



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Taos Field Office
226 Cruz Alta Road
Taos, New Mexico 87571
www.nm.blm.gov

IN REPLY REFER TO:
2000

Dear Reader:

The attached Environmental Assessment (EA) addresses an application to secure a continuous access and utility right-of-way from the Bureau of Land Management (BLM), Taos Field Office for an existing, unimproved road on BLM administered land (BLM Road 119). The applicant, Embudo Al Cielo LLC (EAC), owns 640 acres of private land (EAC property) adjacent to BLM land in Rio Arriba County, New Mexico (see Figure 1). The applicant intends to develop a residential plot on the property, and the sole access to the plot would be via the existing road across BLM land.

The application to the BLM includes improvements to the existing road, temporary construction easements along the road to accommodate drainage improvements, cut/fill slopes, a staging area for construction, and buried utilities in the new road easement. A wider and better surfaced road is needed to safely provide access to the applicant's property. No feasible alternative routes to the property exist due to terrain and the proximity of the property to other public land in the area. As a result of the public scoping meeting, it was suggested that vehicular access on the road be restricted only to users permitted by BLM and EAC (and its assigns) and pedestrian use. This concept is recommended as the preferred alternative.

The EA prepared for this project as required by the National Environmental Policy Act of 1969 (NEPA) provides the analytical basis for BLM to make a decision for BLM lands and resources.

Included in this EA are four action alternatives and a no action alternative. The action alternatives consist of the following:

- Alternative 1 – New Road on South Side of La Mesita
- Alternative 2 – Improving the Existing Road to a “Local” Standard
- Alternative 3 – Improving the Existing Road to a “Resource” Standard
- Alternative 4 (Preferred) – Gated Access and Improve the Road to a “Modified Resource Road” Standard

Alternative 4 was identified as the preferred alternative because it results in the least physical impact to resources in the area, while providing vehicular access the EAC property and pedestrian access to BLM lands.

The BLM's scoping has also identified the environmental and social values that may be affected by selection of any of the alternatives and the potential environmental consequences of each alternative. The key resource values addressed in the EA are earth and biological resources, land use, recreation and socio-economics, air quality, and visual resources.

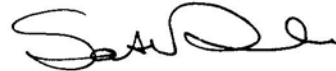
The BLM anticipates issuing a decision as a result of this EA on or about August 1, 2008. Every attempt will be made to consider and potentially incorporate comments received prior to that time, but comments should be received by July 18, 2008, to assure adequate consideration in the decision. Comments may be sent to:

Parametrix
c/o John Taschek
8901 Adams Street NE
Albuquerque, NM 87113

Or at: JTaschek@parametrix.com

Should you have any questions, feel free to contact John Taschek at (505) 821-1631 or Lora Yonemoto at (575) 751-4709.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. DesGeorges', written in a cursive style.

Sam DesGeorges
Field Office Manager

ENVIRONMENTAL ASSESSMENT

EMBUDO AL CIELO LLC ROAD IMPROVEMENT

NM 114194



**U.S. Department of the Interior
The Bureau of Land Management
Taos Field Office
226 Cruz Alta Road
Taos, NM 87571**

June 2008

ENVIRONMENTAL ASSESSMENT

**Embudo al Cielo LLC Road Improvement
NM 114194**

Submitted to:

**U.S. Department of the Interior
The Bureau of Land Management
Taos Field Office
226 Cruz Alta Road
Taos, NM 87571**

Submitted by:

**Taschek Environmental Consulting, LLC
8901 Adams Street NE, Suite D
Albuquerque, NM 87113**

June 2008

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LIST OF ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ARMS	Archaeological Records Management Section
ASTM	American Society for Testing and Materials
BLM	U.S. Bureau of Land Management
BMP's	Best Management Practices
BR	Biological Report
CAA	Clean Air Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CWA	Clean Water Act
EA	Environmental Assessment
EAC	Embudo Al Cielo LLC
EJ	Environmental Justice
EO	Executive Order
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
LLC	Limited Liability Company
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NM	New Mexico or New Mexico State Highway
NMAC	New Mexico Administrative Code
NMCC	New Mexico Climate Center
NMCRIS	New Mexico Cultural Resources Information System
NMDGF	New Mexico Department of Game and Fish
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environmental Department
NMEMNRD	New Mexico Energy, Minerals, and Natural Resources Department
NMNHP	New Mexico Natural Heritage Program
NMOSE	New Mexico Office of the State Engineer
NMSLO	New Mexico State Land Office
NO _x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O ₃	Ozone
Pb	Lead
PE	Professional Engineer
PM ₁₀	Particulate matter 10 microns or less in size
PM _{2.5}	Particulate matter 2.5 microns or less in size
POD	Plan of Development
ppm	parts per million
RGCFP	Rio Grande Corridor Final Plan
RMP	Resource Management Plan

ROW	Right-of-way
SCS	Soil Conservation Service
SO ₂	Sulfur Dioxide
SWPPP	Storm Water Pollution Prevention Plan
TEC	Taschek Environmental Consulting
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area
µg/m ³	micrograms per cubic meter

CHAPTER I – INTRODUCTION

A. INTRODUCTION TO PROCESS AND PROJECT

The National Environmental Policy Act of 1969 (NEPA) requires a systematic, interdisciplinary approach to planning and project implementation and emphasizes that the environmental impacts of federal actions must be given serious consideration in the decision-making process. Environmental documentation consistent with NEPA and other applicable laws and regulations is required on all federal actions. This documentation allows resource managers to make informed decisions regarding project approval and the stipulations necessary to mitigate impacts.

The proposed project involves an application to secure a continuous access and utility right-of-way from the Bureau of Land Management (BLM), Taos Field Office for an existing, unimproved road on BLM administered land (BLM Road 119). The applicant, Embudo Al Cielo LLC (EAC), owns 640 acres of private land (EAC property) adjacent to BLM land in Rio Arriba County, New Mexico (see Figure 1). The applicant intends to develop a residential plot on the property, and the sole access to the plot would be via the existing road across BLM land.

Susan and Kenneth Crawford, the principals of EAC, purchased the property on May 31, 2001. A condition precedent to the purchase was confirmation by the BLM that permanent access to the property was available. BLM staff advised the Crawfords that the existing road could be improved, and that approval to improve the road could be obtained by filing an Application for Permanent Easement with BLM and completing the process. Based on this representation that access was possible and available, the Crawfords purchased the property.

A number of draft Plans of Development (PODs) for the proposed road improvements to BLM Road 119 were submitted and reviewed by the BLM in 2006 and 2007, and a final draft POD was submitted in September 2007. A public scoping meeting was subsequently held in October 2007 in Dixon, New Mexico to obtain input on the design concepts presented in the POD. Additional reporting requirements under NEPA guidelines include completion of the following environmental assessment (EA) for the proposed project.

The application to the BLM included improvements to the existing road, temporary construction easements along the road to accommodate drainage improvements, cut/fill slopes, a staging area for construction, and buried utilities in the new road easement. A wider and better surfaced road is needed to safely provide access to the applicant's property. No feasible alternative routes to the property exist due to terrain and the proximity of the property to other public land in the area. As a result of the public scoping meeting, it was suggested that vehicular access on the road be restricted only to users permitted by BLM and EAC (and its assigns) and pedestrian use. This concept was not included in the final draft POD but was discussed with the BLM in December 2007, and has been incorporated into the proposed project.

The analysis for the following EA was conducted in accordance with BLM procedures for preparing environmental documents, including the requirements of Chapter 23, Part 771, Code of Federal Regulations (23 CFR 771) and the BLM Handbook H-1790-1. This EA included consultation with numerous federal, state, regional, and local planning agencies.

The EA serves to inform the public and elected officials of the consequences of the proposed project, and has been prepared by Taschek Environmental Consulting (TEC) for the BLM Taos Field Office. The EA addresses the environmental conditions in the proposed project area near the communities of Embudo and Dixon, located in north central New Mexico near the intersection of State Roads (NM) 68 and NM 75. This area is situated near the confluence of the Rio Embudo Creek and the Rio Grande, in Rio Arriba County, New Mexico.

B. PURPOSE OF AND NEED FOR THE PROJECT

A right-of-way application, #NM-114194, is being submitted along with this EA by EAC for the proposed project. The improvements to BLM Road 119 are needed for access to the EAC property. There is no other access to the property. As shown in Figure 1, the property is bordered on the east by BLM land extending to NM 75 and on the south by New Mexico State Land Office (NMSLO) property, other BLM land, and private land, which has no public access. On the west, the property is bordered partially by BLM land and private land, which also has no public access. On the north, the property is bordered by private land extending to NM 68; however, no access exists across this property, which is very steep. The entire EAC property is located on a topographic feature called La Mesita (USGS 7.5 Minute Quad, Velarde, NM), which is a mesa surrounded by a steep escarpment 500-feet high or more between the EAC property and the nearest roads. These features land-lock the property, except for BLM Road 119.

In this situation, where there is no public access to property, the law will imply an easement or an easement by necessity to the landlocked property. An easement, with the accompanying right to improve the road to allow vehicle access to the EAC property, is necessary for the use and enjoyment of this parcel. The property was originally deeded for homestead purposes; it is suitable for residential use, and the only obstacle is the condition of the road. If the road is improved to allow safe access, then the property can be used for residential purposes as intended.

C. CONFORMANCE WITH LAND USE PLANS

The road improvements are proposed within an existing, but primitive transportation corridor documented on the Velarde USGS 7.5 Minute Quad map (dating back to 1953), and also documented on the BLM map of the area. The existing road provides access from the state road network (NM 75 and NM 68) to BLM land, NMSLO land, and private land on the mesa designated as La Mesita.

The proposed road improvements are within an area that is covered by the BLM's Taos Resource Management Plan (RMP) (1988), although the EAC property is in private ownership. The RMP provides a comprehensive framework for managing public lands and allocating resources under the BLM principles of multiple use and sustainable yield. Generally, the RMP establishes areas of limited or restricted use (for example environmental protection, mining, or grazing), and management directions.

As it relates to the EAC property, the 1988 RMP was largely superseded or amended by the Rio Grande Corridor Final Plan (RGCFP) prepared by the BLM in January 2000. The RGCFP established a Lower Gorge Area of Critical Environmental Concern (ACEC), which has a planning area that encompasses the proposed road improvements and part of the EAC property area (see Figure 2). The Lower Gorge ACEC rescinded and superseded the Racecourse and Black Mesa ACECs that were designated in the project area in the 1988 RMP. The EAC property falls within the Bosque segment of the Lower Gorge ACEC; however, the access road and EAC area are outside the Wild and Scenic River designation and Rio Grande Bosque Wilderness Study Area (WSA) located along the river.

The current Lower Gorge ACEC restricts vehicular use on BLM land except on designated roads and trails. The road to EAC is identified as BLM Road No. 119, which is designated as "open" for the purpose of "private land access." According to the RGCFP, new rights-of-way will be excluded unless needed to administer recreation sites or provide access or utility service to private or state lands where it is otherwise not possible. The RGCFP states that utilities will be underground and co-located with roads. Only one grazing allotment exists in the ACEC, to the west of the EAC property, and no mineral leasing is permitted. Other resource management concerns generally do not apply to the proposed road improvements, except as described in the following sections of this EA.

The expanded right-of-way and improved road will not conflict with any known federal agency, state or local government land use plans, or zoning restrictions. Rio Arriba County has provided a letter to the BLM acknowledging that they have no jurisdiction over the applicant's request to the BLM.

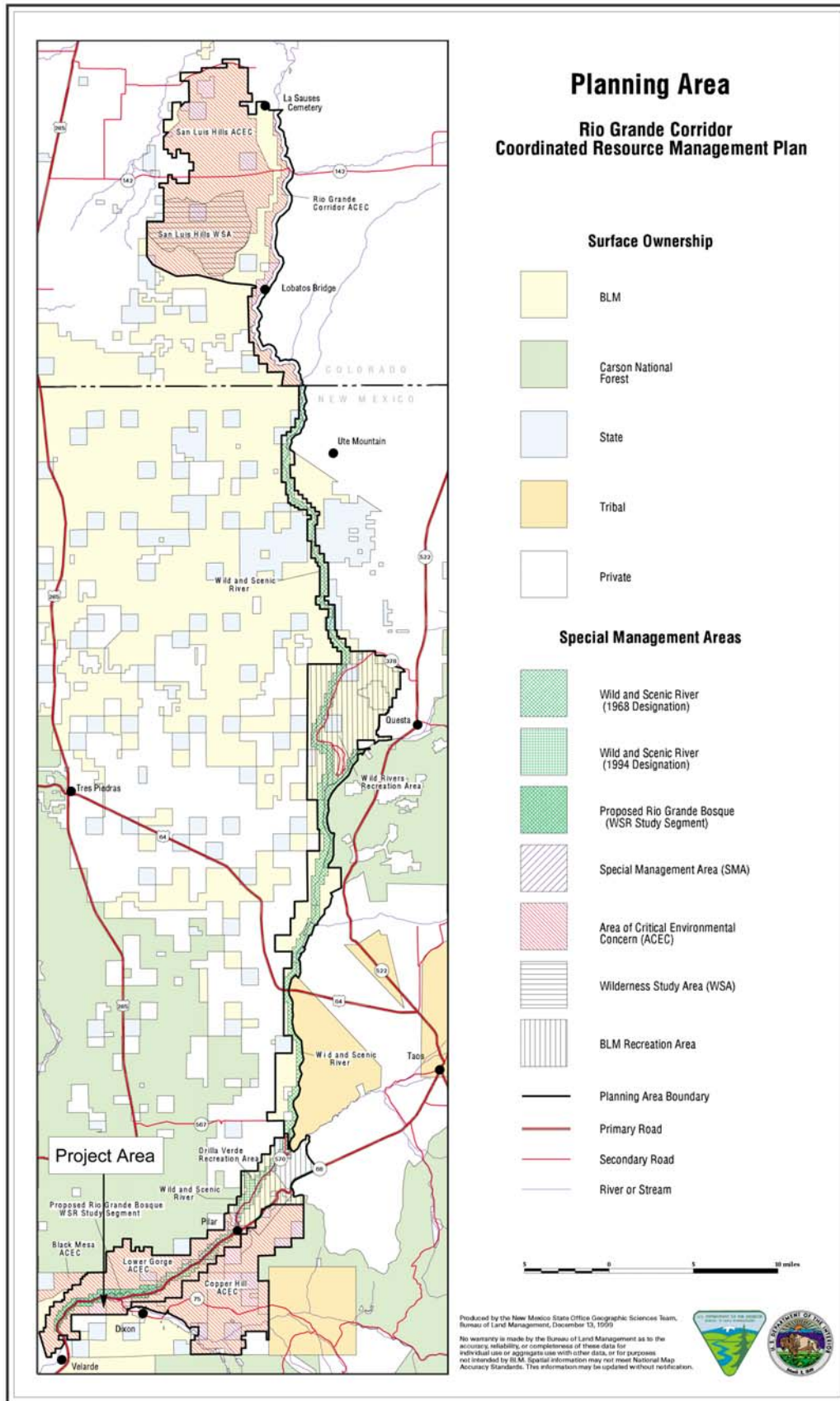


Figure 2: BLM RGCFP Planning Area

D. RELATIONSHIPS TO STATUTES, REGULATIONS, OR OTHER PLANS

The proposed project is consistent with other state, regional, and local planning documents and proposed actions, and meets State of New Mexico and BLM standards for road improvements.

Implementation of the proposed project involves a variety of federal, state, and local permits, authorizations, and approvals. This process involves consultation with federal, state, and local government agencies and authorities. A summary of the authorizing items are presented below:

Executive Order 11988 “Floodplain Management” requires that any potential impacts to floodplain areas be studied, assessed, and identified to reduce the risk of flood loss and to minimize the impacts to the beneficial values served by floodplains. If the final proposed project site is in a floodplain, then a floodplain assessment and consultation with appropriate agencies will be conducted.

Consultation with the U.S. Fish and Wildlife Service (USFWS) and the New Mexico Department of Game and Fish (NMDGF) is required to determine if any listed wildlife or vegetation species, or its critical habitat, occurs or has a strong possibility of occurring in the project area.

Consultation with the U.S. Army Corps of Engineers (USACE) and the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB) will occur to determine Clean Water Act (CWA) Section 404 and Section 401 permitting requirements.

A BLM right-of-way easement for the proposed project is required.

A New Mexico Department of Transportation (NMDOT) driveway permit is required to authorize access to NM 75.

E. PUBLIC SCOPING MEETING AND AGENCY COORDINATION

1. Public Scoping Meeting

A public information meeting was held Thursday, October 4th, 2007, at the Dixon Community Center in Dixon, New Mexico. The meeting was held to provide information and receive community input on the proposed improvements to BLM Road 119. A legal advertisement announcing the meeting was placed in the *Taos News* on September 20, 2007 and the *Rio Grande Sun* on September 27, 2007. Notice of the meeting was also sent to radio station KLDK, which broadcasts in the Dixon area. In addition, notices of the meeting were posted at the Dixon public library and general store, and notification of the meeting was emailed to a list of residents in the Embudo and Dixon area by Mr. Lou Malchie, a community resident and representative of a local acequia association (Appendix A includes copies of the public notices).

The primary purpose of the meeting was to provide an opportunity for the project team to meet interested members of the public, discuss the project, and receive comments from the public on:

- Proposed improvements and issues of local importance
- Cultural resources in the project vicinity; and
- Environmental issues in the project vicinity.

The proposed project representatives for the public information meeting included the following:

- John Bailey, BLM Taos Field Office
- Lora Yonemoto, BLM Taos Field Office
- Ken Crawford, Embudo al Cielo, LLC
- Susan Crawford, Embudo al Cielo, LLC
- John Taschek, Taschek Environmental Consulting

The meeting began with an open house from 6:30 to 7:00 pm. During this time the study team was available to discuss the project and answer questions. The proposed road alignment was depicted on aerial photographs and the POD was available for the public to review and discuss.

At 7:00 pm, John Taschek opened the meeting by introducing the project representatives and summarizing the agenda. John Bailey then presented the BLM's role and study process. John Taschek next discussed the purpose and need for the project, the alternatives that are included in the POD, the proposed design concept, and the environmental studies and process that will be conducted in the future. He discussed the alignments and the ability of each alignment to meet the purpose and need of the project. The Crawfords then described what their plans are for using the property. During the presentation there were several questions for clarification.

Following the presentation, meeting attendees were given the opportunity to comment and ask questions on the proposed project. A handout containing an agenda for the meeting and a comment form were distributed to attendees. A sign-in sheet was circulated to collect attendees' names and contact information. Forty-six people signed the attendance roster. Meeting attendees were encouraged to provide oral or written comments. Approximately 15 people provided oral comments at the meeting and most of these individuals offered several comments. To the extent possible, project representatives responded to oral comments and questions. Comments were recorded on butcher paper and written note pads by the study team. After the meeting, seven written comments were received. A summary of the questions and comments is given below:

- Attendees asked who would pay for the road and what the cost would be.
- Attendees stated a concern that the road improvements would eventually lead to a subdivision on the mesa; however, they did not state how this would affect their interests.
- A conservation easement on the Crawfords' property was suggested to prevent future development of the land.
- Another concern identified was water draining from the escarpment into acequias. Mr. Estevan Arellano mentioned it would be helpful to rebuild some of the old rock erosion control structures along the road and on the Crawford property that his grandfather had originally built. He asked if the Crawfords intended to fence the road at their property.
- It was suggested that the proposed project would establish a precedent for "ridgetop" housing in Rio Arriba County.
- Several attendees stated that the existing road has been used for years by the community as a trail for hiking, mountain biking, and all terrain vehicle (ATV) use, mostly for health benefits but also to collect resources. The biggest concern was the change in the road's

character from a primitive two-track route, which is barely passable for any four-wheel-drive vehicles except ATVs, into a wide graveled road. This would result in the loss of a challenging mountain bike and hiking route. Attendees questioned how a graveled road would impact hikers and mountain bikers. A meeting attendee asked if a primitive trail could be built near the road.

- It was noted that the road provides access to the mesa, which locals have used for grazing, wood collecting, exercise, equestrian activities, and related activities. An attendee asked if an alternate route could be provided that would still allow access to the public lands on the mesa. It was suggested that this could be through a reciprocal easement with the BLM.
- It was suggested that runoff should be directed to the east. There is a small mesa that feeds water to the houses on the west. Residents do not want the runoff problems exacerbated.
- It was stated that if you want good neighbors, you need to be a good neighbor yourself.
- An attendee mentioned that several meetings were held regarding the desire to discourage building in farmland. The Crawfords noted that their land is not agricultural land, and that it may be quite difficult and expensive to obtain water. Several attendees identified a concern about excessive water use if a subdivision were to be developed in the future.

The comment period continued until approximately 8:30 p.m., when no more comments were presented by attendees and most people had left the meeting.

2. Agency Coordination

Scoping letters were sent to a variety of agency stakeholders to obtain comments on the proposed project. In accordance with requirements for agency consultation and coordination, the following agencies and interested parties were contacted regarding the proposed project:

Espanola City Mayor	Espanola City Manager
Espanola City Floodplain Administrator	Espanola City Public Works
Espanola City Planning Department	East Rio Arriba County Soil and Water
Rio Arriba County Manager	Rio Arriba County Public Works
Rio Arriba County Floodplain Manager	Embudo Valley Library & Community Center
Rio Arriba County Planning and Zoning	Rio Arriba County Commissioner
Town of Taos Chamber of Commerce	Town of Taos Fire Department
Town of Taos Mayor	Town of Taos Manager
Town of Taos Public Works	Town of Taos Police Chief
Town of Taos Floodplains Manager	North Central NM Economic Development
State Historic Preservation Office	NM Department of Labor
NM Children, Youth and Families Department	NM State Parks
NM Department of Game and Fish	NMDOT Environmental Section
NM Energy, Minerals, and Natural Resources	NM Office of the State Engineer
NMED Environmental Review Coordinator	NMED Air Quality Bureau
NMED Drinking Water Bureau	NMED Ground Water Bureau
NMED Construction Programs Bureau	NMED Surface Water Quality Bureau

National Park Service, Regional Office
U.S. Environmental Protection Agency
USFWS, Ecological Field Services
Kiowa Tribe of Oklahoma
The Hopi Tribe
The Navajo Nation
Pueblo of Santa Clara
Pueblo of Taos

USACE, Albuquerque District
USDA, Natural Resources Conservation Service
Federal Emergency Management Agency
Pueblo of Pojoaque
Jicarilla Apache Nation
Pueblo of San Ildefonso
Ohkay Owingeh
Comanche Indian Tribe

Responses and comments from these agencies and interested stakeholders were incorporated into the EA and are part of the administrative record for the proposed project.

CHAPTER II – PROPOSED PROJECT AND ALTERNATIVES

A. PROPOSED PROJECT

In order to address the need for access to the EAC property, several alternatives were evaluated. The primary access alternative was to improve the existing road on BLM land, because it is in place and has historically provided access to the property. However, because of potential community, engineering, and environmental concerns about the existing road, an investigation of alternative routes to the site was also conducted. This investigation included review of topographic and land ownership maps and site visits to evaluate engineering opportunities and constraints.

B. PRELIMINARILY DISMISSED ALTERNATIVES

For the environmental analysis described in this EA, no alternatives other than the ones described herein were identified for the proposed project, and none were preliminarily dismissed.

C. VIABLE ALTERNATIVES

1. Alternative 1 – New Road on South Side of La Mesita

Because of the very steep terrain on all sides of La Mesita, only a few areas would accommodate a new road traversing the escarpment leading up to the EAC property. The land directly south of the EAC site, in Section 36, Township 23 N, Range 13 E, appeared to provide the most compatible terrain for a road down the escarpment. This section of land is owned by the NMSLO, and an access easement could likely be obtained on this property. The road down the escarpment would connect to a pipeline road that crosses the southern third of Section 36 and continues to NM 75 and NM 68 to the north and south (identified as the ‘New road alternative’ on the map in Figure 1, Chapter I.B. of this EA). At NM 75 in Dixon and NM 68 in Velarde, the pipeline crosses private property. There are currently locked gates that block public access to the pipeline road.

The road down the escarpment south of the EAC property would likely be feasible from an engineering standpoint; however, it would have a number of constraints and disadvantages. It would create a physical and visual impact on undeveloped and pristine land. The road would likely not be visible from Velarde, but it would be visible driving toward Velarde north on NM 68 (see Figure 3). The physical impacts of constructing a new road would be similar to those created when the existing BLM Road 119 was constructed, in regards to loss of vegetation, erosion potential and cumulative effects on habitat integrity. The road would require expensive construction measures at the basalt escarpment and would likely require a bridge at the Canada del Agua, the arroyo adjacent to the pipeline. The length of the new road, between the EAC property and the existing pipeline road, would be about 1.2 miles.



Figure 3: Photographic Simulation of Alternative 1 from NM 68

The pipeline road would also likely need to be improved to accommodate travel from the EAC property. Easements and improvement agreements would need to be obtained from the NMSLO to allow EAC to use and improve the pipeline road on NMSLO land and to connect to County Road 0067 in Dixon or County Road 0050 in Velarde. None of the county roads currently connect to the pipeline road or provide access to other areas close to the EAC property. If legal access could be obtained on the pipeline road and county roads, connecting to NM 68 or NM 75, a greater total amount of road would have to be improved and maintained to reach the EAC property. In addition, it is likely that traffic on the new road would impact adjacent residential development in Velarde, Dixon, or both communities. For these reasons, the southern route **was not considered to be a reasonable alternative**, and the design was not developed in detail.

2. Alternative 2 – Improving the Existing Road to a “Local” Standard

Several options for improving existing BLM Road 119 were also considered. Initially, a concept for developing the road to a BLM “Local” standard with a 24-foot-wide driving surface was considered. This design concept would have required considerable earthwork to accommodate slopes and drainage facilities. These engineering requirements and costs would be unnecessary for Crawford family residential purposes, which would not require a “Local” standard road. For these reasons, improving BLM Road 119 to “Local” standard was **not considered to be a reasonable alternative**, and the design was not developed in detail.

3. Alternative 3 – Improving the Existing Road to a “Resource” Standard

Another option for existing BLM Road 119 would be to develop a BLM “Resource” road standard, with a 14-foot-wide surface and appropriate passing turn-outs. This design would require considerably less earthwork and have fewer impacts and lower costs than the “Local” standard, and it would handle the traffic (20 trips per day or less) due to Crawford family residential use. Because the “Resource” standard road is an appropriate level of design for the currently proposed uses of the EAC property, it is **considered a viable alternative**.

The road engineering for Alternative 3 was developed in the final draft POD for the project (see attached plans), and includes horizontal and vertical alignments, approximate slope limits, site preparation and earthwork quantities, drainage requirements, and estimated costs for construction. This design concept was prepared by RME Santa Fe Engineering, Inc., 3209 Mercantile Court, Suite A, Santa Fe, New Mexico 87507, under the supervision and direction of Joseph E. Chato, P.E., a professional engineer licensed in New Mexico. The improved road for this alternative would be a single-lane road for rural residential uses that conforms to the standards set forth for “Resource” roads in the BLM’s Road Standards: Excerpts from BLM Manual Section 9113 (BLM, Rel. 9-247, 6/7/85) and the “General Road Stipulations for Embudo al Cielo ROW” from Herbert A. Chavez, PE (BLM, February 2006 and attached in Appendix A). This road would have a 10 mile per hour (mph) posted speed limit. The maximum permanent width of the road surface would be 15 feet, although portions of the road would be widened to accommodate vehicle passing areas at 2,100-foot intervals. Electrical and telephone/communication utilities may be buried in the right-of-way below the roadway. A temporary construction staging area is also proposed on BLM land at a safe location off NM 75.

The Alternative 3 access road would be surfaced with a gravel base course (6 inch depth) over prepared and compacted sub-grade. Road cut slopes would not exceed 1:1. Embankment (fill) slopes would be 3:1 where possible, with a 2:1 maximum slope.

The proposed access road would generally follow the horizontal and vertical alignment of the existing primitive road to minimize overall construction impacts. As with the existing road, the proposed road for Alternative 3 would be sinuous with several switchbacks to provide a steady road grade through the existing steep terrain. In some locations, the minimum horizontal radius for the road centerline would be less than the minimum radius of 82 to 110 feet that is preferred for residential roads with a 15 mph speed limit (*Road Standards: Excerpts from BLM Manual Section 9113*, 1985). Consequently, the road would be posted with a 10 mph speed limit.

