Robertson County Tennessee
Jody Stewart, Finance Director
Finance Department
523 South Brown Street, Springfield, TN 37172
(615) 384-0202 Fax (615) 384-0237

POST DATE: **February 7th, 2020**

BID 1436: ANIMAL CONTROL FACILITY PROJECT
Pre-Bid Meeting: February 19th, 2020 at 2:00 P.M. CST (see details below)

Sealed bids must be received by: **MARCH 5th, 2020 at 10:00 A.M. CST**
at
Robertson County Finance Office
523 South Brown Street
Springfield, TN 37172

THE OUTSIDE OF THE ENVELOPE MUST BE MARKED WITH THE BIDDER'S COMPANY NAME, ITEM BID, TIME OF BID OPENING, DATE OF BID OPENING, BID NO. 1436 AND MUST BE MARKED "SEALED BID, DO NOT OPEN."

Bids shall be opened and read aloud to the public at the Robertson County Finance Office, 523 S. Brown Street, Springfield, TN 37172 immediately following the bid receipt deadline. Each bid must be submitted in a separate sealed envelope with the appropriate notation on the outside. All bids must be signed by an authorized agent and submitted on the prescribed forms. Submission of bids by telegraph, telephone, or other electronic means is strictly prohibited. Any proprietary items offered for bid must be equivalent as to function, basic design, type and quality of material, method of construction, and any required dimensions as required in plans with no restrictions or exclusions.

A non-mandatory pre-bid meeting will be conducting at the project site at 2 p.m. on February 19th, 2020. Pre-bid meeting will begin at the Robertson County Animal Control Facility (2900 W County Farm Rd, Springfield, TN 37172) **Advance notification is requested for the pre-bid coordination with** jason.reynolds@csrengineers.com**.** For assistance with technical / product information contact the CSR Engineering at 1116 Main St., Pleasant View, TN 37146 (615-247-5381). For assistance with bid procedures contact Taylor Tomblin, Robertson County Finance Office at (615) 384-0202 or by email: ttomblin@robcotn.org.

Note: Robertson County reserves the right to reject any or all bids, to waive any technicalities or informalities, and to accept any bid deemed in the best interest of the County. All bids will be considered in accordance with Title VI and without regard to age, sex, color, race, creed, national origin, religious persuasion, marital status, political belief, or disability that does not prohibit the performance of duty.

INFORMATION FOR BIDDERS

BIDS will be received by The Robertson County Finance Department (herein after called the "OWNER"), at 523 South Brown Street, Springfield, TN 37172 until 10:00 A.M. (Central Standard Time) March 5th, 2020, and then at said office will be publicly opened and read aloud.

Each BID must be submitted in a sealed envelope, addressed to the OWNER at Springfield, Tennessee. Each sealed envelope containing a BID must be plainly marked on the outside as BID for ANIMAL CONTROL FACILITY PROJECT and the envelope should bear on the outside the name of the BIDDER, his address and his contractor's license number, if applicable. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at Springfield, Tennessee. All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

Should there be reasons why the contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the OWNER and the BIDDER.

The BIDDER shall have been engaged, for at least five (5) years, and properly experienced in the business of performing the type work required on the PROJECT and hold the appropriate classification of a Tennessee contractor's license.

Bidder must hold a current Robertson County Business License (at time of contracting) and must provide proof of automobile insurance, liability insurance and workers' compensation insurance. Robertson County assumes no liability for accidents incurred to bidder's employees while on the job site.

The BIDDER shall furnish to the OWNER all such information and data as the OWNER may request, to assist the OWNER in determining the ability of the BIDDER to perform the WORK.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities of work in the Bid Schedule by examination of the site and a review of the drawings and specifications including any issued ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the contract.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the performance bond and labor and material payment bond within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the bidder. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and project bond forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may at his option consider the BIDDER in default, in which case the BID bond accompanying the proposal shall become the property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable performance bond, labor and material payment bond, and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be any reasons why the NOTICE TO PROCEED cannot be issued within such period; the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated herein.

A conditional or qualified BID will not be accepted.

Award will be made as a whole to one BIDDER.

SCOPE OF WORK

Contractor shall provide all labor, material, tools, equipment, and supervision necessary to remove and legally dispose demolition material and complete the excavation and installation, including all necessary components of various site and building construction items for the Robertson County Animal Control Facility, located at 2900 West County Farm Road, Springfield, TN 37172. See also the attached February 4, 2020 drawing file defining existing conditions and required scope of work.

BASIS OF AWARD

The AWARD of the CONTRACT will go to the lowest responsible BIDDER.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to his BID.

The ENGINEER is:

CSR Engineering, Inc.
1116 Main St.
Pleasant View, TN 37146
(615-247-5381)

BID FORM

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____, doing business as _____* to the County of Robertson (Springfield, TN) (hereinafter called "OWNER").

**Insert a corporation, a partnership, or an individual as applicable.*

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of ANIMAL CONTROL FACILITY PROJECT in strict accordance with the CONTRACT DOCUMENTS, within the time set forth herein, and at the prices stated below.

By submission of the BID, BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within 180 consecutive calendar days thereafter. BIDDER also agrees to complete all work in a manner so as not to adversely affect the daily operation of the existing Animal Control Facility operations.

BID FORM CONT'D

BIDDER further agrees to pay as liquidated damages, the sum of $500 for each calendar day in which he is in default of the 180 days stipulated above.

BIDDER acknowledges receipt of the following ADDENDUM (A):

_____

_____

_____

_____

_____

_____

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following the **Project** total (lump sum) price:

($_____)

_____

_____ Dollars.

(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.

The above total, lump sum price for the project shall include all labor, materials, shoring, removal, overhead, profit, insurance, etc. to cover the finished work of the several kinds called for.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informality in the bidding. The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids. Upon receipt of written notice of the acceptance of this bid, Bidder

BID FORM CONT'D

will execute a formal Agreement and deliver a Surety Bond or Bonds and Insurance Certificates as defined in the attached bid documents.

The undersigned Bidder does hereby declare and stipulate that this bid is made in good faith, without collusion or connection with any other person or persons bidding for the same work, and that it is made in pursuance of and subject to all the terms and conditions of the Bid Documents and Specifications, and the Plans pertaining to the work to be done.

The bid security attached in the sum of (5% of bid, including all items):

_____($_____)
shall become the property of the Owner in the event the Agreement, Bond and Insurance are not executed or delivered within the time above set forth as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

_____
Prime Contractor Signature

Name: _____

Company: _____

Title: _____

Business Address: _____

_____

Contractor's License No: _____

License Expiration Date: _____

Telephone Number: _____

Email Contact: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____

_____ as PRINCIPAL, and _____

_____ as Surety, are hereby held and firmly bound unto The County of Robertson (Springfield, TN) as **OWNER** in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successor and assigns.

Signed, this _____ day of _____, 20___.

The Condition of the above obligation is such that whereas the PRINCIPAL has submitted to Robertson County a certain Bid, attached hereto and hereby made a part hereof to enter into a contract in writing, for the ANIMAL CONTROL FACILITY PROJECT.

NOW, THEREFORE,

a. If said BID shall be rejected, or in the alternate,

b. If said BID shall be accepted and the PRINCIPAL shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said **BID**, then this obligation shall be void, otherwise the same shall

remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the PRINCIPAL and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper offices, the day and year first set forth above.

_____

Principal

_____

Surety

By: _____

IMPORTANT – Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Tennessee where the project is located.

DRUG-FREE WORKPLACE AFFIDAVIT

The undersigned, principal officer of _____, an employer of five (5) or more employees contracting with Robertson County, Tennessee government to provide construction services, hereby states under oath as follows:

1. The undersigned is a principal officer of _____ (hereinafter referred to as the "Company"), and is duly authorized to execute this affidavit on behalf of the Company.

2. The Company submits this Affidavit pursuant to T.C.A. § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9, of the *Tennessee Code Annotated*.

3. The Company is in compliance with T.C.A. § 50-9-113.

_____

Authorized Signature, Title (Owner/ Corporate Officer) **Date**

_____

Printed Name

_____

Company Name

_____

Mailing Address

_____

Telephone No. **Fax No.**

_____

Witness Signature **Date**

_____

Witness printed name

Robertson County, Tennessee
NON-COLLUSION AFFIDAVIT

The agent of the bidding firm hereby certifies to the best of his/her knowledge and belief that this bid proposal to Robertson County, Tennessee has not been prepared in collusion with any other seller of similar products. The agent also certifies that the prices, terms and conditions of said bid proposal have not been communicated by the undersigned, nor by any employee or agent of the bidding firm, to any other seller of similar products and will not be communicated to any such seller prior to the official opening of said bid. The agent further states that no official or employee of Robertson County Government has promised any personal financial or other beneficial interest, either directly or indirectly in order to influence award of this bid.

_____

Authorized Signature, Title (Owner/ Corporate Officer) **Date**

_____

Printed Name

_____

Company Name

_____

Mailing Address

_____

Telephone No. **Fax No.**

_____

Contact preferred email address

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 20_____, by and between The County of Robertson (Springfield, TN), hereinafter called "OWNER" and _____ doing business as (an individual,) or (a partnership,) or (a corporation) hereinafter called "CONTRACTOR".

WITNESSETH: that for an in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the construction of the ANIMAL CONTROL FACILITY PROJECT.
2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the project described herein.
3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS on or before a date to be specified in the NOTICE TO PROCEED and shall complete the work within bid document requirements for consecutive calendar days and all stated requirements thereafter.
4. The CONTRACTOR agrees to perform all the WORK described in the CONTRACT DOCUMENTS for the sum of $_____.
5. The term "CONTRACT DOCUMENTS" means and includes the following:
    A. Advertisement For Bids
    B. Information For Bidders

C. Bid

D. Bid Bond

E. Agreement

F. General Conditions

G. Supplemental Conditions

H. Payment Bond

I. Performance Bond

J. Notice of Award

K. Notice to Proceed

L. Change Orders

M. DRAWINGS and SPECIFICATIONS prepared by CSR Engineering, Inc. dated February 4th, 2020.

N. ADDENDA:

No._____, dated _____, 20___

No._____, dated _____, 20___

No._____, dated _____, 20___

No._____, dated _____, 20___

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.
7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in two (2) (number of copies) each of which shall be deemed an original on the date first above written.

OWNER:

_____

By:_____

Name:_____
(Please Type)

Title:_____

ATTEST:

_____

Name:_____
(Please Type)

Title:_____

CONTRACTOR:

_____

By:_____

Name:_____
(Please Type)

Address:_____

(SEAL)

ATTEST:

_____

Name:_____
(Please Type)

Address:_____

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____

(Name of Contractor)

_____

(Address of Contractor)

a _____, hereinafter called
(Corporation, Partnership, or Individual)

PRINCIPAL, and _____
(Name of Surety)

_____

(Address of Surety)

hereinafter called SURETY, are held and firmly bound unto **The County of Robertson (Springfield, TN) located at 523 Brown Street, Springfield, Tennessee 37172**

hereinafter called OWNER, in the penal sum of _____

_____ Dollars, $ (_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successor and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____day of _____, 20___ a copy of which is hereto attached and made a part hereof for construction of: ANIMAL CONTROL FACILITY PROJECT**.**

NOW THEREFORE, if the PRINCIPAL, shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alternation or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alternation or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in two (2) counterparts, each of which shall be deemed an original, this the _____ day of _____, 20___

ATTEST:

_____
Principal

_____
(Principal) Secretary

(SEAL) By: _____ (s)

_____
(Address)

_____

_____
Witness as to Principal

_____
(Address)

_____

ATTEST:

_____
Surety

_____
(Surety) Secretary

(SEAL)

By: _____
Attorney-in-Fact

_____

_____

_____
Witness as to Surety

_____
(Address)

_____

NOTE: Date of the Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute the bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Tennessee where the project is located.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____

(Name of Contractor)

_____

(Address of Contractor)

a _____, hereinafter called
(Corporation, Partnership, or Individual)

PRINCIPAL, and _____
(Name of Surety)

_____

(Address of Surety)

hereinafter called SURETY, are held and firmly bound unto

The County of Robertson (Springfield, TN)

523 Brown Street, Springfield, Tennessee 37172

hereinafter called OWNER, in the penal sum of _____

_____ Dollars,

$ (_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of ____ _____, 20___, a copy of which is hereto attached and made a part hereof for the construction of: ANIMAL CONTROL FACILITY PROJECT.

NOW, THEREFORE, if the PRINCIPAL shall well, truly and faithfully perform its duties, all the undertaking, covenants, terms, conditions, and agreements of said contract during the original term thereof, and extensions thereof which may be granted by the OWNER, with or without notice to the SURETY and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alternation or addition of the terms of the contract or to work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this ____ day of _____, 20____.

ATTEST:

_____
Principal

_____
(Principal) Secretary

(SEAL)

By:_____(s)

_____
(Address)

_____

_____
Witness as to Principal

_____
(Address)

_____
(Address)

_____

ATTEST:

_____
Surety

_____
(Surety) Secretary

(SEAL)

_____	By: _____
Witness to Surety	Attorney-in-Fact
_____	_____
(Address)	(Address)
_____	_____

NOTE: Date of bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the Station of Tennessee where the project is located.

NOTICE OF AWARD

To:_____

_____

_____

_____

_____

PROJECT Description:

ANIMAL CONTROL FACILITY PROJECT, The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____ _____, 20____, and Information for Bidders. You are hereby notified that your BID has been accepted for the work in the amount of

$ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required Contractor's Performance Bond and Payment Bond within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said bonds within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out

of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your Bid Bond. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 20 _____

ANIMAL CONTROL FACILITY PROJECT

Owner

By:_____

Title:_____

ACCEPTANCE OF NOTICE

Receipt of the NOTICE OF AWARD is hereby acknowledged by _____

_____ , this the _____ day of _____, 20_____

ANIMAL CONTROL FACILITY PROJECT

By:_____

Title:_____

Contractor should send one completed copy of this form to:

Ms. Taylor Tomblin
Purchasing Officer
Robertson County
523 South Brown Street
Springfield, TN 37172

NOTICE TO PROCEED

To:_____ Date: _____

_____ Project: ANIMAL CONTROL FACILITY PROJECT

_____

You are hereby notified to commence work in accordance with the Agreement dated

_____, 20___, on or before _____,

and you are to complete all WORK within 180 consecutive calendar days thereafter.

The County of Robertson (Springfield, TN)
Owner

By:_____

Title:_____

ACCEPTANCE OF NOTICE

Receipt of the NOTICE TO PROCEED is hereby acknowledged by _____

_____, this the _____ day of _____ 20_____.

ANIMAL CONTROL FACILITY PROJECT

By:_____

Title:_____

Contractor should send one completed copy of this form to:

Ms. Taylor Tomblin
Purchasing Officer
Robertson County
523 South Brown Street
Springfield, TN 37172

CHANGE ORDER

Order No._____

Date:_____

Agreement Date:_____

NAME OF PROJECT: ANIMAL CONTROL FACILITY PROJECT

OWNER: The County of Robertson (Springfield, TN)

CONTRACTOR:_____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE: $ _____

Original CONTRACT PRICE: $ _____

Current CONTRACT PRICE adjusted by previous CHANGE ORDER: $ _____

The CONTRACT PRICE due to this CHANGE ORDER will be (increased) by: $ _____

The CONTRACT PRICE including this CHANGE ORDER will be: $ _____

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____ (Date). Sketch should accompany Change Order when necessary for clarification.

Approvals Required:

To be effective this Order must be approved by the owner if it changes the scope or objective of the project, or if it will increase the budgeted amounts of funds needed to complete the project, or as may otherwise be required by the SUPPLEMENTAL OR GENERAL CONDITIONS.

Requested by: County of Robertson (Springfield, TN)

Recommended by: (Owner Representative)

Ordered by: County of Robertson (Springfield, TN)

Accepted by: (Contractor)

Federal Agency Approval (where applicable): _____

GENERAL CONDITIONS

1. Definitions
2. Additional Instructions and Detail Drawings
3. Schedules, Reports and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, Regulations
11. Protection of Work, Property, Persons
12. Supervision by Contractor
13. Changes in Quantities, Plans or Character of the Work
14. Extra Work
15. Time for Completion and Liquidated Damages
16. Correction of Work
17. Suspension of Work, Termination and Delay
18. Payments to Contractor
19. Acceptance of Final Payment as Release
20. Contract Security
21. Assignments

22. Separate Contracts

23. Subcontracting

24. Engineer’s Authority

25. Land and Rights-of-Way

26. Guarantee

1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 **ADDENDA** – Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS, and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 **BID** – The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 **BIDDER** – Any person, form or corporation submitting a BID for the WORK.

1.5 **BONDS** – Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his SURETY in accordance with the CONTRACT DOCUMENTS.

1.6 **GENERAL CONTRACT PROVISIONS** – Modifications to the General Conditions required by OWNER and/or a Federal Agency for participation in the Project.

1.7 **SPECIAL CONTRACT PROVISIONS** – Additional Modifications to the General Conditions and/or the OWNER General Contract Provisions required by OWNER and/or Federal Agency for participation in the Project.

1.8 **CHANGE ORDER** – A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.9 **CONTRACT DOCUMENTS** – The contract, including Advertisement For Bids, Information For Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, GENERAL PROVISIONS, SUPPLEMENTAL GENERAL CONDITIONS AND OWNER'S GENERAL AND SPECIAL CONTRACT PROVISIONS and ADDENDA.

1.10 **CONTRACT ITEM (PAY ITEM)** – A specifically described unit of work for which a price is provided in the CONTRACT DOCUMENTS.

1.11 **CONTRACT TIME** – The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.13 **CONTRACTOR** – The person, firm or corporation with whom the OWNER has executed the Agreement.

1.14 **DRAWINGS** – The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.15 **ENGINEER** – The person, firm or corporation named as such in the CONTRACT DOCUMENTS.

1.16 **FIELD ORDER** – A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.17 **NOTICE OF AWARD** – The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.18 **NOTICE TO PROCEED** – Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.

1.19 **OWNER** – A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.

1.20 **PROJECT** – The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.21 **RESIDENT PROJECT REPRESENTATIVE** – Authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.22 **SHOP DRAWINGS** – All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.23 **SUBCONTRACTOR** – An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.25 **SUBSTANTIAL COMPLETION** – That date as certified by the ENGINEER when the construction of the PROJECT is sufficiently completed, in accordance with the CONTRACT

DOCUMENTS, so that the PROJECT can be utilized for the purposes for which it is intended.

1.26 **SUPERINTENDENT** – The CONTRACTOR'S authorized representative in responsible charge of the work.

1.27 **SUPPLIERS** – Any person, supplier or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.28 **WORK** – All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated in the PROJECT.

1.29 **WRITTEN NOTICE** – Any notice to any part of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the **CONTRACT DOCUMENTS**.

2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the OWNER may request concerning WORK performed or to be performed.

3.2 Within 10 days after receipt of the NOTICE OF AWARD, the CONTRACTOR shall submit schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part, and, as applicable:

3.2.1 The dates at which special detail drawings will be required, and

3.2.2 The respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK when requested by the OWNER.

3.4 If the **CONTRACTOR'S** operations are materially affected by changes in the plan or in the amount of the work of if he has failed to comply with submitted progress schedule, the **CONTRACTOR** shall submit a revised project schedule, if requested by the **ENGINEER**, which schedule will show how he proposes to prosecute the balance of the work. The **CONTRACTOR** shall incorporate into every progress schedule submitted, any contract requirements regarding the order of performance of portions of the work. The **CONTRACTOR** shall use all practical means to make the progress of the work conform to that shown on the progress schedule which is in effect. No payment will be made to the **CONTRACTOR** while he is delinquent in the submission of a progress schedule. Should the prosecution of the work, for any reason, be discontinued, the CONTRACTOR shall notify the ENGINEER at least 24 hours in advance of resuming operations.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the **CONTRACTOR** shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his

discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall prepare and submit SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS, showing all details of fabrication for all parts of the structure. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S review and acceptance of any SHOP DRAWINGS shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS and shall require a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 SHOP DRAWINGS prepared by the CONTRACTOR and accepted by the ENGINEER shall be deemed the correct interpretation of the work to be done, but they do not relieve the CONTRACTOR of the responsibility for the accuracy of details and dimensions. Fabrication tolerances shall be shown on the shop drawings. Where necessary to assure proper fit-up members, closer tolerances than those required herein shall be shown.

5.4 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of

any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and continued as directed by the manufacture.

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which are interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards.

7.2 The CONTRACTOR shall provide at his expense the necessary testing and inspection services required by the CONTRACT DOCUMENTS, unless otherwise provided.

7.3 The ENGINEER shall provide all other inspection and testing services not required by the CONTRACT DOCUMENTS. Any damage to existing facilities will be the responsibility of the CONTRACTOR and the CONTRACTOR shall reimburse the OWNER prior to final payment.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require and WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Neither observations by the ENGINEER nor inspections, test or approvals by persons other than the CONTRACTOR shall relive the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary to the written request of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

7.8 If any WORK has been covered which the ENGINEER has not specifically requested to observe prior to its being covered, or if the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS

8.1 Whenever a material, article or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient

requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment or equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to the specified, the ENGINEER may approve, with the OWNER'S approval, it's substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitution will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. PATENTS

9.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, but if the CONTRACTOR has reason to believe that the design, process or product specified in an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all land surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for constructing such as

slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations, and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or dues.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, laws, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may

affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

11.4 Until final acceptance of the project, the CONTRACTOR shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements or from any other cause arising from the execution or from the non-execution of the work. The CONTRACTOR shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the CONTRACTOR, including but not limited to acts of God, or the public enemy or governmental authorities.

12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the

CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN QUANTITIES, PLANS OR CHARACTER OF THE WORK

13.1 The ENGINEER reserves the right to make, by CHANGE ORDER, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alternations shall not invalidate the contract nor release the surety, and by signing a CHANGE ORDER, the CONTRACTOR agrees to perform the work as altered and agrees to accept, as payment in full for such work, the monetary amounts set forth in such CHANGE ORDER, as balanced by the ENGINEER. In addition, by signing the CHANGE ORDER, the CONTRACTOR releases the OWNER from any and all claims for compensation with regard to the items of work specified in the CHANGE ORDER, including but not limited to, any and all claims for delay and overhead, unless the ENGINEER is notified in writing at the time of signing the CHANGE ORDER that the CONTRACTOR refuses to release the OWNER from such claims. All increases in quantities which appear in the CONTRACT as PAY ITEMS shall be paid for at the contract unit prices. Decreases in quantities shall be deducted from the contract at the contract unit price.

13.1a If the alterations or changes in quantities significantly change the character of the work under the Contract, whether or not changed by any such different quantities or alterations, an adjustment will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for on the basis of the actual quantity completed at the unit price for such named in the Contract.

The term "significant change" shall be construed to apply only to the following circumstances:

1. When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction or
2. When an item or work, whose total cost is determined by multiplying the contract quantity by the contract unit price and is greater than 5 percent of the original contract price, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed, or
3. When such changes or alterations are sufficient in magnitude to affect the unit cost by 10 percent or more, considering all of the estimated quantity used for bidding purposes, or considering the altered portion of the item, the change in cost shall equal 25,000 dollars or more whichever is the lesser.

13.1b During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed. Upon written notification, the ENGINEER will investigate the conditions, and if the ENGINEER determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the CONTRACT, an adjustment will be made and the CONTRACT modified in writing accordingly. The ENGINEER will notify the CONTRACTOR of the determination whether or not an adjustment of the CONTRACT is warranted.

No contract adjustment which results in a benefit to the CONTRACTOR will be allowed unless the CONTRACTOR has provided the required written notice.

No contract adjustment will be allowed under this clause for any effects caused on unchanged work.

No contract adjustment will be allowed unless such changes or alterations are sufficient in magnitude to affect the unit cost by 10 percent or more, considering all of the estimated quantity used for bidding purposes, or considering the altered portion of the item, the change in cost shall equal 25,000 dollars or more, whichever is lesser.

In no event shall a differing site condition invalidate the contract or release Surety.

14. EXTRA WORK

14.1 In connection with the work covered by the contract, the ENGINEER may, at any time during the progress of the work, order extra work, including materials incidental thereto. The CONTRACTOR shall perform this work whenever it is deemed necessary by the ENGINEER to fully complete the project as contemplated, and such work shall be done in accordance with the intent of the SPECIFICATIONS under the direction of the ENGINEER. Prior to ordering any extra work, the ENGINEER shall furnish written notification stating the location, kind and estimated quantity of the extra work to be done. The CONTRACTOR shall indicate in writing to the Engineer the compensation (unit price or lump sum) for which the extra work will be performed. This proposal shall be submitted to the ENGINEER for approval. If the ENGINEER considers the unit price or lump sum price excessive, the proposal may be disapproved and the work ordered done by force account in accordance with Subsection 14.2.

14.2 When extra work is required, it shall be performed in accordance with the requirements and provisions of Subsection 14.1. Payment for such work will be on the unit price or lump sum basis agreed upon in accordance with Subsection 14.1. When such agreement cannot be reached, the ENGINEER may order such work, including any off-site work, to be done by force account. The compensation as herein provided shall be accepted by the CONTRACTOR as payment in full for extra work done by force account, and the said percentages shall cover profit, superintendence, general expense, overhead, miscellaneous tools and equipment. For approved subcontract work, the CONTRACTOR will be paid an amount equal to 6 percent of the total cost of the subcontract work, as reimbursement for administrative costs incurred in connection with the subcontract work.

When it is necessary for the CONTRACTOR to hire a firm to perform a specialized type of work or service for which the CONTRACTOR or SUBCONTRACTORS are not qualified to do, payment will be made at the invoice cost. The CONTRACTOR will be paid an amount equal to 6 percent of invoice cost, as reimbursement for administrative costs. Prior approval by the ENGINEER is required.

14.2a The CONTRACTOR shall furnish to the ENGINEER, itemized reports of the costs of all force account work. The reports shall be furnished each week and shall include a certified copy of the weekly payroll and copies of bills for the materials used and the freight charges paid on same. Discount for prompt payment or penalty for late payment will not be considered in determining the net amount of the bill. The net amount of the bill shall be charged to the force account work. Where materials used are not specifically purchased for use on extra work but are taken from the CONTRACTOR'S stock, the CONTRACTOR shall submit a certification of the quantity, price, and freight on such materials in lieu of original bills and invoices.

The CONTRACTOR shall prepare itemized statements containing the following detailed information:

- Name, class, dates, number of hours worked each day, total hours computed to nearest half hour, rate, and extension for each laborer and foreman engaged.
- Designation, number of hours computed to nearest half hour worked each day, total hours and rental rate for each unit of equipment engaged.
- Quantities of materials and prices.
- Freight on materials.

The CONTRACTOR and the ENGINEER shall compare records of force account work and bring them into agreement at the end of each day.

14.2b For all labor and all craft foremen directly engaged in the specific work, the CONTRACTOR shall be paid the actual rate of wages and the number of hours paid said labor and foremen in accordance with approved labor agreements, computed to the nearest half hour, to which the sum of 26 percent will be added. Project Foremen will be classified as

Superintendents and their compensation will not be included in the payment provided herein.

Bond premium; Workmen's Compensation Insurance; Personal Injury Public Liability and Property Damage Public Liability Insurance; Unemployment Compensation; Federal Social Security; and payments required to be made to Employer and Employee Trusteeships, the proceeds from which accrue exclusively to the benefit of the employee; will be paid for at actual cost, to which sum 20 percent will be added to the taxable fringe benefits. The CONTRACTOR shall furnish satisfactory evidence of the amounts paid for each of these required costs as related to force account work.

14.2c For materials, the CONTRACTOR will receive the actual cost delivered on the work including freight charges, as shown by copies of bills, to which the sum of 20 percent will be added.

If a change in the amount or type of force account work results in a surplus of the material ordered and delivered to the project site, the OWNER will reimburse the CONTRACTOR for the costs incurred returning the surplus material to the supplier.

14.2d No payment will be allowed for small hand and power tools which are not listed in the Rental Rate Blue Book for Construction Equipment as published by the Equipment Guide-Book Company. All small hand and power tools listed in the Rental Rate Blue Book at a rate of less than one dollar per hour will be considered as part of overhead and will not be paid for separately.

14.2e For any machinery and equipment, including the foreman's transportation unit, which the ENGINEER approves for use on extra work done by force account, the CONTRACTOR will be paid as follows:

The time paid for shall be the period that the equipment is required at the site of the extra work and, in addition, shall include traveling time to the location of the extra work when the equipment is moved under its own power, the actual operating time during periods of loading and unloading will be paid at the regular rental rate and transportation costs will be allowed. When the periods of work are not consecutive and the interval between termination of a period of work and the commencement of the subsequent

period does not exceed 30 days, the rates allowed will be the same as if the periods of work were consecutive.

The rental rate established for each piece of CONTRACTOR owned equipment, including appurtenances and attachments to equipment, used will be determined by use of the Rental Rate Blue Book for Construction Equipment Volume 1, 2, or 3 as applicable; the edition which is current at the time the force account work was started will apply. The established rental rate will be equal to the "Monthly" rate divided by 176; modified by the rate adjustment factor and the applicable map adjustment factor, plus the "Estimated Operating Costs per Hour", to which the sum of 10 percent will be added.

For equipment not listed in the Rental Rate Blue Book, Volume 1, 2, or 3, the rental rate will be determined by using the rate listed for a similar piece of equipment or by proportioning a rate listed so that the capacity, size, horsepower, and age are properly considered.

For equipment for which there are no comparable in the Rental Rate Blue Book, Volume 1, 2, or 3, the monthly rate shall be reasonable, but not more than 5 percent of the current list price, or invoice, of the equipment. The base hourly rate shall then be determined by dividing the monthly rate by 176 to which the sum of 20 percent will be added. The 20 percent includes adjustments and operating costs.

The rental rate for the foreman's transportation unit will be 7 dollars per hour, to which the sum of 20 percent will be added.

When leased or rented equipment is used on force account work, the hourly rate used in computation of payment will be the leased or rented rate, except that if the leased or rented rate exceeds the rental rate established by the Rental Rate Blue Book, the established rate determined from the Blue Book will apply. In either case, the Estimated Operating Cost per Hour will be added to the appropriate hourly rate to which the sum of 10 percent will be added.

In all cases the "Estimated Operating Cost per Hour" includes all fuel, oil, lubricants, tires, parts, and other operating expendables such as truck and labor assigned to the truck for servicing the equipment.

The rental rates allowed herein include the cost of insurance covering usual insurable risks, including fire and theft. The OWNER will not be liable for losses which can be covered by insurance.

In no instance, however, will the OWNER pay, on a total project basis, equipment costs in excess of the equipment's original invoice cost plus any documented improvements to the piece of equipment. The CONTRACTOR shall furnish to the ENGINEER either original bills and invoices or a certification documenting the equipment's original invoice price plus improvements in any instance which equipment costs are being sought under this Subsection for a period in excess of 30 days.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the work are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. The CONTRACTOR shall have completed the work on or before the calendar date specified in the CONTRACT DOCUMENTS, or on or before a later date as extended by CHANGE ORDER. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR finds it impossible for reasons beyond his control to complete the WORK by the date as specified in the CONTRACT DOCUMENTS or as extended by CHANGE ORDER, he may make a written request to the ENGINEER for an extension of time setting forth therein the reasons he believes will justify the granting of his request. Requests for extensions of time shall be filed in writing by the CONTRACTOR with the ENGINEER. The CONTRACTOR'S plea that insufficient time was specified is not a valid reason for extension of time. If the OWNER and ENGINEER find that the WORK was delayed because of

conditions beyond the control and without the fault of the CONTRACTOR, the OWNER may extend the time for completion in such amount as the conditions justify. An appropriate CHANGE ORDER will be issued for the granting of any time extensions and the extended time for completion shall then be in full force and effect the same as though it were the original time for completion.

15.4 Delays caused by weather or season conditions should be anticipated and will be considered as the basis for an extension of time only when the actual number of work days lost exceeds the number of workdays lost each month due to inclement weather as determined by the following schedule:

MONTH	NUMBER OF WORK DAYS LOST DUE TO WEATHER
January	9
February	8
March	8
April	8
May	5
June	5
July	4
August	4
September	5
October	6
November	6
December	8

A work day will be counted as lost if the CONTRACTOR'S efficiency is reduced by more than 50 percent on the critical item under construction at that time. Weekends and Holidays will not be counted as lost work days.

15.5 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted through CHANGE ORDER by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.5.1 If the CONTRACTOR fails to complete the work within the CONTRACT TIME or extension of time granted by CHANGE ORDER, the OWNER, if satisfied that the CONTRACTOR is carrying the work forward with reasonable progress, may allow him to continue in control of the work. It shall be necessary for the CONTRACTOR to make written application to the OWNER to warrant such continuance. Payments to the CONTRACTOR for work performed and material furnished will be made.

15.5.2 For each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS, the amount for liquidated damages as specified in the BID will be deducted from any money due to the CONTRACTOR; provided, however, that the due amount shall be taken of any adjustment of completion dates granted.

15.5.3 Permitting the CONTRACTOR to continue and furnish WORK or any part of it after the date or dates of completion fixed for its completion or after which the date or dates to which completion may have been extended will in no way operate as a waiver on the part of the OWNER of any of its rights under the CONTRACT.

15.6 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.6.1 To any preference, priority or allocation order duly issued by the OWNER.

15.6.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather as defined in Section 15.4; and

15.6.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUSPENSION OF WORK, TERMINATED AND DELAY

17.1 The OWNER may at any time and without cause, suspend the WORK or any portion thereof for a period of not more than ninety (90) days of such further time as agrees upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT RIME, or both, directly attributable to any suspension.

17.2 If the CONTRACTOR is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or

equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his SURETY a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess shall be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

17.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

17.4 Upon delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus a prorate share of their profit based on an independent audit of their records. The OWNER shall select and pay the auditor and all parties shall make their records available.

17.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days

after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by the arbitrators within sixty (60) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all work executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days notice to the OWNER and the ENGINEER stop the work until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of WORK.

17.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessary caused by the failure of the OWNER or ENGINEER.

18. PAYMENTS TO CONTRACTOR

18.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER

will, within ten (10) days after receipt of each partial payment estimate either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within thirty (30) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimated. The OWNER shall retain ten percent (10%) of the amount of each payment until final completion and acceptance of all WORK covered by the CONTRACT DOCUMENTS. The OWNER at any time, however, after fifty percent (50%) of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five percent (5%) on the current and remaining estimates. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

18.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site. This shall be verified by paid invoices.

18.3 Payment for materials stored offsite will be allowed in the following manner:

- Receipted bills or paid invoices must be presented with the partial pay estimate.
- Certificates of compliance with the specifications and plan details shall be provided with each pay estimate for the material which is paid for.
- Off-site storage area shall be identified and accessible for inspection.
- The price allowed for the stored materials shall not exceed 80% of the price of the delivered materials.
- Payment for unpaid bills will be limited to 40% of the total cost of the material. Upon proof of payment to the supplier for the materials, an additional 40% shall be paid. When the partial payment is made for the materials, such materials shall become the property of the OWNER but this does not relieve the CONTRACTOR of the

responsibility for any loss or damage to such materials until they are incorporated into the work and the work is accepted.

18.4 All WORK covered by partial payment made shall thereupon become the sole property of the OWNER, but this provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK upon which payments have been made or the restoration of any damaged WORK, or as a waiver of the right of the OWNER to require the fulfillment of all terms of the CONTRACT DOCUMENTS.

18.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

18.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, material men, and furnishes or machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his SURETY, or any third party. In paying an unpaid bill of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment

made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

18.7 Sales tax on all material shall be paid for by the Contractor. The cost of the tax shall be passed on to OWNER in the appropriate bid items. No separate compensation or waiver will be given for sales tax on this project.

19. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

19.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance Bond and Payment Bonds.

20. CONTRACT SECURITY

20.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNERS with a Performance Bond and a Labor and Material Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the State of Tennessee in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the State of Tennessee in which the WORK is to be performed or is removed

from the list of Surety Companies accepted on Federal Bonds, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums of such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due not shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

21. ASSIGNMENTS

21.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

22. SEPARATE CONTRACTS

22.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

22.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

22.3 If the performance of additional WORK by other CONTRACTORS or the OWNERS is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written

notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefore as provided in Sections 14 and 15.

23. SUBCONTRACTING

23.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty CONTRACTORS.

23.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(S), in excess of fifty percent (50%) of the CONTRACT PRICE, without prior written approval of the OWNER. Assignment of any portion of the work by subcontract must be approved in advance by the OWNER.

23.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

23.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

23.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

24. ENGINEER'S AUTHORITY

24.1 The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT

DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

24.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspection may be made at the factory or fabrication plant of the source of material supply.

24.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

24.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

25. LAND AND RIGHTS-OF-WAYS

25.1 Prior to insurance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

25.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

25.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

26. GUARANTEE

26.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will

give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR shall fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period. This section does not preclude any stated material or workmanship warranties otherwise stated in the contract and bidding documents.

26.2 Nothing in the above intends or implies that this guarantee shall apply to work which has been abused or neglected by the OWNER.

SUPPLEMENTAL GENERAL CONDITIONS

1. CONTRACT CHANGES

   Any proposed change in this contract shall be submitted to the County of Robertson (Springfield, TN) for its prior approval.

2. GOVERNMENT INSPECTION

   The government shall have access to the site of construction and shall have the right to inspect all project works.

3. NOTICE TO ROBERTSON COUNTY OF LABOR DISPUTES

   Whenever the contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the contractor shall immediately give notice thereof, including all relevant information with respect thereto, to THE COUNTY.

4. CONVICT LABOR

   In connection with the performance of work under this contract the contractor agrees not to employ any person undergoing sentence of imprisonment at hard labor. This does not include convicts who are on parole or probation.

6. OWNERSHIP OF DOCUMENTS

   ROBERTSON COUNTY will retain ownership of all plans, specifications, and related documents.

7. PROTEST PROCEDURES

   Protests concerning these instructions, the contract requirements, the specifications, the bidding procedures or the contract award, or any other request for explanation or clarification shall be submitted in writing and will include the following information:

   1. The name of the protester;

   2. The name and telephone number of the protester's contract person having responsibility; and

   3. A complete statement of the ground of the protest with full documentation of the protester's claim.

Protests regarding the bid documents, specifications, instructions, or bidding procedure must be received by ROBERTSON COUNTY not less than ten (10) working days before the scheduled bid opening. Protest involving the award of the bid must be received by ROBERTSON COUNTY no later than five (5) working days after notification of the award of the bid.

8. REQUESTS

Requests for approved equals, clarification of specifications and protest of specifications must be received by ROBERTSON COUNTY, in writing, not less than ten (10) days before the scheduled bid opening. Any request for an approved equal or protest of the specifications must be fully supported with all necessary technical data, test results, or other pertinent information. ROBERTSON COUNTY's replies to requests will be postmarked at least five (5) days before the scheduled bid opening. The supplier must demonstrate the equality of his product to ROBERTSON COUNTY in order that ROBERTSON COUNTY may determine whether the supplier's product is or is not equal to that specified.

DETAILED SPECIFICATIONS

All Items of Work, Reference Standards, Measurements and Payments, and Shop Drawings shall be in strict accordance with Plans attached herein and according to the attached General and Special Provisions and Project Manual, unless noted otherwise in the Plans, which are referenced herein and made a part thereof. All questions related to the Contract Proposal, Plans or Specifications shall be directed to the Engineer. Information received from other persons or offices shall be strictly advisory.

(Specification Attached Following)

END OF SECTION

Project Manual/ Technical Specifications

Robertson County Animal Control Center

West County Farm Road Springfield, TN

12/23/19

JOHN F. WERNE III – ARCHITECT
1020 OWEN COURT
ASHLAND CITY, TN 37015
615-792-3966
email: jwerne3@gmail.com

PROFESSIONAL DESIGN TEAM

CIVIL ENGINEER:
CSR Engineering. 615-212-2389

STRUCTURAL ENGINEER:
CSR Engineering. 615-212-2389

ARCHITECT:
JOHN F. WERNE III – ARCHITECT, 615-792-3966

MECHANICAL ENGINEER:
MICHAEL BUSBY. 615-512-7597

ELECTRICAL ENGINEER:
Daron R. Christy, PE DRC Engineering 615-714-1812

Robertson County
Animal Control

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SECTION 01000

ADMINISTRATIVE PROVISIONS

PART 1: GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS:

Construction of a single story facility to serve as an animal control center in Springfield, Tennessee.

1.02 CONTRACT METHOD:

A. Construct the work under a single lump sum contract, to include a guaranteed maximum price.

B. Items noted "Owner Furnished' will be furnished by the Owner and installed by the Contractor.

C. Items noted "N.I.C." (Not in Contract) will be furnished and installed by the Owner.

1.03 CONTRACTOR'S USE OF PREMISES:

A. Limit use of premises for work and materials storage relative to this specific contract.

B. Allow for smooth and uninterrupted flow of traffic on adjacent public streets and into and out of adjacent parcels of property.

C. Coordinate use of the premises under the direction of the Owner.

1.04 OWNER-FURNISHED PRODUCTS:

A. Owner's Responsibilities:
   1. Arrange for and deliver shop drawings, product data, and samples to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage.
   5. Arrange for replacement of damaged, defective or missing items.
   6. Arrange for manufacturer's warranties, inspections and service.

B. Contractor's Responsibilities:
   1. Review shop drawings, product data and samples.
   2. Receive and unload products at site, inspect for completeness, for damage, jointly with Owner.

3. Handle, store, install and finish products.
4. Repair or replace items damaged by Work of this Contract.

1.05 APPLICATIONS FOR PAYMENT:

A. Submit application under procedures of Section 01300 on AIA G702 - Application and Certificate For Payment.

B. Content and Format: That specified for Schedule of Values in Section 01300.

1.06 CHANGE ORDERS:

A. Change Order form: AIA G701.

B. Documentation of change in Contract sum and Contract time.
   1. Maintain detailed records of work done on a time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of change in the Work.
   2. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
   3. On request, provide additional data to support computations:
      a. Quantities or products, labor and equipment.
      b. Taxes, insurance and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract time.
      e. Credit for deletions from Contract, similarly documented.
   4. Support each claim for additional costs, and for work done on a time and material basis, with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Receipts and invoices for products, equipment and subcontracts, similarly documented.

C. Preliminary procedures:
   1. The Architect may initiate changes by submitting a Proposal Request to the Contractor. Request will include:
      a. Detailed description of the change.
      b. Supplementary or revised Drawings and Specifications.
      c. The projected time for executing the change, with a stipulation of any overtime work required.
      d. The period of time during which the requested price will be considered valid.
      e. Such request is for information only, and is not an instruction to execute the changes, nor to stop Work in progress.
   2. The Contractor may initiate a change by submittal of a request to

the Architect containing:

a. Description of the proposed change.
b. Statement of the reason for making the change.
c. Statement of the effect on the Contract Sum and the Contract Time, with full documentation.
d. Documentation of any requested substitutions in accordance with Section 01600.

D. Construction change authorization:
1. In lieu of Proposal Request, the Architect may issue a directive, signed by the Owner, instructing the contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
2. Directive will describe changes in the Work, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.
3. Promptly execute the change in Work.

E. Lump sum change orders:
1. Content of Change Orders will be based on either the Architect's Proposal Request and the Contractor's lump sum quotation or the Contractor's request for a Change Order as approved by the Architect.

F. Unit price change orders:
1. For predetermined unit prices and quantities, change orders will be executed on a lump sum basis.
2. For unit costs or quantities of units of work which are not predetermined, execute Work under a construction change authorization. Changes in Contract sum or Contract time will be computed as specified for time and material change orders.

G. Time and material change orders:
1. At a completion of the change, submit itemized account and supporting data, within time limits in Conditions of the Contract.
2. The Architect will determine the change allowable in the Contract sum and Contract time as provided in the Conditions of the Contract.

H. Execution of change orders:
1. The Architect will issue change orders for signatures of parties as provided in the Conditions of the Contract.

I. Correlation with Contractor's submittals:
1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized change order as a separate item, and adjust the Contract sum as shown on the change order.

2. Promptly revise the Progress Schedule to reflect any change in Contract time. Revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
3. Promptly enter changes in Record Documents.

1.07 COORDINATION:

A. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.

C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practical; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installation, for maintenance, and for repairs.

D. In finished areas, except where otherwise indicated, conceal pipes, ducts and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Execute cutting and patching to integrate elements of Work, uncover ill-timed, defective, and non-conforming work, provide openings for penetrations of existing surfaces, and provide samples for testing. Seal penetrations through floors, walls and ceilings.

1.08 REFERENCE STANDARDS:

A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. The date of the standard is that in effect as of the Bid Date, or date of Owner-Contractor Agreement when there are no bids, except when a specific date is specified.

C. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

D. Some of the organizations and their abbreviations are as follows:

AAMA	Architectural Aluminum Manufacturers Association
ACI	American Concrete Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel construction
AIAI	American Iron and Steel Institute
APA	American Plywood Association
ASHRAC	American Society of Heating, Refrigeration, and Air Conditioning
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWPI	American Wood Preservers Institute
AWS	American Welding Society
BOCA	Building Officials and Code Administration International, Inc.
CS	Commercial Standard, U.S. Department of Commerce
DFPA	Douglas Fir Plywood Association
FIA	Factory Insurance Association
FS	Federal Specification (of the U.S. Government)
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
NBS	National Bureau of Standards
NEC	National Electric Code of NBFU (National Bureau of Fire Underwriters)
NEMA	National Electric Manufacturing Association
NFPA	National Fire Protection Association
NPC	National Plumbing Code
PCA	Portland Cement Association
SDI	Steel Deck Institute
SJI	Steel Joist Institute
SPIB	Southern Pine Inspection Bureau
SSBC	Southern Standard Building Code
UBC	Uniform Building Code
UL	Underwriter's Laboratories

E. Furnish, if requested, certificates from Manufacturers to the effect that products or materials provided for use in this work comply with requirements for materials or products specified.

1.09 ALLOWANCES:

A. NA.

PART 2: PRODUCTS

OMITTED

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01065

SEISMIC CONSIDERATIONS AND REQUIREMENTS

PART 1: GENERAL

1.01 PREFACE:

A. This project will be constructed in a Seismic Zone as defined by the Building Code having jurisdiction; therefore, the building structure, items incorporated in the building and items of equipment installed in and on the building are required to be built and installed to resist vertical loads and lateral forces stated in the applicable edition of the Building Code having jurisdiction.

1.02 RELATED REQUIREMENTS:

A. Section 01300: Shop drawings, product data and samples.

1.03 EQUIPMENT AND NON-STRUCTURAL ELEMENTS:

A. Comply with the requirements of the applicable Building Code. Suppliers of equipment, assemblies, and systems are responsible for the proper design and for adequate proof of proper design in accordance with the applicable Building Code.

B. Where pieces of equipment are constructed so that interior items are concealed, as may be the case with transformers, vacuum systems, pumps, HVAC units, and other mechanical equipment, install, brace and anchor such concealed items to meet the requirements of the applicable Building Code.

1.04 SUBMITTAL DATA REQUIRED:

A. In order to provide adequate information to the Architect for proper checking and evaluation of adequacy of equipment and non-structural items, submit the following information with shop drawings and product.

1. Certificate from the manufacturers stating that the items to be furnished by them will maintain unit integrity by resisting lateral forces using the Horizontal Force Factor (Cp value) specified in the applicable Building Code.
2. Dimensions and details of each piece of equipment,

weight of each piece, and its approximate center of gravity.

3. Size and dimensions of supporting assembly structures and the identification of each of its members including secondary elements used as stiffeners and connectors. Include calculations to indicate the adequacy of the structures to resist the expected vertical load and lateral forces for Seismic Zone as stated in the applicable Building Code.

1.05 POSSIBLE BACK CHARGES TO CONTRACTOR:

A. If the submittals for equipment and non-structural elements do not contain the data required, they will be returned without action for resubmission with required data. If the submittals are returned to the Architect with incomplete or insufficient data which may require the Architect, or any of the Architect's consultants, to perform extra work, the Owner will deduct the Architect's fees for the extra work from payments to the Contractor.

B. If the Contractor requires the Architect, or any of the Architect's consultants, to assist him in compiling earthquake resistant design and design computations, he should address such requests for assistance to the Owner through the Architect. The Owner must approve such requests for assistance before the work is commenced. The Owner will deduct fees for such work from his payments to the Contractor.

PART 2: PRODUCTS

OMITTED

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 01000: Administrative provisions.

B. Section 01300: Submittals.

C. Preinstallation conferences: Individual Specifications Sections.

1.02 PRE-CONSTRUCTION MEETING:

A. The Architect will schedule a pre-construction conference within 15 days after Notice of Award.

B. Attendance:
1. Owner.
2. Architect (and his professional consultants he deems appropriate).
3. Contractor and his superintendent.
4. Others required by the Owner and the Architect.

C. Agenda:
1. Submittal of executed bonds and insurance certificates.
2. Execution of the Owner-Contractor Agreement.
3. Distribution of Contract Documents.
4. Submittal of:
    a. List of subcontractors.
    b. List of products.
    c. Schedule of values.
    d. Progress schedule.
5. Designation of responsible personnel.
6. Procedures and processing of:
    a. Field decisions.
    b. Submittals.
    c. Substitutions.
    d. Applications for payment.
    e. Proposal requests.
    f. Change orders.
    g. Contract closeout procedures.
7. Scheduling.

1.03 SITE MOBILIZATION CONFERENCE:

A. The Architect will schedule conference at the Project site prior to Contractor occupancy.

B. Attendance:
1. Owner.
2. Architect (and his professional consultants he deems appropriate).
3. Contractor and his superintendent.
4. Major subcontractors.
5. Others designated by Architect.

C. Agenda:
1. Use of premises by the Owner and Contractor.
2. Owner's requirements and occupancy.
3. Construction facilities and controls provided by the Owner.
4. Temporary utilities provided by the Owner.
5. Security procedures.
6. Housekeeping procedures.
7. Schedules.
8. Procedures for maintaining record documents.
9. Requirements for start up of equipment.
10. Inspection and acceptance of equipment put into service during the construction period.

1.04 PROJECT MEETINGS:

A. Schedule and administer monthly progress meetings, called meetings, and preinstallation meetings throughout the progress of the Work.
1. Make physical arrangements for meetings.
2. Prepare agenda for meetings.
3. Distribute written notice of each meeting seven days in advance of meeting date.
4. Preside at meetings.
5. Record the minutes.
6. Reproduce and distribute copies of minutes within three days after each meeting. Provide one copy to all participants in the meeting, and all parties affected by decisions made at the meeting. Furnish three copies to the Architect.

B. Location of the meetings: The Contractor's field office.

C. Attendance:

1. Owner.
2. Architect (and his professional consultants he deems appropriate).
3. Contractor.
4. Contractor's job superintendent.
5. Subcontractors as appropriate to the agenda.
6. Suppliers as appropriate to the agenda.
7. Others.
8. Representatives of contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

D. Minimum agenda:
1. Approval of minutes of previous meeting.
2. Review of work in progress.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected schedules.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to the Work.

PART 2: PRODUCTS

OMITTED

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 01000: Applications for payment.

B. Section 01400: Manufacturer's field service reports.

C. Section 01600: Contractor's list of products and substitutions.

D. Section 01700: Closeout submittals.

1.02 PROCEDURES:

A. Deliver submittals to the Architect at the Architect's home office via email. (jwerne@hughes.net)

B. Provide space for the Contractor's and Architect's review stamps. Identify the following:
   1. Project, Contractor, subcontractor, major supplier.
   2. Pertinent Drawing sheet and detail number, and Specification Section number, as appropriate.
   3. Deviations from Contract Documents.

C. Contractor shall legibly mark or stamp the work "**APPROVED**," his name, and the date on each copy of each submittal indicating his approval of the submission and compliance with requirements of Contract Documents. Use of the words "CHECKED" or "REVIEWED" in lieu of "APPROVED," will not be accepted. Shop Drawings will not be accepted directly from Subcontractors or Suppliers.

D. By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

E. Contractor shall delete or strike out information not pertinent to Work of this Contract on all submittals.

F. Submit initial progress schedules and schedule of values within 15 days after award of Contract. After review by Architect, revise and resubmit as required. Submit revised schedules with each Application of Payment, reflecting changes since previous submittal.

G. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.

H. After the Architect has reviewed the submittal, revise and resubmit as required, identifying changes made since previous submittal.

I. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.03 CONSTRUCTION PROGRESS SCHEDULE:

A. Submit horizontal bar chart with separate bar for each major trade or operation, identifying first work day of each week.

B. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Show projected percentage of completion for each item of Work as of time of each progress Application for Payment.

C. Show submittal dates required for Shop Drawings, Product Data, and Samples, and product delivery dates, including those furnished by Owner and those under Allowances.

1.04 SCHEDULE OF VALUES:

A. Submit typed schedule on AIA Form G703.

B. Format: Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification Section.

C. Include in each line item a directly proportional amount of Contractor's overhead and profit.

D. Provide a sub schedule for each separate stage of Work specified in Division 1: General Requirements.

E. Revise schedule to list change orders, for Application for Payment.

1.05 SHOP DRAWINGS:

A. SUBMIT VIA EMAIL TO jwerne@hughes.net IN ADOBE PDF OR *.JPEG FORMAT. *(Large documents may be scanned at local printer if necessary before transmitting.)* Other formats will not be accepted.

1.06 PRODUCT DATA:

A. Identify applicable products, models, options, and other data; supplement manufacturer's standard data to provide information unique to the Work. Include manufacturer's installation instructions when required by the individual Specification Section.

B. When a product other than that specified is submitted, include Product Data of the specified material with the submittal. Identify pertinent information as specified above.
   1. Identify the Product Data of the specified materials with the words "SPECIFIED MATERIAL" written boldly and in a color clearly visible against the background color of the page.
   2. Identify the material being proposed for substitution with the words "PROPOSED SUBSTITUTION" written boldly and in a color clearly visible against the background color of the page.

1.07 MANUFACTURER'S INSTRUCTIONS:

A. When required in individual Specification Sections, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for product data.

1.08 SAMPLES:

A. Submit full range of the manufacturer's standard colors, textures, and patterns for the Architect's selection. Submit samples for selection of finishes within 30 days after the date of the Contract.

B. Submit samples to illustrate functional characteristics of the product with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

C. Include identification on each sample, giving full information.

D. Submit the number specified in respective Specification Section; one will be retained by the Architect. Reviewed samples which may be used in the Work are indicated in the Specification Section.

E. If any return of sample is required provide shipping label with contractors shipping account number.

1.09 FIELD SAMPLES:

A. Provide field samples of finishes at the Project as required by individual Specifications Sections. Install sample complete and finished. Acceptable samples in place may be retained in completed Work.

1.10 CONSTRUCTION PHOTOGRAPHS:

A. Provide photographs of construction throughout progress of the Work.

B. **Take photographs on the cutoff date for each Application for Payment in locations representative of completed work and stored materials.**

C. Use a high- resolution digital camera 5 megapixal or greater. For permanent record. Low resolution is preferred for email submittal.

D. **Submit ".jpeg " images by email. CD or DVD with each pay request.**

E. Take care to see that photographs have the following characteristics:
1. Correct exposure and focus.
2. High resolution and sharpness.
3. Maximum depth of field.
4. Minimum distortion.

F. Identify each print as follows:
1. Orientation of view – unless obvious.
2. Date and time of exposure (metafile data acceptable)

G. Provide photographs from a minimum of six views at each specified time until date of Substantial Completion.

H. Photograph from locations to adequately illustrate the condition of construction and the state of the Project.

I. **Deliver by email, CD or DVD to the Architect with each Application for Payment specified in Section 01300.**

PART 2: PRODUCTS

Note: PDF editing software can be downloaded at:
http://www.pdfill.com/safeorder.html

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Document 00700: Inspection and testing required by governing authorities.

B. Section 01000: Applicability of specified reference standards.

C. Section 01300: Submittal of manufacturer's instructions.

1.02 QUALITY CONTROL, GENERAL:

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.03 WORKMANSHIP:

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work by persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and rating.

1.04 MANUFACTURER'S INSTRUCTIONS:

A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from the Architect before proceeding.

1.05 MANUFACTURER'S CERTIFICATES:

A. When required by individual Specifications Section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

1.06 MANUFACTURER'S FIELD SERVICES:

A. When specified in respective Specification Sections, require supplier or manufacturer, as applicable, to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.

B. Representative shall submit written report to the Architect listing observations and recommendations.

1.07 TESTING LABORATORY SERVICES:

A. The Contractor will employ and pay for services for an Independent Testing Laboratory to perform inspections, tests and other services required by various Specification Sections.

B. Services will be performed in accordance with requirements of governing authorities and with specified standards.

C. Reports will be submitted to the Architect in duplicate giving observations and results of tests, indicating compliance or noncompliance with specified standards and with Contract Documents.

D. Contractor shall cooperate with Testing Laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
   1. Notify the Architect and Testing Laboratory 24 hours prior to expected time for operations requiring testing service. Contractor shall be responsible for the coordination with the Testing Laboratory.
   2. Make arrangements with Testing Laboratory and pay for additional samples and tests for Contractor's convenience.

PART 2: PRODUCTS

OMITTED

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 01000: Contractor's use of premises.

B. Section 01700: Final cleaning.

1.02 ELECTRICITY AND LIGHTING:

A. Provide service required for construction operations, with poles, branch wiring, distribution boxes and other appurtenances located to allow service and lighting by means of construction-type power cords. Pay for costs of energy used.

B. Arrange with local electric power company and pay fees for tapping onto existing electric power source and providing meter for temporary construction lights and power.

C. Provide lighting for construction operations.

D. Permanent lighting may be used during construction. Maintain lighting and make routine repairs.

E. When temporary items are no longer required, remove the system.

1.03 HEAT AND VENTILATION:

A. Provide as required to maintain specified conditions for construction operations and to protect materials, finishes and equipment from damage due to temperature and humidity.

B. Prior to operation of permanent facilities for temporary purposes, verify that installation is approved for operation, and that all filters are in place. Provide and pay for operation and maintenance.

C. Provide smoke free temporary heat required for performance of Work. No open fires or salamanders will be permitted.

D. Provide ventilation of enclosed areas to cure materials, disperse humidity, and prevent accumulations of dust, fumes, vapors or gases.

1.04 TELEPHONE SERVICE:

A. Provide telephone service to the field office. Toll Calls by parties other than the Contractor will be at their own expense.

B. Provide the telephone with an audible signal located so that the signal can be heard over the entire construction area over a normal level of construction related noise.

1.05 WATER:

A. Provide service required for construction operations. Extend branch piping with outlets located so that water is available by use of hoses. Pay meter charges.

B. Arrange with the local water company and pay fees for tapping existing water mains and providing meter for temporary construction water.

C. When temporary piping is no longer required, remove it.

D. Provide drinking water in approved, sanitary containers and disposable cups for workmen.

1.06 SANITARY FACILITIES:

A. Provide and maintain required facilities and enclosures for use by workmen. Have location approved by the Architect.

B. Construct facilities to be weather-tight, and in compliance with applicable legal and health requirements.

C. Keep facilities clean and sanitary and maintain facilities until construction is completed.

D. If temporary facilities are placed over manholes, use flushing type fixtures.

1.07 CONSTRUCTION AIDS:

A. Provide and operate drainage and pumping equipment. Maintain excavations and site free of standing water.

1.08 ENCLOSURES:

A. Provide temporary insulated weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection of the Owner's materials, to allow for temporary heating,

and to prevent entry of unauthorized persons. Provide doors with self-locking hardware and locks.

1.09 BARRIERS:

A. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.

B. Provide protective coverings at walls, projections, jambs, sills and soffits of openings. Protect finished floors from traffic, movement of heavy objects, and storage.

C. Provide barricades and temporary lighting at streets and open ditches where construction work may present hazards to vehicles and personnel.

D. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

1.10 CLEANING DURING CONSTRUCTION:

A. Control accumulation of waste materials and rubbish, and periodically dispose of off-site.

B. Clean interior areas prior to start of finish work. Maintain areas free of dust and other contaminants during finishing operations.

C. See Section 01700 for further cleaning instructions.

1.11 FIELD OFFICES AND SHEDS:

A. Office: Weather-tight building or an office trailer with:

1. Lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with furniture.
2. Job telephone as specified above.
3. Space for project meetings, with table and chairs to accommodate at least 8 persons.
4. Work table large enough to accommodate working drawings.
5. Files, drawings, racks, and shelves to maintain order and neatness.

B. Storage sheds for materials, tools and equipment: Lighted, weather-tight, with raised floors, and with adequate space for organized

storage and access. Provide heat and ventilation for products requiring controlled conditions.

C. Locate these facilities to preclude interference with work and as directed. Existing structures may be utilized where permitted by local authorities.

1.12 PARKING FACILITIES:

A. Parking space at the site is limited.

B. Make arrangements to secure parking spaces for workmen. Do not park on streets except when permitted. Do not block driveways or streets.

C. If designated area is insufficient, contractors and workmen will be required to make their own arrangements for parking.

1.13 REMOVAL:

A. Remove temporary materials, equipment, services and construction prior to Substantial Completion.

B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of two feet and grade as indicated or directed by the Architect.

PART 2: PRODUCTS

OMITTED

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 01300: Submittal of manufacturer's certificates.

B. Section 01700: Operation and maintenance data, warranties and bonds.

1.02 PRODUCTS:

A. Products include material, equipment and systems.

B. Comply with Specifications and referenced standards as minimum requirements.

C. Components required to be supplied in quantity within a Specification Section shall be the same and shall be interchangeable.

D. Do not use materials and equipment removed from existing structures except as specifically required, or allowed, by Contract Documents.

1.03 TRANSPORTATION AND HANDLING:

A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.04 STORAGE AND PROTECTION:

A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

C. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged and are maintained under required conditions.

1.05 PRODUCT OPTIONS:

A. Products specified by reference standards or by description only: Any product meeting those standards.

B. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not specifically named.

C. Products specified by naming several manufacturers: Products of name manufacturers meeting specifications. No options, no substitutions allowed.

D. Products specified by naming only one manufacturer: No options, no substitutions allowed.

1.06 PRODUCTS LIST:

A. Within 15 days after Notice of Award, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

1.07 SUBSTITUTIONS:

A. Only within 30 days after date of Contract will the Architect consider requests from the Contractor for substitutions. Subsequently, substitutions will be considered only when a product becomes unavailable due to no fault of the Contractor.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. Request constitutes a representation that the Contractor:
1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
2. Will provide the same warranty for substitution as for specified product.
3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects.
4. Waives claims for additional costs which may subsequently become apparent.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.

E. The Architect will determine acceptability of proposed substitution and will notify the Contractor of acceptance or rejection in writing within a reasonable time.

F. Only one request for substitution will be considered for each product. When substitution is not accepted, provide specified product.

1.08 SYSTEMS DEMONSTRATION:

A. Prior to final inspection, demonstrate operation of each system to the Architect and the Owner.

B. Instruct the Owner's personnel in operation, adjustment, and maintenance of equipment and systems, using the operation and maintenance data as the basis of instruction.

PART 2: PRODUCTS

OMITTED

PART 3: EXECUTION

OMITTED

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 00700: Fiscal provisions, legal submittals, and other administrative requirements.

B. Section 01500: Cleaning during construction.

1.02 CLOSEOUT PROCEDURES:

A. Comply with procedures stated in General Conditions of the contract for issuance of Certificate of Substantial Completion.

B. When the Contractor considers the Work has reached final completion, submit written certification that Contract Documents have been reviewed, the Work has been inspected, and that the Work is complete in accordance with Contract Documents and ready for the Architect's inspection.

C. In addition to submittals required by the Conditions of the Contract, provide submittal required by governing authorities, and submit a final statement of accounting giving total adjusted Contract sum, previous payments, and sum remaining due.

D. The Architect will issue a final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order.

E. Submit the final Application For Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

1.03 FINAL CLEANING:

A. Execute prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.
   1. Remove temporary labels, stains and foreign substances.
   2. Polish transparent and glossy surfaces.
   3. Vacuum carpeted and soft surfaces.
   4. Clean equipment and fixtures to a sanitary condition, clean or replace filters or mechanical equipment.
   5. For vinyl tile flooring apply 4 coats of wax.

