ADDENDUM NO. 5

Addendum to
Specifications and Drawings
for
Nebraska State Patrol Crime Lab Addition & Renovation
for Combined Contract

NOTICE TO ALL BIDDERS: The following Specifications and Drawings for the above referenced project are hereby revised as follows:

SPECIFICATIONS

ITEM NO. 1 — SECTION 00116 INVITATION TO BID

a) Section 1.2 A Bid Date changed from July 2 to July 9.
b) This Specification is Revised and Reissued with this Addendum.

ITEM NO. 2 — SECTION 004113 PROPOSAL FORM

a) Section 1.2 A Bid Date changed from July 2 to July 9.
b) This Specification is Revised and Reissued with this Addendum.

ITEM NO. 3 — SECTION 316600 AGGREGATE PIERS

a) This Specification is Issued with this Addendum.

DRAWINGS

ITEM NO. 4 — S-001STRUCTURAL GENERAL NOTES

a) This Sheet is Revised and Reissued with this Addendum.

DOCUMENT 001116 - INVITATION TO BID

1.1 PROJECT INFORMATION

A. Notice to Bidders: Qualified bidders are invited to submit bids for Project as described in this Document according to the Instructions to Bidders.

B. Project Identification: Nebraska State Patrol Crime Lab Addition and Renovation

1. Project Location: 3977 Air Park Road, Lincoln, NE 68524

C. Owner: State of Nebraska

1. Owner's Representative: Kevin Herr, Facilities Construction Coordinator, State Building Division, Nebraska Department of Administrative Services, Suite 160, 1526 K Street, Lincoln, NE 68508

D. Architect: LEO A DALY 8600 Indian Hills Drive, Omaha, NE 68114

E. Project Description: Project consists of phased new construction additions and renovation of existing building. Building will remain occupied and operational throughout construction. Project scope consists of addition and/ or renovation of specialty laboratory areas, offices, mechanical, electrical, and storage spaces.

F. Construction Contract: Bids will be received for the following Work:

1. General Contract (all trades).

1.2 BID SUBMITTAL AND OPENING

A. Owner will receive sealed bids until the bid time and date at the location indicated below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:

1. Bid Date: July 9, 2024
2. Bid Time: 2:00 p.m. local time.
3. Location: ATTN: Kevin Herr, Facilities Construction Coordinator, State Building Division, Nebraska Department of Administrative Services, Suite 160, 1526 K Street, Lincoln, NE 68508

B. Bids will be thereafter opened publicly and read aloud.

1.3 BID SECURITY

A. Bid security shall be submitted with each bid in the amount of 5 percent of the bid amount. No bids may be withdrawn for a period of 60 days after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

1.4 PREBID CONFERENCE

A. A prebid conference for all bidders will be held at Nebraska State Patrol Crime Lab on June 13, 2024 at 8:30 a.m., local time. Prospective bidders are required to attend.

1.5 DOCUMENTS

A. Online Procurement and Contracting Documents: Obtain access on or after June 3, 2024, by contacting A&D Technical Supply. Bidders must register with A&D Technical Supple to gain document access. A & D Technical Supply will maintain the plan holders list for the project.
   1. A & D Technical Supply, 1822 N Street, Lincoln, NE 68508. (402) 474-5454.
   2. The following information shall be included with the request for access to bid documents:
      a. Name of requesting company
      b. Name of representative
      c. Contact information including: bidders company name, bidders representative, mailing address, phone number, and email address.
      d. Upon requesting bid documents, bidder acknowledges that their company name and representative contact information will be included on the bidders list for the project and made available upon request.

1.6 TIME OF COMPLETION

A. Bidders shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time.

1.7 BIDDER'S QUALIFICATIONS

A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. A Performance Bond, a separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.

END OF DOCUMENT 001116

004113 – PROPOSAL FORM

Nebraska State Crime Lab Addition and Renovation Project

Brent Flachsbart, Administrator
DAS/State Building Division
1526 K Street – Suite 160
Lincoln, Nebraska, 68508

The undersigned, being familiar with local conditions affecting the cost of the work, and the Proposed Contract Documents, including the Advertisement for Bids, Instructions to Bidders, Proposal Form, Contract Form, Form of Contract Performance And Payment Bond, Form of Appointment of Purchasing Agent, Form of Exempt Sales/Use Tax Certificate, General Conditions, Special Conditions, Specifications and Plans all on file in the Office of the DAS/State Building Division, Lincoln, Nebraska, hereby proposes to furnish all plant, equipment, transportation, materials, tools, labor and skills necessary and required to perform all work as described in the Proposed Contract Documents entitled: Nebraska State Patrol Crime Lab Addition and Renovation all in strict accordance with the Proposed Contract Documents including the following Addenda:

Addendum ____, dated: _____
Addendum ____, dated: _____
Addendum ____, dated: _____
Addendum ____, dated: _____
Addendum ____, dated: _____
Addendum ____, dated: _____

Bidders shall acknowledge the receipt of any and all addenda issued in the space provided above:

For the contract sum of:

Base Bid:_____, $_____

(Alternate Bid # 1: _____, $_____)

(Alternate Bid # 2: _____, $_____)

(Alternate Bid # 3: _____, $_____)

(Alternate Bid # 4: _____, $_____)

Alternate bids shall be determined based on Alternates identified in Section 012300 of the Project Manual and associated Contract Drawing Documents.

The undersigned agrees to complete all work within _____ calendar days following the award of the Contract.

SUBCONTRACTORS AND SUPPLIERS

The following companies shall execute subcontracts for the portions of the Work indicated:

1. Concrete Work: _____.
2. Roofing Work: _____.
3. Plumbing Work: _____.
4. HVAC Work: _____.
5. Electrical Work: _____.

The undersigned states that he is complying with, and will continue to comply with, fair labor standards in the pursuit of his business and in the execution of the contract on which he is bidding.

The undersigned acknowledges having reviewed provisions outlined for exemption of payment of sales taxes to the State of Nebraska and also understands the requirements for registration of any and all nonresident contractors and subcontractors with the Nebraska Department of Revenue.

Bid security is required and accompanies this proposal, the same being subject to forfeiture in the event of default by the undersigned.

In submitting this bid, it is understood that the right is reserved by the DAS/State Building Division to reject any or all bids and to waive informalities, and it is further agreed that this bid may not be withdrawn during the period of sixty (60) days following the scheduled closing time for receipt of the bids.

