REVENUE AUTHORITY OF PRINCE GEORGE'S COUNTY

INVITATION FOR BIDS

For

GROUND IMPROVEMENTS

For

CAPITAL REGION MEDICAL CENTER
PARKING STRUCTURE
LARGO, MARYLAND

PROJECT NO. – 19-10695

Date: May 9, 2019

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I. OBJECTIVE

The Revenue Authority of Prince George's County (the "Client") is seeking sealed bids from Ground Improvement Contractors (hereafter called "Bidder(s)") for the design and installation of Ground Improvements for the Capital Region Medical Center Parking Garage (hereafter called "Project") that the Client will construct at the Capital Region Medical Center to be located in the Largo Town Center, Largo, MD. The objective of this solicitation is to procure an aggregate Pier Foundation System for the 1,150-space parking structure.

The selected Bidder shall have sufficient organization, personnel and construction capability to perform the requested services set forth in this IFB (the "Work") in an expeditious and economical manner at the highest standards of the Bidder's profession. The Bidder shall furnish all labor, services, supplies, materials and equipment required to complete the Work using the Bidder's best efforts, skill, judgment, and abilities in accordance with this IFB. The Bidder accepts the fiduciary relationship of trust and confidence established between it and the Client by the awarded contract.

Bidders shall provide all design and installation services necessary for the Work to support the construction of the Project. The approximate size and location of the Project is shown in Exhibit 'B' of this IFB. All criteria will be evaluated and confirmed by the successful Bidder along with project stakeholders during the early stages of project construction.

A mandatory pre-proposal conference will be held on **May 13, 2019, from 9:00 to 10:00 a.m.** in the Office of the Client, 1300 Mercantile Lane, Suite 108, Largo, Maryland, 20774. This meeting will provide Bidders with the opportunity to ask questions about the selection process and the program.

The full version of this IFB can be downloaded from the Client's website at http:/pgebid.co.pg.md.us/ebid. Questions regarding this IFB should be directed to the Client's Project Manager, Fabian Lewis at REDevelopment@co.pg.md.us:

Bidders shall submit their sealed bids no later than **May 30, 2019 at 3:00 p.m. LOCAL TIME,** to the Revenue Authority of Prince George's County Office located at 1300 Mercantile Lane, Suite 108, Largo, Maryland, 20774. The sealed bids shall be clearly labeled **"BID FOR GROUND IMPROVEMENTS FOR CAPITAL REGION MEDICAL CENTER PARKING STRUCTURE, LARGO TOWN CENTER, LARGO, MD".**

II. SUMMARY OF SERVICES

A. PROJECT BACKGROUND AND SUMMERY OF SERVICES:

The Client is seeking bids from Bidders to provide aggregate Ground Improvement System for the construction of a new parking structure consisting of a multi-story parking structure which will provide parking for the Capital Medical Center of Prince George's County.

III. BIDDER'S QUALIFICATIONS

A. BIDDER'S and SUB-CONSULTANT QUALIFICATIONS

The following is a list of qualifications that the Bidder must possess at the minimum:

1. Maryland registration and licensing in the appropriate and applicable disciplines.
2. Thorough knowledge of Maryland Building Codes and all applicable State Statutes, building codes and regulations including, without limitation, the provisions of Local Public Contracts Law.
3. The Contractor's personnel shall include a Project Manager and a Site Superintendent both of whom will be in responsible charge full-time and on-site during the construction of the ground improvement system.
4. The Superintendent and ground improvement rig operator each shall have at least 10-years of experience including supervision and construction of at least three ground improvement projects of similar scope, application and size in the past year and shall submit evidence of successful installation of similar ground improvement system under similar job conditions.
5. A Field Supervisor who shall have a minimum of 5-years of specific experience. The Contractor's surveyors and other field personnel, including the field survey party chief, shall be subject to the review of the Engineer.
6. Upon award of the contract, ability to secure professional liability insurance for error and omissions as well as commercial general liability, automobile liability and workers' compensation insurance.
7. The Bidder shall have an organizational depth and technical resources in-house to perform the services in a manner consistent with the best interests of the Client.

B. CONTENTS OF BIDS

Bids should include the following:

1. Briefly describe your firm, organizational structure and support resources available to complete the Work outlined above in this IFB.
2. List the qualifications of key personnel who would be assigned to this project including relative experience, degrees, certifications and professional affiliations.
3. Provide list of completed projects with ground improvement system of similar scope and magnitude as required for this project.
4. Provide references including name and phone number for recently completed projects with similar ground improvements systems.
5. Provide a general work plan to complete the Work.

C. SUPPLIER DIVERSITY

1. This IFB has a goal of at least forty percent (40%) certified County-based small business participation. All prime contractors, including certified MBE firms, are required to use best efforts to achieve this goal. All bids must be accompanied by a Supplier Diversity Plan. **Certified County-based small business identified in the Supplier Diversity Plan at time of bid opening cannot be changed without the prior approval of the Director of Purchasing and Supply Services.**

2. The Client strongly encourages Bidders to maximize the use of qualified locally based minority and women-owned business within the geographical boundaries of Prince George's County. The Bidder shall verify, through documentation that good faith efforts were engaged to maximize the use of qualified local minority and women-owned businesses in Prince George's County.

3. **Minority businesses are encouraged to submit bids in response to this IFB.**

IV. BIDDER'S FEE

A. BID FORM AND PROPOSAL

Revenue Authority of Prince George's County
Capital Region Medical Center Garage
Ground Improvements

From: _____
(Proper Name of Bidder)

ACKNOWLEDGEMENT OF GENERAL CONDITIONS

The General Conditions and definitions therein are accessible on the Client's website at http:/pgebid.co.pg.md.us/ebid and are an integral part of the Contract Documents. The Contractor shall not disclaim knowledge of the meaning and effect of any term or provision of these General Conditions, and Supplemental Conditions, if any, and agrees to strictly abide by their meaning and intent. In the event the Contractor fails to initial this acknowledgement, the Client shall have the right to reject the Bid.

CONTRACTOR' INITIALS: _____

BASE BID	**$_____.___**
PERMIT FEE ALLOWANCE	**$_____.___**
THIRD-PARTY PLAN REVIEW COST	**$_____.___**
TOTAL PROPOSED FEE	**$_____.___**

V. PROJECT SCHEDULE

A. PROJECT DESIGN AND CONSTRUCTION SCHEDULE

The following schedule identifies the estimated design and construction phases for this project and the estimated durations.

PROJECT PHASE	EXPECTED COMPLETION DATES
1. Contract Award	**June 06, 2019**
2. Submission of Shop Drawings for DPIE Review	**July 24, 2019**
3. Construction Start	**September 20, 2019**
4. Construction Complete	**November 18, 2019**

B. BIDDER'S DESIGN AND CONSTRUCTION SCHEDULE

The Bidder shall submit a project design bar chart schedule with their bid. The bar chart schedule developed by the Bidder shall reflect their recommended project phases, phase activities, activity durations.

The Bidder shall estimate the duration of the Project Close-Out Phase based on the anticipated time required to complete each deliverable identified in Section XIV of this IFB document entitled "Contract Deliverables - Project Close-Out Phase" and include this information in the bar chart schedule submitted.

A written narrative shall also be included with the bid explaining the schedule submitted and the reasons why and how it can be completed in the time frame proposed by the Bidder.

This schedule and narrative will be reviewed by the Bidder Selection Committee as part of the evaluation process.

C. BIDDER'S DESIGN SCHEDULE

The Client will approve the Bidder's approved project schedule at the first design kickoff meeting. This schedule will be binding for the Bidder's activities and will include the start and completion dates for each design activity. The Bidder and Project team members shall use this schedule to ensure that all dates are being met for the project. The Bidder shall update the schedule to reflect performance periodically (minimally at each design phase) for the Project Team review and approval. Any recommendations for deviations from the approved design schedule must include the

causes for the deviation(s) and impact to the schedule.

VI. PROJECT SITE LOCATION AND TEAM MEMBERS

A. PROJECT SITE ADDRESS

The location of the project site is:

Regional Medical Center
Largo Town Center
Largo, MD 20774

See **Exhibit 'B'** for the project site location.

B. PROJECT TEAM MEMBER DIRECTORY

The following are the names, addresses, and phone numbers of the Project Team members.

1. Client's Project Manager:

Name: Fabian Lewis
Address: 1300 Mercantile Lane, Suite 108
Largo, Maryland 20774
Phone No: 301-850-5057
E-Mail No: REDevelopment@co.pg.md.us

2. Client Representative:

Name: Richard Partlow
Company: Johnson, Mirmiran & Thompson, Inc. (JMT)
Address: 40 Wight Avenue
Hunt Valley, Maryland 21030
Phone No: 442-662-4274
E-Mail No: Rpartlow@jmt.com

VII. BIDDER'S DESIGN RESPONSIBILITIES

A. DESIGN CRITERIA

1. Parking Structure:

The Bidder shall provide the design and specifications to provide ground improvements for the Capital Region Medical Center Parking Structure project**.** The Bidder shall provide for all elements of the design as necessary, including but not limited to, drainage and barrier free requirements.