6. Provide protective covering (thick brown paper taped at edges) over all flooring.

C. Clean site of debris resulting from this Work.
   1. Sweep paved areas.
   2. Rake clean seeded or planted areas.

1.04 PROJECT RECORD DOCUMENTS:

A. Store documents separate from those used for construction.

B. Keep documents current; do not permanently conceal any work until required information has been recorded.

C. At Contract Closeout, submit documents with transmittal letter containing date, project title, the Contractor's name and address, list of documents, and signature of the Contractor.

1.05 OPERATION AND MAINTENANCE DATA:

A. Provide data for:
   1. Mechanical equipment and controls.
   2. Electrical equipment and controls.

B. Submit two sets prior to final inspection, bound in 8-1/2 x 11 inch three-ring binders with durable plastic covers.

C. Provide a separate volume for each system, with a table of contents and index tabs for each volume.

D. Part 1: Directory, listing names, addresses, and telephone numbers of the Architect and the Contractor.

E. Part 2: Operation and maintenance instructions, arranged by specification division. For each specification division, give names, addresses, and telephone numbers of subcontractors and suppliers. List:
   1. Appropriate design criteria.
   2. List of equipment.
   3. Parts list.
   4. Operating instructions.
   5. Maintenance instructions, equipment.
   6. Maintenance instructions, finishes.
   7. Shop drawings and product data.
   8. Warranties.

1.06 WARRANTIES AND BONDS:

A. Provide duplicate, notarized copies. Execute the Contractor's submittals and assemble documents executed by subcontractors, suppliers and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.

B. Submit material prior to final Application For Payment. For equipment put into use with Owner's permission during construction, submit within 10 days after first operation. For items of work delayed materially beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS:

A. Provide products, spare parts, and maintenance materials in quantities specified in each Section, in addition to that required for completion of work. Coordinate with Owner, deliver to project site and obtain receipt prior to final payment.

PART 2: PRODUCTS:

OMITTED

PART 3: EXECUTION:

OMITTED

END OF SECTION

SECTION 01800

CONTRACTOR WARRANTY FORM

PROJECT:

LOCATION:

OWNER:

We _____, Contractor for the referenced project, do hereby warranty that all labor and materials furnished and work performed are in accordance with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of one year from Date of Substantial Completion. This warranty commenced on _____ and expires (Date of Substantial Completion) on _____. (One year from commencement) Should any defect develop during the warranty period due to improper materials, workmanship or arrangement, the same shall, upon written notice by the Owner, be made good by the undersigned at no expense to the Owner.

Nothing in the above shall be deemed to apply to work which has been abused or neglected by the Owner.

DATE:_____ FOR:

BY:

TITLE:

SUBCONTRACTOR WARRANTY FORM

PROJECT:

LOCATION:

OWNER:

GENERAL CONTRACTOR:

We _____, Subcontractor for _____, as described in Specification Section (s) (List Trade)_____, do hereby warrant that all labor and materials furnished and work performed in conjunction with the referenced project are in accordance with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of _____ year(s) from Date of Substantial Completion. This warranty commences on _____(Date of Substantial Completion_____ and expires on _____. affixed by Architect) (Expiration Date) Should any defect develop during the warranty period due to improper materials, workmanship or arrangement, the same shall, upon written notice by the Owner, be made good by the undersigned at no expense to the Owner.

Nothing in the above shall be deemed to apply to work which has been abused or neglected by the Owner.

DATE:_____ FOR:

BY:

TITLE:

SECTION 02110

SITE CLEARING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02210: Removal of other site obstructions.

B. Section 02210: Removal of topsoil.

C. Section 02215: Finish grading.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit the manufacturer's catalog data for wound paint.

1.03 REGULATORY REQUIREMENTS:

A. Call Tennessee One Call **811**, Tennessee One-Call System, Inc.
Phone: 800-351-1111, Alternate: 615-366-1987, www.tnonecall.com
Prior to beginning any site work.

B. Comply to applicable codes and ordinances for disposal of debris.

1.04 PROTECTION:

A. Avoid damage to utilities and other items of physical property.

B. In operating mechanical equipment among and around trees be especially careful to avoid damage to trees and shrubs to remain. Requirements for fencing trees and shrubs are specified below.

PART 2: PRODUCTS

2.01 TREE WOUND PAINT:

A. Use a good grade of commercially produced tree wound paint that will protect wounds and not harm the growth to remain.

2.02 FENCE MATERIALS:

A. Fencing: Plywood or dimension lumber. Salvaged materials are acceptable provided nails and jagged edges are not exposed.

B. Posts: Wood or metal posts, substantial enough to remain during entire construction period.

PART 3: EXECUTION

3.01 EXTENT OF CLEARING AND GRUBBING:

A. Remove driveways, houses and foundations, out buildings, fences, abandoned utilities, trees, bushes, and other perennial growth as indicated.

B. Where trees and shrubs to remain are adjacent to construction area, fence to insure protection.

C. It is not required that other trees and shrubs to remain be fenced, but perform clearing and grubbing operations to avoid damage to those to remain.

3.02 CLEARING AND GRUBBING:

A. Method of removing trees and performing grubbing operations is at the Contractor's option, except that work shall be done in such a way as to cause the least damage to growth to remain, and to physical property to remain.

B. Direct the falling trees so that they fall clear of those to remain and other obstructions.

C. Grub out stumps entirely, and remove roots over 1 1/2 inches in diameter to a depth as follows:
   1. In areas to be covered by construction, remove roots to a depth of at least 2 feet below the bottom of construction (but not to include structural and earth fill). For example, bottom of construction means: Bottoms of footings; bottom of base material under slabs and pavement.
   2. In areas to be lawns, remove roots to a depth of 1 foot below finish grades.

D. Method of removing existing structures foundations, fences, utilities and driveways is at the Contractor's option, except that work shall be done in such a way as to cause the least damage to physical property to remain.

E. Remove foundations and other below grade structures to a depth as follows:
   1. In areas to be covered by construction, remove foundations and utilities to a depth of at least 2 feet below the bottom of construction (but not to include structural and earth fill). For examples, bottom of construction means: bottom of footings, bottom of base material under slabs and pavements.
   2. In areas to be lawns, remove foundations to a depth of 2 feet below finish grades.

F. Contractor to perform work in a manner acceptable to local authorities.

G. Remove surface rock, unless noted to remain.

H. Clear undergrowth and deadwood, without disturbing subsoil.

3.03 PRUNING:

A. If trees, shrubs and other perennial growth are damaged in the course of clearing and grubbing, prune damaged branches back to the first healthy growth, i.e., the nearest undamaged forks in branches, or to the tree trunk.

B. Perform this work in accordance with standard practices of the industry.

C. Where branches are cut back to tree trunks, remove the branches entirely so that there is no stub to become infected, and so that the tree bark can heal itself over the cut.

D. "Head back" cuts (cuts at right angles to line of growth) of branches away from a fork will not be permitted.

3.04 PAINTING WOUNDS:

A. Paint tree and shrub wounds over 1 inch in diameter with specified material.

3.05 REPAIRS:

A. Should utilities to remain, buildings, or other physical property be damaged by this work, repair damage.

3.06 CLEAN UP:

A. Keep site clean and orderly during all operations.

B. Remove all materials, debris, junk and rubbish from the site.

C. Burying of materials on site is not permitted.

D. Coordinate any burning of materials on site with state and local authorities.

END OF SECTION

SECTION 02210
SITE GRADING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 01400: Testing laboratory services.

B. Section 02110: Site clearing.

C. Section 0221: Rock Removal.

1

D. Section 02215: Finish grading.

E. Section 02220: Excavation and backfilling for structures.

F. Section 02221: Excavation and backfilling for utilities.

G. Section 02223: Excavation and backfilling for paving and appurtenances.

1.02 PROJECT RECORD DOCUMENTS:

A. Submit closeout documents in accordance with Section 01700.

B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.03 PROTECTION:

A. Protect tress, shrubs, lawns, and other features remaining as portion of final landscaping.

B. Protect bench marks and items to remain.

C. Protect above or below grade utilities which are to remain.

D. Repair damage.

1.04 QUALITY ASSURANCE:

A. The Contractor will employ an independent testing agency to observe work and make test required. The laboratory will:
   1. Observe proof rolling to determine adequacy of in place soils.
   2. Test in place soil and filled and compacted areas.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Topsoil: Excavated material, graded free of roots, subsoil, debris, large weeds, and rocks larger than one inch.

B. Subsoil: Excavated material, graded free of lumps larger than 6 inches, rocks larger than 3 inches and debris.

PART 3: EXECUTION

3.01 PREPARATION:

A. Identify required lines, levels, contours and datum. Coordinate with Section 01000.

B. Identify known below grade utilities. Stake and flag locations.

C. Identify and flag above grade utilities.

D. Maintain and protect existing utilities remaining which pass through work area.

E. Notify utility company to remove or relocate utilities.

F. Upon discovery of unknown utility or concealed conditions, discontinue affected work and notify the Architect.

3.02 TOPSOIL EXCAVATION:

A. Mow grass, weeds and other annual growth, and brush close to the ground.

B. Scrape or rake area to remove brush, roots, loose grass, weeds, and rocks before stripping topsoil.

C. Excavate topsoil from areas to be further excavated, relandscaped, or regraded and stockpile in area designated on site. Remove excess topsoil not being reused on site.

D. Do not excavate wet topsoil.

3.03 SUBSOIL EXCAVATION:

A. Excavate subsoil from areas to be relandscaped or regraded and stockpile in area designated on site. Remove excess topsoil not being reused on site.

B. Do not excavate wet subsoil.

C. Stockpile subsoil to depth not exceeding 8 feet. Protect from erosion.

D. Completely remove rocks, boulders, stumps, roots over 1 inch in diameter, and similar on grade and below grade obstructions within the area to be covered by new construction and for a distance of 10 feet beyond area in all directions. In other areas disturbed by grading, remove such obstructions to a depth of 2 feet below subgrade.

E. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.

F. If existing basements, cellars, wells, cisterns, septic tanks, drain fields, cesspools, catch basins, sink holes, manholes and similar items are encountered, remove to solid subgrade and break up masonry and/or concrete bottoms so that no pieces remain over 12 inches in their longest dimension.

3.04 PROOF ROLLING:

A. Areas to test:
   1. Areas to be covered by construction.
   2. Areas to be covered with fill.
   3. Areas 10 feet beyond the above areas in all directions.

B. Vehicle: Loaded rubber tired dump truck having a single axle weight of approximately 30,000 pounds, or a roller having a foot print equivalent to that weight.

C. Observation: Run truck or roller at normal walking speed so that the Testing Laboratory personnel may observe the ground at all times. Laboratory personnel will conduct additional test they deem

necessary to determine existing conditions. Laboratory personnel will direct remedial actions they deem necessary.

3.05 REMEDIAL WORK:

A. Remove material identified by Testing Laboratory personnel. Backfill and compaction of such areas is specified in Sections 02220, 02221 and 02223.

B. Keep records as specified in Section 01000 and have them verified by Testing Laboratory personnel.

3.06 GENERAL SITEWORK:

A. Before depositing fill material, remove vegetation and other unsuitable materials. Do not place fill on a subgrade that contains frost, is muddy, or frozen.

B. Fill and grade to attain elevations indicated +/- 0.1' less allowances for placement of aggregate, concrete, walks, drives and parking areas, and topsoil.

C. Inside of building lines, fill with specified earth fill and allow for placement of 4" of granular fill and 4" of concrete, unless noted otherwise on the Contract Drawings.

D. Outside of building, in areas designated to receive topsoil, grade, or fill and compact specified earth, to bring areas to finished grade +0.1' less 6" for placing topsoil.

E. Where exterior walks are indicated, allow for placement of 4" of granular fill and 4" of concrete and finish +/- 0.1'.

F. Where drives are indicated to join the building, allow for placement of 6" of aggregate base and 2" of asphalt.

3.07 GRADING:

A. Grade to uniform levels and slopes, without abrupt changes. Make transition from levels to slopes smooth and with large radius cuts.

B. Finish areas to a reasonably true and even plane at required elevations, less allowances for items specified above.

C. Along the lines indicating the limits of work, taper finished grade to the existing grade at a slope matching the natural contour. Perform all of this work within the limit lines.

3.08 FILLING:

A. Where soft spots are taken out at the direction of the Geotechnical Engineer, backfill with specified earth fill. Deposit fill in loose lifts not to exceed 6" and thoroughly compact each lift before placing succeeding lifts.

B. Within the building lines and for a distance of 10'-0" outside of building lines, place specified earth fill in loose lifts not to exceed 8" and thoroughly compact each lift before placing succeeding lifts.

C. When foundation walls have been constructed to a point above the surface which will contain granular fill, foundation backfilling inside the building has been placed, and utility lines have been placed and backfilled, place granular fill base for concrete slabs. Roll and tap granular fill to thoroughly compact it. Coordinate this work with concrete trade so that concrete can be placed before rain, if a sand base is used.

D. Outside of building in areas to be paved or covered by construction fill as specified above for fill within building lines.

E. Outside of building in areas where no construction or paving will be placed, place specified earth fill in loose lifts of 12" and thoroughly compact.

3.09 COMPACTION DENSITIES:

A. For all compaction, except those areas where there will be no construction or pavements:

1. If cohesion less soil is used for filling, compact to a density of 100 percent at optimum moisture condition ASTM D698-78 Standard Proctor.

2. If clay is used for filling, compact to a density of 98 percent at optimum moisture condition ASTM D1557-78 Standard Proctor.

B. For areas where no construction will be placed, compact to a density of 90 percent at optimum moisture condition ASTM D698-78 Standard Proctor.

3.10 COMPACTION TESTING:

A. While filling and compacting operations are in progress, Geotechnical Engineer will make density test at random depths and at random locations to determine adequacy of compaction. If compaction tests do not meet specified densities, take action to compact to required densities and pay for retesting to prove compaction densities.

3.11 PLACING OF TOPSOIL:

A. Place topsoil in areas disturbed by construction and not covered by paving, buildings and other hard surfaced materials.

B. When directed by Architect, scarify sub grade to a depth of 3" and spread topsoil uniformly to bring finished grade to elevations indicated after topsoil has been lightly compacted with roller. Topsoil shall be 6" thick.

C. Level and slope topsoil as indicated so that finished grades are +/- 0.1" elevations indicated.

3.12 CLEAN UP:

A. After all other work of this section is completed, leave area clean and free of any debris.

END OF SECTION

SECTION 02215
FINISH GRADING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02221: Backfilling and compaction for utilities.

B. Section 02223: Backfilling and compaction of fill.

C. Section 02650: Site concrete work.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit one 10 lb. sample of imported fill (if required), in air-tight containers, to the testing laboratory. Note: Sample submission is not required if recent test results for the source are available.

1.03 PROTECTION:

A. Protect landscaping and other features remaining as final work.

B. Protect existing site items and obstructions to remain.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Topsoil: Reuse existing on-site topsoil. If amount of existing topsoil is insufficient, import friable loam material, free of subsoil, roots, grass, excessive amount of weeds, stone, and foreign matter, and containing a minimum of 4% and a maximum of 25% organic matter.

PART 3: EXECUTION

3.01 INSPECTION:

A. Verify site conditions and note irregularities affecting work of this Section.

B. Beginning work of this Section means acceptance of existing conditions.

3.02 SUBSOIL PREPARATION:

A. Eliminate uneven areas and low spots. Remove debris, roots, branches and stones in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products.

B. Scarify to a depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.03 PLACING TOPSOIL:

A. Place in areas scheduled below.

B. Use topsoil in a relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles and contours of subgrade.

D. Remove stone, roots, grass, weeds, debris and foreign material while spreading.

E. Manually spread topsoil around trees, plants and building to prevent damage.

F. Lightly compact placed topsoil.

G. Remove surplus subsoil and topsoil from the project site.

H. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 TOLERANCES:

A. Top of topsoil: +/- 1/2 inch of desired finish elevation.

3.05 SCHEDULE OF LOCATIONS:

A. The following paragraphs identify compacted topsoil thicknesses for various locations.
   1. Seeded grass: 6 inches.
   2. Sod: 4 inches.
   3. Shrub beds: 18 inches.
   4. Flower beds: 12 inches.
   5. Planter boxes: To within 3 inches of box trim.

END OF SECTION

SECTION 02220

FOUNDATION EXCAVATING AND BACKFILLING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02010: Subsurface exploration.

B. Section 02210: Site grading.

C. Section 02221: Excavating and backfilling for utilities.

1.02 QUALITY ASSURANCE:

A. The Contractor will employ an independent testing agency to observe work and make require tests.

1.03 PROTECTION:

A. Contact Tennessee One Call **811**, Tennessee One-Call System, Inc.
Phone: 800-351-1111, Alternate: 615-366-1987, www.tnonecall.com
Prior to beginning any site work.

B. Protect utilities and other items to remain in place or previously installed work.

C. Protect excavations and grounds from water ponding and water damage. Pump as required to remove water.

1.04 VERIFICATION:

A. Lay out building lines and verify grades. Prior to excavation, building location must be staked and certified by a registered engineer acceptable to the Architect. If discrepancies exist between actual lines and elevations and those indicated on the Drawings, notify the Architect and obtain a decision before starting work.

1.05 COORDINATION:

A. Coordinate with other trades whose work will be affected by this work.

PART 2: PRODUCTS:

2.01 EARTH FILL:

A. Clean earth (free from organic material, cinders, ice and rocks over 2 inches in their longest dimension) consisting of either low plasticity clay having a plasticity index of less than 30, or a cohesionless soil with less than 15 percent passing a No. 200 sieve.

B. On-site earth removed during cutting operations may be used if it meets the above requirements as well as all codes and utility company requirements.

2.02 GRANULAR FILL:

A. Crushed or natural stone conforming to ASTM D448, size 6.

2.03 CONCRETE:

A. Refer to cast-in-place concrete Section. Use 2,500 psi concrete for filling where it is necessary to overexcavate because of soft spots.

PART 3: EXECUTION

3.01 INSPECTION:

A. Have the Geotechnical Engineer inspect all foundation excavations prior to placement of concrete.

3.02 EXCAVATING:

A. Excavate to depths indicated. If forms are required, provide sufficient space to permit erection of forms, shoring, construction and inspection.

B. Do not excavate to full depth when there is probability of frost forming or ground freezing in excavations before concrete is placed.

C. Level bottoms of trenches and excavations. Where elevation changes are required, bench excavation.

D. Foundation trenches may be cut to true size where earth is firm enough to permit it, so that concrete can be placed without forms, unless unknown conditions prohibit it.

E. Keep excavations dry by sloping ground away from holes and trenches. Furnish pumps to keep spaces clear of water, where necessary.

F. If rock is encountered during excavation, remove as necessary to provide foundation system indicated on Drawings. Dispose of excavated rock as directed by Architect.

G. When excavation reaches full depth, Geotechnical Engineer will inspect for adequacy of bearing. If Geotechnical Engineer directs, excavate to a greater depth and backfill with specified concrete. In this case, keep accurate records of materials removed and concrete placed.

3.03 BACKFILL AND COMPACTING:

A. Do not perform this work until Architect has approved foundations, masonry below grade, and other construction to be covered up.

B. Before depositing backfill, remove vegetation and other unsuitable material. Do not place backfill on subgrade that is muddy or is frozen.

C. Use caution to protect walls from unbalanced loads. Place foundation drains and waterproof walls.

D. Backfill foundation walls and all retaining walls with granular fill. Place and compact in 6" lifts to levels of adjacent grades.

E. Where backfill is placed against exterior concrete walls to a level above finished floor, place backfill to subgrade level, place vapor barrier or waterproofing, and pour slab before placing full height of backfill.

3.04 CLEAN UP:

A. Remove excess excavated materials from job site and when work is completed, leave site in a clean condition.

END OF SECTION

SECTION 02221

EXCAVATING AND BACKFILLING FOR UTILITIES

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02010: Soils investigation data.

B. Section 02210: Topsoil and subsoil removal from the site surface.

C. Section 02215: Topsoil cover of backfilled trenches.

D. Section 02220: Excavation and backfilling for structures.

E. Section 02223: Excavation, backfilling and compaction for paving.

1.02 TESTS:

A. Tests and analysis of fill materials will be performed in accordance with Section 01400 and the following.
   1. Particle size analysis of each type of soil per ASTM D 422.
   2. Liquid limits analysis of each type of soil per ASTM D 423.
   3. Plastic limit and plasticity index analysis of each type of soil per ASTM D 424.
   4. Maximum density analysis of each type of soil per ASTM D 698.

1.03 PROTECTION:

A. Contact Tennessee One Call **811**, Tennessee One-Call System, Inc. Phone: 800-351-1111, Alternate: 615-366-1987, www.tnonecall.com Prior to beginning any site work.

B. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave in or loose soil from falling into excavation.

C. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

D. Notify the Architect of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

E. Provide surface drainage to keep excavations free of water. Grade the top perimeter of excavations to prevent surface water run off into excavation. Pump if required.

F. Protect bottom of excavations and soil adjacent to land and beneath foundations from frost.

G. Protect public utilities at project site property lines to prevent damage.

1.04 QUALITY ASSURANCE:

A. Comply with requirements of Local Department of Public Works for this Work.

B. Obtain permits and notices, as required, for excavating and installing utility lines.

1.05 COORDINATION:

A. Coordinate with other trades whose work will be affected by this Work.

B. Schedule trench excavations so that those pipes passing under foundations are in place and trenches are properly backfilled before foundations are in place.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Select bed and fill materials:

1. Coarse aggregate: Pit run or crushed natural stone, free from shale, clay, friable materials and debris, graded in accordance with ASTM C 136 within the following limits:

Sieve Size	Percent Passing
2 inch	100
1 inch	95
3/4 inch	95 to 100
5/8 inch	75 to 100
3/8 inch	55 to 85
No. 4	35 to 60
No. 16	15 to 35
No. 40	10 to 25

2. Fine aggregate: Clean natural or manufactured sand, washed, free of silt, loam, friable or soluble materials, and organic matter, graded in accordance with ASTM C 136 within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 14	10 to 100
No. 50	5 to 90
No. 100	4 to 30
No. 200	0

B. Earth fill:
   1. Clean selected earth free from organic material, cinders, ice, and rocks over 2 inches in their longest dimension. Material removed in course of excavation may be used if this criteria is met.

   2. If material from off site is required, have it tested by the Owner's Testing Agency before bringing material on site.

C. Lining felt: Roofing felt, weighing 15 lbs../100 sq. ft.

D. Straw: Clean coarse straw. At Contractor's option, slater's felt or heavy Kraft paper may be used instead of straw.

PART 3: EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours and datum. Coordinate with Section 01000.

3.02 EXCAVATION

A. General:
   1. Make excavations sufficiently wide to enable installation of utilities and allow inspection.
   2. Hand trim excavation and leave free of loose matter.
   3. Remove lumped subsoil, boulders and rock.
   4. Depths:
      a. Outside of building: Unless otherwise indicated, excavate to a depth which will allow placement of pipes below frost line, but in no case less than 2 feet below finished grade.
      b. Inside of building: See below for depths for different items. Where trenches cross foundations, excavate to a depth which will allow placement of tops of pipes at least 1 foot below the bottoms of foundations.
   5. When excavation is in rock, over excavate at least 6 inches and backfill with sand for bedding. Keep accurate records of rock removed and have records certified by the Soils Engineer.
   6. Do not allow excavation to interfere with normal 45 degree bearing splay of foundations.
   7. Correct unauthorized excavation at no cost to the Owner.
   8. Fill over excavated areas under pipe bearing surfaces in accordance with direction by the Architect.
   9. Provide separate trenches for sewers and water lines. Where sanitary sewer lines and water supply lines will be within three feet of each other, and wherever they cross, place sewer lines at least one foot below water lines.

10. Stockpile excavated material in an area designated on the site. Keep material separate from materials stockpiled for reuse as backfill for structures and lawn areas. Remove excess materials from the site.
11. Do not allow any pipe to be laid in wet, muddy, or frosty trenches.

B. Trenches:
1. Bell and spigot type piping:
   a. Excavate trenches wide enough to allow for jointing, bedding ,and visual inspection of at least the top half of each side of pipe, measuring from top center line.
   b. Excavate to a depth below fill aggregate, or furrowed out in fill aggregate, as applicable, so that the tops of all piping is at least 1 foot below bottoms of concrete slabs.
   c. For sewer and drain lines, unless otherwise indicated, establish uniform rates of fall so that lines will have drop of 1/8 inch per foot inside of building, and 1/8 inch per foot outside of building.
   d. Excavate so that bottom is uniformly smooth, and with bell holes so that the barrel of each length of pipe is fully supported.
2. Copper pipe, PVC pipe, and electrical conduit:
   a. Excavate to a depth below fill aggregate, or furrow out fill aggregate, as applicable, so that tops of all piping is at least 6 inches below bottoms of concrete slabs after bedding is done.
   b. In earth below fill aggregate, excavate to a depth of at least 6 inches below bottoms of pipes in final position and backfill with sand. Tamp sand to settle it and provide a smooth surface to uniformly support pipes.
   c. In furrowed fill aggregate, line trenches with a layer of roofing felt. Place at least 3 inches of sand on top of felt and tamp it smooth.
   d. Trenches may be narrow provided materials to be installed can be properly bedded, connected, and inspected.

C. Pit excavation:
1. Excavate pits for items such as, but not limited to, manholes, catch basins, and grease traps to depths required for proper installation of items.
2. Make bottoms smooth and level.
3. Over excavate sides of pits enough to provide space for construction of forms or masonry work, as required, and for proper installation and inspection.

3.03 INSPECTION:

A. Verify that stockpile fill to be reused is approved.

B. Verify that foundation drainage installation has been inspected.

C. Verify that adjacent construction is braced to support surcharge forces imposed by backfilling operations.

D. Verify areas to be backfilled are free of debris, snow, ice or water, and that ground surfaces are not frozen.

3.04 BACKFILLING:

A. General:
1. Do not backfill until lines are installed, tested, and approved.
2. Support pipe and conduit during placement and compaction of bedding fill.
3. Backfill to contours and elevations. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet or spongy surfaces.
4. Place and compact fill materials in continuous layers not exceeding 6 inches loose depth.
5. Employ a placement method so not to disturb or damage perimeter drainage and dampproofing, as applicable.
6. Maintain optimum moisture content of backfill materials to attain required compaction density.
7. Remove surplus backfill materials from the site.
8. Leave stockpile areas completely free of excess fill materials.

B. Piping outside of building:
1. Cast iron, vitreous clay and concrete pipe:
a. In lawn areas, backfill with aggregate to 6 inches below adjacent grades. Place a thin dense layer of straw and finish backfilling to level of adjacent grades with tamped earth fill.
b. In areas to be paved or covered by other construction, backfill with aggregate to level of adjacent grades. Work aggregate along sides and under bottom half of pipes to fully support them; then place fill on top of pipes in 8 inch lifts and tamp each lift to compact it.
2. Copper PVC and electrical conduit: Backfill with sand to a depth of at least 6 inches over tops of pipes. Backfill and compact along sides and bottoms of pipes to fully support them. Tamp sand to compact it. After sand has been tamped, backfill as follows:
a. In lawn areas, backfill with aggregate to 6 inches below adjacent grades. Place a thin dense layer of straw and finish backfilling to level of adjacent grades with tamped earth fill.
b. In areas to be paved or covered by other construction, backfill with aggregate to level of adjacent grades. Work aggregate along sides and under bottom half of pipes to fully support them; then place fill on top of pies in 8 inch lifts and tamp each lift to compact it.

C. Piping inside of building:
   1. Cast iron pipe:
      a. In earth: Backfill with aggregate to level of adjacent grades.
      b. In fill aggregate: Backfill with aggregate to level of adjacent fill on each side.
   2. Copper, PVC and electrical conduit:
      a. In earth: Backfill with sand to a depth of at least 6 inches over tops of pipes. Work along sides and bottoms of pipes to fully support them. Tamp sand to compact it. Backfill with aggregate to level of adjacent grades.
      b. In fill aggregate: Backfill over the top of pipe with sand at least 3 inches deep after it is tamped. Backfill with aggregate to level of adjacent fill on each side.

D. Backfilling pits:
   1. Do not backfill pits until installed items have been completed and tested.
   2. Concrete masonry and cast iron items: Backfill with coarse aggregate. Place aggregate in one foot layers and compact each layer after it is placed.
   3. Where items are placed in lawn areas, fill with aggregate to 12 inches below adjacent grades, cover with straw or paper, and finish backfilling to grade with earth fill. Tamp and compact earth fill to the same density as adjacent grade materials.
   4. Where items are placed in areas covered by paving or other hard surfaced construction, fill with coarse aggregate to existing grades.

3.05 TOLERANCES:

A. Top surfaces of backfilling: +/- 1 inch.

3.06 COMPACTION:

A. Earth fill: Compact to 95% Standard Proctor (ASTM D698).

B. Aggregate fill: Tamp each lift thoroughly.

3.07 CLEAN UP:

A. After all other work of this Section is completed, leave area clean and free of any debris.

B. After backfill is completed, remove excess fill materials from job site.

END OF SECTION

SECTION 02223

EXCAVATING AND BACKFILLING FOR PAVING AND APPURTENANCES

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02010: Soils investigation data if applicable.

B. Section 02210: Topsoil and subsoil removal from the site surface.

C. Section 02220: Excavation and backfilling for structures.

D. Section 02221: Excavation and backfilling for utilities.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit two test reports, completed by the Contractor's testing agency, for each type of fill material.

1.03 PROTECTION:

A. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave in or loose soil from falling into excavation.

B. Notify the Architect of unexpected subsurface conditions and discontinue affected work until notified to resume work.

C. Protect bottom of excavations and soil adjacent to land and beneath foundations from frost.

D. Grade top perimeter of excavation to prevent surface water run off into excavation.

E. Contact Tennessee One Call **811**, Tennessee One-Call System, Inc. Phone: 800-351-1111, Alternate: 615-366-1987, www.tnonecall.com Prior to beginning any site work.

1.04 QUALITY ASSURANCE:

A. The Contractor will employ an independent testing agency to observe work and make tests required. The agency will:
   1. Determine particle size of each type of soil per ASTM D 422.

2. Determine liquid limits of each type of soil be ASTM D 423.
3. Determine Plastic Limit and Plasticity Index of each type of soil by ASTM D 424.
4. Determine maximum density of each type of soil be ASTM D 1557.
5. Perform a minimum of one field test for each 2500 square feet of fill placed per lift including trenches in accordance with ASTM D 1556.
6. Check excavated areas and make tests to establish load bearing capacity.

PART 2: PRODUCTS

2.01 SELECT FILL MATERIALS:

A. Aggregate fill: Clean sand, free from organic material and other material considered deleterious, and conforming to the following gradation:

U.S. Sieve	Percent Passing
1.5 inches	100
No. 4	75 to 100
No. 200	0 to 10

B. Structural fill: Clean selected silty sand, clay, silty clay, or sandy clay with a plasticity index of less than 20, and free of organic material, cinders, ice, or rocks or other particles over 2 inches in their longest dimension, or a cohesionless soil.

C. Earth fill:
1. Clean earth (free from organic material, cinders, ice, and rocks over 2 inches in their longest dimension), low plasticity clay having a plasticity index of less than 20.
2. On site earth removed during cutting operations may be used if it meets the above requirements.

PART 3: EXECUTION

3.01 PREPARATION:

A. Identify required lines, levels, contours and datum. Coordinate with Section 01000.

3.02 EXCAVATION:

A. Excavate a minimum as required by the testing laboratory to ensure removal of all non compactable material as determined by the method described below.

B. Remove lumped subsoil.

C. Correct unauthorized excavation at no cost to the Owner.

D. Fill over excavated areas under areas to be covered with pavement, walks and other appurtenances in accordance with direction by the Architect.

E. Stockpile excavated material in area designated on the site and remove excess subsoil not being reused from the site.

3.03 FIELD QUALITY CONTROL:

A. Provide for visual inspection of bearing surfaces by testing agency personnel.

B. Proof rolling:
   1. Areas to be proof rolled: Areas to be covered by paving and other appurtenances.
   2. Vehicle: A loaded rubber tired tandem axle dumptruck having a single axle weight of approximately 30,000 lbs. or a roller having a footprint equivalent to that weight.
   3. Observation: Run vehicle at normal walking speed so that the testing agency personnel may observe the ground under and around the vehicle at all times. Testing personnel will:
      a. Conduct additional tests they deem necessary to determine existing conditions.
      b. Direct remedial actions they deem necessary.
      c. Cut out soft areas of subgrade not readily capable of compaction and other areas identified by testing agency personnel. Backfill with structural fill, and compact to density equal to requirement for subsequent backfill material, as specified in Soils Investigation Report.
      d. Keep records as specified in Section 01000 and have the records verified by testing agency personnel.

3.04 BACKFILLING:

A. Backfill to required subgrade elevations. Use unfrozen materials.

B. Backfill systematically, as early as possible, to allow maximum time to natural settlement. Do not backfill over porous, wet or spongy subgrade surfaces.

C. Place and compact fill materials in continuous layers not exceeding 6 inches loose depth.

D. Employ a placement method so not to disturb or damage foundation drainage, foundation dampproofing or waterproofing as applicable and utilities in trenches.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

3.04 TOLERANCES:

A. Top surface of backfilling: +/- 1 inch.

3.05 COMPACTION TESTING:

A. Compaction testing will be performed in accordance with ASTM D 1557. A minimum of one field test for each 2,500 square feet of fill placed per lift, including trenches, will be performed.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.

3.06 SCHEDULE OF LOCATIONS:

A. The paragraphs below identify location, fill material to be used (identified from lower to upper fill material), compacted thickness of each fill, and compaction expressed as a percentage of maximum density and optimum moisture in comparison with soil proctor specified above.

B. Paved areas: Engineered fill compacted to 95% of its modified proctor dry density.

C. Lawn areas: Engineered fill compacted to 90%.

END OF SECTION

SECTION 02250

TERMITE CONTROL

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02220: Backfill materials

1.02 QUALITY ASSURANCE:

A. Applicator: Company specializing in soil treatment for termite control with five years documented experience.

B. Materials: provide certification that toxicants comply with specified requirements.

C. Material packaging: Manufacturer's labels and seals identifying content.

1.03 REGULATORY REQUIREMENTS:

A. Comply with state requirements for application licensing and authority to use toxicant chemicals.

1.04 PRODUCT DATA:

A. Submit product data in accordance with Section 01300.

B. Indicate toxicants to be used, composition by percentage, dilution schedule, and intended application rate.

C. Submit manufacturer's installation instructions.

1.05 PROJECT RECORD DOCUMENTS:

A. Submit documents in accordance with Section 01700.

B. Accurately record moisture content of soil before treatment, date and rate of application, areas of application, diary of meter readings and corresponding soil coverage.

1.06 WARRANTY:

A. Provide five year bonded guaranty for material and installation in accordance with Section 01700.

B. Bonded Guaranty: Cover against invasion or propagation of subterranean termites, damage to building or building contents caused be termites; repairs to building or building contents so caused.

C. Inspect work annually and report in writing to the Owner.

D. Owner reserves the right to renew bonded guaranty for an additional five years.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Toxicant chemical: Water based emulsion, uniform composition, synthetic dye to permit visual identification of treated soil, of the generic chemical aldrin, chlorpyrifos, or heptachlor.

2.02 MIX DILUTION:

A. Dilute toxicant chemical to a 1% solution.

PART 3: EXECUTION

3.01 INSPECTION:

A. Verify the soil surfaces are unfrozen, sufficiently dry to absorb toxicant, ready to receive treatment.

B. Beginning of application means acceptance of soil conditions.

3.03 APPLICATIONS:

A. Apply toxicant immediately prior to installation of vapor barrier under slab on grade or finish grading outside foundation walls.

B. Apply toxicant in accordance with manufacturer's instructions.

C. Apply extra treatment to structure penetrations, pipe, ducts, and other soil penetrations.

D. Apply as a coarse spray to ensure uniform distribution.

E. Coordinate soil treatment at foundation perimeter with finish grading and landscaping work to avoid disturbance or treated soil. Retreat disturbed treated soil.

3.03 RETREATMENT:

A. If inspection identifies the presence of termites, retreat soil and retest.

B. Use same toxicant for original treatment.

END OF SECTION

SECTION 02650
SITE CONCRETE WORK

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 02210: Preparation of subgrade.

B. Section 02223: Compacted fill.

C. Section 02584: Pavement markings.

1.02 QUALITY ASSURANCE:

A. Perform work in accordance with ACI 301.

B. Obtain materials from the same source throughout.

1.03 REGULATORY REQUIREMENTS:

A. Comply with local codes and ordinances for concrete work on public property.

1.04 TESTS:

A. Testing and analysis will be performed in accordance with Section 01400.

B. Submit the proposed mix design of each type of concrete, as applicable, to the Architect for review prior to commencement of work.

C. The Contractor's testing agency will take cylinders and perform slump and air entrainment tests, as applicable, in accordance with ACI 301.

D. Three concrete test cylinders will be taken for every 75 or less cubic yards of concrete placed each day.

E. One additional test cylinder will be taken during cold weather placement and be cured on site under the same conditions as concrete it represents.

F. One slump test will be taken for each set of test cylinders taken.

1.05 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit product data on joint filler and admixtures.

C. Submit the manufacturer's instructions in accordance with Section 01400.

PART 2: PRODUCTS

2.01 CONCRETE MATERIALS:

A. Cement: ASTM C 150 Type I portland cement, gray color.

B. Fine and coarse aggregates: ASTM C 33.

C. Water: Clean and not detrimental to concrete.

2.02 FORM MATERIALS:

A. Wood or steel form material profiled to suit conditions.

B. Joint filler: ASTM D 1751 bituminous type, 1/2 inch thick.

2.03 REINFORCEMENT:

A. Reinforcing steel: ASTM A 615 Grade 40, deformed billet steel bars, uncoated finish.

B. Welded wire fabric: ASTM A 185 plain type in flat sheets, uncoated finish.

C. Tie wire: Minimum 16 gauge annealed steel.

D. Dowels: ASTM A 615 grade 40 plain steel, uncoated finish.

2.04 ADMIXTURES:

A. Air entrainment: ASTM C 260.

B. Water reducing admixture: ASTM C 494, Type F high range (superplasticizer) water reducer.

2.05 CONCRETE MIX:

A. Mix concrete in accordance with ASTM C 94.

B. Provide concrete with a compressive strength of 4,000 psi at 28 days.

C. Do not use accelerating and set retarding admixtures.

PART 3: EXECUTION

3.01 INSPECTION:

A. Verify that compacted substrate is ready to support concrete and imposed loads.

B. Verify gradients and elevations of base are correct.

C. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION:

A. Moisten base to minimize absorption of water from fresh concrete.

B. Notify the Architect a minimum of 24 hours prior to commencement of concreting operations.

3.03 FORMING:

A. Place and secure forms to correct location, dimension and profile.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT:

A. Place reinforcement at mid height of slabs on grade.

B. Interrupt reinforcement at expansion joints.

C. Place reinforcement to achieve slab and curb alignment as detailed.

D. Provide dowelled joints at interruptions of vehicular concrete pavement with one end of dowel set in capped sleeve to allow longitudinal movement.

3.05 FORMED JOINTS:

A. Place expansion, control and contraction joints where indicated on the Drawings to correct elevation and profile. Align curb, gutter and sidewalk joints.

B. Place joint filler between concrete components and building or other appurtenances.

C. Strike control joints at 4 feet intervals of sidewalks, unless indicated otherwise on the Drawings. Control joints to extend a minimum of 1/3 way through sidewalks or curbs.

3.06 PLACING CONCRETE:

A. Place concrete in accordance with ACI 301.

B. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.

C. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

D. Place concrete to pattern indicated.

3.07 FINISHING:

A. Vehicular paving: Light broom finish.

B. Sidewalk paving: Light broom finish.

C. Curbs: Finish to resemble sanded plaster.

D. Accomplish curing in accordance with Section 03300 immediately after finishing.

3.08 FIELD QUALITY CONTROL:

A. Field inspection and testing will be performed in accordance with Section 01400.

B. Maintain records of placed concrete items. Record:
1. Date.
2. Location of pour.
3. Quantity.
4. Air temperature.
5. Test samples taken.

3.09 PROTECTION:

A. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

SECTION 02820

SEEDING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section: Finish grading.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit manufacturer's statement of analysis of the fertilizer, indicating proportions of organic and inorganic matter contained and the availability of plant food.

C. Submit sample of establishment blanket. If erosion control fabric is proposed for use, submit catalog data for fabric. Include data and sample of staples.

1.03 DELIVERY, STORAGE AND HANDLING:

A. Deliver seed in original unopened containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging and location of packaging. Damaged packages are not acceptable.

B. Deliver fertilizer in the manufacturer's original unopened waterproof bags showing weight, chemical analysis, and name of manufacturer. Store fertilizer off the ground in a weatherproof area.

1.03 EXISTING CONDITIONS:

A. Beginning work of this Section means acceptance of existing conditions.

PART 2: PRODUCTS

2.01 SEED:

A. Seed mixture: 90% Kentucky Blue Grass and 10% Norlea Perennial Rye.

1. Kentucky Blue Grass: Blend of varieties "Adelphi,"Glade" and "Baron."
a.90% purity.

b.80% germination.

2.02 FERTILIZER:

A. Commercial fertilizer: 10/10/10 commercial type fertilizer with 50% of the elements derived from organic sources.

B. Agricultural limestone: Finely pulverized limestone (calcium carbonate) containing at least 45% calcium oxide. Pulverize so that residue on #30 and #200 sieves is not more than 0.5% and 15% respectively.

2.03 ACCESSORIES:

A. Mulching material: Oat or wheat straw, reasonably free from weeds, foreign matter detrimental to plant life, and in dry condition. Hay or chopped cornstalks is not acceptable.

B. Weed killer: Treflan herbicide, or equal.

C. Establishment blanket: "HoldGro" erosion control fabric by Gulf States Paper Corporation, or a uniform, open weave jute matting.

PART 3: EXECUTION

3.01 PREPARATION:

A. Protect existing underground improvements from damage.

B. Remove foreign materials, plants, roots, stones and debris from the Project Site. Do not burn or bury material on the site.

C. Remove contaminated soil.

D. Cultivate topsoil to a depth of 6 inches with a mechanical tiller. Cultivate inaccessible areas by hand. Rake until surface is smooth.

E. Remove foreign materials collected during cultivation from the Project Site.

F. Grade to eliminate rough spots and low areas where ponding may occur, maintain smooth uniform grade.

G. Assure positive drainage away from buildings.

H. Finish ground level firm and sufficient to prevent sinkage pockets when irrigation is applied.

3.02 FERTILIZING:

A. Apply at a rate of 25 lbs. commercial fertilizer per 1,000 square feet, and agricultural limestone at a rate of 80 lbs. per 1,000 square feet. May be applied in one operation.

B. Do not apply grass seed and fertilizer at the same time from the same machine.

C. Lightly water to aid breakdown of fertilizer and to provide moist soil for seed.

3.03 SEEDING:

A. Apply seed with mechanical seeder at a rate of 2 1/2 lbs. per 1,000 square feet in two intersecting directions. Rake in lightly.

B. Do not sow immediately following rain, when ground is too dry, or during windy periods.

C. Roll seeded area with roller not exceeding 112 lbs.

D. Spread mulch over seeded areas at a rate of approximately one bale per 1,000 square feet.

E. Apply water in the form of fine spray immediately after each area has been sown.

F. Planting season: March 15 to May 1, or August 15 to October 1.

3.04 SEED PROTECTION ON SLOPES:

A. Cover seeded slopes where grade is 3:1 or greater with establishment blanket. Roll blanket down over slopes without stretching or pulling.

B. If erosion control fabric is used, install in accordance with the manufacturer's printed instructions. If just matting is used, install as follows:

1. Lay matting smoothly on soil surface, burying top end of each section in narrow 6 inch deep trench. Leave 12 inch overlap from top roll over bottom roll. Leave 4 inch overlap adjacent sections.

2. Staple outside edges and overlaps at 36 inch intervals.

3. Lightly dress slopes with topsoil to ensure close contact between matting and soil.

4. In ditches, unroll matting in direction of flow. Overlap ends of strips 6 inches with upstream section on top.

3.05 MAINTENANCE PERIOD:

A. Maintenance period: Until final acceptance of Project by the Owner.

3.06 MAINTENANCE:

A. Maintain surfaces and supply additional topsoil where necessary, including areas affected by erosion.

B. Water to ensure uniform seed germination and to keep surface of soil damp.

C. Apply water slowly so that surface of soil will not puddle and crust.

D. Cut grass the first time when it reaches a height of 2 1/2 inches and maintain to minimum height of 2 inches. Do not cut more than 1/3 of blade at any one mowing. Remove clippings.

E. After first mowing, water grass sufficiently to moisten soil from 3 inches to 5 inches deep.

F. Apply weed killer when weeds start developing, during calm weather when air temperature is above 50 degrees Fahrenheit.

G. Replant damaged grass areas showing root growth failure, deterioration, bare or thin spots, and eroded areas.

3.07 RESTORATION:

A. Restore pavements, concrete, other grassed areas, planted areas and structures damaged during the execution of the work in this Section.

END OF SECTION

SECTION 02835

TREES, PLANTS, AND GROUND COVER

PART 1: GENERAL

1.01 SCOPE:

B. All Trees, Plants, Groundcover and Seeding are part of the General Contractor's scope of work.

1.02 RELATED REQUIREMENTS:

A. Section 02215: Finish grading.

B. Section 02820: Seeding.

1.03 PRECAUTIONS:

A. Check site plan, architectural, mechanical, and electrical plans, and record documents, for locations of utility lines. Use caution when excavating pits and trenches for plants and when placing stakes to avoid damage to utility lines. Should such damage occur to lawns, walks, paved areas, or utilities, have repairs made by appropriate trade.

B. In the event that there is an interference between utility lines or obstructions and plant location, notify the Architect for a decision.

C. Contact Tennessee One Call **811**, Tennessee One-Call System, Inc.
Phone: 800-351-1111, Alternate: 615-366-1987, www.tnonecall.com
Prior to beginning any digging.

1.04 PLANTING SEASON:

A. Perform planting operations only during periods within the season which are normal for such work for the locale, as determined by the weather conditions and acceptable practices.

1.05 STANDARDS:

A. Comply with American Standard for Nursery Stock, published by the American Association of Nurserymen.

B. No substitutions will be allowed, except by written approval of the Architect. Should it be desirable to make substitutions, submit a letter to the Architect stating reasons and any difference in price resulting from such substitutions.

1.06 PLANT MATERIAL:

A. Quality and size:
   1. Provide plants having a habit of growth that is normal for the species which are healthy, vigorous, and equal or exceed the measurements specified on the plant list, which are the minimum acceptable sizes. Measure plant material before pruning, with branches in normal position.
   2. Accomplish necessary pruning at the time of planting.
   3. Follow requirements of the American Standard for Nursery Stock currently recommended by the American Association of Nurserymen, Inc. for measurements, branching, grading, quality, balling, and burlapping of plants. Plants that meet the requirements specified, but do not have the normal balance of height and spread typical for the respective plant, will not be accepted.

B. Substitution: Substitutions will be permitted only upon submission of proof that any plant is not obtainable and after authorization by the Architect for the use of the nearest equivalent. Such situations will be coordinated through appropriate change order.

1.07 PROTECTION:

A. Protect streets, roads, adjacent property, and other work to remain throughout the work by suitable fences or barricades. Plank concrete surfaced areas before loaded vehicles are allowed.

B. Existing trees and other vegetation:
   1. Protect trees as indicated on drawings.

C. Protecting new plant stock:
   1. Balled and burlapped plants: Provide stock dug with firm natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Provide with balls firmly wrapped with burlap or similar materials and bound with twine, cord, or wire mesh.
   2. Protection after delivery: Cover plants which cannot be planted immediately on delivery to the site with moist soil, mulch, or other protection from the drying of wind and sun. Water all plants as necessary until planted.
   3. Remove only a minimum of limbs from the crown of any trees to facilitate moving and handling. Provide clear trunk as specified after the minimum of limbs have been removed.
   4. Protect trees moved by wench or crane from chain marks, girdling, or bark slippage by means of burlap, wood battens, or other approved method.
   5. Existing trees to remain on the site will be marked by the Architect. Any existing trees that are to remain which would in any way receive damage during construction are to have a suitable barricade placed around the tree for protection purposes by the Contractor.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Topsoil: As specified in Section 02215.

B. Manure: Well-rotted, unleached cow manure, not less than six months and not more than two years old, free from sawdust, shavings, or refuse of any kind and not more than 25% straw or other material acceptable for landscape use. Submit statement to the Architect as to the kind of disinfectants, if any, that have been used in storage of or otherwise in connection with the manure.

C. Commercial fertilizer: Time released fertilizer containing the following minimum percentages: 6% nitrogen, 12% phosphorus and 12% potassium, and with the nitrogen content derived from a minimum 50% organic matter. Deliver fertilizer to the site in unopened original containers, each bearing the manufacturer's guaranteed analysis. Fertilizer that becomes caked or otherwise damaged will be rejected.

D. Sulphur: Elemental sulphur 99% derived from secondary nutrient sulphur. Where ericaceous plants are indicated, use a soil sulphur to create an acid soil condition.

E. Lime: Ground limestone containing not less than 45% of calcium oxide and ground to such a fineness that the residue on #30 and #200 sieves is not more than 0.5% and 15% respectively.

F. Peat: Horticultural peat composed of not less than 60% decomposed organic matter by weight, on an over-dried basis. Deliver peat to the site in a workable condition, free from lumps.

G. Mulch: Shredded hardwood mulch, moistened at the time of application to prevent wind displacement.

H. Herbicide: Treflan or equal.

I. Staking, guying, and wrapping materials:

1. Trees less than 10 feet in height: Two 8 foot stakes, 2-1/2 inches square or 2-1/2 inches average diameter, sound wood, treated for one half their full length with creosote or other wood preservative.
2. Trees greater than 10 feet in height: Three nominal 2 x 4 inch x 2 foot stakes treated with creosote or other wood preservative throughout.
3. Wire for guys or for fastening trees to stakes: 12 gauge, pliable, galvanized iron.
4. Hose to encase guy wires or wires used for fastening trees to stakes: Two-ply reinforced rubber garden hose.
5. Wrapping materials for tree trunks: Standard burlap, heavy tree

wrapping paper, or other approved materials.

6. Use other specific items for each of the tree planting details specified herein or indicated on the Drawings.

J. Water: Fresh, clean water, free from oil, acid, alkali, salt, and other substances harmful to plant growth. Have the water source tested prior to use to assure no contaminants.

K. Plant quality:
   1. Sound, healthy, vigorous, freshly dug, nursery grown stock free from plant diseases and insect pests or their eggs, and having healthy, normal root systems. Heeled-in stock or stock from cold storage will not be accepted.
   2. Provide plants which have been grown under climatic conditions similar to those in the locality at least 2 years unless otherwise approved by the Architect.
   3. Provide plants which have been grown in properly spaced blocks.
   4. Provide plants which have been transplanted or root pruned at least twice, and at least once in the last three years. Do not prune prior to delivery except as authorized by the Architect. The Architect will inspect root system upon delivery of plants.
   5. Container grown plants: Plants grown in containers will be acceptable as "B&B" providing that the plant has been growing in the container for at least one full growing season prior to delivery, with a maximum of two years. Use plants with sufficient root growth to hold earth intact when removing from the container, but not root-bound.

L. Measurements:

1. Measure heights and spread of plants and height of tree trunks to foliage line with the branches in their normal position. Measure caliper of trees under 4 inches in caliper 6 inches above ground. Measure caliper of trees 4 inches and over in caliper 12 inches above the ground. Lower branches of a tree need not be the height specified for the foliage line if required foliage line can be obtained by pruning. Do not prune branches to obtain the desired effect before delivery to site unless authorized by Architect.
2. Where plant list gives a range in size, provide plants of that particular variety to be an average of the low and high.
3. If plants of greater caliper or size are furnished for any plants specified, increase the diameter of ball and spread of roots proportionately.

M. Shape and form:

1. Provide plant material to be symmetrical, typical for the variety and species, and in compliance with the measurements specified in the plant list.
2. Match plants used where symmetry is required as nearly as possible.
3. If a plant is well grown with a single stem, is well shaped and bushy and has sufficient well-spaced side branches to give it weight equal to one grown with the number of canes specified in plant list, it will be an acceptable plant.

PART 3: EXECUTION

3.01 INSPECTION:

A. Have inspections of plant materials required by State and Federal Authorities made. Have executed permits and certificates that may be necessary.

3.02 DIGGING AND MOVING:

A. Plants marked "B&B" on Plant List:

1. Adequately ball and burlap with balls as specified above and of sufficient depth to incorporate all roots.
2. Do not use plants if the ball of earth surrounding its roots has been cracked or broken preparatory to or during the process of planting.
3. When burlapped plants cannot be planted immediately on delivery, set on ground and cover balls well with soil, manure, or other acceptable materials.

B. Do not cut roots within the minimum spread specified on Plant List under "Diameter" or "Spread." Handle plants so that roots are protected at all times. If delivery has been made in open vehicles, cover entire load with canvas.

C. Take care to see that canvas is not so tight as to cause heating. Mark plants properly for identification and for checking each bundle of plants. Provide each plant with a legible weatherproof label securely attached with rope or wire so as not to damage bark, break branches, or destroy natural shape.

3.03 LAYOUT:

A. Stake out location for plants and outlines for planting areas on the ground and obtain approval before excavating. Make adjustments in locations and outlines as directed. If pit or areas for planting are prepared and backfilled with topsoil to grade prior to commencement of planting operations, mark them so that when work of planting proceeds, they can be readily located.

3.04 SOIL PREPARATION:

A. Thoroughly mix soil in a relatively dry state to produce mixtures as follows:

1."B&B" plants:
   a 3 parts topsoil.
   b. I part peat moss.
   c. I part sand.
   d. If soil mix tests indicate a pH of less than 6, add sufficient lime to produce a pH of 6 to 6.5.
2. Container-grown plants:
   a. 3 parts topsoil.
   b. 1 part peat moss.
   c. 1 part sand.
   d. 1 pound of fertilizer/2 cubic yards of soil.
   e. If soil mix tests indicate a pH of less than 6, add sufficient lime to produce a pH of 6 to 6.5.
3. Ericaceous, acid-loving plants:
   a. 3 parts topsoil.
   b. 1 part peat moss.
   c. 1 part sand.
   d. 2 pounds of fertilizer/2 cubic yards of soil.
   e. If soil mix tests indicate a pH of greater than 5.5, add sufficient sulphur to produce a pH of 5 to 5.5.

B Treat all planting areas with specified herbicide according to the manufacturer's specifications.

C. Where shrubs are scheduled, prepare planting bed. Planting of shrubs in individual pits in lieu of preparing a bed is unacceptable unless specified in that manner.

D. Shrub and ground cover beds: Top-dress shrub and ground cover areas with 3 inches of topsoil raked and left in a neat, clean manner.

3.05 EXCAVATING:

A. Excavate pits circular in outline with vertical sides and to dimensions indicated.

1. Increase diameter of opening at least 12 inches greater than the diameter of the ball or the root spread.
2. Increase depth as much as necessary to accommodate a bed of topsoil and manure, not less than 4 inches deep at the bottom of each pit.
3. Set ball or roots so that they rest on bed when plant is properly set to finished grade.
4. Dispose of excess earth on site in area designated by the Architect.

B. Tree and shrub sizes: Provide minimum diameter (width) and depth of planting pit for balled and burlapped, and container-grown plants, as follows:

1. Diameter: 12 inches greater than diameter of ball or spread of roots.
2. Depth: 6 inches greater than depth of ball or roots. (Sit large, heavy shrubs directly on pit bottom to prevent settlement.)

C. Backfilling: Accomplish backfill using material specified in the typical installation details on the Drawings.

3.06 SETTING PLANTS:

A. Unless otherwise specified or directed, plant in pits and set at such a level, that, after settlement, a normal and natural relationship of the crown of plant with the growth surface will be established. Face plants to give best appearance to adjacent structures.

B. Place each plant in center of an individual pit unless otherwise directed.

C. After balled and burlapped plants are set, carefully tamp topsoil and manure under and around the base of each ball to fill voids.

1. Loosen and roll wrappings back from top of ball leaving ball unbroken.
2. Cut off excessive amounts of burlap and remove in sufficient quantity to eliminate creation of voids upon decomposition.
3. Do not pull lashing or burlap out from under the balls.

D. If container-grown plants are used, remove plants from containers in a way to

prevent damage to plant or root system.

E. Use topsoil and manure for planting. Thoroughly settle by tamping or watering. Form a shallow saucer at finished grade by forming a ridge of topsoil around edge of each pit or plant group. Use no frozen or muddy material for backfilling plant pits.

F. Finish soil in newly-planted areas so that elevation of the mulch, when settled, will be flush with the surrounding finished grades, or 2 inches below adjacent paved areas, as applicable.

3.07 PRUNING NEW PLANT MATERIALS:

A. Remove dead and broken branches from plant materials.

B. Prune to retain typical growth habit of individual plants with as much height and spread as practicable. Make all cuts with a sharp instrument flush with trunk or adjacent branch in such a manner to insure elimination of stubs.

C. Do not prune the central leader on trees. "Head back" cuts at right angles to line of growth will not be permitted. Do not pole or top trees.

D. Paint cuts over 1/2 inch with a waterproof antiseptic tree paint.

3.08 WRAPPING:

A. Wrap trees to the first branch.

3.09 GUYING TREES:

A. Guy all trees, from 1-1/2 inches and larger in caliper, in two directions with two strands of No. 12 galvanized wire attached to anchors driven below grade.

B. When securing wires to trees, cover all wires which may come in contact with any part of tree with 2-ply reinforced rubber garden hose.

C. Place guys not less than 1/3 height of tree above ground.

D. Place anchors so that guys are equally spaced and at 45 degree angles to horizon.

E. Keep guys tight until project completion.

3.10 PLANTING HEDGE PLANTS:

A. Space hedge plants evenly in row. Plant single row hedges on center line of trenches. Plant hedge for two or more rows equally distanced from the center line of trench. After planting and prior to mulching, neatly mark edges of each trench and rake soil smooth.

3.11 MULCHING:

A. After plants have been set and cultivation within groups of plants has been completed and approved, cover area within the outline of each planting pit or bed with a layer of specified mulch, 2 inches deep.

B. After placing mulch, thoroughly wet down to prevent placement by wind.

3.12 CLEAN-UP:

A. Upon completion of work, clean ground of debris, excess materials and equipment, and remove them from the premises.

3.13 PROTECTION:

A. Protect new plantings and maintain until acceptance of the landscaping as a whole.

B. Maintenance includes watering, spraying, weeding, cultivating, mulching, removal of dead material, resetting plants to proper grades or upright position, and restoration of the planting saucers and other necessary operations.

C. If planting is done after lawn preparation, provide proper protection to lawn areas and promptly repair damage resulting from planting operations.

3.14 PLANT WARRANTY AND REPLACEMENT:

A. Warrant plants for one full year after project completion.

B. At end of the warranty period, make an inspection of the planting with the Owner, at a time mutually acceptable to both parties.

C. Remove and replace plants which are not showing satisfactory growth.

D. Replace plants missing due to installation oversight as conditions permit, but during the normal planting season.

E. In case of questions regarding condition and satisfactory establishment of a rejected plant, that plant may be allowed to remain through another complete growing season. At that time, replace the rejected plant, if found in an unhealthy or badly impaired condition.

F. Replace with plants of same kind and size as specified in Plant List.

END OF SECTION

SECTION 03100
CONCRETE FORMWORK

PART 1: GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 03200: Concrete reinforcement.

B. Section 03300: Cast-in-place concrete.

1.02 WORK INSTALLED BUT FURNISHED BY OTHERS:

A. Build in anchors, inserts, bolts, hangers, sleeves, ferrules, waterstops and other accessories.

1.03 QUALITY ASSURANCE:

A. Design, construct and erect formwork per ACI 347, Recommended Practice for Concrete Formwork.

1.04 ALLOWABLE TOLERANCES:

A. In accordance with ACI 301 as listed in Table 4.3.1 - Tolerances for Formed Surfaces.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Concealed concrete: No. 2 southern pine, S4S, or better.

B. Exposed concrete: B-B plyform, Class I or II, EXT-APA, metal or fiberglass forms may be used.

C. Construction joint forms for slabs-on-grade: Key-type steel formers, Vulcan Screed Joints, Burke Keyed Kold Joint Form, Dayton Sure-Grip G-20 or equal.

D. Expansion joint filler: Asphalt impregnated, premolded fiberboard by full thickness of slab or joint. ASTM D 994.

E. Form coating: Non-staining mineral oil.

F. Form ties: Snap-off type which will break off at least 1/2" below surface of concrete. For sanitary structures, the form ties shall be of the "snap tie type," which can be removed to at least 1" below the surface leaving an opening no larger than the tie diameter, without cones. Wall ties for structures containing liquid shall have integral water stops.

2.02 EARTH FORMS:

A. Where soil is firm enough to permit cutting to true size, concrete may be placed without forms.

PART 3: EXECUTION

3.01 ERECTING:

A. Erect forms to obtain shapes, designs and dimensions indicated. Make forms sufficiently tight to prevent leakage. Brace, shore and tie forms together to maintain position without sagging or bulging.

B. Provide 3/4" chamfering at exposed corners.

C. Prepare insides of forms so that concrete will have a smooth, uniform finish, free from fins, stone pockets, voids and other surface defects.

D. Provide construction joint forms where concrete placement terminates at the end of a day or because of other reasons.

E. Provide bulkheads, with reinforcing steel penetrating bulkheads, where concrete placement stops at end of day or for other reasons.

F. Where soil conditions are such that concrete cannot be placed without forms, and where other conditions cause trenches to be opened wider than footing or slab widths, erect forms for footing or slabs.

G. Install items furnished by others for installation in concrete. Use templates to locate anchor bolts and other critical items.

3.02 PREPARING:

A. Prepare insides of forms so that concrete will have a smooth, uniform finish, free of surface defects,

B. Coat forms before reinforcement steel is placed. Where mill-oiled forming material is used, follow manufacturer's instruction for recoating. Where forming material is not mill-oiled, coat forms before each use.

C. Before reusing forms, thoroughly clean them and remove projecting nails or similar devices.

3.03 FORM REMOVAL:

A. Remove forms in such a manner and such a time as to insure safety of structure and to avoid chipping and spalling of concrete. Refer to Section 6.2 of ACI 318, Section 6.2 of the Commentary to ACI 318, and Section 3.6.2 of ACI 347 for form

removal requirements.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1: GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 03100: Concrete formwork.

B. Section 03300: Cast-in-place concrete:

1.02 SUBMITTALS:

A. Submit warranty from mill or supplier stating that materials meet requirements of referenced ASTM and ACI Standards.

B. Detail reinforcing steel in accordance with ACI 315, "Details and Detailing of Concrete Reinforcement." Submit one reproducible sepia and three prints of shop drawings indicating bending and placement of reinforcement as well as sleeve and built-in work locations. Only marked up sepia will be returned. Fabricator is responsible for making and distributing prints showing required revisions. Do not fabricate reinforcement steel until approval of Engineer has been obtained.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to project site in bundles marked with metal tags for easy identification.

B. Handle and store materials to prevent contamination.

C. Deliver and store welding electrodes in accordance with American Welding Society D1.4.

PART 2: PRODUCTS

2.01 REINFORCEMENT STEEL:

A. ASTM A615, Grade 60, conforming to supplemental requirements S1.

2.02 REINFORCEMENT WIRE:

A. Welded steel wire fabric, ASTM A 185.

2.03 BAR SUPPORTS:

A. Provide plastic coated Class I bar supports per CRSI Specifications.

2.04 OTHER SUPPORTS:

A. Concrete brick may be used to support reinforcement to obtain proper clearance from earth and rigidity of reinforcement under concreting operations for foundations only.

2.05 FABRICATING:

A. In accordance with CRSI Manual of Standard Practice, latest edition.

2.06 DETAILING:

A. Detail reinforcement per the ACI 318 and CRSI standards.

PART 3: EXECUTION

3.01 CONDITION OF SURFACES:

A. Maintain reinforcement surfaces free of rust scale and other coatings which might impair concrete bond as described in Section 7.4 of ACI 318.