_____ _____
Date Firm Name

_____ _____
By Address

_____ _____
Title City State Zip

Firm's Federal Identification Number _____ Fax: _____

Firm's Phone Number _____ Email: _____

Proposal Checklist, all items shall be included in the sealed Proposal to the State of Nebraska:

_____ Completed Proposal Form (two pages)

_____ Completed Attestation Form (attached)

_____ Bid Security in the amount of 5% of Bid Amount

SECTION 316600 – AGGREGATE PIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 00 and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION: Work shall consist of designing, furnishing and installing materials, and constructing a ground improvement system at the locations noted on the drawings and as specified herein. Ground improvement system shall be either vibro stone columns or rammed piers. "Aggregate piers" referenced in these specifications refer to both vibro stone columns and rammed piers.

1.3 WORK INCLUDED:

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

B. The ground improvement system design shall be completed by the contractor to meet the performance criteria as stated in the Drawings of the Contract Documents..

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

1.4 APPROVED INSTALLERS:

A. Installers of aggregate pier foundation systems shall have a minimum of 10 years of experience with the installation of aggregate piers and shall have completed at least at least five local projects of similar soil conditions and loading.

1.5 RELATED WORK:

A. Section 033000 – Cast in Place Concrete.

B. Section 312000 – Building Earthwork.

C. Section 003132 - Geotechnical Report and Recommendations.

1.6 REFERENCE STANDARDS:

A. Design: The ground improvement installer shall be responsible for design of a vibro stone column or rammed pier ground improvement system that meets the global stability, allowable bearing capacity, and settlement requirements stated on the contract plans. Industry recognized standards or design methods specific to the installer's equipment and construction methods shall be used.

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.

1.7 CONFLICTS IN SPECIFICATIONS/REFERENCES: Where specifications and reference documents conflict, the Architect/Engineer shall make the final determination of the applicable document.

1.8 CERTIFICATIONS AND SUBMITTALS:

A. The installer shall submit detailed design calculations and construction drawings to the Engineer of Record and to the Geotechnical Engineer of Record for approval at least three (3) weeks prior to the start of construction. All plans shall be sealed by a Professional Engineer in the State in which the project is constructed (referred in this specification as "the Designer") with at least 10 years of experience in designing Aggregate Pier systems.

B. The Stone Column or Aggregate Pier engineer 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 – A modulus test shall be performed on a non-production Aggregate Pier as required by the ground improvement designer to verify the design assumptions. 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 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.

E. g Agency.

1.9 BASIS OF PAYMENT:

A. This work will be paid for at the contract lump sum price for AGGREGATE PIERS.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Aggregate used for piers constructed 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, except that particles passing the No. 40 sieve shall be eliminated. Alternatively, No.57 stone or other stone selected by the Stone Columns or Aggregate Pier Installer may be used. Dynamic penetration resistance testing is inappropriate for this material.

B. Potable water or other suitable source shall be used to increase aggregate moisture content where required. Access to water on site shall be provided to the Installer.

C. Installer to coordinate 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 STONE COLUMN AND AGGREGATE PIER DESIGN:

A. The Aggregate Pier design stiffness modulus value shall be verified by the results of the modulus test, described in this specification.

B. Stone Columns or 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.

1. Minimum Allowable Bearing Pressure for Aggregate Pier Reinforced Soils: 3,000 psf.

2. Minimum Aggregate Pier Area Coverage (for square Spread Footings): 15%.

3. Estimated Total Long-Term Settlement for Footings: ≤1-inch.

4. Estimated Long-Term Differential Settlement of Adjacent Footings: 2/3 Total Long-Term Settlement

C. The design shall require that the modulus load test be performed to a minimum top-of-pier stress of 3 times the allowable bearing capacity, and the test shall be performed to 150% of the design top-of-pier stress.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.

D. The Stone Column or Aggregate Pier system shall be designed to preclude plastic bulging deformations at the top-of–pier design stress. The results of the modulus test shall be used to verify the design assumptions.

3.2 DESIGN SUBMITTAL: The Installer shall submit detailed design calculations, construction drawings, and shop drawings for approval at least two weeks 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 stone columns or 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 where the piers are to be built.

PART 4 - CONSTRUCTION

4.1 STONE COLUMNS:

A. The following sections provide general criteria for the construction of the Aggregate Pier elements. Unless otherwise approved by the Designer, the installation method used for Rammed Aggregate Pier construction shall be that as used in the construction of the successful modulus test

B. Install stone columns with a down-hole vibrator capable of densifying the aggregate by forcing it radially into the surrounding soil. The vibrator shall be of sufficient size and capacity to construct stone columns to the diameters and lengths shown on the installer’s approved construction drawings.

C. The probe and follower tubes shall be of sufficient length to reach the elevations shown on the installer’s approved construction drawings. The probe, used in combination with the available pressure to the tip jet,

shall be capable of penetration to the required tip elevation. Preboring shall be permitted if it is specified in the installer's approved construction procedure submittal.

D. The probe shall penetrate into the foundation soil layer to the minimum depths required in the installer's construction plans.

E. Lift thickness shall not exceed 4 feet. After penetration to the treatment depth, slowly retrieve the vibrator in 12-inch to 18-inch increments to allow backfill placement.

F. Compact the backfill in each lift by repenetrating it at least twice with the vibrating probe to densify and force the stone into the surrounding soil.

G. Install stone columns so that each completed column is continuous throughout its length.

4.2 RAMMED PIERS:

A. The following sections provide general criteria for the construction of the Rammed Aggregate Pier elements. Unless otherwise approved by the Designer, the installation method used for Rammed Aggregate Pier construction shall be that as used in the construction of the successful modulus test.

B. 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.

C. ance and remolding of the matrix soils surrounding the piers.

D. 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.

E. 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.

F. 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. Compaction equipment that induces horizontal vibratory energy is not permitted.

G. A minimum tamper energy level of 250,000 foot-pounds of force per minute shall be applied by the energy source.

H. 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.

I. 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.

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

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

4.3 PLAN LOCATION AND ELEVATION OF AGGREGATE PIER ELEMENTS: The center of each pier shall be within six inches of the plan locations indicated. The final measurement of the 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.

