



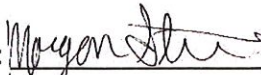
MATERIALS MEMO

LOCAL, 1ST STREET WIDENING, AMMON

PROJECT NUMBER - A024(250)

KEY NUMBER - 24250

Prepared By:  Date: 4/8/2026
Kelly Hoopes, Consultant Project Manager

Recommended By:  Date: 4/28/26
Morgan Stewart, City of Ammon
Signer ID: SCPY5PB116...

Recommended By:  Date: 5/4/26
Lance Bates, Bonneville County

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INTRODUCTION

The City of Ammon, in cooperation with the Local Highway Technical Assistance Council (LHTAC) and Bonneville County, has undertaken the task of widening 1st Street between 25th E (Hitt Rd) and 35th E (Ammon Rd) (Project Number A024(250)). This roadway is utilized by traffic from all over the Bonneville Metropolitan area. Prior to this project, the Sand Creek Bridge and the roadway connection to the west in Idaho Falls has previously been completed. East of the bridge, the roadway stakeholders are the City of Ammon and Bonneville County.

PROJECT LOCATION

The project is located between the Hitt Rd/Ammon Rd in Bonneville County. See Figure 1 for more detail.

PROJECT DESCRIPTION

Key number 24250, 1st Street Hitt Rd. to Ammon is a reconstruction of 1st Street from 2 lanes to 5 lanes with two lanes in each direction and a center two-way turn lane. It will add curb, gutter, and sidewalk along the entire section. It will also add a traffic signal at the 1st Street and Curlew Rd intersection.

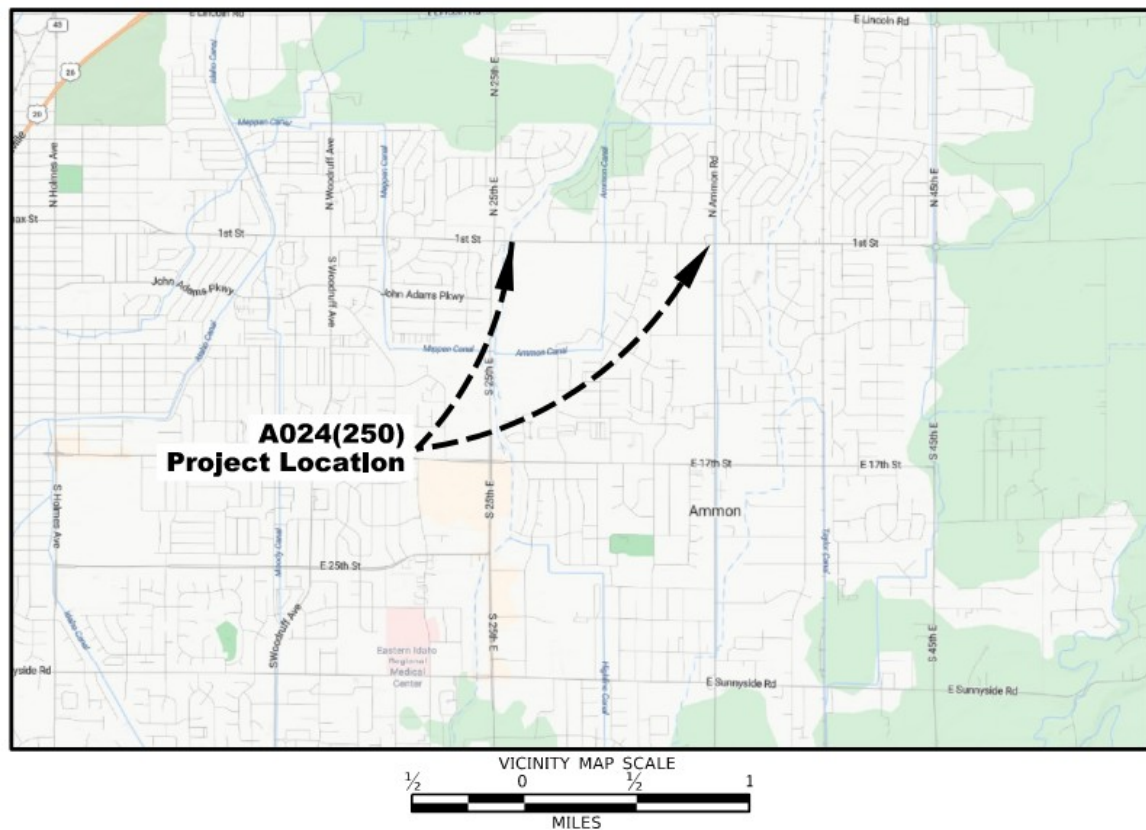


Figure 1: Vicinity Map

TRAFFIC

Traffic data shows that the current v/c ratio is 1.63. This is a level of service on 1st Street of a LOS F. Without any improvements the v/c ratio will be 2.36 in 2040 and an LOS F rating. Data from the safety analysis shows accidents from attempting to turn left onto or off 1st Street and vehicles being rear-ended while waiting to turn left.

The road will be expanded from the current two lanes to a five-lane road with 2 lanes in each direction and a center two-way turn lane. A Raised median will be installed on 1st St. to restrict left hand turning movements out of the exit approach for the Snake River Montessori School. A raised median will be placed on 1st St. to provide a protected left hand turn into the one-way entrance approach and to restrict left hand turning movements out of the exit approach to a right-in-right-out traffic pattern for the commercial business locate between Curlew Dr and Hitt Rd(25th).

The truck density for this roadway is relatively low based on the current and projected land uses.

A traffic signal will be installed at the intersection of 1st Street to Curlew Dr

All other traffic patterns will remain the same as their preconstruction conditions

RIGHT-OF-WAY

All proposed construction will be on existing right of way or in city-owned sources. No right-of-way acquisition is anticipated for this project.

HYDRAULICS

There are no hydraulic structures on this project.

UTILITIES

All utilities in the project vicinity are to be retained and protected. Water valves and Sanitary sewer lids will be raised to the proposed grade. Sanitary sewer collars will be repaired with asphalt collars.

STORMWATER

Storm water will be collected in the new curb and gutter where it will follow to catch basins. It will then be directed underground through pipes to underground infiltration basins.

SUMMARY

Initial funding for this project came from local stakeholders. LHTAC administered federal funds, but inflation outpaced these resources, so some parts—like the Sand Creek Bridge and the western tie-in—were completed entirely with local funds.

A Draft abbreviated Phase II-III report was prepared in 2020 by American Geotechnics Inc to support recommendations for the roadway improvements associated with the bridge construction. Limited soil samples were taken and analyzed for the development of this report. The scope of investigation was limited for American Geotechnics Inc. for this investigation. The DRAFT report included in this document was never finalized, however, the analysis completed for the flexible pavement structure was used by the engineers for the development of the construction plans.

Flexible Reconstruction	
Ballast Layer	Minimum Layer Thickness (feet)
HMA	0.34' (4.1 inches)
Untreated Base	0.63' (7.6 inches)
Existing Granular Base	1.71' (20.5 inches)
Total	2.74' (32.2 inches)

Figure 2 Flexible Pavement Section from Draft Materials Rpt.

Since the flexible pavement analysis closely matched Bonneville County's standard surfacing section and met the City of Ammon's requirements, the team chose to follow the flexible pavement thickness and related pavement recommendations.

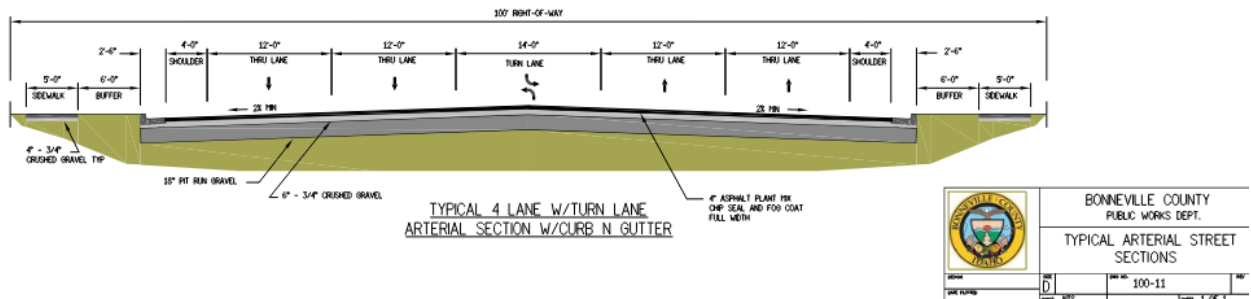


Figure 3 Excerpt from Bonneville County Stds.

