OGMCOAL DNR <ogmcoal@utah.gov>

Lower Robinson Creek reconstruction Stream Alteration Permit 07-85-0002

4 messages

Priscilla Burton <priscillaburton@utah.gov> Thu, Apr 9, 2015 at 12:00 PM
To: Charles Williamson <charleswilliamson@utah.gov>
Cc: Keenan Storrar <kstorrar@utah.gov>, OGMCOAL DNR <ogmcoal@utah.gov>, Daron Haddock <daronhaddock@utah.gov>

Hello Mr. Williamson,

The stream alteration was completed as described in the Stream Alteration Permit 07-85-0002. Now the mined channel is being reconstructed in its approximate, original alignment as required by the Mining and Reclamation Plan. The approved plan for reconstruction is drawing 5-21A, attached.

Alton Coal Development, LLC has proposed a new design which is under review by the Division hydrologist, Keenan Storrar. I have attached copies of the draft documents for your review (see Figures 1 - 3 and the rip rap plan attached). Feel free to discuss the engineering design with Keenan. I included him on this email and he is in OGM's Salt Lake City office, downstairs from your office. I can also arrange a meeting at the mine site with Alton Coal representatives.

We expect a formal submittal of these designs on April 17, and you will have an opportunity to comment at that time as well.

Will a revision of the stream alteration permit be necessary?

Priscilla Burton, MS, CPSSc
Environmental Scientist III
Utah Division of Oil, Gas & Mining
Price Field Office
phone: 435-613-3733

5 attachments

DWG. 5-21A.pdf
1694K

Robinson Figure 1.pdf
268K

Robinson Figure 2.pdf
184K

Robinson Figure 3.pdf
566K

Robinson Rip-Rap Plan.pdf
244K

Priscilla Burton <priscillaburton@utah.gov> Thu, Apr 9, 2015 at 12:04 PM
To: Charles Williamson <charleswilliamson@utah.gov>
Cc: Keenan Storrar <kstorrar@utah.gov>, OGMCOAL DNR <ogmcoal@utah.gov>, Daron Haddock <daronhaddock@utah.gov>

I should also have send the plan view of the Lower Robinson Creek reconstruction. It is attached.

Priscilla Burton, MS, CPSSc
Environmental Scientist III
Utah Division of Oil, Gas & Mining
Price Field Office
phone: 435-613-3733

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DWG. 5-20A.pdf
1825K

Charles Williamson <charleswilliamson@utah.gov> Thu, Apr 9, 2015 at 2:24 PM
To: Priscilla Burton <priscillaburton@utah.gov>
Cc: Keenan Storrar <kstorrar@utah.gov>, OGMCOAL DNR <ogmcoal@utah.gov>, Daron Haddock <daronhaddock@utah.gov>

Thank you Priscilla,

I have reviewed our file and note that the change from a permanent to temporary realignment was presented to our office in June of 2009. This change was accepted and the permit was extended until 6/25/2011. The permit has since expired and re-realignment of the channel will require a new state stream alteration application be submitted to and processed by this office.
[Quoted text hidden]
--
Chuck Williamson, P.G.
Stream Alteration Specialist
Utah Division of Water Rights
1594 West North Temple, Suite 220
Salt Lake City, Utah 84114
(801)538-7404

Priscilla Burton <priscillaburton@utah.gov> Thu, Apr 9, 2015 at 2:31 PM
To: Charles Williamson <charleswilliamson@utah.gov>
Cc: Keenan Storrar <kstorrar@utah.gov>, OGMCOAL DNR <ogmcoal@utah.gov>, Daron Haddock <daronhaddock@utah.gov>

Mr. Williamson,

Thank you for notifying me of this requirement. I will pass this information along to the company. Please let us know if you have any further comments on the design.

