SPECIFICATIONS
FOR
HORSE BARN
DAIRY-CATTLE BARN
BEEF-CATTLE BARN
TO BE ERECTED AT
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO

Prepared by
JOSEPH N. BRADFORD, University Architect
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THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO

Prepared by
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Examined by
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Board of Trustees.

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Director of Highways and Public Works.

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SPECIFICATIONS
Prepared, February, 1922

Specifications of labor and materials required in the erection and completion of a Horse Barn, Dairy-cattle Barn, Beef-cattle Barn, for The Ohio State University, Columbus, Ohio, in accordance with these specifications and accompanying drawings and under the supervision of Joseph N. Bradford, University Architect.

General Instructions to Contractors

Bidders are requested to read this entire specification to inform themselves as to the work to be done and materials to be furnished by contractors for other branches than their own.

Art. 1. Bids:

Bids will be received for the entire work and upon the separate branches of the work as set forth in these specifications and shown on accompanying drawings.

The different kinds of work for which bids are called for are as follows:

HORSE BARN
General Contract
1. Excavation, Grading and Fill, and cinder floor.
2. Concrete Work.
3. Cement Floors.
5. Clay Floors.
7. Plastering.
8. Carpenterwork and Builders' Hardware, Stable Fixtures, Tracks, Etc.
11. Concrete Gutters, Curbs, and Water Troughs.
Electrical Contract
11. Electrical Work.

Water Supply and Drainage Contract
Alternate "A": To construct reinforced concrete mow floor instead of frame floor, brick walls extending to top of floor with rolled-steel angle lintels over windows after Section shown on sheet No. 6.
Alternate "B": Lightning Rods—furnish and install.
Alternate "C": Omit Stallion Pavilion.
Alternate "D": Omit Colt Pavilion.

DAIRY-CATTLE BARN

General Contract
1. Excavation, Grading and Fill, and clay floors.
2. Concrete Work.
3. Cement Floors.
5. Brickwork.
6. Plastering.
7. Carpenterwork, Builders' Hardware, Stable Fixtures, Lally Columns, Tracks, Etc.
8. Painting and Glazing.
10. Silos.
11. Concrete Gutters, Mangers, and Curbs.

Electrical Contract
10. Electrical Work.

Plumbing and Drainage Contract
11. Plumbing, Drainage, and Sewer.
Alternate "A": To construct reinforced concrete mow floor instead of frame floor, brick walls extending to top of floor with rolled-steel angle lintels over windows after Section shown on Sheet No. 9.
Alternate "B": Lightning Rods—furnish and install.

BEEF-CATTLE BARN

General Contract
1. Excavation, Grading and Fill, and cinder floor.
2. Concrete Work.
3. Cement Floors.
5. Plastering.
6. Carpenterwork, Builders' Hardware, Lally Columns, Stable Fixtures, Tracks, Etc.
7. Painting and Glazing.

Electrical Contract
8. Electrical Work.

Plumbing and Drainage Contract
Alternate "A": To construct reinforced concrete mow floor instead of frame floor, brick walls extending to top of floor with rolled-steel angle lintels over windows after Section shown on Sheet No. 9.
Alternate "B": Lightning Rods—furnish and install.
Alternate "C": Silos—Type "a" Silos each.
   Type "b" Silos each.
   Type "c" Silos each.
   Type "d" Silos each.
   Type "e" Silos each.
   Type "f" Silos each.
Alternate "D": Omit open covered run (a leanto on
   south side of main barn).
Alternate "E": Omit open pens north side and east
   side of open yard north of main barn.
Alternate "F": For King or James Ventilation System
   in place of that shown.

Bids must be made upon blank forms, furnished by the
Architect, in strict accordance with the building laws of
Ohio, accompanied by a surety bond, as stated below, from
a company authorized to do business in Ohio, as a guar-
antee that if the bid is accepted, a contract will be entered
into and the work faithfully performed by the bidder.

Bids must be enclosed in sealed envelopes, endorsed
with the name of the bidder, and marked, "Proposal for
Horse Barn," "Proposal for Dairy-cattle Barn," "Pro-
posal for Beef-cattle Barn," and addressed to the Secre-
tary of the Board of Trustees, C. E. Steeb, and left at his
office on or before the time named in the advertisement,
12 o'clock, March 27, 1922.

Art. 2. Bond:

The usual bond, as provided for in statute, with good
and sufficient sureties, will be required, with an addition-
al obligation for the payment by the Contractor, and by all
subcontractors, for all labor performed or materials fur-
nished in the construction of the building.

Such bond shall be executed by such Contractor, with
such sureties as shall be approved by the Board of Trus-
tees, in an amount equal to the contract price, and con-
ditioned for the payment by the Contractor and by all
subcontractors, of all indebtedness which may accrue
to any person, firm, or corporation, on account of

any labor performed or materials furnished in the con-
struction of the building. Such bond shall be deposited
with the Board of Trustees, for the use of any party
interested therein.

The bond provided for shall be conditioned that, if his
proposal is accepted, the bidder will within ten days after
the awarding of such contract, enter into a proper contract
in accordance with the proposal, plans, details, specifica-
tions and bills of material and that he will faithfully per-
form each and every condition of the same. Such bond
shall also indemnify the State against the damage that may
be suffered by failure to perform such contract according
to the provisions thereof, and in accordance with the plans,
details, specifications and bills of material therefor.
Such bond shall also be conditioned for the pay-
ment of all material and labor furnished for or used
in the construction for which contract is made. The
bond may be enforced against the person, persons, or
company executing such bond, by any claimant for labor
or material and suit may be brought on such bond in the
name of the State of Ohio on relation of the claimant,
within one year from the date of delivering or furnishing
such labor or material, in the court of common pleas of
Franklin County, and such bonds or sureties thereon shall
not be released by the execution of any additional security,
notes, retentions from estimates or other instrument on
account of such claim, or for any other reason whatsoever,
except the full payment of such claim for labor or mate-
rial.

No contract shall be entered into until the Department
of Industrial Relations of Ohio has certified that the cor-
poration, partnership, or person so awarded the contract
has complied with each and every condition of the act of
February 26, 1913, and of all acts amendatory and supple-
mentary thereto, known as the workmen's compensation
law, and until, if the bidder so awarded the contract is a
foreign corporation, the secretary of state has certified
that such corporation is authorized to do business in this
state, and until, if the bidder so awarded the contract is a
person or partnership non-resident of this state, such per-
son or partnership has filed with the secretary of state a
power of attorney designating the secretary of state as his agent for the purpose of accepting service of summons in any action brought under the provisions of section 2816 of the General Code or under the provisions of the workmen's compensation law; and until the contract and bond shall be submitted to the attorney-general and his approval certified thereon.

Art. 3. Lowest Bidder:
If in the opinion of such Owner, the acceptance of the lowest bid or bids is not for the best interests of the State, with the written consent of the state authorities, they may accept, in their discretion, another proposal so opened or reject all proposals, and advertise for other bids, such advertisement to be for such time, in such form and in such newspapers as may be directed by the state building commission. All contracts shall provide that the Board of Trustees may make any change in work or materials on the conditions and in the manner hereinafter provided.

Art. 4. Alteration, Revisions, or Changes:
The Owner, without invalidating the contract, may make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract, except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.
No change shall be made unless in pursuance of a written order from the Owner signed or countersigned by the Architect and no claim for an addition to the contract sum shall be valid unless so ordered.
The value of any such change shall be determined in one or more of the following ways:
(a) By estimate and acceptance in a lump sum.
(b) By unit prices named in the contract or subsequently agreed upon.
(c) By cost and percentage or by cost and fixed fee.
(d) If none of the above methods are agreed upon, the Contractor, provided he receive an order in writing signed by the Owner and countersigned by the Architect, shall proceed with the work, no appeal to arbitration being allowed from such order to proceed.
In cases (c) and (d), the Contractor shall keep and present in such form as the Architect may direct, a correct amount of the net cost of labor and materials, together with the vouchers. In any case the Architect shall certify to the amount, including a reasonable profit, due to the Contractor. Pending final determination of value, payment on account of changes shall be made on the Architect's certificate.

