

S P E C I F I C A T I O N S

TROY UNIFIED SCHOOL DISTRICT #429

EXTERIOR STAIR REPLACEMENT

TROY HIGH SCHOOL
319 S. PARK
TROY, KS 66087

MAY 2009



HANNEY & ASSOCIATES ARCHITECTS

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TROY U.S.D. 429-HIGH SCHOOL EXTERIOR STAIR REPLACEMENT

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SECTION 00100 - INVITATION TO BID & INSTRUCTIONS TO BIDDERS

Exterior Stair Replacement at Troy High School

Troy Unified School District 429
Troy, Kansas

Drawings and Specifications Dated May 4, 2009

1. SCOPE OF PROJECT:

The Specifications and the accompanying drawings are intended to provide for all materials and labor necessary for the **Exterior Stair Replacement at Troy High School, Troy USD 429, Troy, Kansas.**

2. CONTRACT DOCUMENTS:

2.1 The General Contractor may obtain drawings and specifications from the school district or the office of the Architects, **HANNEY & ASSOCIATES ARCHITECTS**, 1726 South Hillside, Wichita, Kansas 67211, or via our website at www.haarchitects.com.

3. PROPOSAL PROCEDURE:

3.1 Bid Date:

A. Sealed proposal for this project will be received by the Owners, The Board of Education, Troy Unified School District 429, at the Central Office, 230 West Poplar, Troy, Kansas 66087

Friday, May 15th, 2009.

1. General Construction.....up to and until 1:30 PM.

B. At which time proposals received will be opened and read publicly. Any proposals received after closing time will be returned unopened.

3.2 Should a proposer find discrepancies in, or omissions from the drawings or documents, or should he be in doubt as to their meaning, he shall at once notify the Architect, who will send written instructions to all proposers. Neither Owner nor Architect will be responsible for any oral instructions.

3.3 Proposals shall be made upon the PROPOSAL FORM or exact copy thereof bound into the specifications.
Fill in all blanks on the PROPOSAL FORM clearly with ink. Erasures or other changes in a proposal must be explained or noted over the signature of the proposer. Signatures shall be in longhand by a principal duly authorized to sign contracts, and if proposal is by a corporation, the signature shall be accompanied by the corporate seal impression. Proposals shall contain neither alterations nor recapitulation of work to be done.

3.4 Should the Contractor fail to complete all of the work required by the Contract Documents on or before the date set for substantial completion, the Contractor shall pay as liquidated damages, the sum of \$200.00 per day for each consecutive calendar day the work extends past that date, Sundays and legal holidays excluded.

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- 3.5 Each proposer is required to bid all alternates included in the Proposal Form, except that should he desire not to bid an alternate he may insert the words “no bid” in the space provided for prices for such alternate. In such case, if it is determined to use such alternate, the fact that the cost of the type or method bid in the proposal may be lower than that chosen shall not constitute the basis of a claim by the proposer that the contract shall be awarded to him. If an alternate price called for involves no change in price, proposer shall so indicate by writing the words “no change” in the space provided.
- 3.6 No oral or telephonic proposals or modifications will be considered. No telegraphic proposals will be considered, but modification by telegraph of proposals already submitted will be considered if received prior to time set for proposal opening.
- 3.7 Before submitting his proposal, each proposer shall carefully examine all documents pertaining to the work, visit the site of work, and fully inform himself as to all existing conditions under which the work will be performed. Submission of a proposal will be considered presumptive evidence that the proposer is fully aware of the Contract Documents, pertinent state and markets, and has made allowances in his proposal for all work and all contingencies.
- 3.8 Any addenda issued during the time of preparation of proposals are to be acknowledged in the Proposal Form and in closing a contract, they will become a part thereof.
- 3.9 Enclose the proposal along with the required Proposal Security, in an opaque envelope:
Proposal For: (State category of the work)

Exterior Stair Replacement at Troy High School
Troy Unified School District 429
Troy, Kansas
Name of Bidder.

4. PROPOSAL SECURITY:

- 4.1 Proposal Security, consisting of a bid bond, certified check or cashier’s check on a solvent bank, must be enclosed with each proposal for at least five percent (5%) of the Base Proposal.
- 4.2 Proposal Security shall be made payable, without condition to **Troy Unified School District #429**, Troy, Kansas as a guarantee that the bidder, if awarded the contract, will promptly execute the formal contract in accordance with the proposal and as required by the other Contract Documents, and that he will furnish good and sufficient bonds for the faithful performance in each category of work will be retained until the contract is awarded or other disposition is made thereof. Proposal Security of all bidders will be returned promptly after the canvass of proposals.
- 4.3 Performance Bond and Statutory Bond will be required in an amount of 100% of the contract amount. Such bonds shall be in such form as indicated in the Revisions in the General Conditions and registered at the **Doniphan County Courthouse**.

5. PROPOSAL WITHDRAWAL:

A Proposal may be withdrawn on written or telegraphic request received from proposer prior to time for proposal opening. No proposal may be altered or withdrawn for a period of at least thirty (30) days after opening of proposals.

6. SUBSTITUTIONS:

6.1 The materials, products and equipment described in the bidding documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

6.2 No substitution will be considered unless written request for approval has been submitted by the bidder and has been received by the architect at least ten (10) days prior to the date for receipt of bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a completed description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work which incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. The Architect's decision of approval/disapproval of a proposed substitute shall be final.

6.3 If the Architect approves any proposed substitute, such approval will be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

7. AWARD OF CONTRACT:

Contract will be awarded as soon as possible to the responsible proposer submitting the lowest acceptable proposal (i.e. combination of Base Proposal and accepted alternates, with due consideration to unit prices), provided:

7.1 Evidence of the experience, qualifications and financial responsibility of the bidder and his subcontractors, and the time of completion are all-acceptable to the Owner.

7.2 Manufacturer's Guarantee, Service Warranty and financial responsibility of manufacturer.

7.3 The total of acceptable proposals are within the financial budget for the project.

7.4 The Owner reserves the right to reject any or all proposals, to accept or reject alternate proposals and unit prices, and to waive all technicalities concerning the proposals received when it may be in his best interest to do so.

END OF SECTION 00100

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SECTION 00150 - GENERAL PROPOSAL

FOR

EXTERIOR STAIR REPLACEMENT AT TROY HIGH SCHOOL

The Board of Education
Troy USD 429
Troy, Kansas

Date: _____

The undersigned, in compliance with your invitation for bids for the **Exterior Stair Replacement at Troy High School, Troy USD 429, Troy, Kansas**, having examined the site of the work, and being familiar with all the conditions surrounding the work, hereby propose to furnish all labor, materials and supplies and do all work necessary for the project in accordance with the contract documents at the price stated below. These prices are to cover all expenses incurred in performing the required work under the Contract Documents, of which this Proposal is a part.

BASE PROPOSAL:

For all the work described in the specifications and shown on the plans for **Exterior Stair Replacement at Troy High School, Troy USD 429, Troy, Kansas**; I or (we) agree to perform all the work and furnish all materials complete for the sum of:

Dollars (\$) _____).

CONTRACT START AND TIME OF COMPLETION:

Construction for this project shall begin immediately after school is dismissed for summer break. The undersigned agrees, if awarded the Contract; to work through the school district's summer break and reach substantial completion before the start of the next school year. The undersigned further agrees that, from the compensation otherwise to be paid; the Owner may retain the sum of Two Hundred Dollars (\$200.00) for each day thereafter, Sundays and Holidays excluded, that the Contract remains incomplete, which sum is agreed upon as the proper measure of liquidated damages which the Owner will sustain per diem by the failure of the undersigned to complete the work at the time stipulated, and this amount is not to be construed as in any sense of penalty.

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ALTERNATE NUMBER ONE: New Sidewalk

This alternate considers the additional cost to the Base Bid to remove the existing sidewalk that extends East from the new work in the Base Bid to the existing North-South walk that is to remain. This alternate shall include the additional demolition, and finished grading that will be required.

The amount of the Base Bid will be increased/decreased/unchanged by the following amount:

Dollars (\$) _____

ALTERNATE NUMBER TWO: Helical Pier

This alternate considers the additional cost to the Base Bid to engage a foundation contractor to design and implement a helical pier system that will stabilize and raise the existing concrete piers that are located on each side of the concrete entrance stair that is being replaced. The system shall be designed by an engineer licensed in the State of Kansas.