Sincerely,

Priscilla Burton, MS, CPSSc
Environmental Scientist III
Utah Division of Oil, Gas & Mining
Price Field Office
phone: 435-613-3733

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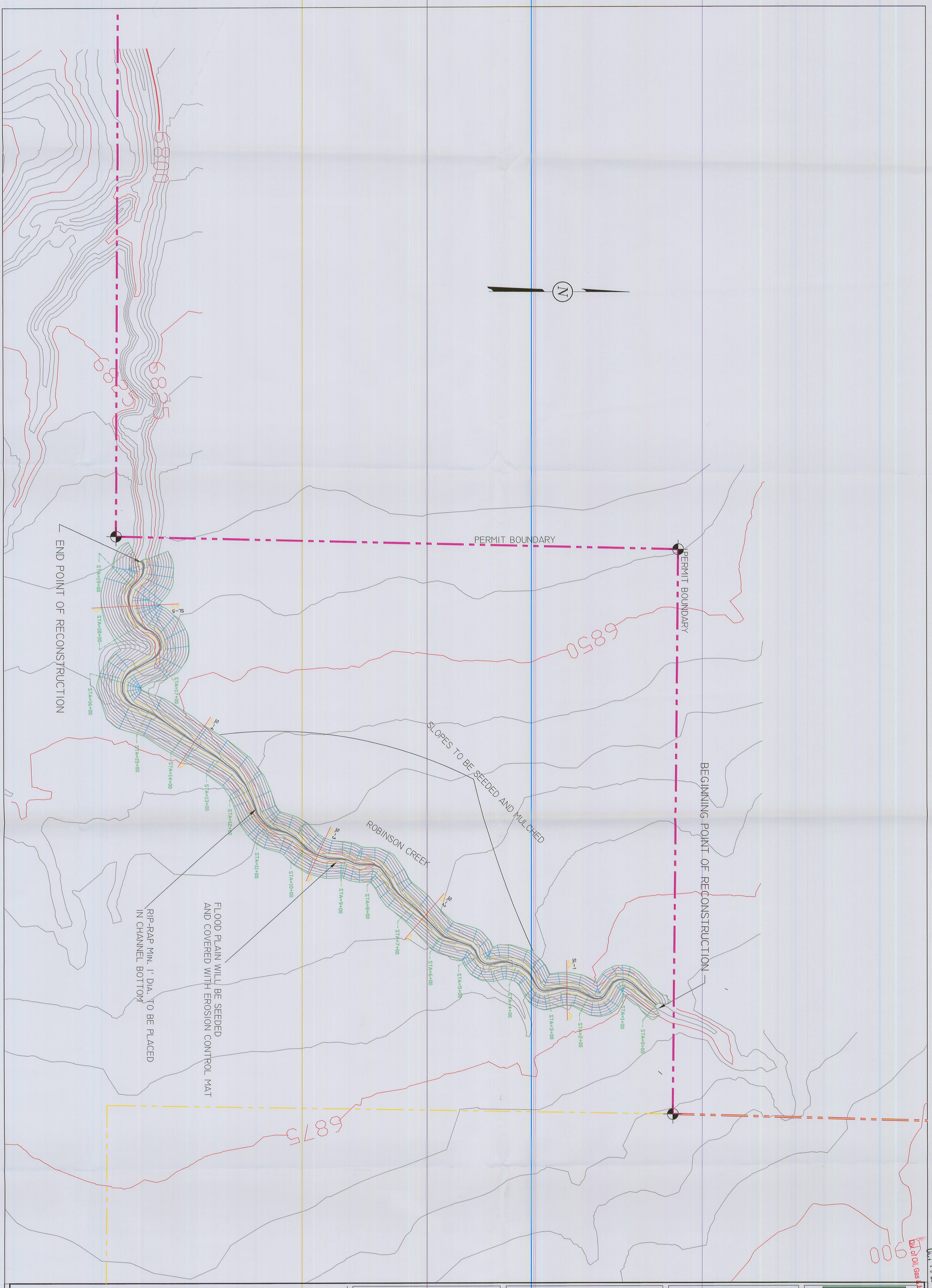

LEGEND:

- PERMIT BOUNDARY
- FEDERAL COAL OWNERSHIP
- FOUND SECTION CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	GG
DRAWING: 5-20A	DATE: 11/12/08
	SCALE: 1" = 100'
JOB NUMBER: 1400	SHEET

REVISIONS	
DATE:	BY:

ROBINSON CREEK RECONSTRUCTION PLAN VIEW

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-20A

Registered Professional Engineer
275875-2202
CHRIS R. McCOURT
12-15-08
State of Utah

Alton Coal Development
Coal Hollow Project
463 North 100 West, Suite 1
Cedar City, Utah 84720
Phone (435)867-5331
Fax (435)867-1192

