

**HYDROLOGY STUDY FOR
WB MINING, LLC**

**FISHTRAP MINE NO. 2
P-3930 REVISION R-1
JEFFERSON COUNTY, ALABAMA**

BY

**PERC ENGINEERING CO., INC.
1606 HWY. 78 WEST
JASPER, ALABAMA 35501**

**PRIMARY ROAD 3P, 4P, 5P & 6P
DESIGN PLANS
ATTACHMENT III-B-5**

SEPTEMBER 16, 2011



Telephone: (205) 384-5553
Facsimile: (205) 295-3114 - Main Building
(205) 295-3115 - Water Lab
Web Address: www.percengineering.com

September 16, 2011

Mr. Michael Harrison, P.E.
Alabama Surface Mining Commission
Post Office Box 2490
Jasper, Alabama 35502-2490

RE: WB Mining, LLC
Fishtrap Mine No. 2
P-3930 Revision R-1

Dear Michael:

I hereby certify the attached detailed design plans for Primary Road 3P, 4P, 5P & 6P for the above referenced mine are in accordance with current prudent engineering practices and the Regulations of the Alabama Surface Mining Commission and are true and correct to the best of my knowledge and belief.

If you have any questions or required additional information, please feel free to call.

Sincerely,
PERC Engineering Co., Inc.

A handwritten signature in cursive script that reads "Leslie G. Stephens".

Leslie G. Stephens, P.E., P.L.S.
Alabama Registration No. 14117-E



**SPECIFICATIONS FOR THE CONSTRUCTION, MAINTENANCE
AND RECLAMATION OF PRIMARY ROADS**

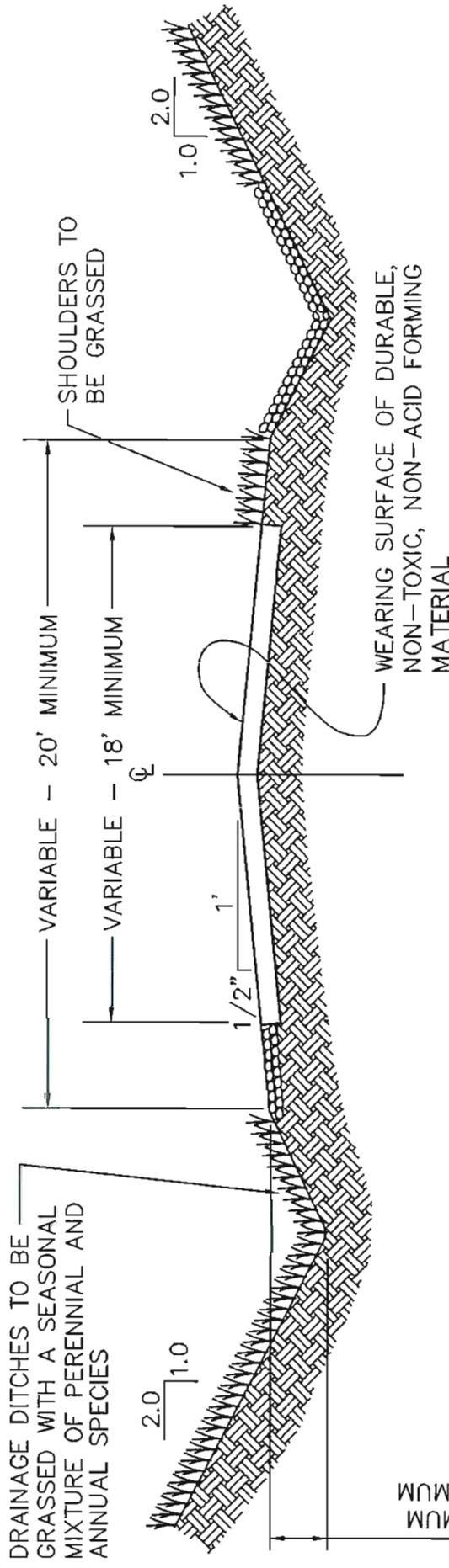
1. Primary roads shall be designed by or under the direction of a registered professional engineer in accordance with the Alabama Surface Mining Commission rules and regulations and prudent engineering practice.
2. Each roadway embankment will be designed and constructed so as to have a minimum static safety factor of 1.3.
3. To the extent possible, roads will be located on ridges or on the most stable available slopes to prevent or minimize erosion, downstream sedimentation and flooding in an effort to prevent adverse effects to fish, wildlife and related environmental values.
4. To the extent possible, roads will be located above the sediment basins to be constructed for the mining operation in an effort to control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area and to comply with State and Federal water quality standards applicable to receiving waters and avoid the alteration of the normal flow of water in streambeds or drainage channels while preventing or controlling damage to public or private property. Where it is not possible or is impractical to locate roads in this manner, sediment control devices such as silt fencing, hay bale check dams and rock filter check dams will be used as necessary to maintain water quality. No fording of intermittent or perennial streams will be conducted unless specifically approved by the Alabama Surface Mining Commission as temporary routes to be used during road construction.
5. Prior to construction, the roadway will be cleared, grubbed and will have the topsoil removed. The clearing limits will be kept to the minimum necessary to accommodate the roadbed and associated ditch construction.
6. Roads will be constructed of suitable compacted subgrade material. The material will be free of sod, roots, stones over 12 inches in diameter, and other objectionable materials. The material will be placed and spread over the entire fill area, starting at the lowest point in layers not to exceed 12 inches in thickness. The material will be compacted to 95 percent of the density, based on standard proctor as outlined in ASTM.
7. Primary roads will have a minimum width of eighteen feet and a maximum width necessary to accommodate the largest equipment traveling the road.
8. Roadbeds will be cut to consolidated non-erodible material or will be surfaced with durable non-toxic, non-acid forming substances. The wearing surface will consist of durable sandstone, chert, crushed limestone, crushed concrete, crushed asphalt, red rock, ironore refuse, gravel, or other durable non-toxic, non-acid forming material approved by the Regulatory Authority. The wearing surface will be placed on the roadbed to a depth of four inches.
9. No sustained grades will exceed ten percent unless deemed necessary, in which case appropriate sediment control facilities will be constructed. If grades in excess of fifteen percent are required, cross drains, ditch relief drains and road drainways will be located at a minimum distance of three-hundred feet.

