

Technical Memorandum

Subject: Final Pavement & Materials Recommendations (V2)
NM FLAP SIE 10(1) Lakeshore Road

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INTRODUCTION

This memorandum provides preliminary pavement and material recommendations for the Lakeshore Road project located in Sierra County, east of Truth or Consequences, New Mexico.

The Lakeshore Road project consists of five hydraulic structure upgrades at separate locations along Lakeshore Road on the west side of the reservoir.

CFLHD standards and guidelines were used to complete the pavement and materials recommendations.

FIELD INVESTIGATION

CFLHD geotechnical engineer Brendan McGarity performed a field investigation of Lakeshore Road from January 18th to 21st, 2021. A truck-mounted drill rig with an 8" O.D. hollow stem auger was used to complete the borings. Pavement borings were logged at 5 locations. Additional geotech borings were drilled for the project, the data and analysis for which is available in a separate geotechnical report.

The primary objectives of this field investigation were as follows:

- Measure and record existing pavement and subgrade layer depths;
- Gather subgrade soil samples for follow-up testing to determine engineering properties;
- Evaluate and record pavement distress conditions;
- Evaluate roadway and project area for constructability concerns.

Lakeshore Road has an asphalt paved surface and the structure was observed to be performing well. The construction and maintenance history of the roadway are not known at this time.

The information gathered as described above was used to support pavement rehabilitation, structural design, and material recommendations.

Below are summary tables of the data gathered and test results.

Summary of Sampling & Test Results, Lakeshore Road

| Pavement Depth | Roadbase Depth | R-value, subgrade | Plasticity Index | Comments |
|----------------|----------------|-------------------|------------------|---|
| 2 to 4 inches | 2 to 3 inches | 44 | 15 | <ul style="list-style-type: none"> • Resistivity values were evaluated as part of a separate geotechnical investigation. |

Summary of Sampling & Test Results, CR 64

| Pavement Depth | Roadbase Depth | R-value, subgrade | Plasticity Index | Comments |
|-----------------|----------------|-------------------|------------------|---|
| 0 to 4.5 inches | 0 to 3 inches | 22 to 73 | NP to 15 | <ul style="list-style-type: none"> • Subgrade material consists of Silty Sands and Clayey Gravels, A-1-b (0) and A-2-6 (0). • Practical refusal was encountered in several locations at depths of 6 inches to 1 foot. |

TRAFFIC:

Traffic counts for Lakeshore Road were provided with the FLAP application and used to develop estimates for ESALs. The road is primarily used for recreational access with little commercial use. Truck counts were based on engineering judgement and are assumed to be very low. The counts appear generally consistent with other historical traffic data and they align with what was experienced during the field investigation. An Annual Average Daily Traffic (AADT) value was used for analysis due to high seasonal variability in traffic volumes. The following is a summary of traffic data as well as the estimated ESALs used for design:

- 2019 AADT = 350
- 2039 ADT = 520 (2% growth rate)
- 2019 % trucks = 15% Class 5 (trucks/RVs), 1% Class 8
- Directional factor = 60%
- Calculated Lane ESAL's = 170,000

DESIGN RECOMMENDATIONS

The pavement design, rehabilitation method, and other recommendations are included below.

In developing the pavement structural and rehabilitation recommendations for Lakeshore Road the following criteria was used:

Design Criteria

| | |
|---------------------------------------|------------|
| Initial Serviceability | 4.2 |
| Terminal Serviceability | 2.0 |
| Design Reliability Level | 75% |
| Overall Standard Deviation | 0.49 |
| Soil Resilient Modulus (R-value = 44) | 10,800 psi |
| Performance Period (3R) | 20 years |
| 20-year ESAL | 170,000 |
| Calculated Structural Number (SN) | 2.02 |

The following is the recommended pavement structural section:

Lakeshore Road

| Layer | Thickness |
|-----------------------|----------------------|
| HACP | 3 inches (two lifts) |
| Aggregate Base Course | 6 inches |
| SN | 2.06 |

ADDITIONAL RECOMMENDATIONS:

- Include a nominal amount of subexcavation (~200 cu yd) to be used at discretion of the CO.
- Recommend the following bid items.

| Item Number | Item Description | Unit |
|--------------------|-----------------------------------|-------------|
| 20402-0000 | Subexcavation | CUYD |
| 30202-2000 | Roadway Aggregate, Method 2 | TON |
| 40301-0100 | Asphalt Concrete Pavement, Type 1 | TON |

CONSTRUCTION CONSIDERATIONS & SPECIAL CONTRACT PROVISIONS

The project is located in a mountainous area where cobbles and refusal were encountered during the subsurface investigation. The contractor should expect to encounter some cobbles and boulders during construction.

CFLHD standard SCR's related to pavements & materials will be used. If the decision is made to use a local borrow source and/or develop a source, an SCR may need to be developed.