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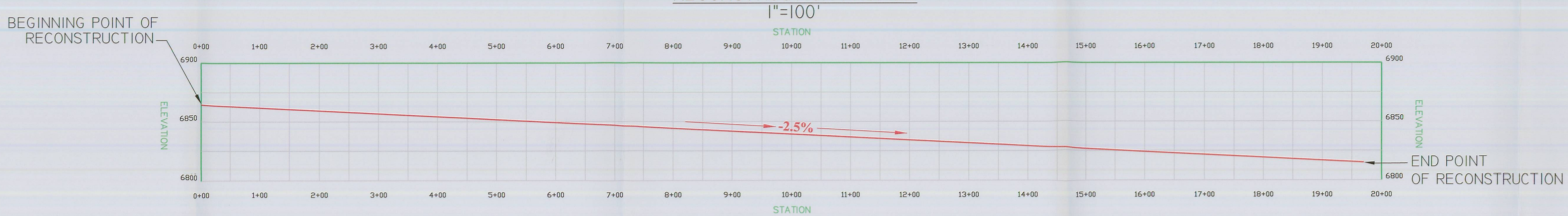
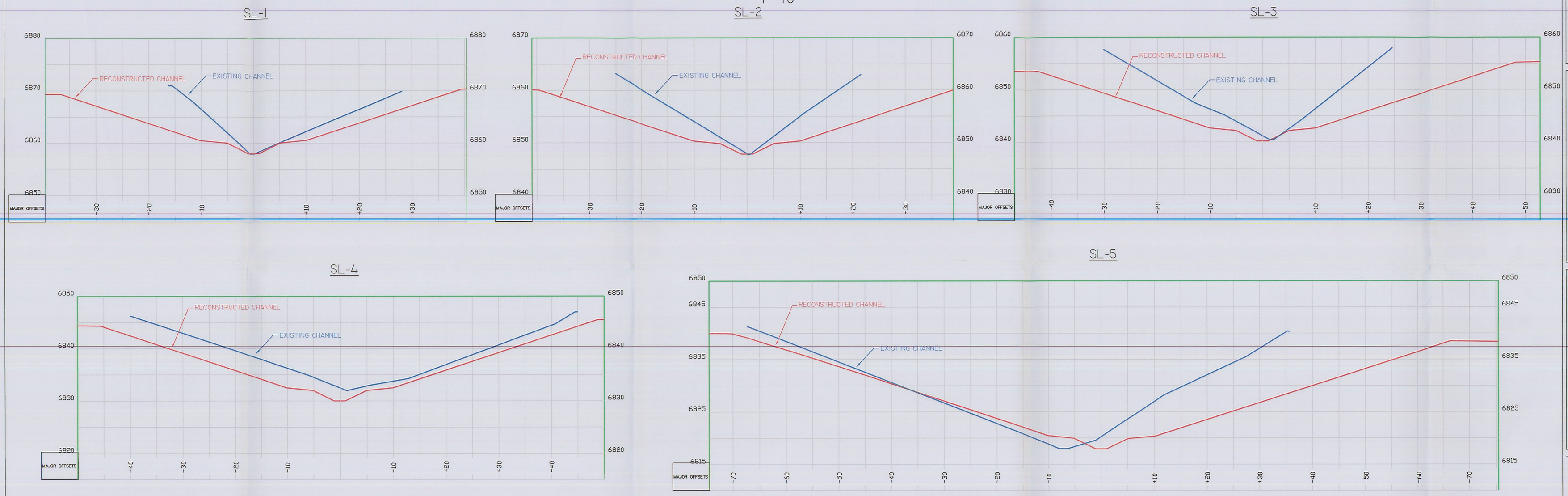
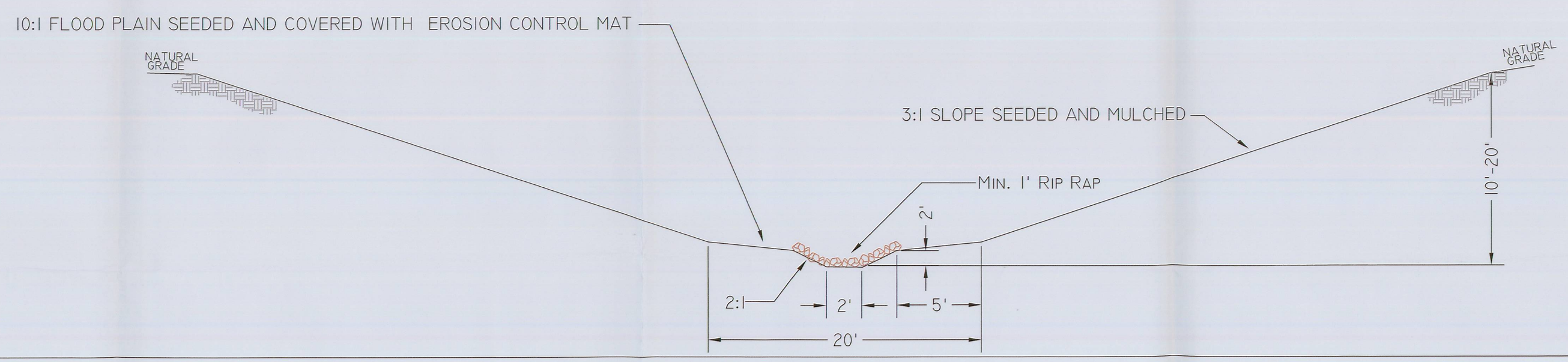
RECONSTRUCTION PROFILE
1"=100'