3.02 INSTALLING REINFORCING STEEL:

A. Handle, place and tie reinforcement steel in accordance with "Building Code Requirements for Reinforced Concrete," ACI 318 and CRSI publication "Placing Reinforcing Bars."

B. All reinforcement bars shall be supported and secured as directed in ACI 315 and CRSI Manual of Standard Practice.

C. Provide Class C tension splices for all splices unless indicated or noted otherwise. Do no splicing of reinforcement steel except as authorized by Architect.

D. Accomplish welding in accordance with American Welding Society publication "Recommended Practices for Welding reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction," AWS D1.4 and AWS D12.1.

E. Bend bars cold. Do not field bend bars partially embedded in concrete except as specifically permitted by Architect. Do not heat or cut bars with a torch.

3.03 INSTALLING WELDED WIRE FABRIC:

A. After vapor barrier or underfloor waterproofing, as applicable, for slab-on-grade has been placed, install welded wire fabric.

B. Locate welded wire fabric in center third of slabs.

C. Lap side one full mesh plus 2". Lap ends two full meshes. Offset end laps in

adjacent width to prevent continuous laps.

3.04 CONCRETE PROTECTION FOR REINFORCEMENT:

A. Protect reinforcing by thickness of concrete indicated.

B. Variation from clear cover and depth of members shall conform to Section 7.5 of ACI 318.

END OF SECTION

SECTION 03252 PVC WATERSTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provision of waterstops embedded in concrete and spanning control, expansion, and/or construction joints to create a continuous diaphragm to prevent fluid migration.
B. Non-metallic waterstops for use in concrete joints subjected to chlorinated water, sea water, and many waterborne chemicals.

1.02 REFERENCES

A. PVC WATERSTOP
1. Corps of Engineers: CRD-C 572-74
2. American Society for Testing Materials (ASTM)
3. Bureau of Reclamation: C-902
4. Canadian General Standards Board: 41-GP-35M Types 1 & 3

1.03 QUALITY ASSURANCE

A. Waterstop manufacturer shall demonstrate five years (minimum) continuous, successful experience in production of waterstops.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store waterstops under tarps to protect from oil, dirt, and sunlight.

PART 2 PRODUCTS

2.01 MATERIALS

A. Provide flexible PVC (polyvinyl chloride) waterstop as manufactured by Greenstreak, profile style number (753 9" WIDE 3/8" THICK).

B. The PVC waterstop shall be extruded from an elastomeric plastic material of which the basic resin is prime virgin polyvinyl chloride. The PVC compound shall not contain any scrapped or reclaimed material or pigment whatsoever.

C. Performance Requirements as follows:

Property	Test Method	Required Limits
Water absorption	ASTM D 570	0.15% max
Tear Resistance	ASTM D 624	200 lb/in (35 kN/m) min.
Ultimate Elongation	ASTM D 638	350% min.
Tensile Strength	ASTM D 638	2000 psi (13.78 Mpa) min.
Low Temperature Brittleness	ASTM D 746	No Failure @ -35° F (-37° C)
Stiffness in Flexure	ASTM D 747	600 psi (4.13 Mpa) min.
Specific Gravity	ASTM D 792	1.45 max.
Hardness, Shore A	ASTM D 2240	79 $\pm$3
Tensile Strength after accelerated extraction	CRD-C 572	1850 psi (11.03 Mpa) min.
Elongation after accelerated extraction	CRD-C 572	300% min.
Effect of Alkalies after 7 days:	CRD-C 572	

Weight Change Hardness Change		between -0.10% / +0.25% +/- 5 points

2.02 ACCESSORIES

A. Provide factory made waterstop fabrications for all changes of direction, intersections, and transitions leaving only straight butt joint splices for the field.
B. Provide hog rings or grommets spaced at 12 inches on center along length of waterstop.
C. Provide Teflon coated thermostatically controlled waterstop splicing irons for field butt splices.

PART 3 EXECUTION

3.01 INSTALLATION

A. Field butt splices shall be heat fused welded using a Teflon coated thermostatically controlled waterstop splicing iron at approximately 380 degrees F. Follow approved manufacturer recommendations. Lapping of waterstop, use of adhesives, or solvents shall not be allowed.
B. Center waterstop in joint and secure waterstop in correct position using hog rings or grommets spaced at 12 inches on center along the length of the waterstop and wire tie to adjacent reinforcing steel.

3.02 FIELD QUALITY CONTROL

A. Waterstop splicing defects which are unacceptable include, but are not limited to the following:
    1. Tensile strength less than 80 percent of parent section.
    2. Misalignment of centerbulb, ribs, and end bulbs greater than 1/16 inch.
    3. Bond failure at joint deeper than 1/16 inch or 15 percent of material thickness.
    4. Misalignment which reduces waterstop cross section more than 15 percent.
    5. Visible porosity in the weld.
    6. Bubbles or inadequate bonding.
    7. Visible signs of splice separation when cooled splice is bent by hand at a sharp angle.
    8. Charred or burnt material.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1: GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

1.02 QUALITY ASSURANCE:

A. Contractor will employ an Independent Testing Laboratory approved by the Architect, to perform concrete tests. Included in the responsibilities for concrete testing are the taking, handling, protecting and storing of test specimens, and the accurate reporting of compressive strength, weight of cylinders, or content of concrete, slump, air content, and location of concrete. If the concrete fails to meet any part of the specifications, immediately notify the Architect to obtain instructions. Payment for testing will be made by the Contractor.

B. Laboratory will be required to obtain samples, in accordance with ASTM C 31 and perform compression tests per ASTM C 39; air content tests per ASTM C 138 (gravimetric method) or ASTM C 231 (pressure method); slump tests per ASTM C 143.

C. Laboratory will test one set of cylinders (6 specimens) for each 150 cubic yards, or fraction thereof, or for each 5,000 square feet of surface area for slabs or walls, whichever is smaller, of each class of concrete placed each day; two cylinders shall be tested prior to stressing post-tensioning tendons or at 7 days for concrete which is not post-tensioned, for information, and two cylinders shall be tested at 28 days for acceptance. If the cylinders tested at 28 days do not indicate proper strength, the third set of two will be tested at a later time as directed by the Engineer.

D. The strength level shall be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength f'c, and no individual test result falls below the specified strength f'c by more than 500 psi.

E. Additional tests may be required if evidence of faulty workmanship, failure of laboratory tests, or questionable concrete exists. These tests shall be paid for by the Contractor.

1.03 EVALUATION AND ACCEPTANCE OF CONCRETE:

A. Concrete strength will be evaluated by the Engineer according to the provisions of ACI 318, Section 4.7. Should evidence of low-strength concrete exist, or if test results indicate non-conformance with these specifications, additional testing, as outlined in ACI 318, Section 4.7.4 may be directed by the Engineer. The Contractor shall bear the cost of any additional testing required.

B. If, after additional testing, evidence of low-strength concrete still exists, load tests in accordance with Chapter 20 or ACI 318 may be ordered by the Engineer. In the event the concrete is determined to be inadequate by the Engineer, the Contractor will remove it from the Project and replace it with concrete conforming to these specifications subject to all testing requirements herein. All such remedial work shall be at the Contractor's expense.

C. The Contractor shall be fully responsible for insuring that all concrete and concrete placement are in accordance with the Project Specifications. Failure of Architect or Testing Laboratory to detect defective work, workmanship, or materials shall in no way prevent rejection and the Contractor taking approved corrective action when such defects are discovered. The Architect or the Testing Laboratory shall not, thereby, be obligated to make a final acceptance.

D. Contractor shall provide Testing Laboratory with assistance required to gather and store sample cylinders. On site storage of cylinders, if required, shall be provided for adequate protection of the samples.

1.04 CONCRETE QUALITY DESIGN:

A. All concrete mix designs shall be proportioned in accordance with Chapter 4 of ACI 318. Submit mix design for each class of concrete based on a standard deviation analysis or trial mixtures. If a standard deviation analysis is used, the concrete shall achieve an average strength in accordance with 4.3.2.1 of ACI 318. If trial mixtures are used, the proposed mix design shall achieve an average strength in accordance with Table 4.3.2.2 of ACI 318. Refer to Figure 4.3 of the Commentary on Building Code Requirements for Reinforced Concrete (ACI 318) for flow chart outlining this procedure. Submittals made that do not conform to Section 4.3 of ACI 318 shall be rejected.

1.05 SUBMITTALS:

A. Submit copies of the concrete mix designs with supporting data confirming compliance with ACI 318, Chapter 4 and this Specification. Indicate types and quantities of materials used, the fresh unit weight, compressive strength, slump, air content, and aggregate analysis in mix design.

B. Submit copies of certification showing that the aggregate, cement and all admixtures conform to these Specifications.

C. Submit copies of each laboratory test report indicating type of concrete furnished, compressive strength, slump, air content, and water added to concrete after batching.

D. Retain ready-mix delivery tickets at job site for inspection by Architect.

1.06 ENVIRONMENTAL REQUIREMENTS:

A. Do not place concrete when temperature is below 40°F (4.5°C), or forecasted to go below 40°F within 24 hours, unless adequate heating and protecting equipment is on hand to warm concrete. In these circumstances, use heating and protecting equipment continuously until concrete has set and for at least 72 hours after placing.

B. Perform cold weather concrete work in accordance with ACI 306R, "Cold Weather Concreting."

C. Perform hot weather concrete work in accordance with ACI 305R, "Hot Weather Concreting."

D. When high temperatures and/or placing or humidity conditions dictate, the mix may be initially retarded by use of the water reducing, retarding formulation (Type D) or the specified water reducing admixture (Type A).

1.07 REFERENCES:

A. The following references shall be obtained by the Contractor and maintained at the job site in a readable condition at all times.

B. ACI 318, Building Code Requirements for Reinforced Concrete.

C. ACI 315, Details and Detailing of Concrete Reinforcement.

D. ACI 306R, Cold Weather Concreting.

E. ACI 305R, Hot Weather Concreting.

F. ACI 302.11R, Guide for Concrete Floor and Slab Construction.

G. ACI 301 (Rev. 1981), Specifications for Structural Concrete for Buildings.

H. Manufacturer's instructions of all products required for proper use of installation of the product.

PART 2: PRODUCTS

2.01 PORTLAND CEMENT:

A. ASTM C150-81a, Type 1. Use only one brand.

B. For watertight structures the following additional limitation shall apply:
1. The cement shall contain no more than 8% tri-calcium aluminate.

2.02 FINE AGGREGATE:

A. Natural siliceous sand conforming to ASTM C 33.

B. For watertight structures, use the fine aggregate specified except Section 4.2 of ASTM C 33 shall not apply.

2.03 COARSE AGGREGATE:

A. Washed gravel or crushed stone, ASTM C 33. Size coarse aggregate in accordance with ACI 318, Chapter 3, subparagraph 3.3.3.

B. For watertight structures the following additional limitations shall apply:
1. Soft particles: 2.0% maximum.
2. Chert as a soft impurity (defined in Table 3 of ASTM C 33): 1.0% maximum.
3. Total of soft particles and chert as a soft impurity: 2.0% maximum.
4. Flat and elongated particles (long dimension more than 5 times short dimension): 15.0% maximum.

2.04 WATER:

A. Potable water, free from elements, which might adversely affect concrete, and embedded items.

2.05 ADMIXTURES:

A. Water reducing admixture: The admixture shall conform to ASTM C 494, Type A, and not contain more chloride ions than are present in municipal drinking water.

B. Water reducing, retarding admixture: The admixture shall conform to ASTM C 494, Type D, and not contain more chloride ions than are present in municipal drinking water.

C. High range water reducing admixture/superplasticizer: The admixture shall conform to ASTM C 494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.

D. Non-chloride accelerator: Accelguard 80 by the Euclid Chemical Company, Darex Set Accelerator by W.R. Grace, or PSI-HE by Gifford-Hill and Company, or equal. The admixture shall conform to ASTM C 494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.

E. Air entraining admixture: Conforming to ASTM C 260.

F. Calcium chloride: Calcium chloride or admixtures containing more than 0.05% chloride ions are not permitted.

G. Certification: Written conformance to requirements stated above and the chloride ion content will be required from the admixture prior to mix design review by the Engineer.

2.06 FLY ASH:

A. Shall conform to ASTM C 619, Class F, with loss on ignition of less than 5%.

2.07 READY MIX CONCRETE:

A. In accordance with ASTM C 94.

B. Strength: As specified on the Structural Drawings.

C. Air content: Provide entrained air in accordance with ACI 302.1R, Table 5.2.7a within tolerances specified. All interior slabs subject to abrasion shall have a maximum air content of 3%.

D. Water-cement ratio: All concrete exposed to freezing and thawing shall have a maximum water-cement ratio of 0.50. All concrete subjected to deicers and/or required to be watertight shall have a maximum water-cement ratio of 0.45.

E. Slump: All concrete containing the high range water reducing admixture (superplasticizer) shall have a maximum slump of 8" unless otherwise approved by the Engineer. The concrete shall arrive at the job site at a slump of 2" to 3", be verified, then the high range water reducing admixture added to increase the slump to the approved level.

F. All other concrete shall have a maximum slump of 3" for slabs and 4" for other members.

G. Maximum water soluble chloride ion concentrations in hardened concrete at an age of 28 days contributed from the ingredients including water, aggregates, cementitious materials and admixtures shall not exceed the limits established in Table 4.5.4 of ACI 318.

H. Admixtures: All concrete shall contain the specified water reducing admixture or high range water reducing admixture (superplasticizer). At the Contractor's option, both water reducing admixtures may be included in the concrete mix. All concrete slabs placed at air temperatures below 50°F shall contain the specified non-chloride accelerator. All concrete required to be air entrained shall contain the approved air entraining admixture. All pumped concrete, architectural concrete, concrete for industrial slabs and parking decks and concrete with a water-cement ratio below 0.50 shall contain the specified high range water reducing admixture (superplasticizer).

2.08 VAPOR BARRIER:

A. 6 mil polyethylene sheeting conforming to ASTM E 154.

2.09 BOND BREAKER:

A. 30# and 90# asphalt saturated roofing felt.

2.10 EXPANSION JOINT FILLER:

A. Use ceramar flexible foam expansion joint filler by W.R. Meadows or approved equal at locations indicated on the Drawings.

2.11 CURING AND SEALING COMPOUND:

A. Cure concrete per ACI 308. Keep the concrete surface moist. An acrylic cure and seal compound with a minimum solid content of 30% may be used at the Contractor's option per ASTM C 309 and applied per manufacturer's recommendations to surfaces of concrete not protected for five days by formwork. Do not use curing compound in areas that receive material that does not adhere to concrete cured with a curing compound.

2.12 SHEET MATERIAL FOR CURING CONCRETE:

A. Waterproof paper or polyethylene film as per ASTM C 171.

2.13 BONDING COMPOUND:

A. Euco Weld by the Euclid Chemical Company, Welcrete by the Larsen Company, or Everbond by L&M Construction Chemicals, or approved equal.

2.14 EPOXY ADHESIVE:

A. Euco Epoxy #463 or #615 by the Euclid Chemical Company, Epobond by L&M Construction Chemicals, Sikadur Hi-Mod by Sika Chemical Corporation, or Concresive 1001-LPL by Adhesive Engineering Company, or equal. The compound shall be a two (2) component, 100 percent solids, 100 percent reactive compound suitable for use on dry or damp surfaces.

2.15 NON-SHRINK GROUT:

A. Firmix (metallic) or Euco NS (non-metallic) by the Euclid Chemical Company, Embeco 636 (metallic) and Masterflow 713 (non-metallic) by Master Builders, or Crystex by L&M Construction Chemicals, Five Star Grout by U.S. Grout Corporation, or equal. The grout shall conform to CRD-C-621, "Corps of Engineers Specification for Non-Shrink Grout".

PART 3: EXECUTION

3.01 FIELD QUALITY CONTROL:

A. As concrete is delivered, a Testing Laboratory will take three sets of two cylinders per set from each 150 cubic yards, or fraction thereof, or for each 5,000 square feet of surface area for slabs and walls, whichever is smaller, of each type of concrete placed each day. In addition, laboratory will take small batches of the same concrete used for making cylinders for making slump tests and air entrainment tests. Assist the laboratory in taking samples and furnish concrete required for making tests.

3.02 CONDITION OF SURFACES:

A. Notify the testing laboratory at least 48 hours before starting concrete placement. Placement may proceed provided no defective workmanship or materials are detected by inspecting personnel.

B. Place no concrete until reinforcement and other embedded items are positioned and secured.

C. Forms, surfaces, and trenches shall be free from water, mud, ice, frost and debris when concrete is placed.

D. Wet surfaces before placing concrete.

3.03 VAPOR BARRIER:

A. Place vapor barrier under all slabs placed on earth or aggregate. Place smoothly, without wrinkles and trapped air. Lap side and end joints at least 6" (15 cm) and weight down sheeting to avoid blowing. Turn vapor barrier up 4" (10 cm) at vertical surfaces. Keep unnecessary traffic off of vapor barrier. Note areas on Drawings where 3" of damp sand is required prior to concrete placement.

3.04 BOND BREAKERS:

A. Where separation from a vertical surface is desired, place 12" wide strips of 30# felt, creased at a right angle in the long direction, at all vertical surfaces, except where fiberboard is to be installed. Turn up on vertical surfaces for full thickness of concrete.

B. Where floor slabs bear on tops of foundations, place a 90# strip of felt, full width of bearing surfaces, on all bearing surfaces.

3.05 PRODUCTION OF CONCRETE:

A. Produce concrete in accordance with Chapter 7 of ACI 301 for ready-mixed concrete.

3.06 PLACING CONCRETE:

A. Prepare place of deposit and equipment. Convey and place concrete in accordance with ACI 301, Chapter 8, Paragraphs 8.1 through 8.3. Certain parts of those paragraphs are modified below, and where modifications conflict with those paragraphs or add additional instructions they should take precedence over the printed paragraphs or ACI 301.

B. Variation from clear cover and depth of members shall conform to Section 7.5 of ACI 381.

C. Deposit concrete within 1-1/2 hour after water is added to dry batching, or use retarding admixture.

D. Convey concrete promptly to point of use in a manner which will prevent separation of ingredients and loss of water. Deposit concrete near its final position to avoid rehandling.

E. Consolidate concrete, including floor slabs, in accordance with ACI 309, "Recommended Practice for Consolidation of Concrete." All concrete shall be vibrated. Maintain at least one vibrator as a stand-by. Lower frequency vibrators may be used with "flowing" concrete.

F. Do not use vibrators to cause concrete to flow.

G. Concrete column pour shall not extend more than 3/4 inch into the concrete slab. Chip off any concrete that exceeds this dimension.

3.07 CONSTRUCTION JOINTS AND EMBEDDED ITEMS:

A. Construction joints and embedded items shall conform to Chapter 6 of ACI 301. Location of all construction joints shall be approved by the Engineer.

3.08 FINISHING:

A. After placing concrete, screed to levels and slopes indicated. Do not use tamping tools to force aggregate away from surface.

B. When the water sheen has disappeared, use a wood float to bring concrete to a true level or slope as indicated. Depressions between high spots shall not exceed 5/16" under a 10' straightedge after floating, but before troweling.

C. Where troweled finish is required, after concrete has hardened sufficiently to bear a man's weight without imprint, trowel with power and hand tools. Remove small imperfections left by troweling machine and bring to a smooth, dense, polished finish by hand troweling. Continue troweling until a ringing sound is produced as the trowel is moved over the surface.

D. Do not use dry materials such as sand and cement on surface during finishing.

E. Do not use any procedures, such as the addition of water to the concrete surface, that produces a layer of weak material with an increased water-cement ratio at the slab surface.

F. Maximum allowable variation in troweled surfaces should be such that depressions between high spots should not exceed 3/16" under a 10' straightedge.

G. Where floors are to be covered with thin set tile, trowel as specified above and them broom surfaces to form a "tooth".

3.09 CURING:

A. As finished work is completed, begin curing. Curing may be accomplished by either of the methods described below, except for items specifically designated for a particular method.

B. Waterproof paper or plastic film curing: Cover damp surfaces with film or paper and lap at edges at least 4". Apply weights to prevent displacement. Repair

tears and punctures as they occur.

C. All interior slabs with resilient tile, carpet or left exposed and all exterior slabs, sidewalks, curbs, etc. shall be cured with the specified clear curing and sealing compound. The compound shall be applied immediately after final finishing operations are completed. Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas which are subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

D. Do not use curing and sealing compounds on surfaces receiving applied finishes other than resilient tile or carpet.

E. Where forms are left in place, keep forms damp by spraying at frequent intervals for at least 8 days. Do not allow forms to dry out.

3.10 PROTECTION:

A. Protect concrete against traffic for at least 48 hours. Erect barriers as necessary to protect uncured areas. Provide wood covers to protect concrete step-ups from all construction traffic.

B. Protect concrete from paint and other stains, and from abrasive traffic.

3.11 PATCHING:

A. After forms are removed do not patch or repair, except that fins may be removed back to formed surfaces, until Architect has examined the work. After inspection by Architect, patch voids, honeycombs, spalls, chips, as directed.

B. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete, but in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Before placing cement mortar thoroughly clean, dampen with water and apply the specified bonding compound. The cement mortar shall be placed after the bonding compound has dried.

C. Rub exposed interior finished concrete as specified above. Where form marks and fins detract from appearance or are otherwise objectionable remove them by rubbing.

D. All structural repair shall be made with prior approval of the Engineer, as to method and procedure, using the specified epoxy adhesive and/or epoxy mortar.

3.12 GROUTING:

A. All column base plates, equipment bases, and other locations noted on the structural drawings, shall be grouted with the specified non-shrink grout. All exposed grout shall be the specified non-metallic type.

B. After steel columns have been erected and shimmed to proper height, grout under column base plates with specified grout.

3.12 CLEAN UP:

A. Clean up and leave concrete work free from any loose material. Remove any mortar spills from floors or other materials. Leave areas free from any debris.

B. Remove excess material and equipment from site when work is completed.

END OF SECTION

SECTION 03460
PRECAST SPLASH BLOCKS

PART 1: GENERAL

1.01 SUBMITTALS

A. Make submittals in accordance with Section 01300.

B. Submit shop drawings indicating size and shape.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Splash blocks: Precast concrete splash blocks approximately 12" wide d 24" long with 1" upturn on two sides and one end.

PART 3: EXECUTION

3.01 INSTALLATION:

A. Place splash blocks where indicated on the Drawings and in such a manner as to function properly.

END OF SECTION

SECTION 03600

NON-SHRINK GROUT

PART 1: GENERAL

1.01 WORK INCLUDED:

A. Provide non-shrink grout indicated on the Plans, described in these Specifications, or otherwise required for proper completion of the Work.

1.02 RELATED WORK DESCRIBED ELSEWHERE:

A. Section 01300: Submittals.

B. Section 01400: Testing and inspection.

1.03 REFERENCED SPECIFICATIONS, STANDARDS AND CODES:

A. U.S. Corps of Engineers: CRD-C 621 Specification for Non-shrink Grout.

B. American Society for Testing and Materials: ASTM C 109 Standard Method of Test for Compressive Strength of Hydraulic Cement Mortars.

1.04 COMPRESSIVE STRENGTH:

A. Compressive strengths of grout shall be 3,000 psi at 3 days, 5,000 psi at 7 days and 7,000 psi at 28 days.

1.05 MANUFACTURER'S SPECIFICATIONS:

A. Comply with the manufacturer's specifications. Submit 5 copies of the product data sheets for review.

PART 2: PRODUCTS

2.01 GROUT:

A. Provide Master Builder's "Embeco 636 Grout".

2.02 WATER:

A. Provide clean water.

PART 3: EXECUTION

3.01 HANDLING:

A. Deliver, store, and protect non-shrink grout from moisture and contamination.

3.02 CLEANING:

A. Remove mud, dirt and other foreign materials from areas to be grouted.

3.03 MIXING:

A. Mix grout to its fluid, self-leveling consistency. Do not add sand, cement, or other aggregates to grout. Do not retemper grout. Do not exceed manufacturer's maximum limit on water content or use at a consistency which produces free blending. Mix grout in a paddle-type mortar mixer. Do not mix by hand.

3.04 NOTICE:

A. Notify Testing Agency 24 hours prior to grouting.

3.05 CONSOLIDATION:

A. Consolidate grout to provide uniformity. Do not vibrate grout.

3.06 PROTECTION:

A. Protect grout and areas to be grouted from excessive heat and cold per manufacturer's specifications. Protect grout from excessive drying shrinkage resulting from wind or direct sunlight. Protect areas grouted from excessive vibrations for three days.

3.07 COMPRESSIVE STRENGTH TEST:

A. Determine compressive strength tests per ASTM C 109 with 2" x 2" cubes. Perform test per Master Builders Form TR-G-CS. Test one cube at 3 days, two cubes at 7 days and three cubes at 28 days. Perform one test for each ten bags of grout used or one test per day of grouting.

END OF SECTION

SECTION 04000
ARCHITECTURAL CONCRETE MASONRY UNITS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Smooth colored architectural concrete masonry units,

B. Spit faced colored scored concrete masonry units.

C. Reinforced concrete masonry units.

1.2 RELATED SECTIONS

A. Section 05500 - Loose Steel Lintels.

B. Section 07200 - Thermal Protection.

1.3 REFERENCES

A. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2001.

B. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2001.

C. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2001.

D. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength; 2000.

E. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2001.

F. ASTM C 90 - Standard Specification for Load-bearing Concrete Masonry Units; 2001.

G. ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units; 2001.

H. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar; 1999.

I. ASTM C 150 - Standard Specification for Portland Cement; 2002.

J. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes; 1991 (re-approved 1997).

K. ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2001.

L. ASTM C 270 - Standard Specification for Mortar for Unit Masonry; 2001.

M. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout; 1997.

N. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2001.

O. ASTM C 476 - Standard Specification for Grout for Masonry; 2001.

P. ASTM C 744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 1999.

Q. ASTM D 1056 - Standard Specification for Flexible Cellular Materials -- Sponge or Expanded Rubber; 2000.

R. ASTM D 2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging; 1999.

S. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.

T. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials; 2000.

U. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2000.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's product data for each type of masonry unit, accessory, and other manufactured products.

C. Compliance: Certifications that each type complies with specified requirements.

D. Color Selection: For initial selection submit:
1. Unit masonry samples showing full extent of colors and textures available for each type of exposed unit masonry required.
2. Colored mortar samples showing full extent of colors available.

E. Samples: For verification purposes submit:
1. Samples for each type of exposed masonry unit specified, including full range of color and texture to be expected in completed work.
2. Colored masonry mortar samples for each color required. Show full range of color which can be expected in finished work; label samples to indicate type and amount of colorant used.

1.5 QUALITY ASSURANCE

A. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies, equivalent thickness, whose fire endurance has been determined in compliance with ASTM E 119 by means acceptable to authorities having jurisdiction.

B. Mock-Ups:
1. Before installation of masonry work, erect sample wall panels:
   a. To further verify selections made for color and texture characteristics under sample submittals of masonry units and mortar.
   b. To represent completed masonry work for qualities of appearance, materials, construction, and workmanship.
2. Erect mock-ups approximately 6 feet (1829 mm) long by 4 feet (1219 mm) high by full thickness, for the following types of masonry, including face and back-up wythes as well as accessories:
   a. Each type of exposed unit masonry work.

b. Typical exterior wall.
c. Typical interior wall.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry materials to project in undamaged condition.
1. Deliver Architectural Masonry Units on wood pallets, packaged with protective cushions between all architectural block layers to eliminate chipping; protect each pallet with a plastic cover.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, or other causes.

C. Store cementitious materials off the ground, under cover, and in a dry location.

D. Store and protect aggregates where grading and other required characteristics can be maintained.

E. Store masonry accessories, including metal items, to prevent deterioration by corrosion and accumulation of dirt.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not lay masonry units that are wet or frozen.

B. Remove ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

C. Remove masonry damaged by freezing conditions.

D. Mortar: Heat mortar materials while masonry work is progressing, maintaining mixing temperature selected within 10 degrees F (6 degrees C); temperature ranges below apply to air temperature at time of installation.
1. 40 Degrees to 32 Degrees F (4.5 Degrees to 0 Degrees C): Heat mixing water to produce mortar temperature between 40 degrees and 120 degrees F (4.5 degrees and 49 degrees C).
2. 32 Degrees to 25 Degrees F (0 Degrees to Minus 4 Degrees C):
a. Heat mixing water and sand to produce mortar temperature between 40 degrees and 120 degrees F (4.5 degrees and 49 degrees C).
b. Maintain temperature of mortar on boards above freezing.
3. 25 Degrees to 20 Degrees F (Minus 4 Degrees to Minus 6.7 Degrees C):
a. Heat mixing water and sand to produce mortar temperature between 40 degrees and 120 degrees F (4.5 degrees and 49 degrees C).
b. Maintain temperature of mortar on boards above freezing.
c. Heat both sides of walls under construction using salamanders or other heat sources.
d. Use windbreaks or enclosures when wind exceeds 15 mph (24 km/h).
4. 20 Degrees F and Below (Minus 6.7 Degrees C and Below):
a. Heat mixing water and sand to produce mortar temperature between 40 degrees and 120 degrees F (4.5 degrees and 49 degrees C); do not heat mixing water to above 160 degrees F (71 degrees C).
b. Heat masonry units to above 20 degrees F (6.7 degrees C) at time of laying.
c. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 degrees F (4.5 degrees C) for 24 hours after laying units.

E. Grout: Heat grout materials while masonry work is progressing, maintaining mixing

temperature selected within 10 degrees F (6 degrees C); temperature ranges below apply to anticipated minimum night temperatures.

1. 40 Degrees to 32 Degrees F (4.5 Degrees to 0 Degrees C): Follow normal masonry procedures.
2. 32 Degrees to 25 Degrees F (0 Degrees to Minus 4 Degrees C): Heat grout materials to 90 degrees F (32 degrees C) to produce in-place grout temperature of 70 degrees F (21 degrees C) at end of work day.
3. 25 Degrees to 20 Degrees F (Minus 4 Degrees to Minus 6.7 Degrees C):
   a. Heat grout materials to 90 degrees F (32 degrees C) to produce in-place grout temperature of 70 degrees F (21 degrees C) at end of workday.
   b. Heat both sides of walls under construction using salamanders or other heat sources.
   c. Use windbreaks or enclosures when wind exceeds 15 mph (24 km/h).
4. 20 Degrees F and Below (Minus 6.7 Degrees C and Below):
   a. Heat grout materials to 90 degrees F (32 degrees C) to produce in-place grout temperature of 70 degrees F (21 degrees C) at end of work day; do not heat mixing water to above 160 degrees F (71 degrees C).
   b. Heat masonry units to above 20 degrees F (6.7 degrees C) at time of laying.
   c. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 degrees F (4.5 degrees C) for 24 hours after laying units.

F. Protect completed masonry and masonry not being worked on in the following manner. For grouted masonry, temperature ranges below apply to anticipated minimum night temperatures. For all other masonry, temperature ranges below apply to mean daily air temperature.

1. 40 Degrees to 32 Degrees F (4.5 Degrees to 0 Degrees C): Protect masonry from rain or snow for at least 24 hours by covering with weather-resistant membrane.
2. 32 Degrees to 25 Degrees F (0 Degrees to Minus 4 Degrees C): Completely cover masonry with weather-resistant membrane for at least 24 hours.
3. 25 Degrees to 20 Degrees F (Minus 4 Degrees to Minus 6.7 Degrees C): Completely cover masonry with weather-resistant insulating blankets or similar protection for at least 24 hours; 48 hours for grouted masonry.
4. 20 Degrees F and Below (Minus 6.7 Degrees C and Below):
   a. Except as otherwise indicated, maintain masonry temperatures above 32 degrees F (0 degrees C) for 24 hours, using enclosures and supplementary heat, electric heating blankets, infrared lamps, or other methods proven to be satisfactory.
   b. For grouted masonry, maintain heated enclosure to 40 degrees F (4.5 degrees C) for 48 hours.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Clayton Block, which is located at: P. O. Box 3015 ; Lakewood, NJ 08701; Toll Free Tel: 800-662-3044; Tel: 732-751-7600; Email: request info (katroeclay@aol.com); Web: www.claytonco.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

D. Obtain mortar ingredients of uniform quality including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

2.2 CONCRETE MASONRY UNITS

A. Concrete Masonry Units - General:
   1. Provide units complying with characteristics indicated below for each form of block included for weight classification.
   2. Size: Manufacturer's standard units with face dimensions of 16 inches (406 mm) long by 8 inches (203 mm) high, nominal; 15-5/8 inches (396 mm) long by 7-5/8 inches (194 mm) high, actual, by thicknesses indicated.
   3. Hollow and Solid Load-Bearing Block: ASTM C 90, normal weight, 125 pounds per cubic foot (2000 kg per cubic m) dry weight.

B. Architectural Concrete Block: Clayton Architectural Block series; all contain integral water repellent.
   1. Face: Smooth, colored; standard concrete masonry unit texture.
   2. Weight: Normal weight; When tested in accordance with ASTM C 90.
   3. Size: As indicated on drawings.
   4. Color: As selected by Architect from manufacturer's full line for each specified face.
   5. Shapes: Provide special shapes where required for lintels, jambs, corners, sash, control joints, headers, bonding, and other special conditions.
   6. Cleaning: Use masonry detergent cleaners in accordance with manufacturer's directions; do not use steel wool or other abrasives, or any product containing unbuffered hydrochloric acid or other acids. The use of high-pressure washers is NOT recommended.

C. Architectural Concrete Block: Clayton Architectural Block series; all contain integral water repellent.
   1. Face: Split; unevenly textured appearance.
   2. Weight: Normal weight; When tested in accordance with ASTM C 90.
   3. Size: As indicated on drawings.
   4. Color: As selected by Architect from manufacturer's full line for each specified face.
   5. Shapes: Provide special shapes where required for lintels, jambs, corners, sash, control joints, headers, bonding, and other special conditions.
   6. Cleaning: Use masonry detergent cleaners in accordance with manufacturer's directions; do not use steel wool or other abrasives, or any product containing unbuffered hydrochloric acid or other acids. The use of high-pressure washers is NOT recommended.

D. Reinforced Concrete Masonry Units: Grout Block; as produced by Clayton Block Company.
   1. Weight: Medium weight; When tested in accordance with ASTM C 90.
   2. Minimum Net Compressive Strength: 3,000 psi (21 MPa) when tested in accordance with ASTM C 90.
   3. Size: As indicated on drawings.
   4. Reinforcement Bars: Deformed bars complying with ASTM A 615, of the following grades unless otherwise indicated:
      a. No. 3 to No. 6 Bars: Grade 40.
      b. No. 6 to No. 18 Bars: Grade 60.
      c. Shop fabricate reinforcement bars which are shown to be bent or hooked.

5. Mortar: ASTM C 270, Type M.
6. Concrete Fill: 3,000 psi (20.7 MPa) compressive strength, 8 inch (203 mm) minimum slump.

2.3 MASONRY CELL INSULATION

A. Masonry Cell Insulation: Expanded polystyrene masonry block inserts; manufactured as Korfil or Icon (W.R. Grace & Co. Construction Products, Cambridge, MA) or approved equal.
   1. Type: _____.
   2. Dimensional Stability: 0.55 percent, complying with ASTM D 2126.
   3. Water Vapor Transmission: Complying with ASTM E 96:
      a. Type II: 1.27 percent.
   4. Thermal Resistance: Complying with ASTM C 518, 75 degrees F (24 degrees C):
      a. Type II: 4.08.
   5. Surface Burning Characteristics: Complying with ASTM E 84; flame spread less than 75, smoke developed less than 450.

2.4 MORTAR AND GROUT PRODUCTS

A. Portland Cement: ASTM C 150.
   1. Type III, for Construction below 40 degrees F (4.5 degrees C)I.

B. Water: Clean and potable.

C. Integral Water Repellent Admixture: Chemstrong AquaShield by Great Eastern Technologies, LLC, Yardville, NJ.

2.5 JOINT REINFORCEMENT, TIES, AND ANCHORS

A. Manufacturers:
   1. Dur-O-Wal, Inc.

B. General: Comply with requirements indicated below for basic materials, as well as requirements for each form of joint reinforcement, tie, and anchor for size and other characteristics.

C. Hot-Dip Galvanized Steel Wire: Uncoated wire in accordance with ASTM A 82, with zinc coating applied after prefabrication into units in accordance with ASTM A 123, 1.5 oz. per sq. ft. (0.46 kg/sq m) of wire surface.

D. Joint Reinforcement: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
   1. Width: Approximately 2 inches (51 mm) less than nominal width of walls and partitions, providing mortar cover of not less than 5/8 inch (16 mm) on joint faces exposed to exterior and 1/2 inch (13 mm) elsewhere.
   2. Wire Size, Side Rods: 9 gauge, 0.15 inches (4 mm).
   3. Wire Size, Cross Rods: 9 gauge, 0.15 inches (4 mm).
   4. Wire Size, Two-Piece Adjustable: 9 gauge (6 mm) diameter in exterior walls.
   5. Single-Wythe Configuration: Truss design, continuous diagonal cross rods spaced not more than 16 inches (406 mm) on center.
   6. Multi-Wythe Configuration, Non-Aligned Bed Joints in Cavity or Composite Masonry Walls:
      a. Adjustable wall tie pintle section fitting into eye section of rectangular box-type cross ties spaced not more than 16 inches (406 mm) on

center.

b. Truss type units with side rods spaced for embedment within each face shell of back-up wythe, ties extended to within 1 inch (25 mm) of exterior face of facing wythe.

E. Anchor Bolts: Steel bolts with hex nuts and flat washers, complying with ASTM A 307, Grade A, hot dip galvanized complying with ASTM A 153, Class C; sizes and configurations indicated.

F. Pencil Rods at Construction Joints: Dowels dipped in tar for half of length.

G. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.

2.6 MISCELLANEOUS MASONRY ACCESSORIES

A. Weepholes: Quadrovent.

PART 3 EXECUTION

3.1 MORTAR AND GROUT MIXES

A. Mortar and Grout - General: Use only specified additives; do not use calcium chloride.
1. Limit cementitious materials in mortar to Portland Cement and lime.
2. Mixing:
a. Combine and thoroughly mix cementitious materials, water, aggregates, and admixtures in a mechanical batch mixer.
b. Comply with applicable ASTM standards and material manufacturers' recommendations for mixing time and water content.
c. Measure and batch materials by volume to accurately control and maintain required proportions.
d. Measure sand using container constructed for consistent volume measurement; measurement of sand by shovel not permitted.

B. Unit Masonry, Mortar: Complying with ASTM C 270, Proportion Specifications, Portland Cement-Lime Mortar, Types as follows unless otherwise indicated:
1. Type M: Masonry below grade, in contact with earth, and where indicated; 8 to 12 percent maximum air content.
2. Type N: Interior non-load-bearing walls; 8 to 14 percent maximum air content.
3. Type S: All other masonry; 8 to 12 percent maximum air content.
4. Colored Aggregate Mortar: Mortar of color required by use of colored aggregates in combination with selected cementitious materials.
a. Color: As selected by Architect.

C. Unit Masonry, Grout: Complying with ASTM C 476, consistency at time of placement to completely fill all spaces intended to receive grout.
1. Mix: Portland cement, sand, gravel, and water; proportion as required to provide minimum 3,000 psi (21 MPa) 28-day compressive strength.
2. Use: Reinforced masonry lintels, bond beams, reinforced masonry piers, and wherever grouting full is indicated or specified.

END OF SECTION

SECTION 05500

MISCELLANEOUS STEEL FABRICATIONS

PART 1: GENERAL

1.01 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit one sepia and three prints of shop drawing sepia indicating profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories.

C. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

D. Upon request, submit mill certification that steel supplied meets requirements of the specifications.

E. Upon request, submit electrode manufacturer's certification that the electrode and flux combination meets the requirements of the particular classification or grade of electrodes.

1.02 QUALIFICATIONS:

A. Welders, tackers, and welding operators: Qualified in accordance with AWS D1.1 to perform the type of work required.

1.03 PRODUCT HANDLING:

A. Deliver steel to project site and stack in designated areas. Deliver materials in time to be installed in proper sequence with other work. Provide setting drawings, templates, and directions for installation of items.

B. Stack and store steel above ground on dunnage. Protect steel from corrosion and damage. Keep materials clean.

C. Store other materials in a weather-tight, dry place until ready for use.

D. Store packaged materials in their original, unbroken package or container.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Steel Sections: ASTM A 36.

B. Bolts, nuts and washers:
   1. High strength bolts: ASTM A 325.
   2. Other bolts: ASTM A 307.

C. Welding materials: Electrodes having low hydrogen covering and purchased in hermetically sealed containers.
   1. For fabricating plant use: E-70 electrodes, AWS A5.1 or A5.5, A5.17 or A5.20.
   2. For field use: E-70 electrodes, AWS A5.5, A5.17 or A5.20.

D. Primer: FS TT-P-31, red, for shop application and field touch up.

2.02 FABRICATION:

A. Verify dimensions on site prior to shop fabrication.

B. Fabricate items with joints tightly fitted and secured.

C. Fit and shop assemble in largest practical sections for delivery to the site.

D. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius.

E. Supply components required for anchorage of metal fabrications. Fabricate anchorage and related components of the same material and finish as metal fabrication, except where specifically noted otherwise.

2.03 FINISH:

A. Clean surfaces of rust, scale, grease and foreign matter prior to finishing.

B. Do not prime surfaces where field welding is required.

C. Prime paint items with one coat.

PART 3: EXECUTION

3.01 PREPARATION:

A. Obtain the Architect's approval prior to site cutting or making adjustments not scheduled.

B. Clean and strip site primed steel items to bare metal where site welding is scheduled.

C. Make provision for erection loads with temporary bracing. Keep work in alignment.

3.02 INSTALLATION:

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Perform field welding in accordance with AWS D1.1.

C. After installation, touch up field welds, scratched and damaged surfaces with primer.

3.03 CLEAN UP:

A. When steel has been installed, clean up spatter and debris resulting from welding. Where welding is rough and may interfere with smooth installation of other work, grind welds.

B. When miscellaneous steel has been cleaned, touch up welds, scarred and abraded places on miscellaneous steel items, structural steel and bar joists with rust-inhibiting paint.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes wood grounds, nailers and blocking; installation of all items not installed by the supplier; carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

1.2 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by NIST PS 20.
   2. Plywood Grading Agency: Certified by APA/The Engineered Wood Association.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

A. Lumber Grading Rules: SPIB, WCLIB and WWPA G-5.

B. Non-structural Light Framing: Pine or Douglas Fir species, No. 2 grade, 19 percent maximum moisture content.

C. Plywood: Structural I, C-D INT APA, Douglas Fir Plywood. Fire treated as required by Building Official.

2.2 ACCESSORIES

A. Fasteners: Galvanized steel for exterior, high humidity, and treated wood locations, plain finish elsewhere.

B. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

2.3 WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA Treatment C1, using water borne preservative with 0.25 pcf retention.

B. Shop preservative treat the following wood materials in accordance with manufacturer's instructions:

1. Cants, nailers, curbs, stripping, and similar members in connection with roofing, flashing, vapor barrier and waterproofing.
2. Sills, sleepers, blocking, furring stripping and similar concealed members in contact with masonry or concrete.
3. Framing members less than 18 inches above grade.

PART 3 EXECUTION

3.1 INSTALLATION

A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards and in accordance with manufacturer's instructions.

D. Countersink nail heads on exposed carpentry work and fill holes.

E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD GROUNDS, NAILERS, BLOCKING AND SLEEPERS

A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

C. Curb roof openings except where curbs are provided. Construct curb members of single pieces for each side.

3.3 FRAMING

A. Erect wood framing members in accordance with applicable code. Place members level and plumb. Place horizontal members crown side up.

B. Bridge framing in excess of 8 feet span at mid-span members. Fit solid blocking at ends of members.

3.4 SITE APPLIED WOOD TREATMENT

A. Treat site-sawn cuts. Brush apply two coats of preservative treatment on untreated wood in contact with cementitious materials roofing and related metal flashings.

B. Allow preservative to cure prior to erecting members.

END OF SECTION

SECTION 06200

FINISH CARPENTRY AND MILLWORK

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 06100: Rough carpentry.

1.02 SUBMITTALS:

A. Shop drawings: Submit for, standing and running trim, panelwork, shelving and miscellaneous ornamental work. Indicate construction and installation details, species and grades of materials, and finishes.

B. Samples: Submit as follows:
   1. Hardware items: Submit if requested by Architect. Samples will be returned to supplier.

1.03 DELIVERY, STORAGE AND HANDLING:

A. Immediately upon delivery to job site, place materials indoors, protected from weather.

B. Store materials a minimum of 6" above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation and ventilation. Store in dry, conditioned space.

1.04 JOB CONDITIONS:

A. Field measurements: Take field measurements to ascertain exact sizes. Indicate exact dimensions on shop drawings.

B. Install no interior finish carpentry until spaces are enclosed, dry and capable of being heated. Maintain temperature between 55°F and 70°F for 72 hours before beginning installation for duration of project.

1.05 QUALITY CRITERIA:

A. Grading rules of the following industry associations apply to lumber furnished, as specified.
   1. National Hardwood Lumber Association (NHLA).
   2. Redwood Inspection Service (RIS).
   3. Southern Pine Inspection Bureau (SPIB).
   4. West Coast Lumber Inspection Bureau (WCLB).
   5. Western Wood Products Association (WWPA).

B. Industry standards for architectural woodwork: Quality Standards of the Architectural Woodwork Institute (AWI).

C. Preservative treated material: Meeting specified standards of the American Wood Preservers Association (AWPA) and the American Wood Preservers Institute (AWPI).

D. Plywood grading rules:
1. For softwood plywood: Product Standard PS-1.
2. For hardwood plywood: Product Standard PS-51.

E. Grade marks: Identify lumber and plywood by official grade mark.
1. Lumber: Grade stamp shall contain symbol of grading agency, mill number or name, grade of lumber, species or species grouping or combination designation, rules under which graded, where applicable, and condition of seasoning at time of manufacture.
2. Plywood: Appropriate grade trademark of the American Plywood Association. Indicate type, grade, class and identification index and inspection and testing agency mark.
3. Grade marks on components to be exposed to view shall be located so as to be concealed in finished work.

PART 2: PRODUCTS

2.01 GENERAL REQUIREMENTS:

A. Dimensions: Indicated lumber dimensions are nominal. Actual dimensions conform to industry standards established by the American Lumber Standards Committee and the rules writing agencies.

B. Moisture content: 10% maximum at time of permanent closing in of building or structure, except as otherwise noted.

C. Surfacing: Surface four sides (S4S), unless otherwise noted.

D. Grades for exposed and semi-exposed finish carpentry and millwork lumber and plywood are based on AWI Quality Standards. Grades for unexposed work are based on rules writing agencies' grading rules.

2.02 LUMBER:

A. Species and grades:
1. Unexposed framing and blocking (2" x 4" and larger): #2 White Pine, kiln dried.
2. Semi-exposed millwork components: Custom Grade Poplar.
3. Exposed and semi-exposed painted millwork and trim: Custom Grade White Pine, kiln dried.
4. Transparent finish standing and running trim: Premium Grade plain sawn clear poplar.
5. For interior wood trim around windows: Clear Poplar, kiln dried.
6. For finished ceiling: Cypress, kiln dried.

2.03 SHEET MATERIAL:

A. Plywood:
   1. Unexposed and semi-exposed millwork and general carpentry: ZPZ-AC-INT, Group 1.
   2. Exposed transparent finish millwork: Conforming to AWI Quality Standards for millwork grade specified, plain sliced.

B. Particleboard: Three-ply, mat formed, manufactured of long fibered cuttings, bonded with water-resistant adhesive; weighing minimum of 42.5 lbs./cubic feet; filled on faces to be painted.

C. Wood siding: Double 4" horizontal.

D. Window sills: (Interior) 3/4" methol methacrylate as manufactued by Dupont Corian Building Products.

E. Closet shelving: 3/4" x 16" plywood with plastic laminate finish

F. Base: as indicated.

2.04 HARDWARE:

A. Closet shelf and rod bracket: Stanley #7045. Paint finish: Provide one at midpoint in spaces 5'-0" and one bracket for each additional 2'-6". Space brackets equal from each side.

B. Clothes rod: 1-5/16" diameter wood dowel with wall support at each end.

PART 3: EXECUTION

3.01 WORKMANSHIP:

A. Install work plumb, level, true and straight without distortions. Shim using concealed shims.

B. Finish work shall be smooth, free from abrasion, tool marks, raised grain grade markings or similar defects on exposed surfaces.

C. Cut work to fit unless specified to be shop cut to exact size. Where carpentry and millwork abuts other finished work, scribe and cut for accurate fit. Before making cut-outs, drill pilot holes at corners.

D. Distribute defects allowed in the quality grade specified to the best overall advantage when installing job assembled work.

E. Window sill material should be laminated to rough sill with water-resistant construction adhesive with factory edge to interior.

3.02 INSTALLATION OF STANDING AND RUNNING TRIM:

A. Trim and moldings: Install in single, unjointed lengths for openings and for runs less than 10'-0". For longer runs, use only one piece less than 10'-0" in straight runs. Stagger joints in adjacent members. Cope at returns and miter at corners.

B. Attach and secure in place with uniform joints providing for thermal and building movements.

C. Nailing: Blind nail where possible. Use finishing nails where exposed. Set exposed nail heads for filling.

D. Anchoring: Secure work to anchors or blocking built-in or directly attached to substrate.

3.03 CLEANING AND PROTECTION:

A. Protect finished and prefinished surfaces from work of other trades.

B. Prior to date of Substantial Completion, examine work for damages. Repair or replace such damages to original condition.

C. Clean wood, metal and accessory items using a neutral cleaner. Check and correct operating mechanism for proper operation. Adjust and lubricate hinges, catches and other operating hardware.

END OF SECTION

SECTION 07160
BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies materials and workmanship for bituminous dampproofing on concrete and masonry surfaces.

1.2 SUBMITTALS:

A. Submit in accordance with Section 01340, SAMPLES AND SHOP DRAWINGS.

B. Manufacturer's Literature and Data:

1. Product description.
2. Application instructions.

1.3 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing And Materials (ASTM):

D226-97 .....Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

D1227-95 (R2000) .....Emulsified Asphalt Used as a Protective Coating for Roofing

PART 2 - PRODUCTS

2.1 EMULSIFIED ASPHALT:

ASTM D1227, Type III for first coat, and Type IV for second coat.

2.2 ASPHALT SATURATED FELT:

ASTM D226, Type I, 7 kg (15 pound).

PART 3 - EXECUTION

3.1 SURFACE PREPARATION:

A. Surfaces to receive dampproofing shall be clean and smooth.

B. Remove foreign matter, loose particles of mortar or other cementitious droppings.

C. Clean and wash soil or dirt particles from surface.
D. Remove free water; surfaces may be damp.
E. Surfaces shall be approved by Resident Engineer before dampproofing is applied.

3.2 APPLICATION:

A. Schedule application so that drying will be accomplished prior to backfilling and so that backfilling will be accomplished as soon as possible after drying.
B. Apply when the ambient temperature is above 4°C (40°F) and rising. Do not apply if the temperature is expected to fall below 4°C (40°F).
C. Apply in accordance with manufacturer's printed instructions unless specified otherwise.
D. Apply each coat at the rate of not less than 1 L/m^2 (2-1/2 gallons per 100 square feet) and allow not less than 24 hours drying time after application.
E. Apply first coat by brush, spray, or mop and allow to dry.
F. Apply second coat by brush or mop and allow to dry.
G. Inspect for holidays; recoat holidays. The finish dampproofing shall be free of holidays.

3.3 PROTECTIVE COVERING:

A. Protect dampproofing surfaces against which backfill will be placed with one layer of 7 kg (15 pound) asphalt saturated felt.
B. Imbed felt shingle fashion in the second coating of bitumen.
C. Lap edges and ends of felt not less than 25 mm (1 inch), coating laps with emulsion.

3.4 LOCATION:

A. Dampproof exterior surfaces of exterior walls of all inhabited areas below grade that are not shown to be waterproofed.
    1. Apply to outside surface from bottom of walls to 100 mm (4 inches) below finished grade on concrete walls extending above grade.
    2. Where a ledge occurs for facing material support below grade, coat ledge and coat backing wall to 300 mm (1 foot) above grade when wall is concrete or masonry.

3. When concrete or masonry backing walls do not extend 300 mm (1 foot) above grade, coat to top of walls.

B. Apply to exterior surface of inner with of masonry cavity walls. Coordinate application with masonry work.

- - - E N D - - -

SECTION 07210

BATT INSULATION

PART 1: GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 01600: Substitutions and product options.

1.02 SUBMITTALS:

A. Submit the manufacturer's catalog data to the Architect and obtain his approval before ordering.

1.03 DELIVERY:

A. Deliver materials in original packages, containers, or bundles bearing manufacturer's labels. Labels shall indicate brand name and descriptive data confirming compliance with requirements herein specified.

1.04 PROTECTION:

A. Keep materials dry, protected against moisture, weather and damage.

1.05 COORDINATION::

A. Coordinate shipment and delivery with job progress and other trades for timely installation, to preclude delays and interferences and to minimize job storage time.

PART 2: PRODUCTS

2.01 INSULATION:

A. Owens-Corning FS-25 kraft faced fiberglass batts or blankets of thickness indicated.
   1. Where installed in walls, use insulation wide enough to compress between studs and completely fill the wall cavity between studs.
   2. Moisture-proof tape compatible with foil facing on insulation, 2" wide.

PART 3: EXECUTION

3.01 INSTALLATION:

A. Where indicated cut into usable sizes and secure in place. Be sure all space is filled.

3.02 CLEAN UP:

A. When work is completed in each area, remove debris, equipment, and excess material and leave area broom clean.

END OF SECTION

SECTION 07217

EXTRUDED CAVITY WALL INSULATION

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 04000: Concrete block.

B. Section 07160: Dampproofing material.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit manufacturer's product data indicating physical and thermal properties, and the manufacturing process.

C. Submit two 6 x 6 inch samples.

1.03 DELIVERY AND STORAGE:

A. Deliver materials in accordance with Section 01600. Deliver in original packages, containers, or bundles bearing manufacturer's labels indicating the brand name and descriptive data confirming compliance with requirements herein specified.

B. Store materials in accordance with Section 01600.

1.04 MANUFACTURER'S INSTRUCTIONS:

A. Submit the manufacturer's installation instructions in accordance with Section 01600.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Insulation: "Styrofoam SM" closed cell, extruded polystyrene foam insulation, 16 inches wide x 8 feet long x thickness indicated on the Drawings, by Dow Chemical Co.
   1. Water absorption: 1% by volume, ASTM D 2842.
   2. Water vapor permeability: .6 perm-inch, ASTM E 96.
   3. Compressive strength: 25 psi minimum, ASTM D 1621.

B. Adhesive: Adhesive recommended by the insulation manufacturer for the application.

C. Tape: A transparent self-adhering tape recommended by the insulation manufacturer.

D. Substitutions: Extruded polystyrene board of same function and performance is acceptable in accordance with Section 01600.

PART 3: EXECUTION

3.01 PREPARATION:

A. Verify that substrate and adjacent materials, and insulation boards, are dry and ready to receive insulation and adhesive.

B. Verify that substrate is flat and free of irregularities and materials that will impede adhesive bond.

C. Verify that insulation boards are unbroken and free of damage, including board skin.

3.02 INSTALLATION:

A. Apply adhesive to substrate in accordance with the adhesive manufacturer's instructions for the application. Apply to the coverage recommended for the application.

B. Cut insulation neatly to fit around obstructions, across cavities such as vents, louvers, pipes, and conduit. Do not leave open spaces and loosely fitted joints where water might enter.

C. Install boards on substrate horizontally between cavity ties. Stagger end joints. Butt edges tight to adjacent boards and protrusions.

D. Take care to ensure insulation boards are butted tightly together at joints, are fully adhered, and fit flush against back-up wall.

E. Tape joints with specified tape.

3.03 CLEAN UP:

A. When work is completed, clean up and remove excess materials and tools from job site.

END OF SECTION

SECTION 07250

PERIMETER BOARD INSULATION

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit the manufacturer's product data indicating density, insulating value, water absorption characteristics and recommended adhesive for the application.

1.03 DELIVERY AND STORAGE:

A. Deliver materials in accordance with Section 01600. Deliver in original packages, containers, or bundles bearing manufacturer's labels indicating the brand name and descriptive data confirming compliance with requirements herein specified.

B. Store materials in accordance with Section 01600.

1.04 COORDINATING:

A. Coordinate shipment and delivery with job progress and other trades for timely installation to preclude delays and interferences and to minimize job storage time. Especially work closely with concrete installers to ensure proper installation.

1.05 MANUFACTURER'S INSTRUCTIONS:

A. Submit the manufacturer's installation instructions in accordance with Section 01600.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Insulation: 2" thick Styrofoam SM foundation insulation by Dow Chemical.

B. Adhesive: Type recommended by the insulation manufacturer for the

application.

C. Substitutions: Materials of the same function and performance are acceptable in accordance with Section 01600.

PART 3: EXECUTION

3.01 PREPARATION:

A. Verify that substrate and adjacent materials, and insulation boards, are dry and ready to receive insulation and adhesive.

B. Verify that substrate is flat and free of irregularities and materials that will impede adhesive bond.

C. Verify that insulation boards are unbroken and free of damage, including board skin.

3.02 INSTALLATION:

A. To be installed below the floor slab, recess the insulation enough to allow the slab to remain at its full thickness above the insulation. Extend 24" under slab, Install over vapor barrier.

END OF SECTION

SECTION 07410
METAL SOFFIT PANELS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Factory-formed metal soffits, including flashing and accessories.

B. Related Sections: Section(s) related to this section include:
1. Wood Framing and Decking: Division 6 Rough Carpentry Section.
2. Flashing and Trim: Division 7 Flashing and Sheet Metal Section.
3. Sealants: Division 7 Joint Sealers Sections.

1:02 REFERENCES

A. American Society for Testing and Materials (ASTM):

B. Underwriters Laboratories (UL Classified Tests):

C. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
1. SMACNA Architectural Sheet Metal Manual

1:03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide sheet metal roofing that has been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure of infiltration of water.
1. Wind-Uplift: Roof panel assembly shall comply with UL Classification 580 for UL Classified 90 rated assemblies
2. Static Air Infiltration: Completed system shall have a maximum of .06 cfm/sf with 6.24 kPa air pressure differential as per ASTM E283/1680.
3. Water Infiltration: No evidence of water penetration at an inward static air pressure differential of not less than 6.24 psf (43 kPa) and not more than 12.0 psf (83 kPa) as per ASTM E331/1646.

1:04 SUBMITTALS

A. General: Submit listed submittals in accordance with *Conditions of the Contract* and Division 1 Submittal Procedures Section.
1. Product Data: Submit product data, including manufacturer's SPEC-DATA® product sheet, for specified products.

B. Shop Drawings:
1. Submit complete shop drawings and erection details, approved by the metal roofing manufacturer, to the architect for review. Do not proceed with manufacturer of soffit materials prior to review of shop drawings and field verification of all dimensions. Do not use drawings prepared by the architect for shop or erection drawings.
2. Shop drawings show plans, and flashing details.

C. Performance Tests:
1. Submit certified test results by a recognized testing laboratory in accordance with

specified test methods for each panel system.

D. Samples: Submit selection and verification samples for finishes, colors and textures.

E. Quality Assurance Submittals: Submit the following:
1. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
2. Manufacturer's Instructions: Manufacturer's installation instructions.

1:05 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.

B. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association(SMACNA) *Architectural Sheet Metal Manual*.

1:06 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division 1 Product Requirements Sections.
1. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Identify fabricated components with UL 90 Classified label where appropriate.

C. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above ground location.
1. Stack prefinished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture to run off.
2. Prevent contact with material that may cause corrosion, discoloration or staining.
3. Do not expose to direct sunlight or extreme heat trim material with factory applied strippable film.

1:07 PROJECT CONDITIONS

A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

Specifier Note: Coordinate article below with *Conditions of the Contract* and with Division 1 Closeout Submittals, Warranty Section.

1:08 WARRANTY

A. Project Warranty: Refer to *Conditions of the Contract* for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of, other rights Owner may have under the Contract Documents.

Specifier Note: Coordinate paragraph below with manufacturer's warranty requirements. Petersen Aluminum Corporation offers a 20-year nonprorated warranty covering PAC-CLAD finish, including color, fade, chalking and Film integrity. Consult with manufacturer for specific

project warranty requirements.

1. Warranty Period: 20 years commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2:01 Aluminum soffit panels

A. Manufacturer: Petersen Aluminum Corporation

1. Contact: 1005 Tonne Road, Elk Grove Village, IL 60007;
Telephone (800) 323-1960, (847) 228-7150; Fax (800) 722-7150

B. PAC-CLAD Soffit Panels:
1. Type: PAC-850 Soffit (Half Vent) Panel
2. Material: .040in ga (.10 mm) alloy 3105-H14 Aluminum
3. Panel Dimension: 11in (279 mm) o.c. (1 in/25 mm seam height)
4. Texture: Stucco embossed
5. Panels shall be full length – no end joints.
6. Provide J Chanel to match panel
7. Provide min 30 X30 access panel for blower access

C. Substitutions: As per section 1300.

2:02 RELATED MATERIALS

A. General: Coordinate use of related materials:
1. Provide support as indicated on structural drawings spaced at manufactures recommendation.

2:03 FABRICATION

A. General:
1. Continuous Length: Fabricate panels 55’ (16.2 m) and less in one continuous length.
2. Trim and Flashings: Fabricate trim and flashings from same material as soffit material.
.

2:04 FINISHES

A. PAC-CLAD Factory Applied Finish:
1. Topside (exposed side): Full-strength fluoropolymer (70% Kynar® 500 or Hylar® resin) system of 1.0 mil (.025 mm) total dry film thickness.
2. Underside: Wash coat of 0.3 - 0.4 mil dry film thickness.
3. Texture: (Smooth texture, dull matte specular gloss 25 - 35% at 60°) (Standard E-5 stucco embossed pattern).
4. Protective film: Strippable vinyl film applied during panel fabrication and finishing.

PART 3 EXECUTION

3:01 MANUFACTURER’S INSTRUCTIONS

A. Compliance: Comply with manufacturer’s product data, recommendations and installations instructions for substrate verification, preparation requirements and installation.

1. Strippable Film: Remove manufacturer's protective film, if any, from surfaces of roofing panels.

3:02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for project installation in accordance with manufacturer's instructions.

3:03 PREPARATION

A. Coordination: Coordinate metal soffits with other Work (drainage, flashing and trim, deck substrates, parapets, copings, walls) and other adjoining work to provide a non-corrosive and leak-proof installation.

B. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

3:04 INSTALLATION

A. General: Install metal panels to profiles, patterns and drainage indicated and required for leak-proof installation. Provide for structural and thermal movement at work. Seal joints for leak-proof installation.

1. Seams: Provide uniform, neat seams.
2. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leak-proof installation.
3. Sealant-Type Joints: Provide sealant-type joint where indicated. Form joints to conceal sealant. Comply with Division 7 Joint Sealants Section for Sealant installation.

3:05 FIELD QUALITY REQUIREMENTS

A. Site Tests (Post Installation Testing): Owner reserves right to perform post installation testing of installed metal soffits.

3:06 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

3:07 PROTECTION

A. Protection: Protect installed product from damage during construction.

End of Section

SECTION 07416
STANDING SEAM METAL ROOFING

PART 1: GENERAL

1.01 SECTION INCLUDES

A. Preformed, prefinished metal roofing and flashings.
B. Miscellaneous trim, flashing, closures, drip flashing, and accessories.
C. Sealant
D. Fastening devices.

1.02 RELATED SECTIONS

A. Section 05120: Structural Steel Framing.
B. Section 05500: Miscellaneous metal fabrication.
C. Section 06100: Rough Carpentry.
D. Section 07631: Flashing and Sheet Metal Gutters.
E. Section 07900: Sealants.