10. Roads will be constructed so as to have adequate drainage utilizing ditches, culverts, cross drains and ditch relief drains designed to safely pass the peak runoff from a ten year, six hour precipitation event. Drainage pipes and culverts shall be installed as designed and will be maintained in a free and operating condition to prevent and control erosion at inlets and outlets. Culverts have been designed to support the load of the heaviest equipment to travel the road and are based on the Handbook of Steel Drainage and Highway Construction Products by the American Iron and Steel Institute and the equipment specifications. Drainage ditches will be constructed and maintained in accordance with the approved design to prevent uncontrolled drainage over the road surface and embankment. Roads will not be located in the channel of an intermittent or perennial stream unless specifically approved by the Alabama Surface Mining Commission. Additionally, no relocation and/or alteration of an intermittent or perennial stream will be done unless specifically approved by the Alabama Surface Mining Commission. In the event that it becomes evident that any drainage structures including culverts, bridges and/or low water crossings will be required in order to cross an intermittent or perennial stream, the structure will be designed and constructed in accordance with Alabama Surface Mining Commission requirements and prudent engineering practice and the approval of the design(s) will be acquired prior to the commencement of construction. Hay bale check dams and silt fences will be used at strategic locations when necessary to control sediment runoff. Immediately upon completion of construction, the side slopes of the road embankments and/or cuts will be fertilized, seeded with annual and perennial grasses and mulch will be added to aid in the prevention of erosion and to enhance seed germination. The seed mix will consist of, but is not limited to, some combination of the following species: bermuda grass, fescue, lespedeza, rye grass, brown top millet, clover and vetch. The particular species to be planted will vary with the planting season at the time of seed application. Upon completion of construction of each phase of the roadway the construction will be certified to the Alabama Surface Mining Commission as having been done in accordance with the approved plans for the roadway and associated facilities.
11. Routine maintenance will be required to assure that the road continually meets performance standards and will consist of periodic grading, resurfacing, dust suppression and maintenance of sediment control facilities. Dust suppression will consist of the application of water, chemical binders and/or other dust suppressants. No oil will be utilized in this process. Spot seeding, fertilizing and mulching will be performed as necessary to improve vegetative cover on roadway slopes. A road damaged by a catastrophic event shall be repaired as soon as practicable after the damage has occurred.
12. Roads not to be retained as part of the post mine land use shall be reclaimed in accordance with the approved reclamation plan for this permit as soon as practicable after they are no longer needed as part of the mining and reclamation operation, using the following procedures:
 - a. The road will be closed to traffic.
 - b. All bridges, culverts and other drainage structures not approved as part of the post mine land use will be removed.
 - c. All road surfacing materials that are not compatible with the post mine land use or revegetation requirements will be properly disposed of on-site or removed from the site for re-use.

- d. Roadway cut and fill slopes shall be regraded and reshaped to be compatible with the post mine land use and to compliment the natural drainage pattern of the surrounding terrain.
 - e. The natural drainage patterns shall be protected from surface runoff and erosion utilizing the installation of dikes and/or cross drains as necessary.
 - f. The roadbed shall be ripped or scarified as necessary, the topsoil or substitute or approved growing medium shall be replaced and revegetated in accordance with the approved reclamation plan for this permit.
13. The drawings and data contained in the specific design plans illustrate typical roadbed configurations for primary roads as well as site specific design of drainage structures, stability analysis and ditch sections.

TYPICAL HAUL ROAD CUT SECTION

NO SCALE



TYPICAL CUT SECTION
PRIMARY HAUL ROAD

DRAWN BY: K.D.P.
DWG. NAME: TYPHAULC

DATE: 2-3-97

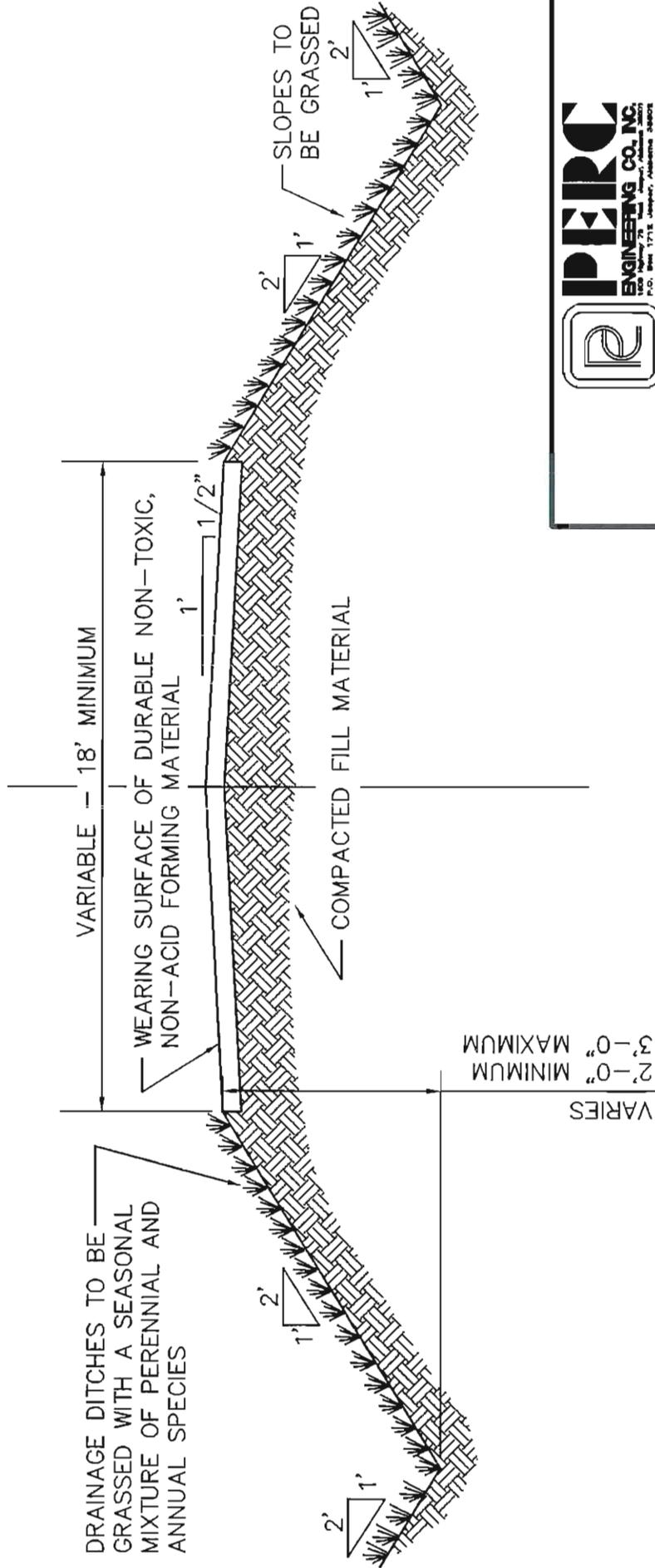
APPROVED BY: S.R.I.

