

RECLAMATION

Managing Water in the West

High Lakes Stabilization Construction Report

Kidney Lake

Uinta Basin Replacement Project



March 2010

High Lakes Stabilization Construction Report

Kidney Lake

Uinta Basin Replacement Project

prepared by

**Provo Area Office
Upper Colorado Region**

Contents

| | Page |
|---|-----------|
| Introduction..... | 1 |
| Construction Oversight | 1 |
| UCC Crew..... | 2 |
| Helicopter Fly in | 2 |
| Kidney Lake Construction..... | 3 |
| Equipment Used at Brown Duck Lake | 3 |
| Appendix A – Crew Daily Logs | 14 |
| UCC Crew..... | 15 |
| Bureau of Reclamation Crew..... | 17 |
| Appendix B – Contract Record Drawings..... | 22 |
| Appendix C – Historical Drawings..... | 26 |

Introduction

The Uinta Basin Replacement Project (UBRP Project) was authorized by Section 203 of the Central Utah Project Completion Act [CUPCA; Titles II through VI of P.L. 102-575]. A component of the UBRP Project is that 13 high mountain lakes formerly used to store water rights would be stabilized at No-Hazard levels and the water rights transferred downstream for storage in the enlarged Big Sand Wash Reservoir, another feature of the UBRP Project. The stabilization of the thirteen reservoirs is mitigation for the enlargement of Big Sand Wash Reservoir.

Stabilization of the thirteen high mountain lakes at No-Hazard levels will provide constant lake water levels year-round. Nine of these lakes (Bluebell, Drift, Five Point, Superior, Water Lily, Farmers, East Timothy, White Miller, and Deer) are located in the upper Yellowstone River watershed and four (Brown Duck, Island, Kidney and Clements) are in the Brown Duck Basin portion of upper Lake Fork watershed.

The work accomplished in the Swift Creek Drainage portion of the upper Yellowstone River watershed in 2006 was to stabilize Water Lily Lake, plug the Farmers Lake Tunnel, and remove the outlet structure at White Miller Lake. Clements Lake, in the Brown Duck Basin, was stabilized in 2007. The work accomplished in the Brown Duck Basin in 2008 was the stabilization of Island Lake and Brown Duck Lake.

This report includes work completed during 2009 where the crews worked to stabilize Kidney Lake. Contract record drawings showing location maps and applicable details for Kidney Lake are included in the Appendices. For complete details on design analysis and methodology of the process used to stabilize this lake, please refer to the High Lake Stabilization Technical Memorandum for Kidney Lake dated January 2008 by the Bureau of Reclamation, Upper Colorado Region, Provo Area Office.

Construction Oversight

Project management was provided by the Utah Reclamation Mitigation and Conservation Commission. Construction oversight throughout the project was accomplished by multiple entities. The Bureau of Reclamation designed and constructed the stabilization of Kidney Lake with assistance by the Utah Conservation Corps (UCC). The U.S. Forest Service and Utah Department of Natural Resources' Division of Water Rights were responsible for inspecting the project. Other entities including U.S. Department of the Interior CUPCA Office, U.S. Fish and Wildlife Service, Duchesne County Water Conservancy District (DCWCD), and Moon Lake Water Users Association were involved in ensuring a successful project was accomplished. Pack train services were provided by Flying J Outfitters, a contractor, and the U.S. Forest Service.

UCC Crew

Construction work during the summer of 2009 consisted of preparation of the site by the UCC prior to mobilization at the site by the Reclamation Force Account Crew. The UCC crews were arranged and managed by the U.S. Forest Service.

Helicopter Fly in

Equipment and materials were brought to the staging area adjacent to Center Park for loading by the helicopter contractor. The contractor was responsible for loading all equipment and materials to the helicopter. All material was safely flown to the work site at Kidney Lake.



Figure 1: Helicopter flying equipment from Center Park to Kidney Lake.



Figure 2: Reclamation Crew Manager Mike Talbot alongside the Helicopter used to transport equipment to worksite.

Kidney Lake Construction

Kidney Lake is located near the top of Brown Duck Creek. It has a surface area of about 175 acres at the reservoir spillway and holds approximately 3,725 acre-feet of water. The dam is a homogeneous embankment 22 feet high and has a 30-inch diameter low-level outlet located at the maximum section. Kidney Lake was placed under filling restrictions in 2006 due to the recent development of a seepage hole in the embankment. The outlet works gate has remained fully open to prevent any reservoir storage at or above the seepage hole location.

Construction on Kidney Lake was performed by the Reclamation Force Account Crew with help from the UCC crew. The following summaries are based on crews' recorded entries in their daily logs, copies of which are included in Appendix A of this report.

As part of this project, the outlet works was removed and a stabilized outlet channel was constructed according to the design done by Reclamation engineers. The seepage hole was excavated and filled. Formal survey work was performed at Kidney Lake and the contract record drawings are included in Appendix B of this document. The reservoir spillway elevation is 10,287 feet. The stabilized outlet channel inlet was set at elevation 10,275 to restore Kidney Lake to close to the original natural lake level.

Equipment Used at Brown Duck Lake

- 2 – Caterpillar 305C Trackhoe
- 2 – Caterpillar 277B Skid Steer Loader

1 – Honda Generator

1 – Trash Pump

1 – Concrete Mixer

1 – Grout Plant – Chem Grout - Self Contained

Miscellaneous Hand Tools - shovels, sledgehammers, pry bars, cross cut saws, axes

Diesel and Gasoline Fuel Containers

June 22-June 27

Activities at Kidney Lake began on Tuesday, June 23rd, 2009. The Utah Conservation Corps (UCC) and Reclamation crews hiked or rode horses in and set up camp. The equipment and supplies were flown in to Kidney Lake by Helitech crew the week before. With help from the UCC crew, the Reclamation crew built a fuel containment cover and started removing riprap from the downstream face of the dam.



Figure 3: Some of the UCC crew that assisted with work at Kidney Lake getting instructions from Forest Service on proper use of water filtration equipment.



Figure 4: Reclamation crew working on removing riprap.



Figure 5: Reclamation crew using skid steer to begin cutting breach through the dam.

June 29-July 04

Work continued at Kidney Lake with the Reclamation crew starting removal of earthen embankment. The UCC crews built wooden sand filters and assembled gabion baskets. They also set up eye wash stations and assisted the fire crew with inventory.

One of the two skid steers used by Reclamation crew broke down. The

shaft mount was broken off completely and needed to be welded back together. The crew continued work on the breach with one skid steer out of commission the entire week. The Reclamation crew worked until Thursday, July 2nd and then rode out.



Figure 6: Reclamation crew continued cutting through dam using two mini-excavators and one skid steer.



Figure 7: View of breach prior to placing cut-off walls and riprap.

July 07-July 11

Work continued at Kidney Lake with the UCC crew assisting the Reclamation crew in building gabion forms, setting baskets and placing concrete in the first gabion basket located upstream of the breach. A couple of the Reclamation crew worked on fixing the broken skid steer using a small welding machine to weld the broken pieces together. All four pieces of equipment were working fine for Tuesday and Wednesday until the same skid steer broke down late Wednesday. It was determined that a professional welder was needed to fix the skid steer.