The amount of the Alternate One will be increased/decreased/unchanged by the following amount:

Dollars (\$) _____

UNIT PRICE NO. ONE:

Unit price per linear foot of five-foot (5') wide x four inches (4") thick reinforced concrete sidewalk.

\$ _____ Per linear foot

DECLARATION:

The undersigned declares that he has carefully examined and understands all Bid Documents, including Invitation to Bid, instructions to Bidders, Drawings, Specifications, and Addenda, that he has visited the location of the work and familiarized himself with all conditions under which the work is to be performed, including all pertinent codes and the conditions of labor and material markets, that he has checked quantities and prices, that he has made allowance in his bid for all work and all contingencies, and understands that in signing this bid he waives all right to plead any misunderstanding regarding the same.

The undersigned acknowledges receipt of the following Addenda to the Drawings and/or Specifications.

(Give number and date of each.)

Respectfully Submitted,

(legal name of bidder)

(address of bidder)

Seal

(If bid is by a corporation)

(signed by authorized officer)

(title)

END OF SECTION 00150

SECTION 00300 - SPECIAL CONDITIONS

1. **A.I.A. GENERAL CONDITIONS:**

A.I.A. Document A201 "General Conditions of the Contract For Construction", 1997 Edition, hereinafter referred to as the "A.I.A. General Conditions", is hereby made a part of this Specification, as if hereto attached or herein repeated. Contractor shall consult this document and become intimately familiar with its contents before submitting his proposal. Copies are available for purchase from the American Institute of Architects, 1735 New York Avenue, N.W., Washington D.C. and from local A.I.A. offices.

2. **WORK INCLUDED:**

These Specifications and the accompanying Drawings are intended to provide for all materials and labor necessary for the **Exterior Stair Replacement at Troy High School, Troy USD 429, Troy, Kansas.**

3. **INTERPRETATION OF DOCUMENTS:**

If any person contemplating submitting a bid for the proposed Contract is in doubt to the meaning of any part of the Plans, Specifications, or other proposed Contract Documents, he may submit to the Architect a written request for an interpretation thereof, prior to 48 hours of the hour of opening bids. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by Addendum duly issued and a copy of such Addendum will be mailed, faxed or delivered to each person receiving a set of such documents.

4. **VERIFICATION OF DOCUMENTS:**

Before submitting his proposal, each bidder shall check his set of Specifications and Drawings and advise the Architect if any sheets are missing.

4.1.1 Enumeration of Specifications appears in the Specifications Index.

4.1.2 Enumeration of Drawings appears on Sheet Number One (1) of the Plans.

5. **CONTRACT DOCUMENTS:**

The Contract Documents consist of: The Agreement, the conditions of the Contract (General Conditions, Revisions in General Conditions and Supplementary General Conditions), the Drawings, the Specifications, all Addenda issued prior to the execution of the Agreement, and Change Orders thereafter.

6. **DOCUMENTS FURNISHED:**

6.1.1 Contractors will be furnished free of charge the following number of sets of Working Drawings and Specifications, including all modifications thereof:

General Contractor 10 sets

6.1.2 Contractor shall pay the actual cost of reproduction for all additional sets requested by him.

7. **PROPOSALS:**

Bidders are required to use the Proposal Form furnished by the Architect, which shall be made part of the Contract Documents. Each proposal must be accompanied by a certified check, cashiers check, or bid bond acceptable to the Owner, in the amount of five (5) percent of the base bid, payable to the Owner, without condition, as a guarantee that the bidder if awarded the contract will promptly execute such Contract in accordance with proposal and in the manner and form required by the Contract Documents, and will furnish good and sufficient bond for the faithful performance of same. The bid security of the three lowest bidders will be retained until the Contract is awarded or other disposition is made thereof. The bid security of all bidders except the three lowest will be returned promptly after the canvass of bids.

8. **EXAMINATION OF PREMISES:**

The Contractor shall carefully examine the premises before submitting his bid. No allowance will be made for lack of full knowledge of all conditions, except underground conditions as are indeterminable before the commencement of the work.

THE COMPLETE SET OF PLANS AND SPECIFICATIONS ARE BEING ISSUED FOR BIDS. AS SUCH, EACH BIDDER IS REQUIRED TO REVIEW THE ENTIRE SET OF DOCUMENTS FOR WORK THAT MAY BE REQUIRED/DESCRIBED OUTSIDE THE EXPECTED AREA.

9. **CHANGES:**

It is understood that the Owner shall have the right during the progress of construction to make any alterations, additions, or omissions that he may desire to work or material herein specified or shown on the Drawings. The same shall be carried into effect by the Contractor without in any way violating the Contract, but if such changes are made, the value of same must be agreed upon in writing between Owner, Architect, and Contractor.

No omissions will be allowed or extra work paid for unless ordered in writing by the Architect.

10. **SPECIAL WORK NOT INCLUDED:**

The Owner reserves the right to have special work, not included in the Contract, done during the course of the work herein included.

11. **PERMITS:**

The Contractor shall obtain and pay for all permits, surveys, plan review fee's and inspector's fees required without cost to the Owner. **(Doniphan County and City of Troy)**

12. **RESPONSIBILITY FOR ACCIDENTS:**

The Contractor must bear all loss of damage from accident which may occur to any person or persons, by or on account of the execution of the work, until possession is taken by the Owner. The Contractor must provide all legal and necessary guard railing, lights, warning signs, etc., during the progress of the work.

13. **INSURANCE:**

13.1 The Contractor shall purchase and maintain coverage's required by the General Conditions of the Contract, Paragraph 11.1 and these Specifications in the following minimum amounts, and provide the Owner, through the Architect, three copies of a Certificate of Insurance on A.I.A. form G705.

KIND OF INSURANCE	LIMITS OF LIABILITY
13.1.1 (1) Workmen's Compensation	Statutory Workmen's Comp.
(2) Employer's Liability	
Bodily injury by Accident	\$100,000.00 each occurrence
Bodily Injury by Disease	\$500,000.00 each employee
Bodily Injury by Disease	\$500,000.00 policy limit
Aggregate Disease	

14. **DETAIL AND WORKING DRAWINGS:**

Additional detail and working drawings will be furnished in amplification of the Contract Drawings as they may be required; all such additional drawings are to be considered of equal force with those which accompany these specifications. A complete set of the drawings and specifications must be kept in the building at all times during the progress of the work.

15. **DIMENSIONS:**

Figures given on the Drawings govern scale measurements and larger scale govern smaller.

16. **FOREMAN:**

Special Conditions
Hanney & Associates Architects

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The Contractor must have at the building from start to finish one responsible foreman throughout the entire job; in addition the Contractor must give the work his personal supervision; the foreman must be on duty during all working hours. Any instructions for notices given to him shall have the same force as if given to the Contractor in person.

17. **MATERIALS AND WORKMANSHIP:**

All materials and workmanship are to be the best of their several kinds, unless specified to the contrary. The Contractor is to furnish all accessories needed, such as scaffolding, forms, protection and all other temporary work, unless otherwise specified distinctly.

18. **DEFECTIVE OR IMPROPER WORK:**

Any work or materials not conforming to the specifications must be removed by the Contractor and replaced by approved materials or work without extra compensation. All condemned material must be removed from the premises immediately.

19. **PROTECTION:**

All materials in or designed for the work shall be at all times suitably housed or protected, particular care being taken of all finished parts.

20. **DISRUPTION OF SERVICES:**

Before digging or trenching commences, each Contractor shall verify with Public Service Companies all known plumbing, gas and underground electrical lines.

21. **CLOSING-IN WORK:**

21.1.1 The General Contractor shall notify his the Owner, all Contractors and subcontractors under the Owner, when he is ready for them to install their portions of their work and see that they comply with any reasonable period of time. Neither enclose nor cover any piping, wiring, ducts, equipment or other items until proper tests, observations, and/or inspections have been made by the Architect and/or proper authorities.

21.1.2 Notify the Architect to observe any work when placing of subsequent work would prevent observation of previous work.

22. **FINISHING:**

22.1.1 Adjust windows, doors, drawers, hardware, appliances, motors, valves, controls and other equipment for proper operations.

22.1.2 Seal exterior joints between materials to form a waterproof enclosure.

22.1.3 Touch-up imperfections in surfaces, paint and other finishes after all Contractors and Tradesmen have completed their work.

22.1.4 Clean surfaces using appropriate materials and methods that will thoroughly clean but not damage materials and their finishes, nor damage or adversely affect other materials in the project.