2. Survey:

The Bidder shall be responsible for obtaining all field measurements and record all data necessary to provide the design for the ground improvement, including subsurface utility surveying as necessary.

The Bidder shall provide a topographic survey that depicts the location and elevation of the existing features that are to remain, those that are to be removed and those that are new at the site.

Contours shall be accurately plotted to an acceptable scale and labeled with spot elevations at high, low, and critical points. Legends and symbols for various topographic features must be clearly indicated on the drawing.

Any survey data or drawings provided to the Bidder must be field verified to determine the accuracy of the information.

B. GENERAL PROJECT OVERVIEW

1. Design Detail:

Section VII of this IFB is intended as a guide for the Bidder to understand the overall basic design requirements of the project and is not intended to identify each specific design component related to code and construction items. The Bidder shall provide details during the design phase of the project ensuring that they are in compliance with all applicable codes, regulating authorities, and the guidelines established in the Client Procedures.

The Bidder shall understand that construction documents submitted to the Client shall go beyond the basic requirements set forth by the current copy of the Uniform Construction Code. Drawings and specifications shall provide detail beyond that required to merely show the nature and character of the work to be performed. The construction documents shall provide sufficient information and detail to illustrate,

describe and clearly delineate the design intent of the Bidder.

The Bidder shall ensure that all the design items described in this IFB are addressed and included in the project drawings and specification sections where appropriate.

It shall be the Bidder's responsibility to provide all the design elements for this project. Under no circumstance may they delegate the responsibility of the design; or portions thereof, to a 3rd party unless specifically allowed in this IFB.

2. Submittal Schedule:

The Bidder shall include a submittal schedule in Division 1 of the design specifications. The schedule (list of required submittals) shall identify the general conditions and/or specification section (number and name) and the type of submittal required (material data, product data, test results, calculations, etc.). The submittal schedule is a compilation of the submittals required on the project and is provided as an aid to the Owner.

C. PROJECT COMMENCEMENT

A pre-construction meeting shall be scheduled with the Bidder and the Project Team members at the commencement of the project to obtain and/or coordinate the following information:

1. Project Directory:

Develop a project directory that identifies the name and phone number of key designated representatives who may be contacted during the design and construction phases of this project.

2. Site Access:

Develop procedures to access the project site and provide the names and phone numbers of approved escorts when needed.

3. Project Coordination:

Review and become familiar with any current and/or future projects at the site that may impact the design, construction, and scheduling requirements of this project. Incorporate all appropriate information and coordination requirements in Division 1 of the specification.

4. Existing Documentation:

Civil Site and DD level Structural drawings of the Capital Region Medical Center Parking Structure are available for review. The Bidder shall obtain copies of the existing drawings by contacting the Project Manager or the Client Representative directly.

The Bidder shall review these documents and any additional information available such as reports, studies, surveys, equipment manuals, as-built drawings, etc. The Client does not attest to the accuracy of the information provided and accepts no responsibility for the consequences of errors by the use of any information and material contained in the documentation provided. It shall be the responsibility of the Bidder to verify the contents and assume full responsibility for any determination or conclusion drawn from the material used. If the information provided is insufficient, the Bidder shall take the appropriate actions necessary to obtain the additional information required.

All original documentation shall be returned to the provider at the completion of the project.

5. Scope of Work:

The Bidder shall review the design and construction administration responsibilities and the submission requirements identified in this IFB with the Project Team members. Items such as: contract deliverables, special sequencing or phased construction requirements, special hours for construction based on Client Agency programs or building occupancy, security needs, delivery dates of critical and long lead items, utility interruptions or shut down constraints for tie-ins, weather restrictions, and coordination with other project construction activities at the site shall be addressed.

This information and all general administrative information; including a narrative summary of the work for this project, ***shall be included in Division 1*** of the specification. The Bidder shall assure that there are no conflicts between the information contained in Division 1 of the specification and the Contractor's General Conditions.

6. Project Schedule:

Review and update the project design and construction schedule with the Project Team members.

D. CONSTRUCTION BID DOCUMENT SUBMITTAL

In addition to submitting construction bid documents as defined in Section XII Contract Deliverables, Bidder shall submit both specifications and drawings on compact disk

(CD) in *Adobe Portable Document Format (.pdf).*

VIII. BIDDER'S CONSTRUCTION RESPONSIBILITIES

A. GENERAL CONSTRUCTION ADMINISTRATION OVERVIEW

This section of the IFB is intended as a guide for the Bidder to understand their overall basic construction administration responsibilities for the project and does not attempt to identify each specific activity or deliverable required during this phase.

B. PRE-BID MEETING

The Owner's Representative shall attend, chair, record and distribute minutes of the Contractor pre-bid meetings. When Bidders ask questions that may affect the bid price of the project, the Owner's Representation shall develop a Bulletin(s) to clarify the bid documents in a format acceptable to the Client. The Owner's Representative will then distribute the document to all Bidders.

C. BID OPENING

The Bidders do not have to attend the bid opening. In the event that the construction bids received exceed the Owner's approved final cost estimate by 5% or more, the lowest responsible and responsive Bidder, in cooperation with the Owner, shall redesign and/or set up sufficient approved alternate designs, plans and specifications for the project work, to secure a bid that will come within the allocation specified by the State of Maryland without impacting the programmatic requirements of the project. Such redesign work and changes to plans, including reproduction costs for submission in order to obtain final approval, shall be undertaken by the Bidder at no additional cost to the Client.

D. POST BID REVIEW MEETING, RECOMMENDATION FOR AWARD

The Client Representative, in conjunction with the Project Manager, shall review the bid proposals submitted by the various Bidders to determine the lowest responsible and responsive bid for the Work. The Client Representative, in conjunction with the Project Manager and the Project team members, shall develop a post bid questionnaire based on the requirements below and schedule a post bid review meeting with the Bidder's representative to review the construction costs and schedule, staffing, and other pertinent information to ensure they understand the Scope of the Work and that their bid proposal is complete and inclusive of all requirements necessary to deliver the Work in strict accordance with the plans and specifications.

1. Post Bid Review:

The Client Representative, in conjunction with the Project Manager, shall review the project bid proposals including the alternates, unit prices, and allowances within seven (7) calendar days from the bid due date. Provide a bid tabulation matrix comparing all bids submitted and make a statement about the high, low, and average bids received. Include a comparison of the submitted bids to the approved current construction cost estimate. When applicable, provide an analysis with supporting data, detailing why the bids did not meet the construction cost estimate.

2. Review Meeting:

The Client Representative, in conjunction with the Project Manager, shall arrange a meeting with the apparent low bid Bidder to discuss their bid proposal and other issues regarding the award of the contract. Request the Bidder to confirm that their bid proposal does not contain errors. Review and confirm alternate pricing and unit pricing and document acceptance or rejection as appropriate.

Comment on all omissions, qualifications and unsolicited statements appearing in the proposals. Review any special circumstances of the project. Ensure the Bidder's signature appears on all post bid review documents.

E. DIRECTOR'S HEARING

All Bidder must attend any Director's hearing(s) if a Bidder submits a bid protest. The Bidder shall be present to interpret the intent of the design documents and answer any technical questions that may result from the meeting. In cases where the bid protest is upheld, the Bidder shall submit a new "Letter of Recommendation" for contract award.

F. CONSTRUCTION JOB MEETINGS, SCHEDULES, LOGS

The Bidder shall conduct all the construction job meetings, to be held bi-weekly for the duration of construction.

1. Meetings:

The Bidder shall attend the pre-construction meeting and all construction job meetings during the construction phase of the project. The Bidder shall chair the meeting, transcribe and distribute the job-meeting minutes for every job meeting to all attendees and to those persons specified to be on the distribution list by the Project Manager.

Also, the Bidder is responsible for the preparation and distribution of minutes within

three (3) calendar days of the meeting. All meeting minutes are to have an "action" column indicating the party that is responsible for the action indicated and a deadline to accomplish the assigned task. These tasks must be reviewed at each job progress meeting until it is completed, and the completion date of each task shall be noted in the minutes of the meeting following the task completion.

2. Schedules:

The Bidder, with the input from the Owner's Representative and Project Manager, shall review and recommend approval of the project construction schedule prepared by the Bidder. The schedule shall identify all necessary start and completion dates of construction, construction activities, submittal process activities, material deliveries and other milestones required to give a complete review of the project.

The Bidder shall record any schedule delays, the party responsible for the delay, the schedule activities affected, and the original and new date for reference.

The Bidder shall provide a two (2) week "look ahead" construction schedule based upon the current monthly updated schedule as approved at the bi-weekly job meetings and that identifies the daily planned activities for that period. This Contractor requirement must also be included in Division 1 of the specification.