Art. 5. Time of Completion:
Each bidder must state in his proposal the time within which he will complete the work bid upon, and this will be considered in the award of the contracts. Work to begin immediately upon the signing of the contracts, and pushed forward with the utmost vigor during suitable weather, to the end that the entire structure shall be completed on or before the time named in the contract.

Art. 6. Time Schedule:
At the commencement of construction, each contractor and subcontractor, shall, with the Superintendent, prepare a time schedule to govern the progress of the work.

Art 7. Forfeiture:
A forfeiture clause, as required by law, will be inserted in the formal contract and for each day that the contractor shall delay either his own work or the work of any other contractor, the Trustees will reserve from his estimate, as ascertained and liquidated damages, the sum of fifteen dollars ($15.00).

Art. 8. Parties in Interest:
No member of the Legislature, and no officer, superintendent, inspector, clerk, employe, or other person in any manner connected with the offices of the State, shall be interested, either directly or indirectly, in the contract or work herein provided for, or be entitled to any benefit de-
rived therefrom, and any violation of this understanding shall work a forfeiture of all moneys which may become due to the successful bidder.

Art. 9. Local Laws:

The attention of bidders is called to all acts limiting the hours of daily service of laborers and mechanics employed upon public work in the State of Ohio, and to other local regulations with which he must comply.

Art. 10 Separate Contracts:

The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their material and the execution of their work and shall properly connect and coordinate his work with theirs.

If any part of the Contractor's work depends for proper execution or result upon the work of any other contractor, the Contractor shall inspect and promptly report to the Architect any defects in such work that render it unsuitable for such proper execution and results. His failure so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other contractor's work after the execution of his work.

To insure the proper execution of his subsequent work the Contractor shall measure work already in place and shall at once report to the Architect any discrepancy between the executed work and the drawings.

Art. 11. Assignment:

Neither party to the contract shall assign the contract without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner.

Art. 12. Subcontractors:

The Contractor shall notify the Architect in writing of the names of subcontractors proposed for the principal parts of the work and for such others as the Architect may direct and shall not employ any that the Architect may within a reasonable time object to as incompetent or unfit.

The Contractor shall, if so required, submit with his proposal, a list of subcontractors. If the change of any name on such list is required or permitted after signature or agreement, the contract price shall be increased or diminished by the difference between the two bids.

The Architect shall, on request, furnish to any subcontractor, wherever practicable, evidence of the amounts certified to on his account.

The Contractor agrees to be fully responsible to the Owner for the acts or omissions of his subcontractors and of anyone employed either directly or indirectly by him or them and this contractual obligation shall be in addition to the liability imposed by law upon the Contractor for bodily injuries or death through negligence.

Art. 13. Relations of Contractor and Subcontractor:

Each Subcontractor shall report to Superintendent before commencing work and when resuming work after an absence from the job. The Contractor agrees to bind every Subcontractor and every Subcontractor agrees to be bound, by the terms of the General Conditions, Drawings and Specifications, as far as applicable to his work, including the following provisions of this Article, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the Owner or Architect.

The Subcontractor agrees—

(a) To be bound to the Contractor by the terms of the General Conditions, Drawings and Specifications and to assume toward him all the obligations and responsibilities that he, by those documents, assumes toward the Owner.

(b) To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment.

(c) To make all claims for extras, for extensions of time and for damages for delays or otherwise, to the Contractor in the manner provided in the General Conditions.
for like claims by the Contractor upon the Owner, except that the time for making claims for extra cost is one week.

The Contractor agrees—

(d) To be bound to the Subcontractor by all obligations that the Owner assumes to the Contractor under the General Conditions, Drawings and Specifications and by all the provisions thereof affording remedies and redress to the Contractor from the Owner.

(e) To pay the Subcontractor, upon the issuance of certificates, if issued under the schedule of values described in General Conditions, the amount allowed to the Contractor on account of the Subcontractor's work to the extent of the Subcontractor's interest therein.

Materials delivered on the grounds and accepted by the Architect or Superintendent, shall upon such acceptance, become the property of the Owners, and in no case shall materials upon which estimates have been based and payment made be removed from the University grounds. No payment will be made until every part of the work to the point of advancement reached, for which payment is claimed, is satisfactorily supplied and executed in every particular and all defects remedied to the satisfaction of the Architect.

Art. 14. Liens:

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that the releases and receipts include all the labor and material for which a lien might be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any claim by lien or otherwise. If any lien or claim remain unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien or claim, including all costs and a reasonable attorney's fee.

Art. 15. Insurance:

The contractor must obtain at his expense, all necessary policies of insurance on work and material supplied by him, as the same will be at his risk until final completion, inspection and acceptance, but the contractor will be relieved of any risk for that portion of the building occupied by the Owners before entire completion of the contract.

Art. 16. Liability Protection:

The Contractor shall protect the trustees against all claims of any person an account of patent rights connected with any materials, fixtures or articles entering into the construction or used in the completion of the building.

The Contractor shall be responsible for all violations of law. He shall give all requisite notice to public officers, secure and pay for all necessary permits, pay the necessary legal fees and charges to public officers and comply with the laws of the State. He shall insure his workmen and shall hold the Trustees and Architect blameless of all damage to life or limb, incurred during, or as a result, of, the execution of his work under these specifications.

Art. 17. Names:

The word "Owners," as used herein, refers to the Ohio State University, represented by its Board of Trustees. The word "Architect," as used herein, refers to J. N. Bradford, who is the Owner's agent. The word "Superintendent" refers to the authorized representative of the Architect and Owners, who is the superintendent of construction and who will be in charge of the construction of the building.

Art. 18. Delays:

Should the contractor at any time refuse or neglect to supply a sufficiency of properly skilled workmen, or materials of the proper quality, or fail in any respect to prosecute the work with promptness and diligence, or fail in the performance of any of the agreements herein con-
tained, the Trustees shall be at liberty, after five days' written notice to the contractor, to provide any such labor or material, and to deduct the cost thereof from any money then due, or thereafter to become due, the contractor under this contract, and if the Architect shall certify that such refusal, neglect or failure is sufficient grounds for such action, the Trustees shall be at liberty to terminate the employment of the contractor for said work, and to enter upon the premises and take possession for the purpose of completing the work comprehended under this contract, of all tools, materials and appliances thereon, and to employ any other person or persons to finish the work and to provide the material therefor.

In case of such discontinuance of the employment of the contractor, he shall not be entitled to receive any further payment under this contract until the said work shall be wholly completed, at which time if the unpaid balance of the amount to be paid under this contract shall exceed the expense incurred by the Trustees in finishing the work, such excess shall be paid to the contractor by the Trustees, but if such expense incurred by the Trustees shall exceed the unpaid balance, the contractor shall pay the difference to the Trustees.

The expense incurred by the Trustees, as herein provided, either for furnishing materials or for finishing the work and any damage incurred through such default, shall be audited and certified by the Architect, whose certificate hereof shall be conclusive and binding upon the parties.

The Architect, acting for the Owners, reserves the right to suspend any portion of the work embraced in this contract whenever, in his opinion, it would be inexpedient to carry on said work.

Art. 19. Owner's Right to Do Work:

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this contract, the Owner, after five days' written notice to the Contractor, may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor; provided, however, that the Architect shall approve both such action and the amount charged to the Contractor:

Art. 20. Owner's Right to Terminate Contract:

If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should, except in cases recited under "Delays," persistently or repeatedly refuse or fail to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to Subcontractors or for materials or labor, or persistently disregard laws, ordinances or the instructions of the Architect, or otherwise be guilty of a substantial violation of any provision of the contract, then the Owner, upon the certificate of the Architect that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor seven days' written notice, terminate the employment of the Contractor and take possession of the premises and all materials, tools and appliances thereon and finish the work by whatever method he may deem expedient. In such cases the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expense of finishing the work, including compensation to the Architect for his additional services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Architect.