1.03 REFERENCES

A. American Iron & Steel Institute (AISI) Specification for the Design of Coldformed Steel Structural Members.
B. ASTM A-653 & ASTM A924 Steel Sheet, Zinc-Coated (Galvanized)
C. ASTM E-283-84
D. ASTM E-331-86
E. ASTM E-1592
F. Spec Data Sheet - Galvalume Sheet Metal by Bethlehem Corp.
G. SMACNA - Architectural Sheet Metal Manual.
H. Building Materials Directory - Underwriter's Laboratories, Test Procedure 580.

1.04 ASSEMBLY DESCRIPTION

A. The roofing assembly includes preformed sheet metal panels, related accessories, valleys, hips, ridges, eaves, corners, rakes, miscellaneous flashing and attaching devices.

1.05 SUBMITTALS

A. Submit detailed drawings showing layout of panels, anchoring details, joint details, trim, flashing, and accessories. Show details of weatherproofing, terminations, and penetrations of metal work.
B. Submit a sample of each type of roof panel, complete with factory finish.
C. Submit results indicating compliance with minimum requirements of the following performance tests:
    1. Air Infiltration ASTM E 283-84
    2. Water Infiltration ASTM E 331-86
    3. Wind Uplift - U.L.90
D. Submit calculations with registered engineer seal, verifying roof panel and attachment method resists wind pressures imposed on it pursuant to applicable building codes.

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in Architectural Sheet Metal Products with ten (10) years minimum experience.
B. No product substitutions shall be permitted without meeting specifications.
C. Substitutions shall be submitted 10 Days prior to Bid Date and

acceptance put forth in an addendum.

D. No substitutions shall be made after the Bid Date.

1.07 DELIVERY, STORAGE AND HANDLING

A. Upon receipt of panels and other materials, installer shall examine the shipment for damage and completeness.

B. Panels should be stored in a clean, dry place. One end should be elevated to allow moisture to run off.

C. Panels with strippable film must not be stored in the open, exposed to the sun.

D. Stack all materials to prevent damage and to allow for adequate ventilation.

1.08 WARRANTY

A. Paint finish shall have a twenty year guarantee against cracking, peeling and fade (not to exceed 5 N.B.S. units).

B. Galvalume material shall have a twenty year guarantee against failure due to corrosion, rupture or perforation.

C. Applicator shall furnish guarantee covering watertightness of the roofing system for the period of two (2) years from the date of substantial completion.

PART 2 PRODUCT

2.01 ACCEPTABLE MANUFACTURERS

A. Berridge Manufacturing Company, Houston, Texas.

B. Substitutions shall fully comply with specified require-ments.

2.02 SHEET MATERIALS

A. Prefinished Metal shall be Hot-Dipped Galvanized - ASTM A446-85 Grade C G90 Coating A525-86 24 Gauge core steel or prefinished Galvalume - ASTM 792-86 AZ-55.

B. Unfinished Metal shall be Grade C Galvalume ASTM A792-86, AZ 55, "Satin Finish".

C. Finish shall be [full strength Kynar 500 Fluoropolymer coating] [Copper-Cote][Lead-Cote] [Champagne] coating, applied by the manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.70 to 0.90 mil over 0.25 to 0.35 mil prime coat, to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility, and longevity as specified by the Kynar 500 finish supplier.

D. Strippable film shall be applied to the top side of the painted coil to protect the finish during fabrication, shipping and field handling. This strippable film must be removed before installation.

2.03 ACCESSORY MATERIALS

A. Fasteners: [Galvanized Steel] [Stainless Steel] [Cadmium Plated Steel] with washers where required.

B. Sealant: As specified in Section 07900 [ ] Type.

C. Vinyl Weatherseal Insert.

2.04 FABRICATION

A. All exposed adjacent flashing shall be of the same material and finish as the roof panels.

B. Hem all exposed edges of flashing on underside, 1/2 inch.

2.05 BERRIDGE STANDING SEAM TEE-PANEL

1. Panels shall have 12 3/4" on-center seam spacing with a seam height of 1".
2. Panels shall be site-formed with the Berridge Model SS-14 Portable Roll Former in continuous lengths from eave to ridge or factory fabricated to 40' max.
3. Snap-on seams shall be 1" in height and shall contain the Berridge factory-applied Extruded Vinyl Weather Seal Insert (Patent No. 4641475) to prevent siphoning of moisture through the standing seam.
4. Concealed anchor clips shall be spaced as required to meet uplift loads (maximum of 24" on center).
5. When required, Panel assembly shall bear Underwriter's Laboratories Label UL90, pursuant to Construction Number 296 and applicable Fire Ratings.
6. Certification shall be submitted, based on independent testing laboratory, indicating no measurable water penetration or air leakage beyond allowable tolerances through the system when tested in accordance with ASTM E-331-86 and E-283-84.

PART 3 EXECUTION

3.01 INSPECTION

A. Substrate:

1. Examine plywood or metal deck to ensure proper attachment to framing.
2. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves or projections, level to +/- 1/4" in 20', and properly sloped to [valleys] (or) [eaves].
3. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.
4. Verify deck is dry and free of snow or ice. [Flutes in steel deck to be clean and dry] or [joints in wood deck to be solidly supported and nailed].

B. Felting:

1. Verify #30 unperforated asphalt saturated roofing felt underlayment has been installed over solid sheathing and fastened in place.
2. Ensure felt installed horizontally, starting at eave to ridge with a 6" minimum overlap and 18" endlaps.
3. Ensure that all nail heads are totally flush with the substrate. Nails shall be galvanized roofing nails with Berridge Coated Felt Caps.

3.02 INSTALLATION

A. Comply with manufacturers standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.
B. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.
C. Install starter and edge trim before installing roof panels.
D. Remove protective strippable film prior to installation of roof panels.
E. Attach panels using manufacturer's standard clips and fasteners, spaced in accordance with approved shop drawings.
F. Install sealants for preformed roofing panels as approved on shop drawings.

G. Do not allow panels or trim to come into contact with dissimilar materials.
H. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
I. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.
J. Remove and replace any panels or components which are damaged beyond successful repair.

3.03 CLEANING

A. Clean any grease, finger marks or stains from the panels per manufacturer's recommendations.
B. Remove all scrap and construction debris from the site.

3.04 FINAL INSPECTION

A. Final inspection will be performed by a firm appointed and paid for by the owner in accordance with section 01410.

END OF SECTION

SECTION 07620

SHEET METAL

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 06100: Wood nailers.

B. Section 07530: Membrane flashings.

C. Section 07951: Sealant.

D. DIVISIONS 15 and 16: Flashings for vent pipes and electrical conduit roof deck.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit shop drawings indicating materials, profiles, jointing, sizes, lengths of sections, fastening, and installation details.

1.03 EXISTING CONDITION/PROTECTION:

A. Exercise care when working on or about roof surfaces to avoid damaging or puncturing membrane of flexible flashings.

B. Place plywood panels on roof surfaces adjacent to Work of this Section and on access routes. Keep in place until completion of the Work.

1.04 GUARANTEE:

A. Provide the Owner with a written guarantee stating that metal flashings will properly shed water for a minimum period of 5 years from the date of Substantial Completion, and that damage resulting from failure to provide the above stated performance will be repaired to the satisfaction of the Owner at no additional cost.

PART 2: PRODUCTS

2.01 SHEET METAL:

A. Galvanized steel: ASTM A 526, 22 gauge with minimum of 1.25 oz./sq. ft. of galvanized coating.

B. Aluminum: ASTM B209, 5005 Alloy, 24 gauge, 3 coats of Kynar 500 resin.

2.02 ACCESSORY MATERIALS AND COMPONENTS:

A. Fasteners: Size and type to fit the application.
   1. For attaching copper: Stainless steel.
   2. Other metals: Same material as sheet metal.

B. Solder and flux: Type recommended for the materials being used.

C. Plastic cement: ASTM D 2822.

D. Bituminous paint: Acid and alkali resistant type, black in color.

E. Miscellaneous hardware and fasteners: As specified below.

2.03 SHOP FABRICATION:

A. Fabricate metal to be water and weather-tight with lines, arrises, and angles sharp and true and plain surfaces free from waves, and buckles, and other defects detrimental to appearance or performance. Fabricate sheet metal in accordance with Architectural Sheet Metal Manual, published by Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA Manual), and the Contract Documents.

B. Heavily tin solder joints. Soak in solder on all sides. Make lap joints at least 2" wide. Wipe and wash soldered joints to remove traces of flux immediately after soldering.

C. Double back exposed edges of sheet metal 1/2".

D. Form flashings as indicated. Form joint connectors 8 inches long to slip under ends of butted gravel guard joints to form watersheds.

E. Form two-piece flashings as indicated. Form corner pieces and joint connectors as specified above.

F. Fabricate through-wall flashings to be as indicated.

G. Fabricate copper bellows as indicated.

H. Backpaint flashings with bituminous paint where expected to be in contact with cementitious materials or dissimilar materials.

PART 3: EXECUTION

3.01 INSTALLING SHEET METAL:

A. Install sheet metal work in proper sequence with related work.

B. Install through-wall flashing as shown on the shop drawings.

C. Install top pieces of two-piece flashings in close cooperation with masonry trade. Install joint connectors as specified above.

D. When base flashings have been installed, install bottom pieces of two-piece flashings. Slip top of flashing into the reglet and lock it in place by turning the horizontal edge of the top piece down vertically. Use care in turning down metal so that it is smooth.

3.02 CLEAN UP:

A. When work is completed, clean sheet metal and leave it ready for painting.

END OF SECTION

SECTION 07631

Gutters and Downspouts

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Gutters and downspouts.

1.2 RELATED SECTIONS

A. Section 05100 - Structural Steel: Structural support, framing and bracing.

B. Section 06100 - Rough Carpentry: Installation of grounds, blocking and backing for sheet metal installation.

C. Section 07416 – Metal Roofing

1.3 REFERENCES

A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

B. National Roofing Contractors Association (NRCA) - "Roofing and Waterproofing Manual", third edition.

C. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) - Architectural Sheet Metal Manual.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings:
   1. Indicate material profile, dimensions, jointing pattern, jointing details, fastening methods, flashing, termination, and installation details.
   2. Show the layout of wall sections, attachment, joint details, subgirt locations, trim flashing, accessories and air infiltration seals.
   3. Show thickness of treated wood nailers and substrate.

4. Include building location, height and details of related work involved.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Companies specializing in sheet metal work with 5 years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Materials shall be delivered with identification labels, warnings and storage recommendations.

D. Materials shall be stored in a clean, dry location prior to installation to prevent any damage to the contents. Store materials off the ground and protect from damage and deterioration as required by the material manufacturer.

E. Handle materials to prevent damage to their surfaces, edges and ends of metal items. Damaged material shall be rejected and immediately removed from the site.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Warranty Certification: Installing contractor shall certify that sheet metal work has been installed per National Sheet Metal System's printed details

and specifications.

B. Manufacturer warrants sheet metal fabrications are warranted to be free of defects in material and workmanship for a period of five (5) years from date of shipment.
   1. Product modification may be required to adapt to a project's geographic location, building height, or geometry. Product liability is limited to the repair or replacement of furnished materials, provided printed installation instructions have been followed.

C. Provide manufacturer's Twenty (20) year finish warranty for standard coil-coated Kynar 500 colors against peeling, chalking, fading, checking and crazing, commencing upon the date of substantial completion.

D. No other warranties either expressed or implied are acceptable unless so stated in writing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: National Sheet Metal Systems, Inc.; 2964 Alcove Dr., Scottdale, GA 30079. ASD. Toll Free Tel: (877) 438-6385. Toll Free Fax: (866) 298-6767. Tel: (404) 298-9710. Fax: (404) 298-9720. E-mail: ttt@nationalsheetmetal.com. Web: www.nationalsheetmetal.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 GUTTERS AND DOWNSPOUTS

A. Commercial/Industrial Profiles:
   1. 7 inches (178 mm) Roll - Formed Commercial Box Gutter.
   2. Material and Finish:
      a. .032 inch (0.813 mm) aluminum prefinished ASTM B 209 3105-H14 alloy.

2.3 FINISH COLORS

A. Colors:
   1. 0.032 inch (0.813 mm) Aluminum:
      a. Refer to Elevation drawing

2.4 FABRICATION

A. General Metal Fabrication: Shop-fabricate work to the greatest extent possible. Comply with details indicated on Drawings, and with applicable requirements of SMACNA. Fabricate for waterproof and weather-resistant

performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems

B. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. Form seams and solder tin edges to be seamed.

C. Expansion and Contraction:
   1. Provide for thermal expansion and contraction, and building movement in completed work, without over-stressing the material, breaking connections, or producing wrinkles and distortion in finished surfaces. Make watertight and weather-resistive.
   2. Where subject to thermal expansion and contraction, attach members with clips to permit movement without damage, or provide slotted or oversize holes with washers only, as acceptable to Architect.
   3. Make lock seam work flat and true to line, and sweat full of solder, except where installed to permit expansion and contraction.
      a. Lap flat lock seams and soldered lap seams according to pitch, but in no case less than 3 inches (76 mm). Make seams in direction of flow.

D. Sealant Joints: Where movable, non-expansion type joints are indicated, or required for proper performance of work, form metal to provide for proper installation of sealant per SMACNA standards.

E. Metal Separation: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with bituminous coating or other permanent separation as recommended by manufacturer.

F. Soldering:
   1. Clean material and tin prior to soldering. Solder with heavy coppers of blunt design, properly tinned before use.
   2. Solder slowly with well-heated coppers. Heat seams thoroughly and completely fill with solder.
   3. Make exposed joints on finish surfaces full flowing and smooth.
   4. Wash acid flux with soda solution after soldering, and remove soldering flux on exposed and painted surfaces.

G. Accessories:
   1. Miters, scuppers, and accessory items shall be furnished by manufacturer; color to match specified profile unless noted otherwise.
   2. Factory assemblies shall be furnished to maintain watertight integrity.
   3. Provide matching accessories such as extenders, brick/wall caps, gutters and downspouts, or other special fabrications from the

manufacturer; color to match specified profile unless noted otherwise.

H. Fascia/coping/flashing sections furnished with strippable protective vinyl masking shall have film removed immediately before installation to prevent damage to the coating if left exposed to the ultra-violet rays of sunlight.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Prior to the installation of the fascia/coping/flashing, the installing contractor shall inspect the treated wood nailers to determine suitability for attachment of the fascia/coping/flashing system thereto.
1. All horizontal wood nailers to receive the fascia/coping/flashing shall be pressure treated with salt preservatives. They must be installed horizontal, true and level, free of protruding knots, splinter or other irregularities.
2. Nailers Attachment: Comply with Factory Mutual Loss Prevention Data Sheet 1-49 recommendations for the attachment of nailers and spacing of fasteners.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Except as otherwise indicated, comply with SMACNA recommendations.

C. Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units. Conceal fasteners wherever possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather-resistive.

D. Strictly follow the material manufacturer's printed installation requirements. If parapet walls and perimeter nailers are to be covered with roofing membrane, follow the membrane manufacturer's installation requirements.

E. Completed work shall be true to line without buckling, creasing, warp or wind in finished surfaces. "Oil-canning" surfaces are not acceptable.

F. Isolate dissimilar metals, masonry or concrete from metals using bituminous paint, tape or slip-sheet. Use gasketed fasteners where required to prevent corrosive actions.

G. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using continuous cleats, clips and fasteners as required by the system. No exposed face fastening shall be accepted.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Maintain prefinished surfaces in undamaged condition until date of substantial completion. Repair or replace damaged components, any touch-up to be indistinguishable from undamaged surface/finish.

C. Upon completion of work, a final inspection by the owner's representative shall be made. Any necessary corrective actions will be noted and the installing contractor shall make corrections within five (5) working days. Upon acceptance of the project, any applicable warranties shall be presented to the owner's representative.

END OF SECTION

SECTION 07710

THROUGH WALL FLASHING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 04210: Brick masonry.
B. Section 07600: Flashing and sheet metal.

1.02 SUBMITTALS:

A. Product data: Indicate material type, composition, thickness, and installation procedures.
B. Samples: Submit 1'-0" by 1'-0" samples of materials.

PART 2: PRODUCTS

2.01 FLASHING:

A. Acceptable manufacturers:
   1. B.F. Goodrich, General Products Co.
   2. Rubber and Plastics Compound Co., Inc.
   3. Sandell Manufacturing Co.
   4. Sonneborn Division of Contech, Inc.

B. Characteristics:
   1. Type: 20 mil thickness, non-reinforced, homogenous vinyl sheet or sheet copper.
   2. Adhesive: Flashing manufacturer's adhesive recommended for use with flashing material.

PART 3: EXECUTION

3.01 INSTALLATION:

A. Install through wall flashing at exterior door heads, window heads and walls and other wall openings and at weep hole locations, continuous, in same bed joint as weep holes.
B. Extend flashing 8" beyond opening, each side. Lap joints 3" minimum; seal with adhesive.
C. Start flashing 1/2" from outside face of exterior wythe, extend through cavity, rising not less than 4" and terminated in bed joint of interior wythe, 1/2" from inside face.
D. Install copper through wall flashing at brick and roof intersection. Flashing shall step up brick wall and installation shall be per the Brick Institute of America's printed instructions.

END OF SECTION

SECTION 07900
JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sealants and calking.

B. Flexible epoxy joint fillers.

C. Backer rods.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete.

B. Section 04210 – Brick Masonry

C. Section 07620 - Flashing and Sheet Metal.

D. Section 08520 – Aluminum Windows

1.3 REFERENCES

A. ASTM C 321 - Standard Test Method for Bond Strength of Chemical-Resistant Mortars.

B. ASTM C 834 - Standard Specification for Latex Sealants.

C. ASTM C 882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.

D. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications.

E. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.

F. ASTM C 1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

G. FS (Federal Specification) TT-S-00227E (COM-NBS) - Interim Federal Specification for Sealing Compound: Elastomeric Type, Multi-Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures.

H. FS (Federal Specification) TT-S-00230C - Interim Federal Specification for Sealing Compound: Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures.

I. FS (Federal Specification) TT-S-001543 (COM-NBS) - Interim Federal Specification for Sealing Compound: Silicone Rubber Base (for Caulking, Sealing, and Glazing in Buildings and Other Structures.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Comply with Bidding Requirements, Section 00600 - Bonds and Certificates, and Section 00620 - Certificates (Certificates of Insurance).

C. Manufacturer's Technical Data Guides and application procedures.

D. Submit samples illustrating colors selected.

E. Submit laboratory tests or data validating product compliance with performance criteria specified.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company regularly engaged in manufacturing and marketing of products specified in this section.

B. Installer Qualifications: Qualified to perform work specified by reason of experience or training provided by product manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.

B. Store products in a location protected from freezing, damage, construction activity, precipitation, and direct sunlight in strict accordance with manufacturer's recommendations.

C. Condition products to approximately 60 to 70 degrees F (16 to 21 degrees C) for use in accordance with manufacturer's recommendations.

D. Handle all products with appropriate precautions and care as stated on Material Safety Data Sheet.

1.7 PROJECT CONDITIONS

A. Do not use products under conditions of precipitation or freezing weather. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.

B. Ensure substrate is dry.

C. Protect adjacent work from contamination due to mixing, handling, and application of flexible epoxy joint filler.

1.8 WARRANTY

A. Provide manufacturer's five year standard material warranty.

B. Include coverage for replacement of sealant materials which fail to achieve water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

C. Warranty Exclusions: Failure resulting from concrete shrinkage, structural cracks or defects, faulty construction, faulty design, faulty materials (other than joint filler), misuse of structure, settlement, or accident, fire or other casualty or physical damage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers (Sealants and Joint Fillers):
   1. Sonneborn(R) Building Products, ChemRex, Inc., 889 Valley Park Drive, Shakopee, MN 55379-9897; ASD. Tel: (800) CHEMREX (243-6739).
   2. General Electric.
   3. Dow Corning.
   4. Pecora.
   5. Tremco.
   6. United States Gypsum.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. Provide all joint sealers of the same type from a single manufacturer.

2.2 MATERIALS

A. Single Component, Polyurethane Sealant: Plus or minus 25 percent joint movement capability; ASTM C 920, Type S, Grade NS, Class 25, uses NT, M, A, and O; FS TT-S-00230C.

B. Self-Leveling Polyurethane Sealant: Plus or minus 25 percent joint movement capability for horizontal joints; ASTM C 920, Type M, Grade P, Class 25, uses T, M, and O; FS TT-S-00227E; USDA approved.

C. Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT, A, and M; FS TT-S-001543 (COM-NBS); USDA approved.

D. Polysulfide Sealant: ASTM C 920, Type M, Grade NS and FS TT-S-00227 (COM-NBS); plus or minus 25 percent joint movement capability, USDA approved.

E. Poured Flexible Epoxy Joint Filler: Sonneborn(R)/ChemRex "Epolith(R)-P"; two component 100 percent solids epoxy joint filler with flexible, pourable, self-leveling properties.
   1. Shore A Hardness: 85 plus or minus 5.
   2. Shore D Hardness: 34.
   3. Elongation: 75 percent.
   4. Tensile Strength: 655 pounds per square inch (4.5 MPa) plus or minus 10 pounds per square inch (0.07 MPa).
   5. Mixing Ratio: 1 to 1 by volume.
   6. Pot Life: 40 to 55 minutes at 75 degrees F (24 degrees C).
   7. Cure Time, Foot Traffic: 4 hours.
   8. Cure Time, Vehicular Traffic: 24 hours.
   9. Application Temperature: Minimum 55 degrees F (13 degrees C).

F. Gunned Flexible Epoxy Joint Filler: Sonneborn(R)/ChemRex "Epolith(R)-G"; two component 100 percent solids, gun-grade epoxy joint filler with flexible, pick-proof properties for sloped areas.
   1. Shore A Hardness: 90 plus or minus 5.
   2. Shore D Hardness: 50.
   3. Elongation: 50 percent.
   4. Tensile Strength: 900 pounds per square inch (6.2 MPa) plus or minus 10 pounds per square inch (0.07 MPa).
   5. Slant Shear Strength: 865 pounds per square inch (6.0 MPa) per ASTM C 882.
   6. Slant Shear Strength: 112 pounds per square inch (0.8 MPa) per ASTM C 321.

7. Mixing Ratio: 1 to 1 by volume.
8. Pot Life: 40 to 55 minutes at 75 degrees F (24 degrees C).
9. Cure Time, Foot Traffic: 4 hours.
10. Cure Time, Vehicular Traffic: 24 hours.
11. Application Temperature: Minimum 55 degrees F (13 degrees C).

2.3 ACCESSORIES

A. Primer: Sonneborn(R)/ChemRex "Primer No. 733," solvent based.

B. Low VOC Primer: Sonneborn(R)/ChemRex "Primer No. 766," solvent based.

C. Joint Cleaner: Non-corrosive and non-staining type recommended by sealant manufacturer and compatible with joint forming materials.

D. Soft Backer Rod: Sonneborn(R)/ChemRex "Sonofoam Soft Backer Rod"; non-gassing, reticulated closed-cell polyethylene rod designed for use with cold-applied joint sealants.
   1. Comply with ASTM C 1330.
   2. Size required for joint design.

E. Closed-Cell Backer Rod: Sonneborn(R)/ChemRex "Sonofoam Closed-Cell Backer Rod"; closed-cell polyethylene rod designed for use with cold-applied joint sealants for on-grade or below-grade applications.
   1. Comply with ASTM C 1330.
   2. Size required for joint design.

F. Joint Filler: Sonneborn(R)/ChemRex "Expansion Joint Filler"; closed-cell polyethylene joint filler designed for use in cold joints, construction joints, or isolation joints wider than 1/4 inch (6 mm).
   1. Size required for joint design.

H. Bond Breaker: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

2.4 COLOR

A. Sealant Colors: Selected by architect.
   1. Manufacturer's standard color range.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect all areas involved in work to establish extent of work, access, and need for protection of surrounding construction.

B. Protect all surroundings from flexible epoxy joint filler including, but not limited to, floors, equipment, line striping, walkways, and drives.

C. Conduct preapplication inspection of site verification with an authorized manufacturer's representative.

3.2 PREPARATION

A. Remove loose materials and foreign matter which impair adhesion of joint filler.

B. Clean joints and saw cuts by grinding, sandblasting, or wire brushing to expose a sound surface free of contamination and laitance.

C. Ensure structurally sound surfaces, dry, clean, free of dirt, moisture, loose particles, oil, grease, asphalt, tar, paint, wax, rust, waterproofing, curing and parting compounds, membrane materials, and other foreign matter.

D. Where the possibility of joint filler staining of adjacent areas or materials exists, mask joints prior to application.
   1. Do not remove masking tape before joints have been tooled and initial cure of joint filler has taken place.
   2. Work stained due to failure of proper masking precautions will not be accepted.

3.3 INSTALLATION

A. Back-Up Material:
   1. Install appropriate size backer rod, larger than joint where necessary according to manufacturer's recommendations.
   2. Install polyethylene joint filler in joints wider than 1/4 inch (6 mm) to back-up material per manufacturer's recommendations.
   3. Do not install epoxy joint filler over backer rod.

B. Bond Breaker: Install bond-breaker strip in joint to be sealed on top of back-up material to prevent adhesion of sealant to back-up material; install per manufacturer's recommendations.

C. Sealant:
   1. Prepare sealants that require mixing; follow manufacturer's recommended procedures, mixing thoroughly.
   2. Mix only as much material as can be applied within manufacturer's recommended application time period.

3. Apply materials in accordance with manufacturer's recommendations; take care to produce beads of proper width and depth, tool as recommended by manufacturer, and immediately remove surplus sealant.
4. Apply materials only within manufacturer's specified application life period. Discard sealant after application life is expired or if prescribed application period has elapsed.

D. Epoxy Joint Filler:
1. Transfer entire contents of activator container thoroughly with entire contents of base container in separate container of appropriate size.
2. Mix only as much material as can be applied within manufacturer's recommended application time period.
3. Mix with slow-speed drill (80-100 rpm) and slotted paddle. Ensure mixing paddle reaches bottom and scrapes side of container several times. Scrape paddle several times to ensure thorough mixing. Keep paddle blade below surface to avoid whipping air into material.
   a. Mix Epolith(R)-P for 5 to 7 minutes.
   b. Mix Epolith(R)-G for 8 to 10 minutes.
4. Pour Epolith(R)-P from spouted can or professional bulk-loading calking gun.
5. Apply Epolith(R)-G by professional bulk-loading gun.
6. Maintain minimum joint application of 2/3 joint depth or 1 inch (25 mm), whichever is greater.
7. Fill joints from bottom up to exterior face by holding properly sized nozzle against joint bottom.
8. Tool joint to ensure maximum adhesion to joint sides, correct bead configuration, and a neat joint. Dry tool or dampen tool with Reducer 990. Do not use water or soapy water.
9. Apply materials only within manufacturer's specified application life period. Discard joint filler after application life is expired or if prescribed application period has elapsed.

3.4 CLEANING

A. Remove uncured sealant and joint filler with Reducer 990, xylene, toluene, or MEK. Remove cured sealant and joint filler by razor, scraping, or mechanically.

B. Remove all debris related to application of sealants from job site in accordance with all applicable regulations for hazardous waste disposal.

3.5 SCHEDULE OF JOINT SEALERS

A. General-Purpose Interior and Exterior Applications:
   1. Sealant:
      a. Single component polyurethane.
      b. Two component polyurethane.
      c. Polysulfide.
      d. Silicone.
   2. Applications:
      a. Joints and recesses between adjacent constructions and frames, sills, and subsills of windows, doors, curtainwall, storefront, and louvers.
      b. Coping joints and wash joints in precast concrete, cast stone, or natural stone.
      c. Masonry joints beneath shelf angles.
      d. Around penetrations in exterior walls.
      e. Under door thresholds and at bottom of door frames.
      f. Where necessary to prevent infiltration of water or air into or through exterior building envelope.

B. Other Exterior Applications:
   1. Sealant:
      a. Single component polyurethane.
      b. Two component polyurethane.
      c. Silicone.
   2. Applications:
      a. Between adjacent construction and gravel stops, copings, fascias, and miscellaneous flashings.
      b. Metal flashings inserted into reglet.
      c. Top edges of surface mounted counterflashing.
      d. Expansion and control joints in masonry where expansion joint covers are not indicated.
      e. Joints between new and existing exterior construction.

C. Interior Wetted Areas:
   1. Sealant: Silicone.
   2. Applications: Between adjacent construction and vanities, shower stalls, bathtub and shower enclosures, sinks, counter tops, plumbing cut-outs, and plumbing fixtures.

D. Interior High-Movement Joints:
   1. Sealant:
      a. Single component polyurethane.
      b. Two component polyurethane.
      c. Polysulfide.
      d. Silicone.
   2. Applications:
      a. At resilient joint between interior partitions and floor framing above.

E. Other Interior Applications:

1. Sealant:
    a. Single component polyurethane.
    b. Two component polyurethane.
    c. Polysulfide.
    d. Silicone.
2. Applications:
    a. Between adjacent construction and equipment, shelving, casework, and furniture.
    b. Perimeters of door and window frames, access panels.
    c. Between interior partitions and adjoining concrete or steel columns, walls, or other construction.
    d. Other exposed locations within partitions to seal against passage of air.
    e. Other interior joints of small dimension which require painting.
    f. Gypsum board partitions:
        1) Between gypsum panels and metal track at floors and dissimilar walls; install sealant just prior to installation of gypsum panel.
        2) Between adjacent face layers of abutting intersection gypsum board partitions; install sealant before taping and finishing joint.
        3) Between gypsum panels and penetrations: Seal around openings of ducts and pipes. Seal sides and backs of electrical boxes.
        4) Seal control joints prior to installing control joint trim.
    g. Other concealed locations within partitions to completely seal against passage of air.
3. Allow sealant to cure before painting over joint.

F. Exterior Traffic Surfaces:

1. Sealant:
    a. Two component self-leveling polyurethane.
    b. Single component self-leveling polyurethane.
2. Applications:
    a. Control and expansion joints in sidewalks and pavements.

G. Interior Traffic Surfaces:

1. Sealant:
    a. Two component self-leveling polyurethane.
    b. Single component self-leveling polyurethane.
2. Applications:
    a. Control and expansion joints in floors.

H. Interior Heavy Traffic Surfaces:

1. Surface preparation: Freshly saw-cut or blast-clean joints; blow with oil-free compressed air.
2. Sealant: Epoxy Joint Filler.
   a. Pour flush with adjacent surface in 2 pours in accordance with manufacturer's instructions.
3. Applications: Control joints in floors subject to vehicular traffic.

I. Glazing:
   1. Primer: None.
      a. Glass (non-coated).
      b. Ceramic tile, quarry tile.
   2. Primer:
      a. Aluminum (anodized and mill finish).
      b. Iron and steel (carbon, stainless, galvanized).
      c. Plastic (ABS, PVDF, polyurethane, PVC).
      d. Wood.
      e. Marble, slate.
      f. Concrete.
   3. Sealant:
      a. Silicone.
   4. Applications:
      a. Glazing, including butt and lap sheer joints, stopless glazing, and cap, head and toe bead in conventional glazing.
      b. Curtain wall.
      c. Storefront.
      d. Glass partitions.
      e. Glass blocks.
      f. Solar panels.
      g. Skylights.

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel doors.

B. Fire rated steel doors.

C. Steel frames.

1.2 RELATED SECTIONS

A. Section 08710 - Door Hardware.

B. Section 08800 - Glazing.

C. Section 09900 - Paints and Coatings.

1.3 REFERENCES

A. ANSI/SDI 100-91 - Recommended Specifications for Standard Steel Doors & Frames; Steel Door Institute.

B. SDI 105 - Recommended Erection Instructions for Steel frames.

C. SDI 111 - Recommended Standard Details for Steel Doors & Frames.

D. SDI 113 - Test Procedure and Acceptance Criteria for Acoustical Performance for Steel Door and Frame Assemblies.

E. ASTM A 366/A 366M - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.

F. ASTM A 568/A 568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For.

G. ASTM A 569/A 569M - Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality.

H. ASTM A 591/A 591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.

I. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

J. ASTM A 924/A 924M - Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process.

K. NFPA 80 - Standard for Fire Doors and Windows.

L. Building Materials Directory; Underwriters Laboratories Inc.

M. Certification Listings; Warnock Hersey International Inc.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide manufacturer's standard details and catalog data demonstrating compliance with referenced standards. Provide installation instructions.

C. Certificates:
1. Provide manufacturer's certification that products comply with referenced standards.
2. Provide evidence of manufacturer's membership in the Steel Door Institute.

D. Shop Drawings: Submit for approval the following:
1. Door, frame, and hardware schedule in accordance with SDI 111D.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide all products from a single manufacturer who is a member of the Steel Door Institute.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect products from moisture, construction traffic, and damage.
1. Store under cover.
2. Place units on 4-inch high wood sills or in a manner that will prevent rust or damage.
3. Do not use non-vented plastic or canvas shelters.
4. Should wrappers become wet, remove immediately.
5. Provide 1/4-inch space between doors to promote air circulation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Ceco Door Products Division of United Dominion Company; 750 Old Hickory Boulevard, One Brentwood Commons, Suite 150, Brentwood, TN 37027; Telephone (615) 661-5030, FAX (615) 370-5299.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

A. Steel Sheet for Doors and Frames:
   1. Cold rolled steel: ASTM A 366 and A 568.
   2. Hot rolled, pickled, and oiled steel: ASTM A 569 and A 568.
   3. Hot dipped zinc coated steel: ASTM A 924 and A 653; Class A40 for alloyed coatings or G60 for spangled coatings, minimum.

B. Steel Sheet for Anchors and Accessories:
   1. Electrolytically deposited zinc coated steel: ASTM A 591 and A 568; Class B (0.075 oz/sf), minimum.

2.3 STEEL DOORS

A. Acceptable Product: Medallion.
   1. Grade: ANSI/SDI 100 Grade II, Heavy Duty.
   2. Performance:
      a. Thermal Insulation: 'R' factor 2.38; 'U' factor 0.42.
      b. Sound Transmission: STC 38.
   3. Construction:
      a. Face Sheets: Steel, _18_ gage.
      b. Core: Vertical stiffeners, _22_ gage _galvanized_ steel, spaced 6 inches apart and spot-welded to face sheets at 5 inches OC; full-thick glass fiber insulation between stiffeners.
      c. Vertical Edges: Seamless construction or seams welded and ground smooth, full door height.
      d. Top closure channel: 16 gage steel, _galvanized.
      e. Bottom closure channel: 16 gage steel, _galvanized, recessed.
      f. Hinge Preparation: Recess for _4 1/2 inches high, standard weight, full mortise hinges.
      g. Closer Preparation: Concealed 12 gage steel tube continuous across door width, welded to inside face of each face sheet.
      h. Lockset Preparation: __cylindrical lockset, backset 2-3/4 inches.

2. Fire Rated Doors: Furnish door units bearing UL Class Labels for fire ratings indicated in accepted shop drawing schedule.
3. Finish: Factory Primer Finish.

2.4 STEEL FRAMES

A. Standard Steel Frames for Masonry or Stud Walls:
1. Acceptable Product: Series SF.
2. Construction: Three-piece knock-down frames; galvanized steel, 14 gage.
3. Finish: Factory Primer Finish.

4. Hinge Preparation: Recess for _4 1/2 inches high, standard weight, full mortise hinges.
5. Strike Preparation for Single Doors: 4-7/8 inches universal.

2.5 ACCESSORIES

A. Anchors: Manufacturer's standard framing anchors, specified in manufacturer's printed installation instructions for project conditions.

B. Glazing trim for non-labeled doors: Extruded aluminum frame, mitered corners; screwless snap-in glazing beads; glazing pocket for indicated glazing thickness.

C. Glazing trim for labeled doors: Steel frame, mitered corners; screw-on glazing beads; glazing pocket for 1/4 inch glazing thickness.

D. Glazing trim for glazed-design doors: Steel channel screw-on glazing beads; glazing pocket for 3/8 inch glazing thickness.

E. Silencers: Resilient rubber, black color.

F. Glazing: Specified in Section 08800 - Glazing.

2.4 FABRICATION

A. Steel Doors:
1. Fabricate to conform to ANSI/SDI 100, and as follows:
a. Grade I, Standard Duty:
1) Physical Endurance: ANSI 250.4, Level C.
2) Structural: Resist 60 pounds per square foot air pressure inswing, 75 pounds per square foot air pressure outswing, in accordance with ASTM E 330.

2. Hinge Preparation: Recess for specified hinges, provide 07 gage steel hinge reinforcement, tap holes for hinge attachment; locations in accordance with ANSI A156.7 template.
3. Lockset Preparation: Provide cutouts and reinforcement for cylindrical lockset in accordance with ANSI A115.2, backset 2-3/4 inches.
4. Closer Preparation: Continuous reinforcement across door width, welded to inside face of each face sheet.
5. Top closure channels: Set back face of channel web flush with door top; weld to inside face of each face sheet.
6. Provide cut-outs in doors for lites and lovers in accordance with accepted shop drawings.
7. Install lites and louvers in doors:
   a. Lite size in fire rated doors not to exceed ASTM E 152 limitations for indicated rating.

B. Steel Frames:
1. Three-piece knock-down frames: Head and jamb intersecting corners die-cut, mitered at 45 degrees, with locking tabs for rigid connection when assembled.
2. Factory-welded frames: Head and jamb intersecting corners mitered at 45 degrees, with full welded joints ground smooth.
3. Hinge Preparation: Recess for specified hinges, provide 07 gage steel hinge reinforcement, tap holes for hinge attachment; locations in accordance with ANSI A156.7 template.
4. Strike Preparation for Single Doors: Prepare frames for specified strike in accordance with ANSI A115.1 and ANSI A115.2.
5. Silencer Preparation for Non-Gasketed Frames: Tap single door frames with three holes on strike side, spaced 6 inches from top and bottom of door opening, and at center of door opening; tap double door frames with two holes in head, spaced 6 inches each way from meeting point of door swings.

2.5 FINISHES

A. Chemical Treatment: Treat steel surfaces to promote paint adhesion.

PART 3 EXECUTION

3.1 EXAMINATION

A. Have installer verify that project conditions are acceptable before beginning installation of frames.

B. Correct unacceptable conditions before preceding with installation.

3.2 INSTALLATION

A. Install frames in accordance with SDI 105.

B. Install doors plumb and in true alignment and fasten to achieve the maximum operational effectiveness and appearance of the unit. Maintain clearances specified in SDI 100 or NFPA 80.

C. Fill welded wrap-around frames in masonry construction with mortar as masonry is laid-up.

D. Fill welded wrap-around frames in plaster construction with plaster as work progresses.

E. If additives are used in masonry or plaster work during cold weather, field coat inside of steel frames with bituminous compound to prevent corrosion.

3.3 ADJUST AND CLEAN

A. Adjust doors for proper operation, free from binding or other defects.

B. Clean and restore soiled surfaces. Remove scraps and debris, and leave site and a clean condition.

END OF SECTION

Section 08210 - Flush Wood Doors

PART 1. GENERAL

1.1 SECTION INCLUDES

A. Flush
B. Styled™
C. Factory Glazing, (Note: WDMA and its Building Code and Regulations Committee has recommended an update to NFPA 80 requiring companies licensed to machine wood doors also install fire rated glazing to ensure that the opening meets all fire rating requirements). See glass types specified in 08800.
D. Louvers
E. Transoms non-rated and fire-rated
F. Positive Pressure rated fire doors
G. Neutral Pressure rated fire doors
H. Environmental Class™ Doors LEED Version 2.2
I. Applied moldings
J. Dutch doors
K. Workable Surfaces™
L. Variable Privacy™

1.2 RELATED SECTIONS

A. Section 06200 - Finish Carpentry
B. Section 06400 - Architectural Woodwork
C. Section 08100 - Metal doors and frames
D. Section 08700 - Finish hardware
E. Section 08800 – Glazing (Delete when factory glazing is specified).

1.3 REFERENCES AND REGULATORY REQUIREMENTS

A. ASTM E152 - Methods of Fire Tests and Door Assemblies.
B. NFPA 252 - Standard Methods for Fire Assemblies.
C. UBC 7-2, 1997, IBC 2000, IBC 2003, IBC 2006 or NFPA 5000 (Choose applicable code)
D. UL 10 (c) - Fire Tests for Door Assemblies - Positive Pressure
F. NFPA 80 - Fire Doors and Windows.
G. Quality Standards:
    1. WDMA Industry Standard I.S. 1-A-2004 (Choose WDMA or AWI but not both)
    2. AWI Quality Standards 8th Edition, Version 1.0 2004
    3. ANSI A115. W Series, Wood Door Hardware Standards.
    4. FSC – Forest Stewardship Council
    5. SCS – Scientific Certification Systems
H. Labeling Agencies
    1. Intertek Testing Services-Warnock Hersey (ITS-WH) [or]
    2. Underwriters Laboratories, Inc. (UL)

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Shop drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts, special beveling, hardware blocking in mineral core doors, identify cutouts.
C. Indicate compliance with specified fire rating (positive pressure or neutral pressure).
D. Product Data: Indicate door core materials, thickness, construction, veneer species (veneer color selection required Birch.

E. Construction samples: Submit one or more of manufacturer's standard samples demonstrating door construction.
F. Finish samples: Sample to illustrate the color of the specified door face materials. Note: Actual grain and color may vary from sample as wood is a natural material and will vary from tree to tree.
G. Manufacturer's full lifetime warranty
H. FSC Chain of Custody certified MR 7
I. SCS Recovered Fiber Content Certification MR 4.1, 4.2
J. No added Urea Formaldehyde IEQ 4.4 (Note: Marshfield Particleboard now qualifies for no added UF. Composite, Mineral and Lumber Core are available with no Urea Formaldehyde.
K. Glass size, type, pattern and thickness for factory glazed doors.

1.5 QUALITY ASSURANCE

A. Meet or exceed WDMA I.S.1-A Premium Grade, or AWI Version 8 Custom Grade (Choose one, do not use both in the same specification)
B. Labeled Doors: Listed and conform to the requirements of:
   1. Intertek Testing Services-Warnock Hersey (ITS-WH) [or]
   2. Underwriters Laboratories (UL).

1.6 DELIVERY STORAGE AND HANDLING AND SITE CONDITIONS

A. Deliver, store, protect and handle products under provisions of WDMA, AWI, WIC and manufacturer's care and handling instructions.
B. Accept doors on site in manufacturer's standard packaging. Inspect for damage. Do not store in damp or wet areas. HVAC systems should be operating and balanced prior to arrival of doors. Acceptable humidity shall be no less than 25% nor greater than 55%. (**NOTE: Any claim for warp, bow, twist or telegraphing may be denied if required humidity requirements are not maintained).**
C. Certain wood species such as Cherry, Walnut and Mahogany are light sensitive. Protect doors from exposure to natural and artificial light after delivery.

1.7 COORDINATION

A. Coordinate work under provisions of Section 01620.
B. Coordinate the work with door opening construction, door frame and door hardware installation with a pre-installation conference.

1.8 WARRANTY

A. Provide manufacturer's warranty to the following term:
   1. Interior Solid Core Doors: "Full Life of Original Installation" including hanging and finishing if door(s) do not comply with warranty tolerance standards.
   2. Include coverage for delamination, warping, bow, cup and telegraphing of core construction beyond warranty tolerances.

PART 2. PRODUCTS

2.1 MANUFACTURER

A. Marshfield DoorSystems, Inc., Marshfield Signature Series™ quality as defined in this section.

B. Substitutions will be considered.

2.2 MATERIALS

A. **WORKMANSHIP**
   1. Comply with AWI workmanship for veneer faces, vertical edges, crossbands,

horizontal edges and dimensional tolerances.

B. **DOOR CONSTRUCTION GRADE**
   1. Except as otherwise shown on the drawings fabricate the work of this section to AWI "Custom Grade"

C. **WOOD DOOR FACING**
   1. Wood Veneer (5-Ply): (Choose from the selection of grade, species, cuts and color as detailed by WDMA G-6 through G-11 or AWI Section 200 Hardwood Veneer Face Summary. Note: unless otherwise noted Birch, Ash and Maple will be supplied as natural).
   2. Plastic Laminate: (Select manufacturer, thickness, pattern, color and finish).
      a. Laminate to be selected from Wilson Art International standard colors and patterns.
   3. MDO (Medium Density Overlay for paint).

D. **VENEER MATCHING**
   1. Book Match

E. **ASSEMBLY OF SPLICED VENEERS**
   1. Running book match (standard unless otherwise noted), Center balance match. AWI Section 1300 G 13

F. **DOORS IN PAIRS OR SETS**
   1. Specify per project requirements. (See WDMA G-9 / AWI Section 1300 G14). Door schedule shall reflect pairs and sets by door numbers, including doors separated by a mullion.

G. **DOORS WITH TRANSOMS**
   1. Continuous Match

H. **GLAZING OF FLUSH WOOD DOORS**
   1. Glazing shall be by the wood door manufacturer
      a. Glass as selected by architect from Marshfield DoorSystems Expressions del Sol or Artistic Expressions
      b. Logo glass as selected by architect
      c. PyroEdge-20 Fire and Safety Rated Glass. (An excellent replacement for wire glass in educational facilities)
      d. Pattern glass as selected by architect
      e. Specialty designs as detailed

2.3 FABRICATION

A. **DOOR AND TRANSOM PANEL CORE CONSTRUCTION**
   1. Non-rated Marshfield Signature Series™: ANSI A208; (Select 1).
      a. 1-LD-2 Particleboard, DPC-1; [or]
      b. Structural Composite Lumber; DCL-1 [or]
      c. Kiln Dried Staves with one species per core; DSC-1
      d. Environmental Class; ESC-1 (Staved Core, assists in meeting MR 7, IEQ 4.4, [or] ECL (Composite Lumber), assists in meeting 4.4 [or] EPC-1 (Particleboard Core, assists in meeting MR 5.1 and 5.2 and 7, [or] EFM (assists in meeting 4.4. If no added urea (IEQ 4.4) is required, specify EPCUF, ESCUF, ECLUF or EFMUF.

   2. 20-minute fire-rated Marshfield Signature Series™: ANSI A208. Indicate if positive pressure doors are Category B (frame mounted intumescent), if applicable.
      a. 1-LD-2, Particleboard; DFP-20 [or]
      b. Structural Composite Lumber; DCL-20 [or]
      c. Kiln Dried Staves with one species per core; DFS-20 [or]
      d. Environmental Class: ESC-20 [or] EPC-20 [or] ECL-20
   3. 45, 60 or 90 minute mineral core fire-rated Marshfield Signature Series™: Indicate

if doors are Category B (frame mounted intumescent).
a. Fire Rated Mineral Core; DFM-45, -60, -90
b. Environmental Class Fire Rated Mineral Core; EFM-45, -60, -90

4. Marshfield Signature Series™ Acoustic: Sound Retardant construction (Non-rated or 20-minute rated DSR-41, Non-rated, 20 – 45 minute rated DSR-44, DSR-45, DSR-46 or DSR-47)
6. Bond stiles and rails to core, abrasive sand core assembly to achieve uniform thickness.

B. **VERTICAL EDGES (STILES)**
1. Non-rated and 20-minute rated
a. Edges to match face veneer. (May include veneer banding with structural composite lumber backers or inner plies).
2. 20-minute rated pairs (No metal edges or astragal required).
a. Treated edges on meeting stiles to match face veneer. (May include veneer banding with structural composite lumber backers or inner plies).
b. As required by manufacturer to permit positive pressure "S" label per Category H.
3. Mineral Core
a. Mineral core door stiles to manufacturer's standard edge for improved screw holding. [or]
b. Mineral core door stiles to be veneer banded to match face veneer over manufacturer's edge for improved screw holding. (Neutral Pressure)
c. As required by manufacturer to meet Positive Pressure Category A (concealed intumescent) or B (frame mounted intumescent). (Choose one).
d. Environmental Class EFM or EFMUF45, 60 or 90 minute.
4. Plastic laminate:
a. Same as door facing, applied after face [or]
b. Stain edges to match face [or]
c. Paint edges.

C. **HORIZONTAL EDGES (RAILS)**
1. Manufacturer's standard. (No MDF top and bottom rails permitted)
2. As required to meet positive pressure ratings.

D. **ADHESIVES**
1. Face Adhesive: Type 1.

E. **INNERBLOCKING FOR MINERAL CORE FIRE DOORS**
1. Supply innerblocking for all surface applied hardware - Through bolts not accepted.

F. **MACHINING**
1. Factory fit and machine doors for frame and finish hardware in accordance with hardware and NFPA 80 requirements and dimensions. Do not machine for surface hardware. Apply appropriate fire labels.

G. **DUTCH DOORS TYPE: (CHOOSE ONE)**
1. One-side shelf.

2.3 FABRICATION

A. DOOR AND TRANSOM PANEL CORE CONSTRUCTION.
1. Kiln Dried Lumber Staves with one specie per core, with no added Urea Formaldehyde 0r Particleboard core with no added Urea Formaldehyde or Composite Lumber, with no added Urea Formaldehyde
2. Bond stiles and rails to core using Urea formaldehyde free adhesives. Abrasive sand core assembly to achieve uniform thickness

B. VERTICAL EDGES (STILES)
1. Non-rated. Edges to match face veneer. (May include veneer banding and

structural composite lumber backers or inner plies).

2. 20 Minute Rated. Fire treated stiles. Edges to match face veneer. (May include veneer banding and structural composite lumber backers or inner plies.

C. HORIZONTAL EDGES (RAILS)

1. Mill Options structural composite lumber or hardwood lumber.

D. ADHESIVES

1. Facing Adhesive Type I – Waterproof and formaldehyde free.

E. MACHINING FOR RATED DOORS.

1. Factory fit and machine doors for frame and finish hardware in accordance with hardware and NFPA 80 requirements and dimensions. Do not machine for surface hardware. Apply appropriate fire labels.

F. DO NOT TRIM POSITIVE PRESSURE RATED DOORS FOR WIDTH.

2.4 ACCESSORIES

A. **LOUVERS**

1. Wood louvers as detailed on the drawings.
2. Louvers to be furnished by the door manufacturer.
3. Metal Louvers: Specified in Section 10255.

B. **GLAZING STOPS**

1. Non-Rated:
   a. Wood, of the same species/compatible with door species (or)
   b. Metal Vision Frames.
   c. W-8 Reveal Lite Molding
2. Fire-Rated:
   a. Flush, wood veneer clad PVC, of same species as door facing (or)
   b. Veneer wrapped rolled steel, of same species as door facing (or)
   c. Metal Vision Frames.
   d. W-8 Reveal Lite Molding (20 minute only)
   d. Verify compatibility of glazing system with positive pressure requirements.

C. **GLASS & GLAZING IN WOOD DOORS**

1. Glass and glazing provided by the wood door manufacturer

D. **MEETING EDGES FOR PAIRS OF FIRE RATED DOORS**

1. Manufacture doors whereby the opening will not require either an overlapping metal edge and astragal or metal meeting edges.
3. For neutral Pressure 20-minute doors only – treated stiles at meeting edge.
4. Meet Positive Pressure requirements for Category A (concealed intumescent) or Category B (frame mounted intumescent) doors. Choose either A or B.

E. **APPLIED MOLDINGS:**

1. As selected from manufacturer's standard profiles and install as detailed.
2. Applied moldings to be affixed to the door without the use of nails or staples. No visible fasteners are permitted.

2.5 FACTORY FINISH

A. Factory finish doors in accordance with WDMA G-17 Finish System Description or AWI Division 1500–S-4 – Finish System Standards. Factory finish to be water based stain and ultraviolet (UV) cured polyurethane to comply with EPA Title 5 guidelines for Volatile Organic Compound (VOC) emissions limitations. Finish must meet or exceed performance standards of TR-6 catalyzed polyurethane. Color shall be Marshfield DoorSystems Enviroclad UV™ Graffiti Resistant Designer Color to be selected. www.marshfielddoors.com

B. For standing and running trim use Pittsburgh Paint stain formulated to match Marshfield DoorSystems Enviroclad UV™ Designer color.

C. Factory finished doors to be installed just prior to substantial completion.

PART 3. EXECUTION

3.1 EXAMINATION

A. Verify substrate opening conditions
B. Verify that opening sizes and tolerances are acceptable and ready to receive this work.
C. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.2 INSTALLATION

A. Install fire-rated and non-rated doors in accordance with NFPA 80, manufacturers' instructions and to ITS-WH/UL requirements.
B. Trim non-rated door width by cutting equally on both jamb edges.
C. Trim door height by cutting bottom edges to a maximum 3/4 inch (19-mm).
D. Trim fire door height at bottom edge only, in accordance with fire rating requirements.
D. **DO NOT TRIM POSITIVE PRESSURE RATED DOORS FOR WIDTH**
F. Pilot drill screw and bolt holes using templates provided by hardware manufacturer. [Use threaded throughbolts for half surface hinges].
G. EXERCISE CAUTION WHEN DRILLING PILOT HOLES AND INSTALLING HINGES SOTHAT PILOT HOLES ARE NOT OVER DRILLED AND SCREWS ARE NOT OVER TORQUED. FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS FOR POSITIVE PRESSURE DOORS.

H. Coordinate installation of doors with installation of frames and hardware
I. Manufacturer shall install glass in wood doors
I. Install door louvers and light kits plumb and level.
K. Reseal or refinish any doors that required site alteration.

3.3 WARRANTY TOLERANCES

A. Conform to WDMA standards and testing methods for warp, cup, bow and telegraphing.

3.4 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

END OF SECTION

A. Interior Doors (Non Rated).

B. 1. EPC (FSC particleboard) or EPCUF (FSC particleboard with no added urea formaldehyde 1-3/4" (45mm)
1. ESC (FSC stave core) or ESCUF (FSC stave core with no added urea formaldehyde) - Staved Core Door, 1-3/4 (45mm) [OR]
2. EPC-1 or EPCUF - Particleboard Core Door, 1-3/4" (45mm)
3. ECL-1 (Composite lumber) or ECLUF Composite Lumber with no added urea formaldehyde, 1-3/4 (45mm)

B. Interior Doors (Rated)

1. ESC-20 or ESCUF-20. (Neutral Pressure) 20 Minute Staved core door 1-3/4" (45 mm) rated by ITS-WH or UL. FSC chain of custody certified core. The USCUF contains no added urea formaldehyde.
2. ESC-20 or ESCUF - 20. (Positive Pressure, Category A) 20 Minute Staved core door, 1-3/4" (45mm) Positive Pressure with concealed intumescent. Rated by ITS-WH or UL. FSC chain of custody certified core. ESCUF contains no added urea formaldehyde.
3. ESC-20 or ESCUF - 20. (Positive Pressure, Category B) 20 Minute Stave core door, 1-3/4" (45mm) Positive Pressure with frame applied intumescent rated by ITS-WH or UL. FSC chain of custody certified core. ESCUF contains no added urea formaldehyde.
4. ESC-20 or ESCUF-20. 20 Minute Staved core door, 1-3/4" (45mm) Positive Pressure for aluminum frames rated by ITS-WH or UL. FSC chain of custody certified core. ESCUF contains no added urea formaldehyde.

6. EPC-20. (Neutral Pressure) 20 Minute particleboard core door 1-3/4" (45 mm) rated by ITS-WH or UL. Scientific Certification Systems (SCS) certified for recovered fiber content and FSC certified.
7. EPC-20 or EPCUF-20 (no added urea formaldehyde). Positive Pressure, (Category A) 20 Minute Particleboard core door, 1-3/4" (45mm) Positive Pressure with concealed intumescent (Required on pairs only). Rated by ITS-WH or UL. Scientific Certification Systems (SCS) certified for recovered fiber content and FSC certified.
8. EPC-20 or EPCUF (no added urea formaldehyde) Positive Pressure, (Category B) 20 Minute Particleboard core door, 1-3/4" (45mm) Positive Pressure with frame applied intumescent rated by ITS-WH or UL. Scientific Certification Systems (SCS) certified for recovered fiber content and FSC certified.
9. EPC-20 or EPCUF-20 (no added urea formaldehyde). 20 Minute Particleboard core door, 1-3/4" (45mm) Positive Pressure for aluminum frames rated by ITS-WH or UL. Scientific Certification Systems (SCS) certified for recovered fiber content and FSC certified.
10. EFMUF-45, EFMUF-60, EFMUF-90. 45, 60, or 90 Minute Fire-Rated Mineral Core door, 1-3/4" (45mm) Rated by ITS-WH or UL. The composite products in this door contain no added urea-formaldehyde.
11. EFMUF-45, EFMUF-60, EFMUF-90. 45, 60, or 90 Minute Fire-Rated Mineral Core door, 1-3/4" (45mm).
    Positive Pressure with concealed intumescent (Category A). Rated by ITS-WH or UL. The composite products in this door contain no added urea-formaldehyde.
12. ECLUF-20 20 Minute Structural Composite core door 1-3/4" (45 mm) rated by ITS-WH or UL. This product contains no added urea formaldehyde.

SECTION 08360
SECTIONAL OVERHEAD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Insulated Sectional Overhead Doors.

B. Electric Operators and Controls.

C. Operating Hardware, tracks, and support.

1.2 RELATED SECTIONS

A. Section 04810 - Unit Masonry Assemblies: Prepared opening in masonry. Execution requirements for placement of anchors in masonry wall construction.

B. Section 05500 - Metal Fabrications: Steel frame and supports.

C. Section 06114 - Wood Blocking and Curbing: Rough wood framing and blocking for door opening.

D. Section 07900 - Joint Sealers: Perimeter sealant and backup materials.

E. Section 08710 - Door Hardware: Cylinder locks.

F. Section 09900 - Paints and Coatings: Field painting.

1.3 REFERENCES

A. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
   1. Design pressure per local code.

B. Wiring Connections: Requirements for electrical characteristics.
   1. 115 volts, single phase, 60 Hz.

C. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Indicate plans and elevations including opening dimensions and

required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

G. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.

C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened labeled packaging until ready for installation.

B. Protect materials from exposure to moisture until ready for installation.

C. Store materials in a dry, ventilated weathertight location.

1.8 PROJECT CONDITIONS

A. Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Overhead Door Corp., which is located at: 2501 S. State Hwy. 121 Suite 200 ; Lewisville, TX 75067; Toll Free Tel: 800-929-3667; Tel: 469-549-7100; Fax: 972-906-1499; Email: request info; Web: www.overheaddoor.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 INSULATED STEEL SECTIONAL OVERHEAD DOORS

A. Insulated Steel Sectional Overhead Doors: 592 Series Thermacore Insulated Steel Doors by Overhead Door Corporation. Units shall have the following characteristics:
   1. Door Assembly: Metal/foam/metal sandwich panel construction, with EPDM thermal break and ship-lap design.
      a. Panel Thickness: 2 inches (5 mm).

b. Exterior Surface: Ribbed, textured.
c. Exterior Steel: .015 inch (4 mm), hot-dipped galvanized.
d. End Stiles: 16 gauge with thermal break.
e. Standard Springs: 10,000 cycles. (High cycles.)
f. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
g. Thermal Values: R-value of 17.50; U-value of 0.057.
h. Air Infiltration: 0.08 cfm at 15 mph; 0.08 cfm at 25 mph.
i. Pass-Door:
    1) Not required.

j. High-Usage Package: Provide with optional high-usage package.
k. Partial Glazing of Steel Panels:
    1) Insulated double strength tempered glass.

2. Finish and Color: Two coat baked-on polyester with exterior color to be selected and white interior color.
3. Windload Design: ANSI/DASMA 102 standards to meet applicable code.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
    a. Interior mounted slide lock.
6. Weatherstripping: EPDM rubber bulb-type strip at bottom. (Header seal and jamb weatherstripping.)
    a. EPDM rubber bulb-type strip at bottom.
    b. Flexible Jamb seals.
    c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.

8. Electric Motor Operation: Provide UL listed electric operator, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
    a. Entrapment Protection:
        1) Pneumatic sensing edge up to 18 feet (5.5 m) wide.
        2) Electric sensing edge.
        3) Photoelectric sensors.
    b. Operator Controls:
        1) Push-button operated control stations with open, close, and stop buttons.
        2) Surface mounting.
        3) Interior location.
    c. Special Operation:
        1) Pull-rope release automatic opening device.
        2) Vehicle detector operation.
        3) Radio control operation.
        4) Door timer operation.
        5) Pneumatic sensing edge up to 18 feet (5.5 m) wide.
        6) Electric sensing edge.
        7) Photoelectric sensors.
    d. Operator Controls:
        1) Push-button operated control stations with open, close, and stop buttons.
        2) Key operated control stations with open, close, and stop buttons.
        3) Push-button and key operated control stations with open, close, and stop buttons.
        4) Flush mounting.
        5) Surface mounting.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until openings have been properly prepared.

B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

C. Verify electric power is available and of correct characteristics.

D. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.

B. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

C. Anchor assembly to wall construction and building framing without distortion or stress.

D. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

E. Fit and align door assembly including hardware.

F. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.4 CLEANING AND ADJUSTING

A. Adjust door assembly to smooth operation and in full contact with weatherstripping.

B. Clean doors, frames and glass.

C. Remove temporary labels and visible markings.

3.5 PROTECTION

A. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

B. Protect installed products until completion of project.

C. Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

END OF SECTION

SECTION 08520

ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum double hung windows.

B. Aluminum awning windows.

C. Aluminum fixed windows.

1.2 RELATED SECTIONS

A. Section 07900 - Joint Sealers.

B. Section 08800 - Glazing.

1.3 REFERENCES

A. AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC), and Wood Windows and Glass Doors.

B. AAMA 605.2 - Voluntary Specification for High Performance Organic coatings on Architectural Aluminum Extrusions and Panels.

C. AAMA 1503.1 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.

D. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

E. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

F. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.

G. ASTM F 588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

1.4 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Double hung units; thermally broken aluminum dual sash units conforming to, or exceeding, H-HC 40 per AAMA/NWWDA 101/I.S.2.
   2. Aluminum awning units; thermally broken aluminum single sash units conforming to, or exceeding, DW-HC60 per AAMA/NWWDA 101/I.S.2.
   3. Fixed units; thermally broken aluminum fixed sash units conforming to, or exceeding, F-HC40 per AAMA/NWWDA 101/I.S.2.

B. Performance Requirements (Operable Units):
   1. Air Infiltration: Test window in accordance with ASTM E 283, primary sash closed and locked, secondary sash full open position; meet the following performance requirements:
      a. Windows with Less than 18 Feet (5.486 m) of Operable Crack Perimeter: Not more than 2.8 cubic feet per minute (1.32 L/second) total when tested in a static pressure drop of 1.57 pounds per square foot (7.66 kg/square m), equivalent to 25 miles per hour (40.2 km/hour) wind velocity, or 6.3 cubic feet per minute (2.97 L/second) total when tested at 6.24 pounds per square foot (30.47 kg/square m), equivalent to 50 miles per hour (80.5 km/hour) wind velocity.
      b. Windows with 18 Feet (5.486 m) or More of Operable Crack Perimeter: Not more than 1.0 cubic feet per minute (0.47 L/second) per square foot of window area at a static pressure drop of 1.57 pounds per square foot (7.66 kg/square m), or 0.20 cubic feet per minute (0.09 L/second) total when tested at 6.24 pounds per square foot (30.47 kg/square m).
   2. Water Resistance: Test window in accordance with ASTM E 547, in the winter and summer mode with screen removed, as follows:
      a. Primary sash closed and locked, secondary sash full open position; subject window to pressure drop of 8.00 pounds per square foot (39.1 kg/square m).
      b. Both sets of sash closed and latched; subject window to minimum pressure drop of 12.00 pounds per square foot (58.6 kg/square m).
   3. Uniform Load Structure Test: Test window in accordance with ASTM E 330, primary sash closed, secondary sash full open position.
      a. Double Hung Units: Static air pressure difference of 60.0 pounds per square foot (292.9 kg/square m), high pressure applied first on one side of unit and then on the other side.
      b. Horizontal Rolling Units: Static air pressure difference of 90.0 pounds per square foot (439.4

kg/square m), high pressure applied first on one side of unit and then on the other side.
c. Static air pressure difference of 1.5 times design wind class used in AAMA/NWWDA 101/I.S.2.
d. At Conclusion of Test: No glass breakage; no permanent damage to fasteners, hardware parts, support arms, or actuating mechanisms; no other damage which would cause window to be inoperable; permanent deformation of any frame, sash, or ventilator member not exceeding 0.04 percent of its span.