4.4 REJECTED AGGREGATE PIER ELEMENTS: Aggregate pier elements improperly located or installed beyond the maximum allowable tolerances 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 Aggregate Pier Modulus Test

A. A Aggregate Pier Modulus Test(s) will be performed at location(s) agreed upon by the Designer and Testing Agency to verify or modify Aggregate Pier designs. The 100% load test interval shall be a minimum of 3 times the allowable bearing pressure and the test should be performed to 150% of the maximum top-of-pier stress in the design calculations before the unload cycle. The design stiffness modulus shall be achieved at the 100% test interval otherwise remedial action will be required by the Installer. Modulus Test Procedures shall utilize appropriate portions of ASTM D 1143 and ASTM D 1194, as outlined in the Aggregate Pier design submittal.

5.2 QUALITY CONTROL REPRESENTATIVE:

A. 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:

1. Footing and Aggregate Pier location.

2. Aggregate Pier length and drilled diameter.

3. Planned and actual Aggregate Pier depths.

4. Average lift thickness for each Aggregate Pier.

5. Documentation of any unusual conditions encountered.

6. Type and size of densification equipment used.

5.3 QUALITY CONTROL VERIFICATION PROGRAM:

A. The installer shall be responsible for design of a verification program to assure the quality of the construction. The program shall verify that the installed ground improvement system satisfies the performance requirements noted on the contract plans and the design requirements determined by the ground improvement system designer. As a minimum, the verification program shall include the following:

1. Stone column installation shall be monitored by an on-board computer monitoring system. Monitoring system shall log stone column number, time of installation, depth, hydraulic pressure applied during the boring process and during the compacting process. Recorded data for each stone column shall be plotted depth/pressure versus time. Installation records for each shall be made available upon request in electronic format within 24 hours of installation.

2. Proposed means and methods for verification that the installed aggregate piers meet the strength and/or stiffness criteria required by the design. This may include, but shall not be limited to, modulus or load tests on individual elements and/or groups, soil borings, and other methods as approved by the Engineer.

3. Quality control program to verify that the ground improvement system is installed in accordance with the designer's specifications and the requirements in this special provision. The quality control program shall include testing and observations by qualified personnel employed by the ground improvement installer or an independent testing laboratory.

PART 6 - QUALITY ASSURANCE

6.1 INDEPENDENT ENGINEERING TESTING AGENCY: The Owner or General Contractor is responsible for retaining an independent engineering testing firm to provide Quality Assurance services. The Testing Agency should be the Geotechnical Engineer of Record.

6.2 RESPONSIBILITIES OF GEOTECHNICAL ENGINEER & INDEPENDENT ENGINEERING TESTING AGENCY:

A. The Geotechnical Engineer of Record shall review the Installer's Design Submittal.

B. The Testing Agency shall monitor the installation of aggregate pier elements that all work is performed in accordance with the approved Design Submittal. The Testing Agency shall monitor the installation of Rammed Aggregate Pier elements to verify that the production installation practices are similar to those used during the installation of the modulus test

C. The Testing Agency & Geotechnical Engineer of Record shall observe footing excavations and densification of aggregate piers and provide written reports per section 7.3.D. Dynamic Cone Penetration testing may be performed to evaluate the footing bottom condition as determined by the Testing Agency.

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 site access to the Installer, after earthwork in the area has been completed. A working surface shall 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.

C. Prior to, during and following Aggregate Pier installation, the General Contractor shall provide positive drainage to protect the site from wet weather and surface ponding of water.

D. Drill spoil removal from the Aggregate Pier work area shall be removed from the building pad area in a timely manner to prevent interruption of Aggregate Pier installation is required.

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

7.2 AGGREGATE PIER LAYOUT

A. The location of Aggregate Pier-supported foundations for this project shall be marked in the field using survey stakes or similar means at locations shown on the drawings.

7.3 CONTRACTOR'S / OWNER'S INDEPENDENT TESTING AGENCY (OWNER'S QUALITY

ASSURANCE)

A. General Contractor is responsible for acquiring an Independent Testing Agency (Quality Assurance) as required. Testing Agency roles are as described in Part 6 of this specification. The Aggregate Pier Installer will provide Quality Control services as described in Part 5 of this specification.

7.4 EXCAVATIONS OF OBSTRUCTIONS

A. Should any obstruction be encountered during Aggregate Pier Installation, the General Contractor shall be responsible for promptly 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., which shall prevent placing the piers to the required depth, or shall cause the pier to drift from the required location.

B. Dense natural rock or weathered rock layers shall not be deemed obstructions, and piers may be terminated short of design lengths on such materials.

7.5 UTILITY EXCAVATIONS:

A. 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. In the event that utility excavations are required at horizontal distances of less than five feet from installed Aggregate Piers, the General Contractor shall notify the Aggregate Pier Designer to develop construction solutions to minimize impacts on the installed Aggregate Piers.

B. Recommended procedures may include:

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

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

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

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

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

d. 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 subcontractor shall provide notification to the Testing Agency and the Designer when excavation, placement, and compaction will occur and arrange for construction observation and testing.

7.6 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 and (3) avoid exposure to water.

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 the footing is bearing on expansive or sensitive soils.

5. 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.

END OF SECTION

010000 - GENERAL REQUIREMENTS AND DESIGN CRITERIA

1. APPLICABLE BUILDING CODE AND SELECT REFERENCING STANDARDS

   INTERNATIONAL BUILDING CODE, 2018. WITH LINCOLN CODE AMENDMENTS
   ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   AISC 360-16 SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS
   ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES INCLUDING SUPPLEMENT NO. 1 AND 2, EXCLUDING CHAPTER 14 AND APPENDIX 11A
   AWS D1.1-04 STRUCTURAL WELDING CODE - STEEL
   AWS D1.3-08 STRUCTURAL WELDING CODE - SHEET STEEL
   AWS D1.4-98 STRUCTURAL WELDING CODE - REINFORCING STEEL

   OTHER SELECT REFERENCED STANDARDS MAY BE INDICATED ELSEWHERE IN THE CONTRACT DOCUMENTS, AS APPLICABLE.

   THE PROVISIONS OF THE REFERENCED BUILDING CODE AND ALL REFERENCED STANDARDS THEREIN SHALL APPLY TO THIS PROJECT. WHERE THERE IS A CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL BE APPLICABLE. TYPICALLY, THE LATEST EDITION OF CONSTRUCTION STANDARDS SHALL BE UTILIZED, AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.

2. INTERPRETATION OF CONFLICTS

   SHOULD CONFLICTS OCCUR IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REQUEST INTERPRETATION BEFORE PROCEEDING WITH THE ASSOCIATED WORK. ALL SUCH REQUESTS SHALL FIRST BE PRECEDED BY A DILIGENT INVESTIGATION INTO THE CONTRACT DOCUMENTS. EVIDENCE OF SUCH INVESTIGATION SHALL BE CONTAINED IN ALL REQUESTS FOR INTERPRETATION SUBMITTED.

