AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

2. AMENDMENT/MODIFICATION NO.	1. CONTRACT ID CODE	PAGE OF PAGES
0002		1

3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
01/19/2024		ROMO 316223

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
NPS, DSC Contracting Services Div 12795 W. Alameda Pkwy P.O. Box 25287 Denver CO 80225-0287	PDS		

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

CODE | FACILITY CODE

(x) 9A. AMENDMENT OF SOLICITATION NO.: 140P2024R0022

x 9B. DATED *(SEE ITEM 11)*: 01/02/2024

10A. MODIFICATION OF CONTRACT/ORDER NO.:

10B. DATED *(SEE ITEM 13)*:

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended , by one of the following methods: (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted ; or (c) By separate letter or electronic communication which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted , such change may be made by letter or electronic communication, provided each letter or electronic communication makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation data, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

ROMO 316223

The purpose of this amendment is to:

a) Provide an update Price Schedule correcting numerical errors;

b) Provide the Geo-technical Report. This will become Attachment 9 to Section J of the Solicitation;

c) Provide the Virtual Presentation slides;

d) Provide the attendance list for the Pre Bid Virtual Meeting.

Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*			
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		*(Signature of Contracting Officer)*	

NAME OF OFFEROR OR CONTRACTOR

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)

Contract Price Schedule Template

National Park Service (NPS) - Denver Service Center (DSC) | 3-13-18

Solicitation Number:

PARK - PMIS: **316223**

(Project Management Information System)

Developed Area: **Rocky Mountain National Park, Colorado River District (CRD)**

Project Title: **Construct Colorado River District (CRD) Barn and Tack Shed**

Notice: Offerors are required to submit, a minimum, an offer that conforms to the solicitation documents with pricing for Base line items and all option line items. Failure to do so may render the proposal unacceptable. On lump-sum line items, provide the total price only. For all unit-priced line items, provide the unit price and the extended total price. If no specific line item exists for a portion of the work, include the costs in a related item. In case of error in calculation of extended prices, the unit price governs. In case of error in summation, the total of the corrected amounts govern. Round totals and extended prices to whole dollars.

Contract Line Item Number (CLIN)	Contract Line Item (CLI) Title	Quantity	Unit of Measure	Unit Price	Total Price
1	Hay Storage	1	LS		
2	CRD Barn and Tack Shed	1	LS		
3	Sitework	1	LS		
4	Clean-up of Fire Debris	1	LS		
TOTAL BASE PRICE (Contract Line Item Number 1 through 4) ----------					
5	OPTION A, Lightning Protection	1	LS		
6	OPTION B, Photovoltaic System	1	LS		
7	OPTION C, Heavy Duty Concrete Paving	1	LS		
TOTAL PRICE FOR ALL OPTIONS (Contract Line Item Number 4 through 67 ----------					
TOTAL PROPOSED PRICE - BASE PLUS ALL OPTIONS (Contract Line Item Number 1 through 7 ----------					

All measurement and payment information is included in Division 01 Specifications Section 01 27 00 Definition of Contract Line Items.

Geotechnical Investigation Report

Rocky Mountain National Park

CRD Barn & Tack Shed

Grand Lake, Colorado

Yeh Project No.: 221-282

April 1, 2022

Prepared for:

DHM Design
900 S. Broadway, Suite 300
Denver, Colorado 80209

Attn: Ms. Michaela Kaiser

Prepared by:
Yeh and Associates, Inc.
2000 Clay Street, Suite 200
Denver, Colorado 80211

Phone: 303-781-9590

Geotechnical Investigation Report

Rocky Mountain National Park

CRD Barn & Tack Shed

Grand Lake, Colorado

Yeh Project No.: 221-282

April 1, 2022

Prepared by:

Melissa Boyd
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PROFESSIONAL ENGINEER

Samantha C. Sherwood, P.E.
Sr. Project Manager

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

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1 PURPOSE AND SCOPE OF STUDY

This report presents the results of our Geotechnical Investigation for the proposed construction of a new barn and tack/hay storage shed in Rocky Mountain National Park in Grand Lake, Colorado. This study was performed in general accordance with the Scope of Services request for Task Order 140P1221F0056. Our work consisted of field exploration, laboratory testing, engineering analyses and preparation of this report.

This report includes our recommendations for the geotechnical aspects of project design and construction. The conclusions and recommendations stated in this report are based on the conditions found at the location of our exploratory borings at the time our investigation was performed. Our findings, conclusions, and recommendations should not be extrapolated to other areas or used for other projects without our prior review. Furthermore, they should not be used if the site has been altered without Yeh and Associates' prior review to determine if these recommendations remain valid.

The purpose of this investigation was to evaluate the geotechnical characteristics of the subsurface soils for site development and foundations design. The scope of the study included the following tasks:

- A subsurface investigation for the structures where accessible with a truck-mounted drill rig.
- Laboratory testing of the soils encountered during field exploration to evaluate relevant physical and engineering properties of the soil.
- Preparation of this report.

2 PROPOSED CONSTRUCTION

Based on the Scope of Services provided for this project (Task Order 140P1221F0056), the new barn will be built near its previous location. The single-story barn will contain stall space for pack animals, a trails maintenance and storage area, office space, a laundry room and restroom. Hay storage will be a separate structure. Site improvements will also include the upgrade of utilities and paved parking.

3 SITE CONDITIONS AND GEOLOGIC SETTING

The project site is in Grand Lake, north of the main downtown area. The barn area is generally inaccessible between late October and early June each year. The previous barn was burned in the East

Troublesome fire in the Fall of 2020. At the time of drilling, the perimeters of the previous building footprints were surrounded by chain link fencing. The area was covered in several feet of snow, though snow had been plowed along the access road and in the drilling area prior to the geotechnical crews' arrival.

3.1 Geologic Setting

Based on the USGS geologic map of Rocky Mountain National Park, the primary geologic unit in the building vicinity is mapped as Till of Pinedale age (Qp) deposited in the upper Pleistocene. This glacial till consists of subangular to subrounded boulders and cobbles in a matrix of sandy silt to silty sand. Also present near the project area is alluvium (Qa) of Holocene and upper Pleistocene age which consists of similar material deposited along streams and alluvial fans. Subsurface materials logged during our site investigation were consistent with the mapped descriptions.

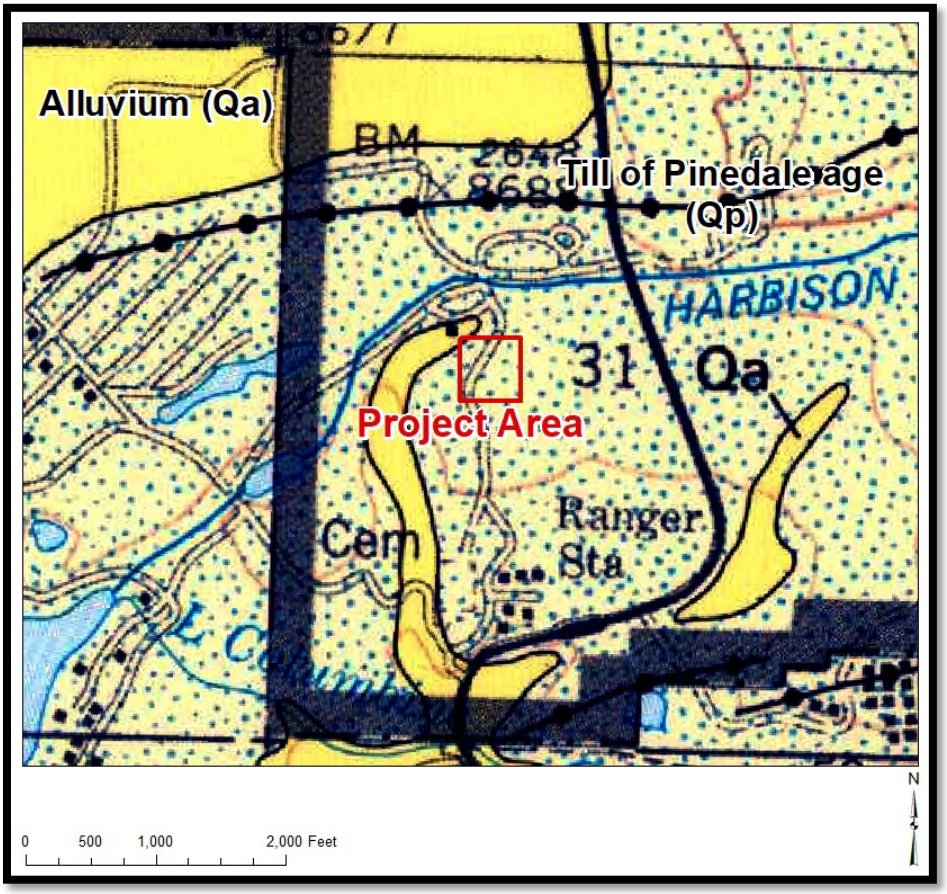


Figure 1 – Geologic map of the project area.

4 SUBSURFACE INVESTIGATION

Three borings were drilled on January 27, 2022. Utility locates were requested prior to drilling. Borings were placed near the location of the new barn and where plowed snow provided access. The boring locations were recorded using a handheld GPS and are shown in Figure 2, and on the Boring Location Plan in Appendix A.

