

Executive Summary

Services provided for Valencia County include: Special Services Work Scope for a Design Analysis Report (DAR), and Additional Special Services in order to provide to the County an estimated Maximum Acceptable Construction Cost (MACC) for the proposed improvements to the Conejo Convenience Center. Additional special services included a geotechnical foundation report and a survey of the Conejo site.



Figure 1 Control Building

The basic DAR provides two concepts and three wall types for extending the existing dumping site wall to allow for the use of two (2) refuse trailers in the refuse collection area for the use of county residents to dump their refuse. The County of Valencia Public Works and Waste Management Managers along with Valencia County executives will select the final design approach the County wishes to use for the Conejo Transfer Station.

Future direction from the County will require a Final Design which may include Construction Bidding Documents or Ready for Construction Documents for use by the County of Valencia work forces and personnel for the improvement selected by the county.

Report prepared by AIO LLC



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1.0 Purpose

The purpose of this Design Analysis Report is to provide to the County of Valencia choices and concepts of reasonable cost which will provide for expanding the unloading dock area of the Conejo Transfer Station. This work also includes special services for survey work and a geotechnical foundation report for use during the final design of the selected retaining wall location for the expanding refuse concrete apron unloading dock and truck collection/transfer concrete loading dock at the Conejo Transfer Station. The concept also includes a fence to contain wind-blown refuse at the unloading dock area.

2.0 Site Description and Contacts

The Conejo Collection Center is located in Valencia County at 1100 Manzano Expressway, Los Lunas New Mexico, 87031. The contact person for this facility is listed as Ms. Lina Benavidez, PO Box 1119, 444 Luna Avenue, Los Lunas New Mexico 87031. Ms. Benavidez is the Public Works Manager with Valencia County. Ms. Benavidez can be contacted by email at Lina.Benavidez@co.valencia.nm.us and by telephone at 505-866-2475. The County of Valencia has recently employed a Solid Waste Manager, Mr. Carl Rael who can be reached by email at Carl.Rael@co.valencia.nm.us and by telephone at 505-514-7475.

The Conejo Collection Center can be entered from two gates which front the Manzano expressway. The southwest most gate is the public entry where clients of the Conejo Facility enter towards the Control Building and Fee Collection area. The Northwest most gate is used by County employees to transfer solid waste from this facility to another regional waste facility.



Figure 2 Conejo Transfer Station Location Map

Existing buildings at the site include the Control Building, two small buildings located southwest of the existing concrete unloading apron and an employee chemical toilet. Utilities which are present include electrical lines, a water line and spigot and telephone service lines. The existing concrete loading and transfer apron is located below the unloading dock. A semi-trailer is used to collect the unloaded solid waste. This trailer is then removed by county forces with a semi-truck. The standard length of this semi-truck vehicle and trailer is 65 feet. The trailer lengths vary from 45 feet to 47 feet in length. There is an existing rubber tire stack that functions as an erosion control/soil retaining element near the southeast corner of the existing north east facing unloading facility. Additionally, a small existing barrier wall is built approximately 12 feet from the outside face of the existing retaining wall.



Figure 3 SE Corner Tire Stack



Figure 4 Utility Pole and Water Spigot



Figure 5 Barrier Wall

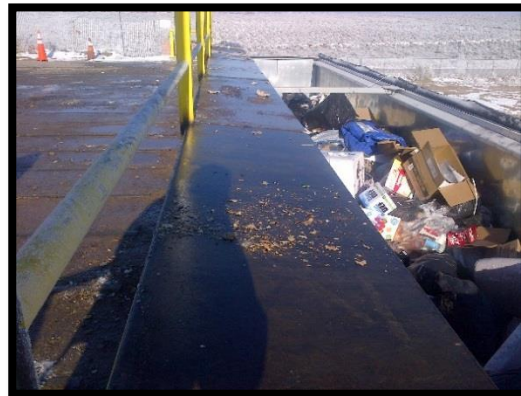


Figure 6 Unloading Dock/Safety rail/trailer

The existing retaining wall and barrier wall are approximately one foot in thickness. The existing retaining wall is approximately 13.5 feet in height above the loading apron. The concrete unloading dock is approximately 20 inches below the top of the steel plate shown above by the safety rail. Unloading and dumping at the site is controlled by Valencia County employees.