4. Thermal Performance ("U" Value): Test window of exactly 4 by 6 foot (1.219 by 1.829 m) size in accordance with AAMA 1503.1.
a. Double Hung Units: Thermal transmittance due to conductance not exceeding 0.55.
b. Horizontal Rolling Units: Thermal transmittance due to conductance not exceeding 0.54.

5. Condensation Resistance Factor (CRF): Test window of exactly 4 by 6 foot (1.219 by 1.829 m) size in accordance with AAMA 1503.1.
a. Double Hung Units: CRF not less than 62.
b. Horizontal Rolling Units: CRF not less than 64.

6. Forced Entry Resistance: ASTM F 588.
a. Horizontal Rolling Windows: Level 40.

C. Performance Requirements (Fixed Units):
1. Air Infiltration: Not more than 0.06 cubic feet per minute (0.028 L/second) per square foot of sash, tested in accordance with ASTM E 283 under a static pressure drop of 6.24 pounds per square foot (30.47 kg/square m), equivalent to 50 miles per hour (80.5 km/hour) wind velocity.
2. Water Resistance: No penetration of water into the plane of the innermost face of the window unit during a 15 minute test period under prescribed conditions of water application, tested in accordance with ASTM E 330 at a rate of 5.0 gallons per hour per square foot (204 L/hour/square m) and a static air pressure differential of 6.24 pounds per square foot (30.47 kg/square m).
3. Uniform Load Structure Test: No glass breakage or other damage and no permanent deformation of any member exceeding 0.04 percent of its span; subject separately to an exterior and interior uniform load in accordance with ASTM E 330, static air pressure difference of 60 pounds per square foot (292.9 kg/square m), pressure applied first on one side of unit and then on the other side.
4. Thermal Performance ("U" Value): Thermal transmittance not exceeding 0.65, tested in accordance with AAMA 1503.1.

5. Condensation Resistance Factor (CRF): CRF not less than 55, tested in accordance with AAMA 1504.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's catalog data, detail sheets, and specifications.

C. Submit evidence that fabrication of fixed windows has not resulted in any corner or joint failure or glass breakage for a period of not less than 10 years.

D. Shop Drawings: Prepared specifically for this project; show dimensions of aluminum windows, elevations, details of all window sections, anchorage and installation details, hardware, and interface with other products.

1.6 QUALITY ASSURANCE

A. Installer Quality: The window manufacturer or their approved representative, using mechanics that are experienced and skilled in the installation of aluminum windows of the type specified.

1.7 WARRANTY

A. Provide written 10-year warranty signed by manufacturer that products are free of material defects. Defects are defined to include uncontrolled leakage of water, corner or joint failure, and abnormal aging or deterioration.

B. Include repair or replacement of defective units for 10 years from date of completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: St. Cloud Window, Inc., P.O. Box 1577, St. Cloud, MN 56302-1577; ASD. Tel: (320) 251-9311, Tel: (800) 383-9311, Fax: (320) 255-1513, email: info@stcloudwindow.com, Website: http://www.stcloudwindow.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. Substitutions: per 01300.

D. Provide all aluminum windows from a single manufacturer.

2.2 MATERIALS

A. Principal Frame Members: Accurately extruded aluminum alloy 6063-T6.
B. Frame, Sash, and Screen Members: Accurately extruded aluminum alloy 6063-T6; 0.062 inch (1.57 mm) minimum wall thickness.

C. Thermal Barrier: Not a structural part of frame assembly, but providing complete metal to metal separation between inner and outer frame members; not less than 1/4 inch (6.3 mm) wide. Poured and debridged polyurethane thermal barrier is not acceptable.

D. Weatherstripping: 100 percent woven pile and Mylar center fins.

E. Screens: Tubular aluminum frames; screen cloth securely held in place by means of reusable vinyl splines.
1. Screen Cloth: 18 by 16 aluminum.
2. Screen Cloth: 18 by 16 fiberglass.

F. Hardware: Spring-loaded metal plunger type lock automatically engaging as window is closed; locate as follows:
1. Double Hung Windows: Interior sill rails.
2. Horizontal Rolling Windows: Interior meeting rails.

G. Double Hung Window Balances: Zinc die cast metal with nylon rollers, capable of providing positive lifting force through full range of sash travel and holding sash stationary at any open position without the use of auxiliary frictional devices or holding clips; overhead balances, exposed balance cables, or fasteners are not acceptable.

H. Sash Rollers: Delrin lubricated with "Moly B" dry lubricant, operating on stainless steel axles.

I. Calking: Grade "A" type calking compound, Pecora, Tremco, Vulkem, or equal approved by architect; color to match color of aluminum unless otherwise approved by architect.

2.3 GLAZING SCHEDULE

A. Operable Windows:
1. Interior Sash: 1/4 inch (6.3 mm) clear float glass.
2. Exterior Sash: 1/4 inch (6.3 mm) clear float glass.

B. Fixed Windows:
1. One inch (25.4 mm) thick insulating glass.

2. One and one quarter inch (31.75 mm) thick insulating glass.

2.4 FABRICATION

A. General:
   1. Fabricate windows as two separate frames permanently interlocked by a rigid thermal barrier.
   2. Operable Frame and Sash Joints: Butt type secured by means of thread-cutting type screws anchored into screw ports, ports integral parts of frame members.
   3. Fixed Frame Joints: Miter or butt type secured by means of thread-cutting type screws anchored into screw ports, ports integral parts of frame members.
   4. Corners: Joined neatly in a manner to provide watertight connections.
   5. Deburr and make smooth all sharp milled edges and corners.
   6. Internally seal sash corners.
   7. Fabricate meeting rails of tubular construction, double weatherstripped and interlocked when in closed position.
   8. Fabricate window units in a manner to facilitate replacement of worn or damaged parts, hardware, or weatherstripping.

B. Sill Frames: Tubular sections, weeped (including weep flaps) to prevent accumulation of water in sill.

C. Exterior and Interior Frame Sill: Tubular design, 5 degrees minimum slope.

D. Thermal Barrier: Interlock both halves of frame, securing them together without inhibiting expansion and contraction of either part; apply bead of sealant to complete perimeter of window to seal joints between frame and thermal barrier.

E. Weatherstripping: Completely weatherstrip sash, securing weatherstripping to prevent movement.

F. Double Hung Windows:
   1. Fully balance each sash with a minimum of two balances.
   2. House balances inside jamb sash; make removable with the use of take out clips for ease of replacement without the use of special tools.

G. Horizontal Rolling Windows: Fabricate sash to operate on rollers in bottom sash rail in a concealed manner, not protruding beyond bottom of sash rail.

2.5 FINISHES

A. Finish exposed surfaces of aluminum windows, panning, and trim as follows:
   1. Natural Anodized: Class II AA-C22A31 204-R1, etched and clear anodized to 0.4 mil (0.010 mm).
   2. Light Bronze Anodized: Class I AA-C22A44 204-R1, anodized to 0.7 mil (0.018 mm).
   3. Medium Bronze Anodized: Class I AA-C22A44 204-R1, anodized to 0.7 mil (0.018 mm).
   4. Dark Bronze Anodized: Class I AA-C22A44 204-R1, anodized to 0.7 mil (0.018 mm).
   5. Black Anodized: Class I AA-C22A44 204-R1, anodized to 0.7 mil (0.018 mm).
   6. Organic Coated: Fluoropolymer organic coating in a color selected by the architect; meet or exceed AAMA 605.1 specifications for high performance organic coatings on extrusions.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install windows and related components in accordance with approved shop drawings and manufacturer's requirements.

B. Erect materials plumb, level, and true relative to the building structure, maximum variation from plumb and level not exceeding 1/8 inch in 10 feet (3 mm in 3 m).

C. Install approved insulation materials in the frame cavity on the interior portion of the window frame, area adjacent to exterior of window frame remaining uninsulated.
   1. Exercise caution to avoid overlapping insulation materials across thermal barrier connectors.
   2. Exercise caution to avoid bridging of the two separated frame members.

D. Apply calking at all points between masonry and aluminum outer frame; apply in a manner to ensure airtight and watertight continuous perimeter seal so as to prohibit seepage of cold air into the insulated cavity.

3.2 FIELD QUALITY CONTROL

A. Retain and pay for a certified testing laboratory to conduct on-site tests for air infiltration and water infiltration as specified in "Performance Requirements" above.

B. Architect will select two windows to be tested.

C. At no additional cost to owner, repair or replace window units not meeting specified performance requirements.

3.3 CLEANING

A. After installation, remove all sealants, calking, and other misplaced materials from all surfaces, including adjacent work.

B. Thoroughly clean window frames, casings, and glass using materials and methods recommended by the window and glass manufacturer that do not cause defacement of work.

END OF SECTION

SECTION 08710

FINISH HARDWARE AND KEY CABINET

PART 1 - GENERAL

1.1 WORK INCLUDED:

A. The work in this section shall include the furnishing of all items of finish hardware as hereinafter specified, or obviously necessary to complete the building, except those items, which are specifically excluded from this section of the specification.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 RELATED WORK:

A. The following section of this specification should be examined in order to identify materials or equipment which may be obtained through this section.
.. Section 08110 - "Steel Doors and Frames"
.. Section 08211 - "Flush Wood Doors"

1.3 DESCRIPTION OF WORK:

A. Finish Hardware: Hardware used in building construction but particularly that used on or in connection with doors, frames, cabinets and other movable members. It also has a finished appearance as well as functional purpose and may be considered as a part of the decorative treatment of a room or building.

1.4 QUALITY ASSURANCE:

A. Hardware has been specified herein by manufacturers' name, brand and catalog numbers for the purpose of establishing a basis for quality, finish, design and operational function. No other products will be furnished unless approved by means of 1.4 Paragraph "D".

B. To insure a uniform basis of acceptable materials, it is the intention that only manufacturers' item specified as "acceptable and approved" be furnished for use on this project.

C. Deviation from or modification of items will be permitted only for special instances caused by reason of construction characteristics and for the purpose of providing proper operational function. The contractor shall be responsible for checking any necessary deviations in order that hardware shall fit and function properly.

D. Substitutions: Request for substitutions of items of hardware other than those listed as "acceptable and approved" shall be made to the architect no later than ten (10) days prior to bid opening. Approval of substitutions will only be given in writing or by Addenda. Requests for substitutions shall be accompanied by samples and/or detailed information for each manufacturer of each product showing design, functions, material thickness and any other pertinent information needed to compare your product with that specified. Lack of this information will result in a refusal.

E. Supplier: A recognized builders hardware supplier who has been furnishing hardware in the project's vicinity for a period of not less than five (5) years; and who is, or has in full time employment an Architectural Hardware Consultant (AHC) in good standing as certified by the American Society of Architectural Hardware Consultants, or equivalent, and who is a direct distributor of the products approved, for warranty purposes. This paragraph will be strictly enforced. All schedules shall be signed by an AHC.

F. Products and installation under the work of this Section shall be in compliance with applicable provisions of published U. S. Justice Department Regulations for the "Americans with Disabilities Act of 1990" (ADA; ADA-AG), and the "Uniform Federal Accessibility Standards" (UFAS), 1988 Edition.

1. Where this requires any substitution of products specified herein, advise Architect in writing for necessary approvals.

1.5 SUBMITTALS:

A. The finish hardware supplier shall, after award of a formal contract submit to the architect, six (6) complete computerized or typewritten (handwritten are not acceptable) copies of the proposed finish hardware schedule for approval. The schedule shall be prepared using the "sequence and format" for the Door and Hardware Institute (DHI). After approval of the schedule the hardware supplier shall provide three (3) copies of this approved schedule to the contractor for file and distribution purposes. Hardware will not be ordered by the hardware supplier until an approved schedule has been received. Horizontal schedules will not be acceptable. Provide vertical format.

B. When submitting schedules for approval, include two manufacturers' cut sheets on each hardware item proposed. Index it with the use of number or letters or a combination of both, with the hardware schedule. The index numbers/letters are to be in right hand column on the same line as the respective manufacturers' numbers. All manufacturers' numbers shall be indexed even when appearing more than once.

C. Templates: The hardware supplier shall provide necessary templates and/or physical hardware to all trades requiring them in order that they may cut, reinforce or otherwise prepare their material or product to receive the hardware item. If physical hardware is required by any manufacturer the hardware supplier shall ship to them such hardware via prepaid freight in sufficient time to prevent any delay in the execution of their work.

1.6 DELIVERY, STORAGE, AND HANDLING:

A. All items of hardware to be delivered to the job site shall be of completely packaged with all necessary screws, bolts, miscellaneous parts, instructions and where necessary installation templates for manufacturers' suggested installation. All boxes are to have a typed label with door hand, room location, item number and keying to conveniently identify them and their intended location in the building.

B. A representative of the general contractor shall receive the hardware when delivered at the job site. A dry locked storage space complete with shelving, shall be set aside for the purpose of unpacking, sorting, checking and storage.

C. Finish hardware shall be delivered to the general contractor by the hardware supplier. Direct factory shipments to the job site are not acceptable.

D. The hardware shall be jointly inventoried by the representative of the general contractor and the hardware supplier.

E. Items damaged in shipment shall be replaced promptly and with proper material without additional cost to the general contractor.

F. All hardware shall be handled in a manner to minimize marring, scratching or damage.

1.7 WARRANTY:

A. All hardware shall have a one year limited warranty except door closers which shall have a ten year limited warranty.

PART 2 - SPECIFIC REQUIREMENTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the hardware schedule at the end of this section.

2.2 FINISH OF HARDWARE:

A. Finish of hardware items shall conform to ANSI A156.18 unless otherwise specified unless specified otherwise in the hardware sets, and shall be as follows for aluminum, hollow metal and wood doors:

2.3 HINGES AND PIVOTS:

A. Templates Hinges: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template hinges which conform to ANSI whenever applicable.

B. Hinge pins, except as otherwise indicated, shall be as follows:

1. Steel Hinges: Steel Pins

2. Non-Ferrous Hinges: Stainless Steel Pins

3. Exterior Doors: Non-Removable Pins (NRP) or Security Stud

4. Out-Swing Corridor Doors: Non-Removable Pins (NRP), whether specified in the hardware sets or not.

5. Interior Doors: Non-Rising Pins

6. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip indicated.

C. Where projection of door trim is such as to prevent desired degree of opening, the proper hinge width shall be provided to allow the door to clear the trim.

D. Acceptable and approved only as follows:
.. Hager
.. Stanley
.. Lawrence

E. Substitutions allowed only as described under paragraph 1.4.D of this section.

2.4 KEYS AND KEYING:

A. All lock cylinders shall be as manufactured by Best Access Systems and shall be master keyed to a Best Access Systems grand master keyed system. All cores shall be Patent Protected and factory keyed. All cores are to be of 7-pin design, and shall be instantly interchangeable without adaptation or modification, into the housing of all locks.

B. All cores and keys shall be marked to correspond with the schematic key plan as determined during a meeting between the owner and the lock manufacturer prior to ordering cylinders. The schematic will describe the proposed master key plan, and will include future expansion capabilities.

C. All keys and key blanks shall be stamped "DO NOT DUPLICATE". All cores shall be stamped with key set symbol in a concealed location. All keys shall be stamped with key set symbols.

D. All keys shall be of nickel silver material.

E. All lock cylinders, cylinder parts, keys and related service equipment must be supplied by a single manufacturer.

F. Furnish keys in the following quantities:

1. 3 each Grand masterkeys per set
2. 3 each master keys per MK group created
3. 2 each Change keys each keyed cylinder
4. 8 each Construction MK
5. 10 each Blanks
6. 2 each control keys

F. Provide one each “Knox” box. Exterior use, recess wall mount type. Architect to advise location for mounting during the submittal process.

G. Provide one each wall mounted key cabinet. Equal to Lund 1200 series. Capacity to be 150%. Equal products by MMF and Telkee will be accepted. Supplier shall deliver key cabinet to job site completely set up per the key cabinet manufacturer’s instructions, with all keys tagged, hang on hooks as required and

with all index cards and key envelopes filled out (type written). Supplier shall instruct the owner (onsite) in use of key cabinet and all its key control accessories. Supplier shall provide up to two hours of on site training to owner for this process at no extra charge. General contractor to mount key cabinet where directed by the owner.

2.5 LOCKSETS & LATCHSETS:

A. Provide series type as specified in the hardware sets.

B. Provide all locksets with Best Patented Keyed Cylinders

C. All mortise locksets shall be supplied with one inch throw deadbolts and 3/4" throw three piece anti-friction latch bolts.

D. Substitutions allowed only as described in paragraph 1.4.D of this section.

2.6 CLOSERS:

A. All closers shall be mounted on interior side of rooms. Provide all necessary brackets as required by wall, frame and other conditions that will provide a smooth operation.

B. All closers shall have full covers, back check feature, separate closing and latching speed valves and be sex bolt mounted on all mineral core fire doors.

C. Provide ADA Compliant Closers where required by codes.

2.7 FLAT GOODS:

A. It is the responsibility of the hardware supplier to provide proper screw attachments per wall or floor conditions for door stops.

B. Provide stops for each and every interior and exterior opening.

C. Kick plates and armor plates shall be mounted by sheet metal screws where indicated in hardware sets, unless specified otherwise in hardware sets.

D. Where stainless steel plates are specified, metal shall be .050" thickness.

E. Substitutions allowed only as described under paragraph 1.4.D of this section.

F. Provide door stops at all openings. Provide positive stop arms on all exterior door closers. Provide wall stops at all locations where applicable. Type Rockwood 409 series. Where a wall stop will not work, use an over head stop Rixson 10 Series.

2.8 EXIT DEVICES:

A. Provide series specified in hardware sets. Provide Cylinder dogging on all non rated doors. Furnish exit devices with Best Access Systems 1E cylinders.

B. Substitutions allowed only as described under paragraph 1.4.D of this section.

C. Where doors have glass molding which projects from face of doors, provide exit device shim kits for clearance purposes. These kits shall be product of the exit

device manufacturer. Provide where required whether specified in the hardware sets or not.

2.9 THRESHOLDS AND WEATHERSTRIPPING:

A. Substitutions allowed only as described under paragraph 1.4.D of this section.

2.11 KEY CABINET:

A. Telkee, Inc. key cabinet, complete with accessories, to accommodate all keys plus 50% for future expansion for wall surface mounting.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Mount hardware units at heights indicated in "recommended locations for builders hardware" for (standard steel doors and frames), (custom steel doors and frames), (wood doors and frames) by the Door and Hardware Institute (DHI), except if otherwise specifically indicated or to comply with requirements of governing regulations, requirements for the disabled or handicapped, or if otherwise directed by the Architect.

B. Degree of opening for doors with overhead holders, closers, etc., shall be included in the hardware schedule for the Architect's approval.

C. All hardware shall be installed by tradesmen skilled in the application of commercial grade hardware.

D. Install each hardware item in compliance with the instructions and recommendations. Securely fasten all parts to be attached. Fit faces of mortised parts snug and flush. Make sure all operating parts move freely and smoothly without binding, sticking or excessive clearance. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted and finished in another way, the hardware shall be removed and stored prior to the painting or finishing. Items shall then be reinstalled only when the finishes have been completed on the surface to which the hardware is to be applied.

E. After installation, representative templates, instruction sheets and installation details shall be placed in a file folder to be turned over to the owner when the building is accepted. Included shall be at least five each of any special adjusting and/or installation tools furnished with the hardware by the manufacturers.

F. **INSTALLING KEY CABINET:**

1. Install in accordance with the manufacturer's printed instructions where directed by the Architect.

2. Prepare and furnish Owner with complete index of keys as directed by the Architect. Tag and file all keys in the cabinet, located as directed by the Architect. Fill in index cards with a typewriter.

3.2 ADJUSTING AND CLEANING:

A. Adjust and check each operating item of hardware to ensure correct operation and function. Units which cannot be adjusted to operate as intended for the application made shall be replaced.

B. Final Adjustment: Wherever hardware installation is made more than one month prior to building acceptance or occupancy of a space or area. The installer shall return to the work during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items. Hardware shall be cleaned as necessary to restore current operation, function and finish. Door control devices shall be adjusted to compensate for final operation of heating and ventilating equipment.

3.3 PROTECTION:

A. Whenever hardware is located in areas where it may be subject to damage during construction by handling, cleaning, etc., (e.g., painting, cleaning of bricks) it shall be protected and/or removed from its location until the hazardous condition is terminated.

3.4 GENERAL NOTES:

A. Before installation of any hardware begins the contractor's installer shall contact the hardware supplier to discuss any special installation requirements for all hardware items. Their discussion shall include, but not be limited to such items as proper closer mounting, proper fasteners to be used for hardware, locksets and exit device backsets, etc.

B. Electric power tools should be used on hardware fasteners so as to prevent damage to screw heads.

C. Hardware supplier should verify all quantities in the following schedule.

3.5 SCHEDULES:

A. The following is a general listing of hardware requirements and is not intended for use as a final hardware schedule. Any items of hardware required by established standards of practice, or to meet state and local codes shall be furnished whether or not specifically called out in the following listed groups.

MANUFACTURERS

HAGER (1)
DORMA (2)
SCHLAGE (3)
GLYNN JOHNSON (4)

NOTE: FURNISH HAGER SILENCERS 307D – 3 PER SINGLE DOOR @ 2 PER PAIR OF DOORS.

End of Section 08710

SECTION 08830

GLASS MIRRORS

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 08800: Glass glazing.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit the mirror manufacturer's product data indicating special handling or installation requirements, installation and cleaning instructions.

C. Submit shop drawings indicating installation details.

1.03 STORAGE AND HANDLING:

A. Deliver, store and protect products in accordance with Section 01600.

1.04 WARRANTY:

A. Provide a warranty from the manufacturer in accordance with Section 01700.

B. Warranty: Replace mirrors found to have silver spoilage at no cost to the Owner for a period of 5 years from the date of Substantial Completion.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Glass: FS DD-M-411 electro-copper plated (galvanic method), mirror quality glass, heat sealed with flat, polished edges, 1/4 inch thick.

B. Accessories: Metal bottom channels and glazing clips with felt pads recommended by the mirror manufacturer for the application.

C. Fasteners: Flat head rust-resistant sheet metal screws of sufficient size and strength to penetrate steel studs and develop full holding power.

PART 3: EXECUTION

3.01 INSTALLATION:

A. Verify that surfaces to receive mirror are clean, free of obstructions, and ready for Work of this Section.

B. Obtain sizes by taking measurements on the job. Size glass in accordance with the manufacturer's printed instructions.

C. Install mirrors in accordance with the manufacturer's printed instructions for the application. Verify installation height with the Architect.

3.02 CLEANING:

A. Remove labels and shipping film and polish glass as recommended by the mirror manufacturer.

END OF SECTION

SECTION 09250

GYPSUM WALLBOARD SYSTEMS

PART 1: GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

A. Section 01600: Substitutions and product options.

B. Section 06100: Wood blocking and stud walls.

D. Section 07210: Thermal insulation in exterior walls.

F. Section 09270: Gypsum board finishing.

G. Section 09900: Painting.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit the manufacturer's catalog data, including installation instructions, for each item specified.

C. Submit copies of evidence of fire hazard classification along with the manufacturer's certification that materials meet or exceed specification requirements to the Architect and obtain his approval before ordering.

1.03 QUALITY ASSURANCE:

A. Maintain a copy of referenced specifications at the job site.

1.04 COORDINATION:

A. Coordinate with other trades to preclude delays and interferences.

1.05 HANDLING AND STORAGE:

A. Deliver materials with manufacturer's labels intact and legible. Store wallboard in a cool, dry, weather-tight place until application. If wallboards are stacked on the floor, stack boards with reverse side up except for the bottom board; turn bottom board down. If wallboards are stacked off the floor, support in such a way which will not cause panels to

sag or warp. Do not stack long lengths over short lengths.

PART 2: PRODUCTS:

A. "Gold Bond" products and accessories, by National Gypsum Company.

B. "Sheetrock" products and accessories, by United States Gypsum Company.

C. Use gypsum board and accessory products of one manufacturer.

D. Substitutions: Materials of the same function and performance are acceptable in accordance with Section 01600.

2.02 GYPSUM BOARD:

A. Regular panels: ASTM C 36 with tapered edge. Provide foil-backed panels at exterior walls.

B. Fire-rated panels: ASTM C 36 Type X with tapered edge.

C. Bottom layer in double gypsum board system may be square edge or tapered edge.

D. Substitutions: Materials of the same function and performance are acceptable in accordance with Section 01600.

2.03 ACCESSORIES:

A. Fasteners:
   1. Screws for attaching gypsum board to wood studs: Type S-12 with bugle head, 1 inch long.
   2. Temporary screws for attaching top layer in double layer applications: Type G with bugle head.

B. Trim: Galvanized accessories as follows: Catalog numbers are from "Gold Bond" catalogs.
   1. Where gypsum board intersects other materials, and where edges are exposed: No. 100 Casing Bead.
   2. At exposed outside 90 degree corners: Standard Corner Bead.
   3. At exposed outside corners other than 90 degree: Multi-Flex Tape Bead.
   4. At control joints: E-Z Strip Expansion Joint.

C. Adhesive: ASTM C 475 suitable for the materials being bonded.

D. Finishing materials: Joint tape and all-purpose joint compound meeting ASTM C 475.

E. Sealant: Acoustical sealant material manufactured for use in conjunction with steel stud framed gypsum drywall partitions.

F. Insulation:
1. Acoustical: 2-1/2 inch thick Owens-Corning Noise Barrier Batts.
2. Fire blankets: US Gypsum Thermafiber Blanket 1-1/2 inches thick.

G. Stenciling materials:
1. Stencil: Substantial stencil material with words formed by 2" high uppercase letters of a Helvetica or similar letter style. Coordinate with Wall Legend on the Drawings for types of rated partitions and form stencils accordingly (i.e., "1 HOUR," "1 HOUR FIRE AND SMOKE," "2 HOUR," etc.).
2. Paint: Porter, gloss or semi-gloss, fluorescent orange in color.

H. Substitutions: Materials of the same function and performance are acceptable in accordance with Section 01600.

PART 3: EXECUTION

3.01 INSPECTION:

A. Inspect the surface to which gypsum board is to be applied and ensure that the surfaces to receive it are square, plumb and true.

B. Verify that wood and sheet metal blocking has been installed.

3.02 INSTALLING SOUND ATTENUATION BLANKETS:

A. Install blankets between studs from floor to ceiling in all interior walls. Cut to lengths and widths as required.

3.03 DRYWALL APPLICATION:

A. Notify the Architect before beginning installation of wallboard. Also, where insulation is to be installed, notify the Architect after installation of one side of gypsum board and insulation.

B. Install gypsum board vertically, and in accordance with the manufacturer's standard specification for the application. If the manufacturer does not

have such a specification, install in accordance with ASTM C 840.

C. Maintain a reasonably uniform temperature range between 55°F and 70°F for 24 hours before application, during application and 24 hours after application of joint materials or until dry (24 hours minimum).

D. Start all boards 3/8 inch above floor slabs. Layout boards so that joints between panels on each side of studs do not occur opposite each other. Install fire blanket between studs in rated walls. Secure blankets with tie wire. For continuous long runs of wall provide control joints maximum 30'-0" on center.

E. Insert gypsum board behind return of door frames. At double studs placed for expansion joints, leave a 1/2 inch separation for installation of control joint trim. Where gypsum board is indicated to go up to bottom of deck, scribe to deck and fill joints with joint compound.

F. Apply acoustical sealant at joints around electrical outlet boxes and joints between drywall and floor at walls designated to be sound attenuating walls.

G. Stenciling walls: Stencil all rated walls on both sides of the wall above the ceiling.
1. On long runs of walls, apply stencil 40'-0" on center maximum.
2. On shorter runs, apply stencil generally at mid-points of rooms along the wall.
3. Where walls of different ratings intersect, stencil the appropriate rating for each wall in the corners.

K. Provide control joints as per manufactures recommendations or a maximum of thirty feet (30') per straight run wall. Preferable place joints at door frames. Maintain all ratings at all control joints.

3.04 FINISHING JOINTS:

A. Inspect surfaces to be finished to see that all panels are square and true at the joints.

B. Finish joints in strict accordance with the manufacturer's printed specifications, for the type of wall application. Employ a qualified drywall finisher, approved by the Architect.

C. Take care to see that this operation is carried out in the neatest manner possible.

D. After finishing is completed, and before paint or wall covering is applied, notify the Architect for his approval of joints.

E. Where walls are fire resistance rated, tape and finish joints to the top of the wall.

F. Where walls are not fire resistance rated, tape and finish joints to a height of 4 inches above the ceiling height. Where the joint treatment terminates above the ceiling, cross-tape with a minimum of 12 inches length of tape and finish over cross-tape.

END OF SECTION

SECTION 09678

RESILIENT BASE

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 09660: Resilient tile flooring.

B. Section 09682: Carpet.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit copies of manufacturer's specifications and installation instructions.

C. Submit 6 inch long samples of base. Include full range of color variation.

D. Submit copies of manufacturer's written instructions for recommended maintenance practices.

1.03 EXTRA MATERIAL:

A. Furnish the Owner with one extra carton of base used.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Base: Resilient base with matching end stops and preformed corner units. Colors as selected by Architect from manufacturer's standard colors.
   1. Size: 4" high.
   2. Thickness: 1/8" gauge.
   3. Style: Standard top-set cove at resilient flooring and straight base without cove at carpeted areas.

B. Adhesive: Adhesive recommended by the base manufacturer for the application.

C. Substitutions: Material of the same function and performance is acceptable in accordance with Section 01600.

PART 3: EXECUTION

3.01 CONDITIONS FOR APPLICATION:

A. Do not install resilient materials until other trades have substantially completed their work.

B. Do not install base in areas to receive carpet until carpet is in place.

3.02 INSTALLATION:

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter inside corners. Use premolded sections for external corners and exposed ends.

C. Install base on solid backing. Adhere tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other obstructions.

E. Install straight and level to variation of +/- 1/8" over 10 feet.

3.03 PROTECTING:

A. When work is completed, tape heavy paper over areas subject to traffic.

3.04 CLEAN UP:

A. Remove excess adhesive from base surfaces, taking care not to damage base surface, or surrounding surfaces.

B. Clean and wax base in accordance with the manufacturer's printed instructions.

END OF SECTION

SECTION 09900

PAINTING

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

1.02 STANDARDS:

A. Flame spread rating of interior paint products: 25 or less, in accordance with NFC requirements.

1.03 SUBSTITUTION OF BRANDS:

A. Sherwin Williams and Porter are permitted substitutions.
If a brand other than those specified is proposed for use, Architect's written approval is to be obtained at least ten days before painting materials are brought to the project site. Where such prior approval is not obtained, only those brands specified will be used in painting.

B. In order to obtain possible approval, submit the following:
1. Prepare six copies of a neat, typewritten schedule in columnar form. In the left column, list the products specified. In the right column, and opposite the specified products, list the proposed substitution. Provide enough information to give the Architect sufficient knowledge of the proposed materials on which to make an intelligent value judgement.
2. Provide six sets of technical descriptive data published by the manufacturer of proposed materials which allow the Architect to familiarize himself with the qualities and characteristics of the materials.
3. Provide two sets of color samples covering the manufacturer's full color range for the proposed materials.

C. The Architect will have no obligation to approve proposed substitutions after he reviews the submittals unless he feels that such substitutions are to the Owner's benefit.

D. Do not bring materials to the project site without Architect's written approval and color selections.

1.04 COLOR SELECTION AND COLORANTS:

A. Color selections will be made by the Architect or his designated organization and color selections will be sent to the Contractor for proper distribution.

B. Where colorants are to be added to paints and filler to achieve colors selected, have the coloring process done only in a facility equipped to perform the task and approved by the materials manufacturer. In that case, have containers opened, the correct colorants added and mixed, and the containers resealed. Adding thinners or adulterants of any sort to the opened containers will be cause for rejection of work.

1.05 MOCK-UP:

A. Before proceeding with paint application, finish one complete surface of each color scheme required, clearly indicating selected colors, finish texture, materials and workmanship.

B. If approved, sample area will serve as a minimum standard for the work throughout.

1.06 MAINTENANCE MATERIALS:

A. Leave on premises, not less than one gallon of each color used.

B. Leave containers tightly sealed and clearly labeled for identification.

1.07 DELIVERY AND STORAGE:

A. Deliver materials to project site in manufacturer's labeled containers. Except where colorants are to be added to achieve colors selected, materials shall be delivered in manufacturer's unopened containers.

B. Store materials in a protected area so that containers do not get wet. Maintain temperature in storage areas to be at least 45^{o}F. Do not allow materials to freeze, and if any do freeze, immediately remove them from the project site.

C. Take precautionary measures to prevent fire hazards and spontaneous combustions.

1.08 ENVIRONMENTAL CONDITIONS:

A. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture contents of surfaces are below 12%.

B. Ensure surface temperatures or the surrounding air temperature is above 40F and 50^{o}F for exterior work. Minimum application temperature for varnish finishes is 65^{o}F.

C. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 45^{o}F for 24 hours before, during and 48 hours after application of finishes.

D. Provide minimum 25 foot candles of lighting on surfaces to be finished.

1.09 PROTECTION:

A. Adequately protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection.

B. Furnish sufficient drop cloths, shields and protective equipment or prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

C. Place cotton waste, cloths and material which may constitute a fire hazard in closed metal containers and remove daily from site.

D. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items are to be carefully stored, cleaned and replaced on completion of

work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

PART 2: PRODUCTS

2.01 MANUFACTURER:

A. Porter Paints, except as specifically called out otherwise.

B. Substitutions: Paints with the same characteristics and performance are acceptable in compliance with "SUBSTITUTION OF BRANDS" Paragraph and Section 01600.

2.02 MATERIALS:

A. Paint, varnish, stain, enamel, lacquer and fillers: Type and brand listed herein approved by the Architect.

B. Paint accessory materials: Linseed oil, shellac, turpentine and other materials not specifically indicated herein but required to achieve the finishes specified of high quality and approved manufacturer.

C. Paints: Ready-mixed with pigments fully ground, maintaining a soft paste consistency, capable of readily and uniformly dispersed to a complete homogenous mixture.

D. Use paints having good flowing and brushing properties which are capable of drying or curing free of streaks or sags.

PART 3: EXECUTION

3.01 INSPECTION:

A. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to the Architect, any condition that may potentially affect proper application. Do not commence until such defects have been corrected.

B. Correct defects and deficiencies in surfaces which may adversely affect work of this Section.

3.02 PREPARATION OF SURFACES:

A. Remove mildew in accordance with paint manufacturer's printed instructions. Rinse with clean water and allow surface to dry completely.

B. Remove contamination from gypsum wallboard surfaces and prime to show defects, if any. Paint after defects have been remedied.

C. Remove surface contamination and oils from galvanized surfaces and wash with solvent. Apply coat of etching type primer.

D. Remove surface contamination and oils from zinc coated surfaces and prepare for priming in accordance with metal manufacturer's recommendations.

E. Remove grease, rust, scale, dirt and dust from steel and iron surfaces. Where heavy coatings of scale are evident, remove by wire brushing, sandblasting or any other necessary method. Ensure steel surfaces are satisfactory before painting.

F. Clean unprimed steel surfaces by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Prime surfaces to indicate defects, if any. Paint after defects have been remedied.

G. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

H. Wipe off dust and grit from miscellaneous wood items and millwork prior to priming. Spot coat knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried and sand between coats. Back prime interior and exterior woodwork.

3.03 PREPARATION OF MATERIALS:

A. Do not open containers until material application can promptly commence.

B. Thoroughly mix paints before use.

C. Do not thin paints and fillers, except as may be specified below for certain sealer coats. If it is necessary to thin paints, obtain the Architect's approval each time it is necessary to do so. Unless approval is so obtained, thinning of materials will be cause for rejection of work.

3.04 APPLICATION:

A. The systems specified herein are taken from manufacturer's specifications. If it is believed that these systems will not provide coverage specified below, notify Architect in writing, stating reasons why coverage cannot be attained, and obtain a decision before beginning work. Otherwise, be responsible for attaining coverage.

B. Apply paint materials as they come from the manufacturer's container after being properly stirred. Do not thin materials unless permission is received from the Architect.

C. Employ only skilled mechanics in this Work.

D. Apply materials evenly, in sufficient body to fully cover without holidays and provide surfaces free from sags, runs, crawls, and other defects.

E. Apply paint and finish materials in accordance with manufacturer's directions using brushes or rollers. Spray where specified below.

F. Sand lightly between coats to achieve required finish.

G. Do not apply finishes on surfaces that are not sufficiently dry.

H. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by manufacturer.

I. Where clear finishes are required ensure tint fillers match wood. Work fillers well into the

grain before set. Wipe excess from the surface.

J. Backprime interior woodwork, which is to receive paint or enamel finish, with enamel undercoater paint.

K. Backprime interior woodwork, which is to receive paint or enamel finish, with enamel undercoater paint.

L. Prime top and bottom edges of metal doors with enamel undercoat when they are to be painted.

3.05 MECHANICAL AND ELECTRICAL EQUIPMENT:

A. Refer to mechanical and electrical sections with respect to painting and finishing requirements, color coding, and identification banding of equipment, ducting, piping and conduit.

B. Remove grilles, covers and access panels for mechanical and electrical systems from location and paint separately.

C. Finish paint primed equipment to color selected.

D. Prime and paint insulated bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated or covered with a pre-finished coating.

E. Replace identification markings on mechanical or electrical equipment when painted over or spattered.

F. Paint interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.

G. Paint exposed conduit and electrical equipment occurring in finished areas. Color and texture to match adjacent surfaces.

H. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

I. Color code equipment, piping, conduit and exposed ductwork in accordance with requirements indicated, color banding and identification (flow arrows, naming, numbering, etc.).

3.06 CLEANING:

A. As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered.

B. During progress or work keep premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris.

3.07 PAINTING AND FINISHING SCHEDULE:

A. Exterior:

1. Unprimed ferrous metal:
   a. 1 coat 297 alkyd red primer.
   b. 2 coats 4110 alkyd gloss enamel.
2. Shop primed ferrous metal:
   a. Touch up places where primer is broken with a matching primer.
   b. 1 coat 296 zinc chromate primer.
   c. 2 coats 400 alkyd gloss enamel.
3. Galvanized metal:
   a. Wash with no. 45 galvaprep.
   b. Rinse with no. 5132 thinner.
   c. 1 coat 299 alkyd zinc dust primer.
   d. 2 coats 400 alkyd gloss enamel paint.
4. Aluminum:
   a. 3 coats of kynar 500 resin.

B. Interior:

1. Concrete masonry units - semi-gloss latex finish:
   a. 1 coat 896 acri-fil.
   b. 2 coats 109 latex semi-gloss.
2. Concrete masonry units - semi-gloss alkyd enamel finish:
   a. 1 coat 896 acri-fil.
   b. 2 coats 129 alkyd satin enamel.
3. Gypsum wallboard - semi-gloss latex finish: 2 coats 109 latex semi-gloss.
4. Gypsum wallboard - semi-gloss alkyd enamel finish:
   a. 1 coat 767 latex primer sealer.
   b. 2 coats 129 alkyd satin enamel.
5. Wood fiber acoustical wall panel - flat acoustical finish: 2 coats 6009 latex flat.
6. Ferrous metal work - semi-gloss alkyd enamel finish:
   a. 1 coat 297 alkyd red primer.
   b. 2 coats 129 alkyd satin enamel.
7. Exposed joists, structural steel, and metal deck: 1 coat 2482 spraying dry fog, white (heavy coat).
8. Grilles, register, etc. - semi-gloss finish:
   a. 1 coat 297 alkyd red primer.
   b. 2 coats 129 alkyd stain enamel.
9. Galvanized metal - semi-gloss finish:
   a. 1 coat 299 alkyd zinc dust coating.
   b. 2 coats 129 alkyd satin enamel.
10. Wood - painted, semi-gloss enamel finish:
    a. 1 coat 429 enamel undercoater.
    b. 2 coats 129 alkyd satin enamel.
11. Closed grain wood - stained, semi-gloss alkyd varnish finish:
    a. 1 coat of a mixture of 1 part shellac and 5 parts denatured alcohol.
    b. 1 coat 832 wood stain.
    c. 1 coat 671 sanding sealer.
    d. 2 coats 431 satin varnish.
12. Aluminum - 2 coats of kynar 500 resin.
13. Interior surface of water tank – Sikagard 62, solvent free colored epoxy coating.
    a. 2 brushed coats as per manufacture’s recommendations.

END OF SECTION

SECTION 10440

INTERIOR SIGNAGE

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit shop drawings of selected items indicating mounting details, room names and other pertinent data.

C. Submit color samples for color selection.

PART 2: PRODUCTS

2.01 SIGNS:

A. Provide 1" plastic signage adjacent to the strike side **of each door designating each room name**.

B. To be accordance with all ADA – Americans with disabilities act and the North Carolina Handicap Code.

PART 3: EXECUTION

3.01 INSTALLATION:

A. Install signage in accordance with the manufacturer's printed instructions at locations designated by the Owner.

END OF SECTION

SECTION 10522

FIRE EXTINGUISHERS, CABINETS (FEC) AND ACCESSORIES

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 09900: Finish painting.

1.02 QUALITY ASSURANCE:

A. Comply with NFPA 10 requirements for fire extinguishers.

1.03 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit manufacturer's catalog data indicating operational features and color and finish.

C. Submit shop drawings indicating physical dimensions, mounted measurements, anchorage details, rough in measurements, locations and details.

D. Submit the manufacturer's installation instructions in accordance with Section 01400.

1.04 OPERATION AND MAINTENANCE DATA:

A. Submit the manufacturer's operation and maintenance data in accordance with Section 01700.

B. Include test, refill or recharge schedules, procedures and recertification requirements.

1.05 ENVIRONMENTAL REQUIREMENTS:

A. Do not install extinguishers when ambient temperatures may cause freezing.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Extinguishers: Red enamel finished tanks with chrome valves and large pressure gauge by J.L. Industries.
   1. Dry Chemical Type: ABC Cosmic 10E steel tank (cabinet mounted).

B. Cabinets: "Ambassador" 1016 V 10, with Futura Fire Handle, factory primed trim and door, and white epoxy coated interior. Provide mounting hardware appropriate to cabinet.

C. Fire extinguisher brackets: MB 810M for use with specified extinguishers.

D. Substitutions: Items of the same function and performance are acceptable in accordance with Section 01600.

PART 3: EXECUTION

3.01 INSPECTION:

A. Verify rough openings for cabinet are correctly sized and located.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION:

A. Install cabinets plumb and level in wall openings at heights indicated on the Drawings. Secure rigidly in place in accordance with the manufacturer's printed instructions.

B. Install brackets using the fastener recommended by the bracket manufacturer for the application. Install plumb and level at heights indicated on the Drawings. Secure rigidly in place in accordance with the manufacturer's printed instructions.

C. Just prior to inspection for substantial completion, install extinguishers. Have required tests and inspections made by the authorities having jurisdiction.

END OF SECTION

SECTION 10810

TOILET ACCESSORIES

PART 1: GENERAL

1.01 RELATED REQUIREMENTS:

A. Section 06100: Wood blocking for attaching toilet accessories.

1.02 SUBMITTALS:

A. Make submittals in accordance with Section 01300.

B. Submit the manufacturer's product data illustrating each accessory at large scale and installation method.

C. Submit shop drawings indicating installation details.

D. When requested by the Architect, provide one sample of each fixture requested.

1.03 DELIVERY, STORAGE AND HANDLING:

A. Do not deliver accessories to the site until rooms in which they are to be installed are ready to receive them.

B. Pack accessories individually in a manner to protect accessory and its finish.

1.04 PROTECTION:

A. Protect adjacent or adjoining finished surfaces and work from damage during installation of work of this Section.

PART 2: PRODUCTS

2.01 MANUFACTURER:

A. Bobrick Washroom Equipment, Inc.

B. Substitutions: Items of the same function and performance are acceptable in accordance with Section 01600.

2.02 MATERIALS:

A. Toilet paper holders: B-3570/35704.

B. 36 inch grab bars: B-6806 Mounting height 34” above finish floor

C. 42 inch grab bars: B-6806. Mounting height 34" above finish floor.

D. 18 inch grab bar: B-6806X18.

E. "L" grab bars: B-6861. Mounting height: 34" above finish floor.

F. Mirror: B2904 1630

G. Recessed paper towel dispensers: B-359. Mounting height: 48" above finish floor to

center.

H. Soap dispenser surface mtd: B-132

I. Towel dispenser surface mounted: A&J Washroom Accessories U190.
J. Soap Holder: B-7680
K.

2.03 FASTENERS:

A. Concrete masonry anchors – stainless steel as per manufactures recomendations.

B. Where heads are exposed, use a spanner head or other security type fastener. Provide the Owner with two tools required to operate fasteners if tools other than conventional tools are required.

PART 3: EXECUTION

3.01 PREPARATION:

A. Deliver inserts and rough in frames to the job site at appropriate time for building in. Provide templates and rough in measurements as required.

B. Before starting work of this Section, notify the Architect in writing of conflicts detrimental to installation or operation of units.

C. Verify with the Architect the exact location of accessories.

3.02 INSTALLATION:

A. Install fixtures and accessories in accordance with the manufacturer's printed instructions and instructions specified below.

B. Install true, plumb and level, securely and rigidly anchored to substrate.

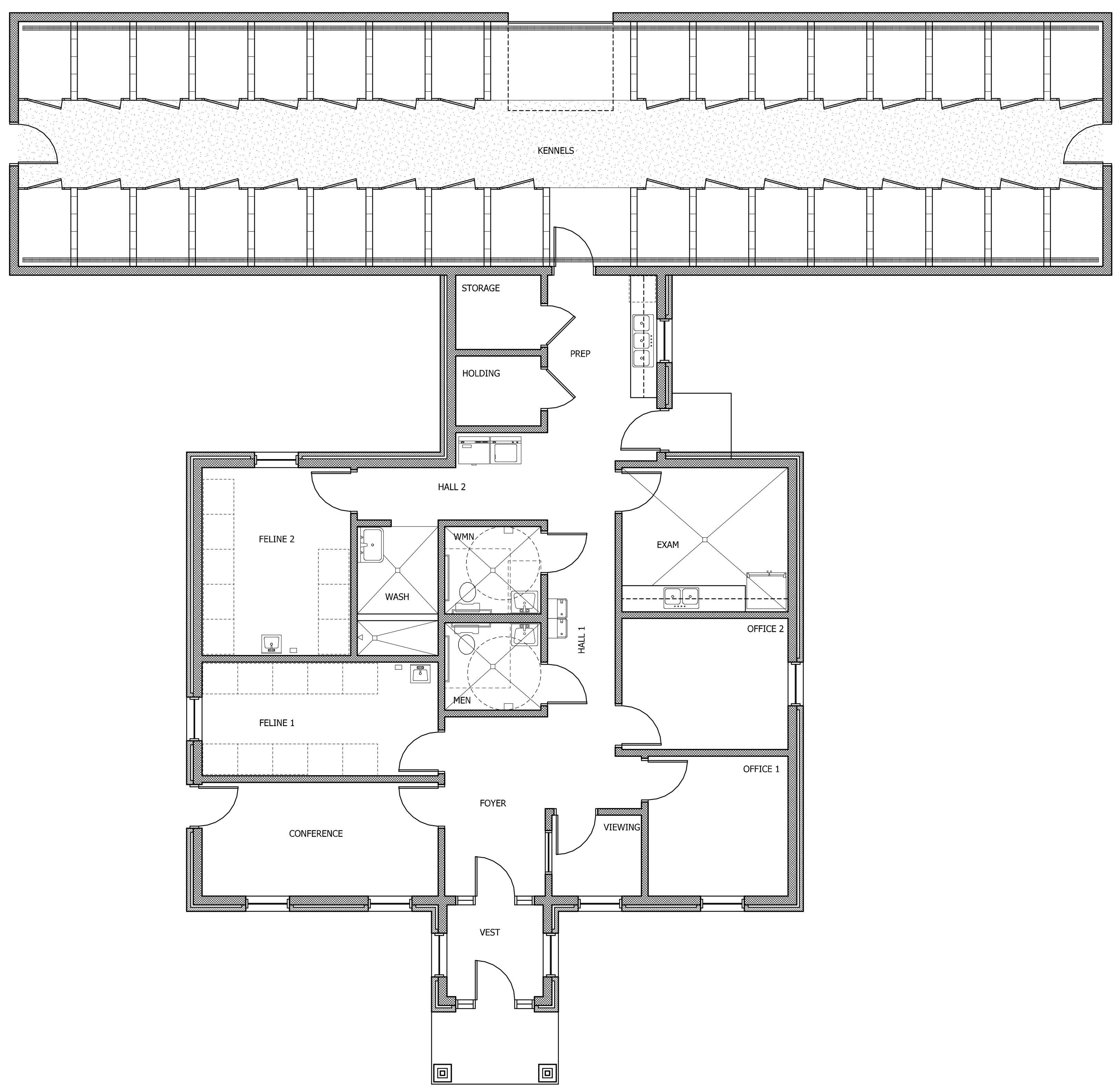
C. Install accessories in accordance with the manufacturer's instructions for mounting on walls with wood blocking behind.

D. Coordinate accessory locations with carpentry trade so that wood blocking in walls is set at proper height and location.

END OF SECTION

Construction Plans

(attached document dated February 4th, 2020)



ROBERTSON COUNTY
ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

JOHN F. WERNE III
ARCHITECT
1020 OWEN COURT, ASHLAND CITY, TENNESSEE 37015 615-792-3966

CSR ENGINEERING, INC.
CIVIL/STRUCTURAL ENGINEER
1116 Main St. Pleasant View, TN 37146 615.247.5384 direct

MICHAEL BUSBY, PE
MECHANICAL ENGINEER
P.O. BOX 813, GOODLETTSVILLE, TN 37070, 615-512-7597

DRC ENGINEERING
DARON CHRISTY, ELECTRICAL ENGINEER
2585 PLEASANT VIEW RD, PLEASANT VIEW, TN 37146, 616-714-1812

INDEX OF DRAWINGS

NOTE: ALL DRAWINGS, SPECIFICATIONS AND CODES LISTED OR REFERENCED ABOVE APPLY AS A WHOLE DOCUMENT AND SHALL NOT BE CONSIDERED AS SEPARATE REQUIREMENTS BASED ON DISCIPLINE, SUBCONTRACT OR OTHER ENTITY.

CONSTRUCTION SHALL COMPLY WITH:

- 2012 International Building Code
- 2012 International Plumbing Code
- 2012 International Mechanical Code
- 2012 International Fire Code
- 2012 International Fuel Gas Code
- 2009 International Energy Conservation Code
- 2009 ICC A 117.1 Accessible & Useable Buildings & Facilities
- 2012 NFPA Life Safety Code 101
- 2011 National Electric Code

AMERICANS WITH DISABILITIES ACT (ADA)

ALL IBC W/ LOCAL AMENDMENTS

JOHN F. WERNE III, REGISTERED ARCHITECT, No. 2098, STATE OF TENNESSEE

JOHN F. WERNE
ARCHITECT
1020 OWEN COURT, ASHLAND CITY, TENNESSEE 37015 615-792-3966 jwerne3@gmail.com

ROBERTSON COUNTY
ANIMAL CONTROL
W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER
REVIEWER
PROJECT
DATE 1/14/20
SHEET

REVISIONS

NO.	DATE	BY	DESCRIPTION

SITE DEVELOPMENT PLANS

OF

ANIMAL CONTROL EXPANSION

FOR

ROBERTSON COUNTY ANIMAL CONTROL

SPRINGFIELD, TN

JANUARY 2020

CONTRACTOR'S NOTES:

THE CONTRACTOR'S WORK TO BE PERFORMED UNDER THIS PROJECT WILL CONSIST OF FURNISHING ALL EQUIPMENT, LABOR, MATERIALS, TOOLS AND SUPERVISION NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED ANIMAL CONTROL EXPANSION AND OTHER RELATED WORK AS LISTED IN THE PLANS AND SPECIFICATIONS.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, UTILITY LOCATIONS, ELEVATIONS, EXISTING INVERTS PRIOR TO ORDERING ANY MATERIAL. IF A DISCREPANCY IS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR REPRESENTATIVE IMMEDIATELY.

ALL WORK SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL CODES AND LAWS. ALL NECESSARY LICENSES AND PERMITS NOT OBTAINED BY THE OWNER SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

EXTERIOR CONCRETE SHALL BE 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS, 4-INCH MAXIMUM SLUMP AND 5 TO 7 PERCENT AIR ENTRAINED.

ALL SITE CONCRETE SHALL BE FINISHED AS SPECIFIED IN THE PLANS.

ALL WORK PERFORMED SHALL BE IN THE BEST RECOGNIZED TRADE PRACTICES AND TO THE ENTIRE SATISFACTION OF THE OWNER.

INDEX OF DRAWINGS

UTILITY COMPANIES:

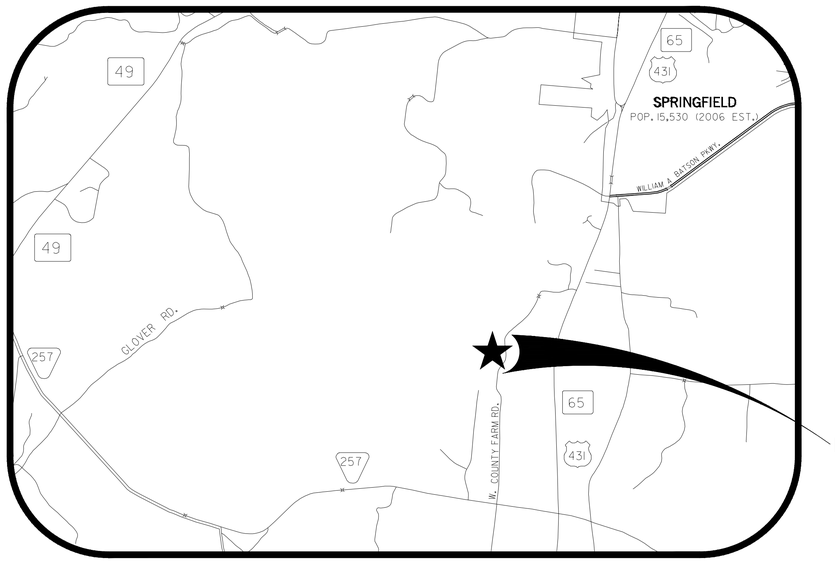
GAS -
SPRINGFIELD GAS DEPARTMENT
1311 R. W. GORDON DRIVE,
SPRINGFIELD TN
(615) 382-2200

WATER-
SPRINGFIELD WATER DEPARTMENT
824 CENTRAL AVE,
SPRINGFIELD, TN
(615) 382-1600

SEWER-
SPRINGFIELD WASTEWATER DEPT
824 CENTRAL AVE,
SPRINGFIELD, TN
(615) 382-1600

ELECTRIC -
CEMC
1201 5TH AVE NORTH,
SPRINGFIELD, TN
(615) 384-5566

North



PROJECT SITE

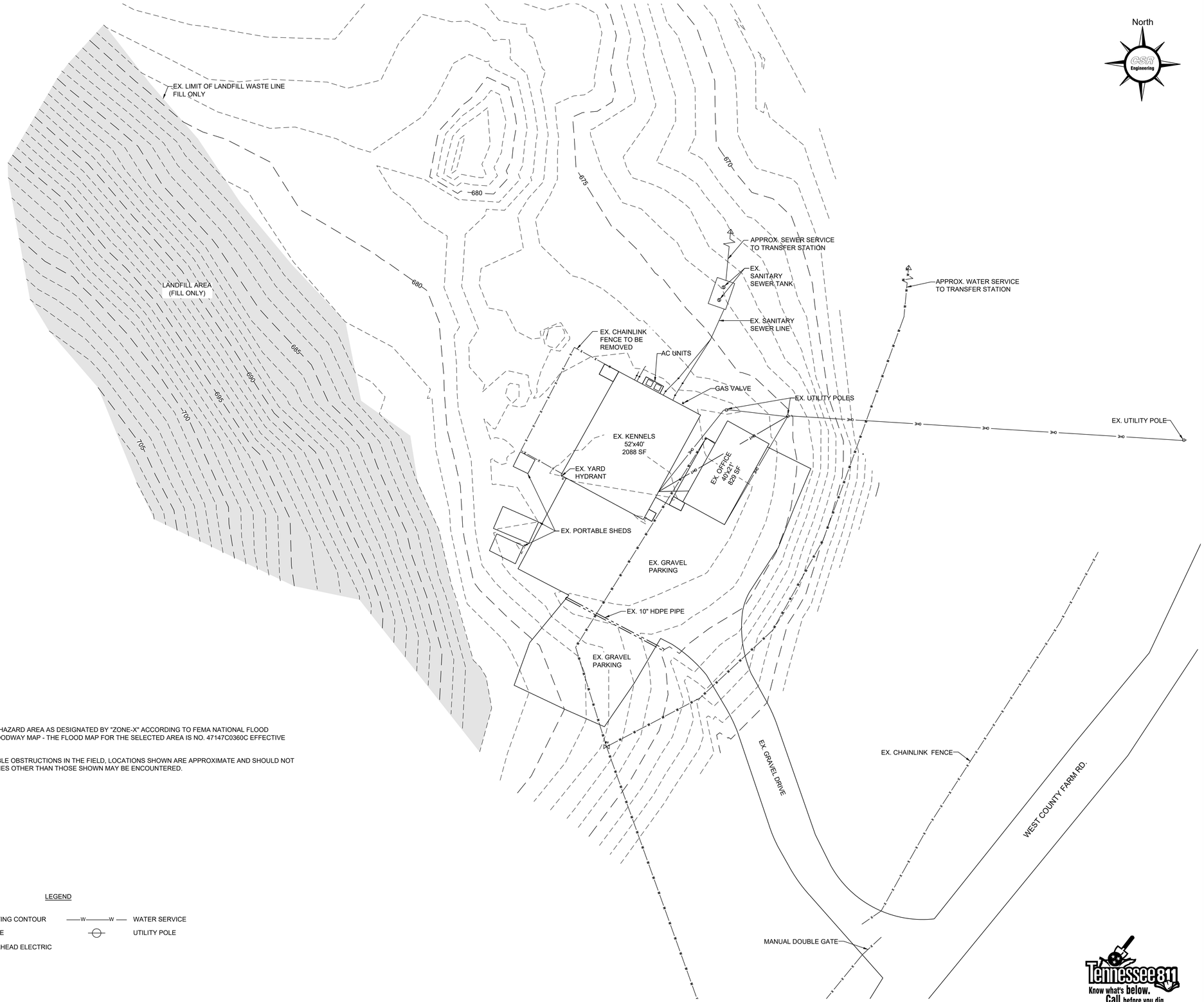
LOCATION MAP

CSR Engineering, Inc.
1116 Main Street
Pleasant View, TN 37146
P: 615.212.2389
F: 615.246.3815
www.csrengineers.com

PHILLIP L. CASTERLINE
REGISTERED ENGINEER
AGRICULTURE
No. 119354
04/30/20
STATE OF TENNESSEE

Tennessee 811
Know what's below.
Call before you dig.

PURPOSE FOR ISSUE: CONSTRUCTION



EXISTING SITE NOTE

THIS BUILDING SITE DOES NOT LIE WITHIN A FLOOD HAZARD AREA AS DESIGNATED BY "ZONE-X" ACCORDING TO FEMA NATIONAL FLOOD INSURANCE PROGRAM - FLOOD BOUNDARY AND FLOODWAY MAP - THE FLOOD MAP FOR THE SELECTED AREA IS NO. 47147C0360C EFFECTIVE DATE: APRIL 16. 2008.

UTILITIES SHOWN HEREON WERE TAKEN FROM VISIBLE OBSTRUCTIONS IN THE FIELD, LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD NOT BE RELIED UPON AS ACCURATE. ADDITIONAL, UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED.

LEGEND

- 680 EXISTING CONTOUR
- x x x FENCE
- OHE OVERHEAD ELECTRIC
- W W WATER SERVICE
- UTILITY POLE

Tennessee 811
Know what's below.
Call before you dig.

