

SECTION 00110
BID #FA19-04-038
REQUEST FOR PROPOSALS

The City of Greeley, Colorado is requesting sealed proposals for the Construction of Fire Station #6. This is a CMAR contract. Sealed proposals must be received at the Public Works Building, 1001 9th Avenue, Greeley, Colorado 80631 **before April 30, 2019 before 1:00 pm.** No late, faxed or electronic proposals will be accepted.

The necessary documents are available online at the Rocky Mountain Online Bid System site (Bidnet). Go to <http://www.RockyMountainBidSystem.com>, in the upper right corner of the screen choose "Login" if your company has a login established or "Register" if it is the first time you are visiting this site. Follow the prompts for the option chosen. Select "Search for Open Bids and Addenda by Agency" and then select "City of Greeley." Bid opportunities will be listed, in bid due date sequence, by project name and bid number.

A pre-proposal meeting will be held on April 18, 2019 at 11:30 am at the Greeley Recreation Center, 651 10th Avenue, Room 101, Greeley, Colorado. All prospective vendors are encouraged to attend.

Proposals submitted must include the information as outlined in the selection criteria section. This is the information the firm will be evaluated upon.

No proposals shall be withdrawn after receipt of proposal for a period of sixty (60) days after the scheduled time of the receiving the proposals.

The City of Greeley retains the right to reject any and all proposals and to waive any informality as deemed in the best interest of the city.

Questions pertaining to the project may be directed to Adela Gain at adela.gain@greeleygov.com no later than April 23, 2019 before noon.

Adela R. Gain

CITY OF GREELEY

Purchasing

Request for Construction Manager-At-Risk Proposals

RFP #FA19-04-038

CONSTRUCTION OF FIRE STATION #6

for

Engineering Division of Public Works Department

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Section 1. Background

1.1 Introduction

This request for proposals (RFP) for the **City of Greeley's, Construction of Fire Station #6** project (Project) invites potential Contractors to submit Proposals according to the requirements set forth in this RFP. The Project is to be designed and constructed using the Construction Manager-At-Risk (CMAR) delivery method. The Proposals will be reviewed and evaluated by the City's selection committee using the evaluation criteria as detailed in this RFP.

Phase 1 services generally consist of design services performed in close collaboration with the Owner consisting of value engineering, constructability reviews, cost estimating, schedule development and management, as well as risk management planning. Phase 1 services will culminate in the Contractor's submittal of a Guaranteed Maximum Price (GMP) proposal for the construction of the Project. The GMP proposal shall be based on the Project's design for the proposed Fire Station #6 and site development. A GMP is anticipated to be set at no less than the 75% level of completion from the Owner's project schedule, and will include supporting documentation. Phase 2 services generally encompass completing the Project's construction, startup and commissioning, and warranty. See general descriptions provided below for scope of services included in Phase 1 and Phase 2.

This RFP is subject to revision after the date of issuance via written addenda. Any such addenda will be transmitted to the potential Proposers maintained by the Owner and or it's Representative. It is each Proposer's responsibility, however, to obtain all RFP addenda prior to submitting its Proposal.

The capitalized terms in this RFP have the meanings as first used in the text of this RFP and/or as defined in Attachment A (Definition of Terms). In no event will the Owner be liable for any costs incurred by any Proposer or any other party in developing or submitting a Proposal.

1.2 RFP Organization

This RFP consists of seven (7) sections and five (5) attachments for the purposes of defining the structure of the document. The sections include the following:

- Section 1: Background
- Section 2: Project Overview
- Section 3: Construction Manager-At-Risk Services
- Section 4: Procurement Process
- Section 5: Proposal Submission Requirements
- Section 6: Proposal Evaluation and Selection
- Section 7: Conditions for Proposers
- Attachment A: Definition of Terms
- Attachment B: Scope of Construction Manager-At-Risk Services
- Attachment C: Draft Construction Manager-At-Risk Contract
- Attachment D: Geotechnical Report and Topographic Survey
- Attachment E: Forms for Affirmation of Compliance

The contents of the RFP Attachments, identify the Owner's specific requirements, and take priority

over any conflicting statements in the RFP Sections. Certain project background documents are being made available as Attachment D (Geotechnical Report and Topographic Survey) for the purpose of preparing Proposals. The Owner is providing these documents only for the purpose of obtaining Proposals for the Project. The extent to which the CMAR may rely on such background documents is set forth in Attachment C (Draft Construction Manager-At-Risk Contract).

1.3 Owner's Objectives and Project Priorities

The Owner's objectives for delivery of the Project are as follows (in alphabetical order):

- **Collaboration with Design Elements:** Review and participate with Owner and Designer on the selection of design elements that will minimize project costs and meet and/or accelerate the project schedule.
- **Flexibility in construction scheduling:** To meet and/or accelerate the project schedule and work with local residents to minimize disruption and maintain operations of the impacted project areas and other infrastructure.
- **Project Cost:** Construction of the project within the City's project budget and minimizing life-cycle costs.
- **Minimize Risk for Change Orders:** Achieve an optimal balance of risk allocation between the Owner and other parties and manage the risk to reduce the likelihood of change orders.
- **Project Schedule:** CMAR's ability to meet and/or accelerate the project schedule.
- **Quality:** Provide materials and installation that will be sustainable and reliable throughout the life cycle of the project.
- **Risk:** Achieve an optimal balance of risk allocation between the Owner and the CMAR.
- **Safety:** Implement an effective safety program incorporating best industry practices that provide safe working conditions for the team during construction as well as long term operational safety.
- **Selection of a Qualified CMAR Firm with available staff:** Selection of an experienced CMAR firm that understands the Owner's objectives, has experience with the project delivery method, and can construct the project to meet or exceed the project schedule and budget.

By selecting the CMAR delivery method for the Project, the Owner is committed to working with the CMAR to achieve the Project objectives and to obtain a mutually-agreeable GMP for the delivery of the project.

Section 2. Project Overview

2.1 Project Scope

The City of Greeley (Owner) found that the CMAR delivery method would provide Best Value to the City for the successful and timely completion of the Construction of Fire Station #6. It is expected that the selected CMAR will achieve this through seamless collaboration with the Owner and Design Architect during both Phase 1 and 2 of the Project. The Project scope, design standards and performance requirements are described in more detail below and in Attachment B (Scope of Construction Manager-At-Risk Services).

The City of Greeley is proposing to design and construct a new Fire Station #6 at the northeast corner of Promontory Parkway and 18th St (Promontory Circle). The proposed Fire Station #6 will be ±18,000 sf in size which includes ±15,000 sf for Fire Services and a ±3,000 sf Police Services sub-station. The project will generally entail: development of the existing site, installation of utilities and construction of the proposed Fire Station #6. The selected contractor will demonstrate the ability to: perform site and utility improvement activities, construct buildings up to two stories in height (preferably with previous experience in Fire Station construction) and work with local agencies and know local building code.

The CMAR will be responsible for tracking the project cost, or estimated cost, to provide confirmation that the design and construction is completed within the City's budget. The complete CMAR scope of services is described in greater detail in Section 3.

Construction Restrictions:

The Project will be constructed within the Fire Station #6 site and within the City's existing Right of Way or Right of Way acquired as part of the project. During construction, it is important that traffic flow be maintained with minimal disturbances to the general public as much as possible. Work hours / days shall be constrained to normal hours of operation for the City of Greeley, or Monday – Friday, 7:00 am – 5:00 pm. Weekend construction may be allowed with the authorization of the City's Project Manager.

2.2 Project Budget and Funding

The total City cost for construction activities of the Project is currently budgeted at \$6.3 million. Said budget includes Owner's other project costs, such as engineering and design services, CMAR preconstruction services, property or access rights, site investigations, traffic signal work, adjacent roadway improvements, environmental studies, certain governmental approvals, furniture, equipment, fixtures, taxes, etc. The Owner intends to self-fund the Project.

The work included in this RFP shall only include the construction and site development of Fire Station #6 itself. All offsite improvements are excluded from this RFP and scope of work and shall be constructed under a different contract.

The City of Greeley is exempt from all federal excise taxes and all Colorado State and local governmental sales and use taxes. Where applicable, contractor will be responsible for payment of use taxes.

2.3 Project Schedule

As indicated in Section 4, it is anticipated that the CMAR Contract is estimated to be executed in May 2019. Key Project milestones to be delivered by the CMAR include:

- 30% Design Document Review Completion 6/1/2019
- 75% Design Document Review Completion 8/2/2019
- GMP Negotiation and Agreement 9/13/2019
- Final completion for Fire Station #6 7/1/2020

All awards and extensions are subject to annual appropriation of funds. The provisions of the foregoing paragraphs with respect to extensions of the terms of the contract shall be null and void if the contract has been terminated or revoked during the initial term of any extension thereof. All decisions to extend the contract are at the option of the City.

Section 3. CMAR Services

3.1 General

As noted in Section 1 and more fully described in Attachment B (Scope of CMAR Services), the CMAR will provide services in two distinct phases.

Phase 1 services generally consist of value engineering, constructability reviews, cost estimating, schedule development and management, and risk management planning as well as preparation, in close collaboration with the Owner, of GMP proposal. The GMP proposal shall be based on the Project's design for site development and construction of the proposed Fire Station #6 and utility work. A GMP is anticipated to be set at no less than the 75% level of completion from the Owner's project schedule, and will include supporting documentation. Phase 2 services generally encompass completing the Project's construction, startup and commissioning, and warranty. See general descriptions provided below for scope of services included in Phase 1 and Phase 2:

Phase 1 Services

- Develop a preliminary project management plan and project schedule.
- Establish a value engineering process
- Provide constructability/ best-value added and constructability reviews of the project design at the 30% and 75% design levels
- The contractor shall be expected to provide a 30% constructability / best-value added review of the project within 14 days of the Notice to Proceed. The 30% design documents will be distributed to the winning proposer immediately after Notice of Award.
- Develop and update both a project cost model and a critical path method (CPM) schedule to meet project restrictions.
- Provide preconstruction services as defined in Attachment B.
- Prepare and maintain a project cost model, and submit detailed cost estimates.
- Prepare, implement and maintain a project risk management plan
- Develop, submit and negotiate a GMP proposal to complete Phase Two services (The CMAR may be requested to provide additional GMP proposals as necessary to the successful completion of the Project).
- Develop Construction Management Plan for Phase Two, including a subcontracting and procurement plan.
- The CMAR may be requested to pre-purchase materials or equipment or perform construction prior to the 75% GMP (early out packages).

Phase 2 Services

- Input to the final design.
- Continued value engineering.
- Procure equipment and subcontractors.
- Secure necessary construction related permits.
- Construct the Project. Inspection services for construction will be supplied by the City at no cost to the contractor.
- Identify manage and mitigate project risks.
- Conduct startup and testing.
- Provide warranty coverage.

3.2 Roles and Responsibilities

Owner: The Owner will cooperate with the CMAR and will fulfill its responsibilities in a timely manner to facilitate the CMAR's timely and efficient performance of services. Owner responsibilities include:

- Review Phase 1 deliverables and submissions, providing comments to CMAR.
- Furnish existing studies and provide complete, accurate and reliable data and information regarding the Project, including record drawings, preliminary studies, etc.
- Provide information and provide (or engage CMAR to perform) additional studies that may be necessary to complete the Project.
- Provide adequate funding based upon the adopted City budget.
- Provide access to the Project site and any necessary easements.
- Assist CMAR in obtaining governmental approvals and permits CMAR is responsible for obtaining.
- Provide necessary data and inputs.
- Participation in Design Review Workshops and construction progress meetings.

CMAR: The CMAR will cooperate with the Owner and Design Architect and will provide, in a timely manner, the Phase 1 and Phase 2 services necessary to complete the Project scope specified in this RFP. CMAR responsibilities include:

- Collaborate with Owner and Design Architect as required to meet project objectives.
- Prepare construction packages and distribute construction packages to subcontractors and suppliers.
- Supervise subcontractors and CMAR personnel.
- Obtain certain governmental approvals and permits for construction purposes only.
- Maintain site security and safety.
- Conduct performance and acceptance testing.
- Implement quality-management procedures.
- Implement Project health and safety practices.
- Warranty guarantees and Insurance.
- Perform risk management and mitigation activities
- Establish and maintain Change Order Management Plan
- Participation in Design Review Workshops and construction progress meetings.

The roles and responsibilities of the Owner and the CMAR are more fully described in Attachment C (Draft Construction Manager-At-Risk Contract). The Draft CMAR contract is included for reference purposes and may be modified by the City prior to finalization.

Architectural Firm: The Architect will cooperate with the Owner and CMAR and will provide, in a timely manner, the Phase 1 and Phase 2 services necessary to complete the Project scope specified in this RFP. The Design Architect responsibilities include:

- Preparation of all design documents except those items specifically denoted as delegated design and performance specified in the Architect's project manual.
- Participation in Design Review Workshops and meetings.
- Provide services during construction to assist the Owner in verifying that the project as constructed conforms to the design intent and Owner's objectives.

Section 4. Procurement Process

4.1 Communications and Owner Contact

All official communication from the City to Respondents will be via email. The Purchasing Contact will send notices that will include, but not be limited to, proposal document, addenda, etc. It is incumbent upon Respondents to carefully and regularly monitor their email for any such postings.

On behalf of the Owner, Adela Gain will act as the sole point of contact for this RFP and shall administer the RFP process. Prospective Respondents may make written inquires by email before the written inquiry deadline concerning this RFP to obtain clarification of requirements. All questions or comments should be directed to the Purchasing Contact as follows:

E-Mail: adela.gain@greeleygov.com
Subject Line: RFP #FA19-04-038

Response to Respondents inquiries will be published as addenda via Rocky Mountain BidNet no later than April 25th, 2019 at 3:00 pm MST. Respondents cannot rely on any other statement that clarify or alter any term of condition of the RFP.

Should any interested Respondent find any part of the listed terms and conditions to be discrepant, incomplete or otherwise questionable in any respect, it shall be the responsibility of the concerned party to notify the Purchasing Contact of such matters immediately upon discovery.

No oral communications from the Purchasing Contact or other individual is binding. No contact with Owner staff, board members or any public official concerning the Project during the procurement process is allowed. A violation of this provision may result in disqualification of Respondent.

4.2 Procurement Schedule

The current procurement schedule is as follows:

- Issue RFP: 4/2/2019
- Pre-Proposal Meeting (Time/Place) 4/18/2019 at 11:30 am, Greeley
Recreation Center, 651 10th Avenue, room 101
- Final Questions (By 12:00pm MST): 4/23/2019
- Final Addendum Issued (By 3:00 pm MST): 4/25/2019
- Qualified Contractors Proposals Due (By 1:00 pm MST): 4/30/2019
- Award CMAR (tentative) 5/6/2019

Section 5. Proposal Submission Requirements

5.1 Submittal Place and Deadline

Five paper copies and one flash drive must be received no later than **April 30th, 2019 before 1:00 pm local time**, addressed to:

**Public Works Building
Attention-Adela Gain
City of Greeley
1001 9th Avenue
Greeley, CO 80631**

Each Proposer assumes full responsibility for timely delivery of its Proposal at the required location. **Any Proposal received after the submittal deadline will be deemed non-responsive and returned unopened.** The delivered packaging containing the Proposal documents must note "Proposal Enclosed" on its face:

**Company Name
RFP #FA19-04-038
Proposal – CONSTRUCTION OF FIRE STATION #6
Due Date and Time: April 30th, 2019, before 1:00 pm**

Proposals may be modified or withdrawn by the Respondent prior to the established due date and time.

5.2 Submission Format

The Proposal must not exceed **15** total pages (with the front not counting as one page, most or all 8½ x 11 inch with 1-inch or greater margins), excluding the transmittal letter, index or table of contents, front and back covers, title pages/separation tabs, and appendices. A maximum of **5** of the total pages may be 11 x 17-inch tri-fold format. Eleven-point font or larger must be used in Proposal Parts 1 - 5.

5.3 Submission Content

The content requirements set forth in this RFP represent the minimum content requirements for the Proposal. It is the Proposer's responsibility to include information in its Proposal to present all relevant qualifications and other materials. The Proposal, however, should not contain standard marketing or other general materials. It is the Respondent's responsibility to modify such materials so that only directly relevant information is included in the Proposal.

The City is currently also requesting proposals for the construction of Fire Station #2. The contractor may choose to bid on both of these projects; however, these projects must be proposed completely independently from one another, as they are separate projects within the City. The proposals for both projects will be reviewed together, and in the event the same contractor is the apparent successful proposer for both projects, the company's ability to perform both projects simultaneously will be considered as part of the final award consideration. The contractor shall submit proposals for each or both of the projects separately and stand alone for each project.

The Proposal must include the following information in the order listed below:

- Transmittal Letter
- Executive Summary
- Project Team
- Project Approach and Schedule
- Pre-Construction Fee and Construction Rate Schedule
- Appendix A – Forms for Affirmation of Compliance
- Appendix B – Schedule

As a part of Appendix A include Exhibit 1 (Proposal Acknowledgements) and the Debarment/Suspension Certification Statement (Attachment E), and sworn statement attesting to any legal proceedings and judgments.

5.3.1 Transmittal Letter

Proposers must submit a transmittal letter (2 page maximum) on the Proposer's letterhead. It must be signed by a representative of the Proposer who is authorized to sign such material and to commit the Proposer to the obligations contained in the Proposal. The transmittal letter must include the name, address, phone number and e-mail address for the Proposer Contact and must specify who would be the CMAR's signatory to any contract documents executed with the Owner. The transmittal letter may include other information deemed relevant by the Proposer. The Proposer must notify the Owner of any changes subsequent to submission of the Proposal and before the selection process is completed (and, in the case of the selected Proposer, before execution of the Construction Manager-At-Risk Contract).

5.3.2 Executive Summary

The executive summary (maximum 2 pages) must include a concise overview of the key elements of the Proposal. The executive summary shall not be used to convey additional information not found elsewhere in the Proposal.

5.3.3 Project Team

The composition, organization and management of the contractor Project Team must be described in two separate subsections.

Contractor/other firms:

- Identify any other key firms (such as subcontractors and sub-consultants) included on the Project Team along with the contractor, and describe the scope of the contractor's and each firm's services and responsibilities during phase 1 and phase 2 of the Project.
- Provide a list of sub-contractors the contractor has previous experience with including firms name and address.

Key Personnel

- Identify all Key Personnel (and their firm affiliations) on the Project Team and describe their specific responsibilities during the Project.
- Provide organizational charts showing the reporting relationships and responsibilities of all Key Personnel (along with their firm affiliations) and describe the contractor's approach to the management of such Key Personnel.
- Indicate the commitment of all Key Personnel in terms of an estimated percentage of time (or total hours) committed to the Project.

- Describe the current workload for Key Personnel in terms of projects underway; include project role, the location of the project (City and State), the anticipated date for project completion and the estimated percentage of time dedicated to the current project.
- Demonstrate ability of project managers or field superintendents has experience with preconstruction related services and construction of fire station facilities as well as site development.

Any change in the firms or Key Personnel included in the RFP will require approval by the Owner and can result in loss of the contract at the sole discretion of the City of Greeley.

Project Approach and Schedule

Provide a conceptual description of the contractor's approach for managing and performing its services during Phase 1 and Phase 2 of the Project, addressing the following topics.

5.3.4 Project Approach

- Discuss how a collaborative relationship with the Owner and Design Architect would be established during Phase 1 preconstruction services including design development, scheduling, cost estimating and GMP development.
- Discuss previous experience acting as a CMAR.
- Discuss how the design and construction processes will interface (including how constructability issues, construction document packaging, value engineering and risk issues will be addressed).
- Describe your firm's approach to construction sequencing for this project.
 - If early-out packages could be utilized in the process, define the potential packages and the benefits to the City to approve such packages.
- Identify the work components critical to the Project's success and how these components would be achieved.
- Discuss your company's ability to self-perform construction activities, define what activities you anticipate self-performing, and percentage anticipated for this project. An ability to self-perform a minimum of 30% of the construction is required.
- Identify key project risks your firm has identified, and describe your plan to mitigate those risks across all phases of the project.
 - Specifically, describe your plan to mitigate the risk associated with winter construction, hazardous materials and possible surface water control issues.
- Describe the process for developing the GMP proposals at 75% design milestone (defined by the Owner and including the approach to establishing contingency) and for developing early-out equipment and/or construction package GMPs if they are proposed.
- Discuss the project schedule and identify your specific approach to meeting or exceeding the schedule.
- Discuss previous experience working with the City of Greeley and an understanding of the local building codes and requirements.
- Discuss previous experience constructing Fire Stations.

5.3.5 Schedule

- Provide a schedule showing duration of the specific tasks outlined in the scope along with key milestones and completion dates. The schedule should identify critical path tasks related to the design and construction of the project.
- Demonstrate the ability to complete the scope of work to meet required completion dates. The schedule should also demonstrate other means to which the project design team can

accelerate the project schedule to work towards project completion prior to the specified completion dates.

- Demonstrate in the schedule how early packages can accelerate project completion.

5.3.6 Pre-Construction Fee and Construction Rate Proposal

The Proposer must include their fee for performing the work outlined in Phase 1 and their Construction Rates that will be used in Phase 2. The scope of CMAR services for which pricing is required is defined in RFP Attachment B (Scope of CMAR Services), which shall correspond to the fee provided for Phase 1: Pre-Construction Services. The Phase 2 CMAR Construction Services Rates shall be included in the Proposal. The contractor should include estimated project contingencies, general conditions costs, overhead, profit, and Insurances and Bond associated costs. The Proposal should describe the rate proposal and discuss its viability from the CMAR's perspective. The City is requesting the proposal fee structures be based on an Hourly Not-To-Exceed method for the project.

If the contractor is proposing on both Fire Station projects the contractor may discuss the benefits and potential efficiencies of being selected for both projects.

Be advised that the Owner is not interested in proposed fees or rates that provide excessive discounts from the CMAR's anticipated actual costs for the requested services. If Owner determines (at its sole discretion) that the fees and rates included in a Proposal are unacceptably below industry norms or that a Proposer's fees and rates are substantially or unacceptably below other Proposals, the Owner may (at its sole discretion) either declare that Proposal to be non-responsive or seek additional detailed information from that Proposer concerning the cost basis for its fee and rate proposal, prior to rendering a decision on the Proposal's responsiveness.

5.3.7 Project Familiarity (Local Code and Previous Fire Station Work)

- Discuss your company's previous experience with working on projects for the City of Greeley.
- Discuss your company's familiarity with the City of Greeley's codes and processes.
- Identify your companies work plan for hiring local companies and sub-consultants.
- Discuss your company's previous experience constructing fire and police facilities.

Section 6. Proposal Evaluation and Selection

6.1 General

The Proposals will be reviewed and evaluated by the Owner’s selection committee (with assistance provided by outside advisors if desired by Owner) according to the requirements and criteria outlined in this Section 6. During the Proposal evaluation process, written questions or requests for clarification may be submitted to one or more Proposers regarding its Proposal or related matters. Failure to respond in a timely manner to any such questions or requests may be grounds for elimination of the Proposer from further consideration. A presentation and/or demonstration may be requested by short-listed offerors prior to award. However, a presentation/demonstration may not be required, and therefore, complete information should be submitted with your proposal. Committee members may revise their initial scores based upon additional information and clarification received in this phase. If your company is invited to give a presentation to the committee, these dates may not be flexible.

6.2 Responsiveness

Each Proposal will be reviewed to determine whether it is responsive to the RFP. Failure to comply with the requirements of this RFP may result in a Proposal being rejected as non-responsive. At its sole discretion, however, the selection committee may waive any such failure to meet a requirement of this RFP and may request clarification or additional information to remedy a failure.

6.3 Evaluation Criteria

The City of Greeley awards contracts to responsible vendors only. The City of Greeley’s Municipal Code defines a “Responsible Respondent” as one who has “the capability in all respects to perform fully the contract requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment, and credit which will assure good faith performance.” The City reserves the right to request information as it deems necessary to determine a Respondent’s responsibility. If the Respondent fails to supply the requested information, the City shall base the determination of responsibility upon any available information or may find the Respondent non-responsible if such failure is unreasonable.

In ranking the proposals, the selection committee will utilize a 100-point scale whereby the maximum points awarded for each of the evaluation criteria will be based on the percentage weight set forth above. In this process the selection committee reserves the right to normalize the committee member’s scores to complete the ranking portion of the evaluation.

Proposal Comparative Evaluation Requirements:	Points Available
Part 5.3.3 - Project Team	20
Part 5.3.4 - Project Approach	25
Part 5.3.5 - Schedule	35
Part 5.3.6 - Pre-Construction Fee and Construction Rate Proposal	10
Part 5.3.7 – Project Familiarity (Local Code and Previous Fire Station Work)	10
Total	100

6.4 Selection

The City of Greeley will base their selection on the results from the combination proposals and presentation if required. After the evaluation process is complete, the Owner will select the proposer that submits the proposal that offers the best value based on the published selection criteria and on its ranking evaluation.

The Owner shall first attempt to negotiate a contract with the selected proposer. If the Owner is unable to negotiate a satisfactory contract with the selected proposer, the Owner will, formally and in writing, end negotiations with that proposer and proceed to negotiate with the next proposer in the order of the selection ranking until a contract is reached or negotiations with all ranked proposers end.

Section 7. Conditions for Proposers

7.1 Ineligible Firms and Individuals

The following firms and individuals are serving in an advisory capacity to the Owner for this Project and are therefore not eligible to assist or participate with any Respondent that submits a Proposal for the Project.

- Short Elliott Hendrickson Inc. (SEH)
- Interwest Consulting Group

7.2 Proprietary Information

All proposals will be confidential until a contract is awarded and fully executed. At that time, all proposals and documents pertaining to the proposals will be open for public inspection, except for the material that is proprietary or confidential. However, requests for confidentiality can be submitted to the Purchasing Contact provided that the submission is in accordance with the following procedures. This remains the sole responsibility of the offeror. The Purchasing Contact will make no attempt to cure any information that is found to be at a variance with this procedure. The offeror may not be given an opportunity to cure any variances after proposal opening. Neither a proposal in its entirety, nor proposal price information will be considered confidential/proprietary. Questions regarding the application of this procedure must be directed to the Purchasing Contact listed in this RFP.

7.3 Rights of the Owner

In connection with this procurement process, including the receipt and evaluation of Proposals and award of the Construction Manager-At-Risk Contract, Owner reserves to itself (at its sole discretion) all rights available to it under applicable law, including without limitation, with or without cause and with or without notice, the right to:

- Cancel, withdraw, postpone, or extend this RFP, in whole or in part, at any time prior to the execution of the Construction Manager-At-Risk Contract, without incurring any obligations or liabilities.
- Modify the procurement schedule.
- Waive deficiencies, informalities and irregularities in a Proposal and accept and review a non-conforming Proposal.
- Suspend and terminate the procurement process or terminate evaluations of Proposals received.
- Permit corrections to data submitted with any Proposal.
- Hold meetings and interviews, and conduct discussions and correspondence, with one or more of the Proposers to seek an improved understanding of any information contained in a Proposal.
- Seek or obtain, from any source, data that has the potential to improve the understanding and evaluation of the Proposals.
- Seek clarification from any Proposer to fully understand information provided in the Proposal and to help evaluate and rank the Proposers.
- Reject a Proposal containing exceptions, additions, qualifications or conditions not called for in the RFP or otherwise not acceptable to the Owner.

- Conduct an independent investigation of any information, including prior experience, included in a Proposal by contacting project references, accessing public information, contacting independent parties, or any other means.
- Request additional information from a Proposer during the evaluation of its Proposal.
- Negotiate the award for services with a sole Proposer in lieu of accepting the Proposal as is, in the event only one (1) responsive RFP is received by the City.

7.4 Obligation to Keep Project Team Intact

Proposers are advised that all firms and Key Personnel identified in the Proposal shall remain on the Project Team for the duration of the procurement process and execution of the Project. (The anticipated dates for award of the Construction Manager-At-Risk Contract and for completion of the Project are set forth in Sections 4.2 and 2.3 of this RFP.) If extraordinary circumstances require a change, it must be submitted in writing to the Owner Contact, who, at his sole discretion, will determine whether to authorize a change, recognizing that certain circumstances (such as termination of employment) may occur that are beyond the CMAR's control. Unauthorized changes to the Project Team at any time during the procurement process may result in elimination of the Proposer from further consideration.

7.5 Addenda

If any revisions to the RFP or procurement process become necessary or desirable (at the Owner's sole discretion), the Owner may issue written addenda. **The Owner will post all addenda via Rocky Mountain BidNet. It is Proposer's responsibility to obtain all addenda prior to submitting its Proposal.**

7.6 Protests

Any actual or prospective firm, Respondent or contractor who is aggrieved in connection with the solicitation or award of a contract must protest in writing to the City Manager as a prerequisite to seeking judicial relief. Protestors are urged to seek informal resolution of their complaints initially with the Purchasing Manager. A protest shall be submitted within ten (10) calendar days after such aggrieved person knows or should have known of the facts giving rise thereto. A protest with respect to an invitation for bids or request for proposals shall be submitted in writing prior to the opening of bids or the closing date of proposals, unless the aggrieved person did not know and should have known the facts giving rise to such protests prior to bid opening or the closing date for submittals.

Stay of procurement during protests. In the event of a timely protest under, the Purchasing Manager shall not proceed further with the solicitation or award of the contract until all administrative and judicial remedies have been exhausted or until the City Manager makes a written determination on the record that the award of a contract without delay is necessary to protect substantial interest of the City. (Ord. 75, 1984 §2 (part))

7.7 Other Conditions under this RFP

Acceptance of RFP Terms: A submission in response to this RFP shall constitute a binding offer. The autographic signature of a person who is legally authorized to execute contractual obligations on behalf of the Proposer shall indicate acknowledgment of this condition. A submission in response to this RFP acknowledges acceptance by the Respondent of all terms and conditions as

set forth herein. Respondents shall identify clearly and thoroughly any variations between their Proposal and the RFP in the cover letter. Failure to do so shall be deemed a waiver of any rights to subsequently modify the terms of performance, except as outlined or specified in the RFP.

Assignment and Delegation: Neither party for any resulting contract may assign or delegate any portion of the agreement without the prior written consent of the other party.

Availability of Funds: Financial obligations of the City of Greeley payable after the current fiscal year are contingent upon funds for the purpose being appropriated, budgeted and otherwise made available. In the event funds are not appropriated, any resulting contract will become null and void without penalty to the City.

Incurring Costs: The City is not liable for any cost incurred prior to issuance of a legally executed contract and/or purchase order.

Non-Discrimination: The Respondent shall comply with all applicable state and federal laws, rules and regulations involving non-discrimination on the basis of race, color, religion, national origin, age or sex.

Taxes: The price or prices for the Work will include full compensation for taxes that the Contractor is or may be required to pay. The Contractor shall bear the risk of any added or increased taxes occurring during the prosecution of the Work. A change in taxes shall under no circumstances entitle the Contractor to an adjustment under the Contract.

The Contractor's attention is directed to the fact that this Project is exempt from payment of City of Greeley Sales and Use taxes, and such taxes must not be included in the amount of bid.