Figure 2 – Boring Location Map

Borings were advanced using a CME 75 truck-mounted drill rig owned and operated by Vine Laboratories of Denver, Colorado. Borings were advanced with 4-inch solid stem, continuous flight auger to a maximum of 30 feet depth or auger refusal. At selected intervals, a modified California sampler with a 2-inch interior diameter (ID) and 2.5 inch outside diameter (OD), or a standard split spoon sampler with a 1.375-inch ID and 2-inch OD were used to record blow counts and obtain samples. The sampler was seated at the bottom of the boring, then advanced by an automatic hydraulic hammer equivalent to 140 pounds falling 30 inches. The number of blows (blow count) required to drive the sampler 12 inches or a fraction thereof, constitutes the N-value. The N-value, when properly evaluated,

is an index of the consistency or relative density of the material tested. Bulk samples of drill cuttings were also obtained. The boring logs and legend are presented in Appendix B.

4.1 Laboratory Testing

The samples collected during the field investigation were transported to Yeh's laboratory in Denver, Colorado. They were examined and a program of laboratory testing was developed to evaluate the engineering properties of the subsurface materials. Selected soil and bedrock samples were tested to evaluate their engineering properties, using the following tests:

- Description and Identification of Soils (Visual-Manual Procedure)
- Moisture Determination
- Unit Weight
- In-Situ Dry Density
- Grain Size Analysis
- Atterberg limits
- Water Soluble Sulfates and Chlorides
- Resistivity
- pH

Weld Laboratories performed the pH, resistivity, and water-soluble sulfate and chloride tests. The test results are shown on the boring logs and are included in Appendix C. Following the completion of the laboratory testing, the field descriptions were confirmed or modified as necessary and boring logs were finalized.

Results of the Atterberg limit tests and grain size analyses were used to classify the soils according to AASHTO and the Unified Soil Classification System (USCS) standards. Atterberg limits tests were performed in general accordance with ASTM D4318 and the grain size analyses were performed in general accordance with ASTM D421. Dry density tests and moisture content tests were performed in general accordance with ASTM D7263 and ASTM D2216, respectively.

5 SUBSURFACE CONDITIONS

All three borings encountered sand (fill and native) with variable amounts of silt, clay, gravel, cobbles, and boulders. Samples analyzed in the laboratory classified as silty sand (SM) and silty, clayey sand (SC-SM) by the United Soil Classification System (USCS). These samples classified as A-4 (0) based on AASHTO. Borings YA-B-1 and YA-B-3 were terminated at 26 and 21 feet, respectively, due to auger refusal on cobbles and boulders. The first location of boring YA-B-2 encountered auger refusal at 2.5 feet. A second attempt offset by five feet northwest from the first encountered auger refusal at four feet. The third and final attempt offset five feet northwest of the second attempt encountered auger refusal at eight feet.

The bulk samples collected from one to five feet in each boring were combined and tested for R-value in accordance with AASHTO M190 (ASTM D-2844). The resulting R-value is 23.

5.1 Groundwater

Groundwater was not encountered during drilling. Groundwater levels may fluctuate with varying seasonal and weather conditions and land-use changes, but we do not anticipate groundwater will affect the planned construction.

6 CONSTRUCTION CONSIDERATIONS

Site preparation and earthwork operations should be performed in accordance with applicable codes, safety regulations, and other local, state, or federal guidelines. Earthwork on the project should be observed and evaluated by Yeh and Associates (Yeh). The evaluation of earthwork should include observation and testing of engineered fills, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

6.1 Site Development

Unsuitable materials including construction/fire debris, organic materials and large boulders should be stripped from the building site and completely removed. Stripped materials consisting of vegetation and organic materials should be wasted from the site or used to revegetate landscaped areas after completion of grading operations. The stripped materials should be removed for offsite disposal in

accordance with local laws and regulations. All exposed surfaces should be free of mounds and depressions, which could prevent uniform compaction.

Following initial stripping and grading, all exposed areas which will receive fill or support structures, once properly cleared, should be scarified to a minimum depth of 12 inches, moisture conditioned, and compacted according to Section 6.4 of this report.

Suitable engineered and structural fill should be placed to design grade as soon as practical after reworking the subgrade to avoid moisture changes in the underlying soils. Any fill materials should be placed on a horizontal plane and placed in loose lifts not to exceed 8-inches in thickness. The moisture content and compaction of subgrade soils or fill should be maintained until slab construction or placement of pavement structures.

Based upon the subsurface conditions encountered, subgrade soils exposed during construction are anticipated to be relatively stable. However, the stability of the subgrade may be affected by precipitation, repetitive construction traffic and other factors. If unstable conditions are encountered or develop during construction, stability may be improved by scarifying and drying the subgrade soils. If additional stabilization is required, Yeh should be contacted to evaluate the conditions, so a suitable stabilization method can be provided as necessary.

6.2 Excavation and Trench Construction

Excavations into the on-site soils will encounter a variety of conditions. All excavations must comply with the applicable local, State, and Federal safety regulations, and particularly with the excavation standards of the Occupational Safety and Health Administration (OSHA). Construction site safety, including excavation safety, is the sole responsibility of the Contractor as part of its overall responsibility for the means, methods, and sequencing of construction operations. Yeh's recommendations for excavation support is provided for the Client's sole use in planning the project, in no way do they relieve the Contractor of its responsibility to construct, support, and maintain safe slopes. Under no circumstances should the following recommendations be

interpreted to mean that Yeh is assuming responsibility for either construction site safety or the Contractor's activities.

We believe the overburden soils encountered on this site will classify as a Type C material, using OSHA criteria. OSHA requires that unsupported cuts be no steeper than 1½:1 for Type C for unbraced excavations up to 20 feet in height. In general, we believe that these slope ratios will be temporarily stable under unsaturated conditions. Flattened slopes may be required if excavations encounter groundwater or the slopes will be exposed for an extended period. Please note that the Contractor's OSHA-qualified "competent person" must make the actual determination of soil type and allowable sloping in the field.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a lateral distance equal to at least the depth of the excavation from the crest of the slope. The exposed slope face should be protected against the elements and monitored by the contractor on at least a daily basis.

6.3 Structural Fill Requirements

Based on our laboratory test results, the sandy soils encountered on site may be used a structural fill if verified to meet the structural fill criteria presented in Table 6-1. Additional imported structural fill, if required, should consist of non-expansive granular material meeting the criteria presented in Table 6-1.

Table 6-1. Structural Fill Criteria

Gradation Requirements	
Standard Sieve Size	Percent Passing
2-inch	100
No. 200	10 – 30
Plasticity Requirements (Atterberg Limits)	
Liquid Limit	30 or less
Plasticity Index	6 or less

We recommend that a qualified representative of Yeh and Associates visit the site during excavation to verify the soils exposed in the excavations are consistent with those encountered during our subsurface exploration and that proper foundation subgrade preparation and placement is performed.
All fill placed on this site should be compacted according to the recommendations in Section 6.4 of this report. Fill to be placed at this site during leveling/grading operations should be placed under controlled conditions. A sample of any imported fill material, if required, should be submitted to our office for approval.

6.4 Compaction Requirements

Fill materials should be placed in horizontal lifts compatible with the type of compaction equipment being used, moisture conditioned, and compacted in accordance with the criteria shown in Table 6-1.

Table 6-2. Subgrade Preparation and Fill Placement Criteria

Fill Location	Material Type	Percent Compaction (ASTM Method)	Moisture Content
Foundation and Subgrade Soils	On Site Sand Soils	95 minimum (ASTM D698)	± 2% of OMC
	Imported Structural Fill	95 minimum (ASTM D1557)	± 2% of OMC
Trench Backfill	On Site Sand Soils	95 minimum (ASTM D698)	± 2% of OMC
	Imported Structural Fill	95 minimum (ASTM D1557)	± 2% of OMC
Aggregate Base (ABC)	Imported CDOT Class 6 ABC (See Section 9.3.1)	95 minimum (AASHTO T180)	± 2% of OMC

*** OMC = Optimum Moisture Content determined from Proctor Test**

Fill should be placed in level lifts not exceeding 8 inches in loose thickness and compacted to the specified percent compaction to produce a firm and unyielding surface. If field density tests indicate the required percent compaction has not been obtained, the fill material should be reconditioned as necessary and re-compacted to the required percent compaction before placing any additional material.

6.5 Utility Trench Backfill

On-site soils may be utilized as backfill material in utility trenches provided the backfill is essentially free of plant matter, organic soil, debris, trash, other deleterious matter, and rock particles larger than 2-inches. Backfill should be placed in loose lifts of 8-inches or less and compacted with appropriate trench equipment. Utility trench backfill should be compacted as recommended in Section 6.4 of this report.

6.6 Drainage Considerations

Positive drainage should be provided during construction and maintained throughout the life of the proposed project. Proper design of drainage should include prevention of ponding water on or immediately adjacent to the structures. Landscaped irrigation and roof run-off should be minimized or eliminated adjacent to the foundation system and the building. Surface features that could retain water in areas adjacent to the structures should be sealed or eliminated. In areas where paving does not immediately adjoin the structure, we recommend that, if feasible, protective slopes be provided with a minimum grade of approximately 5 percent for at least 5 feet. These slopes should be constructed with relatively low permeability, non-expansive materials, i.e., the silty sands encountered on-site. Backfill against any kind of structure and in utility line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration and migration. Concentrated runoff should be avoided in areas susceptible to erosion and slope instability. Slopes and other stripped areas should be protected against erosion by re-vegetation or other methods.

For slab-on-grade and shallow foundation construction on these types of soils, we do not recommend construction of a foundation perimeter drain.