PURPOSE FOR ISSUE: CONSTRUCTION

SCALE: 1"=20'

CSR Engineering

CSR Engineering, Inc.
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ROBERTSON COUNTY TENNESSEE AGRICULTURE INDUSTRY 1796

PHILLIP L. CASTERLINE REGISTERED ENGINEER AGRICULTURE COMMERCE No. 119354 STATE OF TENNESSEE
01/30/20

EXISTING SITE

W. COUNTY FARM RD.
ANIMAL CONTROL EXPANSION
FOR
ROBERTSON COUNTY
ANIMAL CONTROL

REVISIONS

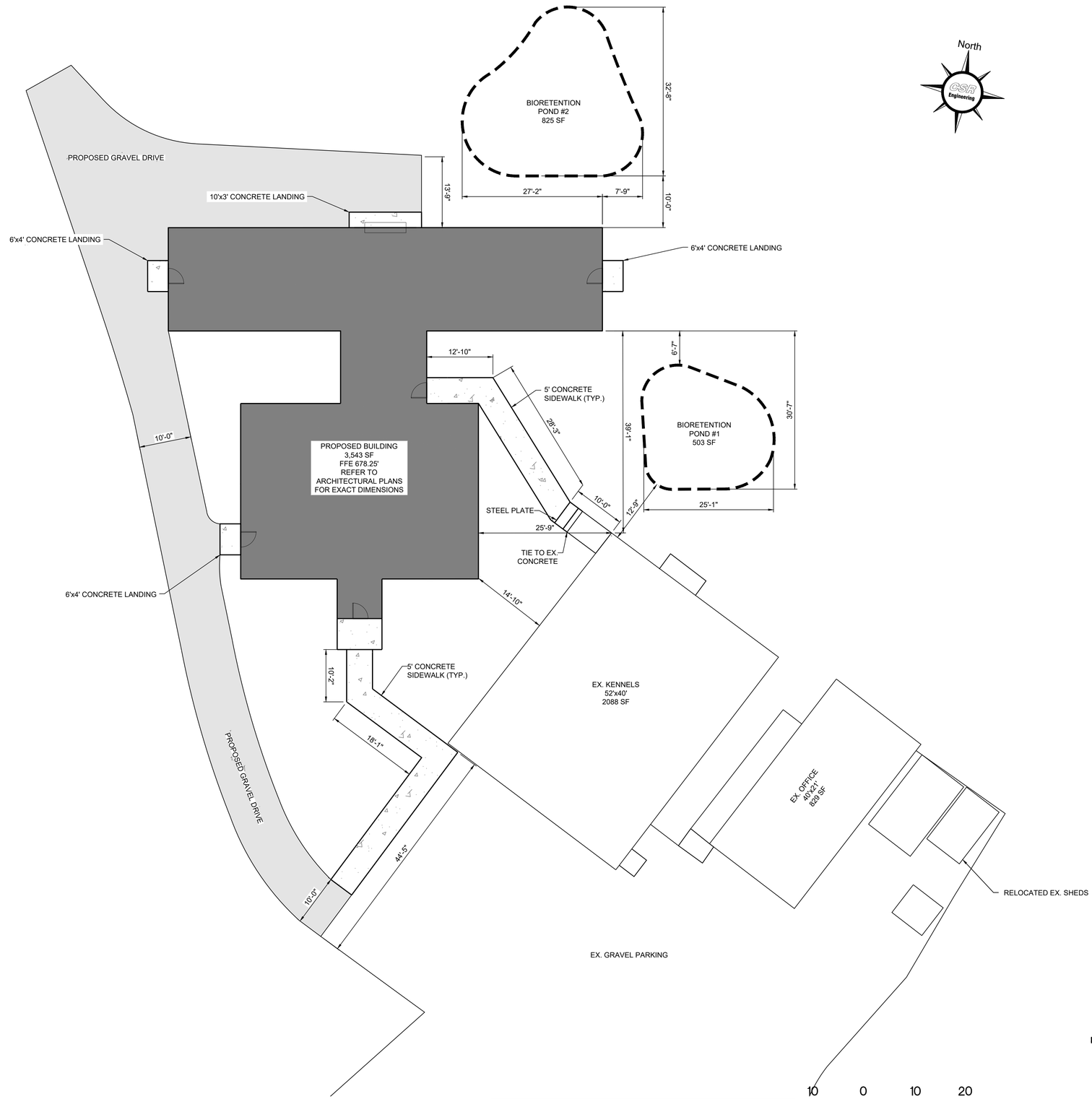
NO.	DATE	BY	DESCRIPTION

DESIGNER MSS
REVIEWER PLC

PROJECT 18-145

DATE 1-30-20

SHEET C1



PURPOSE FOR ISSUE: CONSTRUCTION

SCALE: 1"=10'

Tennessee 811
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ROBERTSON COUNTY TENNESSEE
AGRICULTURE
INDUSTRY
1796

SITE PLAN

W. COUNTY FARM RD.
ANIMAL CONTROL EXPANSION
FOR
ROBERTSON COUNTY
ANIMAL CONTROL

PHILLIP L. CASTERLINE
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 119334
01/30/20
STATE OF TENNESSEE

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGNER MSS
REVIEWER PLC

PROJECT 18-145

DATE 1-30-20

SHEET C2

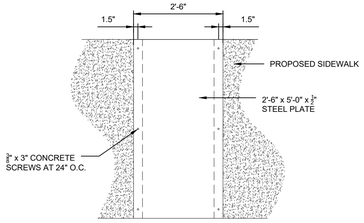
GRADING LEGEND

680 — EXISTING CONTOUR

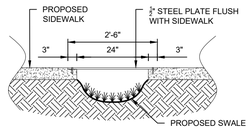
680 — PROPOSED CONTOUR

X 679.25 — PROPOSED SPOT ELEVATION

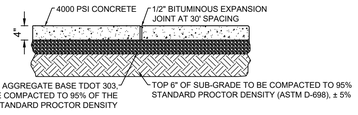
PROPOSED DITCH/SWALE



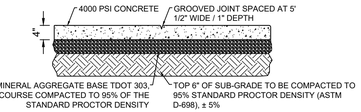
STEEL PLATE PLAN VIEW



STEEL PLATE SECTION VIEW

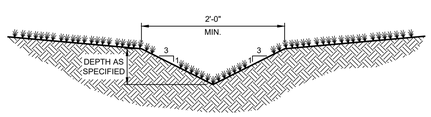


EXPANSION / CONTRACTION JOINT DETAIL



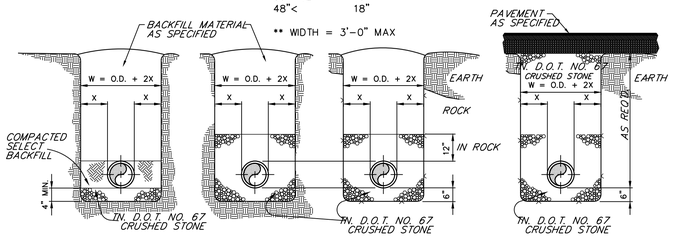
CONTROL JOINT DETAIL

SIDEWALK DETAILS



TYPICAL V-DITCH GRASS LINING DETAIL

PIPE SIZE	X
≤12"	**
12"–30"	12"
33"–42"	15"
48"<	18"

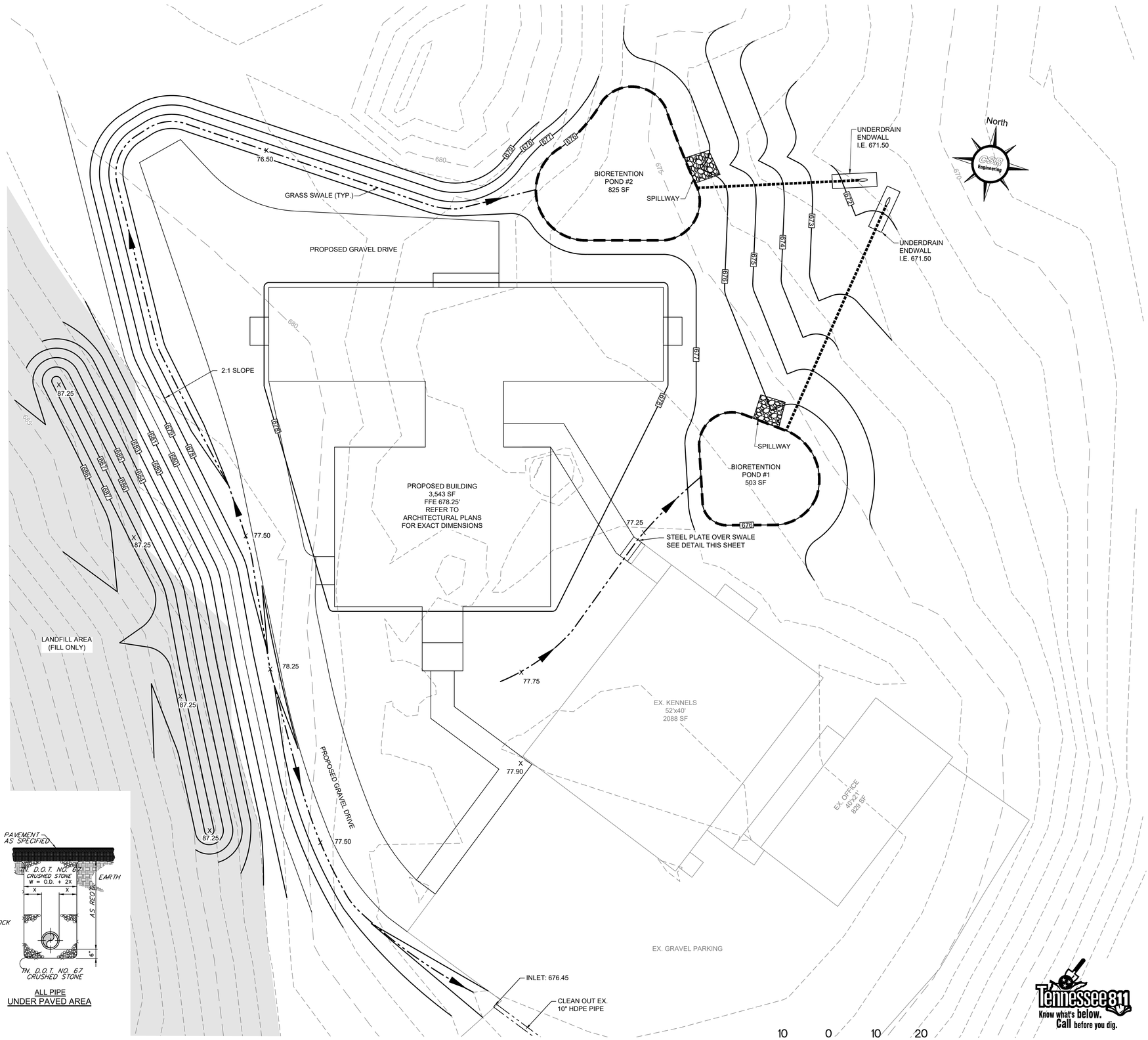


DUCTILE IRON PIPE — P.V.C., RCP, OR HDPE — IN EARTH

ALL PIPE — IN ROCK

ALL PIPE — UNDER PAVED AREA

STANDARD PIPE BEDDING



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ROBERTSON COUNTY TENNESSEE — AGRICULTURE INDUSTRY — 1796

GRADING PLAN

W. COUNTY FARM RD.
ANIMAL CONTROL EXPANSION
FOR
ROBERTSON COUNTY
ANIMAL CONTROL

PHILLIP L. CASTERLINE — REGISTERED ENGINEER — AGRICULTURE — 04/30/20 — No. 119354 — STATE OF TENNESSEE

REVISIONS

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PROJECT 18-145

DATE 1-30-20

SHEET C3

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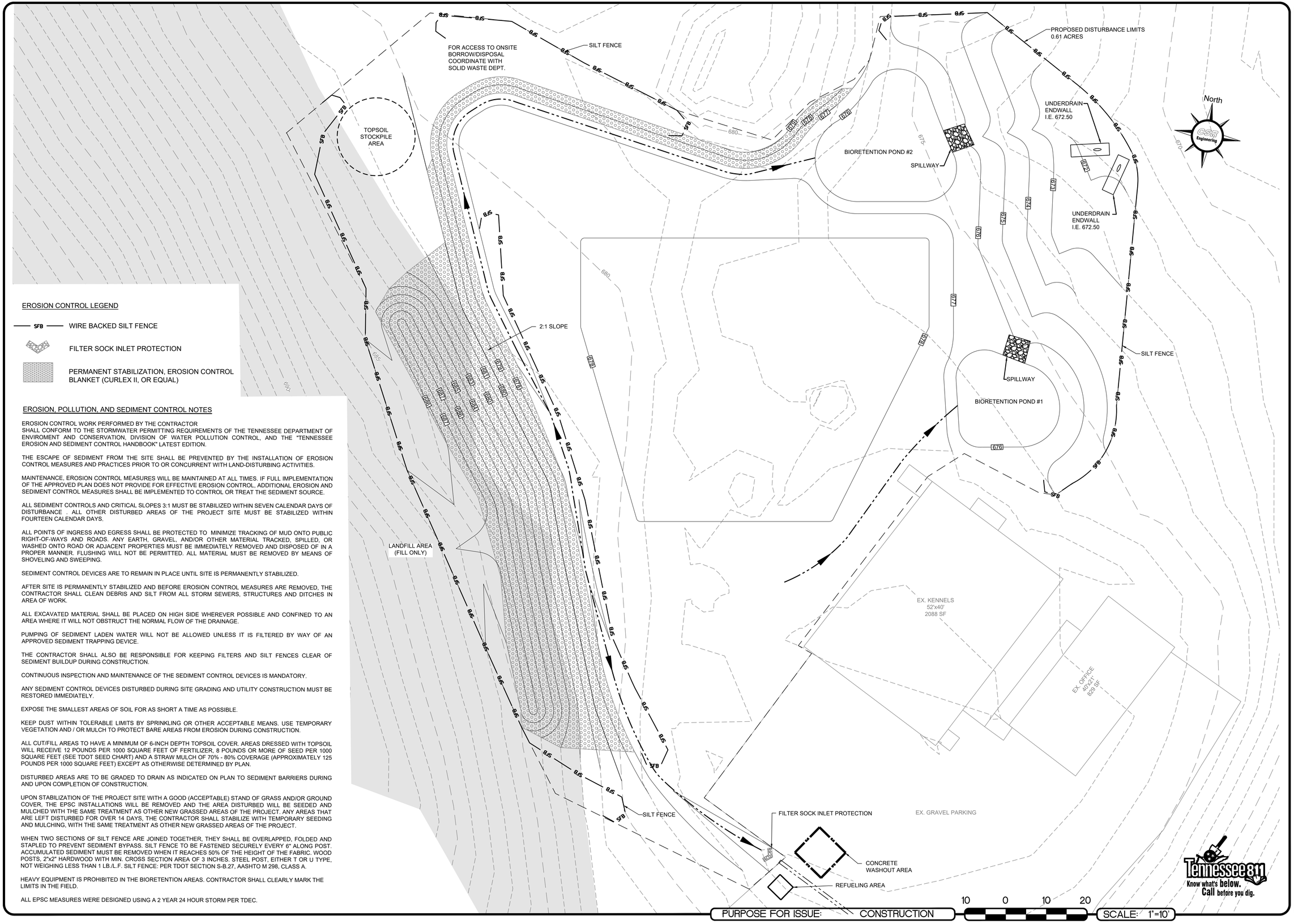
PURPOSE FOR ISSUE: CONSTRUCTION

10 0 10 20

SCALE: 1"=10'



EROSION CONTROL LEGEND

SFB — WIRE BACKED SILT FENCE

FILTER SOCK INLET PROTECTION

PERMANENT STABILIZATION, EROSION CONTROL BLANKET (CURLEX II, OR EQUAL)

EROSION, POLLUTION, AND SEDIMENT CONTROL NOTES

EROSION CONTROL WORK PERFORMED BY THE CONTRACTOR SHALL CONFORM TO THE STORMWATER PERMITTING REQUIREMENTS OF THE TENNESSEE DEPARTMENT OF ENVIROMENT AND CONSERVATION, DIVISION OF WATER POLLUTION CONTROL, AND THE "TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK" LATEST EDITION.

THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES PRIOR TO OR CONCURRENT WITH LAND-DISTURBING ACTIVITIES.

MAINTENANCE. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.

ALL SEDIMENT CONTROLS AND CRITICAL SLOPES 3:1 MUST BE STABILIZED WITHIN SEVEN CALENDAR DAYS OF DISTURBANCE . ALL OTHER DISTURBED AREAS OF THE PROJECT SITE MUST BE STABILIZED WITHIN FOURTEEN CALENDAR DAYS.

ALL POINTS OF INGRESS AND EGRESS SHALL BE PROTECTED TO MINIMIZE TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS AND ROADS. ANY EARTH, GRAVEL, AND/OR OTHER MATERIAL TRACKED, SPILLED, OR WASHED ONTO ROAD OR ADJACENT PROPERTIES MUST BE IMMEDIATELY REMOVED AND DISPOSED OF IN A PROPER MANNER. FLUSHING WILL NOT BE PERMITTED. ALL MATERIAL MUST BE REMOVED BY MEANS OF SHOVELING AND SWEEPING.

SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL SITE IS PERMANENTLY STABILIZED.

AFTER SITE IS PERMANENTLY STABILIZED AND BEFORE EROSION CONTROL MEASURES ARE REMOVED, THE CONTRACTOR SHALL CLEAN DEBRIS AND SILT FROM ALL STORM SEWERS, STRUCTURES AND DITCHES IN AREA OF WORK.

ALL EXCAVATED MATERIAL SHALL BE PLACED ON HIGH SIDE WHEREVER POSSIBLE AND CONFINED TO AN AREA WHERE IT WILL NOT OBSTRUCT THE NORMAL FLOW OF THE DRAINAGE.

PUMPING OF SEDIMENT LADEN WATER WILL NOT BE ALLOWED UNLESS IT IS FILTERED BY WAY OF AN APPROVED SEDIMENT TRAPPING DEVICE.

THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR KEEPING FILTERS AND SILT FENCES CLEAR OF SEDIMENT BUILDUP DURING CONSTRUCTION.

CONTINUOUS INSPECTION AND MAINTENANCE OF THE SEDIMENT CONTROL DEVICES IS MANDATORY.

ANY SEDIMENT CONTROL DEVICES DISTURBED DURING SITE GRADING AND UTILITY CONSTRUCTION MUST BE RESTORED IMMEDIATELY.

EXPOSE THE SMALLEST AREAS OF SOIL FOR AS SHORT A TIME AS POSSIBLE.

KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS. USE TEMPORARY VEGETATION AND / OR MULCH TO PROTECT BARE AREAS FROM EROSION DURING CONSTRUCTION.

ALL CUT/FILL AREAS TO HAVE A MINIMUM OF 6-INCH DEPTH TOPSOIL COVER. AREAS DRESSED WITH TOPSOIL WILL RECEIVE 12 POUNDS PER 1000 SQUARE FEET OF FERTILIZER, 8 POUNDS OR MORE OF SEED PER 1000 SQUARE FEET (SEE TDOT SEED CHART) AND A STRAW MULCH OF 70% - 80% COVERAGE (APPROXIMATELY 125 POUNDS PER 1000 SQUARE FEET) EXCEPT AS OTHERWISE DETERMINED BY PLAN.

DISTURBED AREAS ARE TO BE GRADED TO DRAIN AS INDICATED ON PLAN TO SEDIMENT BARRIERS DURING AND UPON COMPLETION OF CONSTRUCTION.

UPON STABILIZATION OF THE PROJECT SITE WITH A GOOD (ACCEPTABLE) STAND OF GRASS AND/OR GROUND COVER, THE EPSC INSTALLATIONS WILL BE REMOVED AND THE AREA DISTURBED WILL BE SEEDED AND MULCHED WITH THE SAME TREATMENT AS OTHER NEW GRASSED AREAS OF THE PROJECT. ANY AREAS THAT ARE LEFT DISTURBED FOR OVER 14 DAYS, THE CONTRACTOR SHALL STABILIZE WITH TEMPORARY SEEDING AND MULCHING, WITH THE SAME TREATMENT AS OTHER NEW GRASSED AREAS OF THE PROJECT.

WHEN TWO SECTIONS OF SILT FENCE ARE JOINED TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS. SILT FENCE TO BE FASTENED SECURELY EVERY 6" ALONG POST. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN IT REACHES 50% OF THE HEIGHT OF THE FABRIC. WOOD POSTS, 2"x2" HARDWOOD WITH MIN. CROSS SECTION AREA OF 3 INCHES. STEEL POST, EITHER T OR U TYPE, NOT WEIGHING LESS THAN 1 LB./L.F. SILT FENCE: PER TDOT SECTION S-B.27, AASHTO M 298, CLASS A.

HEAVY EQUIPMENT IS PROHIBITED IN THE BIORETENTION AREAS. CONTRACTOR SHALL CLEARLY MARK THE LIMITS IN THE FIELD.

ALL EPSC MEASURES WERE DESIGNED USING A 2 YEAR 24 HOUR STORM PER TDEC.

PURPOSE FOR ISSUE: CONSTRUCTION

10 0 10 20

SCALE: 1"=10'

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ROBERTSON COUNTY TENNESSEE AGRICULTURE INDUSTRY 1796

EPSC PLAN

W. COUNTY FARM RD.
ANIMAL CONTROL EXPANSION
FOR
ROBERTSON COUNTY
ANIMAL CONTROL

PHILLIP L. CASTERLINE REGISTERED ENGINEER AGRICULTURE 04/30/20 COMMERCE No. 119358 STATE OF TENNESSEE

REVISIONS

NO.	DATE	BY	DESCRIPTION

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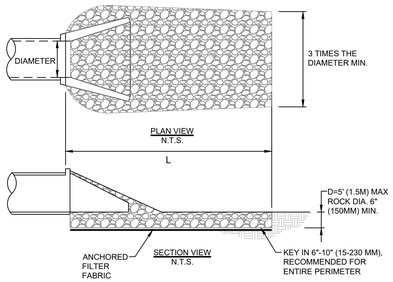
REVIEWER PLC

PROJECT 18-145

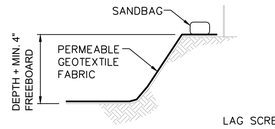
DATE 1-30-20

SHEET C4

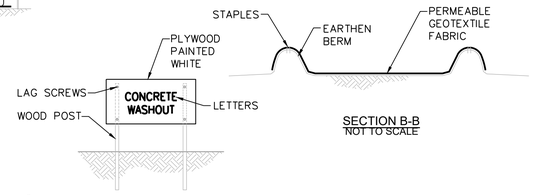


PIPE DIAMETER	APRON LENGTH	RIP-RAP D_{50} MIN.
15"	10'	6"
18"	10'	6"
24"	16'	8"
30"	20'	8"
36"	20'	10"

PERMANENT OUTLET PROTECTION (PESC-07)

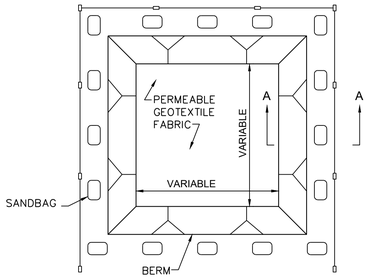


SECTION A-A
NOT TO SCALE



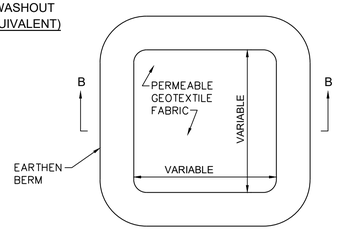
SECTION B-B
NOT TO SCALE

CONCRETE WASHOUT SIGN (OR EQUIVALENT)



PLAN VIEW
NOT TO SCALE

TYPE "BELOW GRADE"



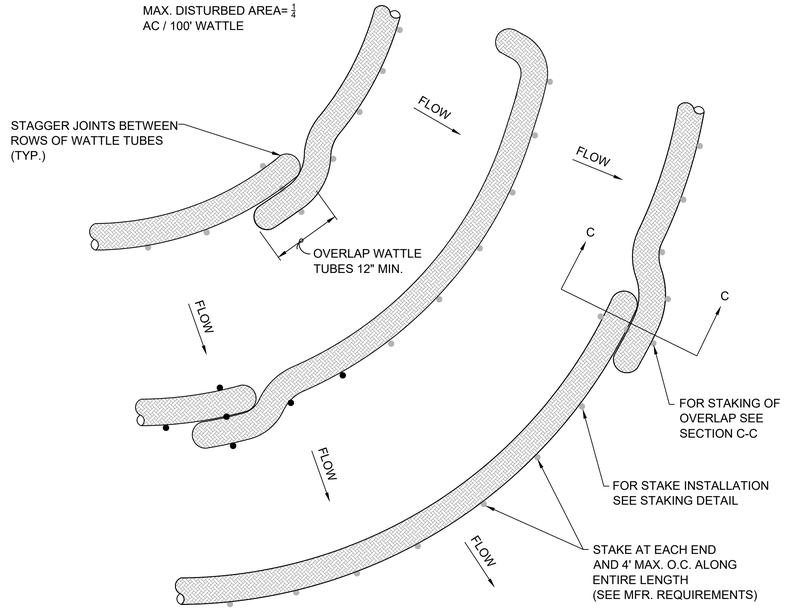
PLAN VIEW
NOT TO SCALE

TYPE "ABOVE GRADE" WITH EARTHEN BERMS

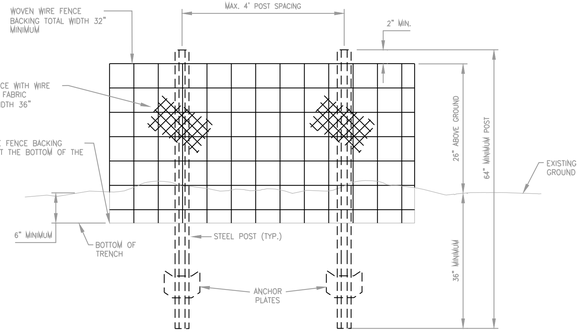
NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. SIGNAGE IDENTIFYING THE CONCRETE WASHOUT AREA SHALL BE INSTALLED WITHIN 5FT.OF THE WASHOUT FACILITY.

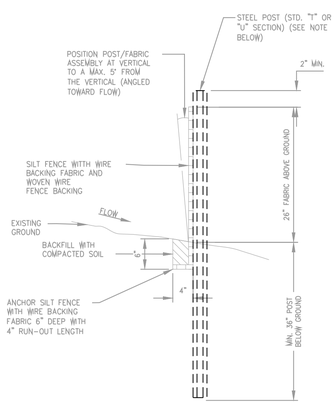
CONCRETE WASHDOWN AREA DETAIL (CP-10)



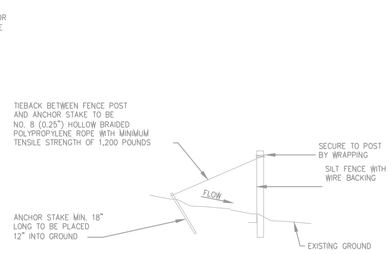
PLAN VIEW FOR SLOPE APPLICATION



ELEVATION VIEW



SECTIONAL VIEW



SILT FENCE TIEBACK

(WHEN REQUIRED BY THE ENGINEER OR NOTED IN THE PLANS. COST TO BE INCLUDED IN THE ITEMS FOR SILT FENCE WITH WIRE BACKING)

NOTE: STEEL POSTS SHALL BE ROLLED FROM HIGH CARBON STEEL AND SHALL HAVE A MINIMUM WEIGHT OF 1.25 LB/FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH GRADE WEATHER RESISTANT STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH AN ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED TO AID IN THE ATTACHMENT OF THE WIRE BACKING. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702.

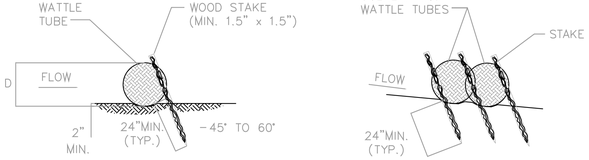
EROSION CONTROL PLAN LEGEND: —SFB— SILT FENCE WITH WIRE BACKING

SILT FENCE NOTES

1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS.
2. USE METAL TIES TO SECURE SILT FENCE TO METAL FENCE.
3. SILT FENCE SHALL COMPLY WITH THE TN. DEPT. OF ENVIRONMENT AND CONSERVATION EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
4. INSTALL PERIMETER SILTATION CONTROL PRIOR TO APPLICATION OF GRADING PERMIT.

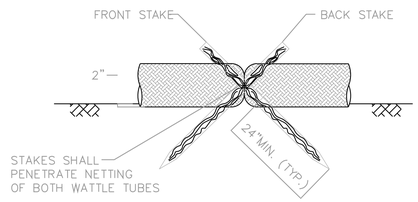
SILT FENCE MAINTENANCE PLAN

1. CARE SHALL BE TAKEN TO MINIMIZE THE MOVEMENT OF SEDIMENT INTO ALL STORM DRAIN APPURTENANCES AND PUBLIC ROADS UNTIL THE IMPERVIOUS MATERIAL (ROAD/PARKING AREA SURFACE) IS APPLIED.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED FOR STABILITY AND OPERATIONAL INTEGRITY FOLLOWING EVERY RUNOFF PRODUCING RAINFALL BUT IN NO CASE LESS THAN EVERY WEEK. ANY NECESSARY REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN THE MEASURE'S PERFORMANCE AS DESIGNATED.
3. SEDIMENT WILL BE REMOVED FROM THE UPSTREAM FACE OF SILT FENCE WHEN IT REACHES A MAXIMUM SIX-INCH (6") DEPTH AT THE FENCE. THE FENCE WILL BE REPLACED AS NECESSARY TO MAINTAIN A BARRIER.



STAKING DETAIL

SECTION C-C



JOINT STAKING DETAIL

WEIGHTED SEDIMENT TUBE (TCP-14)

PURPOSE FOR ISSUE: CONSTRUCTION

SCALE: NONE

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ESPC DETAILS
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PROJECT 18-145

DATE 1-30-20

SHEET C5

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UTILITY LEGEND

———	OHE	OVERHEAD ELECTRIC
———	UGE	UNDERGROUND ELECTRIC
———	OHT	OVERHEAD TELECOMMUNICATIONS
———	W	SERVICE WATER LINE
———	4"-SA	SANITARY SEWER SERVICE
	⊙	CLEANOUT SANITARY SEWER

UTILITY NOTES

1. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPECIFICATIONS AND STANDARD DETAILS OF THE SPRINGFIELD WATER/WASTE WATER DEPARTMENT AND OSHA GUIDELINES.
2. UTILITIES SHOWN HEREON WERE TAKEN FROM VISIBLE OBSTRUCTIONS IN THE FIELD. LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD NOT BE RELIED UPON AS ACCURATE. ADDITIONALLY, UTILITIES OTHER THAN THOSE SHOWN MAY BE ENCOUNTERED.
3. PRIOR TO CONSTRUCTION, EXCAVATION, OR DISTURBANCE OF THE EXISTING GROUND ELEVATION, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY AND EXPENSE OF CONTACTING THE LOCAL UTILITY OWNERS AND DEFINITIVELY ESTABLISHING THE EXISTENCE, EXACT LOCATIONS AND SIZES OF UNDERGROUND UTILITIES TO AVOID ANY HAZARD OR CONFLICT.
4. TENNESSEE LAW REQUIRES NO LESS THAN THREE NOR MORE THAN TEN WORKING DAYS NOTICE TO UNDERGROUND UTILITY OWNERS PRIOR TO INTENT TO EXCAVATE. A LIST OF THESE UTILITIES MAY BE OBTAINED FROM EACH COUNTY'S REGISTER OF DEEDS. THOSE UTILITIES THAT PARTICIPATE IN THE TN ONE-CALL SYSTEM CAN BE NOTIFIED AT 1-800-351-1111.
5. CONTRACTOR IS TO PROTECT UTILITIES THAT ARE TO REMAIN AND ALL EXISTING IMPROVEMENTS INCLUDING BUT NOT LIMITED TO STRUCTURES, PAVEMENT, RAMPS, TREES, SIDEWALKS, CULVERTS, ETC. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING IMPROVEMENTS AND UTILITIES TO REMAIN ACCORDING TO LOCAL STANDARDS AND AT THE CONTRACTOR'S EXPENSE. CONTRACTOR IS TO COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY AUTHORITIES.

WATER NOTES

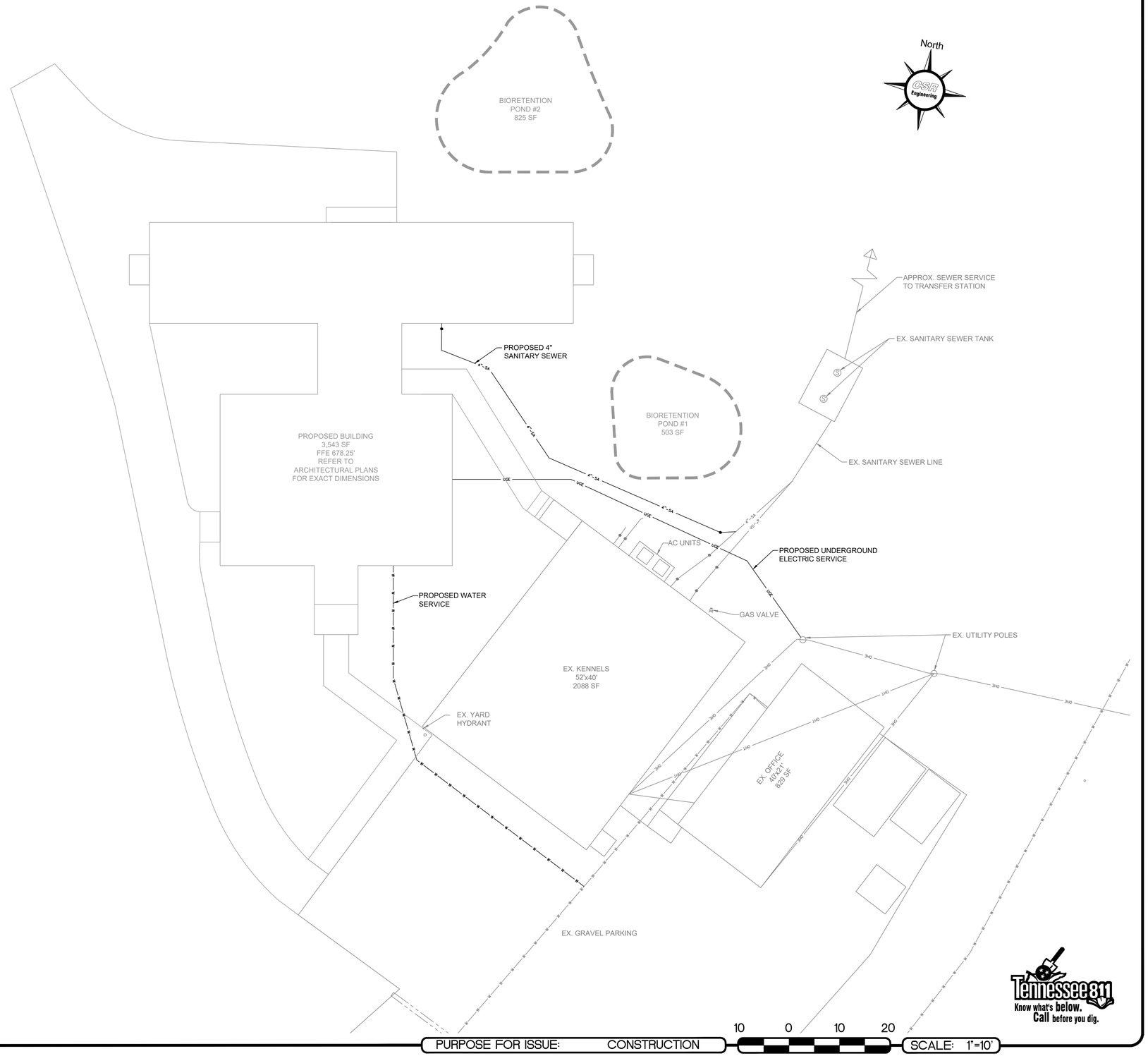
ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPECIFICATIONS AND STANDARD DETAILS OF SPRINGFIELD WATER/WASTE WATER DEPARTMENT.

PROPOSED UTILITY NOTES

SEE SHEET C7 FOR STORMWATER DETAILS.

ALL UTILITIES SHALL BE INSTALLED UNDERGROUND UNLESS NOTED OTHERWISE.

UNDERGROUND ELECTRIC SHOWN IS APPROXIMATE. FINAL LOCATION AND EASEMENTS SHALL BE DETERMINED BY CEMC.



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PURPOSE FOR ISSUE: CONSTRUCTION

SCALE: 1"=10'

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UTILITY PLAN

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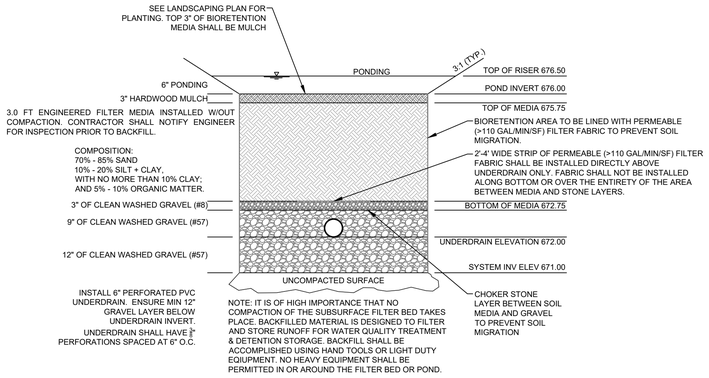
PROJECT 18-145

DATE 1-30-20

SHEET C6



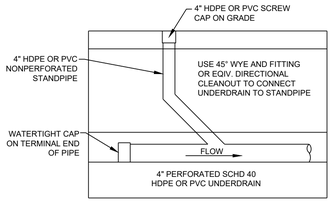
BIO-RETENTION AREA DETAIL (GIP-01) (LEVEL 2)

MATERIAL SCHEDULE #1

SURFACE AREA 503 SF
ENGINEERED FILTER MEDIA = 1509 CF (503 X 3')
WASHED GRAVEL (#57) = 880 CF (503 X 1.75)
CHOKER STONE (#8) = 126 CF (503 X 0.25)

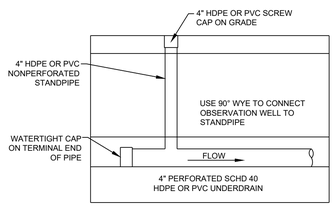
MATERIAL SCHEDULE #2

SURFACE AREA 825 SF
ENGINEERED FILTER MEDIA = 2475 CF (825 X 3')
WASHED GRAVEL (#57) = 1444 CF (825 X 1.75)
CHOKER STONE (#8) = 206 CF (825 X 0.25)

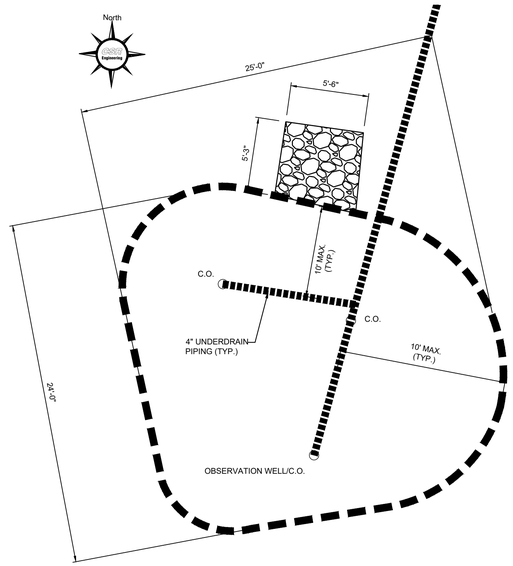


BIORETENTION AREA UNDERDRAIN DETAIL

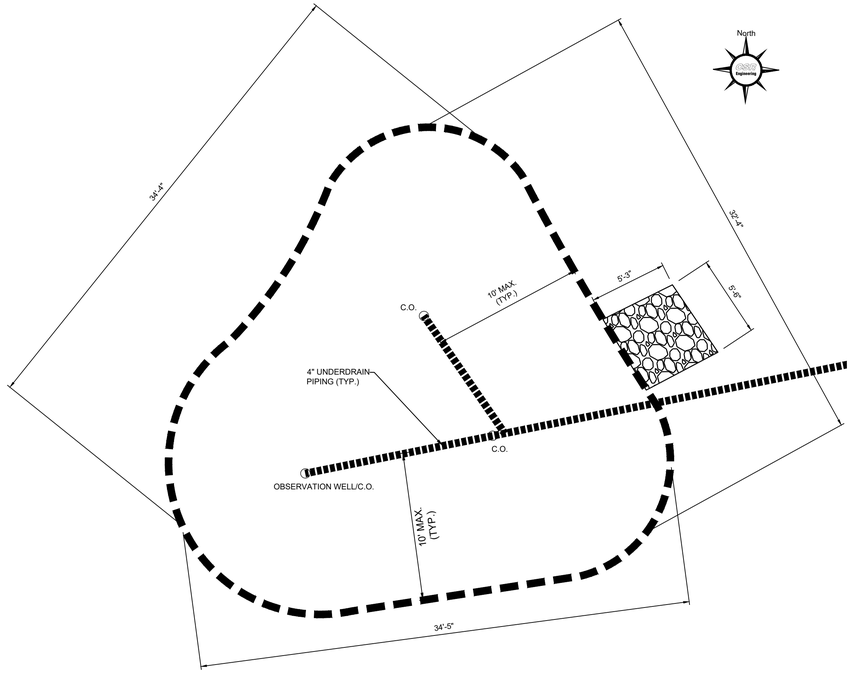
METRO STORMWATER MANUAL VOL. 5, GIP-01, FIG. 1-B.1



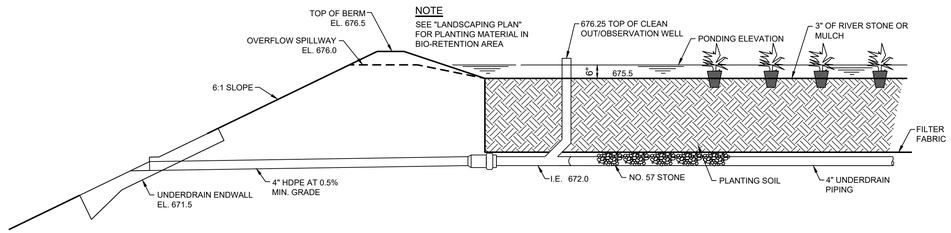
BIORETENTION AREA OBSERVATION WELL DETAIL



BIORETENTION POND #1



BIORETENTION POND #2



CSR Engineering

CSR Engineering, Inc.
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www.csrengineers.com

STORMWATER DETAILS

W. COUNTY FARM RD.
ANIMAL CONTROL EXPANSION
FOR
ROBERTSON COUNTY
ANIMAL CONTROL

PHILLIP L. CASTERLINE
REGISTERED ENGINEER
AGRICULTURE
04/30/20
COMMERCE
No. 119584
STATE OF TENNESSEE

REVISIONS

NO.	DATE	BY	DESCRIPTION

DESIGNER MSS
REVIEWER PLC

PROJECT 18-145

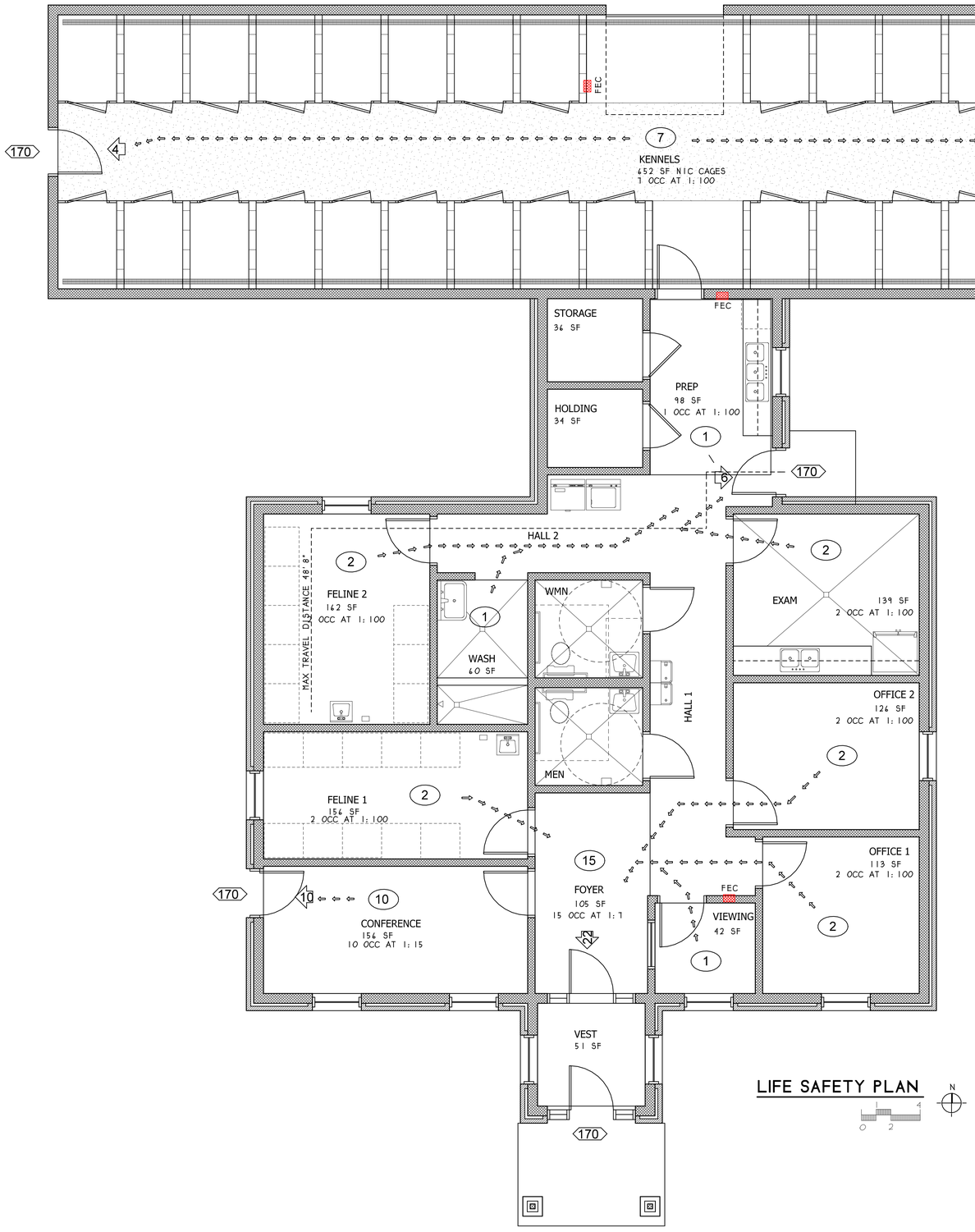
DATE 1-30-20

SHEET C7

Tennessee 811
Know what's below.
Call before you dig.

PURPOSE FOR ISSUE: CONSTRUCTION

SCALE: NONE



LIFE SAFETY PLAN

N

0 2 4

22 DESIGNATES NUMBER OF OCCUPANTS AT EXIT

2 DESIGNATES OCCUPANT LOAD BY MOST STRINGENT CODE APPLIED

170 DESIGNATES CAPACITY OF EXIT ACCESS .2" PER OCC (IBC)

OCCUPANCY:	B BUSINESS
CONSTRUCTION TYPE:	VB, UNPROTECTED, UNSPRINKLED
ALLOWABLE AREA TABLE 503 IBC	9,000 SF PER FLOOR
LARGEST FLOOR AREA	3,544 SF
NUMBER OF STORIES	2 PERMITED/ 1 ACTUAL
BUILDING HEIGHT: 40' PERMITTED	ACTUAL 19'-4" TO RIDGE
IECC CLIMATE ZONE	4

RATINGS FOR BUILDING ELEMENTS IN SPRINKLERED BUILDINGS

BUILDING ELEMENT	HOURS
CORRIDORS OCC GREATER THAN 30 OCC TABLE 1018.1	30 MIN

TABLE 601
FIRE-RESISTANCE RATING FOR BUILDING ELEMENTS

BUILDING ELEMENT	TYPE V B CONSTRUCTION HOURS
PRIMARY STRUCTURAL FRAME	0
INTERIOR BERTING WALL	0
EXTERIOR BEARING WALL	0
NONBEARING EXTERIOR WALLS	0
NONBEARING INTERIOR WALLS	0
FLOOR CONSTRUCTION	0
ROOF CONSTRUCTION	0

TABLE 602
FIRE-RESISTANCE RATING FOR EXTERIOR WALLS BASED ON SEPARATION DISTANCE

SEPARATION DISTANCE FOR TYPE V B CONSTRUCTION	B OCC
LESS THAN 5'	1 HOUR
= OR GREATER THAN 5' LESS THAN 10'	1 HOUR
= OR GREATER THAN 10' LESS THAN 30'	0 HOUR
= OR GREATER THAN 30'	0 HOUR

ALL EXTERIOR WALLS ARE GREATER THAN 10' FROM PROPERTY LINE

INTERIOR WALL AND CEILING FINISH REQUIREMENTS PER IBC TABLE 803.9 FOR SPRINKLERED BUILDINGS			
GROUP	EXIT ENCLOSURES & EXIT PASSAGEWAYS	CORRIDORS	ROOMS & ENCLOSED SPACES
BUSINESS	C	C	C

1014.3 COMMON PATH OF EGRESS TRAVEL.
THE COMMON PATH OF EGRESS TRAVEL SHALL NOT EXCEED THE COMMON PATH OF EGRESS TRAVEL DISTANCES IN TABLE 1014.3.

TABLE 1014.3 COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet) OCCUPANT LOAD	
	(= 30	) 30
B	100	75

TABLE 1015.1 SPACES WITH ONE EXIT

OCCUPANCY	MAX OCCUPANT LOAD
B	49

TABLE 1016.2 EXIT ACCESS TRAVEL DISTANCE

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)
B	200

TABLE 1021.2(2) STORIES WITH ONE EXIT

STORY	OCCUPANCY	MAX OCC / STORY	MAX EXIT ACCESS TRAVEL DISTANCE
1ST OR BASEMENT	B	49	75

EACH STORY ABOVE THE SECOND FLOOR SHALL HAVE A MINIMUM OF ONE INTERIOR OR EXTERIOR EXIT STAIRWAY

TABLE 1018.2
MINIMUM CORRIDOR WIDTH

OCCUPANCY	WIDTH
ANY FACILITIES NOT LISTED BELOW	44 INCHES
ACCESS TO MPLE EQUIP	24 INCHES
OCC LESS THAN 50	36 INCHES

CONSTRUCTION SHALL COMPLY WITH:

- 2012 International Building Code
- 2012 International Plumbing Code
- 2012 International Mechanical Code
- 2012 International Fire Code
- 2012 International Fuel Gas Code
- 2009 International Energy Conservation Code
- 2009 ICC A 117.1 Accessible and Useable Buildings and Facilities
- 2012 NFPA Life Safety Code 101
- 2008 National Electric Code

AMERICANS WITH DISABILITIES ACT (ADA)
ALL IBC W/ LOCAL AMENDMENTS

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COMMERCE
No. 2.0.9.8.4
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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER

REVIEWER

PROJECT

DATE 1/14/20

SHEET A-0

TOILET FIXTURE & ACCESSORIES LEGEND
A 36" GRAB BAR
B 42" GRAB BAR
C COAT HOOK
D ACCESSIBLE DRINKING FOUNTAIN
J SERVICE SINK
L ACCESSIBLE LAV.
M MIRROR
P PAPER TOWEL DISPENSER/TRASH RECPT.
R SHOWER ROD
S SOAP DISPENSER
T TOILET PAPER HOLDER
U ACCESSIBLE URINAL
V 18" VERTICAL GRAB BAR
W ACCESSIBLE WATER CLOSET

DOOR SCHEDULE

DOOR NUMBER	TYPE	WIDTH	HEIGHT	DOOR MATERIAL	FRAME MATERIAL	RATING	LOCATION
1	FULL GLASS	3' -0"	7	HM	HM		VEST ENT
2	1/2 GLASS	3' -0"	7	HM	HM		CONFRENCE
3	1/2 GLASS	3' -0"	7	HM	HM		KENNELS
4	SECTIONAL	8' -0"	7				KENNELS
5	1/2 GLASS	3' -0"	7	HM	HM		KENNELS
6	1/2 GLASS	3' -0"	7	HM	HM		PREP
7	FULL GLASS	3' -0"	7	HM	HM		VEST/FOYER
8	1/2 GLASS	3' -0"	7	HM	HM		CONFRENCE
9	1/2 GLASS	3' -0"	7	HM	HM		FELINE 1
10	1/2 GLASS	3' -0"	7	HM	HM		VIEWING
11	FLUSH W/VIEW	3' -0"	7	HM	HM		OFFICE 1
12	FLUSH W/VIEW	3' -0"	7	HM	HM		OFFICE 2
13	FLUSH	3' -0"	7	HM	HM		MEN
14	FLUSH	3' -0"	7	HM	HM		WOMEN
15	FLUSH	3' -0"	7	HM	HM		EXAM
16	1/2 GLASS	3' -0"	7	HM	HM		FELINE 2
17	1/2 GLASS	3' -0"	7	HM	HM		HOLDING
18	FLUSH	3' -0"	7	HM	HM		STORAGE
19	1/2 GLASS	3' -0"	7	HM	HM		KENNELS

HARDWARE SCHEDULE

SET OF HINGES	LOCKSET	PRIVACY LATCHSET	CLOSER	PUSH/PULL	SILENCERS	STOP	THRESHOLD	WEATHER SEAL
■	■		■		■	■	■	■
■	■		■		■	■	■	■
■	■		■		■	■	■	■
								■
■	■		■		■	■	■	■
■	■		■		■	■	■	■
■			■	■	■	■		
■	■				■	■		
■	■		■		■	■		
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■	■		■		■	■		
■	■				■	■		
■	■				■	■		
■	■		■		■	■		

ALL OPERABLE HARDWARE SHALL BE LEVER ACTION, PUSH/PULL OR PANIC DEVICE.

WINDOW SCHEDULE

MARK	TYPE	NOMINAL OPENING WIDTH	NOMINAL OPENING HEIGHT	HEAD HEIGHT	FRAME	GLAZING	REMARKS
A	DBL HUNG	3' -4"	5' -4"	7' -4"	AL	DBL	
B	DBL HUNG	3' -4"	3' -4"	7' -4"	AL	DBL	

FLOOR PLAN

1 0 2 4

N

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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

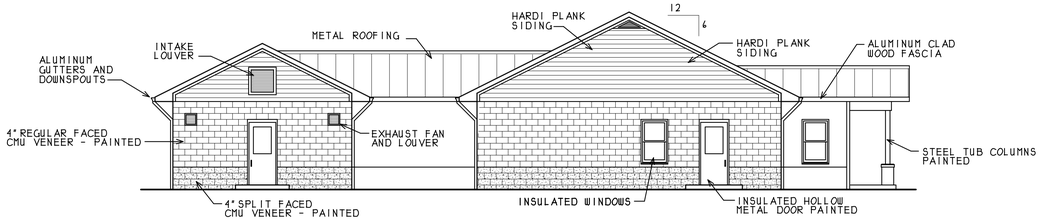
DESIGNER

REVIEWER

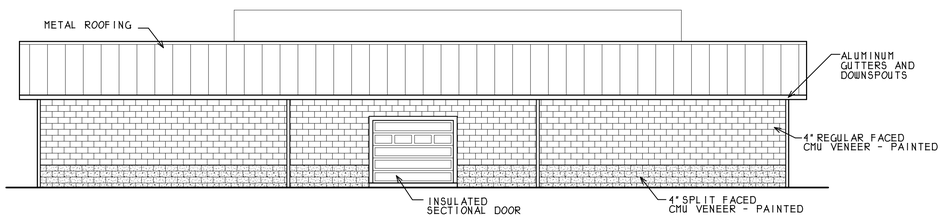
PROJECT

DATE 1/14/20

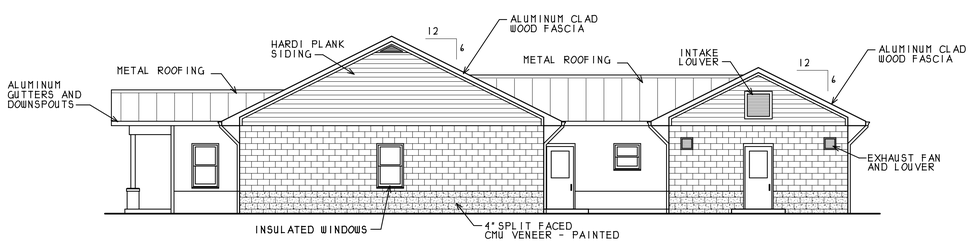
SHEET A-1



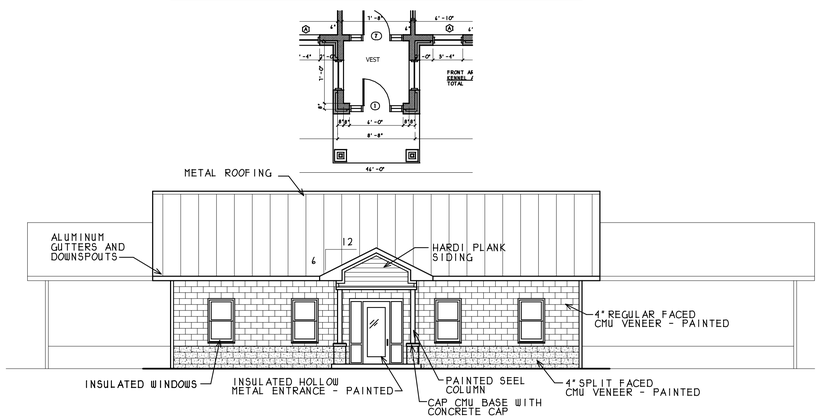
LEFT ELEVATION



REAR ELEVATION



RIGHT ELEVATION



FRONT ELEVATION

2 8
0 4

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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUNTY, TN

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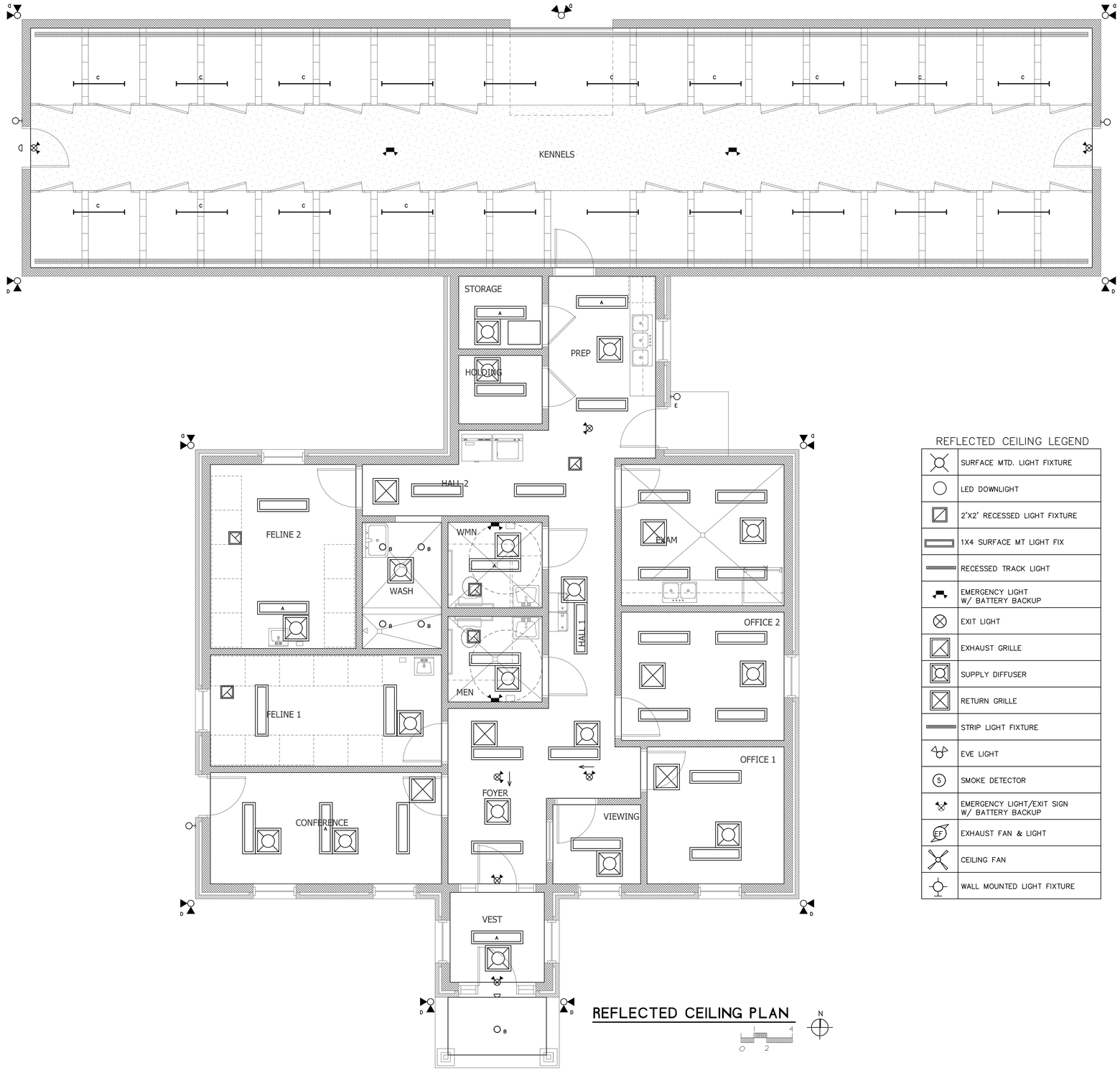
SHEET A-2



REFLECTED CEILING PLAN

REFLECTED CEILING LEGEND

	SURFACE MTD. LIGHT FIXTURE
	LED DOWNLIGHT
	2'X2' RECESSED LIGHT FIXTURE
	1X4 SURFACE MT LIGHT FIX
	RECESSED TRACK LIGHT
	EMERGENCY LIGHT W/ BATTERY BACKUP
	EXIT LIGHT
	EXHAUST GRILLE
	SUPPLY DIFFUSER
	RETURN GRILLE
	STRIP LIGHT FIXTURE
	EVE LIGHT
S	SMOKE DETECTOR
	EMERGENCY LIGHT/EXIT SIGN W/ BATTERY BACKUP
EF	EXHAUST FAN & LIGHT
	CEILING FAN
	WALL MOUNTED LIGHT FIXTURE

JOHN F. WERNE III
REGISTERED ARCHITECT
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1/14/20

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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

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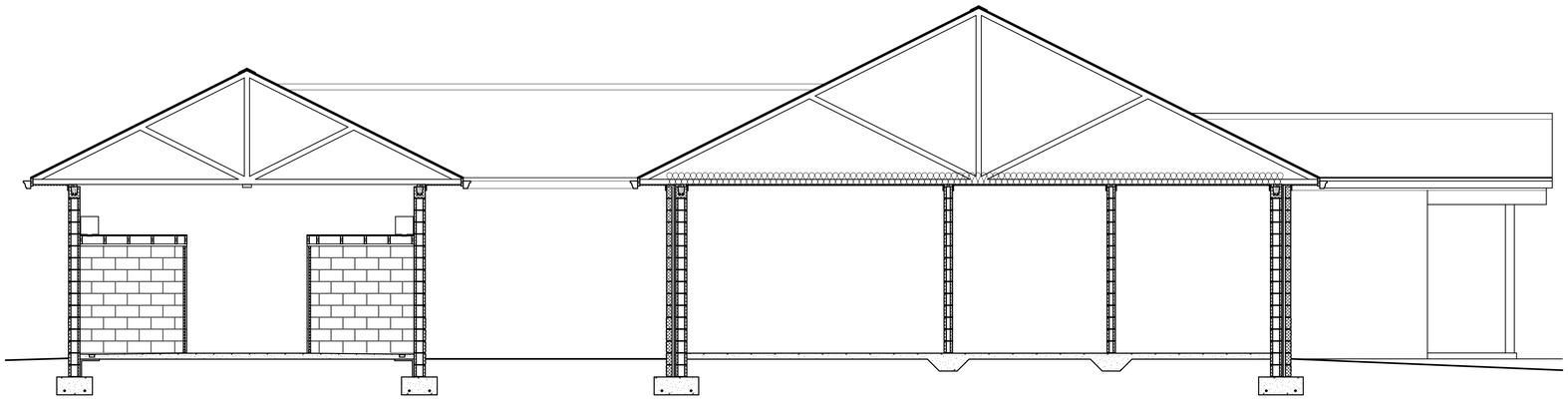
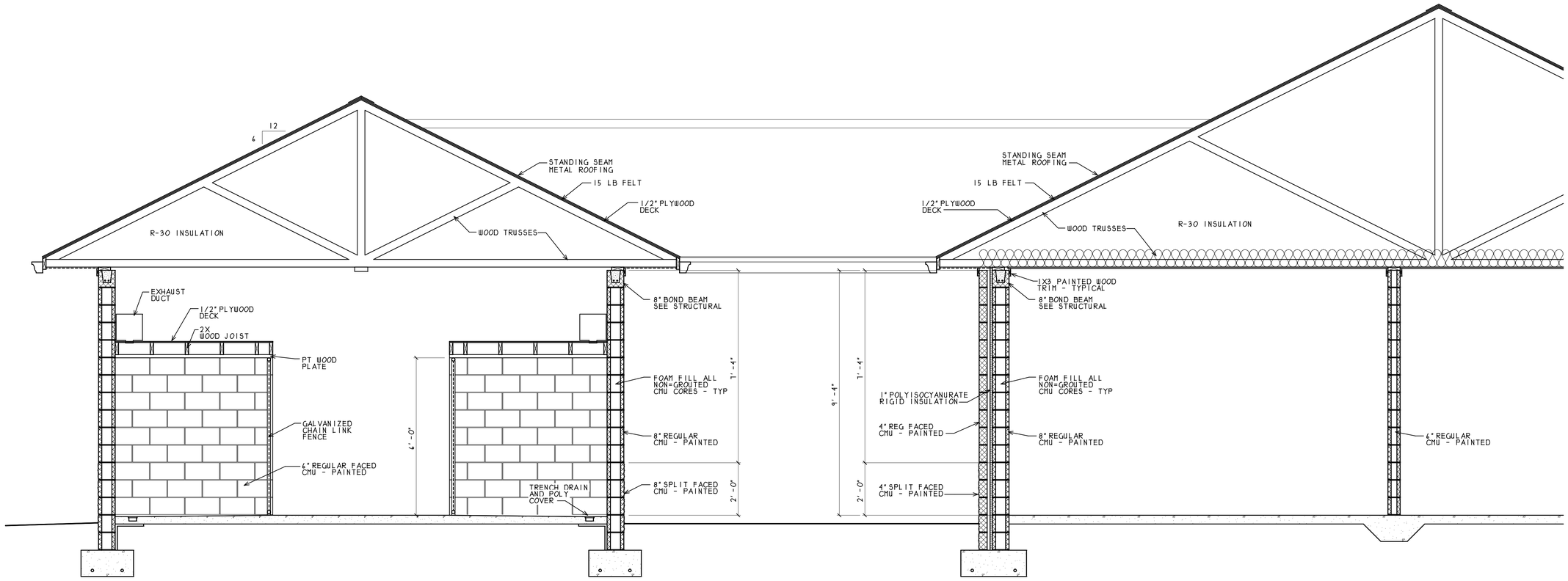
SHEET A-3



OVERALL SECTION



SECTION

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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