23. **COMPLETED WORK:**

23.1.1 Completed work shall find materials structurally sound, free from scratches, abrasions, distortions, chips, breaks, blisters, holes, splits or other disfigurement considered as imperfections for the specific material. Equipment shall operate properly to design performance capacities and requirements.

23.1.2 Finished installations shall illustrate first class workmanship.

23.1.3 Completed surfaces shall be thoroughly clean and free from foreign materials and stains.

24. **PERMANENT SYSTEMS:**
Install, connect, service and operate permanent systems at earliest practical dates, except as may be modified by special conditions of these specifications.
25. **COLOR SCHEDULE:**
A color schedule has been included with the Room Finish Schedule, on the Plans for bidding purposes. The Contractor and his subcontractors and material suppliers shall cooperate in furnishing required color samples to aid in the final selections. Where special colors are selected by the Architect, furnish accurate reproductions of these colors, on actual material to be furnished to the Project, for review.
26. **INTERNET CONNECTION, DIGITAL CAMERA, FAX AND TELEPHONE:**
General Contractor shall provide a computer on site with **internet access**, digital camera, temporary fax machine and telephone at the site for use by all trades and the Architect. General Contractor shall pay for all local calls and internet.
27. **GUARANTEE:**
The Contractor shall be responsible for and shall make good any defects due to faults in labor and materials, which may arise or be discovered within one (1) year after the completion of the work and its acceptance by the Architect.
28. **RETURNING DRAWINGS & SPECIFICATIONS:**
All drawings and Specifications must be returned to the Architect before the final certificate will be issued to the Contractor.
29. **WRITTEN WORDS IN PROPOSAL:**
In case of a difference between words and figures in a proposal, the amount stated in written words shall govern.
30. **TRASH AND DEBRIS:**
Each Contractor shall be responsible to remove all loose paper, cardboard, etc. from the site in a consistent manner to avoid blowing of trash and debris. The General Contractor shall be responsible for maintaining a central trash receptacle that can be used by all contractors.
31. **TEMPORARY LIGHTING & POWER:**
The Owner is responsible for paying for electrical service for construction of this project. It shall be the electrical contractor's responsibility to provide power and lighting at the site for all trades during construction.
32. **SALES TAX EXEMPTION:**
- 32.1.1 Materials and equipment incorporated into this project are exempt from payment of Kansas Sales Tax and such Sales Tax shall be excluded from bidder's proposal.
 - 32.1.2 The Owner will provide the Contractor with a proper exemption certificate number within ten (10) days of Contract date. Upon issuance of a proper exemption certificate number to the Contractor, the Contractor shall assume full responsibility for his own proper use of the certificate number and shall pay all costs of any legally assessed penalties relating to the Contractor's improper use of the exemption certificate number.
 - 32.1.3 Should the Owner fail to provide a proper exemption certificate number, the amount of the Sales Tax for the project shall be allowed as an extra to the Contract amount.

33. **TAXES:**

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The Contractor shall make all necessary forms for and shall pay for all taxes on labor and materials, such as Sales Tax, Social Security Tax, Withholding Tax, etc., without additional cost to the Owner, where such taxes are required by the State and Federal Laws.

34. **OMISSIONS:**

34.1.1 The Drawings and Specifications are intended to cooperate anything shown on the Drawings but not mentioned in the Specifications or vice versa, or anything not expressly set forth in either, but which is reasonable implied, shall be furnished as though specifically shown and mentioned in both, without any charge.

34.1.2 Should anything be omitted from the Drawings, necessary to the proper construction of the work herein described, it shall be the duty of the Contractor to so notify the Architect before signing the Contract and in the event of the Contractor failing to give such notice, he shall make good any damages of defects in his work caused thereby without extra charge.

35. **PROTECTION OF WORK AND PROPERTY:**

The General Contractor shall take charge of and assume general responsibility for proper protection of the building during construction. He shall further provide substantial enclosures at all openings as necessary for protection, including doors and locks. Each Contractor shall assume responsibility for his materials stored on the premises.

43. **EQUAL EMPLOYMENT OPPORTUNITY:**

Sections 1 through 5 of K.S.A. 44-1030 (as follows) shall be included in this Contract except those subcontractors, vendors or suppliers whose cumulative dollar total in any fiscal year is \$5,000 or less, or who have fewer than four (4) employees:

35.1.1 The contractor shall observe the provisions of the Kansas Act against discrimination and shall not discriminate against any person in the performance of work under the present Contract because of race, religion, color, sex, physical handicap unrelated to such person's ability to engage in the particular work, national origin or ancestry;

35.1.2 In all solicitations or advertisements for employees, the contractor shall include the phrase, "equal opportunity employer," or a similar phrase to be approved by the commission;

35.1.3 If the contractor fails to comply with the manner in which the contractor reports to the commission in accordance with the provisions of K.S.A. 1976 Supp. 44-1030, as amended, he shall be deemed to have breached the present Contract and it may be cancelled, terminated or suspended, in whole or in part, by the contracting agency;

35.1.4 If the contractor is found guilty of a violation of the Kansas Act against discrimination under a decision or order of the commission which has become final, the contractor shall be deemed to have breached the present Contract and it may be cancelled, terminated or suspended, in whole or in part, by the contracting agency;

35.1.5 The contractor shall include the provisions of Paragraphs (1) through (4) inclusively of this Subsection (a) in every subcontract or purchase order so that such provisions will be binding upon such subcontractor or vendor.

36. **EQUIPMENT VERIFICATION:**

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- 36.1.1 Contractor check physical sizes of all material and equipment furnished under this Contract and require other Contractors and Owner to verify sizes of their equipment, in time to allow ample room for transporting equipment to and installing in its final location before enclosing spaces for it. Notify Architect in writing of any openings, ceiling heights or enclosures that are insufficient to accommodate equipment; such notice in ample time for Architect to direct necessary adjustments before such openings, ceilings or enclosures are placed.
- 36.1.2 Before construction proceeds to point that would prevent necessary modifications, Contractor check Drawings, Specifications, Shop Drawings and Change Orders and notify Architect, in writing, of any Mechanical/Electrical services and/or connections required but not indicated, or incorrectly indicated, for equipment furnished. Failing to do so, Contractor furnishing equipment provides required services and/or connections at his expense.
37. **REPAIRS:**
Unless the Architect grants permission to repair any defective work, remove defective work from project and replace with new work in accordance with Contract Documents, permission to repair such work shall not constitute a waiver of Architect's right to require complete replacement of defective work if repair operation does not restore quality and appearance of member or surface to Architect's satisfaction. If permission is granted, repair according to Architect's direction.
38. **CONSTRUCTION REPORT:**
The Contractor shall submit to the Owner through the Architect schedules of costs and quantities of materials and of other items; schedules shall be in such form and shall be supported as to correctness by the estimates upon which they are based as the Owner may require. The Contractor shall also submit to the Owner the following records on forms to be supplied by the Owner.
38.1.1 Detailed estimates
38.1.2 Periodical estimates for partial payment.
38.1.3 Construction Schedule Dates with critical path chart
39. **LAWS AND ORDINANCES:**
The Contractor is required to familiarize himself with and observe all laws, ordinances and regulations relating to the work, and such laws, ordinances and regulations are hereby incorporated in and made a part of these specifications and the Contract for this work.

All work shall comply with the Americans with Disabilities Act.
40. **COMMENCE WORK:**
Work may commence with Owner's approval.
41. Company's approved equals to the original specified suppliers are required to meet all requirements of the plans, specifications, and standards of performance and construction as established by the first named originally specified manufacturers product.
42. **SUBPARAGRAPH 11.3 OF THE GENERAL CONDITIONS OF THE CONTRACT PROPERTY INSURANCE:**
42.1 Builders Risk Insurance shall be carried and paid for by the Contractor.
Builders Risk will carry special extended coverage's endorsement (All-Risks Builders Risk including transit and storage) in addition to the normal fire, vandalism and extended coverage.
The Contractor shall be responsible for any deductible.

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- 42.2 Builders Risk to be carried for the completed value of the work for the insurable value of the work completed in the names of the Owner, the Contractor and all Sub-contractors as their interest may appear.
- 42.3 Completed products coverage to extend at least one year after final completion of the job.
- 42.4 The Contractor will provide his own Liability Insurance.
- 42.5 All rights of subrogation of the Insurance Company must be waived on all insurance's coverage's involved under this contract to all parties including Owner
- 42.6 Contractor's and Sub-contractor's equipment will not be covered by any insurance provided by the Owner.