6.7 Construction in Wet or Cold Weather

Grading fill, structural fill or other fill should not be placed on frosted or frozen ground, nor should frozen material be placed as fill. Frozen ground should be allowed to thaw or be completely removed prior to placement of fill. A good practice is to cover the compacted fill with a “blanket” of loose fill to help prevent the compacted fill from freezing. Concrete and asphalt structures should not be

constructed on frozen soil. Frozen soil should be completely removed from beneath the concrete elements, or thawed, scarified and re-compacted. The amount of time passing between excavation or subgrade preparation and placing concrete should be minimized during freezing conditions to prevent the prepared soils from freezing. Blankets, soil cover, or heating as required may be utilized to prevent the subgrade from freezing.

7 FOUNDATION DESIGN RECOMMENDATIONS

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the borings. Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, we recommend that the proposed building structure be supported on a spread footing foundation system bearing on reconditioned subgrade. Design and construction details for the foundation options are given for on Allowable Stress Design (ASD).

7.1 Spread Footings

The proposed buildings may be supported on shallow spread and strip footings founded on existing foundation soils. Shallow foundations founded on 12 inches of scarified and recompacted subgrade material should be designed using the maximum allowable bearing pressure of 3,000 pounds per square foot (psf) for spread footings. The allowable bearing pressure is based on a factor of safety (F.O.S.) of approximately three (3) with respect to shear failure of the foundation bearing materials. A one-third increase in the allowable bearing pressure may be used for the maximum allowable bearing pressure for temporary loading conditions including wind or seismic conditions.

Continuous wall footings should have a minimum width of 18 inches, and isolated spread footings should have a minimum width of 24 inches.

All exterior footings and footings founded in the unheated portions of the structure should be placed a minimum of 3 feet below the final exterior grade to provide protection against frost penetration. Interior footings should bear a minimum of 12 inches below finished grade. Finished grade is the lowest adjacent grade for perimeter footings and floor level for interior footings. Footings should be proportioned to reduce differential foundation movement. Proportioning on the basis of equal total

movement is recommended; however, proportioning to relative constant dead load pressure will also reduce differential movement between adjacent footings. Total movement is estimated to be on the order of 1 inch or less. Differential movement is anticipated to be on the order of ½ inch to ¾ inch of the estimated total movement. Additional foundation movements could occur if water from any source infiltrates the foundation soils, therefore, proper drainage should be provided in the design and during construction.

Footings, foundations, and masonry walls should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities and at periodic intervals on long masonry walls is recommended.

Foundation excavations should be observed by the geotechnical engineer or engineer's representative. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

8 FLOOR SLAB DESIGN AND CONSTRUCTION

Conventionally reinforced slabs-on-grade are feasible for this project, provided that the foundation soils are scarified, moisture conditioned and compacted according to Section 6.4 to a minimum depth of 12 inches below the bottom of the floor slab. Recommendations for interior and exterior slabs are provided below.

8.1 Interior Slabs

For structural design of concrete slabs-on-grade, a modulus of subgrade reaction of 150 pounds per cubic inch (pci) may be used for floors supported on properly prepared existing subgrade. If a higher modulus of subgrade reaction is required, consideration could be given to constructing the floor slab section on a granular base course.

Additional floor slab design and construction recommendations are as follows:

- Landscaped irrigation and roof run-off should be minimized or eliminated adjacent to the foundation system and the building.

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns, or utility lines to allow independent movement.
- Control joints should be provided in slabs to control the location and extent of cracking.
- Interior trench backfill placed beneath slabs should be compacted in accordance with recommended specifications outlined herein.
- In areas subjected to normal loading, a minimum 4-inch layer of sand, clean graded gravel or aggregate base course should be placed beneath interior slabs. For heavy loading, reevaluation of slab and/or base course thickness may be required.
- If moisture-sensitive floor coverings are used on interior slabs, consideration should be given to the use of vapor barriers to minimize potential vapor rise through the slab.
- Floor slabs should not be constructed on frozen subgrade.
- Other design and construction considerations, as outlined in Section 302.1 R of the "ACI Design Manual" are recommended.

8.2 Exterior Slabs

Some of the on-site soils, whether in-place or used in fills, may have susceptibility to frost heave. Covering of the native soils and/or introduction of moisture from irrigation or concentrated precipitation may increase the moisture content of the soils and result in frost heave. Therefore, movement may occur in exterior concrete slabs, which can result in off-sets, tilting and cracking. The movement and cracking may affect the appearance and performance of the slabs and can affect slab compliance with ADA requirements. There are several mitigation measures to improve slab appearance and performance; however, these options are not solely related to the geotechnical aspects, so input from the design team is suggested. In areas where movement is to be mitigated, we believe these options can be considered for best performance.

- The upper 12 inches of the native sandy subgrade soils and/or topsoil could be removed and replaced with granular non-plastic fill with less than 10 percent fines by weight. CDOT Class 6 aggregate base or Class 1 Structure backfill generally meet this requirement.
- At entrances to the building, the exterior slab may be structurally tied to the building foundation. This detail would reduce offsets between the exterior slab and the building interior;

however, the movement may be translated to other portions of the exterior slab. The structural engineer should also include uplift loads from the exterior slab in designing the foundation.

- Moisture is one of the key elements; therefore, elimination of irrigation around the exterior slabs, directing roof discharges away from these slabs and preventing snow accumulation adjacent to the slabs can reduce the potential for movement. Additionally, slopes should be graded to slope away from the building for a minimum of 10 feet.
- Use of plants that do not require irrigation and will help absorb the moisture beneath the exterior slab without creating large root masses, which could cause slab movement, may also reduce potential movement.

9 OTHER CONSTRUCTION CONSIDERATIONS

9.1 Sulfate Attack and Corrosion

Water-soluble sulfate, pH, water soluble chloride, and soil resistivity tests were performed on a sample from boring YA-B-2 to evaluate the potential attack on a concrete and buried metal at the site. The concentration of water-soluble sulfate measured in the sample was 0.0026 percent. This concentration of water-soluble sulfate represents a Class 0 degree of sulfate attack on concrete exposed to these geologic materials. The degree of attack is based on a range of Class 0 (negligible) to Class 3 (very severe) as described in the American Concrete Institute (ACI) Standard 201.2R, "Guide to Durable Concrete" and as presented in the CDOT Section 601, Structural Concrete, of the Standard Specifications for Road and Bridge Construction, 2021 edition.

The sample tested indicated a pH value of 8.2. This value is slightly basic and should represent a negligible degree of acid attack on concrete and metal exposed to these materials. Electrical resistivity measured value of 7700 ohm-cm and water-soluble chloride was below detection limits at 0.0003 percent. Where corrosion may be an issue the services of a qualified corrosion engineer should be retained.

9.2 Seismicity

Based upon the nature of the subsurface materials, a Site Class D, should be used for the design of the risk category II structure for the proposed project (IBC 2021, site coordinates: 40.26445° N, -105.83652° W). The project site is located in a seismic area with a mapped maximum short period (Ss) and 1-second period (S1) ground motion of 0.27 g and 0.055 g, respectively. The site coefficient Fa for the same period is 1.4.

The site is low risk for seismic-related or induced hazards including liquefaction, lateral spreading, settlement and slope instability.

10 PAVEMENT DESIGN RECOMMENDATIONS

10.1 Anticipated Pavement Subgrade

The anticipated pavement subgrade materials encountered in our borings consist of silty or clayey sand and the soil type was AASHTO A-4 (0). An R-value of 23 measured in the lab and was used to calculate a resilient modulus (M_R) of 5,448 psi which was used as input to the pavement thickness design program.

10.2 Traffic Loading and Pavement Sections

We recommend a hot mix asphalt (HMA) for most paved areas, with recommend Portland Cement Concrete (PCC) be placed in trash/dumpster areas. Traffic loading was based on the assumed mix of traffic using this facility, which we anticipate to be cars and pickups in the parking area, heavy semi-trucks for hay delivery and Class 5 or lighter trucks for hauling out hay, and routine visits such as trash pickup and snow plowing. Complete calculation of the traffic loading is presented in Appendix D.

Using the measured R-value of 23 we calculated a resilient modulus of 5,448 psi using the equations from AASHTO Report 72-128 which is part of the 1993 AASHTO Pavement Design Guide. This data was entered in the WinPas pavement design software (AASHTO 93) which calculated a structural number of 2.30 to address 20-year traffic loading. Table 10-1 presents recommended pavement sections to address that structural number. The pavement design program output is presented in Appendix D.

Table 10-1. Recommended Pavement Thickness

AC Pavement	PCC Pavement
4-inches HMA Over 6-inches ABC	6-inches PCC Over 6-inches ABC
Pavements should be placed over a minimum 8-inches moisture treated and compacted subgrade	

10.3 Pavement Materials

The pavement design and recommendations presented herein are in conformance with the Central Federal Lands Project Design and Development Manual Guidelines. Recommended materials are available in the Colorado market.

10.3.1 Base Course

We recommend CDOT aggregate base course (ABC) Class 6 be used for the aggregate base materials. The material should be placed in a uniform layer without segregation of size and compacted in loose lifts not to exceed 8 inches. The material should be compacted as recommended in Section 6.4 of this report.

10.3.2 Hot Mix Asphalt

Hot mix asphalt materials, placement procedures, and testing should follow CDOT specifications. We recommend a nominal ½ -inch mix with the PG 58-34 HMA binder, with Grading SX(75) aggregate. Binder recommendations are based on historic weather data from the Grand Lake Weather Station using the Long-Term Pavement Program Binder (LTPPBind). Output from the LTPPBind Program is presented in Appendix D following the traffic data and pavement design program.