SCALE: NONE

ATTACHMENT III - B. - 5.

TYPICAL HAUL ROAD FILL SECTION

NO SCALE



TYPICAL FILL SECTION
PRIMARY HAUL ROAD

DRAWN BY: K.D.P.
DWG. NAME: TYPHAULF

DATE: 2-3-97

APPROVED BY: S.R.I.
SCALE: NONE

ATTACHMENT III. — B. — 5.

NOTES

Primary Road 3P

- 1) Due to there being no significant cut or fill section, no stability analysis is required.
- 2) Drainage structure DS3P is to consist of an 18" diameter corrugated metal pipe which is to be placed in the assumed roadside ditch of Elbo Porter Rd.

Primary Road 4P

- 1) Due to there being no significant cut or fill section, no stability analysis is required.

Primary Road 5P

- 1) Due to there being no significant cut or fill section, no stability analysis is required.
- 2) Drainage structure DS5P is to consist of a 36" diameter corrugated metal pipe which it to be placed at station 4+16 as shown on the Primary Road 5P profile.

Primary Road 6P

- 1) Due to there being no significant cut or fill section, no stability analysis is required.

RIP-RAP CLASSIFICATION SPECIFICATIONS

CLASS 1 RIP-RAP

No more than 10% of the stone will have a diameter greater than twelve (12) inches; no more than 50% of the stone will have a diameter less than ten (10) inches; and no more than 10% of the stone will have a diameter of less than six (6) inches. The thickness of the rip-rap liner will be no less than twelve (12) inches.

CLASS 2 RIP-RAP

No more than 10% of the stone will have a diameter greater than sixteen (16) inches; no more than 50% of the stone will have a diameter less than twelve (12) inches; and no more than 10% of the stone will have a diameter of less than six (6) inches. The thickness of the rip-rap liner will be no less than sixteen (16) inches.

CLASS 3 RIP-RAP

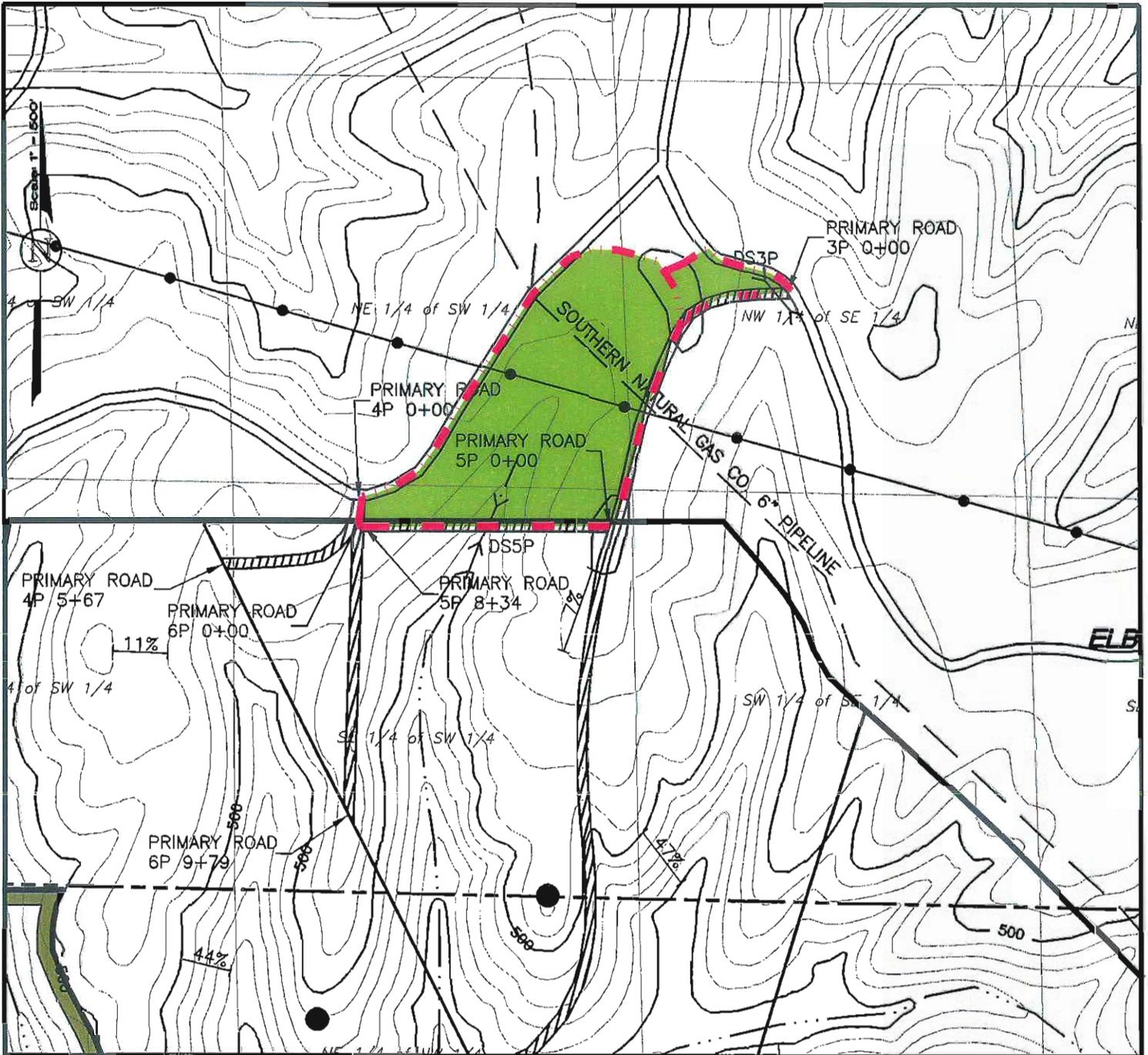
No more than 10% of the stone will have a diameter greater than twenty two (22) inches; no more than 50% of the stone will have a diameter less than sixteen (16) inches; and no more than 10% of the stone will have a diameter of less than eight (8) inches. The thickness of the rip-rap liner will be no less than twenty two (22) inches.