END OF SECTION 00300

SECTION 03300

CONCRETE

1. **GENERAL:**

- 1.1 All work included under this heading shall be subject to the General Conditions of the entire operation. The Contractor for this portion of the work is required especially to refer thereto.
- 1.2 Where not modified or exceeded by these specifications, or by the drawings, the "Specifications for Structural Concrete for Buildings" ACI 301-96, current edition shall be the specification for all concrete construction for this project, as if hereto attached or herein repeated. ACI and CRSI standards and recommendations included in ACI 301-96 shall likewise become minimum construction standards for this specification.
- 1.3 Contractor shall consult this document and its reference documents and become thoroughly familiar with their contents. He shall further procure the following documents and keep at least one copy of each on the work and available to the Architect during all concrete operations:
- | | |
|---------------|---|
| ACI 301-96 | Specifications for Structural Concrete |
| C31-69-80 | Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field. |
| C94-81 | Specifications for Ready-Mixed Concrete |
| C143-78 | Method of Test for Slump of Portland Cement Concrete |
| C173-78 | Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method |
| ACI 318-83 | Building Code Requirements for Reinforced Concrete |
| ACI 347-78-84 | Recommended Practice for Concrete Form Work |
| ACI 306-R88 | Recommended Practice for Cold Weather Concreting |
| ACI 305R-91 | Recommended Practice for Hot Weather Concreting |
| ACI 304R-89 | Recommended Practice for Measuring, Mixing and Placing Concrete |
| CRSI 78 | Recommended Practice for Placing Reinforcing Bars |
- 1.4 All poured-in-place concrete including but not limited to footings, grade beams, floor slabs, toppings, stairs, sidewalks, retaining walls, curbs, light pole bases, concrete parking surfaces and drives.
- 1.5 All exterior concrete including parking surface and sidewalks shall be poured with a max. slump of 3" and compaction for base under concrete shall be in accordance with the specifications; compaction shall be certified by the Testing Laboratory.
- 1.6 All sidewalks (4" thick) shall be reinforced with 6x6, #8/#8, W2.1 x W2.1 W.W.F. and all concrete parking and drives (6" thick) shall be reinforced with 6x6, #4/#4, W4.0 x W4.0 W.W.F., unless otherwise noted.

- 1.7 This section specifies cast-in-place concrete, including formwork, reinforcement concrete, materials, mix design, placement procedures and finishes.
2. **SUBMITTALS:**
 - 2.1 Product data: For each type of manufactured material and product indicated.
 - 2.2 Design Mixes: For each concrete mix, include alternate mix design when characteristics of material, project conditions, assembly, and support of formwork. Design and engineering of formwork are Contractor's responsibility.
 - 2.3 Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. Design and engineering of formwork are Contractor's responsibility.
 - 2.4 Material Test Reports: From a qualified testing agency indicating and interrupting test results for compliance indicated, based on comprehensive testing of current materials.
 - 2.5 Material Certificates: Signed by manufacturer's certifying that each of the following items complies with requirements:
 - 2.5.1 Cementitious materials and aggregates.
 - 2.5.2 Form materials and form-release agents.
 - 2.5.3 Steel reinforcement and reinforcement accessories.
 - 2.5.4 Fiber reinforcement
 - 2.5.5 Ad mixtures
 - 2.5.6 Waterstops
 - 2.5.7 Curing materials
 - 2.5.8 Bonding agents
 - 2.5.9 Adhesives.
 - 2.5.10 Epoxy filler strips
 - 2.5.11 Repair materials
3. **QUALITY ASSURANCE:**
 - 3.1.1 Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
 - 3.1.2 Manufactures Qualifications:
 - 3.1.2.1 A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
 - 3.1.2.2 Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.
4. **WORK INCLUDED:**

This section of the specifications shall include the furnishing of all labor and materials as required in connection with the completion of the following items of concrete - plain and reinforced concrete, or items of a cement nature throughout the building including the following:

 - 4.1 Furnish and set all lumber and plywood as required concerning the forming of the concrete work.
 - 4.2 Place all bar, steel mesh, rebar, and like reinforcement for all reinforced concrete work.
 - 4.3 All concrete as specified herein.

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- 4.4 Footings, foundations and floors.
 - 4.5 Cement floor finish and sealer as required.
 - 4.6 The setting in the concrete of all inserts, hangers, anchors, anchor bolts, ties, rods, etc., as required by the drawings or later sections of these specifications.
 - 4.7 All labor and materials of a plain or reinforced concrete nature required by the drawings or later sections of these specifications or for the correct and substantial installation of the work included herein.
 - 4.8 Sidewalks, slabs and curbs, as indicated.
 - 4.9 All joints materials, curing materials and installation of vapor barriers.
 - 4.10 Expansion joints and tooled joints as required.
 - 4.11 Special concrete foundations for mechanical equipment and electrical work as required by the drawings.
 - 4.12 Shop drawings, inspections and tests.
 - 4.13 The Asphalt contractor shall be clarified to include finish grading of the paved area stabilization with flyash worked into the top 6" of soil, asphalt paving, and all stripping and signage associated with the paved areas. It shall also be clarified that the Earthwork contractor in the general contract shall be responsible for grading of the asphalt paving areas to within $\pm 1/10$ of the finish grading. The General Contractor shall be responsible for all sidewalks as shown on the drawings. The General Contractor shall also be responsible for all bollards.
5. **ALTERNATES:**
Refer to Section 01030 - Alternates where scope and description of Alternates to the contract requirements are given.
6. **MATERIALS INSTALLED IN THIS DIVISION AND/OR FURNISHED BY OTHERS:**
This Contractor shall build into concrete work the following materials, which are furnished by other trades and shall embed and secure same as required.
- 6.1.1 Concrete inserts, hangers, anchors, sleeves for all piping and ductwork as required for all trades.
 - 6.1.2 Anchor bolts, plates, dovetail anchor slots, reglets, etc.
 - 6.1.3 Loose lintels bearing on concrete work.
 - 6.1.4 Door and window frames, bucks, anchors, occurring in concrete work.
7. **COOPERATION WITH OTHER CONTRACTORS:**
This Contractor shall cooperate with all other contractors engaged in work in the building to the end that proper unity of action will facilitate the orderly progress of the work. Shop drawings or other data that may be provided by or for this Contractor for use in the installation of his work shall be given to those contractors who required the information contained therein.

8. **MATERIALS:**

8.1 Portland Cement: Portland Cement shall conform to the "Standard Specifications for Portland Cement" (ASTM Serial Designation C150) and shall be Type 1, 1a or 111. High early strength concrete may be used only upon approval of the Architect.

8.2 Aggregate: Aggregate shall conform to ASTM Serial Specification C33-90.

8.2.1 Fine Aggregate:

Fine aggregate shall consist of sand having clean, hard, durable uncoated grains, free from deleterious substances and shall range in size from fine to coarse within the following percentages by weight:

Passing No. 4 sieve	95-100 Percent
Passing No. 8 sieve	80-100 Percent
Passing No. 16 sieve	50-85 Percent
Passing No. 30 sieve	25-60 Percent
Passing No. 50 sieve	10-30 Percent
Passing No. 100 sieve	2-10 Percent

Volume removed by sedimentation.... not more than 3 percent. Not more than 35 percent shall pass a standard size sieve and be retained on the next smaller sieve.

8.2.2 Coarse Aggregate:

Coarse aggregate shall consist of crushed stone, gravel or other approved inert materials with similar characteristics or combination thereof, having clean, hard, durable, uncoated particles, free from deleterious matter, meeting graduation requirements of ASTM C33, No. 67. After acceptance of a grading, a variation in the amount passing any sieve size of more than 10 percent of the total will not be permitted. The grading shall be within the following percentages by weight:

Passing a 1" sieve.....	100 Percent
Passing a 3/4" sieve	90-100 Percent
Passing a No. 4 sieve	0-10 Percent
Passing a No. 8 sieve	0-5 Percent

The maximum sized aggregate shall be not larger than one-fifth (1/5) of the narrowest dimension between form of the member for which the concrete is to be used nor larger than three-fourths (3/4) of the minimum clear spacing between reinforcing bars, and forms as shown on the drawings.