Some sections of the roadway have recently been built to Bonneville County standards and will be kept where feasible to save costs. The team reviewed the advantages of maintaining consistent thicknesses while preserving these areas. Based on these factors, the chosen roadway section is as follows:

RECOMMENDED BALLAST THICKNESS

<u>Ballast Layer</u>	<u>Layer Thickness (ft)</u>
HMA	0.33' (4.0 inches)
Untreated Base	0.5' (6.0 inches)
Granular Subbase	1.5' (18.0 inches)

Note: Thicknesses are less than recommended by the geotechnical report to extend budget.

Layer	Materials
Superpave Hot Mix Asphalt, Class SP-2 (405); two equal lifts	Aggregate for Superpave HMA Pavement, ½-inch (703.05) Asphalt, PG 58-34 (702.01)
Aggregate Base (303)	Aggregate for Untreated Base, ¾-inch Type B (703.04)
Granular Subbase (301)	Aggregate for Granular Subbase (703.11)

Figure 4 Flexible Pavement Materials and corresponding ITD Specifications.

APPENDIX A: DRAFT Geotechnical Study



Roadway Materials Report

Abbreviated Materials Reports Phases II-III

1st Street Bridge

Ammon, Idaho

Prepared for:
Horrocks Engineers

June 16, 2020

June 16, 2020
File No. 03292



Horrocks Engineers
901 Pier View Drive, Suite 205
Idaho Falls, Idaho 83402

Attention: Mr. Kelly Hoopes, PE

Roadway Materials Report

Abbreviated Materials Reports Phases II-III

1st Street Bridge

Ammon, Idaho

Prepared by:

American Geotechnics

DRAFT

Mart E. Earl, WAQTC
Sr. Geotechnical Technician

DRAFT

Charles E. Burgert, PE
Geotechnical Engineer

June 16, 2020

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- A Vicinity Map
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Boring Logs
- C Laboratory Test Reports

Roadway Materials Report
1st Street Bridge
Ammon, Idaho



June 16, 2020

- D Traffic Data
 Traffic Projection Worksheet
- E Flexible Reconstruction (20-Yr Analysis)
- F LTPPBind Report

June 16, 2020

100.00 SUMMARY

100.01 Pavement Report

This abbreviated pavement report includes the following sections.

- **Section 100 Summary**, offering an overview of the materials investigation
- **Section 540 Pavement Structure Analysis**, covering considerations for the roadway pavement design
- **Section 240 Pavement Estimating**, identifying materials and providing estimating data necessary to develop plan quantities and cost estimates

This report covers the essential roadway components for development of a roadway pavement.

100.02 Purpose and Scope

The purpose of this project is the construction of a replacement bridge over Sand Creek in Ammon, Idaho. The bridge is located on 1st Street, about 0.1 miles east of Hitt Road. A Vicinity Map showing the project location is included in Appendix A. Photographs of the project area are also included in Appendix A.

Replacement of the existing bridge will include extending the existing 5 lane roadway on the west side of the existing bridge eastward towards Ammon Road.

100.03 Conclusions

The City of Ammon standard flexible pavement section was utilized for the existing 5 lane roadway on the west side of the existing bridge. This same pavement section will be utilized to extend the 5 lane roadway west of the bridge eastward towards Ammon Road.

This standard pavement section is assumed to consists of 5.0 inches (0.42 feet) HMA layer over 8.0 inches (0.67 feet) of $\frac{3}{4}$ -inch Untreated Aggregate Base, Type "B", over 21 inches (1.75) feet of Granular Subbase.

June 16, 2020

540.00 PAVEMENT STRUCTURE ANALYSIS

540.01 Introduction

See Section 100.02 Purpose and Scope.

540.02 Site Investigation

A field investigation was performed by American Geotechnics in April, 2020. The investigation consisted of two borings (AG-01 and AG-02) advanced on either side of the existing canal bridge. Boring AG-02 was drilled through the existing flexible pavement on the east side of the bridge.

The borings were advanced by American Geotechnics with our trailer mounted drill rig using hollow-stem flight augers to advance the borings. Bulk soil samples and split-spoon soil samples were obtained at the boring locations.

Materials encountered in the borings were classified by a representative of American Geotechnics in general accordance with ASTM D2488 classification procedures. Soil samples were packaged and transported to the American Geotechnics laboratory for testing.

Appendix B contains an *Exploration Location Map* and detailed logs of the borings, including sampling depths and descriptions of the materials encountered.

Existing Pavement Section

Boring AG-02 was drilled through the existing flexible pavement. The thickness of asphalt concrete encountered at this boring location was 0.39 feet (4.7 inches). Below the asphalt concrete was 0.56 feet (6.8 inches) of Aggregate Base and 2.05 feet (24.6 inches) of Granular Subbase.

Subgrade

Below the pavement structure at Boring AG-02 and below the ground surface at Boring AG-01 was medium dense silty sand to clayey sand with gravel. This stratum extended to a depth of about 6 feet (EL. 4732 feet) at both borings.

Equivalent Standard Penetration Test N-values ranged from 11 to 21 blows per foot of penetration.

Laboratory test results indicated moisture content of 18%, liquid limit (LL) value of 25, and plastic index (PI) value of 9.

June 16, 2020

Laboratory Testing

The following table summarizes the subgrade soil characteristics for the existing aggregate base and subgrade soil. The laboratory test results are included in Appendix C.

Subgrade Soils Laboratory Test Results											
Sample		Moisture (%)	Atterberg Limits			Particle-Size			Sand Equivalent	R- Value	ASTM D2487 Class.
Location	Depth (ft)		LL	PL	PI	Gravel (%)	Sand (%)	Fines (%)			
Aggregate Base											
AG-02	0.5	--	--	--	--	55	39	6	37	--	GW-GM
Subgrade											
AG-02	3	18	25	16	9	30	30	40	--	13	SC

Based on the soil classifications and the results of the hydrometer measurements, the subgrade frost group is F4 per the US Army Corps Engineers, which is a frost susceptible subgrade.

Surface and Subsurface Water

Surface water along the project is generally from seasonal flows in Sand Creek, precipitation runoff and irrigation activities. The seasonal irrigation flows typically occur from Mid-April to October.

Water was not flowing in the Sand Creek at the time of the canal bridge site investigation in April, 2019. Groundwater was not encountered in the site investigation borings.

540.03 Analyses and Design

For the flexible asphalt design, the assumed City of Ammon standard flexible pavement section will be utilized as shown in the following table.

June 16, 2020

City of Ammon Standard Pavement Section (Assumed)	
Layer	Thickness
Superpave Hot Mix Asphalt (HMA)	5.0 inches
Aggregate for Untreated Base	8.0 inches
Granular Subbase	21.0 inches
Total	34.0 inches

Frost

The typical frost penetration is expected to be about 30 inches within the study area. For partial-frost design, American Geotechnics recommends using a ballast section thickness at least 70% of the frost penetration depth, which is 21 inches (US DOD 2001).

Check of Standard Pavement Section

A check of the City of Ammon standard flexible pavement section was performed based on the following assumptions.

Traffic

Traffic was calculated from ITD's Road Data Annual Average Daily Travel Application App website. The 2018 traffic study list the average ADT at 9,000, with a assumed truck traffic at 5% or CADT of 450. Using a 2.0% growth rate, the calculated traffic loads for the 20-year flexible pavement are as follows:

- 852,000 ESAL's (TI = 8.8)

Appendix D contains the traffic data.