   IF THE CONTRACTOR FAILS TO MAKE SUCH A REQUEST, THE CONTRACTOR IS EXPECTED TO COMPLETE THE WORK AS INDICATED IN THE CONTRACT DOCUMENTS. SHOULD CONFLICTS OCCUR IN OR BETWEEN DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL ESTIMATE THE COST OF THE WORK BASED ON THE MORE EXPENSIVE WAY OF DOING THE WORK UNLESS HAVING ASKED FOR, AND OBTAINED, WRITTEN DECISION BEFORE SUBMISSION OF PROPOSAL AS TO WHICH METHOD OR MATERIALS WILL BE REQUIRED.

3. STRUCTURAL SYSTEMS HAVE BEEN DESIGNED TO RESIST THE FOLLOWINGS DESIGN LOADS:
   A. FLOOR LIVE LOADS

      THE "TYPICAL MINIMUM LIVE LOAD USED FOR DESIGN" INDICATED BELOW WAS USED FOR ALL OCCUPANCY OR USE TYPES, EXCEPT THOSE WHERE THE "CODE-SPECIFIED MINIMUM LIVE LOADS" ARE GREATER, IN WHICH CASE THE ASSOCIATED LIVE LOAD INDICATED IN THE TABLE WAS USED FOR DESIGN. SEE ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR THE DEFINITION OF SPACES.

      TYPICAL MINIMUM LIVE LOAD USED FOR DESIGN = 100 PSF, 1000 LB CONCENTRATED LOAD

TABLE 010000-1 - CODE-SPECIFIED MINIMUM FLOOR LIVE LOADS		
OCCUPANCY	UNIFORMLY DISTRIBUTED LOAD (PSF)	CONCENTRATED LOAD * (LBS)
OFFICES	50**	2000
STAIRWAYS, CORRIDORS, LOBBIES, ASSEMBLY AREAS AND ELEVATOR LOBBIES	100	--
MECHANICAL	150	1000
RESTROOMS	60	1000
STORAGE (LIGHT)	125	--
STORAGE (HEAVY)	250	--

      * UNLESS OTHERWISE INDICATED, THE CONCENTRATED LOAD INDICATED WAS DISTRIBUTED OVER AN AREA OF 2.5 FEET BY 2.5 FEET (6.25 SQUARE FEET), AND LOCATED AS TO PROVIDE THE MAXIMUM LOAD EFFECTS IN THE STRUCTURAL MEMBERS.
      ** PROVISIONS FOR MOVEABLE PARTITIONS APPLIED PER BUILDING CODE USING 15 PSF IN ADDITION TO LIVE LOAD INDICATED. FIXED PARTITIONS (E.G., CMU) ARE CONSIDERED A DEAD LOAD.

   B. ROOF LIVE LOADS
      20 PSF MINIMUM ROOF LIVE LOAD
   C. LIVE LOAD REDUCTIONS HAVE NOT BEEN APPLIED.
   D. ROOF SNOW LOADS, APPLIED IN ACCORDANCE WITH THE BUILDING CODE INDICATED HEREIN.
      GROUND SNOW LOAD, Pg = 25 PSF
      FLAT ROOF SNOW LOAD, Pf = 20 PSF
      SNOW EXPOSURE FACTOR, Ce = 1.0
      SNOW IMPORTANCE FACTOR, I = 1.0
      THERMAL FACTOR, Ct = 1.0

      PARTIAL AND UNBALANCED SNOW LOADING HAVE BEEN APPLIED AS REQUIRED FOR DESIGNS INDICATED HEREIN. DRIFT SNOW LOADING HAS BEEN APPLIED AS SHOWN FOR DESIGNS INDICATED HEREIN.

      PARTIAL, UNBALANCED, AND DRIFT SNOW LOADING SHALL BE APPLIED AS SHOWN (OR DETERMINED IF NOT SHOWN) FOR DELEGATED DESIGN ITEMS SUBJECT TO SNOW LOADING.

      SNOW LOADS ARE NOT REDUCIBLE.
   E. INTERIOR WALLS
      5 PSF LATERAL LOAD IN THE ABSENCE OF ANY WIND LOAD EFFECTS
   F. WIND LOADS. APPLIED IN ACCORDANCE WITH THE BUILDING CODE INDICATED HEREIN.
      BASIC WIND SPEED, Vult = 114 MPH
      -Vasflt = 74 MPH (10 - YR MRI WIND)
      RISK CATEGORY = II
      WIND EXPOSURE = C
      INTERNAL PRESSURE COEFFICIENT, GCpi = +/- 0.18

   G. COMPONENTS AND CLADDING WIND LOADS:

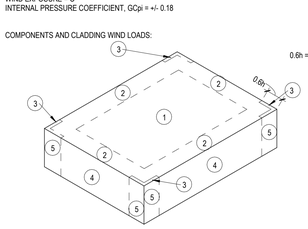

TABLE 010000-2 ROOF SURFACE ULTIMATE PRESSURE (PSF)				
ROOF				
AREA	10 SF	100 SF	200 SF	500 SF
NEGATIVE ZONE 1	-50	-40	-40	-35
NEGATIVE ZONE 2	-65	-50	-50	-45
NEGATIVE ZONE 3	-90	-60	-55	-45
POSITIVE ALL ZONES	20	20	20	20

TABLE 010000-2 - WALL SURFACE ULTIMATE PRESSURE AT h (PSF)				
WALL				
AREA	10 SF	100 SF	200 SF	500 SF
ZONE 4	-35	-30	-30	-25
ZONE 5	-45	-30	-30	-25
POSITIVE ALL ZONES	35	25	25	25

   * PRESSURES SHOWN ARE APPLIED NORMAL TO THE SURFACE. PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM THE SURFACES, RESPECTIVELY.

   ** SEE ASCE 7 FOR DEFINITION. FOR EFFECTIVE WIND AREAS BETWEEN THOSE GIVEN, VALUES MAY BE LINEARLY INTERPOLATED, OTHERWISE USE VALUES ASSOCIATED WITH THE LOWER EFFECTIVE WIND AREA.