The Contractor shall pay all sales and use taxes required to be paid, shall maintain such records in respect of his work, which shall be separate and distinct from all other records maintained by the Contractor and shall be available for inspection by the Owner at any and all reasonable times, and shall furnish the Owner with such data, as may be necessary to enable the Owner to obtain any refunds of such taxes which may be available to the Owner under the laws, ordinances, rules or regulations applicable to such taxes. The Contractor shall require each of his subcontractors to pay all sales and use taxes required to be paid and to maintain such records and furnish the Contractor with such data as may be necessary to enable the Owner to obtain a refund of the taxes paid by such subcontractors.

Attachment A

Definition of Terms

The definitions of some of the capitalized terms used in this RFP are presented below:

Construction Manager-At-Risk (CMAR) – The entity that will enter into the Construction Management-at Risk Contract with the Owner and that will be the single point of accountability to the Owner for delivery of the services and the Project. All CMAR services shall be split in two phases, Preconstruction (Phase 1) and Construction (Phase 2).

Construction Phase (Phase 2) – The portion of the work upon that begins on the acceptance of the Guaranteed Maximum Price through to Final Completion

Contract Documents – The Contract Documents are comprised of all items required to fully construct the project.

Design Architect – An independent architectural firm that provides professional design services and be in responsible charge of the design, leading to the completion of documents deemed ready for construction. This term may be used interchangeably with “Designer”.

Draft Construction Manager-At-Risk Contract – The draft contract, including the agreement and all of its attachments, presented as RFP Attachment C (Draft Construction Manager-At-Risk Contract).

Guaranteed Maximum Price (GMP) – An agreed upon price and schedule for a specified portion of work to be completed by the CMAR as defined in the Contract Documents.

Key Personnel – The individuals, employed by CMAR or other firms included on the Project Team, who would fill certain key roles in delivery of the Project and related services by the CMAR, including the following positions: project manager, safety manager and CMAR.

Minimum Qualification Requirements – The requirements set forth in Subsection 6.3 of this RFP that, at a minimum, must be satisfied (or waived by Owner) in order for the Proposal to be evaluated and ranked according to the comparative evaluation criteria.

Owner – City of Greeley

Preconstruction Phase (Phase 1) - The portion of the work prior to the acceptance of the Guaranteed Maximum Price

Project – Construction of Fire Station #6

Project Team – The Owner, Construction Manager-At-Risk, and other Key Personnel and any additional firms (such as subcontractors and sub consultants) included in the Proposal.

Proposer – The entity responding to this RFP by submitting the Proposal. The term “Respondent” may be used interchangeably with “Proposer”.

Work – Work is comprised of all construction and other services required by the Contract Documents, including procuring and furnishing all materials, equipment, services and labor reasonably inferable from the Contract Documents as well as Pre-Construction services.

Attachment B

Scope of Construction Manager-At-Risk Services

The CMAR Preconstruction Phase services will be provided in accordance with the pricing included and a price proposal for services provided.

The CMAR will provide the following Preconstruction Phase services:

General

- 1) This scope provides additional details on work that shall be completed by the CMAR prior to the acceptance of the Guaranteed Maximum Price (GMP) proposal(s) and the Phase 2 construction work.
- 2) Work that shall be completed by the CMAR prior to the acceptance of the GMP proposal(s) shall herein be referred to as Phase 1 or "Preconstruction".

Administration for Preconstruction Services

1) CMAR Contract Administration

- a) Provide status reports with payment applications. Status reports shall describe activities performed during reporting period, status of the budget, anticipated activities during the next period and any problems or anticipated issues that would impact project scope, schedule or budget.

Phase 1 - Preconstruction Services

1) Construction Management Plan

- a) This plan shall be initiated during the preconstruction phase of the project, and shall be updated and maintained for the entirety of the project. As part of the Construction Management Plan the CMAR shall provide:
 - i) Personnel Plan: identify all Key Personnel including but not limited to preconstruction and construction project manager(s), lead estimator, lead scheduler, procurement Lead, QA/QC lead and all other associated personnel necessary to fully meet the CMAR's obligations for preconstruction phase services.
 - ii) Communication Plan: develop a Project Communication Plan in conjunction with the Design Architect that defines methods of communication between all parties and review project expectations.
 - iii) Construction Management Software: The CMAR is required to utilize a professional, industry standard construction management software. The CMAR shall indicate in their proposal which software they intend to use or if not available acknowledge their willingness to use Newforma as administered and hosted by the Design Architect.
 - iv) Project Schedule: Prepare a project schedule for the Project that shall include the estimated start and finish dates for each project activity, all activities through start-up and commissioning, and the estimated critical path. All preconstruction activities including, but not limited to design milestones provided by the Design Architect shall be included in the schedule. The project schedule shall be submitted to the OWNER and the Design Architect upon Notice to Proceed, (NTP), of the preconstruction phase services of the project. The CMAR shall be responsible for maintaining an up to date schedule. The schedule will be used during the preconstruction phase services to evaluate progress on the evolving design.
 - v) Cost Analysis: Develop and maintain a project cost estimate that will be used during the

- preconstruction phase services to validate conformance with the project budget.
1. Develop a work breakdown structure for the project in the cost model which is to be shared with the Design Architect;
- (ii) Permitting Plan: The plan should identify all construction related permits to be obtained and any other permits OWNER may desire the CMAR to be responsible for managing on their behalf and permits the team has already identified during the preconstruction phase services.
 - (iii) Risk Register: Develop and maintain a project risk register that identifies and quantifies potential project risks and the associated cost, schedule and scope impacts by the potential chance of occurrence.
 - (iv) Safety Plan: Develop and maintain a safety plan that identifies and quantifies potential project risks. Provide a means of tracking safety results for the duration of the project focusing on the construction phase.
 - (v) Environmental Management Plan: Provide an environmental management plan detailing programs for a storm water pollution prevention plan and handling other environmental issues (dust, on site chemicals and fuel, etc.) required to comply with permits and regulations applicable to the Project.
 - (vi) Quality Plan: The quality plan should identify the checks and balance provisions that will be in place during construction to deliver a well-constructed project. Provide details on tracking mechanisms that will be in place to monitor project quality throughout construction. The QC program plan shall focus on the insurance of continuing attention to the production and installation of error-free work.
- (b) The CMAR shall submit three printed copies and electronic copy (PDF format) of the construction management and control plan to OWNER; one electronic copy (PDF format) shall be submitted to the Design Architect.

2) Project Design Meetings

- (a) The CMAR's key personnel including the project manager, superintendent(s), quality manager, lead scheduler, safety officer, lead estimator and/or procurement specialist shall participate in a one (4) hour formal project kick-off meeting with OWNER and Design Architect.
- (i) The CMAR shall review and distribute comments to the minutes of the kick-off meeting to OWNER, Design Architect and others.
- (b) The CMAR's key personnel including the project manager, superintendent(s), quality manager, lead scheduler, safety officer, lead estimator and/or procurement specialist shall participate in project meetings, as needed. The meeting shall be held every two weeks for up to two (2) hours. The total number of meetings is estimated to equal nine (9).
- (i) The CMAR shall review and distribute comments to the minutes of the kick-off meeting to OWNER, Design Architect and others.
 - (ii) The CMAR shall prepare budgetary estimates of design alternatives and present the results at the various project meetings.
 - (iii) Include an updated project Risk Register in the Monthly Status Reports.
 - (iv) The CMAR shall be responsible for tracking intermediate design changes that impact scope, schedule and or budget between milestones. Changes provided by the Design Architect shall then be incorporated into the project schedule and budget. Project Schedule shall be cost loaded and automatically generated by a software package such as Primavera or Microsoft Project.
 1. Gaps, overruns and other changes that may potentially impact the overall project shall be brought to the attention of the Owner and Design Architect in writing.
 2. Through this exercise, advise the Owner of ways to gain efficiency in Project delivery.

3) Review of Design Documents:

- a) The CMAR shall provide constructability review and consult on design document clarity and consistency issues in the development of the, 30%, and 75% design milestone review packages, including recommendations on design packaging to advance the construction schedule, material availability and independent quantity calculations to verify quantities provided by the Design Architect and to propose all items that may provide additional value to the project. Provide written report documenting review comments within fourteen (14) working days of receipt of design documents.
- b) At the aforementioned design milestones, review the design documents being prepared for the project. Within fourteen (14) working days of receiving the design package, present in written form constructability reviews, and innovative alternative suggestions that bring value to the project (with order of magnitude cost and time impacts) to the Design Architect and OWNER for consideration.
 - i) The CMAR's team including the Project Manager, Estimator, Scheduler and Superintendent along with any other necessary personnel shall attend design review workshops at the 30% and 75% engineering design review milestones. Both of these review workshops will be 4 hours in duration.
 - ii) The CMAR shall perform an independent detailed construction cost estimates for the Project and Critical Path schedules at the 30%, and 75% design review milestones parallel to the Design Architect's Cost Estimate; which shall include a construction market survey and cash flow report; project assumptions; reconcile the cost estimates and schedules with the cost estimates and schedules prepared by the Design Architect and present the results of this reconciliation exercise at the workshops;
 - 1. If there is a budget gap between the two parallel cost and schedule estimates the CMAR shall identify the gap and provide potential adjustments to solve the gap and compile them into the written design review report;
 - 2. If there is a gap between the cost estimate, CMAR shall provide project planning and scheduling report in the written report (using critical path methods) to identify non-conformances with the baseline schedule for the design and construction phases to recommend elements of the Project that may need adjustment and/or require less than 100% design in order to alleviate the gap and bring the project back on budget.
 - iii) The CMAR team shall provide value engineering or cost reduction proposals at the design review workshops.
- (a) The CMAR shall submit three printed copies and electronic copy (PDF format) of the design review report to OWNER; one electronic copy (PDF format) shall be submitted to the Design Architect.

4) **Procurement Plan**

- (a) Develop and implement a Project Procurement Plan which identifies the work packages to be used to facilitate bids, quotes and proposals for the major elements of the Work. The Procurement Plan shall meet OWNER's Purchasing Policies and shall:
 - (i) Describe the procurement process for the selection of construction subcontracts, and quotations for equipment and materials;
 - (ii) Clearly identify and justify any need to implement a prequalification process for subcontractors, vendors and suppliers to meet the estimated project schedule; written approval from OWNER must be obtained prior to the prequalification process.
 - (iii) Identify and recommend which work, if any, should be procured through value based competitive selections, in lieu of low bid;
 - (iv) Identify subcontract work packages, equipment and material requests for quotation.
 - (v) Identify long-lead equipment procurement needs and submit a validation report to OWNER indicating how the equipment will be procured without impacts to the critical path schedule;
 - (vi) Clearly identify Work packages that the CMAR intends to bid with the intent to self-perform the work.
-

- (vii) Develop a list of potential bidders, Subcontractors and equipment suppliers.
 - (b) The CMAR shall lead a workshop to review the Procurement Plan with the team and advise the OWNER and the Design Architect of ways to gain efficiency in project delivery and work packages.
 - (c) The CMAR shall submit three printed copies and one electronic copy (PDF format) of the final procurement plan to OWNER; one electronic copy (PDF format) shall be submitted to the Design Architect.
- 5) **Prepare one or more Guaranteed Maximum Price (GMP) Proposals:**
- (a) Finalize the Procurement Plan. Include the list of potential bidders, Subcontractors and equipment suppliers.
 - (b) Prepare a draft GMP Proposal(s) from the 75% submittal and provide the draft to OWNER and Design Architect at least one week ahead of schedule GMP negotiation workshop;
 - (c) The CMAR shall prepare GMP(s) that include unit cost, quantities and estimation assumptions.
 - (i) Attend a GMP negotiation and finalization meeting; assume one half day, (4) hour, review session upon completion of the 75% deliverable to present the GMP proposal(s) to the team and an additional two (2) hour, negotiation session to review the revised GMP(s) from the original session.
 - 1. The GMP(s) will be reviewed by the Design Architect and compared with the opinion of probable construction cost (OPCC) completed by the Design Architect and independent cost estimator at the 75% design milestone.
 - 2. Critical unit costs, quantities and assumptions included in the GMP will be compared to the OPCC and any discrepancies will be resolved during GMP negotiations.
 - (d) The CMAR shall submit three printed copies and electronic copy (PDF format) of the initial and final GMP to OWNER; one electronic copy (PDF format) shall be submitted to the Design Architect.

Phase 2 - Construction Services

The detailed scope of construction services shall be created through the design process in cooperation with the Design Architect and OWNER and shall be published at a later date. However, this scope should be addressed in the Project Approach provided as Part 4.1 of the proposal.

The CMAR shall supply a Rate Schedule for Construction Services as part of this RFP and this information shall be utilized for creation of the GMP.

In the event a mutually acceptable GMP cannot be agreed to, the Phase 2 – Construction Services portion of this RFP shall be removed from this RFP without penalty to the Owner.

The CMAR is required to utilize a professional, industry standard construction management software. The CMAR shall indicate in their proposal which software they intend to use or if not available acknowledge their willingness to use Newforma as administered and hosted by the Design Architect.

Attachment C
Draft Construction Manager-At-Risk Contract

AMENDMENT NO. 1 TO ConsensusDocs® 500

STANDARD AGREEMENT AND GENERAL CONDITIONS BETWEEN OWNER AND CONSTRUCTION MANAGER

(Where the Basis of Payment is a Guaranteed Maximum Price with an Option for Preconstruction Services)

Dated [_____].

Pursuant to Section 3.4 of the Agreement dated [_____] between the Owner, [_____] and the Construction Manager, [_____] for [_____] (the Project), the Owner and the Construction Manager desire to establish a Guaranteed Maximum Price ("GMP") for the Work. Therefore, the Owner and the Construction Manager agree as follows:

ARTICLE 1 GUARANTEED MAXIMUM PRICE

The Construction Manager's GMP for the Work, including the Cost of the Work as defined in Article 8 and the Construction Manager's Fee as set forth in Section 7.3, is [_____] Dollars (\$[_____]).

The GMP is for the performance of the Work in accordance with the exhibits listed below, which are part of this Agreement.

EXHIBIT A Drawings and Specifications, including Addenda, if any, and information furnished by the Owner under Section 4.3, dated [_____] , [_____] pages.

EXHIBIT B Allowance Items, dated [_____] , [_____] pages.

EXHIBIT C Assumptions and Clarifications on which the GMP is based, dated [_____] , [_____] pages.

EXHIBIT D Schedule of Work, dated [_____] , [_____] pages.

EXHIBIT E Alternate Prices, dated [_____] , [_____] pages.

EXHIBIT F Unit Prices, dated [_____] , [_____] pages.

EXHIBIT G A statement of any work to be self-performed by the Construction Manager, dated [_____] , [_____] pages.

ARTICLE 2 DATE OF SUBSTANTIAL COMPLETION

The Date of Substantial Completion of the Work is [_____].

ARTICLE 3 DATE OF FINAL COMPLETION

The Date of Final Completion of the Work is: [_____] or within [_____] ([_____]) Days after the Date of Substantial Completion, subject to adjustments as provided for in the Contract Documents.



This Amendment is entered into as of [REDACTED].

WITNESS: _____

OWNER: [REDACTED]

BY: _____

PRINT NAME [REDACTED] PRINT TITLE [REDACTED]

WITNESS: _____

CONSTRUCTION MANAGER: [REDACTED]

BY: _____

PRINT NAME [REDACTED] PRINT TITLE [REDACTED]

END OF DOCUMENT.

DRAFT



ConsensusDocs 500

STANDARD AGREEMENT AND GENERAL CONDITIONS BETWEEN OWNER AND CONSTRUCTION MANAGER (Where the CM is At-Risk)

TABLE OF ARTICLES

1. AGREEMENT
2. GENERAL PROVISIONS
3. CONSTRUCTION MANAGER'S RESPONSIBILITIES
4. OWNER'S RESPONSIBILITIES
5. SUBCONTRACTS
6. TIME
7. COMPENSATION AND GUARANTEED MAXIMUM PRICE
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9. CHANGES
10. PAYMENT
11. INDEMNITY, INSURANCE, AND BONDS
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14. MISCELLANEOUS
15. CONTRACT DOCUMENTS

ARTICLE 1 AGREEMENT

Job Number: [_____] Account Code: [_____]

This Agreement is made this [_____] day of [_____] in the year [_____] , by and between the

OWNER, [_____]

and the

CONSTRUCTION MANAGER, [_____]

Tax identification number (TIN) [_____]

Contractor License No., if applicable [_____]

for construction and services in connection with the following

PROJECT [_____]

Design Professional is [_____].

ARTICLE 2 GENERAL PROVISIONS

2.1 PARTIES' RELATIONSHIP Each Party agrees to act on the basis of mutual trust, good faith, and fair dealing, and perform in an economical and timely manner. The Parties shall each endeavor to promote harmony and cooperation among all Project participants.



2.1.1 Construction Manager represents that it is an independent contractor and that it is familiar with the type of Work it is undertaking.

2.1.2 Neither Construction Manager nor any of its agents or employees shall act on behalf of or in the name of Owner except as provided in this Agreement unless authorized in writing by Owner's Representative.

2.2 ETHICS Each Party shall perform with integrity. Each shall: (a) avoid conflicts of interest, and (b) promptly disclose to the other Part any conflicts that may arise. Each Party warrants that it has not and shall not pay or receive any contingent fees or gratuities to or from the other Party, including its agents, officers, employees, Subcontractors, Subsubcontractors, Suppliers, or Others to secure preferential treatment.

2.3 DESIGN PROFESSIONAL Owner, through its Design Professional, shall provide all architectural and engineering design services necessary for the completion of the Work excluding, however, (a) design services delegated to Construction Manager in accordance with §3.17, and (b) services within the construction means, methods, techniques, sequences, and procedures employed by Construction Manager, its Subcontractors, and Subsubcontractors in connection with their construction operations.

2.4 Owner shall obtain from Design Professional either a license for Construction Manager and Subcontractors to use the design documents prepared by Design Professional or ownership of the copyrights for such design documents, and shall indemnify and hold harmless Construction Manager against any suits or claims of infringement of any copyrights or licenses arising out of the use of the design documents for the Project.

2.5 DEFINITIONS

2.5.1 "Agreement" means this ConsensusDocs 500 Standard Agreement and General Conditions Between Owner and Construction Manager, as modified, and exhibits and attachments made part of this agreement upon its execution.

2.5.1.1 The following attached exhibits are a part of this Agreement:

Exhibit A: Schedule of the Work, [_____] pages.
Exhibit B: Labor Relations, if applicable.

2.5.2 "Business Day" means all Days, except weekends and official federal or state holidays where the Project is located.

2.5.3 A "Change Order" is a written order signed by the Parties after execution of this Agreement, indicating changes in the scope of the Work, the GMP and Date of Substantial Completion or Date of Final Completion, including substitutions proposed by Construction Manager and accepted by Owner.

2.5.4 The "Contract Documents" consist of (a) this Agreement; (b) documents listed in §15.1 as existing contract documents; (c) drawings, specifications, addenda issued and acknowledged before execution of this Agreement; (d) information furnished by Owner pursuant to §3.15.4, and (e) Change Orders, Interim Directives, and amendments issued in accordance with this Agreement.

2.5.5 "Contract Time" is the period between the Date of Commencement and the total time authorized to achieve Final Completion.

2.5.6 "Cost of the Work" means the costs and discounts specified in ARTICLE 8.



2.5.7 The "Construction Manager" is the person or entity identified in ARTICLE 1 and includes Construction Manager's Representative.

2.5.8 "Date of Commencement" is as set forth in §6.1.

2.5.9 "Day" means a calendar day.

2.5.10 "Defective Work" is any portion of the Work that that does not conform with the requirements of the Contract Documents.

2.5.11 "Design Professional" means the licensed architect or engineer, and its consultants, retained by Owner to perform design services for the Project.

2.5.12 "Final Completion" occurs on the date when Construction Manager's obligations under this Agreement are complete and accepted by Owner and final payment becomes due and payable. This date shall be confirmed by a Certificate of Final Completion signed by the Parties.

2.5.13 "Hazardous Material" is any substance or material identified now or in the future as hazardous under the Law, or any other substance or material that may be considered hazardous or otherwise subject to statutory or regulatory requirement governing handling, disposal, or cleanup.

2.5.14 "Interim Directive" is a written order containing change to the Work directed by Owner pursuant to §9.2 and that is signed by Owner after execution of this Agreement and before Substantial Completion.

2.5.15 "Law" means federal, state, or local laws, ordinances, codes, rules, and regulations applicable to the Work with which Construction Manager must comply that are enacted as of the Agreement date.

2.5.16 "Others" means Owner's other: (a) contractors/constructors, (b) suppliers, (c) subcontractors, subsubcontractors, or suppliers of (a) and (b); and others employed directly or indirectly by (a), (b), or (c) or any by any of them or for whose acts any of them may be liable.

2.5.17 "Overhead" means (a) payroll costs, burden, and other compensation of Construction Manager's employees in Construction Manager's principal and branch offices; (b) general and administrative expenses of Construction Manager's principal and branch offices including charges against Construction Manager for delinquent payments, and costs related to the correction of defective work; and (c) Construction Manager's capital expenses, including interest on capital used for the Work.

2.5.18 "Owner" is the person or entity identified in ARTICLE 1.

2.5.19 The "Owner's Program" is an initial description of Owner's objectives, including budgetary and time criteria, space requirements and relationships, flexibility and expandability requirements, special equipment and systems, site requirements, and any requirements for phased occupancy.

2.5.20 The "Parties" are collectively Owner and Construction Manager.

2.5.21 The "Project," as identified in ARTICLE 1, is the building, facility, or other improvements for which Construction Manager is to perform Work under this Agreement. It may also include construction by Owner or Others.



2.5.22 The “Schedule of the Work” is the document prepared by Construction Manager that specifies the dates on which Construction Manager plans to begin and complete various parts of the Work, including dates on which information and approvals are required from Owner.

2.5.23 “Subcontractor” is a person or entity retained by Construction Manager as an independent contractor to provide the labor, materials, equipment, or services necessary to complete a specific portion of the Work. The term Subcontractor does not include Design Professional or Others.

2.5.24 “Substantial Completion” of the Work, or of a designated portion, occurs on the date when the Work is sufficiently complete in accordance with the Contract Documents so that Owner may occupy or utilize the Work, or a designated portion, for the use for which it is intended, without unapproved disruption. The issuance of a certificate of occupancy is not a prerequisite for Substantial Completion if the certificate of occupancy cannot be obtained due to factors beyond Construction Manager's control. This date shall be confirmed by a certificate of Substantial Completion signed by the Parties.

2.5.25 A “Subsubcontractor” is a person or entity who has an agreement with a Subcontractor or another subsubcontractor or Supplier to perform a portion of the Subcontractor's Work or supply material or equipment.

2.5.26 A “Supplier” is a person or entity retained by Construction Manager to provide material or equipment for the Work.

2.5.27 “Terrorism” means a violent act, or an act that is dangerous to human life, property, or infrastructure, that is committed by an individual or individuals and that appears to be part of an effort to coerce a civilian population or to influence the policy or affect the conduct of any government by coercion. Terrorism includes, but is not limited to, any act certified by the United States government as an act of terrorism pursuant to the Terrorism Risk Insurance Act, as amended.

2.5.28 “Work” means the construction and administrative and management services necessary or incidental to fulfill Construction Manager's obligations for the Project in accordance with and reasonably inferable from the Contract Documents. The Work may refer to the whole Project or only a part of the Project if work is also being performed by Owner or Others.

2.5.29 “Worksite” means the area of the Project location as identified in ARTICLE 1 where the Work is to be performed.

ARTICLE 3 CONSTRUCTION MANAGER'S RESPONSIBILITIES

3.1 GENERAL RESPONSIBILITIES

3.1.1 Construction Manager shall provide all labor, materials, equipment, and services necessary to complete the Work, all of which shall be provided in full accord with the Contract Documents and reasonably inferable from the Contract Documents.

3.1.2 Construction Manager represents that it is an independent contractor and that it is familiar with the type of work required by this Agreement.

3.1.3 Unless the Contract Documents instruct otherwise, Construction Manager shall be responsible for the supervision and coordination of the Work, including the construction means, methods, techniques, sequences, and procedures utilized. When following construction means, methods, techniques, sequences, or procedures instructed by the Contract Documents, Construction Manager is not liable to Owner for damages resulting from compliance with such instructions, unless (a)



Construction Manager recognized and (b) failed to timely report to Owner any error, inconsistency, omission, or unsafe practice that it discovered in such requirements.

3.1.4 Construction Manager shall perform Work only within locations allowed by the Contract Documents, Law, and applicable permits.

3.2 CONSTRUCTION PERSONNEL AND SUPERVISION

3.2.1 Construction Manager shall provide competent supervision for the performance of the Work. Before commencing the Work, Construction Manager shall notify Owner in writing of the name and qualifications of its proposed superintendent(s) and project manager, so Owner may review the individual's qualifications. If, for reasonable cause, Owner refuses to approve the individual, or withdraws its approval after once giving it, Construction Manager shall name a different superintendent for Owner's review.

3.2.2 Construction Manager shall be responsible to Owner for acts or omissions of Parties or entities performing portions of the Work for or on behalf of Construction Manager or any of its Subcontractors.

3.2.3 Construction Manager shall permit only fit and skilled persons to perform the Work. Construction Manager shall enforce safety procedures, strict discipline and good order among persons performing the Work. If Owner determines that a particular person does not follow safety procedures, or is unfit or unskilled for the assigned work, Construction Manager shall immediately reassign the person on receipt of Owner's written notice to do so.

3.2.4 CONSTRUCTION MANAGER'S REPRESENTATIVE Construction Manager's authorized representative is [____]. Construction Manager's Representative shall possess full authority to receive instructions from Owner and to act on those instructions. If Construction Manager changes its representative or their authority, Construction Manager shall immediately notify Owner in writing.

3.3 PRECONSTRUCTION SERVICES The Preconstruction Services under this section are included in Construction Manager's work.

3.3.1 PRELIMINARY EVALUATION Construction Manager shall provide a preliminary evaluation of Owner's Program and report such findings to Owner and Design Professional.

3.3.2 CONSULTATION Construction Manager shall schedule and attend regular meetings with Owner and Design Professional. Construction Manager shall consult with Owner and Design Professional regarding site use and improvements and the selection of materials, building systems, and equipment. Construction Manager shall provide recommendations on construction feasibility; actions designed to minimize adverse effects of labor or material shortages; time requirements for procurement, installation, and construction completion; and factors related to construction cost, including estimates of alternative designs or materials.

3.3.3 SCHEDULE OF THE WORK When Project requirements have been sufficiently identified, Construction Manager shall prepare a preliminary Schedule of the Work for Design Professional's review and Owner's approval. Construction Manager shall coordinate and integrate the Schedule of the Work with the services and activities of Owner, Construction Manager, Design Professional, and the requirements of governmental entities. As design proceeds, Construction Manager shall update the Schedule of the Work to indicate proposed activity sequences, durations, or milestone dates for such activities as receipt and approval of pertinent information, issuance of the drawings and specifications, the preparation and processing of shop drawings and samples, delivery of materials or equipment requiring long-lead-time procurement, Owner's occupancy requirements and estimated date of Substantial Completion of the Project. If Schedule of the Work updates indicate that milestone



dates contained in prior Schedules of the Work will not be met, Construction Manager shall notify and make recommendations to Owner. If the Project is to be completed in phases, Construction Manager shall make recommendations to Owner and Design Professional regarding the phased issuance of the drawings and specifications.

3.3.4 ESTIMATES

3.3.4.1 When Owner has sufficiently identified Owner's Program and other Project requirements and Design Professional has prepared other basic design criteria, Construction Manager shall prepare, for the review of Design Professional and approval of Owner, an initial estimate for the Project, utilizing area, volume, or similar conceptual estimating techniques.

3.3.4.2 When schematic or preliminary design documents have been completed by Design Professional and approved by Owner, Construction Manager shall prepare for the review of Design Professional and approval of Owner, a more detailed budget with supporting data. During the preparation of the design development documents or documents of comparable detail, Construction Manager shall update and refine this estimate at appropriate intervals agreed upon by The Parties.

3.3.4.3 When design development documents or documents of comparable detail have been completed by Design Professional and approved by Owner, Construction Manager shall prepare a further detailed estimate with supporting data for review by Design Professional and approval by Owner. During the preparation of the drawings and specifications, Construction Manager shall update and refine this estimate at appropriate intervals agreed upon by the Parties.

3.3.4.4 If any estimate submitted to Owner exceeds previously approved estimates, Construction Manager shall notify and make recommendations to Owner.

3.3.5 CONSTRUCTION DOCUMENT REVIEW Construction Manager shall review the drawings and specifications in an effort to identify potential constructability problems that could impact Construction Manager's ability to perform the Work in an expeditious and economical manner. Construction Manager shall issue a report to Design Professional and Owner for their review and action as appropriate. In addition, Construction Manager shall promptly report to Owner and Design Professional any errors or omissions which it discovers in the drawings and specifications.

3.3.6 TEMPORARY FACILITIES Construction Manager shall make recommendations regarding temporary construction facilities, equipment, materials, and services for common use by Construction Manager, its Subcontractors, Subsubcontractors, and Suppliers.

3.3.7 LONG-LEAD-TIME ITEMS Construction Manager shall recommend to Owner and Design Professional a schedule for procurement of long-lead-time items which will constitute part of the Work as required to meet the Schedule of the Work. Construction Manager shall help expedite the delivery of long-lead-time items.

3.3.8 SOLICITATION OF SUBCONTRACTORS AND SUPPLIERS Construction Manager shall seek to develop Subcontractor interest in the Project and shall furnish to Owner and Design Professional a list of possible subcontractors from whom proposals may be requested for each principal portion of the Work. Owner shall promptly reply in writing to Construction Manager if Owner or Design Professional know of any objection to a subcontractor. Owner may designate specific persons or entities from whom Construction Manager shall solicit bids.



3.3.9 EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION Construction Manager shall consult with Owner regarding equal employment opportunity and affirmative action programs.

3.3.10 CONSULTANTS Construction Manager shall assist Owner in selecting, retaining, and coordinating the professional services of a surveyor, testing laboratories, and special consultants as needed.

3.3.11 PERMITS Construction Manager shall assist Owner in obtaining building permits and special permits for permanent improvements, except for permits required to be obtained directly by Construction Manager.

3.3.12 OTHER PRECONSTRUCTION SERVICES Construction Manager shall provide such other preconstruction services as are agreed upon by the Parties and identified in an attached exhibit to this Agreement.

3.4 GUARANTEED MAXIMUM PRICE (GMP)

3.4.1 At such time as the Parties agree the drawings and specifications are sufficiently complete, Construction Manager shall prepare and submit to Owner in writing a GMP. The GMP proposal shall include the sum of the estimated cost of the Work, Construction Manager's Fee, the clarifications and assumptions upon which it is based, allowances, and reasonable contingencies, but shall not include compensation for Preconstruction Services. Construction Manager does not guarantee any specific line item provided as part of the GMP, but agrees that it will be responsible for paying all costs of completing the Work which exceed the GMP, as adjusted in accordance with this Agreement.

3.4.2 BASIS OF GUARANTEED MAXIMUM PRICE Construction Manager shall include with the GMP proposal a written statement of its basis, which shall include:

3.4.2.1 a list of the drawings and specifications, including all addenda, which were used in preparation of the GMP Proposal;

3.4.2.2 a list of allowances and a statement of their basis;

3.4.2.3 a list of the assumptions and clarifications made by Construction Manager in the preparation of the GMP Proposal to supplement the information contained in the drawings and specifications;

3.4.2.4 the Date of Substantial Completion or the Date of Final Completion upon which the proposed GMP is based, and the Schedule of Work upon which the Date of Substantial Completion or the Date of Final Completion is based;

3.4.2.5 a schedule of applicable alternate prices;

3.4.2.6 a schedule of applicable unit prices;

3.4.2.7 a statement of any work to be self-performed by Construction Manager.