CLASS 4 RIP-RAP

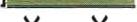
No more than 10% of the stone will have a diameter greater than twenty seven (27) inches; no more than 50% of the stone will have a diameter less than twenty two (22) inches; and no more than 10% of the stone will have a diameter of less than ten (10) inches. The thickness of the rip-rap liner will be no less than twenty seven (27) inches.

CLASS 5 RIP-RAP

No more than 10% of the stone will have a diameter greater than thirty four (34) inches; no more than 50% of the stone will have a diameter less than twenty seven (27) inches; and no more than 10% of the stone will have a diameter of less than sixteen (16) inches. The thickness of the rip-rap liner will be no less than thirty four (34) inches.



LEGEND

-  Permit Boundary/Increment Boundary
-  600 Surface Contour
-  Sediment Basin
-  Drainage Course by ASMC Regulation Definition
-  County Road (Paved unless otherwise designated)
-  Road (Private unless otherwise shown)
-  Primary Road
-  Ancillary Road
-  P-3813
-  Safety Berm
-  Culvert/Drainage Structure

LANDUSE INFORMATION

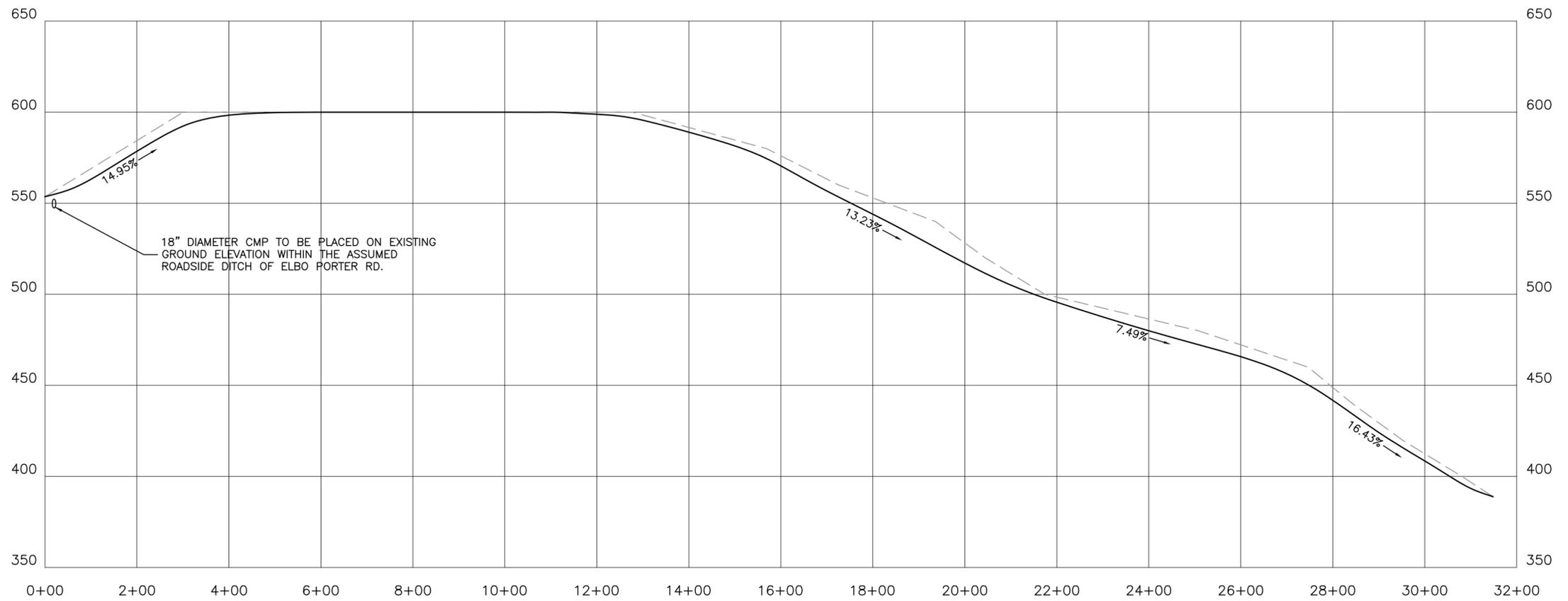
-  Unmanaged Timberland, Curve Number 70