The Reclamation crew continued excavating through the breach with one skid steer and two trackhoes for the rest of the shift. Big rocks removed from the breach were broken up for use as riprap. A bit of water trapped in the dam was encountered during excavation of the breach.



Figure 8: UCC crew helping with installation of gabion baskets at upstream cut-off wall.



Figure 9: Installation of the second cut-off wall.

July 12-July 16

Work continued at Kidney Lake with Reclamation crew continuing work on the breach with four operators and three working pieces of equipment. The crew rotated working on the equipment while one assisted the UCC crew in collecting riprap and putting together gabion baskets.

The UCC crew helped sort the rocks and sand for the gabion baskets. They also assisted in placing the second gabion basket cut-off wall. A mechanic named Josh came up Wednesday morning and worked on the broken skid steer while the Reclamation crew continued digging through the breach. Josh was able to weld back the broken brackets on the skid steer and got it working again. A new UCC crew hiked in on July 14th to replace the UCC crew that had been working on Kidney Lake. The Reclamation crew packed up and rode out on July 16th.



Figure 10: UCC crew assisted in placing the fourth gabion cut-off wall. The third gabion cut-off wall was not installed due to hitting bedrock at its location.



Figure 11: Reclamation crew placing riprap in the channel.



Figure 12: UCC crew using sledge hammer to break up concrete and remove the wheel works and vent pipes.

July 21-July 25

Work continued at Kidney Lake with Reclamation crew arriving in on July 21st. The crew continued work on the breach by removing big rocks and excavating dirt. All four pieces of equipment were working properly. During excavation of the third gabion cut-off wall, the crew hit bedrock and Mike Talbot (Reclamation's supervising engineer) gave permission to eliminate the third gabion due to bedrock. The crew moved on to install the fourth gabion cut-off wall. The gabion cut-off wall was adjusted to avoid a large boulder that the crew was not able to remove.

The Reclamation crew split up work between the breach excavation and removal of the outlet works. Rick Sweat (Reclamation Force Account Crew Leader) dug out the outlet works on both ends and removed the outlet structure. The UCC crew assisted in removing the outlet structure by using sledge hammers to break up the concrete and help prepare the site for grouting. Fifteen feet of the existing outlet pipe was removed from the upstream side and fifteen feet was removed from the downstream side.



Figure 13: Demolition of inlet structure using trackhoe.



Figure 14: Gabion basket installed at each end of outlet pipe and filled with grout.



Figure 15: Grouted outlet pipe with sand filter at downstream end.

July 26-Aug. 01

Work continued at Kidney Lake with Reclamation crew working on grouting the outlet pipe. The UCC crew helped prepare for grouting by filtering sand and collecting rocks for the grouting operation. The grouting operation took place on July 27th with the crews using over 740 47-pound bags of cement to grout the entire pipe. A plasticizer called “Super-P” was added to the cement slurry to aid flowability. Sand and rock were placed on the downstream side of the grouted pipe as required.

The Reclamation crew built the last radius that connects the breach to the existing stream and completed excavation of the breach. The crew continued to place riprap on the channel and started contouring on both sides of the breach. The UCC crew worked on cleaning up after the grouting operation and started to break down the fuel skid tents for fly-out. One skid steer broke down at the end of the shift. The Reclamation crew rode out on July 30th.



Figure 16: Looking downstream to the completed breach channel at Kidney Lake.

Aug. 04-Aug. 13

The Reclamation crew rode in on Aug. 8th and continued contouring the upstream side of the dam and finished placing riprap. The UCC crew worked on packing tools and equipment to prepare for fly-out. They also worked on washing fines into the channel. Both crews worked on naturalizing the “bathtub ring” around the shoreline near the dam and scratched out mud tracks. The UCC crew packed up camp for fly-out, then rode out on Aug. 13th. The stabilization project was completed.

Appendix A – Crew Daily Logs

UCC Crew

| Date | Work Area/Description | Crew Size |
|-------------|---|------------------|
| 6/15/2009 | Traveled from Logan to Kidney Lake & set up tents | 3 |
| 6/16/2009 | Post area closure signs/run security | 3 |
| 6/17/2009 | Helped out with traffic control & helicopter fly-in | 3 |
| 6/18/2009 | Helped out with traffic control & helicopter fly-in | 3 |
| 6/19/2009 | Put back up range fence at Mill Park w/ McClouds/ site clean-up | 3 |
| 6/20/2009 | Tear down drop camp & hike-in to Kidney; setup overnight camp | 3 |
| 6/21/2009 | Set-up FS base camp | 3 |
| 6/22/2009 | Set-up FS base camp/ hike-out & set-up drop camp | 3 |
| 6/23/2009 | Travel from Logan camp near trailhead | 3 |
| 6/24/2009 | Tear down drop camp & hike-in to Kidney | 3 |
| 6/25/2009 | FS trail crew only - cut puncheon wood | 3 |
| 6/26/2009 | Move camp from dead standing timber | 3 |
| 6/27/2009 | Finish moving camp to better location | 3 |
| 6/28/2009 | Help build fuel containment area | 3 |
| 6/29/2009 | Built wooden sand filter | 3 |
| 6/30/2009 | Sort rock & sift sand for gabions/fix closure sign | 3 |
| 7/1/2009 | Sort rock & sift sand for gabions/make gabion baskets w/ tie wire | 3 |
| 7/2/2009 | Put ribbons around dead trees at camp/set-up eye wash stations | 3 |
| 7/3/2009 | Sort & place rock in gabions/place sand in mixer/ sort & place gabion rock | 3 |
| 7/4/2009 | Assist fire crew w/ inventory (1 UCC & 2 fire crew) | 4 |
| 7/5/2009 | Sort & place gabion rock /place sand in mixer | 4 |
| 7/6/2009 | Sort & place gabion rock /place sand in mixer | 4 |
| 7/7/2009 | Hike-out & tie in with replacements& travel to Logan | 4 |
| 7/8/2009 | Sift sand for gabions/helped fix skid steer | 4 |
| 7/9/2009 | Cut puncheon wood/sort & place gabion rock & sand (4 persons) | 4 |
| 7/10/2009 | Redo worksite boundary flagging/ sift sand for gabions | 4 |
| 7/11/2009 | Extend puncheon ramps/approaches with rock & dirt & compact | 4 |
| 7/12/2009 | Moved unused puncheon wood to new fly-out location & prep for fly-out | 3 |
| 7/13/2009 | Sort & place gabion rock & sand (4 persons) | 4 |
| 7/14/2009 | Sara Nieft's crew hiked out, and Mike Davis' crew hikes in | |
| 7/15/2009 | Put up 1st aid tent & took photos of dam | 4 |
| 7/16/2009 | Buck & piled tree at Kidney dam | 4 |
| 7/17/2009 | Cleared Lake Fork trail of rock & debris & put in drains | 4 |
| 7/18/2009 | Cleared Lake Fork trail of rock & debris & cleaned drains (Kidney to Brown Duck Lake) | 4 |
| 7/19/2009 | Cleared Lake Fork trail of rock & debris (on way down mountain) | 4 |
| 7/20/2009 | Mike Davies' crew hiked out and Sara Nieft's crew hiked in | 4 |
| 7/21/2009 | Trail maintenance - trail Brown Duck trail maintenance | 2 |
| 7/22/2009 | Trail maintenance - trail Brown Duck trail maintenance | 2 |
| 7/23/2009 | Trail maintenance - trail Brown Duck trail maintenance | 3 |
| 7/24/2009 | Trail maintenance - trail Brown Duck trail maintenance | 3 |
| 7/25/2009 | Trail maintenance - trail Brown Duck trail maintenance | 3 |
| 7/26/2009 | Trail maintenance - trail Brown Duck trail maintenance | 3 |
| 7/27/2009 | Trail maintenance - trail Brown Duck trail maintenance | 3 |
| 7/28/2009 | Sara Nieft's crew hiked out and Mike Davies' crew hiked in | 3 |
| 7/29/2009 | Trail maintenance between Kidney & Island (drains, rock steps) | 3 |