CROSS SECTIONS
1"=10'



RECONSTRUCTION TYPICAL SECTION DETAIL
WITH RIP RAP IN CHANNEL BOTTOM
NTS



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CHRIS R. McCOURT
12-1-08

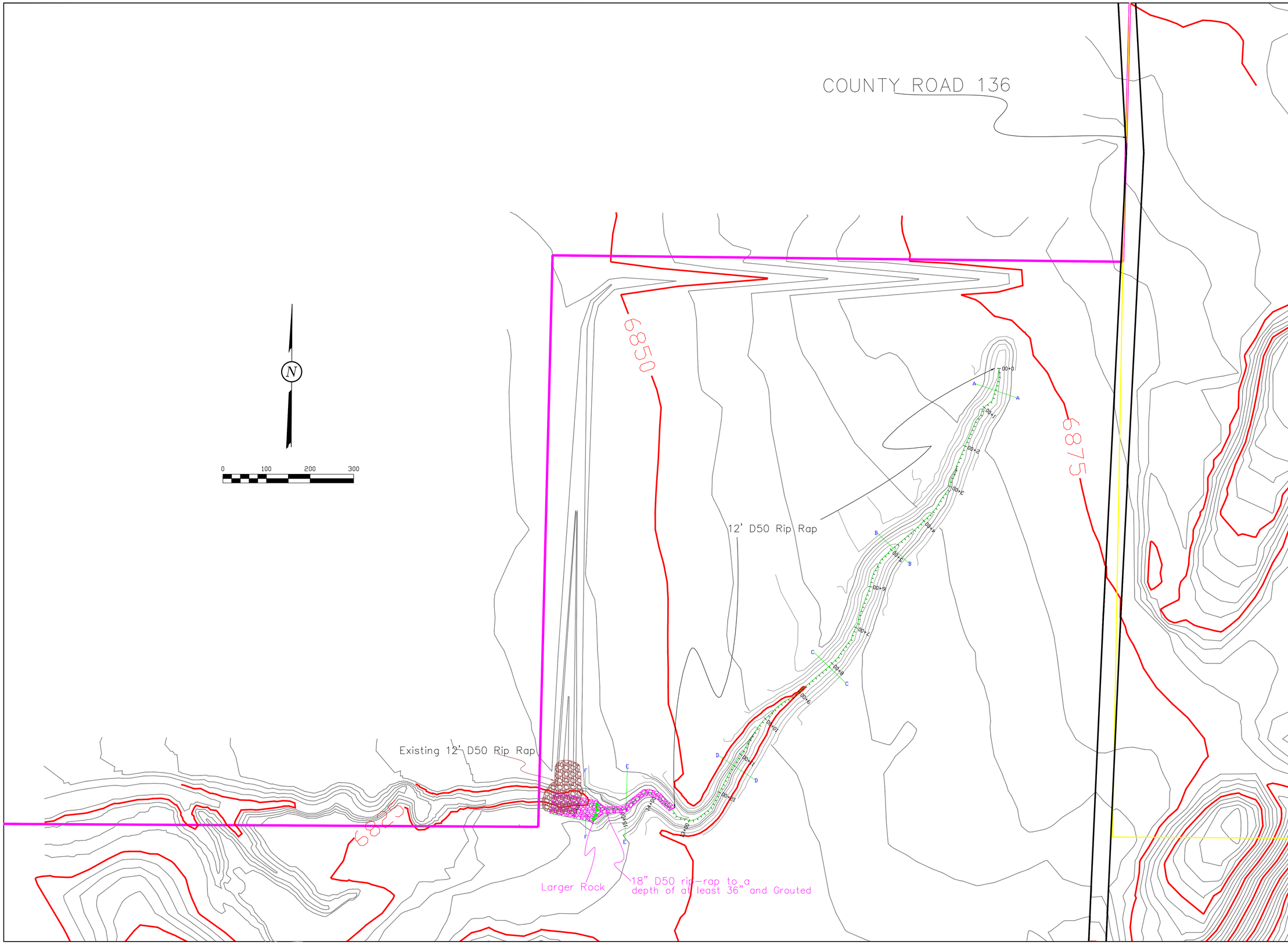
ROBINSON CREEK RECONSTRUCTION DESIGN & DETAILS

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-21A

REVISIONS	
DATE:	BY:

DRAWN BY: C. MCCOURT	CHECKED BY: GG
DRAWING: 5-21A	DATE: 11/13/08
	SCALE: AS SPECIFIED