Pavement Section

The ITD Gravel Equivalency Method was used with an assumed R-value of 13 and a traffic index of 8.8.

The flexible pavement layer thicknesses are summarized in the following table. Appendix E contains the flexible pavement design calculations.

June 16, 2020

Flexible Reconstruction	
Ballast Layer	Minimum Layer Thickness (feet)
HMA	0.34' (4.1 inches)
Untreated Base	0.63' (7.6 inches)
Existing Granular Base	1.71' (20.5 inches)
Total	2.74' (32.2 inches)

The total thickness of the above pavement section is less than the City of Ammon standard flexible pavement section. Therefore, the City of Ammon standard flexible pavement section should be utilized for the project.

540.04 Recommendations

The City of Ammon standard pavement section is recommended for the 1st Street roadway approaches leading up to the replacement bridge over Sand Creek.

The following summarizes the recommendations for the roadway construction.

In Existing Roadway Area:

- Remove existing asphalt concrete, and excavate to a depth of 34.0 inches (2.83 feet) below the top of the proposed pavement surface. Compact excavated subgrade surface to Class A requirements. Any excavated granular base and subbase soils may be reused as Granular Borrow for roadway embankment widening.
- Place and compact 21.0 inches (1.75 feet) of Granular Subbase (703.11).
- Place and compact 8.0 inches (0.67 feet) of $\frac{3}{4}$ -inch Untreated Aggregate Base, Type "B" (703.04).

For Roadway Widening, Including Shoulders:

- Clear, grub and excavate the subgrade to a depth of 34.0 inches (2.83 feet) below the top of the proposed pavement surface. Compact excavated subgrade surface to Class A requirements.

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- Place and compact 21.0 inches (1.75 feet) of Granular Subbase (703.11).
- Place and compact 8.0 inches (0.67) feet of $\frac{3}{4}$ -inch Untreated Aggregate Base, Type "B" (703.04).

After the aggregate base has been placed and compacted in the existing and widened roadway areas, place 5.0 inches (0.42 feet) HMA layer over the entire width of roadway.

Class A compaction requirements should be specified for any fill materials within the roadway pavement section.

Standard roadside cut and fill slopes are planned. All new embankment fill slopes should be constructed of Granular Borrow (205.02.B) compacted to Class A requirements at 2H:1V or flatter grade. Any soil cuts should be 2H:1V or flatter.

End of Abbreviated Phase II Report

June 16, 2020

240.00 PAVEMENT ESTIMATING

This Phase III Estimating Report presents estimating guidance information for the 1st Street Bridge project.

240.01 Pavement Type and Smoothness Determination

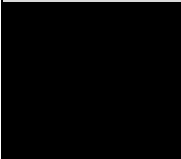
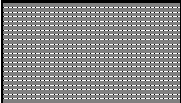
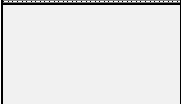
Pavement type is Superpave HMA, Class SP-2 (405).

The project should be constructed to Schedule II Surface Smoothness (405.03.P).

Appendix F includes a summary of the LTPPBind report.

240.02 Typical Section

The following tables summarize the typical section for the project.

Flexible Construction			
	Thickness	Layer	Materials
	0.42 ft	Superpave Hot Mix Asphalt, Class SP-2 (405); two equal lifts	Aggregate for Superpave HMA Pavement, ½-inch (703.05) Asphalt, PG 58-34 (702.01)
	0.67 ft	Aggregate Base (303)	Aggregate for Untreated Base, ¾-inch Type B (703.04)
	1.75 ft	Granular Subbase (301)	Aggregate for Granular Subbase (703.11)

240.03 Earthwork

Granular Borrow (205.02.B)

Imported for embankment fill.

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240.04 Bases

Granular Subbase (301)

Aggregate for Granular Subbase (703.11)

Aggregate Base (303)

Aggregate for Untreated Base, $\frac{3}{4}$ -inch Type B (703.04)

240.05 Pavement

Tack Coat (401)

Emulsified Asphalt, CSS-1h (702.03) diluted (1:1 ratio) asphalt applied at a rate of 0.08 gal/sy (residual rate of 0.04 gal/sy estimated)

Prime Coat (402)

Emulsified Asphalt, CSS-1h (702.03) diluted (1:1 ratio) asphalt applied at an estimated rate of 0.18 gal/sy (residual rate of 0.09 gal/sy estimated).

Superpave Hot Mix Asphalt, Class SP-2

Aggregate for Superpave HMA Pavement, $\frac{1}{2}$ -inch (703.05)

Asphalt, PG 58-34 (702.01) at 5.6% by weight of mix (estimated)

Anti-Stripping Additive (702.04) at 0.5% by weight of asphalt binder (estimated)

240.06 Surface Treatment

A surface treatment is not planned.

240.07 Seal Coat

A seal coat is not planned.

240.08 Aggregate Estimating Data

Superpave Hot Mix Asphalt (405)

Aggregate for Superpave HMA Pavement at 146 lb/cf, including asphalt (estimated)

Aggregate Base (303)

Aggregate for Untreated Base at 144 lb/cf, including 7% water (estimated)

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Granular Subbase (301)

Aggregate for Granular Subbase at 138 lb/cf, including 7% water (estimated).

Embankment Fill

Aggregate for Granular Subbase at 138 lb/cf, including 7% water (estimated)

Disclaimer

The unit weights in this estimating basis are provided to the designer for developing approximate project quantities. The actual quantities will vary dependent on the contractor-provided source, crushing operation, and mix designs. The contractor is solely responsible for determining actual unit weights based on the methods of production and providing adequate materials for the project plus any losses due to stockpile operations, out of specification (rejected) materials or other wastes.