3.4.3 Construction Manager shall meet with Owner and Design Professional to review the GMP. If Owner or Design Professional discovers any inconsistencies, inaccuracies, or omissions in the information presented, they shall promptly notify Construction Manager, who shall make appropriate adjustments to the GMP. Owner shall then give prompt written approval of the GMP.



3.4.4 Owner shall cause Design Professional to revise the drawings and specifications to the extent necessary to reflect the clarifications, assumptions, and allowances on which the GMP is based. Revised drawings and specifications shall be furnished to Construction Manager in accordance with the current Schedule of the Work, unless otherwise agreed by Owner, Construction Manager, and Design Professional. Construction Manager shall promptly notify Owner and Design Professional if the revised drawings and specifications are inconsistent with the GMP's clarifications, assumptions, and allowances.

3.4.5 If the Contract Documents are not complete at the time the GMP proposal is submitted to Owner, Construction Manager shall provide in the GMP for further development of the Contract Documents. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Document.

3.4.6 If this Agreement is executed before establishment of the Guaranteed Maximum Price and its acceptance by Owner, then the GMP and its basis shall be set forth in Amendment 1.

3.4.7 Allowances shall include the costs of materials, supplies, and equipment delivered to the Worksite less applicable trade discounts and including requisite taxes, unloading and handling at the Worksite, and labor and installation, unless specifically stated otherwise. Construction Manager's overhead and profit for the allowances shall be included in the GMP, but not in the allowances. The GMP shall be adjusted by Change Order to reflect the actual costs when they are greater than or less than the allowances.

3.4.8 FAILURE TO ACCEPT THE GMP PROPOSAL Unless Owner accepts the GMP Proposal in writing on or before the date specified in the GMP Proposal for such acceptance and so notifies Construction Manager, the GMP Proposal shall not be effective. If Owner fails to accept the GMP Proposal, or rejects the GMP Proposal, Owner shall have the right to:

3.4.8.1 suggest modifications to the GMP Proposal. If such modifications are accepted in writing by Construction Manager, the GMP Proposal shall be deemed accepted in accordance with §3.4.6;

3.4.8.2 direct Construction Manager to proceed on the basis of reimbursement as provided in ARTICLE 7 and ARTICLE 8 without a GMP, in which case all references in this Agreement to the GMP shall not be applicable; or

3.4.8.3 terminate the Agreement for convenience in accordance with §12.4. In the absence of a GMP the Parties may establish a Date of Substantial Completion or a Date of Final Completion.

3.4.9 PRE-GMP WORK Before Owner's acceptance of the GMP Proposal, Construction Manager shall not incur any cost to be reimbursed as part of the Cost of the Work, except as provided in this Agreement or as Owner may specifically authorize in writing.

3.5 WORKMANSHIP

3.5.1 The Work shall be executed in accordance with the Contract Documents in a workmanlike manner. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except as otherwise provided in the Contract Documents.

3.6 COOPERATION WITH WORK OF OWNER AND OTHERS



3.6.1 Owner may perform work at the Worksite directly or by Others. Any agreements with Others to perform construction or operations related to the Project shall include provisions pertaining to insurance, indemnification, waiver of subrogation, consequential damages, coordination, interference, cleanup, and safety that are substantively the same as the corresponding provisions of this Agreement.

3.6.2 If Owner elects to perform work at the Worksite directly or by Others, the Parties shall coordinate the activities of all forces at the Worksite and agree upon fair and reasonable schedules and operational procedures for Worksite activities. Owner shall require each separate contractor to cooperate with Construction Manager and assist with the coordination of activities and the review of construction schedules and operations. The GMP or the Date of Substantial Completion or the Date of Final Completion may be equitably adjusted in accordance with this Agreement, for changes resulting from the coordination of construction activities, and the Schedule of the Work shall be revised accordingly.

3.6.3 With regard to the work of Owner and Others, Construction Manager shall (a) proceed with the Work in a manner that does not hinder, delay, or interfere with the work of Owner or Others or cause the work of Owner or Others to become defective; (b) afford Owner or Others reasonable access for introduction and storage of their materials and equipment and performance of their activities; and (c) coordinate Construction Manager's Work with theirs.

3.6.4 Before proceeding with any portion of the Work affected by the construction or operations of Owner or Others, Construction Manager shall give Owner prompt, written notification of any defects Construction Manager discovers in their work which will prevent the proper execution of the Work. Construction Manager's obligations in this subsection do not create a responsibility for the work of Owner or Others, but are for the purpose of facilitating the Work. If Construction Manager does not notify Owner of defects interfering with the performance of the Work, Construction Manager acknowledges that the work of Owner or Others is not defective and is acceptable for the proper execution of the Work. Following receipt of written notice from Construction Manager of defects, Owner shall promptly issue an Interim Directive informing Construction Manager what action, if any, Construction Manager shall take with regard to the defects.

3.7 CONTRACT DOCUMENT REVIEW AND ADMINISTRATION

3.7.1 Before commencing the Work, Construction Manager shall examine and compare the drawings and specifications with information furnished by Owner that are considered Contract Documents, relevant field measurements made by Construction Manager, and any visible conditions at the Worksite affecting the Work.

3.7.2 Should Construction Manager discover any errors, omissions, or inconsistencies in the Contract Documents, Construction Manager shall promptly report them to Owner. It is recognized, however, that Construction Manager is not acting in the capacity of a licensed design professional, and that Construction Manager's examination is to facilitate construction and does not create an affirmative responsibility to detect defects or to ascertain compliance with a Law. Following receipt of written notice from Construction Manager of defects, Owner shall promptly inform Construction Manager what action, if any, Construction Manager shall take with regard to the defect.

3.7.3 Construction Manager shall have no liability for errors, omissions, or inconsistencies discovered under this section, unless Construction Manager knowingly fails to report a recognized problem to Owner.

3.7.4 Construction Manager may be entitled to additional costs or time because of clarifications or instructions growing out of Construction Manager's reports described in this §3.7.



3.7.5 Nothing in §3.7 shall relieve Construction Manager of responsibility for its own errors, inconsistencies, or omissions.

3.7.6 COST REPORTING Construction Manager shall maintain complete, accurate, and current records that comply with generally accepted accounting principles and calculate the proper financial management under this Agreement. Construction Manager shall maintain a complete set of all books and records prepared or used by Construction Manager with respect to the Project. Owner shall be afforded access to all of Construction Manager's records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to this Agreement. Construction Manager shall preserve all such records for a period of three years after the final payment or longer where required by Law.

3.7.6.1 Construction Manager agrees to use reasonable skill and judgment in the preparation of cost estimates and Schedule of the Work, but does not warrant or guarantee their accuracy.

3.8 MATERIALS FURNISHED BY OWNER OR OTHERS

3.8.1 If the Work includes installation of materials or equipment furnished by Owner or Others, it shall be the responsibility of Construction Manager to examine the items so provided and thereupon handle, store, and install the items, unless otherwise provided in the Contract Documents, with such skill and care as to provide a satisfactory and proper installation. Loss or damage due to acts or omissions of Construction Manager shall be the responsibility of Construction Manager and may be deducted from any amounts due or to become due Construction Manager. Any defects discovered in such materials or equipment shall be reported at once to Owner. Following receipt of written notice from Construction Manager of defects, Owner shall promptly inform Construction Manager what action, if any, Construction Manager shall take with regard to the defects.

3.9 TESTS AND INSPECTIONS

3.9.1 Construction Manager shall schedule all required tests, approvals, and inspections of the Work or portions thereof at appropriate times so as not to delay the progress of the Work or other work related to the Project. Construction Manager shall give proper notice to all required Parties of such tests, approvals, and inspections. If feasible, Owner and Others may timely observe the tests at the normal place of testing. Except as provided in §3.9.3, Owner shall bear all expenses associated with tests, inspections, and approvals required by the Contract Documents which, unless otherwise agreed to, shall be conducted by an independent testing laboratory or entity retained by Owner. Unless otherwise required by the Contract Documents, required certificates of testing, approval, or inspection shall be secured by Construction Manager and promptly delivered to Owner.

3.9.2 If Owner or appropriate authorities determine that tests, inspections, or approvals in addition to those required by the Contract Documents will be necessary, Construction Manager shall arrange for the procedures and give timely notice to Owner and Others who may observe the procedures. Costs of the additional tests, inspections, or approvals are at Owner's expense except as provided in the subsection below.

3.9.3 If the procedures described in the two subsections immediately above indicate that portions of the Work fail to comply with the Contract Documents due to the negligence of Construction Manager, Construction Manager shall be responsible for costs of correction and retesting.

3.10 WARRANTY



3.10.1 Construction Manager warrants that all materials and equipment furnished under the Construction Phase of this Agreement will be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. At Owner's request, Construction Manager shall furnish satisfactory evidence of the quality and type of materials and equipment furnished. Construction Manager further warrants that the Work shall be free from material defects not intrinsic in the design or materials required in the Contract Documents. Construction Manager's warranty does not include remedies for defects or damages caused by normal wear and tear during normal usage, use for a purpose for which the Project was not intended, improper or insufficient maintenance, modifications performed by Owner or others, or abuse. Construction Manager's warranty shall commence on the Date of Substantial Completion of the Work, or of a designated portion.

3.10.2 With respect to any portion of Work first performed after Substantial Completion, Construction Manager's warranty obligation shall be extended by the period of time between Substantial Completion and the actual performance of the later Work.

3.10.3 To the extent products, equipment, systems, or materials incorporated in the Work are specified and purchased by Owner, they shall be covered exclusively by the warranty of the manufacturer. There are no warranties which extend beyond the description on the face of any such warranty. For such incorporated items, ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED

3.10.4 Construction Manager shall obtain from its Subcontractors and Suppliers any special or extended warranties required by the Contract Documents. Construction Manager's liability for such warranties shall be limited to the one-year correction period referred to in the section immediately below. After that period Construction Manager shall provide reasonable assistance to Owner in enforcing the obligations of Subcontractors or Suppliers for such extended warranties.

3.11 CORRECTION OF WORK WITHIN ONE YEAR

3.11.1 If before Substantial Completion or within one year after the date of Substantial Completion of the Work any Defective Work is found, Owner shall promptly notify Construction Manager in writing. Unless Owner provides written acceptance of the condition, Construction Manager shall promptly correct the Defective Work at its own cost and time and bear the expense of additional services required for correction of any Defective Work for which it is responsible. If within the one-year correction period Owner discovers and does not promptly notify Construction Manager or give Construction Manager an opportunity to test or correct Defective Work as reasonably requested by Construction Manager, Owner waives Construction Manager's obligation to correct that Defective Work as well as Owner's right to claim a breach of the warranty with respect to that Defective Work.

3.11.2 With respect to any portion of Work first performed after Substantial Completion, the one-year correction period shall commence when that portion of the Work is substantially complete. Correction periods shall not be extended by corrective work performed by Construction Manager.

3.11.3 If Construction Manager fails to correct Defective Work within a reasonable time after receipt of written notice from Owner before final payment, Owner may correct it in accordance with Owner's right to carry out the Work. In such case, an appropriate Change Order shall be issued deducting the cost of correcting the Defective Work from payments then or thereafter due Construction Manager. If payments then or thereafter due Construction Manager are not sufficient to cover such amounts, Construction Manager shall pay the difference to Owner.



3.11.4 Construction Manager's obligations and liability, if any, with respect to any Defective Work discovered after the one-year correction period shall be determined by the Law. If, after the one-year correction period but before the applicable limitation period has expired, Owner discovers any Work which Owner considers Defective Work, Owner shall, unless the Defective Work requires emergency correction, promptly notify Construction Manager and allow Construction Manager an opportunity to correct the Work if Construction Manager elects to do so. If Construction Manager elects to correct the Work it shall provide written notice of such intent within fourteen (14) Days of its receipt of notice from Owner and shall complete the correction of Work within a mutually agreed timeframe. If Construction Manager does not elect to correct the Work, Owner may have the Work corrected by itself or Others, and, if Owner intends to seek recovery of those costs from Construction Manager, Owner shall promptly provide Construction Manager with an accounting of the actual correction costs.

3.11.5 If Construction Manager's correction or removal of Defective Work causes damage to or destroys other completed or partially completed work or existing building, Construction Manager shall be responsible for the cost of correcting the destroyed or damaged property.

3.11.6 The one-year period for correction of Defective Work does not constitute a limitation period with respect to the enforcement of Construction Manager's other obligations under the Contract Documents.

3.11.7 Before final payment, at Owner's option and with Construction Manager's agreement, Owner may elect to accept Defective Work rather than require its removal and correction. In such cases the GMP shall be equitably adjusted for any diminution in the value of the Project caused by such Defective Work.

3.12 CORRECTION OF COVERED WORK

3.12.1 Upon issuance of an Interim Directive, Work that has been covered without a requirement that it be inspected before being covered may be uncovered for Owner's inspection. Owner shall pay for the costs of uncovering and replacement if the Work proves to be in conformance with the Contract Documents, or if the defective condition was caused by Owner or Others. If the uncovered Work proves to be defective, Construction Manager shall pay the costs of uncovering and replacement.

3.12.2 If any Work is covered contrary to requirements in the Contract Documents, Owner may issue an Interim Directive to uncover the Work for Owner's observation and recover the Work all at Construction Manager's expense. In this circumstance the Work shall be replaced at Construction Manager's expense and with no adjustment to the Dates of Substantial or Final Completion.

3.13 SAFETY OF PERSONS AND PROPERTY

3.13.1 SAFETY PROGRAMS Construction Manager holds overall responsibility for safety programs. However, such obligation does not relieve Subcontractors of their safety responsibilities and to comply with the Law. Construction Manager shall prevent against injury, loss, or damage to persons or property by taking reasonable steps to protect: (a) its employees and other persons at the Worksite; (b) materials and equipment stored at onsite or offsite locations for use in performing the Work; and (c) property located at the Worksite and adjacent to work areas, whether or not the property is part of the Worksite.

3.13.2 CONSTRUCTION MANAGER'S SAFETY REPRESENTATIVE Construction Manager shall designate an individual at the Worksite in its employ as its safety representative. Unless otherwise identified by Construction Manager in writing to Owner, Construction Manager's project superintendent shall serve as its safety representative. Construction Manager shall report promptly in writing all recordable accidents and injuries occurring at the Worksite. When Construction Manager is



required to file an accident report with a public authority, Construction Manager shall furnish a copy of the report to Owner.

3.13.3 Construction Manager shall provide Owner with copies of all notices required of Construction Manager by the Law. Construction Manager's safety program shall comply with the requirements of governmental and quasi-governmental authorities having jurisdiction.

Damage or loss not insured under property insurance that may arise from the Work, to the extent caused by negligent or intentionally wrongful acts or omissions of Construction Manager, or anyone for whose acts Construction Manager may be liable, shall be promptly remedied by Construction Manager.

3.13.4 If Owner deems any part of the Work or Worksite unsafe, Owner, without assuming responsibility for Construction Manager's safety program, may require by Interim Directive Construction Manager to stop performance of the Work, take corrective measures satisfactory to Owner, or both. If Construction Manager does not adopt corrective measures, Owner may perform them and deduct their cost from the GMP. Construction Manager agrees to make no claim for damages, or an increase in the GMP, or for a change in the Dates of Substantial or Final Completion based on Construction Manager's compliance with Owner's reasonable request.

3.14 EMERGENCIES In an emergency affecting the safety of persons or property, Construction Manager shall act in a reasonable manner to prevent threatened damage, injury, or loss. If appropriate, an equitable adjustment in GMP or Date of Substantial Completion or Date of Final Completion shall be determined as provided for in ARTICLE 9.

3.15 HAZARDOUS MATERIALS

3.15.1 Construction Manager shall not be obligated to commence or continue Work until any Hazardous Material discovered at the Worksite has been removed, rendered or determined to be harmless by Owner as certified by an independent testing laboratory, and approved by the appropriate governmental agency.

3.15.2 If after commencing the Work, Hazardous Material is discovered at the Worksite, Construction Manager shall be entitled to immediately stop Work in the affected area. Construction Manager shall promptly report the condition to Owner, Design Professional, and, if required, the governmental agency with jurisdiction.

3.15.3 Construction Manager shall not resume nor be required to continue any Work affected by any Hazardous Material without written mutual agreement between the Parties after the Hazardous Material has been removed or rendered harmless and only after approval, if necessary, of the governmental agency with jurisdiction.

3.15.4 Owner shall be responsible for retaining an independent testing laboratory to determine the nature of the material encountered and whether the material requires corrective measures or remedial action. Such measures shall be the sole responsibility of Owner, and shall be performed in a manner minimizing any adverse effect upon the Work.

3.15.5 If Construction Manager incurs additional costs or is delayed due to the presence or remediation of Hazardous Material, Construction Manager may be entitled to an equitable adjustment in the GMP or the Dates of Substantial or Final Completion in accordance with this Agreement.

3.15.6 To the extent permitted by §6.7 and to the extent not caused by the negligent or intentionally wrongful acts or omissions of Construction Manager, its Subcontractors and Subsubcontractors, and



the agents, officers, directors, and employees of each of them, Owner shall defend, indemnify, and hold harmless Construction Manager, its Subcontractors and Subsubcontractors, and the agents, officers, directors, and employees of each of them, from and against all claims, damages, losses, costs, and expenses, including but not limited to reasonable attorneys' fees, costs, and expenses incurred in connection with any dispute resolution procedure arising out of or relating to the performance of the Work in any area affected by Hazardous Material.

3.15.7 MATERIALS BROUGHT TO THE WORKSITE

3.15.7.1 Safety Data Sheets (SDS) as required by law and pertaining to materials or substances used or consumed in the performance of the Work, whether obtained by Construction Manager, Subcontractors, Owner or Others, shall be maintained at the Worksite by Construction Manager and made available to Owner, Subcontractors, and Others.

3.15.7.2 Construction Manager shall be responsible for the proper delivery, handling, application, storage, removal, and disposal of all materials and substances brought to the Worksite by Construction Manager in accordance with the Contract Documents and used or consumed in the performance of the Work. Upon the issuance of the Certificate of Substantial Completion, Owner shall be responsible for materials and substances brought to the Worksite by Construction Manager if such materials or substances are required by the Contract Documents.

3.15.7.3 To the extent permitted under §6.7 and to the extent caused by the negligent or intentionally wrongful acts or omissions of Construction Manager, its agents, officers, directors, and employees, Construction Manager shall defend, indemnify, and hold harmless Owner, its agents, officers, directors, and employees, from and against claims, damages, losses, costs, and expenses, including but not limited to reasonable attorneys' fees, costs and expenses incurred in connection with any dispute resolution procedure, arising out of or relating to delivery, handling, application, storage, removal, and disposal of all materials and substances brought to the Worksite by Construction Manager

3.15.7.4 §3.15 shall survive the completion of the Work or Agreement termination.

3.16 SUBMITTALS

3.16.1 Construction Manager shall submit to Owner and Design Professional all shop drawings, samples, product data, and similar submittals required by the Contract Documents for review and approval. Submittals shall be submitted in electronic form if required in accordance with §4.6.1. Construction Manager shall be responsible for the accuracy and conformity of its submittals to the Contract Documents. At no additional cost, Construction Manager shall prepare and deliver its submittals in such time and sequence so as not to delay the performance of the Work or the work of Owner and Others. Construction Manager's submittals shall identify in writing for each submittal all changes, deviations, or substitutions from the requirements of the Contract Documents. The approval of any Construction Manager submittal shall not be deemed to authorize changes, deviations, or substitutions from the requirements of the Contract Documents unless a Change Order or Interim Directive specifically authorizes such deviation, substitution, or change. To the extent a change, deviation, or substitution causes an impact to the Contract Price or Contract Time, such approval shall be memorialized in a Change Order no later than seven (7) Days following approval by Owner. Neither Design Professional nor Owner shall make any change, deviation, or substitution through the submittal process without specifically identifying and authorizing such deviation to Construction Manager. If the Contract Documents do not contain submittal requirements pertaining to the Work, Construction Manager agrees upon request to submit in a timely fashion to Design Professional and



Owner for review any shop drawings, samples, product data, manufacturers' literature, or similar submittals as may reasonably be required by Owner.

3.16.2 Owner shall be responsible for review and approval of submittals with reasonable promptness to avoid causing delay.

3.16.3 Construction Manager shall perform all Work strictly in accordance with approved submittals. Approval of shop drawings is not an authorization to perform changed work, unless the procedures of ARTICLE 9 are followed. Approval does not relieve Construction Manager from responsibility for Defective Work resulting from errors or omissions on the approved shop drawings.

3.16.4 Record copies of the following, incorporating field changes and selections made during construction, shall be maintained at the Worksite and available to Owner upon request: drawings, specifications, addenda and other modifications, and required submittals including product data, samples, and shop drawings.

3.16.5 Construction Manager shall prepare and submit to Owner

- Final marked-up as-built drawings;
- Updated electronic data, in accordance with §4.6.1;
- Other documentation required by the Contract Documents that specifies how various elements of the Work were actually constructed or installed.

3.17 DESIGN DELEGATION If the Contract Documents require Construction Manager to specify that Construction Manager is responsible for the design of a particular system or component to be incorporated into the Project, then Owner shall specify all required performance and design criteria. Construction Manager shall not be responsible for the adequacy of such performance and design criteria. As required by the Law, Construction Manager shall procure design services and certifications necessary to satisfactorily complete the Work from a licensed design professional. The signature and seal of Construction Manager's design professional shall appear on all drawings, calculations, specifications, certifications, shop drawings, and other submittals related to the Work designed or certified by Construction Manager's design professional.

3.18 WORKSITE CONDITIONS

3.18.1 WORKSITE VISIT Construction Manager acknowledges that it has visited, or has had the opportunity to visit, the Worksite to visually inspect the general and local conditions which could affect the Work.

3.18.2 CONCEALED OR UNKNOWN SITE CONDITIONS If a condition encountered at the Worksite is (a) a subsurface or other physical condition materially different from those indicated in the Contract Documents, or (b) an unusual and unknown physical condition materially different from conditions ordinarily encountered and generally recognized as inherent in Work provided for in the Contract Documents, Construction Manager shall stop affected Work after the condition is first observed and give prompt written notice of the condition to Owner and Design Professional. Owner shall investigate and then issue an Interim Directive specifying the extent to which Owner agrees that a concealed or unknown condition exists and directing how Construction Manager is to proceed. Construction Manager shall not be required to perform any Work relating to the condition without the written mutual agreement of the Parties. Any change in the GMP, estimated Cost of the Work, Construction Manager's Fee, Date of Substantial Completion or Date of Final Completion, and, if appropriate, the Compensation for Preconstruction Services as a result of the condition, including any dispute about its existence or nature shall be determined as provided in ARTICLE 9.



3.19 PERMITS AND TAXES

3.19.1 Construction Manager shall give public authorities all notices required by law and, except for permits and fees that are the responsibility of Owner pursuant to §4.4, shall obtain and pay for all necessary permits, licenses, and renewals pertaining to the Work. Construction Manager shall provide to Owner copies of all notices, permits, licenses, and renewals required under this Agreement.

3.19.2 Construction Manager shall pay applicable taxes for the Work provided by Construction Manager.

3.19.3 If, in accordance with Owner's direction, Construction Manager claims an exemption for taxes, Owner shall indemnify and hold Construction Manager harmless from any liability, penalty, interest, fine, tax assessment, attorneys' fees, or other expense or cost incurred by Construction Manager as a result of any such claim.

3.20 CUTTING, FITTING, AND PATCHING

3.20.1 Construction Manager shall perform cutting, fitting, and patching necessary to coordinate the various parts of the Work and to prepare its Work for the work of Owner or Others.

3.20.2 Cutting, patching, or altering the work of Owner or Others shall be done with the prior written approval of Owner. Such approval shall not be unreasonably withheld.

3.21 CLEAN UP

3.21.1 Construction Manager shall regularly remove debris and waste materials at the Worksite resulting from the Work. Before discontinuing Work in an area, Construction Manager shall clean the area and remove all rubbish and its construction equipment, tools, machinery, waste, and surplus materials. Construction Manager shall minimize and confine dust and debris resulting from construction activities. At the completion of the Work, Construction Manager shall remove from the Worksite all construction equipment, tools, surplus materials, waste materials, and debris.

3.21.2 If Construction Manager fails to commence compliance with cleanup duties within two (2) Business Days after written notification from Owner of non-compliance, Owner may implement appropriate cleanup measures without further notice and the cost shall be deducted from any amounts due or to become due to Construction Manager in the next payment period.

3.22 ACCESS TO WORK Construction Manager shall facilitate the access of Owner, its Design Professional, and Others to Work in progress.

3.23 COMPLIANCE WITH LAWS Construction Manager shall comply with all the Law at its own cost. Construction Manager shall be liable to Owner for all loss, cost, or expense attributable to any acts or omissions by Construction Manager, its employees, subcontractors, suppliers, and agents for failure to comply with Laws, including fines, penalties, or corrective measures. However, liability under this subsection shall not apply if prior approval by appropriate authorities and Owner is received.

3.23.1 CHANGES IN THE LAW The GMP, estimated Cost of the Work, Construction Manager's Fee, Date of Substantial Completion or Date of Final Completion, and, if appropriate, the Compensation for Preconstruction Services shall be equitably adjusted in accordance with ARTICLE 9 for additional costs or time needed resulting from Laws enacted after the date of this Agreement, including taxes.



3.24 CONFIDENTIALITY Construction Manager shall treat as confidential and not disclose to third persons, nor use for its own benefit ("Treat as Confidential"), any of Owner's confidential information, know-how, discoveries, production methods, and the like disclosed to Construction Manager or which Construction Manager may acquire in performing the Work. To the extent necessary to perform the Work, Construction Manager's confidentiality obligations do not apply to disclosures to Subcontractors, Subsubcontractors, and Suppliers. Owner shall Treat as Confidential information all of Construction Manager's estimating systems and historical and parameter cost data disclosed to Owner in performing the Work. Each Party shall specify and mark confidential items as "Confidential." Confidentiality obligations do not supersede compulsion by Law, a governmental agency or authority, an order of a court of competent jurisdiction, or a validly issued subpoena. In such event, a Party shall promptly notify the other Party to permit that Party's legal objection.

ARTICLE 4 OWNER'S RESPONSIBILITIES

4.1 INFORMATION AND SERVICES Owner's responsibilities under this Article shall be fulfilled with reasonable detail and in a timely manner.

4.2 FINANCIAL INFORMATION Before commencement of the Work and thereafter at the written request of Construction Manager, Owner shall provide Construction Manager with evidence of Project financing. Evidence of such financing shall be a condition precedent to Construction Manager's commencing or continuing the Work. Construction Manager shall be notified before any material change in Project financing.

4.3 WORKSITE INFORMATION To the extent Owner has obtained, or is required to obtain the following Worksite information, then Owner shall provide Construction Manager the following:

4.3.1 information describing the physical characteristics of the Worksite, including surveys, Worksite evaluations, legal descriptions, data, or drawings depicting existing conditions, subsurface conditions, and environmental studies, reports, and investigations;

4.3.2 tests, inspections, and other reports dealing with environmental matters, Hazardous Material, and other existing conditions, including structural, mechanical, and chemical tests, required by the Contract Documents or Law;

4.3.3 the limits of Pollution Liability Insurance covering the Worksite held by Owner; and

4.3.4 any other information or services requested in writing by Construction Manager which are required for Construction Manager's performance of the Work and under Owner's control.

4.4 BUILDING PERMIT, FEES, AND APPROVALS Except for those permits and fees related to the Work which are the responsibility of Construction Manager pursuant to §3.19.1, Owner shall secure and pay for all other permits, approvals, easements, assessments, and fees required for the development, construction, use, or occupancy of permanent structures or for permanent changes in existing facilities, including the building permit.

4.5 MECHANICS AND CONSTRUCTION LIEN INFORMATION Within seven (7) Days after receiving Construction Manager's written request, Owner shall provide Construction Manager with the information necessary to give notice of or enforce mechanics lien rights and, where applicable, stop notices. This information shall include Owner's real property interests in the Worksite and the record legal title.

4.6 CONTRACT DOCUMENTS Unless otherwise specified, Owner shall provide a reasonable number of hard copies of the Contract Documents to Construction Manager without cost.



4.6.1 ELECTRONIC DOCUMENTS If Owner requires that Owner, Design Professional, and Construction Manager exchange documents and data in electronic or digital form, before any such exchange, Owner, Design Professional, and Construction Manager shall agree on and follow a written protocol governing all exchanges in ConsensusDocs 200.2 or a separate addendum, which, at a minimum, shall specify: (a) the definition of documents and data to be accepted in electronic or digital form or to be transmitted electronically or digitally; (b) management and coordination responsibilities; (c) necessary equipment, software, and services; (d) acceptable formats, transmission methods, and verification procedures; (e) methods for maintaining version control; (f) privacy and security requirements; and (g) storage and retrieval requirements. Except as otherwise agreed upon by the Parties in writing, each Party shall each bear its own costs as identified in the protocol. In the absence of a written protocol, use of documents and data in electronic or digital form shall be at the sole risk of the recipient.

4.7 OWNER'S REPRESENTATIVE Owner's Representative is [____]. Owner's Representative shall be fully acquainted with the Project, and shall have authority to bind Owner in all matters requiring Owner's approval, authorization, or written notice. If Owner changes its Representative or the Representative's authority, Owner shall immediately notify Construction Manager in writing.

4.8 OWNER'S CUTTING AND PATCHING Cutting, patching, or altering the Work by Owner or Others shall be done with the prior written approval of Construction Manager, which approval shall not be unreasonably withheld.

4.9 OWNER'S RIGHT TO CLEAN UP In case of a dispute between Construction Manager and Others with regard to respective responsibilities for cleanup at the Worksite, Owner may implement appropriate cleanup measures after two (2) Business Days' notice and allocate the cost among those responsible during the following pay period.

4.10 COST OF CORRECTING DAMAGED OR DESTROYED WORK With regard to damage or loss attributable to the acts or omissions of Owner or Others and not to Construction Manager, Owner may either (a) promptly remedy the damage or loss and assume affected warranty responsibilities, (b) accept the damage or loss, or (c) issue an Interim Directive or Change Order to remedy the damage or loss. If Construction Manager incurs costs or is delayed due to such loss or damage, Construction Manager may seek an equitable adjustment in the GMP, estimated Cost of the Work, Construction Manager's Fee, Date of Substantial Completion or Date of Final Completion, and, if appropriate, the Compensation for Preconstruction Services under this Agreement.

ARTICLE 5 SUBCONTRACTS

5.1 SUBCONTRACTORS Subcontracts shall be issued on a lump sum basis unless Owner has given prior written approval of a different method of payment to the Subcontractor.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Promptly after the execution of this Agreement, Construction Manager shall provide Owner, and, if directed, Design Professional with a written list of the proposed subcontractors and significant Suppliers. If Owner has a reasonable objection to any proposed subcontractor or material supplier, Owner shall notify Construction Manager in writing. Failure to promptly object shall constitute acceptance.