JOB NUMBER: 1400	SHEET



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UTAH REGISTERED PROFESSIONAL ENGINEER
#154168
DAN W. GUY

ROBINSON CREEK RECONSTRUCTION PLAN VIEW

COAL HOLLOW PROJECT
ALTON, UTAH

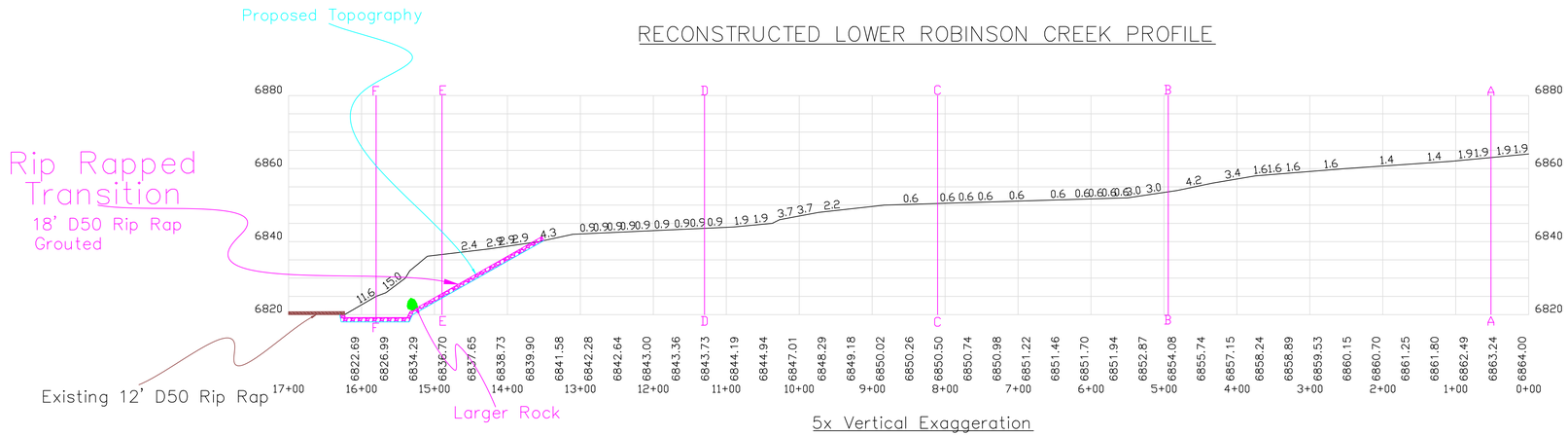
FIGURE 1

REVISIONS	
DATE:	BY:

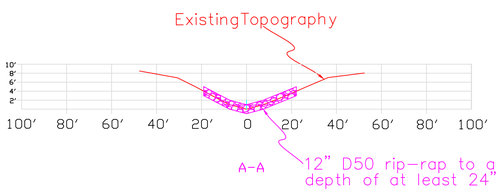
DRAWN BY: K. NICHOLES	CHECKED BY: DWG
DRAWING: Figure 1	DATE: 03/16/15
	SCALE: 1" = 100'
JOB NUMBER: 1400	SHEET