Art. 21. Contractor's Right to Stop Work or Terminate Contract:

If the work should be stopped under an order of any court, for a period of three months, through no act or fault of the Contractor or of any one employed by him, or if the Owner should fail to pay to the Contractor, within seven days of its maturity and presentation, any sum
material fulfilling the same purpose, but in all cases the material must be acceptable to the Architect.

Art. 25. Drawings:
The drawings which accompany these specifications and upon which the contract will be based are as follows:

Horse Barn:
1. Site Plan.
2. Footing, Foundation, and Drainage Plan.
5. South and North Elevation.
7. Side Framing. Details.
8. Section of Stallion Pavilion, Details.
   Ventilation Detail Sheet.

Dairy-cattle Barn:
1. Site Plan.
2. Footing and Foundation Plan. Details.
7. West Elevation.
8. North and South Elevation.
   Ventilation Detail Sheet.

Beef-cattle Barn:
1. Site Plan.
2. Footing, Foundation, and Drainage Plan.
5. East Elevation. Details.
6. West Elevation. Details.
8. South Elevation. Details.
9. Transverse Section.
10. Longitudinal Section.
    Ventilation Detail Sheet.

Art. 24. Similar or Equal:
The above terms refer to one kind of material to be the equal of another. For example, the trademark name mentioned does not limit the bidder to that one particular make of material. The term "or equal" refers to a similar

Art. 22. Mutual Responsibility of Contractors:
Should the Contractor cause damage to any other person employed in the work, the Contractor agrees, upon due notice, to settle with such person by agreement or arbitration, if such person will so settle. If such person sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor, who shall, at his expense, defend such proceedings and, if any judgment against the Owner arise therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Owner.

The Contractor, if damaged by any person held to the Owner by stipulations such as the above, agrees to settle with such person by agreement or arbitration and in no case to sue the Owner on account of such damage.

Art. 23. Guarantee:
This specification requires that certain work be guaranteed and maintained in good condition for a specified time after its final acceptance and payment therefor, and the bond which will be required in connection with this contract must also cover such guarantee.

All work not especially guaranteed, but installed by the contractor, must be kept in perfect condition for a period of one (1) year after acceptance of the building, except such defects as may be due to the occupants of the building, or due to the defective work by contractors not included in the scope of this specification.

Art. 24. Similar or Equal:
The above terms refer to one kind of material to be the equal of another. For example, the trademark name mentioned does not limit the bidder to that one particular make of material. The term "or equal" refers to a similar

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All notes on the drawings are a part of the specifications.

Large scale and full sized drawings shall be followed in preference to small scale drawings.

Figured dimensions shall be followed in preference to scale measurements. All drawings, together with the figured dimensions and written explanations, shall cooperate with the specifications.

Anything shown on the drawings, which is not mentioned in the specifications, or vice versa, or anything not expressly set forth in either, but which is reasonably implied, shall be supplied by the contractor the same as if especially shown or mentioned in both.

Any doubts which may arise regarding the intent or purpose of the drawings and specifications, or any discrepancies between them shall be referred to the Architect who shall decide the question and his decision shall be binding unto both parties to the contract.

Art. 26. Detail Drawings and Instructions:
The Architect shall furnish, with reasonable promptness, additional instructions, by means of drawings or otherwise, necessary for the proper execution of the work. All such drawings and instructions shall be consistent with the contract, documents, true developments thereof, and reasonably inferable therefrom. The work shall be executed in conformity therewith and the Contractor shall do no work without proper drawings and instructions.

The Contractor and the Architect, if either so requests, shall jointly prepare a schedule, subject to change from time to time in accordance with the progress of the work, fixing the latest dates at which the various detail drawings will be required, and the Architect shall furnish them in accordance with the schedule. Under like conditions, a schedule shall be prepared, fixing dates for the submission of shop drawings, for the beginning of manufacture and installation of materials and for the completion of the various parts of the work.

Art. 27. Copies Furnished:

Unless otherwise provided in the contract documents the Architect will furnish to the Contractor free of charge, all copies of drawings and specifications reasonably necessary for the execution of the work.

Art. 28. Ownership of Drawings:

All drawings, specifications and copies thereof furnished by the Architect are the property of The Ohio State University. They are not to be used on other work and, with the exception of the signed contract set, are to be returned to the University Architect on request, at the completion of the work.

Art. 29. Drawings and Specifications on the Work:
The Contractor shall keep one copy of all drawings and specifications on the work, in good order, available to the Architect and to his representative.

Art. 30. Shop Drawings:

Shop drawings, course plans, etc., as hereinafter required, must be furnished the Architect for approval, and all work furnished must be in strict accordance with such drawings when approved. The approval of shop drawings shall be general in character only, and does not mean said drawings have been checked, and shall in no way relieve the contractor from the responsibility for proper fitting and construction of the work nor from the necessity of furnishing materials or workmanship required by the drawings and specifications which may not be indicated on shop drawings when approved.

All shop drawings must be checked and completed in every respect, numbered consecutively, have the name of the building printed thereon, and each lot submitted must be accompanied by a letter of transmission referring to the numbers and names of buildings for identification.

Art. 31. Demurrer:

Should there be any discrepancy between the drawings and specifications, between the working drawings and the detail drawings, or between the scale drawings and the
figured dimensions on same, the latter in each case shall be followed. If the contractor considers any requirement of the detail drawings to be in excess of the requirement of the contract, he must at once serve the Architect with written demurrer thereto. Failure to make such demurrer within ten (10) days after the receipt of such detail drawing shall and will be held to constitute an acceptance of the same.

Art. 32. Claims for Extras:

If the Contractor claims that any instructions, by drawings or otherwise involve extra cost under this contract, he shall give the Architect written notice thereof before proceeding to execute the work and, in any event, within two weeks of receiving such instructions, and the procedure shall then be as provided. No such claim shall be valid unless so made.

Art. 33. Workmanship:

All work shall be done in the best and most skillful manner, exactly as specified or detailed, and if not mentioned or detailed, as the Architect may direct. In all cases the work shall be done to the entire satisfaction of the Architect and Superintendent in full harmony with the drawings and specifications.

Should the work be let in separate parts, each contractor shall work in harmony with and render such assistance to other contractors engaged upon the building as the best interests of the structure will require.

The contractor shall keep a competent foreman or superintendent, satisfactory to the Architect, on the ground at all times during the progress of the work, to receive instructions and with authority to act for the contractor.

Each contractor shall do all cutting and fitting in his work that may be required by other contractors in making their work come right, or as the Architect may direct, and shall make it good after them. Should any such cutting be required through pure neglect of the other contractors, the same must be approved by the Architect before the work is executed, who shall name the price and decide by whom the extra expense is to be paid, and in case the contractor does not secure such decision, the expense must be borne by himself.

Each contractor must obtain all necessary measurements from the various contractors, in order that his work may fit the other branches of the work. He shall further verify all necessary measurements at the building, in order that his work may fit that already in place.

Proper facilities shall be given the Superintendent for the inspection of all work or materials pertaining to the building, whether at the building site or elsewhere. The Architect or Superintendent shall have authority to order the discharge and removal from the building of any employee of the contractor who shall be found incompetent or in any way detrimental to the best interests of the work, or who is, in their judgment, an unsatisfactory person.

No contractor shall permit smoking or the use of intoxicants on the premises, and fires shall be used only when necessary, and then only with the utmost precautions and in proper vessels, such as grates or stoves.

Each contractor shall be responsible for the proper laying off of his own work and for any damage which may accrue to the work of any other branch by his inaccuracy. The Superintendent will assist, but in no case assume the responsibility of laying off the work.

Art. 34. Materials:

All labor and materials necessary to fully complete the work contemplated by the drawings or these specifications shall be furnished. All materials shall be of the best quality and shall be new unless otherwise specified.

Should it become necessary to substitute material different from that called for, the written consent of the Architect and Trustees must be obtained before the change is made, and the materials used shall be equal in every respect to that called for.