| | | |
|-----------|---|---|
| 7/30/2009 | Trail maintenance - east basin trail to Clements - logged out 13 trees | 3 |
| 7/31/2009 | Dam rehab w/ McCloud & rocking & clean-up litter & concrete | 3 |
| 8/1/2009 | pack-up camp/trail maintenance - Brown Duck trail - Island to Brown Duck - water bar production | 3 |
| 8/2/2009 | Kidney to Cleveland Pass/ maintain trails - stepping stones & log out | 3 |
| 8/3/2009 | Trail maintenance - Brown Duck to Lake Fork trailhead –waterbars & drains, logout | 3 |
| 8/4/2009 | Mike Davies' crew hiked out and Sara Neift's crew hiked in | 3 |
| 8/5/2009 | Camp & worksite clean-up & packing equipment in boxes for fly-out | 3 |
| 8/6/2009 | Wash channel to distribute fines in outlet/removed historic cements bags (trash) that was buried for fly-out 5 bags | 3 |
| 8/7/2009 | Lost day - rained out lightning storm with some hail | 3 |
| 8/8/2009 | Unpackaged wood and moved wood to final puncheon location | 3 |
| 8/9/2009 | Worked on building final puncheon/finished washing fines in channel & picking up trash | 3 |
| 8/10/2009 | Packed up UCC/FS kitchen tent and accessories | 3 |
| 8/11/2009 | Mike Davies' crew hiked in and Sara Neift's crew hiked out | 3 |
| 8/12/2009 | Packed up camp for fly-out/washed more sand and fines in channel | 3 |
| 8/13/2009 | Hiked out & travel back to Logan | 3 |
| 9/1/2009 | Jeff Groves' crew hiked in and set up camp near equipment | 3 |
| 9/2/2009 | Camp -out with equipment | 3 |
| 9/3/2009 | Stay half day with equipment and then hike up to Kidney Lake | 3 |
| 9/4/2009 | Moved puncheon wood to new pile off trail | 3 |
| 9/5/2009 | Picked-up trash and micro-litter | 3 |
| 9/6/2009 | Close-off old trail | 3 |
| 9/7/2009 | Close-off old trail | 3 |
| 9/8/2009 | Jeff Groves' crew hiked out and Sara Nieft's crew hiked in | 3 |
| 9/9/2009 | Swift Creek Trail work (preparation for next year's stabilization project) | 3 |
| 9/10/2009 | Swift Creek Trail work (preparation for next year's stabilization project) | 3 |
| 9/11/2009 | Swift Creek Trail work (preparation for next year's stabilization project) | 3 |
| 9/12/2009 | Swift Creek Trail work (preparation for next year's stabilization project) | 3 |
| 9/13/2009 | Swift Creek Trail work (preparation for next year's stabilization project) | 3 |
| 9/14/2009 | Swift Creek Trail work (preparation for next year's stabilization project) | 3 |
| 9/15/2009 | Tear-down camp, hike-out & travel to Logan | 3 |

Bureau of Reclamation Crew

| Date | Work Area/Description |
|-------------|--|
| 6/23/2009 | We packed in and arrived at the camp site at 4:30 pm. While Wade and Duane set some grade stakes, the rest of us started to set up tents and organize camp. Duane rode out with the outfitter that night. |
| 6/24/2009 | 6:00am-2:30pm We set up the rest of camp, putting together the big wall tent and shower tent. We then organized all the work-related boxes around camp. We also put together the rain shelters over the fuel decks that Randy Crozier had made. 2:30pm- 5:30pm After camp was set we began to work on the breach. Wade and Duane ran the track hoes and Ken and Lenny ran the skid-steers. Ken and Duane worked on the downstream side removing the snow drift while Wade and Lenny worked the other side removing riprap. Wade also made an access road across the upstream side of the dam. Together we moved approx. 25 cubic yards of riprap. |
| 6/25/2009 | Today we continued to remove riprap from the dam. Duane finished removing the snow and began to pull the rock from the downstream side. Wade and Lenny worked on the upstream face. We had a 2 hour delay due to a broken bucket on the track hoe Duane was running, but we made repairs and continued working. Together we removed approx. 100 cubic yards of rock. There seems to be an excess of rock. There is a lot more than the plans show. |
| 6/26/2009 | Wade finished with the riprap on the up-stream side of the dam and began to cut the notch. Due to an excess of rock, the downstream side is taking extra time. As Wade was cutting the breach he ran into large amounts of rock. Lenny and Ken were piling the dirt and rock at both sides of the dam. At the end of the day we moved approx. 210 cubic yards of rock and 200 cubic yards of dirt. Today was our most productive day yet. |
| 6/27/2009 | Removal of dirt and riprap continues. As we get deeper into the dam the amount of rock increases. Removal of riprap on the downstream side is finally finished, however there is still a lot of rock. Riprap in some spots is up to ten feet thick. Duane built a road across the downstream side of the dam so Ken could stockpile some of the dirt there. It has proved very difficult to separate the dirt and rocks. We moved approx. 200 cubic yards of dirt and 200 cubic yards of rock today although it seems like a lot more. As we get deeper into the dam we have noticed standing water in the core. We can't tell if it is flowing or just trapped in some kind of lens. |
| 6/28/2009 | We continued working on the breach. Wade and Duane were operating the trackhoes and Ken and Lenny were on the skid steers. Production has been fairly good considering the small equipment we have to use. Some of the rocks we have been pulling out are quite large. I'm just guessing at this point but I think we will have way too much rock at the end of the project. Today was the first time we had bad weather, but not enough to stop working. We are still seeing a lot of water in the core of the dam. It looks like it is flowing run off or spring water. There is standing water in the trench every day now. We are averaging about 200 cubic yards of rock and 200 cubic yards of dirt every day. |
| 6/29/2009 | Today as we were working, the skid steer Ken was running had a break down. Something had caused the tension bar to break causing the hydraulic drive motor to twist breaking the shaft mount. After pulling the track off we discovered that the only way it could be fixed is to weld the mount back on. However we did not have a |

welder in our tool box. The problem was phoned in to Mike Talbot and arrangements were made to get a welder that could be run with a 5000kv generator, and the parts to fix the problem. It was later learned that we could not get the welder till Monday, the following week. So we will be down one skid steer for the remainder of the shift. Production was not as good today. 100 cubic yards of rock and dirt total.

