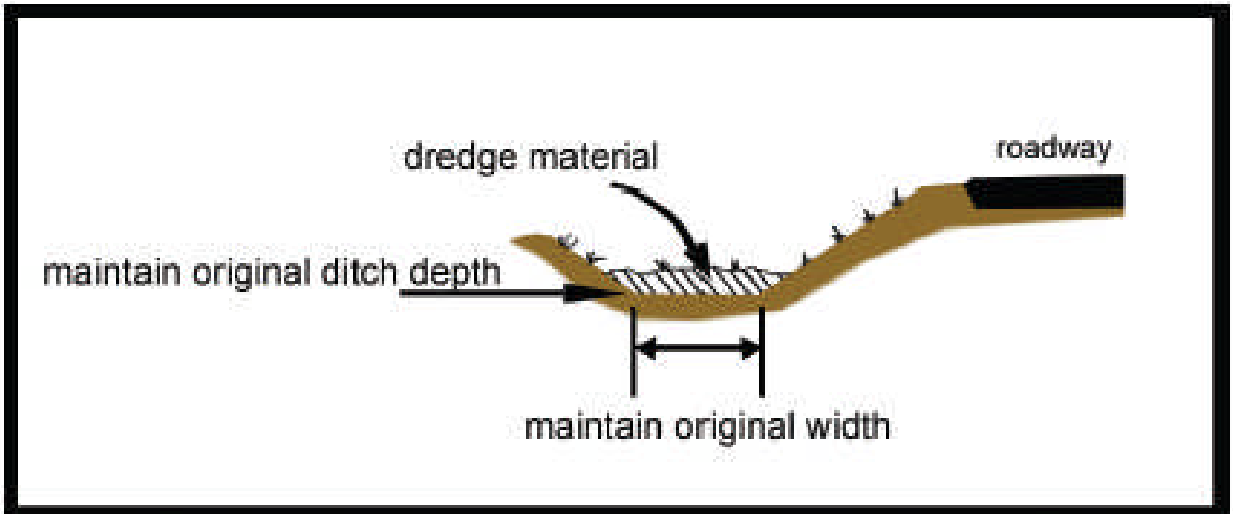


Figure from BMP Handbook (Smith 2005)

Drainage Ditches- Ditches would be vegetated or lined with rock where the underlying substrate is susceptible to erosion or where water velocities in the ditch are expected to be high. (USFS 2005) The roughness and velocities in the drainage ditches would be sufficient to maximize the trapping of sediment. Ditches would only be cleaned when they are not functioning properly. Small blockages impacting ditch function would be removed by hand. The original ditch shape would be maintained where functioning properly. Removal of vegetation growing in ditches would be minimized during reconstruction and maintenance.





Figures from BMP Handbook (Smith 2005)

Outsloping- Outsloping would be used where no ditch system is possible and cross-drains cannot be used effectively. The use of outsloping would consider potential safety issues with icy and snow-covered roads where sliding off may occur. (USFS 2005)

Cross drains/culverts - Cross drains/culverts would be reconstructed where needed to provide adequate drainage and erosion control. Dips may be used to supplement cross drains where needed to interrupt hydrologic connectivity of drainage ditches. (USFS 2005) Additional cross drains may be added where visual indication of drainage failure on the existing road is occurring.

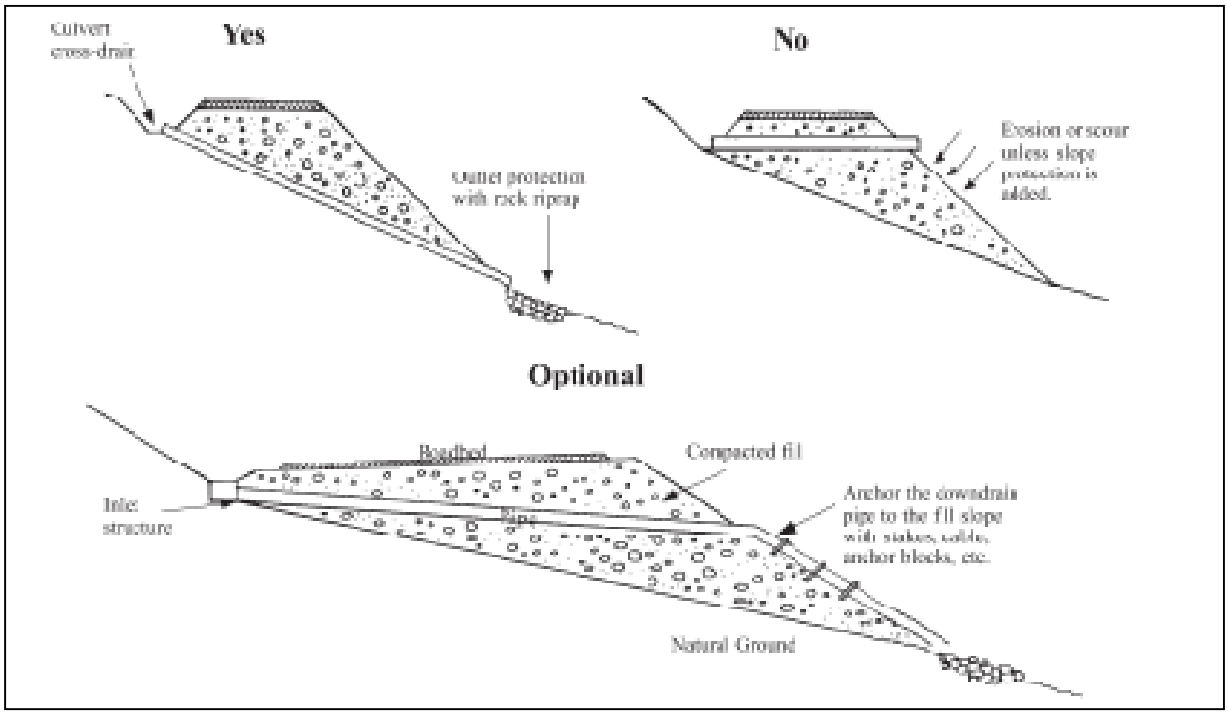


Figure from BMP Handbook (Smith 2005)

Culverts used to pass creeks under the road would be at stream grade. Multiple culverts would be avoided where possible to assist fish bypass and minimize culvert blockages. Revegetation in areas of culvert replacement/maintenance/extension would use seeding and live staking in combination with erosion control devices such as wattles and geotextile.

Energy Dissipation at culvert outlets and down-gradient end of dips (USFS 2005) in combination with vegetative filter strips and/or wattles.

Debris control at culvert approach - (USFS 2005): Where debris hazard is high, debris control would be installed above culverts to minimize the formation of blockages.

Grading would take place only when proper soil moisture is present either after roads are starting to dry out after precipitation or through the application of water.

Material would not be side-cast into creeks. Fills along creeks would utilize erosion control through a combination wattles, seeding, live staking, and/or geotextile.

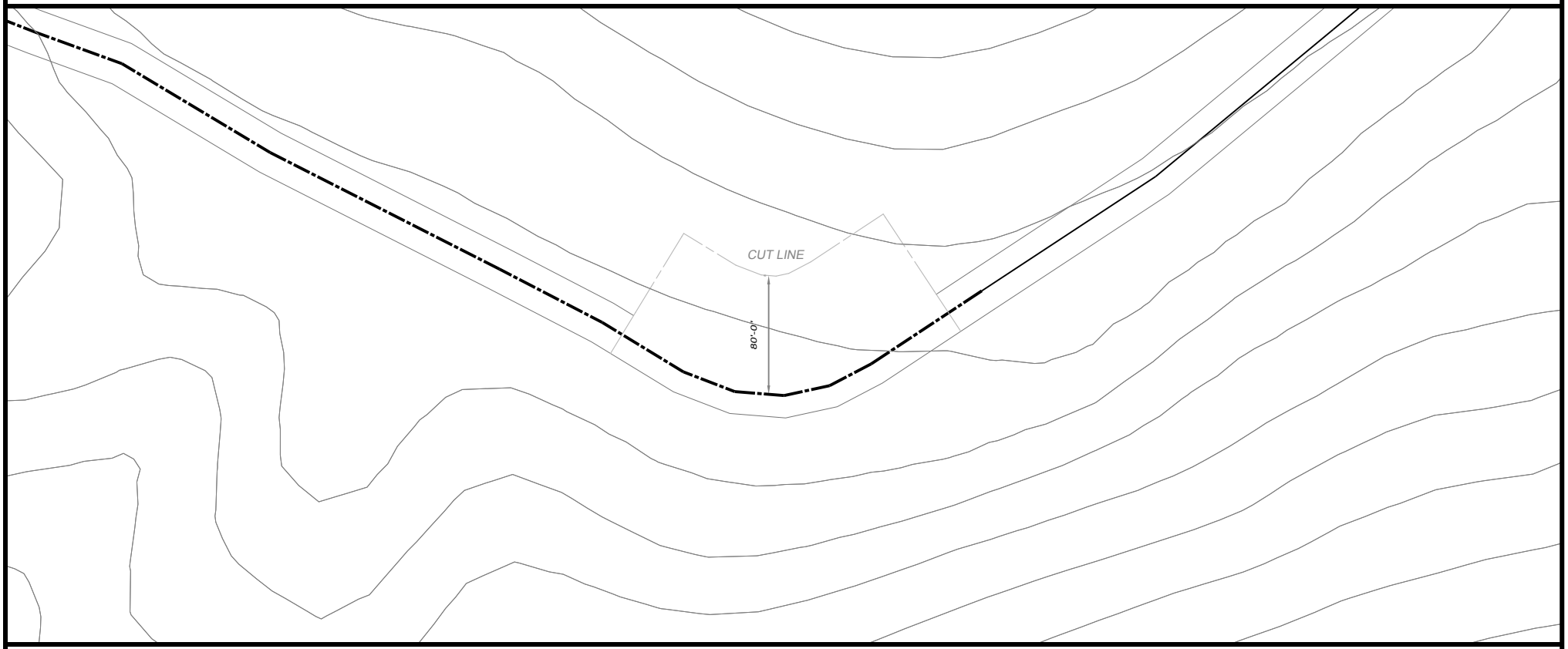
Estimated Cost

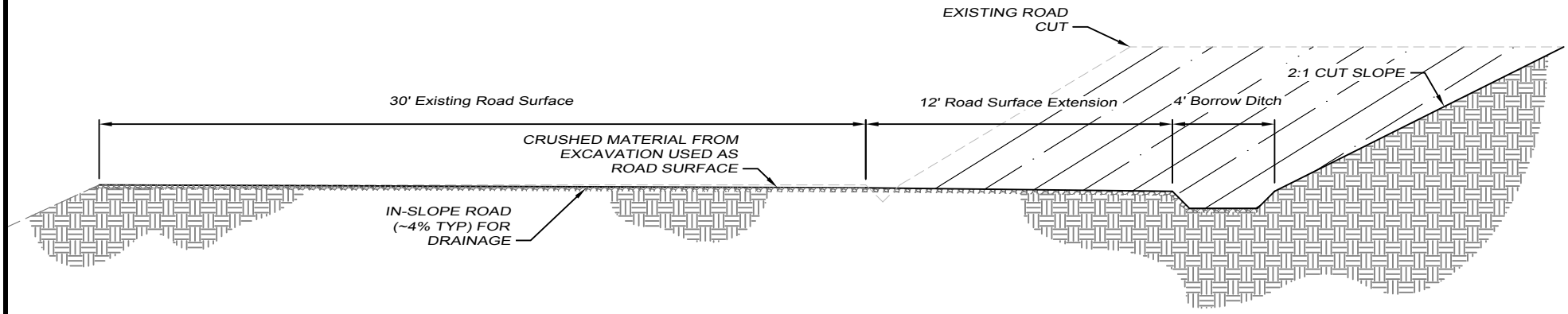
The estimated cost of the proposed project is $250,000.00 to $300,000.00. This includes all material and labor to complete the described work.

Cross Section Diagrams (Corner 1-16)

Below are the individual engineering diagrams for corners 1-16. Corner 7 has two diagrams (7a and 7b) based on the specifics related to each culvert location and construction requirements.