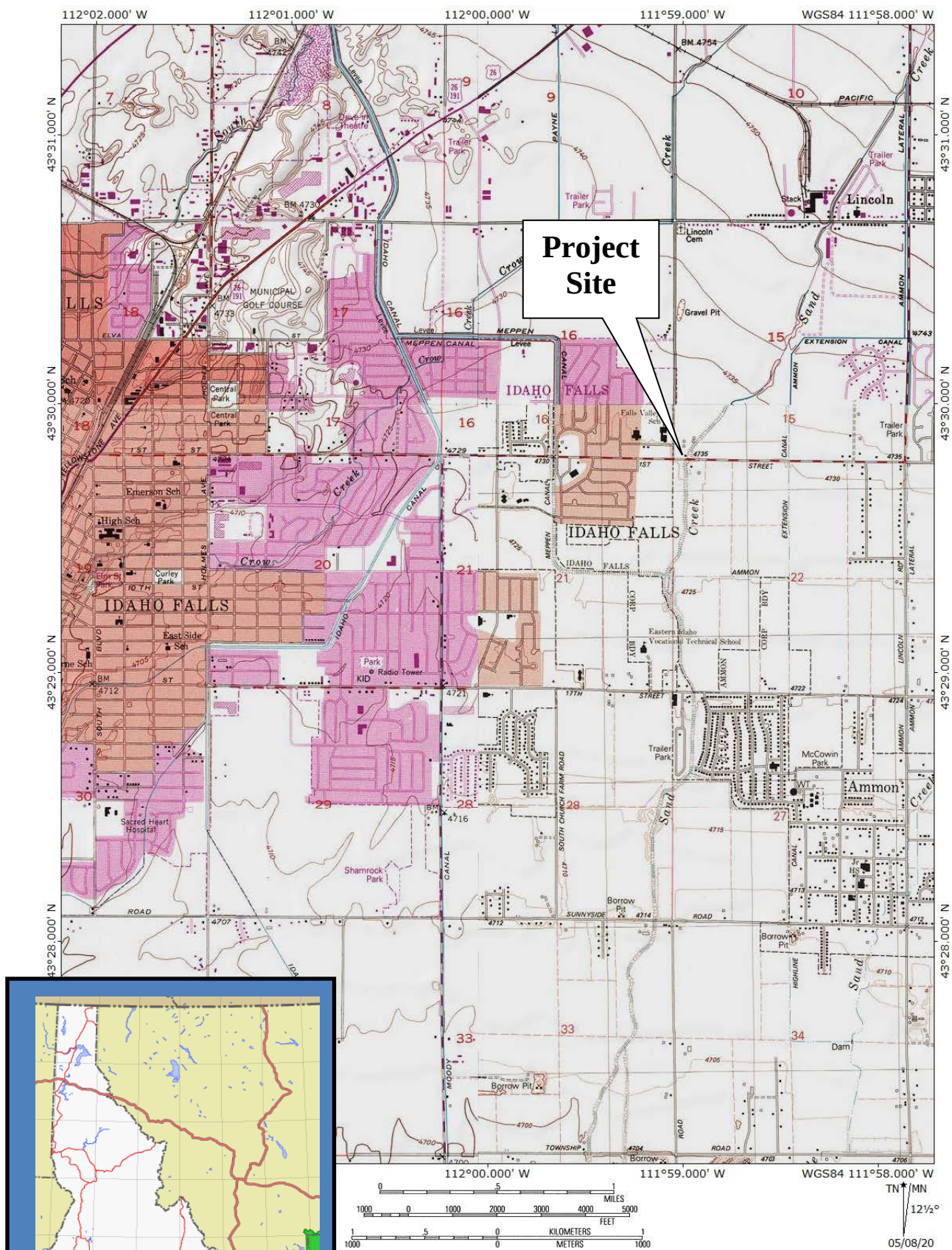
240.09 Aggregate Sources

Approved contractor-furnished sources are specified for all aggregates.

End of Phase III Report

Appendix A

Vicinity Map Site Photographs



Vicinity Map

1st St. Bridge
Ammon, Idaho

File No.
03292

May 8, 2020

Figure 1





Photo 1: 1st Street Bridge – South Side Looking East on 1st Street



Photo 2: 1st Street Bridge – North Side Looking West on 1st Street (Note Gas Line)



Photo 3: 1st Street Bridge – Existing Canal Gate Near Northeast Corner of Bridge



Photo 4: 1st Street Bridge – Existing Canal Gate Near Northeast Corner of Bridge



Photo 5: North Side of Bridge (Note Existing Bridge Supported on Timber Piles)

Appendix B

Exploration Location Map Boring Logs

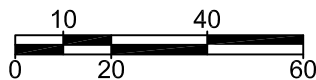


LEGEND

AG-01



BORING LOCATION



SCALE IN FEET

Exploration Location Map

1st St. Bridge
Ammon, Idaho

File No.
03292

May 2020

Figure 2



PROJECT: 1st Street Bridge over Sand Creek
LOCATION: Bonneville County, Idaho

BORING NO. AG-01

METHOD: Hollow-Stem Auger
DATE LOGGED: 4/15/2020
LOGGED BY: Travis Thomsen, WAQTC



COLLAR ELEVATION: 4738.1 ft
NORTHING: 667100.93 by Surveyors
EASTING: 705229.67

GROUNDWATER:

Groundwater not encountered on 4/15/2020

ELEV. (ft)	DEPTH (ft)	TYPE - No.	TYPE - No.	RECOVERY %	LITHOLOGY	MATERIAL DESCRIPTION (Stratification lines represent approximate boundaries between materials)	LAYER THICKNESS (ft.)	DEPTH (ft)	REMARKS
4737.5	0.5								
	1.0								
	1.5								
	2.0						4.00		
4735.0	2.5								
	3.0	BK-1	SS-2	46		Silty Gravel with Sand (GM)- About 60% hard, subrounded gravel to 1"; about 20% hard, fine to coarse subrounded sand; about 20% non-plastic fines; moist; brown.			Northeast of bridge.
	3.5							4.00	
	4.0								
	4.5					Silty Sand (SM)- About 60% fine to medium sand; about 40% non-plastic fines; moist; brown.			
	5.0						2.00		
4732.5	5.5								
	6.0							6.00	
	6.5								
	7.0		SS-3	54		Lean Clay with Sand (CL)- 79% fines; LL=40; PL=19; PI=21; 21% fine sand; 15% red brown.	3.30		
	7.5								

PROJECT: 1st Street Bridge over Sand Creek
LOCATION: Bonneville County, Idaho

BORING NO. AG-01

GROUNDWATER:

Groundwater not encountered on 4/15/2020



ELEV. (ft)	DEPTH (ft)	TYPE - No.	TYPE - No.	RECOVERY %	LITHOLOGY	MATERIAL DESCRIPTION (Stratification lines represent approximate boundaries between materials)	LAYER THICKNESS (ft.)	DEPTH (ft)	REMARKS
4730.0									
	8.5						3.30		
	9.0							9.30	
	9.5					Poorly-Graded Gravel with Silt and Sand (GP-GM)-			
	10.0					54% hard, subrounded gravel to 1"; 37% hard, fine to coarse subrounded sand; 9% fines; 2% light brown.			
4727.5	10.5								
	11.0		SS-4	63					
	11.5								
	12.0								
	12.5								
4725.0	13.0		SS-5	58			7.20		
	13.5								
	14.0					As above except gravel to 2".			
	14.5								
	15.0		SS-6	100					Gravel increases in size 15.0'-16.0'.
4722.5	15.5								
	16.0		SS-7	100					Refusal on boulder or large cobble at 16.5 feet.
	16.5							16.50	

Bottom of Boring at 16.5 ft on 4/15/2020.

PROJECT: 1st Street Bridge over Sand Creek
LOCATION: Bonneville County, Idaho

BORING NO. AG-02

METHOD: Hollow-Stem Auger
DATE LOGGED: 4/15/2020
LOGGED BY: Travis Thomsen, WAQTC



GROUNDWATER:

Groundwater not encountered on 4/15/2020

COLLAR ELEVATION: 4737.9 ft
NORTHING: 667094.91 by Surveyors
EASTING: 705128.39

ELEV. (ft)	DEPTH (ft)	TYPE - No.	TYPE - No.	RECOVERY %	LITHOLOGY	MATERIAL DESCRIPTION (Stratification lines represent approximate boundaries between materials)	LAYER THICKNESS (ft.)	DEPTH (ft)	REMARKS
4737.5	0.5		GB-8			Asphalt Concrete	0.39	0.39	Northwest of Bridge.
	1.0					Well-Graded Gravel with Silt and Sand (GW-GM)- (BASE) 55% hard, subangular gravel to 3/4"; 39% fine to coarse, hard, subangular sand; 6% non-plastic fines; moist; light brown.	0.56	0.95	
	1.5					Poorly Graded Gravel with Sand (GP)- (SUBBASE) About 65% hard, subrounded gravel to 2"; about 35% fine to coarse, subrounded sand.	2.05		
4735.0	3.0		SS-9	0				3.00	R-Value = 13.
	3.5					Clayey Sand with Gravel (SC)- 40% fines; LL=25; PL=16; PI=9 30% fine to coarse, subrounded sand; 30% hard, subrounded gravel to 2"; w=18%; brown.			
	4.0	BK-10						3.00	
	4.5								
4732.5	5.5								
	6.0							6.00	
	6.5					Lean Clay with Sand (CL)- About 85% low plasticity fines; about 15% fine to medium sand; moist; brown.			
	7.0		SS-11	83				3.50	
	7.5								
4730.0									

PROJECT: 1st Street Bridge over Sand Creek
LOCATION: Bonneville County, Idaho

BORING NO. AG-02

GROUNDWATER:

Groundwater not encountered on 4/15/2020



ELEV. (ft)	DEPTH (ft)	TYPE - No.	TYPE - No.	RECOVERY %	LITHOLOGY	MATERIAL DESCRIPTION (Stratification lines represent approximate boundaries between materials)	LAYER THICKNESS (ft.)	DEPTH (ft)	REMARKS
	8.5								
	9.0		SS-12	54			3.50		
	9.5							9.50	
	10.0					Clayey Gravel with Sand (GC)- About 50% hard, subrounded gravel to 1"; about 30% low plasticity fines; about 20% fine to coarse, hard, subrounded sand; moist; light brown.	1.50		
4727.5	10.5							11.00	
	11.0								
	11.5					Poorly Graded Sand with Gravel (SP)- About 50% fine to coarse, subrounded sand; about 40% hard, subrounded gravel to 1"; about 10% non-plastic fines; moist; light brown.			
	12.0								
	12.5						3.00		
4725.0	13.0		SS-13	79					
	13.5								
	14.0							14.00	
	14.5					Poorly Graded Gravel with Sand (GP)- About 70% hard, subrounded gravel to 2"; about 30% hard, fine to coarse sand; moist; light brown.			
	15.0		SS-14	0					
4722.5	15.5						8.00		
	16.0								
	16.5								

PROJECT: 1st Street Bridge over Sand Creek
LOCATION: Bonneville County, Idaho

BORING NO. AG-02

GROUNDWATER:

Groundwater not encountered on 4/15/2020



ELEV. (ft)	DEPTH (ft)	TYPE - No.	TYPE - No.	RECOVERY %	LITHOLOGY	MATERIAL DESCRIPTION (Stratification lines represent approximate boundaries between materials)	LAYER THICKNESS (ft.)	DEPTH (ft)	REMARKS
4720.0	17.0		SS-15	0					
	17.5								
	18.0								
	18.5								
	19.0								
	19.5								
	20.0								
4717.5	20.5								
	21.0		SS-16	4					
	21.5								
	22.0						8.00	22.00	
Bottom of Boring at 22.0 ft on 4/15/2020.									

Appendix C

Laboratory Test Reports

Project Information

Report to: Horrocks Engineers
Project: 1st Street Bridge over Sand Creek
Report Date: 4/29/2020
File No.: 03292

Material Information

Date Sampled: 4/14/ - 4/15/2020
Sampled By: American Geotechnics
Date Received: 4/20/2020
Date Tested: 4/20 - 4/29/2020

SUMMARY OF LABORATORY RESULTS

Lab Number	Borehole	Sample Type	Depth (ft)	Water Content (%)	% Passing #200 Sieve	Liquid Limit (%)	Plasticity Index	Soil Type	Remarks
20-0180	AG-01	SS-3	6.0'-8.0'	14.8	78.5	40	21	CL	--
20-0181	AG-01	SS-4,5&6	10.0'-16.0'	1.7	8.6	--	--	GP-GM	--
20-0183	AG-02	GB-8	0.4'-0.9'	--	6.0	--	--	GW-GM	--
20-0182	AG-02	BK-10	3.0'-5.0'	17.8	39.9	25	9	SC	--

Prepared By: Holly Lockett

Project Information

Report to: Horrocks Engineers
Project: 1st Street Bridge over Sand Creek
Report Date: 4/29/2020
File No.: 03292

Material Information

Date Sampled: 4/14 - 4/15/2020
Sampled By: American Geotechnics
Date Received: 4/20/2020
Date Tested: 4/20 - 4/29/2020

Sand Equivalent Test AASHTO T-176

Lab Number	Location	Sample Type	Depth (ft)	Sand Equivalent	Remarks
20-0183	AG-02	GB-8	0.4'-0.9'	37	--

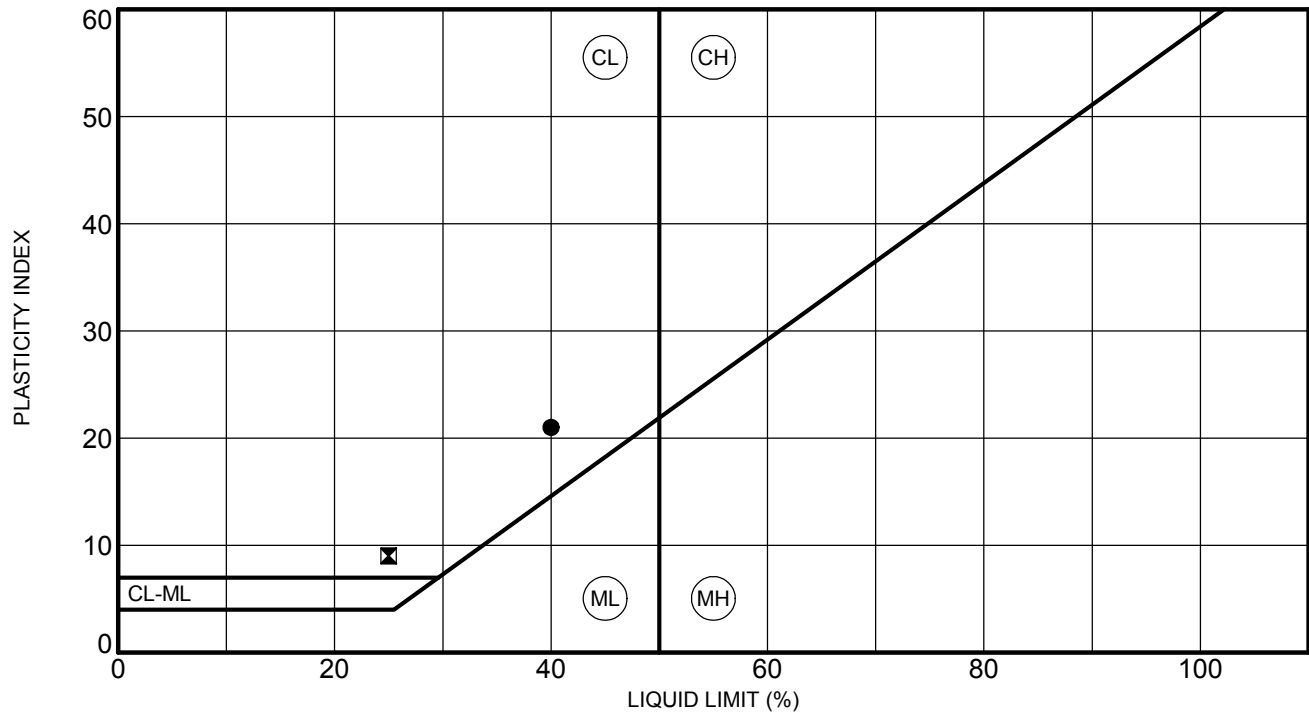
Prepared By: Holly Lockett

ATTERBERG LIMITS REPORT



CLIENT: Horrocks Engineers
FILE NUMBER: 03292

PROJECT NAME: 1st Street Bridge over Sand Creek
PROJECT LOCATION: Bonneville County, Idaho