Attachment III-B-5
WB Mining LLC
Fishtrap Mine No. 2
P-3930 / Revision R-1
Drainage Structure Watershed Map

DRAWN BY: J.W.T.	DATE: 09/15/2011
DWG. NAME: WBFTM2R1ARLM	
APPROVED BY: L.G.S.	SCALE: 1"=500'

C:\Users\jwatt\Documents\Projects\Fishtrap\WBFTM2R1ARLM.dwg, 09/15/2011, 10:58 AM



Horizontal Scale: 1"=200'
 Vertical Scale: 1"=50'

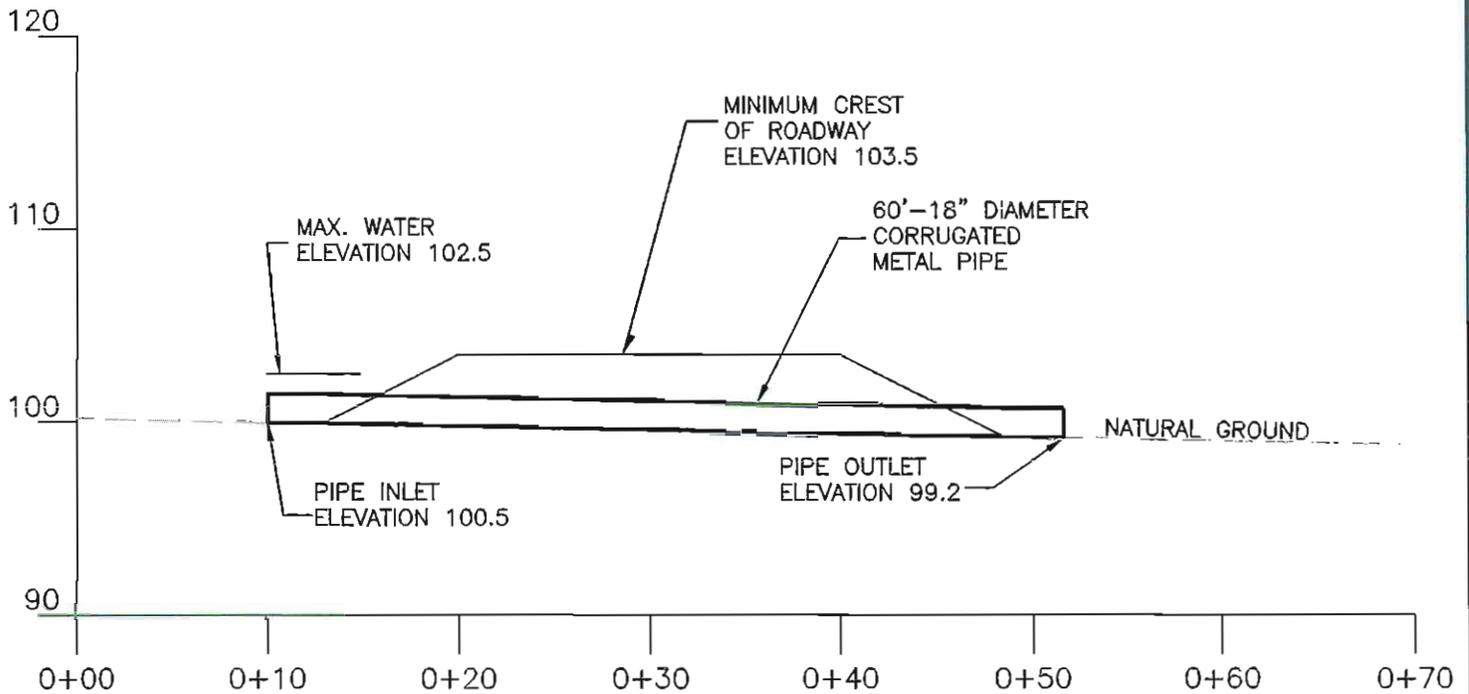
LEGEND

- Natural Ground Profile
- Proposed Finished Grade



WB Mining, LLC
Fishtrap Mine No. 2
P-3930 Revision R-1
Primary Road 3P Profile

DRAWN BY: J.W.T.	DATE: 09/16/2011
DWG. NAME: PR3Pro	
APPROVED BY: L.G.S.	SCALE: AS NOTED



NOTE: ELEVATIONS ARE BASED ON ASSUMED DATUM.

HYDRAULICS INFORMATION

Drainage Area = 1.1 Acres
 10 YR.-6 HR., Q = 2.86 C.F.S.
 Maximum Water Elev. = 526.8
 Minimum Fill Elev. = 527.8
 Maximum Allowable Cover 18" C.M.P. = 166'
 Minimum Allowable Cover 18" C.M.P. = 1'
 Wall Thickness = 0.064"
 Minimum Freeboard = 1'



**WB Mining LLC
 FISHTRAP MINE NO. 2
 P-3930 Revision R-1
 Drainage Structure DS3P
 Primary Road 3P**

DRAWN BY: J.W.T.

DATE: 09/16/2011

DWG. NAME: DS3P

APPROVED BY: L.G.S.