   H. SEISMIC LOADS. APPLIED IN ACCORDANCE WITH THE BUILDING CODE INDICATED HEREIN.

      SEISMIC IMPORTANCE FACTOR, Ie = 1.00
      RISK CATEGORY = II
      MAPPED SPECTRAL RESPONSE ACCELERATIONS
      -SHORT PERIOD, Ss = 0.078g
      -ONE-SECOND PERIOD, S1 = 0.045g
      SPECTRAL RESPONSE COEFFICIENTS
      -SHORT PERIOD, Sds = 0.083g
      -ONE-SECOND PERIOD, Sd1 = 0.071g
      SEISMIC DESIGN CATEGORY, SDC = B
      BASIC SEISMIC-FORCE-RESISTING SYSTEM(S):
         ORDINARY PRECAST SHEAR WALLS (GRIDS 0.3, 3.1, A.1, B1 AND 2)
         STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
      DESIGN BASE SHEAR, V = 15 KIPS (AREA A), V = 25 KIPS (AREA B), V = 25 KIPS (AREA C)
      SEISMIC RESPONSE COEFFICIENT(S), Cs = 0.027
      RESPONSE MODIFICATION FACTOR, R
         R = 4 ORDINARY PRECAST SHEAR WALLS (GRIDS 0.3, 3.1, A.1, B1 AND 2)
         R = 3 STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
      LONG-PERIOD TRANSITION = 12 SEC PERIOD, TL
      ANALYSIS PROCEDURE USED : EQUIVALENT LATERAL FORCE PROCEDURE
      SITE CLASS: D

4. DESIGN ITEMS DELEGATED TO THE CONTRACTOR
   THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE FOLLOWING ITEMS. DESIGNS SHALL SATISFY THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

   A. PRECAST CONCRETE COMPONENTS
   B. OPEN WEB STEEL JOISTS (INCLUDING BRIDGING AND BRACING)
   C. COLD FORMED STEEL STUD FRAMING AND PRE-FABRICATED COMPONENTS
   D. MEZZANINE TOP AND SCREW WALLS
   E. INTERMEDIATE FOUNDATION SYSTEM

   1 ALL ITEMS LISTED AS DELEGATED DESIGN ITEMS SHALL BE PERFORMED AND STAMPED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEBRASKA. STAMPED ENGINEERING CALCULATIONS SHALL BE SUBMITTED FOR REVIEW AT THE SAME TIME THAT RELATED SHOP DRAWINGS ARE SUBMITTED FOR REVIEW.

5. CONTRACTOR RESPONSIBILITIES
   A. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS (INCLUDING FIELD VERIFICATIONS OF EXISTING CONDITIONS AND DIMENSIONS) BEFORE STARTING WORK OR FABRICATING ANY REINFORCING STEEL, STRUCTURAL STEEL, COLD-FORMED STEEL ELEMENTS, OR PRECAST ELEMENTS. THE ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCIES FOUND.
   B. SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR SIZE AND LOCATION OF WALL, ROOF, AND FLOOR OPENINGS AND SLEEVES, AND CONCRETE PADS UNDER EQUIPMENT. THE CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION WITH EQUIPMENT FURNISHED. OPENINGS IN STRUCTURE TO BE HANDLED AS FOLLOWS:

      FOR SLEEVES FOR PIPE PENETRATIONS THROUGH FOUNDATION WALLS, SEE D4/SB501

      OPENINGS THROUGH CONCRETE WALLS, FLOORS, AND ROOFS, WHICH MEASURE 12" OR LESS IN ALL DIRECTIONS, SHALL BE CORE DRILLED.

      OPENINGS THROUGH METAL ROOF DECK, WHICH MEASURE 6" OR LESS IN ALL DIRECTIONS, MAY BE CUT.

      FOR OPENINGS THROUGH METAL DECK (WITHOUT CONCRETE) LARGER THAN 13", SEE D1/SF501

      FOR OPENINGS THROUGH METAL DECK WHICH MEASURE BETWEEN 6" AND 13", SEE D6/SF501

      FOR OPENINGS THROUGH CONCRETE OVER METAL DECK (FLOOR OR ROOF) LARGER THAN 12", SEE E6/SF501
   C. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE SHORING AND BRACING OF THE STRUCTURE FOR ALL LOADS THAT MAY BE IMPOSED DURING CONSTRUCTION.
   D. THE DIAPHRAGM PROVIDED BY THE METAL ROOF DECK IS REQUIRED TO BRACE THE COLUMNS AND COMPLETE THE LATERAL LOAD RESISTING SYSTEM OF THE STRUCTURE. THE CONTRACTOR SHALL PROVIDE LATERAL BRACING AS REQUIRED DURING CONSTRUCTION UNTIL THE METAL ROOF DECK HAS BEEN CONSTRUCTED.
   E. WHEN CUTTING A NEW OPENING IN EXISTING CONCRETE OR MASONRY, THE CONTRACTOR SHALL NOT OVER CUT AT CORNERS. CORE-DRILL, CHIP AND GRIND AS REQUIRED AT CORNERS. A LAYOUT OF ALL PROPOSED OPENINGS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER PRIOR TO SAWCUTTING.
   F. ALL COLUMNS SHALL BE CENTERED ON GRID LINES UNLESS NOTED OTHERWISE.
   G. ALL COLUMN FOOTINGS SHALL BE CENTERED ON COLUMNS UNLESS NOTED OTHERWISE.
   H. ALL WALL FOOTINGS SHALL BE CENTERED ON WALLS UNLESS NOTED OTHERWISE.
   I. CONTRACTOR SHALL ENSURE NO STRUCTURAL MEMBERS OR ELEMENTS ARE DAMAGED OR ALTERED UNLESS SO INDICATED BY THE STRUCTURAL ENGINEER. ANY SUCH DAMAGE THAT DOES OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

6. PROVISIONS FOR FUTURE EXPANSION
   A. NO PROVISIONS FOR FUTURE EXPANSION HAVE BEEN MADE IN THE STRUCTURAL SYSTEMS.

014000 - QUALITY REQUIREMENTS

1. SPECIAL INSPECTIONS AND STRUCTURAL TESTING SHALL BE PERFORMED PER CHAPTER 17 OF IBC, THE CONTRACT DOCUMENTS, AND THE STATEMENT OF SPECIAL INSPECTIONS WHICH IS INCLUDED IN THE CONTRACT DOCUMENTS.