3.0 DAR Description

3.1 Owner Coordination and Meetings

The AIO LLC Project Manager, Joe Sanchez met with Valencia County's designated Project Manager as well as the Solid Waste Manager. Items that were discussed included progress, notable issues, and expected completion.

3.2 Site Inspection and Inventory of Existing Conditions

AIO LLC Project Manager Joe Sanchez and Senior Engineer Luis Alba went to the Conejo Transfer Station and verified survey measurements for the existing wall, and existing concrete apron or docking/parking/ unloading surface and visible dimensions of the proposed improvement area. We were on site December 30th of 2015. While on site we noticed a few existing issues which we think the County may wish to address. We noticed a hole under the existing concrete apron at the unloading dock on the northwest corner and just south of the existing retaining wall. The barrier wall near the existing concrete loading apron has exposed rebar. The existing retaining wall at the southwest corner has a lengthy crack which appears to be at the joint between walls.

3.3 Survey and Mapping (Data Collection)

This effort for design level survey information was performed by Tierra Land Surveys. AIO LLC did coordinate project issues to our sub consultant and did manage this effort. The scope of work for the survey effort is described in section 4.1 below. The actual survey data and mapping is included in the appendix of this DAR.

3.4 Geotechnical Data Collection and Analysis with Report

This effort for geotechnical data collection and geotechnical engineering analysis with recommendations was performed by Western Technologies who is AIO LLC's sub consultant for geotechnical services. AIO LLC did coordinate project issues to our sub consultant and did manage this effort. The geotechnical engineering report is attached to this DAR.



Figure 7 NW Wall Hole under slab



Figure 8 Barrier Wall Exposed Rebar

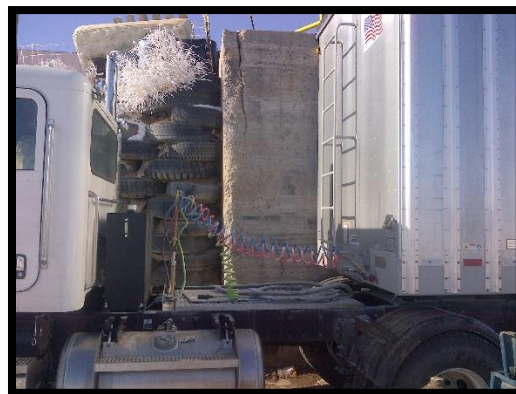


Figure 9 Joint Separation Retaining Wall

3.5 Concepts Report DAR

AIO LLC has prepared an alternatives concepts report to better aid the County with type of wall selection. We have included conceptual costs of construction for three types of retaining walls which can include: a gabion or gravity interlock retaining wall, an MSE (Mechanically Stabilized Earth) retaining wall, and a conventional rigid concrete retaining wall.

Assumptions based on the field visit with Valencia County Representatives: The County will perform surface and subsurface utility identification and relocations of utilities or buildings and construct this project with County resources. No environmental clearances are required on the part of AIO LLC' work scope for this DAR. Note that future clearances to achieve a final design and project construction documents may be required. This DAR does not include construction permit costs that may be required from NM CID.

MAXIMUM ALLOWABLE CONSTRUCTION COST: The Maximum Allowable Construction Cost (MACC) shall be established from the DAR. Future work will include preliminary and final design of a retaining wall concept from the DAR which will be selected by the owner.

4.0 Scope of Services

4.1 Survey and Mapping of the Conejo Transfer Station Site

AIO LLC's sub consultant Terra Land Surveys provided site survey as described below. Services provided are a topographic survey of the Conejo Transfer Station located in Valencia County, New Mexico. This work was initiated on December 3rd, 2015. A survey map is included in the appendix of this DAR.

- 4.1.1. Survey shall be referenced horizontally to the NAD 83 NM Central Zone state plane coordinates modified to the surface and vertically to NAVD 88 vertical datum.
- 4.1.2. Survey limits shall adhere to limits shown on the exhibit provided by AIO on 9/8/15.
- 4.1.3. Survey shall include collection of cross sections, location of improvements, location of visible utilities, location of manholes for storm and sanitary lines (invert elevations shall be provided), and collection of spot elevations.
- 4.1.4. Prepare in AutoCAD base map at 1" = 50ft scale and 1 foot contours

4.2 Geotechnical Report Results and Recommendations

The purpose of our geotechnical engineering services provided are to evaluate the subsurface conditions in order to provide recommendations and/or discussion for the following:

- 4.2.1 Foundation design parameters, including footing types, depths, allowable bearing capacities, and estimated settlements
- 4.2.2 Lateral earth pressures
- 4.2.3 Slabs-on-grade
- 4.2.4 Earthwork, including site preparation, fill placement, and suitability of existing soils for fill materials
- 4.2.5 Drainage
- 4.2.6 Pavements
- 4.2.7 Modulus of subgrade reaction

This work was initiated on December 14, 2015. The full geotechnical report is included in the appendix of this DAR. Field exploration, laboratory testing and a geotechnical report with recommendations is included with this DAR.