10.3.3 Portland Cement Concrete

The Portland Cement Concrete (PCC) shall conform to the requirements for Portland Cement Concrete Pavement, have a minimum 28-day field flexural strength of at least 650 pounds per square inch (psi) and have a required minimum 28-day compressive strength of 4,500 psi based on Colorado Department of Transportation (CDOT) Specifications. We recommend a minimum 28-day compressive strength of 4,000 psi for the PCC. The concentration of water-soluble sulfates measured on

a subsurface sample of onsite soil was 0.0026 percent. Based on sulfate concentration in the tested soil, Type I, Portland cement may be used in pavement concrete.

10.3.4 Pavement Subgrade Preparation

In the planned pavement areas, it is recommended that the top 8 inches of the subgrade be scarified, moisture conditioned and compacted in accordance with Section 6.4 of this report.

10.3.5 Drainage

Proper drainage is of paramount importance in pavement performance. To avoid distress to pavement from wet, soft subgrade soils, we recommend the maintenance of good drainage away from all pavements. Possible water sources include storm runoff, irrigation of landscaping adjacent the pavement and localized groundwater seepage, among others. Joints in the pavement or at asphalt/concrete interfaces should be sealed. Any cracks or openings in the finished pavement surface should be sealed and/or repaired as quickly as possible.

10.3.6 Pavement Maintenance

Annual maintenance generally refers to crack filling and general surface sealers. We recommend implementation of an at least annual if not more frequent flatwork/pavement crack sealing program. This is very important to prevent surface water (especially from slow infiltration from sources such as snow melt and surface run-off) from entering cracks and wetting the subgrade. Any cracks or openings in the finished pavement surface should be sealed and/or repaired as quickly as possible.

10.4 Aggregate Surfacing

Based on the subgrade soil properties and anticipated traffic loading, gravel roads should have a minimum 8-inches thick aggregate surface course conforming to the specifications in Table 10-2. We developed these recommendations following the Aggregate Surfacing Design Standards Guidance document (FHWA 2010) and the FHWA Standard Specifications (FHWA 2014).

Table 10-2. Recommended Aggregate Surfacing Material Specifications

Gradation Requirements	
Standard Sieve Size	Percent Passing
1 inch	100
½ inch	70 – 80
No. 4	40 – 50
No. 10	25 – 40
No. 40	15 – 25
No. 200	8 – 14
Plasticity Requirements (Atterberg Limits)	
Liquid Limit	35 or less
Plasticity Index	10 ± 3

11 LIMITATIONS

The findings and recommendations presented in this report are based upon data obtained from borings, field observations, laboratory testing, our understanding of proposed construction, and other sources of information referenced in this report. It is possible that subsurface conditions may vary between or beyond the locations explored. The nature and extent of such variations may not become evident until construction. If during construction conditions appear to be different from those described herein, Yeh should be advised and provided the opportunity to observe and evaluate those conditions and provide additional recommendations, as necessary. Yeh should also be contacted if the scope of construction changes from that generally described within this report. The conclusions and recommendations contained in this report shall not be considered valid unless Yeh reviews all proposed construction changes and either verifies or modifies the conclusions of this report in writing.

This report was prepared in in a manner consistent with that level of care and skill ordinarily exercised by other members of Yeh's profession practicing in the same locality, under similar conditions and at the date the services are provided. Yeh makes no other representation,

guarantee, or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

This report may be used only by the Client and the registered design professional in responsible charge and only for the purposes stated for this specific engagement within a reasonable time from its issuance, but in no event later than two (2) years from the date of the report.

12 REFERENCES

ASCE, 2016. Minimum Design Loads and Associated Criteria for Buildings and Other Structures, ASCE/SEI 7-16. American Society of Civil Engineers

ASCE, 2021. ASCE 7 Hazard Tool. American Society of Civil Engineers

FHWA, 2010. Aggregate Surfacing Design Standards Guidance, CFLHD Supplement 11.4.2-1. Federal Highway Administration.

FHWA, 2014. Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-14. Federal Highway Administration.

IBC, 2021. International Building Code. Accessed at: https://codes.iccsafe.org/content/IBC2021P1/chapter-18-soils-and-foundations.

CDOT, 2021. Standard Specification for Road and Bridge Construction. Colorado Department of Transportation.

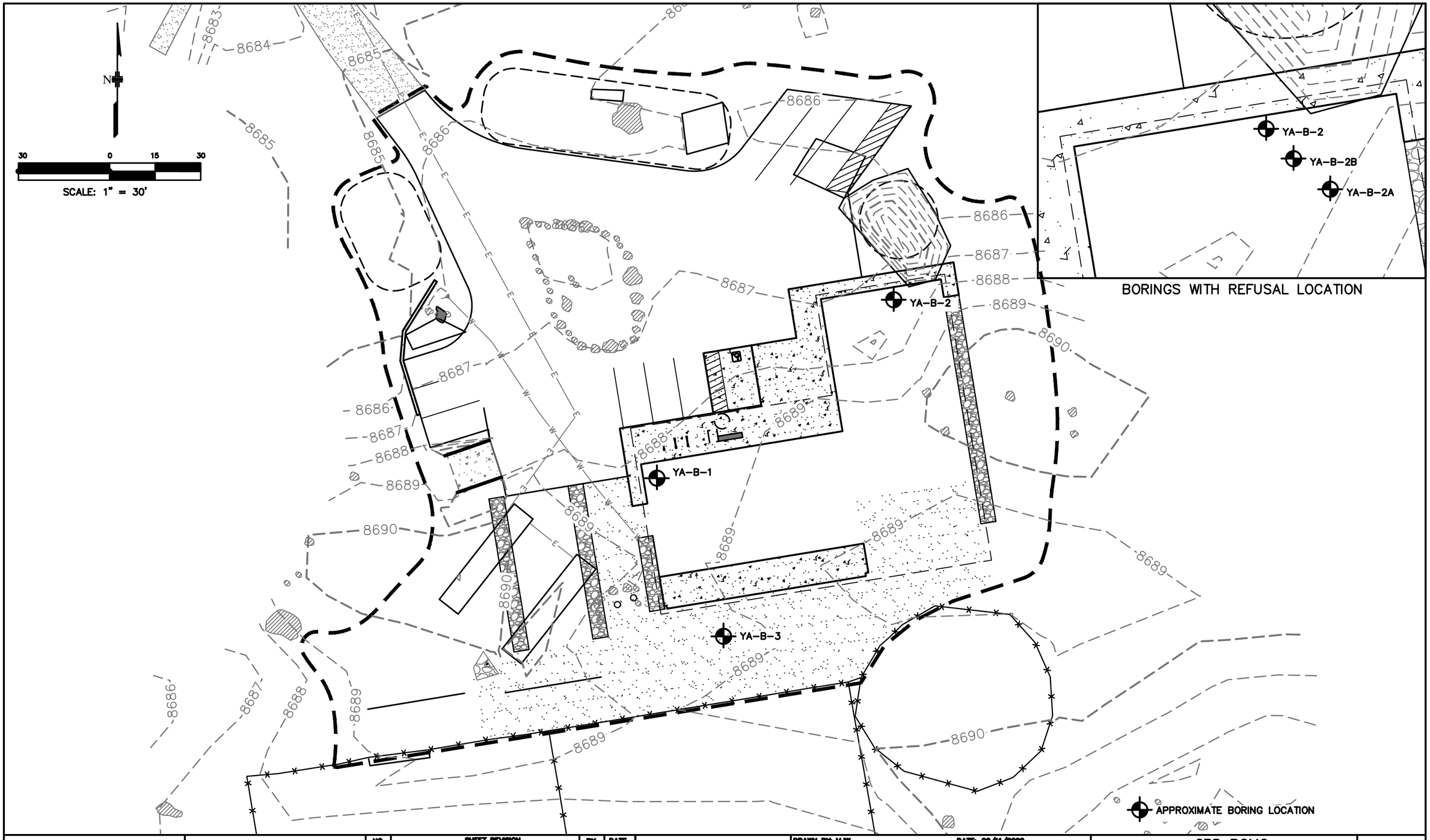
Braddock, W.A. and Cole, J.C., Geologic Map of Rocky Mountain National Park and Vicinity, Colorado, United States Geological Survey Map I-1973, 1990. Scale 1:50,000.

Appendix A

BORING LOCATION PLAN

Appendix B

BORING LOGS AND LEGEND



Yeh and Associates, Inc.
Consulting Engineers & Scientists

NO.	SHEET REVISION	BY	DATE

REUSE OF DOCUMENT

This document is the property of Yeh & Associates, Inc. The ideas incorporated on this document are instruments of professional service and shall not be used for any other project without written authorization from Yeh & Associates, Inc.