SCALE: 1"=10'

WB Mining, LLC
Fishtrap Mine No. 2
P-3930 Revision R-1
Primary Road 3P
Drainage Structure DS3P

4.3 Inch, 10 Year- 6 Hour
NRCS Type II

JWT

PERC Engineering Co., Inc.
PO BOX 1712
Jasper, AL 35503

Phone: 205-384-5553
Email: John.Taylor@percengineering.com

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	4.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Culvert	#1	==>	End	0.000	0.000	Drainage Structure DS3P

#1 Culvert

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.100	1.100	2.86	0.14

Structure Detail:

Structure #1 (Culvert)

Drainage Structure DS3P

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
100.00	2.00	0.0240	2.50	0.00	0.90

Culvert Results:

Design Discharge = 2.86 cfs

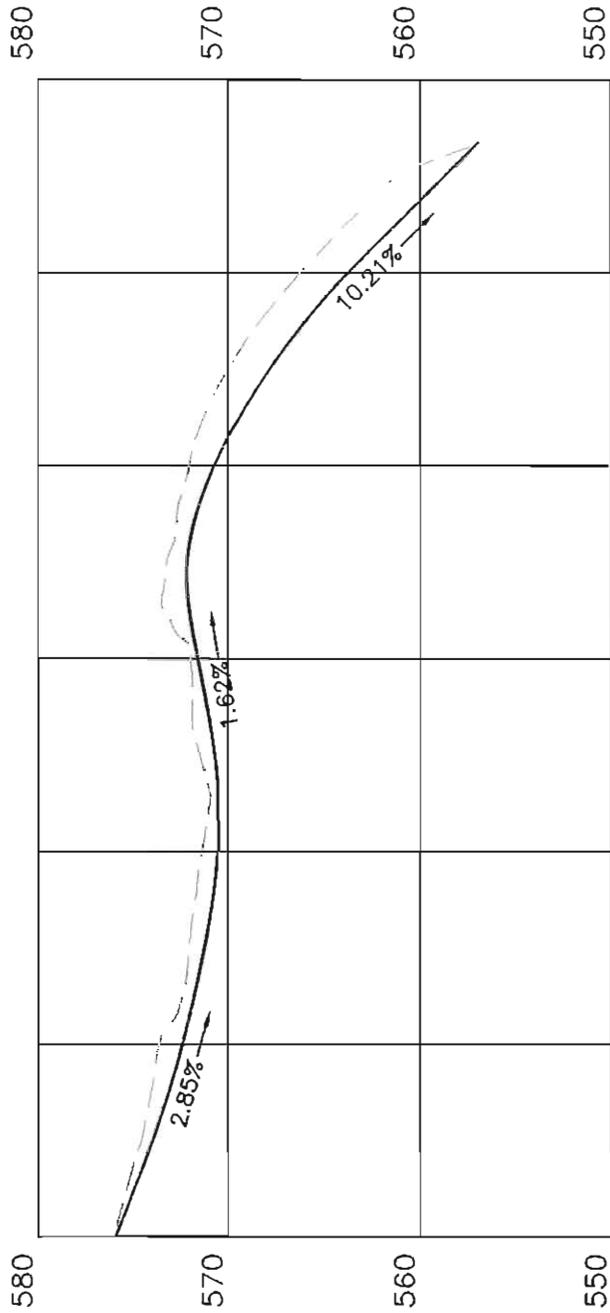
Minimum pipe diameter: 1 - 12 inch pipe(s) required

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.100	0.076	0.000	0.000	70.000	M	2.86	0.140
	Σ	1.100						2.86	0.140

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	1. Forest with heavy ground litter	10.00	20.00	200.00	0.800	0.069
		7. Paved area and small upland gullies	9.32	15.00	161.00	6.140	0.007
#1	1	Time of Concentration:					0.076



Horizontal Scale: 1"=100'
 Vertical Scale: 1"=10'

LEGEND

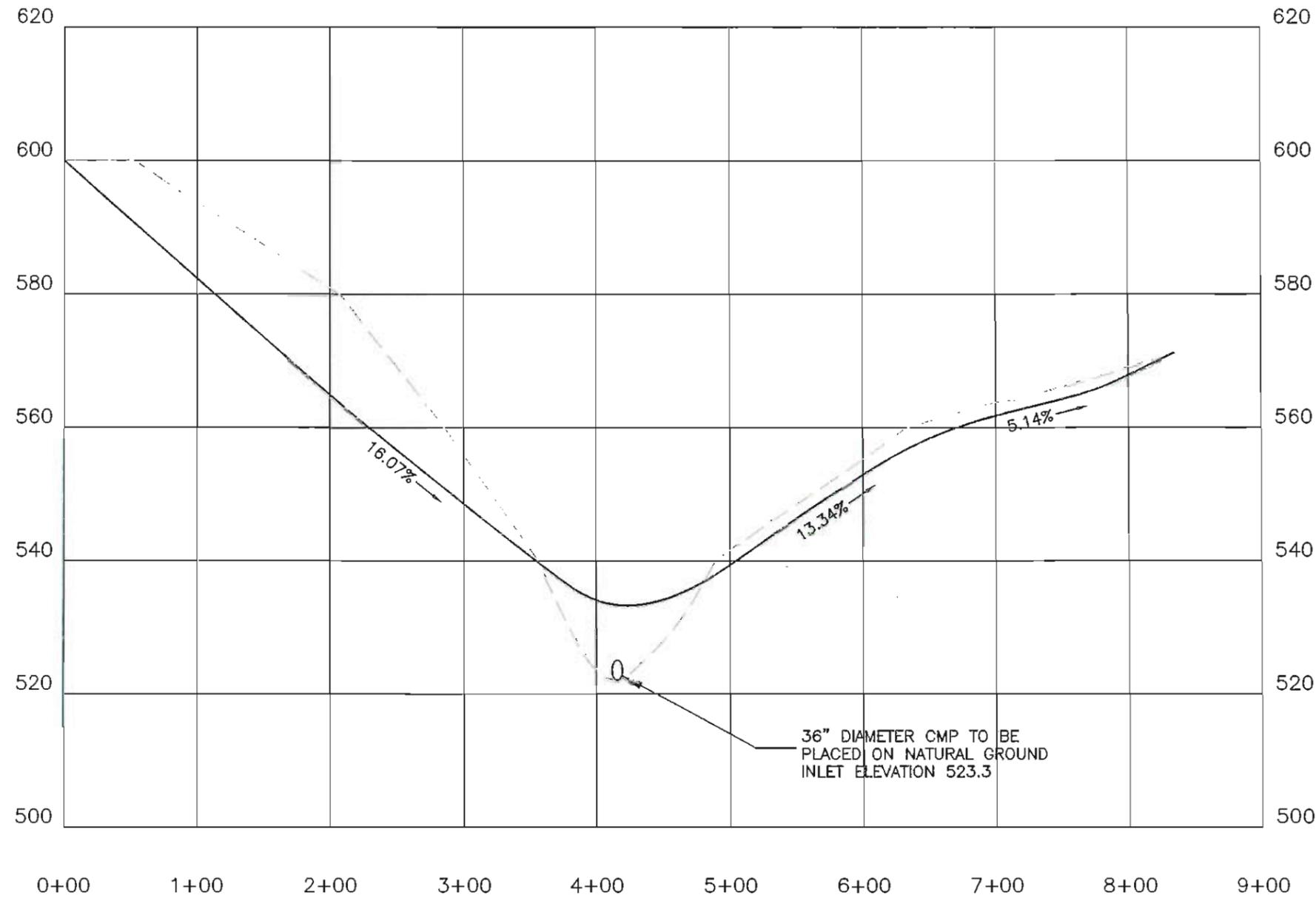
- Natural Ground Profile
- Proposed Finished Grade