Should at any time improper, imperfect or unsound materials or faulty workmanship be observed, whether before or after the same shall have been wrought into the structure, the contractor shall, upon notice from the Su-
perintendent or Architect, cause the same to be removed and good and proper material or work substituted therefor without delay, in default of which the Trustees, under the direction of the Architect or Superintendent, shall effect the same by such other means as may be deemed best, and the cost of such alteration shall be charged to the contractor and the amount thereof deducted from the sum due to or recoverable from him under his contract.

The contractor shall be fully responsible for the safety and good condition of all work and materials in his contract until the completion of his contract as an entirety.

Art. 35. Rejected Materials:

Material or work that has been rejected must be removed from the premises at once, and should the same not be done, the Superintendent may, forty-eight hours after serving notice on the contractor, have the same removed and the cost of such removal will be deducted from any money due the contractor.

Art. 36. Protection:

All work and material of every description contemplated in these specifications, liable to injury during construction, shall be fully protected from damage from any source, and if at any time during the execution of the work any part is liable to damage from weather, such additional protection, including temporary screens and doors, as the Superintendent may deem advisable, shall be provided without extra expense to the Owners. Trees not required to be removed shall be thoroughly protected from injury. The contractor shall also provide and maintain all necessary guards, lights, etc., for the protection of the public.

The Contractor shall build a temporary wooden enclosure fence 6 ft. high, 40 ft. away from the building on all sides, and maintain all his labor and materials therein until completion of the building.

Art. 37. Damage:

The contractor will be held responsible for, and be required to make good at his own expense, any and all damage done or caused by him or his workmen, in the execution of the contract. He shall also be responsible for any damage which may accrue to the property of any other contractor connected with the work, or to the adjacent property, or to any portion of the structure, which in any way results from the acts or neglect of his employees. He shall also be responsible for any and all damage to his work by reason of the action of the elements until the entire building is completed and accepted including loss by fire.

The Contractor shall also protect his work from damage at all necessary times and as the Superintendent may direct; erect all necessary barriers, furnish and keep lighted the required danger signals at night and shall take every precaution to prevent injury to persons.

Art. 38. Scaffolding:

The contractor must furnish all scaffolding, machinery, transportation, tools, utensils, etc., necessary for the proper carrying out of this contract, and the same must at all times be suitable and safe.

Art. 39. Temporary Heat:

The Contractor must furnish, at his own expense, such temporary heat, including apparatus and fuel, as may be necessary to fully protect his work, both during the execution and until its final acceptance, and at no time shall the temperature be allowed to fall below 40° F. in any portion of the building which has received the first coat of plastering or in which there may be mortar or concrete which has not fully set.

Art. 40. Cleaning Up:

Whenever so directed, and at completion of the work, the contractor must clean up all dirt and rubbish in and around the building and remove same from premises and the adjacent roadways.

Art. 41. Samples:

The Contractor shall furnish the Architect samples of material for approval free of cost to the Architect or
Art. 42. Temporary Privy:
The Contractor must provide a suitable temporary privy, with galvanized iron soil box for the use of his workmen, to be placed where directed, maintained in a sanitary condition and on installation of a temporary W. C. removed and the premises left clean. As soon as connection can be made, a temporary water closet, with temporary connections to sewer is to be provided.

Art. 43. Surveys and Levels:
The Contractor must employ and pay for the services of a competent engineer, to lay out the lines of the building, test the elevation of the trenches for footings, the floors, the cornice, and the lines and various elevations when the work has been completed to these points.

Art. 44. Water:
Deep well shown on the Site Plan. Contractor to furnish own pump and own method of distribution of water to mixers and elsewhere needed.

Art. 45. Office:
The Contractor is to furnish a temporary office from the beginning to the completion of the work and to be used for the exclusive use of the Contractor, Owner, and Architect or their representatives. A complete set of drawings and specifications is to be always kept accessible at this office.

Art. 46. Location of Building:
The buildings will be located on the grounds of the Ohio State University, Columbus, Ohio, known as the Lisle Tract, west of the Olentangy River and south of Lane Avenue, as shown on the site plan.
Contours on the site plan, together with the natural grade lines on the elevations will indicate the necessary excavation.

Art. 47. Visit Site:
Bidders are requested to visit the building site to acquaint themselves with the conditions existing and no claim for extras will be allowed on any item for a failure to satisfy this request.
Trucking over the improved roads of the campus will be allowed upon conditions imposed by the Superintendent of Buildings and Grounds.

Art. 48. Roadway to the Site:
This roadway will be built and maintained by the University.

Art. 49. University Railroad:
The University railroad is shown on the site plan. Carloads of material can be set at site on this railroad.

EXCAVATION
(For All Three Barns)

Batter Boards:
The lines of the building shall be fixed by setting batter boards, satisfactory to the Superintendent, in a substantial manner and kept in perfect form until the foundations are constructed. Lines from batter board to batter board shall be wire and not cotton strings.

Removal of the Soil:
The Contractor shall place all the excavated material where directed by the Architect, haul not to exceed 200 feet.

Trenches for footings and holes for piers and columns must be the exact size of the concrete, or if plank forms are necessary, the excavation must be large enough to receive same.

The stable floor shall be roughly graded to finish grade shown on drawings as soon as concrete walls of the foundation are completed. Backfilling around outside walls shall be done as soon as concrete wall of the foundation is
finished. This filling shall be roughly graded as far as excavated materials will do the work. No finished grading with top soil to be included in this contract. All planking shall be removed before filling. Rough grade around the building for a distance of 10 feet. Rough grade within 6 inches of finished grade in all yards connected with the barns.

CONCRETE WORK
(For All Three Barns)

Materials:
The Portland cement used for this work shall be some well-established brand, conforming to the requirements of the specifications adopted by the American Society for Testing Materials. The Architect must be furnished with tests made by some reputable testing laboratory, at the Contractor's expense.

All cement delivered at the building shall be stored in a shed, which will thoroughly protect it from the weather and ground dampness.

All sand shall be clean, coarse, sharp sand, free from deleterious matter.

All crushed stone shall be hard limestone or crushed river gravel, free from dust and dirt, not larger than will pass through a 1/4 inch ring and retained on 1/4 inch mesh.

All material shall be approved by the Architect before being used.

Concrete:
The concrete shall be composed of cement one part, sand two parts, and crushed stone four parts, thoroughly mixed with water in a batch-mixing machine, and deposited as directed by the Superintendent. Where pipes pass through the wall, set iron sleeves 1 inch larger than the pipe. The concrete shall be thoroughly spaded next to the forms to produce a good surface. Concrete shall be placed in horizontal layers.

Concrete shall not be mixed or laid during freezing weather, unless protective precautions, approved by the Architect are used.

All necessary forms must be substantial and unyielding and removed when directed by the Superintendent. All flues and raglans shall be formed in the concrete, as shown on the drawings, or where directed by the Architect.

The price per cubic yard for any extra or deducted concrete shall be stated in the bid.

Reinforcing Concrete: (Applied to alternate proposition).

Steel in tension figure not over 16,000 lbs. per sq. in. Concrete in compression (beams and slabs) not over 700 lbs. per sq. in. Shear in concrete slabs and beams is figured at 50 lbs. per sq. in. Where concrete alone is not sufficient at the above figure, continuous steel stirrups or bent reinforcing bars or both shall be used. Where slabs pass over walls or beams, place in the top, steel or equal area as that used in the bottom of corresponding slabs. This steel to extend a distance equal to 1/3 the span either side of supports. At termination of end spans reinforce top of slabs with steel figured for a moment of WL/16 and 50 Diam. long. All reinforcing rods to have hooks bent to a radius of 4 diameters and return beyond end of half circle a distance not less than 2".

Mow floors to have temperature reinforcement to the amount of 3/10 of 1 percent, running at right angles to main reinforcing and tied at intervals not more than 2 feet with 1/4-inch rods running parallel to main reinforcing.