5.2.2 If Owner has reasonably and promptly objected, Construction Manager shall not contract with the proposed Subcontractor or Supplier, and Construction Manager shall propose another acceptable Subcontractor or Supplier to Owner. An appropriate Change Order shall reflect any increase or decrease in the GMP or Dates of Substantial or Final Completion because of the substitution.



5.3 BINDING OF SUBCONTRACTORS AND SUPPLIERS Construction Manager agrees to bind every Subcontractor and Supplier (and require every Subcontractor to so bind its subcontractors and significant suppliers) to the Contract Documents as they apply to the Subcontractor's or Supplier's applicable provisions to that portion of the Work.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 If this Agreement is terminated, each subcontract and supply agreement shall be assigned by Construction Manager to Owner, subject to the prior rights of any surety, provided that: (a) this Agreement is terminated by Owner pursuant to §12.4 or §12.5; (b) Owner accepts such assignment after termination by notifying the Construction Manager and Subcontractor or Construction Manager and Supplier in writing; and (c) Owner assumes all rights and obligations of Construction Manager pursuant to each subcontract or supply agreement.

5.4.2 If Owner accepts such an assignment, and the Work has been suspended for more than thirty (30) consecutive Days, following termination, the Subcontractor's or Supplier's compensation shall be equitably adjusted as a result of the suspension.

ARTICLE 6 TIME

6.1 DATE OF COMMENCEMENT The Date of Commencement is the Agreement date in ARTICLE 1 unless otherwise set forth below: [_____].

6.1.1 SUBSTANTIAL/FINAL COMPLETION Unless the Parties agree otherwise, the Date of Substantial Completion or the Date of Final Completion shall be established in Amendment 1 to this Agreement subject to adjustments as provided for in the Contract Documents. Owner and Construction Manager may agree not to establish such dates, or in the alternative, to establish one but not the other of the two dates. If such dates are not established upon the execution of this Agreement, at such time as GMP is accepted a Date of Substantial Completion or Date of Final Completion of the Work shall be established in Amendment 1. If a GMP is not established and the Parties desire to establish a Date of Substantial Completion or Date of Final Completion, it shall be set forth in Amendment 1. The dates for Substantial and Final Completion are subject to adjustments as provided for in the Contract Documents.

6.1.2 Time is of the essence with regard to the obligations of the Contract Documents.

6.1.3 Unless instructed by Owner in writing, Construction Manager shall not knowingly commence the Work before the effective date of Construction Manager's required insurance.

6.2 SCHEDULE OF THE WORK

6.2.1 Before submitting its first application for payment, Construction Manager shall submit to Owner and, if directed, Design Professional a Schedule of the Work showing the dates on which Construction Manager plans to begin and complete various parts of the Work, including dates on which information and approvals are required from Owner. Except as otherwise directed by Owner, Construction Manager shall comply with the approved Schedule of the Work or Construction Manager. Unless otherwise agreed, the Schedule of the Work shall be formatted in a detailed precedence-style critical path method that (a) provides a graphic representation of all activities and events, including float values that will affect the critical path of the Work, and (b) identifies dates that are critical to ensure timely and orderly completion of the Work. Construction Manager shall update the Schedule of the Work on a monthly basis or as mutually agreed by the Parties.



6.2.2 Owner may determine the sequence in which the Work shall be performed, provided it does not unreasonably interfere with the approved project schedule. Owner may require Construction Manager to make reasonable changes in the sequence at any time during the performance of the Work in order to facilitate the performance of work by Owner or Others. If Construction Manager consequently incurs costs or is delayed, the GMP or the Dates of Substantial or Final Completion, or both, Construction Manager may seek equitable adjustment under ARTICLE 9.

6.3 DELAYS AND EXTENSIONS OF TIME

6.3.1 If Construction Manager is delayed at any time in the commencement or progress of the Work by any cause beyond the control of Construction Manager, Construction Manager shall be entitled to an equitable extension of the Date of Substantial Completion or Date of Final Completion. Examples of causes beyond the control of Construction Manager include, but are not limited to, the following: (a) acts or omissions of Owner, Design Professional, or Others; (b) changes in the Work or the sequencing of the Work ordered by Owner, or arising from decisions of Owner that impact the time of performance of the Work; (c) encountering Hazardous Materials, or concealed or unknown conditions; (d) delay authorized by Owner pending dispute resolution or suspension by Owner under §12.1; (e) transportation delays not reasonably foreseeable; (f) labor disputes not involving Construction Manager; (g) general labor disputes impacting the Project but not specifically related to the Worksite; (h) fire; (i) Terrorism; (j) epidemics; (k) adverse governmental actions; (l) unavoidable accidents or circumstances; (m) adverse weather conditions not reasonably anticipated. Construction Manager shall submit any requests for equitable extensions of Contract Time in accordance with the provisions of ARTICLE 9.

6.3.2 In addition, if Construction Manager incurs additional costs as a result of a delay that is caused by items (a) through (d) immediately above, Construction Manager shall be entitled to an equitable adjustment in the GMP subject to §6.7.

6.3.3 NOTICE OF DELAYS If delays to the Work are encountered for any reason, Construction Manager shall provide prompt written notice to Owner of the cause of such delays after Construction Manager first recognizes the delay. The Parties each agree to take reasonable steps to mitigate the effect of such delays.

6.4 NOTICE OF DELAY CLAIMS If Construction Manager requests an equitable extension of the Contract Time or an equitable adjustment in the Contract Price as a result of a delay described in §6.3, Construction Manager shall give Owner written notice of the claim in accordance with §9.4. If Construction Manager causes delay in the completion of the Work, Owner shall be entitled to recover its additional costs subject to §6.7. Owner shall process any such claim against Construction Manager in accordance with ARTICLE 9.

6.5 MONITORING PROGRESS AND COSTS Following acceptance by Owner of the GMP, Construction Manager shall establish a process for monitoring actual costs against the GMP and actual progress against the Schedule of Work. Construction Manager will provide written reports to Owner at intervals as agreed to by the Parties on the status of the Work, showing variances between actual costs and the GMP and actual progress as compared to the Schedule of Work, including estimates of future costs and recovery programs if actual progress indicates that the Dates of Substantial Completion or Final Completion may not be met.

6.6 LIQUIDATED DAMAGES

6.6.1 SUBSTANTIAL COMPLETION Liquidated damages based on the Substantial Completion date [_____] shall/ [_____] shall not apply.



6.6.1.1 Owner will suffer damages which are difficult to determine and accurately specify if the Substantial Completion date, which may be amended by Change Order, is not attained. Construction Manager shall pay Owner [_____] dollars (\$[_____]) as liquidated damages and not as a penalty for each Day that Substantial Completion extends beyond the Substantial Completion date. These liquidated damages are in lieu of all liability for all extra costs, losses, expenses, claims, penalties, and any other damages of any nature incurred by Owner resulting from not attaining the Substantial Completion date.

6.6.2 FINAL COMPLETION Liquidated damages based on the Final Completion date [_____] shall/ [_____] shall not apply.

6.6.2.1 Owner will suffer damages which are difficult to determine and accurately specify if the Final Completion date, as may be amended by subsequent Change Order, is not attained. Construction Manager shall pay Owner [_____] dollars (\$[_____]) as liquidated damages and not as a penalty for each Day that Final Completion extends beyond the Final Completion date. These liquidated damages are in lieu of all liability for any extra costs, losses, expenses, claims, penalties, and any other damages of any nature incurred by Owner resulting from not attaining Final Completion date.

6.6.3 Other applicable liquidated damages shall be included as Agreement exhibit.

6.7 LIMITED MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES Except for damages mutually agreed upon by the Parties as liquidated damages in §6.6 and excluding losses covered by insurance required by the Contract Documents, the Parties agree to waive all claims against each other for any consequential damages that may arise out of or relate to this Agreement, except for those specific items of damages excluded from this waiver as mutually agreed upon by the Parties and identified below. Owner agrees to waive damages including but not limited to Owner's loss of use of the Project, any rental expenses incurred, loss of income, profit, or financing related to the Project, as well as the loss of business, loss of financing, loss of profits not related to this Project, loss of reputation, or insolvency. Construction Manager agrees to waive damages including but not limited to loss of business, loss of financing, loss of profits not related to this Project, loss of bonding capacity, loss of reputation, or insolvency. The provisions of this section shall also apply to the termination of this Agreement and shall survive such termination. The following are excluded from this mutual waiver: [_____] .

6.7.1 The Parties shall each require similar waivers in contracts with Subcontractors and Others retained for the Project.

ARTICLE 7 COMPENSATION AND GUARANTEED MAXIMUM PRICE

7.1 Owner shall compensate Construction Manager for Work performed on the following basis:

7.1.1 the Cost of the Work as allowed in ARTICLE 8; and

7.1.2 Construction Manager's Fee paid in proportion to the Work performed subject to adjustment as provided in §7.4.

7.2 The compensation to be paid shall be limited to the GMP established in Amendment 1, as the GMP may be adjusted under ARTICLE 9.

7.2.1 Payment for Work performed shall be as set forth in ARTICLE 10.

7.3 CONSTRUCTION MANAGER'S FEE Construction Manager's Fee shall be as follows, subject to adjustment as provided in §7.4: [_____] .



7.4 FEE ADJUSTMENTS:

7.4.1 Changes in the Work as provided in ARTICLE 9, shall adjust Construction Manager's Fee as follows: [_____].

7.4.2 except as provided for in §6.36.3, delays in the Work not caused by Construction Manager shall adjust Construction Manager's Fee to compensate for increased expenses as provided for in ARTICLE 9; and

7.4.3 managing the replacement of an insured or uninsured loss shall increase Construction Manager's fee in the same proportion that Construction Manager's Fee bears to the estimated Cost of the Work for the replacement.

7.5 PRECONSTRUCTION SERVICES COMPENSATION Construction Manager shall be compensated for Preconstruction Services as follows: [_____].

ARTICLE 8 COST OF THE WORK

8.1 Owner agrees to pay Construction Manager for the Cost of the Work as defined in this article. This payment shall be in addition to Construction Manager's Fee stipulated in §7.3.

8.2 COST ITEMS

8.2.1 Labor wages directly employed by Construction Manager in performing of the Work.

8.2.2 Salaries of Construction Manager's employees when stationed at the field office, in whatever capacity employed, employees engaged on the road expediting the production or transportation of material and equipment, and employees from the principal or branch office as mutually agreed by the Parties in writing.

8.2.3 Cost of all employee benefits and taxes, including but not limited to, workers' compensation, unemployment compensation, social security, health, welfare, retirement, and other fringe benefits as required by law, labor agreements, or paid under Construction Manager's standard personnel policy, insofar as such costs are paid to employees of Construction Manager who are included in the Cost of the Work pursuant to §8.2.1 and §8.2.2.

8.2.4 Reasonable transportation, travel, hotel, and moving expenses of Construction Manager's personnel incurred in connection with the Work.

8.2.5 Cost of all materials, supplies, and equipment incorporated in the Work, including costs of inspection and testing if not provided by Owner, transportation, storage, and handling.

8.2.6 Payments made by Construction Manager to Subcontractors for work performed under this Agreement.

8.2.7 Cost, including transportation and maintenance of all materials, supplies, equipment, temporary facilities, and hand tools not owned by the workers that are used or consumed in the performance of the Work, less salvage value or residual value; and cost less salvage value on such items used, but not consumed that remain the property of Construction Manager.

8.2.8 Rental charges of all necessary machinery and equipment, exclusive of hand tools owned by workers, used at the Worksite, whether rented from Construction Manager or others, including



installation, repair, and replacement, dismantling, removal, maintenance, transportation, and delivery costs. Rental from unrelated third parties shall be reimbursed at actual cost. Rentals from Construction Manager or its affiliates, subsidiaries, or related parties shall be reimbursed at the prevailing rates in the locality of the Worksite up to eighty-five percent (85%) of the value of the piece of equipment.

8.2.9 Cost of the premiums for all insurance and surety bonds which Construction Manager is required to procure or deems necessary, and approved by Owner including any additional premium incurred as a result of any increase in the GMP.

8.2.10 Sales, use, gross receipts, or other taxes, tariffs, or duties related to the Work for which Construction Manager is liable.

8.2.11 Permits, fees, licenses, tests, royalties.

8.2.12 Losses, expenses, or damages to the extent not compensated by insurance or otherwise, and the cost of corrective work during the Construction Phase and for a one-year period following the Date of Substantial Completion, provided that such losses, expenses, damages, or corrective work did not arise from Construction Manager's negligence.

8.2.13 Costs associated with establishing, equipping, operating, maintaining, and demobilizing the field office.

8.2.14 Water, power, and fuel costs necessary for the Work.

8.2.15 Cost of removal of all nonhazardous substances, debris, and waste materials.

8.2.16 Costs incurred due to an emergency affecting the safety of persons or property.

8.2.17 Legal, mediation, and arbitration fees and costs, other than those arising from disputes between Owner and Construction Manager, reasonably and properly resulting from Construction Manager's performance of the Work.

8.2.18 Costs directly incurred in the performance of the Work or in connection with the Project, and not included in Construction Manager's Fee as set forth in ARTICLE 7, which are reasonably inferable from the Contract Documents.

8.3 DISCOUNTS All discounts for prompt payment shall accrue to Owner to the extent such payments are made directly by Owner. To the extent payments are made with funds of Construction Manager, all cash discounts shall accrue to Construction Manager. All trade discounts, rebates, and refunds, and all returns from sale of surplus materials and equipment, shall be credited to the Cost of the Work.

ARTICLE 9 CHANGES

Changes in the Work that are within the general scope of this Agreement shall be accomplished, without invalidating this Agreement, by Change Order and Interim Directive.

9.1 CHANGE ORDER

9.1.1 Construction Manager may request or Owner may order changes in the Work or the timing or sequencing of the Work that impacts the GMP or the estimated Cost of the Work, Construction Manager's Fee, Date of Substantial Completion or Date of Final Completion and, if appropriate, the Compensation for Preconstruction Services. All such changes in the Work shall be formalized in a



Change Order. Any such requests for changes in the Work shall be processed in accordance with this article.

9.1.2 For changes in the Work, the Parties shall negotiate an equitable adjustment to the GMP or the Date of Substantial Completion or Date of Final Completion in good faith and conclude negotiations as expeditiously as possible. Acceptance of the Change Order and any equitable adjustment in the GMP or Date of Substantial Completion or Date of Final Completion shall not be unreasonably withheld.

9.1.3 NO OBLIGATION TO PERFORM Construction Manager shall not be obligated to perform changes in the Work that impact the GMP or the estimated Cost of the Work, Construction Manager's Fee, Date of Substantial Completion or Date of Final Completion without a Change Order or Interim Directive.

9.2 INTERIM DIRECTIVES

9.2.1 Owner may issue an Interim Directive directing a change in the Work before reaching agreement with Construction Manager on the adjustment, if any, in the GMP, Construction Manager's Fee, Date of Substantial Completion or Date of Final Completion, or directing Construction Manager to perform Work that Owner believes is not a change. If the Parties disagree that the Interim Directed work is within the scope of the Work, Construction Manager shall perform the disputed Work and furnish Owner with an estimate of the costs to perform the disputed work in accordance with Owner's interpretations.

9.2.2 The Parties shall negotiate expeditiously and in good faith for appropriate adjustments, as applicable, to the GMP or the Date of Substantial Completion or Date of Final Completion arising out of an Interim Directive. As the directed Work is performed, Construction Manager shall submit its costs for such Work with its application for payment beginning with the next application for payment within thirty (30) Days of the issuance of the Interim Directive. If there is a dispute as to the cost to Owner, Owner shall pay Construction Manager fifty percent (50%) of its actual (incurred or committed) cost to perform the Work. In such event, the Parties reserve their rights as to the disputed amount, subject to the requirements of ARTICLE 13. Owner's payment does not prejudice its right to be reimbursed should it be determined that the disputed work was within the scope of the Work. Construction Manager's receipt of payment for the disputed work does not prejudice its right to receive full payment for the disputed work should it be determined that the disputed work is not within the scope of the Work. Undisputed amounts may be included in applications for payment and shall be paid by Owner in accordance with this Agreement.

9.2.3 When the Parties agree upon the adjustments in the GMP or the Date of Substantial Completion or Date of Final Completion, for a change in the Work directed by an Interim Directive, such agreement shall be the subject of an appropriate Change Order. The Change Order shall include all outstanding Interim Directives on which the Parties have reached agreement on GMP or the Date of Substantial Completion or Date of Final Completion issued since the last Change Order.

9.3 DETERMINATION OF COST

9.3.1 An increase or decrease in the GMP or the Date of Substantial Completion or Date of Final Completion resulting from a change in the Work shall be determined by one or more of the following methods:

9.3.1.1 unit prices set forth in this Agreement or as subsequently agreed;

9.3.1.2 a mutually accepted, itemized lump sum;



9.3.1.3 Cost of the Work as defined by ARTICLE 8 and determined as a net savings from the change in the work; plus [_____] % for Overhead and [_____] % for profit. Construction Manager's Overhead and profit shall be added to any net increase in GMP. No Overhead and profit shall be applied to any net decrease in the GMP that is less than ten percent (10%). Overhead and profit shall be applied to any net decrease of the GMP that is ten percent (10%) or more.

9.3.1.4 If there is a net increase in the GMP, Construction Manager's Fee shall be adjusted accordingly. In case of a net decrease in the GMP, Construction Manager's Fee shall not be adjusted unless ten percent (10%) or more of the Project is deleted. Construction Manager shall maintain a documented, itemized accounting evidencing the expenses and savings.

9.3.2 If unit prices are set forth in the Contract Documents or are subsequently agreed to by the Parties, but the character or quantity of such unit items as originally contemplated is so different in a proposed Change Order that the original unit prices will cause substantial inequity to either Party, such unit prices shall be equitably adjusted.

9.3.3 If the Parties disagree as to whether work required by Owner is within the scope of the Work, Construction Manager shall furnish Owner with an estimate of the costs to perform the disputed work in accordance with Owner's interpretations.

9.4 CHANGES NOTICE Except as provided in §6.3.2 and §6.4 for any claim for an increase in the GMP or the Date of Substantial Completion or Date of Final Completion, Construction Manager shall give Owner written notice of the claim within fourteen (14) Days after the occurrence giving rise to the claim or within fourteen (14) Days after Construction Manager first recognizes the condition giving rise to the claim, whichever is later. Owner's failure to so respond shall be deemed a denial of Construction Manager's claim. Except in an emergency, notice shall be given before proceeding with the Work. Thereafter, Construction Manager shall submit written documentation of its claim, including appropriate supporting documentation, within twenty-one (21) Days after giving notice, unless the Parties mutually agree upon a longer period of time. No later than fourteen (14) Days after receipt, Owner shall respond in writing denying or approving the claim. Owner's failure to so respond shall be deemed a denial of the claim. Any change in the GMP or the Date of Substantial Completion or Date of Final Completion resulting from such claim shall be authorized by Change Order.

9.5 INCIDENTAL CHANGES Owner may direct Construction Manager to perform incidental changes in the Work, upon concurrence with Construction Manager that such changes do not involve adjustments in the Contract Price or the Contract Time. Incidental changes shall be consistent with the scope and intent of the Contract Documents. Owner shall initiate an incidental change in the Work by issuing a written order to Construction Manager. Such written notice shall be carried out promptly and is binding on the Parties.

ARTICLE 10 PAYMENT

10.1 SCHEDULE OF VALUES Within twenty-one (21) Days from the date of execution of this Agreement, Construction Manager shall prepare and submit to Owner and Design Professional a schedule of values apportioned to the various divisions or phases of the Work. Each line item contained in the schedule of values shall be assigned a value such that the total of all items shall equal the GMP.

10.2 PROGRESS PAYMENTS

10.2.1 APPLICATIONS Construction Manager shall submit to Owner and, if directed, Design Professional a monthly application for payment no later than the [_____] ([_____] Day of the



calendar month for the preceding calendar month. Construction Manager's applications for payment shall be itemized and supported by Construction Manager's schedule of values based on a percentage of completion and shall include any other substantiating data as required by this Agreement. Applications for payment shall include payment requests on account of properly authorized Change Orders or Interim Directives. Owner shall pay the amount otherwise due on any payment application, as certified by Design Professional, no later than fifteen (15) Days after accepting such application. Owner may deduct from any progress payment amounts that may be retained pursuant to §10.2.4.

10.2.2 STORED MATERIALS AND EQUIPMENT Unless otherwise provided in the contract documents, applications for payment may include materials and equipment not yet incorporated into the Work but delivered to and suitably stored onsite or offsite including applicable insurance, storage, and costs incurred transporting the materials to an offsite storage facility. Approval of payment applications for stored materials and equipment stored offsite shall be conditioned on a submission by Construction Manager of bills of sale and proof of required insurance, or such other documentation satisfactory to Owner to establish the proper valuation of the stored materials and equipment, Owner's title to such materials and equipment, and to otherwise protect Owner's interests therein, including transportation to the Worksite.

10.2.3 LIEN WAIVERS AND LIENS

10.2.3.1 PARTIAL LIEN WAIVERS AND AFFIDAVITS If required by Owner, as a prerequisite for payment, Construction Manager shall provide a partial lien and claim waiver in the amount of the application for payment and affidavits from its Subcontractors and Suppliers for the completed Work. Such waivers shall be conditional upon payment. In no event shall Construction Manager be required to sign an unconditional waiver of lien or claim, before receiving payment or in an amount in excess of what it has been paid.

10.2.3.2 RESPONSIBILITY FOR LIENS If Owner has made payments in the time required by this article, Construction Manager shall, within thirty (30) Days after filing, remove any liens filed against the premises or public improvement fund by any party or parties performing labor or services or supplying materials in connection with the Work. If Construction Manager fails to take such action on a lien, Owner may cause the lien to be removed at Construction Manager's expense, including bond costs and reasonable attorneys' fees. This subsection shall not apply if there is a dispute pursuant to ARTICLE 13 relating to the subject matter of the lien.

10.2.4 RETAINAGE From each progress payment made before Substantial Completion, Owner may retain [_____] percent ([_____]%), of the amount otherwise due after deduction of any amounts as provided in §10.3, provided such percentage doesn't exceed the Law. If Owner chooses to use this retainage provision:

10.2.4.1 after the Work is fifty percent (50%) complete, Owner shall withhold no additional retainage and shall pay Construction Manager the full amount due on account of subsequent progress payments;

10.2.4.2 Owner may, in its sole discretion, reduce the amount to be retained at any time;

10.2.4.3 Owner may release retainage on that portion of the Work a Subcontractor has completed in whole or in part, and which Owner has accepted. In lieu of retainage, Construction Manager may furnish a retention bond or other security interest acceptable to Owner, to be held by Owner.



10.3 ADJUSTMENT OF CONSTRUCTION MANAGER'S PAYMENT APPLICATION Owner may adjust or reject a payment application or nullify a previously approved payment application, in whole or in part, as may reasonably be necessary to protect Owner from loss or damage based upon the following, to the extent that Construction Manager is responsible under this Agreement:

10.3.1 Construction Manager's repeated failure to perform the Work as required by the Contract Documents;

10.3.2 except as accepted by the insurer providing builder's risk or other property insurance covering the Project, loss or damage arising out of or relating to this Agreement and caused by Construction Manager to Owner or others to whom Owner may be liable;

10.3.3 Construction Manager's failure to properly pay Subcontractors and Suppliers following receipt of such payment from Owner for that portion of the Work or for supplies, provided that Owner is making payments to Construction Manager in accordance with this Agreement;

10.3.4 rejected or Defective Work not corrected in a timely fashion;

10.3.5 reasonable evidence of delay in performance of the Work such that the Work will not be completed by the Dates of Substantial or Final Completion;

10.3.6 reasonable evidence demonstrating that the unpaid balance of the GMP is insufficient to fund the cost to complete the Work; and

10.3.7 uninsured third-party claims involving Construction Manager or reasonable evidence demonstrating that third-party claims are likely to be filed unless and until Construction Manager furnishes Owner with adequate security in the form of a surety bond, letter of credit, or other collateral or commitment sufficient to discharge such claims if established.

No later than seven (7) Days after receipt of an application for payment, Owner shall give written notice to Construction Manager, at the time of disapproving or nullifying all or part of an application for payment, stating its specific reasons for such disapproval or nullification, and the remedial actions to be taken by Construction Manager in order to receive payment. When the above reasons for disapproving or nullifying an application for payment are removed, payment will be promptly made for the amount previously withheld.

10.4 ACCEPTANCE OF WORK Neither Owner's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of Work not complying with the Contract Documents.

10.5 PAYMENT DELAY If for any reason not the fault of Construction Manager Construction Manager does not receive a progress payment from Owner within seven (7) Days after the time such payment is due, then Construction Manager, upon giving seven (7) Days' written notice to Owner, and without prejudice to and in addition to any other legal remedies, may stop Work until payment of the full amount owing to Construction Manager has been received, including interest for late payment. If Construction Manager incurs costs or is delayed resulting from shutdown, delay, and start-up, Construction Manager may seek an equitable adjustment in the GMP and Dates of Substantial or Final Completion may be equitably adjusted by a Change Order in accordance with ARTICLE 9.

10.6 SUBSTANTIAL COMPLETION

10.6.1 Construction Manager shall notify Owner and, if directed, Design Professional when it considers Substantial Completion of the Work or a designated portion to have been achieved. Owner, with the assistance of its Design Professional, shall promptly conduct an inspection to determine



whether the Work or designated portion can be occupied or used for its intended use by Owner without excessive interference in completing any remaining unfinished Work. If Owner determines that the Work or designated portion has not reached Substantial Completion, Owner, with the assistance of its Design Professional, shall promptly compile a list of items to be completed or corrected so Owner may occupy or use the Work or designated portion for its intended use. Construction Manager shall promptly complete all items on the list.

10.6.2 When Substantial Completion of the Work or a designated portion is achieved, Construction Manager shall prepare a Certificate of Substantial Completion establishing the date of Substantial Completion and the respective responsibilities of each Party for interim items such as security, maintenance, utilities, insurance, and damage to the Work, and fixing the time for completion of all items on the list accompanying the Certificate. The Certificate of Substantial Completion shall be submitted by Construction Manager to Owner and, if directed, to Design Professional for written acceptance of responsibilities assigned in the Certificate of Substantial Completion.

10.6.3 Unless otherwise provided in the Certificate of Substantial Completion, warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or a designated portion.

10.6.4 Upon Owner's written acceptance of the Certificate of Substantial Completion, Owner shall pay to Construction Manager the remaining retainage held by Owner for the Work described in the Certificate of Substantial Completion less a sum equal to one hundred and fifty percent (150%) of the estimated cost of completing or correcting remaining items on that part of the Work, as agreed to by the Parties as necessary to achieve Final Completion. Uncompleted items shall be completed by Construction Manager in a mutually agreed upon timeframe. Owner shall pay Construction Manager monthly the amount retained for unfinished items as each item is completed.

10.7 PARTIAL OCCUPANCY OR USE

10.7.1 Owner may occupy or use completed or partially completed portions of the Work when (a) the portion of the Work is designated in a Certificate of Substantial Completion, (b) appropriate insurer(s) consent to the occupancy or use, and (c) public authorities authorize the occupancy or use. Construction Manager shall not unreasonably withhold consent to partial occupancy or use. Owner shall not unreasonably refuse to accept partial occupancy.

10.8 FINAL COMPLETION AND FINAL PAYMENT

10.8.1 Upon notification from Construction Manager that the Work is complete and ready for final inspection and acceptance, Owner, with the assistance of its Design Professional shall promptly conduct an inspection to determine if the Work has been completed and is acceptable under the Contract Documents.

10.8.2 When the Work is complete, Construction Manager shall prepare for Owner's written acceptance a final application for payment stating that to the best of Construction Manager's knowledge, and based on Owner's inspections, the Work has reached Final Completion in accordance with the Contract Documents.

10.8.3 Final payment of the balance of the GMP shall be made to Construction Manager within twenty (20) Days after Construction Manager has submitted an application for final payment, including submissions required under §10.8.4, and a Certificate of Final Completion has been executed by the Parties.

10.8.4 Final payment shall be due on Construction Manager's submission of the following to Owner:



10.8.4.1 an affidavit declaring any indebtedness connected with the Work, to have been paid, satisfied, or to be paid with the proceeds of final payment, so as not to encumber Owner's property;

10.8.4.2 as-built drawings, manuals, copies of warranties, and all other close-out documents required by the Contract Documents;

10.8.4.3 release of any liens, conditioned on final payment being received;

10.8.4.4 consent of any surety; and

10.8.4.5 any outstanding known and unreported accidents or injuries experienced by Construction Manager or its Subcontractors at the Worksite.

10.8.5 If, after Substantial Completion of the Work, the Final Completion of a portion of the Work is materially delayed through no fault of Construction Manager, Owner shall pay the balance due for any portion of the Work fully completed and accepted. If the remaining contract balance for Work not fully completed and accepted is less than the retained amount before payment, Construction Manager shall submit to Owner and, if directed, Design Professional the written consent of any surety to payment of the balance due for portions of the Work that are fully completed and accepted. Such payment shall not constitute a waiver of claims, but otherwise shall be governed by this §10.8.

10.8.6 OWNER RESERVATION OF CLAIMS Owner's claims not reserved in writing with final payment are waived, except for claims relating to liens or similar encumbrances, warranties, Defective Work, and latent defects.

10.8.7 ACCEPTANCE OF FINAL PAYMENT Unless Construction Manager provides written identification of unsettled claims with an application for final payment, its acceptance of final payment constitutes a waiver of such claims.

10.9 LATE PAYMENT Payments due but unpaid shall bear interest from the date payment is due at the statutory rate at the place of the Project.

ARTICLE 11 INDEMNITY, INSURANCE, AND BONDS

11.1 INDEMNITY

11.1.1 To the fullest extent permitted by law, Construction Manager shall indemnify and hold harmless Owner, Owner's officers, directors, members, consultants, agents, and employees, Design Professional, and Others (the "Indemnitees") from all claims for bodily injury and property damage, other than to the Work itself and other property insured, including reasonable attorneys' fees, costs, and expenses, that may arise from the performance of the Work, but only to the extent caused by the negligent or intentionally wrongful acts or omissions of Construction Manager, Subcontractors, Suppliers, Subsubcontractors, or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable. Construction Manager shall be entitled to reimbursement of any defense costs paid above Construction Manager's percentage of liability for the underlying claim to the extent provided for by §11.1.2.

11.1.2 To the fullest extent permitted by law, Owner shall indemnify and hold harmless Construction Manager, its officers, directors, members, consultants, agents, and employees, Subcontractors, Suppliers, or anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable from all claims for bodily injury and property damage, other than property insured,



including reasonable attorneys' fees, costs, and expenses, that may arise from the performance of work by Owner, Design Professional, or Others, but only to the extent caused by the negligent or intentionally wrongful acts or omissions by Owner, Design Professional, or Others. Owner shall be entitled to reimbursement of any defense costs paid above Owner's percentage of liability for the underlying claim to the extent provided for by §11.1.1.

11.1.3 NO LIMITATION ON LIABILITY In any and all claims against the Indemnitees by any employee of Construction Manager, anyone directly or indirectly employed by Construction Manager, or anyone for whose acts Construction Manager may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Construction Manager under workers' compensation acts, disability benefit acts, or other employment benefit acts.