3. Submittal Log:

Based on the Submittal Schedule in Division 1 of the specifications, the Bidder shall develop and implement a submittal log that includes all the required project submittals as identified in the general conditions and technical specifications. The dates of submission shall be determined and approved by all affected parties during the pre-construction meeting.

Examples of the submissions to be reviewed and approved by the Bidder include: project schedule, schedule of values, shop drawings, equipment and material catalog cuts, spec sheets, product data sheets, MSDS material safety data sheets, specification procedures, material samples, mock-ups, etc. The submittal review process must be conducted at each job progress meeting and shall include the Bidder, Bidder's sub-Contractor, Project Manager, and Owner's Representatives.

The Bidder shall provide an updated submittal log at each job meeting that highlights the status of all required submissions.

G. CONSTRUCTION SITE ADMINISTRATION SERVICES

The Bidder shall provide construction site administration services during the duration of the project. The Bidder and Sub-Consultant(s) do not necessarily have to be on site

concurrently if there are no critical activities taking place that require the Sub-Consultant's participation.

The services required shall include, but not be limited to, field observations sufficient to verify the quality and progress of construction work, conformance and compliance with the contract documents, and to attend/chair meetings as may be required by the Project Manager to resolve special issues.

The Bidder shall conduct weekly site inspection/field observation visits. Site inspection/field observation visits may be conducted in conjunction with regularly scheduled bi-weekly construction job meetings, depending on the progress of work, for weeks that construction job meetings are scheduled. The Bidder and their Subcontractor(s) shall submit a field observation report for each site inspection to the Project Manager within three (3) calendar days of the site visit. Also, they shall conduct inspections during major construction activities including, but not limited to the following examples: concrete pours, steel and truss installations, code inspections, final testing of systems, achievement of each major milestone required on the construction schedule, and requests from the Project Manager. The assignment of a full time on-site Subcontractor does not relieve the Bidder of their site visit obligation.

The Bidder shall refer to Section XII Contract Deliverables of this IFB subsection entitled "Construction Phase" to determine the extent of services and deliverables required during this phase of the project.

H. SUBCONTRACTOR PARTICIPATION

It is the responsibility of the Bidder to ensure that they have provided adequate hours and/or time allotted in their bid so that their Subcontractors may participate in all appropriate phases and activities of this project or whenever requested by the Project Manager. This includes the pre-bid site visit and the various design meetings and construction job meetings, site visits, and close-out activities described in this IFB. Field observation reports and/or meeting minutes are required to be submitted to the Project Manager within three (3) calendar days of the site visit or meeting. All costs associated with such services shall be included in the Bidder's base bid.

I. DRAWINGS

1. Shop Drawings:

The Bidder shall review the specifications and determine the numbers and nature of each shop drawing submittal. Five (5) sets of the documents shall be submitted with reference made to the appropriate section of the specification. The Bidder shall review the all shop drawing submissions for conformity with the Garage construction documents within seven (7) calendar days of receipt. The Bidder shall return each shop drawing submittal stamped with the appropriate action, i.e. “Approved”, “Approved as Noted”, “Approved as Noted Resubmit for Records”, “Rejected”, etc.

2. As-Built and Record Set Drawings:

The Bidder shall keep the contract drawings up-to-date at all times during construction and upon completion of the Work, submit their AS-BUILT drawings to the Owner with the Bidder’s certification as to the accuracy of the information prior to final payment. All AS- BUILT drawings submitted shall be entitled AS-BUILT above the title block and dated.

The Bidder shall review the AS-BUILT drawings with the Owner’s Representative at each job progress meeting to ensure that they are up-to-date. Any deficiencies shall be noted in the progress meeting minutes.

The Owner’s Representative shall acknowledge acceptance of the AS-BUILT drawings by signing a transmittal indicating they have reviewed them and that they reflect the AS-BUILT conditions as they exist.

The Bidder shall obtain the original RECORD-SET drawings from Owner’s Representative and transfer the AS-BUILT conditions to the original full sized signed reproducible drawings to reflect RECORD conditions within fourteen (14) calendar days of receipt of the original RECORD-SET drawings.

The Bidder shall note the following statement on the original RECORD-SET drawings. “The AS-BUILT information added to this drawing(s) has been supplied by the Bidder.

Upon completion, the Bidder shall deliver the RECORD-SET original reproducible drawings to the Client who will acknowledge their receipt in writing. This hard copy set of drawings and two (2) sets of current release AUTO CAD discs shall be submitted to the Owner’s Representative. The discs shall contain all AS-BUILT drawings in both “.dwg” (native file format for AUTO CAD) and “.pdf” (Adobe portable document format) file formats.

J. CONSTRUCTION DEFICIENCY LIST

The Bidder shall prepare, maintain and continuously distribute an on-going deficiency list to the Contractor, Project Manager, and Owner's Representative during the construction phase of the project. This list shall be separate correspondence from the field observation reports and shall not be considered as a punch list.

K. INSPECTIONS: SUBSTANTIAL AND FINAL COMPLETION

The Bidder and their subcontractor(s) accompanied by the Project Manager, Department of Inspection and Enforcement, Owner's Representative and Contractor shall conduct site inspections to determine the dates of substantial and final completion. The Project Manager will issue the only recognized official notice of substantial completion. The Bidder shall prepare and distribute the coordinated punch list, written warranties and other related Client forms and documents, supplied by the Contractor, to the Project Manager for review and certification of final contract acceptance.

If applicable, the punch list shall include a list of attic stock and spare parts.

L. CLOSE-OUT DOCUMENTS

The Bidder shall review all project close-out documents as submitted by the Contractors to ensure that they comply with the requirements listed in the "Procedure for Architects and Engineers' Manual." The Bidder shall forward the package to the Project Manager within fourteen (14) calendar days from the date the Certificate of Occupancy/Certificate of Approval is issued. The Bidder shall also submit a letter certifying that the project was completed in accordance with the contract documents, etc.

M. CLOSE-OUT ACTIVITY TIME

The Bidder shall provide all activities and deliverables associated with the "Close-Out Phase" of this project as part of their Lump Sum base bid. The Bidder and/or Subconsultant(s) may not use this time for additional job meetings or extended administrative services during the Construction Phase of the project.

N. TESTING, TRAINING, MANUALS AND ATTIC STOCK

The Bidder shall ensure that all equipment testing, training sessions and equipment manuals required for this project comply with the requirements identified below.

1. Testing:

All equipment and product testing conducted during the course of construction is the responsibility of the Contractor. However,, the Bidder shall ensure the testing procedures comply with manufacturers recommendations. The Bidder shall review the final test reports and provide a written recommendation of the acceptance/rejection of the material, products or equipment tested within seven (7) calendar days of receipt of the report.

O. CHANGE ORDERS

The Bidder shall review, and process all change orders in accordance with the contract documents and procedures described below.

1. Bidder:

The Bidder shall prepare a detailed request for Change Order including a detailed description of the change(s) along with appropriate drawings, specifications, and related documentation and submit the information to the Contractor for the change order request submission.

2. Recommendation for Award:

The Client Agency Representative shall evaluate the reason for the change in work and provide a detailed written recommendation for approval or disapproval of the Change Order Request including backup documentation of costs in the Construction Specification Institute format and all other considerations to substantiate that decision.

3. Code Review:

The Bidder shall determine if the Change Order request will require Code review and shall submit six (6) sets of signed and sealed modified drawings and specifications to the Client Plan and Code Review Unit for approval, if required. The Bidder must also determine and produce a permit amendment request if required.

4. Time Extension:

When a Change Order Request is submitted with both cost and time factors, the Bidder's independent cost estimate is to take into consideration time factors associated with the changed work. The Bidder is to compare their time element with that of the Contractor's time request and if there is a significant difference, the Bidder in conjunction with the Project Manager is to contact the Contractor by telephone and negotiate the difference.

When a Change Order Request is submitted for time only, the Bidder is to do an independent evaluation of the time extension request using a recognized scheduling formula.

5. Submission:

The Bidder shall complete all the Client Change Order Request forms provided and submit a completed package to the Project Manager with all appropriate backup documentation within seven (7) calendar days from receipt of the Contractor's change order request. The Bidder shall resubmit the package at no cost to the Client if the change order package contents are deemed insufficient by the Project Manager.

6. Meetings:

The Bidder shall attend and actively participate at all administrative hearings or settlement conferences as may be called by Project Manager in connection with such Change Orders and provide minutes of those meetings to the Project Manager for distribution.

7. Bidder Fee:

If the Owner's Representative requests a scope change; and it is approved by the Project Manager, the Bidder may be entitled to be reimbursed through an amendment and in accordance with the requirements stated in paragraph 'O' of this Section.

IX. PERMITS AND APPROVALS

A. REGULATORY AGENCY PERMITS

The Bidder shall comply with the following guidelines to ensure that all required permits, certificates, and approvals required by State regulatory agencies are obtained for this project.