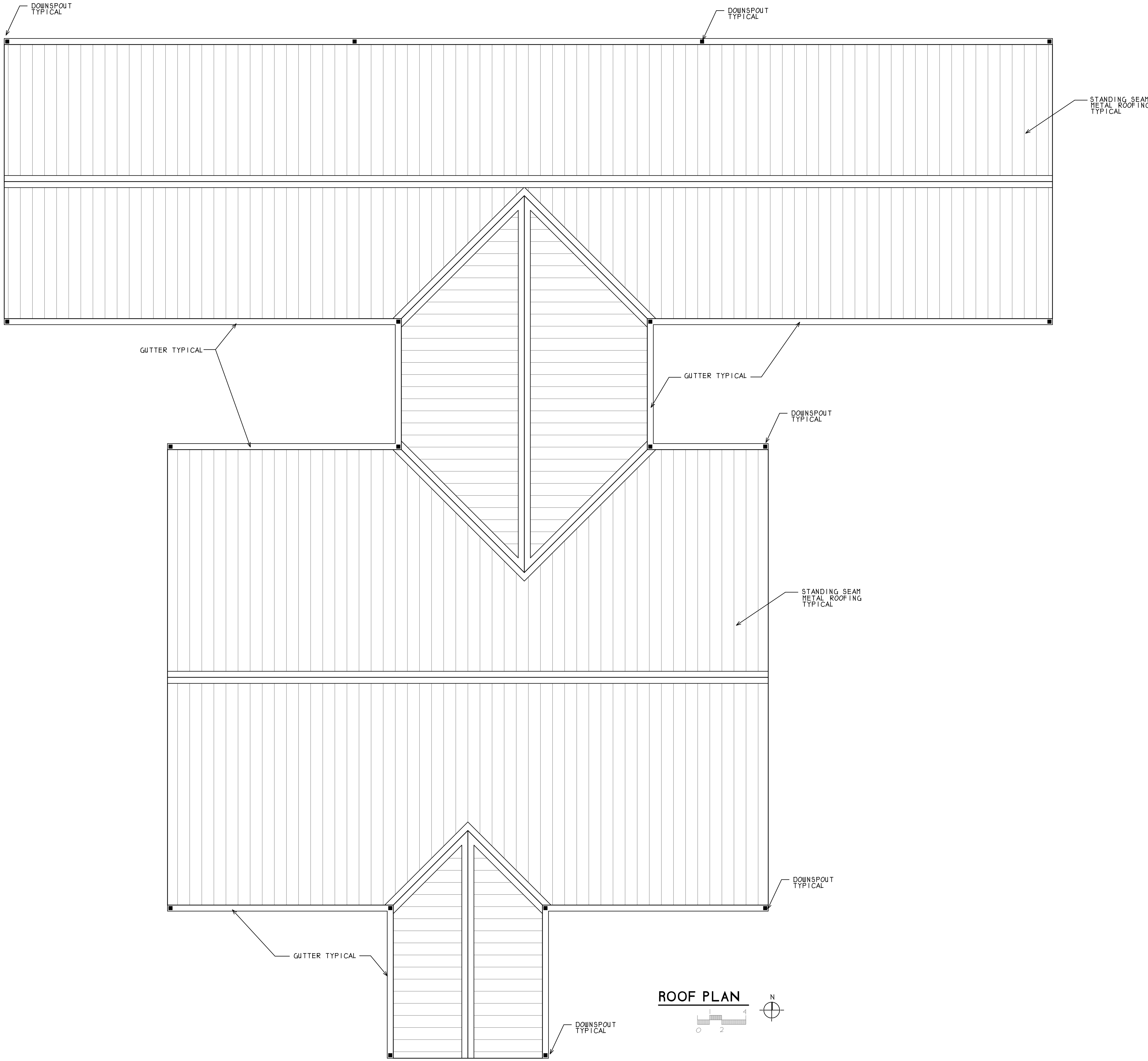
DESIGNER

REVIEWER

PROJECT

DATE 1/14/20

SHEET A-4



ROOF PLAN

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ROBERTSON COUNTY
ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUNTY, TN

DESIGNER

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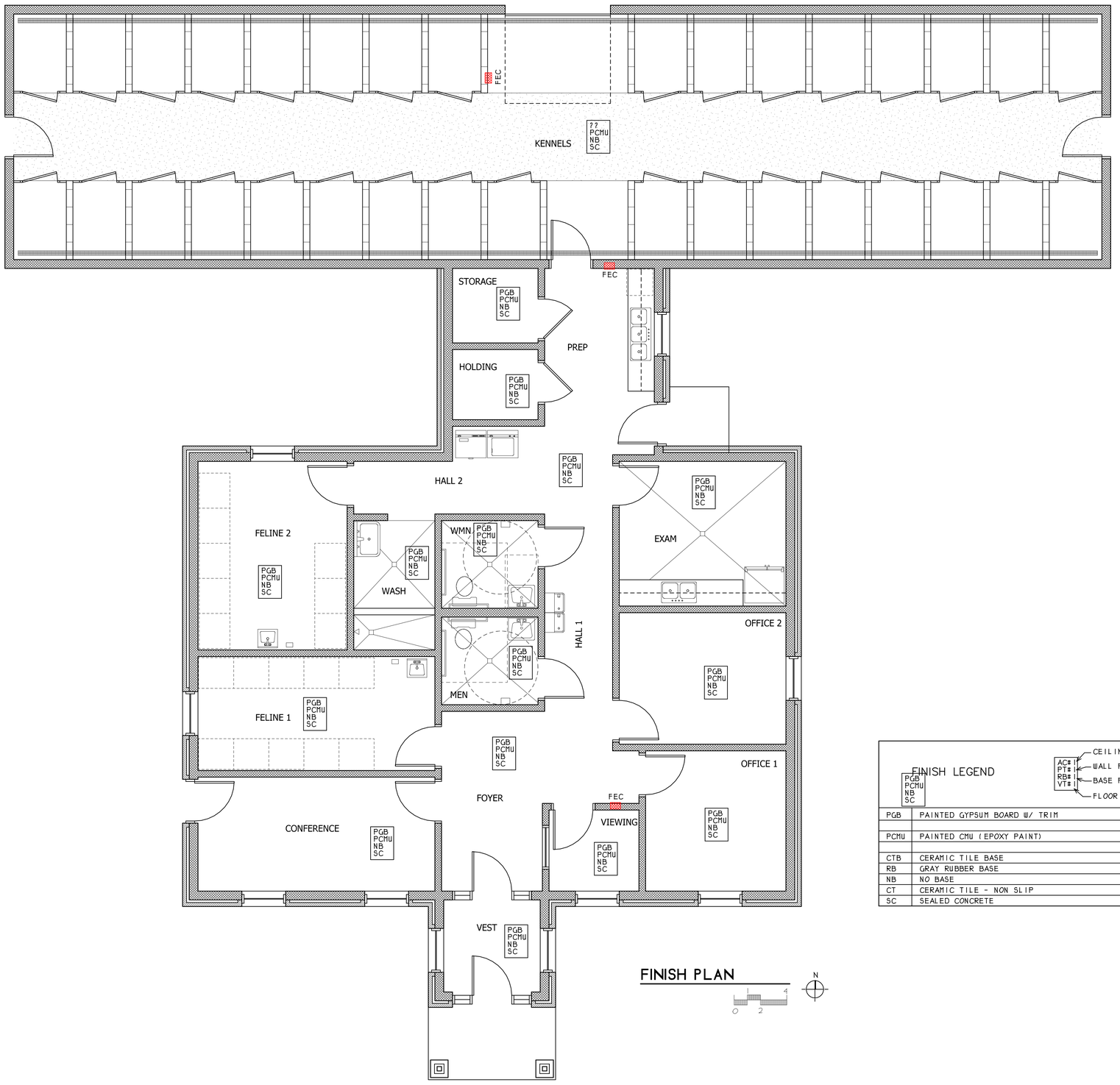
PROJECT

DATE 1/14/20

SHEET A-5



FINISH PLAN

N

0 2 4

FINISH LEGEND

PGB PCMU NB SC

AC# PT# RB# VT#

- CEILING FINISH
- WALL FINISH
- BASE FINISH
- FLOOR FINISH

PGB	PAINTED GYPSUM BOARD W/ TRIM
PCMU	PAINTED CMU (EPOXY PAINT)
CTB	CERAMIC TILE BASE
RB	GRAY RUBBER BASE
NB	NO BASE
CT	CERAMIC TILE - NON SLIP
SC	SEALED CONCRETE

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REGISTERED ARCHITECT
COMMERCE
No. 2 0 9 9 4
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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER

REVIEWER

PROJECT

DATE 1/14/20

SHEET A-6

GENERAL NOTES

DESIGN CRITERIA

(1) CODE: INTERNATIONAL BUILDING CODE, 2012 EDITION WITH LOCAL AMENDMENTS

(2) DESIGN LOADS:

DEAD LOADS:
SELF WEIGHT OF STRUCTURE
GROUND SNOW LOAD ——— 10 PSF

LIVE LOADS:
ROOF LIVE LOAD ——— 20 PSF; 300 LB CONCENTRATED
PERMITTED TO BE REDUCED PER IBC SECTION 1607.12.2.1
PARTITION LOADING ——— 5 PSF MINIMUM

WIND DESIGN CRITERIA:
RISK CATEGORY ——— II
ULTIMATE DESIGN WIND SPEED ——— 115 MPH
EXPOSURE CATEGORY ——— C
ENCLOSURE CLASSIFICATION ——— ENCLOSED
SEE SHEET S7 FOR C&C WIND PRESSURES (SERVICE LEVEL)

SEISMIC DESIGN CRITERIA:
IMPORTANCE FACTOR ——— 1.0
SITE CLASS ——— C
SEISMIC DESIGN CATEGORY ——— C
S/S ——— 0.335
S/1 ——— 0.155
S/DS ——— 0.268
S/D1 ——— 0.170

SEISMIC FORCE RESISTING SYSTEM:
RESISTING SYSTEM: ——— INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
RESPONSE MODIFICATION FACTOR R: ——— 3.5
ANALYSIS PROCEDURE: ——— EQUIVALENT LATERAL FORCE
SEISMIC RESPONSE COEFFICIENT: ——— 0.077
BASE SHEAR: ——— 26K

GENERAL

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS PRIOR TO STARTING CONSTRUCTION AND NOTIFY THE ARCHITECT & ENGINEER OF ANY DISCREPANCIES OR INCONSISTENCIES

ALL DIMENSIONS TO TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS, SECTIONS, AND DETAILS

THE CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION AS WELL AS ALL JOBSITE SAFETY AND MEASURES NECESSARY TO PROTECT THE PROPOSED AND EXISTING STRUCTURES. SUCH MEASURES INCLUDE, BUT ARE NOT LIMITED TO BRACING, SHORING FOR EXCAVATIONS, SHORING FOR CONSTRUCTION EQUIPMENT, FORMWORK, SCAFFOLDING, AND PROTECTION OF UTILITIES.

FOUNDATION NOTES

INDIVIDUAL FOOTINGS ARE DESIGNED TO BEAR ON UNIFORM SOIL CAPABLE OF SUPPORTING 3,000 PSF. STRIP FOOTINGS ARE DESIGNED TO BEAR ON UNIFORM SOIL CAPABLE OF SUPPORTING 3,000 PSF. IF POOR SOILS ARE ENCOUNTERED, THEY SHALL BE REMOVED AND FILLED IN WITH COMPACTED STRUCTURAL FILL.

THE SOIL BEARING CAPACITY AND CONSISTENCY SHALL BE VERIFIED FOR THE BUILDING LIMITS BY A PROFESSIONAL ENGINEER WHEN FOUNDATION EXCAVATIONS HAVE BEEN CARRIED DOWN TO THE PROPOSED ELEVATIONS

BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE 1'-6" BELOW FINISHED GRADE.

WHERE FOOTING STEPS ARE NECESSARY, THEY SHALL BE NO STEEPER THAN 1 VERTICAL TO 2 HORIZONTAL UNLESS SHOWN OTHERWISE ON PLANS

IF IT IS NECESSARY TO LEAVE FOOTINGS OPEN OVERNIGHT OR MAY BE EXPOSED TO RAINFALL, THEY SHALL BE COVERED AND THE GROUND SURFACE ALONG THE SIDES OF THE FOOTINGS SLOPED AWAY FROM THE FOOTING EXCAVATION. ALTERNATIVELY, THE EXCAVATION MAY BE UNDERCUT AND A 3 INCH THICK MUD MAT OF 2,000 PSI CONCRETE SHALL BE PLACED IN THE BOTTOM TO PROTECT THE BEARING SOIL.

REINFORCED CONCRETE

REINFORCED CONCRETE DESIGNED PER ACI 318.

CONCRETE WORK SHALL CONFORM TO REQUIREMENTS OF ACI 301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE.

THE COMPRESSIVE STRENGTH AT 28 DAYS OF ALL CAST IN PLACE CONCRETE SHALL BE:

4,000 PSI - ELEVATED SLABS, SLAB ON GRADE, WALLS, AND FOOTING PEDESTALS

3,000 PSI - ISOLATED, PERIMETER, AND INTERIOR STRIP FOOTINGS

5,000 PSI - CONCRETE EXPOSED TO FREEZING-AND-THAWING CYCLES AND DEICING AGENTS

REINFORCING STEEL SHALL BE DEFORMED BARS ASTM A615 GRADE 60.

LAP SPLICES FOR REINFORCING BARS SHALL BE CLASS B IN ACCORDANCE WITH ACI 318-11, UNLESS NOTED OTHERWISE

PROVIDE MINIMUM (2) #4 X 6'-0" BARS AT 45 DEGREES AT ALL REENTRANT CORNERS IN SLAB ON GRADE

CLEAR CONCRETE COVER FOR REINFORCING STEEL (U.N.O.):

WALLS	2" FOR #6 BARS OR GREATER
	1-1/2" FOR #5 BARS OR SMALLER
FOOTINGS	2" FORMED EDGES
	3" CAST AGAINST GROUND
SLAB ON GRADE	LOCATED IN TOP 1/3 OF SLAB
MASONRY WALLS	LOCATE IN CENTER OF WALL

CONCRETE MIX DESIGNS SHALL BE ESTABLISHED BY THE SUPPLIER IN ACCORDANCE WITH ACI 318-11. MIX DESIGNS SHALL BE SUBMITTED WITH BACK-UP DATA PER ACI 318-11 TO THE ENGINEER FOR REVIEW PRIOR TO CONCRETE PLACEMENT.

ALL CONCRETE EXPOSED TO WEATHER SHALL CONTAIN 6 TO 8% ENTRAINED AIR.

ALL CONCRETE PLACED SHALL BE VIBRATED WITH MECHANICAL VIBRATORS

FINISHED CONCRETE SLAB SHALL HAVE A HARD TROWELED FINISH IN ACCORDANCE WITH ACI 117

LONGITUDINAL REINFORCING STEEL IN BOND BEAMS, WALLS, AND FOOTINGS SHALL BE CONTINUOUS AROUND CORNERS.

AN EVAPORATION CONTROL AGENT (CURING COMPOUND) SHALL BE APPLIED TO THE SURFACE OF THE NEWLY CAST SLABS AT THE RATE SPECIFIED BY THE MANUFACTURER. SAWCUT TYPE CONTROL JOINTS IN CONCRETE SLABS SHALL BE CUT AS SOON AS THE CONCRETE CAN BE SAWED WITHOUT CAUSING THE EDGES TO RAVEL AND IN NO CASE SHALL BE LATER THAN 12 HOURS AFTER THE SLAB IS PLACED.

CONCRETE SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318-11 SECTIONS 5.6

CONCRETE MASONRY

CONCRETE MASONRY SHALL CONFORM TO THE NATIONAL CONCRETE MASONRY ASSOCIATION SPECIFICATIONS AND HAVE A DENSITY OF 125 PCF AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (F'm) OF 1500 PSI

GROUT FOR FILLING CONCRETE MASONRY CELLS SHALL CONFORM TO STANDARD SPECIFICATIONS ASTM C476 AND SHALL HAVE A COMPRESSIVE STRENGTH (F'm) OF 3,000 PSI AT 28 DAYS. THE SLUMP SHALL BE BETWEEN 9 AND 11 INCHES. WHERE THE MINIMUM DIMENSION OF ANY CONTINUOUS VERTICAL CELL IS 3 INCHES OR LESS, USE FINE GROUT OTHERWISE USE A COARSE (PEA GRAVEL) GROUT.

MORTAR FOR CONCRETE MASONRY SHALL BE TYPE 'S' AND SHALL CONFORM TO ASTM C-270

MASONRY CONSTRUCTION SHALL BE BUILT IN LIFTS NOT TO EXCEED 4 FEET PRIOR TO GROUTING CORES. KEY NEXT GROUT LIFT INTO PRIOR LIFT BY STOPPING FIRST LIFT 2" BELOW TOP OF BLOCK. DO NOT FORM GROUT KEYS IN BEAMS OR LINTELS

ALL REINFORCING BARS IN FILLED CELLS SHALL BE DOWELED INTO FOOTINGS WITH STANDARD 90 DEGREE HOOKS AND DOWELED 7 INCHES INTO BOND BEAMS AT TOPS OF WALLS

REBAR POSITIONERS SHALL BE USED TO ENSURE PROPER BAR ALIGNMENT IN CELLS

MASONRY WALL CONTROL JOINTS SHALL BE LOCATED AS SHOWN ON THE ARCHITECTURAL DRAWINGS.

REINFORCEMENT IN WALLS SHALL BE PLACED IN THE CENTER OF THE WALL UNLESS NOTED OTHERWISE. ALL CELLS WITH VERTICAL REINFORCING BARS SHALL BE GROUTED SOLID.

ALL GROUT SHALL BE VIBRATED

EXTERIOR MASONRY WALLS (8")

VERTICAL REINFORCING BARS SHALL BE LOCATED WITHIN 16" OF EACH SIDE OF OPENINGS, 8" OF END OF WALLS, AND SPACED NO GREATER THAN 32" ON CENTER. ALL VERTICAL BARS SHALL BE #5 BARS

HORIZONTAL REINFORCING BARS SHALL BE PROVIDED AT THE TOP OF WALLS AND BOTTOM AND TOP OF WALL OPENINGS AND SHALL EXTEND 24" OR 40 BAR DIAMETERS PAST THE OPENING. HORIZONTAL REINFORCEMENT SHALL CONSIST OF 8" CMU BOND BEAMS W/ (2) #5's TYPICAL. HORIZONTAL REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS

INTERIOR MASONRY WALLS (6")

VERTICAL REINFORCING BARS SHALL BE LOCATED WITHIN 16" OF EACH SIDE OF OPENINGS, 8" OF END OF WALLS, AND SPACED NO GREATER THAN 72" ON CENTER. ALL VERTICAL BARS SHALL BE #5 BARS

HORIZONTAL REINFORCING SHALL CONSIST OF W1.7 LADDER MESH REINFORCEMENT SPACED AT 16" O.C. WITH A 6" CMU BOND BEAMS W/ (1) #5's TYPICAL

INTERIOR MASONRY WALLS ARE DESIGNED TO BE LOAD BEARING. PROVIDE BLOCKING BETWEEN TRUSSES AT 32" O.C. TO LATERALLY SUPPORT TOPS OF WALLS THAT ARE PARALLEL TO TRUSS ORIENTATION.

DOG KENNEL MASONRY WALLS (6") ARE TO BE OF PLAIN MASONRY CONSTRUCTION AND DO NOT REQUIRE REINFORCEMENT

STRUCTURAL STEEL

ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION ALLOWABLE STRESS DESIGN"

MATERIALS ARE TO BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

W-SHAPES - ASTM A-992 GRADE 50

CHANNEL, PLATE, AND ANGLES - ASTM A-36

ROUND HSS - ASTM A500 GRADE B (Fy=42KSI)

RECT. HSS - ASTM A500 GRADE B (Fy=46KSI)

STRUCTURAL PIPE COLUMNS - ASTM A53 GRADE B

ANCHOR RODS - ASTM F1554 GRADE 36

ANCHOR EPOXY - HILTI HIT-HY 200-R OR APPROVED EQUAL

WELDS - E70 SERIES ELECTRODES

NON-SHRINK GROUT - 5,000 PSI MINIMUM

WOOD NOTES

MATERIAL

1. ALL MATERIAL SHALL BE CLEARLY MARKED WITH GRADE STAMPS
2. ALL LUMBER SHALL BE KILN-DRIED
3. PRESSURE TREATED LUMBER SHALL BE KILN DRIED AFTER TREATMENT
4. SHEATHING SHALL BE O.S.B. OR PLYWOOD CONFORMING TO DOC PS 1 OR PS 2
5. SHEATHING MATERIAL SHALL BE APA RATED SHEATHING GRADE
6. JOISTS, RAFTERS, HEADERS, AND SILLS SHALL BE NO.1 GRADE SOUTHERN PINE (SPIB) OR NO. 1/NO.2 SPRUCE PINE FIR (WWPA)

ROOF SHEATHING

1. EXTERIOR, PS 1 OR PS 2
2. SPAN RATING: 32/16
3. THICKNESS: 1/2"
4. FASTENING: USE 10d NAILS (1 ½" MINIMUM PENETRATION INTO FRAMING AT 6" O.C. AT SUPPORTING EDGES AND 6" O.C. FOR INTERMEDIATE FRAMING MEMBERS.

NAILS SHALL BE COMMON WIRE NAILS UNLESS NOTED OTHERWISE AND MATERIAL SHALL BE PER A.I.T.C., NDS, AND APPLICABLE BUILDING CODE REQUIREMENTS

NAILS SHALL PENETRATE A MINIMUM OF 10 TIMES THE NAIL DIAMETER INTO SUPPORTING MEMBER, UNLESS NOTED OTHER WISE

NAILS SHALL BE SPACED AND LOCATED AWAY FROM EDGES AND ENDS IN A MANNER TO PREVENT SPLITTING OF WOOD

BOLT HOLES IN WOOD SHALL BE OVERSIZED BY ⅛" MAX. LARGER THAN THE BOLT DIAMETER AND STANDARD WASHERS SHALL BE SUPPLIED AT BOTH THE BOLT HEAD AND NUT

PROVIDE ⅛" GAP ON ALL EDGES OF ROOF SHEATHING. INSTALL ONE SIMPSON "PSCL" PANEL SHEATHING CLIP PER SPAN

SHEATHING SHALL BE INSTALLED IN AT LEAST A 2 SPAN CONDITION WITH THE LONG DIMENSION ACROSS SUPPORTS

ANY WOOD IN CONTACT WITH CONCRETE, MASONRY, OR STEEL SHALL BE PRESSURE TREATED

ALL WOOD SILLS (TOP PLATES) ARE TO HAVE ANCHOR BOLTS PLACED NOT MORE THAN 12" FROM ENDS OF SILL PIECES AND SHALL NOT BE SPACED GREATER THAN 3'-0" ON CENTER. ANCHORS SHALL BE 1/2" DIAMETER WITH 7" EMBEDMENT INTO BOND BEAM. USE 3X3X1/4" PLATE WASHERS WITH ANCHORS

SEE ARCHITECTURAL PLAN SHEETS FOR DIMENSIONS AND WALL SECTION PREFERENCES

DO NOT CUT OR NOTCH WOOD MEMBERS WITHOUT APPROVAL FROM ENGINEER

ALL FASTENERS AND ACCESSORIES IN CONTACT WITH PRESERVATIVE TREATED WOOD OR FIRE TREATED WOOD SHALL HAVE CORROSION PROTECTION

USE SIMPSON HGA10 CONNECTORS AT 24" ON CENTER FOR GABLE END TRUSSES ON MASONRY SILL PLATE. USE BURMON BHBSP CONNECTORS WITH 3 FASTENERS PER SIDE FOR ALL OTHER ROOF TRUSS BEARING LOCATIONS UNLESS NOTED OTHERWISE

ROOF TRUSS NOTES

TRUSS SHOP DRAWINGS SHALL BE PREPARED AND CERTIFIED BY A QUALIFIED PROFESSIONAL ENGINEER IN LICENSED IN THE STATE OF TENNESSEE AND SHALL BE SUBMITTED TO EOR PRIOR TO MANUFACTURE. TRUSS MANUFACTURER MAY SUBMIT ALTERNATE ROOF DESIGN/LAYOUT TO EOR FOR APPROVAL

TRUSS MANUFACTURER SHALL INDICATE ALL TEMPORARY AND PERMANENT BRACING AND BRIDGING REQUIREMENTS ON THE TRUSS ERECTION DRAWINGS

ROOF TRUSSES SHALL BE DESIGNED FOR L/240 TOTAL AND L/360 LIVE

TRUSS MANUFACTURER SHALL SUBMIT PREFERRED METHOD OF BRACING TOPS OF INTERIOR WALLS FROM LATERAL MOVEMENT. DESIGN OUT OF PLANE LOADING AT TOP OF WALL FOR INTERIOR 6" CMU WALLS IS 25PLF (SERVICE LOAD)

6" INTERIOR WALLS ARE DESIGNED AS LOAD BEARING. NOTIFY EOR IF ANY TRUSS REACTIONS ON INTERIOR WALLS ARE TO EXCEED 3KIPS

INSTALLATION AND BRACING OF WOOD TRUSSES SHALL COMPLY WITH "HANDLING, INSTALLING, AND BRACING METAL PLATE CONNECTED WOOD TRUSSES" (BCSI 1-08) AS PUBLISHED BY THE TPI AND WTCA

STATEMENT OF SPECIAL INSPECTIONS

SOILS AND FOUNDATIONS

SPECIAL INSPECTOR SHALL PERFORM PERIODIC INSPECTIONS TO VERIFY THE FOLLOWING:

1. MATERIAL BELOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE DESIGN BEARING CAPACITY.
2. EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.
3. OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.

CONCRETE CONSTRUCTION

SPECIAL INSPECTOR SHALL PERFORM PERIODIC INSPECTIONS TO VERIFY THE FOLLOWING:

1. VERIFY LOCATION, QUANTITY, GRADE, AND PLACEMENT OF REINFORCING STEEL
2. INSPECTION OF ANCHORS POST-INSTALLED IN CONCRETE.
3. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF CONCRETE MEMBER BEING FORMED.
4. VERIFY USE OF REQUIRED DESIGN MIX.

SPECIAL INSPECTOR SHALL PERFORM CONTINUOUS INSPECTIONS TO VERIFY THE FOLLOWING:

1. FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AD AIR CONTENT TESTS, AND RECORD TEMPERATURE OF FRESH CONCRETE. (PER ACI 318-11 SECTION 5.6)

MASONRY CONSTRUCTION

SPECIAL INSPECTOR SHALL PERFORM INSPECTIONS TO VERIFY THE FOLLOWING:

PERIODICALLY VERIFY PROPORTIONS OF SITE PREPARED MORTAR, CONSTRUCTION OF MORTAR JOINTS, GROUT SPACE, GRADE TYPE, AND SIZE OF REINFORCEMENT AND ANCHORS, AND PLACEMENT OF MASONRY UNITS ARE IN COMPLIANCE

CONTINUOUSLY VERIFY PLACEMENT OF REINFORCEMENT AND CONNECTORS, THE GROUT SPACE PRIOR TO GROUTING, AND THE TYPE, SIZE, AND LOCATION OF ANCHORS INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS

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ROBERTSON COUNTY TENNESSEE — AGRICULTURE — INDUSTRY — 1796

GENERAL NOTES
OF
ANIMAL CONTROL BUILDING
FOR
ROBERTSON COUNTY ANIMAL CONTROL
2900 WEST COUNTY FARM RD.
SPRINGFIELD, TN 37172
ROBERTSON COUNTY

SEAN JUSTIN COFFELT — REGISTERED ENGINEER — AGRICULTURE — COMMISSION No. 117369 — STATE OF TENNESSEE

REVISIONS

NO.	DESCRIPTION	DATE	BY

DESIGNER DKH
REVIEWER SJC

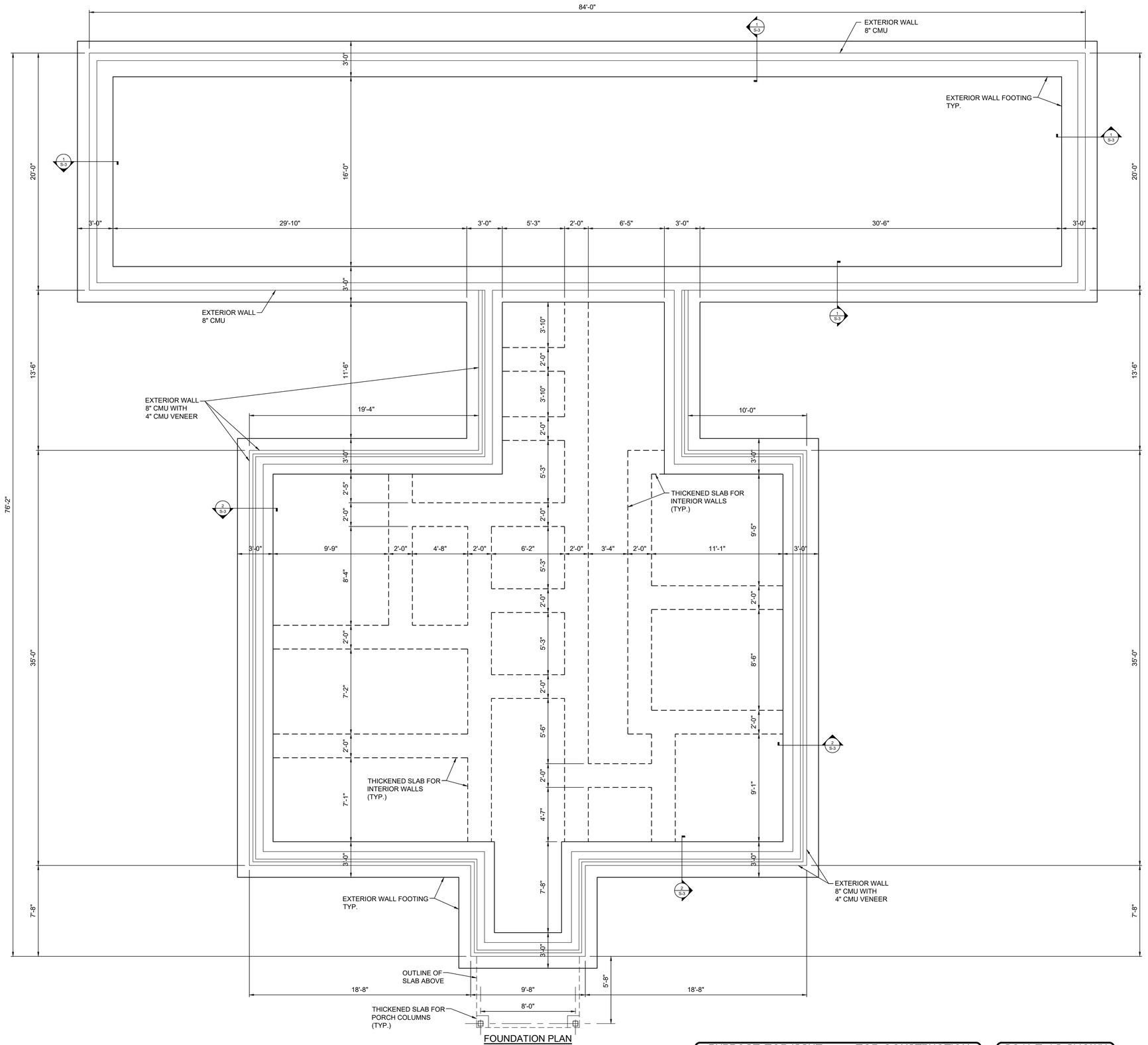
PROJECT 18-145

DATE 1-17-20

SHEET S-1

PURPOSE FOR ISSUE: FOR CONSTRUCTION

SCALE: AS SHOWN



FOUNDATION PLAN

PURPOSE FOR ISSUE: FOR CONSTRUCTION

SCALE: AS SHOWN

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FOUNDATION PLAN

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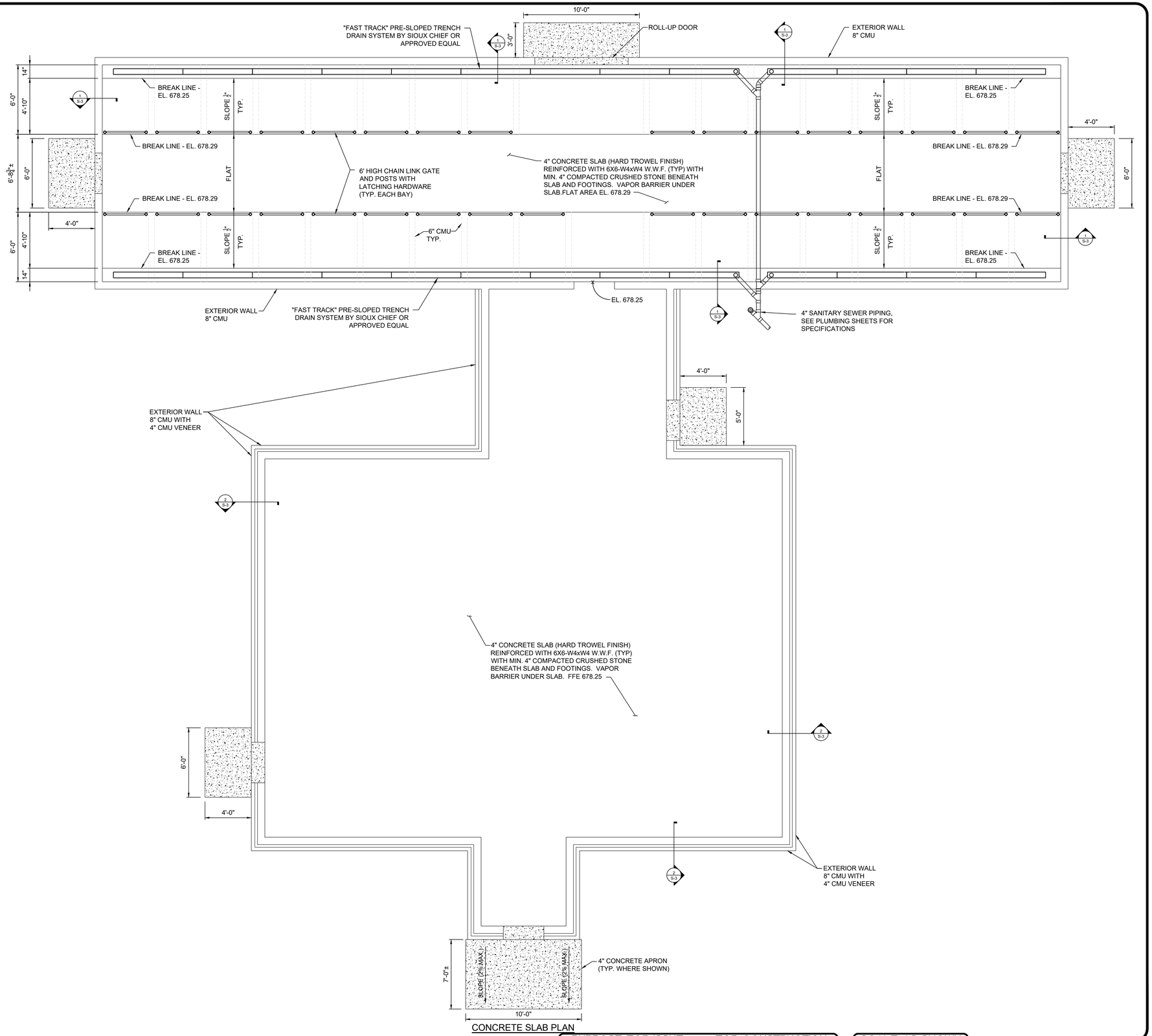
SHEET S-2



CONCRETE SLAB PLAN

PURPOSE FOR ISSUE: FOR CONSTRUCTION

SCALE: AS SHOWN

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CONCRETE SLAB PLAN

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STATE OF TENNESSEE

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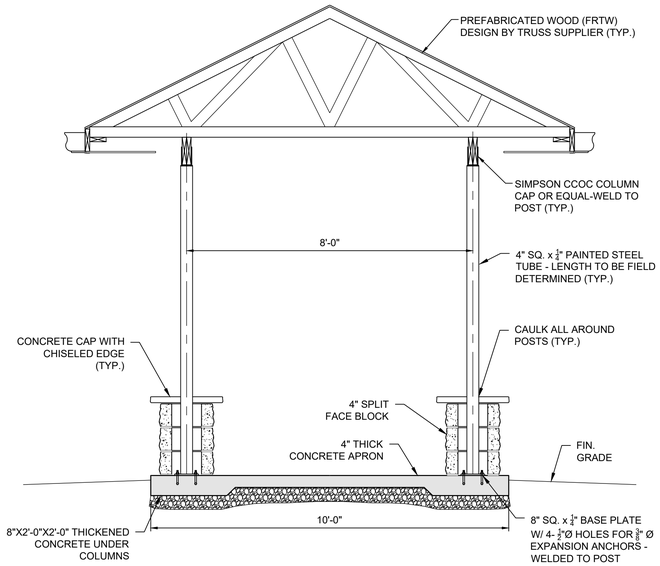
PROJECT 18-145

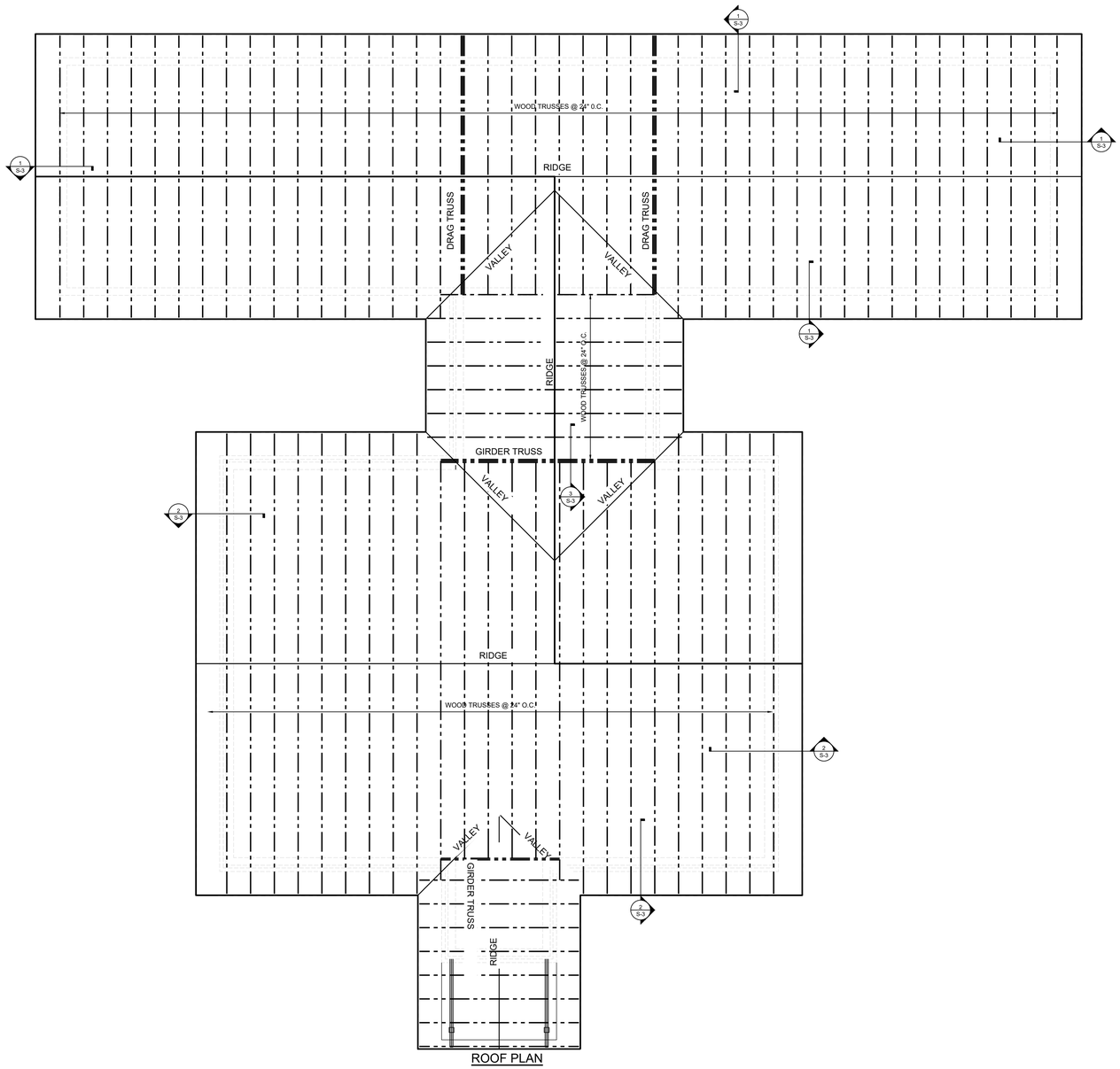
DATE 1-17-20

SHEET S-3

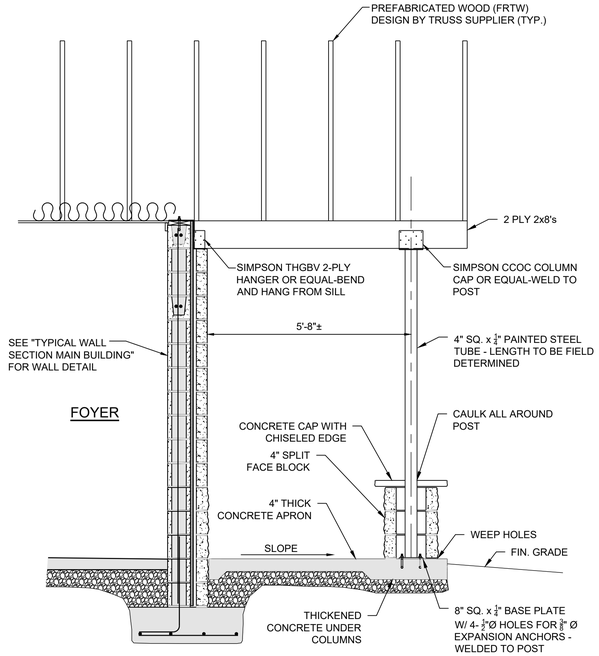


COVERED PORCH DETAIL

SEE "ARCHITECTURAL PLANS" FOR ADDITIONAL FINISHING DETAILS

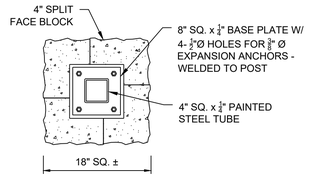


ROOF PLAN



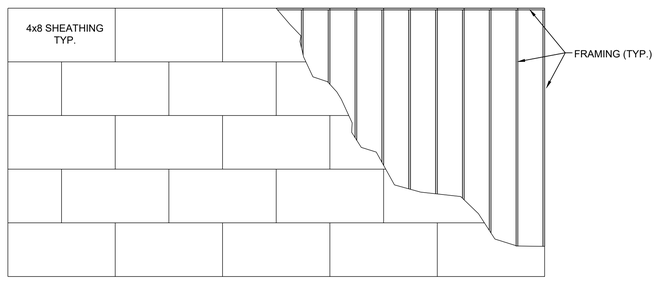
COVERED PORCH DETAIL

SEE "ARCHITECTURAL PLANS" FOR ADDITIONAL FINISHING DETAILS



BASE PLATE AND THE BOTTOM 18" OF POST SHALL BE COATED WITH MASTIC AFTER INSTALLATION

COLUMN BASE PLAN



TYPICAL ROOF SHEATHING PATTERN

PURPOSE FOR ISSUE: FOR CONSTRUCTION

SCALE: AS SHOWN

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ROOF PLAN

OF

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FOR

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SPRINGFIELD, TN 37172
ROBERTSON COUNTY

SEAN JUSTIN COFFEY
REGISTERED ENGINEER
AGRICULTURE
No. 117580
STATE OF TENNESSEE

REVISIONS

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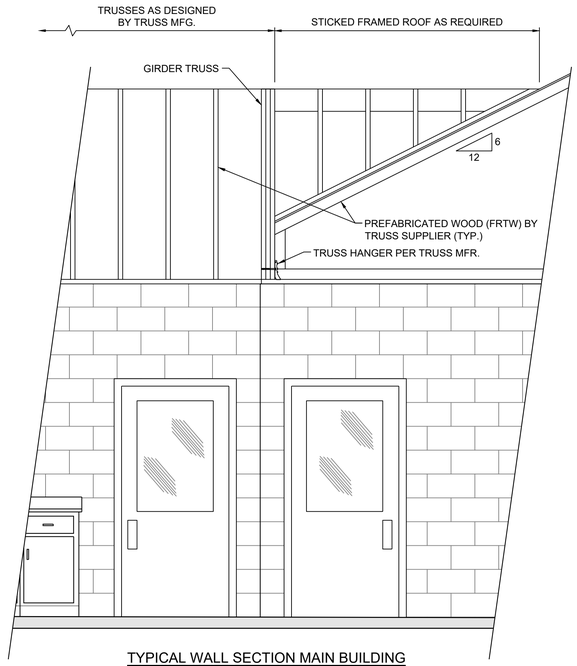
DESIGNER DKH
REVIEWER SJC

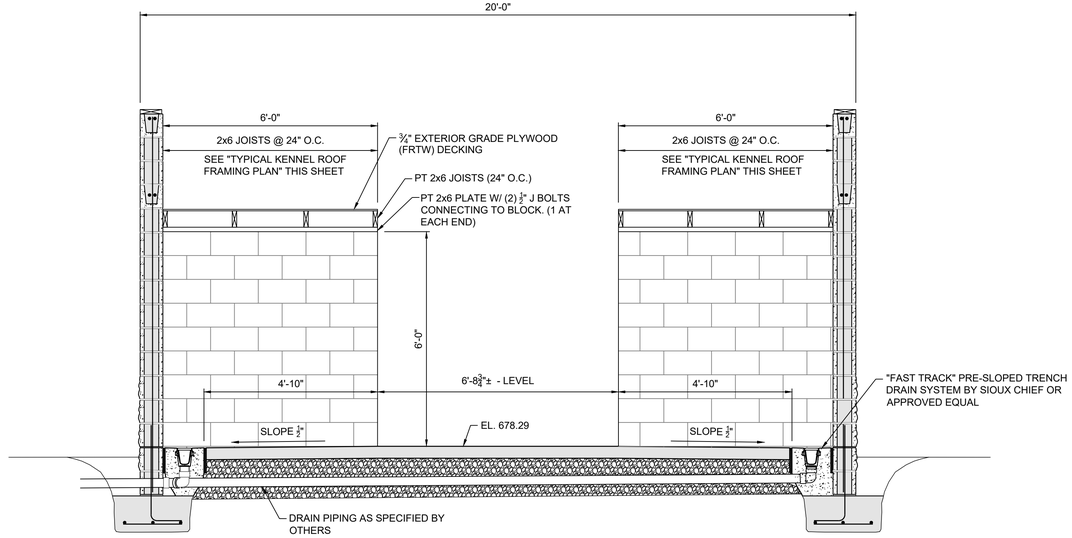
PROJECT 18-145

DATE 1-17-20

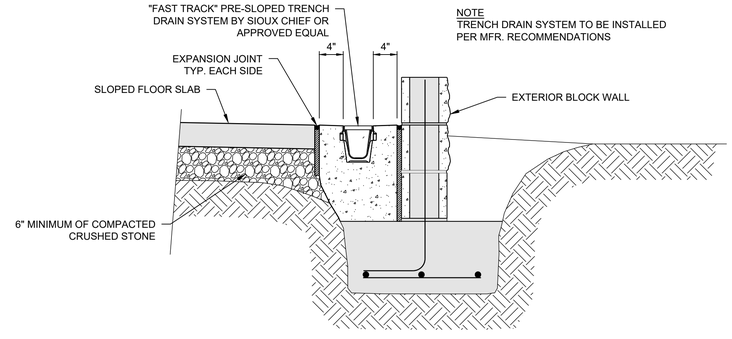
SHEET S-3



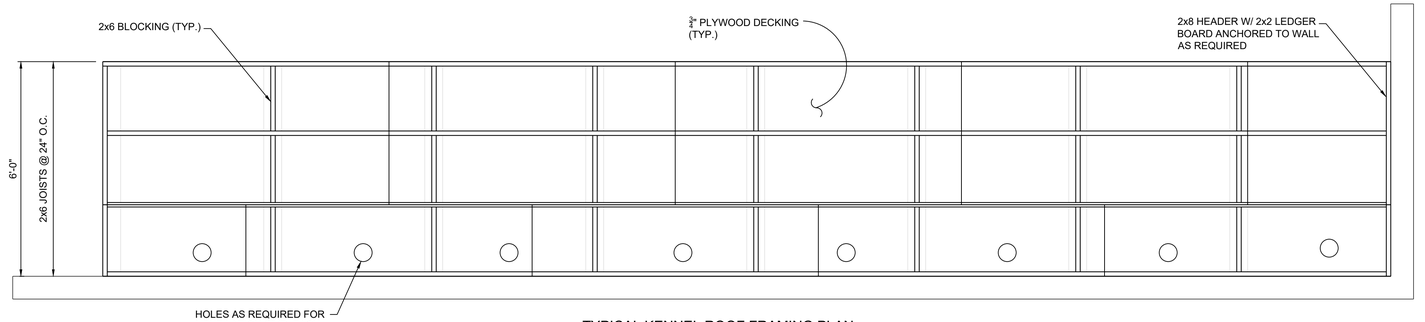
TYPICAL WALL SECTION MAIN BUILDING



TYPICAL WALL SECTION KENNEL BUILDING



TRENCH DRAIN DETAIL



TYPICAL KENNEL ROOF FRAMING PLAN

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ROBERTSON COUNTY TENNESSEE AGRICULTURE INDUSTRY 1796

OFFICE DETAILS

OF

ANIMAL CONTROL BUILDING

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SEAN JUSTIN COFFELT REGISTERED ENGINEER AGRICULTURE LICENSE No. 117369 STATE OF TENNESSEE

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PROJECT 18-145

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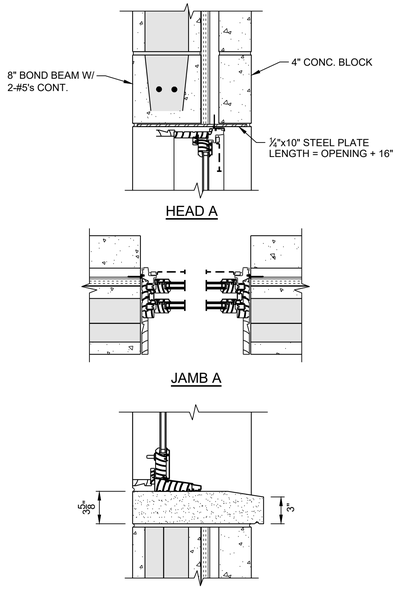
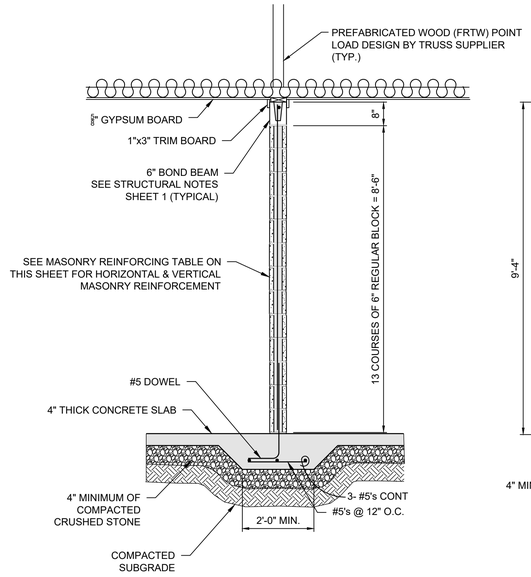
SHEET S-5

PURPOSE FOR ISSUE: FOR CONSTRUCTION

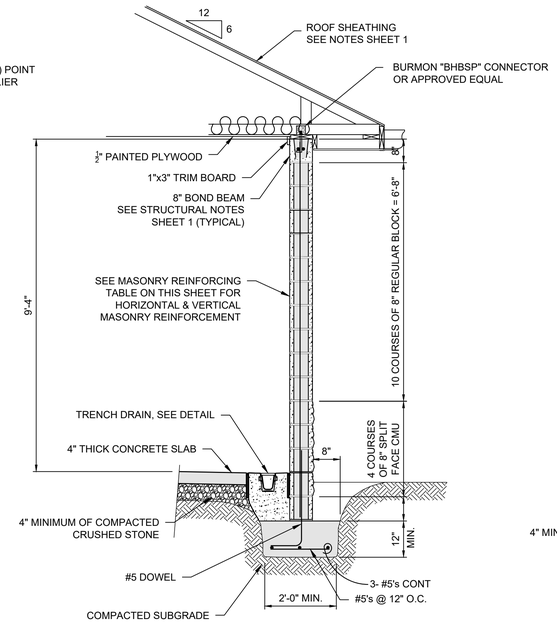
SCALE: AS SHOWN



TYPICAL WINDOW DETAIL
NO SCALE



TYPICAL WALL SECTION INTERIOR WALLS
SEE "ARCHITECTURAL PLANS" FOR ADDITIONAL FINISHING DETAILS



TYPICAL WALL SECTION KENNEL BUILDING
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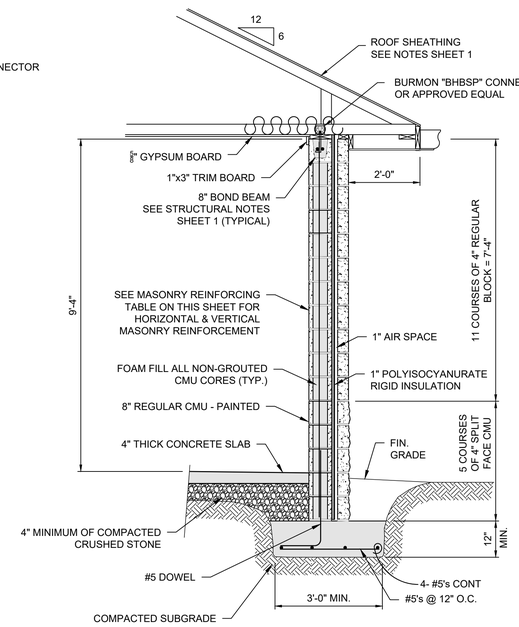
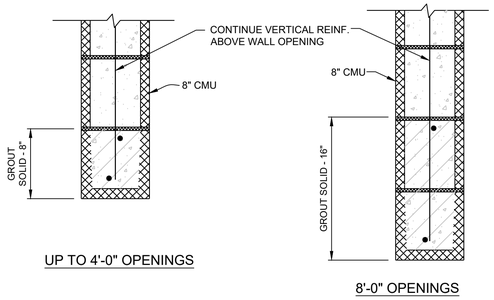


TYPICAL WALL SECTION MAIN BUILDING
SEE "ARCHITECTURAL PLANS" FOR ADDITIONAL FINISHING DETAILS

MASONRY REINFORCEMENT TABLE

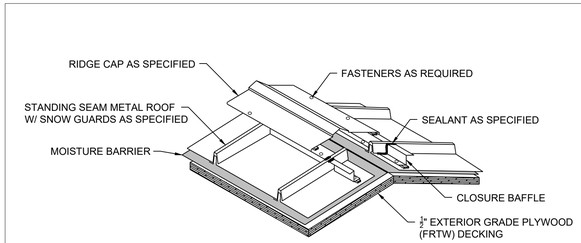
BLOCK SIZE	VERTICAL REINFORCEMENT	HORIZONTAL REINFORCEMENT
8" BLOCK	WITHIN 16" OF EACH SIDE OF OPENINGS, 8" OF END OF WALLS & CORNERS & @ 32" O.C. MAX	BOND BEAMS W/ (2) #5's AT TOP OF WALLS (CONTINUOUS AROUND CORNERS). SINGLE #5 AT BOTTOM OF OPENINGS, SEE LINTEL SCHEDULE FOR TOP OF WALL OPENINGS. BARS SHALL EXTEND 24" OR 40 BAR DIAMETERS PAST THE OPENING.
6" BLOCK	WITHIN 16" OF EACH SIDE OF OPENINGS, 8" OF END OF WALLS & CORNERS & @ 72" O.C. MAX	W1.7 LADDER MESH @ 16" O.C. & BOND BEAM AT TOP OF WALL WITH (1) #5 BAR CONTINUOUS AROUND CORNERS. SEE LINTEL SCHEDULE FOR TOP OF WALL OPENINGS.

* BARS SHALL HAVE 180° HOOKED ENDS PAST OPENINGS

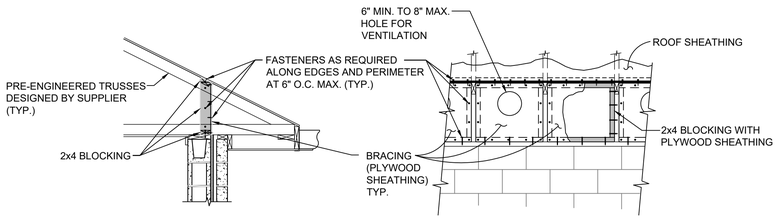


UP TO 4'-0" OPENINGS		
WALL SIZE	LINTEL TYPE	REMARKS
6" BLOCK	6"x8" BOND BEAM W/ (1) #5 T&B	
8" BLOCK	8"x8" BOND BEAM W/ (1) #5 T&B	
8'-0" OPENINGS		
WALL SIZE	LINTEL TYPE	REMARKS
8" BLOCK	8"x16" BOND BEAM W/ (1) #5 T&B	

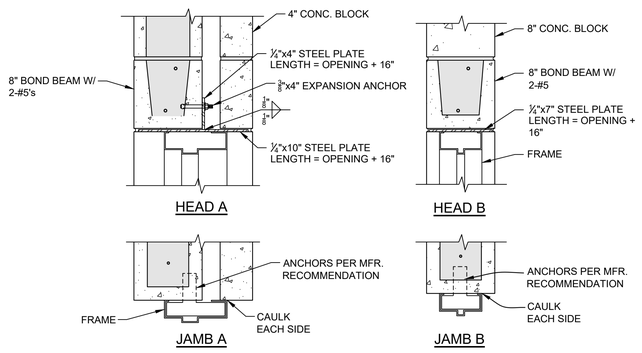
STANDARD LINTEL SCHEDULE - 6 FT. & 8 FT.
SCALE: NTS



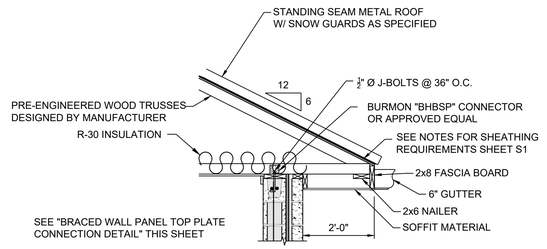
ROOF COVERING DETAIL



BRACED WALL PANEL TOP PLATE CONNECTION DETAIL



DOOR DETAILS
NO SCALE



TYPICAL ROOF DETAIL - BOTH BUILDINGS

NOTE: TRIM , INSULATION, AND OTHER NON STRUCTURAL ITEMS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY. REFER TO ARCHITECTURAL DRAWINGS CONCERNING ANY DISCREPANCIES.

PURPOSE FOR ISSUE: FOR CONSTRUCTION

SCALE: AS SHOWN

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OFFICE DETAILS
OF
ANIMAL CONTROL BUILDING
FOR
ROBERTSON COUNTY ANIMAL CONTROL
2900 WEST COUNTY FARM RD.
SPRINGFIELD, TN 37172
ROBERTSON COUNTY

REVISIONS

NO.	DATE	BY	DESCRIPTION

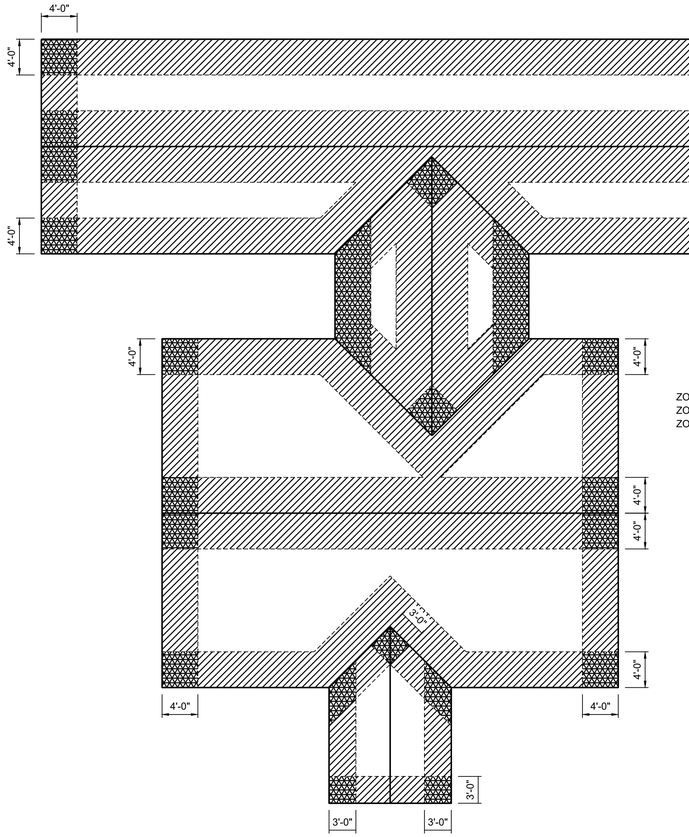
SEAN JUSTIN COFFELT
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 117349
STATE OF TENNESSEE

DESIGNER DKH
REVIEWER SJC

PROJECT 18-145

DATE 1-17-20

SHEET S-6



ROOF PRESSURE ZONES (C&C)

C&C WIND PRESSURES (SERVICE LEVEL 0.6W)
(EFFECTIVE WIND AREA = 10 SF, MAY BE REDUCED IF APPLICABLE)

DIRECTION	UP	DOWN	HORIZONTAL
ZONE 1 =	-17.3 PSF	10 PSF	
ZONE 2 =	-29.3 PSF	10 PSF	
ZONE 3 =	-43.7 PSF	10 PSF	
ZONE 2 OH=	-33.7 PSF	11.5 PSF	
ZONE 3 OH=	-50.2 PSF	11.5 PSF	
ZONE 4=			21.6 PSF
ZONE 5=			33.4 PSF

*OH DENOTES THE PORTION OF ROOF OVERHANGING EXTERIOR WALLS
ZONES 4 & 5 REFER TO WALL PRESSURES BELOW ZONES 2 & 3 RESPECTIVELY. THESE PRESSURES ARE ALSO APPLIED TO THE UNDERSIDE OF ROOF OVERHANG.