PERC
 ENGINEERING CO., INC.
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 Oklahoma City, Oklahoma 73106
 Phone: (405) 241-1100
 Fax: (405) 241-1101
 www.perc-engineering.com

WB Mining LLC
 Fishtrap Mine No. 2
 P-3930 / Revision R-1
 Primary Road 4P Profile

DRAWN BY: J.W.T.	DATE: 09/16/2011
DWG. NAME: PRA4P0	
APPROVED BY: L.G.S.	SCALE: AS NOTED



Horizontal Scale: 1"=100'
 Vertical Scale: 1"=20'

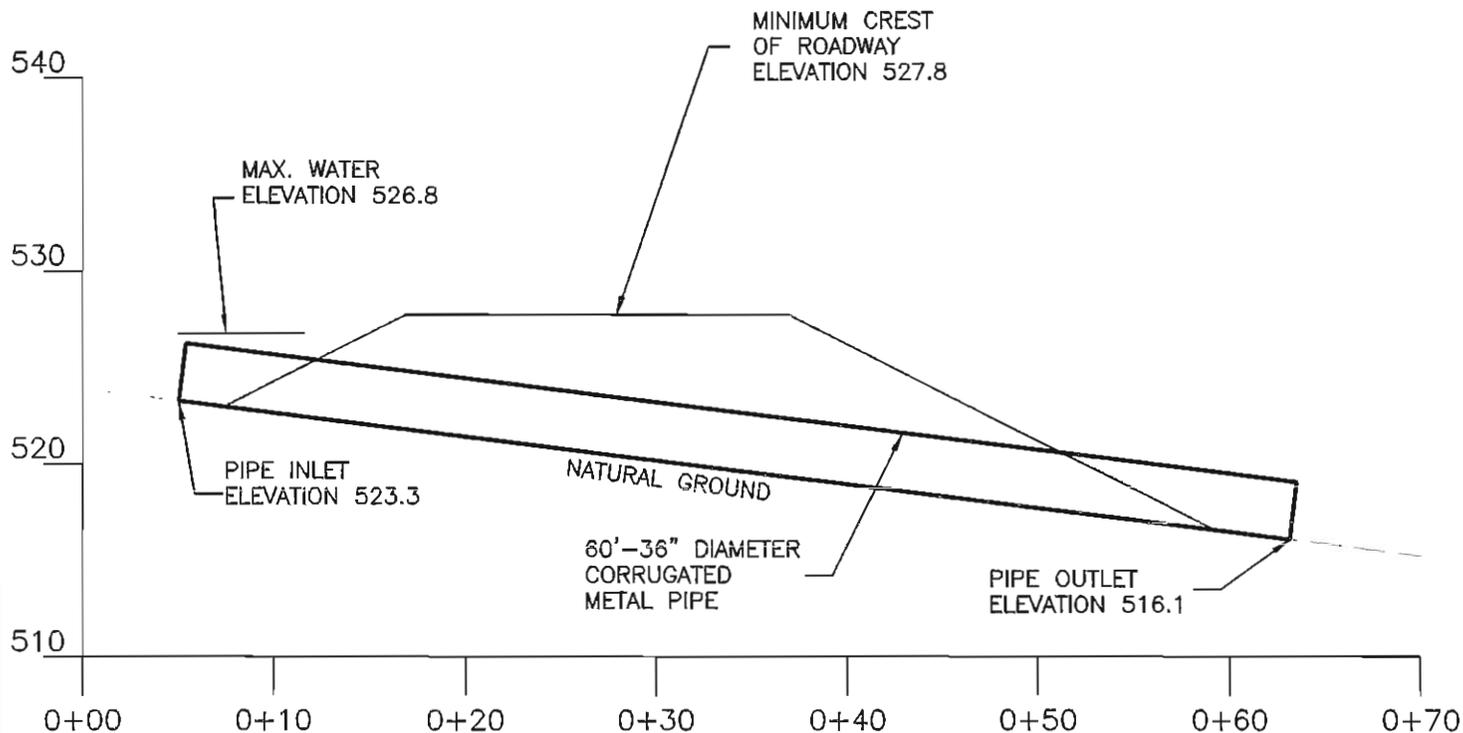
LEGEND

- Natural Ground Profile
- Proposed Finished Grade



WB Mining LLC
Fishtrap Mine No. 2
P-3930 / Revision R-1
Primary Road 5P Profile

DRAWN BY: J.W.T.	DATE: 09/16/2011
DWG. NAME: PR5Pro	
APPROVED BY: L.G.S.	SCALE: AS NOTED



HYDRAULICS INFORMATION

Drainage Area = 13.1 Acres
 10 YR.-6 HR., $Q = 34.10$ C.F.S.
 Maximum Water Elev. = 526.8
 Minimum Fill Elev. = 527.8
 Maximum Allowable Cover 36" C.M.P. = 83'
 Minimum Allowable Cover 36" C.M.P. = 1'
 Wall Thickness = 0.064"
 Minimum Freeboard = 1'



WB MINING LLC
FISHTRAP MINE NO 2
P-3930 Revision R-1
Drainage Structure DS5P
Primary Road 5P

DRAWN BY: J.W.T.