DRAWN BY: MJW	DATE: 02/11/2022
CHECKED BY: SCS	DATE: 02/11/2022
DESIGNED FOR:	
PROJECT NUMBER: 221-282	
SCALE	
HORIZ: 1"=30'	VERT:

CRD ROMO
BARN AND TACK SHED

BORING LOCATION PLAN

SHEET 1 OF 1

Appendix C

LAB SUMMARY

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project: ROMO Barn and Tack Shed

Project Number: 221-282

Legend for Symbols Used on Borehole Logs

Sample Types


Bulk Sample of auger/odex cuttings


Modified California Sampler (2.5 inch OD, 2.0 inch ID)


Standard Penetration Test (ASTM D1586)

Drilling Methods


SOLID-STEM AUGER

Lithology Symbols

(see Boring Logs for complete descriptions)


Fill


Poorly Graded Sand (SP)


Silty, Clayey Sand (SC-SM)


Silty Sand (SM)

Lab Test Standards

Moisture Content	ASTM D2216
Dry Density	ASTM D7263
Sand/Fines Content	ASTM D421, ASTM C136, ASTM D1140
Atterberg Limits	ASTM D4318
AASHTO Class.	AASHTO M145, ASTM D3282
USCS Class.	ASTM D2487

(Fines = % Passing #200 Sieve
Sand = % Passing #4 Sieve, but not passing #200 Sieve)

Other Lab Test Abbreviations

pH	Soil pH (AASHTO T289-91)
S	Water-Soluble Sulfate Content (AASHTO T290-91, ASTM D4327)
Chl	Water-Soluble Chloride Content (AASHTO T291-91, ASTM D4327)
S/C	Swell/Collapse (ASTM D4546)
UCCS	Unconfined Compressive Strength (Soil - ASTM D2166, Rock - ASTM D7012)
R-Value	Resistance R-Value (ASTM D2844)
DS (C)	Direct Shear cohesion (ASTM D3080)
DS (phi)	Direct Shear friction angle (ASTM D3080)
Re	Electrical Resistivity (AASHTO T288-91)
PtL	Point Load Strength Index (ASTM D5731)

Notes

1. Visual classifications are in general accordance with ASTM D2488, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedures)".
2. "Penetration Resistance" on the Boring Logs refers to the uncorrected N value for SPT samples only, as per ASTM D1586. For samples obtained with a Modified California (MC) sampler, drive depth is 12 inches, and "Penetration Resistance" refers to the sum of all blows. Where blow counts were > 50 for the 3rd increment (SPT) or 2nd increment (MC), "Penetration Resistance" combines the last and 2nd-to-last blows and lengths; for other increments with > 50 blows, the blows for the last increment are reported.
3. The Modified California sampler used to obtain samples is a 2.5-inch OD, 2.0-inch ID (1.95-inch ID with liners), split-barrel sampler with internal liners, as per ASTM D3550. Sampler is driven with a 140-pound hammer, dropped 30 inches per blow.
4. "ER" for the hammer is the Reported Calibrated Energy Transfer Ratio for that specific hammer, as provided by the drilling company.

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project Name: ROMO Barn and Tack Shed

Project Number: 221-282 *Boring No.:* **YA-B-1**

Boring Began: 1/27/2022
Boring Completed: 1/27/2022
Drilling Method(s): Solid-Stem Auger
Driller: Vine Laboratories
Drill Rig: CME 75 Truck
Hammer: Automatic (hydraulic), ER: %

Total Depth: 26.0 ft
Ground Elevation: 8688
Coordinates: Lat: 40.26458 Long: 105.83666
Location:
Logged By: C. Wallace
Final By: C. Wallace

Weather Notes: Cloudy, 10s
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/Depth	Drilling Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
8685	0						**0.0 - 2.0 ft. Silty, clayey SAND (SC-SM) (Fill)**, gray-brown, moist, dense.									
				25-17	42		**2.0 - 4.0 ft. Silty, clayey SAND (SC-SM)**, gray-brown, moist, dense, contains cobbles.	10.0 *10.8*	110.8	*8.8*	*51.5*	53 *39.7*	*22*	*5*	*A-4 (0) SC-SM*	Auger grinding on cobble
8680	5			17-27-30	57		**4.0 - 14.0 ft. Poorly graded SAND (SP)**, light gray-brown, moist, medium dense to very dense, contains cobbles.									
8675	10			11-10-9	19			10.2				35	NV	NP		
8670	15			12-14-24	38		**14.0 - 20.0 ft. Silty SAND (SM)**, gray-brown and reddish brown, moist, dense, contains cobbles and layers of thinly laminated poorly graded sand.	9.5				37.2				
8665	20			21-30-50:5"	80:11"		**20.0 - 26.0 ft. Silty SAND with gravel (SM)**, gray-brown, dry to moist, very dense, weak to moderate cementation, contains cobbles.									Hard drilling
8660	25			50:6"	50:6"											Auger refusal at 26 ft
8655							Bottom of Hole at 26.0 ft.									

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project Name: ROMO Barn and Tack Shed

Project Number: 221-282 *Boring No.:* **YA-B-2**

Boring Began: 1/27/2022
Boring Completed: 1/27/2022
Drilling Method(s): Solid-Stem Auger
Driller: Vine Laboratories
Drill Rig: CME 75 Truck
Hammer: Automatic (hydraulic), ER: %

Total Depth: 8.0 ft
Ground Elevation: 8687
Coordinates: Lat: 40.26474 Long: 105.83643
Location:
Logged By: C. Wallace
Final By: C. Wallace

Weather Notes: Cloudy, 10s
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/Depth	Drilling Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
8685	5			20-50:3"	70:9"		**0.0 - 2.0 ft. Silty SAND (SM) (Fill)**, light brown, moist, medium dense to dense.									
							2.0 - 5.0 ft. Silty SAND (SM), light brown, moist, very dense, contains cobbles and boulders.	9.3 *14.5*	113.4	*10.2*	*47.6*	*42.2*	*22*	*2*	*A-4 (0) SM*	pH=8.2 S=0.0026% Chl=<0.0003% Re=7700ohm·cm Auger refusal at 2.5 ft. Offset 5 ft northwest
8680				26-17-15	32		**5.0 - 8.0 ft. Poorly graded SAND with gravel (SP)**, gray-brown, moist, dense, contains cobbles and boulders.									Auger refusal at 4 ft. Offset 5 ft northwest Auger refusal at 8 ft
							Bottom of Hole at 8.0 ft.									
8675																
8670																
8665																
8660																
8655																

Yeh and Associates, Inc.
Geotechnical • Geological • Construction Services

Project Name: ROMO Barn and Tack Shed

Project Number: 221-282 *Boring No.:* **YA-B-3**

Boring Began: 1/27/2022
Boring Completed: 1/27/2022
Drilling Method(s): Solid-Stem Auger
Driller: Vine Laboratories
Drill Rig: CME 75 Truck
Hammer: Automatic (hydraulic), ER: %

Total Depth: 21.0 ft
Ground Elevation: 8689
Coordinates: Lat: 40.26445 Long: 105.83652
Location:
Logged By: C. Wallace
Final By: C. Wallace

Weather Notes: Snow, 10s
Inclination from Horiz.: Vertical
Night Work: ☐

Groundwater Levels: Not Observed

Symbol			
Depth	-	-	-
Date	-	-	-

Elevation (feet)	Depth (feet)	Sample Type/Depth	Drilling Method	Soil Samples: Blows per 6 in	Soil Samples: Penetration Resistance	Lithology	Material Description	Moisture Content (%)	Dry Density (pcf)	Gravel Content (%)	Sand Content (%)	Fines Content (%)	Atterberg Limits: Liquid Limit	Atterberg Limits: Plasticity Index	AASHTO & USCS Classifications	Field Notes and Other Lab Tests
8685	0						**0.0 - 5.0 ft. Silty, clayey SAND (SC-SM) (Fill)**, light gray-brown, moist, medium dense.									
				7-8	15			2.4 *16.2*	115.3	*10.9*	*47.8*	5.4 *41.3*	*25*	*6*	*A-4 (0) SC-SM*	
8680	5			23-35-23	58		**5.0 - 21.0 ft. Silty SAND with gravel (SM)**, gray-brown, dry to moist, medium dense to very dense, contains cobbles and layers of poorly graded sand.									
8675	10			14-15-15	30			6.7				34	NV	NP		
8670	15			11-11-14	25											Heavy rig chatter
8665	20			38-50:1"	50:1"											Auger refusal on boulder at 21 ft

Bottom of Hole at 21.0 ft.

Summary of Laboratory Test Results

Project No: 221-282 Project Name: ROMO Barn and Tack Shed Date: 03-04-2022

Sample Location			Natural Moisture Content (%)	Natural Dry Density (pcf)	Gradation			Atterberg			pH	Water Soluble Sulfate (%)	Water Soluble Chloride (%)	Resistivity (ohm-cm)	Swell (+) / Collapse (-) (% at Load in psf)	Unconf. Comp. Strength ()	R-Value	Classification	
Boring No.	Depth (ft)	Sample Type			Gravel > #4 (%)	Sand (%)	Fines < #200 (%)	LL	PL	PI								AASHTO	USCS
MIX YA-B-1+B-2+B-3	1.0	BULK															23		
YA-B-1	1.0	BULK	10.8		8.8	51.5	39.7	22	17	5								A-4 (0)	SC-SM
YA-B-1	2.0	MC	10	110.8															
YA-B-1	10.0	SPT	10.2					NV	NP	NP									
YA-B-1	15.0	SPT	9.5																
YA-B-2	1.0	BULK	14.5		10.2	47.6	42.2	22	20	2								A-4 (0)	SM
YA-B-2	2.0	MC	9.3	113.4							8.2	0.0026	<0.0003	7700					
YA-B-3	1.0	BULK	16.2		10.9	47.8	41.3	25	19	6								A-4 (0)	SC-SM
YA-B-3	2.0	MC	2.4	115.3															
YA-B-3	10.0	SPT	6.7					NV	NP	NP									

Appendix D

PAVEMENT DESIGN

Rocky Mountain National Park CRD Barn and Shed — Yeh No. 221-282

Traffic Loading Calculations — 3/8/2022

Estimated Traffic Volumes

This facility will have 12 parking spaces and will have occasional service trucks such as trash and snow plow vehicles. Hay deliveries from outside will be made by semi-trailer trucks and hay will be dispensed using medium to small trucks.