Two sections of the existing BLM Road 119 have a longitudinal slope that exceeds 16 percent, the maximum recommended for BLM “Resource” roads. These sections would be reconstructed for the proposed road with slopes of less than 15 percent. In steep sections of the proposed access road, the slope limits could extend beyond the limits of the proposed roadway easement. In these sections, retaining walls may be appropriate along the road shoulder to minimize the construction impact from excessive cut or fill slopes.

With the relatively steep existing terrain, a preliminary storm drainage analysis and erosion plan were prepared to estimate surface runoff impacts from a 100-year frequency design storm event. Recommended drainage improvements to convey runoff include parallel roadside cut ditches and drainage structure crossings. Erosion control features would include channel lining with appropriate materials, check dams, permanent slope stabilization, and re-vegetation measures as part of the road improvements. These measures would help to mitigate erosion and sedimentation impacts during high-intensity storm events. In addition, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared to address erosion concerns related to road improvements in detail.

The environmental consequences of Alternative 3 are discussed in Chapter IV.

4. Alternative 4 (Preferred) – Gated Access and Improve the Road to a “Modified Resource Road” Standard

As a result of input received at the public scoping meeting, another alternative was developed. This alternative would consist of improving the road to a condition passable by most vehicles; however, it would be considered a “Modified Resource” road not subject to the higher construction standards of a “Resource” or “Local” road. To allow this “Modified Resource” road to function under safe and low-maintenance conditions and also achieve BLM’s planning goal of limiting general access to the region, access would be restricted with a gate located at a mutually agreeable location along the “Modified Resource” road. The gate would limit access to non-vehicular users and specific BLM and EAC permitted users. This alternative would address many of the concerns raised by the public at the scoping meeting about their continued ability to access the area around the EAC property for hiking, mountain biking, horseback riding, and resource collection (with BLM permits). In order to allow access to the public lands beyond the EAC property, the owners would grant an easement to the BLM for non-vehicular use. The easement on the EAC property would be a mutually agreeable location on the property to be determined by BLM and EAC, and would be constructed by the BLM.

The “Modified Resource” road design on BLM property would be similar to the “Resource” standard as described above, with some exceptions described below.

- Although the road centerline proposed for the “Resource” standard design would generally be maintained, some turning radii would be reduced somewhat to reduce the area of impact on the ground.
- Less area for passing would be constructed because there would be fewer vehicles on the road at any time; however, there are a number of existing turn outs that could continue to be utilized.
- The “Modified Resource” road design would generally have less cut and fill areas; however, the maximum slopes of less than 15 percent would be maintained.
- Less base course material (4 inch depth) would be used to surface the road, since fewer vehicles would drive on it.
- The road sub-grade and surface material would be compacted in accordance with standard construction practices; however, compaction testing required for public roads would be eliminated.

The “Modified Resource” road design would maintain the drainage improvements proposed for the “Resource” road design. In accordance with the National Pollutant Discharge Elimination System process of the Clean Water Act, a storm water pollution prevention plan (SWPPP) would be prepared to control erosion and downstream sedimentation during and after construction.

The final design of the “Modified Resource” road will be subject to BLM approval; however, a new set of formal engineering plans will not be prepared and the “Modified Resource” road design will be based on the “Resource” road plans. Because this road alternative is an appropriate level of design for the proposed uses of the EAC property and generally reduces

costs and impacts to the land, this alternative is **considered the preferred project**. The environmental consequences of Alternative 4 are discussed in Chapter IV.

5. Alternative 5 – No Build Alternative

The no build alternative is also possible; however, it would not provide acceptable access to the EAC property. This alternative is **not preferred** but is considered for comparison purposes.

CHAPTER III – AFFECTED ENVIRONMENTS

A. INTRODUCTION

The environmental resources evaluated in this document include topography and geology, land use, farmland, floodplains, wetlands, surface water, groundwater, biological resources, vegetation, noxious weeds, wildlife, migratory birds, threatened and endangered species, cultural resources, socioeconomic and environmental justice issues, public health and safety/environmental inspection, air quality, transportation, visual impacts, and noise.

B. GENERAL ENVIRONMENT

Location

The proposed EAC home site is located on a 640-acre tract, approximately five miles southwest of the community of Dixon, New Mexico, in Rio Arriba County. The meandering existing BLM Road 119 follows a prominent ridge on the easterly end of the mesa. It climbs approximately 750 feet from the entrance road intersection at NM 75 to the property, which is located at the top of the mesa (La Mesita) (TEC 2007).

History

Two communities with significant history, Dixon and Embudo, New Mexico occur in the area near the proposed project location. Historical accounts for these communities are provided in the following paragraphs.

The community of Dixon was settled by Spaniards in the 17th century and called *Embudo*. Two explanations exist for the name of this locality, which was once the site of an Indian pueblo. One is that the settlement received the name from 17th-century Spanish settlers because the Rio Grande here is funneled between the steep walls of a gorge. The other explanation is that the village was named for its proximity to Embudo Creek, a stream that flows through a gorge of its own to the Rio Grande just west of this community. In the will of Juan Francisco Martin, the village is called *San Antonio del Embudo*. When the Denver & Rio Grande Railroad (D&RG) built a station near the Rio Grande about 2 miles west of the village, the railroad called the station Embudo, which caused great confusion. This led to the old Embudo settlement being renamed Dixon, in honor of the area's first school teacher, Collin Dixon.

The present settlement of Embudo is not the original one; that older settlement was renamed Dixon as stated previously. A settlement sprang up around the D&RG Railroad station named Embudo. The complex of railroad structures on the west bank of the Rio Grande is now known as the Embudo Historic District. The Embudo Gaging Station is also a part of the district. In 1889 John Wesley Powell, the famous explorer, established the original station, the first of its kind anywhere, for the USGS. The present station still measures the flow of the Rio Grande here. The locality now known as Embudo appears on some maps as *La Cienaga*, with Embudo simply the post office, though on other maps La Cienaga appears as a “suburb” of Embudo, just north of NM 68 (Julyan 1996).

Climate

The climate for the proposed project area is described as semi-arid. Average annual total precipitation is 9.88 inches. Most of the precipitation is rain from brief but intense thunderstorms occurring in the summer months, particularly July and August. Average annual maximum and minimum temperatures are 68.2°F and 34.0°F, respectively. According to the weather station in Alcalde, New Mexico, the prevailing wind is from the southeast. Alcalde is approximately ten miles southwest of the proposed project location and the closest weather station on record. Wind speeds over the state are usually moderate (an average annual wind speed of 10 mph occurs at the Santa Fe airport) although strong winds and wind advisories do occur particularly in advance of thunderstorms (NMCC 2003, WRCC 2005).

Topography, Geology and Soils

The topography of the proposed project vicinity includes broad mesas, extensive talus hill slopes, narrow valleys, and dissected bajadas to the south. Tertiary basalt and andesite lava flows and colluvial and alluvial Quaternary deposits characterize the surface geology. The entire project area is located on La Mesita, a large, flat mesa capped with Tertiary basalt and andesite lava flows of the Servilleta Formation. The slopes of La Mesita primarily consist of large, blocky colluvial and landslide deposits from the Tertiary Period. These colluvial deposits overlay earlier Tesuque Formation deposits from the Lower and Middle Santa Fe Group. Sandstones, conglomerates, and mudstones make up the Tesuque Formation.

The project area is part of a much larger neotectonic and volcanic region that extends from the San Luis Valley of southern Colorado to Mesa Chivato west of the Albuquerque Basin. The center of this region is defined by the Jemez Mountains with the Taos Plateau defining the northern portion. This region of volcanic fields extends along a large fault zone roughly paralleling the northern Rio Grande.

One smaller fault, the La Mesita fault, extends from southwest to northeast across La Mesita. It is a normal left-lateral fault that offsets the basalt flows on La Mesita by 50 to 60 meters and provides a break in the steep hill slope and cliff topography on the north side of the mesa. The existing BLM access road leading from NM 75 to the top of La Mesita roughly parallels this fault. The La Mesita fault has not resulted in development of an analogous break in the hillslopes and cliffs on the south side of the mesa.

The top of the mesa (La Mesita) is capped by the Cisneros Basalt, a Quaternary period basalt flow layer from the Hinsdale Series characteristic of the Taos Plateau to the north and the Black Mesa to the west. This basalt layer, ranging in thickness from 50-200 feet, forms the prominent cliff around the perimeter of the mesa where the EAC property is located. At the base of the basalt ridge is a talus slope comprised of large basalt boulders mixed with thin sections of debris flow and alluvium. The basalt layer has prominent normal faults typically aligned in a north-south direction. Slopes at the proposed project location range from 5 percent to more than 50 percent.

Soil resources in the project area consist of three soil types: Chita loam, Florita-Rock outcrop complex, and Tinaja-Rock outcrop complex. Chita soils are located on the 0 to 5 percent slopes; typical of the majority of the top of La Mesita. The soil is well drained with moderately slow permeability. The runoff class is low and depth to a restrictive feature is greater than 60 inches. Chita loams are moderately prone to sheet, rill, and aeolian erosion. Florita sandy loams are located on 2 to 45 percent slopes. The soil is well drained with moderately rapid soil permeability. Available water capacity is moderate and the runoff class is medium. Florita soils are highly prone to aeolian erosion. Tinaja gravelly loams are located on slopes ranging from 45 to 75 percent. This soil type is widely distributed throughout the project area, comprising the dominant soil type on the talus and scree slopes flanking La Mesita. This soil is well drained and the runoff class is high. Soil permeability is moderate and Tinaja soils are highly prone to aeolian erosion (TEC 2007).

Table 1 presents a summary of the soil units found in the proposed project area, with associated characteristics. A soil map for the project area from the Natural Resources Conservation Service (NRCS) is included in Appendix C (NRCS 2007).

Table 1: Soil Characteristics within the Project Area

Soil Unit Name	Slope	Drainage Class Rating	Runoff Class	Erosion Potential
Chita Series	0 to 5 percent	Well drained	Moderately slow	Moderate
Florita Series	2 to 45 percent	Well drained	Moderately rapid	Medium
Tinaja Series (project majority)	45 to 75 percent	Well drained	High	High, especially for wind

(NRCS 2007)

Land Use

The proposed road improvements are within an area that is covered by the BLM’s Taos Resource Management Plan (RMP) (1988), although the EAC property is in private ownership. Generally, the RMP establishes areas of limited or restricted use (for example environmental protection, mining, or grazing), and management directions.

As it relates to the EAC property, the 1988 RMP was largely superseded or amended by the RGCFP prepared by the BLM in January 2000. This plan established a Lower Gorge Area of Critical Environmental Concern (ACEC), which has a planning area that encompasses the proposed road improvements and part of the EAC property area (see Figure 2). The EAC property falls within the Bosque segment of the Lower Gorge ACEC; however, the access road and EAC area are outside the Wild and Scenic River designation and Rio Grande Bosque Wilderness Study Area (WSA) located along the river.

Only one grazing allotment exists in the Lower Gorge ACEC, to the west of the EAC property, and no mineral leasing is permitted. The project road currently provides access to this nearby grazing allotment.

BLM land at the proposed project site is currently managed for access by public users for a variety of activities including firewood collection, surface mineral collection, hiking, biking, horseback riding, and hunting.

Farmland

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978 (NRCS 2007).

Of the three soil types classified for the proposed project area in Table 1, none are described by the NRCS as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland.

There are no formally classified lands in the proposed project area. The nearest classified lands to the project site include the Wild and Scenic River designation and Rio Grande Bosque WSA located along the river. There would be no impacts to any formally classified lands as a result of the proposed project.

7. Floodplains

Executive Order 11988 "Floodplain Management" requires that any potential impacts to floodplain areas be studied, assessed, and identified to reduce the risk of flood loss and to minimize the impacts to the beneficial values served by floodplains. Planning for the proposed project requires that construction activities be compatible with floodplain areas and that impacts and mitigation measures are identified as needed. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Rio Arriba County were consulted to identify floodplains within the project area. The appropriate FIRM panel that shows the flood zone designation for the project site is in Rio Arriba County, NM, Unincorporated Areas, Panel No.350049 1070 B, 1/5/89.

FEMA flood insurance maps display the zone designations for any given community according to areas of designated flood hazards. The zone designations include four general categories for assessment of flood risk. These include Moderate to Low Risk Areas, High Risk Areas, High Risk-Coastal Areas, and Undetermined Risk Areas (NFIP 2006).

The flood zone map for the proposed project area is designated as Other Areas: Zone X – Areas determined to be outside of 500-year floodplain. Zone X is in the lowest flood risk category (Moderate to Low Risk Areas), and typically includes areas outside the 1% annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1

foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No base flood elevations or depths are shown within this zone, and insurance purchase is not required (NFIP 2006).

Based on this information, it was determined that there would be no occupancy of or modification to floodplains. No floodplains exist at the proposed project site, and no flood hazard areas would be affected by construction activities.

8. Wetlands

Jurisdictional wetlands, those protected under Section 404 of the Clean Water Act (CWA) and Executive Order 11990, have three essential characteristics:

- Dominance by hydrophytic vegetation
- Hydric soils
- Wetland hydrology

Hydrophytic vegetation requires inundated or saturated soils. Hydric soils are ponded or flooded for a sufficient time during the growing season to develop anaerobic conditions. Wetland hydrology is the availability of surface water or groundwater to create a wetland environment.

It was determined during field surveys and background research that no wetlands occur within the proposed project area and no wetlands would be impacted or affected by the proposed project (USFWS 2007).

9. Surface Water

Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. (USEPA 2007). Any stormwater discharges associated with construction activities that result in the disturbance (or re-disturbance) of one or more acres of land shall be conducted under NPDES Construction General Permit (CGP) guidance.

The New Mexico Environment Department (NMED) Surface Water Quality Bureau and the USACE were both consulted during the production of the EA for the proposed project. These agencies were provided with a description of the project to give them an opportunity to respond with any concerns or issues they may have in regards to potential impacts to surface water features in the region. The NPDES permit includes provisions for a SWPPP, managed through NMED, which has been completed for the project at this time (SFE 2007). Standard Best Management Practices (BMP's) to prevent on- and off-site erosion and concurrent storm water pollution from construction would be incorporated into contract specifications and are part of the SWPPP. Implementation of the SWPPP will serve to mitigate potential surface water impacts and is a commitment of the EA.

The National Map from the USGS was used to assess presence of surface water resources that could occur or be impacted by construction activities for the proposed project. A copy of the map is provided in Appendix C (USGS 2005).

The National Map shows that the major perennial surface water features nearest to the proposed project area are Embudo Creek to the northeast, and the Rio Grande River to the north. Both are outside of the project area and should not be impacted by construction activities as long as erosion control practices presented in this EA and in project design documents are followed.

Although BLM Road 119 follows a prominent ridge from NM 75 up to the EAC property, two significant ephemeral drainage basins occur on either side of the road alignment through BLM property. Surface runoff in these steep drainage basins characteristically has a short time of concentration, resulting in high-velocity peak flows, especially during high-intensity thunderstorms.

Twelve unnamed ephemeral arroyos cross the proposed project road alignment. In addition, one artificially improved waterbar to improve drainage was observed on the access road. All of the arroyos would be affected by construction activities for the access road to the EAC property (USGS 2005). No other surface water features would be affected by the proposed project. The twelve arroyos and one artificial waterbar are represented on the map in Figure 4, followed by representative photographs of some of these waterways within the proposed project area in Figure 5. Map locational data for the arroyos are available upon request from TEC.



Figure 4: Aerial View of Surface Water Features on BLM Road 119.



Arroyo DR-3



Arroyo DR-6



Artificial Waterbar



Arroyo DR-12

Figure 5. Representative Photographs of Surface Waterways at Project Location

10. Groundwater

The groundwater aquifer system at the proposed project site occurs in unconsolidated sediments and is known as the Rio Grande aquifer system of southern Colorado and central New Mexico.

The Rio Grande Rift is the principal geologic feature of the area. The rift affected the configuration of the bounding highlands, which in turn has affected precipitation, runoff, groundwater recharge, source material of the basin fill, aquifer characteristics, and water quality.

Surficial aquifers, such as the Rio Grande, occur primarily at shallow depth in unconsolidated sediments along parts of major river valleys. Individual stream-valley aquifers are mostly small and separate from aquifers in other valleys or from distant aquifers in the same valley.

The Rio Grande aquifer system generally consists of unconsolidated gravel, sand, silt, and clay, or partly consolidated sedimentary or volcanic materials. These materials have filled deep fault-block valleys formed by large vertical displacement across faults. Mountain ranges that generally consist of impermeable rocks separate adjacent valleys. When mountains encircle a valley, the aquifer in the valley is isolated, and groundwater is contained within the valley. However, most valleys are interconnected, and groundwater moves from valley to valley through the interconnected network of aquifers. The Rio Grande aquifer system extends southward beyond New Mexico into Texas and Mexico.

Recharge to the Rio Grande aquifer system primarily originates as precipitation in the mountainous areas that surround the basins. Runoff from snowmelt or rainfall enters the basins and generally flows for short distances across permeable alluvial fans before the water percolates downward through streambeds or evaporates. If the volume of runoff is large or becomes part of a perennial stream, groundwater recharge can be distributed through a much longer reach of stream channel. Some of the precipitation in the mountains supplies water to bedrock aquifers that were formed by fractures or permeable layers in the bedrock. The bedrock aquifers can discharge water directly to the basin-fill aquifer in the subsurface at the mountain front or discharge water to base flow in mountain streams that subsequently recharge the basin-fill aquifers near the mountain front. Such recharge from precipitation in mountainous areas is termed "mountain-front recharge" and is distributed along the mountainous boundaries of most basins. Larger quantities of recharge generally occur along the higher mountains in the northern parts of the aquifer system (USGS 2007).

11. Biological Resources

A survey and subsequent Biological Report (BR) was completed by William Widener with Parametrix, Inc. on September 28, 2007 for the proposed project, and a copy is provided in Appendix B. This survey was conducted in order to describe the general biological properties of the area and determine the potential presence of federal or state listed species that might be affected by the proposed road improvement. The easement was completely surveyed, including a 25-foot buffer on either side of the proposed road. A list of federal and state endangered, threatened, and species of concern plants and animals was obtained for Rio Arriba County and the area surveyed for their presence. This information includes the distribution and habitat requirements for these species, and includes a determination of habitat occurrence for each species. The area was also surveyed for any Class A, B, and C noxious weeds as designated by the New Mexico Department of Agriculture (NMDA). Observations of wildlife and plants present during the survey were also noted and are listed in the BR (Parametrix 2007).

Vegetation:

The project area occurs at an elevation between 5,910 and 6,600 feet above mean sea level. The requested easement is situated in the *Pinus edulis* - *Juniperus monosperma* / *Artemisia tridentata* / *Bouteloua gracilis* association of the Colorado Piñon - One-seed Juniper Series of Woodland and Savanna vegetation, as classified by Dick Peddie (1993). The plant community in this area is best characterized as having a sparse overstory dominated by one-seed juniper (*Juniperus monosperma*) and piñon pine (*Pinus edulis*); the understory is dominated by big sagebrush

(*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), broom snakeweed (*Gutierrezia sarothrae*), and blue grama (*Bouteloua gracilis*) (Parametrix 2007).

Some vegetation within the proposed project alignment may be damaged or have to be removed during construction activities. Localized impacts to these individual plant species would be expected from construction but this would not adversely impact the plant community as a whole. This is especially relevant when considering the relatively small amount of new projected ground disturbance for the proposed project, since most of the area was previously disturbed from the existing road.

Disturbances to the plant community from construction activities will depend on the type, extent, location of work, and the preventative measures implemented. Mitigation measures are discussed in Chapter V. If these recommendations are followed, it can be expected that the proposed project would have minimal impacts to vegetation.

Noxious Weeds:

The State of New Mexico under the administration of the Department of Agriculture lists certain weed species as being noxious. “Noxious” in this context means plants not native to New Mexico that have a negative impact on the economy or environment and are targeted for management and control.

No class A or B noxious weeds were observed at the site. Three class C noxious weeds were identified at the site. A small population of both Siberian elm (*Ulmus pumila*) and saltcedar (*Tamarix chinensis*), each consisting of less than ten individuals, was observed. Additionally, two small patches of jointed goatgrass (*Aegilops cylindrica*), each being smaller than 100 square-feet in area, were observed. All occurrences of class C noxious weeds occurred in, and adjacent to, the eastern 200-foot section of roadway adjacent to NM 75. Class C listed weeds are common, widespread species that are well established within the state. Management and suppression of Class C weeds is a local option. These populations should be treated before construction begins, in order to avoid spreading noxious weed seeds the entire length of the roadway (Parametrix 2007).

The prevention of spreading noxious weed growth should be a planning and management priority prior to the construction of the proposed project. Mitigation measures are discussed in Chapter V.

Wildlife:

Wildlife species are dependent on the habitat that supports them. It is reasonable to assume that historic trends in vegetative communities will guide the general trends and existing conditions for wildlife populations. Habitat available to wildlife at the proposed project location is in a native or natural condition for the most part, having been in BLM management for a number of years. Impacts from the existing dirt road have already been experienced by the surrounding habitat, with associated effects to wildlife species distribution and population densities. Also, the affected environment for wildlife can vary depending on the species in question. For example,

migratory birds could be permanently influenced by road improvements for the entire project, while short segments of excavation for road installation might temporarily displace small rodents. For the purposes of this EA, all of the project features were considered in analyzing the affected environment as it relates to the wildlife species that could occur in this area.

Common wildlife taxa that could be seen at the project site and in pinyon-juniper woodland habitat include but are not limited to large mammals such as mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*); small mammals including deer mouse (*Peromyscus maniculatus*), long-tailed weasel (*Mustela frenata*), porcupine (*Erethizon dorsatum*), wood rat (*Neotoma albigula*), pocket gopher (*Thomomys bottae*), long-tailed vole (*Microtus longicaudus*), and cottontail (*Sylvilagus audubonii*); birds such as the northern pygmy-owl (*Glaucidium gnoma*), olive warbler (*Peucedramus taeniatus*), red-faced warbler (*Cardellina rubrifrons*), hepatic tanager (*Piranga flava*), mountain bluebird (*Sialia currucoides*), pygmy nuthatch (*Sitta pygmaea*), white-breasted nuthatch (*Sitta carolinensis*), Steller's jay (*Cyanocitta stelleri*), red-shafted flicker (*Colaptes auratus*), goshawk (*Accipiter gentilis*), and red-tailed hawk (*Buteo jamaicensis*); and reptiles including the short-horned lizard (*Phrynosoma solare*) (Bailey 1995).

There were ten distinct species of wildlife observed in the proposed project area during field surveys at the site in 2007 as presented in the BR. None of these species are target species or listed as endangered, threatened or sensitive.

Although no federal or state-listed wildlife species or species of concern were observed during the field survey, habitat is present near the road alignment for two avian species and one bat species listed by the state as Threatened. This includes the American peregrine falcon (*Falco peregrinus anatum*), the arctic peregrine falcon (*Falco peregrinus tundrius*), and the spotted bat (*Euderma maculatum*). The affected environment for these species is discussed in more detail in the BR and in the following section for Threatened and Endangered Species.

Disturbances to wildlife from construction activities for the proposed project will depend on the type, extent, location and timing of work, and the preventative measures implemented. There may be some incidental mortality of small animals that use the current road easement. Most animals, however, would be expected to relocate into the surrounding area as the work is completed. Mitigation measures are discussed in Chapter V. If these recommendations are followed, it can be expected that road improvement activities would have minimal to no impacts on wildlife in the area.

Migratory Birds:

The Migratory Bird Treaty Act (MBTA) protects against the “taking” of migratory birds, their nests, and eggs except as permitted by the USFWS. No evidence of breeding bird activity was observed in the proposed project alignment. Unseen nests could be present in the junipers and piñons alongside the road. Some of these trees may need to be removed during the construction of the project (Parametrix 2007).

The scheduling of construction activities for the proposed project should consider the spring/summer breeding/nesting season for migratory birds. If construction activities are planned from March through August, then a nesting bird survey should be conducted by qualified

personnel before vegetation removal. If active nests are found, then vegetation removal in the immediate area is prohibited unless permit approval is obtained from the USFWS. Occupied nest sites should be avoided until nesting is complete. This serves to avoid impacts and comply with the requirements of the MBTA of 1918.

12. Threatened and Endangered Species

In regards to listed wildlife species, potential habitat is present at the proposed project location for two avian species and one bat species listed by the state as Threatened. The American peregrine falcon has the potential to occupy piñon-juniper woodland, especially in areas near water with large gulfs of air. The proximity of the project area to the Rio Grande Gorge provides such habitat. However, no individuals were observed during the survey, and no suitable nesting sites were present. Although habitat is also present for the arctic peregrine falcon, it is considered to be a rare migrant in New Mexico.

Additionally, Townsend's big-eared bat (*Corynorhinus townsendii*), the spotted bat (*Euderma maculatum*), western small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), long-eared myotis bat (*Myotis evotis evotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), long-legged myotis bat (*Myotis volans interior*), and Yuma myotis bat (*Myotis yumanensis yumanensis*) have the potential to occur in piñon-juniper woodland in the cracks and crevices created by the rocky terrain. All of these species are listed as BLM sensitive, and the spotted bat is also a state-listed Threatened species. Only piles of small boulders were adjacent to the road, creating areas of small cracks and crevices, where bats could potentially roost. Many large rocky outcrops, with larger crevices and potential caves, are present in the immediate vicinity. The project, as proposed, is not anticipated to destroy any cliff faces or other potential roosting sites. No impacts are anticipated for these species (Parametrix 2007).

In Rio Arriba County, six species of *Astragalus* are listed as "Species of Concern" for New Mexico, two of which (*A. oocalycis* and *A. puniceus* var. *gertrudis*) have suitable habitat in the proposed project area. One *Astragalus* species was found growing in the project alignment during field surveys at the site. However, without flowers *Astragalus* is an extremely difficult genus to identify to species. The BR provides a more in-depth analysis of the attributes of the *Astragalus* in question with those that are listed for the county. The *Astragalus* present in the project area is not one listed by the state. Suitable habitat is also present for Pagosa phlox (*Phlox pruinosa*); however, none were observed during the survey (Parametrix 2007).

Disturbances to protected wildlife and plant species from construction activities will depend on the type, extent, location, and timing of work, and the preventative measures implemented. Mitigation measures are discussed in Chapter V. If these recommendations are followed, it can be expected that the proposed project would have no adverse impacts on threatened or endangered species. For selected bird species, also refer to the recommendations for migratory birds.

13. Cultural Resources

A Class III, 100-percent pedestrian intensive cultural resources survey of the proposed project area was conducted by TEC on 30 November 2007. Because of the small-scale nature of the

undertaking, and to satisfy the BLM guidelines, TEC surveyed a 15-meter (50-foot) buffer around the proposed road improvements. This larger area was considered the area of potential effects (APE). The total survey area/APE consists of 21.1 acres consisting exclusively of BLM property.

No archaeological sites, historic buildings, acequias, historic districts, or cultural landscapes were identified within the APE. However, three isolated manifestations (IMs) were documented by TEC. These resources have not, and likely will not provide information to better our understanding of prehistory or history. Therefore, subject to consultation and comment, the three IMs are recommended as not eligible to the National Register of Historic Places (NRHP).

The Archaeological Records Management Section (ARMS) and BLM databases indicate that a number of sites are located within the general project vicinity; however, only one is located within 1000 meters (3281 feet) of the current APE. This site, LA 47699, consists of a PIII sherd and lithic scatter. Although two petroglyphs were identified in the vicinity of LA 47699 (Clifton 1984) (and on other escarpments in the area; Williams personal communication 2007), none were identified within the current APE.

As well, two previous cultural resource inventories were identified during the BLM and ARMS file searches. The first, drafted by the New Mexico State Highway Department (Clifton 1984), covered less than 1 acre of the current APE and was centered on two borrow pit locations. Clifton (1984) identified one site (LA 47699) and two petroglyphs. As stated above, neither is near the current APE. The second inventory (NMCRI 35891; Williams 1991) covered a large portion of the current project area, as the BLM inventoried the existing two-track roadway for upgrading in 1991. During this inventory, no cultural resources were identified (Williams 1991).

14. Socioeconomic and Environmental Justice Issues

Improvements to BLM Road 119 for the proposed project are intended to provide access to private property through BLM administered land. The access road has been in place prior to the current planning process for proposed improvements. The BLM Taos Field Office has maintained the road in a primitive state to provide access to public land by the surrounding community for activities such as firewood collection, hunting, horseback riding, and hiking. EAC has committed to maintaining access to public land, in cooperation with the BLM, following completion of the road improvements. Construction activities to improve the road would be short-term and temporary. The character of the community is not expected to change as a result of the proposed project, and no adverse impacts to land uses are anticipated. Improvements would occur along an existing road right-of-way on BLM land with no existing structures adjacent to the road, and no displacement of homes or businesses or changes to zoning or rights-of-way. Some barb wire fencing and vegetation extending into the proposed project alignment would be impacted. Notification and coordination with the property owner (BLM) will take place before construction commences.