1. Prince George's County Department of Permitting, Inspections and Enforcement (DPIE):

The Bidder shall submit the ground improvement design with the permit application. Application fees are set in accordance with the County Code and the nature of the project.

The Bidder may obtain copies of all DPIE Building, Fire, Plumbing, Electrical and Elevator permit applications at the following website:
https://dpiepermits.princegeorgescountymd.gov/

The project construction documents must comply with the latest adopted edition of the MD Uniform Construction Code.

All other required project permits shall be obtained and paid for by the Bidder in accordance with the procedures described in paragraph two, below.

a. Third-Party Plan Review (TPPR):

In accordance with the DPIE's TPPR program, the Bidder is required to use the TPPR process for plan review to certify that the design complies with the applicable County codes. The cost for such TPPR review shall be included in the Bidder's proposal.

2. Other Regulatory Agency Permits, Certificates, and Approvals:

The Bidder shall identify and obtain all other State Regulatory Agency permits, certificates, and approvals that will govern and affect the work described in this IFB. An itemized list of these permits, certificates, and approvals shall be included with the Bidder's bid and the total amount of the application fees should be entered in the Fee Proposal line item entitled, **"Permit Fee Allowance."**

The Bidder shall determine the appropriate phase of the project to submit the permit application(s) to meet the approved project milestone dates.

Where reference to an established industry standard is made, it shall be understood to mean the most recent edition of the standard unless otherwise noted. If an industry standard is found to be revoked or should the standard have undergone substantial change or revision from the time that the IFB was developed, the Bidder shall comply with the most recent edition of the standard.

3. Prior Approval Certification Letters:

The issuance of a construction permit for this project may be contingent upon acquiring various "prior approvals" as defined by the State of Maryland. It is the Bidder's responsibility to determine which prior approvals, if any, are required. The Bidder shall submit a general certification letter to the Client during the Permit Phase of this project that certifies all required prior approvals have been obtained.

B. BARRIER FREE REQUIREMENTS

The Bidder, in cooperation with the Owner's Representative, shall assure that this project complies with the DPIE Barrier Free Sub code where applicable.

C. STATE INSURANCE APPROVAL

The Bidder shall respond in writing to the FM Global Insurance Underwriter plan review comments through the Client's Plan and Code Review Unit Manager as applicable. The Bidder shall review all the comments and, with agreement of the Project Team, modify the documents while adhering to the project's IFB requirements, State code requirements, schedule, budget, and Bidder fee.

D. PUBLIC EMPLOYEES OCCUPATIONAL SAFETY AND HEALTH PROGRAM

A paragraph shall be included in the design documents, if applicable to this project that states: The Contractor shall comply with all the requirements stipulated in the Public Employees Occupational Safety and Health Program (PEOSHA) document, paragraph 12:100-13.5 entitled "Air quality during renovation and remodeling". The Contractor shall submit a plan demonstrating the measures to be utilized to confine the dust, debris, and air contaminants in the renovation or construction area of the project site to the Project Team prior to the start of construction.

The link to the document is: https://dpiepermits.princegeorgescountymd.gov/

E. PERMIT MEETINGS

The Bidder shall attend and chair all meetings with Permitting Agencies necessary to explain and obtain the required permits.

F. MANDATORY NOTIFICATIONS

The Bidder shall include language in Division 1 of the specification that states the Contractor shall assure compliance with the Maryland "One Call" Program (1-800-272-1000) if any excavation is to occur at the project site.

The One Call Program is known as the "Maryland Underground Facility Protection Act."

X. GENERAL REQUIREMENTS

A. SCOPE CHANGES

The Bidder must request any changes to this IFB in writing. An approved Client Consultant Amendment Request form reflecting authorized scope changes must be received by the Bidder prior to undertaking any additional work. The Client's form must be approved and signed by the Director of the Client and written authorization issued from the Project Manager prior to any work being performed by the Bidder.

Any work performed without the executed Client form is done at the Bidder's own financial risk.

B. ERRORS AND OMISSIONS

All claims for errors and omissions will be pursued by the Client on an individual basis. The Client will review each error or omission with the Bidder and determine the actual amount of damages, if any, resulting from each negligent act, error or omission.

C. ENERGY INCENTIVE PROGRAM

The Bidder shall review the programs described on the "Maryland's Clean Energy Program" website at: http://www.mdcleanenergy.org to determine if any proposed upgrades to the mechanical and/or electrical equipment and systems for this project qualify for "Maryland Clean Energy Program" rebates and incentives such as SmartStart, Pay4Performance, Direct Install or any other incentives.

The Bidder shall be responsible to complete the appropriate registration forms and applications, provide any applicable worksheets, manufacturer's specification sheets, calculations, attend meetings, and participate in all activities with designated representatives of the programs and utility companies to obtain the entitled financial incentives and rebates for this project. All costs associated with this work shall be estimated by the Bidder and the amount included in the base bid of their fee proposal.

XI. ALLOWANCES

A. PERMIT FEE ALLOWANCE

The Bidder shall obtain and pay for all the project permits in accordance with the guidelines identified below.

1. Permits:

The Bidder shall determine the various State permits, certificates, and approvals required to complete the Work.

2. Permit Costs:

The Bidder shall determine the application fee costs for all the required project permits, certificates, and approvals (excluding the Maryland Uniform Construction Code permit) and include that amount in their fee proposal line item entitled **"Permit Fee Allowance"**. A breakdown of each permit and application fee shall be attached to the fee proposal for reference.

NOTE: The Maryland Uniform Construction Code permit is excluded since it is obtained and paid for by Client.

3. Applications:

The Bidder shall fill out and submit all permit applications to the appropriate permitting authorities and the costs shall be paid from the Bidder's permit fee allowance provided. A copy of the application(s) and the original permit(s) obtained by the Bidder shall be given to the Project Manager for distribution during construction.

4. Bidder Fee:

The Bidder shall determine what is required to complete and submit the permit applications, obtain supporting documentation, attend meetings, etc., and include the total cost in the base bid of their fee proposal under the "Permit Phase" column.

Any funds remaining in the permit allowance account will be returned to the State at the close of the project.

XII. SUBMITTAL REQUIREMENTS

A. CONTRACT DELIVERABLES

The following is a listing of Contract Deliverables that are required at the completion of each phase of this project. The Bidder shall contact the Client's Project Manager with any questions regarding the deliverables required for each item listed below. All submissions shall include the Contract Deliverables identified in this Section of the IFB.

B. CATALOG CUTS

The Bidder shall provide catalog cuts as required by the Client Plan and Code Review Unit during the design document review submissions. Examples of catalog cuts include, but are not limited to mechanical equipment, hardware devices, plumbing fixtures, fire suppression and alarm components, specialized building materials, electrical devices, etc.

C. PROJECT DOCUMENT BOOKLET

The Bidder shall submit all the required Contract Deliverables to the Project Manager at the completion of each phase of the project. All reports, meeting minutes, plan

review comments, project schedule, cost estimate in CSI format (2004 Edition), correspondence, calculations, and other appropriate items identified on the Submission Checklist form provided in the A/E Manual shall be presented in an 8½" x 11" bound "booklet" format.

D. DESIGN DOCUMENT CHANGES

Any corrections, additions, or omissions made to the submitted drawings and specifications at the Permit Phase of the project must be submitted to Client's Plan and Code Review Unit as a complete document. Corrected pages or drawings may not be submitted separately unless the Bidder inserts the changed page or drawing in the original documents. No Addendums or Bulletins will be accepted as a substitution to the original specification page or drawing.

The Bidder must still develop the Construction Cost Estimate (CCE) for each trade and the amount shall be included on the Client Project Cost Analysis form where indicated. This document shall be submitted at each design phase of the project and updated immediately prior to the advertisement to bid.

E. PERMIT APPLICATION PHASE

This Permit Application Phase should not include any additional design issues. Design documents shall be 100% complete at the Final Design Phase.