- 6/30/2009 Despite the loss of one skid steer we continued working on digging out the breach. Both Wade and Duane dug out the dirt and Lenny stockpiled it. Even though we were down one piece of equipment we still had a productive day. We opened up about 25 feet of trench. Ken stayed in camp and filtered water and cleaned up the kitchen tent. We made some more phone calls to make sure we have everything ordered to fix the broken skid steer.
- 7/1/2008 Finally the last working day of the shift. Today we just kept working on opening up more of the breach. We are getting close to being able to pour the first gabion basket. Lenny has been working on getting the bottom of the trench to grade while Wade and I continued to dig with the hoes. Ken set up the laser and helped Lenny with the grading. Not too bad for the first shift. We would be a lot further if we didn't have to deal with such large rocks. We have so much riprap already; I don't know how we will use all of it. I'm glad the weather has been good. Only one day of rain so far. It's kind of hard to tell how much dirt we are moving but I would guess at least 100 cubic yards or more a day.
- 7/2/2008 Today is pack out day. Alesha (Flying J Outfitters) arrived at our camp at 9:00 am. It took about an hour to pack our things and we left. It's a three and a half hour ride back to the truck. We unloaded our things and drove back to Provo.
- 7/7/2008 We had a safety meeting before leaving Provo. After the meeting we drove to the trail head to meet up with the outfitter. It took a couple hours to weigh and pack our things and then we packed in to camp. After arriving in camp Wade and I met with the UCC crew boss and discussed the plan for this shift. Wade and I took inventory of the parts we needed to fix the skid steer to make sure everything made the pack trip. The welder we had gotten is pretty neat.
- 7/8/2009 From 6am to 11:30am we fixed the skid steer. The little welder worked great. I'm amazed at how well such a small welder could work. After welding the bracket on, we replaced the rear bogey assembly and installed the new tension arm. Putting the track back on was very challenging, but we were able to get it installed and the track adjusted. The rest of the day we continued working on the dam. Lenny put the power hammer on the track hoe to bust up some of the bigger rocks. It was nice to have both skid steers working again.
- 7/9/2009 Today we started out digging out the trench for the first gabion basket. While doing that, the UCC crew set up the cement mixer and helped Frank with the pallets of cement. They gathered up a barrel for water and set up the two-inch water pump. The two crews split into teams, one placing rock and cement and the other mixing concrete. Valton Mortenson (Forest Service engineer) was present for the operation. It took us till lunch to complete the job. After lunch we went back to working on the dam. Right about quitting time the skid steer broke again. We used the other skid steer to move it to a more suitable place to make repairs. After examination it was determined that we couldn't fix it, that it had to be fixed by a professional welder/fabricator.
- 7/10/2009 Continuation of breach excavation. Lenny and I were running the trackhoes while Wade and Frank switched off running the skid steer. We simultaneously dug trench

and placed riprap. As we were digging out the breach, the rocks we were digging out we placed as riprap. The dirt we were excavating was stock piled to be used as fill. Alesha brought up some supplies for the UCC crew and we had told her about our broken skid steer and she told that her brother was a welder/fabricator and that she could bring him up to repair the equipment. We made a phone call to Mike Talbot to get approval and he authorized. However, he wouldn't make it up until Tuesday.

- 7/11/2009 We continued with the breach excavation and riprap placement. As I dug the trench, Lenny used the power hammer to bust bigger rocks to be used as riprap. We're still running into a lot of water that has been trapped inside the dam. Wade and I determined that the water was runoff instead of flowing spring water. We are getting close to being able to set the second gabion basket. We're averaging 25-30 feet of breach per day, despite the broken skid steer. Job would be going a lot faster if it wasn't for the broken equipment. Thank goodness the weather is holding out! All and all project is going really well.
- 7/12/2009 Just more of the same. Digging breach and placing riprap. Because we only have three pieces of equipment and four operators, we have been rotating on the equipment. The fourth man of the crew has been helping the UCC crew. I cannot believe the amount of rock we have excavated. Breach is starting to take shape. The water that was trapped is starting to evaporate, and what is not we use the two-inch trash pump on. We have got to the point where we can dig out for the second gabion.
- 7/13/2009 Today we placed the second gabion basket. This time it went a lot faster because we knew what we were doing. The UCC crew also knew what to do, how to do it and where to be. I'm very happy with the UCC crews. They work very hard. No matter what we tell them to do they don't question it they just do it. The job wouldn't be going as well without them. After we placed the gabion basket, we went back to work on the breach. Hopefully the welder shows up tomorrow. Alesha is supposed to be coming in so he probably will be with her.
- 7/14/2009 Continued working on the dam. Had some difficulty with some larger boulders. Had to use the power hammer to break them up in the ground because the trackhoes were too small to lift them. The weather is starting to turn bad. I hope the storm will move around us like they have been doing. Welder showed up around three o'clock. He looked at it; he came up with a plan to fix it. But it was too late in the afternoon because he still had to put his camp together. He'll start on it in the morning.
- 7/15/2009 Josh, the welder, came up to our camp first thing in the morning. After breakfast, we moved the generator, the tools, and the welder over by the broken skid steer. As Josh started fixing the skid steer, Lenny, Wade and I worked on the dam while Frank helped Josh. It took Josh about 3 and-a-half hours to finish welding up the brackets (because both were broken this time). After Josh was finished we all helped Josh put the tracks back together. Yay, we have two skid steers back to working again.
- 7/16/2009 Pack out day! Alesha showed up at nine o'clock. Took an hour and a half or so to load up the mules. Another long ride to the bottom.
- 7/21/2009 We had a safety meeting at six am. Met Alesha at trail head at 10:30 am. Packed in. When we arrived to camp, Rick Sweat and I reviewed the plans to determine how much we have completed and how far we have to go. According to the plan of operations we are 31 days ahead.