DATE: 09/16/2011

DWG. NAME: DS5P

APPROVED BY: L.G.S.

SCALE: 1"=10'

WB Mining, LLC
Fishtrap Mine No. 2
P-3930 Revision R-1
Primary Road 5P
Drainage Structure DS5P

4.3 Inch, 10 Year- 6 Hour

NRCS Type II

JWT

PERC Engineering Co., Inc.
PO BOX 1712
Jasper, AL 35503

Phone: 205-384-5553
Email: John.Taylor@percengineering.com

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	4.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Culvert	#1	==>	End	0.000	0.000	Drainage Structure DS5P

#1
Culvert

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	13.100	13.100	34.10	1.67

Structure Detail:

Structure #1 (Culvert)

Drainage Structure DS5P

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
100.00	12.60	0.0240	3.50	0.00	0.90

Culvert Results:

Design Discharge = 34.10 cfs

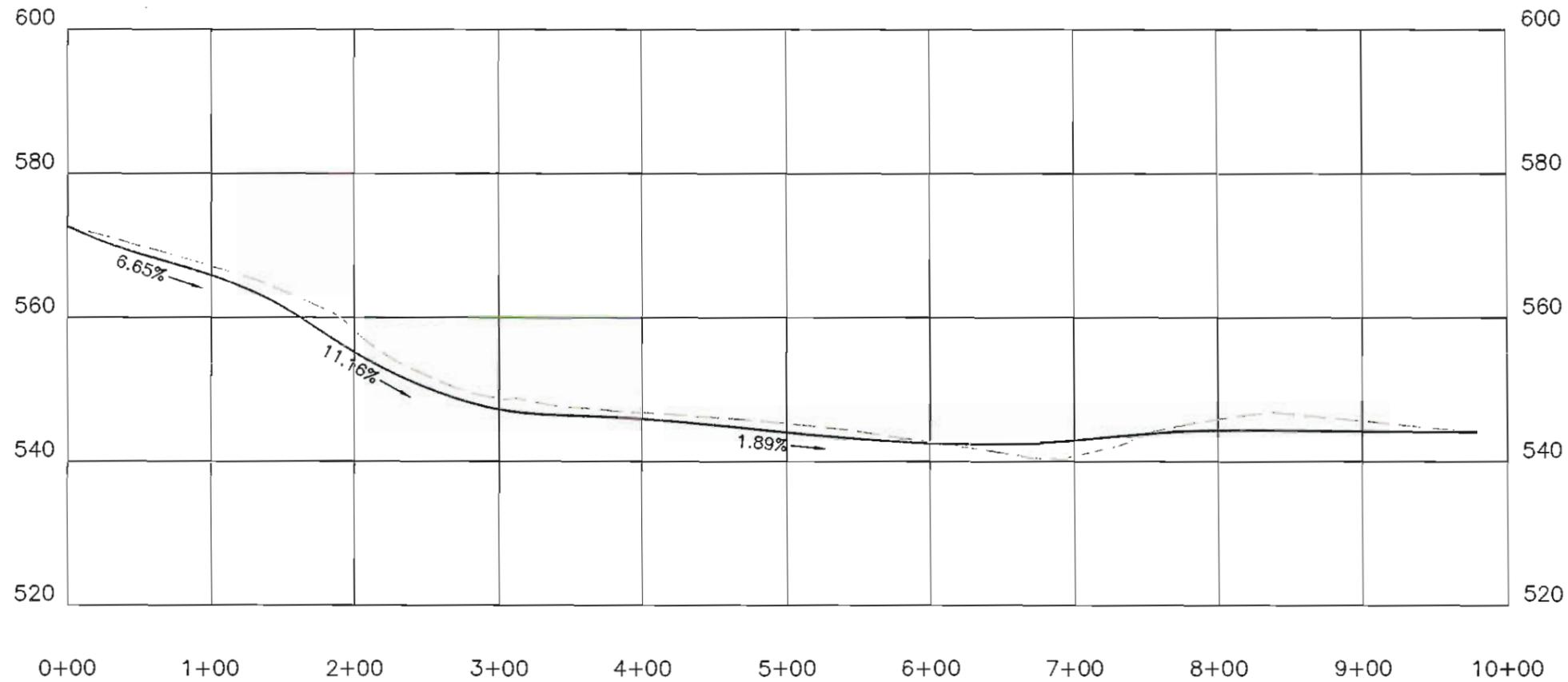
Minimum pipe diameter: 1 - 36 inch pipe(s) required

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	13.100	0.111	0.000	0.000	70.000	M	34.10	1.667
	Σ	13.100						34.10	1.667

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	1. Forest with heavy ground litter	10.00	20.00	200.00	0.800	0.069
		7. Paved area and small upland gullies	7.69	65.00	845.00	5.580	0.042
#1	1	Time of Concentration:					0.111



Horizontal Scale: 1"=100'
 Vertical Scale: 1"=20'

LEGEND

- Natural Ground Profile
- Proposed Finished Grade



WB Mining LLC
Fishtrap Mine No. 2
P-3930 / Revision R-1
Primary Road 6P Profile

DRAWN BY: J.W.T.	DATE: 09/16/2011
DWG. NAME: PR6Pro	
APPROVED BY: L.G.S.	SCALE: AS NOTED