033000 - CAST-IN-PLACE CONCRETE (REINFORCED)

1. ALL STRUCTURAL CONCRETE SHALL BE DESIGNED FOR A 28-DAY COMPRESSIVE STRENGTH OF:

   f'c EQUALS 3500 PSI (NORMAL WEIGHT) [SLAB-ON-GRADE, SLAB-ON-DECK]
   f'c EQUALS 4500 PSI (NORMAL WEIGHT) [FOUNDATIONS, STOOP SLABS]
   f'c EQUALS 5000 PSI (NORMAL WEIGHT) [PRECAST]
2. ALL REINFORCING STEEL SHALL BE DEFORMED, NEW, AND CONFORM TO ASTM A615 GRADE 60 (DEFORMED BARS).
3. ALL PLAIN WELDED WIRE REINFORCEMENT SHALL BE NEW AND CONFORM TO ASTM A185.
4. ALL DEFORMED WELDED WIRE REINFORCEMENT SHALL BE NEW AND CONFORM TO ASTM A497.
5. DEFORMED BAR ANCHORS SHALL BE NEW AND CONFORM TO ASTM A706. WELDING OF DEFORMED BAR ANCHORS SHALL BE DONE WITH E80XX ELECTRODES IN CONFORMANCE WITH THE AMERICAN WELDING SOCIETY (AWS) "STRUCTURAL WELDING CODE - REINFORCING STEEL" AWS D1.4 - LATEST EDITION.
6. HEADED DEFORMED BARS SHALL BE NEW AND CONFORM TO ASTM A615 GRADE 60 AND ASTM A970 INCLUDING ANNEX A1 REQUIREMENTS FOR CLASS HA HEAD DIMENSIONS. OBSTRUCTIONS OR INTERRUPTIONS OF THE BAR DEFORMATIONS, IF ANY, SHALL NOT EXTEND MORE THAN 2 BAR DIAMETERS FROM THE BEARING FACE OF THE HEAD.
7. HEADED SHEAR STUDS SHALL CONFORM TO A.W.S. D1.1 - LATEST EDITION REQUIREMENTS FOR STANDARD HEADED STUDS.
8. CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT AT SURFACES NOT EXPOSED DIRECTLY TO EARTH OR WEATHER SHALL BE 3/4" FOR SLABS, JOISTS, AND WALLS AND 1 1/2" FOR BEAM STIRRUPS AND COLUMN TIES OR SPIRALS, UNLESS DETAILED OTHERWISE.
9. CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT AT SURFACES WHICH WILL BE EXPOSED TO THE WEATHER OR BE IN CONTACT WITH EARTH (BUT NOT CAST AGAINST) SHALL BE 2" FOR BARS LARGER THAN #5 AND 1 1/2" FOR #5 BARS OR SMALLER, PROVIDE 3" COVER FOR REINFORCEMENT CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH, UNLESS DETAILED OTHERWISE.
10. SLABS ON GRADE: UNLESS NOTED OTHERWISE, SHALL BE 5 INCHES THICK WITH #4 @ 18" EACH WAY OVER VAPOR BARRIER OVER MINIMUM 6 INCHES OF GRANULAR FILL OR AS REQUIRED BY INTERMEDIATE FOUNDATION SYSTEM DELEGATED DESIGNER. REINFORCING SHALL BE LAPPED AS PER TABLE BELOW. AT CONTRACTOR'S OPTION, MACRO SYNTHETIC FIBER (STRUX 90/40 OR EQUIVALENT (DOSAGE PER MFR. INSTRUCTIONS) MAY BE SUBSTITUTED IN NON-EXPOSED SLAB-ON-GRADE. 1
11. CONTRACTION JOINTS IN SLABS ON GRADE SHALL BE PLACED AT COLUMN LINE INTERSECTIONS AND AS NECESSARY TO NOT EXCEED A SPACING OF 36 TIMES THE SLAB THICKNESS OR 15'-0", WHICHEVER IS LESS. MAXIMUM ASPECT RATIO SHALL BE 1.5 TO 1.0 UNLESS NOTED OTHERWISE.
12. PROVIDE 3/4-INCH CHAMFER ON ALL EXPOSED CONCRETE CORNERS EXCEPT WHERE MASONRY WALLS ARE LAID FLUSH WITH COLUMN OR BEAM FACE.
13. WHERE THE WEIGHT OF EQUIPMENT OR MATERIALS BEING TRANSPORTED TO LOCATION, OR TEMPORARILY STORED, EXCEEDS THE DESIGN LIVE LOAD, PLANKING SHALL BE PROVIDED ON THE FLOOR SLAB AND SHORING PROVIDED BENEATH THE FLOOR AS REQUIRED TO SUPPORT THE LOADS.
14. FORMWORK SHALL BE ADJUSTED BEFORE AND AFTER CONCRETE PLACING OPERATIONS (PRIOR TO INITIAL SET) TO COMPENSATE FOR FORMWORK DEFLECTION, IN ADDITION TO ANY CAMBER SPECIFIED ON THE DRAWINGS.
15. PROVIDE EXTERIOR CORNER BARS SAME SIZE AND SPACING AS HORIZONTAL REINFORCING AT ALL CONCRETE WALLS AND FOOTINGS - LAP AS PER TABLE BELOW
16. PROVIDE LAP SPLICES IN CONFORMANCE WITH TABLE 033000-1, UNLESS OTHERWISE INDICATED. FOLLOW RESTRICTIONS ON LOCATIONS OF SPLICES AS INDICATED IN DETAILS, NOTES, OR SPECIFICATIONS.

TABLE 033000-1 - LAP SPLICE LENGTHS (GRADE 60 BARS, NORMAL WEIGHT CONCRETE)

BAR SIZE	f'c=3000 psi		f'c=3500 psi		f'c=4000 psi		f'c=4500 psi		f'c=5000 psi	
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	2'-4"	1'-10"	2'-2"	1'-8"	2'-0"	1'-7"	1'-11"	1'-6"	1'-10"	1'-5"
#4	3'-1"	2'-5"	2'-11"	2'-3"	2'-8"	2'-1"	2'-6"	2'-0"	2'-5"	1'-10"
#5	3'-11"	3'-0"	3'-8"	2'-9"	3'-4"	2'-7"	3'-2"	2'-5"	3'-0"	2'-4"
#6	4'-8"	3'-7"	4'-4"	3'-4"	4'-0"	3'-1"	3'-10"	2'-9"	3'-7"	2'-9"
#7	6'-9"	5'-3"	6'-3"	4'-10"	5'-10"	4'-6"	5'-6"	4'-3"	5'-3"	4'-1"
#8	7'-9"	6'-0"	7'-2"	5'-7"	6'-8"	5'-2"	6'-4"	4'-11"	6'-0"	4'-7"
#9	8'-9"	6'-9"	8'-1"	6'-3"	7'-7"	5'-10"	7'-2"	5'-6"	6'-9"	5'-3"
#10	9'-10"	7'-7"	9'-1"	7'-0"	8'-6"	6'-7"	8'-0"	6'-2"	7'-7"	5'-10"
#11	10'-11"	8'-5"	10'-1"	7'-10"	9'-5"	7'-3"	8'-11"	6'-10"	8'-5"	6'-6"