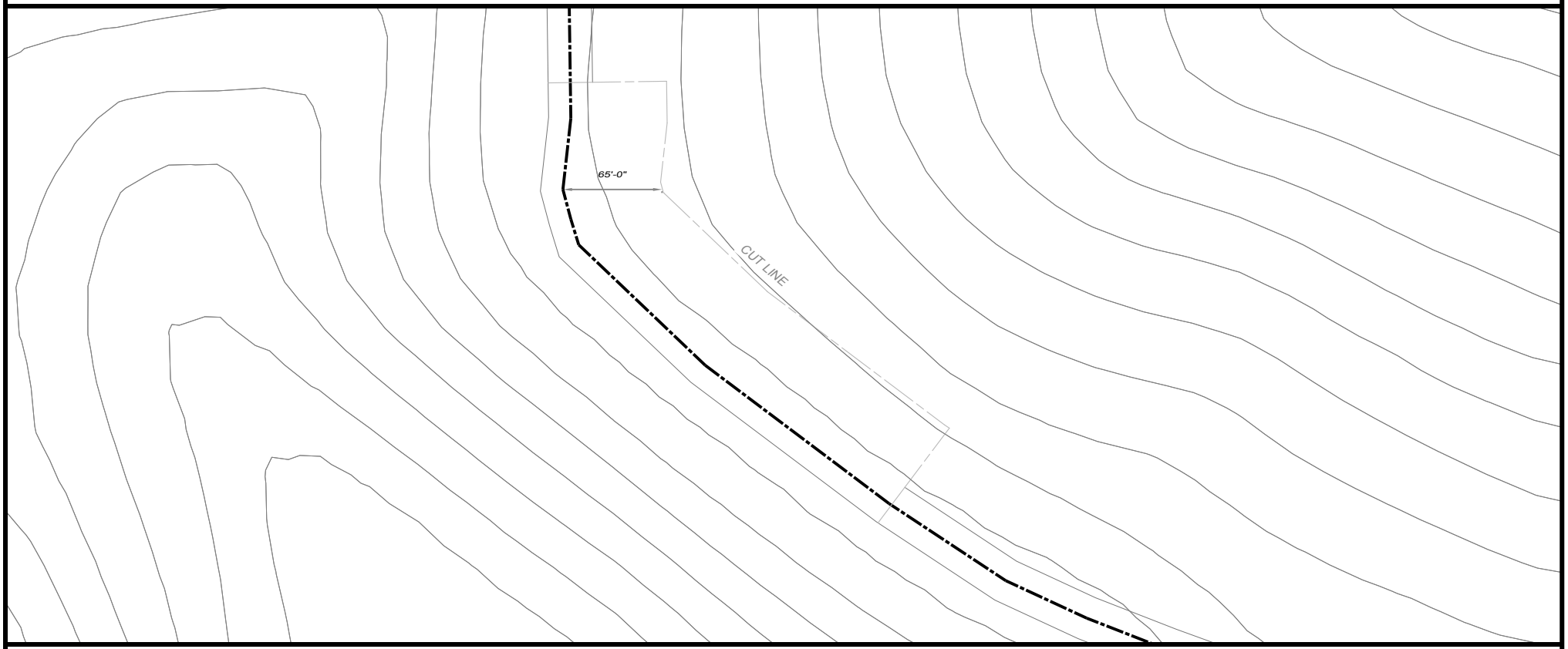
CORNER 1

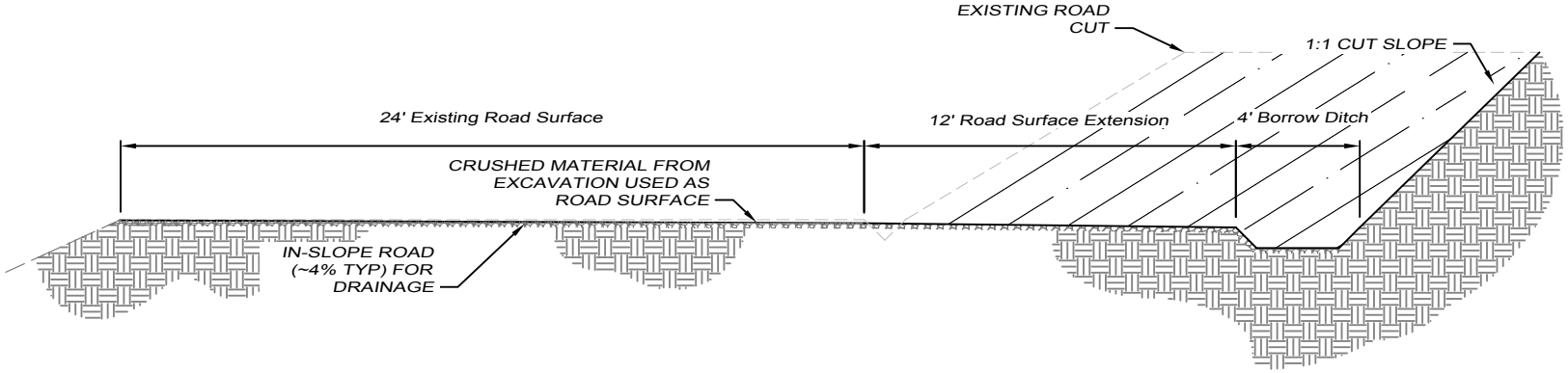




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

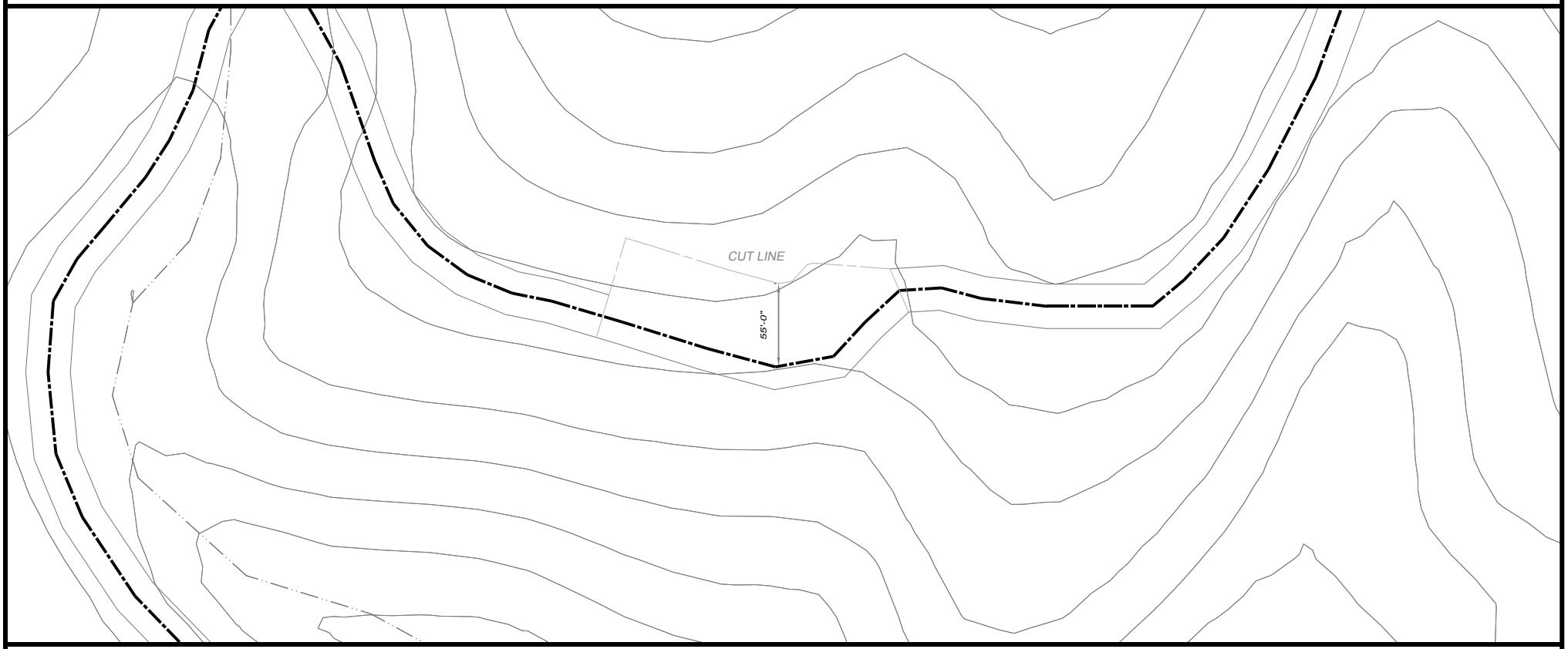
CORNER 2

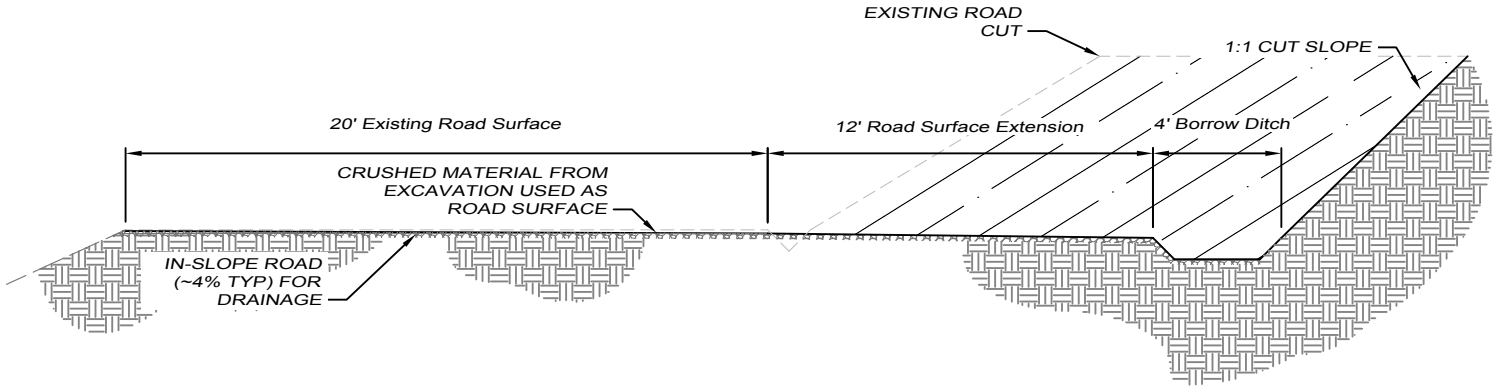




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

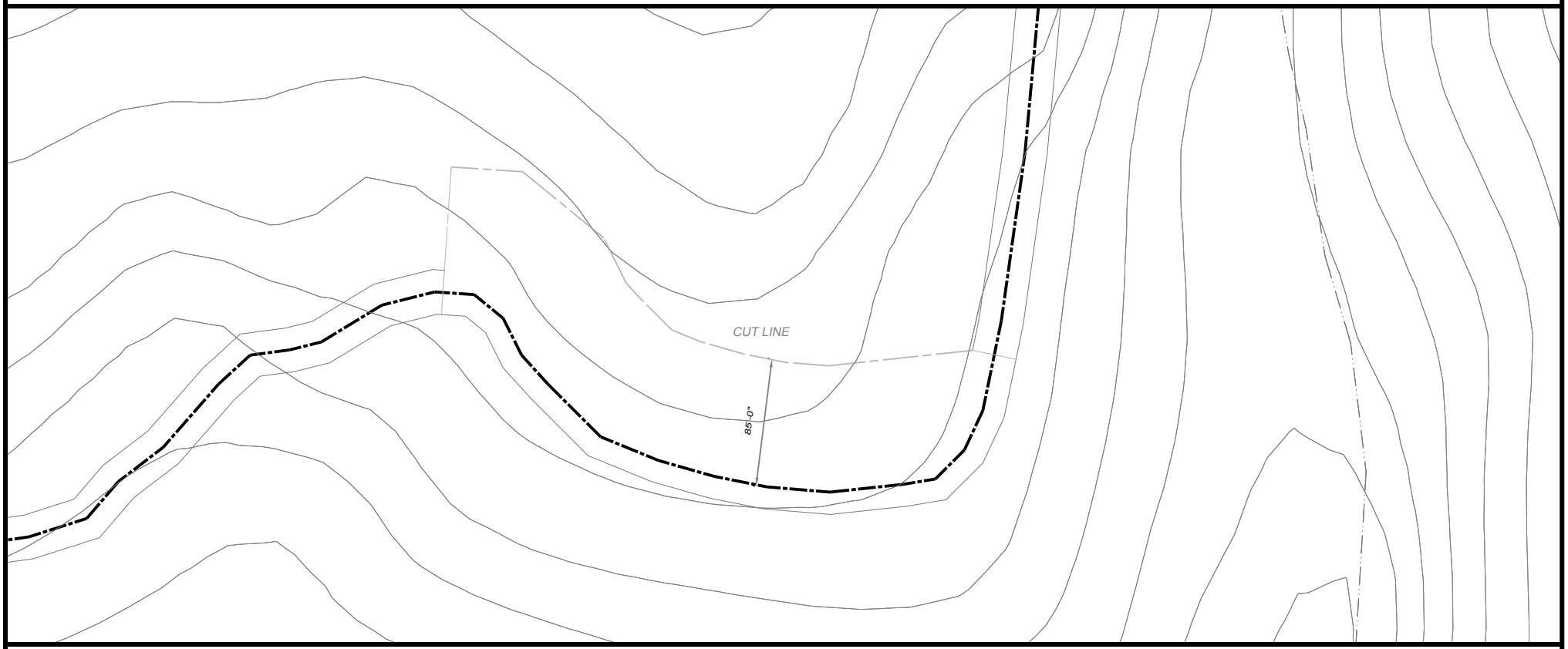
CORNER 3

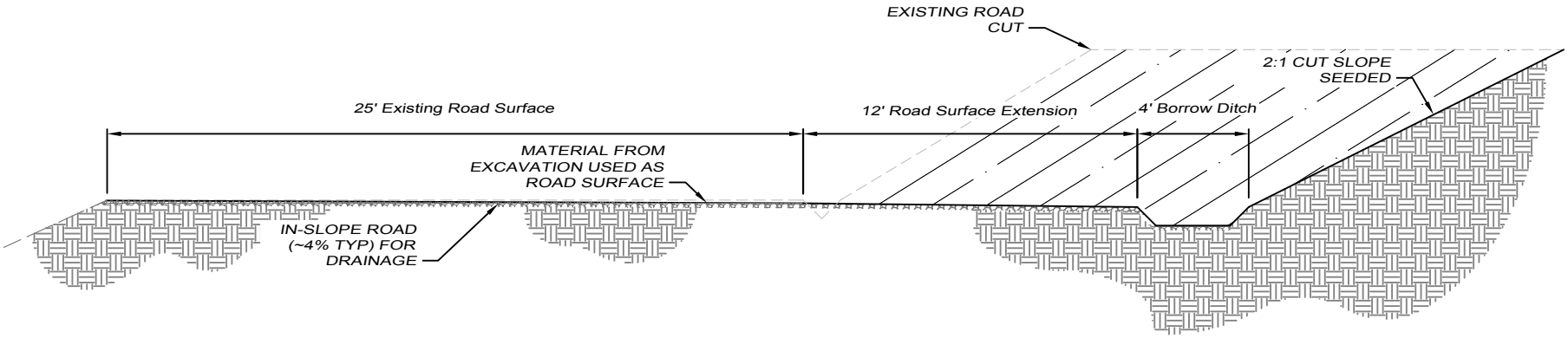




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

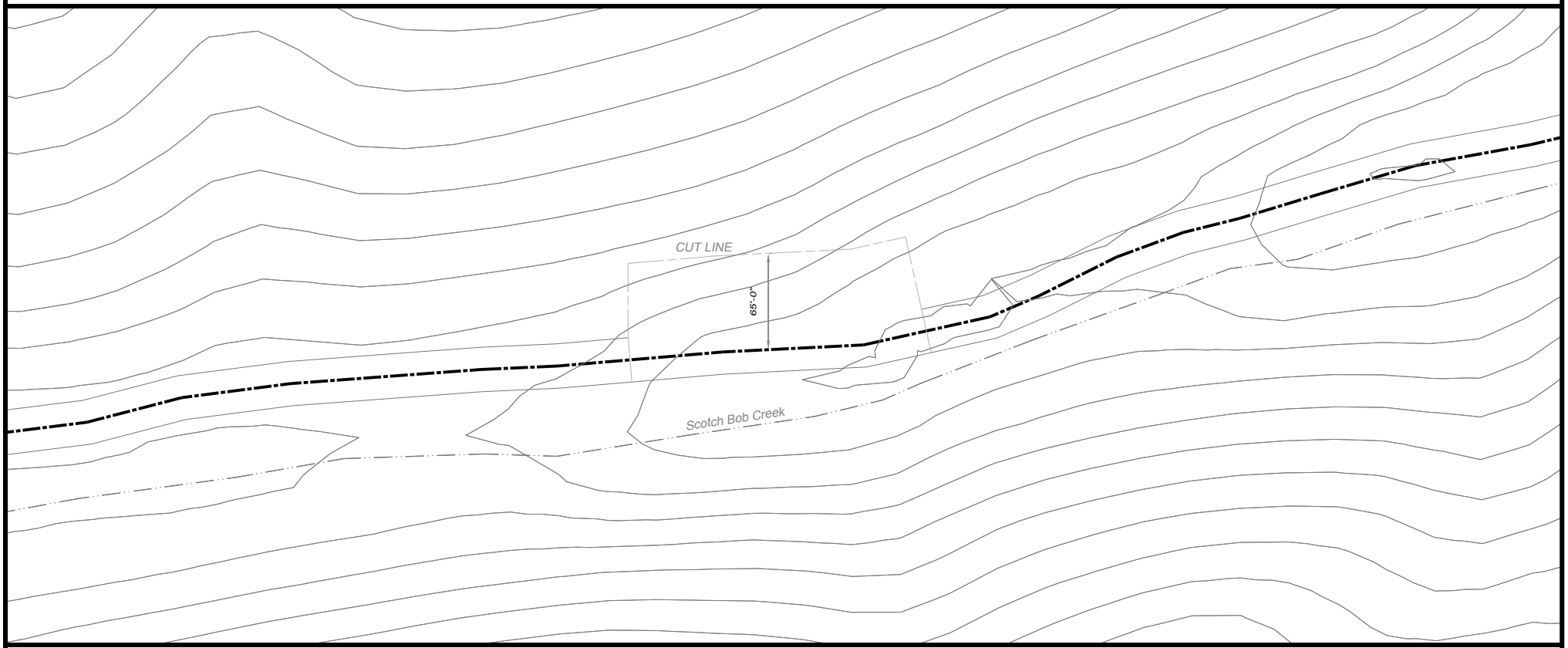
CORNER 4

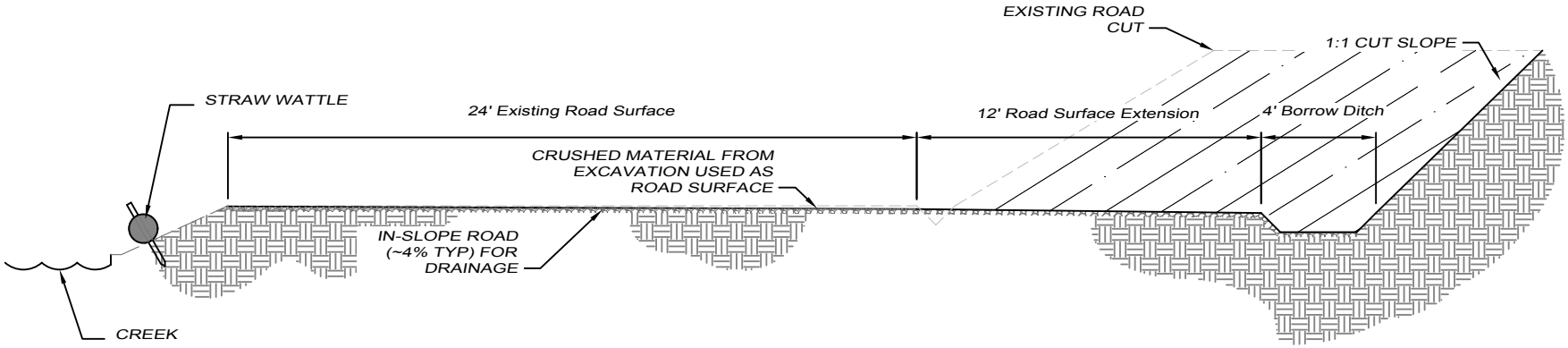




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