Environmental justice (EJ) is defined by the USEPA as the fair and meaningful involvement of all people regardless of race, color, national origin, or income with respect to development, implementation, and enforcement of environmental laws, regulations, and policies. The goal of

fair treatment is not to shift risks among populations but to identify potential disproportionately high or adverse impacts and to identify alternatives to mitigate those impacts. Under Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” it is federal policy to avoid disproportionately high or adverse impacts on minority and low-income communities.

The USEPA maintains a website to assist users in obtaining demographic and economic data for any given project area to assess impacts to EJ. The Environmental Justice Geographic Assessment Tool was used to derive pertinent information for EJ impacts at the proposed project location near Embudo, New Mexico. Environmental parameters obtained from the USEPA include population density, percent below poverty, and percent minority for each census block. Maps provided by the EJ Geographic Assessment Tool are part of the administrative record for this EA and are available upon request from TEC (USEPA 2008).

The project site is rural in nature and historically has had low population densities. Most of the area around BLM Road 119 (proposed project alignment) portrayed population densities of between 0 and 100 individuals per census block, the lowest category. A small linear strip along the Rio Grande at Embudo showed a slightly higher density, or between 100 and 2000 individuals per census block, the second lowest category and in an area not directly adjacent to proposed project activities.

The percent of the local population below poverty level by census block at the proposed project location was uniform for the entire area mapped. The percent below poverty fell into the second lowest category from the USEPA, between 10 and 20 percent of the population in the census block at the proposed project site.

Percent of the local population considered minority by census block at the proposed project location was relatively uniform, with most of the area mapped showing minority populations of between 20 and 30 percent, the third lowest category from the USEPA.

EJ values for the proposed project location indicate that low population density, a low percentage of individuals below poverty, and a relatively low percentage of minority population exists within the census block at the site. The proposed project would be conducted in a manner to ensure that there would be no discrimination because of race, color, income level, or national origin, in accordance with EO 12898. The proposed project would not have adverse or disproportional impacts on low income or minority groups.

15. Public Health and Safety / Environmental Inspection

A field inspection was conducted to investigate the possible presence of hazardous materials, otherwise known as recognized environmental conditions, in the project area in 2007. The inspection was based on the scope of the American Society for Testing and Materials (ASTM) E 1527-00 standard and included the on-site field inspection and an evaluation of available data.

Historical aerial photographs show that the proposed project area has largely remained undeveloped and managed by the BLM for public use. BLM Road 119 also has been in existence at the location for some time, providing access for use of the surrounding public land. No other

residential or commercial development, utilities, roads or any other infrastructure have occurred at the proposed project location. Since the project site appears to have been historically maintained in a natural state, past or current storage or releases of chemical products or wastes typically associated with recognized environmental conditions are not expected.

There are no known or reported environmental conditions attributed to waste dumping or releases of chemical or petroleum products at the proposed project location. Field surveys at the project site revealed no evidence of stained soil, vegetation with abnormal growth, strange odors or liquids, exposed pipes or any containers that would indicate the presence of any abandoned waste sites or areas of uncontrolled hazardous waste contamination at the surface or underground.

It is possible that the nearby communities of Embudo and Dixon could have listed sites of known recognized environmental conditions, such as gas stations or material storage facilities, but these sites would be outside of the immediate influence of road improvement activities for the proposed project.

In summary, there are no known recognized environmental conditions attributed to facilities or past land uses in the proposed project area. It is unlikely that any recognized environmental conditions would be encountered during construction of road improvements since the area and road are managed by the BLM and historically have been relatively undisturbed; however, in the event that contamination is encountered in the subsurface during ground disturbance excavation (e.g. any unusual odors, liquids, materials, or stained soils) then appropriate response procedures would need to be readily available. This includes work area controls, notification instructions, and subsequent investigations to determine the source and any appropriate response measures.

16. Air Quality

Air quality refers to the composition of air with respect to quantities of pollutants and is routinely compared with “standards” of maximum acceptable pollutant concentrations. Air quality in a given location can be described by the concentration of individual pollutants in the atmosphere and is generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Data used to determine impacts to air quality is based on pollutant concentrations, usually defined as criteria pollutants, from the National Ambient Air Quality Standards (NAAQS).

Under the authority of the Clean Air Act (CAA), the USEPA established NAAQS to protect public health and welfare, with an adequate margin of safety. NAAQS were developed for one or more of seven criteria pollutants, including lead (Pb), nitrogen oxide (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter 10 microns or less in size (PM₁₀), particulate matter 2.5 microns or less in size (PM_{2.5}), and ozone (O₃).

The USEPA has classified all areas of the U.S. as either meeting the NAAQS (in attainment), or not meeting the NAAQS (in nonattainment) for each individual criteria pollutant. Under the CAA, state and local agencies may establish air quality standards and regulations of their own, provided they are at least as stringent as the federal requirements. The CAA amendments of 1990 established a framework for achieving attainment and maintenance of the health-protective NAAQS.

The affected environment for inert pollutants (all pollutants other than ozone and its precursors) is generally limited to a few miles downwind of a source. For PM₁₀ particulate matter emissions from construction and operational activities, such as the ones anticipated from road improvement for the proposed project, the affected environment is limited to the area immediately surrounding the construction site.

The USEPA's "Green Book" (EPA 2005a) lists all of the nonattainment areas in the U.S. by criteria pollutant, state, population, and number of counties affected. The Town of Anthony is the only nonattainment area listed for the State of New Mexico. It is reported as having moderate levels of PM₁₀, affecting approximately 3,000 people in Doña Ana County.

The NMED air quality bureau classifies the air quality in the proposed project area as in attainment under the CAA. This means that the air quality in the proposed project area does not exceed acceptable levels of the NAAQS criteria pollutants per USEPA standards. The NMED lists the following nonattainment areas for the State of New Mexico: (1) O₃ in the Town of Sunland Park, Doña Ana County; (2) PM₁₀ in the Town of Anthony, Doña Ana County; and (3) SO₂ in Grant County. Two other areas meet air quality standards by a slim margin: Doña Ana County (PM₁₀ NAAQS) and San Juan County (8-hour ozone NAAQS) (NMED 2005).

In summary, areas currently listed by both the USEPA and the NMED for NAAQS nonattainment in New Mexico include regions or towns in both Doña Ana and Grant Counties. The proposed project area in Rio Arriba County is in NAAQS attainment.

Greenhouse Gases (carbon dioxide emissions)

As with any field of scientific study, there are uncertainties associated with the science of climate change. This does not imply that scientists do not have confidence in many aspects of climate science. Some aspects of the science are known with virtual certainty, because they are based on well-known physical laws and documented trends. Scientists know with virtual certainty that (USEPA 2007a):

- Human activities are changing the composition of Earth's atmosphere. Increasing levels of greenhouse gases like carbon dioxide (CO₂) in the atmosphere since pre-industrial times are well-documented and understood.
- The atmospheric buildup of CO₂ and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
- An "unequivocal" warming trend of about 1.0 to 1.7°F occurred from 1906-2005. Warming occurred in both the Northern and Southern Hemispheres, and over the oceans (IPCC, 2007).
- The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries. It is therefore virtually certain that atmospheric concentrations of greenhouse gases will continue to rise over the next few decades.
- Increasing greenhouse gas concentrations tend to warm the planet.

High energy prices and international instability motivated passage of the 2005 Energy Policy Act. In addition to comprehensive energy legislation, stand-alone bills have been introduced to directly address energy supply and demand issues.

With respect to proposed legislation to reduce greenhouse gas emissions, a common thread is their focus on energy supply and demand. This linkage is reflected in the current debate on these proposals. The corporate average fuel economy (CAFE) standard for passenger cars, appliance efficiency, renewable portfolio standard, and other proposals would have a direct effect on fuel demand and choice, if enacted. Likewise, proposals directly focused on CO₂ emissions, including multi-pollutant bills, are being debated with respect to their impact on energy policy (particularly with respect to effects on natural gas and coal demand).

Given that energy consumption is the dominant source of carbon dioxide emissions in this country, and a substantial source of overall greenhouse gas emissions, any reduction in energy consumption will likely lead to lower emissions. Energy-related activities are responsible for about 85% of the country's greenhouse gas emissions, and 96% of its carbon dioxide emissions. Any effective climate change policy directed at reducing greenhouse gas emissions has to deal directly with energy consumption and, thus, be integrated with energy policy. However, because at the present time energy supply and demand issues are seen as more pressing than climate change, the political climate has favored action on general energy legislation, as opposed to legislation specifically targeting climate change, as indicated by passage of the 2005 Energy Policy Act.

Climate change - as a specific issue needing a regulatory response - was debated during deliberations on the 2005 Energy Policy Act and recognized in passage of Senate Amendment 866 expressing the Sense of the Senate that Congress should enact a comprehensive and effective national program of mandatory, market based limits and incentives on greenhouse gases that slow, stop, and reverse the growth of such emissions. However, the effect of the 2005 Energy Policy Act on future greenhouse gas emissions is unclear, and specific action on the issue will depend on efforts to enact the national program called for in Senate Amendment 866. If perceptions of the urgency of the climate change problem increase, either due to further research and understanding of the issue and its risks, or from an empirical event such as an abrupt change in climate, the need to reintegrate the energy-climate change policy debate might have to be considered (CRS 2007).

The State of New Mexico currently has regulations for Green House Gas Mandatory Emissions Inventories, with Emissions Quantification Procedures (20.2.73 New Mexico Administrative Code [NMAC] and 20.2.87 NMAC, Emissions year: 2008). This legislation provides data requirements and calculation methods for greenhouse gas emissions from cement plants, electric generating facilities and retail providers and marketers, cogeneration facilities, petroleum refineries, hydrogen plants, general stationary combustion facilities, and multiple types of energy facilities in the state.

The USEPA maintains a database titled 'CO₂ Emissions from Fossil Fuel Combustion in Million Metric Tons of CO₂.' This database provides estimated CO₂ emissions by state for the years 1990 through 2004 for commercial, industrial, residential, transportation, and electric power sources. New Mexico produced an estimated 58.32 million metric tons of CO₂ in 2004. The lowest CO₂ producer for 2004 was Vermont with 7.01 million metric tons, and the highest CO₂ producer for 2004 was Texas with 688.4 million metric tons. The median value for 2004 CO₂ production was 86.73 million metric tons. New Mexico's CO₂ production was lower than the median value, and thirty-four states (68 percent) in the database produced higher CO₂ emissions than New Mexico in 2004. (USEPA 2008a).

17. Transportation

BLM Road 119 is currently used as a primitive access road for BLM resource and recreational users. The road is one of the only ways to access the top of the mesa, and users must cross the EAC property to gain access to adjacent BLM land on the mesa top. Resource and recreational users conduct a variety of activities on the access road and at the top of the mesa including livestock grazing, wood gathering, hunting, biking, and hiking. EAC has committed to maintaining BLM Road 119 for permitted user activities, users would have to obtain a key for the proposed gate at the bottom of the road for access. EAC will also allow permitted users to cross a portion of their private property to continue to access adjacent BLM land on the mesa top. Following road improvements proposed for the project, user access would likely improve because of better road conditions. An increase in traffic on BLM Road 119, as well as NM 68 and NM 75, would also occur from construction and resident activities at the EAC property.

18. Visual Impacts

Visual resources are based on an assessment and classification of visual landscapes or scenic views for their attractiveness and ability to provide recreational opportunities. The definition of this resource category includes what viewers like and dislike about visual resources that compose a particular scene. Different viewers may evaluate visual resources differently. Neighbors and travelers may, in particular, have different opinions on what they like and dislike about a scene. Viewers define visual quality in terms of natural harmony, cultural order, and project coherence. All lands administered by the BLM are managed to achieve some level of visual or scenic quality.

The BLM uses a Visual Resource Management (VRM) system to identify and manage scenic values on federal lands administered by that agency. The VRM system includes a visual resource inventory, which classifies visual resources on BLM land into one of four categories (Class I, II, III, or IV), and sets management objectives through the RMP process. The manner in which the four visual resource inventory classifications are determined is explained in BLM Handbook H-8410-1, *Visual Resource Inventory* and Handbook H-8431-1, *Visual Resource Contrast Rating* (BLM 1986). Table 2 provides information regarding the management objectives for the various VRM classes.

Table 2: VRM Classes and Management Objectives

BLM - Visual Resources Management Class	Management Objectives
Class I	Preserve the existing character of the landscape. Provides for natural ecological changes; however, it does not preclude very limited management activity. Level of change should be very low and must not attract attention.
Class II	Retain the existing character of the landscape. Level of change should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements found in the landscape.

BLM - Visual Resources Management Class	Management Objectives
Class III	Partially retain the existing character of the landscape. Level of change should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the landscape.
Class IV	Provides for major modification of the existing character of the landscape. Level of change can be high. Management activities may dominate the view and be the major focus of viewer attention; however, every attempt should be made to minimize impacts through location, minimal disturbance, and repeating basic elements found in the landscape.

The Taos Field Office of the BLM has classified the proposed project area at BLM Road 119 for visual resource management through the RGCFP. The project area is encompassed by the Lower Gorge ACEC designated in the RGCFP. VRM Class II was assigned to most of the Lower Gorge ACEC including the project location. This would indicate that road improvements for the project should retain the existing character of the landscape. Level of change to the viewshed should be low, and may be seen but should not attract the attention of the casual observer (BLM 2000).

The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape (BLM 2004). The affected visual resource environment for the proposed project is the area immediately surrounding BLM Road 119.

Visual impacts from the proposed project include removal of limited vegetation located along the edges of the alignment, soil cut and fill and water bars (ditches) to improve the road alignment and erosion control, and installation of gravel on the improved road. The removal of vegetation and soil cut and fill activities would be minimized to the extent possible. BLM Road 119 has already been in place with resultant impacts to local visual resources. In addition, the escarpment to the mesa top that this road traverses has a high level of topographic relief. It is very difficult to see the entire road from any angle at ground level, and most casual viewers would not be able to see more than about 200 feet of the road from various vantage points. Indeed, the only way to view the full length of BLM Road 119 is via aerial photographs (see photograph in Figure 4).

Road improvements at the proposed project location would comply with the VRM Class II designation for the site discussed in the RGCFP.

19. Noise

Noise impacts would consist of construction disturbances such as increased traffic noise and the sounds of heavy equipment and machinery. These impacts are unavoidable but would be temporary, and only during the construction period. Most of the road alignment is rural, with no immediately adjacent residents within sight or sound of construction zones. Machinery would be required to be in good working order with appropriate noise baffles to help reduce impacts. No

noise impacts are anticipated from the proposed project once installation activities are completed.

20. Energy

The original plans for the proposed project included provisions for a new primary underground electrical main to be installed along the access road within the road construction limits. This would comply with the BLM's requirements outlined in the RGCFP to co-locate utilities within the road alignment. Since then, EAC has indicated that it is considering a solar option for the residence and may not require an electric main within the road. An underground telephone service line may also be installed in the road alignment with or without the electrical main. Final locations of the underground electrical and/or telephone service lines will be determined with the final design of the road. No impacts to energy resources from the proposed project are anticipated (TEC 2007).

CHAPTER IV – ENVIRONMENTAL CONSEQUENCES

A. ALTERNATIVE 4 (PREFERRED) – GATED ACCESS AND MODIFIED RESOURCE ROAD IMPROVEMENTS

1. Introduction

The human and environmental resources potentially affected by the proposed project include topography, geology and soils, land use, farmland, floodplains, wetlands, surface water, groundwater, biological resources, cultural resources, socioeconomic and environmental justice issues, public health and safety/environmental inspection, air quality, transportation, visual impacts, noise, and energy. Effects are usually discussed as direct, which are caused by the proposed project and occur at the same time and place; and indirect, which occur later in time or farther removed in distance, but are still reasonably foreseeable and caused by the proposed project (*Code of Federal Regulations*, Section 1508.8). The direct and indirect effects of the project are addressed below for each resource, followed by a discussion of cumulative impacts.

2. Topography, Geology and Soils

The proposed project site has steep topography, with some soils exhibiting slopes up to 75 percent. Potential environmental consequences include excessive soil loss from erosion, primarily to the Tinaja Series soil unit, with subsequent changes in slope and topography within the project area for Alternative 4.

There would be no adverse, direct, or indirect impacts to geology as a result of this alternative. Most of the work would occur within an existing road bed, and depth of disturbance would be a maximum of six feet for utilities, and two feet for the road. The RGCFP from the BLM indicates that no mineral leasing will be allowed in the Lower Gorge ACEC and the project area for Alternative 4.

Topography would incur some direct impacts from cut and fill activities required for road improvements and drainage control, but these effects are expected to be minor. Adverse impacts to topography from this alternative are avoidable as long as BMP's presented in the SWPPP are followed. Steep terrain at the site has a medium-to-high erosion potential, and construction effects can be minimized utilizing the SWPPP.

Proposed improvement activities for this alternative would disturb approximately 2.64 acres of soil, but a majority of this (2.43 acres) was previously disturbed from the road. The remaining 0.21 acres would be new disturbance to project area soils including Chita loam, the Florita-Rock outcrop complex, and the Tinaja-Rock outcrop complex. The SWPPP outlines BMP's designed to limit the amount of soil potentially lost to wind and water erosion during and after construction activities for Alternative 4. Mitigation measures for this resource topic are provided in Chapter V.

Since the road improvements will disturb more than one acre of land, a SWPPP was prepared as required under the NPDES of the CWA. In conformance with the SWPPP, temporary and

permanent erosion and sedimentation control measures will be included in the construction plans for the final design. Implementation of the SWPPP is a commitment of this EA.

3. Land Use

There are no adverse impacts to land use anticipated as a result of Alternative 4. The project area is located on undeveloped land administered by the BLM, and the proposed improvements would directly affect about 2.43 acres of previously disturbed roadway, and approximately 0.21 acres of undisturbed land. This proposed project alternative is in compliance with the BLM RGCFP for the region, and no special management areas occur at the project site. No BLM grazing allotments occur at the project site, although the road does provide access to a nearby grazing allotment. A key for gate access at the bottom of the road will be provided to the current BLM range permittee for the nearby allotment.

Environmental consequences for this alternative include the conversion of about a fifth of an acre of land from public use to a restricted use “Modified Resource” road. Considering the total amount of land available for public use in context with the loss from the proposed project alternative, no severe impacts to local land use are anticipated from the improvements to BLM Road 119.

Recreation and Wilderness Resources

The objective of BLM’s recreation program is to ensure the availability of quality outdoor recreation opportunities and experiences that are not available readily from other sources. The RGCFP is designed to provide a balance between recreation uses, protection of resources, visitor safety, and the needs of local residents.

In the Lower Gorge planning area, most of the recreational management guidelines address boating in the Rio Grande. The plan states that public lands may be used for recreational pursuits that require little in the way of facilities, developments, or intensive management (for example wildlife and bird watching, rock collecting, camping, etc.). The plan indicates that casual recreational use was considered in the policies for vehicular use in the Lower Embudo area, and that trails are an important element in recreational use (TEC 2007). The plan identifies trails that will be maintained by the BLM; this alternative includes provisions for maintaining public access for permitted recreational uses. EAC has agreed to provide trail access across their property to BLM land that is currently accessed via BLM Road 119 (see Figure 1). There would be no adverse, short- or long-term, direct or indirect impacts to recreational and wilderness opportunities on public land following completion of construction activities for this alternative.

4. Farmland

Three soil types occur in the proposed project area for Alternative 4, and none are described by the NRCS as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Likewise, there are no formally classified lands in the project area. No farmland would be impacted by the proposed alternative, and there would be no environmental consequences to this resource as a result of road improvements.

5. Floodplains

Following a review of FEMA flood zones maps for the project site, it was determined that no floodplains exist within the area. There would be no occupancy of or modification to floodplains as a result of this alternative, and no environmental consequences to this resource following road improvements.

6. Wetlands

The proposed project area was surveyed for the presence of wetlands in 2007. Jurisdictional wetlands, those protected under Section 404 of the CWA and Executive Order 11990 and meeting the characteristics described in Chapter III.B.8, are not present in the project area. There would be no impacts or environmental consequences to wetlands as a result of the construction of this alternative.

7. Surface Water

Twelve ephemeral arroyos (surface waterways) were identified in the proposed project area. The arroyos are small in scope; the largest (DR-11) is actually the sum of two branches with a combined ordinary high water mark of approximately 4.6-foot width within the channel. All of them would be impacted directly by improvements to the road. The road would disturb about 15 feet in the channel, and the total combined width of the affected arroyos' channels is approximately 33.8 feet. Using an estimated 15-foot-wide road crossing within 33.8 feet of total arroyo channel gives an approximate impact area of 507 square feet or 0.01 acre. The environmental consequence to this resource by improving the road for this alternative would equate to 1/100th of an acre of disturbed fill in surface waterways.

Based on this information, twelve ephemeral waterways and one artificial water feature have the potential to be directly impacted by construction activities; sediment deposition (pollution) into these waterways would be avoidable as long as erosion control practices are in place during and after installation of the proposed project. No other direct or indirect impacts to surface waterways are anticipated. Mitigation measures designed to prevent impacts to surface water from the project are presented in Chapter V.

8. Groundwater

The depth to groundwater at the proposed project location according to the NMED Ground Water Bureau is 200 feet or less, although depths to groundwater levels are general in nature. One would expect that the depth to groundwater at the proposed project location would increase as BLM Road 119 goes up in elevation and eventually levels off at the EAC property. (NMED GWB 2003). According to the New Mexico Office of the State Engineer (NMOSE), a search of known water wells within a three-mile radius of the proposed project location indicated approximately 30 wells with minimum depth to water from the surface ranging from 2 to 134 feet deep. The average depth to water from the 30 surface wells provided by OSE is 25 feet. Well data from the OSE supports the concept that depth to groundwater from the surface becomes greater with increasing elevation at the proposed project location (NMOSE 2007). No water

wells occur immediately adjacent to BLM Road 119, and project activities would occur at the surface or at shallow depths that are highly unlikely to impact groundwater resources.

As part of the agency consultation process for this EA, the NMOSE was contacted to provide information and identify concerns about the proposed project. There would be no adverse, direct, or indirect impacts to groundwater as a result of this alternative.

9. Biological Resources

Vegetation:

Some vegetation within the proposed project construction area would be damaged or have to be removed during road improvement activities. Environmental consequences to vegetation resources would be localized. Direct effects to plants would occur from this alternative, but are not expected to adversely impact the plant community (piñon-juniper woodland) as a whole. This is especially relevant when considering the relatively small amount (0.21 acres) of projected habitat disturbance for Alternative 4. No indirect effects to vegetation from the proposed project are expected as long as mitigation measures presented in Chapter V are followed.

Noxious Weeds:

No class A or B noxious weeds were observed at the project site. Three class C noxious weeds were identified along the road alignment during surveys for the BR in 2007 including Siberian elm, saltcedar, and jointed goatgrass. Class C listed weeds are common, widespread species that are well established within the state. Management and suppression of Class C weeds is a local option. These populations should be treated before construction begins, in order to avoid spreading noxious weed seeds the entire length of the roadway. Mitigation measures for this resource are discussed in Chapter V.

Wildlife:

Construction of the proposed project is not expected to incur significant environmental consequences to wildlife species. Short-term impacts to wildlife as a result of the proposed project for Alternative 4 would include the immediate permanent loss of approximately 0.21 acres of piñon-juniper habitat due to previously undisturbed road improvements. Based on the total native habitat available to wildlife on surrounding properties and the region taken as a whole, cumulative impacts to wildlife in this ecosystem are expected to be minor. Exceptions would be smaller species such as rodents, reptiles, and insects that live underground or utilize the habitat within the road alignment. These species are not as mobile as larger animals and tend to use a limited area during their life cycles. Consequently, they are more likely to experience impacts from the proposed project. Long-term impacts to wildlife as a result of the proposed project would include the permanent loss of approximately 0.21 acres of piñon-juniper habitat along the road alignment. This impact is similar in scope to the short-term impact of habitat loss for wildlife and is considered minor in relation to the total amount of habitat available. Long-term impacts should be minor after implementation of vegetative reclamation following construction to help minimize habitat loss for wildlife. If the mitigation recommendations

provided in Chapter V are implemented, the proposed project would have minimal impacts to wildlife.

Migratory Birds:

No bird nests, either old or in use, were observed in the proposed project area for this alternative during field visits in 2007. Environmental consequences for migratory nesting birds at the project site would be indirect if construction occurs outside of the spring/summer nesting season since no nests were found, and direct if work occurs during the nesting season. Indirect effects would be limited to the removal of 0.21 acres of available nesting habitat for migratory birds; direct effects can be dismissed as long as mitigation measures provided in Chapter V are followed.

10. Threatened and Endangered Species

Environmental consequences were considered for listed species in the region. None of the threatened and endangered species that are likely to occur in the proposed project area for Alternative 4 were observed during 2007 site visits. Direct effects from road improvements to potentially occurring protected wildlife species would be avoidable using mitigation methods presented in Chapter V. Indirect effects would include removal of 0.21 acres of available habitat for growing/foraging/denning/nesting depending on the species, a minor impact based on the total amount of habitat available.

11. Cultural Resources

Based on the results of the current inventory, and subject to consultation and comment, the proposed EAC right-of-way will have *no effect* to any cultural resource listed, or eligible for listing, on the NRHP. No further investigations are recommended. However, if buried cultural deposits are discovered during project activities, work should cease immediately and the BLM archaeologist and the New Mexico State Historic Preservation Officer should be notified.

This recommendation of *no effect* was submitted to the BLM on December 18, 2007 (Parker 2007, TEC-2007-75). Pending concurrence by the BLM and the SHPO, the proposed undertaking will have *no effect* on registered or eligible properties.

12. Socioeconomic and Environmental Justice Issues

The primary economic impact for the proposed road is likely to be on the developer of the EAC property. Without reasonable access, the property's value for residential purposes will diminish. Improvements to the road would allow the owner to realize the use of the property. Economic impacts to the general public would be minor. No private property will be acquired or impacted. Construction may have some local beneficial effects on employment and money spent on materials and services.

The development of the road or right-of-way will not restrict access to the BLM land in the area. The road will continue to accommodate pedestrians and equestrians for primitive access and use (TEC 2007).

The proposed project area for Alternative 4 is on undeveloped BLM land, with no displacement of homes or businesses as a result of road improvements. The socioeconomic character of the community is not expected to change. Environmental consequences from the project for socioeconomic concerns include no direct or indirect effects.

After reviewing the EJ data from the EPA presented in Chapter III.B.14 for the proposed project area, it was determined that road improvement activities to BLM Road 119 would have no environmental consequences to EJ in the communities of Embudo and Dixon, New Mexico. The project area exhibits low population densities, relatively low percentages of population below the poverty level (low income), and although minority levels in the local population are moderate, they are uniform whether at or adjacent to project construction zones. Proposed road improvements for this alternative are not likely to have disproportionately high or adverse impacts on minority and low-income populations in the area.

13. Public Health and Safety / Environmental Inspection

A review of potential public health and safety issues and environmental inspection for the proposed project was completed in 2007 and is presented in Chapter III.B.15. There are no known recognized environmental conditions attributed to facilities or past land uses in the project area. It is unlikely that any environmental conditions involving hazardous materials would be encountered during construction of improvements to BLM Road 119, since it is managed by the BLM and this area has historically remained relatively undisturbed. Environmental consequences to this resource from implementation of Alternative 4 include no direct or indirect effects as long as mitigation measures presented in Chapter V are followed.

14. Air Quality

The proposed road improvements for this alternative would serve a low-density rural residential area. After construction, the residential traffic would consist primarily of passenger vehicles and occasional delivery trucks/vans. The total volume of traffic on the improved road with development of the EAC residence is estimated to be ten vehicles per day using standard trip generation rates for residential property (Trip Generation, Institute of Transportation Engineers). This volume of traffic would produce little air pollution. Emission levels from vehicles using the EAC road will be less than those using NM 75 and NM 68. Improvements include a road surface of 4 inches of compacted base course for this alternative, which would greatly minimize dust levels from traffic in the long term (TEC 2007).

The proposed project area is in attainment for all state and national ambient air quality standards. Environmental consequences to air quality from installation of this alternative would be limited to short-term direct effects from disturbed particulate matter (fugitive dust) during construction activities, which would cease upon completion.