4.3 Design Analysis Report Recommendations

AIO LLC will prepare a design alternatives concepts report (DAR) to better aid the County with type of wall selection. We will prepare conceptual costs of construction for three types of retaining walls which can include: a gabion or gravity interlock retaining wall, an MSE (Mechanically Stabilized Earth) retaining wall, and a conventional rigid concrete retaining wall. The basic DAR design will need to address extending the existing dumping site wall to allow for the use of two (2) refuse trailers in the refuse collection area and for the use of county residents.

The deliverables for this DAR include:

- a) Site Survey and Mapping
- b) Geotechnical Report
- c) A Design Analysis Report.

Assumptions based on the field visit with Valencia County Representatives: The County will perform surface and subsurface utility identification and relocations of utilities or buildings and construct this project with County resources. No environmental clearances are required on the part of AIO LLC to achieve a final design and project construction documents. We have not included construction permit costs that may be required from NM CID.

MAXIMUM ALLOWABLE CONSTRUCTION COST: The Maximum Allowable Construction Cost (MACC) shall be established from the DAR.

4.3.1 Comments and Concerns

When on site, Luis and I interviewed the Convenience Center Employees to learn about the functions of the Waste Convenience Center at Conejo. In discussing with employees we asked how they unload vehicles and remove the trash bins from the collection area.

- 1) The employees identified the traffic patterns and how vehicles maneuver around the site.
- 2) A concern for employees is making sure the waste haul truck and trailer combos do not interfere with business operations at the facility or affect work safety and vehicle maneuverability.
- 3) A second concern the workers have is making sure they maintain enough common area so the people entering and unloading waste have enough room to maneuver to the unloading dock and not interfere with each other when unloading at the docking area.
- 4) The workers also explained how they use the railroad ties in the existing dock area to align truck or car vehicles prior to backing to the unloading porch.



Figure 10 County Staff Interacting with Customers

5) The workers also identified how keeping enough clearance between the off-loading lip of the metal extension and the truck tarps is important from the perspective of not tearing truck tarps.



Figure 11 Old Off-loading Deck

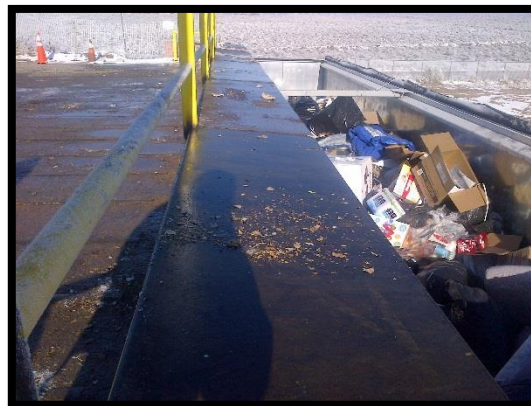


Figure 12 Existing Off-loading Deck

6) The workers also identified how scrap iron is hauled off the common area and docking area and unloaded in the large open space ground area north by SE of the waste collection area.

7) The workers also explained that Waste Management style trash collector trucks do not unload at this location. The principal users arrive in trucks with small trailers, or cars.

8) We also confirmed that the OSHA style protective rail (yellow railing currently in place) would also be a component of the new unloading dock area.

9) We discussed that a Trash Containment fence would be built around the exposed sides of the unloading dock to better control wind block refuse. The concern provided by employees was that if the trash containment fences were wire mesh, trash might stick to the fence and create an unpleasant visual feature at the facility. This feedback from employees will help us provide a better DAR to the County. We have identified the need to give the County a choice to either have an offset parallel unloading area on the SE face, or a southwest unloading dock area.