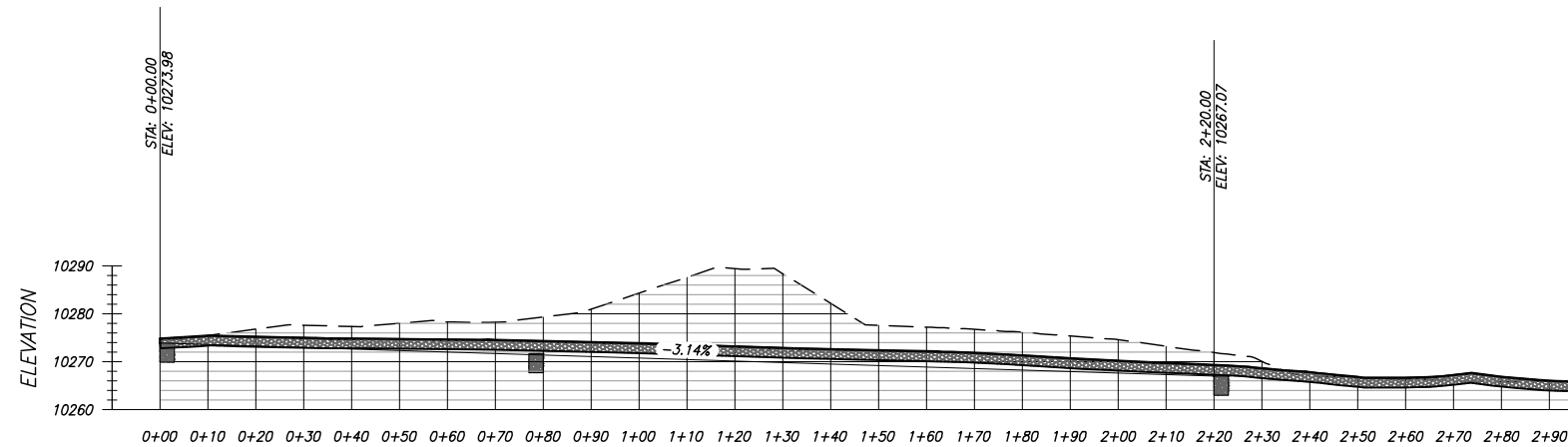
- 7/22/2009 Continued work on the breach. Rick and I ran the trackhoes while Ken and Frank ran skid steers. We're approaching the spot for the third gabion basket. It is solid rock. Rick Sweat called Mike Talbot to see if we could eliminate the third gabion basket because it didn't make sense to bust out native rock just to replace it with rocks. Mike agreed, so we eliminated the third gabion. We started excavating the radiuses. Breach is really starting to look good. Riprap is going in well but I think we are going to have way too much. Without doing the third gabion basket, we will be able to do the fourth and final gabion tomorrow.
- 7/23/2009 Dug the trench for the fourth gabion basket. Had to adjust the basket because of a large boulder that we couldn't remove. After the gabion we just went back to doing the riprap. Can't finish the last radius until after we remove outlet works. Sweat dug out downstream head wall. Ken and Frank used the skid steers to bring the riprap to me and I placed it with a trackhoe. Cofferdammed off the outlet channel and began pumping out the water in the channel
- 7/24/2009 Rick Sweat dug out the upstream side outlet works, exposing the pipe. After he was finished he went to the other side and did the same to the downstream side. I used the power hammer to bust up the concrete outlet structure. The UCC crew used a cutting torch and a power saw to remove the wheel works and vent pipe. As I was busting out the structures, a couple of the UCC guys were using a sledge hammer to bust up chunks of concrete still stuck to the rebar. After I finished I did the same to the downstream side.
- 7/25/2009 Today we finished the removal of the concrete structures. We exposed 20 feet of pipe on either side. Using the hot saw and torches we cut off 15 feet per side. After cutting off the pipes we excavated for the placement of the gabion baskets. Welded in the fill pipes on both sides of the dam. We are seeing a lot of flowing water coming from around the coffer dam so were having to constantly pump it out. UCC crews cut out plywood to fit between open end of the pipe and the gabion basket.
- 7/26/2009 Today we placed the gabion baskets. We placed the gravel and the sand filters on the downstream side behind the gabion. We back-filled up to the filler pipe to displace the water so during the grouting operation we weren't working in mud. Frank and Ken Lew brought over one of the flight decks to use as a platform to set the grout pump and mixer on. They also brought over all the boxes of cement and prepared for the grouting of the pipe.
- 7/27/2009 The grouting operation was today. Very hard work. The UCC crews worked their butts off! Even Jeff the wilderness ranger helped. Everybody rotated positions working on different phases of the operation. Of the 900+ bags it was thought to take to fill the pipe, it only took 740 or so bags. However, most of the bags were 47 pounders. One whole pallet was the 90 pound bags. We were all very tired and dirty at the end of the day. Valton Mortenson wanted to be present at the time of the grouting, but Mike Talbot was unable to contact him. However, we couldn't wait for him so we just did it anyways. During the grouting, I was the lucky one and was building the last radius that connects the breach to the existing stream.
- 7/28/2009 After yesterday's grouting experience, we decided to start later in the morning because everybody worked so hard and deserved to sleep in. We back-filled the pipe ends and started contouring the area on both sides of the breach. Rick was placing riprap while Ken and Frank were bringing him the riprap. I can not believe we will use most of the riprap if not all. The UCC crew started to break down the fuel skid tents for the fly-out. I cannot believe we are so far ahead! This time the other

skid steer (not the one we fixed twice already) broke down. We noticed that the bearings on the main drive pulley shaft had come apart. Back down to one skid steer. Thank god the shift is almost done.