033000 - LAP SPLICE LENGTHS NOTES

1. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW BARS.
2. TABULATED VALUES ARE FOR UNCOATED OR ZINC-COATED (GALVANIZED) BARS. FOR EPOXY COATED BARS, MULTIPLY LENGTH BY 1.5.
3. IF CONCRETE COVER IS LESS THAN 1.0 x db OR C-C SPACING IS LESS THAN 3.0 x db, MULTIPLY LENGTH BY 1.5. (db = BAR DIAMETER)

17. WHERE REINFORCING STEEL IN TENSION IS REQUIRED TO BE MECHANICALLY SPLICED, MECHANICAL SPLICE SHALL BE DESIGNED FOR 125% OF THE SPECIFIED YIELD STRENGTH OF THE LARGER BAR BEING SPLICED.
18. NO PENETRATIONS (SUCH AS PIPE SLEEVES, ELECTRICAL CONDUITS, ETC.) THROUGH ANY STRUCTURAL MEMBER, SHALL BE MADE WITHOUT APPROVAL BY THE STRUCTURAL ENGINEER.
19. NON-CONTINUOUS ENDS OF TOP BARS IN BEAMS AND SLABS SHALL TERMINATE WITH A STANDARD 90-DEGREE OR 180-DEGREE HOOK, UNLESS DETAILED OTHERWISE.

034100 - PRECAST CONCRETE PANELS

1. PRECAST CONCRETE WALL PANEL REINFORCING (INCLUDING REINFORCING REQUIRED FOR LIFTING PURPOSES) SHALL BE PROVIDED BY PRECAST CONCRETE PANEL MANUFACTURER. DESIGN OF THE PRECAST UNITS SHALL BE PERFORMED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEBRASKA AND SHALL INCORPORATE ALL OF THE LOADS AS INDICATED IN THE CONTRACT DOCUMENTS AND AS REQUIRED BY APPLICABLE CODES.
2. CONCRETE FOR ALL PRECAST WALL PANELS SHALL BE NORMAL WEIGHT WITH A 28-DAY COMPRESSIVE STRENGTH, f'c = 5000 PSI.
3. GROUT FOR SETTING PRECAST CONCRETE UNITS SHALL BE NON-SHRINK WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI.
4. MISCELLANEOUS METAL FOR PRECAST WALL PANEL CONNECTIONS (ANGLES AND PLATES) SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123, PREPARED, AND FIELD PAINTED AS SPECIFIED. REPAIR GALVANIZED SURFACES THAT ARE DAMAGED BY WELDING IN ACCORDANCE WITH ASTM A780.
5. PRECAST CONCRETE CONNECTIONS NOT SPECIFICALLY DETAILED SHALL BE DESIGNED FOR THE LOADS INDICATED USING STANDARD CONNECTIONS AS PER THE CONTRACT DOCUMENTS. DESIGN OF PRECAST CONCRETE CONNECTIONS SHALL BE PERFORMED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEBRASKA.
6. ELEMENTS OF PRECAST CONNECTIONS EXPOSED TO THE EFFECTS OF WEATHER AND EXTERIOR CONDITIONS SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

042000 - UNIT MASONRY

1. HOLLOW CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90.
2. MORTAR SHALL CONFORM TO ASTM C270, TYPE N OR S.
3. NET AREA COMPRESSIVE STRENGTH OF CONCRETE MASONRY, f'm = 2000 PSI.
4. GROUT FOR REINFORCED CONCRETE MASONRY SHALL CONFORM TO ASTM C476, WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
5. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SHORING NECESSARY TO LATERALLY SUPPORT ALL CONCRETE MASONRY WALLS AS REQUIRED.
6. PROVIDE GALVANIZED HORIZONTAL JOINT REINFORCING EVERY 16 INCHES IN HEIGHT IN ALL WALLS, NO. 9 GAGE MINIMUM, UNLESS INDICATED OTHERWISE.
7. GROUT ALL CELLS FULL UNDER STEEL BEAMS BEARING ON CONCRETE MASONRY WITHIN AN AREA 24 INCHES WIDE BY 24 INCHES HIGH.
8. REINFORCE ALL CONCRETE MASONRY WALLS WITH #5 VERTICAL REINFORCEMENT AT 24 INCHES o/c IN GROUTED CELLS. LAP AS SCHEDULED UNLESS OTHERWISE DETAILED. PLACE BOND BEAMS AT TOP REINFORCED WITH (2)-#5 x CONTINUOUS, AND AS DETAILED.
9. PROVIDE LAP SPLICES OF REINFORCING STEEL IN CONFORMANCE WITH TABLE 042000-01, UNLESS OTHERWISE INDICATED. FOLLOW RESTRICTIONS ON LOCATIONS OF SPLICES, AS INDICATED IN DETAILS, NOTES, AND SPECIFICATIONS.

TABLE 042000-1 - LAP SPLICE LENGTHS IN GROUTED CMU (GRADE 60 BARS)

BAR SIZE	BARS CENTERED IN CELL		BARS OFFSET IN CELL (1 1/2" MIN. CLR.)	
	f'm=1,500 psi****	f'm=2,000 psi****	f'm=1,500 psi****	f'm=2,000 psi****
#3	1'-0"	1'-0"	1'-7"	1'-5"
#4	1'-3"	1'-1"	2'-10"	2'-6"
#5*	1'-11"	1'-8"	3'-9"	3'-9"

050519 - POST-INSTALLED ANCHORAGE

1. POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE STRUCTURAL ENGINEER-OF-RECORD PRIOR TO INSTALLING POST-INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. ALL POST-INSTALLED ANCHORS (IN CONCRETE OR CMU) ARE TO BE INSTALLED IN STRICT CONFORMANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS (MPII) (INCLUDING BUT NOT LIMITED TO DRILL BIT SIZE, PROPER CLEANING OF HOLES, INSTALLATION TORQUE, AND TEMPERATURE CONSTRAINTS).
2. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
3. EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. UNLESS NOTED ON THE DRAWINGS THAT THE BARS CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL UNDERTAKE TO LOCATE THE REINFORCING BARS AT THE LOCATIONS OF THE CONCRETE ANCHORS, BY FERROSCAN, GPR, X-RAY, CHIPPING OR OTHER MEANS AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.

