

Blanco Wash/ Old Meadow Lane Culvert installation



Building concrete forms on a trailer for easy transport to job site.



The wash bottom was graded flat to accommodate these five 48" diameter culverts, here a laborer is oiling a form so the poured concrete will not stick to the form when it is removed. Note the trench under the end of the culvert, the form sits down inside the trench flat against the end of the culvert. When the concrete head and end walls are poured the concrete will extend two feet below grade. This photo is looking upstream. Note: the flatter/wider wash bottom will accommodate more water flow allowing runoff to spread out as it reaches the culverts thereby lessening the speed of the flow while allowing less depth at the culvert location. This maximizes the flow capacity of the culverts.



This photo shows the bottom row of forms installed in the trench, most of the back filling is done by backhoe but some must be done with a shovel. Each of these forms are 4'x16', two are installed here. Water trailer in the background is used for water compacting soil.



Here the second row of forms is being installed.



Here the inside wall forms are being installed, note the void underneath the form between each culvert, this must be filled with individual and intricately fabricated flat boards. Note how the form is tailored to each culvert on the bottom where it rests on top of each culvert so the form sits level. This was a lot of extra work because we used old used culverts that were bent, twisted and “out of round”. We tried to make the culverts on each end as round as possible by squashing them with the backhoe and banging the ends around with sledge hammers the way a body man fixes a fender on an automobile, this was somewhat successful but created no real uniformity from end to end.



Another photo showing fabrication of the concrete forms, voids between the culverts not installed yet.



This shows a minor level of intricacy necessary to build these forms and to prevent concrete from leaking into the culverts during the pour. This will be attached next to the culvert (note the round portion) to prevent leakage of concrete into the culvert as it is being poured.



Here back-filling by hand takes place with a shovel, in this photo the forms extends two feet below the level of the visible soil (two feet below the bottom edge of the culverts).



This photo shows the individually fabricated “hourglass” shaped flat boards between the culverts that form the inside wall of the forms. Note how each culvert extends beyond the inside form.



This photo shows the forms extending below grade. The interior flat boards cannot be removed, they will eventually deteriorate on their own and provide no structural benefit after the concrete is poured. It would have been easier to simply fill the spaces between the culverts completely with concrete, this would eliminate the time consuming effort to fabricate the inside form walls but would be much more expensive due to increased concrete volume, approximately \$10,000.00 more.



Here one of my laborers has had to crawl into the 10" wide cavity to install a rebar reinforcement to prevent the inside wall from caving in due to the weight of soil behind it. He is exiting the form now but had to reach four feet below the level of his head to accomplish this task. It was an oversight this happened in the first place, I have high praise for this individual that could perform this need. If not for his flexibility and lack of claustrophobia we would have had a LOT more labor to remove/rebuild the form.

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Oiling forms. Not shown in any photos, it was necessary to seal two men into each culvert with the top form in order to install aluminum strips to compensate for the bent culvert ends. Paper lined aluminum strips can be seen in the second culvert from the right and at the extreme right edge of the right culvert. Note how the culvert second from left is bent up, if not for these aluminum strips concrete would have leaked into the culvert during the pour. This was a tedious, hot, time consuming process, thankfully none who performed this task had claustrophobia. It took four men to accomplish this task.



Another intricate piece that took a lot of thought, in and out of a tight place many times, measuring, figuring, a lot of trial error to get it right. This was to keep concrete from leaking into places we didn't want it to go. The smaller pieces required more thought than the larger pieces. One has to take into account how to remove the form once the concrete has set up.



This is form is ready to pour. The spacers, shown with a hole will be removed as the concrete is poured. The spacers hold the form apart until the concrete is in place. Note the earth piled up on both sides of the forms, this is much less expensive than wood or steel bracing, it is free and took only about half an hour with a backhoe to place. Wood or steel bracing would have cost more, not only to install but to fabricate, the soil was free. This was the most cost effective way to build this structure. In this photo only about 12” of the form can be seen, it actually extend about seven feet below what can be seen here.

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With the volunteer help of WVR property owners and board members the concrete pour was made much easier and less costly. Here rebar is being installed vertically at the culvert ends, there is both horizontal and vertical 1-1/8" rebar inside the concrete. My special thanks to Jake Tormolen, Mike McDowell, Angel Palmer, Dean Rachwitz and Zolin Moses for their help.
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Here even the concrete truck drivers lend a hand. Note the heavy rebar laying about ready to be installed.
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The concrete has set up hard, here we begin to remove the soil that held the forms in place.
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And here excavation below grade begins to access the bottom forms.



Here one of the bottom forms is being removed.
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The concrete head and end walls are 10" thick, 36.5 feet long and 8' high, two feet below grade, two feet above the top edge of each culvert.



The completed project looking downstream. (continued)



Looking upstream.



An end view, note how the culverts are not uniformly round. Using these old bent, twisted culverts did save some money in spite of the extra effort expended to fabricate around them.



This photos shows reflectors installed on each end of the head and end walls. These should show up brightly at night in a vehicles headlights to warn motorists where the edge of the road is.
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This new water turn out deflects run off from the ditch away from the erosion/waterfall effect that can be seen between the camera and the truck in the background (the photo here does no justice), the new culverts are just out of sight at the right side of this photo. This will buy some time, perhaps a few years before the road is again endangered. This is on the south east side of the Old Meadow Lane/Blanco wash culvert installation. The “water fall effect” causes a lot of erosion at Woodland Valley Ranch. Most never see it because we take preventative measures to try to control it, we are successful most of the time by staying ahead of problems before they become major issues. This saves the POA funds in the long run which can be used to make major improvements such as the Blanco Wash culvert installation.