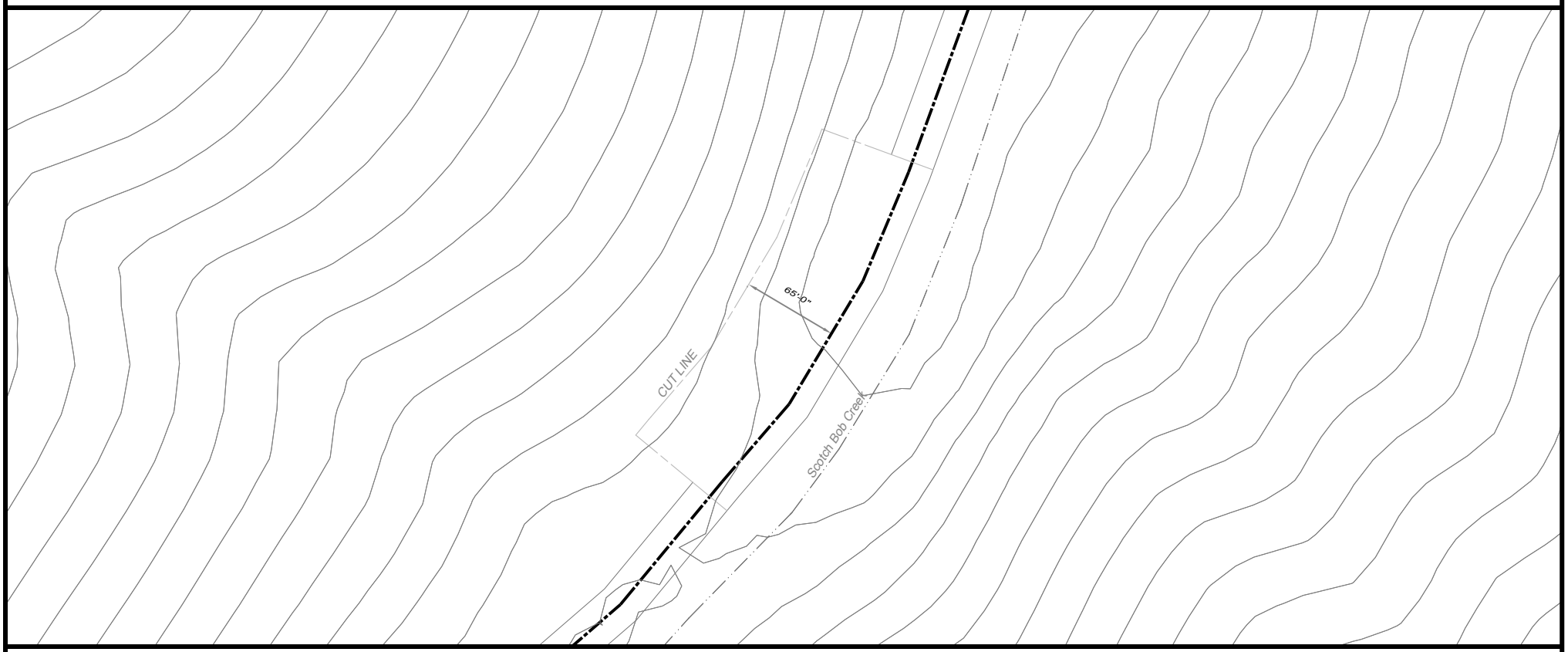
CORNER 5

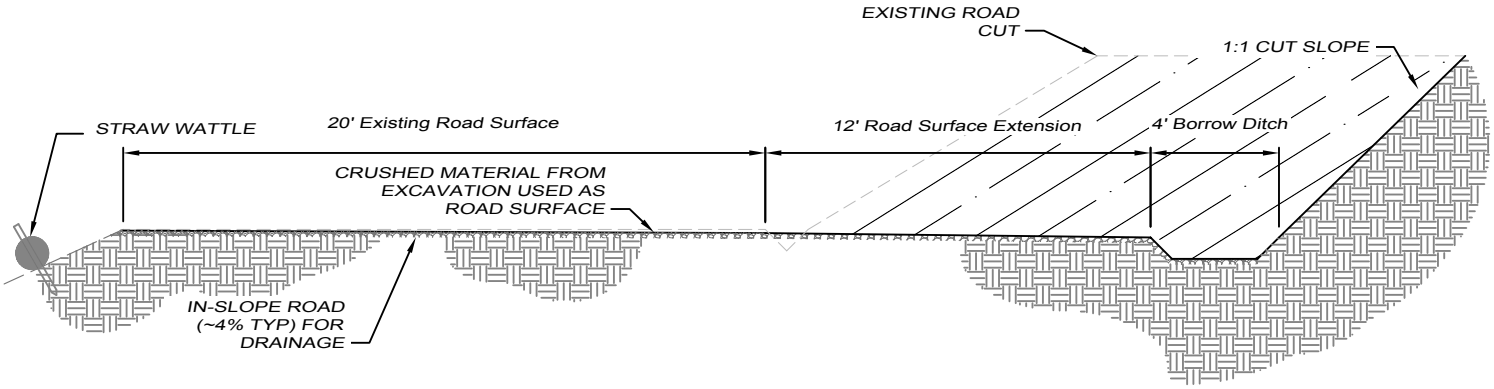




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

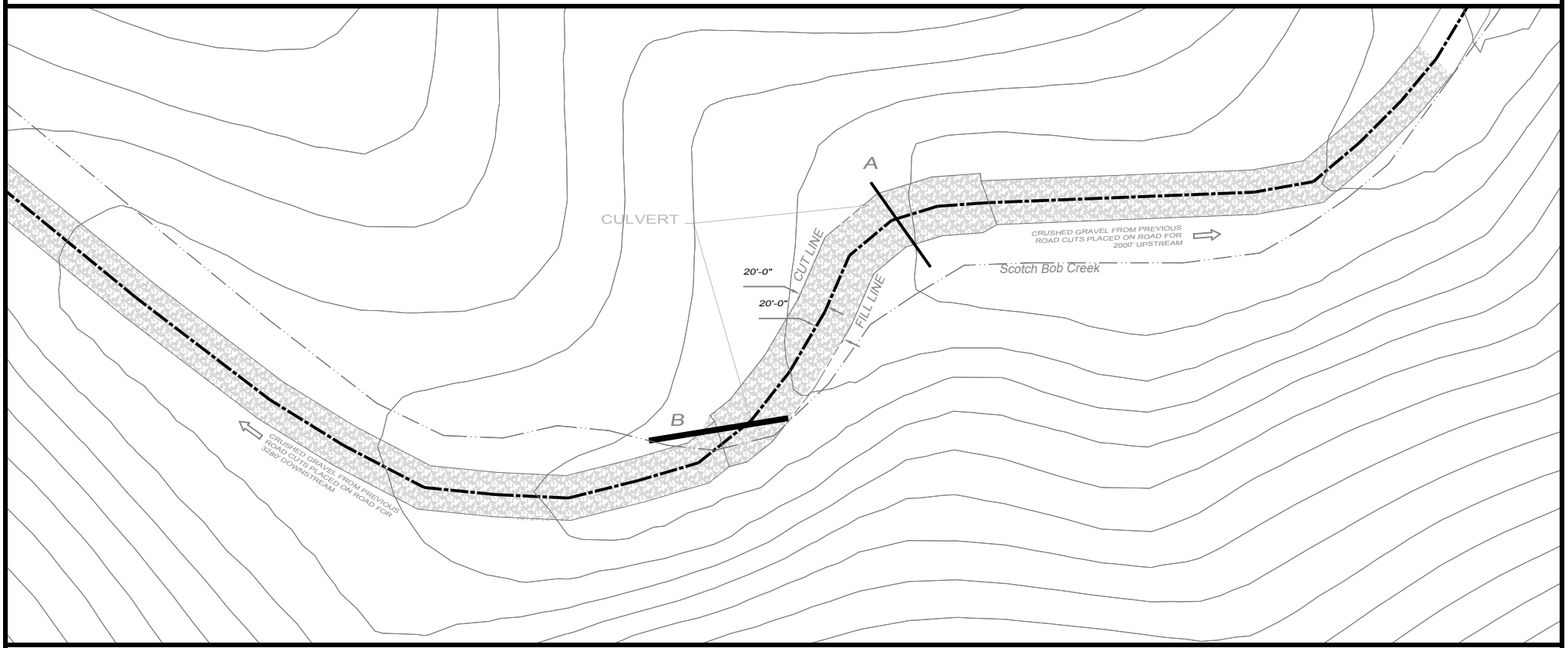
CORNER 6

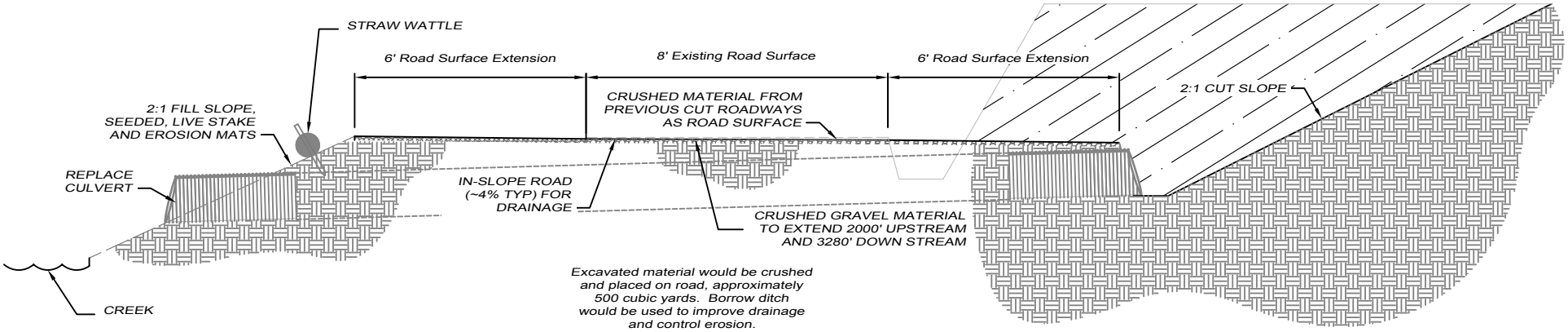




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

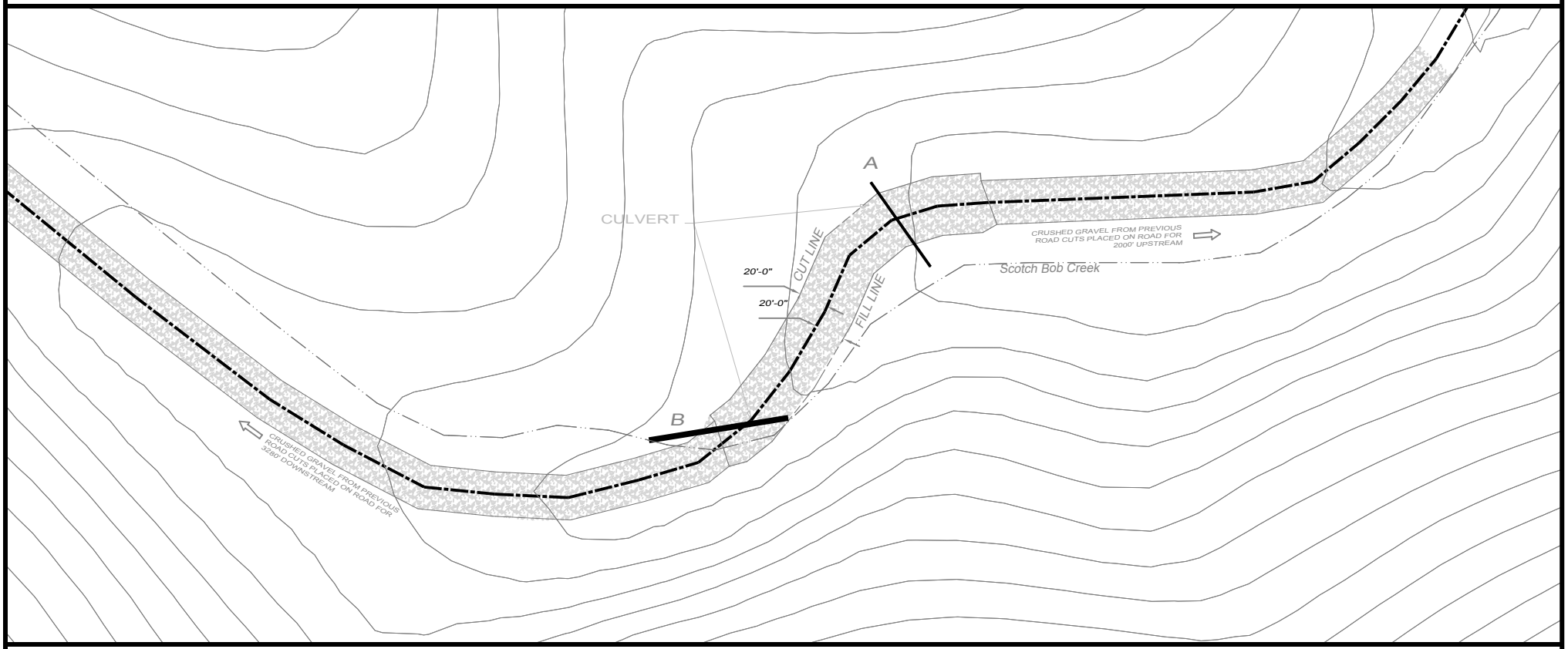
CORNER 7a

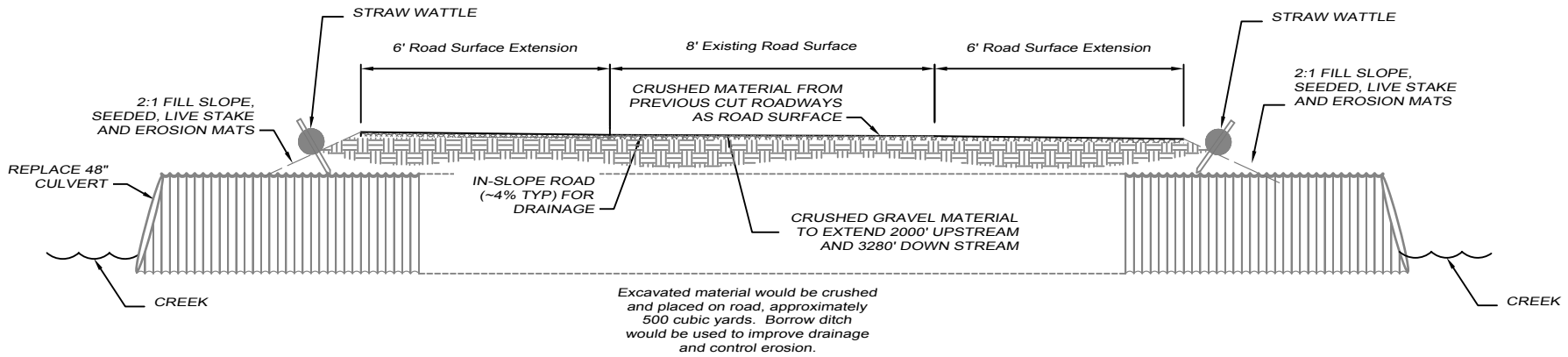




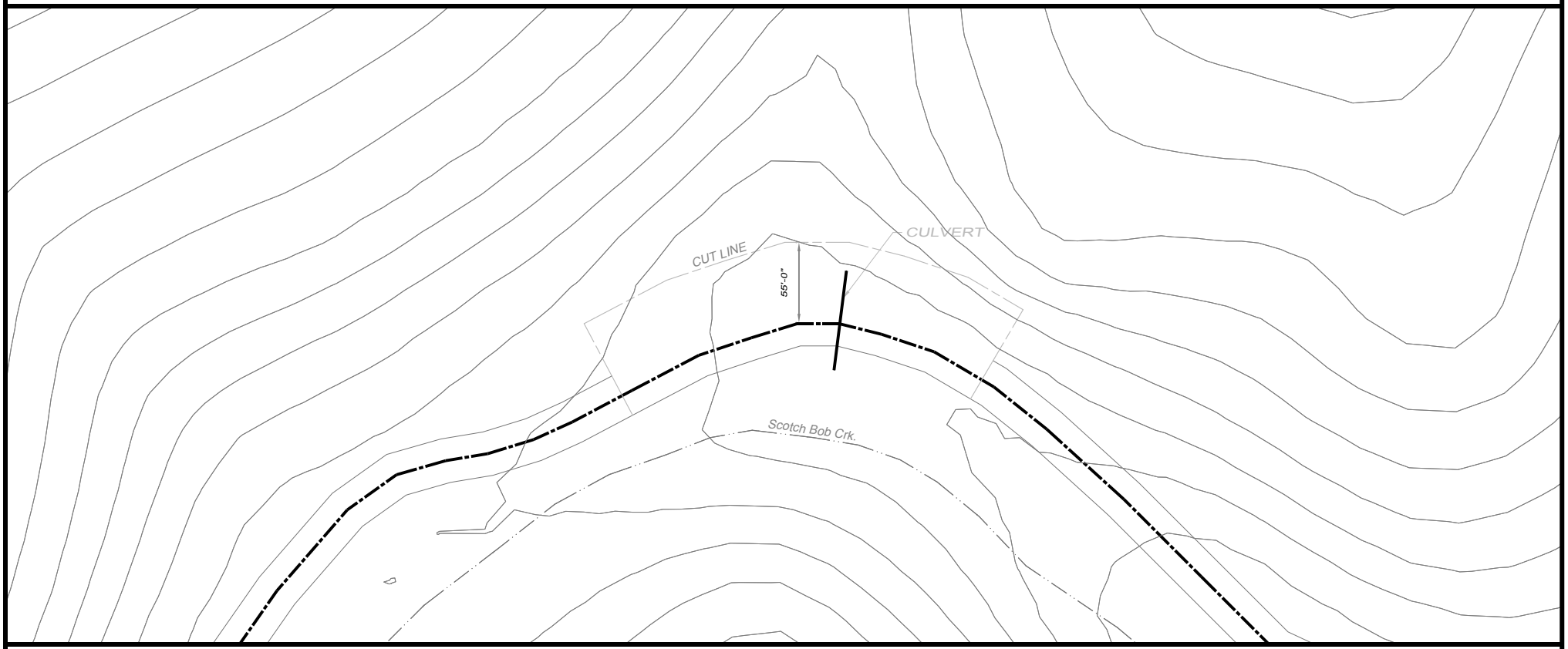
Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

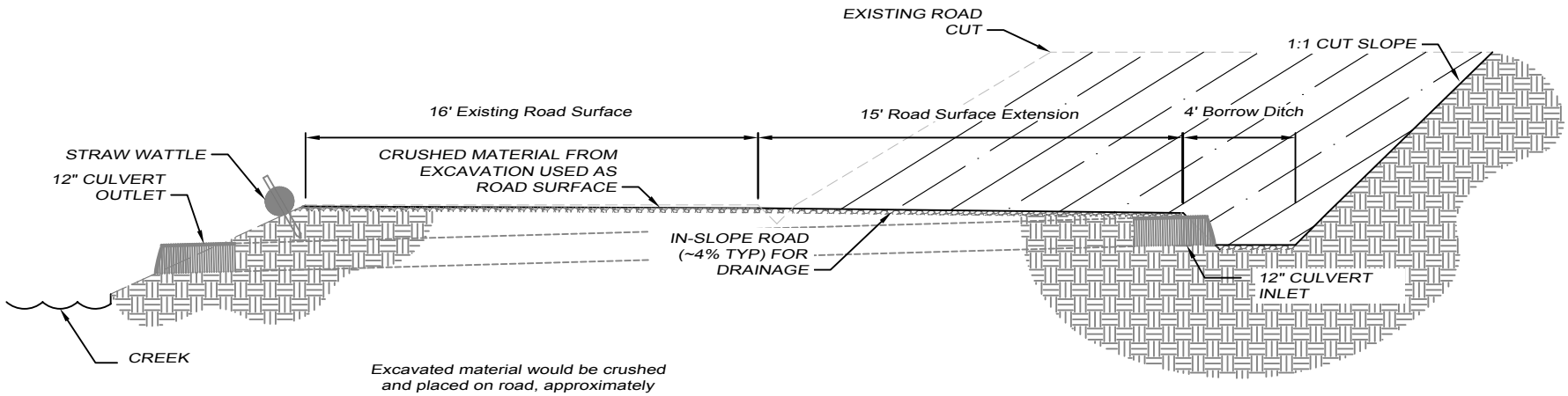
CORNER 7b


A
B
CULVERT
CUT LINE
FILL LINE
20'-0"
20'-0"
CRUSHED GRAVEL FROM PREVIOUS ROAD CUTS PLACED ON ROAD FOR 2000' UPSTREAM
Scotch Bob Creek
CRUSHED GRAVEL FROM PREVIOUS ROAD CUTS PLACED ON ROAD FOR 3280' DOWNSTREAM


STRAW WATTLE
6' Road Surface Extension
8' Existing Road Surface
6' Road Surface Extension
STRAW WATTLE
2:1 FILL SLOPE, SEEDED, LIVE STAKE AND EROSION MATS
CRUSHED MATERIAL FROM PREVIOUS CUT ROADWAYS AS ROAD SURFACE
2:1 FILL SLOPE, SEEDED, LIVE STAKE AND EROSION MATS
REPLACE 48" CULVERT
IN-SLOPE ROAD (~4% TYP) FOR DRAINAGE
CRUSHED GRAVEL MATERIAL TO EXTEND 2000' UPSTREAM AND 3280' DOWN STREAM
CREEK
CREEK
Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