To be of a form which will develop a high bond resistance and should be placed and be well distributed near the exposed surface of the concrete.

In concrete columns, use not to exceed 550 lbs. per sq. in., compressive stress on concrete, with not less than 1 percent, nor more than 4 percent vertical steel reinforcement, vertical steel to be figured at not to exceed 9750 lbs. per sq. in., to have circular hooping of an amount not less than 1 percent of the volume of the column enclosed. The pitch of such hooping shall not be greater than one-tenth the diameter of the enclosed column and in no case more than 2 1/2 inches. All columns, as shown, have 2-inch concrete outside the hooping and vertical reinforcing. Anything not expressly shown or specified to follow Joint Committee Recommendations latest ruling.
The construction floors shall be Meyer Steel Form Construction or its equal on Horse and Beef-cattle Barn; hollow tile concrete slab for Dairy Barn.

Floor loads figured as follows: Grain bins at 250 lbs. per sq. ft.; mow floors 100 lbs. per sq. ft.

See also structural Terra Cotta.

Cement Floors:

Stable floors, where noted on plans will be cement as follows: Level and tamp firm the sub-grade; upon this foundation place a 4-inch concrete floor, except driveways which will be 5 inches, composed of Portland cement one part, clean, sharp sand two parts, and clean, broken stone or river gravel varying from $\frac{3}{4}$" to 1". This concrete shall be a wet mixture. Float and trowel smooth in the offices, milk room, toilets, harness, and feed rooms, men's room. All other surface finish for floors to be sand floated to a surface, true but not smooth. The concrete shall be thoroughly integrally waterproofed with 8 percent hydrated lime, based on weight of the cement used. Expansion joints shall be formed not more than 40' apart, as shown on plans.

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**BRICKWORK**

(All Three Barns)

Materials Furnished:

The Ohio State University will furnish all exterior face brick and all backing brick on the site on cars. The Contractor shall furnish all mortar, all labor, and scaffolding necessary to place all brick in the walls of the building. All brick shall be paving brick manufactured by the State Board of Administration.

Mortar:

The exterior and backing brick shall be laid in Portland cement mortar one part, clean, sharp sand three parts, tempered with 10 percent of hydrated lime. No retempering of mortar will be allowed. The face joints shall be flush.

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**Bonding:**

All bonding shall be every sixth course using full headers.

No brickwork shall be laid in freezing weather, and when required by the Superintendent, all brick shall be thoroughly wet with water.

Level for and accurately set all plates, anchor bolts and build in all other iron work and flashings in connection with the brickwork.

Where pipes pass through the wall set G. I. sleeves 1 inch larger than the pipe.

At all necessary times the Contractor shall cover the tops of walls to thoroughly protect them, using tarpaulin in severe weather.

**Bolts:**

Bolts $\frac{3}{4}$" x 30", as shown in section, with nut and large washer, spaced 4 feet longitudinal on centers shall be set in foundations to secure sills of all barns. Bolts must protrude far enough to allow full grip of nut above washer plates or sills.

Bolts $\frac{3}{4}$" x 20" with nuts and washers, spaced 6 feet longitudinally on centers shall be set in foundations of sheds, pavilion, or other additions to main barns.

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**STRUCTURAL TERRA COTTA**

Dairy Barn (Alternate "A")

**Floors:**

All floors so marked on the drawings, shall be long span terra cotta and reinforced concrete, guaranteed to safely carry the live loads specified. Contractor shall submit to the Architect for his approval large scale drawings of floor construction. A test load, made at Contractor's expense will be required. The design of floor for each span shall be submitted for approval.

All reinforcing metal shall be delivered free of rust, grease, etc., and stored in a dry place until used.
Quality:

All interior structural terra cotta shall be semi-porous terra cotta, equal to the National Fireproofing product, and shall be moulded fair and true, thoroughly and evenly burned, unwarped, free from limestone or magnesia pebbles, or other defects. Surfaces receiving plaster to be deeply scored.

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STRUCTURAL STEEL

(Applied to Alternate Proposition for all three barns)

Shop drawings in triplicate of all steel and iron work of every description must be submitted, as hereinbefore specified, for the approval of the Architect.

The exact thickness of walls depends on size of brick used and may vary from sizes noted, and the steel work must be framed accordingly.

Steel:

All structural steel must be medium steel of uniform quality, finished straight and smooth, free from defects, full weight called for, have a tensile strength of from 60,000 to 85,000 pounds to the square inch, elastic limit not less than one-half the tensile strength, minimum elongation of 40 percent and must bend cold through 180° on a diameter equal to the thickness of test pieces without showing crack or flaw.

Setting:

All steel must be accurately set and substantially secured in place. All structural steel and iron work, including all miscellaneous work must be furnished by the Contractor.

Painting of Structural Steel:

This work shall be included in the structural steel contract. All anchors and clamps shall be either galvanized or heavily coated with hot asphalt. All structural steel shall be cleaned of all scale, dirt, etc., before painting. All surfaces in contact must be thoroughly cleaned and given one heavy coat of paint before assembling.

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All surfaces inaccessible after erection must be given three coats of paint before erection. All work shall receive three coats of protecting paint. The different coats of protective paint shall be of different colors to facilitate inspection of this work. All work must be clean and dry while being painted and each coat shall be dry before applying the next.

All material for painting must be delivered in the original package with unbroken seals.

The paint for structural steel shall be Detroit Graphite or red lead and linseed oil in proportion of one gallon of oil to 25 lbs. red lead. Other makes of paint must be approved by the Architect.

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PLASTERING

(All Three Barns)

Lathing:

All lath shall be No. 24 gauge, self-centering Hy-Rib or Ribplex. All lath shall be coated to prevent rust. The Contractor shall submit samples of the lath he proposes to use to the Architect for his approval. The lath must be secured in place as shown in detail in a first-class manner and acceptable to the Architect.

Plaster:

This work will consist of office and man's room in the Horse Barn; office, man's room, toilet and transformer room in Beef-cattle Barn; office, man's room, toilet, all ceilings and sidewalls on frame construction in the main barn stable floor and milking room in the Dairy-cattle Barn.

The materials shall be "Tiger Brand" or equal hydrated lime, clean, sharp lake sand, and Portland cement. This mix shall be 50-50 lime and Portland cement.

Upon all lath put a scratch coat, above mix, with cattle hair. Upon the scratch coat put a second coat of above mix, gauged as before. Steel trowel to a smooth finish.

The workmanship must be strictly first-class. The walls must be swept free of all dirt and dust before applying the plaster. The plaster shall be free from defects at completion of the building and guaranteed for a period of one year.
CARPENTERWORK AND HARDWARE

(All Three Barns)

This work shall consist of:
1. Any rough lumber necessary for building erection purposes.
2. Forms for concrete work.
3. Framing Lumber.
5. Interior Finish.
6. Flooring other than Concrete, Wood Block, and Clay.
7. Stall and stall partitions.
8. Doors and door frames with trim.
9. Windows and window frames with trim.
10. Trim and Base.
11. Stairways.
12. Fences and Gates.

Rough Lumber:
Any rough lumber necessary for the erection of the work shall be furnished. The Carpenter shall set all grounds for the plastering and all centers for the masons.

Forms for Concrete Work:
All lumber for forms shall be of a quality and be braced so that the finished concrete will be free from irregularities, bulges, or honeycombed surfaces. All forms shall be erected and braced in a thorough and unyielding manner.

Framing Lumber:
Framing lumber for all trusses or bents in plank frame barns shall be “B” or better, well-seasoned yellow pine. All other framing lumber shall be well-seasoned No. 1 stock pine free from large or loose knots, shakes, or dry rot. The sizes and spacing shall be as noted on the drawings. The trusses shall be spiked and securely bolted at all joints indicated in sections and details, using 16 d. spikes and %4-inch bolts with large washers. Framing lumber shall be SISIE except wood columns which shall be S 4 S and chamfered.