Road improvements for the proposed project should not result in degradation of air quality in the region. Construction activities will incorporate dust suppression practices and mitigation measures described in Chapter V to prevent deterioration of air quality; fugitive dust from ground disturbance would be restricted to the immediate area around the construction site; and

impacts to air quality would be short-term and temporary in duration. No indirect or long-term effects to air quality are expected.

Greenhouse Gases (carbon dioxide emissions):

EAC has committed to building an ‘off-the-grid’ residential dwelling on their property for this alternative. CO₂ emissions from the new residence should be insignificant as long as renewable energy sources are explored and utilized during and after construction.

Greenhouse gas (CO₂) emissions for the proposed project would come from vehicle use both during and after construction of road improvements. The EPA provides an online tool titled ‘Greenhouse Gas Equivalencies Calculator’ which allows the user to enter data for various emission sources to estimate CO₂ produced (USEPA 2008b). Using an estimated 10 vehicle trips per day to the EAC property (from the previous section) and entering into the EPA calculator provides a result of approximately 54.6 metric tons of CO₂ produced from proposed project activities. New Mexico’s annual estimated CO₂ production in 2004 was approximately 58.32 million metric tons (from Chapter III.B.16 of this EA). The additional annual CO₂ emissions produced from this alternative in relation to the total annual CO₂ production for the state is about 0.00009 percent or 1/100,000 of the total.

Road improvements for the proposed project should not result in significant changes to greenhouse gas (CO₂) production in New Mexico. There are however, mitigation measures described in Chapter V to help reduce CO₂ production and slow climate change relating to this greenhouse gas.

15. Transportation

The proposed project would have no permanent impacts to any transportation facility; however, construction would have temporary impacts to state roads in the immediate area. Road improvements to BLM Road 119 for the proposed project may cause increased heavy equipment traffic on NM 68 and NM 75, although no detours or temporary closures would occur on these routes and the level of increased traffic is not expected to significantly change or impede traffic flow on these highways. In addition, all construction activities, staging areas, spoil piles, equipment storage and other related aspects of the proposed project would occur outside of NMDOT rights-of-way on private land or on easements obtained from the BLM. Increased traffic on NM 68 and NM 75 for the project would be temporary and short term. No long-term effects to transportation are anticipated from proposed project road improvements. EAC has committed to maintaining access for primitive, restricted use of BLM land via Road 119 once improvements to the road are completed. No mitigation measures are recommended for transportation resources in regards to the proposed project.

16. Visual Impacts

Through the on-site visits and the modeling exercise using a visual resource contrast rating, it was determined that the proposed project met the definition of a VRM Class II in accordance with BLM’s RGCFP. Once the proposed project is completed, it would retain the existing

character of the landscape; the facilities may be seen, but should not attract the attention of the casual observer. Both short- and long-term direct effects would occur to the viewshed from this alternative, and these impacts would be in line with the existing visual contrast at the site. No indirect effects to visual resources are anticipated.

Standard mitigation for visual impacts from this alternative would be incorporated into the project design including road location, soil cut and fill, gravel color, replacing removed vegetation, and reseeding disturbed areas. Mitigation measures for visual impacts from the proposed project are presented in Chapter V.

17. Noise

Environmental consequences for this alternative in regard to noise impacts include direct effects such as increased traffic noise and the sounds of heavy equipment and machinery. These impacts are unavoidable, can be mitigated to a small degree with measures described in Chapter V, and would end upon completion of activities for Alternative 4. No indirect effects relating to noise from the proposed project are anticipated. Other than improvements that have already been made to the existing road, there are no required BLM financial obligations with the proposed project.

Once road improvements are completed, the low traffic volume anticipated for the EAC property would contribute minimal amounts of additional noise to the existing environment. The existing road is surrounded by BLM holdings, and there are no noise-sensitive residential areas or homes adjacent to the road alignment. The terrain near the project site has a high level of topographic relief and acts as a natural noise buffer for the nearest residences. The combined effects of terrain, isolation, low traffic volumes, and rural residential land use results in minimal noise impacts to the nearest receptors to the project site (TEC 2007).

18. Cumulative Impacts

Cumulative impacts are those that result from the incremental effects on the environment of the proposed project alternative when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or persons undertake such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Secondary impacts are those caused by an action that are later in time or farther removed in distance but still reasonably foreseeable (*Code of Federal Regulations*, Section 1508.7).

For the proposed project, cumulative impacts include visual effects, minor losses of vegetation and wildlife habitat, and slightly increased traffic associated with road improvements to BLM Road 119. It is unlikely that the level of current activities on the road such as firewood collecting and off-road vehicle use would change since the road already exists and only permitted users would have access to the gate planned at the bottom of the road near NM 75 for this alternative. The cumulative impacts of the proposed project on these resources are expected to be relatively minor, based on the small scope of the road improvements as described in the previous chapters.

The project site is rural and the road is pre-existing, both of which contribute to reduced cumulative and secondary impacts associated with proposed road improvements. No major construction developments are projected for the proposed project area and immediately surrounding areas. In addition, mitigation measures described within this EA would serve to alleviate potential cumulative and secondary impacts from the proposed project.

B. ALTERNATIVE 3 – IMPROVING THE EXISTING ROAD TO A “RESOURCE” STANDARD:

This alternative was included in this section because it is considered a viable option for the proposed project. During the design and planning stage for road improvements, Alternative 3 was the preferred alternative. Since that time, focus shifted to Alternative 4 as the preferred alternative as described in the previous section.

Environmental consequences of Alternative 3 are essentially the same as those outlined for Alternative 4 with some minor differences. These differences for Alternative 3 are discussed in more detail in Chapter II.C.4, and include the following:

- Increased turning radii on road curves
- More area for passing vehicles on the road
- More cut and fill areas for road construction
- More base course material (6 inch depth) would be used to surface the road
- Road compaction testing (required for public roads)

The ‘Primitive’ road standard with gated access presented for Alternative 4 was desirable to EAC over the ‘Resource’ road standard presented for Alternative 3. Alternative 3 is more expensive and would take longer to design and build, and would allow unrestricted public use that could expose EAC to additional liability and might reduce the quality of life for the planned residence. The Taos Field Office of the BLM accepted Alternative 4 as the preferred alternative for the Environmental Assessment during planning meetings for the proposed project.

Because Alternative 3 was no longer considered the preferred alternative, and the differences in the proposed project impacts between Alternatives 3 and 4 are small in scope, the environmental consequences from Alternative 3 are not analyzed any further in this EA. Impacts from this alternative are considered the same as those presented for Alternative 4 (preferred alternative).

C. ALTERNATIVE 5 – NO-ACTION ALTERNATIVE

Introduction

The No-Action alternative would deny the EAC a right-of-way application from the Taos BLM Field Office, and the proposed project of road improvements to BLM Road 119 would not be initiated. No viable access to the EAC private property would be available, in contradiction to the guidance set forth in the BLM RGCFP, and no environmental impacts would occur at the proposed project site. The environmental consequences of direct and indirect effects from the No Action alternative are addressed in the following sections for each resource.

1. Topography, Geology and Soils

No direct or indirect impacts to topography, geology and soils would occur from the No-Action alternative. Topography, geology and soils would remain the same at the proposed project location.

2. Land Use

No direct or indirect impacts to land use are expected as a result of the No-Action alternative. Land use at the proposed project site would continue to be managed by the BLM according to RGCFP guidelines.

3. Farmland

No direct or indirect impacts to farmland would occur from the No-Action alternative. No farmland was identified at the proposed project site.

4. Floodplains

The No-Action alternative would have no direct or indirect effects to floodplains. No floodplains were present at the proposed project location.

5. Wetlands

No direct or indirect impacts to wetlands would take place through the No-Action alternative. No wetlands were identified at the proposed project site.

6. Surface Water

No direct or indirect effects to surface water features or quality would occur from the No-Action alternative. Twelve ephemeral arroyos (waterways) were observed at the proposed project area, and their flow, channel, and quality would remain unchanged as a result of this alternative.

7. Groundwater

No direct or indirect impacts to groundwater resources would occur from the No-Action alternative. The existing water system would continue to utilize groundwater resources at current levels.

8. Biological Resources (Vegetation and Wildlife)

No direct or indirect effects to biological resources including vegetation, noxious weeds, wildlife, and migratory birds would occur from the No-Action alternative. Available habitat and species composition at the proposed project location would remain the same.

9. Threatened and Endangered Species

No direct or indirect impacts to threatened and endangered species are anticipated from the No-Action alternative. None of the listed threatened or endangered species for Rio Arriba County were observed at the proposed project site.

10. Cultural Resources

No direct or indirect effects to cultural resources are expected from the No-Action alternative for the proposed project.

11. Socioeconomic and Environmental Justice Issues

No direct or indirect impacts to socioeconomic and environmental justice issues are anticipated from the No-Action alternative. No critical items surrounding these issues were identified within the proposed project area.

12. Public Health and Safety / Environmental Inspection

The No-Action alternative would have no direct or indirect effects to public health and safety, and environmental inspection. No recognized environmental conditions, hazardous materials, or public health and safety concerns were identified at the proposed project location.

13. Air Quality

No direct or indirect effects to air quality are anticipated for the No-Action alternative. The proposed project area is in attainment for all state and national ambient air quality standards.

14. Transportation

The No-Action Alternative would have no direct or indirect impacts to transportation in the proposed project area. Traffic patterns and densities on NM 68 and NM 75, the nearest roads to the site, would remain unchanged.

15. Visual Impacts

No direct or indirect effects would occur to visual resources as a result of the No-Action alternative. The viewshed in the proposed project area would continue to be managed according to BLM VRM guidelines outlined in the RGCFP.

16. Noise

No direct or indirect impacts in regards to noise are anticipated from the No-Action alternative. Noise levels would remain the same in the proposed project area.

17. Cumulative Impacts

The No-Action alternative would not directly or indirectly affect or change the environment of the area; consequently, it would have no cumulative impacts.

CHAPTER V—POSSIBLE MITIGATION AND MONITORING MEASURES

A. MITIGATION MEASURES FOR AFFECTED RESOURCES

Topography, Geology and Soils

Mitigation measures for this resource topic are centered on topography and soils at the proposed project location.

Any areas disturbed by installation activities should be managed to control erosion by wind and water. Road improvements for the proposed project would have an area of approximately 2.64 acres of total disturbance, with 0.21 acres of that new disturbance requiring removal of some vegetation. Following construction of the road, any disturbed areas would be re-contoured and re-vegetated according to BLM standards and the RGCFP. Any seed mixes used for replanting or reseeded of disturbed areas should be certified weed free seed. Excavated soil from cut and fill areas for road improvements would be temporarily placed nearby until completion of construction. Erosion control techniques and materials, such as the BMP's described in the following paragraph, should be in place prior to and during construction to contain loose soil, avoid soil loss, and prevent adverse effects to water and air quality in the proposed project area.

The proposed project would be constructed according to the Standard Stipulations for Roads, BLM Taos Field Office, as reviewed and approved by the BLM staff. Road improvements would require BMP's for storm water pollution prevention during and after construction. This would help to alleviate immediate erosion concerns and prevent further erosion to the project site. BMP's can include but are not limited to: check dams, culverts, blading/grading, bar ditches, straw waddles, gabion mats, silt fencing, and rip-rap to prevent waterborne sediment movement; and soil watering, tarps, silt fencing, and avoiding work on extremely dry and windy days to limit the amount of fugitive dust being released into the air. The building contractor should use discretion in choosing the appropriate BMP's in consultation with the BLM and in compliance with the RGCFP. Immediately upon completion of road improvements, any excess fill from the project area would be transported to an approved upland site and stabilized.

2. Surface Water

Twelve ephemeral arroyos would be impacted by road improvements for the proposed project. The discussion in this section for surface water relies in part on the measures presented in the previous section for topography and soils, since the issues for both resources in regard to erosion control are similar. The ultimate goal for the BLM and the proposed project on public land is to limit to the greatest extent possible the level of disturbance and subsequent erosional impacts, and prevent potential pollution to the environment that might occur from the proposed project.

Additional construction practices that would be employed to reduce impacts to surface water resources from the proposed project include: controlling vehicles and equipment to restrict off-road travel, preventing destruction of vegetation immediately adjacent to work areas, and

preventing releases of materials from the construction area, such as plant material, trash, and oil or fuel from equipment.

Surface area impacts to waterways are expected to be below 1/10th of an acre for each access road ‘crossing.’ Normally, the USACE would require notification of intent to discharge sediment (Section 404 of the CWA) from proposed project construction activities. This would require a Nationwide Permit from the USACE allowing the discharge; however, estimated disturbance areas within the ordinary high water mark of jurisdictional waterways of less than 1/10th of an acre do not require a permit in advance of the proposed work. It is recommended by the USACE that a verification request letter be submitted to that agency for planning purposes prior to the commencement of construction on the proposed project.

Surface water regulatory controls for the proposed project would include attention to the following items:

- Development of a SWPPP under the NPDES permit process, which has been completed at the time of this EA. The SWPPP needs to be approved by the BLM, with verification of on the ground erosion control measures and BMP’s prior to and during construction. Efficacy of BMP’s from the SWPPP needs to be monitored during and after construction
- Consultation with the USACE to ensure compliance and verification for proposed project impacts of less than 1/10th of an acre, Nationwide Permit under the CWA Section 404. Consultation with the NMED Surface Water Quality Bureau would also occur to determine Section 401 permitting requirements

EAC has indicated that no temporary or permanent fill (soil) will be deposited into waters of the U.S. during or after construction of the proposed project. Mitigation for surface waters would help ensure that waterways are not adversely impacted by construction activities for the proposed project. Mitigation measures described herein would be used when disturbing waterways at the site.

3. Biological Resources

Vegetation:

Mitigation measures for the proposed project that would ensure limited impacts to vegetation include:

- Grading the areas affected following completion of construction activities
- Replanting or reseeding the disturbed areas with an acceptable mix of certified weed free native plants typically found in the habitat at the proposed project site. The finished road alignment would be maintained for travel and not replanted or reseeded, but adjacent areas on the road edges that are disturbed by construction would be replanted or reseeded according to these guidelines
- Monitoring restoration efforts to assess their overall success and progress

Noxious Weeds:

Mitigation measures for noxious weeds are geared toward prevention of spread and elimination of existing populations. Any fill material (soil) brought in from an outside source should be weed and invasive species free. The proposed project site should be managed to control noxious weeds, both for reproduction and spread of these species within the project area, as well as restricting spread of these species to other areas. Noxious weeds such as Siberian elm, saltcedar, and jointed goatgrass were observed at the project site, but other species could be present and any found during construction activities should be controlled as appropriate. All heavy equipment would be cleaned to remove mud and dirt prior to entering and exiting public lands to remove potentially occurring noxious weed seeds. The BLM may require monitoring of the project site for noxious weed infestation and spread, and treatment of any noxious weeds found should they occur. Treatment methods would be approved in advance of construction activities by the BLM Taos Field Office.

Noxious weed management methods may include the following:

- Mechanical removal and hand pulling
- Herbicide applications (limitations around aquatic areas)
- Equipment cleaning: washing wheels and undercarriages of vehicles used for construction
- Soil management: removal and stockpiling (onsite or offsite) of the top 6 inches of soil from the infested area. Treatment is then performed on the stockpiled soil. Treatment can be herbicide treatment or heat treatment (i.e. cover with black plastic during the summer heat); or burial in a landfill. Even if the soil were to be buried in a landfill, it is still best to kill residual seeds by treating the soil
- Minimizing disturbance of soil and vegetation to immediate construction zones as much as possible
- Revegetation with a variety of grasses, especially perennial species, and forbs
- The use of certified weed free seed, and fill material
- Monitoring and field assessment

Wildlife:

Although impacts to wildlife are expected to be minor or at least not adverse, mitigation measures for the proposed project would include training construction personnel to recognize situations that may cause harm to wildlife in the road alignment, such as disturbance to fresh underground mammal burrows. Also, limiting heavy equipment travel to the immediate construction right-of-way, and avoiding areas of heavy growth and native habitat when feasible would help limit potential effects to local wildlife species.

Migratory Birds:

The MBTA protects against the “taking” of migratory birds, their nests, and eggs except as permitted by the USFWS. No bird nests were observed within the proposed project alignment. If

trimming or removal of trees or vegetation potentially used by nesting birds is done outside of the nesting season at the project site, little or no impact to migratory bird species would occur. A follow-up nesting bird survey would be conducted by qualified personnel prior to construction activities if the project is planned during the nesting season (approximately March through August). Copies of the survey report would be made available to the BLM Taos Field Office. If active nests are present, then permit approval and appropriate protection and mitigation measures would be completed prior to construction for the BLM from the USFWS, in compliance with the requirements of the MBTA.

Limiting construction activities to the time of year outside the general migratory bird nesting season of March through August, or surveying areas proposed for construction during the nesting season and avoiding any occupied areas until nesting is complete would ensure that the proposed project would incur no impacts to nesting migratory birds.

4. Threatened and Endangered Species

Discussions in this section focus on mitigation measures for the threatened and endangered species presented in the BR. Although none of these species were observed directly at the proposed project site, available habitat and environmental conditions in the area are such that the occurrence of these species cannot be ruled out. The following mitigation measures would address the possible presence of these species, and help avoid impacts from the proposed project.

Avian populations in particular experience seasonal fluctuations due to migration patterns. Time of year for proposed project construction can have varying degrees of impact on wild bird species. Due to the highly mobile habit of birds, they are more likely to be found over a wide geographic area than other species of wildlife. If construction of the proposed project occurs during the primary nesting season for migratory birds (spring and summer for most), the BLM recommends that surveys be conducted by a qualified biologist prior to construction activities to help mitigate impacts to and/or the possibility of harming these protected species. This relates directly to the American and arctic peregrine falcons, which could use the immediate area for roosting and foraging.

One species of state Threatened mammal, the spotted bat, and six other species of bats listed as BLM sensitive have the potential to occur in habitat adjacent to the proposed road alignment. If any of these species is observed at the project site, then appropriate mitigation measures designed to avoid impacts would be developed by the BLM in consultation with the USFWS and NMDGF.

The proposed project would permanently disturb a small amount of total acreage (0.21 acres) in relation to the surrounding habitat available for use by wildlife and plants, and though intensive, would only disturb each component of the proposed project right-of-way for a short period of time. Surface habitat at the newly disturbed sites would recover quickly from the disturbance as long as reclamation practices are followed.

It should be noted that plant species in particular are difficult to properly identify during the non-flowering season. The flowering season can vary considerably, depending on the species in question. The BLM may require that surveys be conducted by a qualified botanist prior to construction activities within the proposed project alignment during peak flowering periods to mitigate impacts to and/or the possibility of harming these sensitive species. This includes the

three species of plants (*Astragalus oocalycis*, *Astragalus puniceus* var. *gertrudis*, and *Phlox pruinosa*) presented in the BR. If any of these species are discovered at the proposed project site, appropriate mitigation measures would be developed by the BLM in consultation with the USFWS and the New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD).

5. Public Health and Safety / Environmental Inspection

No storage of hazardous materials is permitted at the construction site and no equipment repair is permitted on-site that involves hazardous substances including petroleum products. The ROW holder (EAC) will remove all solid waste within the ROW grant after completion of construction.

In the event that environmental contamination is encountered during excavation at the proposed project location (e.g. any unusual odors, liquids, materials, or stained soils), appropriate response procedures would need to be available, including a plan for work area controls, notification instructions, and subsequent investigations.

6. Air Quality

Some short-term deterioration of air quality would be expected during construction due to the operation of equipment and disturbance of soil. To address this issue, standard air quality mitigation measures would be implemented, including using a water truck to wet exposed soils to minimize generation of dust and covering any loose soil stockpiles with tarps. Construction activities would incorporate dust suppression practices to prevent air quality deterioration. Also, heavy equipment used for construction of the proposed project should be in good mechanical condition with proper exhaust controls to limit the effects of emissions to local air quality.

Greenhouse Gases (carbon dioxide emissions)

BMP's to help reduce CO₂ emissions for this alternative include using low or non-sulfurous diesel fuel in construction vehicles, limiting unnecessary vehicle idling, minimizing construction activities requiring fuel and limiting passenger vehicle trips when possible, use of alternative fuel sources with low CO₂ emissions such as biodiesel, and use of newer vehicles with lower CO₂ emissions.

In general, reduction in greenhouse gases depends on the need to both improve energy intensity and develop carbon-emissions-free power sources.

Economic productivity of energy use should be addressed:

- Improve efficiency of cars, homes, powerplants, etc. (device efficiency)
- Improve economic value generated per unit of energy consumed (system efficiency)

Carbon sequestration strategies should be explored:

- Source options include geologic injection, ocean injection, carbonate weathering, carbon black storage, silicate weathering.
- Sink options include ocean fertilization, land biosphere, air removal.
- Non-fossil energy strategies include renewable, fission, and fusion.

Very large amounts of carbon-emissions-free power will be needed to stabilize the climate. Only a portfolio of technologies and approaches can produce the amounts of carbon-emissions-free primary power needed in the next decades for economic growth (Caldeira and Hoffert 2003).

7. Visual Impacts

The visual impacts from proposed road improvements can be mitigated by incorporating the following items into project planning:

- Road design should take into consideration existing topography and line of sight, road placement can take advantage of relief to limit impacts to the viewshed
- Soil cut and fill areas should be kept to a minimum whenever possible, and will be recontoured and stabilized to pre-construction conditions immediately following road improvements
- Mature trees removed for road improvements should be replaced (replanted) with native species similar to the ones removed and appropriate for the location. Disturbed soil outside of the bar ditches and road bed should be reseeded with a certified weed free native plant seed mix appropriate for the habitat at the project location
- Base course gravel used to top the road should be a color that blends well with the existing tone of the surrounding environment to limit visual contrast
- Monitoring visual restoration efforts, primarily vegetation, to assess their overall success and progress

Coordination and consultation with the BLM Taos Field Office regarding the visual impacts of the proposed project would continue as the final design proceeds. Compliance with BLM VRM objectives would ensure that the proposed project has minimal impacts to the existing viewshed.

8. Noise

Noise impacts will consist of construction disturbances such as increased traffic noise and the sounds of heavy equipment and machinery. These impacts are unavoidable but would be temporary, during the construction period only. All heavy equipment would be in good mechanical condition, including mufflers and sound baffles on exhausts, to limit the impacts from the proposed project to noise levels in the area.

B. MONITORING AND MEMORANDUM OF UNDERSTANDING

It is anticipated that construction of the road improvements will be completed within 36 months of the approvals granted by BLM. The access will be utilized in perpetuity.

Ultimately, the BLM Taos Field Office and EAC will enter into a Memorandum of Understanding (MOU) for the proposed project to establish an easement; BLM would grant the road easement on federal land for EAC, and EAC would grant a trail access across their private property for BLM personnel and non-vehicular users. The MOU would also establish, between the BLM and EAC, a mutually agreeable location for the access gate near the bottom of the road.

No other monitoring activities other than the items discussed previously for erosion (SWPPP), vegetation, wildlife, and threatened and endangered species are required for the proposed project.

CHAPTER VI– CONSULTATION AND COORDINATION

A. DISTRIBUTION

The preparation of the EA was conducted in consultation with numerous federal, state, and local agencies described in Chapter I.E.

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APPENDIX A

GENERAL ROAD STIPULATIONS FOR EMBUDO AL CIELO ROW

General Road Stipulations
For
Embudo al Cielo ROW
February, 2006
Herbert A. Chavez, CE

The following is a synopsis of road stipulations that I would recommend for the Embudo al Cielo Road Right of way. The information comes from the BLM Manual Section 9113 for Road Standards. These standards apply to roads on BLM that are either built by BLM or an outside entity, which in this case would be the private land holder. The BLM requirements are usually held as the minimum standard, but local codes can determine road requirements, or whichever is most stringent. These road stipulations are by no means all inclusive and exist solely for the informational purposes for use on this ROW.

Roads in general are designed by use. Average Daily Traffic (ADT), for Bureau purposes is defined as the annual traffic divided either by 365 or by the actual number of days the road is open to traffic. The amount of traffic is determined by the number of vehicles passing a point, regardless of direction of travel. The BLM uses the geometric road standards based on a projected ADT in 20 years.

Roads on BLM are classified by functionality as follows:

- Collector Roads: Accommodate mixed traffic and serve many uses. Normally provide primary access to large blocks of land and connect with or are extensions of a public road system. The roads usually require application of the highest standards.
- Local Roads: Roads that serve a smaller area and connect to collector roads or public road systems. Local roads receive lower volumes and generally serve fewer uses. May need turnouts.
- Resource Roads: (May be temporary or permanent) These are normally spur roads that provide point access and connect to local or collector roads. They carry very low volume traffic and only one or two types of use. May need turnouts.
- Primitive Roads: (not in green book) The roads are two-track roads that are created by vehicle traffic; there are no engineering standards.

The BLM manual also states that all permanent roads constructed across public lands by non-government entities must be designed by or under the direction of a Licensed Engineer. A route analysis must be performed for either existing or new roads.

Since Geometric standards are driven by use, so the following is recommended: (see table on geometric standards in green book or manual):

- The existing primitive road can be used for public access or under ROW application with no engineering standards except that spot erosion control may be done to halt erosion.
- The road may be considered a Resource type road if the estimated 20 yr ADT is less than 20. The terrain is considered mountainous and the design speed is preferred at 15 mph. The travel way shall be a minimum of 14 ft. (with turnouts) and a preferred grade of 8% with a maximum of 16%.
- The road may be considered a Local road if the 20 yr. ADT is less than 100. For mountainous areas the design speed shall be 20 mph, the travel width 14 ft. (with turnouts) and the preferred grade 8% with a maximum of 16%.
- If the road has a use greater than 100 ADT it shall be considered a Collector road, with a 30 mph speed, 24 ft. travel width and a preferred grade of 8% but a maximum of 12%.

The existing road in question is, for obvious reasons primitive at best. The location, width, curve radii, and steep grades do not meet engineering standards. The road can be used as public access at this time but may need more than just spot erosion control to make it passable, which would move it into the Resource class at the very least. Some heavy equipment may not be able to traverse the steep grades or sharp turns. I would recommend that the road be designed and built for Resource use, less than 20 ADT, or Local, less than 100 ADT. If the road is designed to Resource use at this time, it will require a new ROW if the use passes the 20 ADT and becomes a Local class road. The difference between the Resource and Local road is an increase design speed to 20 mph (from 15 mph) and a max grade of 15%.

Because the 20 ADT may or may not be exceeded at this time and the unknown casual user may push the use up, I recommend that the road centerline and ROW be designed for the Local road. A smaller road section may be built at this time to meet the Resource standard and if and when the use increases, the bigger road can be built without further BLM review. Design speed drives the curve radii and location and will be the driving factor for any road design standard.

Other requirements include tying the centerline survey to nearby legal section corners, balancing cut/fill sections for the entire road segment (if possible), controlling runoff and drainage across the road, sight distance, horizontal curves, horizontal clearances and so on and so forth. Issues like public access after completion, maintenance, local requirements, etc. are points to ponder as well.

The bureau manual (section 9113), the green book (excerpts from 9113), local requirements, etc., will control the road design. It is my recommendation that the centerline be designed to Local road standards and only the Resource standard road be built at this time. A route analysis shall be completed outlying hopefully three routes, or so, that should be evaluated for things such as resource values, cost, view shed, etc..

The existing primitive road cannot support more use than the occasional 4x4 and should not be the controlling centerline. The existing road also has many problems with erosion and steep grades and is not necessarily in the best location for an engineered road.

In this case, it is not apparent whether designing a local road versus a resource road is any more expensive.

Finally, it is my opinion that trying to design and build a road via the existing primitive road route centerline is a mistake and will not necessarily be cheaper to complete. A safe road with the correct curve radii and grade will also help to keep maintenance costs down, as compared to a steep erosive grade.

APPENDIX B

BIOLOGICAL REPORT

OVERVIEW

Parametrix conducted this survey on September 28, 2007 to describe the general biological properties of the area and determine the potential presence of federal or state listed species that might be affected by the proposed road improvement.

PROJECT DESCRIPTION

Embudo al Cielo LLC is filing for an Application for Permanent Easement with BLM to secure access to a 640 acre parcel of land, owned by the applicant. Due to terrain and adjacent land ownership, the only feasible access to this land is an existing road on BLM land that is in poor condition. Work will include improving the existing road to meet BLM “resource” road design standards, and resurfacing the roadway with 6 inches of compacted base course. Additionally, the road will serve as a utility easement, with utilities being buried in the roadway. The project roadway connects with NM 75 approximately one-half mile east of the junction between NM 75 and NM 68 located between the towns of Embudo and Dixon, Rio Arriba County, NM.. The roadway winds west through the steep terrain for approximately 1 mile, before reaching the intended parcel.

PURPOSE AND NEED

The existing road is in poor condition; a wider and better surfaced road is needed to safely provide access to the applicant’s property.

BIOLOGICAL SURVEY

William Widener conducted a biological survey of the project site on September, 28 2007. This survey was conducted in order to describe the general biological properties of the area and determine the potential presence of federal or state listed species that might be affected by the proposed road improvement. The easement was completely surveyed, including a 25-foot buffer on either side of the proposed road. A list of federal and state endangered, threatened, and species of concern plant and animal species was obtained for Rio Arriba County (see references) and the area surveyed for their presence (see Attachment A for species list). This information includes the distribution and habitat requirements for these species, which has been summarized in Attachment A, and includes a determination of habitat occurrence for each species. The area was also surveyed for any Class A, B, and C noxious weeds as designated by the New Mexico Department of Agriculture (NMDA). Observations of wildlife and plants present during the survey were also noted and are listed below.

The section of roadway slated for improvement occurs at an elevation between 5,910 and 6,600 ft. above mean sea level. The requested easement is situated in the *Pinus edulis* - *Juniperus monosperma* / *Artemisia tridentata* / *Bouteloua gracilis* association of the Colorado Piñon - One-seed Juniper Series of Woodland and Savanna vegetation, as classified by Dick Peddie (1993). The plant community in this area is best characterized as having a sparse overstory dominated by one-seed juniper (*Juniperus monosperma*) and piñon pine (*Pinus edulis*); the understory dominated by big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), broom snakeweed (*Gutierrezia sarothrae*) and blue grama (*Bouteloua gracilis*).

Table 1. Wildlife and Plant Species Observed at Project Location

	Common Name	Abundance
Wildlife Species		
<i>Canis latrans</i>	coyote	Evident from observed scat and tracks
<i>Parus gambeli</i>	mountain chickadee	Common

	Common Name	Abundance
<i>Pica pica</i>	black-billed magpie	Common
<i>Corvus corax</i>	common raven	Uncommon
<i>Junco hyemalis</i>	dark-eyed junco	Common
<i>Turdus migratorius</i>	American robin	Adundant
<i>Odocoileus hemionus</i>	mule deer	Evident from observed tracks
<i>Colaptes auratus</i>	northern flicker	Uncommon
<i>Sylvilagus audubonii</i>	cottontail rabbit	Evident from observed scat and tracks
<i>Thomomys bottae</i>	Botta's pocket gopher	Uncommon
Plant Species		
<i>Aegilops cylindrica</i>	jointed goatgrass	Uncommon
<i>Amaranthus</i> sp.	pigweed	Uncommon
<i>Ambrosia acanthicarpa</i>	flatspine burr ragweed	Uncommon
<i>Aristida purpurea</i>	purple threeawn	Common
<i>Artemisia tridentata</i>	big sagebrush	Abundant
<i>Astragalus</i> sp.	milkvetch	Common
<i>Atriplex canescens</i>	fourwing saltbush	Uncommon
<i>Bassia scoparia</i>	burningbush	Abundant
<i>Bothriochloa laguroides</i>	silver bluestem	Rare
<i>Bouteloua curtipendula</i>	sideoats grama	Common
<i>Bouteloua eriopoda</i>	black grama	Common
<i>Bouteloua gracilis</i>	blue grama	Abundant
<i>Bromus tectorum</i>	cheatgrass	Abundant
<i>Carex</i> sp.	sedge	Rare
<i>Chamaesyce</i> sp.	sandmat	Common
<i>Cleome serrulata</i>	Rocky Mountain bell plant	Uncommon
<i>Conyza canadensis</i>	Canadian horseweed	Common
<i>Cylindropuntia imbricata</i>	tree cholla	Common
<i>Echinocereus triglochidiatus</i>	kingcup cactus	Common
<i>Elymus elymoides</i>	squirreltail	Common
<i>Elymus trachycaulus</i>	slender wheatgrass	Uncommon
<i>Ericameria nauseosa</i>	rubber rabbitbrush	Abundant
<i>Escobaria</i> sp.	foxtail cactus	Rare
<i>Euphorbia dentata</i>	toothed spurge	Uncommon
<i>Fendlera rupicola</i>	Cliff fendlerbush	Uncommon
<i>Festuca</i> sp.	fescue	Rare
<i>Grindelia squarrosa</i>	curlycup gumweed	Uncommon
<i>Gutierrezia sarothrae</i>	broom snakeweed	Abundant
<i>Hesperostipa neomexicana</i>	New Mexico feathergrass	Rare
<i>Holodiscus dumosus</i>	mountain spray	Common
<i>Houstonia acerosa</i>	needleleaf bluet	Common
<i>Ipomea</i> sp.	morning glory	Rare
<i>Ipomopsis longiflora</i>	flax-flowered ipomopsis	Common
<i>Juniperus monosperma</i>	One-seeded juniper	Abundant
<i>Lactuca serriola</i>	Prickly lettuce	Uncommon
<i>Lepidium</i> sp.	Peppergrass	Uncommon
<i>Machaeranthera</i> sp.	tansyaster	Common
<i>Machaeranthera canescens</i>	hoary tansyaster	Common
<i>Medicago sativa</i>	Alfalfa	Uncommon

	Common Name	Abundance
<i>Melilotus officinalis</i>	sweetclover	Common
<i>Mentzelia pumila</i>	dwarf mentzelia	Rare
<i>Muhlenbergia</i> sp.	muhly	Uncommon
<i>Opuntia phaeacantha</i>	tulip pricklypear	Common
<i>Opuntia polyacantha</i>	plains pricklypear	Abundant
<i>Penstemon</i> cf. <i>secundiflorus</i>	sidebells penstemon	Uncommon
<i>Pinus edulis</i>	piñon pine	Common
<i>Pleuraphis jamesii</i>	James' galleta	Common
<i>Polygonum aviculare</i>	prostrate knapweed	Uncommon
<i>Populus deltoides</i>	cottonwood	Rare
<i>Portulaca oleracea</i>	little hogweed	Rare
<i>Salsola tragus</i>	prickly russian thistle	Common
<i>Schizachyrium scoparium</i>	little bluestem	Rare
<i>Senecio flaccidus</i> .	threadleaf ragwort	Uncommon
<i>Sisymbrium irio</i>	London rocket	Common
<i>Sphaeralcea</i> sp.	Globemallow	Uncommon
<i>Sporobolus cryptandrus</i>	Sand dropseed	Abundant
<i>Stephanomeria pauciflora</i>	brownplume wirelettuce	Rare
<i>Symphotrichum</i> sp.	aster	Uncommon
<i>Tamarix chinensis</i>	saltcedar	Rare
<i>Tragopogon dubius</i>	yellow salsify	Uncommon
<i>Tribulus terrestris</i>	puncturevine	Uncommon
<i>Ulmus pumila</i>	Siberian elm	Rare
<i>Yucca baccata</i>	banana yucca	Common
<i>Yucca glauca</i>	soapweed yucca	Uncommon

FEDERAL AND STATE LISTED SPECIES

Although no federal or state-listed wildlife species or species of concern were observed during the field survey, habitat is present for two avian species and one bat species listed by the state as Threatened. The American peregrine falcon (*Falco peregrinus anatum*) has the potential to occupy piñon-juniper woodland, especially in areas near water with large gulfs of air. The proximity of the project area to the Rio Grande gorge provides such habitat. However, no individuals were observed during the survey, and no suitable nesting sites were present in the 25-foot buffer. Although, habitat is also present for the arctic peregrine falcon (*Falco peregrinus tundrius*), it is considered to be a rare migrant in New Mexico, and one would not be expected to be in the project area at the time of construction.

Additionally, Townsend's big-eared bat (*Corynorhinus townsendii*), the spotted bat (*Euderma maculatum*), western small-footed myotis bat (*Myotis ciliolabrum melanorhinus*), long-eared myotis bat (*Myotis evotis evotis*), fringed myotis bat (*Myotis thysanodes thysanodes*), long-legged myotis bat (*Myotis volans interior*), and Yuma myotis bat (*Myotis yumanensis yumanensis*) have the potential to occur in piñon-juniper woodland in the cracks and crevices created by the rocky terrain. All of these species are listed as BLM sensitive. The spotted bat is also a state listed Threatened species. Only piles of small boulders were adjacent to the road, creating areas of small cracks and crevices, where bats could potentially roost. Many large rocky outcrops, with larger crevices and potential caves are present in the immediate vicinity. The project, as proposed, is not anticipated to destroy any cliff faces or other potential roosting sites. No impacts are anticipated for these species.

In Rio Arriba County, six species of *Astragalus* are listed as a "Species of Concern" for New Mexico, two of which (*A. oocalycis* and *A. puniceus* var. *gertrudis*) have suitable habitat in the project area. One *Astragalus* species was found growing in the project area. However, without flowers *Astragalus* is an

extremely difficult genus to identify to species. See Table 2, which analyzes the attributes of the *Astragalus* in question with those that are listed for the county. The *Astragalus* present in the project area is not one listed by the state. Suitable habitat is also present for Pagosa phlox (*Phlox pruinosa*); however, none were observed during the survey.

Table 2. Attributes of *Astragalus* listed in Rio Arriba County compared to unknown specimen.

Attributes	<i>Astragalus</i> sp.	<i>A. cyaneus</i>	<i>A. micromerius</i>	<i>A. missouriensis</i> var. <i>humistratus</i>	<i>A. oocalycis</i>	<i>A. puniceus</i> var. <i>gertrudis</i>	<i>A. repleyi</i>
Elevation (ft.)	5,910-6,600	6,900-7,300	6,600 – 7,300	7,050 – 7,700	5,600 – 7,200	6,000–7,000	7,000-8,250
Soil derivation	Igneous	Unspecified	Gypseous	Clay	Clay	Unspecified	Unspecified
Fruit length (mm)	12	25 – 35	4 – 5	12 – 25	14	15 – 25	20 – 30
Fruit width (mm)	8 – 10	7 – 13	Unspecified	6 – 9	11	5 – 9	4 – 6
Carpel #	Didymous	Didymous	Unilocular	Unilocular	Grooved	Unilocular	Unilocular
Leaflet #	13-19	15-29	3-9	11-19	19-27	Numerous	11 – 21
Leaflet length (mm)	4 - 8	5-15	Unspecified	5 – 15	20-40	Unspecified	9 – 25
Leaflet shape	Elliptic to Oblanceolate	Obovate to Elliptic	Linear to Oblong	Obovate to Elliptic	Linear	Linear to Linear-Elliptic	Linear to Linear Elliptic
Leaf length (cm)	2 – 6.5	5 – 15	4 – 20	5 – 14	5 – 15	2.5 – 10	4 – 9
Pubescence	Strigose/basifixed	Strigulose/basifixed	Silvery-hairy/dolabriform	dolabriform	Nearly glabrous above	Villosulous	Strigulose
Reasons for exclusion		Elevation, fruit length	Fruit length, leaflet number, carpel number	Elevation, carpel number, pubescence	Leaflet length, leaflet shap	Fruit length, Carpel number, Leaflet shape	Elevation, Fruit length & width, Carpel number, Leaflet shape

Information retrieved from New Mexico Rare Plant Technical Council, 1999

NESTING MIGRATORY BIRDS AND OTHER WILDLIFE

No evidence of breeding bird activity was observed in the project area. No further bird surveys are recommended. Unseen nests could be present in the junipers and piñons along-side the road. Some of these trees may need to be removed during the construction of the project. We recommend that these trees be thoroughly inspected for nests before they are removed. There may be some incidental mortality of small animals that use the easement. Most animals, however, would be expected to relocate into the surrounding area as the work is completed.

NOXIOUS WEEDS

No class A or B noxious weeds were observed at the site. Three class C noxious weeds were identified at the site. A small population of both, Siberian elm (*Ulmus pumila*) and Saltcedar (*Tamarix chinensis*), each consisting of less than ten individuals was observed. Additionally, two small patches of jointed goatgrass (*Aegilops cylindrica*), each being smaller than 100 square-feet in area, were observed. All occurrences of class C noxious weeds occurred in, and adjacent to, the eastern 200-foot section of roadway adjacent to NM 75. These should be treated before construction begins, in order to avoid spreading seed the entire length of roadway.

WETLANDS

There were no wetlands, as defined by the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987), identified on the project site.

Twelve unnamed ephemeral arroyos cross the proposed project road alignment. In addition, one artificially improved waterbar was observed on the access road to improve drainage. All of the arroyos would be affected by construction activities for the access road to the EAC property. No other surface water features would be affected by the proposed project. Representative maps and photographs are provided in the Environmental Assessment.

The arroyos are small in scope, with the largest one (DR-11) actually the sum of two branches with a combined ordinary high water mark of approximately 4.6 feet wide within the channel. It is expected that surface area impacts to waterways would be below 1/10th of an acre for each access road 'crossing'. Normally, the USACE would require notification of intent to discharge sediment (Section 404 of the CWA) from proposed action construction activities. This would require a Nationwide Permit from the USACE allowing the discharge; however, estimated disturbance areas within the ordinary high water mark of jurisdictional waterways of less than 1/10th of an acre do not require a permit in advance of the proposed work. It is recommended by the USACE that a verification request letter be submitted to that agency for planning purposes prior to the commencement of construction on the proposed project.

RECOMMENDATIONS

- Treat all Class C noxious weeds at the junction of NM 75 before work commences.
- Consult with ACOE to determine whether or not the arroyos are jurisdictional and required level of permitting.
- Minimize vegetation and rock disturbance during the improvement to the road.
- Implement best management practices to reduce erosion and sediment run-off.

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ATTACHMENT A

Threatened and Endangered Species of Rio Arriba County

ATTACHMENT A

Threatened and Endangered Species of Rio Arriba County

Species Name	Common Name	Distribution & Abundance in Rio Arriba County	Habitat and Diet Notes	Agency Status			Presence of Suitable Habitat
				USFWS	NM	BLM	
Birds							
<i>Accipiter gentiles</i>	northern goshawk	Reported summer resident (breeds)	Mature, closed canopy coniferous forests of high mountains and mesas; feeds on a variety of small mammals and birds.	Species of Concern	Sensitive	Sensitive	No
<i>Aegolius funereus</i>	boreal owl	Uncommon year-round resident	Mainly above 2,900 m in climax spruce-fir forests.		Threatened		No
<i>Ammodramus bairdii</i>	Baird's sparrow	Rare	Inhabits Chihuahuan desert grasslands, shortgrass (breeding)/tallgrass prairie, mountain meadows up to 3,600 m.; Ag lands, and Croplands. Eats seeds (esp. grass) and insects.	Species of Concern	Threatened	Sensitive	No
<i>Athene cunicularia hypugea</i>	western burrowing owl	Unverified	Prairie Dog towns or other burrows in open areas with sparse vegetation and bare ground. Feeds on a variety of arthropods and small mammals.	Species of Concern		Sensitive	No
<i>Buteo regalis</i>	ferruginous hawk	Reported to occur in the county	Open plains and meadows, bare ground, or (occasionally) woodlands up to 7,000'; Feeds on a variety of small mammals and large insects.			Sensitive	Unlikely
<i>Charadrius montanus</i>	mountain plover	Present in the county	Lowland grasslands, esp. with heavy grazing; ag fields; short vegetation and bare ground; playas; eats ants, beetles, crickets, and other ground-dwelling insects.	Species of Concern	Sensitive		No
<i>Childonias niger</i>	black tern	Summer resident	Breeds and feeds in vegetated marshes, prairie wetlands, and bogs with some open water. Known to occupy desert riparian, deciduous woodland, marsh, and grassland habitat.	Species of Concern		Sensitive	No

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Coccyzus americanus</i>	yellow-billed cuckoo	Summer resident	Upper elevation, mature, closed-canopy forests, riparian areas, esp. those with multi-storied canopy, steep cliffs, permanent water; Feeds on a variety of small-med. sized mammals, birds.	Candidate	Sensitive		No
<i>Empidonax traillii extimus</i>	southwestern willow flycatcher	Spring, summer, and fall resident (breeds)	Riparian or lacustrine habitats, esp. those with thick willows or other vegetation, permanent water, and a multi-layered canopy	Endangered <i>Designated Critical Habitat</i>	Endangered		No
<i>Falco peregrinus anatum</i>	American peregrine falcon	Reported summer resident (rare)	Wide variety of open habitats incl. Wetlands, riparian, montane, lowlands; Nests on ledges, usually near water, elev. 3,500-9,000; preys almost exclusively on live birds.	Species of Concern	Threatened		Yes
<i>Falco peregrinus tundrius</i>	arctic peregrine falcon	Present in the county	Mountain cliffs and river gorges. Preferred hunting habitats include croplands, meadows, river-bottoms, marshes and lakes.	Species of Concern	Threatened		Yes
<i>Haliaeetus leucocephalus</i>	bald eagle	Winter resident (common)	Prefers lowland or montane riparian and wetland habitats (though not exclusively), esp. with large trees; feeds on wide variety of live birds, mammals and fish; carrion.	Threatened	Threatened		No
<i>Lagopus leucurus altipetens</i>	white-tailed ptarmigan	Year-round Resident	Inhabit alpine tundra and timberline habitats, mainly above 3,200 m.		Endangered		No
<i>Lanius ludovicianus</i>	loggerhead shrike	Reported to occur in the county.	Open country, grasslands and prairies, esp. interspersed with small trees and shrubs; ag. lands, pastures, hayfields			Sensitive	No
<i>Pelecanus occidentalis carolinensis</i>	brown pelican	Rare visitors to the state, primarily in summer-fall seasons.	Generally found in warm marine waters, rarely occurring inland. Only individuals seen in NM, near water. May be storm-driven birds that moved inland during duress.		Endangered		No
<i>Plegadis chihi</i>	white-faced ibis	Uncommon, regular summer breeders.	Shoreline and marsh habitats, esp. with emergent vegetation bordering open water; feed in ag. Fields and open areas. Feeds on a variety of plants and insects, amphibians and reptiles			Sensitive	No

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Sterna antillarum</i>	least tern (Interior Population)	Rare	A colonial nester that seldom swims. Feeds on fish, crustaceans, and insects. Nests on the ground, typically on sites that are sandy and relatively free of vegetation. In New Mexico and other parts of the southern Great Plains, alkali flats are selected as nesting areas	Endangered	Endangered		No
<i>Strix occidentalis lucida</i>	Mexican spotted owl	Year-round resident	Upper elevation, mature, closed-canopy forests, riparian areas, esp. those with multi-storied canopy, steep cliffs, and permanent water. Feeds on a variety of small-med. sized mammals, birds.	Threatened Designated Critical habitat	Sensitive		No
Mammals							
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	Present in the County	Occurs in a variety of xeric to mesic habitats, including desert scrub, sagebrush, chaparral, deciduous and coniferous forests. Roosts and breeds in caves or abandoned mines. Feeds on a variety of insects.	Species of Concern	Sensitive	Sensitive	Yes
<i>Euderma maculatum</i>	spotted bat	Believed to occur in county, found in Jemez Mountains in adjacent Sandoval County	Cliff dwellers that roosts in cracks and crevices of canyons and cliffs. Found in ponderosa pine woodlands during the reproductive season, and lower elevations at other times of the year. In NM, prefers meadows in subalpine coniferous forests.		Threatened	Sensitive	Yes
<i>Lutra canadensis sonorae</i>	southwestern otter	Historically occurred in County	Use rivers with permanent water and deep pools to hunt for food, take refuge from danger, and travel. More at home in the water than on land. Usually observed along river banks and on sand bars.	Species of Concern			No
<i>Martes americana origenes</i>	American marten	Rare, year-round resident	Inhabit forests of spruce, fir, Douglas-fir, and associated trees in northern NM. Optimum habitat is mature old-growth spruce-fir communities with >30% canopy cover, and well-established understory.		Threatened		No

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Mustela nigripes</i>	black-footed ferret	Extirpated	Inhabits large prairie dog colonies nearly exclusively and feeds on variety of mammals, esp. prairie dogs.	Endangered			No
<i>Myotis ciliolabrum melanorhinus</i>	western small-footed, myotis bat	Reported to occur in the county	Primarily in wooded, montane areas, but a few specimens have been taken in grassland and desert scrub habitats.			Sensitive	Yes
<i>Myotis evotis evotis</i>	long-eared, myotis bat	Reported to occur in the county	The species occurs in coniferous forests at moderate elevations. It is most common in ponderosa pine woodlands and is also found in pinyon-juniper woodlands and subalpine forests. The animals use day roosts in tree cavities, under loose bark, and in buildings. These sites as well as caves and mines are used for night roosts. The long-eared myotis feeds over water and along the margins of vegetation."			Sensitive	Yes
<i>Myotis thysanodes thysanodes</i>	fringed myotis bat	Reported to occur in the county	Habitats ranging from mountainous pine, oak, and piñon-juniper to desert scrub but seems to prefer grassland areas at intermediate elevations. These bats roost in caves, mine tunnels, rock crevices, and old buildings in colonies that may number several hundred.			Sensitive	Yes
<i>Myotis volans interior</i>	long-legged myotis bat	Reported to occur in the county	<i>Myotis volans</i> uses desert-scrub, oak-woodland, oak-juniper, piñon-juniper, ponderosa pine, spruce-fir, deciduous riparian, and coniferous riparian habitat types			Sensitive	Yes
<i>Myotis yumanensis yumanensis</i>	Yuma myotis bat	Reported to occur in the county	Occurs in a variety of habitats including riparian, arid shrublands and deserts, and forests. The species roosts in bridges, buildings, cliff crevices, caves, mines, and trees."			Sensitive	Yes
<i>Nyctinomops macrotis</i>	big, free-tailed bat	Reported to occur in the county	Coniferous and mixed woodland and depend on rocky cliffs for roosting			Sensitive	Yes
<i>Ochotona princeps nigrescens</i>	Goat Peak pika	Year-round resident (uncommon, breeder)	Restricted to talus slides and boulder fields in Alpine and sub-Alpine areas, generally 9,000-12,000 feet in elevation. Forages on herbaceous vegetation.	Species of Concern	Sensitive	Sensitive	No

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Zapus hudsonius luteus</i>	New Mexican meadow jumping mouse	Year-round resident (breeds)	Often associated with a grass perennial forb community with at least 65% vegetative cover. Usually found in marshes, moist meadows and riparian habitats in open prairie.	Species of Concern	Endangered	Sensitive	No
Fish							
<i>Catostomus plebius</i>	Rio Grande sucker	Year-round resident	Small to clear, large, mid elevation (2,000-2,600 m) streams, usually over gravel and/or cobble, or backwaters and pools below riffles. Rarely found in waters with heavy silt and organic detritus. Periphyton common.	Species of Concern			No
<i>Gila robusta</i>	roundtail chub	Year-round resident	Cool to warm water, mid-elevation streams and rivers where typical adult microhabitat consists of pools up to 2.0 meters deep adjacent to swifter riffles and runs. Smaller chubs generally occupy shallower, low velocity water adjacent to overhead bank cover.	Species of Concern	Endangered	Sensitive	No
<i>Hybognathus amarus</i>	Rio Grande silvery minnow	Known to historically occur in County	The Rio Grande silvery minnow occupies a variety of habitats in low-gradient, large streams with shifting sand or silty bottoms.	Endangered	Endangered		No
<i>Oncorhynchus clarki virginalis</i>	Rio Grande cutthroat trout	Known to occur in county	Large generally cool, clear, streams and rivers. Opportunistic feeders on terrestrial insects, aquatic invertebrates, zooplankton and crustaceans.	Species of Concern			No
<i>Platygobio gracilis</i>	flathead chub	Year-round resident	Inhabits turbid alkaline waters with shifting sand or gravel substrates in streams and rivers. Found in depths of less than 1 meter, in currents less than 40 cm/s, over a sand substrate.			Sensitive	No
Other Taxa							
<i>Bufo boreas complex</i>	boreal toad/mountain toad	Year-round resident known to occur in County	Occurs between 2775 and 3200 m in New Mexico and appears to be exclusively a high-mountain form (i.e., above 2600 m), and is usually associated with beaver ponds. Totally dependent upon standing or running water for breeding.	Species of Concern	Endangered		No

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Plethodon neomexicanus</i>	Jemez Mountains salamander	Known to occur in County	These small woodland salamanders are restricted to coniferous forests at high elevations (2200-2900 m) in specific microhabitat conditions.	Species of Concern	Endangered	Sensitive	No
<i>Speyeria nokomis nitocris</i>	New Mexico silverspot butterfly	No known county occurrence	Found in streamside meadows and open seepage areas with an abundance of violets in generally desert landscapes. The colonies are often isolated. <i>Viola nephrophylla</i> is a host to larvae; adults feed on flower nectar, including thistles.	Species of Concern			No
Plants							
<i>Abronia bigelovii</i>	tufted sand verbena	Present in the County	Hills and ridges of gypsum in the Todilto Formation, 1,750-2,250 m (5,700-7,400 ft). Populations are restricted to gypsum or strongly gypseous soils derived from gypsum outcrops.		Species of Concern		No
<i>Astragalus cyaneus</i>	cyanic milkvetch	Present in the County	Dry hillsides and gullied banks in sandy-gravelly soils, usu. in p-j woodland; 6,900-7,300 ft.		Species of Concern		No
<i>Astragalus micromerius</i>	Chaco milkvetch	Present in the County	Gypseous or limy sandstones in piñon-juniper woodland or Great Basin desert scrub; 2,000-2,250 m (6,600-7,300 ft).		Species of Concern		No
<i>Astragalus missouriensis var. humistratus</i>	Pagosa milkvetch	Present in the County	Soils derived from the Mancos and Lewis formations. Openings in ponderosa pine, Gambel oak, and upper piñon-juniper woodlands at 2,150-2,345 m (7,050 – 7,700 ft.)		Species of Concern		No
<i>Astragalus oocalycis</i>	Arboles milkvetch	Present in the County	Seleniferous clay soils (e.g. Mancos Formation) with sagebrush, piñon-juniper woodland, and transitional areas between piñon-juniper woodland and ponderosa pine forest; often on roadsides, roadcuts, and in other disturbed areas; 1,700-2,200 m (5,600-7,200 ft).		Species of Concern		Yes
<i>Astragalus puniceus var. gertrudis</i>	Taos milkvetch	Present in the County	Dry banks and gravelly benches among piñon and junipers, 6,000-7,000 ft.		Species of Concern		Yes

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Astragalus ripleyi</i>	Ripley's milkvetch	Present in the County	Sagebrush, p-j woodland, and Gambel oak thickets in ponderosa pine forest; 7,000-8,250 ft.	Species of Concern	Species of Concern		No
<i>Delphinium robustum</i>	robust larkspur	Present in the County	Canyon bottoms and aspen groves in montane coniferous forest; 7,200-11,200 ft.		Species of Concern		No
<i>Ericameria microcephala</i>	small-headed goldenweed	Present in the County	Granitic rock crevices in open ponderosa pine forests; 8,000-8,500 ft.		Species of Concern		No
<i>Hackelia hirsuta</i>	New Mexico stickseed	Present in the County	Dry shaley or igneous soils in montane forests, usu. w/ Gambel oak; 7,700-10,200 ft.		Species of Concern		No
<i>Mentzelia conspicua</i>	Chama blazingstar	Present in the County	Road cuts and barren hillsides, on gray to red shales and clays of the Mancos and Chinle formations in piñon-juniper woodland; 1,800-2,200 m (5,900-7,200 ft).		Species of Concern		No
<i>Phlox caryophylla</i>	Pagosa phlox	Present in the County	Open woodlands, slopes, and sagebrush communities, often in deep soils; 2,000-2,300 m (6,500-7,500 ft). <i>Phlox caryophylla</i> occasionally grows in highway rights-of-way and may be impacted by maintenance operations.		Species of Concern		Yes
<i>Physaria pruinosa</i>	Pagosa bladderpod	Present in the County	Limited to soils derived from the upper cretaceous Mancos Shale Formation; 2,095-2,514 m (6,810-8,250 ft). Occurs in patches in a 10 by 40-mile band (northwest-southeast) within the Archuleta uplift. The highest densities tend to be on exposed gray clay barrens surrounded by montane grasslands. Smaller populations are found in open ponderosa pine stands and Gambel oak communities with the numbers apparently decreasing when plants become part of the forest understory. <i>Physaria pruinosa</i> can also be associated with Douglas fir and Engelmann spruce communities at the upper limits of its range.		Species of Concern		No

ATTACHMENT A - Threatened and Endangered Species of Rio Arriba County (continued)

<i>Salix arizonica</i>	Arizona willow	Present in the County	Sedge meadows and wet drainage ways in subalpine coniferous forest; 10,000-11,200 ft.	Species of Concern	Species of Concern		No
<i>Senecio cliffordii</i>	Clifford's groundsel	Present in the County	Limy mudstones or sandy soils in piñon-juniper woodland up to mixed conifer forest; 2,250 – 2,350 m (7,380 – 7,700 ft).		Species of Concern		No

* **Endangered:** Any species which is in danger of extinction throughout all or a significant portion of its range. **Threatened:** Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. **Candidate:** Candidate Species (taxa for which the Service has sufficient information to propose that they be added to list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities). **Species of Concern:** Taxa for which further biological research and field study are needed to resolve their conservation status OR are considered sensitive, rare, or declining on lists maintained by Natural Heritage Programs, State wildlife agencies, other Federal agencies, or professional/academic scientific societies. Species of Concern are included for planning purposes only. **State of New Mexico Status** is included for planning purposes.