8.5 Permit Application Submission Requirements

8.5.1 - 8.6.7: If all the deliverables of these sections have been previously submitted to the Client and approved, there are no further deliverables due at this time
8.6.8 Regulatory Agency Approvals
(a) UCC Permit Application and Technical Sub-codes completed by A/E
8.6.9 Utility Availability Confirmation
8.6.10 Signed and Sealed Drawings: 6 sets
8.6.11 Signed and Sealed Specifications: 6 sets
8.6.12 Current Working Estimate/Cost Analysis
8.6.13 Bar Chart Schedule
8.6.14 Project Presentation (N/A this Project)
8.6.15 Plan Review/IFB Compliance
Statement 8/6.16 Submission
Checklist

F. BIDDING AND CONTRACT AWARD

9.1 Bidding Phase Requirements

9.1 Original Drawings signed and sealed by A/E and drawings on compact disk (CD) in *Adobe Portable Document Format (*.pdf)

9.2 One Unbound Specification Color Coded and specifications on compact disk (CD) in *Adobe Portable Document Format (*.pdf)

` 9.03 Bid Documents Checklist

9.4 Bid Proposal Form

9.5 Notice for Advertising

9.2 Chair Pre-Bid Conference/Mandatory Site Visit

9.3 Prepare Bulletins

9.4 Attend Bid Opening

9.5 Recommendation for Contract Award

9.4.1 Prepare Letter of Recommendation for Award and Cost Analysis

9.6 Attend Pre-Construction Meeting

9.7 Submission Checklist

G. CONSTRUCTION PHASE

10.1 Site Construction Administration

10.2 Pre-Construction Meeting

10.3 Construction Job Meetings

10.3.1 Agenda: Schedule and Chair Construction Job Meetings

10.3.2 Minutes: Prepare and Distribute Minutes within 5 working days of meeting

10.3.3 Schedules; Approve Contractors' Schedule and Update

10.3.4 Minutes Format: Prepare Job Meeting Minutes in approved format, figure 10.3.4-a

10.4 Correspondence

10.5 Prepare and Deliver Conformed Drawings

10.7 Approve Contractors Invoicing and Payment Process

10.8 Approve Contractors 12/13 Form for Subs, Samples and Materials

10.10 Approve Test Reports

10.11 Approve Shop Drawings

10.12 Construction Progress Schedule

10.12.1 Construction Progress Schedule

10.13 Review and Recommend or Reject Change Orders

10.13.1 Scope Changes
10.13.2 Construction Change Orders
10.13.3 Field Changes

10.14 Construction Photographs

10.15 Submit Field Observation Reports

H. PROJECT CLOSE-OUT PHASE

11.1 Responsibilities: Plan, Schedule and Execute Close-Out Activities

11.2 Commencement: Initiate Close-Out w/Client's Project Close-Out Form

11.3 Develop Punch List and Inspection Reports

11.4 Verify Correction of Punch List Items

11.5 Determination of Substantial Completion

11.6 Ensure Issuance of "Temporary Certificate of Occupancy or Approval"

11.7 Initiation of Final Contract Acceptance Process

11.8 Submission of Close-Out Documentation

11.8.1 As-Built and Record Set Drawings, 3 sets AUTOCAD Discs Delivered to the Client
11.8.2 (a) Maintenance and Operating manuals, Warranties, etc.: 7 sets each
(b) Guarantees
(c) Shop Drawings
(d) Letter of Contract Performance
11.8.3 Final Cost Analysis-Insurance Transfer
11.8.4 This Submission Checklist

11.9 Final Payment

11.9.1 Contractors Final Payment
11.9.2 A/E Invoice and Close-Out Forms for Final Payment

11.10 Final Performance Evaluation of the A/E and the Contractors

11.11 Ensure Issuance of a "Certificate of Occupancy or Approval"

XIII. EXHIBITS

The attached exhibits in this section will include any supporting documentation to assist the Bidder in the design of the project such as maps, drawings, specifications, photographs, floor plans, studies, reports, etc.