Exterior Finish:
The Horse Barn and Beef-cattle Barn shall be covered with clear barn boards of yellow pine, cypress, or red wood of a uniform width, not less than 94 inches nor more than 12 inches and shall be securely nailed at each end and crossing with any framing member. All joints shall be covered with stock O.G. battens.
The Dairy Barn shall be covered with clear drop siding, similar to pattern 106, Southern Pine Association stock patterns. This siding shall be securely nailed at each end and at each stud. Joints shall be broken.

Roof Sheathing:
Shall be surfaces so as to lay to an even thickness, shall be No. 1 stock pine or hemlock, free from loose or large knots, and must be laid close with joints broken. All boards must be securely nailed on all rafters. For open-covered run Beef-cattle Barn roof with corrugated asbestos roofing use 2 in. x 4 in. purlins instead sheathing according to detail.

Interior Finish:
All interior finish other than stalls and stall partitions, shall be clear, yellow pine as noted on details, plans, and elevations.

Flooring Other Than Concrete, Clay, or Wood Block:
Mow floors, bins, bin floors shall be of No. 1 plain-sawed yellow pine 13/16” x 4 1/2” laid on joints. Joints must be on joists only and must be broken.

Stalls and Stall Partitions (All Barns):
a. Horse Barn. All stalls and stall partitions shall be constructed of 2” x 10” first-quality oak bridge plank, braced and bolted as shown in details of horse stalls and box stalls. All projecting bolt heads and nuts shall be countersunk and filed smooth to avoid injury to animals. Stall guards shall be of a type equal to “Star” Wrought
Steel Guard.

Metal feed boxes and automatic hay racks of a type equal to “Star” may be substituted for the wood construction manger shown in tie stalls:

b. Beef-cattle Barn. All stalls and stall partitions, unless otherwise specified shall be of wood construction as shown in the details. Tie stalls and stanchions to be of steel construction.

Pipe partitions may be substituted for all box stall partitions shown.

c. Dairy-cattle Barn. Stalls and stanchions and Stall partitions in the tie section shall be secured to floors and curbs by sockets or clamps or both, so that the whole shall be replaceable without damage to concrete work. Stalls and stanchions shall be No. 8 “Star” Steel Stall or equal; stanchions to be wood-lined.

All pens and pen partitions and gates to be of steel tubing of first quality “James” or equivalent, to be approved by the Architect.

Calf pens shall be equipped with regular calf stanchions and guards.

Windows, Window Frames, and Trim (All Barns):

Window frames shall be No. 1 stock cypress, kiln dried and free from defects, surfaced smooth for the painter and of the designs shown on detail drawings.

Exterior trim shall be No. 1 stock cypress, free from defects and surfaced for the painter. Frames not to be set until after being primed all over.

Sash shall be white pine and shall be glazed with B.D.S. glass except in feed and harness rooms where sash shall be glazed with factory-ribbed glass.

Window guards shall be installed on all windows shown on stable floor plans, except in harness room only.

Door Frames and Trim:

All door frames shall be of No. 1 stock cypress, kiln dried and free from defects. Frames shall not be set until after priming coat is applied. Doors shall be of pine, according to schedule. Door trim shall be No. 1 stock, free from defects.

Trim and Base:

Trim and base in men’s rooms, offices, toilets, and milk room to be No. 1 stock pine of neat design.

Stairways:

Stairs shall be substantial and shall follow the details. Yellow pine horses, strings, and treads shall be No. 1 stock, free from defects.

Fence and Gates:

Fences shall be constructed of Red Cedar posts not less than 6 inches in diameter and 2 in. by 6 in. unfinished No. 1 white oak boards, securely fastened with 1/2 in. carriage bolts with large washers under heads and nuts. Posts shall be set not less than 30 inches deep. Fence of court yard on north of Horse Barn shall be secured to wall by anchor bolts the same as sills in Horse Barn.

Exterior gates shall be constructed as shown in elevations and details of No. 1 clear, yellow pine or cypress.

Builders’ Hardware (All Barns):

The carpenter contractor shall furnish all rough and finished hardware, except as noted, including nails, screws, bolts, locks, butts, door checks, hooks, sash locks, operating hardware, hay carrier tracks, stalls, stanchions, or other stable fixtures, door stops, to make the work complete.

All hardware shall be guaranteed to the University by the manufacturer free from defective workmanship or materials. Where catalogue numbers are given, equals may be substituted if approved by the Architect.

Horse Barn:

Two pairs large rolling doors, opening 14’ 0" x 12’ 0" high, wicket door inset into one large door of each pair. Each pair to be equipped with

Cannon Ball track, 30 ft. linear, with two end brackets.
6 Cannon Ball hangers, No. 440.
2 Louden door stops, Fig. 1205.
2 hasps and staples, No. 1821—Stanley.
2 steel foot bolts, No. 1056—Stanley.

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2 concrete floor strike, No. 1140—Stanley.
3 pair wicket door 3” x 2½” butts, No. 808—Stanley.
2 wrought steel thumb latches, No. 1260—Stanley
(size 3).

Sliding Gates:
4 section strap hanger track, each 18’ 0”—Louden.
13 section strap hanger track, each 9’ 0”—Fig. 566.
2: pairs double strap jointed barn door hanger—487.
2: door stops—Louden, Fig. 1206.
21 combination Latches and catches—Stanley, No. 1120Z.

Swing Doors “B”:
6 pairs 10” heavy Tee Hinges, No. 1457Z—Stanley.
2 wrought steel barn latches, No. 1240—Stanley.
2 wrought steel foot bolts, No. 1056—Stanley.
2 concrete floor strikes, No. 1140—Stanley.
2 wrought steel chain bolts, No. 1055Z—Stanley.

Doors “C” and “D”:
2” pairs 10” heavy tee hinges, No. 1457—Stanley.
18 wrought steel barn latches, No. 1240—Stanley.
4 wrought steel foot bolts, No. 1056—Stanley.
4 wrought steel floor strikes, No. 1140—Stanley.
4 wrought steel chain bolts, No. 1055—Stanley.

Doors “E”:
18 pairs 3” x 3” loose pin butt, No. 289—Stanley.
2 3” mortise knob locks (Sheradized knobs) complete, equal to Corbin, 885B.
3 wrought steel barn latches, No. 1240—Stanley.

Hay Doors:
8 offset hay door hinges, Fig. 349—Louden.
4 Seal-Tite inside door latch, Fig. 860—“Star.”
2 1½” x 3” wrought steel rings on 1½” eye bolts.

Folding Stairs:
2 pairs extra heavy T hinges, 12”, No. 931, galvanized —Stanley.
2 upright pulleys 3 in., No. 55 Sargent.
30 ft. 3½” Samson spot cord.
5 counter weights to suit stairs.

Windows:
102 pairs 3” x 3” fast joint brass pin butts, No. 808—Stanley.
51 wrought steel window catches, No. 31½—Stanley.
80 pair G.I. window guards, Fig. 740—“Star.”

Miscellaneous:
152 linear feet steel hay carrier track, complete with stops, joints, hangers, brackets, screws, splices, Fig. 571—Louden.
1 Carry-all sling carrier, Fig. 1306—Louden.
4 gutter drains, Fig. 1309—Louden.
6 horse tie rings.
3 G.I. ventilator heads, King "Aerator" or equal.
3 pair heavy wrought gate hinges, wrought iron suitable for masonry posts.
Bolts, spikes, etc., necessary for erection.
49 Window guards ¾” channel iron frame, Fabric No. 10 gauge wire woven in 1½” diamond mesh to fit box stall and pen windows.

BEef CATTLE BARN

Doors “A”:
3 pairs 10” heavy Tee hinges, No. 1457—Stanley.
1 wrought steel barn latch, No. 1240—Stanley.
1 wrought steel foot bolt, No. 1056—Stanley.
1 wrought steel concrete floor strike, No. 1140—Stanley.
1 wrought steel chain bolt, No. 1055.

Doors “B,” “C,” “E”:
12 pairs 10” heavy tee hinges, No. 1457—Stanley.
8 wrought steel barn latch, No. 1240R.