Specimen Identification				MC	LL	PL	PI	Fines	Classification
●	AG-01	SS-3	6.0	14.8	40	19	21	79	LEAN CLAY with SAND (CL)
⊠	AG-02	BK-10	3.0	17.8	25	16	9	40	CLAYEY SAND with GRAVEL (SC)
				--				--	
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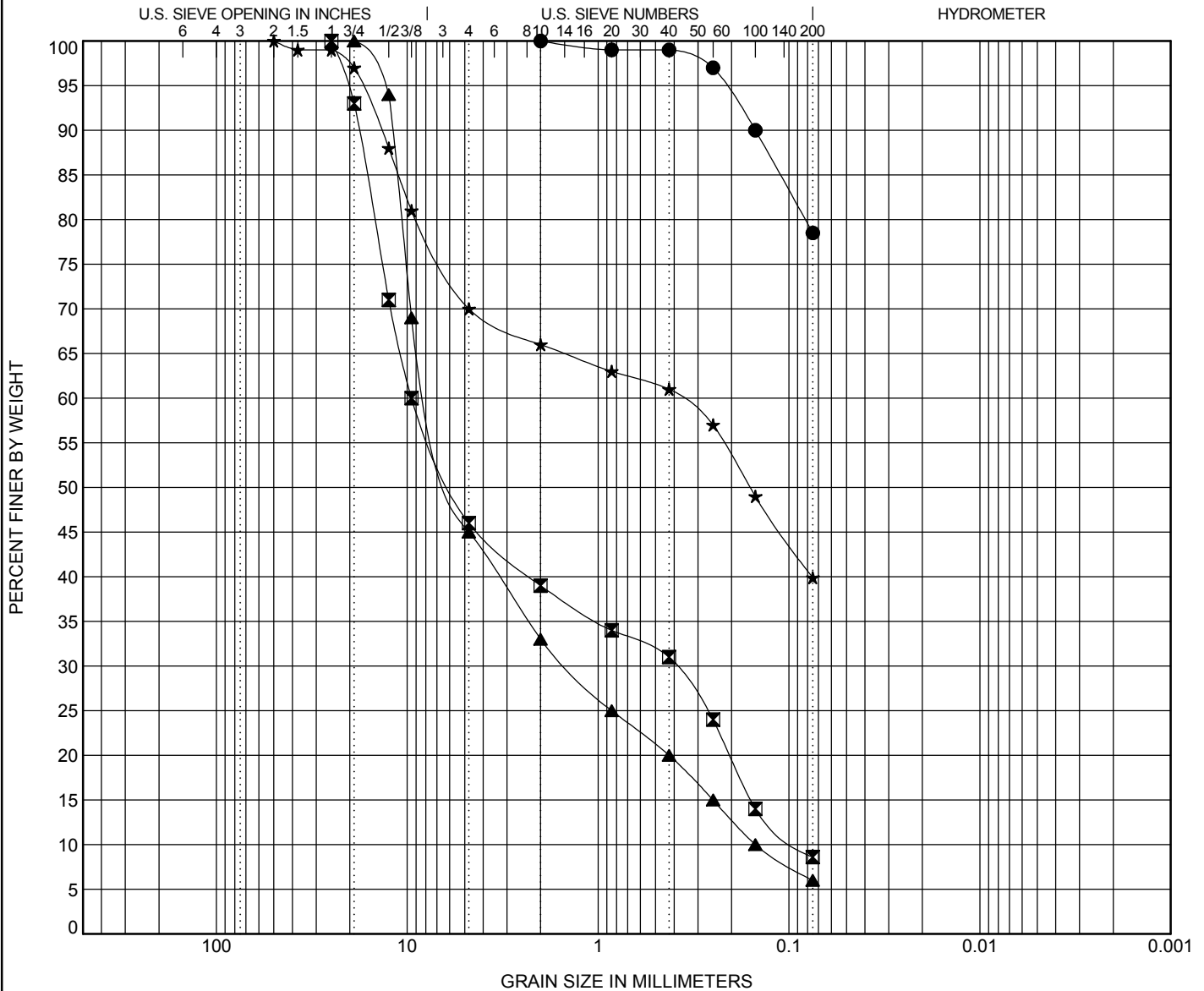
Prepared By: Holly Lockett

PARTICLE-SIZE DISTRIBUTION REPORT



CLIENT: Horrocks Engineers
FILE NUMBER: 03292

PROJECT NAME: 1st Street Bridge over Sand Creek
PROJECT LOCATION: Bonneville County, Idaho



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					D10	D30	D60
● AG-01 SS-3 6.0	LEAN CLAY with SAND (CL)					--	--	--
☒ AG-01SS-4,5&6 10.0	POORLY GRADED GRAVEL with SILT and SAND (GP-GM)					0.09	0.394	9.5
▲ AG-02 GB-8 0.4	WELL-GRADED GRAVEL with SILT and SAND (GW-GM)					0.15	1.451	7.326
★ AG-02 BK-10 3.0	CLAYEY SAND with GRAVEL (SC)					--	--	0.372

Specimen Identification	%Gravel	%Sand	%Fines	D15	D50	D85	Cc	Cu	MC	LL	PI
● AG-01 SS-3 6.0	0.0	21.5	78.5	--	--	0.111	--	--	14.8	40	21
☒ AG-01SS-4,5&6 10.0	54.0	37.4	8.6	0.158	5.79	16.317	0.18	105.83	1.7	--	--
▲ AG-02 GB-8 0.4	55.0	39.0	6.0	0.25	5.488	11.324	1.92	48.84	--	--	--
★ AG-02 BK-10 3.0	30.0	30.1	39.9	--	0.16	11.113	--	--	17.8	25	9

Prepared By: Holly Lockett

American Geotechnics
 5260 Chinden Blvd.
 Boise, Idaho 83714
 Phone: (208) 658-8700
 Fax: (208) 658-8703



Report To: Horrocks
 Project: 1st Street Bridge over Sand Creek
 Project No.: 03292
 Sample ID: AG-2, BK-10; 3.0';-5.0'
 Soil Description: Clayey Sand with Gravel (SC)

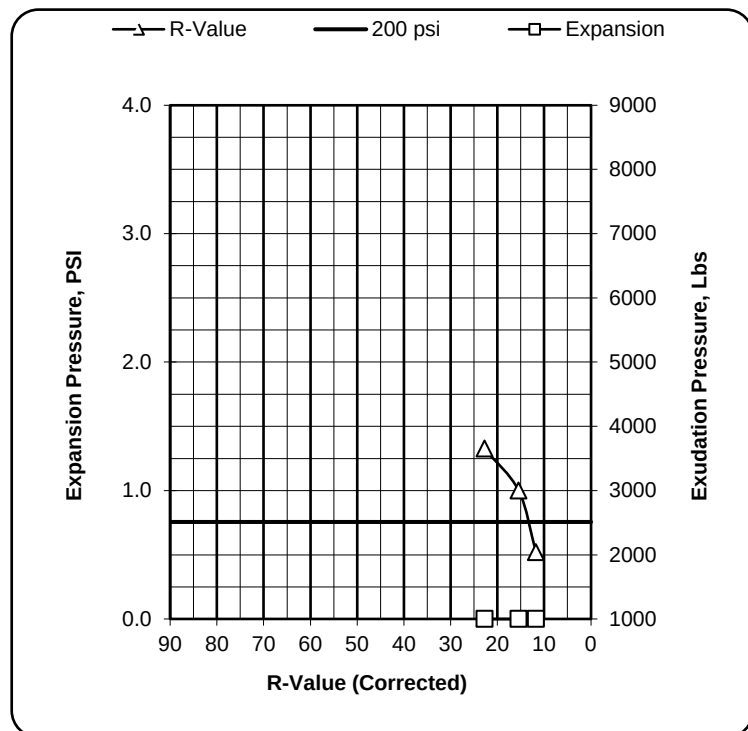
Report Date: 4/29/2020
 Date Sampled: 4/15/2020
 Date Received: 4/20/2020
 Tested By: HL
 Lab Number: 20-0182

R-VALUE IDAHO T-8

	Point 1	Point 2	Point 3
Drainage Description	Zero	Zero	Zero
Dry Density, PCF	123.2	124.1	125.8
Moisture Content, %	10.9	10.7	10.5
Exudation, PSI	162	239	290
R-Value (Corrected)	12	15	23
Expansion, PSI	0.00	0.00	0.00

R-Value @ 200 PSI Exudation Pressure

13



Gradation: AASHTO T-11, T-27

Screen Sizes	% Passing As Received	% Passing As Tested
4"		
3"		
2"	100	
1"	99	
3/4"	97	100
1/2"	88	91
3/8"	81	84
No. 4	70	72
No. 8		
No. 16		
No. 30		
No. 50		
No. 100		
No. 200		