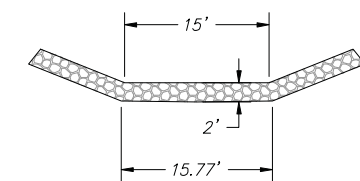
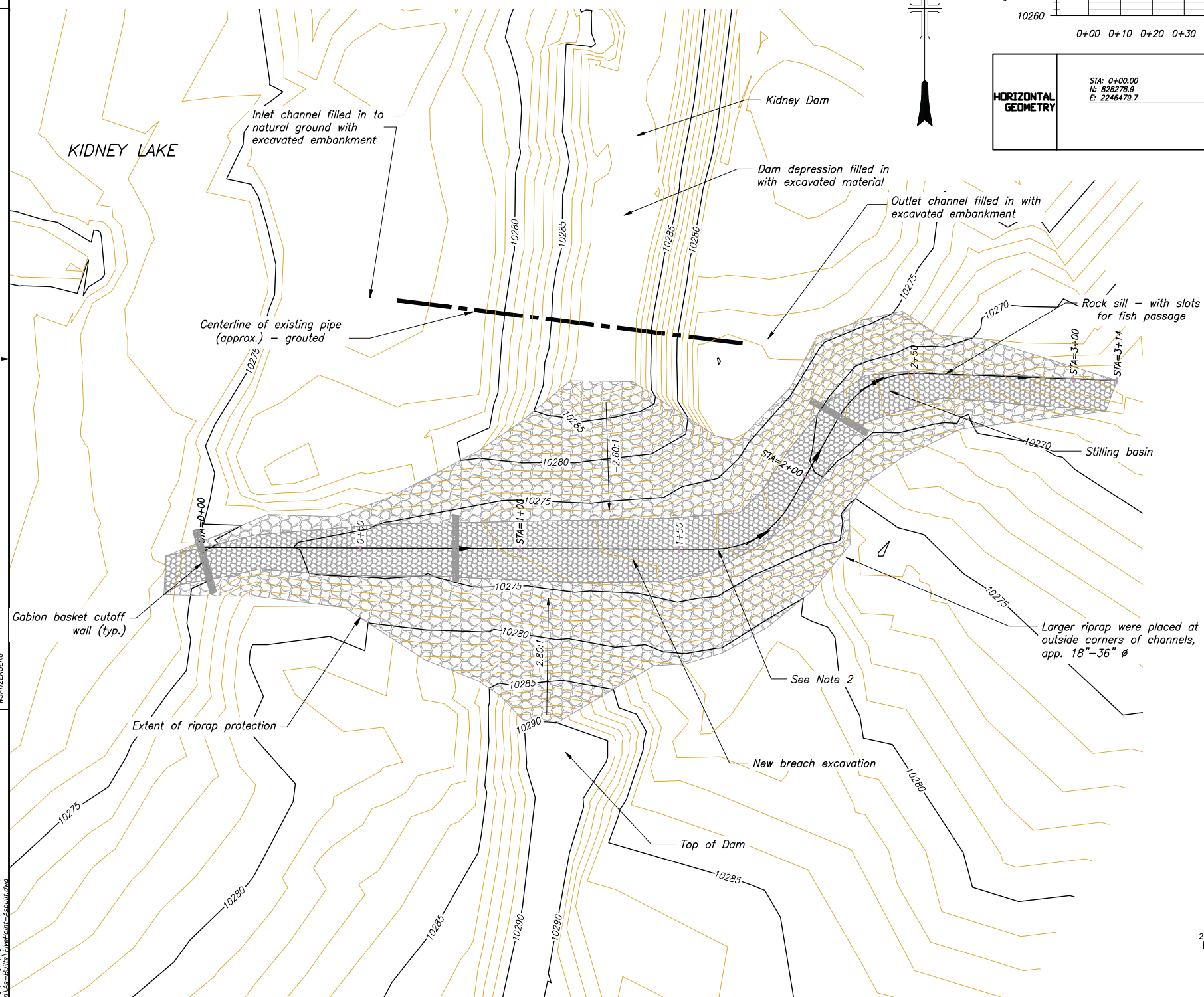
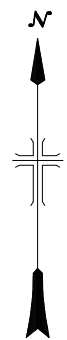
- 7/29/2009 Breach is totally excavated! Today all we are focusing on is cleaning up after the grout operation and contouring outside of the breach. It's hard to make things look like the way mother nature had them before we came along. I'm so happy that the job has gone so well despite the equipment problems. Almost all riprap is complete. Just need to do a little here and there to blend it all together. I believe we will be completely done next shift.
- 7/30/2009 Pack out day! Alesha showed up same time as usual about 8-9 o'clock. We loaded up and headed home. Thank goodness I'm tired.
- 8/4/2009 Pack in day! Met Alesha at trail head. Spent two hours loading gear then headed up the mountain. Once we were in camp, we spent the rest of the day getting ready for the rest of the shift.
- 8/5/2009 Frank and I spent most of the day contouring the upstream side of the dam and finishing the riprap. We stockpiled rocks to use on the "bathtub ring". UCC crews put tools and misc. equipment away and started packing for the fly-out. Weather is turning bad, started raining, we quit early. I hope it breaks tomorrow.
- 8/6/2009 The weather is horrible! We had rain, lightning and thunder all night and it's not letting up. We didn't even work today because I felt it was unsafe to work with the lightning. Some of it was striking the trees directly above our tent. So today is a complete wash. Frank and I will spend the day cleaning the kitchen equipment and preparing for the fly-out.
- 8/7/2009 The weather broke so we get to work today. Frank and I continued contouring the upstream side. The UCC crew used the two-inch trash pump to wash sand into the riprap in the bottom of the channel. Started to rebuild the bathtub ring.
- 8/8/2009 Today we finished the bathtub ring. Good thing because the other skid steer broke too. So now I have no skid steers to work with. The one that lost the bearings will still work but I'm saving it to load the pallets for the fly out. Frank and I are using the two trackhoes to finish the job. Not much left to do all we have left is the front apron and just scratching out our tracks.
- 8/9/2009 Frank and I spent the day packing everything but the bare essentials. We did the best we could to finish up the breach but I blew a hydraulic hose so now I have one piece of equipment left to use.

Appendix B – Contract Record Drawings

PROFILE: KIDNEY BREACH



| HORIZONTAL GEOMETRY | |
|--|--|
| STA: 0+00.00 N: 828278.9 E: 2246479.7 | S89°47'02.5"E 160.85 |
| PC N: 828278.3 PC E: 2246640.5906 DELTA: 60.91 R: 26.97 L: 28.68 | N28°18'22.9"E 31.87 |
| STA: 1+89.53 N: 828292.1 E: 2246664.2 | PC N: 828319.9 PC E: 2246679.8122 DELTA: 62.84 R: 26.97 L: 29.58 |
| STA: 2+50.98 N: 828333.6 E: 2246704.3 | S87°51'16.2"E 62.68 |

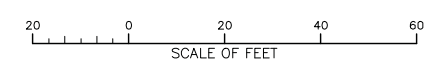


Breach - 24" Riprap Thickness
15 ft. bottom width
2.5:1 Cut slopes

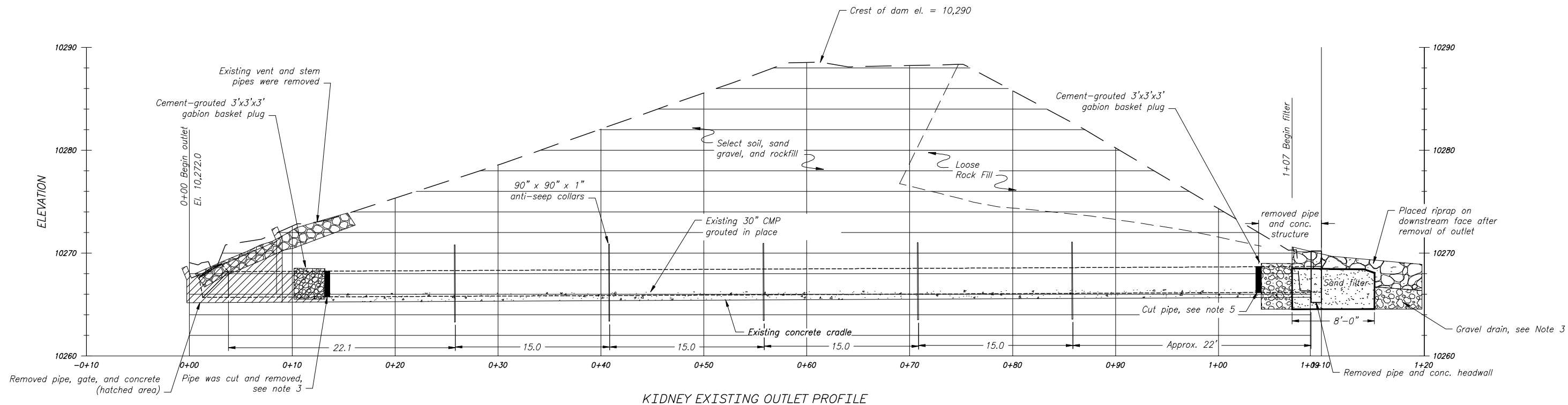
NOTES

1. Contour interval is 1 feet.
2. Centerline alignment varied along ramp to create resting pools.
3. Breach El. 10,274.50
4. Cut vol. ≈ 3,600 c.y. to bottom of riprap
5. Riprap volume ≈ 1,150 c.y.
6. Grid factor = 0.99949466