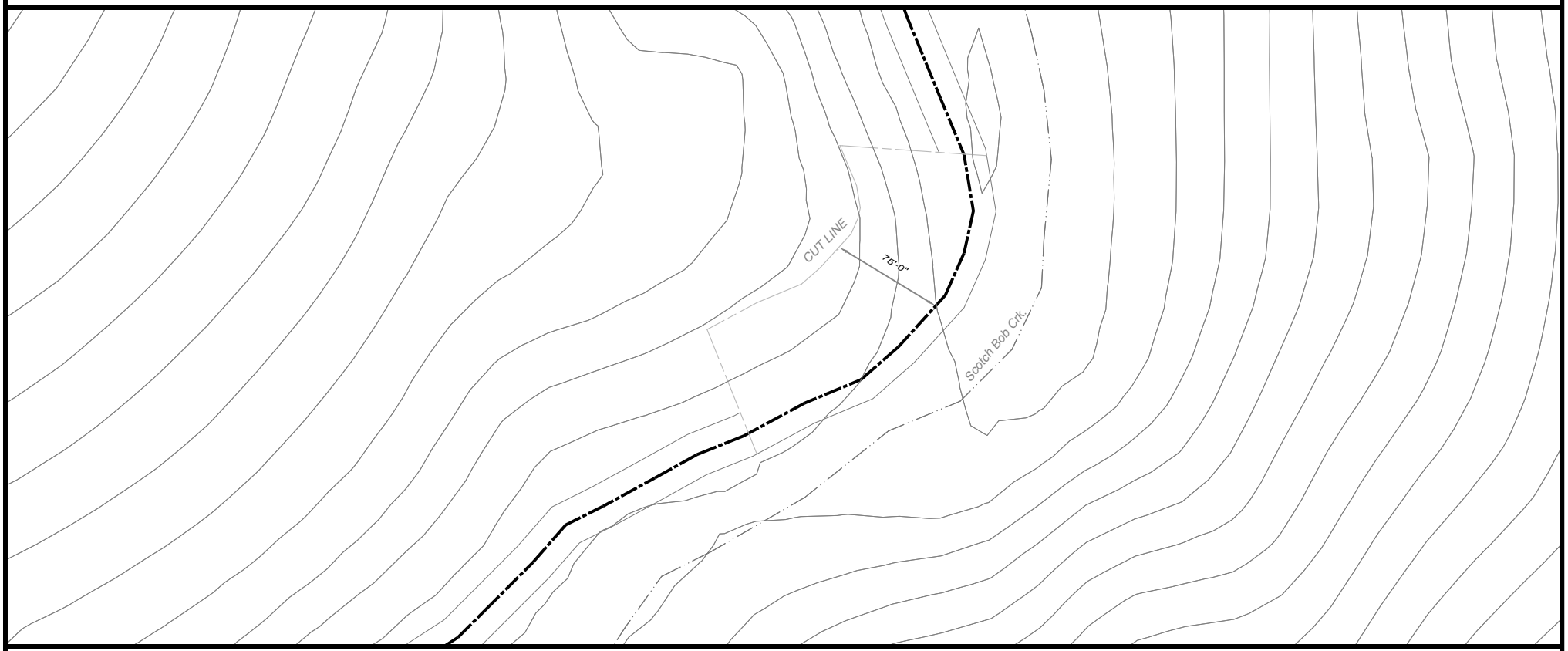
CORNER 8

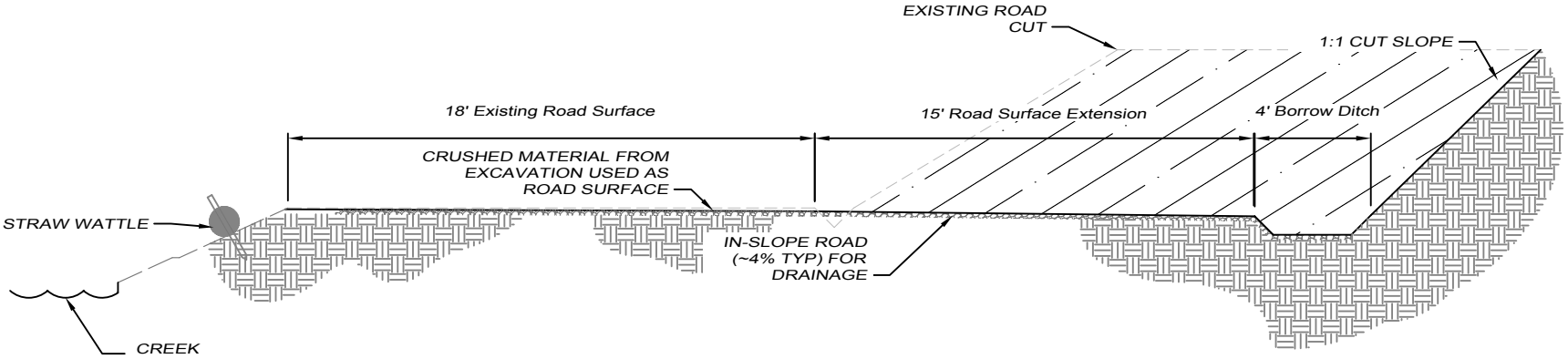




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

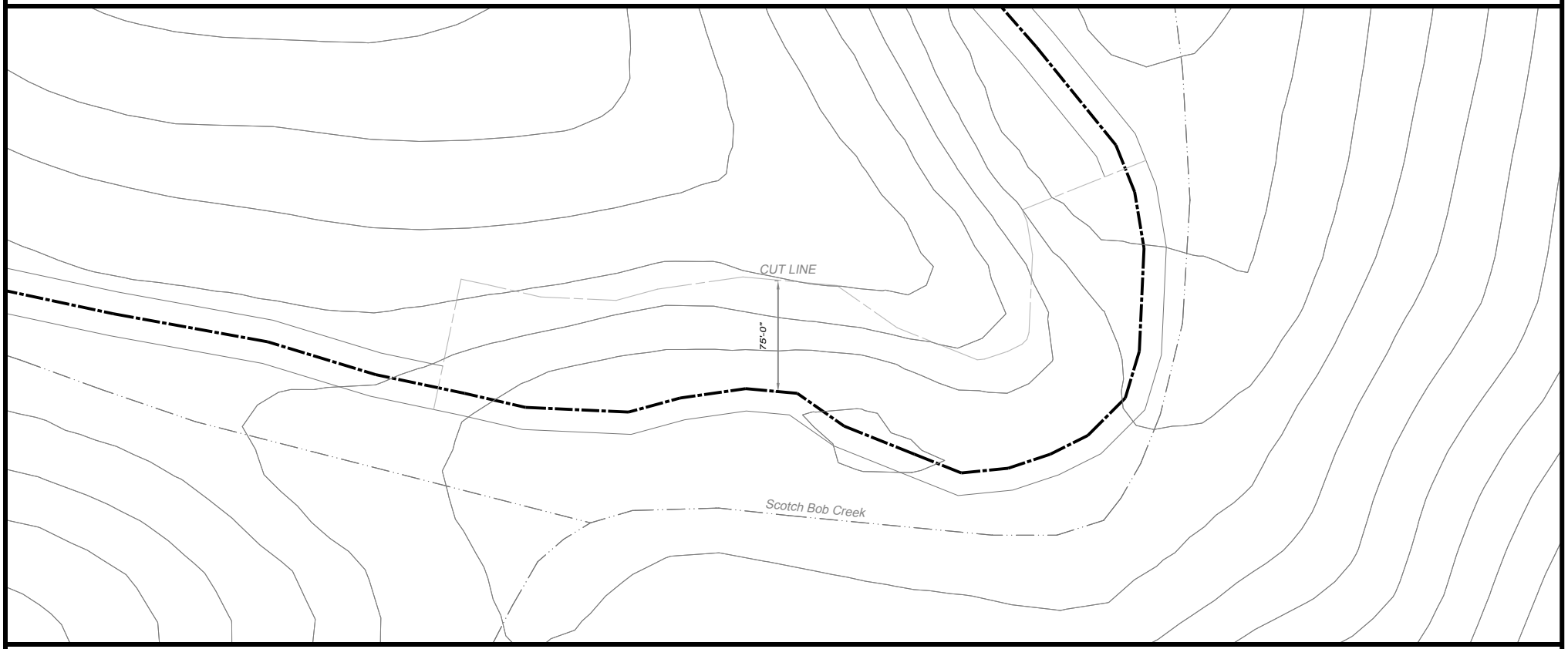
CORNER 9

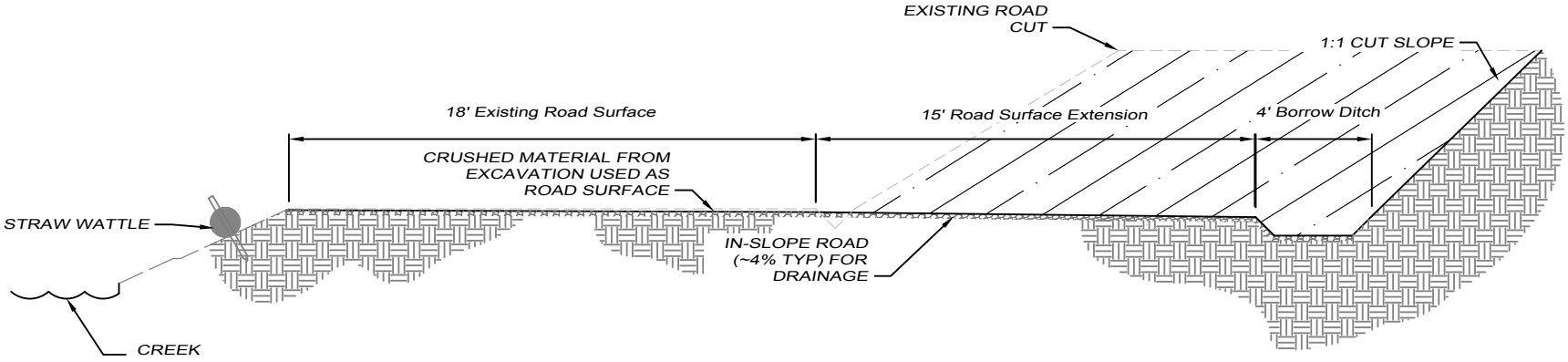




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

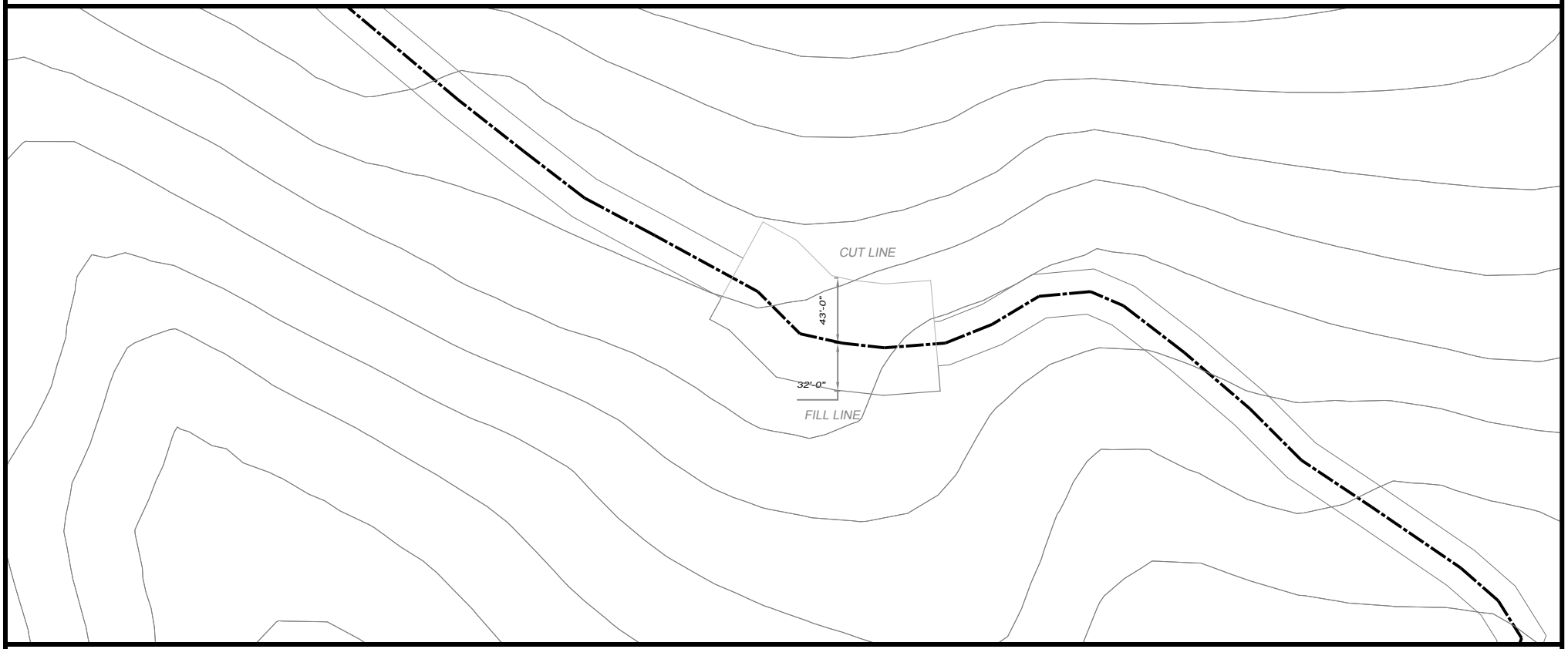
CORNER 10

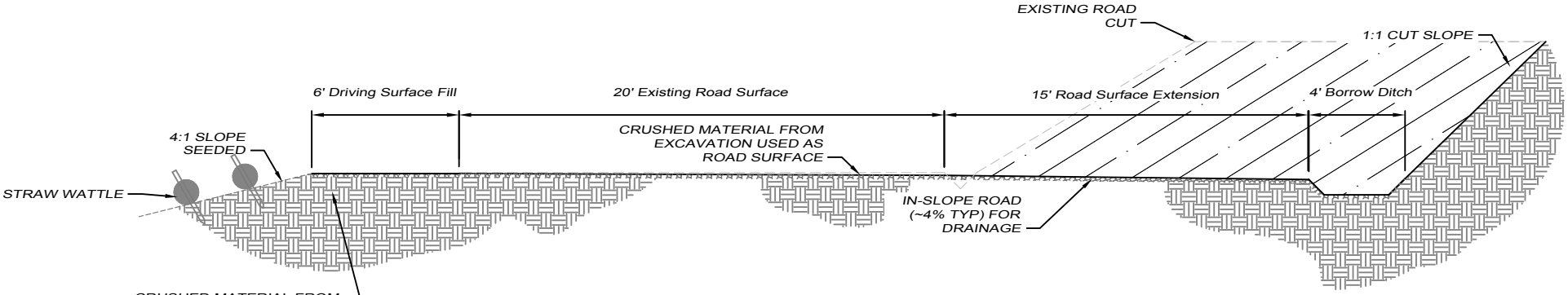




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

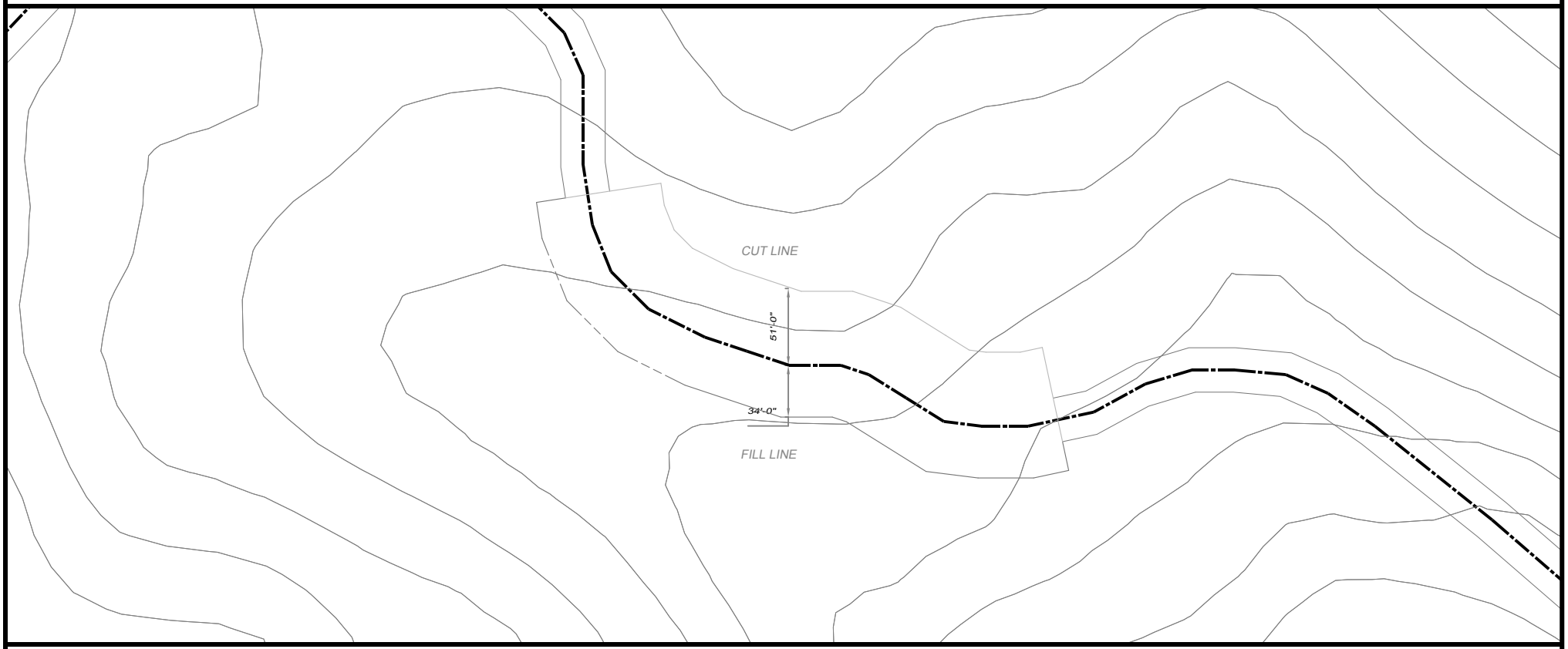
CORNER 11

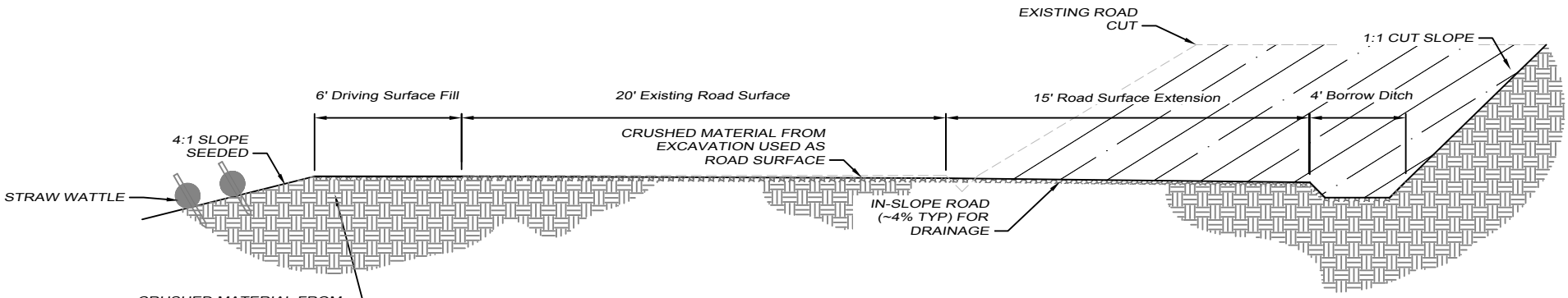




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

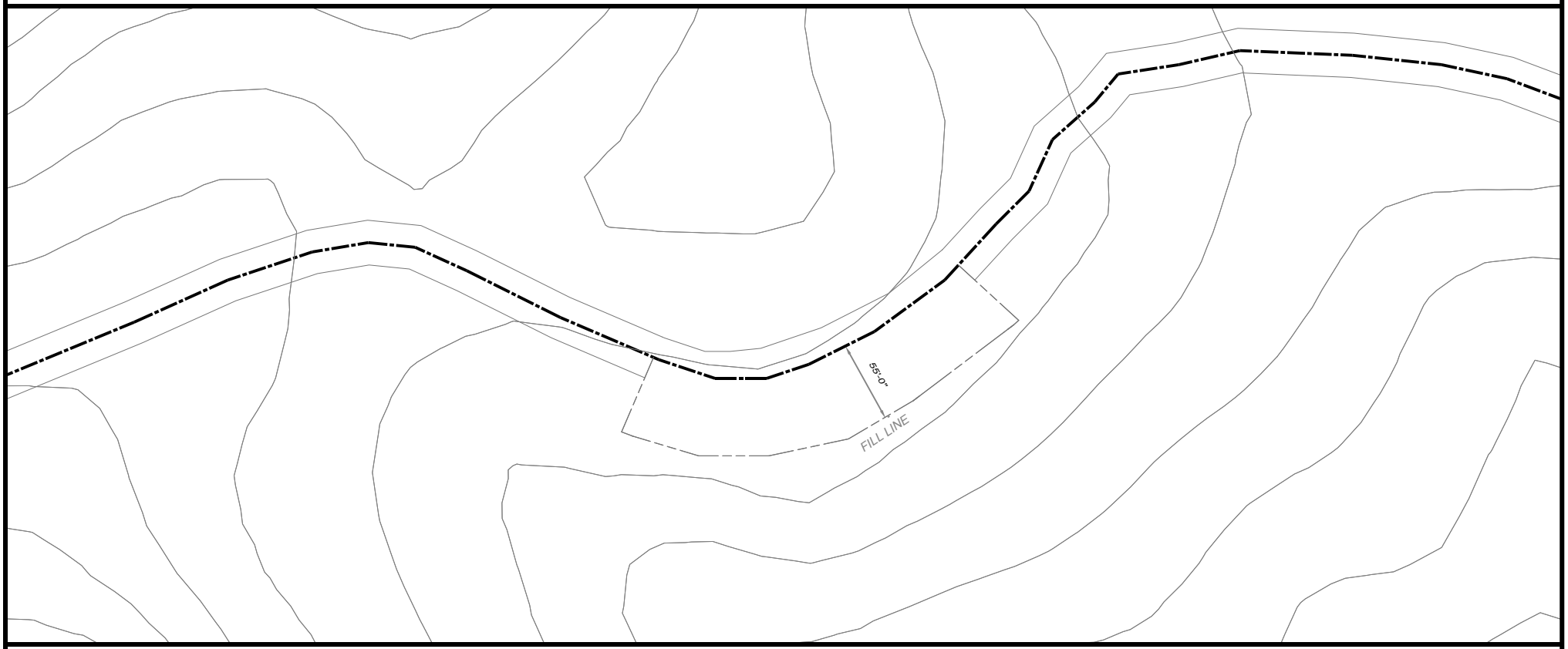
CORNER 12

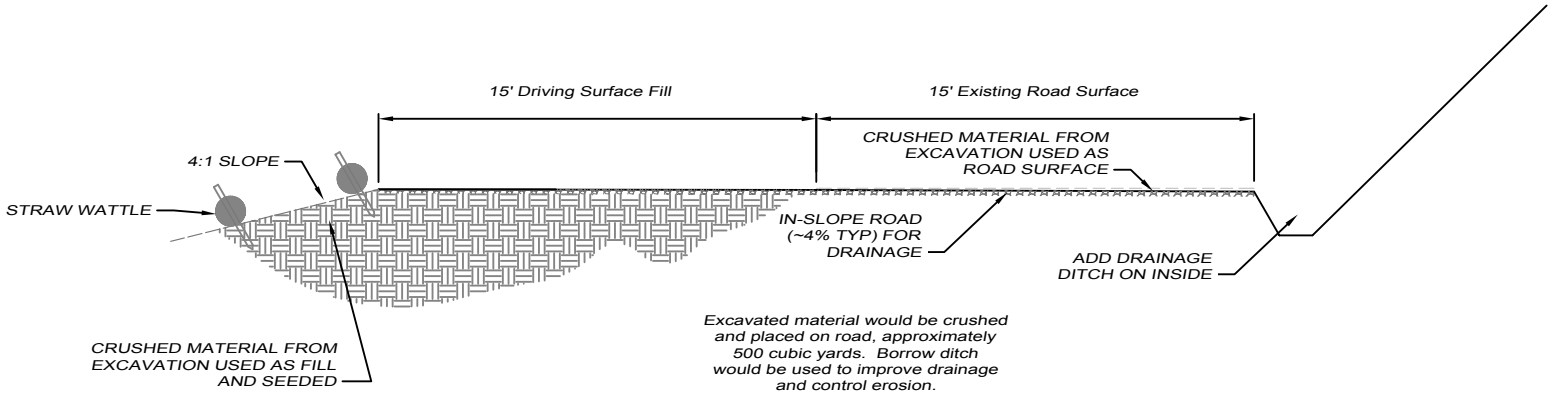




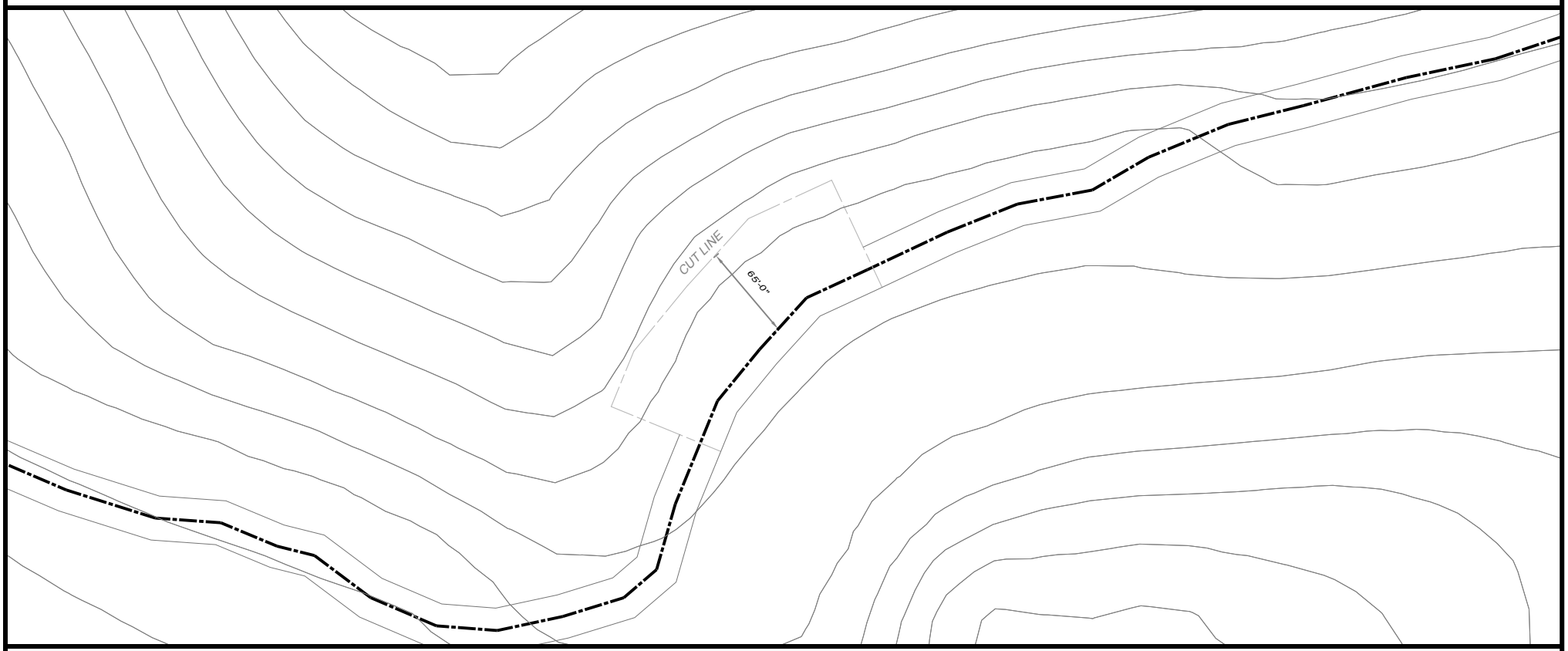
Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

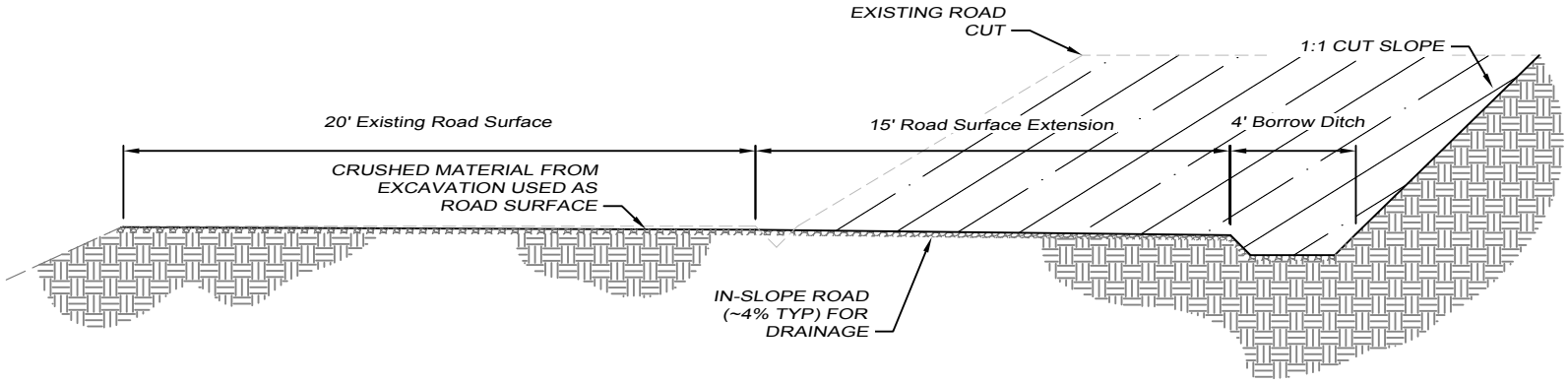
CORNER 13


55'-0"
FILL LINE


15' Driving Surface Fill
15' Existing Road Surface
CRUSHED MATERIAL FROM EXCAVATION USED AS ROAD SURFACE
4:1 SLOPE
STRAW WATTLE
IN-SLOPE ROAD (~4% TYP) FOR DRAINAGE
ADD DRAINAGE DITCH ON INSIDE
Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.
CRUSHED MATERIAL FROM EXCAVATION USED AS FILL AND SEEDED

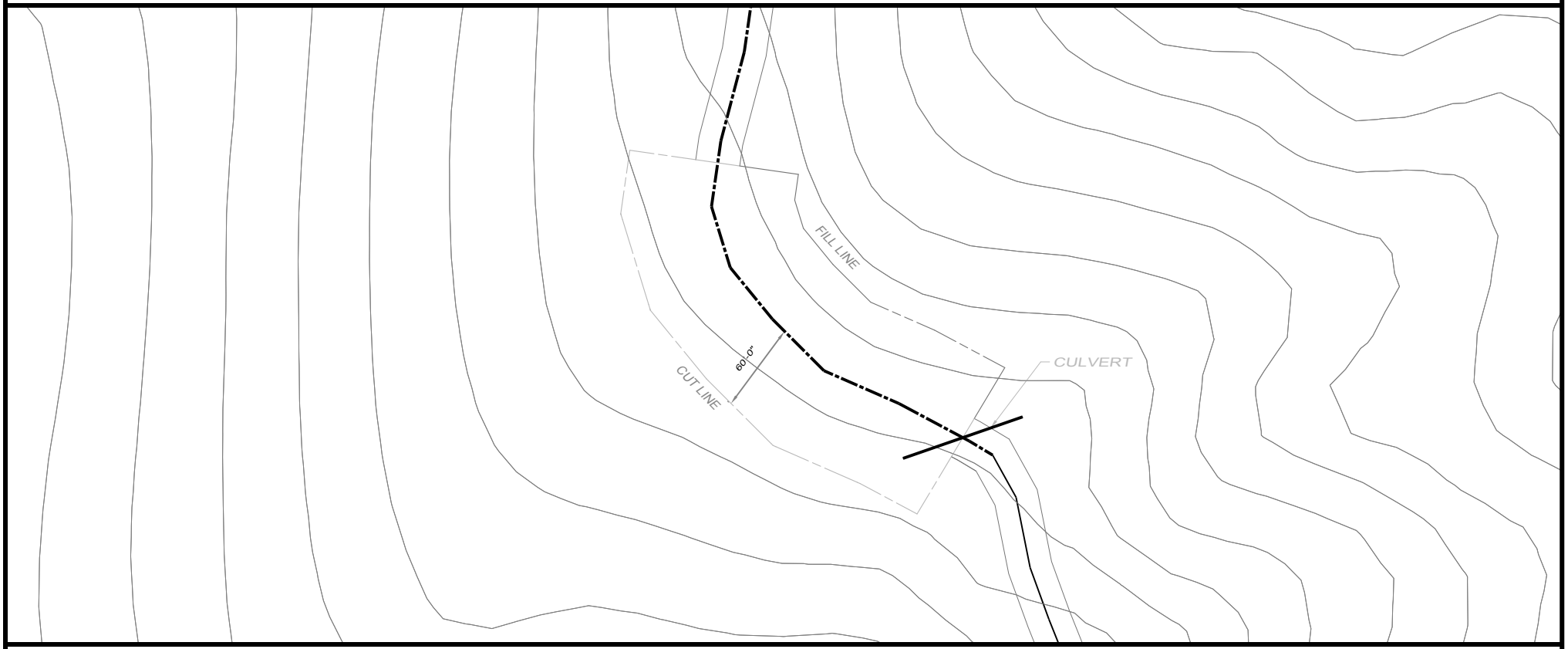
CORNER 14

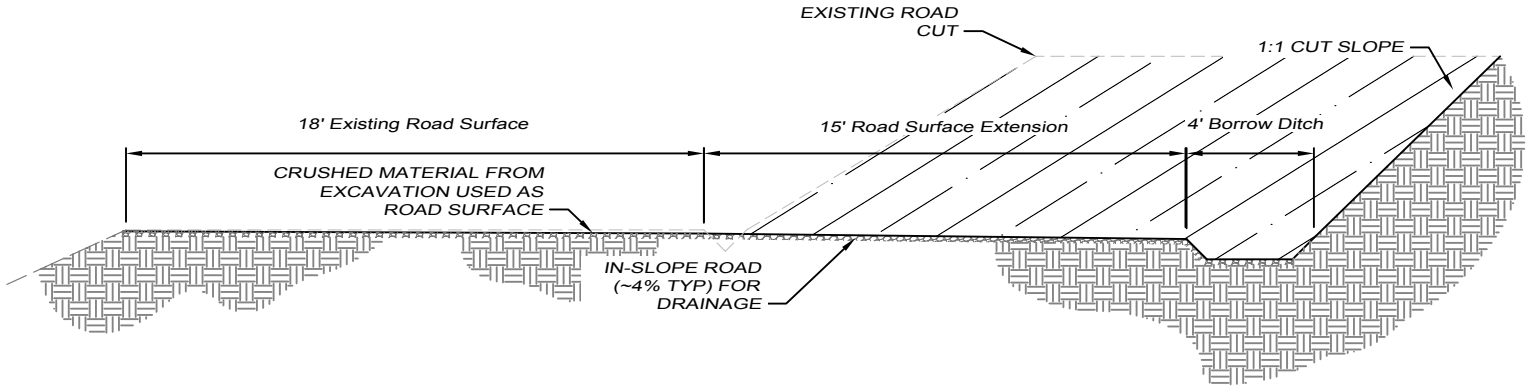




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

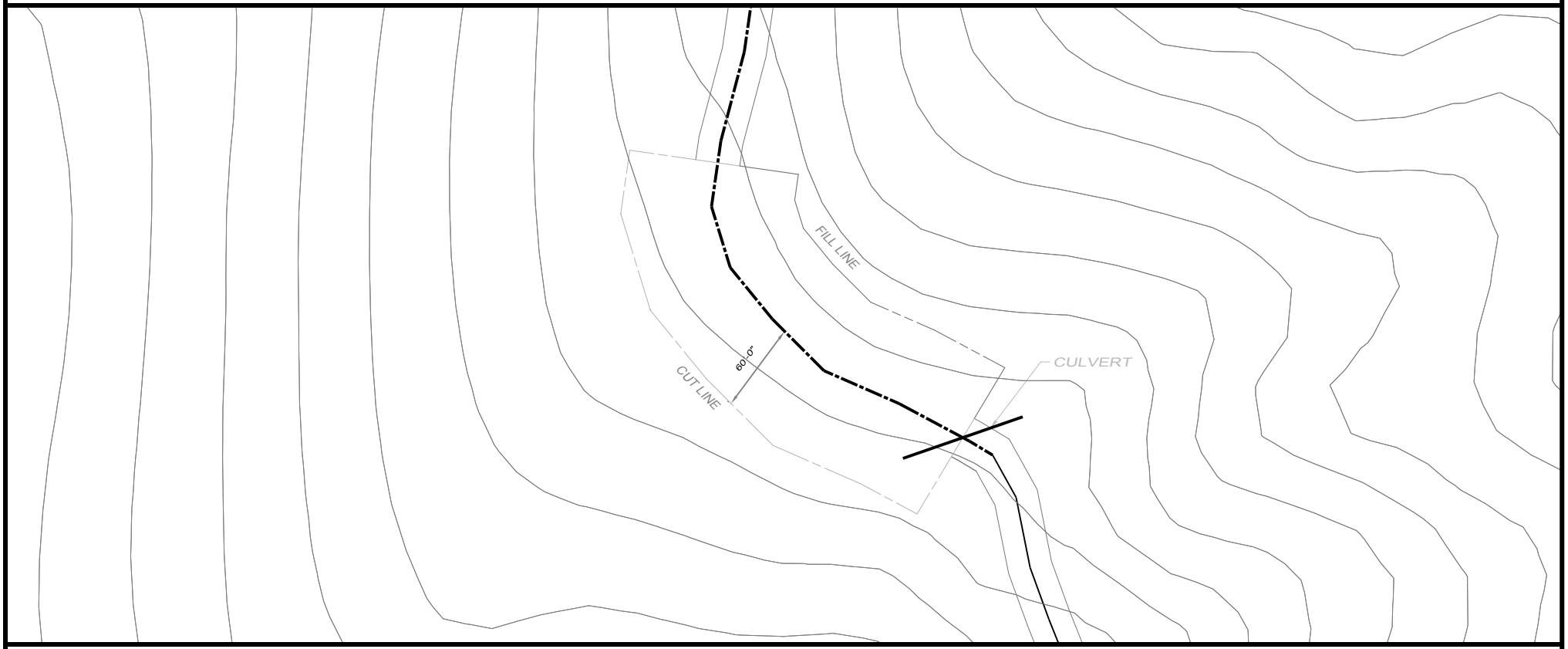
CORNER 15

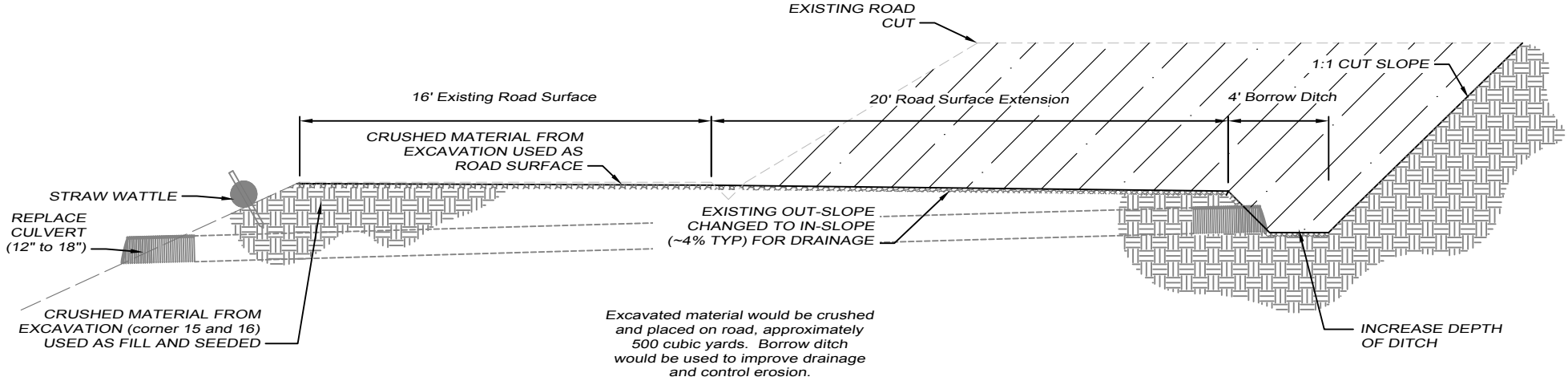




Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.

CORNER 16


FILL LINE
CUT LINE
60'-0"
CULVERT


EXISTING ROAD CUT
1:1 CUT SLOPE
16' Existing Road Surface
20' Road Surface Extension
4' Borrow Ditch
CRUSHED MATERIAL FROM EXCAVATION USED AS ROAD SURFACE
STRAW WATTLE
REPLACE CULVERT (12" to 18")
EXISTING OUT-SLOPE CHANGED TO IN-SLOPE (~4% TYP) FOR DRAINAGE
CRUSHED MATERIAL FROM EXCAVATION (corner 15 and 16) USED AS FILL AND SEEDED
Excavated material would be crushed and placed on road, approximately 500 cubic yards. Borrow ditch would be used to improve drainage and control erosion.
INCREASE DEPTH OF DITCH