Exhibit 'A' - Site Location Map

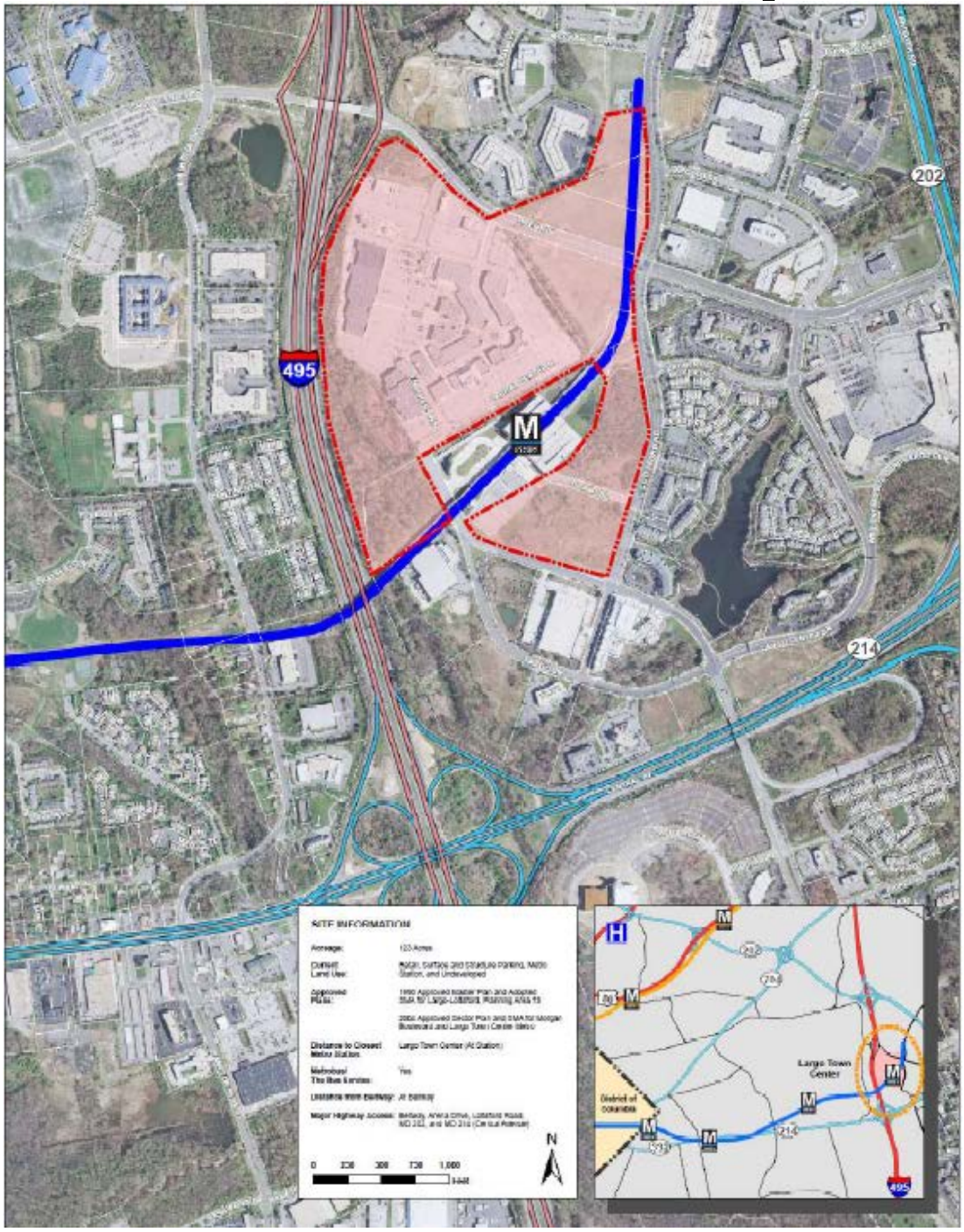


Exhibit 'B' - Site Location Plan

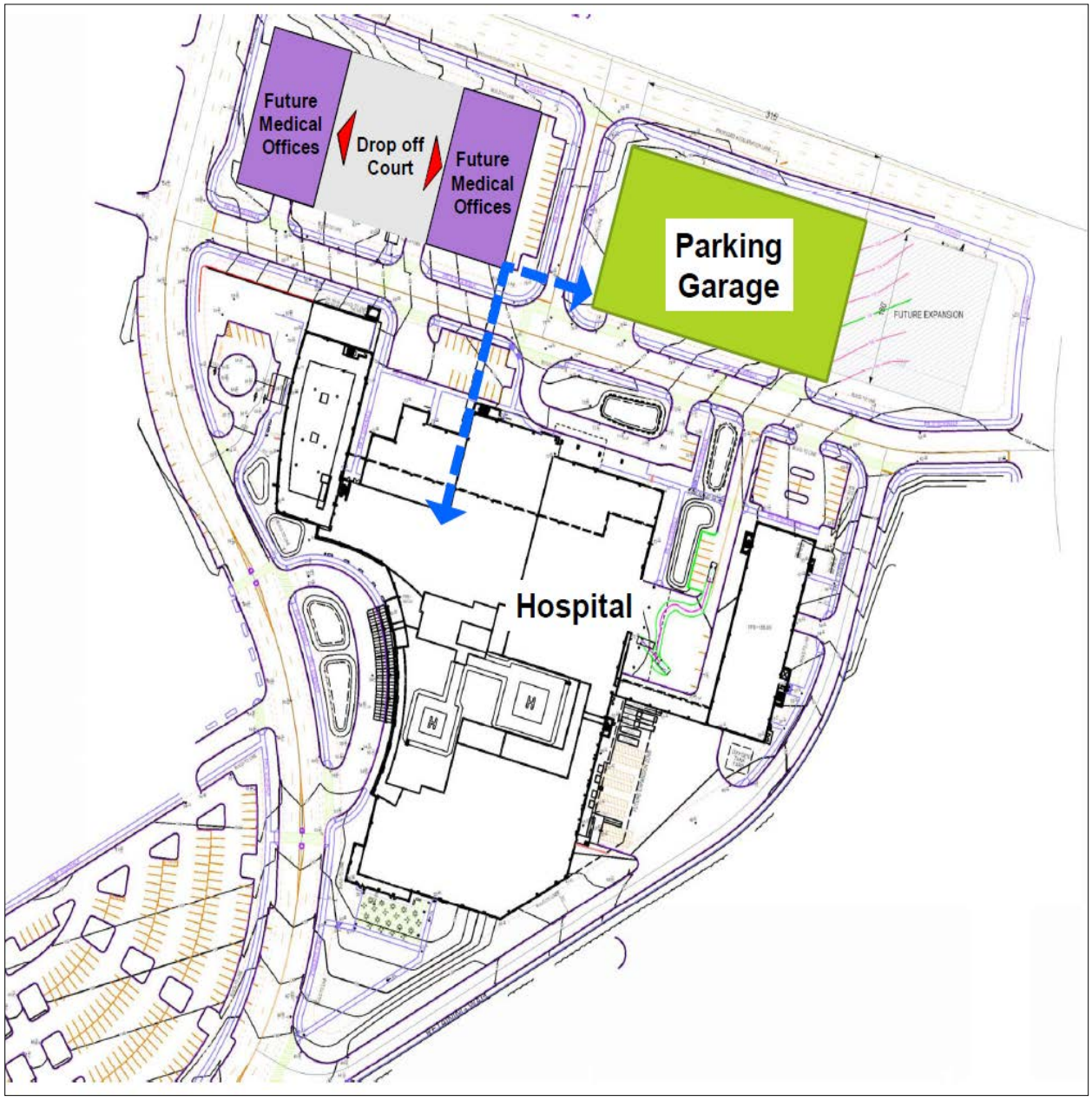


Exhibit 'C' - Ground Improvement Specifications

SECTION 316300 – RAMMED AGGREGATE PIERS

PART 1 - GENERAL REQUIREMENTS

1.1 DESCRIPTION

A. Work shall consist of designing, furnishing and installing aggregate pier elements as specified herein. The aggregate pier elements shall be constructed by compacting aggregate in an excavated hole using special high-energy impact densification equipment. The aggregate pier elements shall be in a columnar-type configuration and shall be used to reinforce soils for the support of high bearing pressure spread footings.

1.2 WORK INCLUDED

B. Provision of all equipment, material, labor, and supervision to design layouts, removal of spoils off the working pad, and install aggregate pier elements. Design shall rely on subsurface information presented in the project geotechnical report. Layout of aggregate pier elements, removal of spoils from the site (which result from aggregate pier construction), footing excavation, and subgrade preparation following aggregate pier installation is not included.

C. Drawings and General Provisions of the Contract, including General and Supplemental Conditions, and Division 1 Specifications, apply to the work in this specification.

1.3 APPROVED INSTALLERS

A. Installers of Aggregate Pier Foundation Systems shall have a minimum of 5 years of experience with the installation of aggregate piers and shall have completed at least 50 projects.

1.4 RELATED WORK

A. Division 31 Section - "Earthwork"

1.5 REFERENCE STANDARDS

A. Design

1. Lawton, E.C., N.S. Fox, and R.L. Handy. "Control of Settlement and Uplift of Structures Using Short Aggregate Piers." ASCE. Proceedings of In-Situ Deep Soil Improvement. ASCE National Convention, Atlanta, Georgia. October 9-13, 1994.
2. Lawton, E.C. and N.S. Fox. *"Settlement of Structures Supported on Marginal or Inadequate Soils Stiffened with Short Aggregate Piers."* ASCE. Geotechnical Special Publication No. 40: Vertical and Horizontal Deformations of Foundations and Embankments, ASCE 2, 962-974.
3. Fox, N.S. and M. Cowell. 1998. Geopier Reference Manual. Published by Geopier Foundation Company, Inc., Scottsdale, AZ.
4. Wissmann, K.J., E.C. Lawton, and T.M. Farrell. 1999. "Behavior of Geopier-Supported Foundation Systems During Seismic Events." Technical Bulletin No. 1. Geopier Foundation Company, Inc., Scottsdale, AZ.
5. Wissmann, K.J. 1999. "Bearing Capacity of Geopier-Supported Foundation Systems." Technical Bulletin No. 2. Geopier® Foundation Company, Inc., Scottsdale, AZ.
6. Wissmann, K.J., J.M. Caskey, and B.T. Fitzpatrick. 2001. "Geopier® Uplift Resistance." Technical Bulletin No. 3. Geopier® Foundation Company, Inc., Scottsdale, AZ.
7. Wissmann, K.J., B.T. Fitzpatrick, and E.C. Lawton. 2001. "Geopier® Lateral Resistance." Technical Bulletin No. 4. Geopier® Foundation Company, Inc., Scottsdale, AZ.
8. Fitzpatrick, B.T. and K.J. Wissmann. 2002. "Geopier® Shear Reinforcement for Global Stability and Slope Stability." Technical Bulletin No. 5. Geopier® Foundation Company, Inc., Scottsdale, AZ.

B. Modulus and Uplift Testing

1. ASTM D-1143 – Pile Load Test Procedures
2. ASTM D-1194 – Spread Footing Load Test
3. ASTM-D-3689 – Uplift Load Test

C. Materials and Inspection

1. ASTM D-1241 – Aggregate Quality
2. ASTM STP 399 – Dynamic Penetrometer Testing
3. ASTM D-422 – Gradation Soils

1.6 CONFLICTS IN SPECIFICATIONS/REFERENCES

Where specifications and reference documents conflict, the Architect/Engineer shall make the final determination of the applicable document.

1.7 CERTIFICATIONS AND SUBMITTALS

A. The installer shall submit detailed design calculations and construction drawings prepared by the Aggregate Pier Designer (the Designer) to the Owner or Owner's Engineer for approval at least 4 weeks prior to the start of construction. All plans shall be sealed by a Professional Engineer from the State of Maryland.

B. The Aggregate Pier Designer shall have Errors and Omissions design insurance for the work. The insurance policy should provide a minimum coverage of $2 million per occurrence.

C. Modulus test data - The Installer shall furnish the General Contractor a description of the installation equipment, installation records, complete test data, analysis of the test data and recommended design parameter values based on the modulus test results. The report shall be prepared under supervision of a registered professional engineer.

D. Daily Aggregate Pier Progress Reports – The Installer shall furnish a complete and accurate record of aggregate pier installation to the General Contractor. The record shall indicate the pier location, length, average lift thickness and final elevations of the base and top of piers. The record shall also indicate the type and size of the densification equipment used. The Installer shall immediately report any unusual conditions encountered during installation to the General Contractor, to the Designer and to the Testing Agency.

1.8 BASIS OF PAYMENT

A. Payment will be on a lump-sum basis for performance design aggregate pier system.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate used for piers constructed above the water table shall be Type I Grade B in accordance with ASTM D-1241-68 or shall be other graded aggregate selected by the Installer and successfully used in the modulus test. It shall be compacted to a densification and strength, which provides resistance to the dynamic penetration test (ASTM STP 399) of a minimum average of 15 blows per 1.75-inch vertical movement.

B. For aggregate used for piers constructed below the water table, the gradation shall be the same as Type I Gradation B, except that particles passing the No. 40 sieve shall be eliminated. Alternatively, No.57 stone or other stone or cement/grout products selected by the Aggregate Pier Installer may be used. Dynamic penetration resistance testing is inappropriate for this material.

C. Potable water or other suitable source shall be used to increase aggregate moisture content where required. The General Contractor shall provide such water to the Installer.

D. The General Contractor will provide adequate and suitable marshalling areas on the project site for the use of the Installer for the storage of aggregate and equipment.

PART 3 - DESIGN REQUIREMENTS

3.1 AGGREGATE PIER DESIGN

A. Aggregate piers shall be designed in accordance with generally-accepted engineering practice and the methods described in Section 1 of these Specifications. The design shall meet the following criteria.

Maximum Allowable Bearing Pressure for
Aggregate Pier Reinforced Soils **7,000 psf**

(See drawings for gravity loads on footings subject to gravity loads only. Footings subject to lateral loads (under retaining walls, stair towers, and shear/light walls) shall have piers providing a uniform 7,000 psf)

Minimum Aggregate Pier Area Coverage
(for square Spread Footings) **30%**

Estimated Total Long-Term Settlement for Footings (Dead + Live Load): **≤ 1"**

Estimated Long-Term
Differential Settlement of Adjacent Footings: **≤ ½**

Minimum Number of Piers Under a Footing: **4**

All aggregate piers installed shall fully penetrate existing fill or soft soils.

B. The design submitted by the Installer shall consider the bearing capacity and settlement of all footings supported by aggregate piers and shall be in accordance with acceptable engineering practice and these specifications. Total and differential settlement shall be considered. The design life of the structure shall be 50 years.