051200 - STRUCTURAL STEEL FRAMING

1. ALL STRUCTURAL STEEL W SHAPES AND CHANNELS SHALL BE ASTM A992 UNLESS NOTED OTHERWISE. STRUCTURAL STEEL FOR ANGLES AND PLATES SHALL BE ASTM A572, GRADE 50 UNLESS NOTED OTHERWISE.
2. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE C WITH A MINIMUM YIELD STRENGTH OF 46,000 PSI FOR ROUND SECTIONS, AND 50,000 PSI FOR SQUARE AND RECTANGULAR SECTIONS.
3. ALL ANCHOR RODS SHALL BE ASTM F1554, GRADE 55 UNLESS NOTED OTHERWISE.
4. STRUCTURAL STEEL HAS BEEN DESIGNED IN ACCORDANCE WITH "AISC 360-10, SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 2010". ALLOWABLE STRENGTH DESIGN METHOD.
5. ALL FIELD CONNECTIONS SHALL BE MADE WITH 3/4-INCH DIAMETER ASTM F1852 (TWISTOFF) BOLTS (BEARING TYPE CONNECTION), UNLESS NOTED OTHERWISE. BOLTS SHALL BE TIGHTENED IN CONFORMANCE WITH "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
6. WHEN SLIP CRITICAL CONNECTIONS ARE SPECIFIED USE 3/4-INCH DIAMETER ASTM A325 BOLTS UNLESS NOTED OTHERWISE. BOLTS SHALL BE TIGHTENED BY THE "TURN OF NUT" METHOD OR DIRECT TENSION INDICATING WASHERS CONFORMING TO ASTM F959 AND IN CONFORMANCE WITH "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
7. ALL BEAM FRAMING MEMBERS SHALL BE SPACED EVENLY IN STRUCTURAL BAYS, UNLESS NOTED OTHERWISE.
8. BASE PLATE HOLE AND WASHER SIZES FOR ANCHOR RODS:

TABLE 051200-1 - STRUCTURAL STEEL FRAMING ANCHOR ROD SCHEDULE

ANCHOR ROD SIZE	BASE PLATE HOLE DIAMETER	MIN. WASHER DIAMETER	MIN. WASHER THICKNESS
3/4"ø	1 5/16"ø	2"ø	1/4"
7/8"ø	1 9/16"ø	2 1/2"ø	5/16"
1"ø	1 13/16"ø	3"ø	3/8"
1 1/4"ø	2 1/16"ø	3"ø	1/2"
1 1/2"ø	2 5/16"ø	3 1/2"ø	1/2"
1 3/4"ø	2 3/4"ø	4"ø	5/8"
2"ø	3 1/4"ø	5"ø	3/4"
2 1/2"ø	3 3/4"ø	5 1/2"ø	7/8"

9. ALL WELDING SHALL BE DONE WITH E70XX ELECTRODES IN CONFORMANCE WITH THE AMERICAN WELDING SOCIETY (AWS) "STRUCTURAL WELDING CODE" AWS D1.1 - LATEST EDITION.
10. ALL RE-ENTRANT CORNERS OF BEAM COPES AND PLATE CUTS MUST BE SHAPED NOTCH-FREE. PER AWS D1.1 TO A RADIUS. AN APPROXIMATE MINIMUM RADIUS TO WHICH THIS CORNER MUST BE SHAPED IS 1/2 INCH.
11. BEARING SURFACES OF COLUMNS SHALL BE FINISHED TO PROVIDE FULL BEARING CONTACT WITH BASE PLATE (AND CAP PLATE IF REQUIRED BY LOAD TRANSFER). BASE PLATES AND CAP PLATES SHALL BE FINISHED IN ACCORDANCE WITH SECTION M2.8 OF THE AISC SPECIFICATION.
12. THE FREE END OF CANTILEVERS SHALL USE FULL-DEPTH STIFFENERS EACH SIDE.
13. ALL STEEL MEMBERS AND COMPONENTS EXPOSED TO EXTERIOR CONDITIONS WITHIN THE CAVITY OF THE EXTERIOR WALL OR LOCATED OUTSIDE THE EXTERIOR VAPOR BARRIER SHALL BE GALVANIZED. APPLY ZINC COATING BY THE HOT DIP PROCESS ACCORDING TO ASTM A123. AFTER ERECTION OF STEEL, REPAIR DAMAGED GALVANIZED COATING WITH GALVANIZED REPAIR PAINT. FILL ALL BENT HOLES THAT WILL NOT BE COVERED BY CONCRETE IN FINISHED STRUCTURE.
14. ALL STRUCTURAL STEEL EXPOSED TO THE EXTERIOR ENVIRONMENTS SHALL BE PROTECTED BY APPLICATION OF HIGH-PERFORMANCE COATINGS. REFER TO HIGH-PERFORMANCE COATINGS SPECIFICATION.
15. ALL INTERIOR EXPOSED STEEL SHALL MEET PRIMING AND PAINTING REQUIREMENTS AS DEFINED IN THE INTERIOR PAINTING SPECIFICATION.

052100 - STEEL JOIST FRAMING

1. STEEL JOISTS AND COMPONENTS SHALL CONSIST OF A STANDARD STEEL COMPOSED OF MATERIAL(S) WITHIN THE STEEL JOIST INSTITUTE (SJI) STANDARDS AND HAVE A MINIMUM ALLOWABLE YIELD STRENGTH OF 36,000 PSI, AND A MAXIMUM LIVE LOAD DEFLECTION OF L/360.
2. STEEL JOISTS AND BRIDGING SHALL COMPLY WITH "STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS" OF THE STEEL JOIST INSTITUTE.
3. STEEL ROOF JOISTS SHALL BE DESIGNED FOR A GROSS UPLIFT PER THE COMPONENTS AND CLADDING WIND LOADS TABLE IN SECTION 010000 OF THESE GENERAL NOTES.
4. JOIST MANUFACTURER SHALL DESIGN JOISTS WHERE INDICATED ON DRAWINGS WITH "SP". SEE PLANS AND DETAILS FOR SUPERIMPOSED LO