4.3.2 Alternative One Parallel Offset Unloading Dock on the Southeast Face of Existing Site

Alternative one adds an additional offloading dock as a parallel offset to the existing unloading and transfer dock area. The proposed concrete apron at the unloading dock is estimated at eight (8) inches in thickness and represents an area of approximately the same dimensions as the existing facility. A concrete apron for use as the trailer loading pad is included. The divider between the parallel offset unloading and loading bays will be a rubber mountable curb. This divider is necessary to provide the vehicle operators some form of linear guidance will backing into the loading bay. This rubber mountable curb is also needed to keep a reasonable separation between containment units (the semi-trailers used to haul off the refuse). The height of the retaining wall from loading dock to 20 inches above the unloading dock finished floor is 14.5 feet.

AIO LLC prepared cost variations for a rigid concrete retaining wall, a gabion type retaining wall, and a block MSE wall known for solid performance. This block retaining wall with mechanically stabilized earth (MSE) components is referred herein this report by its trade name, RediRock. For a conceptual layout see Sheet C-2 in the Appendix.

4.3.3 Alternative Two Unloading Dock on the Southwest face of the Existing Site

Alternative two adds an additional offloading dock on the southwest side of the raised earth pad which exists today for the existing unloading and transfer dock area. The proposed concrete

apron at the unloading dock is estimated at eight (8) inches in thickness and represents an area of approximately the same dimensions as the existing facility. A concrete apron for use at the semi-trailer loading pad is included. This alternative will require a second retaining wall around the exterior loading apron in order to provide the level loading dock concrete apron for the semi-trailers used to collect the refuse. The height of the retaining wall from loading dock to 20 inches above the unloading dock finished floor is 14.5 feet.

AIO LLC prepared cost variations for a rigid concrete retaining wall, a gabion type retaining wall, and a block MSE wall known for solid performance. This block retaining wall with mechanically stabilized earth(MSE) components is referred herein this report by its trade name, RediRock. For a conceptual layout see Sheet C-3 in the Appendix.

Alternative Wall Option Rigid Concrete

The rigid concrete retaining wall will require a one foot thickness, a foundation footing or pad, reinforcing steel, concrete form construction for concrete placement, special shoring requirements for the form construction, an upper and lower concrete apron of approximate thickness of eight inches, engineered fill and backfill, a drainage layer and piping behind the retaining wall, an OSHA type barrier for offloading, and a refuse containment fence.

Alternative Wall Option Gabion Type Retaining Wall

The gabion retaining type wall will require a minimum basket thickness of 18 inches to 24 inches, a drainage layer and piping behind the retaining wall, engineered fill and backfill, retaining anchors and extensive setback or stepped construction to accommodate the height of the wall, an upper and lower concrete apron of approximate thickness of eight inches, and additional geotextile fabric for drainage management, and a refuse containment fence.

Alternative Wall Option RediRock MSE Type Retaining Wall

The RediRock MSE type retaining wall will require a minimum thickness of two feet, a foundation footing or pad, reinforcing MSE soil ties, an upper and lower concrete apron of approximate thickness of eight inches, engineered fill and backfill, a drainage layer and piping behind the retaining wall, an OSHA type barrier for offloading, and a refuse containment fence.

4.3.4 Alternative Retaining Wall Estimated Costs

The estimates presented below are based on the NMDOT bid items list and the Missouri DOT bid item costs for RediRock. The table shown immediately below presents the estimated project costs for each wall alternative.

Wall Alternate	SWPPP	Site Staking	Mobilization	Estimate Mob, SWPPP, SS	Estimate Job by Alternate
1a	3,000.00	\$2,500.00	\$52,141.35	\$57,641.35	\$266,206.75
1b	3,000.00	\$2,500.00	\$52,578.45	\$58,078.45	\$268,392.25
2a	3,000.00	\$2,500.00	\$37,264.65	\$42,764.65	\$191,823.25
2b	3,000.00	\$2,500.00	\$36,174.80	\$41,674.80	\$186,374.00
3a	3,000.00	\$2,500.00	\$113,393.85	\$118,893.85	\$572,469.25
3b	3,000.00	\$2,500.00	\$121,927.87	\$127,427.87	\$615,139.33

The table below summarizes estimated earthwork.