DATE AND TIME PLOTTED: 8-Dec-09 11:40 AM
 CADD FILENAME: F:\Eng\Design\High Mountain Lakes\Corfield Basin\As-Built\OA58-418-78.dwg
 CADD SYSTEM: AUTOCAD 2005
 PLOTTER: HP DesignJet 5000



| | | |
|--|---------------------------------------|--------------------------------|
| REV NO: 1 | DATE: 2009-11-17 | DESCRIPTION: AS-BUILT DRAWINGS |
| ALWAYS THINK SAFETY | | |
| UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION PROVO AREA OFFICE PROVO, UTAH BROWN DUCK BASIN LAKES DAM STABILIZATION KIDNEY LAKE BREACH SITE PLAN - CONTRACT RECORD | | |
| DESIGNED: /s/ Scott Winterton, P.E. | CHECKED: /s/ Mike Talbot, P.E. | |
| DRAWN: /s/ Will Spitzenberg, P.E. | TECH. APPR: /s/ Cary Southworth, P.E. | |
| APPROVED: _____ | | |
| PROVO, UTAH | 2009-11-17 | OA58-418-78 |

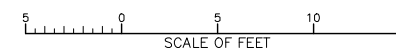


NOTES

1. Compacted filter material was placed over last 8' of pipe removal trench.
2. Trench walls were sloped to allow adequate compaction between fill and natural ground.
3. Inlet area was filled with embankment material compacted to 95% maximum density.

| SAND FILTER MATERIAL GRADATION REQUIREMENTS | |
|---|---------------------|
| SIEVE SIZE | % PASSING BY WEIGHT |
| 1/2 inch | 100 |
| 3/8 inch | 100 |
| No. 4 | 95-100 |
| No. 8 | 80-100 |
| No. 16 | 50-85 |
| No. 30 | 25-60 |
| No. 50 | 10-30 |
| No. 100 | 2-10 |
| No. 200 | 0-3 |

| GRAVEL DRAIN MATERIAL GRADATION REQUIREMENTS | |
|--|---------------------|
| SIZE | % PASSING BY WEIGHT |
| 1 1/2 inch | 90-100 |
| 3/4 inch | 55-100 |
| 3/8 inch | 19-75 |
| No. 4 | 0-40 |
| No. 8 | 0-10 |
| No. 16 | 0 |



ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PROVO AREA OFFICE
PROVO, UTAH

**BROWN DUCK BASIN LAKES
DAM STABILIZATION**
KIDNEY LAKE BREACH
EXISTING OUTLET PROFILE - CONTRACT RECORDS

DESIGNED /s/ Scott Wintersten, P.E. CHECKED /s/ Mike Talbot, P.E.
DRAWN /s/ Will Spitzenberg, P.E. TECH. APPR. /s/ Cary Southworth, P.E.

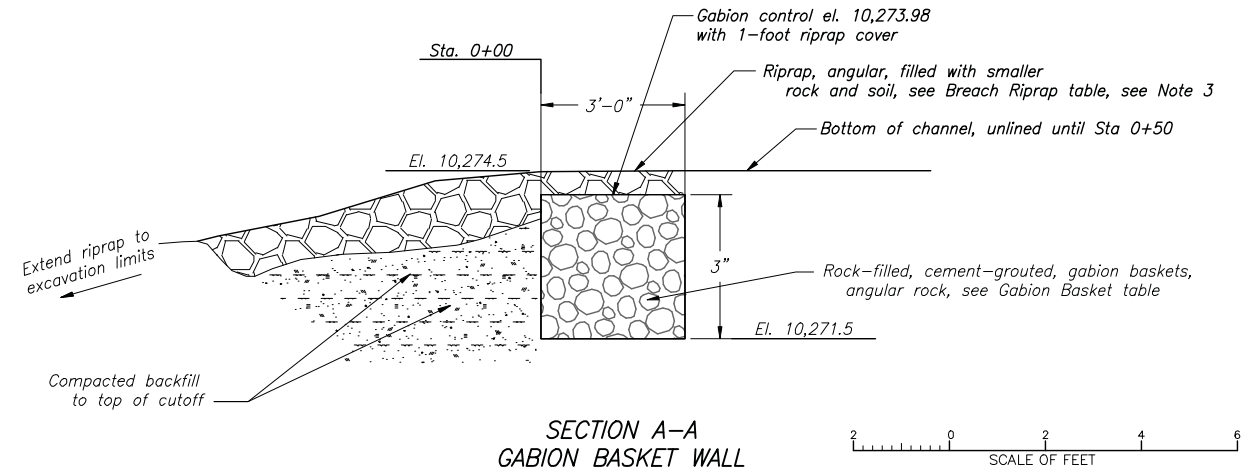
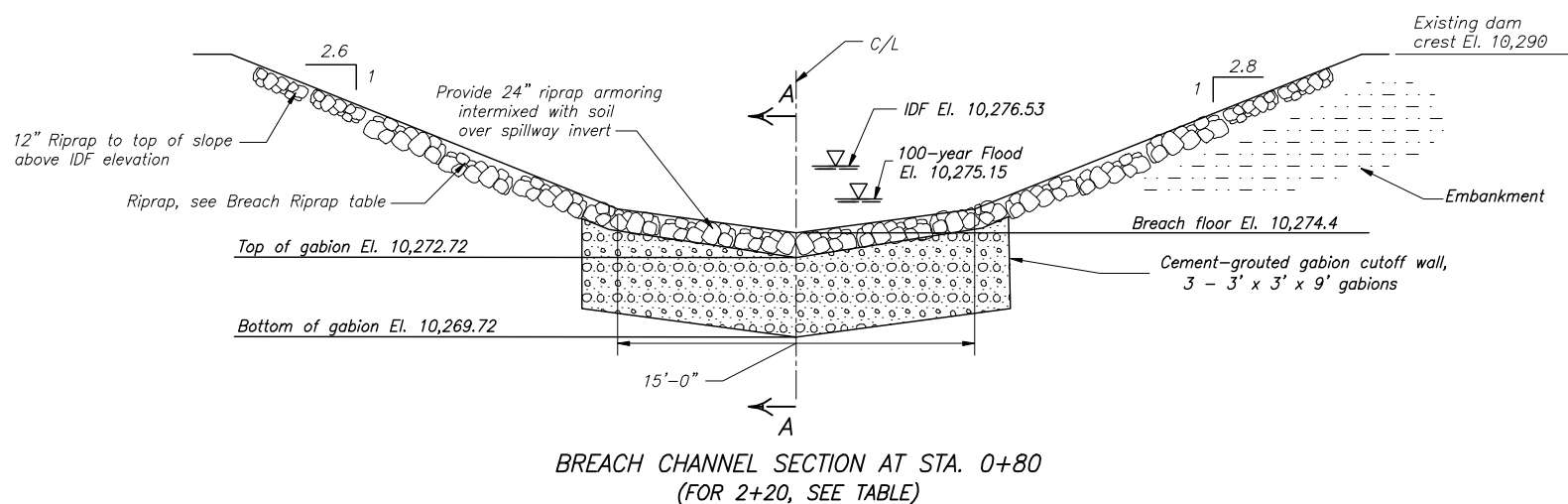
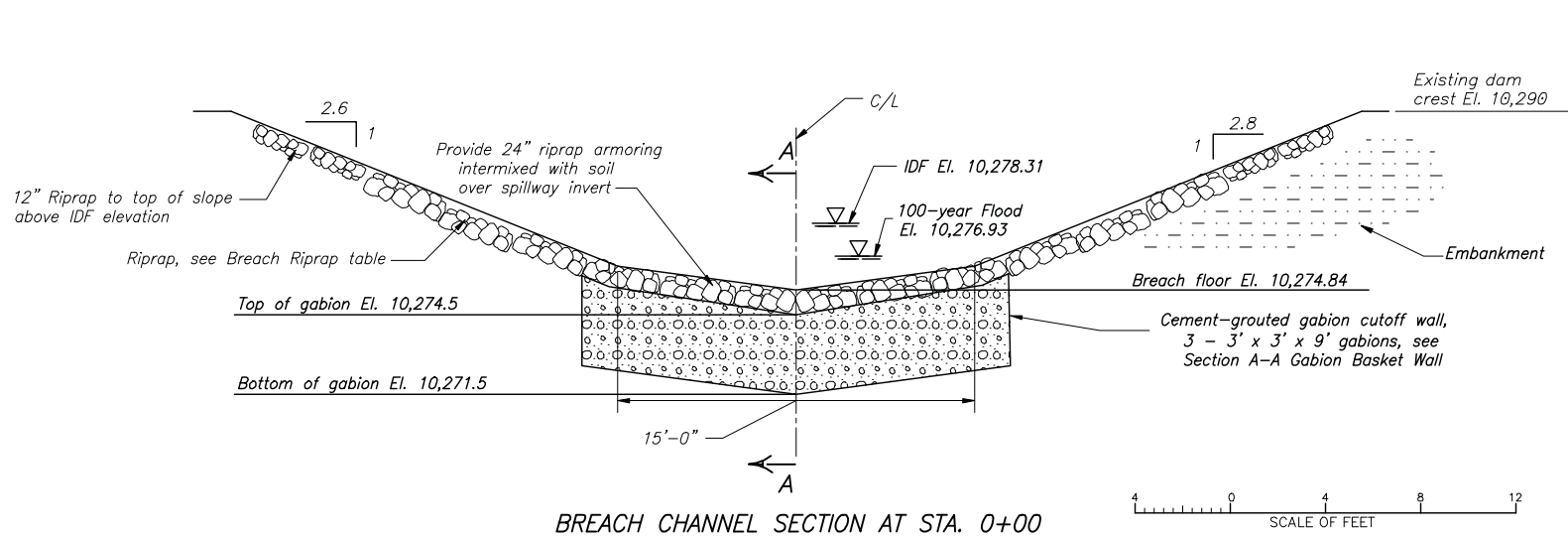
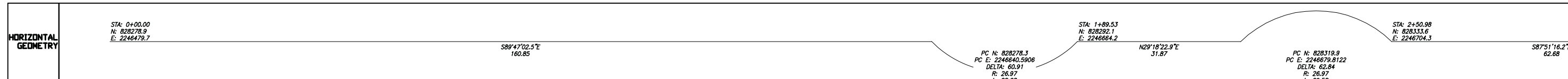
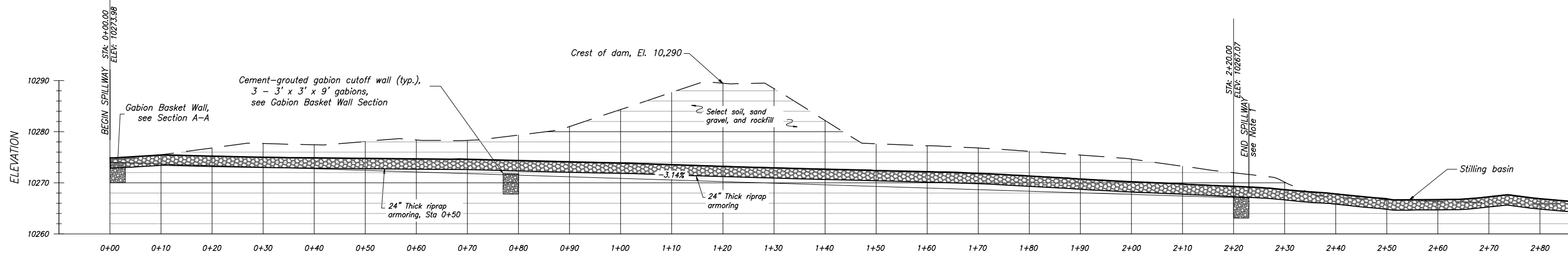
APPROVED _____
PEER REVIEWER _____