11.2 INSURANCE

11.2.1 Before starting the Work and as a condition precedent to payment, Construction Manager shall procure and maintain in force Workers' Compensation Insurance, Employers' Liability Insurance, Business Automobile Liability Insurance, and Commercial General Liability Insurance ("CGL"). The CGL policy shall include coverage for liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, contractual liability, and broad form property damage. Construction Manager shall maintain completed operations liability insurance for one year after Substantial Completion, or as required by the Contract Documents, whichever is longer. Construction Manager's Employers' Liability, Business Automobile Liability and CGL policies shall be written with at least the following limits of liability:

11.2.1.1 Employers' Liability Insurance

- (a) \$[_____] bodily injury by accident per accident.
- (b) \$[_____] bodily injury by disease policy limit.
- (c) \$[_____] bodily injury by disease per employee.

11.2.1.2 Business Automobile Liability Insurance \$[_____] per accident.

11.2.1.3 Commercial General Liability Insurance

- (a) \$[_____] per occurrence.
- (b) \$[_____] general aggregate.
- (c) \$[_____] products/completed operations aggregate.
- (d) \$[_____] personal and advertising injury limit.

11.2.2 Employers' Liability, Business Automobile Liability, and CGL coverages required under §11.2.1 may be provided by a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or umbrella liability policies.

11.2.3 Construction Manager shall maintain in effect all insurance coverage required under §11.2.1 with insurance companies lawfully authorized to do business in the jurisdiction in which the Project is located. If Construction Manager fails to obtain or maintain any insurance coverage required under this Agreement, Owner may purchase such coverage and charge the expense to Construction Manager, or terminate this Agreement.

11.2.4 To the extent commercially available to Construction Manager from its current insurance company, insurance policies required under §11.2.1 shall contain a provision that the insurance company or its designee must give Owner written notice transmitted in paper or electronic format: (a) thirty (30) Days before coverage is nonrenewed by the insurance company and (b) within ten (10) Business Days after cancelation of coverage by the insurance company. Before commencing the



Work and upon renewal or replacement of the insurance policies, Construction Manager shall furnish Owner with certificates of insurance until one year after Substantial Completion or longer if required by the Contract Documents. In addition, if any insurance policy required under §11.2.1 is not to be immediately replaced without lapse in coverage when it expires, exhausts its limits, or is to be cancelled, Construction Manager shall give Owner prompt written notice upon actual or constructive knowledge of such condition.

11.3 PROPERTY INSURANCE

11.3.1 Unless otherwise directed in writing by Owner, before starting the Work, Construction Manager shall obtain and maintain a Builder's Risk Policy upon the entire Project for the full cost of replacement at the time of loss, including existing structures. This insurance shall also (a) name Construction Manager, Subcontractors, Subsubcontractors, and Design Professional as named insureds; (b) be written in such form to cover all risks of physical loss except those specifically excluded by the policy; and (c) insure at least against and not exclude:

11.3.1.1 the perils of fire, lightning, explosion, windstorm, hail, smoke, aircraft (except aircraft, including helicopter, operated by or on behalf of Construction Manager) and vehicles, riot and civil commotion, theft, vandalism, malicious mischief, debris removal, flood, earthquake, earth movement, water damage, wind damage, testing if applicable, collapse, however caused;

11.3.1.2 damage resulting from defective design, workmanship, or material;

11.3.1.3 coverage extension for damage to existing buildings, plant, or other structures at the Worksite, when the Project is contained within or attached to such existing buildings, plant or structures. Coverage shall be to the extent loss or damage arises out of Construction Manager's activities or operations at the Project;

11.3.1.4 equipment breakdown, including mechanical breakdown, electrical injury to electrical devices, explosion of steam equipment, and damage to steam equipment caused by a condition within the equipment;

11.3.1.5 testing coverage for running newly installed machinery and equipment at or beyond the specified limits of their capacity to determine whether they are fit for their intended use; and

11.3.1.6 physical loss resulting from Terrorism.

11.3.2 The Party that is the primary cause of a Builder's Risk Policy claim shall be responsible for any deductible amounts or coinsurance payments. If no Party is the primary cause of a claim, then the Party obtaining and maintaining the Builder's Risk Policy pursuant to §11.3.1 shall be responsible for the deductible amounts or coinsurance payments. This policy shall provide for a waiver of subrogation. This insurance shall remain in effect until final payment has been made or until no person or entity other than Owner has an insurable interest in the property to be covered by this insurance, whichever is sooner. Partial occupancy or use of the Work shall not commence until Owner has secured the consent of the insurance company or companies providing the coverage required in this subsection. Before commencing the Work, Owner shall provide a copy of the property policy or policies obtained in compliance with this §11.3.

11.3.3 If Owner elects to purchase the property insurance required by this Agreement, including all of the coverages and deductibles for the same durations specified in this §11.3, Owner shall give written notice to Construction Manager before the Work is commenced and provide a copy of the property policy or policies obtained in compliance with this §11.3. Owner may then provide insurance to protect its interests and the interests of the Construction Manager, Subcontractors, Suppliers, and



Subsubcontractors. The cost of this insurance shall be paid by Owner in a Change Order. If Owner gives written notice of its intent to purchase property insurance required by this Agreement and fails to purchase or maintain such insurance, Owner shall be responsible for costs reasonably attributed to such failure.

11.3.4 The Parties each waive all rights against each other and their respective employees, agents, contractors, subcontractors, suppliers, subsubcontractors, and design professionals for damages caused by risks covered by the property insurance provided under §11.3.1, except such rights as they may have to the proceeds of the insurance. To the extent of the limits of Construction Manager's Commercial General Liability Insurance specified in §11.2.1 or [_____] dollars (\$[_____]), whichever is more, Construction Manager shall indemnify and hold harmless Owner against any and all liability, claims, demands, damages, losses, and expenses, including attorneys' fees, in connection with or arising out of any damage or alleged damage to any of Owner's existing adjacent property that may arise from the performance of the Work, to the extent caused by the negligent or intentionally wrongful acts or omissions of Construction Manager, Subcontractor, Supplier, Subsubcontractor, or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable.

11.3.5 RISK OF LOSS Except to the extent a loss is covered by applicable insurance, risk of loss from damage to the Work shall be upon the Party obtaining and maintaining the Builder's Risk Policy pursuant to §11.3.1 until the Date of Final Completion.

11.3.6 POLLUTION LIABILITY INSURANCE Construction Manager is/ is not required to maintain pollution liability insurance. Unless indicated affirmatively, the obligation to procure such insurance is not triggered.

11.3.6.1 If applicable: in the following amounts: [_____] per occurrence, and shall apply for [_____] year(s) after Final Completion. The policy shall cover Construction Manager's liability during construction, removal, storage, encapsulation, transport and disposal of hazardous waste and contaminated soil, and asbestos abatement. The policy shall include coverage for on-site and off-site bodily injury and loss of damage to, or loss of use of property, directly or indirectly arising out of the discharge, dispersal, release, or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gas, waste materials, or other irritants, contaminants or pollutants into or upon the land, the atmosphere or any water body, whether it be gradual or sudden and accidental. The policy shall not have exclusions for mold or asbestos.

11.4 ADDITIONAL GENERAL LIABILITY COVERAGE Owner shall/ shall not require Construction Manager to purchase and maintain additional liability coverage. If required, Construction Manager shall provide:

11.4.1 Additional Insured. Owner shall be named as an additional insured on Construction Manager's CGL specified, for on-going operations and completed operations, excess/umbrella liability, commercial automobile liability, and any required pollution liability, but only with respect to liability for bodily injury, property damage, or personal and advertising injury to the extent caused by the negligent acts or omissions of Construction Manager, or those acting on Construction Manager's behalf, in the performance of Construction Manager's work for Owner at the Worksite. The insurance of the Construction Manager and its Subcontractors (both primary and excess) shall be primary to any insurance available to the Additional Insureds. Any insurance available to the Additional Insureds shall be excess and non-contributory.



11.4.2 OCP. Construction Manager shall provide an Owners' and Contractors' Protective Liability Insurance ("OCP") policy with limits equal to the limits on CGL specified, or limits as otherwise required by Owner.

Any documented additional cost in the form of a surcharge associated with procuring the additional liability coverage in accordance with this subsection shall be paid by Owner directly or the costs may be reimbursed by Owner to Construction Manager by increasing the Contract Price to correspond to the actual cost required to purchase and maintain the coverage. Before commencing the Work, Construction Manager shall provide either a copy of the OCP policy, or a certificate and endorsement evidencing that Owner has been named as an additional insured, as applicable.

11.4.3 ROYALTIES, PATENTS, AND COPYRIGHTS Construction Manager shall pay all royalties and license fees which may be due on the inclusion of any patented or copyrighted materials, methods, or systems selected by Construction Manager and incorporated in the Work. Construction Manager shall defend, indemnify, and hold Owner harmless from all suits or claims for infringement of any patent rights or copyrights arising out of such selection. Owner agrees to defend, indemnify, and hold Construction Manager harmless from any suits or claims of infringement of any patent rights or copyrights arising out of any patented or copyrighted materials, methods, or systems specified by Owner or Design Professional.

11.5 BONDS Performance and Payment Bonds are/ are not required of Construction Manager. Such bonds shall be issued by a surety admitted in the state in which the Project is located and must be acceptable to Owner. Owner's acceptance shall not be withheld without a reasonable cause. The penal sum of the bonds shall each be one hundred percent (100%) of the GMP. Construction Manager shall endeavor to keep its surety advised of changes potentially impacting the GMP and Contract Time, though Construction Manager shall require that its surety waives any requirement to be notified of any alteration or extension of time.

11.6 PROFESSIONAL LIABILITY INSURANCE To the extent Construction Manager is required to procure design services in accordance with §3.17, Construction Manager shall require its design professionals to obtain professional liability insurance for claims arising from the negligent performance of professional services under this Agreement, with a company reasonably satisfactory to Owner, including coverage for all professional liability caused by any consultants to Construction Manager's design professional, written for not less than [_____] dollars (\$[_____]) per claim and in the aggregate with the deductible not to exceed [_____] dollars (\$[_____]). Construction Manager's design professional shall pay the deductible. The Professional Liability Insurance shall contain a retroactive date providing prior acts coverage sufficient to cover all Services performed by the Construction Manager's design professional for this Project. Coverage shall be continued in effect for [_____] ([_____]) year(s) following Substantial Completion. Construction Manager's design professional shall pay the self-insured retention and deductible. The combined total deductible and self-insured retention maximum shall be [_____] dollars (\$[_____]).

ARTICLE 12 SUSPENSION, NOTICE TO CURE, AND TERMINATION

12.1 SUSPENSION BY OWNER FOR CONVENIENCE

12.1.1 OWNER SUSPENSION Should Owner order Construction Manager in writing to suspend, delay, or interrupt the performance of the Work for the convenience of Owner and not due to any act or omission of Construction Manager or any person or entity for whose acts or omissions Construction Manager may be liable, then Construction Manager shall immediately suspend, delay, or interrupt that portion of the Work for the time period ordered by Owner.



12.1.2 Any action taken by Owner that is permitted by any other provision of the Contract Documents and that results in a suspension of part or all of the Work does not constitute a suspension of Work under this section.

12.2 NOTICE TO CURE A DEFAULT If Construction Manager persistently fails to supply enough properly qualified workers, proper materials, or equipment to maintain the approved Schedule of the Work or fails to make prompt payment to its workers, Subcontractors, or Suppliers, disregards a Law or orders of any public authority having jurisdiction, or is otherwise guilty of a material breach of a provision of this Agreement, Construction Manager may be deemed in default.

12.2.1 After receiving Owner's written notice, if Construction Manager fails within seven (7) Days after receipt of written notice to commence and continue satisfactory correction of such default with diligence and promptness, then Owner shall give Construction Manager a second notice to correct the default within three (3) Business Days after receipt. The second notice to Construction Manager, and if applicable, the surety, may include, that Owner intends to terminate this Agreement for default absent appropriate corrective action.

12.2.2 If Construction Manager fails to promptly commence and continue satisfactory correction of the default following receipt of such second notice, Owner without prejudice to any other rights or remedies may: (a) take possession of the Worksite; (b) complete the Work utilizing reasonable means; (c) withhold payment due to Construction Manager; and (d) as Owner deems necessary, supply workers and materials, equipment, and other facilities for the satisfactory correction of the default, and charge Construction Manager, the costs and expenses, including reasonable Overhead, profit, and attorneys' fees.

12.2.3 In the event of an emergency affecting the safety of persons or property, Owner may immediately commence and continue satisfactory correction of such default without first giving written notice to Construction Manager, but shall give Construction Manager prompt written notice.

12.3 OWNER'S RIGHT TO TERMINATE FOR DEFAULT

12.3.1 Upon expiration of the second notice to cure pursuant to §12.2, and absent appropriate corrective action, Owner may terminate this Agreement by written notice. Termination for default is in addition to any other remedies available to Owner under §12.2. Termination for default is in addition to any other remedies available to Owner under §12.2. If Owner's costs arising out of Construction Manager's failure to cure, including the costs of completing the Work and reasonable attorneys' fees, exceed the unpaid GMP, Construction Manager shall be liable to Owner for such excess costs. If Owner's costs are less than the unpaid GMP, Owner shall pay the difference to Construction Manager. If Owner exercises its rights under this section, upon the request of Construction Manager, Owner shall furnish to Construction Manager a detailed accounting of the costs incurred by Owner.

12.3.2 If Owner or Others perform work under this section, Owner shall have the right to take and use any materials and supplies for which Owner has paid and located at the Worksite for the purpose of completing any remaining Work. Owner or Others performing work under §12.3 shall also have the right to use construction tools and equipment belonging to the Construction Manager or its subcontractors and located on the Worksite for the purpose of completing the remaining Work but only after Construction Manager's written consent which shall not be unreasonably withheld. If Owner uses Construction Manager's construction tools and equipment in accordance with this subsection, then Owner shall indemnify and hold harmless Construction Manager and applicable Subcontractors and the agents, officers, directors, and employees of each of them, from and against all claims, damages, losses, costs, and expenses, including but not limited to reasonable attorneys' fees, costs, and expenses incurred in connection with Owner's use of Construction Manager's or applicable subcontractor's construction tools and equipment. Immediately upon completion of the Work, any



remaining materials, supplies, or equipment not consumed or incorporated in the Work shall be returned to Construction Manager in substantially the same condition as when they were taken, reasonable wear and tear excepted.

12.3.3 If Construction Manager files a petition under the Bankruptcy Code, this Agreement shall terminate if: (a) Construction Manager or Construction Manager's trustee rejects the Agreement; (b) a default occurred and Construction Manager is unable to give adequate assurance of required performance; or (c) Construction Manager is otherwise unable to comply with the requirements for assuming this Agreement under the applicable provisions of the Bankruptcy Code.

12.3.4 Owner shall make reasonable efforts to mitigate damages arising from Construction Manager's default, and shall promptly invoice Construction Manager for all amounts due pursuant to §12.2 and §12.3.

12.4 TERMINATION BY OWNER FOR CONVENIENCE

12.4.1 Upon Construction Manager's receipt of written notice from Owner, Owner may, without cause, terminate this Agreement. Construction Manager shall immediately stop the Work, follow Owner's instructions regarding shutdown and termination procedures, and strive to minimize any further costs.

12.4.2 If Owner terminates this Agreement for convenience, Construction Manager shall be paid (a) for the Work performed to date including Overhead and profit; (b) for all demobilization costs and costs incurred resulting from termination, but not including Overhead or profit on Work not performed; and (c) reasonable attorneys' fees and costs related to termination; and (d) a premium as follows: [_____].

12.4.3 If Owner terminates this Agreement, Construction Manager shall:

12.4.3.1 execute and deliver to Owner all papers and take all action required to assign, transfer, and vest in Owner the rights of Construction Manager to all materials, supplies, and equipment for which payment has been or will be made in accordance with the Contract Documents and all subcontracts, orders, and commitments which have been made in accordance with the Contract Documents;

12.4.3.2 exert reasonable effort to reduce to a minimum Owner's liability for subcontracts, orders, and commitments that have not been fulfilled at the time of the termination;

12.4.3.3 cancel any subcontracts, orders, and commitments as Owner directs; and

12.4.3.4 sell at prices approved by Owner any materials, supplies, and equipment as Owner directs, with all proceeds paid or credited to Owner.

12.5 CONSTRUCTION MANAGER'S RIGHT TO TERMINATE

12.5.1 Seven (7) Days after Owner's receipt of written notice from Owner, Construction Manager may terminate this Agreement if the Work has been stopped for a thirty (30) Day period through no fault of Construction Manager for any of the following reasons:

12.5.1.1 under court order or order of other governmental authorities having jurisdiction;

12.5.1.2 as a result of the declaration of a national emergency or other governmental act during which, through no act or fault of Construction Manager, materials are not available; or



12.5.1.3 suspension by Owner for convenience pursuant to §12.1.

12.5.2 In addition, upon seven (7) Days' written notice to Owner and an opportunity to cure within three (3) Days, Construction Manager may terminate this Agreement if Owner:

12.5.2.1 fails to furnish reasonable evidence pursuant to §4.2 that sufficient funds are available and committed for Project financing, or

12.5.2.2 assigns this Agreement over Construction Manager's reasonable objection, or

12.5.2.3 fails to pay Construction Manager in accordance with this Agreement and Construction Manager has stopped Work in compliance with §10.5, or

12.5.2.4 otherwise materially breaches this Agreement.

12.5.3 Upon termination by Construction Manager in accordance with this section, Construction Manager shall be entitled to recover from Owner payment for all Work executed and for any proven loss, cost, or expense in connection with the Work, including all demobilization costs plus reasonable Overhead and profit on Work not performed.

12.6 OBLIGATIONS ARISING BEFORE TERMINATION Even after termination, the provisions of this Agreement still apply to any Work performed, payments made, events occurring, costs charged or incurred, or obligations arising before the termination date.

ARTICLE 13 DISPUTE MITIGATION AND RESOLUTION

13.1 WORK CONTINUANCE AND PAYMENT Unless otherwise agreed in writing, Construction Manager shall continue the Work and maintain the Schedule of the Work during any dispute mitigation or resolution proceedings. If Construction Manager continues to perform, Owner shall continue to make payments in accordance with this Agreement.

13.2 DIRECT DISCUSSIONS If the Parties cannot reach resolution on a matter relating to or arising out of this Agreement, the Parties shall endeavor to reach resolution through good faith direct discussions between the Parties' representatives, who shall possess the necessary authority to resolve such matter and who shall record the date of first discussions. If the Parties' representatives are not able to resolve such matter within five (5) Business Days from the date of first discussion, the Parties' representatives shall immediately inform senior executives of the Parties in writing that a resolution could not be reached. Upon receipt of such notice, the senior executives of the Parties shall meet within five (5) Business Days to endeavor to reach resolution. If the dispute remains unresolved after fifteen (15) Days from the date of first discussion, the Parties shall submit such matter to the dispute mitigation and dispute resolution procedures selected below.

13.3 MITIGATION If the Parties select one of the dispute mitigation procedures provided in this section, disputes remaining unresolved after direct discussions shall be directed to the selected mitigation procedure. The dispute mitigation procedure shall result in a nonbinding finding on the matter, which may be introduced as evidence at a subsequent binding adjudication of the matter, as designated in §13.5. The Parties agree that the dispute mitigation procedure shall be:

- Project Neutral
- Dispute Review Board.



13.3.1 MITIGATION PROCEDURES As soon as practicable after the execution of this Agreement, the Project Neutral/Dispute Review Board ("Neutral/Board") shall be mutually selected and appointed by the Parties and shall execute a retainer agreement with the Parties establishing the scope of the Neutral's/Board's responsibilities. The costs and expenses of the Neutral/Board shall be shared equally by the Parties. The Neutral/Board shall be available to either Party, upon request, throughout the course of the Project, and shall make regular visits to the Project so as to maintain an up-to-date understanding of the Project progress and issues and to enable the Neutral/Board to address matters in dispute between the Parties promptly and knowledgeably. The Neutral/Board shall issue nonbinding findings within five (5) Business Days of referral of the matter to the Neutral/Board, unless good cause is shown.

13.3.2 If the matter remains unresolved following the issuance of the nonbinding finding by the mitigation procedure or if the Neutral/Board fails to issue nonbinding findings within five (5) Business Days of the referral, the Parties shall submit the matter to the binding dispute resolution procedure designated in §13.5 ("DRB").

13.3.3 MITIGATION PROCEDURES As soon as practicable after the execution of this Agreement, the Neutral or DRB shall be mutually selected and appointed by the Parties and shall execute a retainer agreement with the Parties establishing the scope of responsibilities, including requirements for nonbinding findings. Costs and expenses of the Neutral or DRB shall be shared equally by the Parties. A Neutral or DRB shall be available to either Party, upon request, throughout the course of the Project, and shall make regular visits to the Project so as to maintain an up-to-date understanding of the Project progress and issues and to enable the Neutral or DRB to address matters in dispute between the Parties promptly and knowledgeably.

13.3.4 If the matter remains unresolved following the issuance of the nonbinding findings or such findings are not made within five (5) Business Days of the referral, the Parties shall submit the matter to the binding dispute resolution procedure designated in §13.5.

13.3.5 If the Parties execute a DRB Addendum, then the dispute mitigation procedures and time requirements in §13.3.1 and §13.3.2. shall be governed by that DRB Addendum.

13.4 MEDIATION If direct discussions pursuant to §13.2 do not result in resolution of the matter and no dispute mitigation procedure is selected under §13.3, the Parties shall endeavor to resolve the matter by mediation through the current Construction Industry Mediation Rules of the American Arbitration Association, or the Parties may mutually agree to select another set of mediation rules. The administration of the mediation shall be as mutually agreed by the Parties. The mediation shall be convened within thirty (30) Days of the matter first being discussed and shall conclude within forty-five (45) Business Days of the matter first being discussed. Either Party may terminate the mediation at any time after the first session by written notice to the non-terminating Party and mediator. The costs of the mediation shall be shared equally by the Parties.

13.5 BINDING DISPUTE RESOLUTION If the matter is unresolved after submission of the matter to a mitigation procedure or to mediation, the Parties shall submit the matter to the binding dispute resolution procedure selected below:

Arbitration using:

- the current Construction Industry Arbitration Rules of the AAA and administered by the AAA;
- the current JAMS Engineering and Construction Arbitration Rules and Procedures and administered by JAMS; or
- the current arbitration rules of [_____] and administered by [_____].



Unless the Parties mutually agree otherwise in writing, if arbitration is selected as the binding dispute resolution procedure and this Agreement does not specify the arbitration rules to be utilized, then the arbitration shall be conducted using the current Construction Industry Arbitration Rules of the AAA and the arbitration shall be administered by the AAA.

Litigation in either the state or federal court having jurisdiction of the matter in the location of the Project.

13.6 COSTS The costs of any binding dispute resolution procedures and reasonable attorneys' fees shall be borne by the non-prevailing Party, as determined by the adjudicator of the dispute.

13.7 VENUE To the extent permitted by Law, the venue of any binding dispute resolution procedure shall be the location of the Project.

13.8 MULTIPARTY PROCEEDING All parties necessary to resolve a matter agree to be parties to the same dispute resolution proceeding, if possible. Appropriate provisions shall be included in all other contracts relating to the Work to provide for the joinder or consolidation of such dispute resolution procedures.

13.9 LIEN RIGHTS Nothing in this article shall limit any rights or remedies not expressly waived by Construction Manager which Construction Manager may have under lien laws.

ARTICLE 14 MISCELLANEOUS

14.1 EXTENT OF AGREEMENT Except as expressly provided, this Agreement is for the exclusive benefit of the Parties, and not the benefit of any third party. This Agreement represents the entire and integrated agreement between the Parties, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement and each and every provision is for the exclusive benefit of the Parties and not for the benefit of any third party.

14.2 ASSIGNMENT Except as to the assignment of proceeds, neither Party shall assign their interest in this Agreement without the written consent of the other Party. The terms and conditions of this Agreement shall be binding upon both Parties, their partners, successors, assigns, and legal representatives. Neither Party shall assign the Agreement as a whole without written consent of the other except that Owner may assign the Agreement to a wholly owned subsidiary of Owner when Owner has fully indemnified Construction Manager or to an institutional lender providing construction financing for the Project as long as the assignment is no less favorable to Construction Manager than this Agreement. If such assignment occurs, Construction Manager shall execute any consent reasonably required. In such event, the wholly owned subsidiary or lender shall assume Owner's rights and obligations under the Contract Documents. If either Party attempts to make such an assignment, that Party shall nevertheless remain legally responsible for all obligations under this Agreement, unless otherwise agreed by the other Party.

14.3 GOVERNING LAW The law in effect at the location of the Project shall govern this Agreement.

14.4 SEVERABILITY The partial or complete invalidity of any one or more provisions of this Agreement shall not affect the validity or continuing force and effect of any other provision.

14.5 NOTICE Unless changed in writing, a Party's address indicated in Article 1 shall be used when delivering notice to a physical address. Except for Agreement termination and as otherwise specified in the Contract Documents, notice is effective upon transmission by any effective means, including U.S. postal service and overnight delivery service.



14.6 NO WAIVER OF PERFORMANCE Either Party's failure to insist upon any of its rights, in any one or more instances, on the performance of any of the terms, covenants, or conditions of this Agreement, or to exercise any of its rights, shall not be construed as a waiver or relinquishment of such term, covenant, condition, or right with respect to further performance or any other term, covenant, condition, or right.

14.7 TITLES The titles given to the articles are for ease of reference only and shall not be relied upon or cited for any other purpose.

14.8 JOINT DRAFTING The Parties expressly agree that this Agreement was jointly drafted, and that both had opportunity to negotiate its terms and to obtain the assistance of counsel in reviewing its terms before execution. Therefore, this Agreement shall be construed neither against nor in favor of either Party, but shall be construed in a neutral manner.

ARTICLE 15 CONTRACT DOCUMENTS

15.1 EXISTING CONTRACT DOCUMENTS The Contract Documents in existence at the time of execution of this Agreement are as follows:

- (a) Drawings: [_____]
- (b) Specifications: [_____]
- (c) Addenda: [_____]
- (d) Owner Provided information: [_____]
- (e) Other: [_____]

15.2 INTERPRETATION OF CONTRACT DOCUMENTS

15.2.1 The drawings and specifications are complementary. If Work is shown only on one but not on the other, Construction Manager shall perform the Work as though fully described on both.

15.2.2 In case of conflicts between the drawings and specifications, the specifications shall govern. In any case of omissions or errors in figures, drawings, or specifications, Construction Manager shall immediately submit the matter to Owner for clarification. Subject to an equitable adjustment in the GMP, Dates of Substantial or Final Completion pursuant to ARTICLE 9 or a dispute mitigation and resolution, Owner's clarifications are final and binding.

15.2.3 Where figures are given, they shall be preferred to scaled dimensions.

15.2.4 Unless otherwise specifically defined in this Agreement, any terms that have well-known technical or trade meanings shall be interpreted in accordance with their well-known meanings.

15.2.5 ORDER OF PRECEDENCE In case of any inconsistency, conflict, or ambiguity among the Contract Documents, the documents shall govern in the following order: (a) Change Orders and written amendments to this Agreement; (b) the Agreement; (c) subject to §15.2.2 the drawings, specifications, and addenda issued before the execution of this Agreement; (d) approved submittals; (e) information furnished by Owner pursuant to §3.15.4 or designated as a Contract Document in §15.1; (f) other Contract Documents listed in this Agreement.

OWNER: [_____]

BY: _____ NAME: _____ TITLE: _____

WITNESS: _____ NAME: _____ TITLE: _____



CONSTRUCT MANAGER: [_____]

BY: _____ NAME: _____ TITLE: _____

WITNESS: _____ NAME: _____ TITLE: _____

END OF DOCUMENT.

DRAFT



Attachment D
Geotechnical Report and Topographic Survey

GROUND

ENGINEERING

**Geotechnical Subsurface Exploration Program
Greeley Fire Station #6
Greeley, Colorado**



**Prepared for:
City of Greeley
1001 9th Avenue
Greeley, Colorado 80631**

Attention: Mr. Brian Ward

Job Number: 19-0006

March 6th, 2019

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**Greeley Fire Station #6
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PURPOSE AND SCOPE OF STUDY

This report presents the results of a geotechnical evaluation performed by GROUND Engineering Consultants, Inc. (GROUND) for the City of Greeley in support of design of the proposed Greeley Fire Station #6 located northeast of the traffic circle at the intersection of Promontory Parkway and Promontory Circle in Greeley, Colorado. Our study was conducted in general accordance with Proposal Number 1902-0203 between the City of Greeley and GROUND, dated February 1st, 2019.

A field exploration program was conducted to obtain information on the subsurface conditions. Material samples obtained during the subsurface exploration were tested in the laboratory to provide data on the engineering characteristics of the on-site soils. The results of the field exploration and laboratory testing are presented herein.

This report has been prepared to summarize the data obtained and to present our findings and conclusions based on the proposed development/improvements and the subsurface conditions encountered. Design parameters and a discussion of engineering considerations related to the proposed improvements are included herein. This report should be understood and utilized in its entirety; specific sections of the text, drawings, graphs, tables, and other information contained within this report are intended to be understood in the context of the entire report. This includes the *Closure* section of the report which outlines important limitations on the information contained herein.

This report was prepared for the design purposes of the City of Greeley based on our understanding of the proposed project at the time of preparation of this report. The data, conclusions, opinions, and geotechnical parameters provided herein should not be construed to be sufficient for other purposes, including the use by contractors, or any other parties for any reason not specifically related to the design of the project. Furthermore, the information provided in this report was based on the exploration and testing methods described below. Deviations between what was reported herein and the actual surface and/or subsurface conditions may exist, and in some cases those deviations may be significant.

PROPOSED CONSTRUCTION

We understand that the proposed construction will consist of a Fire Station facility of approximately 15,000 square feet in building footprint as well as an approximately 400 foot length of 18th Street starting at the traffic circle and going east. Additionally, paved parking areas, drive lanes, entrances/exits, and underground utilities are also planned. Building load information was unavailable at the time this report preparation. Based provided preliminary information we anticipate wall loads on the order of 1 to 3 kips per linear foot and column loads on the order of 50 to 200 kips. Specific grading information was not available at the time of this study; however, it is our understanding that cuts on the order of 5 feet will be required to facilitate proposed construction. The project site is shown in Figure 1. If proposed construction, including the anticipated site grading and structural loading, differs from those described above, or changes subsequently, GROUND should be notified to re-evaluate the information in this report.

SITE CONDITIONS

At the time of our exploration, the project site was associated with a vacant undeveloped lot northeast of the traffic circle at the intersection of Promontory Parkway and Promontory Circle. The project is bordered to the west by Promontory Parkway and by agricultural land to the north, east, and south. The general topography across the site was gently sloping to rolling with slopes ranging up to approximately 10 percent generally descending towards the west and south.

Man-made fill was not identified within the test holes at the time of drilling. Delineation of the complete lateral and vertical extents of any fills at the site, or their compositions, however, was beyond our present scope of services. If fill soil volumes and compositions at the site are of significance, they should be further evaluated using test pits. Fills should be anticipated to be present on-site associated with previous grading for the adjacent roadways.