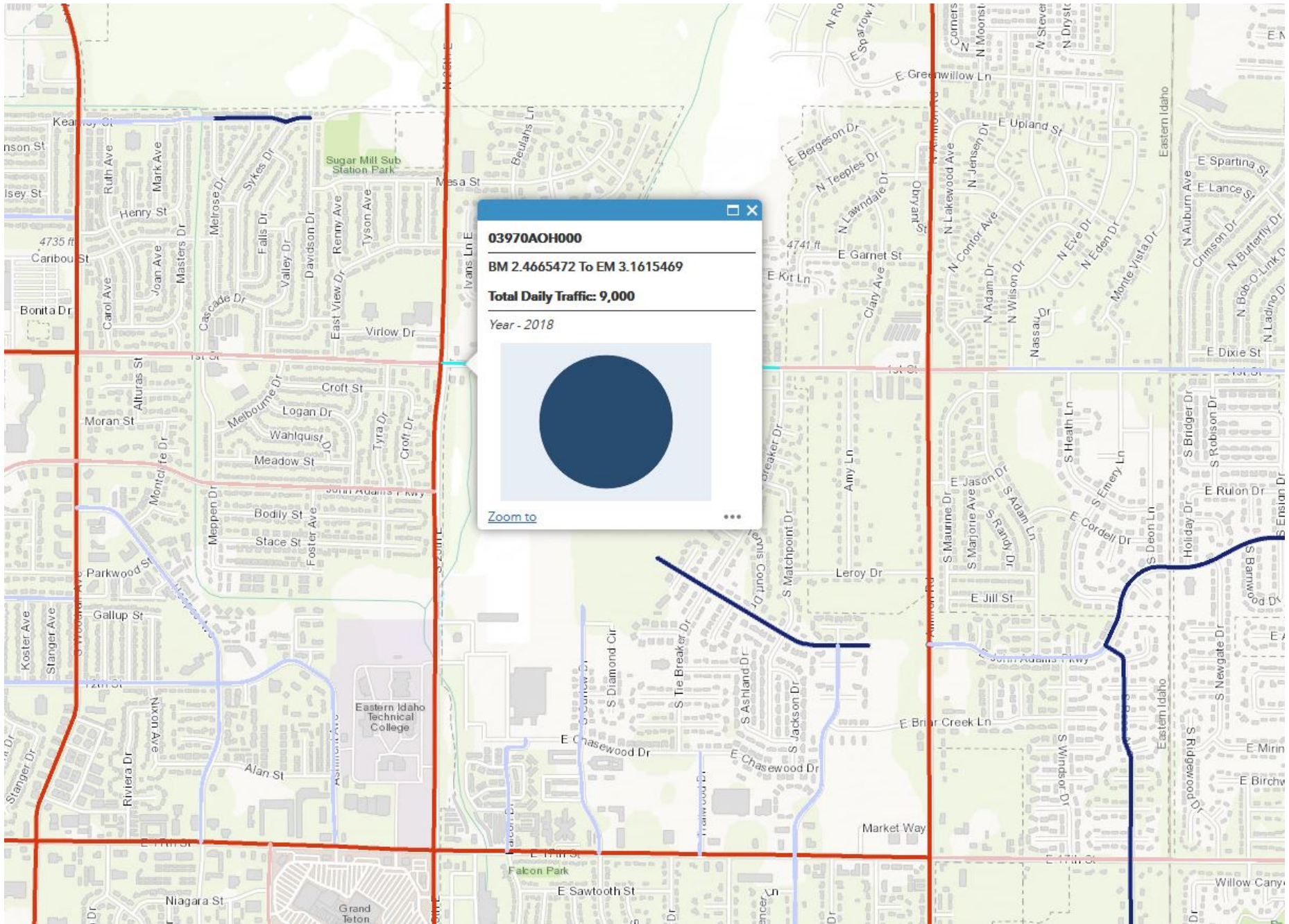
* This report covers only material as represented by this sample and does not necessarily cover all soils from this layer or source.

Reviewed By: Travis Thomsen

Appendix D

Traffic Data

Traffic Projection Worksheet



Route ID	Year	From Measure	To Measure	AADT	Passenger AADT	Commercial AADT	Description From	Description To	OBJECTID_1	DHV
03970AOH000	2018	2.46654719	3.16154687	9000		9000	0 25TH E RD (HITT RD)	TIE BREAKER DR	3417	1080

Traffic Projection Worksheet

Project: **1st Bridge (Sand Creek)**

File No: **3292**

Date: **June 15, 2020**

Flexible Pavement --> Beginning Year: **2022**

Ending Year: **2042**

Analysis Period: **20**

Rigid Pavement --> Beginning Year:

Ending Year:

(Years) **NA**



		Roadway Segment					
		1st					
<u>Lane Information</u>							
No. of Lanes in Design Direction		1					
% Split of Trucks in Design Direction		60%					
% of Trucks in Design Lane		100%					
From ITD's AADT Projection Report	<u>Total Traffic - Both Directions</u>						
	2022 AADT	9,742					
	2042 AADT	14,476					
	AADT for the Analysis Period	12109					
	<u>Truck Traffic - Both Directions</u>						
	% Truck Traffic	5.0%					
	AADTT	605					
	Truck Density (H, M, L)	I					
	<u>Design Lane</u>						
	AADTT	363					
From ITD's ESAL Projection Report	Traffic Index, TI	8.8					
	Flexible Design ESALs	852,007					
	Compound Annual Growth Rate	2.0%					
	<u>Flexible ESAL Projections - Both Directions</u>						
	2022 Yearly and Cumulative ESALs						
	2042 Cumulative ESALs						
	<u>Design Lane</u>						
	Flexible Design ESALs						
	Traffic Index, TI						
	<u>Rigid ESAL Projections - Both Directions</u>						
	Yearly and Cumulative ESALs						
	Cummulative ESALs						
	<u>Design Lane</u>						
	Rigid Design ESALs						

Flexible

Rigid

Growth Projection Worksheet

Project: 1st (Sand Creek Bridge)
Segment:

Beginning Year 2018
Beginning AADT 9000
Growth rate per year (%) 2

	<u>Year</u>	<u>AADT</u>
Year 0	2018	9000
Year 1	2019	9180
Year 2	2020	9364
Year 3	2021	9551
Year 4	2022	9742
Year 5	2023	9937
Year 6	2024	10135
Year 7	2025	10338
Year 8	2026	10545
Year 9	2027	10756
Year 10	2028	10971
Year 11	2029	11190
Year 12	2030	11414
Year 13	2031	11642
Year 14	2032	11875
Year 15	2033	12113
Year 16	2034	12355
Year 17	2035	12602
Year 18	2036	12854
Year 19	2037	13111
Year 20	2038	13374
Year 21	2039	13641
Year 22	2040	13914
Year 23	2041	14192
Year 24	2042	14476

Appendix E

Flexible Reconstruction (20-Yr Analysis)

FLEXIBLE PAVEMENT DESIGN - Idaho R-Value Method

Project Name: **1st Street Bridge, Ammon**
 File No: **3292**
 Date: **June 15, 2020**
 Roadway Segment: **Sand Creek Bridge**
 Strategy: **New Construction**

Layer Names

Layer 1:	HMA
Layer 2:	Untreated Base
Layer 3:	Granular Subbase
	Subgrade

R-Values

Layer 2:	Untreated Base	80	Expansion Pressure (psi)
Layer 3:	Granular Subbase	60	
	Subgrade	13	
			0.18

Traffic Index (T.I.): **8.8** → ESALs ≈ 852,000

Regional Climate Factor: **1.10** (Reference Figure 16-510.5.1
ITD Materials Manual)

Material Substitution Ratios

Layer 1:	HMA	1.80
Layer 2:	Untreated Base	1.00
Layer 3:	Granular Subbase	0.85

Layer	Layer Thickness	Gravel Equivalency
Layer 1:	HMA Required Thickness: 0.34 feet Recommended Thickness: 0.34 feet 4.1 Inches	GE1 Required: 0.62 GE1 Actual: 0.61
Layer 2:	Untreated Base Required Thickness: 0.63 feet Recommended Thickness: 0.63 feet 7.6 Inches	GE2 Required: 1.24 GE2 Actual: 1.24
Layer 3:	Granular Subbase Required Thickness: 1.71 feet Recommended Thickness: 1.71 feet 20.5 Inches	GE3 Required: 2.69 GE3 Actual: 2.70
Typical Subgrade Frost Group: F2 Granular Subbase D_{15} : 1.1 mm Subgrade Type: Silty Design Frost Depth: 30 Inches on Subgrade D_{85} : 10 mm Required Ballast for Frost-Susceptible Subgrade: 70 % of Frost Depth D_{15}/D_{85} : 0.11 <5 Subgrade Separation Geotextile Not Required		