8.2.3 Soundness:

The fine and coarse aggregate when subjected to five alternations of the sodium sulfate soundness test (ASTM Designation C88-46T) shall not show an average weighted loss of more than 10 percent for the fine aggregate and 13 percent for the coarse aggregate unless evidence satisfactory to the Architect is furnished that concrete of comparable proportions in which similar materials from the same sources were used has been exposed to natural weathering for a period of at least 5 years without appreciable disintegration.

8.3 Mixing Water: Mixing water shall be clean and free from oil, acid and injurious amounts of vegetable matter, organic materials, alkalis, salts, or other substances that may be deleterious to concrete or steel.

- 8.4 Expansion Joint Filler: Expansion joint filler shall be premoulded and composed of fiber board impregnated with asphalt similar and equal to "Flexcell" as manufactured by the Celotex Company. All joint filler material shall be the thickness of the slab or joint and unless otherwise indicated shall be one-half (1/2) inch thick.
- 8.5 Metal Reinforcement:
- 8.5.1 Metal reinforcement shall conform to the requirements of the "Standard Specifications for Billet-Steel Bars Concrete Reinforcement." (Serial Designation ASTM A-615-82 of the American Society for Testing Materials.)
- 8.5.2 Welded wire fabric for concrete reinforcement shall conform to the requirements of the "Standard Specifications for welded steel wire fabric for concrete reinforced" shall conform to ASTM A185-79.
- 8.6 Reinforcing Bar Supports:
All reinforcing shall be properly and adequately supported at the design heights indicated on the Structural Plans by the use of chair supports. Chair supports with galvanized legs shall be equal to bar supports manufactured by the Dayton Sure Grip & Shore Co., Miami, Ohio.
9. **EXTREME WEATHER CONDITIONS:**
- 9.1 Concrete when deposited in hot weather shall be in strict accordance with ACI 305R-91 "Recommended Practice for Hot Weather Concrete."
- 9.2 Concrete when deposited in cold weather shall be handled in strict accordance with ACI 306R-88 "Recommended Practice for Cold Weather Concreting."
10. **FORMS:**
- 10.1 General: The foundation is designed for a combination of trench and formed footings or walls.
- 10.1.1 Forms shall conform to shape, lines and dimensions of the members as shown on the Plans. They shall be properly spaced or tied together to maintain position and shape and insure safety to workmen and passerby. Forms shall be made tight to prevent leakage of mortar.
- 10.1.2 Formwork for concrete shall be designed and constructed in strict accordance with ACI 347 Recommended Practice for Concrete Formwork".
- 10.1.3 If adequate foundations for shores cannot be secured, trussed supports of adequate design shall be provided.
- 10.2 Exposed Concrete:
- 10.2.1 Unlined forms shall be used for the face of all exposed concrete walls and all other exposed surfaces where indicated on the Drawings. All forms shall be built in place except that panel forms may be used where a single panel will form an entire area from one reveal to another. The use of panel forms will not be permitted where the joints between adjacent panels must be made on flat surfaces or in any other conspicuous locations.
- 10.2.2 The contact surface of all unlined forms shall be constructed of 5/8" or 3/4" five-ply Douglas Fir structural plywood of concrete form grade according to Bureau of Standards Commercial Standards CS45-42. All concrete form plywood shall be so designed by grade marking each panel. Full-sized sheets of plywood must be used except where smaller pieces will cover an entire area. The edges of all plywood sheets shall be straightened on the bench to insure close-fitting, tight joints.

- 10.2.3 When the outside form is erected and reinforcement is in place and before the inside form is erected, the Architect shall be notified and the inside form shall not be placed until work already done is approved. Open joints, which would permit leakage of grout, shall be sufficient cause for rejection of forms.
- 10.2.4 If, in the opinion of the Architect, pointing of an occasional slightly open joint will prevent leakage, then such pointing shall be done using a material approved by the Architect. Pointing shall be carefully done and there shall be no trace of the pointing mixture on the surfaces of the sheathing.

11. **REINFORCEMENT:**

- 11.1 Reinforcement shall be detailed, fabricated and placed in strict accordance with SP66-94 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
- 11.2 Cleaning:
Metal reinforcement before placed shall be thoroughly cleaned of mill and rust scale and of coatings that will destroy or reduce the bond. Reinforcement appreciably reduced in section shall be rejected. Where there is delay in depositing concrete, reinforcement appreciably reduced in section shall be rejected. Where there is delay in depositing concrete, reinforcement shall be reinspected and when necessary, cleaned.
- 11.3 Bending and Straightening:
11.3.1 Reinforcement shall be carefully formed to the dimensions indicated on the Plans. Cold bends shall be made around a pin having a diameter of six or more times the least dimensions of the reinforcement bars.
- 11.3.2 Metal reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bands not shown on the Plans shall not be used. Heating of reinforcement will be permitted only when the entire operation is approved by the Architect.
- 11.4 Placing:
11.4.1 Metal reinforcement shall be accurately positioned and secured against displacement by using annealed wire of not less than No. 16 gauge or suitable clips of intersections and shall be supported in a manner that will keep all metal away from the exposed surface of the wall. Structural concrete reinforcement shall be adequately secured in position by concrete or metal chairs and spacers. Nails shall not be driven into the outside forms to support reinforcement not shall any other device for this purpose come in contact with the outside form except that wood strips shall be inserted between the reinforcement and the forms at intervals to maintain the required clear distance between the reinforcement and the inside and outside surfaces of the concrete.
- 11.4.2 The strips shall be pulled up and removed from the wall as the level of the concrete rises. The minimum clear distance between any bar and the weather side of all exterior walls shall not be less than two (2") inches. At all, wall surfaces not exposed to the weather a minimum of one (1") inch of concrete cover over all steel shall be provided.
- 11.5 Concrete Protection for Reinforcement:
11.5.1 Other metal reinforcement shall be protected by the thickness of concrete indicated on the Plans. Where not otherwise shown, the thickness over the reinforcement shall be as follows:

- 11.5.1.1 Where concrete is deposited against ground without the use of forms, not less than three inches (3").
- 11.5.1.2 Where concrete is exposed to the weather, or exposed to the ground but is placed in forms, not less than two inches (2") for bars #6 through #18 and one and one half inches (1-1/2") for bars #5 and smaller.
- 11.5.1.3 In slabs and walls not exposed to the ground or the weather, not less than 3/4".
- 11.5.1.4 In beams, girders and columns not exposed to the ground or to the weather, not less than 1-1/2".
- 11.5.1.5 In all cases the thickness of concrete over the reinforcement shall be at least equal to the diameter of round bars and one and one-half times the side dimension of square bars.

11.6 Splicing:

- 11.6.1 Wherever it is necessary to splice reinforcement otherwise than as shown on the Plans, the character of the splice shall be decided by the Architect on the basis of allowable bond stress and the stress in the reinforcement at the splice. Splicing shall not be made at points of maximum stress nor shall adjacent bars be spliced at the same point.
- 11.6.2 All bars shall be lapped at least 30 bar diameters or 24" minimum unless otherwise noted at all corners and at abrupt changes in directions of walls.
- 11.6.3 In slabs, beams and girders, splices of reinforcement at points of maximum stress shall generally be avoided. Splices shall provide sufficient lap to transfer the stress between bars by bond and shear.

12. **PROPORTIONING AND STRENGTH REQUIREMENTS:**

12.1 Trial Batches:

The Contractor shall employ and pay for services of a testing laboratory approved by the Architect, who will be responsible for analysis on design of the concrete in accordance with these specifications.

12.2 Measuring Ingredients:

- 12.2.1 All measurements of fine and coarse aggregates shall be made separately by weight. Proportioning aggregates for fractional sacks of cement will not be permitted unless the cement is weighed for each batch. Weighing equipment shall be arranged to permit making compensation for changes in the weight of moisture contained in the aggregates. Weighing equipment shall meet the approval of the Architect and shall be accurate within one percent of the net load being weighed.
- 12.2.2 A satisfactory auxiliary device shall be used in connection with the scale beam to indicate or register at least the last 100 lbs. of each of the aggregates required for the batch.
- 12.2.3 One gallon of water shall be considered as weighing 8.33 lbs.
- 12.2.4 Portland Cement in standard unopened cloth or paper sacks as packed by the manufacturer may be considered as weighing 94 lbs. per sack. Batches shall be proportioned that only full bags of cement are required for a single batch.

12.3 Strength Requirements:

All concrete shall have a minimum compressive strength of 3,000 lbs. per square inch at twenty-eight (28) days. Refer to the Structural Notes on the Drawings for additional strength requirements.