SUBSURFACE EXPLORATION

The subsurface exploration for the project was conducted on February 13th, 2018. A total of eight (8) test holes were drilled with a truck-mounted drill rig, advancing continuous flight auger to evaluate the subsurface conditions as well as to retrieve soil and bedrock samples for laboratory testing and analysis. Of these, four (4) test holes were drilled for the proposed building, one (1) test hole was drilled for the pavements at the project site, and three (3) test holes were drilled for proposed reach of 18th Street. The building test holes were drilled to depths of approximately 28 to 30 feet and the pavement area test holes were drilled to depths of approximately 4 to 15 feet below existing grades. A representative of GROUND directed the subsurface exploration, logged the test holes in the field, and prepared the soil and bedrock samples for transport to our laboratory. The test holes were backfilled with soil cuttings.

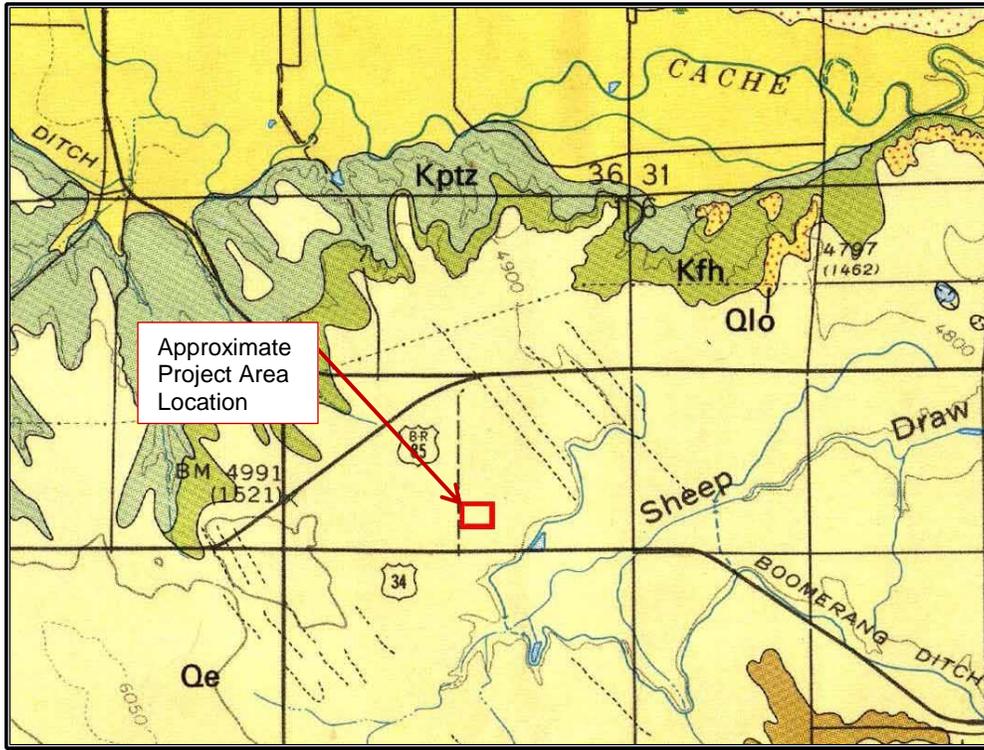
Samples of the subsurface materials were retrieved with a 2-inch I.D. California liner sampler. The sampler was driven into the substrata with blows from a 140-pound hammer falling 30 inches. This procedure is similar to the Standard Penetration Test described by ASTM Method D1586. Penetration resistance values, when properly evaluated, indicate the relative density or consistency of soils. Depths at which the samples were obtained and associated penetration resistance values are shown on the test hole logs.

The approximate locations of the test holes are shown in Figure 1. Logs of the exploratory test holes and a legend are presented in Appendix A. GROUND utilized the Client-provided site plan indicating existing features, etc., and Google Map imagery to approximately locate the test holes.

LABORATORY TESTING

Samples obtained from the exploratory holes were examined and classified in the laboratory by the project engineer. Laboratory testing included soil classification, moisture/density, Atterberg limits, particle size analysis, and swell/consolidation. Water soluble sulfates, pH and corrosivity tests were completed on selected samples of the soils. Results of the laboratory testing program are summarized in Tables 1 and 2. The laboratory testing was conducted in general accordance with applicable ASTM/AASHTO specifications.

GEOLOGIC SETTING



Published maps, e.g. Colton(1978¹) depict the surficial soils as consisting of Holocene Eolian Sand and Loess (**Qe**). These materials are underlain by the Fox Hills Sandstone (**Kfh**). The eolian sand and loess generally consist of fine grained clayey/silty sand and sandy/clayey silt. Such soils are typically prone to hydro-collapse upon wetting under loads. The Fox Hills sandstone generally consists of fine-grained silty sandstone and interbedded with gray fissile shale.

SUBSURFACE CONDITIONS

The subsurface conditions encountered generally consisted of a thin veneer of topsoil², approximately 6 to 12 inches thick, underlain by silty sands to depths of approximately 2 to 8 feet. The silty sand materials were underlain by sandstone bedrock with local claystone lenses that continued to the termination depths ranging from approximately 28

¹ Colton, R.B., 1978, *Geologic map of the Boulder-Fort Collins-Greeley area, Front Range Urban Corridor, Colorado*: U.S. Geological Survey, Miscellaneous Investigations Series Map I-855-G

² "Topsoil" as used herein is defined geotechnically. The materials so described may or may not be suitable for landscaping or as a growth medium for such plantings as may be proposed for the project.

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to 31 feet. Local cemented layers were encountered during drilling and should be expected at various depths during construction.

Additionally, the 2-inch diameter (or smaller) sampling apparatus inherently cannot sample undisturbed cobble and boulder materials due to their larger size. It should be understood that the samples obtained during drilling operations may not be representative of the larger sized earth materials that may be encountered during construction. Material sizes and descriptions are largely interpreted based on drilling advancement rates and other observations during the drilling operations. Additional exploration utilizing alternate methods, such as test pits, should be considered if more information is desired.

Silty Sand consisted of fine grained, silty sand, had low to non-plasticity, was dry to moist, occasionally calcareous, and light brown to orange-brown in color.

Sandstone consisted of fine grained sand and siltstone and claystone, was non-plastic to medium plasticity, hard to very hard, moist to wet, poorly cemented, and yellow brown to brown-gray in color with local iron staining.

It should be noted that sandstone cementation can be highly variable locally across a site, and that the potential for highly cemented, resistant layers can be present even where not specifically identified.

Swell-Consolidation Testing of samples of the on-site materials encountered in the project test holes indicated potentials for heave and consolidation (See Table 1). Swells of approximately 0.5 to 2.0 percent and consolidations ranging from 0.8 to 3.6 percent were measured at various surcharge loads.

Groundwater was observed at depths ranging from 28 to 29 feet below existing grades in the test holes at the time of drilling and at depths ranging from 17 to 22 feet below existing grades when measured 24 hours later. Groundwater levels can be expected to fluctuate, however, in response to short term disturbances such as drilling, as well as annual and longer-term cycles of precipitation, irrigation, surface drainage, nearby rivers and creeks, land use, and the development of transient, perched water conditions. The groundwater observations performed during our exploration must be interpreted carefully as they are short-term and do not constitute a groundwater study. In the event the Client

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desires additional/repeated groundwater level observations, GROUND should be contacted; additional exploration and fees will be necessary in this regard.

SEISMIC CLASSIFICATION

According to the 2015 International Building Code[®] (Section 1613 Earthquake Loads), “Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapter 14 and Appendix 11A. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 (2015 IBC) or ASCE 7.” Exceptions to this are further noted in Section 1613.

Based on extrapolation of available data to depth and our experience in the project area, we consider the site likely to meet the criteria for a **Seismic Site Classification of C** according to the 2015 IBC classification (Section 1613.3.2). If, however, a quantitative assessment of the site seismic properties is desired, then sampling or shear wave velocity testing to a depth of 100 feet or more should be performed.

Utilizing the United States Geological Survey’s Seismic Design Maps Tool (<http://geohazards.usgs.gov/designmaps/us/application.php>), assuming a Site Class C the project area is indicated to possess an **S_{DS}** value of **0.133g** and an **S_{D1}** value of **0.063g** for the site latitude and longitude. If however, local codes require quantitative assessment of the site then assuming a Site Class D the tool provides an **S_{DS}** value of **0.177g** and an **S_{D1}** value of **0.089g** for the site latitude and longitude.

FOUNDATION/FLOOR SYSTEM OVERVIEW

Geotechnical Considerations for Design: According to our field and laboratory analysis, it is GROUND’s opinion the materials encountered in our exploration are generally suitable to support the proposed structure on a shallow foundation system consisting of spread footings with a slab-on-grade floor system. Hydro-consolidation was noted in the dry over-burden sand materials, however it is our understanding that cuts on the order of 5 feet are planned at the project site that will remove this material. If grading plans change GROUND should be notified to adjust the parameters provided in the report. Testing of the claystone/siltstone layers observed in sandstone bedrock indicated a potential for swell. Due to the variable depth of sandstone bedrock at the

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site, there is a potential that portions of the foundation may bear on the sandstone bedrock while other portions will bear on overburden sands. Bearing foundations on these different materials will tend to increase the potential for differential settlement of the foundations. Due to these factors, it is GROUND's opinion that the foundations should bear on a prism of over-excavated and re-compacted site generated materials.

Foundations: Footings should bear on at least 2 feet of over-excavated and replaced site generated materials. This prism of fill should extend at full depth at least 2 feet laterally out from the edges of the foundations. This over-excavation should be performed in general accordance with the *Project Earthworks* section of this report.

Footings bearing on **2 feet** of properly moisture-density treated site generated materials may be designed for an **allowable soil bearing pressure (Q) of 2,500 psf**.

Floor System: At least **2 feet** of onsite materials below the proposed slab-on-grade floor and under-slab gravel, if present, should be over-excavated and re-compacted in a properly moisture-density conditioned state in accordance with the *Project Earthworks* section of this report.

Geotechnical Risk: To use these parameters, the Owner must accept the risk of post-construction foundation movement associated with shallow foundation systems placed on the on-site soils. Utilizing the above parameters as well as other parameters in this report, we estimate likely post-construction foundation and floor movements to be on the order of 1 inch, with 1 inch differential movements over spans of about 40 feet. Movement estimates are difficult to predict and actual movements may be more or less

The conclusions and parameters provided in this report were based on the data presented herein, our experience in the general project area with similar structures, and our engineering judgment with regard to the applicability of the data and methods of forecasting future performance. A variety of engineering parameters were considered as indicators of potential future soil movements. Our parameters were based on our judgment of "likely movement potentials," (i.e., the amount of movement likely to be realized if site drainage is generally effective, estimated to a reasonable degree of engineering certainty) as well as our assumptions about the owner's willingness to accept geotechnical risk. "Maximum possible" movement estimates necessarily will be larger than those presented herein. They also have a significantly lower likelihood of

being realized in our opinion, and generally require more expensive measures to address. We encourage the Client, upon receipt of this report, to discuss these risks and the geotechnical alternatives with us.

FOUNDATION SYSTEM

The design and construction criteria presented below should be observed for a spread footing foundation system. The construction details should be considered when preparing project documents. The precautions and parameters provided below will not prevent movement of the footings if the underlying materials are subjected to alternate wetting and drying cycles. However, the recommended measures will tend to make the movement more uniform, and reduce resultant damage if such movement occurs.

Geotechnical Parameters for Shallow Foundation Design

- 1) Footings bearing on materials as described in the *Foundation / Floor System Overview* section above may be designed for the associated allowable soil bearing pressure provided in that section.

These values may be increased by $\frac{1}{3}$ for transient loads such as wind or seismic loading. For larger footings, a lower allowable bearing pressure may be appropriate.

Compression of the bearing soils for the provided allowable bearing pressure is estimated to be 1 inch, based on an assumption of drained foundation conditions. If foundation soils are subjected to an increase/fluctuation in moisture content, the effective bearing capacity will be reduced and greater post-construction movements than those estimated above may result.

This estimate of foundation movement is from direct compression of the foundation soils.

- 2) To be able to use the allowable bearing capacity values presented above, strip footings should be limited to 5 feet or less in width and pad footing should have a maximum dimension of 10 feet. For other estimated settlements associated with allowable bearing pressure values or footing widths exceeding the dimensions above please contact this office.

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- 3) To reduce differential settlements between footings or along continuous footings, footing loads should be as uniform as possible. Differentially loaded footings will settle differentially.
- 4) Spread footings should have a minimum lateral dimension of 16 or more inches for linear strip footings and 24 inches for isolated pad footings. Actual footing dimensions should be determined by the structural engineer.
- 5) Footings should bear at an elevation 3 or more feet below the lowest adjacent exterior finish grades to have adequate soil cover for frost protection
- 6) Continuous foundation walls should be reinforced as designed by a structural engineer to span an unsupported length of at least 10 feet.
- 7) Geotechnical parameters for lateral resistance to foundation loads are provided in the *Lateral Earth Pressure* section of this report.
- 8) Connections of all types must be flexible and/or adjustable to accommodate the anticipated, post-construction movements of the structure.
- 9) The lateral resistance of spread footings will be developed as sliding resistance of the footing bottoms on the foundation materials and by passive soil pressure against the sides of the footings.
- 10) In order to reduce differential settlements between footings along continuous footings, footing loads should be as uniform as possible. Differentially loaded footings will settle differentially. Similarly, differential fill thicknesses beneath footings will result in increased differential settlements.

Shallow Foundation Construction

- 11) The contractor should take adequate care when making excavations not to compromise the bearing or lateral support for nearby improvements.
- 12) Footing excavation bottoms may expose loose, organic or otherwise deleterious materials, including debris. Firm materials may become disturbed by the excavation process. All such unsuitable materials should be excavated and the foundations deepened.

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- 13) Foundation-supporting soils may be disturbed or deform excessively under the wheel loads of heavy construction vehicles as the excavations approach footing bearing levels. Construction equipment should be as light as possible to limit development of this condition. The movement of vehicles over proposed foundation areas should be restricted.
- 14) All foundation subgrade should be properly compacted with a vibratory plate compactor prior to placement of concrete.
- 15) Fill placed against the sides of the footings should be properly compacted in accordance with the *Project Earthwork* section of this report.

FLOOR SYSTEMS

The following measures are recommended to reduce damage, which may result from movement of the slab subgrade material. These measures will not eliminate potential movements. If slab-on-grade construction is used in accordance with the following criteria, as well as other applicable parameters contained in this report, we estimate that potential slab movements may be on the order of 1 inch. The actual magnitude of movement is difficult to estimate and may be more or less.

Geotechnical Parameters for Design of Slab-on-Grade Floors

- 1) Slab subgrade materials shall be scarified and to a depth of at least 12 inches and re-compacted in a properly moisture-density conditioned state in accordance with the *Project Earthworks* section of this report
- 2) An allowable subgrade vertical modulus (K) of 100 pci may be utilized for lightly loaded slabs supporting static loads on the on-site materials. This value is for a 1-foot x 1-foot plate; it should be adjusted for slab dimension. Slabs supporting transient vehicular loads should be designed as pavements.
- 3) The prepared surface on which the slabs will be cast should be observed by the Geotechnical Engineer prior to placement of reinforcement. Exposed loose, soft, or otherwise unsuitable bedrock materials should be excavated to competent bedrock. Additional gravel may be necessary to achieve proper grades.

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- 4) Slabs should be separated from all bearing walls, columns, and footings with slip joints, which allow unrestrained vertical movement. Slabs should not bear on footings or other foundation elements.
- 5) Joints should be observed periodically, particularly during the first several years after construction. Slab movement can cause previously free-slipping joints to bind. Measures should be taken to assure that slab isolation is maintained in order to reduce the likelihood of damage to walls and other interior improvements.
- 6) Interior partitions (if applicable) resting on floor/concrete slabs should be provided with slip joints so that if the slabs move, the movement cannot be transmitted to the upper structure. This detail is also important for wallboards and door frames. A slip joint, which will allow at least 2 or more inches of vertical movement, is suggested. If slip joints are placed at the tops of walls, in the event that the slabs move, it is likely that the wall will show signs of distress, especially where the slabs meet the exterior wall.
- 7) Concrete slabs-on-grade should be placed on properly prepared subgrade. They should also be constructed and cured according to applicable standards and be provided with properly designed and constructed control joints. The design and construction of such joints should account for cracking as a result of shrinkage, tension, and loading; curling; as well as proposed slab use. Joint layout based on the slab design may require more frequent, additional, or deeper joints, and should also be based on the ultimate use and configuration of the slabs. Areas where slabs consist of interior corners or curves (at column blockouts or around corners) or where slabs have high length to width ratios, high degree of slopes, thickness transitions, high traffic loads, or other unique features should be carefully considered. The improper placement or construction of control joints will increase the potential for slab cracking. ACI, AASHTO, and other industry groups provide many guidelines for proper design and construction of concrete slabs-on-grade and the associated jointing.
- 8) Slabs should be adequately reinforced. Structural considerations for slab thickness, jointing, and steel reinforcement in floor slabs should be developed by the Structural Engineer. Placement of slab reinforcement continuously through

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the control joint alignments will tend to increase the effective size of concrete panels and reduce the effectiveness of control joints.

- 9) All plumbing lines should be carefully tested before operation. Where plumbing lines enter through the floor, a positive bond break should be provided. Flexible connections allowing 2 or more inches of vertical movement should be provided for slab-bearing mechanical equipment. Greater movements may occur depending upon the fill prism section selected by the owner.
- 10) Moisture can be introduced into a slab subgrade during construction and additional moisture will be released from the slab concrete as it cures. Placement of a properly compacted layer of free-draining gravel, 4 or more inches in thickness, beneath the slabs should be performed. This layer will help distribute floor slab loadings, ease construction, reduce capillary moisture rise, and aid in drainage. The free-draining gravel should contain **less than 5 percent material passing the No. 200 Sieve, more than 50 percent retained on the No. 4 Sieve, and a maximum particle size of 2 inches.**
- 11) The capillary break and the drainage space provided by the gravel layer also may reduce the potential for excessive water vapor fluxes from the slab after construction as mix water is released from the concrete. A vapor barrier beneath a building floor slab can be beneficial with regard to reducing exterior moisture moving into the building, through the slab, but can retard downward drainage of construction moisture. Uneven moisture release can result in slab curling. Elevated vapor fluxes can be detrimental to the adhesion and performance of many floor coverings and may exceed various flooring manufacturers' usage criteria.

Per the 2015 ACI *Location Guideline*, a vapor barrier is required under concrete floors when that floor is to receive moisture-sensitive floor covering and/or adhesives, or the room above that floor has humidity control. GROUND recommends the Project Team review ACI (2015) Sections 201/302/360 for additional guidance and recommendations regarding slab on grade design and construction.

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Therefore, in light of the several, potentially conflicting effects of the use of vapor barriers, the Owner and the Architect and/or Flooring Contractor should weigh the performance of the slab and appropriate flooring products in light of the intended building use, etc., during the floor system design process and the selection of flooring materials. Use of a vapor barrier may be appropriate for some buildings and not for others.

In the event a vapor barrier is utilized, it should consist of a minimum 15 mil thickness, extruded polyolefin plastic (no recycled content or woven materials), maintain a permeance less than 0.01 perms per ASTM E-96/E-96M or ASTM F-1249, and comply with ASTM E-1745 (Class "A"). Vapor barriers should be installed in accordance with ASTM E-1643.

Polyethylene ("poly") sheeting (even if 15 mils in thickness, which polyethylene sheeting commonly is not) does not meet the ASTM E-1745 criteria and is not recommended for use as vapor barrier material. It can be easily torn and/or punctured, does not possess necessary tensile strength, gets brittle, tends to decompose over time, and has a relatively high permeance.

Slab movements are directly related to the increases in moisture contents to the underlying soils after construction is completed. The precautions and parameters itemized above will not prevent the movement of floor slabs if the underlying materials are subjected to moisture fluctuations. However, these steps will reduce the damage if such movement occurs.

MECHANICAL ROOMS/MECHANICAL PADS/TRASH ENCLOSURES

Often, slab-bearing mechanical rooms/mechanical equipment/trash enclosures are incorporated into projects. Our experience indicates these are located as partially below-grade or adjacent to the exterior of a structure. These elements should be founded on the same type of foundation systems as the main structure. Where post-construction movements greater than ½ inch are not tolerable, deep foundations should be used. Furthermore, mechanical connections must allow for potential differential movements.

FIRE TRUCK ACCESS APRON, CONCRETE BAYS, AND LOADING DOCKS (EXTERIOR ONLY)

Concrete bays and loading docks in front of the equipment bays for fire trucks should be designed as a reinforced concrete slab consisting of **at least 9 inches of Portland cement concrete** in order to support heavily loaded fire truck traffic weighing up to approximately 90,000 pounds as well as temporary static loads. Additionally, **at least 12 inches of CDOT Class 6 aggregate base course** should be placed beneath the concrete in these areas. Designed slab thickness may exceed 9 inches.

Concrete slabs should consist of a plant mix composed of a mixture of aggregate, Portland cement and appropriate admixtures meeting the requirements of a job-mix formula established by a qualified engineer. Concrete should have a minimum modulus of rupture of third point loading of 650 psi. Normally, concrete with a 28-day compressive strength of 4,000 psi should develop this modulus of rupture value. The concrete should be air-entrained with approximately 6 percent air and should have a minimum cement content of 6 sacks per cubic yard. Maximum allowable slump should be 4 inches. Please refer to the *Water Soluble Sulfates* section of this report for the type of cement suggested based on the sulfate content obtained from the on-site soils.

In areas of repeated turning stresses the concrete slab joints should be fully tied and doweled. We suggest that civil design consider joint layout in accordance with CDOT's M Standards (<http://www.dot.state.co.us/DesignSupport/>). Reinforcement should be designed by the Structure Engineer.

Welded wire fabric/"mesh" is not suggested as an equal alternate to reinforcing bar.

EXTERIOR FLATWORK

Care should be taken with regard to proper design and subgrade preparation under and around site improvements. Similar to slab-on-grade floors, exterior flatwork and other hardscaping placed on the soils encountered on-site will experience post-construction movements due to volume change of the subsurface soils and the relatively light loads that they impose. Both vertical and lateral soil movements can be anticipated. Distress to hardscaping will result. The measures outlined below will help to reduce, but not eliminate, damages to these improvements.

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Provided the owner understands the risks identified above, we believe that subgrade under exterior flatwork or other (non-building) site improvements could be scarified to a depth of 12 or more inches. It has been our experience that greater overexcavation and replacement depths (i.e. 2 to 3 feet) often provides enhanced performance but at an increased initial cost. The excavated soil should be replaced as properly moisture-conditioned and compacted fill as outlined in the *Project Earthwork* section of this report.

The processing depth should occur prior to placing any additional fill required to achieve finished design grades. This processing depth will not eliminate potential movements. The excavated soil should be replaced as properly moisture-conditioned and compacted fill as outlined in the *Project Earthwork* section of this report.

Prior to placement of flatwork, a proof roll should be performed to identify areas that exhibit instability and deflection. The soils in these areas should be removed and replaced with properly compacted fill or stabilized.

Flatwork should be provided with effective control joints. Increasing the frequency of joints may improve performance. Industry guidelines developed by ACI, PCA, and others should be consulted regarding construction and control joints.

In no case should exterior flatwork extend to under any portion of the building where there is less than several inches of clearance between the flatwork and any element of the building. Exterior flatwork in contact with brick, rock facades, or any other element of the building can cause damage to the structure if the flatwork experiences movements.

As discussed in the *Surface Drainage* section of this report, proper drainage also should be maintained after completion of the project and re-established as necessary. In no case should water be allowed to pond on or near any of the site improvements or a reduction in performance should be anticipated.

Concrete Scaling Climatic conditions in the project area including relatively low humidity, large temperature changes and repeated freeze – thaw cycles, make it likely that project sidewalks and other exterior concrete will experience surficial scaling or spalling. The likelihood of concrete scaling can be increased by poor workmanship during construction, such as ‘over-finishing’ the surfaces. In addition, the use of de-icing salts on exterior concrete flatwork, particularly during the first winter after construction, will increase the likelihood of scaling. Even use of de-icing salts on nearby roadways,

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from where vehicle traffic can transfer them to newly placed concrete, can be sufficient to induce scaling. Typical quality control / quality assurance tests that are performed during construction for concrete strength, air content, etc., do not provide information with regard to the properties and conditions that give rise to scaling.

We understand that some municipalities require removal and replacement of concrete that exhibits scaling, even if the material was within specification and placed correctly. The contractor should be aware of the local requirements and be prepared to take measures to reduce the potential for scaling and/or replace concrete that scales.

In GROUND's experience the measures below can be beneficial for reducing the likelihood of concrete scaling. It must be understood, however, that because of the other factors involved, including weather conditions and workmanship, surface damage to concrete can develop, even where all of these measures were followed. Also, the mix design criteria should be coordinated with other project requirements including the criteria for sulfate resistance presented in the *Water-Soluble Sulfates* section of this report.

- 1) Maintaining a maximum water/cement ratio of 0.45 by weight for exterior concrete mixes.
- 2) Include Type F fly ash in exterior concrete mixes as 20 percent of the cementitious material.
- 3) Specify a minimum, 28-day, compressive strength of 4,500 psi for all exterior concrete.
- 4) Including 'fibermesh' in the concrete mix also may be beneficial for reducing surficial scaling.
- 5) Cure the concrete effectively at uniform temperature and humidity. This commonly will require fogging, blanketing and/or tenting, depending on the weather conditions. As long as 3 to 4 weeks of curing may be required, and possibly more.
- 6) Avoid placement of concrete during cold weather so that it is not exposed to freeze-thaw cycling before it is fully cured.

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- 7) Avoid the use of de-icing salts on given reaches of flatwork through the first winter after construction.

We understand that commonly it may not be practical to implement some of these measures for reducing scaling due to safety considerations, project scheduling, etc. In such cases, additional costs for flatwork maintenance or reconstruction should be incorporated into project budgets.

Frost and Ice Considerations Nearly all soils other than relatively coarse, clean, granular materials are susceptible to loss of density if allowed to become saturated and exposed to freezing temperatures and repeated freeze – thaw cycling. The formation of ice in the underlying soils can result in heaving of pavements, flatwork and other hardscaping (“frost heave”) in sustained cold weather up to 2 inches or more. This heaving can develop relatively rapidly. A portion of this movement typically is recovered when the soils thaw, but due to loss of soil density, some degree of displacement will remain. This can result even where the subgrade soils were prepared properly.

Where hardscape movements are a design concern, e.g., at doorways, replacement of the subgrade soils with 3 or more feet of clean, coarse sand or gravel should be considered or supporting the element on foundations similar to the building and spanning over a void. Detailed guidance in this regard can be provided upon request. It should be noted that where such open graded granular soils are placed, water can infiltrate and accumulate in the subsurface relatively easily, which can lead to increased settlement or heave from factors unrelated to ice formation. Therefore, where a section of open graded granular soils are placed, a local underdrain system should be provided to discharge collected water. GROUND will be available to discuss these concerns upon request.

WATER-SOLUBLE SULFATES

The concentration of water-soluble sulfates measured in a selected sample retrieved from the test holes was approximately 0.01 percent. Such a concentration of water-soluble sulfates represents a negligible environment for sulfate attack on concrete exposed to these materials. Degrees of attack are based on the scale of ‘negligible,’ ‘moderate,’ ‘severe’ and ‘very severe’ as described in the “Design and Control of Concrete Mixtures,” published by the Portland Cement Association (PCA). The Colorado

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Department of Transportation (CDOT) utilizes a corresponding scale with 4 classes of severity of sulfate exposure (Class 0 to Class 3) as described in the published table below.

**REQUIREMENTS TO PROTECT AGAINST DAMAGE TO
CONCRETE BY SULFATE ATTACK FROM EXTERNAL SOURCES OF SULFATE**

Severity of Sulfate Exposure	Water-Soluble Sulfate (SO₄) In Dry Soil (%)	Sulfate (SO₄) In Water (ppm)	Water Cementitious Ratio (maximum)	Cementitious Material Requirements
Class 0	0.00 to 0.10	0 to 150	0.45	Class 0
Class 1	0.11 to 0.20	151 to 1,500	0.45	Class 1
Class 2	0.21 to 2.00	1,501 to 10,000	0.45	Class 2
Class 3	2.01 or greater	10,001 or greater	0.40	Class 3

Based on these data GROUND, makes no suggestion for use of a special, sulfate-resistant cement in project concrete.

SOIL CORROSIVITY

The degree of risk for corrosion of metals in soils commonly is considered to be in two categories: corrosion in undisturbed soils and corrosion in disturbed soils. The potential for corrosion in undisturbed soil is generally low, regardless of soil types and conditions, because it is limited by the amount of oxygen that is available to create an electrolytic cell. In disturbed soils, the potential for corrosion typically is higher, but is strongly affected by soil chemistry and other factors.

A preliminary corrosivity analysis was performed to provide a general assessment of the potential for corrosion of ferrous metals installed in contact with earth materials at the site, based on the conditions existing at the time of GROUND's evaluation. Soil chemistry and physical property data including pH, reduction-oxidation (redox) potential, and sulfides content were obtained. Test results are summarized in Table 2.

pH Where pH is less than 4.0, soil serves as an electrolyte; the pH range of about 6.5 to 7.5 indicates soil conditions that are optimum for sulfate reduction. In the pH range above 8.5, soils are generally high in dissolved salts, yielding a low soil resistivity (AWWA, 2010). Testing indicated a pH value of approximately 8.1.

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Reduction-Oxidation testing indicated a negative potential: approximately -95 millivolts. Such a low potential typically creates a more corrosive environment.

Sulfide Reactivity testing for the presence of sulfides indicated 'trace' results. The presence of sulfides in the site soils also suggests a more corrosive environment.

Soil Resistivity A sample of materials retrieved from the test holes was tested for resistivity in the laboratory, at the as-received moisture content. Resistivity also varies inversely with temperature. Therefore, the laboratory measurements were made at a controlled temperature.

A measurement of electrical resistivity indicated a value of approximately 1,640 ohm-centimeters in a sample of the site earth materials.

Corrosivity Assessment The American Water Works Association (AWWA, 2010³) has developed a point system scale used to predict corrosivity. The scale is intended for protection of ductile iron pipe but is valuable for project steel selection. When the scale equals 10 points or higher, protective measures for ductile iron pipe are suggested. The AWWA scale (Table A.1 Soil-test Evaluation) is presented below. The soil characteristics refer to the conditions at and above pipe installation depth.

Additionally, the North American Steel Sheet Piling Association (NASSPA) indicates a typical loss of thickness for hot-rolled steel due to corrosion of 1.20 mm for a 100-year design life in undisturbed natural soils or compacted, non-aggressive fills. This value may be linearly interpolated for shorter design lives.⁴

³ American Water Works Association ANSI/AWWA C105/A21.5-05 Standard.

⁴ North American Steel Sheet Piling Association, Guidance on Corrosion, © 2008

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Table A.1 Soil-test Evaluation

<u>Soil Characteristic / Value</u>	<u>Points</u>
Resistivity	
<1,500 ohm-cm	10
1,500 to 1,800 ohm-cm	8
1,800 to 2,100 ohm-cm	5
2,100 to 2,500 ohm-cm	2
2,500 to 3,000 ohm-cm	1
>3,000 ohm-cm	0
pH	
0 to 2.0	5
2.0 to 4.0	3
4.0 to 6.5	0
6.5 to 7.5	0 *
7.5 to 8.5	0
>8.5	3
Redox Potential	
< 0 (negative values)	5
0 to +50 mV	4
+50 to +100 mV	3½
> +100 mV	0
Sulfide Content	
Positive	3½
Trace	2
Negative	0
Moisture	
Poor drainage, continuously wet	2
Fair drainage, generally moist	1
Good drainage, generally dry	0

* If sulfides are present and low or negative redox-potential results (< 50 mV) are obtained, add three points for this range.