ATTACHMENT B

Representative Project Photos

ATTACHMENT B
Representative Project Photos



Rocky outcrop near the existing road where bats could potentially roost.



Existing road to be improved.

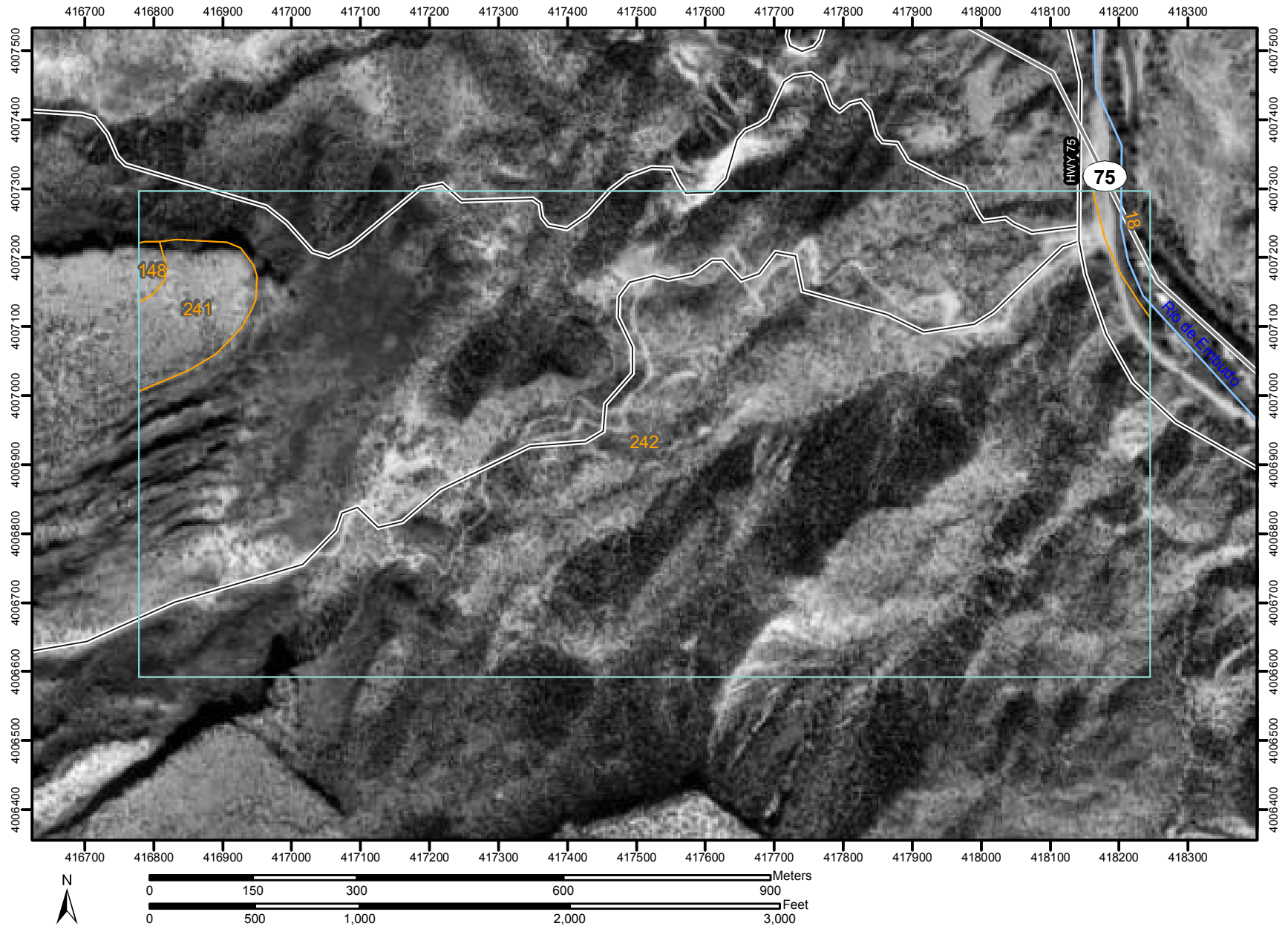


More bat roosting habitat further from the road.

APPENDIX C

SUPPORTING ENVIRONMENTAL DOCUMENTATION


Soil Map—Rio Arriba Area, New Mexico, Parts of Rio Arriba and Sandoval Counties
(Embudo al Cielo Soil Map)



Soil Map—Rio Arriba Area, New Mexico, Parts of Rio Arriba and Sandoval Counties
(Embudo al Cielo Soil Map)

MAP LEGEND






















Area of Interest (AOI)

 Area of Interest (AOI)

Soils


 Soil Map Units

Special Point Features




-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

 Very Stony Spot

 Wet Spot



 Other

Special Line Features



-  Gully
-  Short Steep Slope
-  Other

Political Features

Municipalities

-  Cities
-  Urban Areas






Water Features

-  Oceans
-  Streams and Canals

Transportation

 Rails

Roads

-  Interstate Highways
-  US Routes
-  State Highways
-  Local Roads
-  Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 13N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

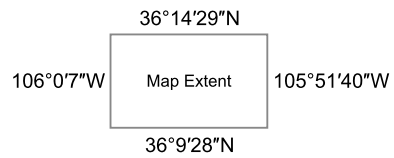
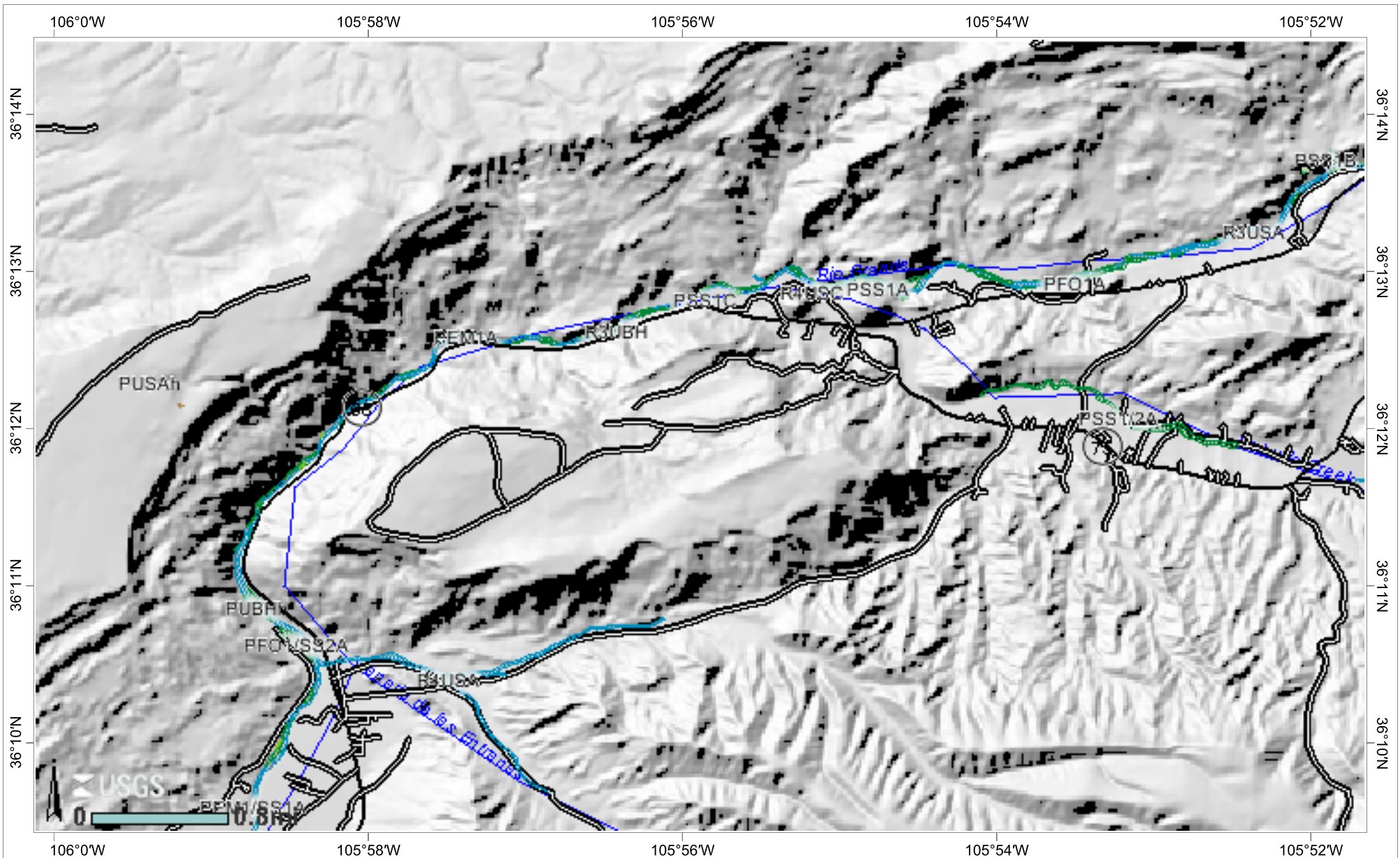
Soil Survey Area: Rio Arriba Area, New Mexico, Parts of Rio Arriba and Sandoval Counties
Survey Area Data: Version 6, Apr 15, 2007

Date(s) aerial images were photographed: 10/4/1997

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

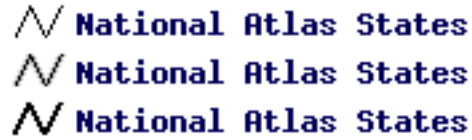
Rio Arriba Area, New Mexico, Parts of Rio Arriba and Sandoval Counties (NM650)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
18	Abiquiu-Peralta complex, 0 to 3 percent slopes	2.3	0.9%
148	Chita loam, 0 to 5 percent slopes	0.7	0.3%
241	Florita-Rock outcrop complex, 15 to 45 percent slopes	6.4	2.5%
242	Tinaja-Rock outcrop complex, 45 to 75 percent slopes	245.9	96.3%
Totals for Area of Interest (AOI)		255.3	100.0%



Geographic Coordinate System (WGS84)

BOUNDARIES

US States



TRANSPORTATION

County Road Labels (USGS)

No legend available

New Mexico Roads (BTS)



State Highway Labels (USGS)

No legend available

Texas Roads (BTS)



US Highway Labels (USGS)

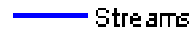
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HYDROGRAPHY

National Atlas Stream Labels

No legend available

National Atlas Streams



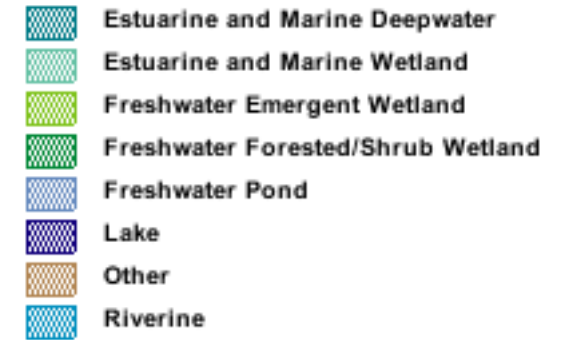
National Atlas Waterbodies



National Atlas Waterbody Labels

No legend available

Wetland Polygons (USFWS)

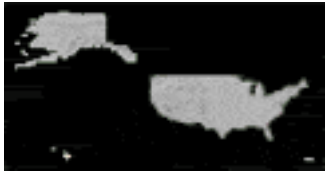


Wetland Scans (USFWS)

No legend available

ELEVATION

US NED Shaded Relief



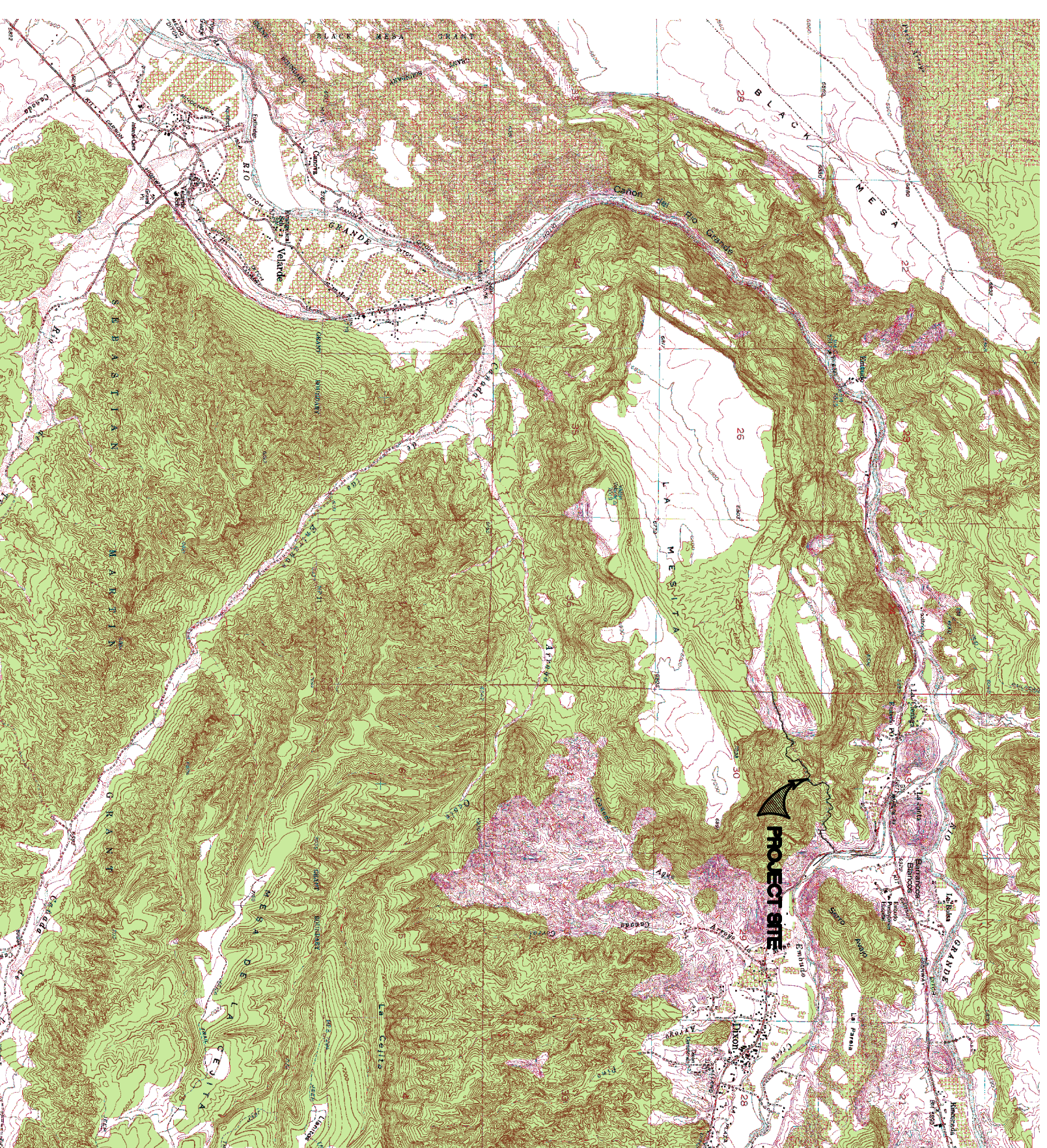
APPENDIX D

ACCESS ROAD IMPROVEMENTS GRAPHICS

ACCESS ROAD IMPROVEMENTS EMBUDO AL CIELO DEVELOPMENT

Rio Arriba County, New Mexico

June 2007



V I C I N I T Y M A P

SCALE: 1" = 5000'

<u>SHEET</u>	<u>DESCRIPTION</u>
C1.1	COVER SHEET
C2.1	TYPICAL SECTIONS AND GENERAL NOTES
C2.2	MISCELLANEOUS QUANTITIES
C3.1	ROADWAY PLAN AND PROFILE - STA. 10+00 TO STA. 20+00
C3.2	ROADWAY PLAN AND PROFILE - STA. 20+00 TO STA. 34+00
C3.3	ROADWAY PLAN AND PROFILE - STA. 34+00 TO STA. 48+00
C3.4	ROADWAY PLAN AND PROFILE - STA. 48+00 TO STA. 62+00
C3.5	ROADWAY PLAN AND PROFILE - STA. 62+00 TO STA. 76+00
C3.6	ROADWAY PLAN AND PROFILE - STA. 76+00 TO STA. 84+16.44
C4.1	STRUCTURE PLACEMENT SECTIONS
C4.2	STRUCTURE PLACEMENT SECTIONS


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Santa Fe
Engineering, Inc.



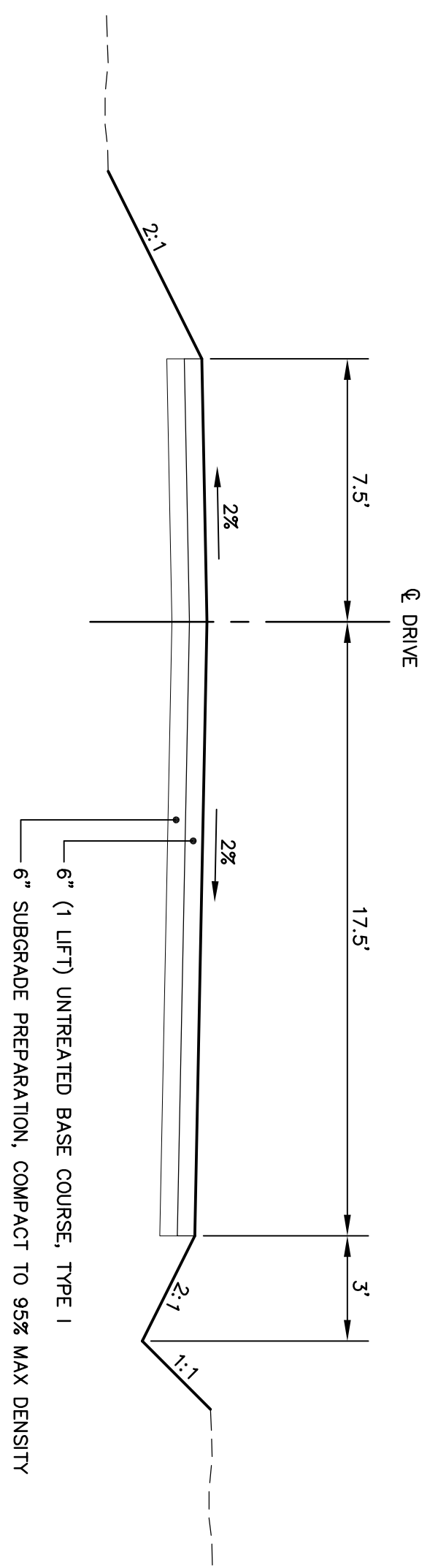
3209 Mercantile Court, Suite A
Santa Fe, NM 87507-2959
Phone: (505) 474-9219
Fax: (505) 424-4601

SHEET No.
C1.1



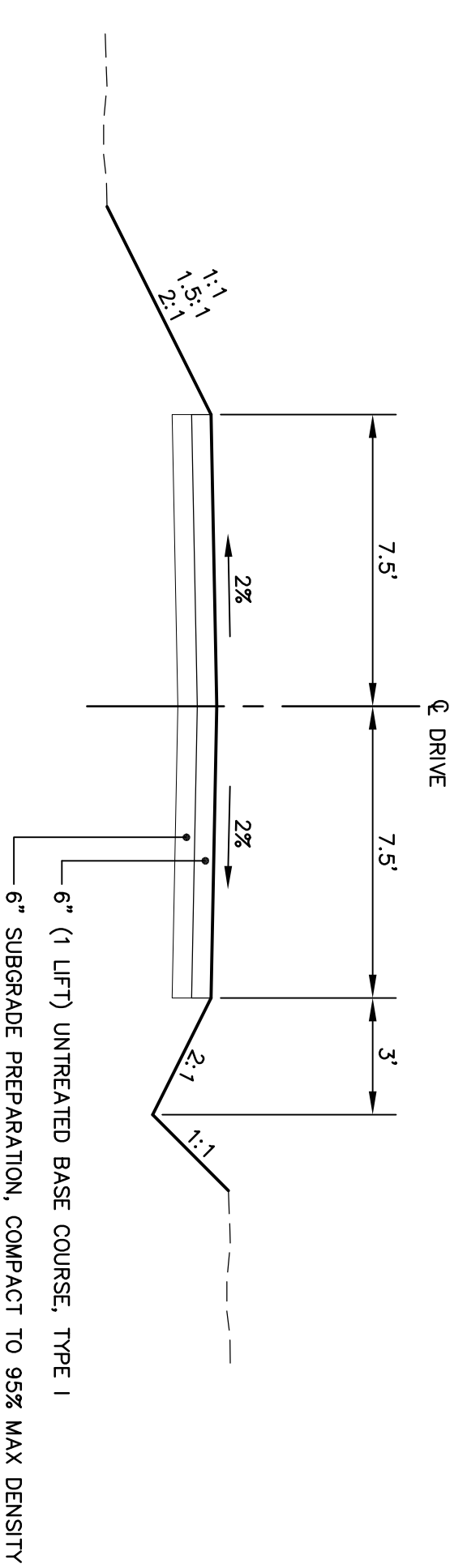
GENERAL NOTES:

1. ALL ROADWAY WORK SHALL CONFORM TO THE NEW MEXICO DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, 2000 EDITION".
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF ALL EXISTING UTILITIES AND SHOULD NOT RELY SOLELY ON THESE PLANS FOR EXISTING UTILITY LOCATIONS.
3. THE CONTRACTOR SHALL PROVIDE AN AREA TO STORE CONSTRUCTION DEBRIS WHERE IT WILL NOT BE A HAZARD TO ADJACENT PROPERTIES. ALL DEBRIS SHALL BE STORED IN A MANNER THAT WILL PREVENT SCATTERING. ALL DEBRIS INCLUDING TREES AND UNDERGROWTH SHALL BE DISPOSED OF PROPERLY AT A CERTIFIED LANDFILL. ALL DEBRIS SHALL BE REMOVED FROM THE SITE PRIOR THE FINAL SITE INSPECTION.
4. THE CONTRACTOR SHALL CONFINE HIS OPERATIONS TO THE CONSTRUCTION LIMITS OF THE PROJECT AND IN NO WAY SHALL ENCROACHMENT OCCUR ONTO ADJACENT PROPERTIES UNLESS LEGAL EASEMENTS ARE OBTAINED. ALL FILL AND CUT SLOPES SHALL BE SETBACK FROM THE PROPERTY LINE IN ACCORDANCE WITH THE NECESSARY EROSION CONTROL AGREEMENTS. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY AGREEMENTS NECESSARY OR DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES TO PUBLIC OR PRIVATE PROPERTY INCLUDING UTILITIES.
5. THE DEVELOPER/CONTRACTOR DURING CONSTRUCTION SHALL MAINTAIN THE PROPER TRAFFIC CONTROL DEVICES IN COMPLIANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
6. THE CONTRACTOR SHALL IMPLEMENT THE NECESSARY SITE EROSION CONTROL MEASURES THROUGHOUT ALL PHASES OF CONSTRUCTION, MOVEMENT OFFSITE DURING ALL PHASES OF CONSTRUCTION.
7. ASTM OR ASHTO CERTIFICATE OF MATERIALS COMPLIANCE ARE TO BE SUBMITTED DIRECTLY TO THE ENGINEER.
8. SUBGRADE AND BASE MATERIAL REQUIRE COMPACTION TESTS FOR EACH 500 LINEAR FEET. ALL TEST RESULTS FROM THE TESTING LABORATORY ARE TO BE SENT DIRECTLY TO THE ENGINEER.