CHECK OF BALLAST SECTION				
HMA :	0.34	4.0		
Untreated Base :	0.65	7.5		
Granular Subbase :	1.75	20.5		
	2.74 feet	32.0 inches		
GE Required:	2.68	feet		
GE Provided:	2.75	feet	OK	
Ballast Required to Counter Expansion Pressure:	2	Inches		
Ballast Provided:	33	Inches	OK	
Ballast Required for Frost Protection:	21	Inches		
Ballast Provided:	33	Inches	OK	

Appendix F

LTPPBind Report

1ST Street, Ammon (Sand Creek Bridge)

LTPPBind V3.1 PG Binder Selection Report (Date: 6/16/2020)

Parameter	A=2 km	B=8 km	C=22 km	D=36 km	E=45 km
Station ID	ID4455	ID4457	ID4456	ID0915	ID7644
Elevation, m	4426	4393	5434	4189	4570
Degree-Days >10 C	2633	2477	2012	2633	2460
Low Air Temperature, C	-26.8	-28.5	-33.1	-26.1	-29.6
Low Air Temp. Std Dev	5	4.9	5	4.8	4.9

Input Data

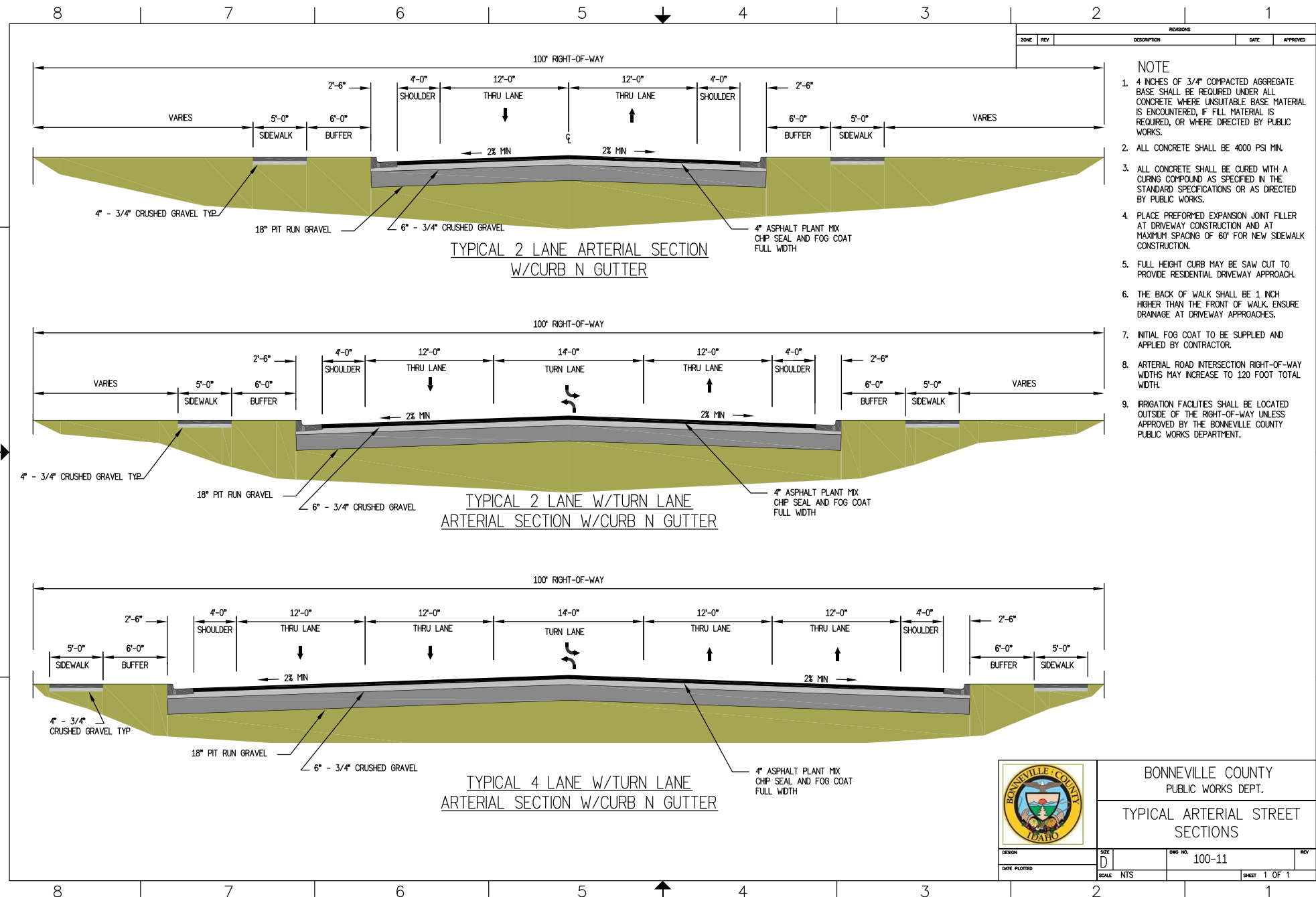
Latitude, Degree	43.47
Yearly Degree-Days>10C	2443
Lowest Yearly Air Temp., Deg. C	-28.8
Low Temp. Std. Dev., Deg. C	4.9
Base HT PG	52

Traffic Adjustments for HT

Desired Reliability, Percent	98
Traffic Loading, Million ESAL	Up to 3 M. ESAL
Traffic Speed	Slow
High Temp. Adjustment	2.8

PG Temperature	HIGH	LOW
PG Temp. at 50% Reliability	51.7	-21.1
PG Temp. at Desired Reliability	54.8	-29.5
Adjustments for Traffic	2.8	
Adjustments for Depth	0.0	0.0
Adjusted PG Temperature	57.6	-29.5
Selected PG Binder Grade	58	-34

APPENDIX B: Bonneville County Standard



NOTE

1. 4 INCHES OF 3/4" COMPACTED AGGREGATE BASE SHALL BE REQUIRED UNDER ALL CONCRETE WHERE UNSUITABLE BASE MATERIAL IS ENCOUNTERED, IF FILL MATERIAL IS REQUIRED, OR WHERE DIRECTED BY PUBLIC WORKS.
2. ALL CONCRETE SHALL BE 4000 PSI MIN.
3. ALL CONCRETE SHALL BE CURED WITH A CURING COMPOUND AS SPECIFIED IN THE STANDARD SPECIFICATIONS OR AS DIRECTED BY PUBLIC WORKS.
4. PLACE PREFORMED EXPANSION JOINT FILLER AT DRIVEWAY CONSTRUCTION AND AT MAXIMUM SPACING OF 60' FOR NEW SIDEWALK CONSTRUCTION.
5. FULL HEIGHT CURB MAY BE SAW CUT TO PROVIDE RESIDENTIAL DRIVEWAY APPROACH.
6. THE BACK OF WALK SHALL BE 1 INCH HIGHER THAN THE FRONT OF WALK. ENSURE DRAINAGE AT DRIVEWAY APPROACHES.
7. INITIAL FOG COAT TO BE SUPPLIED AND APPLIED BY CONTRACTOR.
8. ARTERIAL ROAD INTERSECTION RIGHT-OF-WAY WIDTHS MAY INCREASE TO 120 FOOT TOTAL WIDTH.
9. IRRIGATION FACILITIES SHALL BE LOCATED OUTSIDE OF THE RIGHT-OF-WAY UNLESS APPROVED BY THE BONNEVILLE COUNTY PUBLIC WORKS DEPARTMENT.



BONNEVILLE COUNTY
PUBLIC WORKS DEPT.

TYPICAL ARTERIAL STREET
SECTIONS

DESIGN	SIZE	DWG NO.	REV
DATE PLOTTED	D	100-11	
SCALE	NTS	SHEET	1 OF 1