12.4 Water-Cement Ratio:

The proportioning of materials shall be based on the requirements for a plastic and workable mix with the use of not less than 5-1/2 sacks of cement per cubic yard and no more water than is necessary to gain desired strength, expressed in terms of the quantity of cement. The water in the aggregate must be included in the quantity specified and subtracted from the amount added to the mixture. It shall be measured by methods satisfactory to the Architect which will give results within one (1) pound for each one hundred (100) pounds of aggregate.

12.5 Proportioning and Consistency:

12.5.1 The proportions of aggregate to cement shall produce concrete that can be thoroughly compacted.

12.5.2 The combined aggregate shall be of such composition of sizes that when separated by the No. 4 standard sieve, the weight retained on the sieve shall be not less than one-half (1/2) nor more than two-thirds (2/3) of the total based on dry materials, except where adjustment is necessary in the opinion of the Architect for casting in special details. In all cases, the regular mix can be used for casting details, except where detail is intricate it may be necessary to reduce the amount of coarse aggregate.

12.6 Quality Control:

Determination of Maximum Water Content:

The strength quality of the concrete proposed for use shall be established by tests made in advance of the beginning of operations using consistencies suitable for the work meeting the requirements of these specifications. Trial design batches and testing shall be the responsibility of the Contractor. Certified copies of all tests and proportions used therein shall be furnished to the Architect for approval. Specimens shall be made and cured in accordance with ASTM Standard C192-49. A curve representing the relation between the water content and the average 28-day compressive strength shall be established for a range of values including the compressive strength specified herein. The curves shall be established by at least three (3) points, each point representing average values from at least 4 test specimens. The maximum allowable water content for the concrete to be used in the work shall be as determined from this curve and shall correspond to a strength fifteen (15) percent greater than specified. No substitutions shall be made in the materials used in the work without additional tests in accordance herewith to show that the quality of the concrete is satisfactory.

13. **CONCRETE MIXING PLANT:**

Job mixed concrete will not be allowed. Concrete shall be batched at a central plant and conveyed to the job in mixing trucks. Ready-mix concrete shall conform to ASTM Tentative Specifications C94. It shall be the responsibility of the Contractor to maintain a proper and uniform air content as determined by test at the jobsite and variations in air content beyond the specified limits for two consecutive tests shall be sufficient cause for rejection of all concrete until evidence of adequate corrective measures has been furnished the Architect.

14. **DEPOSITING CONCRETE:**

14.1 Cleaning Equipment:

Before beginning a run of concrete hardened concrete and foreign materials shall be removed from the inner surfaces of the mixing and conveying equipment. All conveyances, buggies, or barrows shall be kept clean during the placing of the concrete.

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14.2 Transportation:

Concrete shall be handled from the mixer to the place of final deposit in cars, buggies or conveyers. The concrete shall not be spouted nor delivered by spout or trough from the hoists, not dumped into carts with a free fall from the mixer of more than three feet. Every possible precaution shall be kept on temporary runways built over the floor system and runway supports shall not bear upon reinforcement steel or fresh concrete.

14.3 Time of Placing:

Concrete shall not be placed until all reinforcement is secured and properly fastened in its correct position, nor until the trenches have been inspected and approved by the Architect, nor until all sleeves, hangers, pipers, conduits, bolts, wires and any other fixtures required to be embedded therein have been placed and anchored by the Contractor not until the trenches and reinforcement have been cleaned. Concrete shall not be placed at any time except under the direct supervision of the Architect nor outside of regular working hours unless the Architect is notified at least 4 hours in advance and the Architect's superintendent or inspector is on the job.

14.4 Preparation for Placing:

14.4.1 Water shall be removed for excavations before concrete is deposited. Any flow of water shall be diverted through proper side drains and shall be removed without washing over freshly deposited concrete. Hardened concrete, debris and foreign materials shall be removed from interior of forms, unless lines, shall be oiled or except in freezing weather, wet with water in advance of concrete placement to prevent seepage of cement grout from the mix.

14.4.2 Reinforcement shall be secured in position, inspected and approved by the Architect before placing concrete. All concrete placed in violation of this provision shall be rejected and removed. Runways or other means approved by the Architect shall be provided for wheeled equipment to convey concrete to points of deposit. Equipment used to deposit concrete shall not be wheeled over reinforcement not shall runways be supported on reinforcement.

14.5 Placing:

14.5.1 Special care must be exercised to prevent segregation of the concrete and to prevent splashing the trench or reinforcement with concrete and any such splashes or accumulations of hardened or partially hardened concrete on the forms or reinforcement above the general level of the concrete already in place must be removed before the work proceeds.

14.5.2 Concrete shall be handled from mixer or transport vehicle to place of final deposit in a continuous manner and as rapidly a practicable until the given unit of operation, approved by the Architect is completed. Concrete that has attained its initial set or has contained its water content for more than 1-1/2 hours shall not be used in the work. Reinforcement shall not be splashed with concrete in advance of placing operation.

14.5.3 Concrete shall be deposited in the trenches in uniform layers not exceeding 24" in depth and as nearly as practicable in final position to avoid rehandling. Immediately after depositing, concrete shall be compacted by thoroughly agitating in a manner approved by the Architect, to force out air pockets, work the mixture into corners and around reinforcement and inserts, and prevent formation of voids.

15. **DEPOSITING AGAINST OTHER CONCRETE:**

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Before depositing new concrete in the walls on or against concrete that has hardened, the forms shall be retightened, the surface of the hardened concrete shall be roughened, as required, thoroughly cleaned of foreign matter and laitance, and moistened with water. The new concrete placed in contact with hardened or partially hardened concrete shall contain an excess of mortar to insure bond. To insure sufficient mortar at the juncture of the hardened and the newly deposited concrete, a layer of Portland Cement-sand mortar one inch to two inches thick shall be deposited against the hardened concrete into which the regular mix concrete shall be deposited immediately. The cement-sand mortar shall be of the same proportions as the regular concrete mix except that the coarse aggregate is omitted.

16. **CONCRETE SLAB FINISH:**

16.1 Concrete slabs shall be finished as hereinafter described. The dusting of wearing surfaces with dry materials WILL NOT be permitted. In preparation for finishing, floor slabs shall be struck off true to the required level at or below the elevation or grade of the finished floors as shown on the drawings. Floors shall be left with a tolerance (Class "B") of 1/4" in 10 feet except where drains occur or a definite slope is given in which case the floors shall be finished to the lines and grades shown on the drawings or as directed by the Architect.

16.2 Monolithic Finish: Tamping the concrete with special tools to force the coarse aggregate away from the surface shall finish floors shown on the drawings to receive a monolithic finish. Then screeding and floating with straight edges to bring the surface to required finish level shown on the drawings. While the concrete is still green but sufficiently hardened to bear a man's weight without imprinting, it shall be wood floated to a true even plane with not coarse aggregate visible. Sufficient pressure shall be used on the wood floats to bring moisture to the surface. The concrete shall then be hand-trowelled to produce a surface free from trowel marks.

16.3 Wood or Cork Float Finish: Floors indicated on the drawing to receive wood or cork float or broomed finish shall be finished by tamping the concrete with special tools to force aggregate away from the surface, then screeding with straight edges to bring surface to required line as shown on the drawings. While the concrete is still green but hardened sufficiently to bear the cement finisher's weight, the surface shall be floated with a wood or cork float to a true uniform plane with no coarse aggregate visible.

16.4 Power Machine Finishing: In lieu of hand finishing, the contractor may use a power machine for finishing concrete floors in accordance with the direction of the machine manufacturer. The preparation of concrete surfaces for finishing by machine shall in general be as herein before required for hand finishing.

17. **PROTECTION AND CURING:**

17.1 Protection Against Moisture Loss:

Immediately after placing or finishing concrete surfaces not covered by forms shall be protected from loss of surface moisture for not less than 7 days where a normal Portland cement has been used or 3 days where a high-early strength Portland cement has been used by covering with Kraft paper mats. Kraft paper shall be sealed. Protect concrete from too rapid drying or freezing for 6 days.