The FHWA Central Federal Lands Project Development and Design Manual follows the 1993 AASHTO Pavement Design Guide and published equivalent single load (ESAL) factors for the various type of vehicles to facilitate calculate the ESAL Loading to represent the traffic loading for pavement design. Using this information, the following traffic loading was calculated for this facility.

		20-Year Vehicle Count	
12 vehicle parking, filled twice per day = 12 X 2 or 24 vehicle per day X 365 days/year X 20 Years =	Class 3	175200	vehicles
2 vehicles with trailers per day = 2 vehicles X 365 days/year X 20 Years =	Class 5	14600	veh-trailers
1 semi trucks per week = 1 vehicles X 52 weeks X 20 Years =	Class 6	1040	Service veh
	Twenty Year Total Vehicles =	190840	

Assumptions: ESAL Values from Exhibit 11.2, page 11-10 & 11-11 of FHWA PDDM

			Vehicle Class	ESAL Factor	Description
DHV =	10%		3	0.004	Cars, Pickups, Vans & SUVs
Dir Dist	60%	(Lane Corr. Factor)	4	1.75	School Buses
Trucks	< 5%		5	0.7	RVs, Motor Homes, Delivery Trucks
			6	1.5	Large RVs, Motor Homes, Garbage & Dump trucks
			9	2.3	Semis

ESAL Calculations (Low ESAL Values)

Design AADT (2022 vol + 2042 Vol)/2 AADT

Design (Daily ESALS) = Design Vol X % Veh type X ESAL/veh

				Veh. ESAL Factor			20-Year ESAL	Check # Vehicles	
175200	Cl 3 Veh X	1	X	0.004	ESAL/PU	=	701	175200	Split Car & PU Vehicle ESAL
0	CL 4 Veh X	1	X	1.75	ESAL/PU	=	0	0	
14600	CL 5 Veh X	1	X	0.7	ESAL/PU	=	10220	14600	Campers with Trailers
1040	CL 6 Veh X	1	X	1.5	ESAL/PU	=	1560	1040	Service Trucks
0	CL 9 Veh X	1	X	2.3	ESAL/PU	=	0	0	
					Total Design ESALs =		12481	190840	Design ADT 20-Year Volume

The Central Lands Division of the FHWA requires that a minimum of 50,000 ESALs be used to address the unknowns for growth and other factors such as vehicle weight changes. **We recommend that the 50,000 ESAL loading be used to address both the parking area and entrance road to the new facility. That loading would address a growth factor of just over 4 over the 20 Years.**

WinPAS

Pavement Thickness Design According to

1993 AASHTO Guide for Design of Pavements Structures

American Concrete Pavement Association

Flexible Design Inputs

Project Name: ROMO CRD Barn and Tack Shed
Route: Local RMNP Road
Location: Grand Lake, Colorado
Owner/Agency: RMNP
Design Engineer: Access Road and Local Parking Area

Flexible Pavement Design/Evaluation

Structural Number	2.30		**Subgrade Resilient Modulus**	5,448.00	**psi**
Total Flexible ESALs	50,000		**Initial Serviceability**	4.20	
Reliability	85.00	**percent**	**Terminal Serviceability**	2.00	
Overall Standard Deviation	0.49				

Layer Pavement Design/Evaluation

Layer Material	Layer Coefficient	Drainage Coefficient	Layer Thickness	Layer SN
Asphalt Cement Concrete	0.40	1.00	4.00	1.60
Granular Subbase	0.12	1.00	6.00	0.72
			ΣSN	2.32

Asphalt Binder Recommendation

Report - 170 Selected Weather Stations

State/Province: CO

Weather Station: GRAND LAKE 1 NW

Station ID	CO3496	Latitude	40.27
County / District	GRAND	Longitude	105.83
Last Year Data Avail.	1997	Elevation, m	2468

Air Temperature	Mean	Std Dev	Min	Max	Years
High Air Temperature, Deg. C	27.2	1.5	24.7	30.5	35
Low Air Temperature, Deg. C	-33.2	3.6	-41.5	-26.5	35
Low Air Temp. Drop, Deg. C	29.6	2.6	25.5	34.5	35
Degree Days over 10 Deg. C	1711	188	1369	2103	35

Pavement Temperature and PG	HIGH	LOW	High Rel	Low Rel
Pavement Temperature, C	44.3	-23.2	50	50
50% Reliability PG	46	-28	96	92
>50% Reliability PG	46	-34	96	98
=	52	-34	98	98
=				
=				
=				

? PG Chart PG Distribution Save Cancel

The LTPPBind recommended Asphalt Binder is PG 52-34. Asphalt Binder PG 58-34 is available in Colorado which meets the low temperature requirements and exceed the high temperature requirements.

We recommend using an Asphalt Binder meeting the requirements of PG 58-34

Pre-Proposal Teleconference & Virtual Site Visit

ROCKY MOUNTAIN NATIONAL PARK

CONSTRUCT CRD BARN AND TACK SHED
Solicitation: 140P2024R0022
NPS PMIS #: ROMO 316223