TYPICAL SECTION WITH TURNOUT

NOT TO SCALE
 STA 18+77.00 TO STA 19+07.00 RT
 STA 40+41.00 TO STA 40+71.00 RT
 STA 61+85.00 TO STA 62+15.00 LT



ACCESS ROAD TYPICAL SECTION

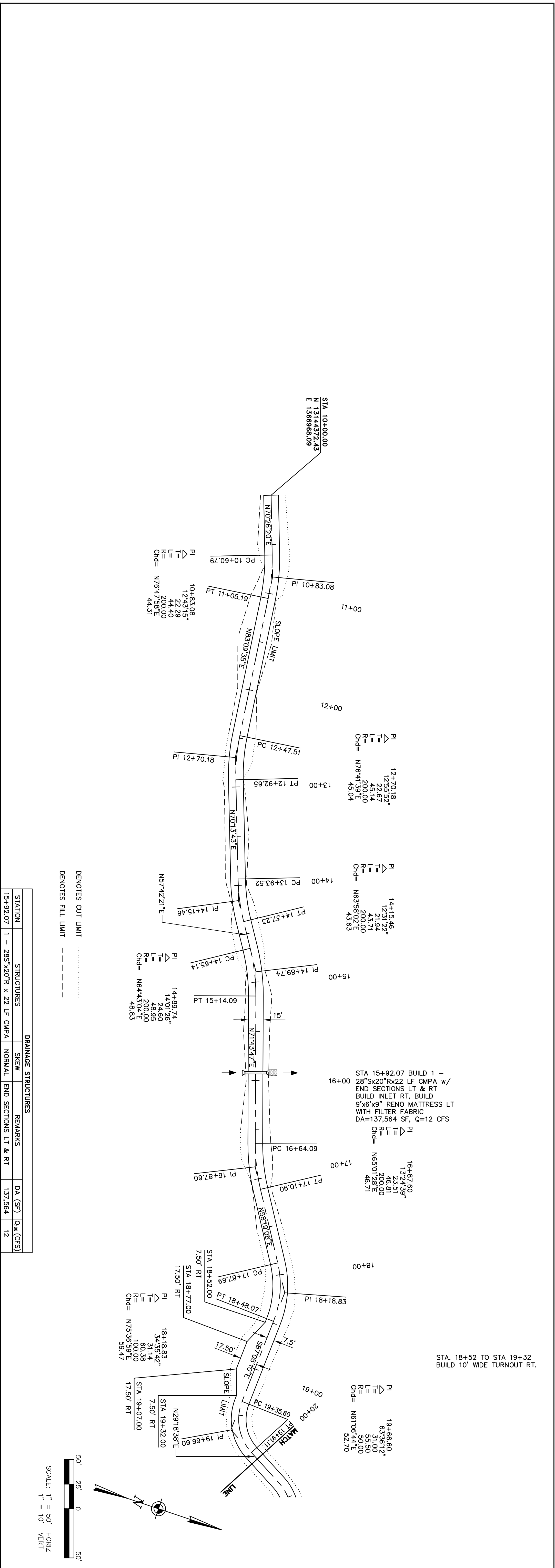
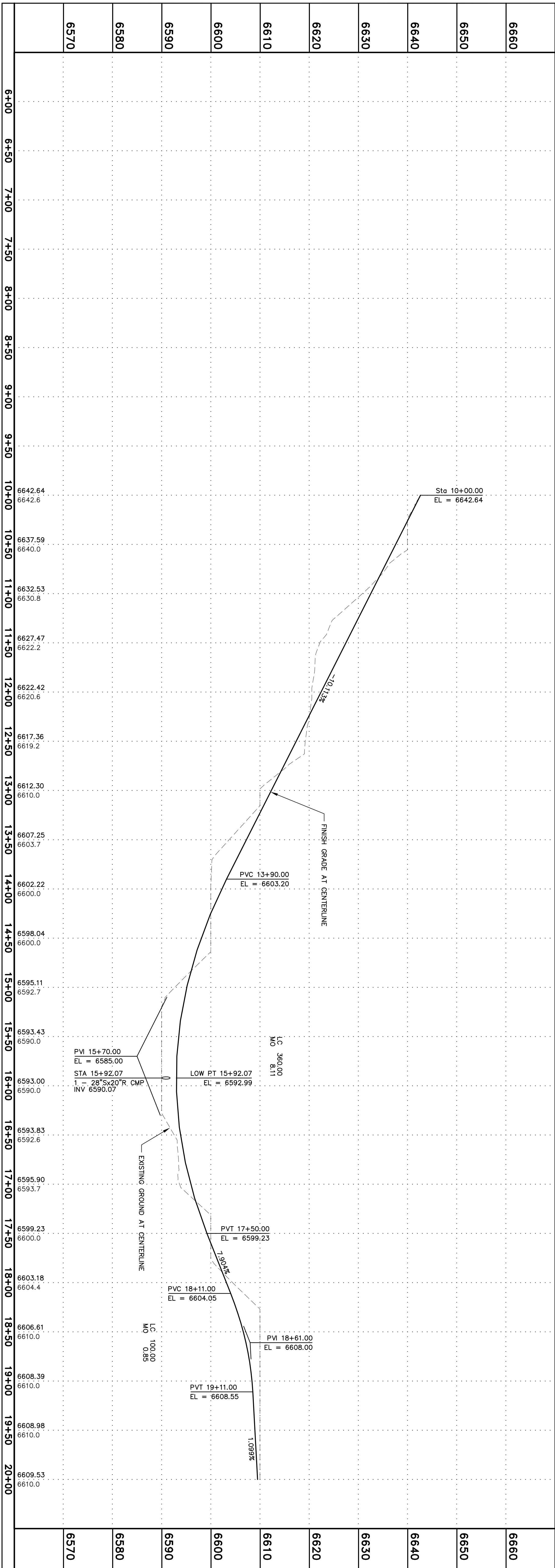
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 STA 10+00.00 TO STA 18+77.00
 STA 19+07.00 TO STA 40+41.00
 STA 40+71.00 TO STA 61+85.00
 STA 62+15.00 TO STA 84+16.44

PROJECT: ACCESS ROAD IMPROVEMENTS	
Embudo Al Cielo Development, Rio Arriba County, NM	
SHEET TITLE: TYPICAL SECTIONS AND GENERAL NOTES	

No.	REVISION	BY	APPVD.	DATE

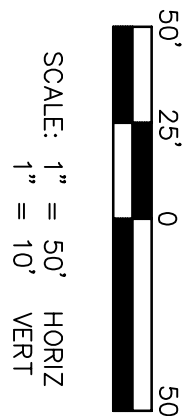
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DATE:	06-07-07	DRAWN:	JEC
SCALE:	AS NOTED		

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STATION	STRUCTURES	REMARKS
15+92.07	1 - 28'x20'x22' LF CMPA	END SECTIONS LT & RT

..... DENOTES CUT LIMIT
 - - - - - DENOTES FILL LIMIT



No.	REVISION	BY	APPVD.	DATE

PROJECT: **ACCESS ROAD IMPROVEMENTS**
Embudo Al Cielo Development, Rio Arriba County, NM

SHEET TITLE: **ROADWAY PLAN AND PROFILE**
(Sta 10+00 to Sta 20+00)

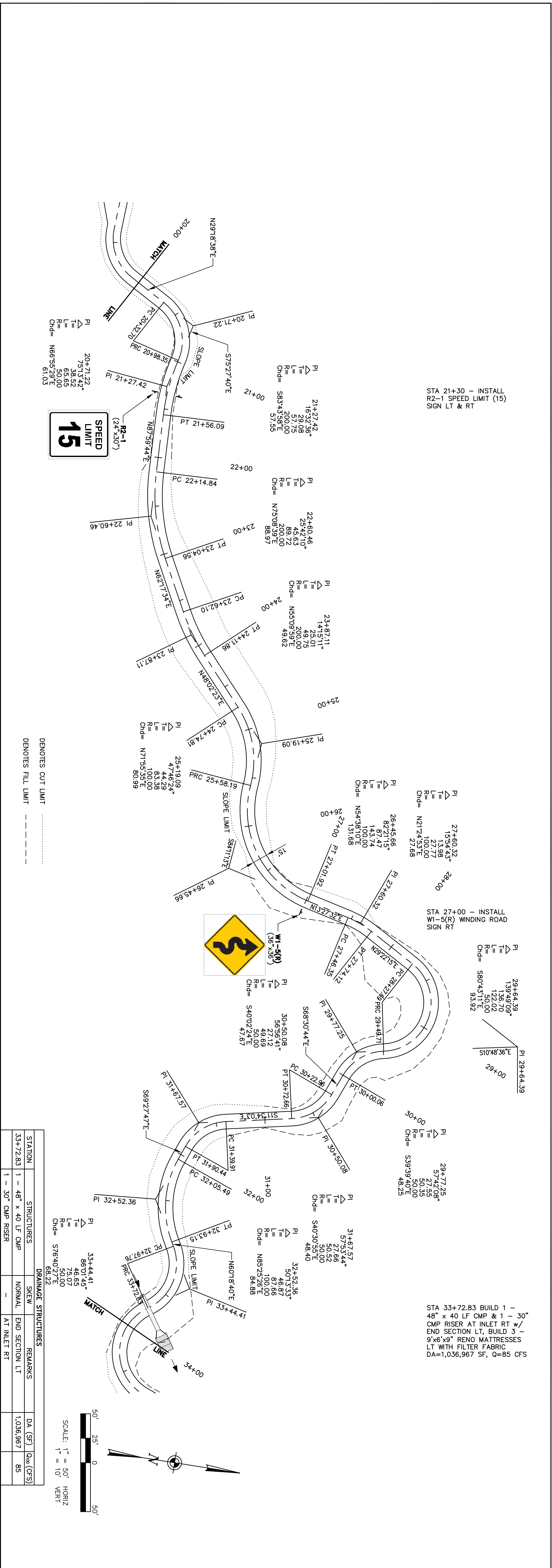
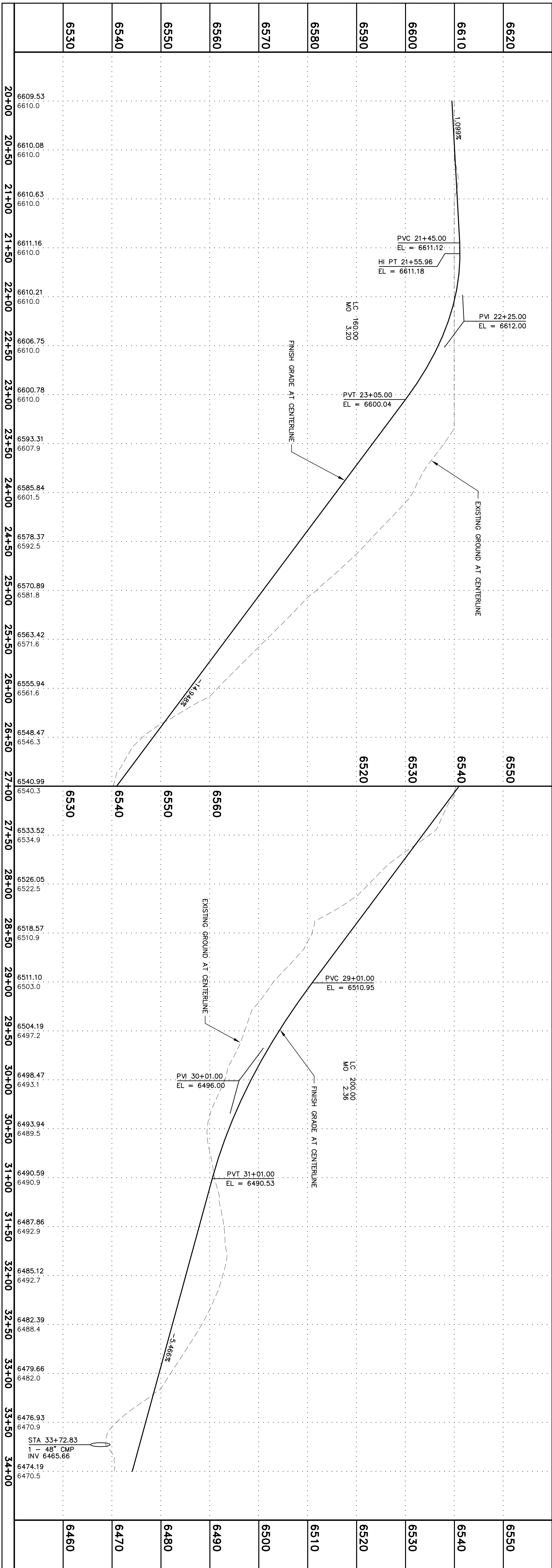
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RME
 Santa Fe
 Engineering, Inc.

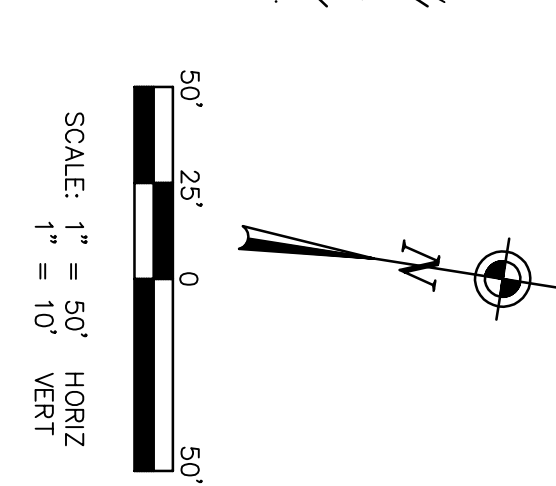
3209 Mercantile Court, Suite A
 Santa Fe, NM 87507-2959
 Phone: (505) 474-8219
 Fax: (505) 424-4601

SHEET NO.
C3.1

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STATION	STRUCTURES	REMARKS	DA (SF)	Q ₈₅ (CFS)
33+72.83	1 - 48" x 40" LF CMP	END SECTION LT	1,036,967	85
31+00	1 - 30" CMP RISER	AT INLET RT		



No.	REVISION	BY	APPVD.	DATE

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 SCALE: H: 1"=50' V: 1"=10'

PROJECT: **ACCESS ROAD IMPROVEMENTS**
Embudo Al Cielo Development, Rio Arriba County, NM

SHEET TITLE: **ROADWAY PLAN AND PROFILE**
(Sta 20+00 to Sta 34+00)

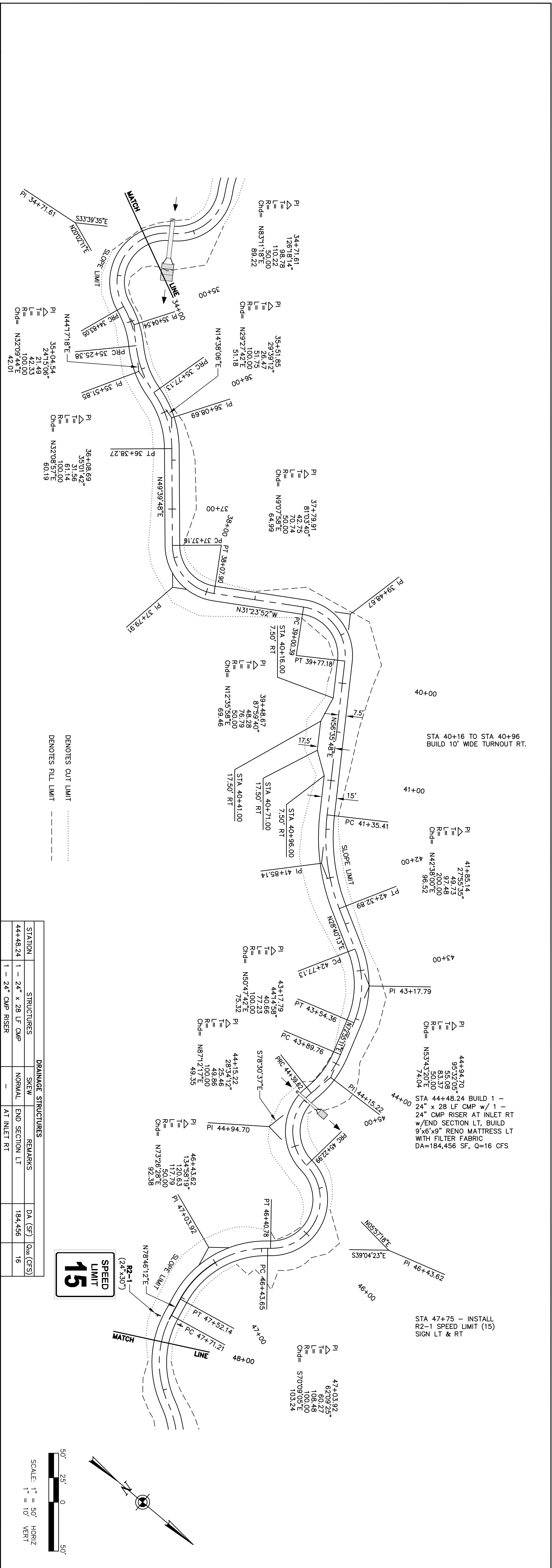
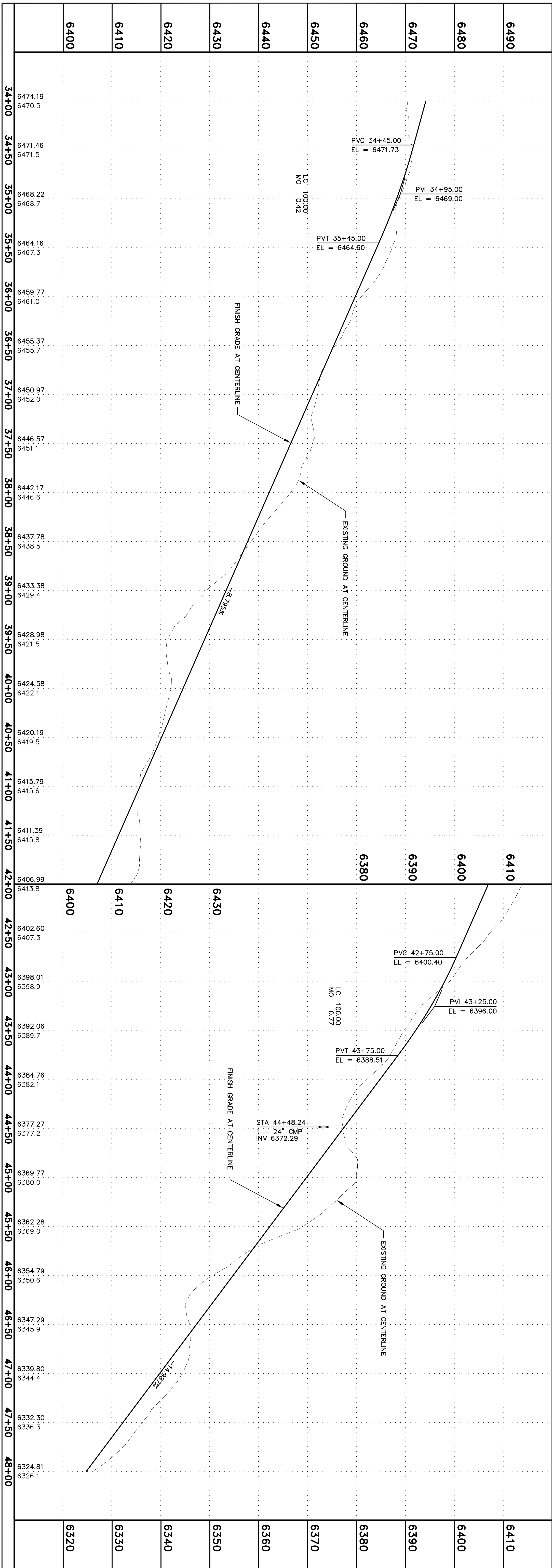
PROJECT: 2121 DESIGN: JEC
 FILE NAME: 2121.dwg CHECKED: JEC
 DATE: 06-07-07 DRAWN: brc
 SCALE: H: 1"=50' V: 1"=10'

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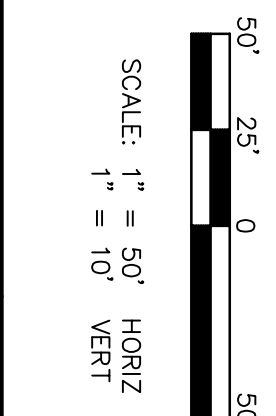
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SHEET NO.
C3.2

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STATION	STRUCTURES	SKEW	REMARKS	DA (SF)	Qmax (GFS)
44+48.24	1 - 24" x 28" LF CMP	NORMAL	END SECTION LT	184,456	16
	1 - 24" CMP RISER		AT INLET RT		



No.	REVISION	BY	APPVD.	DATE

PROJECT: 2121 DESIGN: JEC
 FILE NAME: 2121.dwg CHECKED: JEC
 DATE: 06-07-07 DRAWN: brc
 SCALE: H: 1"=50' V: 1"=10'

PROJECT: ACCESS ROAD IMPROVEMENTS
 Embudo Al Cielo Development, Rio Arriba County, NM

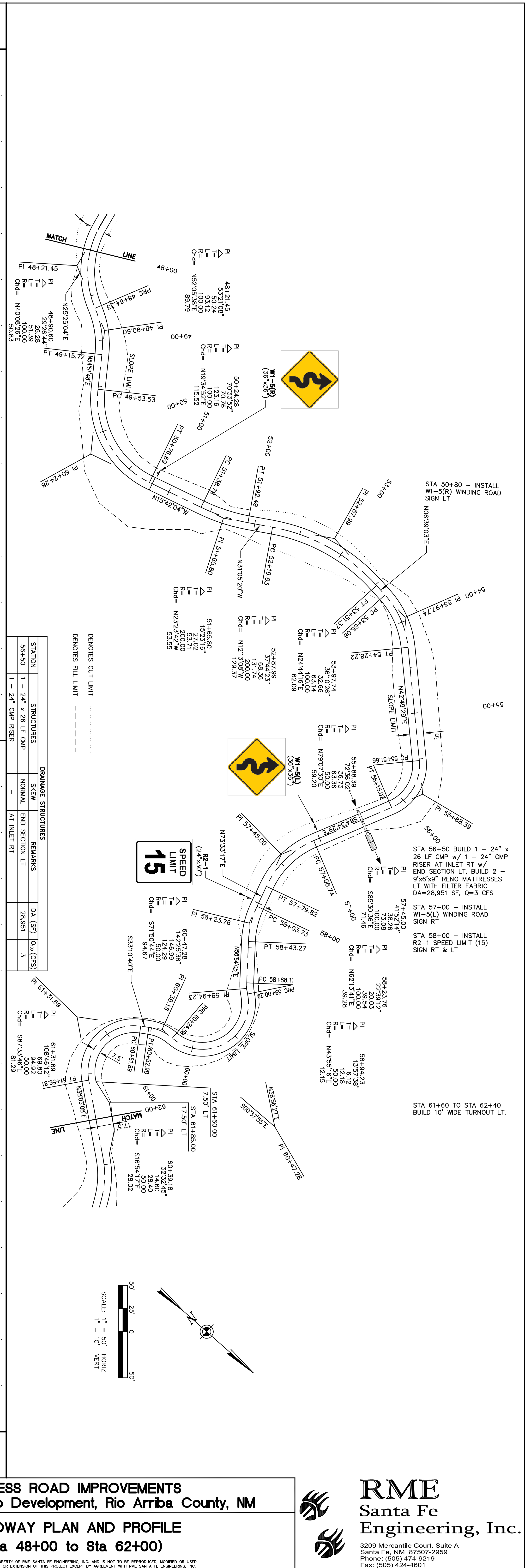
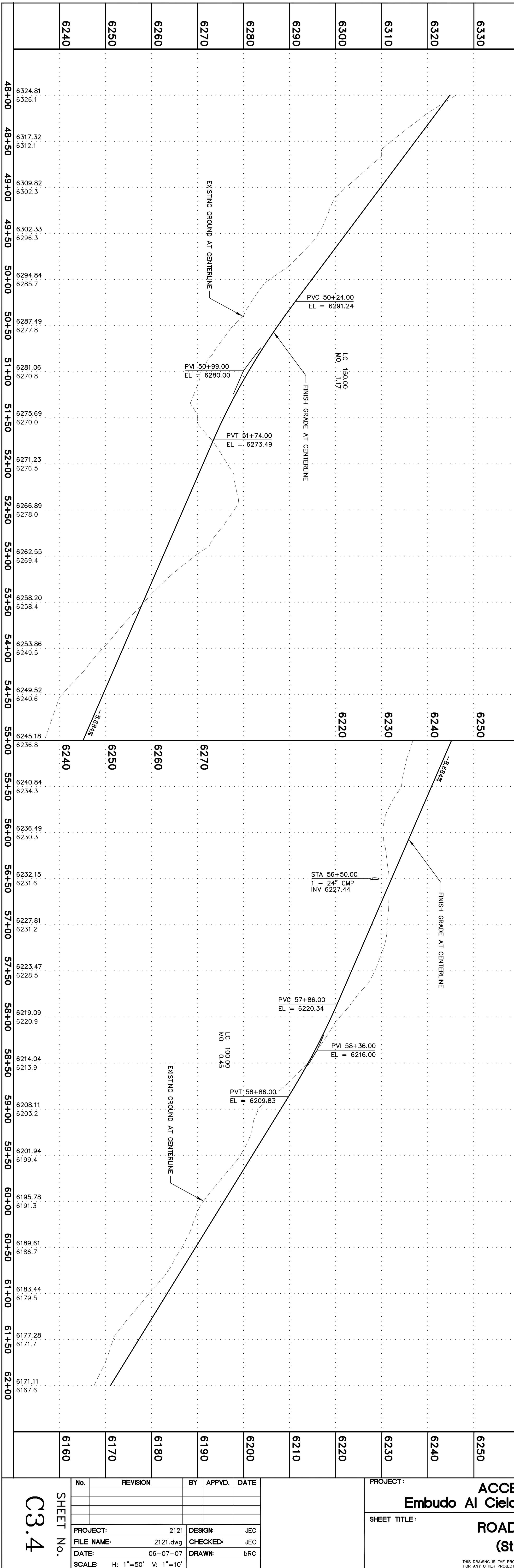
SHEET TITLE: ROADWAY PLAN AND PROFILE
 (Sta 34+00 to Sta 48+00)

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SHEET NO.
C3.3

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SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
56+50	1 - 24" x 26" LF CMP	END SECTION LT	28.951	3
56+50	1 - 24" CMP RISER	AT INLET RT		

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
61+60	7.50' LT			
61+85	17.50' LT			
60+40	17.50' LT			
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
61+60	7.50' LT			
61+85	17.50' LT			
60+40	17.50' LT			
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+40	17.50' LT			
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+17	17.50' LT			

SITATION	STRUCTURES	REMARKS	DA (SF)	Qam (CFS)
60+17	17.50' LT			

No.	REVISION	BY	APPVD.	DATE

PROJECT: 2121 DESIGN: JEC
 FILE NAME: 2121.dwg CHECKED: JEC
 DATE: 06-07-07 DRAWN: bRC
 SCALE: H: 1"=50' V: 1"=10'

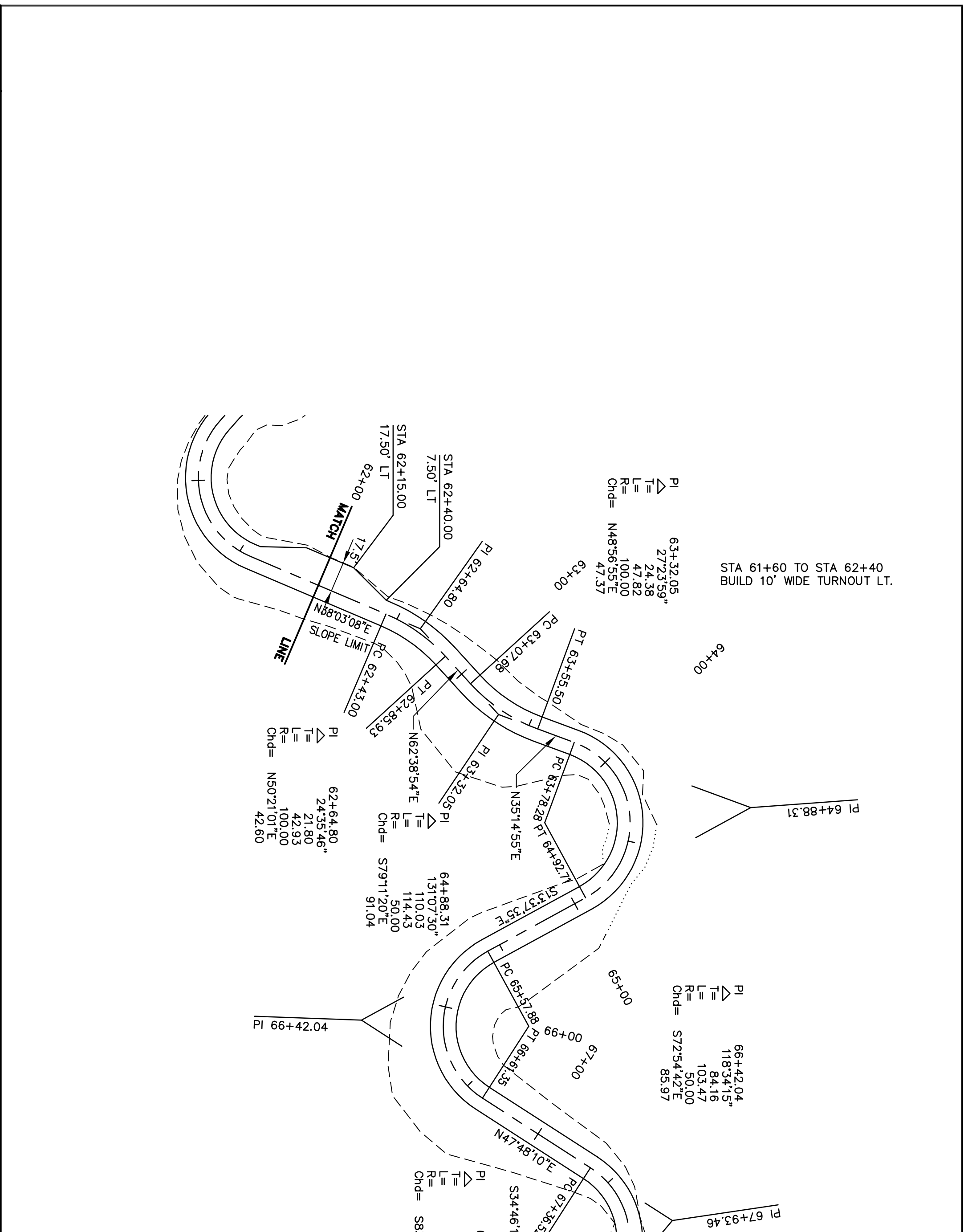
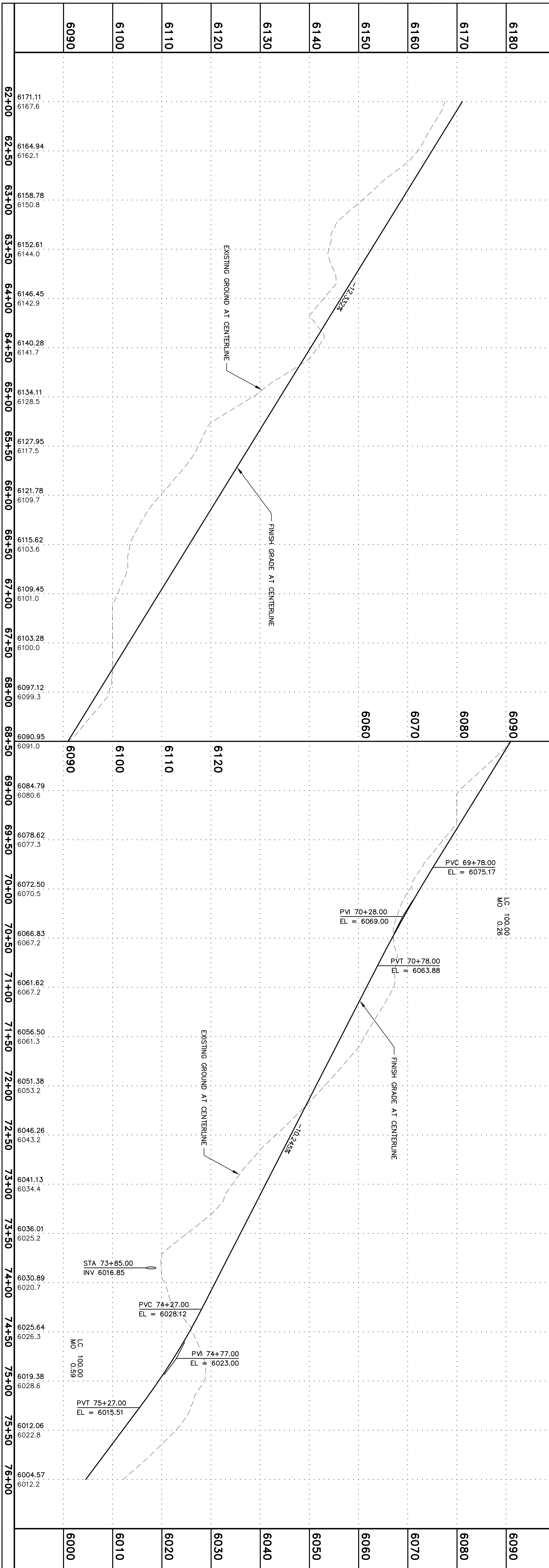
PROJECT: ACCESS ROAD IMPROVEMENTS
 Embudo Al Cielo Development, Rio Arriba County, NM
 SHEET TITLE: ROADWAY PLAN AND PROFILE
 (Sta 48+00 to Sta 62+00)

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SHEET NO.
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STATION 61+60 TO STA 62+40
BUILD 10' WIDE TURNOUT LT.