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- 17.2 **Curing Compound:** Membrane curing compound shall comply with ASTM C-309, Type I, Class A and B and AASHTO M-148, Type 1 and/or Type I-D. Curing compound shall be equal to "Conspec Cureseal" as manufactured by Conspec Marketing and Manufacturing Co., Inc., 636 South 66th Terrace, Kansas City, Kansas (800) 348-7351 or the approved equal. Materials shall be applied to all newly finished concrete floors and walks. **Special Curing requirements shall be necessary in areas which receive resinous flooring. All curing compounds shall be compatible with the concrete finish specified.**
- 17.3 **Patching:**
Any concrete which is not formed as shown on the plans or for any reason is out of alignment or level or shows a defective surface shall be considered as not conforming with the intent of these specifications and shall be removed from the job by the contractor at his expense unless the Architect grants permission to patch the defective area, which shall be done in accordance with the following procedure: Permission to patch any such area shall not be considered a waiver of the Architect's right to required complete removal of the defective work if the patching does not, in his opinion, satisfactorily restore the quality and appearance of the surface.
- 17.4 **Cleaning:**
- 17.4.1 No cleaning operations shall be undertaken until the walls of the building are entirely completed. Cleaning portions of the walls as the work progresses will not be permitted. Mix one part Portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint. White Portland cement shall be used for all or part of the cement in the grout, as directed by the Architect, to give the color directed. Wet the surface of the concrete and apply the grout, float the surface with a cork float, scouring the wall vigorously. While the grout is still plastic, the surface shall be finished with a sponge rubber float, removing all excess grout. This finishing shall be done at the time when grout will not be pulled from holes or depressions.
- 17.4.2 Next, allow the surface to dry thoroughly, then rub it vigorously with dry burlap to completely remove any dried grout. There shall be no visible fill or grout remaining after this rubbing. The entire cleaning operation for any areas must be completed the day it is started. No grout shall be left on the wall overnight. After the surfaces to be treated have been grout clean, if any slightly dark spots or streaks remain, they shall be wiped off lightly with a fine abrasive hone without using water, but the rubbing with the hone shall not be sufficient to change the texture of the concrete.
18. **GROUT:**
Furnish U.S. Grout Corporations' pre-mixed, five star, non-shrink, non-metallic grout or Euo N.S. grout for setting column bases and beam bearing. Grout shall be used in strict accordance with the manufacturer's printed instructions.
19. **JOINTS IN CONCRETE:**
- 19.1 **Expansion Joints:** Provide expansion joints where so indicated on the drawings. Expansion joints shall be continuous of width to extend full thickness of the concrete on plans. In no case shall the reinforcement, corner protection angles, or other fixed metal items embedded in or bonded into concrete, be run continuous through an expansion joint.
- 19.2 Concrete walks and ramps shall have expansion joints across the width of the walk or ramp, spaced where indicated on the drawings, but shall not exceed 30' o.c.

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- 19.3 All concrete slabs on fill that are not made an integral part of the concrete vertical surface they intersect, such as walls, columns, etc., shall be provided with continuous expansion strips at the intersection.
- 19.4 Construction Joints:
The unit of operation shall not exceed 80 feet in any horizontal direction unless otherwise approved by the Architect, concrete shall be placed continuously so that the unit will be monolithic in construction. At least 48 hours shall elapse between casting the adjoining units unless this requirement is waived by the Architect. Construction joints, if required, shall be located near the midpoint of spans for slabs, seams, or girders unless a beam intersects a girder at its center in which case the joints in the girder shall be offset a distance equal to twice the width of the beam and provision for shear shall be made by use of inclined reinforcement. Vertical joints in wall footings shall be reduced to a minimum. Except where indicated on drawings, no jointing shall be made in footings or foundation work without specific approval of the Architect. Placement of concrete shall be at such rate that surfaces of concrete not carried to joint levels will not have attained initial set before additional concrete is place thereto.
- 19.5 Control Joints:
Shall be as detailed on the drawings and accurately located to comply with design requirements. Extreme care shall be taken to assure that the break point of reinforcing bars designated to be cut or stopped at control joints coincides exactly with the center line of the joint as shown on the Drawings.
20. **SIDEWALKS:**
The sidewalks shall be provided and installed by the General Contractor. The line of work starts at the back of curb, when abutting the Paving Contractors work.
- 20.1 Furnish and install a two (2) inch minimum thickness leveling sand fill for all sidewalks and provide continuous joints adjacent to the building. Expansion joints shall be installed the full width of the walks at approximately thirty (30) foot intervals.
- 20.2 Sidewalks shall be at least four (4) inches thick (unless noted otherwise) and graded to an even slope to building entrances. Finish as per detail on the Drawings.
- 20.3 All sidewalks shall have reinforcing of 6" x 6", W1.4 welded wire fabric. All reinforcing shall terminate at expansion joints.
- 20.4 Finish is to be monolithic with cork or wood floats to provide a reasonable non-slip surface and the surface shall be marked off with tooled joints in approximately five (5) foot squares with a finish to be similar to details of the Plans.
21. **DRAWINGS:**
- 21.1 The drawings and schedules show the typical arrangement of reinforcement.
- 21.2 Before proceeding with the work, the Contractor shall submit complete drawings and working details for approval.
- 21.3 Bar list, bonding diagrams and erection diagrams of the reinforcement steel shall be prepared by a licensed engineer. The Engineer whose name appears of the structural drawings is recommended by the Architect.

22. **AIR CONTENT:**

All concrete subjected to freezing and thawing after curing and or required to be watertight shall be air entrained. Total air content as determined in accordance with ASTM C173 shall be:

22.1 5 plus/minus (1) percent for coarse aggregate size No. 467 (1-1/2" max.)

22.2 6 plus or minus (1) percent for coarse aggregate size No. 57 (1" max.) or No. 67 (3/4" max.)

22.3 All interior slabs to receive a surface hardener or subject to abrasion shall have a maximum total air content of three percent.

End of Section 03300

SECTION 04100

MORTARS

1. **GENERAL:**
All work included under this heading shall be subject to the General Conditions of the entire operation. The Contractor for this portion of the work is required to refer especially thereto.
2. **WORK INCLUDED:**
This Contractor shall furnish all labor and materials to complete all masonry mortar work as required by the drawings and/or herein specified.
3. **USES OF MORTAR:**
Type "S" Portland -Cement -lime mortar, as herein specified, shall be used for exterior and interior masonry units of all exterior and interior walls. (ASTM C-270 or BIA M1-72.) Type "M" shall be used for masonry below grade and in contact with the Earth.
4. **MATERIALS:**
 - 4.1 **Cementitious Materials:**
Shall conform to the appropriate ASTM Standard Specifications, amended to date for the materials as follows:
 - A. Masonry cement shall be Lehigh Masonry Cement from their plant at Iola, Kansas, or Ash Grove Masonry Cement from their plant at Chanute, Kansas or Atlas Masonry Cement from their plant at Independence, Kansas.
 - B. This masonry cement shall be an interground mixture of Portland Cement Clinker and Limestone and shall meet the requirements of the ASTM Specifications C91-53, type 11. Expansion shall not be greater than 1% when tested in accordance with ASTM Specifications C0154-49, except that the test bars shall remain in molds for 48 hours prior to test.
 - C. This Contractor will be allowed the option of using hydrated lime (High Calcium, type S) or quick lime.
 - D. Quicklime: Standard Specifications for Quick Lime for Structural purposes. (ASTM C-5-26).
 - E. Hydrated Lime: Tentative Specifications for Hydrated Lime for Masonry purposes (ASTM20).
 - 4.2 **Aggregates:** Standard Specifications for Aggregate for Masonry Mortar (ASTM C-144).
 - 4.3 **Water:** Water shall be clean and free of deleterious amounts of acids, alkalies or organic materials.
 - 4.4 **Admixtures:** Admixtures not mentioned in these specifications shall not be used in mortar without the approval of the Architect.
 - 4.5 **Anti-Freeze Compounds:** No Anti-Freeze liquid, salts or other substances shall be used in the mortar to lower the freezing point.