The redox potential of a soil is significant, because the most common sulfate-reducing bacteria can only live in anaerobic conditions. A negative redox potential indicates anaerobic conditions in which sulfate reducers thrive. A positive sulfide reaction reveals a potential problem caused by sulfate-reducing bacteria. Anaerobic conditions are regarded as potentially corrosive.

Based on a maximum possible score of 25.5 using the AWWA method, the value of 10 for the use of corrosion protection, and a score of approximately 15 in the on-site

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materials, the soil appears to comprise a potential corrosive environment for buried metals.

If additional information are needed regarding soil corrosivity, the American Water Works Association or a Corrosion Engineer should be contacted. It should be noted, however, that changes to the site conditions during construction, such as the import of other soils, or the intended or unintended introduction of off-site water, may significantly alter corrosion potential.

LATERAL EARTH PRESSURES

Structures which are laterally supported and can be expected to undergo only a limited amount of deflection should be designed for “at-rest” lateral earth pressures. The cantilevered retaining structures will be designed to deflect sufficiently to mobilize the full active earth pressure condition, and may be designed for “active” lateral earth pressures. “Passive” earth pressures may be applied in front of the structural embedment to resist driving forces.

The at-rest, active, and passive earth pressures in terms of equivalent fluid unit weight for the on-site backfill are summarized on the table below. Base friction may be combined with passive earth pressure if the foundation is in a drained condition. The values for the on-site material in the upper 10 feet provided in the table below were approximated utilizing a unit weight of 120 pcf and a phi angle of 27 degrees, and are un-factored. Appropriate factors of safety should be included in design calculations.

Lateral Earth Pressures (Equivalent Fluid Unit Weights)

Material Type	Water Condition	At-Rest (pcf)	Active (pcf)	Passive (pcf)	Friction Coefficient
On-Site Backfill	Drained	69	49	255 (max. 2,550 psf)	0.31

The lateral earth pressures indicated above are for a horizontal upper backfill slope. The additional loading of an upward sloping backfill as well as loads from traffic, stockpiled materials, etc., should be included in the wall/shoring design.

Project Retaining Walls We are not aware of any significant retaining structures proposed as part of the facility improvements. Therefore, the above parameters should be considered preliminary with regard to design of walls, etc. In the event that retaining walls are added once project design begins, a geotechnical engineer should be retained to develop parameters for retaining wall parameter design.

PROJECT EARTHWORK

The following information is for private improvements; public roadways or utilities should be constructed in accordance with applicable municipal / agency standards.

General Considerations: Site grading should be performed as early as possible in the construction sequence to allow settlement of fills and surcharged ground to be realized to the greatest extent prior to subsequent construction.

Prior to earthwork construction, relic structures, construction debris, vegetation and other deleterious materials should be removed and disposed of off-site. Relic underground utilities should be abandoned in accordance with applicable regulations, removed as necessary, and properly capped.

Topsoil present on-site should not be incorporated into ordinary fills. Instead, topsoil should be stockpiled during initial grading operations for placement in areas to be landscaped or for other approved uses.

Existing Fill Soils: Man-made fill was not obviously encountered in the test holes at the time of drilling, however may be encountered on-site. Some of the excavated man-made fill materials, if encountered, may not be suitable for replacement as backfill. The Geotechnical Engineer should be retained during site excavations to observe the excavated fill materials and provide parameters for its suitability for reuse.

Use of Existing Native Soils: Overburden soils that are free of trash, organic material, construction debris, and other deleterious materials are suitable, in general, for placement as compacted fill. Organic materials should not be incorporated into project fills.

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Fragments of rock, cobbles, and inert construction debris (e.g., concrete or asphalt) larger than 3 inches in maximum dimension will require special handling and/or placement to be incorporated into project fills. In general, such materials should be placed as deeply as possible in the project fills. A Geotechnical Engineer should be consulted regarding appropriate guidance for usage of such materials on a case-by-case basis when such materials have been identified during earthwork. Standard recommendations that likely will be generally applicable can be found in Section 203 of the current CDOT Standard Specifications for Road and Bridge Construction.

Imported Fill Materials: If it is necessary to import material to the site, the imported soils should be free of organic material, and other deleterious materials. **Imported material should consist of soils that have less than 40 percent passing the No. 200 Sieve and should have a plasticity index less than 15.** Representative samples of the materials proposed for import should be tested and approved prior to transport to the site.

Fill Platform Preparation: Prior to filling, the top 12 inches or more of in-place materials on which fill soils will be placed should be scarified, moisture conditioned and properly compacted in accordance with the parameters below to provide a uniform base for fill placement. *If over-excavation is to be performed, then these parameters for subgrade preparation are for the subgrade **below the bottom** of the specified over-excavation depth.*

If surfaces to receive fill expose loose, wet, soft or otherwise deleterious material, additional material should be excavated, or other measures taken to establish a firm platform for filling. The surfaces to receive fill must be effectively stable prior to placement of fill.

GROUND's experience within the project area suggests the frost depth to be approximately 3 feet, below ground surface.

Fill Placement: Fill materials should be thoroughly mixed to achieve a uniform moisture content, placed in uniform lifts not exceeding 8 inches in loose thickness, and properly compacted.

Building and Private Pavements

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Soils that classify as GP, GW, GM, GC, SP, SW, SM, or SC in accordance with the USCS classification system (granular materials) should be compacted to **95 or more percent** of the maximum modified Proctor dry density at moisture contents within 2 percent of optimum moisture content as determined by ASTM D1557.

Soils that classify as ML, MH, CL or CH should be compacted to **95 percent** of the maximum standard Proctor density at moisture contents within 2 percent of the optimum moisture content as determined by ASTM D698.

No fill materials should be placed, worked, rolled while they are frozen, thawing, or during poor/inclement weather conditions.

Care should be taken with regard to achieving and maintaining proper moisture contents during placement and compaction. Materials that are not properly moisture conditioned may exhibit significant pumping, rutting, and deflection at moisture contents near optimum and above. The contractor should be prepared to handle soils of this type, including the use of chemical stabilization, if necessary.

Compaction areas should be kept separate, and no lift should be covered by another until relative compaction and moisture content within the suggested ranges are obtained.

Use of Squeegee: Relatively uniformly graded fine gravel or coarse sand, i.e., “squeegee,” or similar materials commonly are proposed for backfilling foundation excavations, utility trenches (excluding approved pipe bedding), and other areas where employing compaction equipment is difficult. In general, GROUND does not suggest this procedure for the following reasons:

Although commonly considered “self-compacting,” uniformly graded granular materials require densification after placement, typically by vibration. The equipment to densify these materials is not available on many job-sites.

Even when properly densified, granular materials are permeable and allow water to reach and collect in the lower portions of the excavations backfilled with those materials. This leads to wetting of the underlying soils and resultant potential loss of bearing support as well as increased local heave or settlement.

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It is GROUND's opinion that wherever possible, excavations be backfilled with approved, on-site soils placed as properly compacted fill. Where this is not feasible, use of "Controlled Low Strength Material" (CLSM), i.e., a lean, sand-cement slurry ("flowable fill") or a similar material for backfilling should be considered.

Where "squeegee" or similar materials are proposed for use by the contractor, the design team should be notified by means of a Request for Information (RFI), so that the proposed use can be considered on a case-by-case basis. Where "squeegee" meets the project requirements for pipe bedding material, however, it is acceptable for that use.

Settlements: Settlements will occur in filled ground, typically on the order of 1 to 2 percent of the fill depth. If fill placement is performed properly and is tightly controlled, in GROUND's experience the majority (on the order of 60 to 80 percent) of that settlement will typically take place during earthwork construction, provided the contractor achieves the compaction levels herein. The remaining potential settlements likely will take several months or longer to be realized, and may be exacerbated if these fills are subjected to changes in moisture content.

Cut and Filled Slopes: Permanent site slopes supported by on-site soils up to 20 feet in height may be constructed no steeper than 3:1 (horizontal : vertical). Minor raveling or surficial sloughing should be anticipated on slopes cut at this angle until vegetation is well re-established. Surface drainage should be designed to direct water away from slope faces.

Wet, Soft, or Unstable Subgrades Where wet, soft, or unstable subgrades are encountered, the contractor must establish a stable platform for fill placement and achieving compaction in the overlying fill soils. Therefore, excavation of the unstable soils and replacing them with relatively dry or granular material, possibly together with the use of stabilization geo-textile or geo-grid, may be necessary to achieve stability. A geotechnical engineer should be retained to provide appropriate stabilization criteria based on conditions encountered. Stabilization methods should be verified using a test section to evaluate the effectiveness prior to use over a larger area.

EXCAVATION CONSIDERATIONS

Test holes for the subsurface exploration were advanced to the depths indicated on the test hole logs by means of conventional, truck-mounted, geotechnical drilling equipment.

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Lenses of dry, resistant, claystone/siltstone bedrock were occasionally encountered in the test holes during exploration. Due to the anticipated depth of earthwork we anticipate no significant excavation difficulties in the majority of the site with conventional heavy-duty excavation equipment in good working condition.

Temporary, un-shored excavation slopes up to 10 feet in height be cut no steeper than 1½:1 (horizontal : vertical) in the site soils in the absence of seepage. Sloughing on the slope faces should be anticipated at this angle. Local conditions encountered during construction, such as groundwater seepage and loose sand, will require flatter slopes. Stockpiling of materials should not be permitted closer to the tops of temporary slopes than 5 feet or a distance equal to the depth of the excavation, whichever is greater.

Should site constraints prohibit the use of the slope angles, temporary shoring should be used. The shoring should be designed to resist the lateral earth pressure exerted by building, traffic, equipment, and stockpiles.

Groundwater was observed at depths ranging from 28 to 29 feet below existing grades in the test holes at the time of drilling and at depths ranging from 17 to 22 feet below existing grades when measured 24 hours later. The test holes were backfilled upon drilling completion for safety. Groundwater levels can be expected to fluctuate, however, in response to annual and longer-term cycles of precipitation, irrigation, surface drainage, nearby rivers and creeks, land use, and the development of transient, perched water conditions. The groundwater observations performed during our exploration must be interpreted carefully as they are short-term and do not comprise a groundwater study. In the event the Client desires additional/repeated groundwater level observations, GROUND should be contacted; additional exploration and fees will be necessary in this regard.

However unlikely, it is possible for perched groundwater to be encountered in project excavations. Therefore, the contractor should be prepared to dewater excavations during construction. Pumps adequate to discharge water and/or well points to draw down the water level may be appropriate methods. Other methods may also be necessary. The dewatering approach should ultimately be determined by the contractor based on their experience. If seepage or groundwater is encountered during excavation or at any time during construction, the Geotechnical Engineer and project team should be contacted to evaluate the conditions. The presence of groundwater in these types of

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situations and associated potential design changes can have an impact to both the financial and schedule components of a project.

The contractor should take pro-active measures to control surface waters during construction and maintain good surface drainage conditions to direct waters away from excavations and into appropriate drainage structures. A properly designed drainage swale should be provided at the tops of the excavation slopes. In no case should water be allowed to pond near project excavations.

Excavations in which personnel will be working must comply with all OSHA Standards and Regulations. The Contractor's "responsible person" should evaluate the soil exposed in the excavations as part of the Contractor's safety procedures. GROUND has provided the information above solely as a service to the Client, and is not assuming responsibility for construction site safety or the Contractor's activities.

SURFACE DRAINAGE

The site soils are relatively stable with regard to moisture content – volume relationships at their existing moisture contents. Other than the anticipated, post-placement settlement of fills, post-construction soil movement will result primarily from the introduction of water into the soil underlying the proposed structure, hardscaping, and pavements. Based on the site surface and subsurface conditions encountered in this study, we do not anticipate a rise in the local water table sufficient to approach grade beam or floor elevations. Therefore, wetting of the site soils likely will result from infiltrating surface waters (precipitation, irrigation, etc.), and water flowing along constructed pathways such as bedding in utility pipe trenches.

The following drainage measures should be incorporated as part of project design and during construction. The facility should be observed periodically to evaluate the surface drainage and identify areas where drainage is ineffective. Routine maintenance of site drainage should be undertaken throughout the design life of the project. If these measures are not implemented and maintained effectively, the movement estimates provided in this report could be exceeded.

- 1) Wetting or drying of the foundation excavations and under slab areas should be avoided during and after construction as well as throughout the improvements' design life. Permitting increases/variations in moisture to the adjacent or

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supporting soils may result in a decrease in bearing capacity and an increase in volume change of the underlying soils, and increased total and/or differential movements.

- 2) Positive surface drainage measures should be provided and maintained to reduce water infiltration into foundation soils.

The ground surface surrounding the exterior of each building should be sloped to drain away from the foundation in all directions. A minimum slope of 12 inches in the first 10 feet should be incorporated in the areas not covered with pavement or concrete slabs, or a minimum 3 percent in the first 10 feet in the areas covered with pavement or concrete slabs. Reducing the slopes to comply with ADA requirements may be necessary by other design professionals but may entail an increased potential for moisture infiltration and subsequent volume change of the underlying soils and resultant distress.

In no case should water be allowed to pond near or adjacent to foundation elements, hardscaping, utility trench alignments, etc.

- 3) Drainage should be established and maintained to direct water away from sidewalks and other hardscaping as well as utility trench alignments. Where the ground surface does not convey water away readily, additional post-construction movements and distress should be anticipated.
- 4) In GROUND's experience, it is common during construction that in areas of partially completed paving or hardscaping, bare soil behind curbs and gutters, and utility trenches, water is allowed to pond after rain or snow-melt events. Wetting of the subgrade can result in loss of subgrade support and increased settlements / increased heave. By the time final grading has been completed, significant volumes of water can already have entered the subgrade, leading to subsequent distress and failures. The contractor should maintain effective site drainage throughout construction so that water is directed into appropriate drainage structures.
- 5) On some sites, slopes may descend toward buildings locally. Such slopes can be created during grading even on comparatively flat sites. In such cases, even where the slopes as described above are implemented effectively, water may

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flow toward and beneath a structure or other site improvements with resultant additional, post-construction movements. Where the final site configuration includes graded or retained slopes descending toward the improvements, surface drainage swales and/or interceptor drains should be installed between the improvements and the slope.

Where irrigation is applied on or above slopes, drainage structures commonly are needed near the toe-of-slope to prevent on-going or recurrent wet conditions.

- 6) Roof downspouts and drains should discharge well beyond the perimeter of the structure foundations (minimum 10 feet) and backfill zones and be provided with positive conveyance off-site for collected waters.
- 7) Based on our experience with similar facilities, the project may include landscaping/watering near site improvements. Irrigation water – both that applied to landscaped areas and over-spray – is a significant cause of distress to improvements. To reduce the potential for such distress, vegetation requiring watering should be located 10 or more feet from building perimeters, flatwork, or other improvements. Irrigation sprinkler heads should be deployed so that applied water is not introduced near or into foundation/subgrade soils. Landscape irrigation should be limited to the minimum quantities necessary to sustain healthy plant growth.
- 8) Use of drip irrigation systems can be beneficial for reducing over-spray beyond planters. Drip irrigation can also be beneficial for reducing the amounts of water introduced to foundation/subgrade soils, but only if the total volumes of applied water are controlled with regard to limiting that introduction. Controlling rates of moisture increase beneath the foundations, floors, and other improvements should take higher priority than minimizing landscape plant losses.

Where plantings are desired within 10 feet of a building, it is GROUND's opinion that the plants be placed in water-tight planters, constructed either in-ground or above-grade, to reduce moisture infiltration in the surrounding subgrade soils. Planters should be provided with positive drainage and landscape underdrains. As an alternative involving a limited increase in risk, the use of water-tight planters may be replaced by local shallow underdrains beneath the planter beds.

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Colorado Geological Survey – Special Publication 43 provides additional guidelines for landscaping and reducing the amount of water that infiltrates into the ground.

GROUND understands many municipalities require landscaping within 10 feet of building perimeters. Provided that positive, effective surface drainage is initially implemented and maintained throughout the life of the facility and the Owner understands and accepts the risks associated with this requirement, vegetation that requires little to no watering may be located within 10 feet of the building perimeter.

- 9) Inspections must be made by facility representatives to make sure that the landscape irrigation is functioning properly throughout operation and that excess moisture is not applied.
- 10) Plastic membranes should not be used to cover the ground surface adjacent to the building as soil moisture tends to increase beneath these membranes. Perforated “weed barrier” membranes that allow ready evaporation from the underlying soils may be used.

Cobbles or other materials that tend to act as baffles and restrict surface flow should not be used to cover the ground surface near the foundations.

- 11) Maintenance as described herein may include complete removal and replacement of site improvements in order to maintain effective surface drainage.
- 12) Detention ponds commonly are incorporated into drainage design. When a detention pond fills, the rate of release of the water is controlled and water is retained in the pond for a period of time. Where in-ground storm sewers direct surface water to the pond, the granular pipe bedding also can direct shallow groundwater or infiltrating surface water toward the pond. Thus, detention ponds can become locations of enhanced and concentrated infiltration into the subsurface, leading to wetting of foundation soils in the vicinity with consequent heave or settlement. Therefore, unless the pond is clearly down-gradient from the proposed buildings and other structures that would be adversely affected by wetting of the subgrade soils, including off-site improvements, the detention pond should be provided with an effective, low permeability liner. In addition, cut-off

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walls and/or drainage provisions should be provided for the bedding materials surrounding storm sewer lines flowing to the pond.

SUBSURFACE DRAINAGE

As a component of project civil design, properly functioning, subsurface drain systems (underdrains) can be beneficial for collecting and discharging saturated subsurface waters. Underdrains will not collect water infiltrating under unsaturated (vadose) conditions, or moving via capillarity, however. In addition, if not properly constructed and maintained, underdrains can transfer water into foundation soils, rather than remove it. This will tend to induce heave or settlement of the subsurface soils, and may result in distress. Underdrains can, however, provide an added level of protection against relatively severe post-construction movements by draining saturated conditions near individual structures should they arise, and limiting the volume of wetted soil.

Although inclusion of an underdrain system is common on commercial sites like the subject facility, particularly where shallow foundations are used, professional opinion varies regarding the potential benefits relative to the cost. Therefore, the owner and the design team and contractor should assess the net benefit of an underdrain system as a component of overall project drainage.(GROUND does not specifically recommend underdrains at this site with the exception of any below grade levels if added)

If, however, below-grade or partially below-grade level(s) are added to the building, then we recommend that an underdrain system be included. Damp-proofing should be applied to the exteriors of below-grade elements. The provision of Tencate MiraFi® G-Series backing (or comparable wall drain provisions) on the exteriors of (some) below-grade elements may be appropriate, depending on the intended use. If a (partially) below-grade level is limited in extent, the underdrain system, etc., may be local to that area.

Geotechnical Parameters for Underdrain Design Where an underdrain system is included in project drainage design, it should be designed in accordance with the recommendations below. The actual underdrain layout, outlets, and locations should be developed by a civil engineer. A typical underdrain detail can be provided upon request.

An underdrain system should be tested by the contractor after installation and after placement and compaction of the overlying backfill to verify that the system functions properly.

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- 1) An underdrain system for a building should consist of perforated, rigid, PVC collection pipe at least 4 inches in diameter, non-perforated, rigid, PVC discharge pipe at least 4 inches in diameter, free-draining gravel, and filter fabric, as well as a waterproof membrane.
- 2) The free-draining gravel should contain less than 5 percent passing the No. 200 Sieve and more than 50 percent retained on the No. 4 Sieve, and have a maximum particle size of 2 inches. Each collection pipe should be surrounded on the sides and top (only) with 6 or more inches of free-draining gravel.
- 3) The gravel surrounding the collection pipe(s) should be wrapped with filter fabric (MiraFi 140N[®] or the equivalent) to reduce the migration of fines into the drain system.
- 4) The waterproof membrane should underlie the gravel and pipe, and be attached to the foundation grade beam or stem wall.
- 5) The underdrain system should be designed to discharge at least 5 gallons per minute of collected water.
- 6) The high point(s) for the collection pipe flow lines should be below the grade beam or shallow foundation bearing elevation. Multiple high points can be beneficial to reducing the depths to which the system would be installed.

The collection and discharge pipe for the underdrain system should be laid on a slope sufficient for effective drainage, but a minimum of 1 percent. (Flatter gradients may be used but will convey water less efficiently and entail an increased risk of local post-construction movements.)

Pipe gradients also should be designed to accommodate at least 1 inch of differential movement after installation along a 50-foot run.

- 7) Underdrain 'clean-outs' should be provided at intervals of no more than 100 feet to facilitate maintenance of the underdrains. Clean-outs also should be provided at collection and discharge pipe elbows of 60 degrees or more.

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- 8) The underdrain discharge pipes should be connected to one or more sumps from which water can be removed by pumping, or to outlet(s) for gravity discharge. We suggest that collected waters be discharged directly into the storm sewer system, if possible.

PAVEMENT SECTIONS

It is our understanding that the pathways servicing the Fire Engines will be paved with concrete. In our experience, parking areas for light vehicles are occasionally also included for similar facilities. Additionally a pavement design for the reach of 18th Street to be constructed as part of this project is also included.

A pavement section is a layered system designed to distribute concentrated traffic loads to the subgrade. Performance of the pavement structure is directly related to the physical properties of the subgrade soils and traffic loadings. The standard care of practice in pavement design describes the flexible pavement section as a “20-year” design pavement: however, most flexible pavements will not remain in satisfactory condition without routine maintenance and rehabilitation procedures performed throughout the life of the pavement. Pavement designs for the private pavements were developed in general accordance with the design guidelines and procedures of the City of 2015 City of Greeley Design Criteria and Construction Specifications as well as American Association of State Highway and Transportation Officials (AASHTO).

Subgrade Materials: Based on the results of our field exploration and laboratory testing, the potential pavement subgrade materials generally classify as A-2-4 to A-4 soils in accordance with the American Association of State Highway and Transportation Officials (AASHTO) classification system.

Testing indicated an R-value of 11 for the on-site materials. This value converts to a resilient modulus value of 3,681 psi based on CDOT correlation tables. It is important to note that significant decreases in soil support as quantified by the resilient modulus have been observed as the moisture content increases above the optimum. Therefore, pavements that are not properly drained may experience a loss of the soil support and subsequent reduction in pavement life.

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Anticipated Traffic: Specific traffic loadings were not available at the time of this report preparation. Based on our experience with similar projects equivalent 18-kip daily load application (EDLA) values of 5 and 30 were assumed for the general parking areas (standard-duty pavement) and high traffic areas (heavy-duty pavement), respectively. The EDLA values of 5 and 30 were converted to equivalent 18-kip single axle load (ESAL) values of 36,500 and 219,000, respectively for a 20-year design life. If anticipated traffic loadings differ significantly from these assumed values, GROUND should be notified to re-evaluate the pavement sections below.

We understand that the length of 18th Street that is anticipated to be constructed as part of this project is classified as a major arterial. Based on the 2015 City of Greeley Design Criteria and Construction Specifications the EDLA for a two lane major arterial is 100. This EDLA converts to an ESAL value of 730,000

Pavement Sections: The soil resilient modulus and the ESAL values were used to determine the required design structural number for the project pavements. The required structural number was then used to develop the pavement sections. Pavement designs were based on the DARWin™ computer program that solves the 1993 AASHTO pavement design equations. A reliability level of 85 percent and a terminal serviceability of 2.5 were utilized for design of the private pavement sections. A reliability level of 90 percent is specified by City of Greeley standards noted above. A structural coefficient of 0.44 was used for hot bituminous asphalt and 0.11 was used for aggregate base course. The minimum pavement sections for a 20-year design are tabulated below. Pavement section calculations are presented in Appendix A.

**Greeley Fire Station #6
Promontory Circle and Promontory Parkway**

MINIMUM PAVEMENT SECTIONS

Location	Flexible Section (inches Asphalt)	Composite Section (inches Asphalt / inches Aggregate Base)	Rigid Section (inches Concrete / inches Aggregate Base)
18 th Street	9.5	7.0 / 10	-
Standard-Duty Pavement	6	4.0 / 8	6 / 6
Heavy-Duty Pavement	7.5	5.5 / 10	7 / 6
Fire Truck Exterior Parking / Apron	-	-	9 / 12

Additionally, trash collection areas, as well as other pavement areas subjected to high turning stresses or heavy truck traffic should be provided with rigid pavements consisting of Portland cement concrete (see table above). Additionally, the owner should consider reinforced concrete in these areas. Concrete sections should be underlain by 6 inches of properly compacted aggregate base.

In areas of repeated turning stresses the concrete pavement joints should be fully tied or doweled. We suggest that civil design consider joint layout in accordance with CDOT's M Standards. Standard plans for placement of ties and dowels, etc., (CDOT M Standards) for concrete pavements can be found at the CDOT website: <http://www.dot.state.co.us/DesignSupport/>. Fully tied and doweled slabs will help to enhance load transfer and improve corner and edge cracking performance. Fiber reinforcement can also help to improve corner and edge cracking performance for heavily loaded slabs. Fiber reinforcement can also help to minimize surficial deterioration from freeze-thaw and the use of de-icing chemicals.

Edge confinement for concrete and asphalt pavements, such as curbs and gutters, will enhance performance and help to promote drainage. Additionally, pavements should not be placed near the crests of slopes without adequate edge confinement.

Concrete pavements should consist of a plant mix composed of a mixture of aggregate, Portland cement and appropriate admixtures meeting the requirements of a job-mix formula established by a qualified engineer. Concrete should have a minimum modulus of rupture of third point loading of 650 psi. Normally, concrete with a 28-day compressive strength of 4,000 psi should develop this modulus of rupture value. The concrete should

**Greeley Fire Station #6
Promontory Circle and Promontory Parkway**

be air-entrained with approximately 6 percent air and should have a minimum cement content of 6 sacks per cubic yard. Maximum allowable slump should be 4 inches.

Asphalt pavements should consist of a bituminous plant mix composed of a mixture of aggregate and bituminous material. Asphalt mixture(s) should meet the requirements of a job-mix formula established by a qualified Engineer.

Aggregate base material should meet the criteria of CDOT Class 5 or 6 aggregate base course. Base course should be placed in uniform lifts not exceeding 8 inches in loose thickness and compacted to at least 95 percent of the maximum dry density a uniform moisture contents within 2 percent of the optimum as determined by ASTM D1557 / AASHTO T-180, the "modified Proctor."

Subgrade Preparation: Shortly before paving, the pavement subgrade should be excavated and/or scarified to a minimum depth of **12 inches**, moisture-conditioned and properly re-compacted. Although subgrade preparation to a depth of 12 inches is typical in the project area, pavement performance commonly can be improved by a greater depth of moisture-density conditioning of the soils.

Subgrade preparation should extend the full width of the pavement. The subgrade for sidewalks and other project hardscaping also should be prepared in the same manner (moisture density treatment to a depth of 12-inches).

Criteria and standards for fill placement and compaction are provided in the *Project Earthwork* section of this report. The contractor should be prepared either dry the subgrade materials or moisten them, as needed, prior to compaction.

Where adequate drainage cannot be achieved or maintained, excavation and replacement should be undertaken to a greater depth, in addition to the edge drains discussed below.

Proof Rolling Immediately prior to paving, the subgrade should be proof rolled with a heavily loaded, pneumatic tired vehicle. Areas that show excessive deflection during proof rolling should be excavated and replaced and/or stabilized. Areas allowed to pond prior to paving will require significant re-working prior to proof-rolling. Establishment of a firm paving platform (as indicated by proof rolling) is an additional requirement beyond proper fill placement and compaction. It is possible for soils to be compacted within the

limits indicated in the *Project Earthwork* section of this report and fail proof rolling, particularly in the upper range of specified moisture contents.

Additional Observations

The collection and diversion of surface drainage away from paved areas is extremely important to the satisfactory performance of the pavements. The subsurface and surface drainage systems should be carefully designed to ensure removal of the water from paved areas and subgrade soils. Allowing surface waters to pond on pavements will cause premature pavement deterioration. Where topography, site constraints, or other factors limit or preclude adequate surface drainage, pavements should be provided with edge drains to reduce loss of subgrade support. The long-term performance of the pavement also can be improved greatly by proper backfilling and compaction behind curbs, gutters, and sidewalks so that ponding is not permitted and water infiltration is reduced.

Landscape irrigation in planters adjacent to pavements and in “island” planters within paved areas should be carefully controlled or differential heave and/or rutting of the nearby pavements will result. Drip irrigation systems are suggested for such planters to reduce over-spray and water infiltration beyond the planters. Enclosing the soil in the planters with plastic liners and providing them with positive drainage also will reduce differential moisture increases in the surrounding subgrade soils. In our experience, infiltration from planters adjacent to pavements is a principal source of moisture increase beneath those pavements. This wetting of the subgrade soils from infiltrating irrigation commonly leads to loss of subgrade support for the pavement with resultant accelerating distress, loss of pavement life and increased maintenance costs. This is particularly the case in the later stages of project construction after landscaping has been emplaced but heavy construction traffic has not ended. Heavy vehicle traffic over wetted subgrade commonly results in rutting and pushing of flexible pavements, and cracking of rigid pavements. In relatively flat areas where design drainage gradients necessarily are small, subgrade settlement can obstruct proper drainage and yield increased infiltration, exaggerated distress, etc. (These considerations apply to project flatwork, as well.)

As noted above, the standard care of practice in pavement design describes the flexible pavement section as a “20-year” design pavement; however, most pavements will not remain in satisfactory condition without routine, preventive maintenance and

**Greeley Fire Station #6
Promontory Circle and Promontory Parkway**

rehabilitation procedures performed throughout the life of the pavement. Preventive pavement treatments are surface rehabilitation and operations applied to improve or extend the functional life of a pavement. These treatments preserve, rather than improve, the structural capacity of the pavement structure. In the event the existing pavement is not structurally sound, the preventive maintenance will have no long-lasting effect. Therefore, a routine maintenance program to seal cracks, repair distressed areas, and perform thin overlays throughout the life of the pavement is suggested.

A crack sealing and fog seal/chip seal program should be performed on the pavements every 3 to 4 years. After approximately 8 to 10 years, patching, additional crack sealing, and asphalt overlay may be required. Prior to future overlays, it is important that all transverse and longitudinal cracks be sealed with a flexible, rubberized crack sealant in order to reduce the potential for propagation of the crack through the overlay. Traffic volumes that exceed the values utilized by this report will likely necessitate the need of pavement maintenance practices on a schedule of shorter timeframe than that stated above. The greatest benefit of preventive maintenance is achieved by placing the treatments on sound pavements that have little or no distress.

GROUND's experience indicates that longitudinal cracking is common in asphalt-pavements generally parallel to the interface between the asphalt and concrete structures such as curbs, gutters or drain pans. Distress of this type is likely to occur even where the subgrade has been prepared properly and the asphalt has been compacted properly. The use of thick base course or reinforced concrete pavement can reduce this. Our office should be contacted if these alternates are desired.

The assumed traffic loading does not include excess loading conditions imposed by heavy construction vehicles. Consequently, heavily loaded concrete, lumber, and building material trucks can have a detrimental effect on the pavement. An effective program of regular maintenance should be developed and implemented to seal cracks, repair distressed areas, and perform thin overlays throughout the life of the pavements.