Conejo Transfer Center Valencia County					
Preliminary Quantities for earthwork					
Earth Work					
Station	Fill (ft3)	Fill(CY)	Shrink(20%)	Cut (ft3)	Cut(CY)
0+50	-1006.65	-37.28	-44.74	343.5	12.72
0+45	-660.10	-24.45	-29.34	417.35	15.46
0+40	-328.60	-12.17	-14.60	479.15	17.75
0+35	-239.15	-8.86	-10.63	552.75	20.47
0+30	-233.65	-8.65	-10.38	588.8	21.81
0+25	-233.65	-8.65	-10.38	627.5	23.24
0+20	-233.65	-8.65	-10.38	645.5	23.91
0+15	-235.50	-8.72	-10.47	574.75	21.29
0+10	-245.50	-9.09	-10.91	523.15	19.38
0+05	-399.30	-14.79	-17.75	501.15	18.56
0+00	-425.35	-15.75	-18.90	450.7	16.69
Estimated		-157.08	-188.49		211.27
Estimated Costs		Backfill (@60.00)	\$11,310.00	Excavation (@36.00)	\$7,610.00
With Contingency		" @20%"	\$13,572.00		\$9,132.00

The table below summarizes component costs of the various alternatives.

Wall Alternate1	Concrete wall(\$F)	Steel(lbs)	Fencing (LF)	Concrete Apron (SY@8in)	Concrete Footing(LF)	Wall Drainage Layer (Peagravel)(CY)	Piping for Drainage(LF)	Geotextile for Wall(SY)	Estimated Total	20% Contingency
1a.Rigid Concrete(NE)	2268 or 84CY	4800	297	387	126 ft 84 CY	84	200	484		
estimated	\$37,800.00	\$6,000.00	\$40,837.50	\$29,025.00	\$37,800.00	\$1,470.00	\$500.00	\$1,452.00	\$154,884.50	\$185,861.40
1.b Rigid Concrete(Sw)	2556	5500	288	295	142 or 95CY	95	200	568		
estimated	\$40,850.00	\$7,150.00	\$39,600.00	\$22,125.00	\$42,750.00	\$1,662.50	\$500.00	\$1,704.00	\$156,341.50	\$187,609.80
Wall Alternate2	Gabions (\$F)	Geotextiles(SY)	Fencing (LF)	Concrete Apron	Leveling Pad(LF)	Wall Drainage Layer (Peagravel)(CY)	Piping for Drainage(LF)	Geotextile for Wall(SY)		
2.a Gabion (NE)	2268 or126 CY	112	297	387	126 ft or10 CY	84	200	484		
estimated	\$31,500.00	\$336.00	\$40,837.50	\$29,025.00	\$175.00	\$1,470.00	\$500.00	\$1,452.00	\$105,295.50	\$126,354.60
2.b Gabion(SW)	2556 or 142 CY	126.22	288	295	142 or 11 CY	95	200	568		
estimated	\$35,500.00	\$378.67	\$39,600.00	\$22,125.00	\$192.50	\$1,662.50	\$500.00	\$1,704.00	\$101,662.67	\$121,995.20
Wall Alternate3	RediRock(\$F)	Anchor Fabric (SY)	Fencing (LF)	Concrete Apron	Leveling Pad(LF)	Wall Drainage Layer (Peagravel)(CY)	Piping for Drainage(LF)	Geotextile for Wall(SY)		
3.a RediRock (NE)	2268	420	297	387	126 or 10 CY	84	200	484		
estimated	\$283,500.00	\$2,100.00	\$40,837.50	\$29,025.00	\$175.00	\$1,470.00	\$500.00	\$1,452.00	\$359,059.50	\$430,871.40
3.b RediRock(SW)	2556	444.44	288	295	142 or 11 CY	95	200	568		
estimated	\$319,500.00	\$2,222.22	\$39,600.00	\$22,125.00	\$192.50	\$1,662.50	\$500.00	\$1,704.00	\$387,506.22	\$465,007.47

4.4. Recommended Alternative

AIO LLC is recommending the RediRock MSE wall for the following reasons:

- 1) Can be constructed by County Employees.
- 2) Does not require extensive forming methods for construction.
- 3) Can be built without interfering with the existing operations of the Conejo Transfer Center.
- 4) Requires minimal construction equipment that is already on hand at the County.
- 5) Long Term Performance Results at other transfer centers has been favorable.

Although AIO LLC is recommending the RediROck MSE wall solution for final design, AIO LLC will design the alternative which the County selects. AIO LLC does state the gabion alternative is not constructible for this site and fill conditions or functional conditions. The gabion alternative will not work for the conditions at the Conejo Transfer Station.

Appendix

C-1 Original Site Location (Survey Deliverable)

C-2 Alternate One

C-3 Alternate Two

C-4 Miscellaneous Details

Geotechnical Report (Deliverable)