C. The Aggregate Pier system shall be designed to preclude plastic bulging deformations at the top-of–pier design stress and to preclude significant tip stresses as determined from the shape of the telltale test curve from telltales installed in modulus test piers. The results of the modulus test shall be used to verify the design assumptions.

3.2 DESIGN SUBMITTAL

The Installer shall submit 3 sets of detailed design calculations, construction drawings, and shop drawings (showing detailed location layout of RAPs) (the Design Submittal), for approval at least 4 week(s) prior to the beginning of construction. A detailed explanation of the design parameters for settlement calculations shall be included in the Design Submittal. Additionally, the quality control test program for aggregate piers, meeting these design requirements, shall be submitted. All computer-generated calculations and drawings shall be prepared and sealed by a Professional Engineer, licensed in the State of Maryland.

PART 4 - CONSTRUCTION

4.1 EXCAVATION

A. All Aggregate Pier elements shall be pre-augered using mechanical drilling or excavation equipment. Installation of piers without pre-augering shall not be allowed because this technique results in significant disturbance and remolding of the matrix soils surrounding the piers.

B. If cave-ins occur during excavation such that the sidewalls of the hole are deemed to be unstable, steel casing or a drilling slurry shall be used to stabilize the excavation.

C. If cave-ins occur on top of a lift of aggregate such that the volume of the caved soils is greater than 10 percent of the volume of the aggregate in the lift, then the aggregate shall be considered contaminated and shall be removed and replaced with uncontaminated aggregate.

4.2 DENSIFICATION

A. Special high-energy impact densification apparatus shall be employed to densify the Aggregate Pier elements during installation. The apparatus shall apply direct downward impact energy to each lift of aggregate.

B. A minimum tamper energy level of 2,000 foot-pounds of force (CIMA rating) shall be applied by the energy source.

C. The bottom of the excavation shall be densified prior to the placement of the aggregate. If wet, soft or sensitive soils are present, open-graded aggregate, such as ASTM No.57 stone or other, shall be placed at the bottom of the excavation and compacted to stabilize the element bottom and may serve as the initial lift.

D. Densification shall be performed using a beveled tamper. The beveled tamper foot is required to adequately increase the lateral earth pressure in the matrix soil during installation.

E. Downward pressure shall be applied to the tamper shaft during tamping.

F. Each lift of aggregate shall be tamped for a minimum of 15 seconds.

4.3 PLAN LOCATION AND ELEVATION OF AGGREGATE PIER ELEMENTS

All pier groups shall be concentrically located under columns. The center of each pier shall be within six inches of the plan locations indicated. The final measurement of the plan location and top of piers shall be the lowest point on the aggregate in the last compacted lift. Piers installed outside of the above tolerances and deemed not acceptable shall be rebuilt at no additional expense to the Owner. The site will be rough graded to 1'-0" + above the top of the foundations (coordinate with the General Contractor) and is the termination of the aggregate piers. The General Contractor will then excavate down to the bottom of footing elevation and surface compact the piers.

4.4 REJECTED AGGREGATE PIER ELEMENTS

Aggregate pier elements improperly located or installed beyond the maximum allowable tolerance of 6" shall be abandoned and replaced with new piers, unless the Designer approves other remedial

measures. All material and labor required to replace rejected piers shall be provided at no additional cost to the Owner.

PART 5 - QUALITY CONTROL

5.1 QUALITY CONTROL REPRESENTATIVE

The Installer shall have a full-time Quality Control (QC) representative to verify and report all QC installation procedures. The Installer shall immediately report any unusual conditions encountered during installation to the Design Engineer, the General Contractor, and to the Testing Agency. The QC procedures shall include the preparation of Aggregate Pier Progress Reports completed during each day of installation and containing the following information:

A. Footing and Aggregate Pier location.

B. Aggregate Pier length and drilled diameter.

C. Planned and actual Aggregate Pier elevations at the top and bottom of the element.

D. Average lift thickness for each Aggregate Pier.

E. Soil types encountered at the bottom of the Aggregate Pier and along the length of the element.

F. Depth to groundwater, if encountered.

G. Documentation of any unusual conditions encountered.

H. Type and size of densification equipment used.

5.2 MODULUS TEST

Two modulus tests shall be performed to verify the parameter values selected for design. The modulus tests shall be of the type and installed in a manner specified herein.

A. A telltale shall be installed at the bottom of the test pier so that bottom-of-pier deflections may be determined. Acceptable performance is indicated when the bottom of the pier deflection is no more than 20% of the top of pier deflection at the design stress level.

B. ASTM D-1143 general test procedures shall be used as a guide to establishing load increments, load increment duration, and load decrements.

C. With the exception of the load increment representing approximately 115% of the design maximum top of Aggregate Pier stress, all load increments shall be held for a minimum of 15 minutes, a maximum of 1 hour, and until the rate of deflection reduces to 0.01 inch per hour, or less.

D. The load increment that represents approximately 115% of the design maximum stress on the Aggregate Pier shall be held for a minimum of 15 minutes, a maximum of 4 hours and until the rate of deflection reduces to 0.01 inches per hour or less.

E. A seating load equal to 5 percent of the total load shall be applied to the loaded steel plate prior to application of load increments and prior to measurement of deflections to compensate for surficial disturbance.

F. Aggregate Pier modulus testing shall be performed in accordance with the requirements outlined in the Design Submittal.

G. The location of the aggregate pier modulus test should be coordinated with the project Geotechnical Engineer of record.

5.4 BOTTOM STABILIZATION VERIFICATION TEST

A. After completion of the bottom pier bulb, or at any time during the process of constructing the pier, the energy source may be turned off, and bottom stabilization verification test may be performed. These tests shall be performed when a new soil formation is encountered, or at the beginning of a project to provide quantitative information on pier stabilization.

B. Bottom Stabilization Tests are performed by placing a reference bar over the cavity, marking the tamper shaft, applying energy to the tamper for an additional 15 seconds, and observing the downward deflection of the tamper shaft by observing the deflection of the mark on the tamper shaft.

C. Acceptable performance is indicated if the vertical movement of the shaft is less than 150% of the vertical movement measured for the modulus test pier or $3/8^{th}$ of an inch.

D. If the measured vertical movement exceeds 150% of the value achieved during the modulus test, added energy is applied to re-densify the bulb. The procedure for measure is then repeated. If there is still movement greater than 150% of that achieved during the modulus test and greater than ½ inch, a lift of loose aggregate may be placed on top of the compacted aggregate, and the verification test may be performed on this next lift after it is densified. If there is excessive movement on this lift, another lift may be placed and tested. Movement must be limited to below 150% of the values achieved for the modulus test before completion of 2/3 of the pier depth.

5.5 DYNAMIC CONE PENETROMETER TEST

A. The Aggregate Pier elements shall be tested by the Dynamic Cone Penetrometer method (ASTM STP 399) at locations within the upper 1/3 of the pier shaft length.

B. The minimum acceptable criteria as an indicator of acceptable densification shall be at least 15 blows per 1-3/4-inch penetration.

C. Dynamic Cone Penetrometer testing shall be performed in each Aggregate Pier until such time as five consecutive tests indicate that the minimum criterion is met. Thereafter, such tests need not be performed on every pier, provided that the aggregate used in the elements is representative of that previously tested. If average penetration resistances measured exceed 15 blows, and less than 10% of tests fall below 15 blows, then testing may be reduced to spot checks. A pattern of successful tests is sufficient to reduce testing to several tests per day.

D. Observation of questionable aggregate moisture content or questionable aggregate gradation appearance may determine the need for additional dynamic penetration testing to verify that the proper densification is being achieved.

E. Use of Dynamic Cone Penetrometer is not appropriate for use on open-graded aggregate such as No. 57 stone.

PART 6 - QUALITY ASSURANCE

6.1 INDEPENDENT ENGINEERING TESTING AGENCY

The Owner is responsible for retaining an independent engineering testing firm to provide Quality Assurance services. The Testing Agency should be the Geotechnical Engineer of Record, if possible.

6.2 RESPONSIBILITIES OF INDEPENDENT ENGINEERING TESTING AGENCY

A. The Testing Agency shall monitor the modulus and uplift test(s) when modulus or uplift test(s) are to be performed. The Installer shall provide and install all dial indicators and other measuring devices.

B. The Testing Agency shall monitor the installation of aggregate pier elements to verify that the production installation practices are similar to those used during the installation of the modulus test elements.

C. The Testing Agency shall perform Dynamic Cone Penetrometer tests as described herein.

D. The Testing Agency shall report any discrepancies to the Installer and General Contractor immediately.

PART 7 - RESPONSIBILITIES OF GENERAL CONTRACTOR

7.1 PREPARATION

A. The General Contractor shall locate and protect underground and aboveground utilities and other structures from damage during installation of the Aggregate Pier elements.

B. The General Contractor will provide the site to the Installer, after earthwork in the area has been completed.

C. Site subgrade shall be established by the General Contractor within 6 inches of final design subgrade, as approved by the Design Engineer.