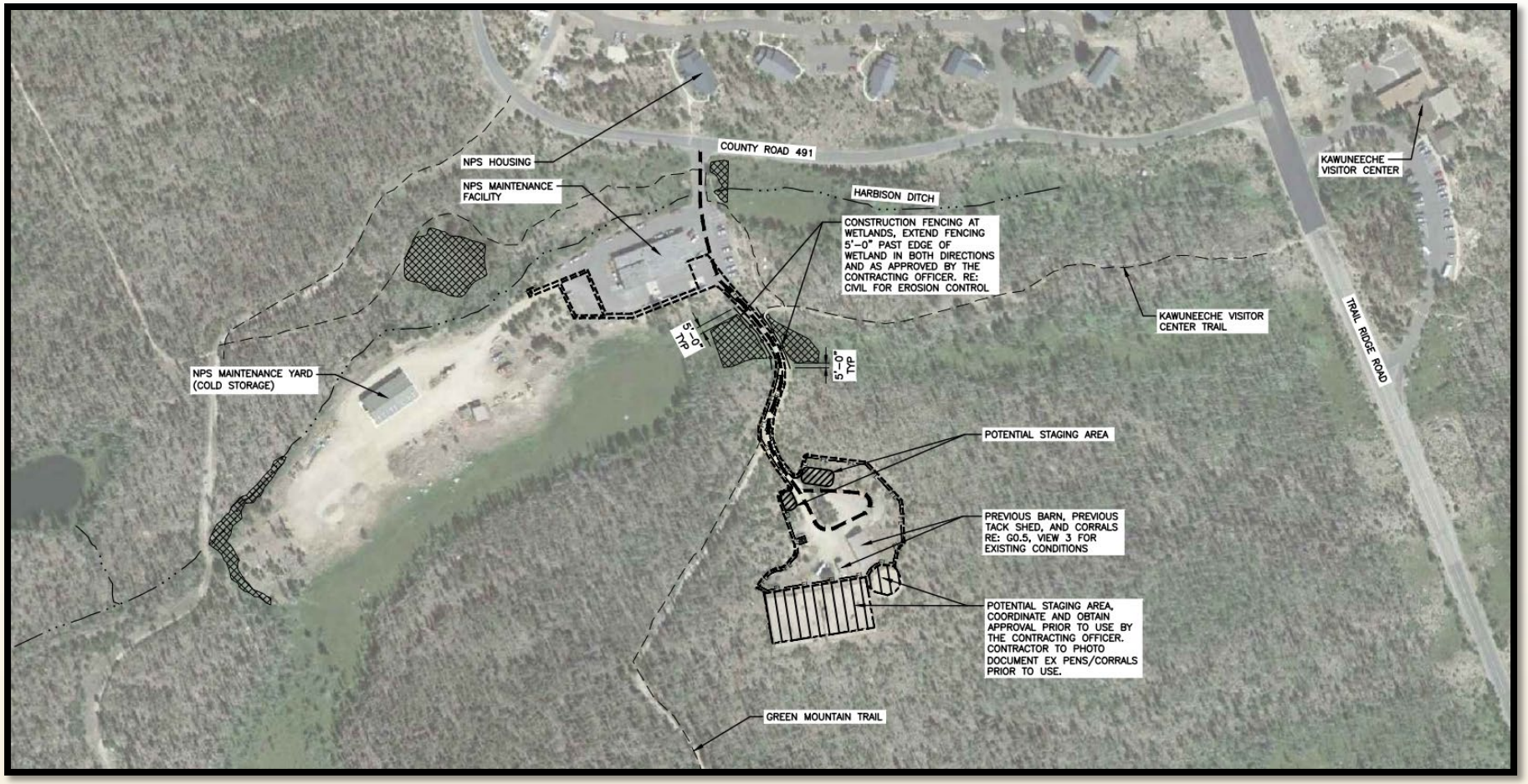
THIS MEETING WILL BE RECORDED

January 18, 2023

AGENDA

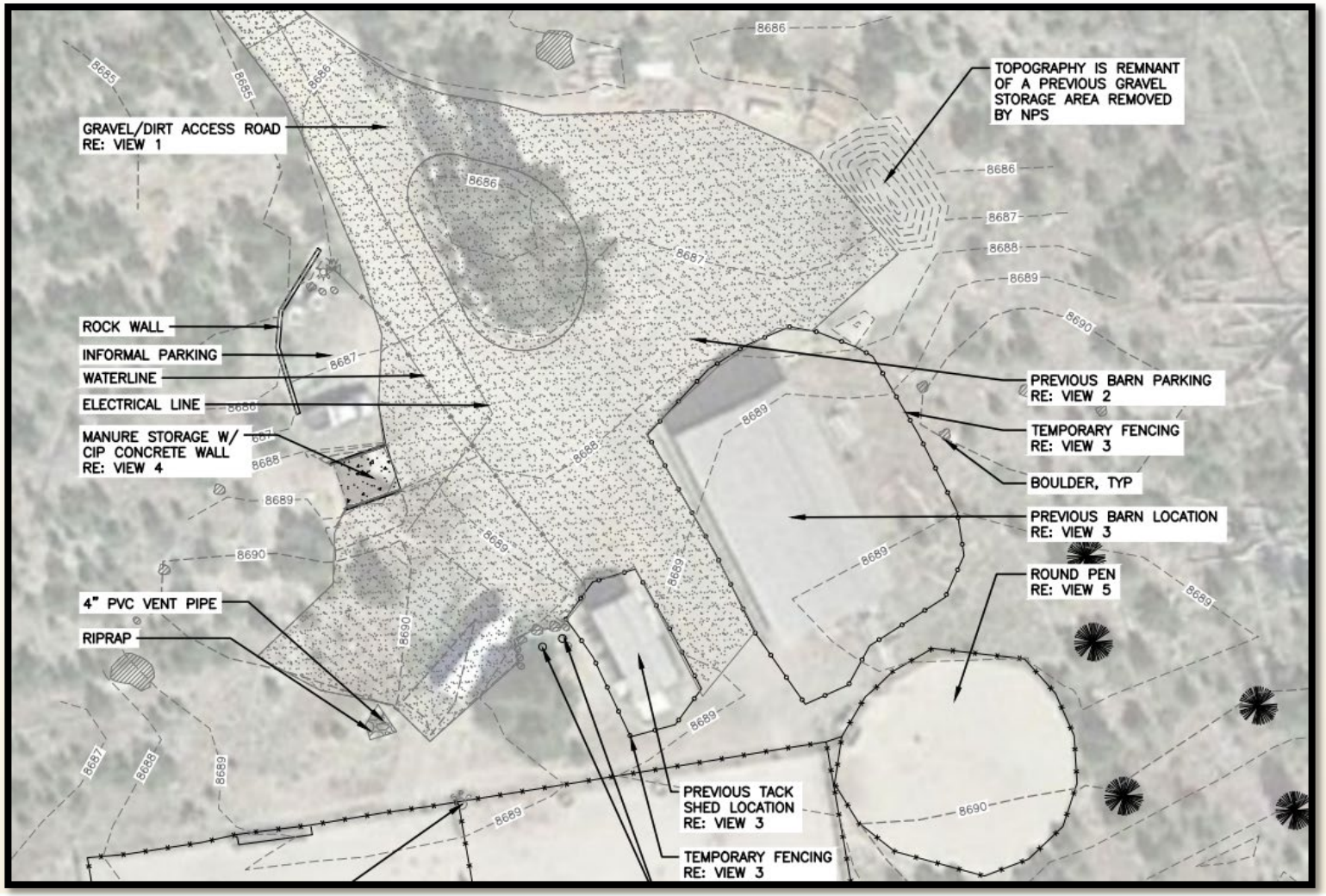
- INTRODUCTIONS
  - *Attendees List will be included in an amendment*
  - *Meeting Participation logistics – Agenda posted with Solicitation amendments*
- PROJECT OVERVIEW - SITE LAYOUT AND ORIENTATION (Project Manager)
- PROJECT OVERVIEW - SCOPE OF WORK – OVERALL (Project Manager)
- SITE /PROJECT CONSIDERATIONS (Project Manager)
- VIRTUAL TOUR (Park Manager)
- BID INFORMATION (Contracting)
- BID CLINS (Contracting)
- PRE-PROPOSAL CONFERENCE QUESTIONS (Contracting)
- CONCLUSION

SITE LAYOUT AND ORIENTATION



Project Location: West Side of ROMO, Grand Lake, CO

SITE LAYOUT AND ORIENTATION



SCOPE OF WORK - OVERALL

Base Bid

- Environmental clean-up of debris left behind from the fires. Including permitting, debris and soil removing, and confirmation testing
- Installing site utilities from the maintenance area including water, electric, and installing an OWTS septic system
- Construction of new stick built Barn building (~5500 sf) and pre-engineered metal hay storage building (~1000 sf), including mechanical, plumbing, and HVAC
- Site improvements such as new colored concrete accessible parking and sidewalks at the barn/tack shed, gravel parking and road, and misc. site furnishings