Doors “D”:
7½ pairs 3” x 3” loose pin butts, No. 289—Stanley.
5 mortise knob locks complete, sherardized knobs, equal to Corbin 855B.

Doors “F,” “G,” “H”:
14 pairs 10” heavy tee hinges, No. 1457—Stanley.
14 wrought steel barn latch, No. 1240R.
Outside Granary:
4 3" x 2 1/8" fast joint brass pin butts, No. 808—Stanley.
2 barn latch, No. 1240 R—Stanley.

Hay Doors:
8 offset hay door hinges, Fig. 349—Louden.
4 seal-tight inside door latch, Fig. 860—Star.
2 3/8" x 3" wrought steel rings on 1 1/4" eyebolts.

Windows:
82 pairs 3" x 3" fast joint brass pin butts, No. 808—Stanley.
82 wrought steel window catches, No. 3 1/2—Stanley.
66 pairs G.I. window guards, Fig. 740—Star.
40 window guards (screens) 3/4" channel iron frame.
fabric is No. 10 gauge wire woven into 1 1/2" diamond mesh to fit box stall and pen windows.

Pen Gates:
27 pairs extra heavy tee hinges, galvanized, No. 1345—Stanley.
27 hooks or bolts.

Miscellaneous:
176 linear feet steel hay carrier track, complete with stops, joints, hangers, brackets, screws, splicers.
Fig. 571—Louden.
14 gutter drains, Fig. 1309—Louden.
3 G.I. ventilator heads, King "Aerator" or equal.
8 pairs heavy gate hinges for masonry posts.
4 heavy gate latches for masonry posts.
40 4' 0" cow stalls, complete with stanchion stop, Fig. 990—Star.
4 pairs 10" strap hinges, galvanized iron, for hay chute doors.
4 automatic door latches for hay chute doors.
Bolts, spikes, etc., necessary for erection.
5 5" Lallee columns 8' 0"; 33 4' Lallee columns, 8' 0".

DAIRY BARN

Doors "A":
12 pairs, 10" heavy tee hinges, No. 1457—Stanley.
4 wrought steel barn latches, No. 1240—Stanley.
4 wrought steel floor bolts, No. 1055.
4 concrete floor strikes, No. 1140.
4 wrought steel chain bolts, No. 1055.

Doors "B":
14 pairs 10" heavy tee hinges, No. 1457.
14 wrought steel barn latches, No. 1240.
7 Star gravity barn door catches, No. 177—Star.

Doors "D" and "E":
21 pairs 3" x 3" loose pin butts, No. 733—Stanley.
14 lock sets mortise, equal to Corbin 855B.

Doors "C":
9 pairs, extra heavy galvanized tee hinges, No. 931—Stanley.
6 gravity barn door catches, No. 177—Star.
6 steel hinge hasps, 8", No. 914—Stanley.

Doors "F":
Door, track, and hangers, similar to "Penco" Tin Clad.
Fire door and fixtures, Penn Metal Co., Boston, Mass.

Doors "G":
22 feet Flexo track.
4 hangers Flexo, Fig. 940—Star.
4 door stops, Fig. 1205—Louden.

Doors "H":
1 1/2 pairs extra heavy tee hinges, No. 1348—Stanley.
1 barn door latch, No. 1240 B—Stanley.

Hay Doors:
8 offset hay door hinges, Fig. 349—Louden.
4 seal-tight inside door latches, Fig. 860—Star.
2 3/8" x 3" wrought steel rings on 1 1/2" eye bolts.

Grainary Door:
4 3" x 2 1/2" fast joint brass pin butts, No. 808—Stanley.
2 barn latch, No. 1240 R—Stanley.

Hay Chute Doors:
4 pairs 10" strap hinges, galvanized iron.
4 automatic door latches.
Windows:
116 pairs 3” x 3” fast joint brass pin butts, No. 808—Stanley.
116 wrought steel window catches, No. 3½Z—Stanley.
116 pairs G. I. window guards, Fig. 740—Star.
42 window guards ¾” channel iron frame. Fabric is No. 10 gauge wire woven into 1½” diamond mesh to fit box stall and pen window.
25 pairs 3” x 3” fast joint butts, No. 808—Stanley.
25 wrought steel window catches, No. 3½Z—Stanley.

Stalls:
40 3’ 6” cow stalls complete as Fig. 990—Star.
12 3’ 0” cow stalls complete as Fig. 856—Star.

Bull Pens:
5 bull pens No. 630—Star (pens to fit approximately 11’ 6” x 12’ 0” spaces shown in stable floor plan.

Cow Pens:
6 cow pens, No. 631—Star, with self cleaning lift manger, without automatic hay rack. (To fit 9’ 4” x 11’ 0” spaces shown as boxes, stable floor plan).

Hospital Stalls:
2 hospital stalls 11’ 0” x 12’ 6” with No. 992 Star cow pen gates. No other equipment, to fit spaces so marked on stable floor plan.

Calf Pens:
2 8’ 0” x 12’ 6” plus mangers to be equipped with feed guards, No. 994 pen gates, calf stanchions, No. 976 feeding rack each.

Calf Pens:
6 small calf pens, each with No. 994 Star calf pen gates and No. 973 milk pail holder.

Miscellaneous:
176 linear feet, steel hay carrier track, complete with stops, joints, hangers, brackets, splices, screws, Fig. 571—Louden.
18 gutter drains, Fig. 1309—Louden.
6 G. I. ventilator heads, King “Aerator.”

32 Lalley columns 4” 8’ 6”.
3 Lalley columns, 5” 8’ 0”.
Bolts, screws, and nails necessary for erection of building.

PAINTING AND GLAZING
(All Three Barns)

Scope of Work:
This branch of the work includes all painting and glazing, except glass in roof of open covered run, indicated on plan of Beef Cattle Barn.

Painting:
All exterior wood work shall be given two coats of white lead and linseed oil paint. Proportions: First coat, 100 pounds white lead to 6½ gallons linseed oil; second coat, 100 pounds white lead to 5 gallons linseed oil. Putty stop following the first coat.

All interior wood finish in Offices, Men’s Rooms, Toilet Rooms and Milk Room, shall be given two coats of paint as specified for exterior wood work. All sash, door frames, and window frames to be primed on all surfaces before placing. Putty stop following the first coat of paint.

All gutters, conduits, and other G.I. work shall be given one coat of “Galvanum” or red lead and linseed oil paint and two coats of paint as specified for second coat work for exterior wood work.

All outside posts and sills coming in contact with masonry to be thoroughly creosoted with hot creosote.

Glazing:
The glass for glazing shall be B.D.S. window glass. The glass shall be bedded, bradded, back puttied, and puttied in place in a first-class manner, using a first quality putty with 25% white lead.
ROOFING
(All Three Barns)

The roofing, except lean to as hereinafter specified, shall be red surface asphalt slate, “Genasco” Latite shingles, or equal, laid as directed by the Barber Asphalt Co. They shall match in color and size the roofing of the Sheep and Hog Building. The roof shall be guaranteed in writing for a period of ten (10) years, during which time any defects due to materials or workmanship shall be repaired, free of any expense to the University. To be complete with flashing at all intersections, on hips, ridges, and valleys.

Lean to roof of open covered run of Beef Cattle Barn shall be covered with Asbestos Corrugated Roofing, similar and equal in quality to “Amblers” into which shall be incorporated Pittsburgh Corrugated Wire Glass for skylights, as indicated on the plans, elevations, and sections of the Beef Cattle Barn. All asbestos corrugated sheets and wire glass sheets to be secured by aluminum “Independent” wire fasteners with lead washers under heads. Galvanized or zinc clad nails with lead washers under heads may be used where wire fasteners are inexpedient.

G.I. Metal Work:
Counterflash with 24 gauge galvanized iron at all silos, dormers, ventilators, intersections of roofs to walk, etc. Hinging gutters and conductors shall be 24 gauge G.I. where shown, firmly secured in place in a substantial manner. Conductors shall be corrugated and have elbows at bottom to spill water on ground and away from the building.