D. A working surface will be established and maintained by the General Contractor to provide wet weather protection of the subgrade and to provide access for efficient operation of the Aggregate Pier installation.

7.2 LAYOUT OF THE AGGREGATE PIER ELEMENTS

The General Contractor shall provide layout of the basic column grids. The aggregate pier installer will then layout (construction staking) of the Aggregate Piers. The General Contractor shall provide ground elevations in sufficient detail to estimate drilling depth elevations to within 4 inches.

7.3 AGGREGATE PIER EXCAVATION

Should any obstruction be encountered during drilling or excavation for aggregate piers, the General Contractor shall be responsible for removing such obstruction, or the pier shall be relocated or abandoned. Obstructions include, but are not limited to, boulders, timbers, concrete, bricks, utility lines, etc., that prevent installing the aggregate piers to the required depth, or cause the aggregate pier to drift from the required locations. Dense natural rock or weathered rock shall not be deemed obstructions, and piers may be terminated short of design lengths on such materials. If the General Contractor cannot or does not remove such obstructions within one hour from the time the Installer reports the obstruction to the General Contractor, the Installer may remove such obstructions with his own means. Should this occur, the Installer shall receive an extra to the contract to account for their additional expenses, including delay time involved to crew and equipment.

7.4 UTILITY EXCAVATIONS

The General Contractor shall coordinate all excavations made subsequent to Aggregate Pier installations so that at least five feet of horizontal distance remains between the edge of any installed Aggregate Pier and the excavation. Protection of completed Aggregate Pier elements is the responsibility of the General Contractor. In the event that utility excavations are required at horizontal distances of less than five feet from installed Aggregate Piers, the General Contractor shall contact the Aggregate Pier Designer to develop construction solutions to minimize impacts on the installed Aggregate Piers.

Recommended procedures may include:

A. Using cement-treated base to construct portions of the Aggregate Piers subject to future excavations.

B. Replacing excavated soil with compacted crushed stone in the portions of excavations the where Aggregate Piers have been disturbed. The placement and compaction of the crushed stone shall meet the following requirements.

   1. The crushed stone shall meet the gradation specified by the Designer.

   2. The crushed stone shall be placed in a controlled manner using motorized impact compaction equipment.

   3. The aggregate should be compacted to 95% of the maximum dry density as determined by the modified Proctor method (ASTM D-1557).

   4. The Testing Agency shall be on site to observe placement, compaction, and provide density testing. The test results shall be submitted to the Designer and the General Contractor. The General Contractor shall provide notification to the Testing Agency and the Designer when excavation, placement, and compaction will occur and arrange for construction observation and testing.

7.5 FOOTING BOTTOMS

A. Excavation and surface compaction of all footings shall be the responsibility of the General Contractor.

B. Foundation excavations to expose the tops of Aggregate Pier elements shall be made in a workmanlike manner, and shall be protected until concrete placement, with procedures and equipment best suited to (1) prevent softening of the matrix soil between and around the Aggregate Pier elements before pouring structural concrete, and (2) achieving direct and firm contact between the dense, undisturbed Aggregate Pier elements and the concrete footing.

C. Recommended procedures for achieving these goals are to:

1. Limit over-excavation below the bottom of the footing to 3-inches (including disturbance from the teeth of the excavation equipment,
2. Compaction of surface soil and top of Aggregate Pier elements shall be prepared using a motorized impact compactor ("Wacker Packer," "Jumping Jack," or similar). Sled-type tamping devices shall not be used. Compaction shall be performed over the entire footing bottom to compact any loose surface soil and loose surface pier aggregate.
3. Place footing concrete immediately after footing excavation is made and approved, preferably the same day as the excavation. Footing concrete must be placed on the same day if the footing is bearing on expansive or sensitive soils.
4. If same day placement of footing concrete is not possible, place a minimum 3-inch thick lean concrete seal ('mud mat") immediately after the footing is excavated and approved.

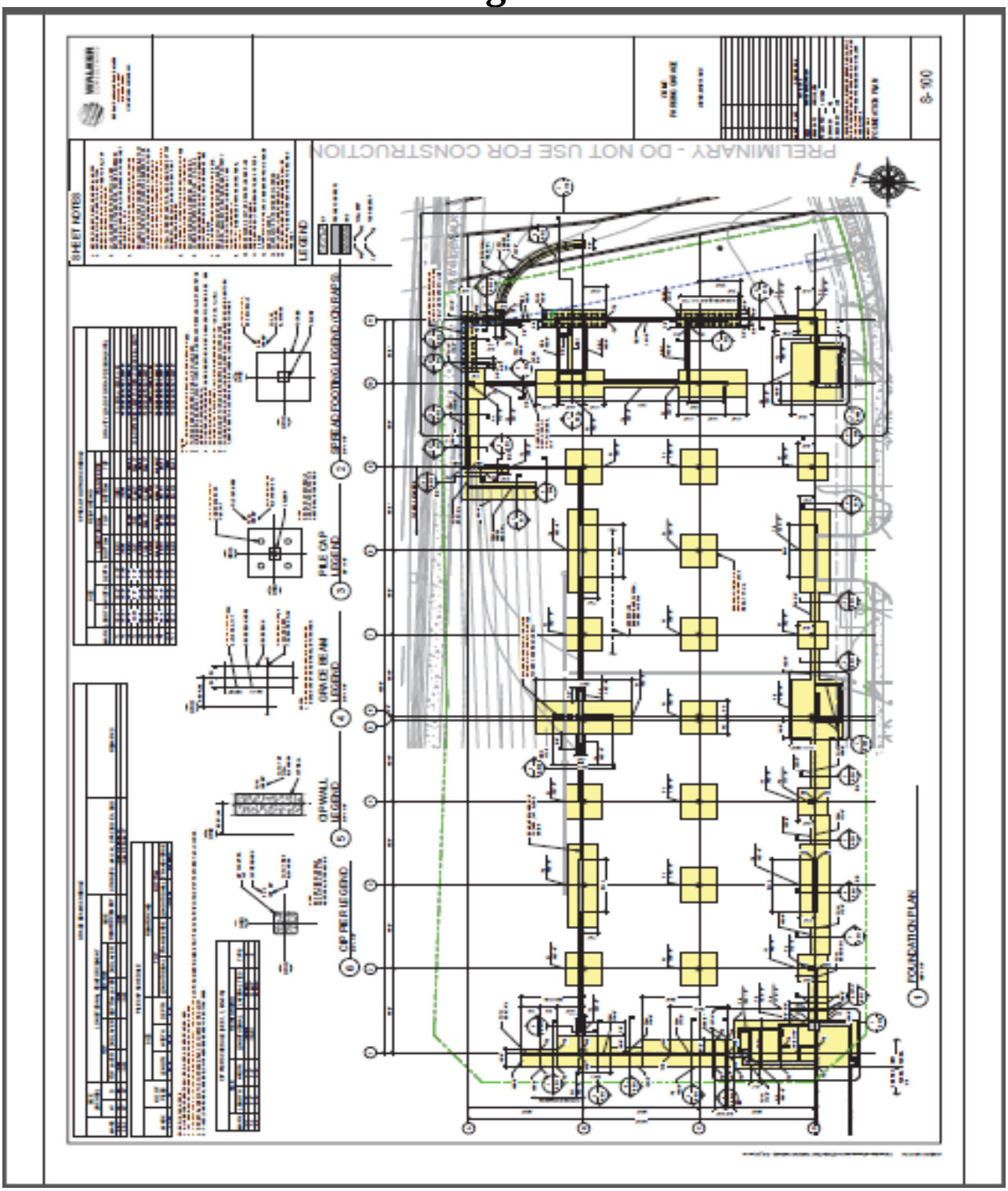
D. The following criteria shall apply, and a written inspection report sealed by the project Geotechnical Engineer shall be furnished to the Installer to confirm:

1. That water (which may soften the unconfined matrix soil between and around the Aggregate Pier elements and may have detrimental effects on the supporting capability of the Aggregate Pier reinforced subgrade) has not been allowed to pond in the footing excavation at any time.
2. That all Aggregate Pier elements designed for each footing have been exposed in the footing excavation.
3. That immediately before footing construction, the tops of all the Aggregate Pier elements exposed in each footing excavation have been inspected and recompacted as necessary with mechanical compaction equipment, and that the tops of any Aggregate Pier elements which may have been disturbed by footing excavation and related activity have been recompacted to a dry density equivalent to at least 95% of the maximum dry density obtainable by the modified Proctor method (ASTM D-1557).
4. That no excavations or drilled shafts have been made after installation of Aggregate Pier elements within horizontal distance of five feet from the edge of any pier, without the written approval of the Installer or Designer.

E. Failure to provide the above inspection and certification by the project.

F. Geotechnical Engineer, which are beyond the responsibility of the Aggregate Pier Installer, may void any written or implied warranty on the performance of the Aggregate Pier system.

Exhibit 'D' – Garage Foundation Plan



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