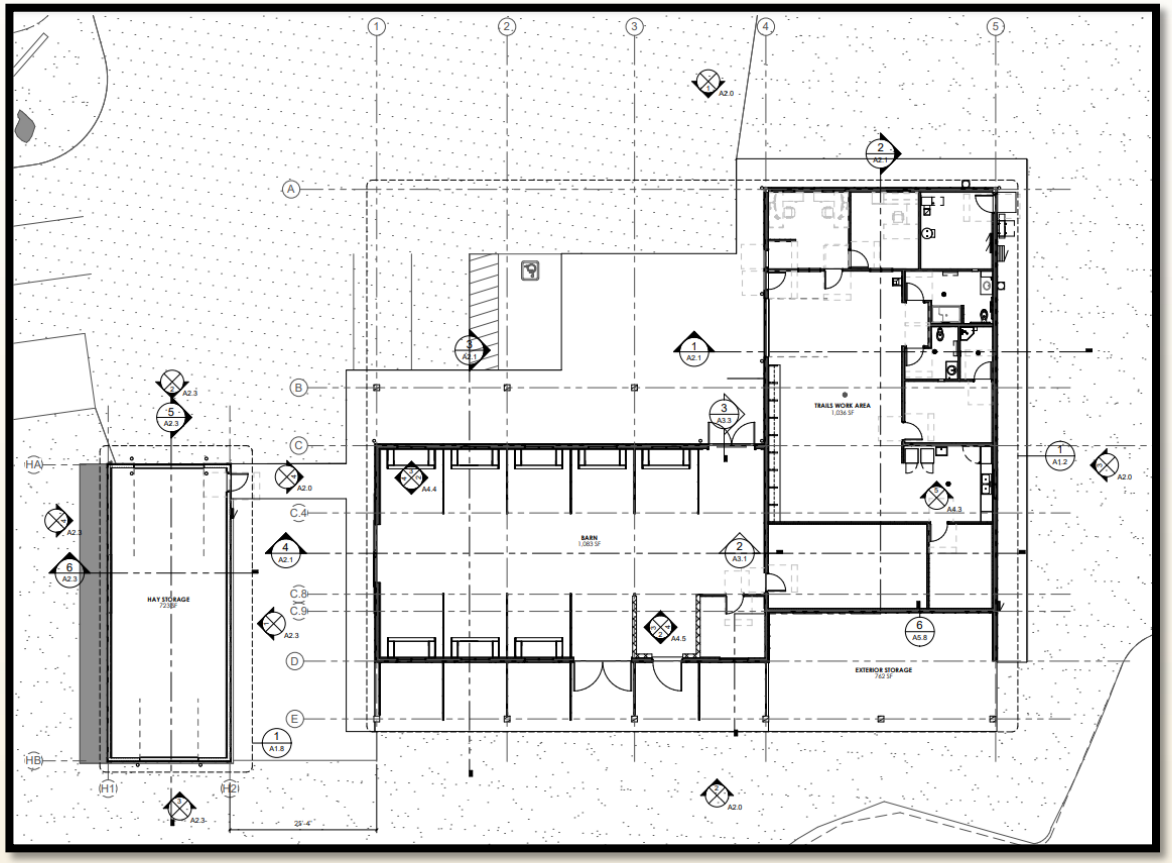
Bid Options

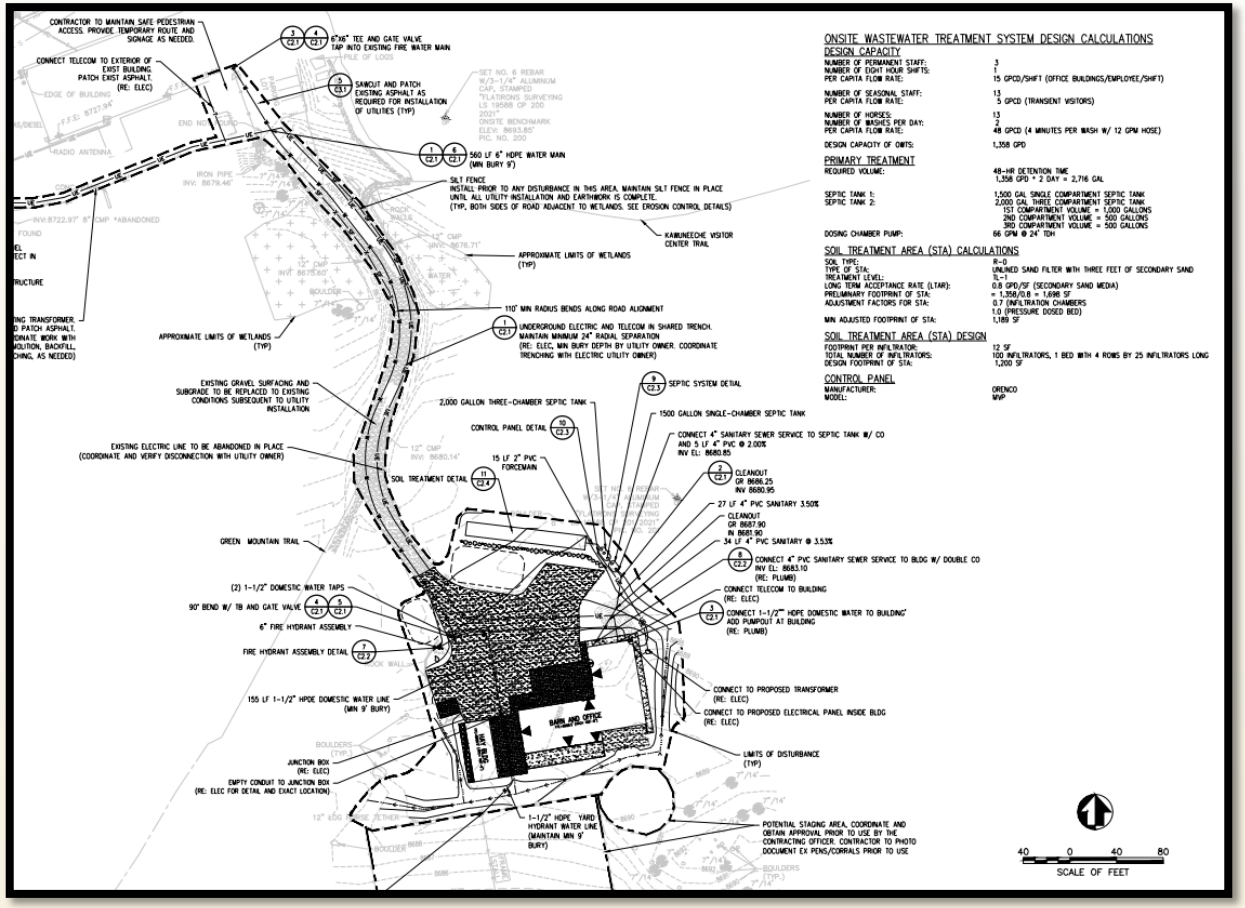
- Lightning protection
- Photovoltaic System
- Additional Heavy Duty Concrete

SITE / PROJECT CONSIDERATIONS

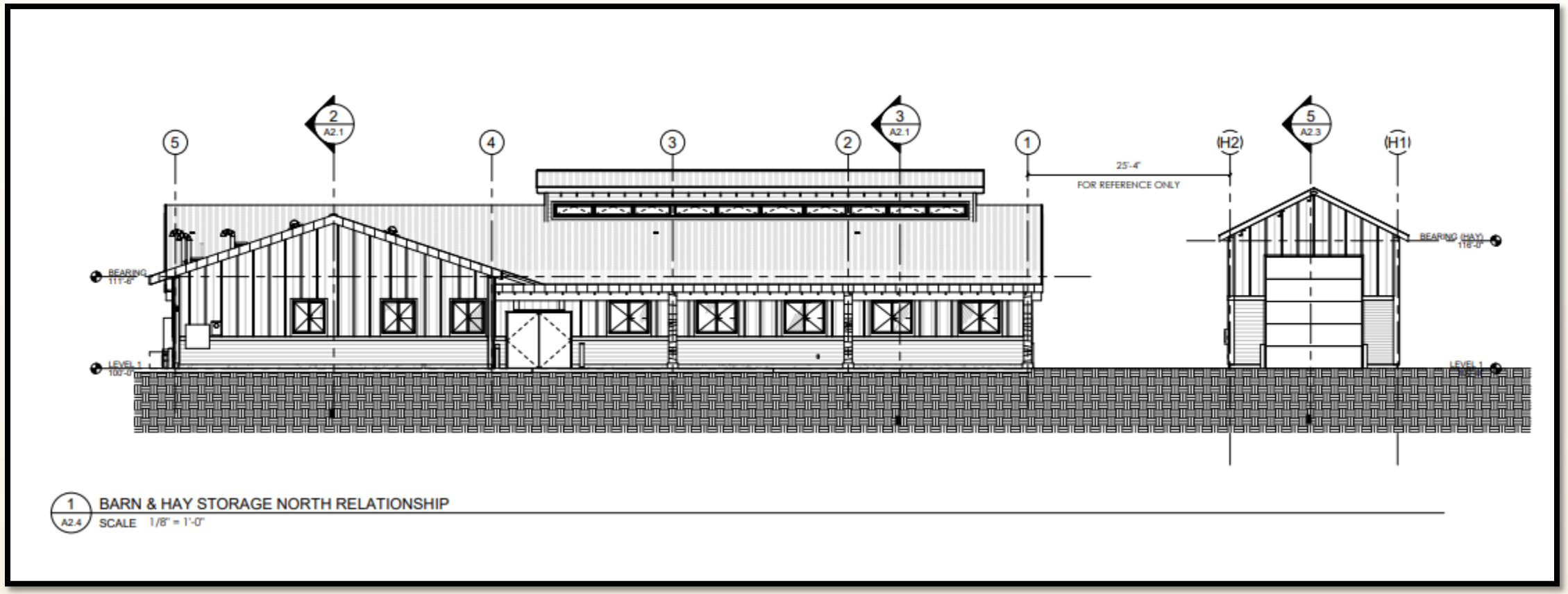
- The project site is located just north of Grand Lake, CO, right at the west side entrance to Rocky Mountain National Park.
- It is located through the park admin/maintenance area. Contractors will have full access to the specific site with very little need of park access. Public and visitors will not be able to access the site.
- The project site is located at about 8,400 ft elevation and is regularly snow covered from October-April.
- Staging and storage of materials and equipment will be kept within the project site limits of disturbance.
- Temp construction trailer is acceptable but must be kept within construction limits, final location to be determined after contract award.
- Water from a yard hydrant is available at the site for contractor use but limited to 400 gal/day
- Road between east (Estes Park) and West side (Grand Lake) of the park is closed from about early October through mid/late May
- Concurrent projects – There will be other construction projects in the area, constructing Grand Lake Entrance station, and Constructing new housing. Both are in the vicinity but not in direct conflict with this project and site. Except higher than normal construction traffic in the area.

SCOPE OF WORK – VIRTUAL TOUR





SCOPE OF WORK – VIRTUAL TOUR



SOLICITATION NO. 140P2024R0022
SUMMARY OF SOLICITATION AND AWARD INFORMATION

Refer to the Solicitation for complete information.

- PRE PROPOSAL MEETING – January 18, 2024
- PRE PROPOSAL QUESTIONS DUE – January 30, 2024 2:00 PM MDT
- OFFERS DUE – February 6, 2024 2:00 PM MDT
- SUBMISSION – Electronic only to: CS_DSC_Proposal_Submission@nps.gov and jason_longshore@nps.gov
- SECTION L – 52.216-1 – Type of Contract – Firm Fixed Price
- NAICS Code: 236220 - Small Business Size Standard: $45M
- THIS IS A COMPETIVE PROCUREMENT WITH A SET-ASIDE FOR TOTAL SMALL BUSINESS
- PERIOD OF PERFORMANCE: 300 calendar days from issuance of Notice to Proceed.

CONTRACT PRICE SCHEDULE – Definition of Contract Line Items

Contract Line Item Number (CLIN)	Contract Line Item (CLI) Title	Quantity	Unit of Measure	Unit Price	Total Price
1	Hay Storage	1	LS		
2	CRD Barn and Tack Shed	1	LS		
3	Sitework	1	LS		
4	Clean-up of Fire Debris	1	LS		
TOTAL BASE PRICE (Contract Line Item Number 1 through 3) ----------					
5	OPTION A, Lightning Protection	1	LS		
6	OPTION B, Photovoltaic System	1	LS		
7	OPTION C, Heavy Duty Concrete Paving	1	LS		
TOTAL PRICE FOR ALL OPTIONS (Contract Line Item Number 4 through 6) ----------					
TOTAL PROPOSED PRICE - BASE PLUS ALL OPTIONS (Contract Line Item Number 1 through 6) ----------					
All measurement and payment information is included in Division 01 Specifications Section 01 27 00 Definition of Contract Line Items.					

PRE-PROPOSAL CONFERENCE QUESTIONS

- Administrative questions are the only questions permitted to be asked and answered during this conference. Please state your name and company before you ask your question. the question will be repeated, and responses provided. The CO requests all non-adminstrative questions be submitted in writing via email to the CO, Jason Longshore, as follows:

  Jason_longshore@nps.gov

- Responses to questions that may be stated during the pre-solicitation site visit do not change the Solicitation document.
- Changes to the Solicitation document shall be made as an amendment to the solicitation document. Answers to questions received will be issued as an amendment to the solicitation.
- Offerors are required to fill out and sign the acknowledgment of amendments received (SF1442 Section 19) and include this when submitting their offer on the Form 1442.

QUESTIONS AFTER PRE-PROPOSAL CONFERENCE

- Direct all questions the CO requests that they be submitted in writing via email to both the CO, Jason Longshore:
  Jason_longshore@nps.gov
- Questions and answers will be issued by written amendment posted as an amendment to the solicitation. Offerors are required to fill out and sign the acknowledgment of amendments received (SF1442 Section 19) and include this when submitting our offer on the Form 1442.
- The DEADLINE FOR QUESTIONS IS: January 30, 2024 2:00 PM MDT
- This presentation and the recorded pre-proposal site visit meeting will be available to participants via an e-mail attachment through the DOI FTP Site.
- For all other interested vendors not able to attend this pre-proposal site visit, an amendment will have directions on how to request this presentation and the recorded pre-proposal site visit.

Thank You For Your Interest in This Project

National Park Service
U.S. Department of the Interior

Attendance List

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