PURPOSE FOR ISSUE: FOR CONSTRUCTION

SCALE: AS SHOWN

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ROOF PRESSURE DIAGRAM

OF

ANIMAL CONTROL BUILDING

FOR

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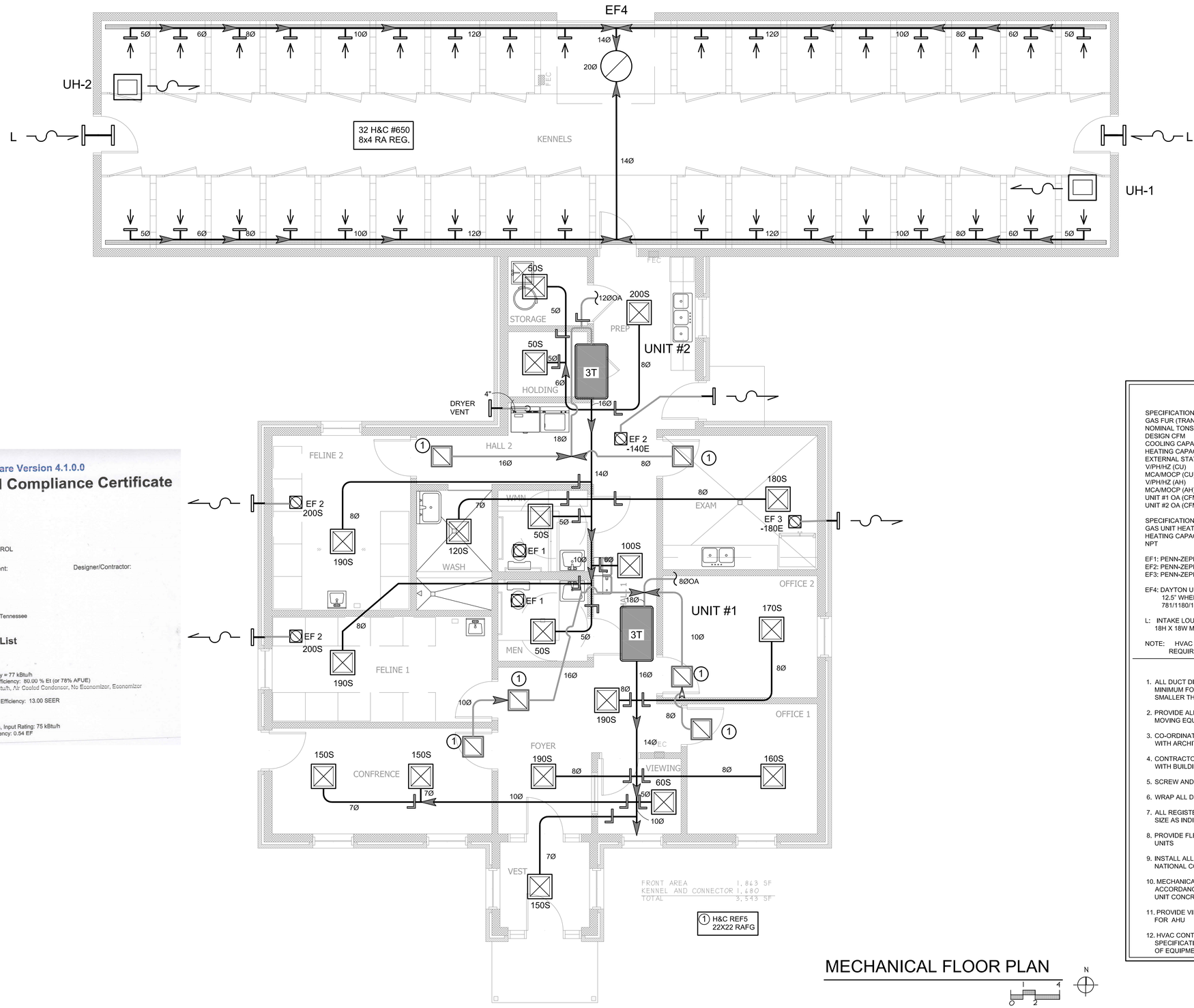
REVIEWER SJC

PROJECT 18-145

DATE 1-17-20

SHEET S-7

M.R.BUSBY, P.E. LLC
P.O. BOX 813 GOODLETTSVILLE, TN. 37070-0813
PHONE: (615) 512-7597



MECHANICAL FLOOR PLAN

SUPPLY REGISTER SCHEDULE
DRY WALL CEILING CONSTRUCTION

HART & COOLEY ARF 4-WAY CEILING DIFFUSERS

6 X 6	50 - 70 CFM
9 X 9	100 - 140 CFM
12 X 12	150 - 250 CFM
15 X 15	250 - 400 CFM
18 X 18	400 - 500 CFM

ROBINSON COUNTY ANIMAL CONTROL

SPECIFICATIONS (UNIT #1 & UNIT#2)	
GAS FUR (TRANE OR EQUAL)	4TTR4036/4TXCB004+TUH1C1B080
NOMINAL TONS	3
DESIGN CFM	1200
COOLING CAPACITY, BTUH	35400
HEATING CAPACITY, IN/OUT, BTU	77000/73200
EXTERNAL STATIC, IN WG	0.30
V/PH/HZ (CU)	208-230/1/60
MCA/MOCP (CU)	10.2/15
V/PH/HZ (AH)	115/1/60
MCA/MOCP (AH)	18/30
UNIT #1 OA (CFM)	200
UNIT #2 OA (CFM)	400

SPECIFICATIONS (UH-1 &UH-2)
GAS UNIT HEATER (TRANE OR EQUAL) GPND-006
HEATING CAPACITY, IN/OUT,BTUH 60000/48600
NPT 1/2-IN

EF1: PENN-ZEPHR Z3H: 39 W; 0.5 A; 1550 RPM; 70 CFM @ 0.125 "
EF2: PENN-ZEPHR Z6H: 108 W; 1.4 A; 1550 RPM; 200S CFM @ 0.125
EF3: PENN-ZEPHR Z6H: 108 W; 1.4 A; 1550 RPM; 180 CFM @ 0.25 "

EF4: DAYTON UPBLAST VENTILATOR MODEL# 48C180 GRAINGER # 48C180
12.5" WHEEL DIA; DIRECT DRIVE; EC MOTOR; 11V/1 PH/60 HZ;
781/1180/1923 CFM @ 0.25"

L: INTAKE LOUVER: DAYTON MODEL # 20UA08 GRAINGER # 20UA08
18H X 18W MIN WALL OPENING; 0.89 SQ FT; BIRD SCREEN

NOTE: HVAC UNIT MUST HAVE AIR ECONOMIZER IF REQUIRED BY LOCAL CODES

GENERAL NOTES

1. ALL DUCT DIMENSIONS INDICATE CLEAR INSIDE OPENING: 26 GA. MINIMUM FOR DUCT LARGER THAN 14" OR 28 GA. MINIMUM FOR DUCT SMALLER THAN 14"
2. PROVIDE ALL NECESSARY DUCT TRANSITIONS TO AND FROM ALL AIR MOVING EQUIPMENT
3. CO-ORDINATE EXACT LOCATION OF CEILING DIFFUSERS AND REGISTERS WITH ARCHITECT CEILING PLAN AND ELECTRICAL LIGHTING
4. CONTRACTOR TO FIELD VERIFY ALL DUCTWORK SIZING AND ROUTING WITH BUILDING CONTRACTOR PRIOR TO FABRICATION
5. SCREW AND TAPE ALL DUCT JOINTS; SCREW AND CAULK ALL TAKE-OFFS
6. WRAP ALL DUCTWORK WITH R-8 FOILBACK DUCTWRAP INSULATION
7. ALL REGISTERS SHALL BE HART & COOLEY OR EQUIVALENT; STYLE AND SIZE AS INDICATED
8. PROVIDE FLEXIBLE CONNECTORS AT SUPPLY AND RETURN DUCTS AT UNITS
9. INSTALL ALL SYSTEMS IN COMPLIANCE WITH LOCAL, STATE, AND NATIONAL CODES
10. MECHANICAL CONTRACTOR TO INSTALL REFRIGERANT LINES IN ACCORDANCE TO MANUFACTURER'S DATA AND TO PROVIDE OUTDOOR UNIT CONCRETE PADS.
11. PROVIDE VIBRATION ISOLATORS AND CONDENSATE PAN WITH DRAIN FOR AHU
12. HVAC CONTRACTOR TO COORDINATE AND VERIFY ALL UNIT SPECIFICATIONS AND ELECTRICAL REQUIREMENTS PRIOR TO PURCHASE OF EQUIPMENT AND INSTALLATION.

COMcheck Software Version 4.1.0.0
Mechanical Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: ROBERTSON COUNTY ANIMAL CONTROL
Project Type: New Construction

Construction Site: W COUNTY FARM ROAD SPRINGFIELD, TN
Owner/Agent:
Designer/Contractor:

Section 2: General Information

Building Location (for weather data): Springfield, Tennessee
Climate Zone: 4a

Section 3: Mechanical Systems List

Quantity	System Type & Description
2	HVAC System 1 (Single Zone) : Heating: 1 each - Central Furnace, Gas, Capacity = 77 kBtu/h Proposed Efficiency = 80.00% Et, Required Efficiency: 80.00 % Et (or 78% AFUE) Cooling: 1 each - Split System, Capacity = 35 kBtu/h, Air Cooled Condenser, No Economizer, Economizer exception: None Proposed Efficiency = 14.00 SEER, Required Efficiency: 13.00 SEER Fan System: None
1	Water Heater 1: Gas Storage Water Heater, Capacity: 71 gallons, Input Rating: 75 kBtu/h Proposed Efficiency: 0.54 EF, Required Efficiency: 0.54 EF

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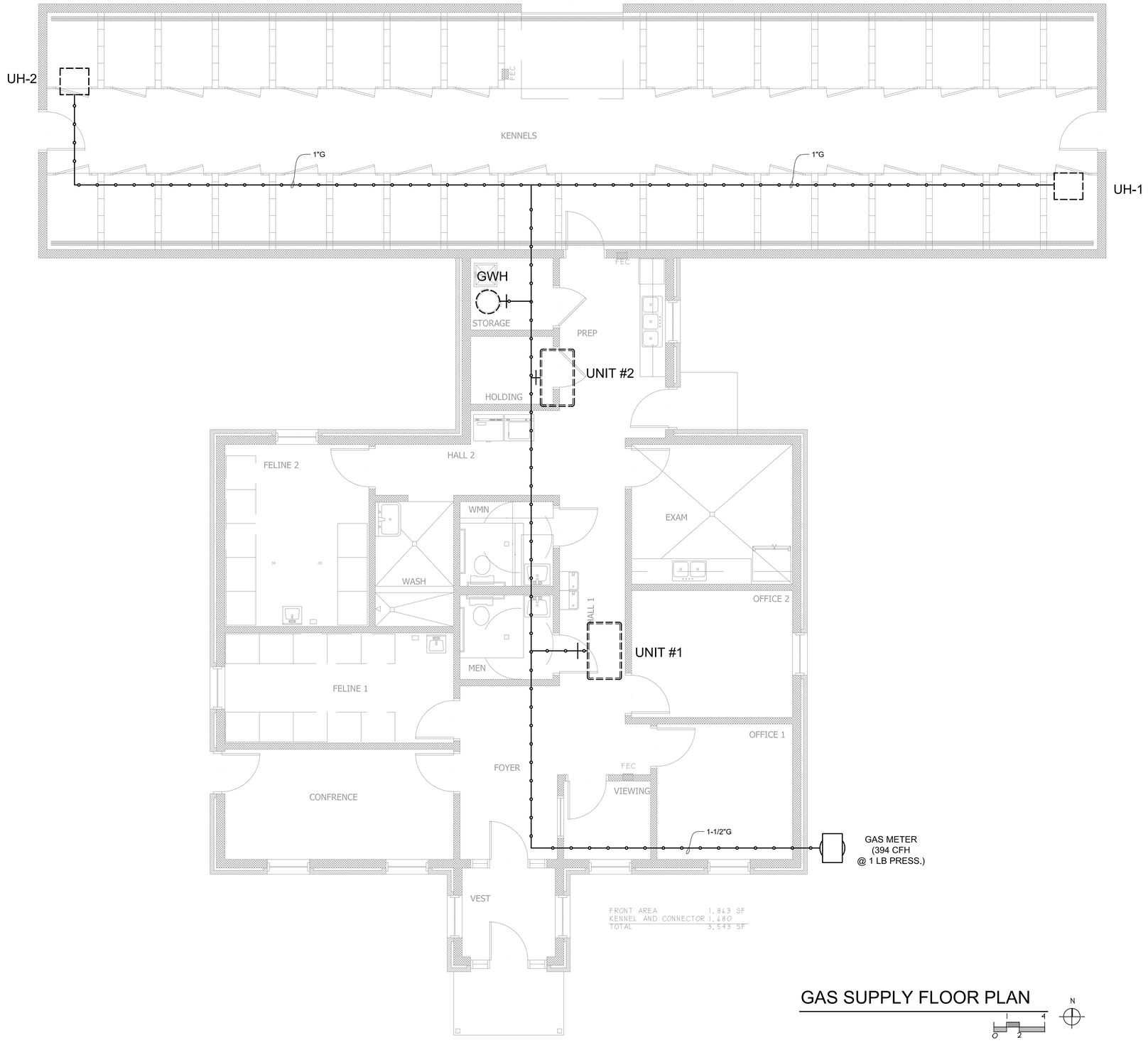
ROBERTSON COUNTY
ANIMAL CONTROL
W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER
REVIEWER
PROJECT
DATE 9/26/19
SHEET M-1

M.R.BUSBY, P.E. LLC
P.O. BOX 813 GOODLETTSVILLE, TN. 37070-0813
PHONE: (615) 512-7597



GAS SUPPLY FLOOR PLAN

N

0 1 2 4

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ROBERTSON COUNTY
ANIMAL CONTROL
W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER
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SHEET M-2

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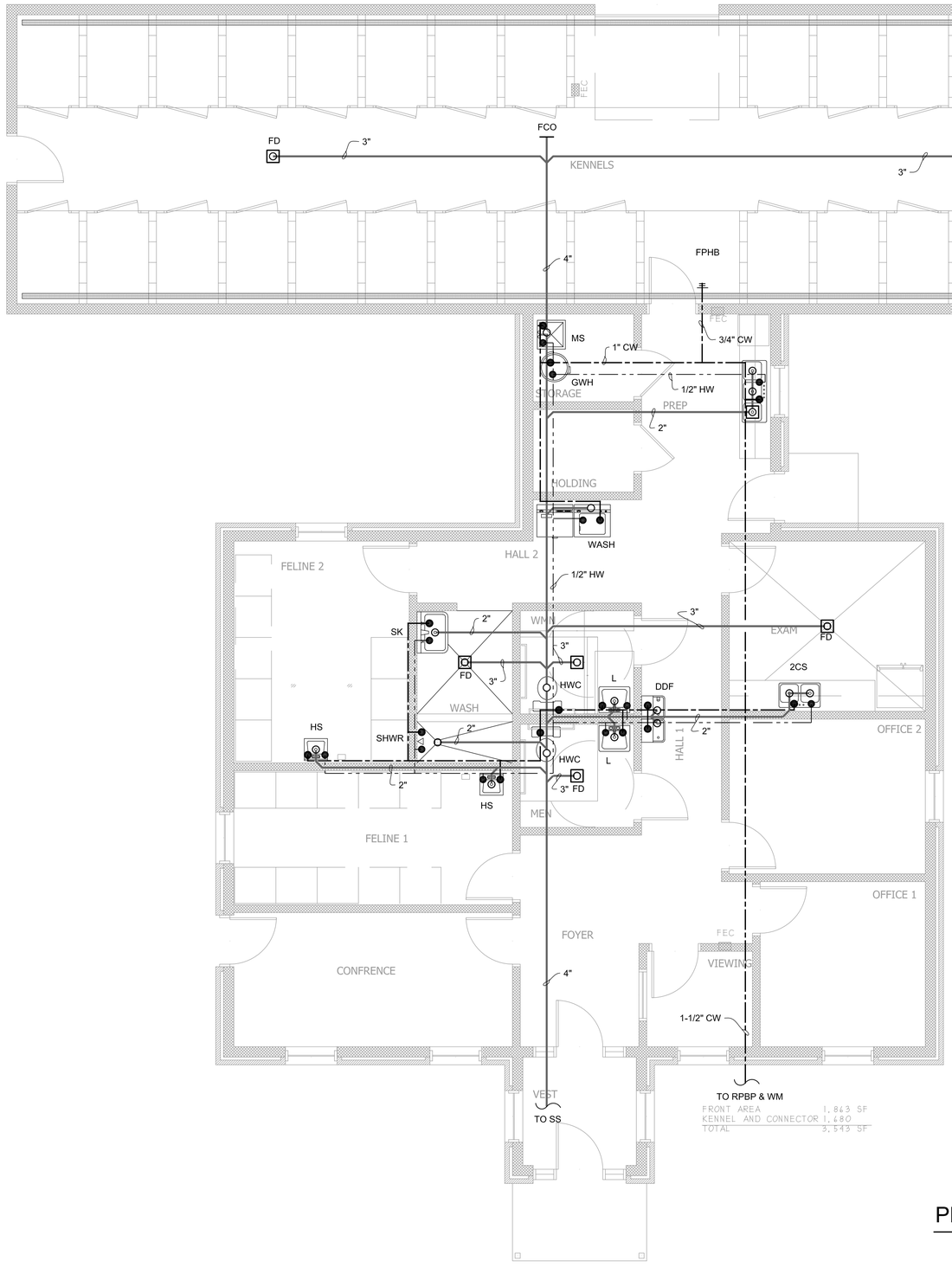

PLUMBING FLOOR PLAN

N

1 0 2 4

PLUMBING SPECIFICATIONS

1. FURNISH & INSTALL ALL PIPE, VALVES, AND FITTINGS WITH COMPLETE AND SATISFACTORY INSTALLATION INCLUDING ALL NECESSARY PARTS AND DEVICES, ACCESSORIES, ETC. AS REQUIRED BY LOCAL, STATE, AND NATIONAL CODES.
2. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL CODES AND ORDINANCES.
3. THE FOLLOWING ITEMS SHALL REQUIRE SUBMITTALS: PIPE & FIXTURES; PLUMBING FIXTURES; VALVES; WATER HEATERS.
4. WASTE AND VENT PIPING AND FITTINGS SHALL BE SOLVENT CEMENT JOINT SCHEDULE 40 PVC.
5. ALL WATER PIPING SHALL BE COPPER TUBE ASTM-88. WATER PIPING BELOW GRADE SHALL BE TYPE K SOFT ANNEALED. WATER PIPING ABOVE GRADE SHALL BE TYPE L HARD DRAW. FITTINGS SHALL BE WROUGHT WITH LEAD FREE SOLDER.
6. ALL WATER PIPING ABOVE SLAB IN UNCONDITIONED AREAS SHALL BE INSULATED WITH FIBERGLASS INSULATION WITH AN ALL SERVICE JACKET. INSULATION THICKNESS: PIPE 1" AND SMALLER: ½" THICK; PIPE 1 1/4" AND LARGER: 1" THICK.*
7. ALL WATER PIPING BELOW SLAB SHALL BE INSULATED WITH FOAM CELL INSULATION 1" THICK.
8. ALL RELATED MATERIALS INCLUDING INSULATION CLOTHS, CEMENTS, JACKETS, FACINGS, ADHESIVES, TAPES, ETC. SHALL HAVE A COMPOSITE FIRE AND SMOKE HAZARD RATING NOT TO EXCEED A FLAME SPREAD RATING OF 25 AND DEVELOPED SMOKE RATING OF 50.
9. PROVIDE DIELECTRIC UNIONS WHEN JOINING DISSIMILAR METALS.
10. APPROVED STANDARD WEIGHT VALVES SUITABLE FOR A WORKING PRESSURE MINIMUM OF 125 PSIG.
11. GATE VALVES SHALL BE BRASS WITH OPERATING WHEELS, PACKING GLANDS, AND RISING STEMS.
12. VACUUM BREAKERS SHALL BE INSTALLED ON ALL FIXTURES WHERE REQUIRED BY CODES.
13. MAKE ALL WATER AND AIR TESTS OF THE PLUMBING SYSTEMS IN THE PRESENCE OF AND TO THE SATISFACTION OF THE ARCHITECT OR HIS DESIGNATED REPRESENTATIVE. ALL TESTS SHALL BE CONDUCTED PRIOR TO THEM BEING COVERED AND SEALED.
14. THE PIPING SYSTEM SHALL BE STERILIZED AND COMPLY WITH ALL THE GOVERNING REGULATIONS AND WITH THE STERILIZATION PROCEDURES AS RECOMMENDED BY THE AMERICAN WATER ASSOCIATION.

* PEX TUBING MAY BE USED IN LIEU OF COPPER IF APPROVED BY CODES

PLUMBING FIXTURES SPECIFICATIONS

NOTE:
ALL SPECIFIED PLUMBING FIXTURES MAY BE SUBSTITUTED WITH THOSE OF EQUAL QUALITY AND FUNCTION. PRIOR TO PURCHASE, ALL PLUMBING FIXTURES MUST BE APPROVED BY OWNER & PLUMBING SUBMITTALS ARE REQUIRED

HWC ADA FLUSH VALVE WATER CLOSET
KOHLER K4368-0 1.6 12 EB VC BOWL *HIGHCL WHIT
ZURN ZZ6000WS1YBYC 1.6 CLST FLUSH VLV W/ SWT KIT
PROFLO PFTSCOF2000WH EB CLST SEAT COMM OFLC WHIT

L LAVATORY (WALL HUNG, A.D.A. COMPLIANT)
AMERICAN STANDARD MODEL #0321.026
SYMMONS #5-20 SINGLE LEVEL HANDLE FAUCET
MCGUIRE #155-A GRID DRAIN
MCGUIRE 1 ¼ IN # 8872 P-TRAP
MCGUIRE #2165CC SUPPLIES

3CS THREE COMPARTMENT SINK
ADVANCE TABCO FE-3-1620-18RLX SS
ELJER MODEL #4182070 FAUCETS; TWO WRIST ACTION HANDEL HI-RINSE

2CS B SS SINK W/GOOSENECK FCT
ELKAY ELR33213 2CS 33X21 3H 2B SS SINK *LUSTER
CHICAGO C786GN2FCCP CP 2HDL GN FCT
ZURN ZZ8741 2-3/4X4-3/8 CP BASKET STRAINER
ZURN ZZ8702 1-1/2X1-1/2 CP P-TRAP WITH C/O
ZURN ZZ8804LR TWO 1/2NOMX3/8OD STD STOPS W/ FLEX

FS FLOOR SINK (3" DIAM OUTLET)
J.R. SMITH MODEL #2230-S-Y WITH SQUARE TOP HINGED GRATE; SEDIMENT BUCKET, P-TRAP AND TRAP PRIMER CONNECTION

HS 1B SS SINK W/GOOSENECK FCT (WALL-MOUNTED)
ELKAY EHS-14-SSX 1B SS SINK W/ 18 GA; 300 SERIES SS; 6-IN BACKLASH; GOOSENECK FAUCET

DDF WATER COOLER BI-LEVEL
ELKAY EEZSTL8LC 8G BI LVL ADA WTR COLR LIGR COMP

WASH CLOTHES WASHER (SELECTED BY OWNER)

SHWR SHOWER BY OWNER

FPHB FREEZE PROOF HOSE BIBB
ZURN MODEL #Z-1320 WITH ANTI-SOPHON BACKFLOW PREVENTER, AUTOMATIC DRAINING; KEY OPERATED

SK SINK (SELECTED BY OWNER)

MS MOP SINK
AMERICAN STANDARD MODEL #7741000 28"X28"X13"
FLOOR MOUNTED BASIN WITH VINYL RIM GUARD
CAMBRIDGE #28T9 FAUCET WITH VACUUM BKR,
STOPS, PAIL HOOK, 4-ARM HANDLES

FD FLOOR DRAIN (3" DIAM OUTLET)
J. R. SMITH MODEL #2005-A WITH ADJUSTABLE ROUND STRAINER HEAD; P-TRAP AND TRAP PRIMER CONNECTION

FPHB FREEZE PROOF HOSE BIBB
ZURN MODEL #Z-1320 WITH ANTI-SOPHON BACKFLOW PREVENTER, AUTOMATIC DRAINING; KEY OPERATED

GWH GAS WATER HEATER
STATE SSBD71120NE; 71G; 71 GAL; 120,000 BTUH; NAT GAS WATER HEATER ALUM; 187013 IPS CORP; 30" ALUMINUM WATER HEATER PAN WITH HOSE CONNECTION, 6 IN DIAM GAS FLUE, ASME T&P RELIEF VALVE, DIELECTRIC UNIONS AT CONNECTIONS TO DISSIMILAR METALS, SHUT-OFF VALVES ON HOT & COLD WATER

HOT WATER
COLD WATER
SEWER
VENT

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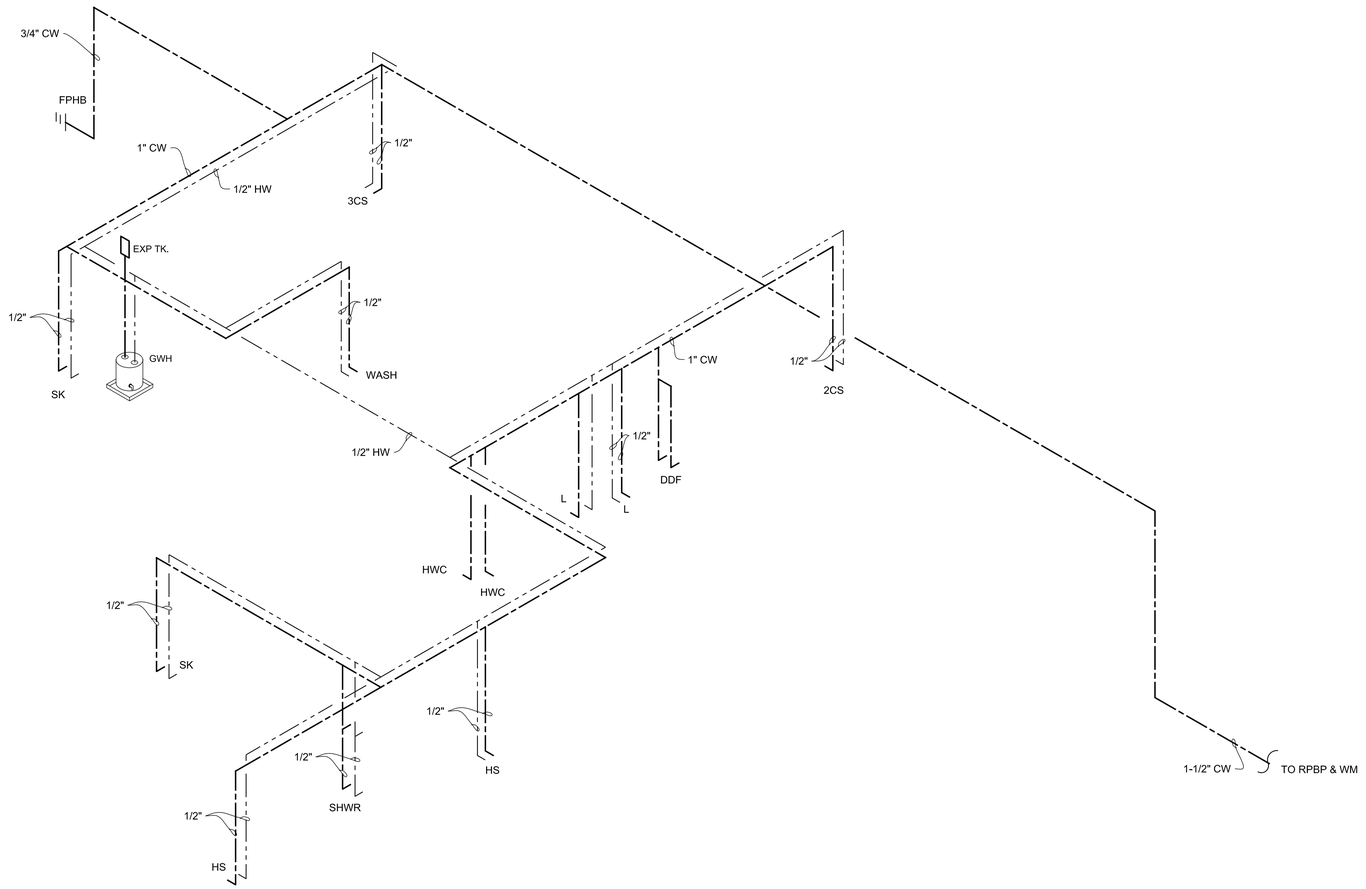
ROBERTSON COUNTY
ANIMAL CONTROL
W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER
REVIEWER

PROJECT

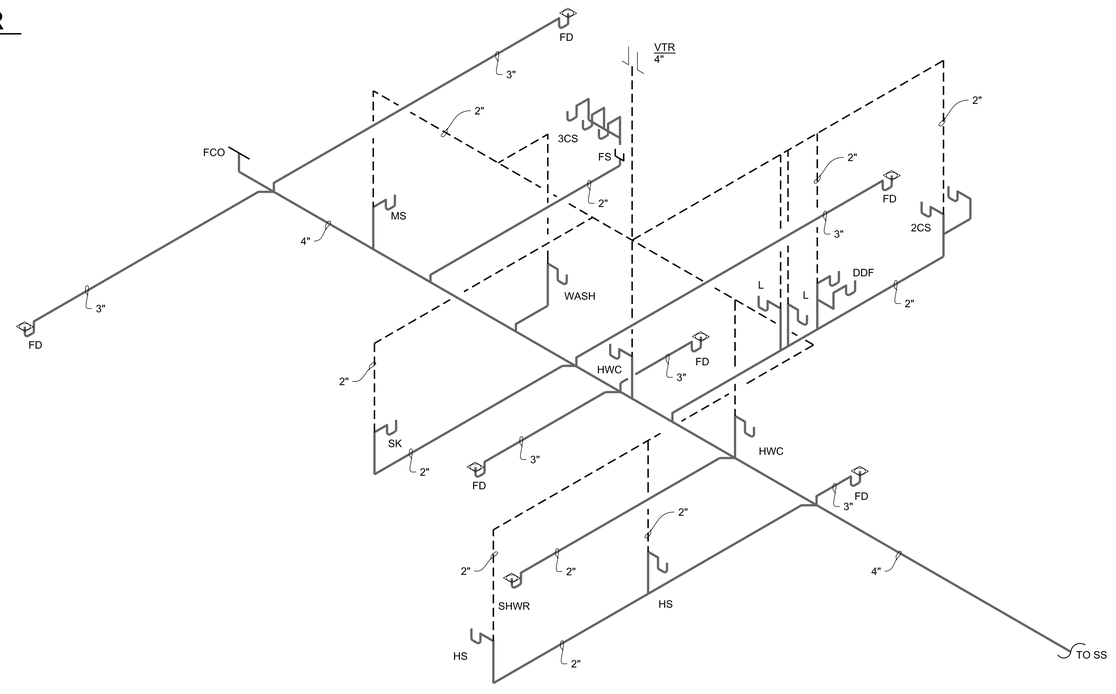
DATE 9/26/19

SHEET P-1



SUPPLY RISER

SCALE: NTS



WASTE RISER

SCALE: NTS

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PAN WITH HOSE CONNECTION, 6 IN DIAM GAS FLUE, ASME T&P
RELIEF VALVE, DIELECTRIC UNIONS AT CONNECTIONS TO
DISSIMILAR METALS, SHUT-OFF VALVES ON HOT & COLD WATER

HOT WATER
COLD WATER
SEWER
VENT

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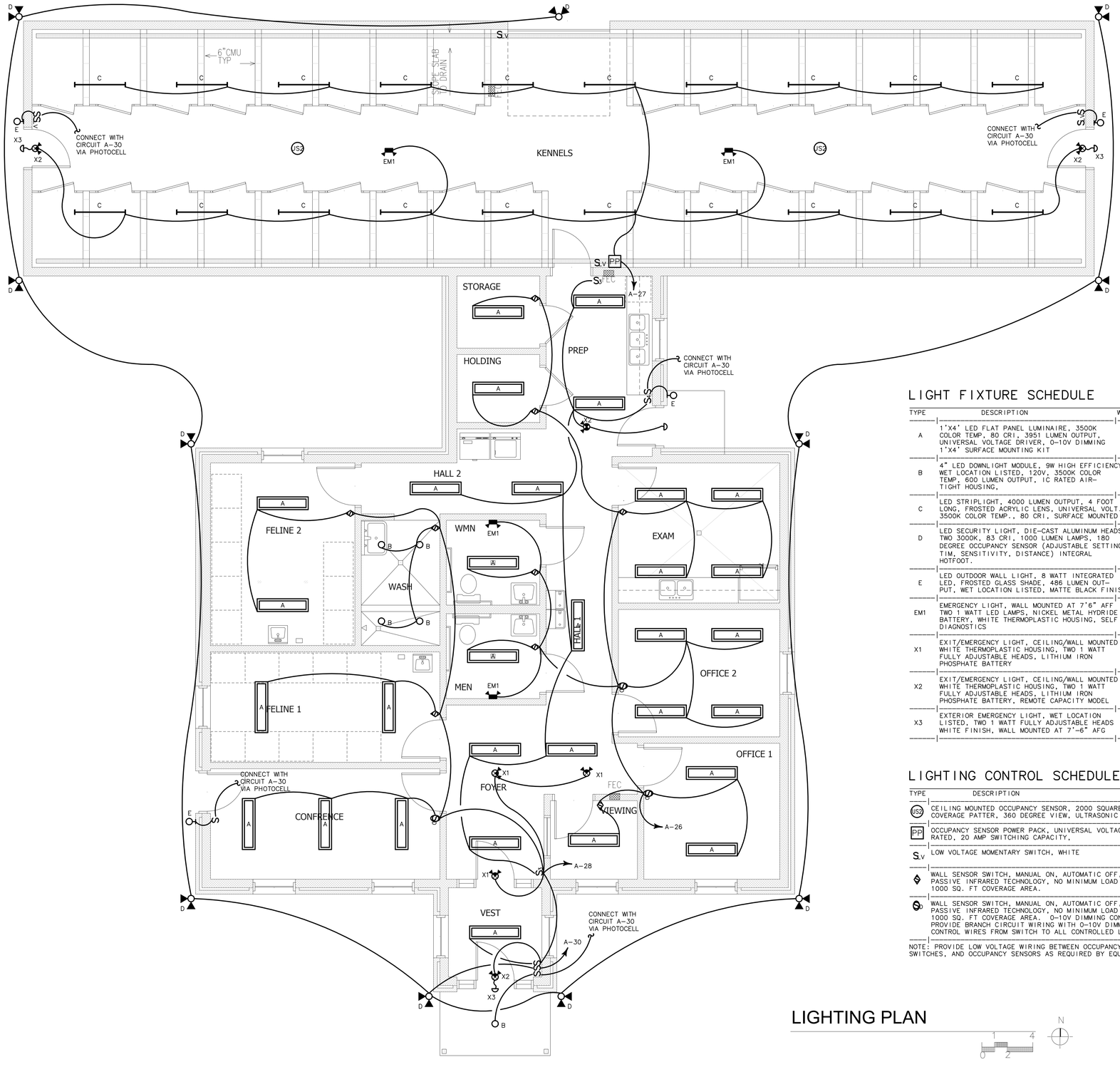
ROBERTSON COUNTY
ANIMAL CONTROL
W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER
REVIEWER
PROJECT
DATE 9/26/19
SHEET P-2



LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	WATT	VOLT	MANUFACTURER
A	1'X4' LED FLAT PANEL LUMINAIRE, 3500K COLOR TEMP, 80 CRI, 3951 LUMEN OUTPUT, UNIVERSAL VOLTAGE DRIVER, 0-10V DIMMING 1'X4' SURFACE MOUNTING KIT	39	UNV	COLUMBIA LIGHTING #CFP14-4035-CFPSMK-14
B	4" LED DOWNLIGHT MODULE, 9W HIGH EFFICIENCY WET LOCATION LISTED, 120V, 3500K COLOR TEMP, 600 LUMEN OUTPUT, IC RATED AIR-TIGHT HOUSING,	9	120	PRESCOLITE #LB4A-6L-35K-9-WH + #IBX4QL-120
C	LED STRIPLIGHT, 4000 LUMEN OUTPUT, 4 FOOT LONG, FROSTED ACRYLIC LENS, UNIVERSAL VOLT. 40.2 3500K COLOR TEMP., 80 CRI, SURFACE MOUNTED		UNV	COLUMBIA LIGHTING #CSL4-4035
D	LED SECURITY LIGHT, DIE-CAST ALUMINUM HEADS TWO 3000K, 83 CRI, 1000 LUMEN LAMPS, 180 DEGREE OCCUPANCY SENSOR (ADJUSTABLE SETTINGS TIM, SENSITIVITY, DISTANCE) INTEGRAL HOTFOOT.	26.6	120	HUBBELL OUTDOOR LIGHTING #ML-2L-3K1-WH
E	LED OUTDOOR WALL LIGHT, 8 WATT INTEGRATED LED, FROSTED GLASS SHADE, 486 LUMEN OUTPUT, WET LOCATION LISTED, MATTE BLACK FINISH	9	120	PORTFOLIO #FEW1691A-7
EM1	EMERGENCY LIGHT, WALL MOUNTED AT 7'6" AFF TWO 1 WATT LED LAMPS, NICKEL METAL HYDRIDE BATTERY, WHITE THERMOPLASTIC HOUSING, SELF DIAGNOSTICS	1.1	120	DUAL LITE #EV2-I
X1	EXIT/EMERGENCY LIGHT, CEILING/WALL MOUNTED WHITE THERMOPLASTIC HOUSING, TWO 1 WATT FULLY ADJUSTABLE HEADS, LITHIUM IRON PHOSPHATE BATTERY	1.7	120	DUAL LITE #EVCURW
X2	EXIT/EMERGENCY LIGHT, CEILING/WALL MOUNTED WHITE THERMOPLASTIC HOUSING, TWO 1 WATT FULLY ADJUSTABLE HEADS, LITHIUM IRON PHOSPHATE BATTERY, REMOTE CAPACITY MODEL	1.7	120	DUAL LITE #EVCURWD4
X3	EXTERIOR EMERGENCY LIGHT, WET LOCATION LISTED, TWO 1 WATT FULLY ADJUSTABLE HEADS WHITE FINISH, WALL MOUNTED AT 7'-6" AFG			DUAL LITE #EVO-D-W

LIGHTING CONTROL SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER
(VS2)	CEILING MOUNTED OCCUPANCY SENSOR, 2000 SQUARE FOOT COVERAGE PATTER, 360 DEGREE VIEW, ULTRASONIC TECH.	LUTRON #LOS-CUS-2000
PP	OCCUPANCY SENSOR POWER PACK, UNIVERSAL VOLTAGE, PLENUM RATED, 20 AMP SWITCHING CAPACITY,	LUTRON #PP-DV-M
S.v	LOW VOLTAGE MOMENTARY SWITCH, WHITE	LUTRON #NTRCS-1-WH
S	WALL SENSOR SWITCH, MANUAL ON, AUTOMATIC OFF, PASSIVE INFRARED TECHNOLOGY, NO MINIMUM LOAD 1000 SQ. FT COVERAGE AREA.	LUTRON #MS-OPS6M2N-DV-WH
S	WALL SENSOR SWITCH, MANUAL ON, AUTOMATIC OFF, PASSIVE INFRARED TECHNOLOGY, NO MINIMUM LOAD 1000 SQ. FT COVERAGE AREA. 0-10V DIMMING CONTROL PROVIDE BRANCH CIRCUIT WIRING WITH 0-10V DIMMING CONTROL WIRES FROM SWITCH TO ALL CONTROLLED LIGHT FIXTURES.	LUTRON #MS-Z101-WH

NOTE: PROVIDE LOW VOLTAGE WIRING BETWEEN OCCUPANCY SENSOR POWER PACKS, LOW VOLTAGE SWITCHES, AND OCCUPANCY SENSORS AS REQUIRED BY EQUIPMENT MANUFACTURER.

LIGHTING PLAN

1/4" = 1'-0"

DRC ENGINEERING
2385 PLEASANT VIEW RD
Pleasant View, TN 37146
Phone: 615-714-1812

CHARLES R. CHANEY
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 104082
STATE OF TENNESSEE

JOHN F. WERNE
ARCHITECT
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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER

REVIEWER

PROJECT

DATE 11/22/19

SHEET E-1

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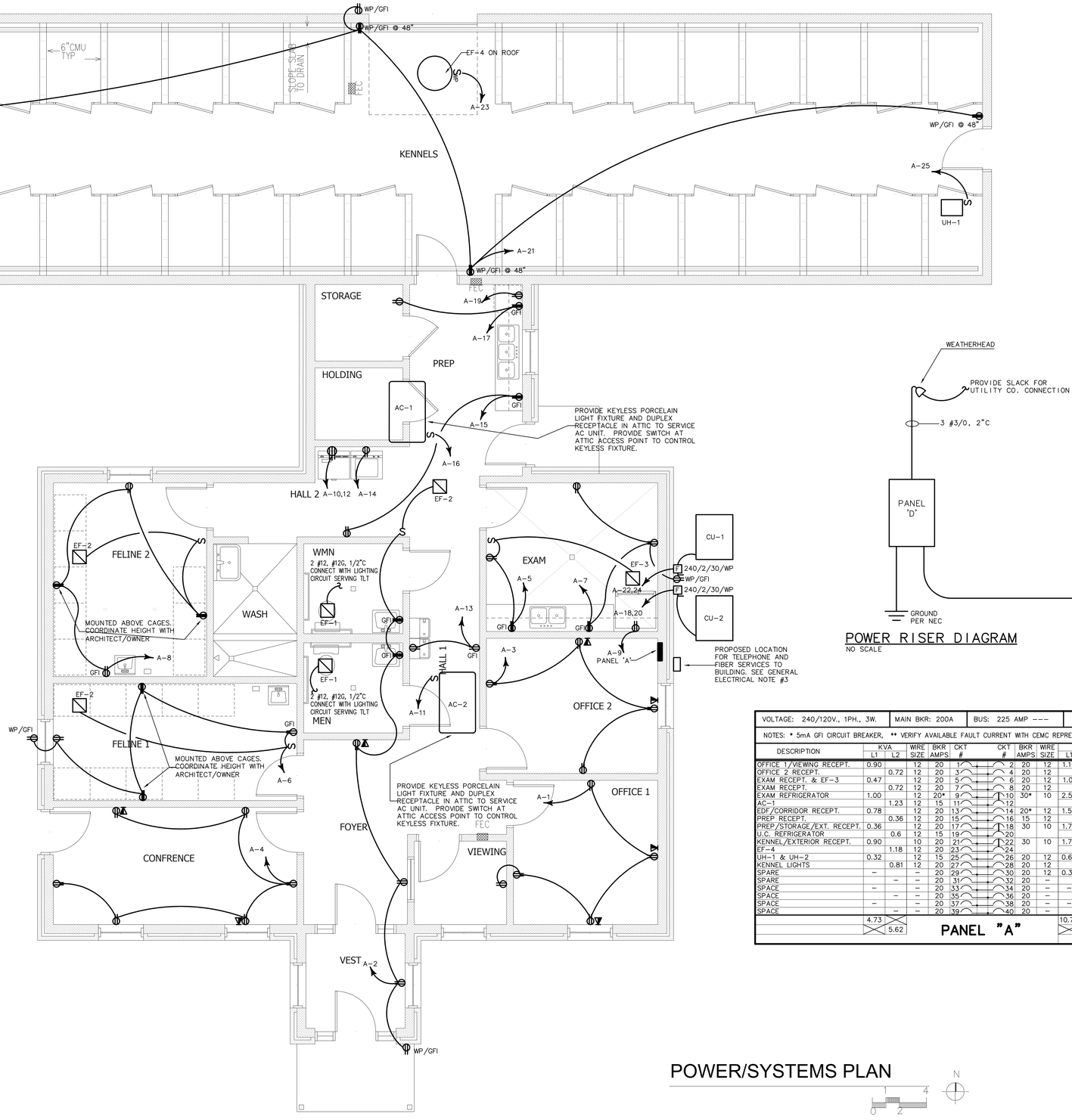
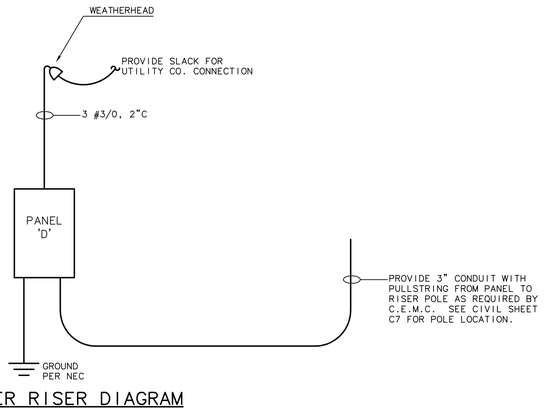
Pleasant View, TN 37146
Phone: 615-714-1812



POWER/SYSTEMS PLAN



POWER RISER DIAGRAM

NO SCALE

VOLTAGE: 240/120V., 1PH., 3W.			MAIN BKR: 200A		BUS: 225 AMP ---			A.I.C.: 22K**		FLUSH MOUNTED
NOTES: * 5mA GFI CIRCUIT BREAKER, ** VERIFY AVAILABLE FAULT CURRENT WITH CEMC REPRESENTATIVE PRIOR TO ODERING PANEL										
DESCRIPTION	KVA L1	KVA L2	WIRE SIZE	BKR AMPS	CKT #	CKT #	BKR AMPS	WIRE SIZE	KVA L1	KVA L2	DESCRIPTION
OFFICE 1/VIEWING RECEPT.	0.90		12	20	1	2	20	12	1.19		RECEPT./EF-2
OFFICE 2 RECEPT.		0.72	12	20	3	4	20	12		1.08	CONF. RECEPTACLES
EXAM RECEPT. & EF-3	0.47		12	20	5	6	20	12	1.01		FELINE 1 RECEPT./EF-2
EXAM RECEPT.		0.72	12	20	7	8	20	12		0.83	FELINE 2 RECEPT./EF-2
EXAM REFRIGERATOR	1.00		12	20*	9	10	30*	10	2.50		CLOTHES DRYER
AC-1		1.23	12	15	11	12				2.50	
EDF/CORRIDOR RECEPT.	0.78		12	20	13	14	20*	12	1.50		CLOTHES WASHER
PREP RECEPT.		0.36	12	20	15	16	15	12		1.23	AC-1
PREP/STORAGE/EXT. RECEPT.	0.36		12	20	17	18	30	10	1.79		CU-2
U.C. REFRIGERATOR		0.6	12	15	19	20				1.79	
KENNEL/EXTERIOR RECEPT.	0.90		10	20	21	22	30	10	1.79		CU-1
EF-4		1.18	12	20	23	24				1.79	
UH-1 & UH-2	0.32		12	15	25	26	20	12	0.63		LIGHTS
KENNEL LIGHTS		0.81	12	20	27	28	20	12		0.66	LIGHTS
SPARE	–		–	20	29	30	20	12	0.33		EXTERIOR LIGHTS
SPARE		–	–	20	31	32	20	–		–	SPARE
SPACE	–		–	20	33	34	20	–	–		SPARE
SPACE		–	–	20	35	36	20	–		–	SPACE
SPACE	–		–	20	37	38	20	–	–		SPACE
SPACE		–	–	20	39	40	20	–		–	SPACE
	4.73				PANEL "A"				10.74		L1: 15.47 KVA
		5.62								9.88	L2: 15.50 KVA
											TOTAL: 30.97 KVA

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ROBERTSON COUNTY ANIMAL CONTROL

W. COUNTY FARM ROAD, ROBERTSON COUNTY, TN

DESIGNER
REVIEWER

PROJECT

DATE 11/22/19

SHEET E-2

COMcheck Software Version 4.1.1.0
Interior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: Robertson Co. Animal Control
Project Type: New Construction

Construction Site: W. County Farm Road, Springfield, TN
Owner/Agent:
Designer/Contractor:

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Office	3635	1	3635
		Total Allowed Watts =	3635

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Office (3635 sq.ft.)				
LED 1: A: 1x4 Surface LED: Other:	1	31	39	1209
LED 2: B: 4" LED Downlight: Other:	1	4	9	36
LED 3: C: LED striplight: Other:	1	20	40.2	804
			Total Proposed Watts =	2049

Section 4: Requirements Checklist

Interior Lighting PASSES: Design 44% better than code.

Lighting Wattage:

❑ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
3635	2049	YES

Controls, Switching, and Wiring:

❑ 2. Daylight zones under skylights more than 15 feet from the perimeter have lighting controls separate from daylight zones adjacent to vertical fenestration.

❑ 3. Daylight zones have individual lighting controls independent from that of the general area lighting.

Exceptions:

❑ Contiguous daylight zones spanning no more than two orientations are allowed to be controlled by a single controlling device.

❑ Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

❑ 4. Independent controls for each space (switch/occupancy sensor).

Exceptions:

❑ Areas designated as security or emergency areas that must be continuously illuminated.

❑ Lighting in stairways or corridors that are elements of the means of egress.

❑ 5. Master switch at entry to hotel/motel guest room.

❑ 6. Individual dwelling units separately metered.

❑ 7. Medical task lighting or art/history display lighting claimed to be exempt from compliance has a control device independent of the control of the nonexempt lighting.

❑ 8. Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps, switching the middle lamp luminaires independently of other lamps, or switching each luminaire or each lamp.

Exceptions:

❑ Only one luminaire in space.

❑ An occupant-sensing device controls the area.

❑ The area is a corridor, storeroom, restroom, public lobby or sleeping unit.

❑ Areas that use less than 0.6 Watts/sq.ft.

❑ 9. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

Exceptions:

❑ Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.

❑ 10. Photocell/astronomical time switch on exterior lights.

Exceptions:

❑ Lighting intended for 24 hour use.

❑ 11. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

Exceptions:

❑ Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COMcheck Version 4.1.1.0 and to comply with the mandatory requirements in the Requirements Checklist.

Daron R. Christy, P.E. — Name - Title
Daron Clty — Signature
11-22-19 — Date

COMcheck Software Version 4.1.1.0
Exterior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: Robertson Co. Animal Control
Project Type: New Construction
Exterior Lighting Zone: 2 (Residentially zoned area)

Construction Site: W. County Farm Road, Springfield, TN
Owner/Agent:
Designer/Contractor:

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Main entry	3 ft of door width	20	Yes	60	9
Other door (not main entry)	12 ft of door width	20	Yes	240	32
Illuminated length of facade wall or surface	379 ft	2.5	No	948	292
			Total Tradable Watts* =	300	41
			Total Allowed Watts =	1248	
			Total Allowed Supplemental Watts** =	600	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Main entry (3 ft of door width): Tradable Wattage				
LED 1: B: 4" LED downlight: Other:	1	1	9	9
Other door (not main entry) (12 ft of door width): Tradable Wattage				
LED 2: E: LED Wall light: Other:	1	4	8	32
Illuminated length of facade wall or surface (379 ft): Non-tradable Wattage				
LED 3: D: LED Motion Activated: Other:	2	11	26.6	292.6
			Total Tradable Proposed Watts =	41

Section 4: Requirements Checklist

Lighting Wattage:

❑ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.
Compliance: Passes.

Controls, Switching, and Wiring:

❑ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.

❑ 3. Lighting not designated for dusk-to-dawn operation is controlled by either a a photosensor (with time switch), or an astronomical time switch.

❑ 4. Lighting designated for dusk-to-dawn operation is controlled by an astronomical time switch or photosensor.

❑ 5. All time switches are capable of retaining programming and the time setting during loss of power for a period of at least 10 hours.

Exterior Lighting Efficacy:

❑ 6. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

Exceptions:

❑ Lighting that has been claimed as exempt and is identified as such in Section 3 table above.

❑ Lighting that is specifically designated as required by a health or life safety statue, ordinance, or regulation.

❑ Emergency lighting that is automatically off during normal building operation.

❑ Lighting that is controlled by motion sensor.

Exterior Lighting PASSES: Design 95% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COMcheck Version 4.1.1.0 and to comply with the mandatory requirements in the Requirements Checklist.

Daron R. Christy, P.E. — Name - Title
Daron Clty — Signature
11-22-19 — Date

ELECTRICAL SPECIFICATIONS

SECTION 16000 GENERAL PROVISIONS

PART 1 GENERAL
1.01 Reference Standards
A. 2017 NFPA 70 National Electrical Code
B. 2012 International Building Code
C. 2009 International Energy Conservation Code
D. All other applicable State and Local codes.
1.02 Submittals
A. Shop Drawings:
1. Submit for approval, prior to installation, one pdf copy of complete descriptive data on all equipment and systems as required by other sections of this specification. Clearly indicate all proposed substitutions and deviations from drawings and specifications.
2. Check all submittals for clearances and coordination with other trades. Submittals shall be certified, by the Contractor's approval stamp, that all conditions have been checked and that no conflicts exist.
B. Record Drawings
1. Submit, to the Owner, record drawings showing field changes marked in red.
1.03 Coordination
A. Utility Company
1. Coordinate with utility companies for specific requirements and exact locations for electric power, cable tv, and telephone services.
B. Other Trades
1. Coordinate with mechanical and plumbing drawings for power and control requirements for the specific equipment to be installed and for equipment such as starters and disconnect switches which may be furnished with equipment.
1.04 Work Included
A. The work of this section includes furnishing of labor and materials as required for installation of a new electrical distribution system including service, feeders, panelboards, branch circuits, lighting, and connections to all equipment requiring electrical power.
B. Installation of conduit for telephone cabling. Cable installation by others.
1.05 Drawings
A. The drawings are partly diagrammatic and do not show in detail all required features of the work nor concealed conditions. They shall be supplemented by the Contractor's knowledge and experience.

PART 2 PRODUCTS
2.01 General
A. All electrical equipment installed shall bear the U.L. label except where U.L. does not label such equipment.
2.02 Guarantee
A. Furnish a written guarantee that all equipment furnished and installed will be free of defects of material and workmanship for a period of 1 year from date of acceptance of the work by the Owner. Promptly replace and repair all defective equipment and all other equipment damaged thereby at no additional cost to the Owner.

PART 3 EXECUTION
3.01 General
A. Visit project site before submission of bid and become familiar with existing conditions and locations of existing utilities.
B. The entire installation shall be made in a neat manner by persons skilled in the electrical trade and shall be in accordance with the reference standards listed above.
C. Make power connections to air conditioning equipment and Owner furnished equipment. Furnish and install all associated receptacles and disconnect switches. Fuse sizes for disconnect switches shall be as recommended by the equipment manufacturer.
D. Furnish and install conduit and wire for air conditioning control equipment. See mechanical drawings for locations and requirements.
3.02 Testing
A. All systems and equipment installed shall be completely tested and shall be left in good working order.

SECTION 16050 BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL
1.01 Submittals
A. Wiring Devices

PART 2 PRODUCTS
2.01 Raceways
A. Rigid Steel Conduit
B. Electrical Metallic Tubing
C. Polyvinylchloride Conduit
2.02 Wires and Cables
A. Feeders and Branch Circuit Wires: Copper conductor, 600 Volt, type THHN or THWN insulation.
B. Branch Circuit Cables (concealed above ceiling or within walls that provide a thermal barrier of material that has at least a 1-minute finish rating as identified in listings of fire-rated assemblies): Copper conductor, type NM cable.
C. Control Circuit Cables: Copper conductor, No.14 AWG, type THHN, or as required by equipment manufacturer.
2.03 Wiring Devices
A. Wall Switches: AC general use snap switch with toggle handle, specification grade, 20 amperes, 120-277 volts. Verify device finish with owner's representatives prior to ordering.
B. Receptacles: Type 5-15R, unless indicated otherwise, specification grade, plastic face. Duplex receptacles on dedicated circuits shall be NEMA type 5-20R. Verify device finish with owner's representatives prior to ordering.
C. Coverplates
1. Indoor: Nylon. Verify device finish with owner's representatives prior to ordering.
2. Outdoor: Galvanized steel, weatherproof while-in-use type
2.04 Identification
A. Provide laminated plastic tags for all panelboards and disconnect switches. Tags shall completely identify equipment marked or controlled.

PART 3 EXECUTION
3.01 Raceways
A. All raceways shall be installed in accordance with manufacturers' instructions.
B. Permitted Usage:
1. All interior raceways shall be galvanized electrical metallic tubing (EMT) equipped with steel set screw couplings and box connectors.
2. Raceways underground, exposed to exterior, or cast in concrete shall be galvanized rigid steel conduit (RGS) or schedule 40 PVC.
C. Installation:
1. In long raceways furnish and install the proper number and size pull boxes to facilitate installation of conductors.
2. Install separate grounding conductor in each raceway.
3. Provide rigid galvanized steel elbows and vertical sections of underground and underfloor runs of PVC conduit.
3.02 Wires and Cables
A. All power wiring shall be installed in conduit.
B. Branch Circuit Cables (concealed above ceiling or within walls that provide a thermal barrier of material that has at least a 1-minute finish rating as identified in listings of fire-rated assemblies): Copper conductor, type NM cable.
C. Low voltage control and signal cable may be run unopen. Cables installed in air plenums must be plenum rated. Open wiring shall be supported from structure.

SECTION 16400 SERVICE AND DISTRIBUTION

PART 1 GENERAL
1.01 Submittals
A. Panelboards
B. Disconnect switches

PART 2 PRODUCTS
2.01 Panelboards
A. Circuit breaker type as described on the panel schedules. Load center type panelboards are not acceptable. Approved manufacturers are Cutler Hammer, General Electric, Seimens, and Square D.
2.02 Disconnect Switches
A. Fusible or nonfusible quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in "On" position. Approved manufacturers are Cutler Hammer, General Electric, Siemens, and Square D.

PART 3 EXECUTION
3.01 General
A. Maintain code required working clearances around all electrical equipment. Coordinate installation with architectural features, piping locations, and ductwork.
3.02 Panelboards
A. Install new panelboards as indicated.
B. All panels shall have engraved plastic labels and typewritten directories. Directories shall describe type of load and location of load, using Owner's space names or numbers, for each branch circuit.

SECTION 16500 LIGHTING

PART 1 GENERAL
1.01 Submittals
A. Lighting Fixtures

PART 2 PRODUCTS
2.01 General
A. Provide lighting fixtures as specified on Lighting Fixture Schedule of sizes, types, ratings, and with features indicated. Substitutions shall be equal in performance and appearance to fixtures listed.
B. Fixtures shall be complete with all parts, hardware, and accessories for installation and proper operation.

PART 3 EXECUTION
3.01 General
A. Install fixtures as indicated on drawings. Refer to reflected ceiling plan for exact locations.

END OF ELECTRICAL SPECIFICATIONS

DRC ENGINEERING
2385 PLEASANT VIEW RD
Pleasant View, TN 37146
Phone: 615-714-1812

GENERAL ELECTRICAL NOTES

1. VISIT PROJECT SITE BEFORE SUBMISSION OF BID AND BECOME FAMILIAR WITH EXISTING CONDITIONS AND LOCATIONS OF UTILITIES.

2. COORDINATE INSTALLATION OF NEW ELECTRICAL SERVICE WITH ELECTRIC UTILITY COMPANY. PROVIDE TRENCHING, CONDUIT, AND OTHER ITEMS AS REQUIRED. COORDINATE WITH UTILITY COMPANY TO MAINTAIN EXISTING C.T. METERING.

3. COORDINATE INSTALLATION OF TELEPHONE SERVICE CONDUIT WITH TELEPHONE COMPANY AND FIBER OPTIC SERVICE WITH CEMC. PROVIDE 2" CONDUIT WITH PULLSTRING FROM BUILDING TO RISER POLE FOR TELEPHONE SERVICE AND 1" CONDUIT WITH PULLSTRING FROM BUILDING TO RISER POLE FOR FIBER SERVICE. ALSO PROVIDE A #6 COPPER GROUND WIRE FROM BUILDING SERVICE ENTRANCE POINT(S) TO THE SERVICE ENTRANCE GROUND.

4. INSTALL 3/4" CONDUIT FROM EACH TELEPHONE OUTLET AND DATA OUTLET INTO THE ATTIC SPACE WITH AN INSULATED BUSHING ON EACH END.

5. VERIFY ELECTRICAL REQUIREMENTS FOR ALL EQUIPMENT. PROVIDE CIRCUITS AND FUSES SIZED IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.

6. MAINTAIN CODE REQUIRED WORKING CLEARANCE AT ALL ELECTRICAL PANELS, DISCONNECT SWITCHES, AND STARTERS. THERE SHALL BE NO EQUIPMENT, PIPING OR DUCT WORK INSTALLED IN OR ABOVE THE WORKING CLEARANCES.

7. PROVIDE DISCONNECT SWITCH FOR ANY HARDWIRED EQUIPMENT NOT SUPPLIED WITH DISCONNECTING MEANS.

8. SEE MECHANICAL PLANS FOR EXACT LOCATIONS AND CONTROL REQUIREMENTS FOR MECHANICAL EQUIPMENT.

9. CONNECT EXHAUST FAN TO LIGHT FIXTURE IN SAME SPACE SUCH THAT THEY ARE SWITCHED TOGETHER.

10. COORDINATE EXACT LOCATION OF ALL CEILING MOUNTED LIGHT FIXTURES WITH ARCHITECTURAL DRAWINGS. PROVIDE FIXTURES COMPATIBLE WITH CEILING TYPE INSTALLED.

11. SEE ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION OF EXTERIOR WALL-MOUNTED LIGHTING FIXTURES.

12. CONNECT EXIT LIGHTS AND EMERGENCY LIGHTS WITH INTEGRAL BATTERY TO LOCAL LIGHTING CIRCUIT AHEAD OF SWITCH SUCH THAT THEY AUTOMATICALLY CONVERT TO BATTERY OPERATION UPON LOSS OF NORMAL POWER.

13. ALL RECEPTACLES ON DEDICATED CIRCUITS SHALL BE RATED NO LESS THAN CIRCUIT OVERCURRENT DEVICE.

14. EXTERIOR LIGHTING SHALL BE TURNED ON AND OFF BY A PHOTOCELL. PHOTOCELLS SHALL BE MOUNTED ON BUILDING NEAR ROOF.

15. FURNISH AS-BUILT DRAWINGS FOR ELECTRIC POWER SYSTEMS WITHIN 30 DAYS OF BUILDING ACCEPTANCE TO TENANT'S REPRESENTATIVE.

16. FURNISH O & M INSTRUCTIONS FOR SYSTEMS AND EQUIPMENT TO THE TENANT'S REPRESENTATIVE.

17. TEST LIGHTING SYSTEMS TO ENSURE PROPER CALIBRATION, ADJUSTMENT, PROGRAMMING, AND OPERATION COMPLY WITH THE APPLICABLE INTERNATIONAL ENERGY CONSERVATION CODE BEING ENFORCED BY LOCAL AUTHORITIES.

ELECTRICAL LEGEND

MOUNTING HEIGHTS MEASURED TO ℄

- CONDUIT RUN CONCEALED IN WALL, CEILING, OR FLOOR
- CONDUIT RUN, CONCEALED IN FLOOR OR UNDERGROUND
- HOMERUN TO PANEL INDICATED
- RECEPTACLE, DUPLEX, 120V, 15A. UNO, @ 18" AFF
- RECEPTACLE, DUPLEX, 120V, 15A. UNO, SMH
- RECEPTACLE, QUADRAPLEX, 120V, 15A. UNO, @ 18" AFF
- RECEPTACLE, QUADRAPLEX, 120V, 15A. UNO, SMH
- RECEPTACLE, SINGLE, 250V, AMPS AS NOTED, @ 18" AFF
- J — JUNCTION BOX, SIZE AS REQUIRED
- S — SWITCH, SINGLE POLE, 120/277V, 20A, 45" AFF
- S_{LV} — SWITCH, LOW VOLTAGE, 45" AFF. SEE LIGHTING CONTROL SCHEDULE
- S_{LV4} — FOUR SWITCHES, LOW VOLTAGE, 45" AFF. SEE LIGHTING CONTROL SCHEDULE
- SWITCH, OCCUPANCY SENSOR TYPE, 120/277V, 45" AFF SEE OCCUPANCY SENSOR SCHEDULE
- PP — OCCUPANCY SENSOR POWER PACK, MOUNTED ABOVE CEILING SEE OCCUPANCY SENSOR SCHEDULE
- OS — CEILING MOUNTED OCCUPANCY SENSOR, SEE OCCUPANCY SENSOR SCHEDULE
- PHONE/DATA OUTLET – @ 18" AFF
- LIGHTING FIXTURES SEE FIXTURE SCHEDULE
- DISCONNECT SWITCH, NON-FUSED, DESCRIBED BY: VOLTAGE RATING/NO. OF POLES/SWITCH SIZE IN AMPS
- F — DISCONNECT SWITCH, FUSED, DESCRIBED BY: VOLTAGE RATING/NO. OF POLES/FUSE SIZE IN AMPS

ABBREVIATIONS:

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
BRKR	BREAKER
℄	CENTERLINE
CU	CONDENSING UNIT
EF	EXHAUST FAN
GFI	GROUND FAULT INTERRUPTER
MTD	MOUNTED
SMH	SPECIAL MOUNTING HEIGHT (4" ℄ ABOVE CASEWORK/BACKSPLASH OR 45" ℄ AFF IF NO CASEWORK/BACKSPLASH)
UNO	UNLESS NOTED OTHERWISE
XFMR	TRANSFORMER
WH	WATER HEATER
WP	WEATHERPROOF

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ROBERTSON COUNTY
ANIMAL CONTROL
W. COUNTY FARM ROAD, ROBERTSON COUINTY, TN

DESIGNER
REVIEWER
PROJECT
DATE 11/22/19
SHEET E-3