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- 4.6 Water Repellant: EUCO INTEGRAL WATERPELLER as manufactured by Euclid Chemical Co., 19218 Redwood Road, Cleveland, Ohio 800-321-7628 or an approved equal shall be included in the mortar for all masonry walls exposed to the weather. Water repellant shall be added to the mix (quantities and methods) in accordance with the manufacturer's recommendations.
- 4.7 Storage of Materials: Cementitious materials and aggregates shall be stored in such a manner as to prevent deterioration and intrusion of foreign matter. Any material having become unsuitable for good construction shall not be used.
5. **MEASURING AND MIXING:**
- 5.1 Measurement of Materials: Method of measuring materials for the mortar shall be such that the specified proportions of the mortar materials can be controlled and accurately maintained during the entire progress of the work. Mortar mixer sized to accommodate full bags of Portland cement and lime. Mixing mortar shall be in complete accord with BIA technical notes 8B.
- 5.2 Mixing Mortar: Cementitious materials and aggregate shall be mixed with the maximum amount of water consistent with satisfactory workability for a minimum period of 3 minutes in a drum type batch mixer.
- 5.3 Mixing Grout: Grout shall consist of mortar meeting the applicable specification requirements to which sufficient additional water is added to cause the mixture to flow readily.
- 5.4 Minimum Aggregate Ratio: The damp loose volume of aggregate in mortar shall be not less than 2-1/4 time nor more than 3-1/2 time the total separate volumes of cementitious materials used.
6. **MORTAR PROPORTIONS:**
Type "S" and "M" Mortar mix shall be designed in accordance with ASTM C-270 thru a testing laboratory.

End of Section 04100

SECTION 04200

MASONRY

1. **GENERAL:**

- 1.1 All work included under this heading shall be subject to the General Conditions of the entire operation. The Contractor for this portion of the work is required to refer especially thereto.
- 1.2 This Contractor will be held responsible for obtaining a waterproof wall with all mortar joints filled with a full joint of mortar. The masonry foreman shall supervise carefully the work continuously; any work not complying with these specifications shall be torn down and replaced with proper workmanship.

2. **WORK INCLUDED:**

This Contractor shall furnish all labor and materials to complete all masonry work as required by the drawings and/or herein specified, as follows:

- 2.1 All concrete block/masonry work indicated on the drawings.
- 2.2 All brick work indicated on the drawings.
- 2.3 All required anchors and ties.

3. **DELIVERY, STORAGE & HANDLING:**

- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, containment's, corrosion, and other causes. If units become wet, do not install until they are in air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

4. **MATERIALS:**

4.1 **Masonry ties**

- A. Veneer Anchors:
 - 1. Masonry wall reinforcement where gypsum wall board back up walls are noted on the plans shall be equal to Dur-O-Wall Masonry veneers anchors, D/A 213 hot dipped galvanized (4 Ga.) reinforced plate with 3/16" ties screwed to studs with 3/16" ties screwed to studs with (2) 300 series stainless screws (DA 995). Lengths as required to meet manufacturer's standards.
 - 2. Wall ties to be spaced at 16" o/c. vertically and 2'-0" o/c. horizontally.
- B. Control and Expansion Joints:
As shown on the drawings. Care should be used to keep these joints free and open. Install water stops.

4.2 **Concrete Masonry UNITS.**

Block-Lightweight Concrete Masonry units shall conform to the current ASTM C-90 for hollow load bearing grade "A" units. Block shall be Standard Haydite weighing not more than thirty (30) pounds per unit. All block shall be produced by either the high pressure Autoclave curing system or "lo-Shrink" method to produce material acceptable to the Corps of Engineers

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Group II standards. Blocks shall be kept dry from point of manufacture until the units have been laid in the walls. Size and locations as shown on the Drawings.

- A. Interior units with exposed outside corners (not covered with a finish material) shall be radiused.
- B. Units scored to look like 8" x 8" units shall be used in the interior spaces where CMU is the finished material.

4.3 **Face Brick**

- A. Face brick shall be modular, rug texture, blonde to match existing installed in running bond pattern.
- B. Brick shall be approved by the Owner and Architect before an order is placed. All brick shall be free of chips and cracks and in accordance with the specifications. Face brick shall conform to the Standard Specifications for Facing Brick (solid masonry units made from clay or shale). ASTM Designation C216-50, ASA No. A99.1-2008.

5. **INSTALLATION AND WORKMANSHIP:**

5.1 **General.**

- A. No masonry shall be erected when the ambient temperature is below 32 degrees F. on a rising temperature or below 40 degrees F. on a falling temperature or when there is a probability of such conditions existing within 48 hours, unless special provisions are made for heating the materials and protecting the work. Such provisions shall be approved by the Architect. Masonry work which has frozen before the mortar has set to the satisfaction of the Architect shall be removed and replaced.
- B. Face brick shall be laid running bond with special shapes and decorative coursing as shown and shall be tied to back-up with wall reinforcement. Thoroughly fill head and bed joints of face brick.
- C. Slush with mortar thoroughly around all windows and doors frames and all other built-in parts. Point with mortar around all windows and window sills, making this perfectly weathertight. Walls shall be built perfectly true, plumb and straight so as to work in courses to correspond with heights of all openings as indicated on the drawings. Where reinforced concrete floors or slabs extend into walls, brick work shall be built above such floors or slabs only after the concrete work has been poured. Masonry shall not serve as vertical concrete forms. Pour concrete first and then build masonry.
- D. The built surfaces of all walls and piers shall be protected with boards at all times when work is not in progress and shall also be covered with canvas during stormy or damp weather or cold weather and in case of delay. Also properly protect with boards, exposed corners and angles of face and other brick work during construction.
- E. Brick shall be laid so that three bricks plus three joints equal (8") vertically and one brick plus one joint equal (8") horizontally. If the latter does not produce head joints approximately 3/8" wide and appear similar, consult with the Architect for possible adjustments.
- F. Build control joints where shown and as detailed. All such joints shall be completely free of mortar.
- G. No brick or other units having a film of water or frost on their surface shall be laid in the walls. All masonry shall be laid plumb, true to line, with level and accurately

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spaced courses, and reveals, with corners plumb and true, and with each course breaking joint with the course below. Bond shall be kept plumb throughout.

- H. Work required to be built in with the masonry, including anchors, wall plugs, and accessories, shall be built in as the erection progresses. Unless otherwise shown on the drawings or specified the space around built-in items shall be filled solidly with masonry. Chases and reglets shall be kept clean and free from mortar or other debris.
- I. Masonry units shall be culled so that only perfect faces of the units shall be expressed.
- J. Face Brick - outside corners of soldier course at wall coping shall be/use a stack bond to turn corners to ensure quality of structure and appearance. Refer to detail 19 on sheet A3.9

6. **WALL HEIGHTS:**

This Contractor shall build-up masonry walls to the elevations indicated.

7. **WETTING BRICK:**

- 7.1 Brick with initial rate of absorption (suction) more than 30g/30sq. inches per minute when tested per ASTM C 67 be wetted and permitted to surface dry prior to laying. Reference BIA Technical Notes on brick construction 7B, revised. Allow units to absorb the water so they are damp but not wet at the time of laying.
- 7.2 Wetting of the brick and the water content of the mortar shall be such to form a perfect bond without shrinkage cracks.

8. **MORTAR JOINTS:**

All mortar joints shall be completely filled especially the head joints. Special care shall be taken to ensure head joints are filled completely. Cavities and expansion joints shall be kept clean and free of mortar and/or mortar drippings.

9. **TOOLING OF MORTAR JOINTS:**

The tool shall be slightly larger than the masonry joint and shall be of concave profile struck to a weather tight joint.

- 9.1 Exposed joints inside and outside of the building shall be ironed smooth and concave. Tools for striking joints shall be not less than 3/4" in diameter. Use extreme care to not have wide head and bed joints. If necessary to avoid wide head joints, brick shall be cut. Any face brick cutting which is required must be done with a power saw.
- 9.2 Burnished to Concrete Block
The horizontal joint at the transition between the two materials shall be a rack joint, 3/8" deep, and caulked.

10. **CLEANING:**

- 10.1 When masonry work is complete, proceed with cleaning and caulking. Remove excess mortar and stains using scrapers and brushes.
- 10.2 After walls have been completed and allowed to dry out a minimum of twenty-eight (28) days, clean exterior and interior brick surfaces with "Sure Klean" cleaning agent, as manufactured by Process Solvent Co., Inc.
- 10.3 Product to be determined by consulting cleaner manufacturer and the brick manufacturer.

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- 10.4 Before cleaning agent is applied, thoroughly wet wall down with clear water.
 - 10.5 Apply solution over no area greater than twenty (20) square feet, clean with a stiff fiber brush, then hose down with clean water immediately after cleaning, removing all traces of cleaning agent.
 - 10.6 Protect all trim, windows or concrete against contact with the solution.
11. **POINTING:**
This contractor shall examine all exterior and interior masonry joints carefully, especially head joints, rake out all defective joints to a minimum depth of 3/4" removing all loose mortar, specified under Section 4100 - Mortar, of these specifications. Re-clean areas to remove excess mortar and streaks.

End of Section 04200