Temporary Fire Truck Access Commonly, construction sites are required by local fire departments to provide temporary access for emergency response. It has been GROUND's experience these access drives are to provide support for trucks weighing up to 90,000 pounds and are typically desired to be gravel/aggregate-surfaced.

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Promontory Circle and Promontory Parkway**

Based on our experience, a temporary section consisting of at least 12 inches of material meeting the requirements of CDOT Class 5 or Class 6 Aggregate Base Course or at least 8 inches of CDOT Class 5 or Class 6 Aggregate Base Course over a layer of stabilization geotextile/geofabric, such as Mirafi® RS380i or the equivalent, could be utilized provided the Owner understands that this section is for temporary access during construction only and is not a replacement or an equal alternate to the pavement section(s) that was indicated previously. The aggregate base course placed for this purpose should be compacted to at least 95 percent of the maximum modified Proctor dry density. It should be noted that the aggregate base course sections indicated above are not intended to support fire truck outriggers without cribbing or similar measures.

It should be understood that with any aggregate surface, shoving and displacement of the granular materials should be expected during repetitive vehicular/equipment loading. Therefore, regular maintenance should be implemented to ensure proper surface and subsurface drainage, repair distressed/damaged areas, and re-establish grades. Application of additional aggregate may be required in this regard. Additionally, the ability of the aggregate temporary access drive to accommodate loads as indicated above is directly related to the quality of the subgrade materials on which the aggregate is placed, not only on the aggregate section. If water infiltrates these areas, additional rutting and other distress, including a reduction in capacity, will result, requiring additional maintenance.

CLOSURE AND LIMITATIONS

Geotechnical Review The author of this report or a GROUND principal should be retained to review project plans and specifications to evaluate whether they comply with the intent of the measures discussed in this report. The review should be requested in writing.

The geotechnical conclusions and parameters presented in this report are contingent upon observation and testing of project earthwork by representatives of GROUND. If another geotechnical consultant is selected to provide materials testing, then that consultant must assume all responsibility for the geotechnical aspects of the project by concurring in writing with the parameters in this report, or by providing alternative parameters.

**Greeley Fire Station #6
Promontory Circle and Promontory Parkway**

Materials Testing The City of Greeley should consider retaining a geotechnical engineer to perform materials testing during construction. The performance of such testing or lack thereof, however, in no way alleviates the burden of the contractor or subcontractor from constructing in a manner that conforms to applicable project documents and industry standards. The contractor or pertinent subcontractor is ultimately responsible for managing the quality of his work; furthermore, testing by the geotechnical engineer does not preclude the contractor from obtaining or providing whatever services that he deems necessary to complete the project in accordance with applicable documents.

Limitations This report has been prepared for the City of Greeley as it pertains to design of the proposed Fire Station #6 as described herein. It should not be assumed to contain sufficient information for other parties or other purposes. The Client has agreed to the terms, conditions, and liability limitations outlined in our agreement between the City of Greeley and GROUND. Reliance upon our report is not granted to any other potential owner, contractor, or lender. Requests for third-party reliance should be directed to GROUND in writing; granting reliance by GROUND is not guaranteed.

In addition, GROUND has assumed that project construction will commence by Summer/Fall 2019. Any changes in project plans or schedule should be brought to the attention of a geotechnical engineer, in order that the geotechnical conclusions in this report may be re-evaluated and, as necessary, modified.

The geotechnical conclusions and parameters in this report were based on subsurface information from a limited number of exploration points, as shown in Figure 1, as well as the means and methods described herein. Subsurface conditions were interpolated between and extrapolated beyond these locations. It is not possible to guarantee the subsurface conditions are as indicated in this report. Actual conditions exposed during construction may differ from those encountered during site exploration. Design modifications may be necessary by the project team; this may result in an increase in project costs and schedule delays. In addition, a contractor who obtains information from this report for development of his scope of work or cost estimates does so solely at his own risk and may find the geotechnical information in this report to be inadequate for his purposes or find the geotechnical conditions described herein to be at variance with his experience in the greater project area. The contractor should obtain the additional geotechnical information that is necessary to develop his workscope and cost estimates

**Greeley Fire Station #6
Promontory Circle and Promontory Parkway**

with sufficient precision. This includes, but is not limited to, information regarding excavation conditions, earth material usage, current depths to groundwater, etc. Because of the necessarily limited nature of the subsurface exploration performed for this study, the contractor should be allowed to evaluate the site using test pits or other means to obtain additional subsurface information to prepare his bid.

If during construction, surface, soil, bedrock, or groundwater conditions appear to be at variance with those described herein, work should cease and a geotechnical engineer should be retained at once, so that our conclusions and design parameters for this site may be re-evaluated in a timely manner and dependent aspects of project design can be modified, as necessary.

The materials present on-site are stable at their natural moisture content, but may change volume or lose bearing capacity or stability with changes in moisture content. Performance of the proposed structure and pavement will depend on implementation of the conclusions and information in this report and on proper maintenance after construction is completed. Because water is a significant cause of volume change in soils and rock, allowing moisture infiltration may result in movements, some of which will exceed estimates provided herein and should therefore be expected by the City of Greeley

ALL DEVELOPMENT CONTAINS INHERENT RISKS. It is important that ALL aspects of this report, as well as the estimated performance (and limitations with any such estimations) of proposed improvements are understood by the City of Greeley. Utilizing the geotechnical parameters and measures herein for planning, design, and/or construction constitutes understanding and acceptance of the conclusions with regard to risk and other information provided herein, associated improvement performance, as well as the limitations inherent within such estimates. Ensuring correct interpretation of the contents of this report by others is not the responsibility of GROUND. If any information referred to herein is not well understood, it is imperative that the City of Greeley or the owner contact the author or a GROUND principal immediately. We will be available to meet to discuss the risks and remedial approaches presented in this report, as well as other potential approaches, upon request.

This report was prepared in accordance with generally accepted soil and foundation engineering practice in the project area at the date of preparation. Current applicable

**Greeley Fire Station #6
Promontory Circle and Promontory Parkway**

codes may contain criteria regarding performance of structures and/or site improvements which may differ from those provided herein. Our office should be contacted regarding any apparent disparity.

GROUND makes no warranties, either expressed or implied, as to the professional data, opinions or conclusions contained herein. Because of numerous considerations that are beyond GROUND's control, the economic or technical performance of the project cannot be guaranteed in any respect.

This document, together with the concepts and conclusions presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Re-use of, or improper reliance on this document without written authorization and adaption by GROUND Engineering Consultants, Inc., shall be without liability to GROUND Engineering Consultants, Inc.

GROUND appreciates the opportunity to complete this portion of the project and welcomes the opportunity to provide the City of Greeley with a proposal for construction observation and materials testing.

Sincerely,
GROUND Engineering Consultants, Inc.



Kelsey Van Bommel, P.E.

Reviewed by Joseph Zorack, P.E.



GOOGLE EARTH AERIAL IMAGE (DATE UNKNOWN)

1



Indicates test hole number and approximate location.



(Not to Scale)

GROUND

ENGINEERING CONSULTANTS

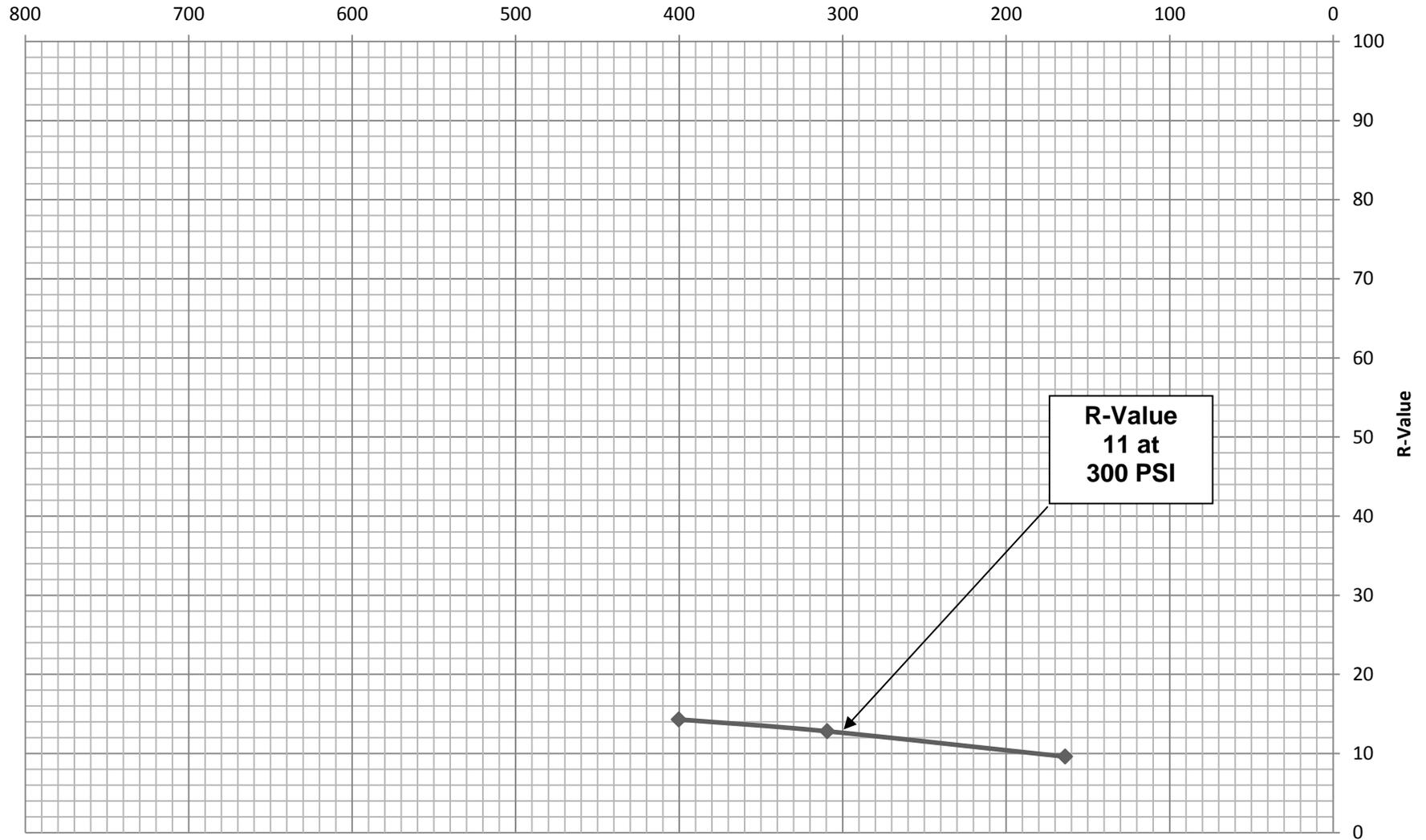
LOCATION OF TEST HOLES

JOB NO.: 19-0006

FIGURE: 1

CADFILE NAME: 0006SITE.DWG

Exudation Pressure (PSI)



Location: Bulk , 5-10' P-1 o P-3

Test Specimen	1	2	3
Moisture (%)	12.4	14.3	15.9
R-Value	14	13	10
Exudation Pressure	400	309	164

Sample ID No. 0006 Bulk

Job No. 19-0006

Soil Type: Silty Sand

**GROUND
ENGINEERING CONSULTANTS**
R-VALUE TEST RESULT
ASTM D 2844-07e1

Figure 2

***Material will be considered "unstable" if optimum moisture is greater than 300 psi exudation moisture and the decrease in R-value from 400 psi to 300 psi exudation pressure is 10 or greater



TABLE 2
SUMMARY OF SOIL CORROSION TEST RESULTS

Sample Location		Water Soluble Sulfates (%)	pH	Redox Potential (mV)	Sulfides Content	Resistivity (ohm-cm)	USCS Classification	Soil or Bedrock Type
Test Hole No.	Depth (feet)							
P-2	5	0.01	8.1	-95	trace	1,640	(SM)	Silty SAND

Job No. 19-0006



TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

Sample Location		Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	Atterberg Limits		Percent Swell (Surcharge Pressure)	USCS Classification	AASHTO Classification (GI)	Soil or Bedrock Type
Test Hole No.	Depth (feet)				Liquid Limit	Plasticity Index				
1	4	2.7	99.3	31	-	NP	-	(SM)	A-2-4(0)	Sandstone
1	9	13.5	111.4	73	35	10	2.0 (500 psf)	(ML)s	A-4(7)	Siltstone
2	3	4.9	98.6	38	27	5	-3.6 (500 psf)	(SM)	A-4(0)	Silty SAND
2	8	15.4	106.6	34	22	NP	-	(SM)	A-2-4(0)	Sandstone
3	7	19.8	102.8	72	36	15	0.5 (500 psf)	(CL)s	A-6(10)	Claystone
4	10	11.2	94.2	26	25	NP	-	(SM)	A-2-4(0)	Sandstone
4	15	16.1	SD	30	26	NP	-	(SM)	A-2-4(0)	Sandstone
P-1	2	12.8	91.4	23	25	NP	-	(SM)	A-2-4(0)	Sandstone
P-2	5	7.4	97.0	40	21	NP	-	(SM)	A-4(0)	Silty SAND
P-3	4	5.1	103.0	46	26	NP	-0.8(150 psf)	(SM)	A-4(0)	Silty SAND
P-1 to P-3	5 to 10'	R-Value = 11		37	23	NP	-	(SM)	A-4(0)	Silty SAND

SD = Sample Disturbed, NV = Non-Viscous, NP = Non-Plastic

Job No. 19-0006

APPENDIX A

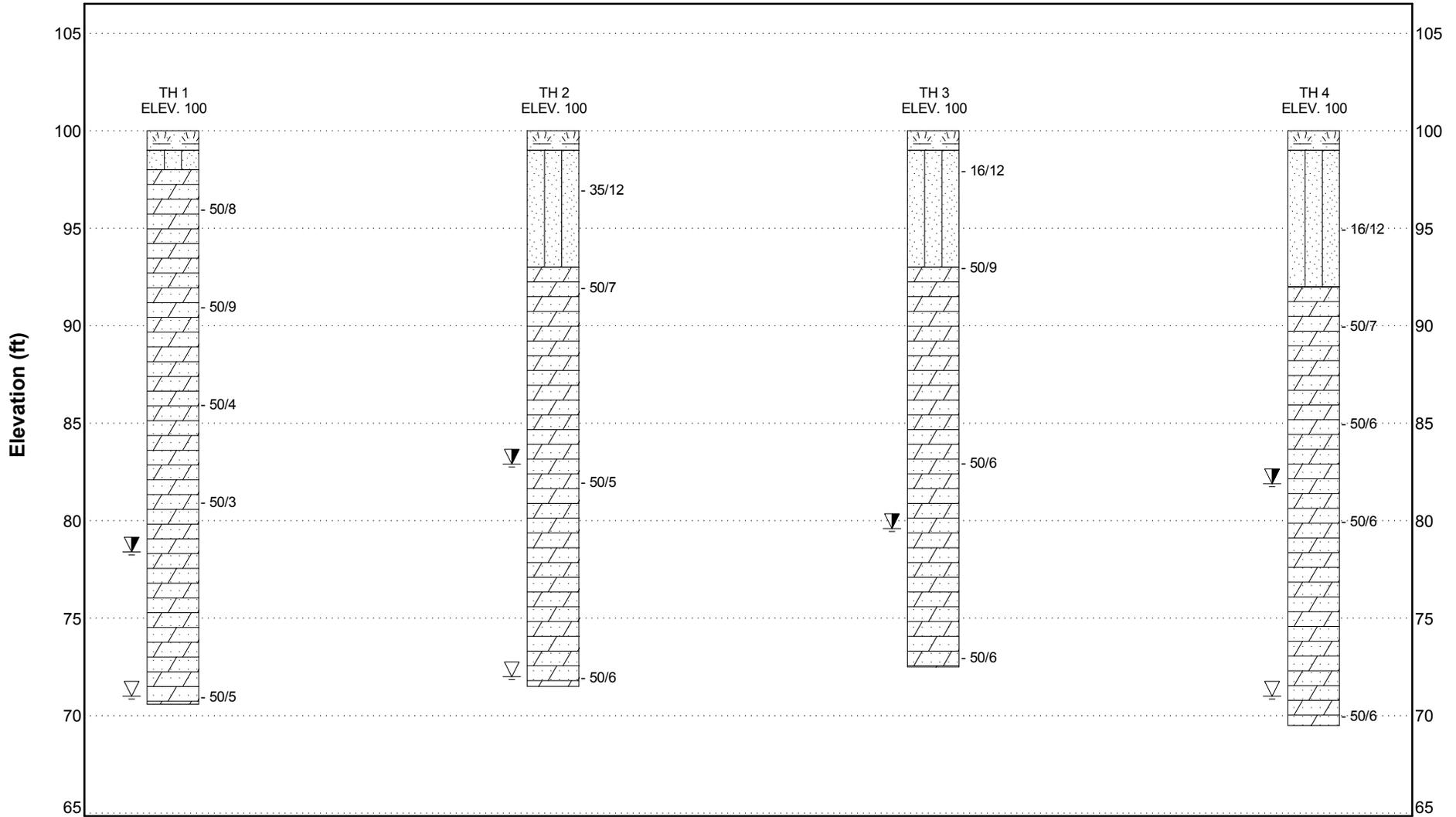
BORING LOGS AND LEGEND

CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

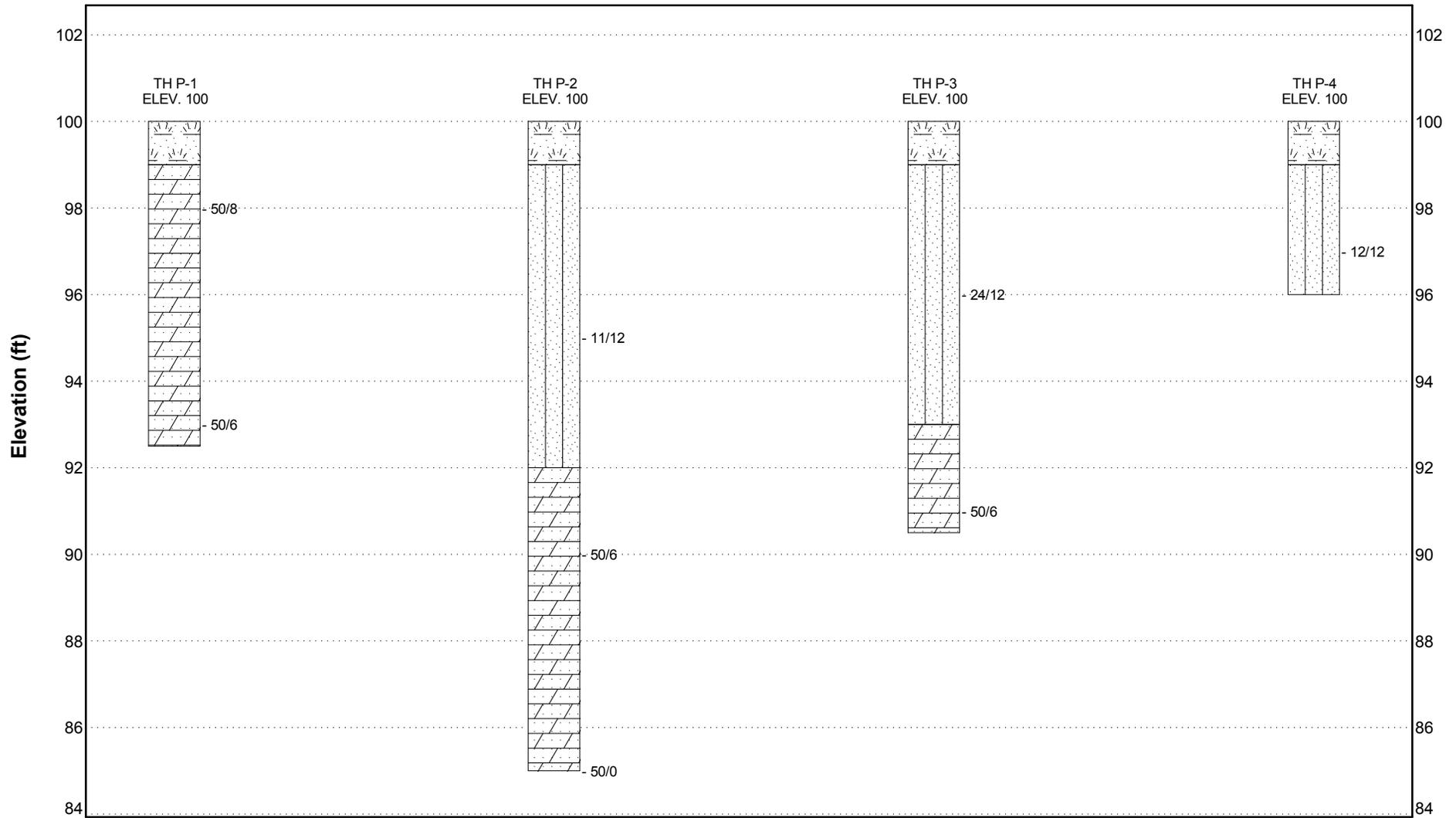


CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO



CLIENT: City of Greeley PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006 PROJECT LOCATION: Greeley, CO

LITHOLOGIC SYMBOLS



TOPSOIL



SILTY SAND (SM)



SANDSTONE & CLAYSTONE BEDROCK

SAMPLER SYMBOLS



California Sampler
23 / 12 Drive sample blow count indicates 23 blows of a 140 pound hammer falling 30 inches were required to drive the sampler 12 inches.

NOTES:

1. Test holes were drilled on 02/13/2019 with 4-inch Diameter Continuous Flight Auger.
2. Locations of the test holes were measured approximately by pacing from features shown on the site plan provided.
3. Elevations of the test holes were not measured and the logs of the test holes are drawn to depth.
4. The test hole locations and elevations should be considered accurate only to the degree implied by the method used.
5. The lines between materials shown on the test hole logs represent the approximate boundaries between material types and the transitions may be gradual.
6. Groundwater level readings shown on the logs were made at the time and under the conditions indicated. Fluctuations in the water level may occur with time.
7. The material descriptions on these logs are for general classification purposes only. See full text of this report for descriptions of the site materials & related recommendations.
8. All test holes were immediately backfilled upon completion of drilling, unless otherwise specified in this report.

NOTE: See Detailed Logs for Material descriptions.

ABBREVIATIONS

▽ Water Level at Time of Drilling, or as Shown

▼ Water Level at End of Drilling, or as Shown

▽ Water Level After 24 Hours, or as Shown

NV No Value
NP Non Plastic



CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND										
			SANDSTONE and CLAYSTONE BEDROCK										
95	5			50/8	2.7	99.3	31	NV	NP				SM
90	10			50/9	13.5	111.4	73	35	10	2.0 @ 500			ML
85	15			50/4									
80	20			50/3									
75	25			50/5									

Bottom of borehole at Approx. 29 feet.



CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND	35/12	4.9	98.6	38	27	5	-3.6 @ 500			SM
95	5												
			SANDSTONE and CLAYSTONE BEDROCK	50/7	15.4	106.6	34	22	NP				SM
90	10												
85	15												
				50/5									
80	20												
75	25												
				50/6									

Bottom of borehole at Approx. 29 feet.

CLIENT: City of Greeley PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006 PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND	◆	16/12								
95	5												
			SANDSTONE and CLAYSTONE BEDROCK	◆	50/9	19.8	102.8	72	36	15	0.5 @ 500		CL
90	10												
85	15												
				◆	50/6								
80	20												
75	25												
				◆	50/6								

Bottom of borehole at Approx. 28 feet.



CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND										
95	5			50/12	16/12								
90	10		SANDSTONE and CLAYSTONE BEDROCK	50/7		11.2	94.2	26	25	NP			SM
85	15			50/6		16.1	SD	30	26	NP			SM
80	20			50/6									
75	25												
70	30			50/6									

Bottom of borehole at Approx. 31 feet.

CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			SANDSTONE and CLAYSTONE BEDROCK										
				50/8	12.8	91.4	23	25	NP				SM
95	5												
				50/6									

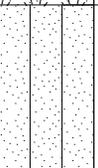
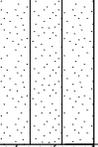
Bottom of borehole at Approx. 8 feet.

CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND										
95	5			◆	11/12	7.4	97.0	40	21	NP			SM
90	10		SANDSTONE and CLAYSTONE BEDROCK	◆	50/6								
85	15												

Bottom of borehole at Approx. 15 feet.

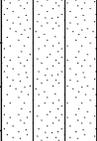
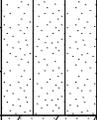
50/0

CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND										
95	5		SANDSTONE and CLAYSTONE BEDROCK	◆	24/12	5.1	103.0	46	26	NP	-0.8 @ 150		SM
			SANDSTONE and CLAYSTONE BEDROCK	◆	50/6								

Bottom of borehole at Approx. 10 feet.

CLIENT: City of Greeley

PROJECT NAME: Greeley Fire Station No. 6

JOB NO.: 19-0006

PROJECT LOCATION: Greeley, CO

Elevation (ft)	Depth (ft)	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Blow Count	Natural Moisture Content (%)	Natural Dry Density (pcf)	Percent Passing No. 200 Sieve	ATTERBERG LIMITS		% Swell at Surcharge (psf)	Unconfined Strength (psf)	USCS
									Liquid Limit	Plasticity Index			
100	0		TOPSOIL										
			Silty SAND										
				⬇	12/12								

Bottom of borehole at Approx. 4 feet.

APPENDIX B

PAVEMENT SECTION CALCULATIONS

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
Network Administrator

Flexible Structural Design Module

Greeley Fire Station #6
Promontory Parkway and 18th Street
Greeley, Colorado
General Parking Full Depth Asphalt Section

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	36,500
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	85 %
Overall Standard Deviation	0.44
Roadbed Soil Resilient Modulus	3,681 psi
Stage Construction	1
Calculated Design Structural Number	2.49 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	<u>Struct Coef. (Ai)</u>	<u>Drain Coef. (Mi)</u>	<u>Thickness (Di)(in)</u>	<u>Width (ft)</u>	<u>Calculated SN (in)</u>
1	Hot Mix Asphalt	0.44	1	6	-	2.64
Total	-	-	-	6.00	-	2.64

1993 AASHTO Pavement Design

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Computer Software Product
Network Administrator

Flexible Structural Design Module

Greeley Fire Station #6
Promontory Parkway and 18th Street
Greeley, Colorado
General Parking Composite Asphalt Section

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	36,500
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	85 %
Overall Standard Deviation	0.44
Roadbed Soil Resilient Modulus	3,681 psi
Stage Construction	1
Calculated Design Structural Number	2.49 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	<u>Struct Coef. (Ai)</u>	<u>Drain Coef. (Mi)</u>	<u>Thickness (Di)(in)</u>	<u>Width (ft)</u>	<u>Calculated SN (in)</u>
1	Hot Mix Asphalt	0.44	1	4	-	1.76
2	Aggregate Base Course	0.11	1	8	-	0.88
Total	-	-	-	12.00	-	2.64

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare Computer Software Product

Network Administrator

Flexible Structural Design Module

Greeley Fire Station #6
Promontory Parkway and 18th Street
Greeley, Colorado
Private Drive Full Depth Asphalt Section

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	219,000
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	85 %
Overall Standard Deviation	0.44
Roadbed Soil Resilient Modulus	3,681 psi
Stage Construction	1
Calculated Design Structural Number	3.30 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	<u>Struct Coef. (Ai)</u>	<u>Drain Coef. (Mi)</u>	<u>Thickness (Di)(in)</u>	<u>Width (ft)</u>	<u>Calculated SN (in)</u>
1	Hot Mix Asphalt	0.44	1	7.5	-	3.30
Total	-	-	-	7.50	-	3.30

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

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Computer Software Product
Network Administrator

Flexible Structural Design Module

Greeley Fire Station #6
Promontory Parkway and 18th Street
Greeley, Colorado
Private Drive Composite Asphalt Section

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	219,000
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	85 %
Overall Standard Deviation	0.44
Roadbed Soil Resilient Modulus	3,681 psi
Stage Construction	1
Calculated Design Structural Number	3.30 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	<u>Struct Coef. (Ai)</u>	<u>Drain Coef. (Mi)</u>	<u>Thickness (Di)(in)</u>	<u>Width (ft)</u>	<u>Calculated SN (in)</u>
1	Hot Mix Asphalt	0.44	1	5.5	-	2.42
2	Aggregate Base Course	0.11	1	10	-	1.10
Total	-	-	-	15.50	-	3.52

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare Computer Software Product

Network Administrator

Flexible Structural Design Module

Greeley Fire Station #6
Promontory Parkway and 18th Street
Greeley, Colorado
18th Street Full Depth Asphalt Section

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	730,000
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.44
Roadbed Soil Resilient Modulus	3,681 psi
Stage Construction	1
Calculated Design Structural Number	4.11 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	<u>Struct Coef. (Ai)</u>	<u>Drain Coef. (Mi)</u>	<u>Thickness (Di)(in)</u>	<u>Width (ft)</u>	<u>Calculated SN (in)</u>
1	Hot Mix Asphalt	0.44	1	9.5	-	4.18
Total	-	-	-	9.50	-	4.18

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
Network Administrator

Flexible Structural Design Module

Greeley Fire Station #6
Promontory Parkway and 18th Street
Greeley, Colorado
18th Street Composite Pavement Design

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	730,000
Initial Serviceability	4.5
Terminal Serviceability	2.5
Reliability Level	90 %
Overall Standard Deviation	0.44
Roadbed Soil Resilient Modulus	3,681 psi
Stage Construction	1
Calculated Design Structural Number	4.11 in

Specified Layer Design

<u>Layer</u>	<u>Material Description</u>	<u>Struct Coef. (Ai)</u>	<u>Drain Coef. (Mi)</u>	<u>Thickness (Di)(in)</u>	<u>Width (ft)</u>	<u>Calculated SN (in)</u>
1	Hot Mix Asphalt	0.44	1	7	-	3.08
2	Aggregate Base Course	0.11	1	10	-	1.10
Total	-	-	-	17.00	-	4.18

Attachment E
Forms for Affirmation of Compliance

EXHIBIT 1

PROPOSAL ACKNOWLEDGEMENT

The Respondent hereby acknowledges receipt of addenda numbers _____ through _____.

Falsifying this information is cause to deem your proposal nonresponsive and therefore ineligible for consideration. In addition, falsification of this information is cause to cancel a contract awarded based on one or both of the above preferences.

By signing below, you agree to all terms & conditions in this RFP, except where expressly described in your cover letter.

Original Signature by Authorized Officer/Agent

Type or printed name of person signing

Company Name

Title

Phone Number

Vendor Mailing Address

Fax Number

City, State, Zip

Proposal Valid Until (at least for 90 days)

E-Mail Address

Website Address

Project Manager:

Name (Printed)

Phone Number

Vendor Mailing Address

Fax Number

City, State, Zip

Email Address

Debarment/Suspension Certification Statement

The proposer certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal, State, County, Municipal or any other department or agency thereof. The proposer certifies that it will provide immediate written notice to the City if at any time the proposer learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstance.

DUNS # (Optional) _____

Name of Organization _____

Address _____

Authorized Signature _____

Title _____

Date _____