PROVO, UTAH 2009-11-17

OA58-418-85

DATE AND TIME PLOTTED
8-Dec-09 10:52 AM
WSPITZENBERG

CAD SYSTEM
AUTOCAD 2005
CAD FILENAME
F:\Eng\Design\High Mountain Lakes\Corfield
Basin\As-Built\Layout\Drawings-ExistingOutletProfile.dwg



| BREACH RIPRAP | | | | |
|---------------|-----|-----|--------|----------------|
| D MIN. | D15 | D50 | D MAX. | THICKNESS MIN. |
| 6" | 8" | 12" | 16" | 24" |

| GABION BASKET ROCK GRADATIONS | | | |
|-------------------------------|--------------------------------|----------------------------|----------------------------|
| GABION BASKET | PREDOMINATE ROCK SIZE (INCHES) | MINIMUM ROCK SIZE (INCHES) | MAXIMUM ROCK SIZE (INCHES) |
| 36 | 6 to 10 | 4 | 12 |

| GABION CUTOFF WALL ELEVATIONS | | | | | |
|-------------------------------|---------------------------|---------------|------------------|--------------------------|---------------|
| STATION | BREACH FLOOR | TOP OF GABION | BOTTOM OF GABION | 100 YEAR FLOOD ELEVATION | IDF ELEVATION |
| 0+00 | 10,274.8 | 10,274.5 | 10,271.5 | 10,276.23 | 10,277.61 |
| 0+80 | 10,274.4 | 10,272.72 | 10,269.72 | 10,275.83 | 10,277.21 |
| 1+50 | NOT REQUIRED, ON BEDROCK. | | | | |
| 2+20 | 10,269.3 | 10,268.06 | 10,265.06 | 10,270.73 | 10,272.11 |

- NOTES**
- Riprap was placed through breach in layers to maintain correct gradations.
 - A minimum of 24" thick layer of riprap was placed at the breach.

REV NO 1 2009-11-17 418 WES AS-BUILT DRAWINGS

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PROVO AREA OFFICE
PROVO, UTAH

**BROWN DUCK BASIN LAKES
DAM STABILIZATION**
KIDNEY LAKE BREACH
PROFILE AND SECTIONS - CONTRACT RECORD

DESIGNED /s/ Scott Winterton, P.E. CHECKED /s/ Mike Talbot, P.E.
DRAWN /s/ Will Spizenberg, P.E. TECH. APPR. /s/ Cary Southworth, P.E.
APPROVED _____ PEER REVIEWER _____
PROVO, UTAH 2009-11-17 OA58-418-79

DATE AND TIME PLOTTED: 8:06:09 AM 1/13/15 AM
 WSPITZENBERG
 CAD SYSTEM: AUTOCAD 2005
 CAD FILENAME: F:\Eng\Design\High Mountain Lakes\Griffith Basin\A5-Build\Drawings\A5-Subfill.dwg

Appendix C – Historical Drawings