STATION 73+85 BUILD 1 - 24" x 68 LF CMP w/ 1 - 24" CMP RISER AT INLET RT w/ END SECTION LT, BUILD 9'x6'x9' RENO MATTRESS LT WITH FILTER FABRIC DA=21,789 SF, Q=2 CFS

--- DENOTES CUT LIMIT
- - - DENOTES FILL LIMIT

STATION	STRUCTURES	DRAINAGE STRUCTURES		REMARKS	DA (SF)	Q _{max} (CFS)
		SKEW	NORMAL			
73+85	1 - 24" x 68 LF CMP			AT INLET RT	21,789	2

No.	REVISION	BY	APPVD.	DATE

PROJECT: 2121 DESIGN: JEC
 FILE NAME: 2121.dwg CHECKED: JEC
 DATE: 06-07-07 DRAWN: brc
 SCALE: H: 1"=50' V: 1"=10'

PROJECT: **ACCESS ROAD IMPROVEMENTS**
Embudo Al Cielo Development, Rio Arriba County, NM

SHEET TITLE: **ROADWAY PLAN AND PROFILE**
(Sta 62+00 to Sta 76+00)

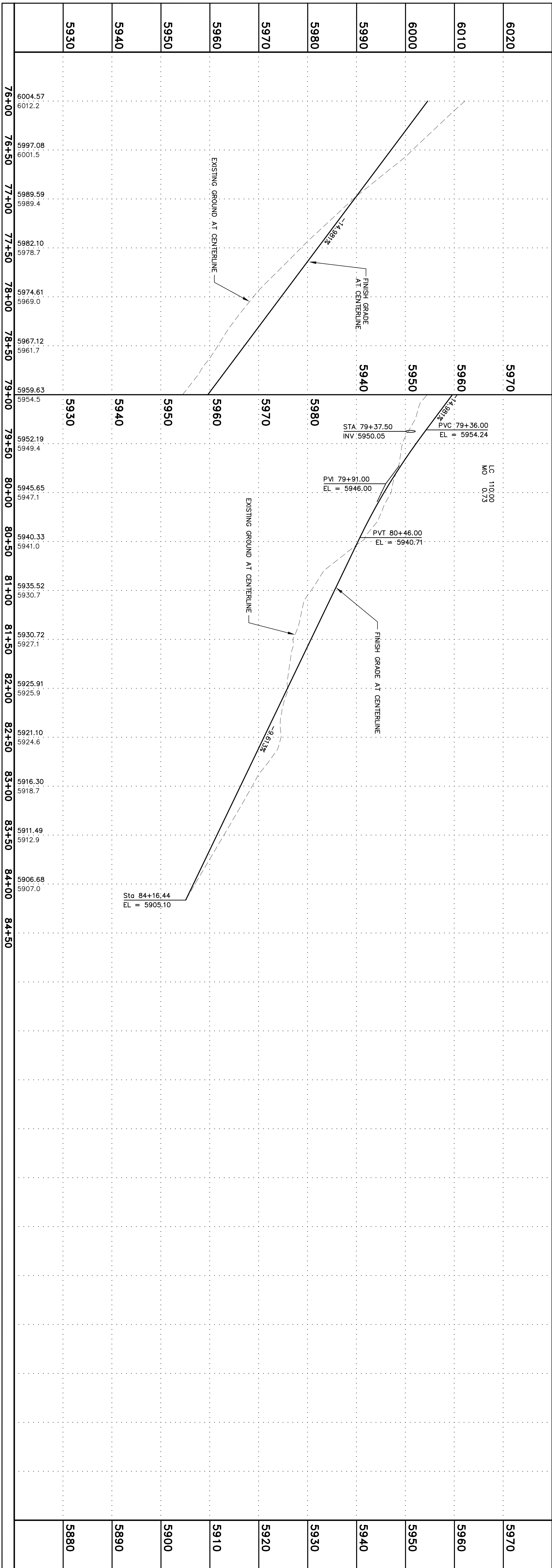
PROJECT: 2121 DESIGN: JEC
 FILE NAME: 2121.dwg CHECKED: JEC
 DATE: 06-07-07 DRAWN: brc
 SCALE: H: 1"=50' V: 1"=10'

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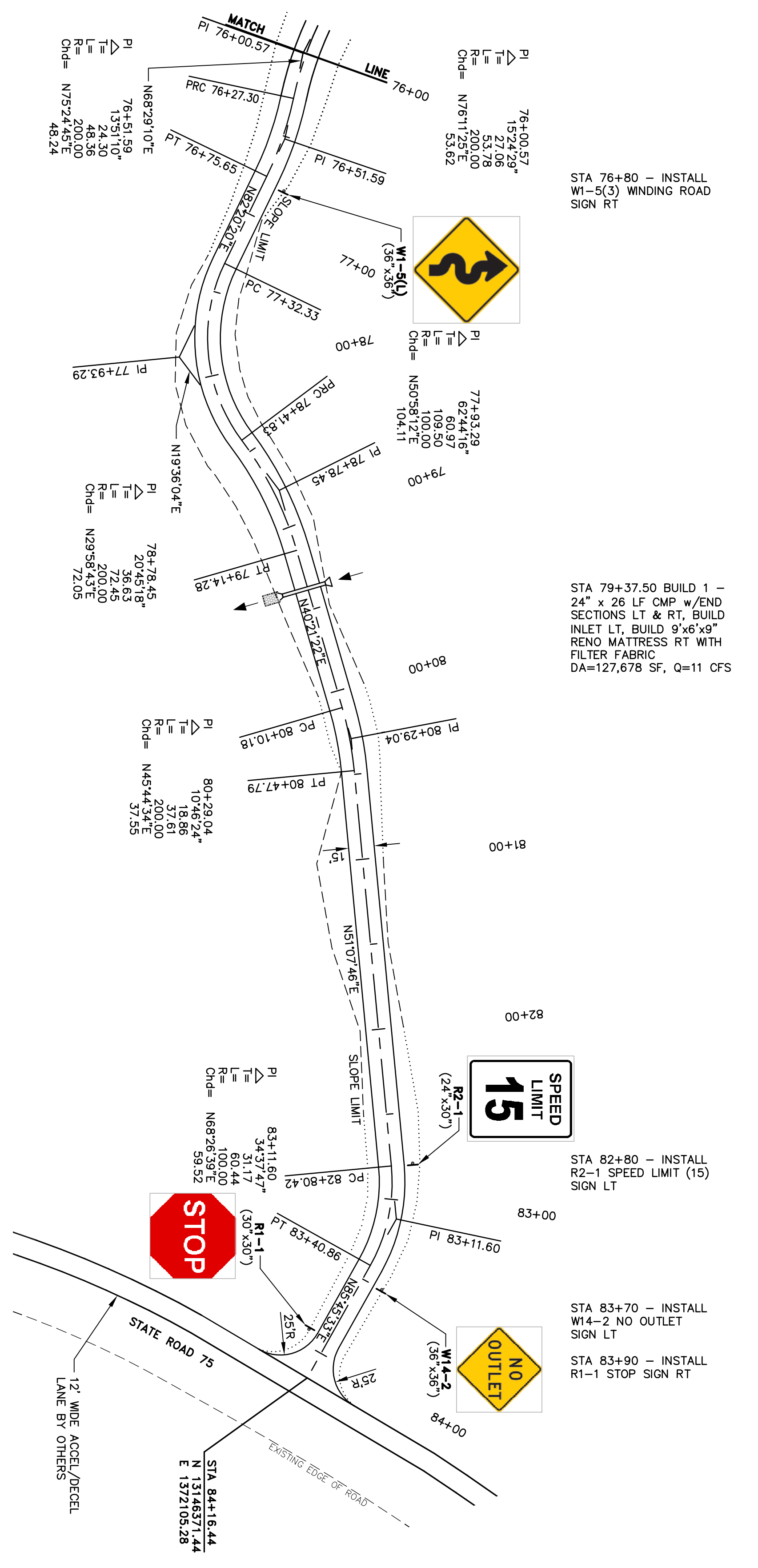
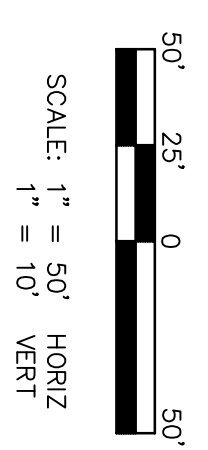
SHEET NO.
C3.5

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STATION	STRUCTURES	REMARKS	DA (SF)	Q _{max} (CFS)
79+37.50	1 - 24" x 26 LF CMP	END SECTIONS LT & RT	127.678	11

..... DENOTES CUT LIMIT
 - - - - - DENOTES FILL LIMIT



STA 76+80 - INSTALL
 W1-5(3) WINDING ROAD
 SIGN RT

STA 79+37.50 BUILD 1 -
 24" x 26 LF CMP w/END
 SECTIONS LT & RT, BUILD
 INLET LT, BUILD 9'x6'x9"
 RENO MATTRESS RT WITH
 FILTER FABRIC
 DA=127.678 SF, Q=11 CFS

STA 82+80 - INSTALL
 R2-1 SPEED LIMIT (15)
 SIGN LT

STA 83+70 - INSTALL
 W14-2 NO OUTLET
 SIGN LT
 STA 83+90 - INSTALL
 R1-1 STOP SIGN RT

No.	REVISION	BY	APPVD.	DATE

PROJECT: 2121 DESIGN: JEC
 FILE NAME: 2121.dwg CHECKED: JEC
 DATE: 06-07-07 DRAWN: bRC
 SCALE: H: 1"=50' V: 1"=10'

PROJECT: **ACCESS ROAD IMPROVEMENTS**
Embudo Al Cielo Development, Rio Arriba County, NM

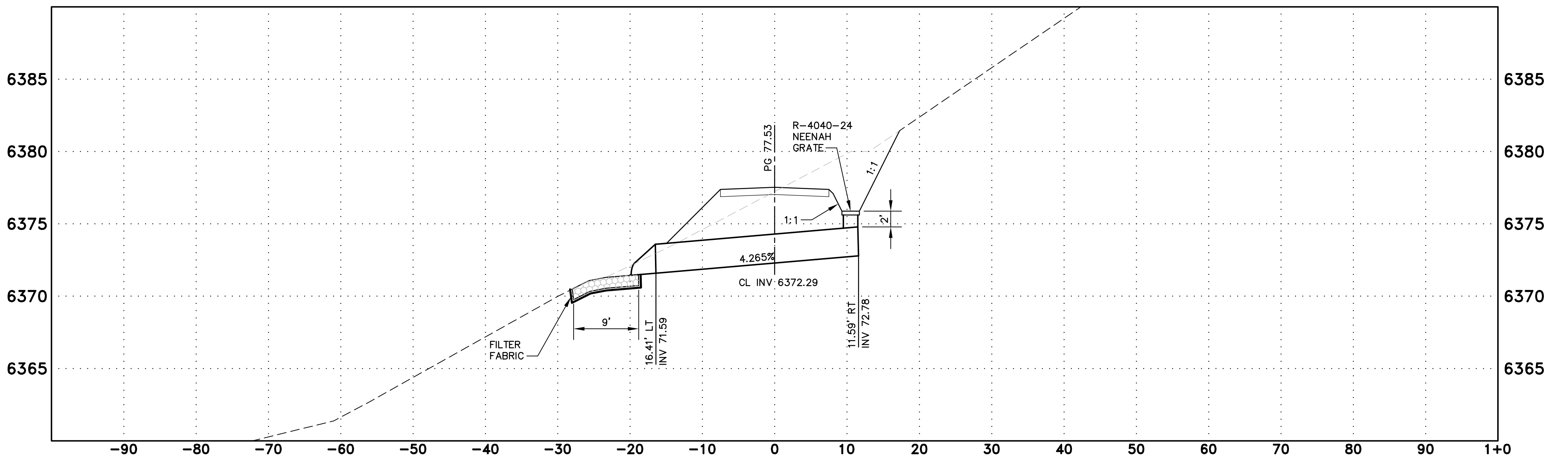
SHEET TITLE: **ROADWAY PLAN AND PROFILE**
(Sta 76+00 to Sta 84+16.44)

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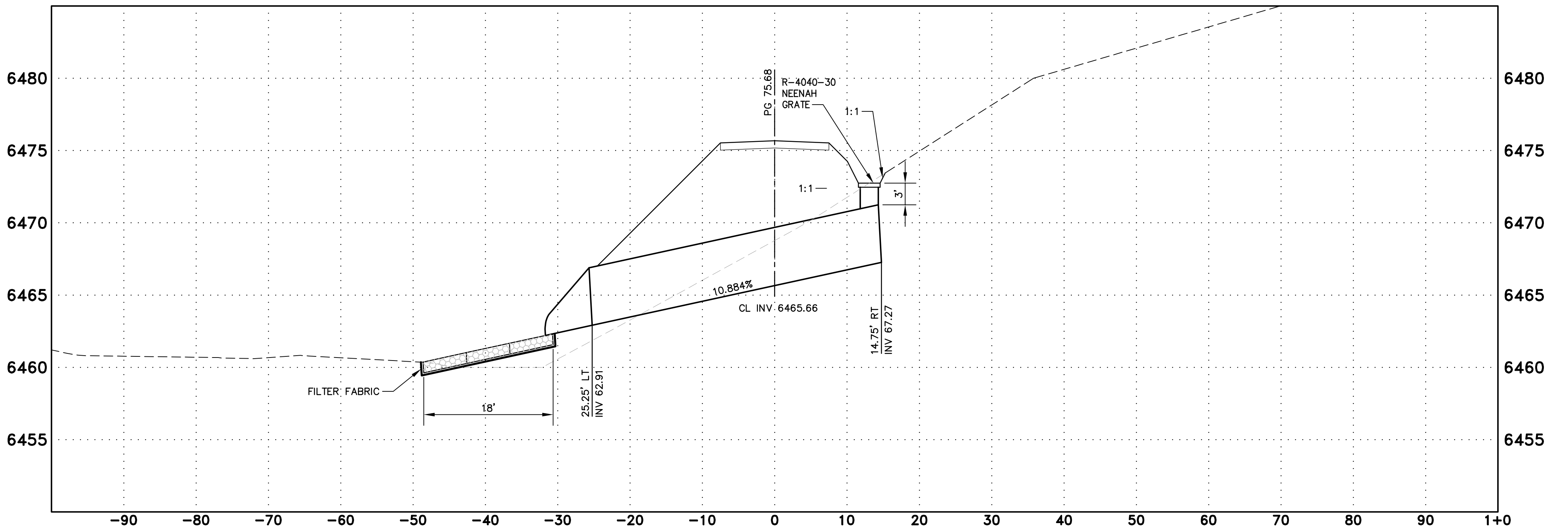
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SHEET NO.
C3.6



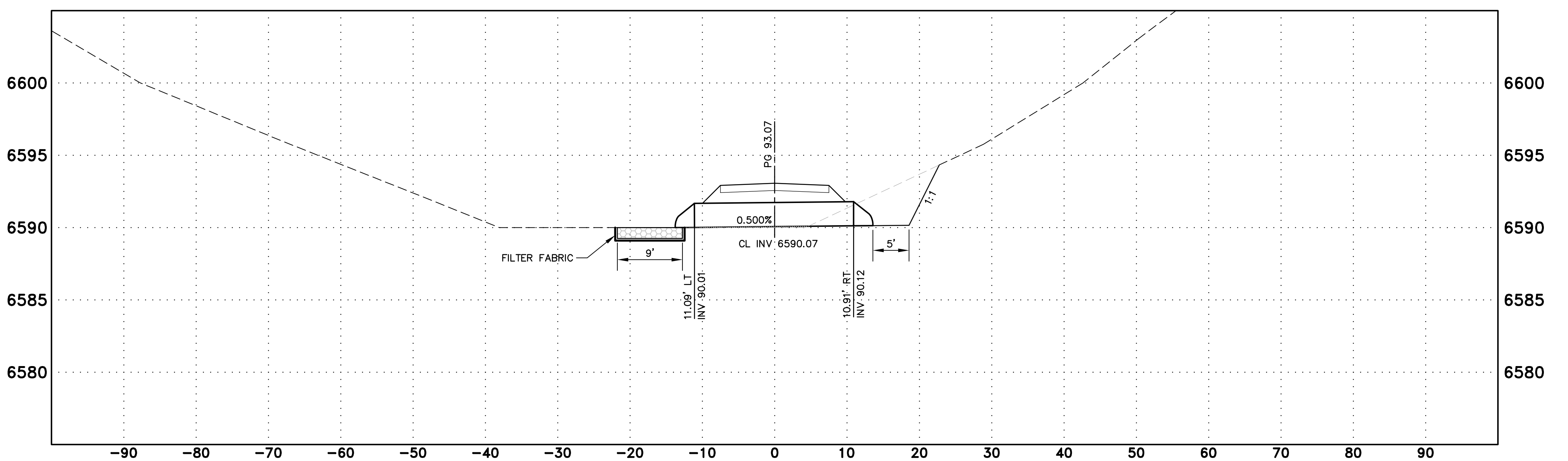
STA 44+48.24
 BUILD 1 - 24" x 28 LF CMP w/
 1 - 24" CMP RISER AT INLET RT w/
 END SECTION LT
 BUILD 9'x6'x9" RENO MATTRESS LT
 WITH FILTER FABRIC

SCALE:
 1" = 10' HORIZ
 1" = 5' VERT



STA 33+72.83
 BUILD 1 - 48" x 40 LF CMP AND
 1 - 30" CMP RISER AT INLET RT w/
 END SECTION LT
 BUILD 3 - 6'x12'x9" RENO MATTRESSES LT
 WITH FILTER FABRIC

SCALE:
 1" = 10' HORIZ
 1" = 5' VERT



STA 15+92.07
 BUILD 1 - 28" x 20" x 22 LF CMPA w/
 END SECTIONS LT & RT
 BUILD INLET RT
 BUILD 9'x6'x9" RENO MATTRESS LT
 WITH FILTER FABRIC

SCALE:
 1" = 10' HORIZ
 1" = 5' VERT

C4.1

No.	REVISION	BY	APPVD.	DATE

PROJECT:	2121	DESIGN:	JEC
FILE NAME:	2121SPS.dwg	CHECKED:	JEC
DATE:	06-07-07	DRAWN:	bRC
SCALE:	H: 1"=10' V: 1"=5'		

PROJECT: ACCESS ROAD IMPROVEMENTS
 Embudo Al Cielo Development, Rio Arriba County, NM

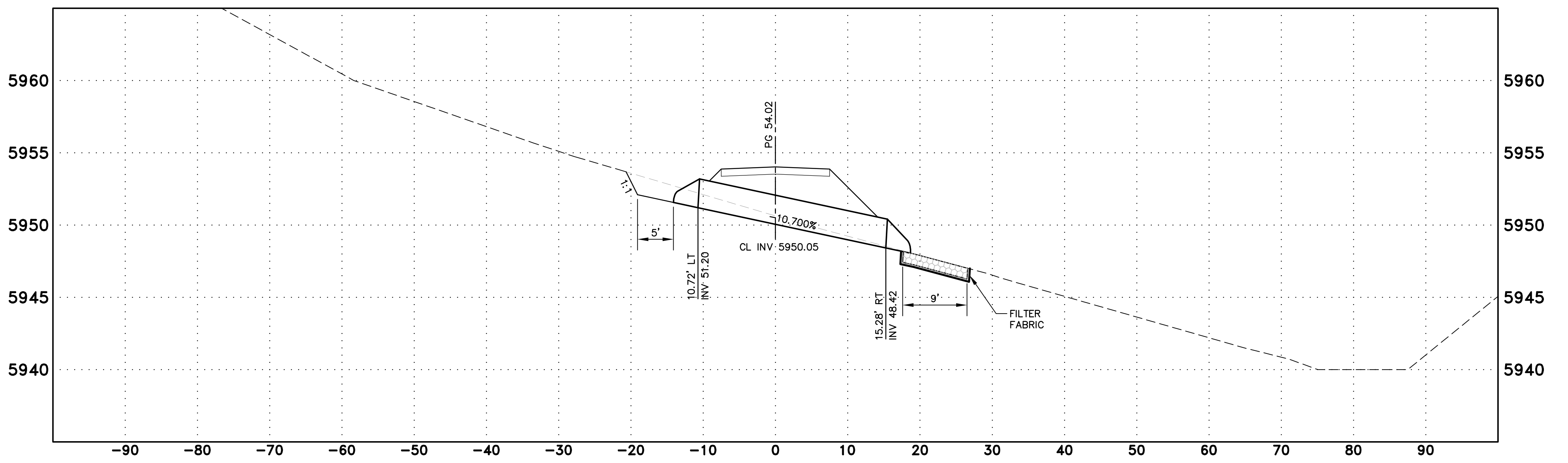
SHEET TITLE: STRUCTURE PLACEMENT SECTIONS

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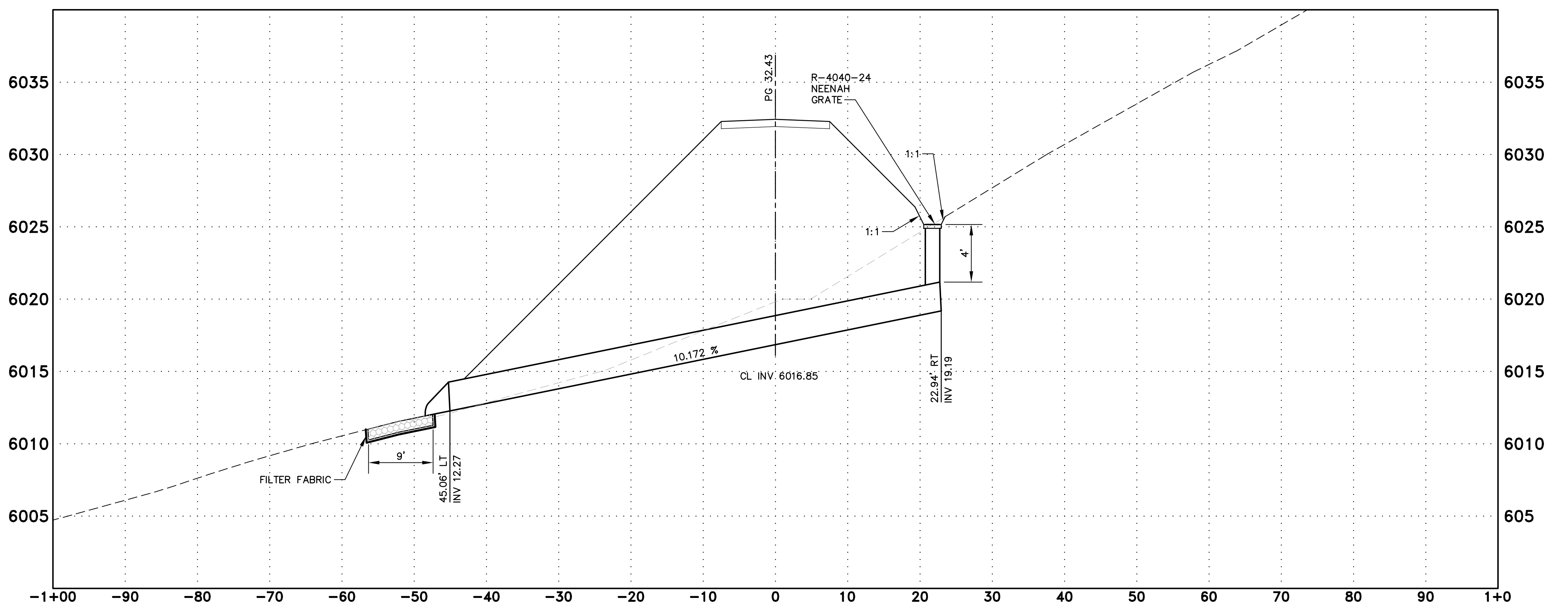
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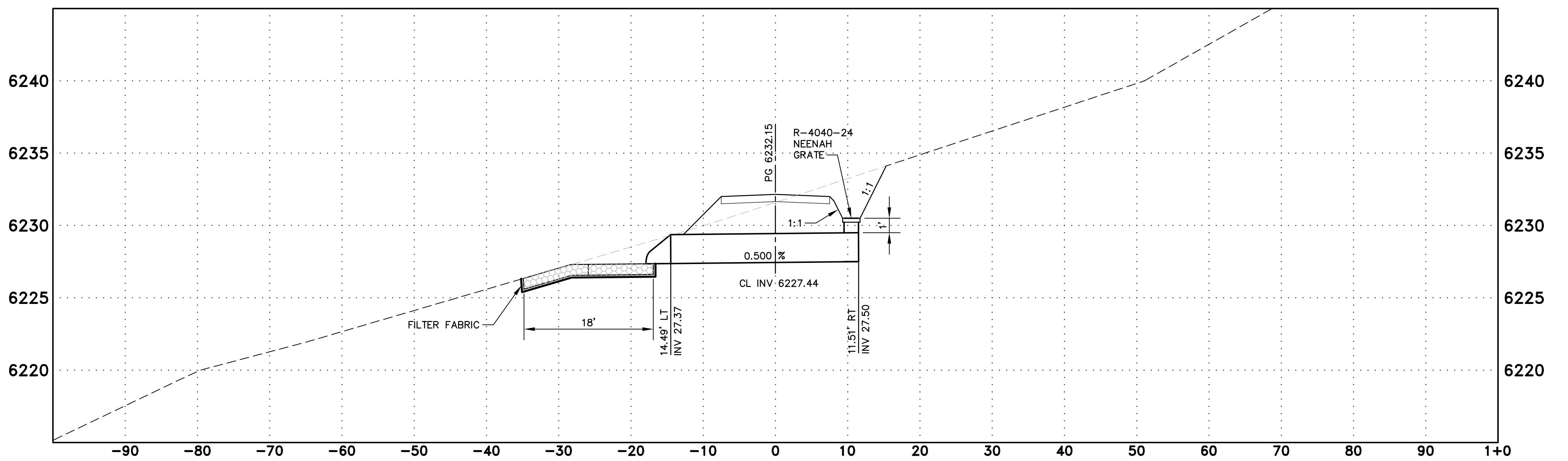
STA 79+37.50
 BUILD 1 - 24" x 26 LF CMP w/
 END SECTIONS LT & RT
 BUILD INLET LT
 BUILD 9'x6'x9" RENO MATTRESS RT
 WITH FILTER FABRIC

SCALE:
 1" = 10' HORIZ
 1" = 5' VERT



STA 73+85
 BUILD 1 - 24" x 68 LF CMP AND
 1 - 24" CMP RISER AT INLET RT w/
 END SECTION LT
 BUILD 9'x6'x9" RENO MATTRESS LT
 WITH FILTER FABRIC

SCALE:
 1" = 10' HORIZ
 1" = 5' VERT



STA 56+50
 BUILD 1 - 24" x 26 LF CMP w/
 1 - 24" CMP RISER AT INLET RT w/
 END SECTION LT
 BUILD 2 - 9'x6'x9" RENO MATTRESSES LT
 WITH FILTER FABRIC

SCALE:
 1" = 10' HORIZ
 1" = 5' VERT

SHEET NO.
C4.2

No.	REVISION	BY	APPVD.	DATE

PROJECT:	2121	DESIGN:	JEC
FILE NAME:	2121SPS.dwg	CHECKED:	JEC
DATE:	06-07-07	DRAWN:	bRC
SCALE:	H: 1"=10' V: 1"=5'		

PROJECT: ACCESS ROAD IMPROVEMENTS
 Embudo Al Cielo Development, Rio Arriba County, NM

SHEET TITLE: STRUCTURE PLACEMENT SECTIONS

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