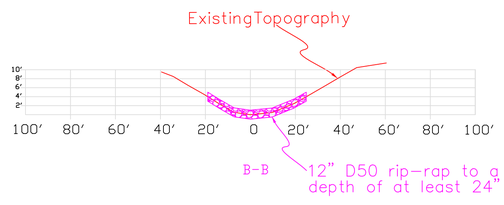
LEGEND:
- PERMIT BOUNDARY
- FEDERAL COAL OWNERSHIP
- FOUND SECTION CORNER

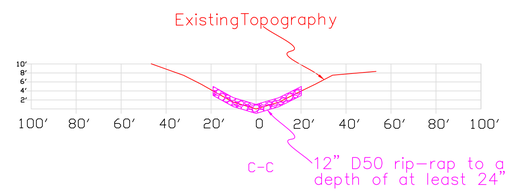
RECONSTRUCTED LOWER ROBINSON CREEK PROFILE

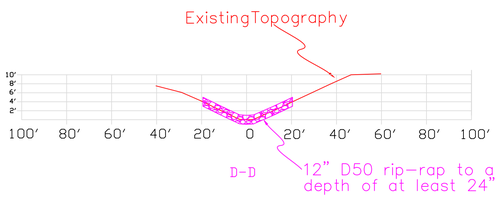


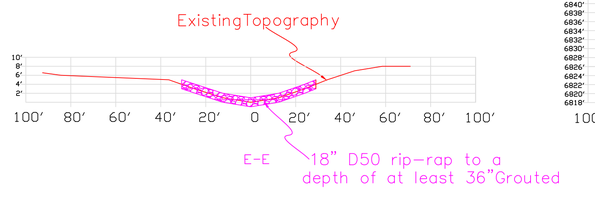
5x Vertical Exaggeration

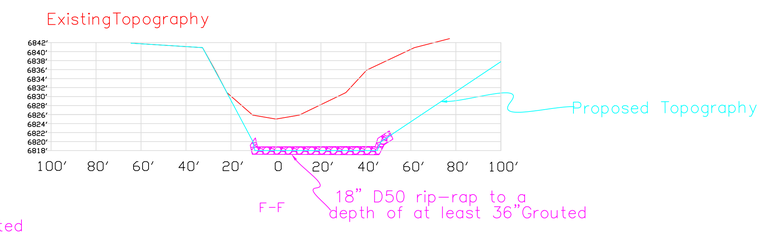












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ROBINSON CREEK RECONSTRUCTION DESIGN & DETAILS

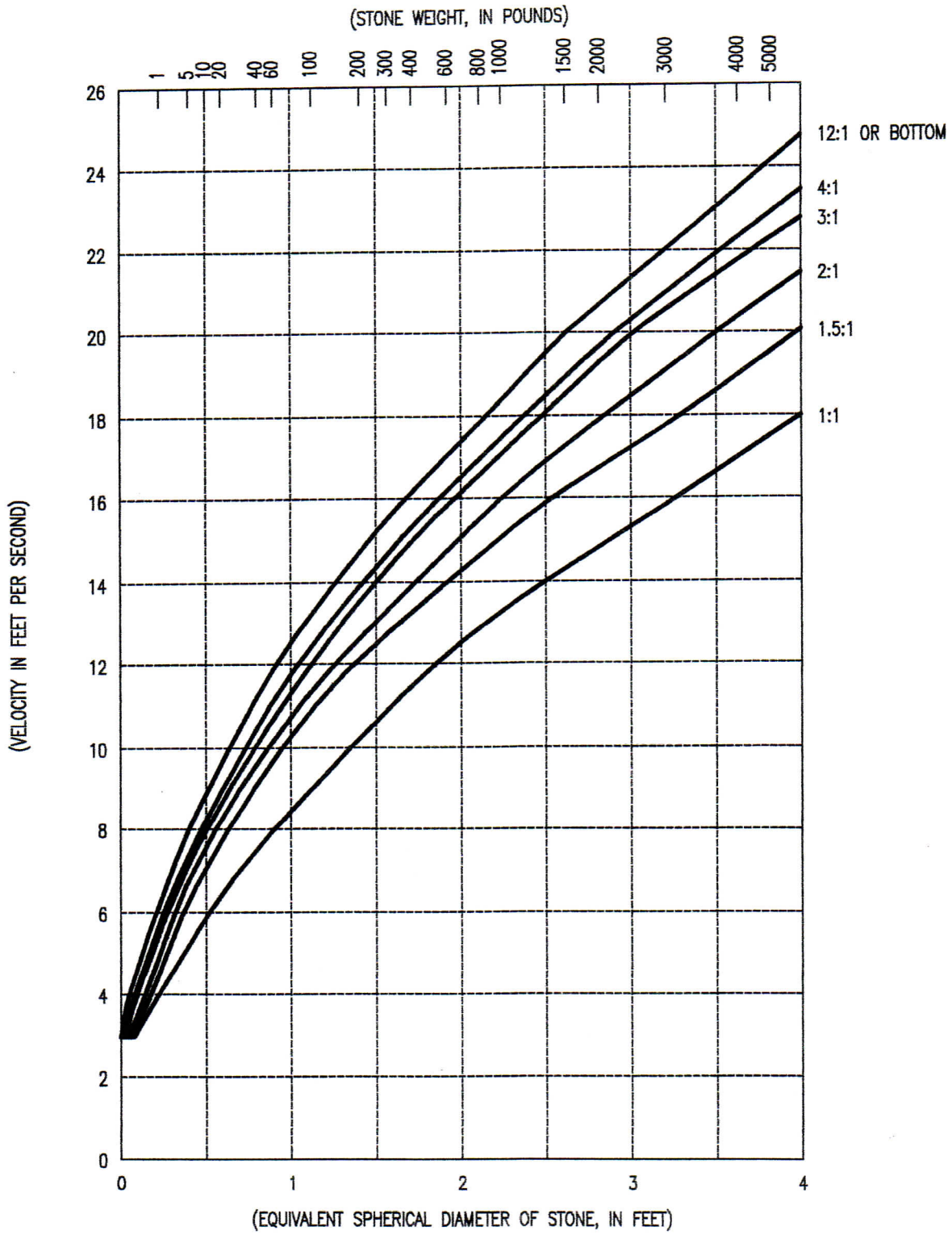
COAL HOLLOW PROJECT
ALTON, UTAH

FIGURE 2

REVISIONS	
DATE:	BY:

DRAWN BY: K. NICHOLES	CHECKED BY: DWG
DRAWING: Figure 1	DATE: 03/16/15
	SCALE: AS SPECIFIED
JOB NUMBER: 1400	SHEET

RIP-RAP CHART



SIZE OF STONE THAT WILL RESIST DISPLACEMENT FOR VARIOUS VELOCITIES AND SIDE SLOPES

NOTE:

ADAPTED FROM REPORT OF SUBCOMMITTE ON SLOPE PROTECTION, AM. SOC. CIVIL ENGINEERS PROC. JUNE 1948.
FOR STONE WEIGHING 165 LBS. PER CUBIC FEET.

Figure 3

Appendix 5-10

EVALUATION AND EROSION CONTROL DESIGN

OF THE RECLAIMED

LOWER ROBINSON CREEK CHANNEL

COAL HOLLOW PROJECT

EVALUATION AND EROSION CONTROL DESIGN

OF THE RECLAIMED

LOWER ROBINSON CREEK CHANNEL

COAL HOLLOW PROJECT

BY

DAN W. GUY

REGISTERED PROFESSIONAL ENGINEER

STATE OF UTAH

EVALUATION AND EROSION CONTROL DESIGN

OF THE RECLAIMED

LOWER ROBINSON CREEK CHANNEL

COAL HOLLOW PROJECT

Evaluation

The Lower Robinson Creek channel has been reclaimed and reseeded; however, it will not be connected to the original drainage for at least 3 growing seasons. Diversion Ditch 4 has been extended along the channel and will continue to divert runoff to Sediment Pond 3. This means the reclaimed channel will only see direct precipitation until vegetation is firmly established. The original design of the reclaimed channel is shown on drawings 5-20A and 5-21A of the MRP. These designs show a channel with 12" minimum rip-rap in the bottom 10' of the channel. The channel side slopes were to be 2H:1V in the rip-rap section, 10H:1V in the floodplain and 3H:1V to the top of the channel. The actual reclaimed channel has an average bottom width of 3.2', with average 2.36H:1V side slopes and an average depth of approximately 8.5'. No rip-rap was placed in the restored channel; however, the entire channel has been seeded with the approved seed mix for the Coal Hollow Project (Table 3-37 of the MRP) and will be enhanced with willow cuttings to further provide erosion control.

This evaluation was performed to assess the adequacy of the restored channel. It was based on an erodible soil with stable vegetation, using the 100 year – 6 hour design flow of 347 cfs, taken from MRP Appendix 5-3, "Lower Robinson Creek Culvert and Diversion Analysis", by Dr. James E. Nelson.

Calculations were performed using the Office of Surface Mining Storm Program 6.20, by Gary E. McIntosh. A conservative value of 5.0 fps was used as the allowable velocity in this channel to prevent erosion. This value was selected from Table 3.4, Permissible Velocities for Vegetated Channels, "Applied Hydrology and Sedimentology for Disturbed Areas", by Barfield, Warner and Haan. Based on a review of numerous websites and Table 3.1, Typical Values for Manning's n, in the above referenced "Applied Hydrology and Sedimentology for Disturbed Areas", by Barfield, Warner and Haan, a Manning's number (n) of 0.030 was considered reasonable for the vegetated channel.

The flow calculations were performed on the average channel configuration, based on 6 cross-sections taken along the length of the reclaimed channel. The following is a list of parameters used in the calculations:

- Design Flow - 347 cfs
- Bottom Width - 3.2 ft.
- Side Slopes - 2.36H:1V
- Channel Slope - 1.83%
- Manning's n - 0.030

Using the above criteria, the calculated flow velocity would be 9.85 fps at a depth of 3.24 feet. Since this velocity is above the estimated allowable velocity of 5.0 fps for vegetated channels, a further evaluation was performed using adequately sized rip-rap along the existing length of the channel. The following criteria were used to evaluate the channel with rip-rap down to the point of transition to the main channel below. The reclaimed channel is shown on Figure 1 "Robinson Creek Reconstruction Plan View".

- Design Flow - 347 cfs
- Bottom Width - 3.2 ft.
- Side Slopes - 2.36H:1V
- Channel Slope - 1.83 %
- Manning's n - 0.035

Using the above criteria, the calculated flow velocity would be 8.78 fps at a depth of 3.47 feet. Based on the calculations, it is proposed to place 12" D50 rip-rap to a minimum depth of 24" along the length of this channel section. The rip-rap will be extended up the side slopes to provide protection for a minimum of 4 feet up from the channel bottom. The 12" D50 sizing is shown to be adequate for the calculated velocity and side slopes based on the Rip-Rap Chart in Figure 3.

Transition to Main Channel

At approximately location 1500' of the reclaimed channel, the configuration and slope change to blend into the main rip-rapped channel below. At this point, the reclaimed channel becomes more "U"-shaped with an approximate 4' bottom width, 1H:1V to 1.8H:1V side slopes and an average slope of 8.0%. When the design runoff of 347 cfs is routed through this section, calculations show a velocity of 18.24 fps at a depth of 2.50 feet. Since this is a steep slope and potentially very erosive section, it is proposed to provide additional protection through this transition area.

It is proposed to widen the channel throughout the transition area to at least a 15 foot bottom width with maximum 2H:1V side slopes. In addition, the channel gradient will be reduced by grading from Station 13+50 to Station 15+50. This section of channel will be lined with 18" D50 rip-rap to a minimum depth of 36" and extended up the side slopes to a depth of at least 3 feet above the channel bottom. The rip-rap will also be grouted for further protection. At the base of the regraded slope (Station 15+50) the transition area from Station 15+50 to Station 16+50 will be widened and deepened to provide an energy control basin at least 2 feet deep and approximately 50 feet wide by 100 feet long. The inlet to this basin will be fitted with at least 30" rocks spaced on approximately 4 foot centers across the channel. The entire basin will be lined with 18" D50 rip-rap and grouted.

The flow characteristics through the transition zone were evaluated using the criteria after placement of the rip-rap with the above channel dimensions. The following are the parameters used:

- Design Flow - 347 cfs
- Bottom Width - 15.0 ft.
- Side Slopes - 2H:1V
- Channel Slope - 8.0%
- Manning's n - 0.038 (Considered conservative for large rock lining).

Using the above criteria, the calculated flow velocity would be 12.83 fps at a depth of 1.50 feet. The attached Rip-Rap Chart in Figure 3 shows that 18" D50 rock is considered adequate to resist displacement at the projected velocity in the transition area. This rip-rap and catchment basin will also tie into the existing, repaired outfall of the Robinson Creek diversion.

It should be noted that an additional erosion control method was evaluated for the transition zone utilizing multiple rock chutes to convey the runoff down the slope from Station 14+50 to Station 15+50, with a similar control basin at the bottom from Station 15+50 to Station 16+50. This method would also provide adequate erosion protection for the transition area; however, the above single rip-rapped slope was proposed because it provides a less complicated design and a more natural transition to the undisturbed drainage below.