ELECTRIC WIRING
(All Three Barns)

Scope of Work:
This work to include furnishing all labor and material necessary to install a complete conduit and wiring system for electric lighting and power service, as described herein and indicated on the drawings. Submit shop drawings for approval before installing work.

This work shall be in galvanized conduit and galvanized conduits, Crouse Hinds or equal, using 2 piece rosettes for drop cords and F. S. switch boxes for switches, installed in strict accordance with the latest ruling of the National Board of Fire Underwriters, and the Contractor shall furnish the University with a certificate of inspection from the Ohio Bureau of Inspection.

Wiring:
Transformer will be furnished, installed, and connected by University. Conductors shall be rubber covered, double braided, well tinned, soft drawn copper of highest conductivity, made in strict accordance with the National Code, latest ruling.

All wire sizes are Brown & Sharpe gauge. The wiring for the lighting must be installed complete from the service switch to cabinet and from cabinet to all outlets indicated on drawings, including ends for fixture connections.

No splices or joints will be permitted, except at outlets, and hence they must first be made mechanically and electrically secure, then soldered and taped with three layers of rubber and two of friction tape. Rubber tape to be Okonite or equal and friction tape to be Manson or equal. Large nests of wires and splices which overcrowd outlet and junction boxes will not be allowed.

The entire wiring must test free from short circuits and from grounds and have an insulation resistance between conductors and ground, based on maximum load, not less than the requirements of the latest ruling of the National Code, and not to exceed two volts drop in voltage on any circuit of the farthestmost lamp from the distributing cabinet when all lights are burning on that circuit.

Power outlets to be provided with safety switch with lock. Power to be on 2-phase, 440 volts, 3-wire. Wire complete ready for motors. Motors not included.

Main bus bars, feeder switches and feeders to the cabinets to be calculated on 10 amperes per branch lighting circuit and 30 amperes for each extra circuit. All leads to cabinets shall be of sufficient capacity to carry 20% additional load.
Run three-wire circuits to distributing cabinets and power outlets as indicated on plans, installing a fused switch where service enters building for each. Switches to be of size to carry entire load of building and power outlets as indicated on plans and specified herein.

Fixtures:
The electric fixtures will be drop lights installed by this Contractor. Install reinforced cord for drop cords with porcelain keyless sockets.

Switches:
All lights shall be controlled by push switches as shown on plans. Switches to be 10 ampere, single pole, push button type, galvanized stamped metal cover, Perkins 220 switch or equal, and connected on outside of line.

Cabinets:
Cabinets shall be equal to Crouse-Hinds safety panel cabinet, similar to sample in Architect's office. Not more than 600 watts to be dependent on one cutout. Furnish two extra, 30 ampere circuit outlets in each cabinet. Use Economy plug fuses. All branch lighting switches in cabinets to be 30 ampere capacity.

WATER SUPPLY AND DRAINAGE
(All Three Barns)

This work must be strictly in accordance with the latest edition of the Ohio State Plumbing Code.

Scope of Work:
This section of the specification includes the installation complete of the water supply and drainage within the building and to a point 5 feet outside of building.

Salt-glazed Sewer Tile:
All drainage lines underground within the building, shall be hub and spigot salt-glazed sewer pipe with cleanout openings, as shown. All joints shall be made with 1 to 2 cement mortar. The inside of joints shall be thoroughly wiped clean.

Wrought-iron Pipe:
All water supply pipe, shall be best quality galvanized wrought iron. Provide a sufficient number of union couplings in supply pipes to permit removal for repairs. All fittings shall be galvanized cast iron recessed and beaded, screw-jointed, drainage fittings. They shall be Cast-iron Pipe:
Waste from toilet shall be heavy C. I. hub and spigot soil pipe, as indicated on drawings.

Water-supply System:
The main water supply to the plumbing fixtures shall be started at point marked on the drawings and supplied with gate valve protected by a box at starting point. All pipes underground.

SCHEDULE OF FIXTURES

Beef-cattle Barn:
Frost-proof Hydrants, as shown.
Gutter and Floor Drains, as shown.
Lavatory, Water Closet in Toilet-room.

Horse Barn:
Frost-proof Hydrants, as shown.
Gutter and Floor Drains, as shown.

Dairy-cattle Barn:
Frost-proof Hydrants, as shown.
Gutter and Floor Drains, as shown.
Sink in Milkroom.
Lavatories:
Lavatories shall be equal to “Standard” Plate P 3845 E, complete as described.

Water Closets:
Closets shall be equal to Standard Plate P 9010 complete, as described, except omit seat cover.

Shower:
Shower shall be equal to Standard Plate P 2774 complete with floor drain set in slate or Eureka Stone enclosure.

FLOORS
(All Three Barns)

Stable Gutters, Curbs, and Mangers:
Where shown on stable-floor plans construct gutters, curbs, and mangers of slopes and dimensions shown in details, and install gutter drains. Concrete to be wet mix, using one part Portland cement; two parts clean, sharp sand, four parts 1/4-inch to 3/4-inch broken stone or gravel. Surfaces of mangers, gutters, and manger curbs to be steel troweled to a smooth finish.

Wood-block Floors:
Wood-block floors, where indicated on stable-floor plans shall be of creosoted wood blocks 2 1/2 inches thick of a quality and similar to Kreolite Wood-lug Blocks (Jennison-Wright Co., Toledo, Ohio) and shall be laid on a 2" sand cushion over 3 inch concrete base and to be bound with pitch in accordance with the manufacturer’s specifications. Floors shall be laid to a true, even surface and graded as shown in plans and details.

Clay Floors:
Clay floors shall be installed where shown on stable-floor plans. Clay shall be free from vegetable matter. Clay floors are to be 6 inches thick and shall be tamped in wet in layers not to exceed 3 inches in thickness. Surface shall be evenly graded.

Cinder Floors:
Cinder floors shall be placed where so marked in plan of Beef-cattle Barn. Level the curb grade and then place 6 inches of cinders.
The University will deliver the cinders in a pile on north side of railroad at site, the Contractor shall haul the cinders from the pile and place them.

SILOS
(See Alternate)

Silos shall be erected as shown on plans of Dairy-cattle and Beef-cattle Barns. Following are bidders’ options:

a. Concrete block, “Perfect” or equal.
b. Wood Stave, “Indiana” or equal (Creosoted).
c. Glazed hollow tile, “Natco” or equal.
d. Concrete Stave, “Perfect-Playford” or equal.
e. Double Wall-wood Dilo (Creosoted) “Blockit” (Sheboygan, Wis.) or equal.
f. Monolithic concrete, “Polk System” or equal.

All silos to be provided with roofs and chutes consistent with the general design, shown in the plans and elevations. Manufacturer’s specifications as to anchors must be followed. Silos must be guaranteed by maker for a period of five years against defective workmanship and materials.

LIGHTNING RODS
(All Three Barns—See Alternate)

All buildings and silos shall be equipped with standard lightning rods “Shinn,” Chicago, Ill., or equal, in a manner to conform to best practice. All grounds shall be to
a depth of 6 feet where terminals shall be soldered to a zinc plate 12 inches square. All hay-carrier tracks, metal-ventilator heads, and gutters shall be grounded by soldered connections to the ground wires or cables, so as to make a complete electrical circuit. Furnish and install not less than eight points on the Horse Barn, nine points on the Beef cattle Barn, and fourteen points on the Dairy-cattle Barn.
Institution: The Ohio State University

Name of Bldg.: Dairy Cattle Bldg.

Year erected: 1923

Contractor: D. A. O. D. E.

Architect: G. H. Fredrick

Cost: $37,806.28

Construction:

Fireproof? No

Walls: Brick and steel Battened

Floors: Concrete

Roof: Wood, shake, shingling and half round shingles

Basement: None

Use:

Comments:

Remodeling, Repairs and Fixed Equipment: