RIVERBANKS ZOO & GARDEN

Procurement Services
400 Rivermont Drive, Columbia, SC 29210
Phone: 803-602-0831 Fax: 803-771-8722

INVITATION FOR BIDS-
HAY BARN

BID NUMBER: **B2022-06-12** DATE: **06/24/2022**

OPENING DATE AND TIME: **August 8, 2022, 10:00 AM EST**

OPENING LOCATION: Riverbanks Zoo & Garden
Procurement Services
400 Rivermont Drive
Columbia, SC 29210

MAILING ADDRESS: Riverbanks Zoo & Garden
Attn: Raymond Brindle
400 Rivermont Drive
Columbia, SC 29210

PROCUREMENT FOR: **Hay Barn**

Subject to the conditions, provisions and the enclosed specifications, sealed bids will be received at this office until the stated date and time and then publicly opened. Any bid received after the scheduled deadline will be immediately disqualified. The District assumes no responsibility for delivery of bids which are mailed. Oral, telephonic, electronic or telegraphic bids are invalid and will not receive consideration.

IT IS REQUIRED THAT THE BID NUMBER BE SHOWN ON THE OUTSIDE OF ENVELOPE.

DIRECT ALL INQUIRES TO: Raymond Brindle, Procurement Manager, 803-360-0841,
rbrindle@riverbanks.org

KEY EVENTS / DATES

1.	Advertisement / Posting Date	June 24, 2022
2.	Mandatory Site Visit	July 6, 2022, 10:30 AM (EST.)
3.	Deadline for Questions	July 11, 2022, 5:00 PM (EST.)
4.	Bid Due	August 8, 2022, 10:00 AM (EST.)

NOTICE TO BIDDERS: **There will be a Mandatory Site Visit on June 6, 2021, at 10:30 AM (EST.) at Riverbanks Zoo & Garden, 500 Wildlife Parkway, Columbia, SC 29210. Meet at the reception gate. Once you cross the railroad tracks, make a right and the reception gate will be on your left.** Due to the importance of all bidders having a clear understanding of the scope and requirements for this project, *attendance at this meeting will be mandatory.* Any changes that may be agreed upon as a result of this conference will be noted in an amendment to the bid invitation and posted on the Riverbanks Zoo and Garden procurement page. Each bidder shall fully acquaint himself with conditions relating to the scope and restrictions attending the execution of the work under the conditions of this bid. The failure or omission of a bidder to acquaint himself with existing conditions shall in no way relieve him of any obligation with respect to this bid or to the contract. All amendments to and interpretations of this solicitation shall be in writing and issued by the Procurement Manager. Richland-Lexington Riverbanks Park District DBA Riverbanks Zoo & Garden (hereinafter known as "the District") shall not be legally bound by any amendment or interpretation that is not in writing.

If downloading this solicitation from our website or alternate internet location, it is the responsibility of the bidder to email rbrindle@riverbanks.org to be registered as a potential bidder and to receive any subsequent amendments. Deadline for questions is July 11, 2022, by 5:00 PM (EST.) All questions must be submitted in writing.

"NO BID" RESPONSE FORM

To submit a *"No Bid"* response for this project, this form must be completed for your company to remain on our bidders list for commodities/services referenced.

Note: Please show the solicitation number on the outside of the envelope.

Please check statement(s) applicable to your *"No Bid"* response --

Specifications are restrictive, i.e. geared toward one brand or manufacturer only (explain below).
Specifications are ambiguous (explain below).
We are unable to meet specifications.
Insufficient time to respond to the solicitation.
Our schedule would not permit us to perform.
We are unable to meet bond requirements.
We are unable to meet insurance requirements.
We do not offer this product or service.
Remove us from your vendor list for this commodity/service.
Other (specify below).

Comments:

_____

_____

_____ _____
Company Name (as registered with the IRS) **Authorized Signature**

_____ _____
Correspondence Address **Printed Name**

_____ _____
City, State, Zip **Title**

_____
E-mail Address (Please Print)

_____ _____ / _____
Date **Telephone** **Fax**

INSTRUCTIONS TO BIDDERS

1. Only one copy of bid invitation is required, unless otherwise stated.

2. Bids, amendments thereto or withdrawal request must be received by the time advertised for bid openings to be timely filed. It is the vendor's sole responsibility to ensure that these documents are received by the Procurement Office at or before the time indicated in the bid document.

3. When specifications or descriptive papers are submitted with the bid invitation, enter bidder's name thereon.

4. Submit your signed bid on the forms provided. Show bid number on envelope as instructed. The District assumes no responsibility for unmarked or improperly marked envelopes. Unsigned bids will be rejected.

5. Bidders must clearly mark as "Confidential" each part of their bid which they consider to be proprietary information that could be exempt from disclosure under Section 30-4-4C Code of Laws of South Carolina, 1976, (1986 Cum Supp) Freedom of Information Act. The District reserves the right to determine whether this information should be exempt from disclosure and no legal action may be brought against the District or its agents for its determination in this regard.

6. By submission of a bid, you are guaranteeing that all goods and services meet the requirements of the solicitation during the contract period.

7. This solicitation does not commit the District to award a contract, to pay any cost incurred in the preparation of the bid, or to procure or contract for goods or services listed herein.

8. CORRECTION OF ERRORS ON THE BID FORM: All prices and notations shall be printed in ink or typewritten. Errors should be crossed out, corrections entered and initialed by the person signing the bid. Erasures or use of typewriter correction fluid may be cause for rejection. No bid shall be altered or amended after specified time for opening.

9. BIDDERS SCHEDULE: Enter the manufacturer, brand, and model/catalog number, as applicable, and your bid price in the space provided on the bidder's schedule. Additional pages may be attached, when applicable, for alternates, etc.

10. NOTIFICATION: Intent to Award and/or Statement of Award will be posted on the Riverbanks Zoo & Garden website at http://www.riverbanks.org/procurement

11. RIGHT TO PROTEST: (does not apply to procurements $1-$50,000) Any prospective bidder, offeror, or contractor, who is aggrieved in connection with the solicitation of a contract shall protest in writing to the Procurement Manager within ten (10) calendar days of the date of issuance of the Invitation to Bid, Requests for Proposals or other solicitation documents, whichever is applicable, or any amendments thereto, if the amendment is at issue. Any actual bidder, offeror, or contractor, who is aggrieved in connection with the intended award or award of a contract, shall protest in writing to the Procurement Manager within ten (10) calendar days of the notification of Intent to Award or Statement of Award.

12. PROTEST PROCEDURE: A protest shall be in writing, submitted to the Procurement Manager, and shall set forth the specific grounds of the protest with enough particularity to give notice of the issues to be decided.

13. QUESTIONS REGARDING SPECIFICATIONS AND/OR THE BIDDING PROCESS:
    - To ensure fair consideration for all bidders the District prohibits any type of communications to or with any department, employee, or District official during the

solicitation process, except as provided on page one of the solicitation. This includes any communications initiated by a bidder to any District Official or employee evaluating or considering the bidder, prior to the time an award decision has been made public. **Failure to comply shall be grounds for disqualification of the offending bidder from consideration for award of the bid and/or any future solicitations.**

- Any communications between the bidder and the District shall be initiated by the Procurement Office or the appropriate District representative in order to obtain necessary information or clarification needed to develop a proper and accurate evaluation of the bid. **Failure to comply shall be grounds for disqualification of the offending bidder from consideration for award of the bid and/or any future solicitations.**

- It will be the sole responsibility of the bidder to contact the Procurement Office prior to submitting a bid to ascertain if any amendments have been issued in order to obtain all such documentation, and to return the executed documentation with their bid. All amendments will be posted on the Riverbanks Zoo & Garden website at: http://www.riverbanks.org/procurement

GENERAL PROVISIONS

1. The District reserves the right to reject any and all bids, to cancel a solicitation, and to waive any technicality if deemed to be in the best interest of the District.

2. Unit prices will govern over extended prices unless otherwise stated in this bid invitation.

3. PROHIBITION OF GRATUITIES: Amended section 8-13-700 and 705 of the 1976 Code of Laws of South Carolina states: "Whoever gives or offers to any public official or public employee any compensation including a promise of future employment to influence his action, vote, opinion or judgment as a public official or public employee or such public official solicits or accepts such compensation to influence his action, vote, opinion or judgment shall be subject to the punishment as provided by Section 16-9- 210 and Section 16-9-220."

4. BIDDERS QUALIFICATIONS: Consideration will be given only to the contractors who can produce conclusive evidence that they can meet the following requirements:

   4.1 Adequate capital and credit rating sufficient to complete all operations under this contract in a satisfactory manner.
   4.2 An efficient office force with satisfactory record in expediting delivery of materials to field force, and capable of fulfilling proper liaison service with mechanical trade.
   4.3 An adequate and efficient field force with extensive knowledge of all types of work involved under this contract.
   4.4 A record of amicable relations with labor.
   4.5 An adequate supply of applicable equipment in good operating condition to fulfill the contract.

5. LICENSES, PERMITS, INSURANCE, & TAXES: All costs for required licenses, permits, insurances and taxes shall be borne by the Contractor.

6. INSURANCE:

6.1 The amount and types of insurance required should be reasonably commensurate with the hazards and magnitude of the undertaking, but in no event of lesser amount nor more restrictive than the limits of liability and schedule of hazards below described. Without limiting its liability under the contract agreement, the Contractor shall procure and maintain, at its expense during the life of this contract, insurance of the types in the minimum amounts stated below:

SCHEDULE	**LIMIT**
WORKERS COMPENSATION	Statutory
As required by the State of South Carolina.	
COMPREHENSIVE GENERAL LIABILITY	
Premises Operations	$1,000,000 Single Limit
Contractual Liability	
Independent Contractors	
Personal Injury	
Products - Completed Operations	
AUTOMOBILE LIABILITY	
All Owned, Non-Owned, and Hired	$ 100,000 Combined

6.2 The Contractor's comprehensive general liability policy shall also include blanket contractual liability coverage or shall be endorsed to cover the liability assumed by the Contractor. Said insurance shall be written by a company or companies approved to do business in the State of South Carolina and acceptable to the District. Before commencing any work hereunder, certificates evidencing the maintenance of said insurance shall be furnished to the District. The District, its officials, employees and volunteers are to be covered as insured's as respects: liability arising out of activities performed by or on behalf of the contractor, including the insured's general supervision of the contract; products and completed operations of the contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the contractor. The coverage shall contain no special limitations on the scope of protection afforded the District, its officials, employees or volunteers. To accomplish this objective, the District shall be named as an additional insured under the Contractor's insurance as outlined above.

6.3 The contractor shall take out and maintain, during the life of this contract, the statutory Workmen's Compensation and Employer's Liability Insurance for all of his employees to be engaged in work on the project under this contract, and in case any such work is sublet, the contractor shall require the subcontractor similarly to provide Workmen's Compensation and Employer's Liability Insurance for all of the latter's employees to be engaged in such work.

6.4 Contractors insurance coverage shall be primary insurance as respects the District, it's officials, employees and volunteers. Any insurance or self-insurance maintained the District shall be in excess of the Contractor's insurance and shall not be required to contribute. To accomplish this objective, the following wording should be incorporated in the previously referenced additional insured endorsement:

Other Insurance: This insurance is primary, and our obligations are not affected by any other insurance carried by the additional insured whether primary, excess, contingent or on an other basis.

6.5 Each insurance required by the District shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to Riverbanks Zoo & Garden Procurement Office.

6.6 Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage's for subcontractors shall be subject to all the requirements stated herein.

6.7 All certificates and endorsements must be received and approved by the District within ten (10) days after notification of award.

6.8 The District, its officers and employees shall be named as an "additional insured" in the Automobile and General Liability policies, and it shall be stated on the Insurance Certificate with the provision that this coverage "is primary to all other coverage the District may possess".

7. BIDDERS RESPONSIBILITY: Each bidder shall fully acquaint himself with conditions relating to the scope and restrictions attending the execution of the work under the conditions of this bid. It is expected that this will sometimes require on-site observation. The failure or omission of a bidder to acquaint himself with existing conditions shall in no way relieve him of any obligation with respect to this bid or to the contract.

8. AWARD CRITERIA: The contract shall be awarded to the lowest responsible and responsive bidder(s) whose bid meets the requirements and criteria set forth in the Invitation for Bid. The award can be made to one or a multiple of contractors; whichever is in the best interest of the District, or unless otherwise stated on bidders' schedule.

If two or more bidders are tied in price while otherwise meeting all of the required conditions, awards are determined in the following order of priority:

8.1 If there is a South Carolina firm tied with an out-of-state firm, the award must be made automatically to the South Carolina firm.

8.2 Tie bids involving South Carolina produced or manufactured products, when known, and items produced or manufactured out of the State must be resolved in favor of the South Carolina commodity.

8.3 Tie bids involving a business certified by the South Carolina Office of Small and Minority Business Assistance as a Minority Business Enterprise must be resolved in favor of the Minority Business Enterprise.

8.4 Tie bids involving South Carolina firms must be resolved in favor of the South Carolina firm located closest to the District.

8.5 In all other situations in which bids are tied, the award must be made to the tied bidder offering the quickest delivery time, or if the tied bidders have offered the same delivery time, the tie must be resolved by the flip of a coin witnessed by the Procurement Manager. All responding vendors must be invited to attend.

9. WAIVER: The District reserves the right to waive any Instruction to Bidders, General or Special Provisions, General or Special Conditions, or specifications deviation if deemed to be in the best interest of the District.

10. COMPETITION: This solicitation is intended to promote competition. If any language, specifications, terms and conditions, or any combination thereof restricts or limits the requirements in this solicitation to a single source, it shall be the responsibility of the interested contractor to notify the Procurement Services Office in writing within five (5) days prior to the opening date. The solicitation may or may not be changed but a review of such notification will be made prior to the award.

11. REJECTION: The District reserves the right to reject any bid that contains prices for individual items or services that are inconsistent or unrealistic when compared to other prices in the same or other bids or ambiguous bids which are uncertain as to terms, delivery, quantity, or compliance with specifications may be rejected or otherwise disregarded if such action is in the best interest of the District.

GENERAL CONDITIONS

1. DEFAULT: In case of default by the contractor, the District reserves the right to purchase any or all items in default in the open market, charging the contractor with any excessive costs. Should such charge be assessed, no subsequent bids will be considered, or purchase orders issued to the defaulting contractor until the assessed charge has been satisfied.

2. NON-APPROPRIATION: Any contract entered into by the District resulting from this bid invitation shall be subject to cancellation without damages or further obligation when funds are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal period or appropriated year.

3. INDEMNIFICATION: The contractor agrees to indemnify and save harmless the District and all District officers, agents and employees from claims, suits, actions, damages and costs of every name and description, arising out of or resulting from the use of any materials furnished by the Contractor, provided that such liability is not attributable to negligence on the part of the District or failure of the District to use the materials in the manner outlined by the Contractor in descriptive literature or specifications submitted with the Contractor's bid.

4. CONTRACT ADMINISTRATION: Questions or problems arising after award of this contract shall be directed to the Procurement Manager. Copies of all correspondence concerning this contract shall be sent to, 400 Rivermont Drive, Columbia, SC 29210. All change orders must be authorized in writing by the Procurement Manager. The District shall not be bound to any change in the original contract unless approved in writing by the Procurement Manager.

5. PUBLICITY RELEASES: Contractor agrees not to refer to award of this contract in commercial advertising in such a manner as to state or imply that the products or services provided are endorsed or preferred by the User. The contractor shall not have the right to include the Districts name in its published list of customers without prior approval. With regard to news releases, only the name of the project and duration of contract may be used and then only with prior approval of the District. The contractor also agrees not to publish, or cite in any form, any comments or quotes from the Riverbanks Zoo & Garden Staff unless it is a direct quote from the Public Relations Officer.

6. QUALITY OF PRODUCT: Unless otherwise indicated in this bid it is understood and agreed that any items offered or shipped on this bid shall be new and in first class condition unless otherwise indicated herein.

7. S.C. LAW CLAUSE: Upon award of a contract under this bid, the person, partnership, association or corporation to whom the award is made must comply with the laws of South Carolina which require such person or entity to be authorized and/or licensed to do business with this State. Notwithstanding the fact that applicable statutes may exempt or exclude the successful bidder from requirements that it be authorized and/or licensed to do business in this State, by submission of this signed bid, the bidder agrees to subject himself to the jurisdiction and process of the courts of the State of South Carolina as to all matters and disputes arising or to arise under the contract and the performance thereof, including any questions as to the liability for taxes, licenses, or fees levied by the State.

8. ASSIGNMENT: No contract or its provisions may be assigned, sublet, or transferred without the written consent/Acknowledgement of the Procurement Manager.

9. AFFIRMATIVE ACTION: The successful bidder will take affirmative action in complying with all Federal and State requirements concerning fair employment and treatment of all employees, without regard or discrimination by reason of race, color, religion, sex, national origin or physical handicap.

10. BIDDING CONDITION OF PRICE: All bid prices submitted shall remain effective for a minimum period of 90 days, or until evaluation of bids is complete and award is made unless mutual consent of parties is established to extend due to unforeseen circumstances. Thereafter, the contract prices shall remain effective for the term of the contract.

11. 8% S.C. SALES TAX: The District shall add 8% sales tax to all orders; however lump sum bids shall include sales tax in bid price unless otherwise noted. **By submission of a signed proposal, you are certifying, under penalties of perjury that you comply with the SC Code of Laws 1976, as amended, relating to payment of any applicable taxes. This will certify to the District your compliance**.

    Forms to register for all taxes administered by the South Carolina Department of Revenue may be obtained by calling the License and Registration Section at (803) 898-5872 or by writing to the South Carolina Department of Revenue, Registration Unit, Columbia, South Carolina 29214-0140.

12. PAYMENT TERMS: Payment will be made within thirty (30) days after acceptance of completed order/project. Early payment discount, if available, will be calculated from date of acceptance. Application for payment shall reflect services completed through the last day of the month. **There will be no exceptions to these payment terms unless approval is obtained in writing from the Procurement Manager prior to bid opening date.**

13. BID REQUIREMENTS: Bid requirements on the equipment/goods/services specified are not intended to be restrictive to potential bidders but indicate the required features for satisfactory performance. The District will determine if minor deviations from these features are acceptable.

14. DEVIATIONS FROM SPECIFICATIONS: Any deviation from specifications indicated herein must be clearly pointed out; otherwise, it will be considered that items offered are in strict compliance with these specifications, and successful bidder will be held responsible, therefore. Deviations must be explained in detail on separate attached sheet(s). The listing of deviations, if any, is required but will not be construed as waiving any requirements of the specifications. Deviations found in the evaluation of the bid and not listed may be cause for rejection. Bidders offering substitute or equal items must provide information sufficient enough to determine acceptability of item offered.

15. CONTRACT: This bid, contract and submitted documents, when properly accepted by the District along with a written purchase order, shall constitute a contract equally binding between the successful offeror, and the District. No different or additional terms will become a part of this contract with the exception of a Change Order.

16. CHANGE ORDERS: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing by the Procurement Manager.

17. AMENDMENTS: All amendments to and interpretations of this solicitation shall be in writing and issued by the Procurement Manager. The District shall not be legally bound by any Amendment or interpretation that is not in writing.

18. BID EVALUATION: Bids received will be evaluated by the Procurement Manager. However, based on bid total, final decision for bid award may rest with the Richland-Lexington Riverbanks Park Commission. Factors to be considered during the evaluation process include, but are not limited to:

18.1 - Cost.
18.2 - Reputation and dependability of the contractor
18.3 – Past performance

19. ARBITRATION: Under no circumstances and with no exception will the District act as arbitrator between the Contractor.

20. SHIPPING: All deliveries shall be shipped F.O.B. point Destination-freight prepaid; the seller pays and bears all freight charges; collect shipments will not be accepted. It is agreed by the parties hereto that delivery by the contractor to the common carrier does not constitute delivery to the District. Any claim for loss or damage shall be between the contractor and the carrier.

21. "OR APPROVED EQUAL": Certain processes, types of equipment or kinds of material are described in the specifications and/or on the drawings by means of trade/brand names and catalog numbers. In each instance where this occurs, it is understood and inferred that such description is followed by the words "or approved equal". Such method of description is intended merely as a means of establishing a standard of comparability. However, the Owner reserves the right to select the items, which, in the judgment of the Owner, are best suited to the needs of the Owner, based on price, quality, service, availability, standardization and other relative factors. Bidders should indicate brand name, model, model number, size, type, weight, color, etc., of the item bid, if not exactly the same as the item specified. Vendor's stock number or catalog number is not sufficient to meet this requirement. If any bidder desires to furnish an item different from the specifications, vendor should submit along with the bid, the information, data, pictures, designs, cuts, etc., of the material they plan to furnish to enable the Owner to compare the material specified; and such material shall be given due consideration. The Owner reserves the right to insist upon and receive items as specified if the submitted items do not meet the Owner's standards for acceptance.

22. ALTERNATE BIDS: Bidders wishing to submit an alternate for consideration that does not meet the District's specifications (or approved deviations), must submit their proposal as an alternate bid. **This must be properly marked on both the sealed envelope and the Bidder's Schedule and submitted separately from any other bid. Failure to comply shall be grounds for being deemed non-responsive.**

23. DRUG-FREE WORKPLACE: By submittal of this bid, you are certifying that you will comply with Title 44, Code of Laws of South Carolina, 1976, Section 44-107-30.

24. ILLEGAL IMMIGRATION & PUBLIC CONTRACTS: In accordance with the South Carolina Illegal Immigration Reform Act, 2008, Act No. 280. Section 3 of this Act added to Chapter 14 to Title 8 of the South Carolina Code of Laws prohibits covered persons from entering into covered contracts unless the contractor agrees either (a) to verify all new employees through the federal work authorization program [and requires the same from subcontractors and sub-subcontractors] or (b) to employ only qualifying workers. Effectively, the Act also requires contractors to agree to provide any documentation required to establish either (a) that the Act does or does not apply to the contractor, subcontractor, or sub-subcontractor; or (b) that the contractor, and any subcontractor or sub-subcontractor, are in compliance with Section 3 of the Act."

25. NO CONTACT POLICY: After the date and time established for receipt of proposals by the District, any contact initiated by any offeror with any District representative, other than the Purchasing Department representative listed herein, concerning this solicitation is prohibited. Any such unauthorized contact may cause the disqualification of the offeror from this procurement transaction.

26. TERMINATION: Subject to the provisions below, the contract may be terminated for any reason by the District providing a 30-day advance notice in writing is given to the contractor.

    26.1 Termination for Cause: Termination by the District for cause, default or negligence on the part of the contractor shall be excluded from the foregoing provisions, termination costs, if any, shall not apply. The thirty (30) days advance written notice requirement is waived and the default provision in this bid shall apply; see General Conditions.

26.2 Termination for Convenience: The District, by written notice, may terminate this contract in whole or in part, when it is in the best interest of the District.

26.3 Termination requirement does not apply if contract is to terminate at the end of an established contract term.

26.4 Termination for Non appropriations: If the District fails to appropriate or authorize the expenditure of sufficient funds to provide the continuation of this contract, or if a lawful order issued in or for any fiscal year during the term of the contract reduces the funds appropriated or authorized in such amount as to preclude making the payments set out therein, the contract shall terminate on the date said funds are no longer available without any termination charges or other liability incurring to the District. Any termination for non-appropriations shall not prohibit the District from obtaining services from another source or in another manner, which is in the best interest of the District.

SCOPE OF WORK

INTENT:
Riverbanks Zoo and Garden is seeking a contractor to demolish and build a new hay barn attached to the existing Giraffe Barn on the existing footprint and will be conducted in two (2) phases.

Phase One- To accomplish this, a doorway must be closed with Concrete Masonry Unit (CMU), a heavy-duty metal door installed on the upper landing level and a new set of stairs and landings leading to the giraffe upper level must first be built so that Giraffe operations continue without interruption. See Exhibit A for Drawings and Speciation's.

Phase Two- Once the stairs and landings are complete, the demo phase for the existing barn can begin. The current mostly wooden barn will be replaced with a concrete and CMU barn with metal roof. During demo and construction, the utilities supplying the Giraffe barn and surrounding area must be protected and remain active. Some water lines will need to be moved and reinstalled same day to support the giraffe operation. See Exhibit B for Drawings and Speciation's.

REQUIREMENTS:

- Work hours are Monday through Friday 7am till 5pm with some exceptions permittable. Work which requires being in the Giraffe barn will be more restricted if Giraffes cannot be on exhibit and must remain in the barn. Those hours are Monday through Friday 8:30am till 4:30pm to allow for giraffe routine to be consistent.

- Demo methods should be planned so that loud and sudden noises are prevented. Any equipment that generates loud noise through its operation must be preapproved. If the noise is from an issue with the machine it will need to be replaced or repaired.

- Material availability should be verified to prevent delays during construction as cooler weather could impact the work schedule.

- Contractor must have a single point of contact on site at all times work is being performed.

- Bidders shall refrain from direct or indirect communications promoting their qualifications for this Project to the District or any member of the Lexington-Richland Riverbanks Park Commission, other than through the formal submittal process established by this Invitation for Bid (IFB). Failure to comply with submittal requirements may cause the submittal to be removed from further consideration.

- Contractor to submit documents and secure permit for entire project.
- The selected contractor must hold the required license(s) for demolition and construction of the hay barn.
- Contractor must be bondable, a certified contractor and have personnel on site who hold the necessary OSHA required certifications to safely perform the work.
- Must have an Experience Modifier Rate (EMR) of less than one (1).
- The contractor should submit as a part of the bid package the safety program to be used on this site to ensure workplace safety.
- Contractor's site superintendent shall coordinate all activities with Zoo Project Manager.
- All deliveries must be made before 7:00 AM or after 7:00 PM est.
- Riverbanks Zoo and Garden is a smoke free facility.

CONSIDERATIONS:

- The area around the hay barn is open to Riverbanks employees so deliveries, work practices, application processes and behavior of staff will be closely monitored by the Project Manager to ensure the quality of the staff environment.
- Jobsite is in a non-public area with direct access to the back service road. Work vehicles carrying tools and supplies will be allowed to park at site. Active workers only will be allowed inside perimeter fence, no family or pets are allowed within the perimeter fence.

OBLIGATION:

- Riverbanks Zoo and Garden makes no guarantees as to the correctness of the information and materials identified in this specification. It shall be the contractor's responsibility to ascertain the full extent of this job.

REGULATIONS AND STANDARDS:

- The work shall comply with all laws, ordinances and regulations of all legally constituted authorities having jurisdiction over any part of this work, County and State level. These requirements supplement the specifications and shall take precedence in case of conflict.
- All work shall be performed and completed in a thoroughly workmanlike and professional manner in accordance with best modern practices, regardless of any omissions from the attached specifications and/or drawings. All material and equipment shall be new and shall comply with the applicable standard in every case where such a standard has been established for the particular type of material in question.
- Safety Department to review fall protection plans specific to this project as requested. The Zoo Project Manager to final approve all aspects of the project including changes and payments.
- The Bidder shall supply for review, all SCOSHA written programs as applicable to include, but not limited to, the following OSHA standards; Walking-Working Surfaces (Fall Protection), Control of Hazardous Energy (Lockout/Tagout), Personal Protective Equipment and Permit-required Confined Spaces.

SITE CLEAN UP:

- The contractor shall keep the job site clean and free from an accumulation of debris or materials during the project. At the completion of the work, the entire facility and premises shall be left clean.

- The contractor shall remove from the premises all accumulations of trash and other materials, which are not to be used in the project, daily.

CONTRACTOR'S CARE:

- Contractor shall exercise due care in protecting all trees, property, and surrounding property. Contractor will be responsible for any damage and will be required to restore any damage. If the Contractor fails or refuses to repair any damage promptly, the Project Manager may have the necessary work performed and charge the cost thereof to the contractor.

FINAL INSPECTION:

- At the completion of the contract work, a representative of Riverbanks Zoo and Garden shall accompany the contractor on an inspection of the work. All defects found in the work will be corrected before final payment will be authorized.

BIDS MUST INCLUDE

- Solicitation name and number clearly marked on the outside of the envelope
- One hard copy and one digital (i.e. thumb drive)
- A schedule showing phases and duration
- A written introduction summarizing your company's background, resources and relevant experience.
- Three examples of past or current projects of similar size and scope, and the timelines under which they were completed
- Three references from past projects
- MBE/DBE/WBE Cultivation Plan- The owner is committed to cultivating MBE/DBE/WBE involvement in all aspects of owner's operations. Explain how your firm will cultivate MBE/DBE/WBE participation in the Greenhouse.
- A single point of contact – name, title, phone and email address must be included.

HOURS OF OPERATION:

Riverbanks Zoo and Garden is open Monday through Sunday from 9:00 am to 5:00 pm and closed on Thanksgiving and Christmas Days.

DISPOSAL OF WASTE:

- The Contractor will ensure proper handling and disposal of materials removed from the containers to prevent discharges of pollutants to surface waters or groundwater.

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENT:

- Contractor shall comply with current and future requirements of the City of Columbia, City of West Columbia and State of South Carolina's NPDES permits (if any) as it may be amended from time to time.

Procurement Services
400 Rivermont Drive, Columbia, SC 29210
Phone: 803-602-0831 Fax: 803-771-8722

BIDDERS SCHEDULE

BID NUMBER: B2022-06-12 **DATE: 06/24/2022**

OPENING DATE AND TIME: August 8, 2022, 10:00 AM (EST)

OPENING LOCATION: Riverbanks Zoo & Garden
Procurement Services
400 Rivermont Drive
Columbia, SC 29210

PROCUREMENT: Under a fixed price contract provide all materials, equipment, and labor for the demolition and construction of a new hay barn in accordance with the specifications, conditions, and provisions as applicable to this solicitation. All prices are to include all applicable transportation, recycle and disposal costs. **Submit one (1) hard copy and one (1) digital copy.**

Delivery Requirements: All deliveries shall be shipped F.O.B. point Destination-freight prepaid; the seller pays and bears all freight charges; collect shipments will not be accepted. It is agreed by the parties hereto that delivery by the contractor to the common carrier does not constitute delivery to the District. Any claim for loss or damage shall be between the contractor and the carrier.

ITEM NUMBER	QTY U/I	DESCRIPTION MFG/MDL/STK #	PRICE
#1:	**EA**	**Demolition and Construction of Hay Barn**	

Total Price Written: _____

COMPANY: _____

AUTHORIZED SIGNATURE: _____

The attached Certificate of Familiarity must be returned with bid.

SOLICITATION NUMBER: B2022-06-12 **DATE: June 24, 2022**

CERTIFICATE OF FAMILIARITY

The undersigned, having fully familiarized himself with the information contained within this entire solicitation and applicable amendments, submits the attached bid and other applicable information to the District, which I verify to be true and correct to the best of my knowledge. I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm or person submitting a bid for the same materials, supplies or equipment, and is in all respects, fair and without collusion or fraud. I agree to abide by all conditions of this bid and certify that I am authorized to sign this bid. I further certify that this bid is good for a period of ninety (90) days, unless otherwise stated.

Company Name as registered with the IRS	Authorized Signature
Correspondence Address	Printed Name
City, State, Zip	Title
Date	Telephone Number Fax Number
Remittance Address	E-mail Address (PLEASE PRINT)
City, State, Zip	
Telephone Number	Toll-Free Number if available
Federal Tax ID Number	SC Sales and Use Tax Number

INTENTIONALLY LEFT BLANK

Richland-Lexington Riverbanks Park District

B2022-06-12
Hay Barn

LIST OF REFERENCES

Please list four (4) references that your company has recently or currently provided similar products and/or services for.

_____ Company Name	_____ Company Name
_____ Representative	_____ Representative
_____ Address	_____ Address
_____ City, State, Zip Code	_____ City, State, Zip Code
_____ Telephone # / Fax #	_____ Telephone # / Fax #
_____ E-Mail Address	_____ E-Mail Address
_____ Company Name	_____ Company Name
_____ Representative	_____ Representative
_____ Address	_____ Address
_____ City, State, Zip Code	_____ City, State, Zip Code
_____ Telephone # / Fax #	_____ Telephone # / Fax #
_____ E-Mail Address	_____ E-Mail Address

COMPANY: _____

AUTHORIZED SIGNATURE: _____

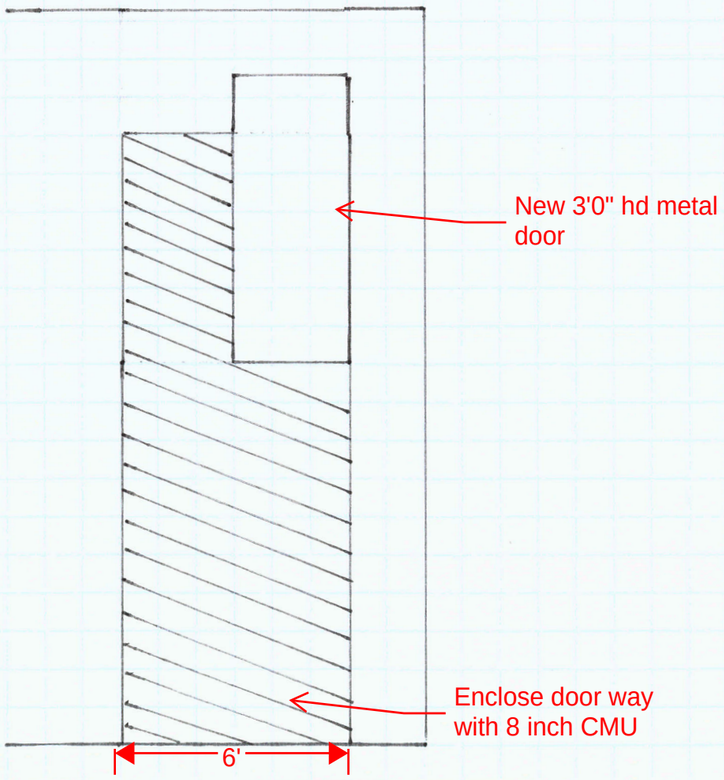
EXHIBIT A

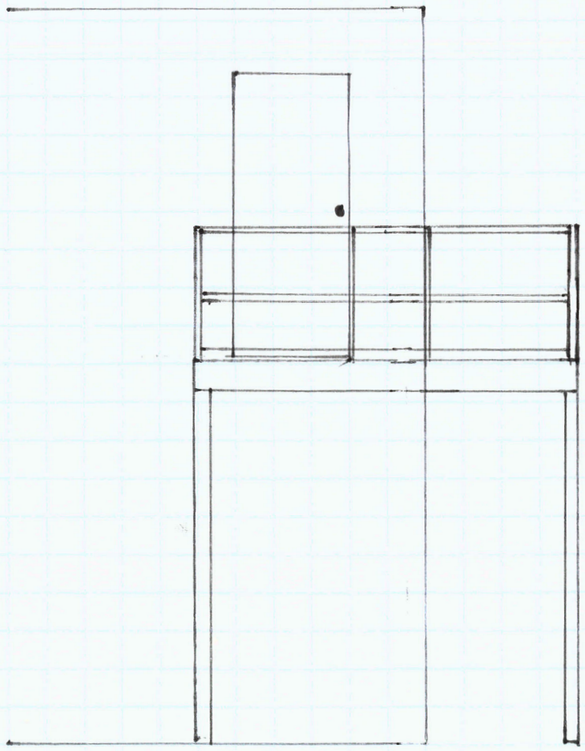
Notes:

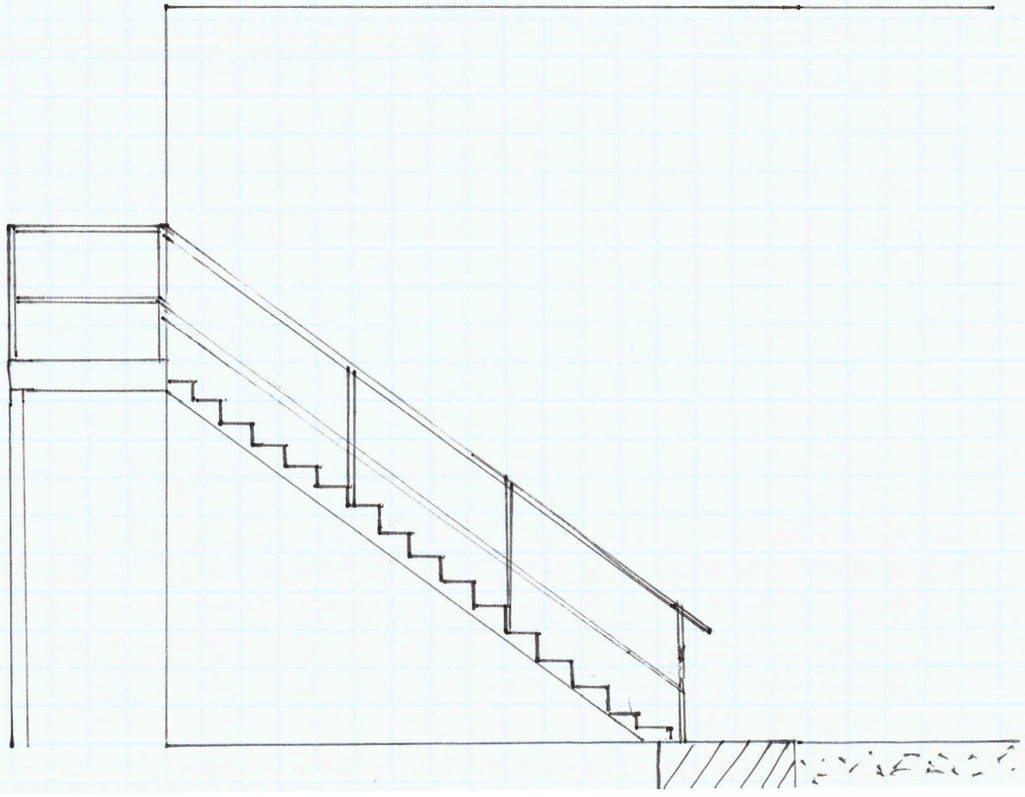
1- Demo sliding door, frame and track, dispose of off site
2- Enclose opening with 8 inch block.
3- Establish new door opening, coordinate height with catwalk height inside barn.
4- New door to be HD Metal with lockset for a schlage E key way
5-Door and walls to be primed and painted to match existing building color
6- Existing concrete and asphalt to be cut and removed for installation of foundations for supports and stairs

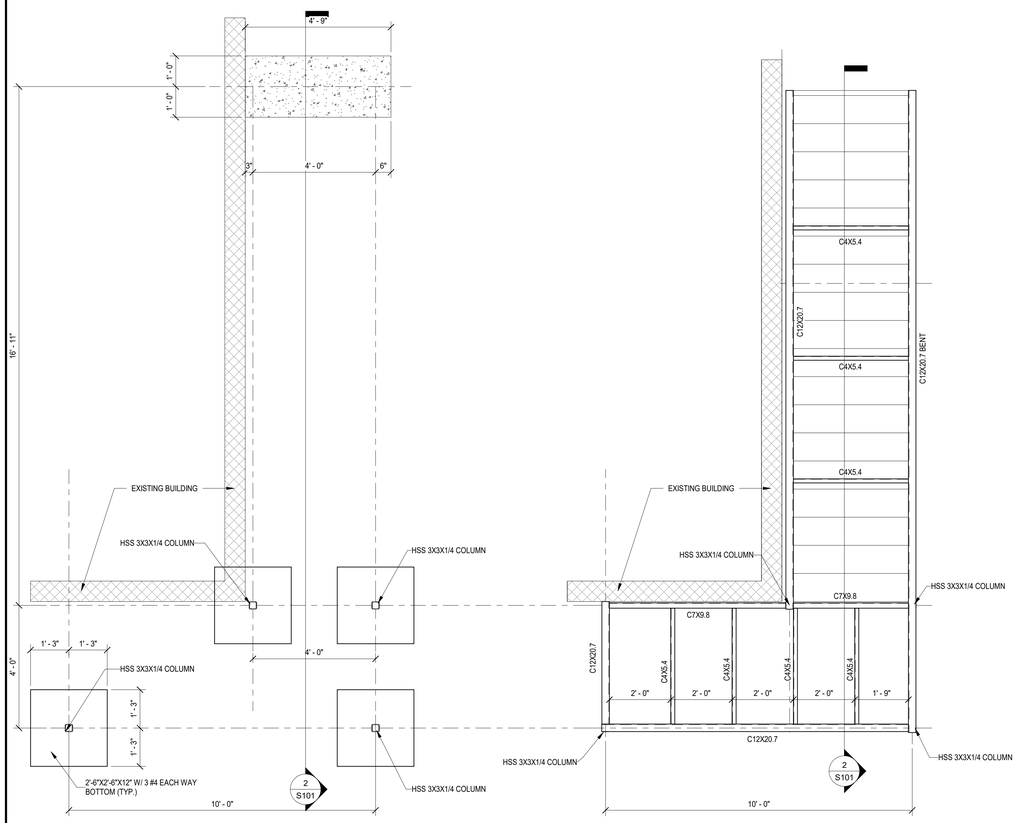
1/4 inch equals 1 foot

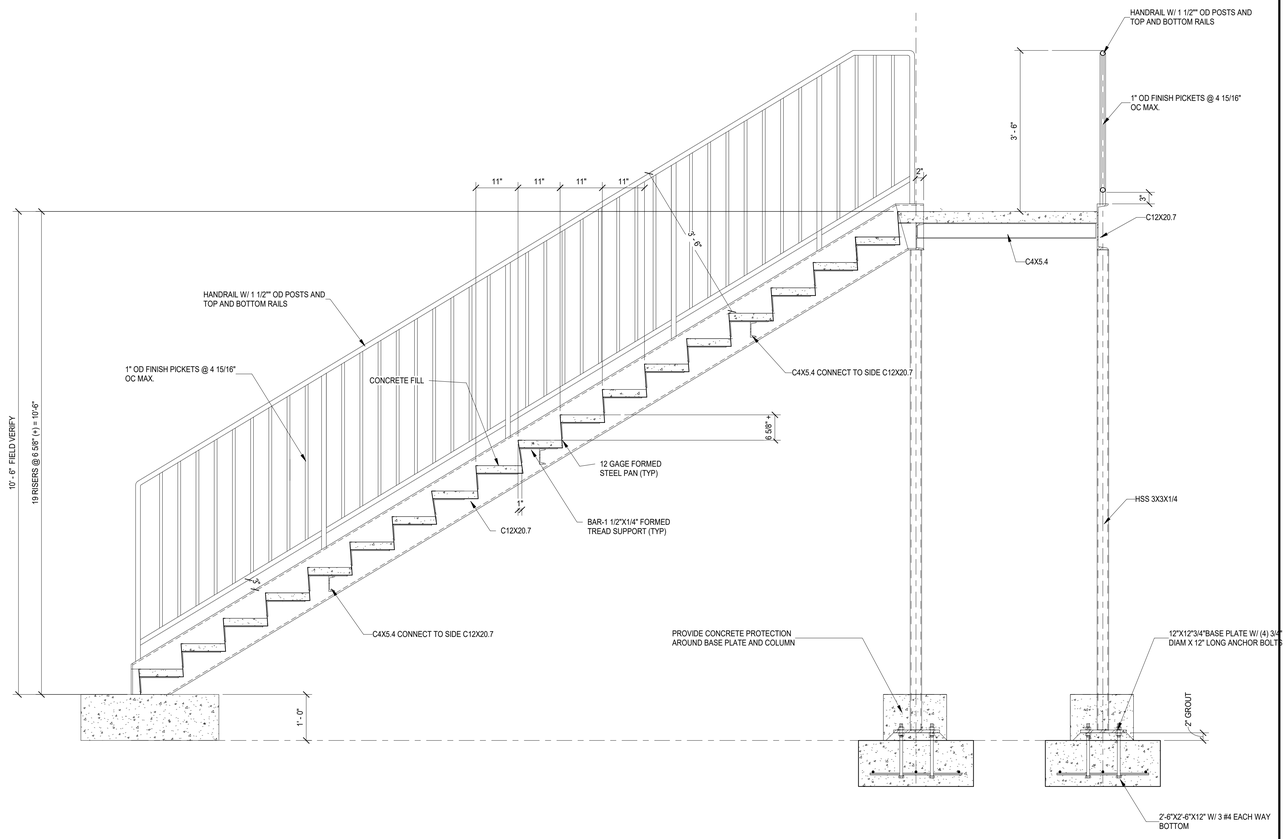
All measurements to be field verified





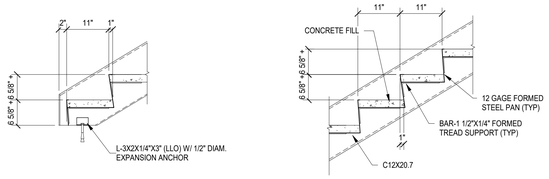






1 STAIR PLANS
S101 — 1/2" = 1'-0"

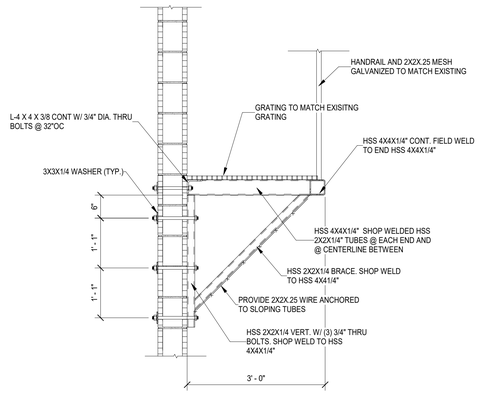
NOTES:
1. ALL STEEL TO BE HOT DIPPED GALVANIZED



3 STAIR DETAILS
S101 — 3/4" = 1'-0"

2 STAIR SECTION
S101 — 3/4" = 1'-0"

NOTES:
1. ALL STEEL TO BE HOT DIPPED GALVANIZED



4 CATWALK
S101 — 3/4" = 1'-0"

NOTES:
1. ALL STEEL TO BE HOT DIPPED GALVANIZED

GENERAL NOTES

1. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS RELATED TO EXISTING CONSTRUCTION.
2. DESIGN CRITERIA
   - A. BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE
   - B. RISK CATEGORY: III
   - C. SEISMIC DESIGN DATA:
     - a. IMPORTANCE FACTOR: 1.25
     - b. S_S = 0.346 S_1 = 0.113
     - c. SD_S = 0.30 SD_1 = 0.113
     - d. SITE CLASS C, SEISMIC DESIGN CATEGORY B
   - D. WIND VELOCITY 125 MPH, EXPOSURE C, INTERNAL PRESSURE COEFFICIENT +/- 0.18.
   - E. ROOF LIVE LOAD: 20 PSF
   - F. GROUND SNOW LOAD: 10 PSF
3. FOUNDATION DESIGN IS BASED ON THE ASSUMED ALLOWABLE BEARING PRESSURE LISTED BELOW. CONTRACTOR SHALL HIRE AN INDEPENDENT TESTING LABORATORY, ACCEPTABLE TO THE ARCHITECT, TO VERIFY THE ALLOWABLE BEARING PRESSURE BEFORE FOOTINGS ARE CONSTRUCTED OR REINFORCING IS FABRICATED.
   - A. ASSUMED ALLOWABLE BEARING PRESSURE = 2500 PSF
   - B. STEP FOOTINGS AS REQUIRED TO LET UTILITIES PASS OVER FOOTINGS.
4. CONCRETE: 28-DAY COMPRESSIVE STRENGTHS SHALL BE AS FOLLOWS:
   - A. ALL CONCRETE: 3000 PSI, NORMAL WEIGHT
5. CONCRETE REINFORCING STEEL
   - A. ASTM A615, GRADE 60, EXCEPT WHERE REINFORCING IS SHOWN TO BE WELDED, USE ASTM A706 WELDABLE REINFORCING. DO NOT WELD OR TACK WELD ANY REINFORCING NOT SHOWN ON THE DRAWINGS TO BE WELDED.
   - B. DETAIL IN ACCORDANCE WITH ACI DETAILING MANUAL, LATEST EDITION.
   - C. LAP ALL BARS WITH CLASS B SPLICES UNLESS NOTED OTHERWISE.
   - D. PROVIDE CORNER BARS OF SAME SIZE AND SPACING AS HORIZONTAL REINFORCING AT ALL WALLS AND FOOTING INTERSECTIONS. LAP WITH CLASS B SPLICES.
6. STRUCTURAL STEEL
   - A. MATERIALS:
     - a. PIPE: ASTM A53, GRADE B
     - b. TUBE: ASTM A500, GRADE C
     - c. WIDE FLANGES AND TEES: ASTM A992, GRADE 50
     - d. OTHER: ASTM A36
   - B. FABRICATION SHALL BE IN ACCORDANCE WITH AISC SPECIFICATIONS.
   - C. BOLTED CONNECTIONS: ASTM A325, 3/4" DIAMETER, SNUG-TIGHTENED, BEARING TYPE CONNECTIONS WITH THREADS IN THE SHEAR PLANE UNLESS NOTED OTHERWISE.
7. WELDED CONNECTIONS: E70XX ELECTRODES. ELECTRODES USED FOR WELDING A992 STEEL SHALL BE LOW HYDROGEN ELECTRODES.

REVISIONS	BY

Seal

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER KENNETH WILLIAM TIMMERMAN No. 11150

SOUTH CAROLINA TIMMERMAN STRUCTURAL ENGINEERING GROUP No. 5537 CERTIFICATE OF AUTHORIZATION

TSEG #22-536

JOB TITLE:

RIVERBANKS ZOO STAIR
COLUMBIA, SOUTH CAROLINA

IMMERMAN
Structural Engineering Group
560 Chris Dr. West Columbia S.C. 29169
Ph. (803)791-4511 Fax (803)791-4522

Drawing Title:
STEEL STAIR AND CATWALK ADDITION

Scale:	AS NOTED
Job Number:	22-536
Designed By:	LWK
Drawn By:	LWK
Checked By:	KWT
Date:	Issue Date

Sheet Number:
S101
of

NEW CONSTRUCTION SHALL MEET
BUILDING CODE IBC 2018 REQUIREMENTS 2009 IECC OR ASHRAE 90.1 2007
BUILDING CODE INFORMATION - IBC 2018
2614 sf -Total square feet IBC 2018- Sect. 303.3 page 41 Occupancy classification: S1 -Storage IBC 2018- chapter 6, section 602.4, Table 601 Construction Type: Va- unsprinklered IBC 2018- chapter 5, section 504.3, Table 506.2 Building Height: max allowed (3 story) Building Height: 2 story actual New Building - Exterior - CMU walls ,concrete floors, steel columns, beams and roof joists - metal roof
IBC 2018- chapter 5, section 504.3, 506.2
Building Area Allowed: 9,000 sf max IBC 2018- chapter 5, section 506.2.1 Building Area Actual: 2614 sf
EGRESS -
IBC 2018 - CHAPTER 10, TABLE 1004.1.2 1 EXIT REQUIRED - 1 PROVIDED- SECTION 1006.2.1 EGRESS WIDTH PROVIDED = 34" EGRESS WIDTH PER OCCUPANT REQUIRED = .015/PER 100' TO EXIT MAX. - TABLE 1017.2 EMERGENCY LIGHTS REQUIRED 34" WIDTH ,REQ. = 34" EXIT WIDTHS PROVIDED ,CORRIDOR WIDTH MIN. 44"
FIRE AREAS AND ALARMS
IBC 2018 - CHAPTER 7 2 HOUR RATED FIRE SEPERATION REQUIRED - EXISTING BUILDING - 2 HR WALL FIRE ALARM SYSTEM- FIRE ALARM PROVIDED EXISTING SHALL MEET NFPA 72 CODE REQUIREMENTS
OCCUPANT LOAD
OCCCUPANCY TYPE - Storage Total - 2614/300 = 9 Occupants ALL AREAS - TOTAL - 9 OCCUPANTS TOTAL
PLUMBING CODE INFORMATION - IBC CHAPTER 29, TABLE 290.2.1
no plumbing facilities is required - no occupants occupy storage facility

ALL PLUMBING WORK SHALL MEET INTERNATIONAL PLUMBING CODE REQUIREMENTS.
ALL ELECTRICAL WORK SHALL MEET INTERNATIONAL ELECTRICAL CODE REQUIREMENTS.
PROVIDE: EXIT LIGHTS W/ BATTERY BACK-UPS AT ALL EXITS,
EMERGENCY LIGHTS IN ALL INTERIOR AREAS REQUIRED FOR EGRESS- MIN. 1 FT CANDLE
EMERGENCY LIGHTS AT ALL EXTERIOR EGRESS AREAS
EMERGENCY LIGHTS AS SHOWN ON PLAN
PROVIDE INTERIOR DOORS HARDWARE (LEVER SET) THAT MEETS ADA CODE REQUIREMENTS
PROVIDE DOOR HARDWARE AT EXIT DOORS TO MEET CODE REQUIREMENTS
PROVIDE SAFETY FALL PROTECTION RAILS AT ROLL-UP DOOR ON SECOND FLOOR
PROVIDE SAFETY FALL PROTECTION RAILS AT ROOF HATCH IF REQUIRED BY CODE.

EXHIBIT A

RIVERBANKS ZOO

NEW HAY BARN

500 WILDLIFE PARKWAY
COLUMBIA , SC

DRAWING INDEX

CO COVER SHEET

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A2 NEW FLOOR PLANS
A3 ELEVATIONS
A4 DEMOLITION AND ROOF PLAN
A5 DETAILS
A6 SPECIFICATIONS
A7 SPECIFICATIONS
A8 SPECIFICATIONS
A9 SPECIFICATIONS

STRUCTURAL

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S1.1 FRAMING PLAN
S2.0 FOUNDATION SECTIONS
S2.1 SECTION CONTINUED
S2.2 TYPICAL DETAILS
S3.0 NOTES
S3.1 SPECIAL INSPECTIONS

PLUMBING

P1 PLUMBING DEMOLITION FLOOR PLAN
P2 PLUMBING FLOOR PLAN
P3 PLUMBING SCHEDULES AND DETAILS
P4 PLUMBING SPECIFICATIONS

ELECTRICAL

E1 LEGEND
E2 LIGHTING PLAN
E3 POWER PLAN
E4 SCHEDULES AND DETAILS

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821 KINLOCK CT.
COLUMBIA, SOUTH CAROLINA 29223
803.447.4817 SimkinsR@aol.com

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ROBERT DUMOUCHEL SIMKINS
COLUMBIA, SC
No. 4919
REGISTERED ARCHITECT

3/01/2022

STATE OF SOUTH CAROLINA
RDS DESIGN
COLUMBIA, SC
No. 00099
REGISTERED ARCHITECT

RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
COVER SHEET

DRAWN BY RS
DATE 3/01/22

SHEET NO. | OF
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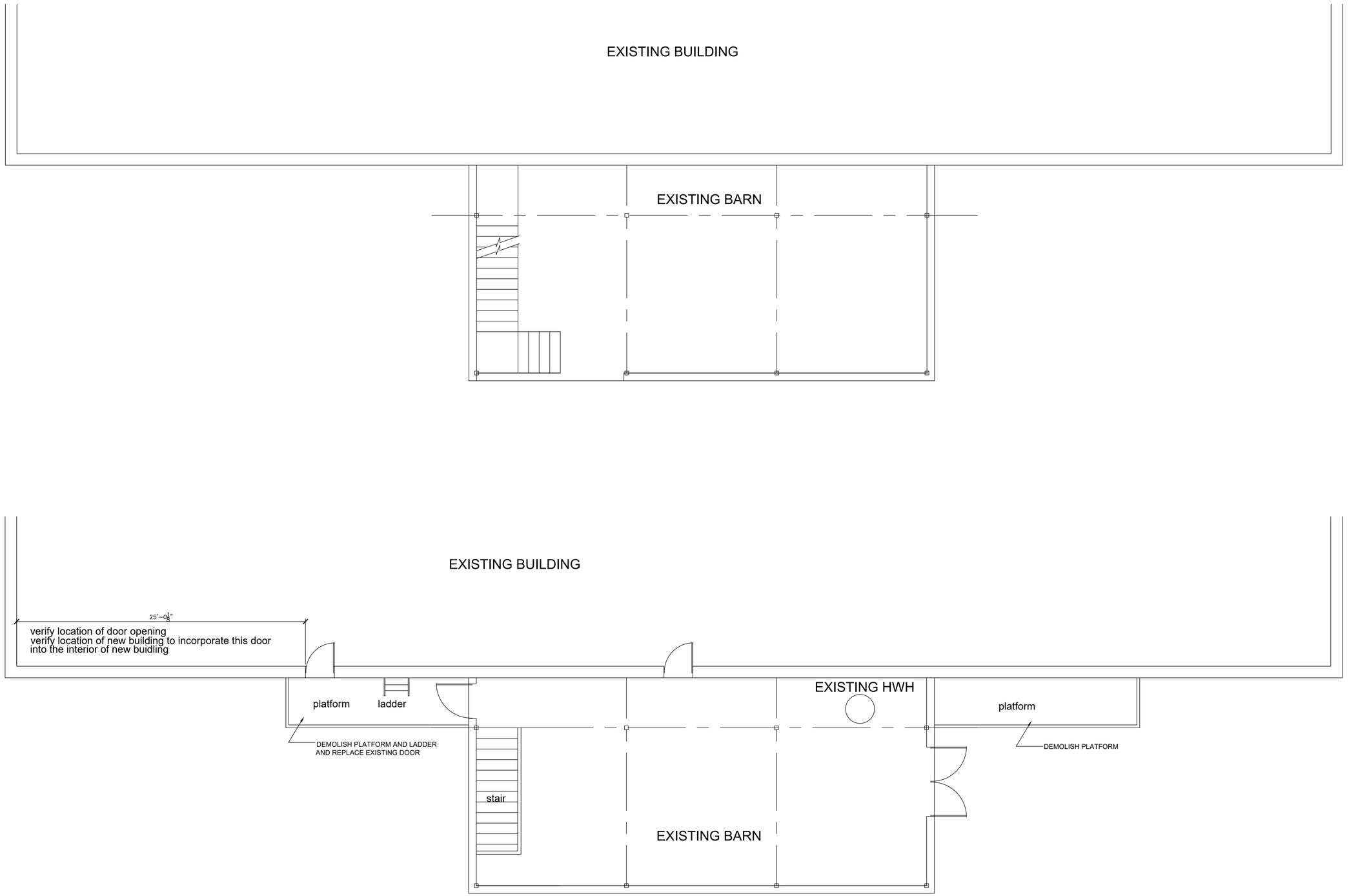

SECOND FLOOR PLAN -EXISTING
SCALE: 1/4"=1'-0"

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SHEET TITLE:
EXISTING FLOOR PLANS

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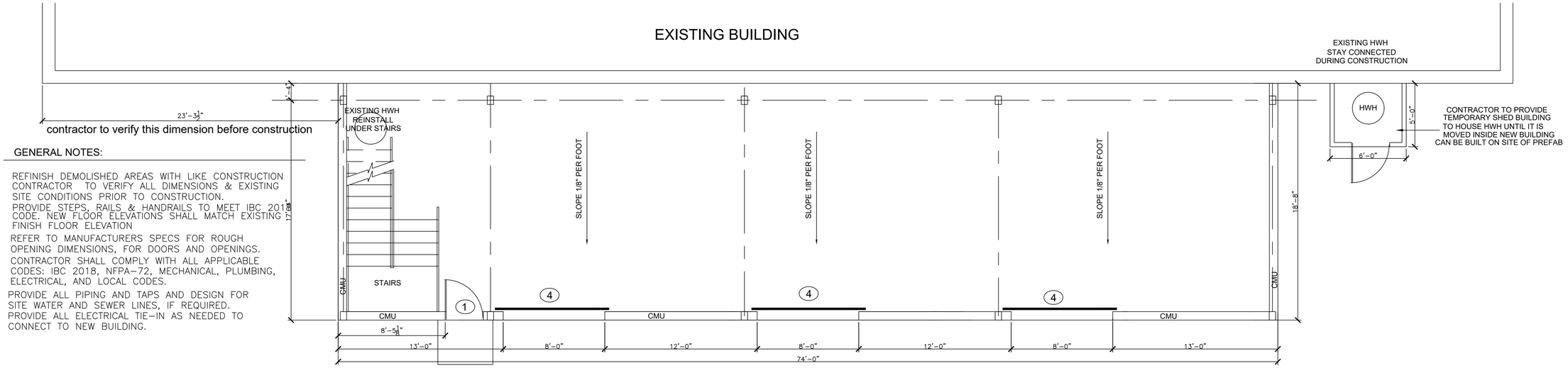
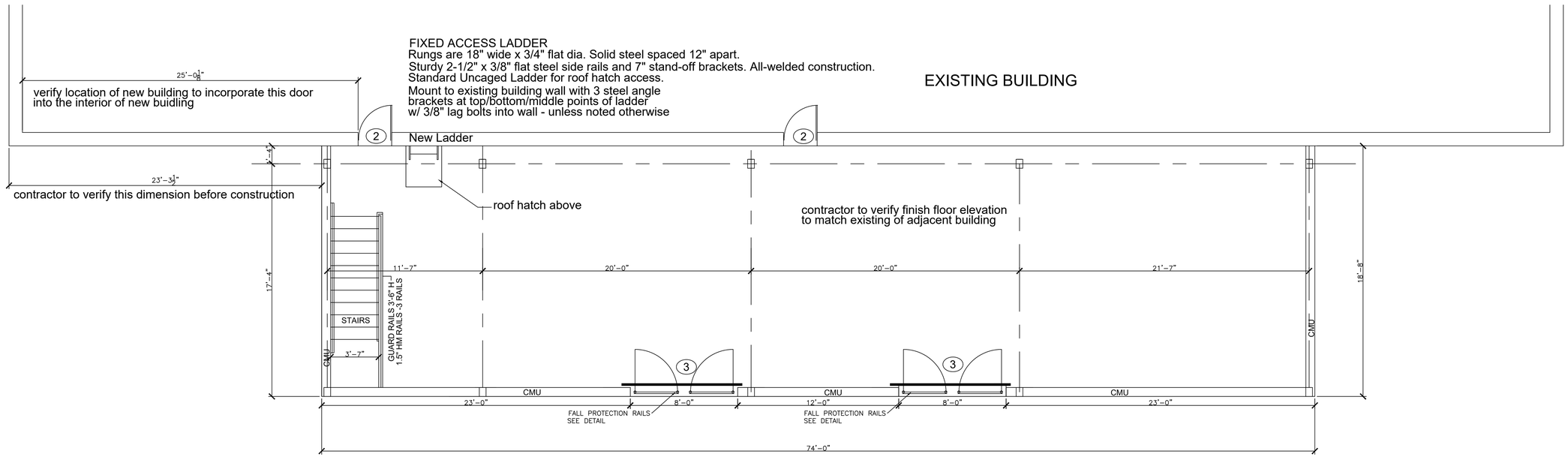
SHEET NO. A1 OF



FIRST FLOOR PLAN - NEW
SCALE: 1/4"=1'-0" 1307 sf



FIXED ACCESS LADDER
Rungs are 18" wide x 3/4" flat dia. Solid steel spaced 12" apart.
Sturdy 2-1/2" x 3/8" flat steel side rails and 7" stand-off brackets. All-welded construction.
Standard Uncaged Ladder for roof hatch access.
Mount to existing building wall with 3 steel angle
brackets at top/bottom/middle points of ladder
w/ 3/8" lag bolts into wall - unless noted otherwise

SECOND FLOOR PLAN - NEW
SCALE: 1/4"=1'-0" 1307 sf

GENERAL NOTES:

REFINISH DEMOLISHED AREAS WITH LIKE CONSTRUCTION
CONTRACTOR TO VERIFY ALL DIMENSIONS & EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
PROVIDE STEPS, RAILS & HANDRAILS TO MEET IBC 2018 CODE. NEW FLOOR ELEVATIONS SHALL MATCH EXISTING FINISH FLOOR ELEVATION
REFER TO MANUFACTURERS SPECS FOR ROUGH OPENING DIMENSIONS, FOR DOORS AND OPENINGS.
CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES: IBC 2018, NFPA-72, MECHANICAL, PLUMBING, ELECTRICAL, AND LOCAL CODES.
PROVIDE ALL PIPING AND TAPS AND DESIGN FOR SITE WATER AND SEWER LINES, IF REQUIRED.
PROVIDE ALL ELECTRICAL TIE-IN AS NEEDED TO CONNECT TO NEW BUILDING.

GENERAL NOTES:

1. ALL NEW WORK SHALL CONFORM TO 2018 IBC BUILDING CODE REQUIREMENTS.
INCLUDING ALL SLAB FOUNDATIONS, BEAMS, WALLS, DOORS ETC.
INCLUDING ALL ELECTRICAL, MECHANICAL, AND PLUMBING LINES
ALL PLUMBING WORK SHALL MEET INTERNATIONAL PLUMBING CODE REQUIREMENTS.
ALL ELECTRICAL WORK SHALL MEET INTERNATIONAL ELECTRICAL CODE REQUIREMENTS.
ALL FIRE ALARM SYSTEM MEET NFPA 72 REQUIREMENTS.

2. CONTRACTOR SHALL VERIFY WORK SCHEDULE WITH CLIENT A MINIMUM OF 24 HOURS WORK BEGINS. STANDARD WORK HOURS ARE M-F 8AM TO 4PM
ANY ADDITIONAL NON STANDARD WORK HOURS MUST BE REQUESTED AND APPROVED BY OWNER.
COORDINATE ACCESS/DELIVERIES AND EQUIPMENT LAYDOWN AREAS WITH OWNER.

3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE ANY WORK BEGINS.
4. CONTRACTOR SHALL INSTALL ALL ITEMS PER MFG. INSTRUCTIONS.
5. CONTRACTOR SHALL VERIFY ALL EXISTING WATER/SEWER/ELECTRICAL AND UNDERGROUND UTILITY LOCATIONS BEFORE STARTING ANY DEMOLITION OR NEW WORK.
6. CONTRACTOR SHALL REROUTE THE EXISTING WATER AND SEWER LINE SO IT IS OPERABLE TO PROVIDE WATER AND SEWER TO EXISTING BUILDING HOT WATER HEATER THAT WILL BE MOVED TO A TEMPORARY LOCATION DURING CONSTRUCTION. CONTRACTOR SHALL MOVE WATER HEATER TO NEW LOCATION INSIDE BUILDING AND RECONNECT AFTER NEW BUILDING IS COMPLETED.

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RIVERBANKS ZOO - HAY BARN
500 WILDLIFE PARKWAY
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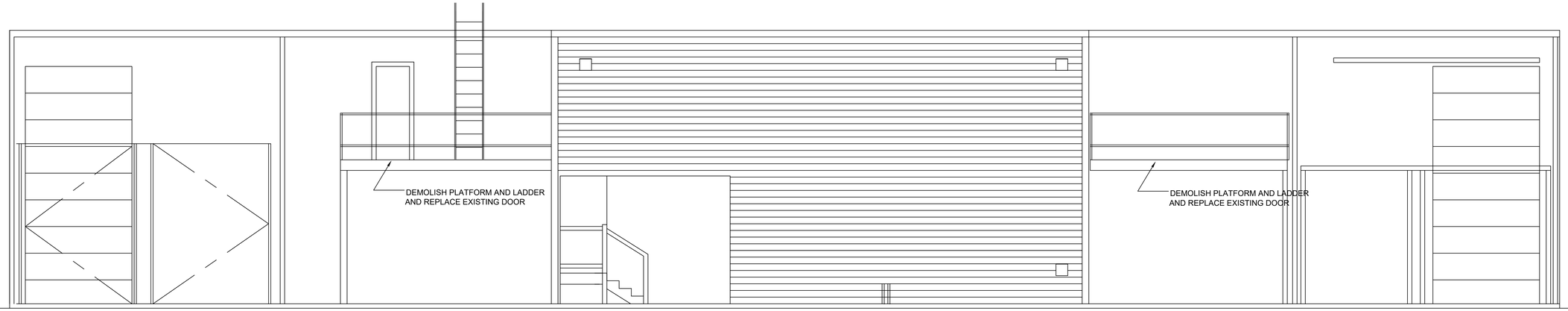
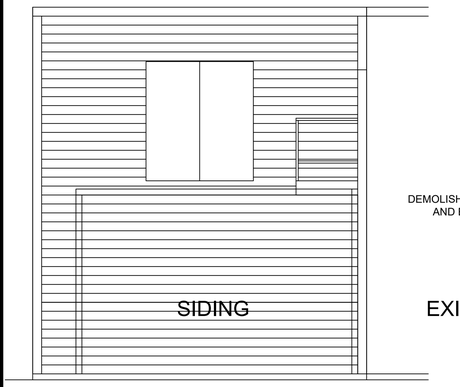
SHEET TITLE:
NEW FLOOR PLANS

DRAWN BY RS
DATE 3/01/22

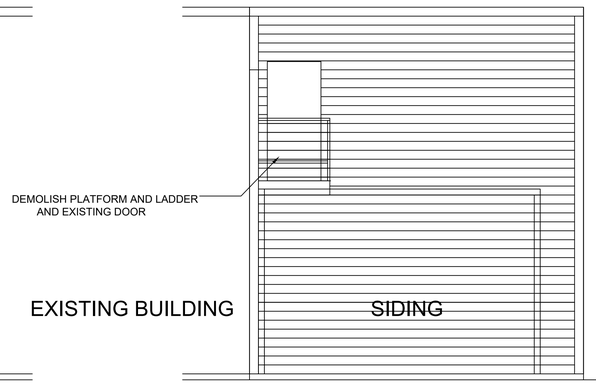
SHEET NO. A2 OF



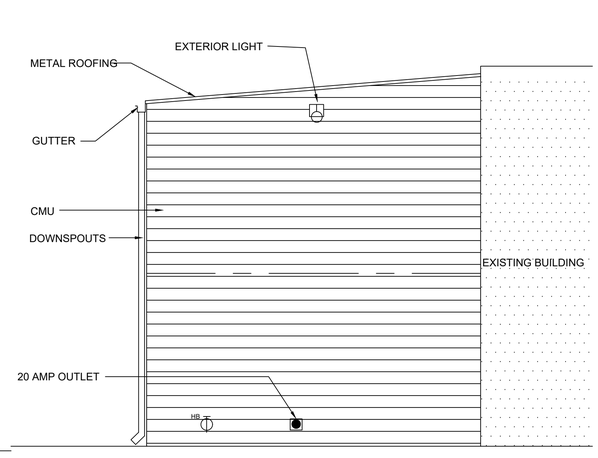
FRONT ELEVATION -EXISTING
SCALE: 1/4"=1'-0"



RIGHT SIDE ELEVATION -EXISTING
SCALE: 1/4"=1'-0"



LEFT SIDE ELEVATION -EXISTING
SCALE: 1/4"=1'-0"



RIGHT SIDE ELEVATION - NEW
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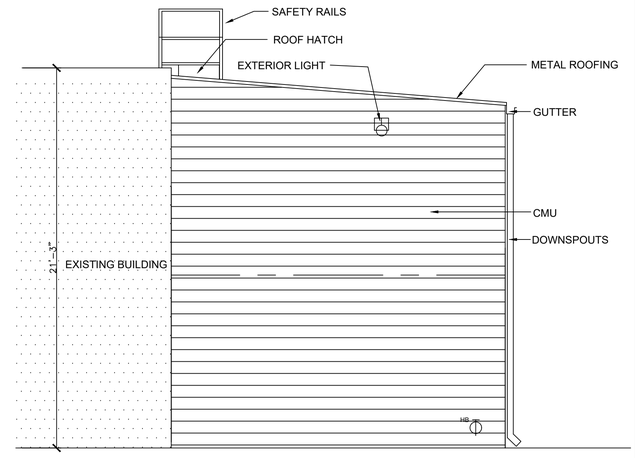

LEFT SIDE ELEVATION - NEW
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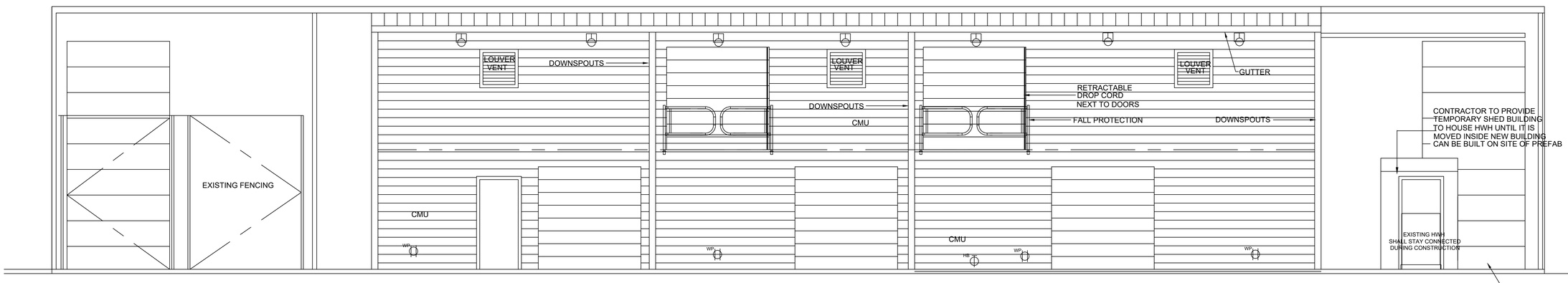

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SHEET TITLE:
ELEVATIONS

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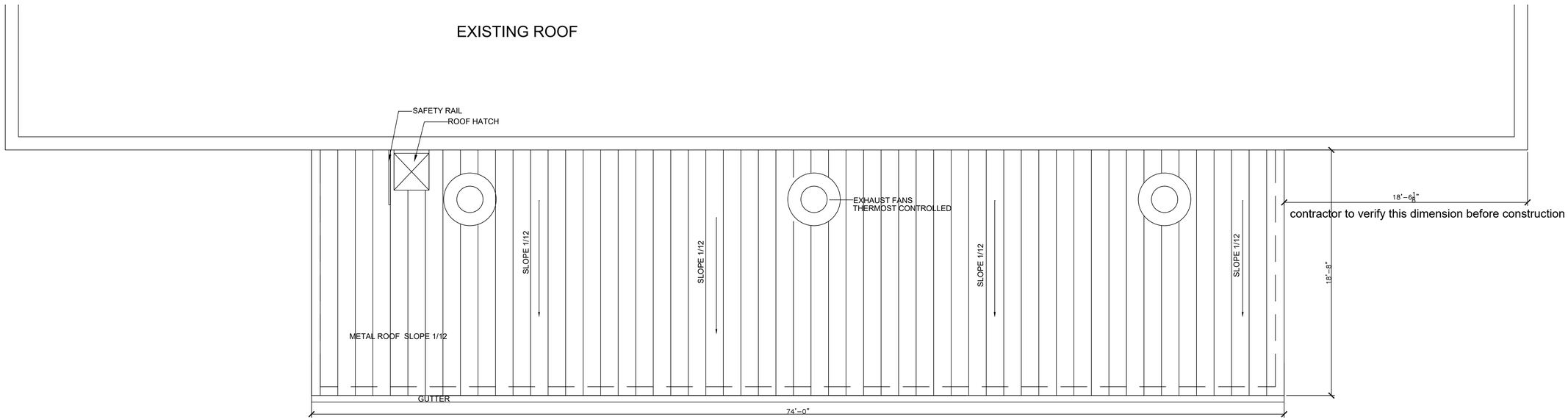
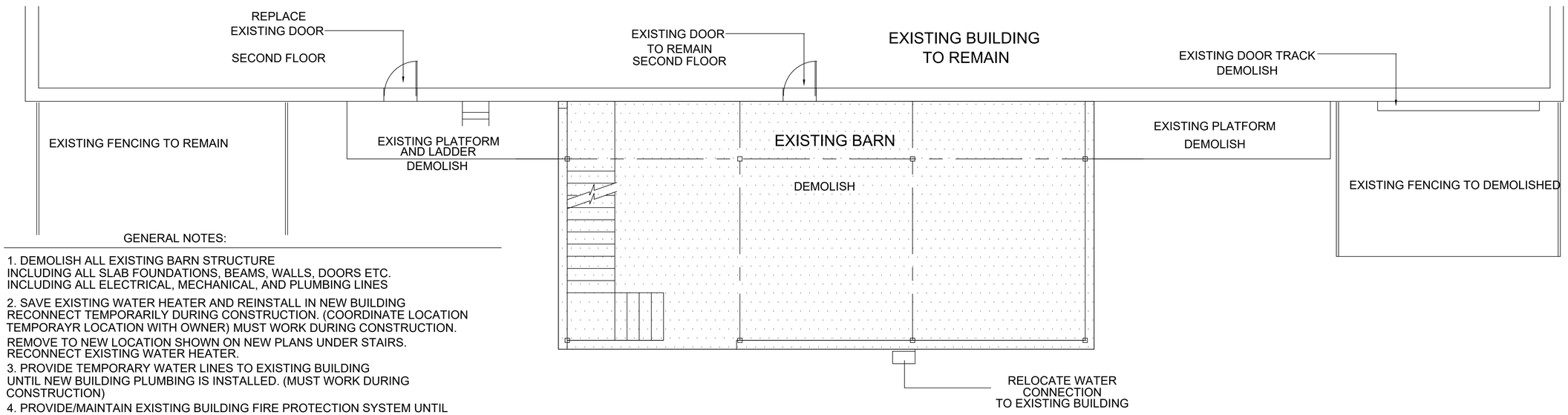
SHEET NO. A3 OF



ROOF PLAN
SCALE: 1/4"=1'-0"



DEMOLITION PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTES:

1. DEMOLISH ALL EXISTING BARN STRUCTURE
INCLUDING ALL SLAB FOUNDATIONS, BEAMS, WALLS, DOORS ETC.
INCLUDING ALL ELECTRICAL, MECHANICAL, AND PLUMBING LINES
2. SAVE EXISTING WATER HEATER AND REINSTALL IN NEW BUILDING
RECONNECT TEMPORARILY DURING CONSTRUCTION. (COORDINATE LOCATION
TEMPORAYR LOCATION WITH OWNER) MUST WORK DURING CONSTRUCTION.
REMOVE TO NEW LOCATION SHOWN ON NEW PLANS UNDER STAIRS.
RECONNECT EXISTING WATER HEATER.
3. PROVIDE TEMPORARY WATER LINES TO EXISTING BUILDING
UNTIL NEW BUILDING PLUMBING IS INSTALLED. (MUST WORK DURING
CONSTRUCTION)
4. PROVIDE/MAINTAIN EXISTING BUILDING FIRE PROTECTION SYSTEM UNTIL
NEW BUILDING FIRE PROTECTION SYSTEM IS INSTALLED IN BUILDING
CONTRACTOR SHALL CONTRACT WITH EXISTING FIRE PROTECTION COMPANY
FOR NEW UPGRADED SYSTEM AS REQUIRED PER CODE.
5. UTILIZE EXISTING FIRE ALARM EQUIPMENT TO PROVIDE COVERAGE OF NEW BUILDING
PROVIDE ADDITIONAL EQUIPMENT EXTENDING SYSTEM AS REQUIRED BY CODE.
6. REMOVE EXISTING SECOND FLOOR PLATFORMS ON EACH SIDE OF BARN.
7. REMOVE EXISTING LADDER , PLATFORM, RAILS, COLUMN AND ALL ATTACHMENTS.
8. MAINTAIN POWER TO EXISTING BUILDING DURING AND AFTER CONSTRUCTION
9. REMOVE EXISTING FENCING AS REQUIRED FOR NEW CONSTRUCTION. TURN OVER TO OWNER.
10. CONTRACTOR SHALL PROVIDE CONSTRUCTION SAFETY FENCING AROUND CONSTRUCTION AREA.
DURING CONSTRUCTION
11. CONTRACTOR SHALL VERIFY ALL DIMENSIONS INCLUDING FLOOR TO FLOOR HEIGHTS, OPENING CLEARANCES,
LOCATIONS OF EXISTING BUILDING OPENINGS OR OBSTRUCTIONS, WATER LINES FIRE ALARM EQUIPMENT, ETC.
BEFORE ANY CONSTRUCTION BEGINS.
12. CONTRACTOR SHALL WORK BETWEEN 9AM AND 4PM DURING REGULAR BUSINESS DAYS.
ANY OTHER DAY OR TIME PERIODS SHALL BE REQUESTED 72 HOURS IN ADVANCE AND APPROVED BY OWNER.

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SEAL

STATE OF SOUTH CAROLINA
ROBERT DUMOUCHEL SIMKINS
COLUMBIA SC
No. 4919
REGISTERED ARCHITECT

3/01/22

STATE OF SOUTH CAROLINA
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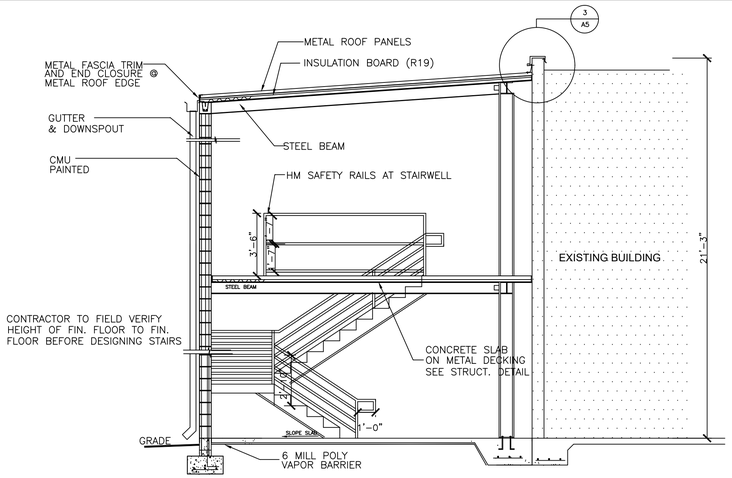
No. 00099
REGISTERED ARCHITECT

RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

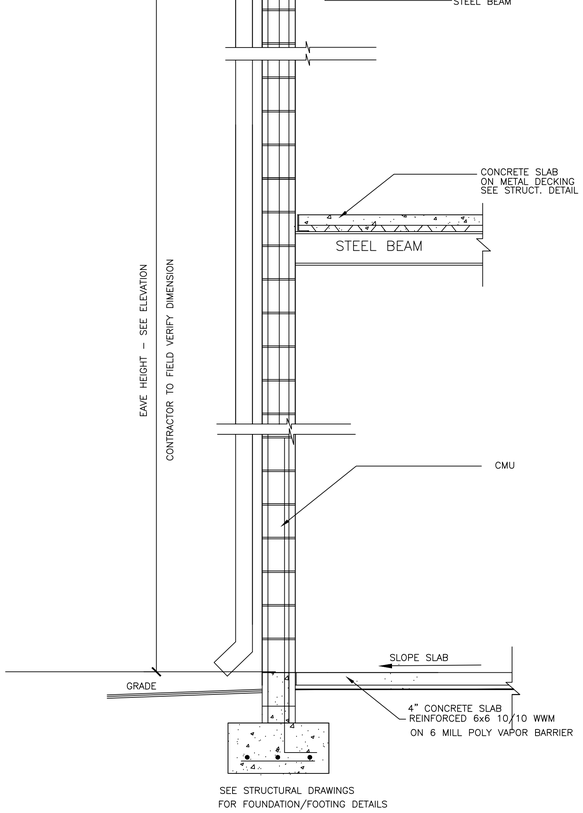
SHEET TITLE:
DEMOLITION AND ROOF PLAN

DRAWN BY RS
DATE 3/01/22

SHEET NO. A4 OF

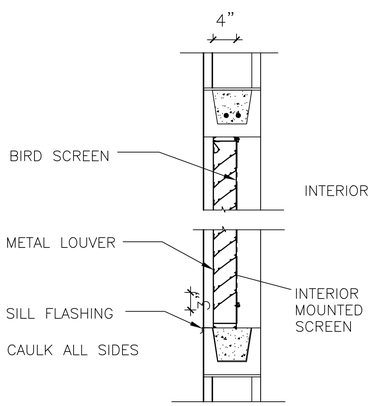


1 / A5 BUILDING SECTION
SCALE: 1/4" = 1'-0"



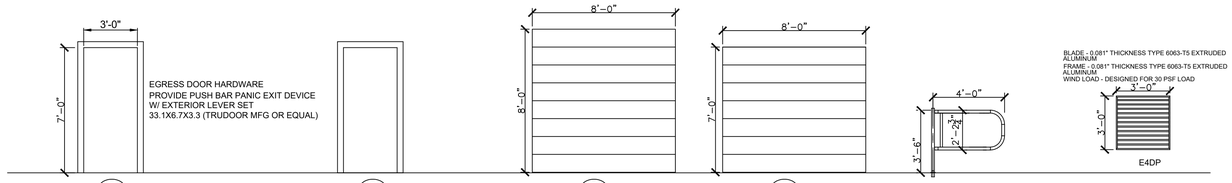
2 / A5 TYPICAL EXTERIOR WALL SECTION
SCALE: 3/4"=1'-0"

3 / A5 FLASHING DETAIL
SCALE: NTS



4 / A5 WALL LOUVER DETAIL
SCALE: NTS

FINISH SCHEDULE							
	ROOM NAME	FLOOR	BASE	WALLS	CEILING		COMMENTS
				FINISH	FINISH	HEIGHT	
	FIRST FLOOR	CONCRETE SEALED	–	CMU EPOXY PAINTED	–	–	
	SECOND FLOOR	CONCRETE SEALED	–	CMU EPOXY PAINTED	–	OPEN	



1 / EXTERIOR HM DOOR
DOOR - CLOSER - IF REQ'D BY CODE
PROVIDE ADA/LEVER SET FOR ALL INTERIOR DOORS
all hardware should meet ADA CODE requirements

2 / INTERIOR - EXISTING HM REPLACE WITH SAME FIELD VERIFY SIZE
DOOR - CLOSER
PROVIDE ADA/LEVER SET

3 / STEEL ROLL-UP DOORS
AUTOMATIC

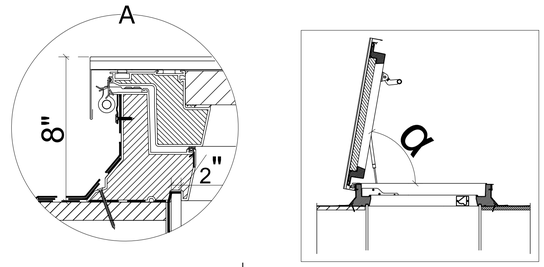
4 / STEEL ROLL-UP DOORS (coiling type) AUTOMATIC

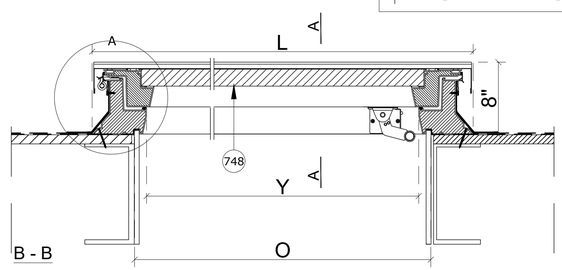
FALL PROTECTION RAILS
SWING IN TYPE GATES
W/ LOCK IN PLACE CAPABILITY

PROVIDE AT SECOND FLOOR ROLL-UP DOORS - EACH SIDE

LOUVER
VENT
ARCHITECTURAL LOUVER 35 DEGREE DRAINABLE "D" BLADE- EXTRUDED STATIONARY LOUVER- OR EQUAL WITH BIRDSCREEN

Door Elevations
SCALE 1/4" = 1'-0"





DRL	Rough opening		Outside frame		Max.clearance		α
	R[inch]	O[inch]	S[inch]	L[inch]	X[inch]	Y[inch]	
36"x36"	34⅛"	34⅛"	44 ⅜"	44 ⅜"	32 ½"	32 ½"	80°

Warning! The present drawing is for informational-demonstrative purposes only and as such cannot constitute a basis for performance. All dimensions presented in this drawing should be verified on site.

MFG DETAILS MAY VARY
INSTALL PER MFG DETAILS.

ROOF HATCH DETAIL
SCALE: NTS

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SEAL

RIVERBANKS ZOO - HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
DETAILS

DRAWN BY RS
DATE 3/01/22

SHEET NO. A5 OF

SECTION 02361 - TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for termite control:

1. Soil treatment for new construction.

1.3 DEFINITIONS

A. EPA: Environmental Protection Agency.

B. PCO: Pest control operator.

1.4 SUBMITTALS

A. Product Data: Treatments and application instructions, including EPA-Registered Label.

B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.

C. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:

1. Date and time of application.
2. Moisture content of soil before application.
3. Brand name and manufacturer of termiticide.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes, and rates of application used.
6. Areas of application.

D. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE
Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and

A. who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.

B. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

1.2 PROJECT CONDITIONS

A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.3 COORDINATION

A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

1.4 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

C. Warranty Period: Five years from date of Substantial Completion.

1.5 MAINTENANCE SERVICE

A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT
Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with wate

A. or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
3. Bayer Corp.; Garden & Professional Care.
4. DowElanco.
5. FMC Corp.; Pest Control Specialties.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

2.2 PREPARATION

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.

C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

2.3 APPLICATION, GENERAL

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

2.4 APPLYING SOIL TREATMENT
Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of

A. termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.

1. Slabs-on-Grade: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. For new construction treat soil materials before concrete footings and slabs are placed for existing construction drill holes in slabs as necessary to treat.
2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
3. Masonry: Treat voids.
4. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.

D. Post warning signs in areas of application.

E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 02361

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RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
SPECIFICATIONS

DRAWN BY RS
DATE 3/01/22

SHEET NO. A6 OF

SECTION 04810 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units.
2. Mortar and grout.
3. Reinforcing steel.
4. Masonry joint reinforcement.
5. Ties and anchors.
6. Embedded flashing.
7. Miscellaneous masonry accessories.

B. Related Sections include the following:

1. Division 7 Section "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.

C. Products installed, but not furnished, under this Section include the following:
1. Steel lintels for unit masonry, furnished under Division 5 Section "Metal Fabrications."

1.3 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry from net-area compressive strengths of masonry units and mortar types according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1. For Concrete Unit Masonry: f'm = 1500 psi (10.3 MPa).

1.5 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product

A. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Each type of masonry unit required.

a. Include size-variation data for CMU, verifying that actual range of sizes falls within specified tolerances.
b. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.

1.2 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

C. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 1 - PRODUCTS

1.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, 90^0 corners and 135^0 corners, jambs, sash, control joints, headers, bonding, and other special conditions.

B. Concrete Masonry Units: ASTM C 90:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi (13.1 MPa).
2. Weight Classification: Normal weight, unless otherwise indicated.
3. Provide Type II, non-moisture-controlled units.
4. Size (Width): Manufactured to the following dimensions:
a. 8 inches (203 mm) nominal; 7-5/8 inches (194 mm) actual.

5. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

a. Cinder units are not acceptable.

1.2 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color selected by the Architect.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

D. Mortar Cement: ASTM C 1329.

E. Masonry Cement: ASTM C 91.

1. Use a colored cement formulation as required to produce a color as selected by Architect. More than one color may be required.

a. Pigments shall not exceed 10 percent of portland cement by weight for mineral oxides nor 2 percent for carbon black.

A. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.

B. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

C. Water: Potable.

1.2 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

1.3 MASONRY JOINT REINFORCEMENT

A. General: ASTM A 951 and as follows:

1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
2. Wire Size for Side Rods: W2.8 or 0.188-inch (4.8-mm) diameter.
3. Wire Size for Cross Rods: W2.8 or 0.188-inch (4.8-mm) diameter.
4. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

B. For single-wythe masonry, provide either ladder type with single pair of side rods and cross rods spaced 16 inches (407 mm) o.c.

1.4 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

C. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180), commercial-quality, steel sheet zinc coated by hot-dip process on continuous lines before fabrication.

D. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.

E. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

1.5 EMBEDDED FLASHING MATERIALS

A. Concealed Flashing: For flashing not exposed to the exterior, use the following, unless otherwise indicated:

1. Copper-Laminated Flashing: Manufacturer's standard laminated flashing consisting of 5-oz./sq. ft. (1.5-kg/sq. m) sheet copper bonded with asphalt between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.

B. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by the flashing manufacturer for bonding flashing sheets to each other and to substrates.

C. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Copper-Laminated Flashing:

a. Copper Fabric Flashing; Advanced Building Products, Inc.
b. Copper Fabric; AFCO Products, Inc.
c. H & B C-Fab Flashing; Hohmann & Barnard, Inc.
d. Type FCC-Fabric Covered Copper; Phoenix Building Products.
e. Copper Fabric Flashing; Polyfite Manufacturing Corp.
f. Copper Fabric Flashing; Sandell Manufacturing Co., Inc.
g. York Copper Fabric Flashing; York Manufacturing, Inc.

1.2 MISCELLANEOUS MASONRY ACCESSORIES

A. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805.
2. PVC: ASTM D 2287, Type PVC-65406.

1.3 MASONRY CLEANERS

A. Cleaner: Masonry Manufacturer's recommended cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1.4 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.

A. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification.

1. For all masonry, use Type S.
2. , not more than 1 percent.

C. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

2.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before

A. placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

1.2 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

1.3 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

1. One-half running bond with vertical joint in each course centered on units in courses above and below, unless otherwise indicated on drawings.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

A. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

B. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

C. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

D. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

E. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

F. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 7 Section "Firestopping."

1.2 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

B. Set precast concrete trim units in full bed of mortar with vertical joints slushed full. Fill dowel, anchor, and similar holes solid. Wet joint surface thoroughly before setting; for soiled precast surfaces, clean bedding and exposed surfaces with fiber brush and soap powder and rinse thoroughly with clear water.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.
1.

1.1 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.
2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings.

a. Reinforcement above is in addition to continuous reinforcement.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

1.2 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

1.3 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Install preformed control-joint gaskets designed to fit standard sash block.

1.4 LINTELS

A. Install steel lintels where indicated or required by notes on drawings.

A. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.

1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

B. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

1.2 FLASHING, WEEP HOLES, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

C. Install flashing as follows:

1. At multiwythe masonry walls, including cavity walls, extend flashing from exterior face of outer wythe of masonry, through outer wythe, turned up a minimum of 8 inches (200 mm), and through inner wythe to within 1/2 inch (13 mm) of the interior face of the wall in exposed masonry.
2. At lintels and shelf angles, extend flashing a minimum of 4 inches (100 mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and turn flashing up not less than 2 inches (50 mm) to form a pan.
3. Cut flashing off flush with face of wall after masonry wall construction is completed.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Use wicking material to form weep holes.
2. Space weep holes 24 inches o.c.

E. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

1.3 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make it sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
1. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements of ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

1.2 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Clean masonry with a proprietary cleaner approved and applied according to masonry manufacturer's written instructions.

1.3 MASONRY WASTE DISPOSAL

A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 04810

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STATE OF SOUTH CAROLINA
ROBERT DUMOUCHEL SIMKINS
COLUMBIA, SC
No. 4919
REGISTERED ARCHITECT

3/01/22

STATE OF SOUTH CAROLINA
RDS DESIGN
COLUMBIA, SC
No. 00099
REGISTERED ARCHITECT

SEAL

RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
SPECIFICATIONS

DRAWN BY RS
DATE 3/01/22

SHEET NO. A7 OF

SECTION 07 72 33
ROOF HATCHES
PART 1 – GENERAL

1.1 SUMMARY

PRODUCT: ROOF ACCESS HATCH, 36" WIDE x 36" LONG OPENING, COLOR TO MATCH ROOF PANELS –14 GAUGE GALVANIZED STEEL COVER, FRAME & SELF FLASHING BASE.MADE IN USA BABCOCK–DAVIS.

FEATURES:
FINISH: GLOSSY FINISH HIGH REFLECTANCE BRITE POLYESTER FINISH

CONSTRUCTION: 14 GUAGE GALVANIZED STEEL COVER, FRAME AND CURB WITH 12" HIGH CURB AND 3–1/2" WIDE FLANGE FOR SECURING TO ROOF DECK.
COVER: 14 GUAGE GALVANIZED STEEL WITH TPE RUBBER DRAFT SEAL GASKET DOOR SEAL. ONE INCH THICK INSULATION LINER IS BUILT INTO THE COVER. INSIDE LINER IS 22 GUAGE GALVANIZED STEEL.
CURB: 14 GUAGE GALVANIZED STEEL 12" HIGH CURB WITH 3–1/2" WIDE FLANGE.
LOAD/DEFLECTION: ROOF HATCH COVERS HAVE BEEN TESTED AND APPROVED TO SUPPORT A MIN. LIVE LOAD OF 40 lbs./ft2 WITH A MAX. DEFLECTION OF 1/150TH OF THE SPAN, MAX. NEGATIVE LOAD OF 50 lbs./ft2 WIND UPFIT, AND 110 MPH WIND LOAD WHEN COVER IS IN AN OPEN POSITION.
INSULATION: THE CURB INCLUDES A 1" FIBERBOARD INSULATION SURROUNDING THE BASE, AND 1" INSULATION BETWEEN THE EXTERIOR COVER AND LINER.
HARDWARE: HARDWARE SHALL INCLUDE CORROSION RESISTANT HEAVY–DUTY HINGE, SLAM LATCH, HEAVY GAGE AUTOMATIC HOLD OPEN ARM WITH RED GRIP, COMPRESSION SPRING–OPERATED CYLINDERS, EXTERIOR HANDLE WITH INTERNAL PADLOCK HASP, AND INTERIOR LOCKING HANDLE WITH INTERIOR PADLOCK HASP.
OPTIONS:
HARDWARE: STAINLESS STEEL HARDWARE KIT (OUTSIDE COMPONENTS INCLUDING HINGE, LATCH/LOCK HASP, CERTAIN INSIDE ITEMS)

DIVISION 23 3470 ROOF EXHAUST FAN

GENERAL

1.1 SUMMARY

PRODUCT: ROOF EXHAUST FANS – DAYTON – ROOF EXHAUST FAN 18 1/2" WHEEL DIRECT DRIVE STAINLESS STEEL WITH AUTOMATIC AND CONTROLLABLE SPEED WITH DIRECT DRIVE.
MODEL NUMBER 65D657, SPECS– 115V/208V, AC/230V AC, 1/2 HP 30"X30", 2994 CFM.

PROVIDE ALL CURBS, ATTACHMENT, ELECTRICAL AND STRUCTURAL SUPPORT AS REQUIRED BY MFG.
PROVIDE ALL FLASHING AND INSTALLATION REQUIREMENTS BY MFG.
OTHER MFG. MAY BE CONSIDERED BY ARCHITECT FOR AS EQUAL PRODUCT.
CONTRACTOR SHALL PURCHASE AND INSTALL ROOF FANS WITH ALL NECESSARY ITEMS FOR A COMPLETE WORKING OPERABLE CONDITION.
CONTRACTOR TO PROVIDE 1 YEAR WARRANTY ON PRODUCT AND INSTALLATION.

DIVISION 07100 RIGID BOARD ROOF INSULATION

GENERAL

1. ARCHITECTURAL METAL ROOFING SYSTEM INSULATION BOARD
MANUFACTURER – OWENS CORNING OR EQUAL
TYPE: FOAMULAR? THERMAPINK? XPS RIGID INSULATION

RIGID INSULATION WITH R–value of 5 per inch. PROVIDE R–19 FOR ROOF APPLICATION

PRODUCT: THERMAPINK? insulation layers with sealed joints under roofing systems. Provide THERMAPINK? 25 insulation with 25 psi compressive strength. provide insulation board that has a moderate perm ratings and high with, long–lasting R–value.

DIVISION 07400 ROOFING – METAL

GENERAL

1.1 SUMMARY

PRODUCT: PETERSON PAC–CLAD 150, 90 DEGREE SINGLE LOCK SYSTEM OR EQUAL

A. FEATURES: 24 GA SMOOTH PANEL TYPE THAT IS MECHANICALLY FASTENED WITH A SINGLE LOCK SYSTEM.

B. WARRANTY: PROVIDE 30 YEAR FINISH WARRANTY, AND WEATHERTIGHTNESS WARRANTY.

C, PAINT FINISH – STANDARD COLORS AS SELECTED BY OWNER.
KINAR 500 FINISH.

D. PROVIDE ALL FLASHING AND INSTALLATION REQUIREMENTS BY MFG.
PROVIDE 24 GA ROOF FINISH TRIM PIECES TO MATCH ROOF AT EAVES AND RAKE OF ROOF TO MATCH ROOF FINISH COLOR, PROVIDE WEATHERTIGHTNESS TRIM AT ALL WALL TO ROOF INTERSECTIONS. EAVE GUTTERS AND DOWN SPOUTS SHALL BE PROVIDED BY CONTRACTOR. CLOSURE STRIPS SHALL BE PROVIDED AT EAVE AND RAKE CONDITIONS.

E. ROOF FASTENERS – ALL ROOF FASTENERS SHALL HAVE A ZINC COATED ALUMINUM CAST HEAD WITH A NEPOPRENE SEALING WASHER FOR WEATHERTIGHTNESS.

F. ROOF INSULATION BOARD – PROVIDE RIGID INSULATION BOARD WITH A MINIMUM TO MEET IBC 2018 BUILDING CODE REQUIREMENTS.

DIVISION 08100 DOORS – METAL

GENERAL

DOOR SPECIFICATIONS:

1–3/4" THICK STEEL DOORS SHALL BE MFG. BY CECO DOOR PRODUCTS OR EQUAL. DOORS SHALL CONFORM TO THE STEEL DOOR INSTITUTE GUIDE SPECIFICATIONS, AINSI A250.8.

REGENT DOORS ARE MADE FULL–FLUSH OR (OPTIONAL) SEAMLESS STYLE. FACE SHEETS ARE COMMERCIAL QUALITY COLD ROLLED STEEL CONFORMIMG TO ASTM A1008 OR (OPTIONAL) HOT–DIPPED GALVANIZED STEEL CONFORMIMG TO ASTM A924 AND A653
REGENT FULL–FLUSH DOORS HAVE MECHANICALLY INTERLOCKED, HEMMED, HAIRLINES ON VERTICAL EDGES AND HAVE NO VISIBLE SEAMS ON FACES. DOORS SPECIFIED "SEAMLESS" HAVE NO VISIBLE SEAMS ON FACES OR VERTICAL EDGES
14 GAGE DOORS WITH OIB=NE PIECE, KRAFT HONEYCOMB CORE SECURLY BONDED TO BOTH FACE PLATES.

HARDWARE PROVISIONS: HINGE PREPARATIONS ARE HANDED. HINGE EDGES ARE MORTISED FOR 4–1/2" OR 5" HIGH, HEAVY WEIGHT HINGES. 7 GAGA STEEL HINGE REINFORCEMENTS ARE WELDED INSIDE THE DOOR EDGE AND ARE DRILLED AND TAPPED FOR FASTENERS IN ACCORDANCE WITH ANSI A156.7. THE LOCK EDGE HAS A STANDARD BEVEL (1:16) AND IS PREPARED FOR HARDWARE

PAINT: 1–3/4" STEEL DOORS SHALL BE PROVIDED WITH ONE COAT OF OVEN–CURED NEUTRAL COLOR PRIMER PAINT. PRIMER COAT SHALL CONFORM WITH ANSI A250.10. THE PRIMER COAT IS A PREPARATORY BASE FOR NECESSARY FINISH PAINTING.

"COLORSTYLE" FINISH COAT IS ALSO AVAILABLE FROM A SELECTION OF STANDARD COLORS. COLORSTYLE FINISH IS ELECTROSTATICALLY APPLIED, OVEN–CURED URETHANE ENAMEL, AND SHALL CONFORM TO ANSI A250.3. FOR ACCURATE COLOR SELECTORS FOR A CECO COLORSTYLE CHART.

DOOR HARDWARE:

RIM EXIT DEVICE 4700 SERIES OR EQUAL. COMMERCIAL HEAVY DUTY TYPE.
"BEST", – ADA LEVER LOCK SET STAINLESS EXTERIOR TYPE.

Ventilator:
B. Wall Louvers: type -blade design, same finish as adjacent material, with steel mesh bird screen and frame, blank sheet metal at unused portions. Louvers shall be designed by their manufacturer to meet the wind load provisions as specified in Section 1.4H. See drawings

Architectural Louvers - http://www.archlouvers.com - phone: 888-568-8371

Specifier Note: Fill in all highlighted areas or delete as necessary to meet your requirements.

SECTION 08 90 00 - LOUVERS AND VENTS

GENERAL

SUMMARY

A. Section Includes:

1. Fixed, extruded-aluminum wall louvers.
2. Wall vents (brick vents).

B. See Division 8 Section "Steel Doors and Frames" for louvers in hollow-metal doors.

C. See Division 8 Section "Flush Wood Doors" for louvers in flush wood doors.

D. See Division 15 Sections for louvers that are a part of mechanical equipment.

PERFORMANCE REQUIREMENTS

E. Design: Design louvers, including comprehensive engineering analysis by a qualified engineer, using structural performance requirements and design criteria indicated.

F. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors.

1. Wind Loads: Determine loads based on a uniform pressure of 30 lb./sq. ft. (1435 Pa), acting inward or outward.

G. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

SUBMITTALS

H. Product Data: For each type of product indicated.

1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

A. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

B. Samples: For each type of metal finish required.

C. Submittal: For louvers indicated to comply with structural performance requirements and design criteria indicated.

D. Product Test Reports: Based on tests performed according to AMCA 500-L.

PRODUCTS

MATERIALS

E. Aluminum Extrusions: ASTM B 221M, Alloy 6063-T5.

F. Aluminum Sheet: ASTM B 209M, Alloy 3003 with temper as required for forming.

G. Fasteners: Use types and sizes to suit unit installation conditions.

1. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.

FABRICATION, GENERAL

H. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

I. Join frame members to each other and to fixed louver blades with fillet welds concealed from view welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

FIXED, EXTRUDED-ALUMINUM LOUVERS

J. Horizontal High Performance Drainable-Blade Louver <Insert louver type, e.g., L1>:

1. Basis-of-Design Product: Architectural Louvers Co. (Harray, LLC); Model E4DP. Subject to compliance with requirements, provide the specified product or comparable product by one of the following:
   a. Manufacturers of equivalent products submitted and approved in accordance with Section 01630 - Product Substitution Procedures.
2. Louver Depth: 4 inches (100 mm)
1. Frame and Blade Nominal Thickness: Not less than 0.080 inch (2.03 mm) for blades and frames.
2. Louver Performance Ratings:
   a. Free Area: Not less than 8.0 sq. ft. (0.74 sq. m) for 48-inch- (1220-mm-) wide by 48-inch- (1220-mm-) high louver.
   b. Point of Beginning Water Penetration: Not less than 925 fpm (4.7 m/s).
   c. Air Performance: Not more than 0.10-inch wg (25-Pa) static pressure drop at 800 fpm (4.1-m/s) free-area velocity.
3. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

LOUVER SCREENS

B. General: Provide screen at each exterior louver.

C. Louver Screen Frames: Same kind and form of metal as indicated for louver to which screens are attached.

D. Louver Screening: Same kind of metal as indicated for louver.

1. Insect Screening: Aluminum, 16 x 18 square mesh, 0.011-inch (0.28-mm) wire.
2. Bird Screening: Flattened, expanded aluminum, 3/4 by 0.050 inch (19 by 1.27 mm) thick.

ALUMINUM FINISHES

E. High-Performance Organic Finish: 3-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

EXECUTION

INSTALLATION

F. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.

G. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weather-tight connection.

A. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

B. Repair damaged finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory and refinish entire unit or provide new units.

C. Protect galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint.

END OF SECTION 08 90 00

SECTION 099123 - INTERIOR PAINTING

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on **the following interior substrates:**

1. Concrete.
2. Concrete masonry units (CMU).

B. Related Requirements:
1. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1.3 CLOSEOUT SUBMITTALS.

1. Coating Maintenance Manual: Provide coating including area summary with finish schedule, area detail designating location where each product/color/finish was used.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials**[, from the same product run,]** that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: [2 **gal (3.8 L)]** of each paint material and color applied.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified.
   a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
2. Final approval of color selections will be based on mockups.
   a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

1.1 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:

1. Product name and type (description).Batch date,Color number,VOC content.
2. Surface preparation requirements.
3. Application instructions.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.2 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.3 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide BEHR ULTRA OR EQUAL; products indicated or comparable product from one of the following:

1. <BEHR ULTRA PAINT AND PRIMER OR EQUAL>.

B. Comparable Products: Comparable products of approved manufacturers will be considered in accordance with Section 016000 "Product Requirements," and the following:

1. Products are approved by manufacturer in writing for application specified.
2. Products meet performance and physical characteristics of basis of design product including published ratio of solids by volume, plus or minus two percent.

C. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

1.4 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

3. Flat Paints and Coatings: 50 g/L.
4. Nonflat Paints and Coatings: 150 g/L.
5. Primers, Sealers, and Undercoaters: 200 g/L.
6. Floor Coatings: 100 g/L.
7. Shellacs, Clear: 730 g/L.

B. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers."

C. Colors: **As selected by Architect from manufacturer's full range.**

D. EXAMINATION

1. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

E. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   a. Concrete: 12 percent.
   b. Masonry (Clay and CMU): 12 percent.

F. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

1.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

C. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

1. Concrete Floors: Remove oil, dust, grease, dirt, and other foreign materials. Comply with SSPC-SP-13/NACE 6 or ICRI 03732.

D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

1.2 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

1.3 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

1.4 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces**[and Clay Masonry]**:

1. Clear seal coating: Submit for approval Sherwin Williams or equal

B. CMU Substrates:

1. Latex System: Sherwin Williams or equal
   a. Block Filler: Block filler, latex, interior/exterior:
      1) S-W PrepRite Block Filler, B25W25, at 75-125 sq. ft. per gal. (1.84 to 3.07 sq. m per liter).
   b. Intermediate Coat: Latex, interior, matching topcoat.
   c. Topcoat: Latex, interior, low sheen:
      1) S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.

END OF SECTION 099123

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SEAL

STATE OF SOUTH CAROLINA
ROBERT DUMOUCHEL SIMKINS
No. 4919
REGISTERED ARCHITECT

3/01/22
Robert Simkins

STATE OF SOUTH CAROLINA
RDS DESIGN
COLUMBIA, SC
No. 00099
REGISTERED ARCHITECT

RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
SPECIFICATIONS

DRAWN BY RS
DATE 3/01/22

SHEET NO. A8 OF

SECTION 08330

ROLLING SERVICE DOORS

STORMTITE™ MODEL 625

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Insulated rolling service doors.

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Support framing and framed opening.

B. Section 08710 - Door Hardware: Product Requirements for cylinder core and keys.

C. Section 09900 - Painting: Field applied finish.

D. Section 16130 - Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station.

E. Section 16150 - Wiring Connections: Power to disconnect.

1.3 REFERENCES

A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.

A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

B. NEMA MG 1 - Motors and Generators.

1.2 DESIGN / PERFORMANCE REQUIREMENTS

A. 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.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.3 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. Details of construction and fabrication.
4. Installation instructions.

C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.

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) long, representing actual product, color, and patterns.

A. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

B. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.

B. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

3 DELIVERY, STORAGE, AND HANDLING

ore products in manufacturer's unopened packaging until ready for installation

A. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

B. Store materials in a dry, warm, ventilated weathertight location.

2 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.

3 COORDINATION

A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

4 WARRANTY

A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.

B. Warranty: Manufacturer's limited door system warranty for 2 years for all parts and components.

C. PowderGuard Finish

1. PowderGuard Premium Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Premium Finish warranty for 2 years.

1. PowderGuard Zinc Base Coat applied to guides, bottom bar, headplates plus PowderGuard Premium applied to curtain and top coat for guides, bottom bar, headplates: Manufacturer's limited Zinc Finish warranty for 4 years.

ART 2 PRODUCTS

1 MANUFACTURERS

A. Acceptable Manufacturer: Overhead Door Corporation, 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com. Or equal

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2 INSULATED ROLLING SERVICE DOORS

A. Stormtite Insulated Rolling Service Doors: Overhead Door Corporation Model 625.

1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
   a. Flat profile type F-265i for doors up to 40 feet (12.19 m) wide.
   b. Front slat fabricated of:
      1) 22 gauge galvanized steel.
   c. Back slat fabricated of:
      1) 22 gauge galvanized steel.
   b. Slat cavity filled with CFC-free foamed-in-place, polyurethane insulation.
      1) R-Value: 7.7, U-Value: 0.13.
      2) Sound Rating: STC-21.
2. Performance:
   a. Through Curtain Sound Rating: Sound Rating: STC-28 (STC-30+ with HZ noise generator) as per ASTM E 90.
   b. Installed System Sound Rating: STC-21 as per ASTM E 90.
   c. U-factor: 0.91 NFRC test report, maximum U-factor of no higher than 1.00.
   d. Air Infiltration: Meets ASHRAE 90.1 & IECC 2012/2015 C402.4.3 Air leakage <1.00 cfm/ft2.
3. Slats and Hood Finish:
   a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
      1) Polyester Top Coat.
         (a) White polyester.
      2) Powder Coat:
         (a) PowderGuard Premium powder coat color as selected by the Architect.
      3) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
   b. Stainless Steel: Slats and hood shall be stainless steel finished as follows.
      1) Finish: No. 4 satin finish.
   c. Aluminum: Slats and hood shall be aluminum finished as follows.
      1) Finish: Powder Coat:
         (a) PowderGuard Premium powder coat color as selected by the Architect.
4. Weatherseals:
1.
   a. Vinyl bottom seal, exterior guide and internal hood seals.
   b. Interior guide weatherseal.
   c. Lintel weatherseal.
   d. Air Infiltration Package, IECC 2012/2015 listed; product to meet C402.4.3 2012 Air leakage <1.00 cfm/ft2.
      1) Air infiltration perimeter seal package includes: guide cover, guide cap, dual brush exterior guide seal, 4 inch finned lintel brush seal and vinyl bottom seal.
2. Bottom Bar:
   a. Two prime painted steel angles minimum thickness 1/8 inch (3 mm) bolted back to back to reinforce curtain in the guides.
3. Guides: Three structural steel angles.
4. Brackets:
   a. Hot rolled prime painted steel to support counterbalance, curtain and hood.
   b. Galvanized steel to support counterbalance, curtain and hood.
   c. Stainless steel to support counterbalance, curtain and hood.
5. Finish; Bottom Bar, Guides, Headplate and Brackets:
   a. PowderGuard Zinc base coat with PowderGuard Premium powder coat color as selected by the Architect.
   b. Finish: PowderGuard Max powder coat color as selected by the Architect.

1. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
2. Hood: Provide with internal hood baffle weatherseal.
   a. 24 gauge galvanized steel with intermediate supports as required.
3. Manual Operation:
   a. Chain hoist.
   b. Crank operation.
4. Electric Motor Operation: Provide UL listed electric operator, size 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. Sensing Edge Protection:
      1) Pneumatic sensing edge.
      2) Electric sensing edge.
   b. Operator Controls:
      1) Push-button and key operated control stations with open, close, and stop buttons.
      2) Controls for interior location.
      3) Controls surface mounted.
   c. Motor Voltage: 115/230 single phase, 60 Hz.
5. Wind Load Design:
   a. Standard wind load shall be 20 PSF.
6. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
7. Locking:
   a. Chain keeper locks for chain hoist operation.
   b. Interior slide bolt lock for electric operation with interlock switch.
   c. Cylinder lock for electric operation with interlock switch.
8. Wall Mounting Condition:
   a. Face-of-wall mounting.

PART 1 EXECUTION

1.1 EXAMINATION

A. Verify opening sizes, tolerances and conditions are acceptable.

B. Examine conditions of substrates, supports, and other conditions under which thi work is to be performed.

C. If substrate preparation is the responsibility of another installer, notify Architect unsatisfactory preparation before proceeding.

1.2 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.

1.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

Securely and rigidly brace components suspended from structure. Secure guides

A. Securely and rigidly brace components suspended from structure. Secure guid structural members only.

B. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

C. Coordinate installation of electrical service with Section 16150. Complete wirir from disconnect to unit components.

D. Coordinate installation of sealants and backing materials at frame perimeter a specified in Section 07900.

E. Install perimeter trim and closures.

F. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

1.2 ADJUSTING

A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.

B. Adjust hardware and operating assemblies for smooth and noiseless operation

1.3 CLEANING

A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

B. Remove labels and visible markings.

C. Touch-up, repair or replace damaged products before Substantial Completion.

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RDS DESIGN, LLC
ARCHITECTURE
821 KINLOCK CT.
COLUMBIA, SOUTH CAROLINA 29223
803.447.4817 SimkinsR@aol.com

STATE OF SOUTH CAROLINA
ROBERT DUMOUCHEL SIMKINS
COLUMBIA, SC
No. 4919
REGISTERED ARCHITECT

3/01/22
Robert Simkins

STATE OF SOUTH CAROLINA
RDS DESIGN
COLUMBIA, SC
No. 00099
REGISTERED ARCHITECT

SEAL

RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
SPECIFICATIONS

DRAWN BY RS
DATE 3/01/22

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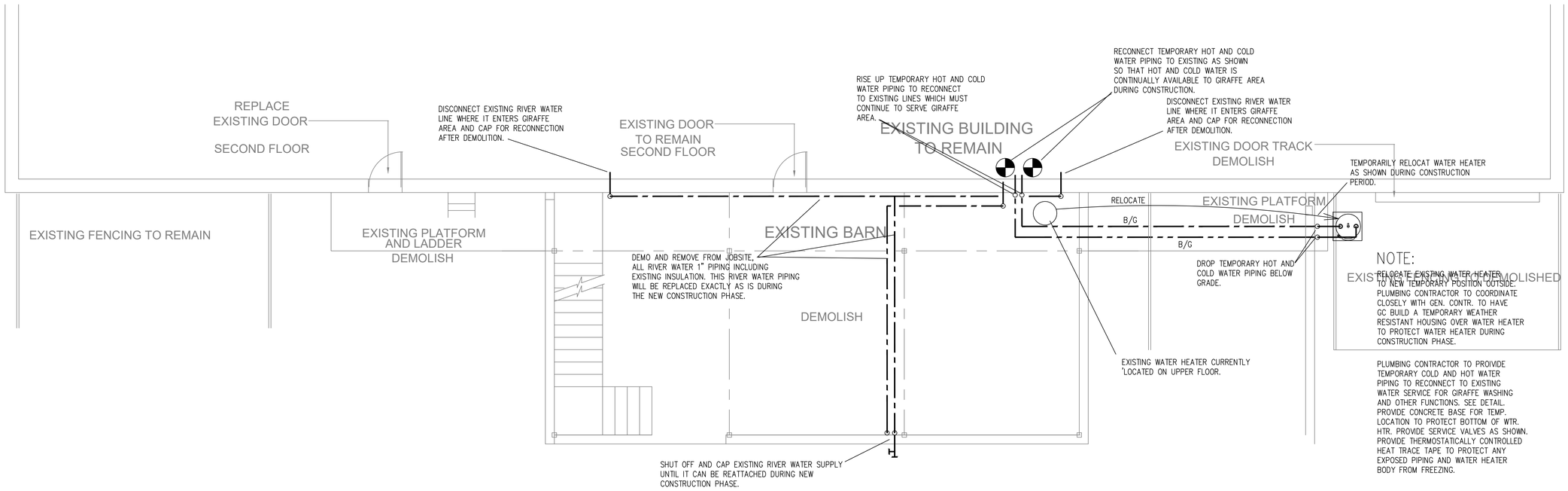

DEMOLITION

PLUMBING FLOOR PLAN

BUILDING SCALE: 1/4" = 1'-0"

VISTA ENGINEERING LLC.
CONSULTING MECHANICAL ENGINEERING
530 S. SALUDA AVE. COLUMBIA, SC 29205
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Raymond R. Cottrell
SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 28429
RAYMOND R. COTTRELL
02.24.2022

VISTA ENGINEERING LLC
SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION
No. CO1952

RIVERBANKS ZOO – HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
PLUMBING DEMOLITION FLOOR PLAN

DRAWN BY RRC
DATE 2/24/2022

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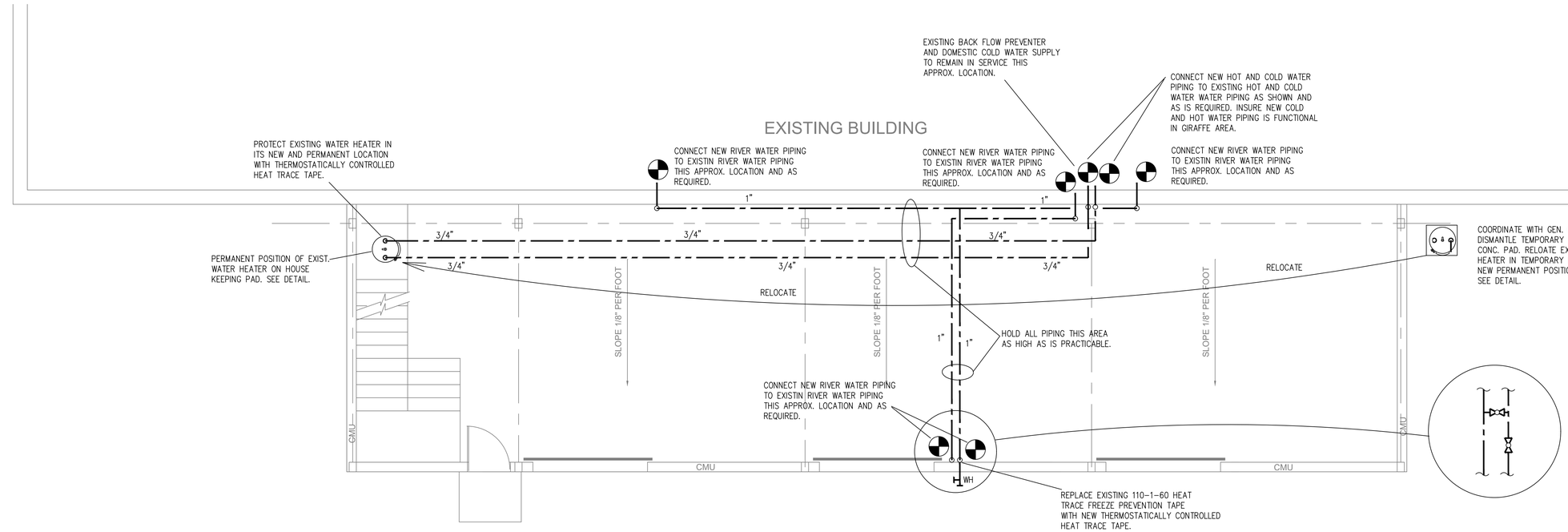
OF



NEW CONSTRUCTION PLAN

PLUMBING FLOOR PLAN

BUILDING SCALE: 1/4" = 1'-0"

DESIGN

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COLUMBIA, SC

SHEET TITLE:
NEW PLUMBING FLOOR PLAN

DRAWN BY RRC
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SHEET NO. P2
OF

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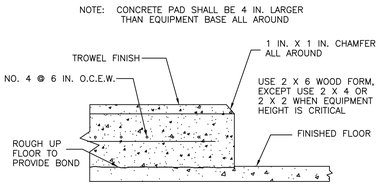


INDOOR EQUIPMENT FOUNDATION

N.T.S.

PLUMBING FIXTURE SCHEDULE

MARK	BASIS OF DESIGN	CW	HW	W	V
WH	WALL HYDRANT: WOODFORD MODEL 65 ANTI-SIPHON AUTOMATIC DRAINING FREEZELESS WALL HYDRANT, SHALL MEET ASSE STANDARD 1019-B, LISTED BY IAPMO, AND MEET GOVERNMENT SPECIFICATION WW-541B TYPE 205. COMPLETE WITH NIDEL MODEL 34HA VACUUM BREAKER WITH 3/4" THREAD MALE HOSE ADAPTOR, UNDER NOZZLE DRAIN, LOOSE KEY OPERATED (DELIVER KEYS TO OWNER) AND WITH CHROME FINISH ON BRASS CASTING.	3/4"			

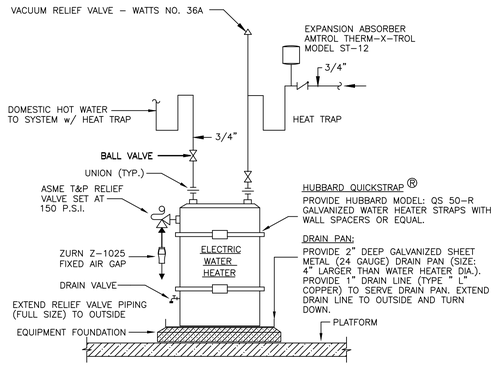
FIXTURES LISTED ABOVE ARE FOR BIDDING PURPOSES ONLY. FIXTURE MANUFACTURER, MODEL, STYLE, COLOR ETC. SHALL BE APPROVED BY ARCHITECT AND OWNER.
NOTE:

PLUMBING NOTES

1. DO NOT SCALE PLUMBING DRAWINGS. ROUGH FROM ARCHITECTURAL DRAWINGS AND EQUIPMENT MANUFACTURER'S CERTIFIED DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS, FIXTURE LOCATIONS, ETC.
2. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
3. UNLESS OTHERWISE SHOWN OR NOTED, LOCATE ALL PIPING ABOVE CEILING.
4. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN "FURNISH AND INSTALL COMPLETE AND READY FOR USE.
5. EXCEPT WHERE PIPE SPACE IS PROVIDED, OR UNLESS OTHERWISE NOTED, ALL SUPPLY, WASTE, SOIL AND VENT RISERS SHALL RUN IN WALLS OR PARTITIONS.
6. LOCATE HOSE BIBBS, AND / OR WALL HYDRANTS 2'-0" ABOVE FINISHED FLOOR AND / OR GRADE.
7. COORDINATE CLOSELY WITH ALL OTHER TRADES FOR WORK DONE UNDER THIS CONTRACTOR TO AVOID INTERFERENCE OR CONFLICT.
8. ALL HOSE BIBBS AND VALVES WITH THREADED HOSE CONNECTIONS SHALL BE EQUIPPED WITH A WATTS REGULATOR COMPANY NO. 8 BACK SIPHONAGE BACKFLOW PREVENTER, AND VACUUM BREAKER OF FINISH TO MATCH HOSE BIBB OR WALL HYDRANT.
9. COORDINATE WITH SITE CONTRACTOR FOR CONTINUATION OF UTILITIES.
10. PROVIDE ACCESS TO ALL EQUIPMENT REQUIRING CLEANING OR ADJUSTMENT. IF ACCESS DOORS ARE REQUIRED, THEY SHALL BE EQUAL TO KEES, INC. STYLE K IN NON RATED APPLICATIONS AND KEES, INC. STYLE AP-FR IN RATED APPLICATIONS.
11. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL CHARACTERISTICS. ELECTRICAL CHARACTERISTICS SHALL BE VERIFIED BEFORE ORDERING EQUIPMENT.
12. EXPOSED WASTE AND WATER PIPING UNDER HANDICAPPED LAVATORIES SHALL INSULATED WITH TRUE-BRO, INC. #103 PROTECTIVE UNDER SINK DRAIN PIPING AND ANGLE VALVE SUPPLY COVERS IN WHITE.
13. ALL PIPING IS SHOWN DIAGRAMMATIC. HOWEVER, CONTRACTOR SHALL PROVIDE ALL REQUIRED FITTINGS, PIPING AND INSULATION FOR ALL OFFSETS, AND / OR CHANGES IN ELEVATION.
14. ALL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS AND FURTHER SUPPORTS OR HANGERS SHALL BE PROVIDED TO PREVENT THE WEIGHT OF THE PIPING BEING PLACED ON THE EQUIPMENT.
15. CONTRACTOR SHALL VERIFY ACTUAL LOCATIONS AND INVERTS OF EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION.
16. COORDINATE LOCATION OF NEW PIPING LOCATED BELOW BUILDING WITH STRUCTURAL PLANS AND OTHER TRADES TO AVOID CONFLICT.

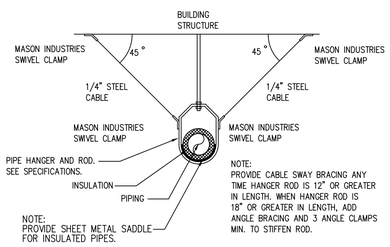
PLUMBING SYMBOLS

SYMBOL	DESCRIPTION
	ROOF DRAIN
	WASTE PIPING
	WASTE VENT PIPING
VTR	VENT THRU ROOF
140 °	140 °(F) HOT WATER PIPING
	HOT WATER PIPING
	HOT WATER RECIRCULATION PIPING
	COLD OR RIVER WATER PIPING
	PIPE TURNS TO, AWAY
	CAP AT END OF LINE
HB	HOSE BIBB
WH	WALL HYDRANT
	BALL VALVE
GAS	GAS PIPING
	BALL VALVE IN VALVE BOX
	LOW PREASURE GAS METER
SA	SHOCK ARRESTOR
	WALL CLEANOUT
GCO	GRADE CLEANOUT
FCO	FLOOR CLEANOUT
FD/F	FLOOR DRAIN WITH FUNNEL
FD	FLOOR DRAIN
FS	FLOOR SINK
CW	COLD WATER
HW	HOT WATER
A/C	ABOVE CEILING
B/S	BELOW SLAB
B/G	BELOW GRADE
RP	RECIRCULATION PUMP
TPV	TRAP PRIMER VALVE
	CONNECT TO EXISTING



WATER HEATER DETAIL

N.T.S.



SEISMIC PIPE BRACING DETAIL

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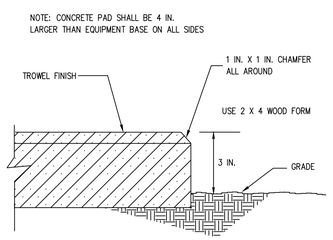

OUTDOOR EQUIPMENT FOUNDATION

N.T.S.

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SEAL
VISTA ENGINEERING LLC
No. CO1952
STATE OF AUTHORIZATION

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500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
PLUMBING SCHEDULES, DETAILS

DRAWN BY RRC
DATE 2/24/2022

SHEET NO. P3
OF

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PLUMBING SPECIFICATIONS

SCOPE:

Drawings and specifications are complimentary and what is called for by one shall be as binding as if called for by both. Provide all supervision, labor, material, equipment, machinery, plant and any other items necessary for a complete, safe and operating plumbing system.
Provide accessories in accordance with manufacturer's recommendations for the conditions encountered. Examine other drawings and specifications and bring to the attention of the Architect prior to bid time any omissions, errors, or discrepancies in this division. Work includes the study of all contract documents, the preparation of shop drawings, and coordination with other trades as necessary to install systems. Systems are to be installed as close to the details ofcontract documents as possible. Submit complete layout shop drawings for all work for review unless otherwise approved.

CODES, RULES, PERMITS, AND FEES:

Permits, fees, including all sanitary sewer and/or water tapping fees, etc. are included. Comply with all City, County, and State applicable laws, ordinances, codes, rules and regulations. Deliver certificates and permits to Architect. All material and work shall comply with the National Fire Codes of the NFPA, National and local codes. Deliver to Architect, permits and licenses including certificates from local and State Health Departments, approving complete sanitary sewer and water systems.

DRAWINGS:

Drawings are schematic and indicate only the general arrangement of systems and work included in the contract. Provide all offsets, fittings as may be required to install system, etc., without extra charge.

DAMAGES:

Cost of repairing damage to building, building contents, and site during construction and guarantee period resulting from this work is a part of this contract.

MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS:

Prior to purchasing equipment procure product manufacturer's recommendations, application, installation and rough in instructions for use in conjunction with the system design drawings and specifications during construction. All printed recommendations shall be kept in a folder on the job site, shall be made available to the Architect/Engineer when requested, and shall be turned over to the Architect before the final project visit.

ELECTRICAL CONNECTIONS:

Electrical characteristics indicated on drawings or in specifications are design values only. Verify actual electrical characteristics to be used on project before ordering equipment. All motors shall be protected with magnetic starters or with built-in thermal overload protection. Provide starters with "Hand-off-Auto" switch. Provide overload protection in all phases. The electrical Contractor shall provide all wiring except: temperature control wiring, equipment control wiring, and interlock wiring. The electrical Contractor shall furnish and install all power wiring complete from power source to motor or equipment junction box, including power wiring through starters. Electrical Contractor shall install all starters not factory mounted on equipment. This Contractor shall, regardless of voltage, provide all interlock wiring, and
equipment control wiring for equipment provided under this Division. This Contractor shall furnish all starters and contactors to the electrical . This Contractor shall provide and be responsible for overload heaters in all starters furnished. Starters shall be provided with a heater in each ungrounded conductor.

INSTRUCTIONS TO OWNER:

Contractor shall conduct a maintenance and operational instruction session for the Owner. Where highly technical or complex equipment is supplied, such as domestic booster pump packages. Manufacturer's representatives and other appropriate personnel who are
particularly qualified, shall conduct training sessions pertaining to their equipment, or systems. Such training shall be scheduled with the Owner in advance.

WARRANTY:

Provide one (1) year warranty on entire plumbing system including material and labor. If any portion of plumbing system fails during the One Year Warranty period starting from date of "Certificate of Occupancy", that portion of the plumbing system shall be repaired or replaced at no charge to the Owner. All refrigeration compressors shall have the manufacturer's standard parts warranty.

SAFETY PRECAUTIONS:

Provide all warning signs, barriers, covers, rails, belts, and other appurtenances required to protect workers, the public, and the owner's personnel in the vicinity of the project. Comply with requirements of OSHA, municipal and insurance regulations, and reasonable standards of good practice.

SHOP DRAWINGS AND SUBMITTALS:

Submit detailed shop drawings for all equipment and materials as supplied for this project. All data shall be submitted in one submission. Partial submissions shall not be accepted. Submittals. shall be stamped "SUBMITTED FOR APPROVAL" and shall contain the Contractor's name and date indicating Contractor has read the submittals and is aware of contents of submission. Shop drawings submitted for review shall be detailed, dimensioned drawings or catalog pages showing construction, size, arrangement, operating clearances, performance characteristics and capacity. Samples, drawings, specifications, and catalogs submitted for review shall be properly labeled indicating specific service for which material or equipment is to be used, section and article number of specifications governing, Contractor's name, and name of job. The Contractor shall make layout shop drawings for work that is to be
installed under this Division of the Contract. Layout drawings shall be based on the study of all contract documents and actual on-site conditions when applicable. The Contractor shall be responsible for all dimensions and space conditions. Review rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. WHERE DRAWINGS ARE REVIEWED, SAID REVIEW DOES NOT MEAN THAT DRAWINGS HAVE BEEN CHECKED IN DETAIL; SAID REVIEW DOES NOT IN ANY WAY RELIEVE THIS CONTRACTOR FROM HIS/HER RESPONSIBILITY OR NECESSITY OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.

OR EQUAL:

Specific reference in the plans or specifications to any article, device, product, materials, fixture, form or type of construction, etc., by name, make, or catalog number, with or without the words "or equal," shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition and the Contractor in such cases may, at his/her option, use any article, device, product, material, fixture, form or type of construction which, in the judgment of the Architect/Engineer expressed in writing, is equal to that named. Where quality and other characteristics are very nearly the same, the question of determining equal materials and readily available service sometimes resolves itself to a matter of personal opinion and judgment and in these and all other cases involving the approval of materials, the opinion, judgment, and decision of the Architect/Engineer and the Owner shall be final and bind all parties concerned. Requests for substitutions shall be submitted in the form of a letter (with one copy minimum) on letterhead of submitting firm. Letter to be addressed to the Engineer and referenced to this job. Items to which the Engineer has given on "OK" to quote shall not be construed as authorizing any deviations from the plans and specifications. This Contractor shall be responsible for verifying all dimensions with available space conditions with provisions for proper access, maintenance, and part replacement, and for coordination with other trades – electrical, HVAC, structural, etc. for proper service and construction requirements. If a substituted item requires a different quantity and arrangement of piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, such equipment shall be provided at no additional cost to the Owner.

STATEMENT OF COMPLETION:

Prior to substantial completion, Contractor shall furnish Architect and Engineer, two (2) copies of the following statement, signed by the Contractor: "Contract Documents have been reviewed and construction of the plumbing systems are complete and in accordance with contract documents to the best of my knowledge and belief. Plumbing systems are ready for Architect and Engineer's review." Prior to substantial completion of this project, the following shall be complete: Preparation and submittal to Architect/Engineer of a list of items to be completed or corrected; Instruction Manual; Maintenance Checklists; Start-Up Reports; Record Drawings; Testing, Adjusting and Balancing; Statement of Completion; and test report results.

PROJECT CLOSEOUT:

At the end of construction, furnish to the Architect three (3) bound and indexed sets of maintenance and operating instructions, parts lists, electrical wiring diagrams, balance data, and manufacturer's literature sufficient for operation and complete maintenance of all equipment by the Owner. Approved submittals and shop drawings may be included in the Maintenance Manuals instead of being separately furnished, if desired. It is intended that the documentation provided in maintenance manuals, along with as-built drawings, shall be complete and detailed enough to permit and facilitate troubleshooting, engineering analysis, and design work for future changes, without extensive field investigations and testing. Manuals shall be prepared so as to explain system operation and equipment to those not acquainted with the job. Manuals shall be durable bound and clearly identified on the front cover (and on the spine of thick volumes). Identification shall include the building or project name, applicable trade (such as Plumbing, Fire Protection, etc.), approximate date of completion (month and year) and contractor's name. Manuals shall be organized into well defined and easy to locate sections, with index tabs or separators to divide the sections. A complete table of contents shall be provided at the front indicating the section or page number for each system, subsystem, or supplier/manufacturer. Manuals shall include complete information and diagrams on all controls, indicators, sensors, and signal sources. Catalog data and cuts shall be clearly marked to indicate model numbers, sizes, capacities, operating points, and other characteristics of each item used. This should include accessories or special features provided. Where various sizes or variations of a series or model are used, documents should clearly show which are used where. Where quantities are appropriate, schedule of usage should be provided. Maintenance literature shall include complete information for identifying and ordering replacement parts, such as illustrated parts breakdowns. Maintenance manuals must include complete test results on all systems.

SITE CONDITIONS:

When work is existing, all bidders shall visit the site of the work and become familiar with all existing conditions before submitting a bid. Submission of a bid will be considered as evidence that this has been done, and no extra payments will be allowed this Contractor because of extra work made necessary by his/her failure to do so.

UTILITY INTERRUPTIONS:

Obtain Owner's approval for water and/or sewer utility interruptions at least five (5) working days in advance of all scheduled interruptions. Contractor shall arrange work so that interruptions are minimized in number and duration.

IDENTIFICATIONS AND NAMEPLATES:

All piping, valves, and equipment on this project shall be identified as specified herein.
All marks of identification shall be easily visible from the floor or usual point of vision. All equipment, except in finished areas, shall be nameplates identifying the piece of equipment by name and numerical sequence relative to other equipment. Example: EWH-1, P-1, etc. Nameplates shall be 1/16" thick plastic with white letters on black background. Letters shall be 1\2" high for equipment and 1/8" high for control devices. Attach nameplates with screws.

All gas piping shall be labeled every 6'-0" as "GAS PIPING". Design gas pressure shall also be part of that labeling and shall appear every 6'-0".

FOUNDATIONS AND SUPPORTS:

Provide all necessary foundations, supports, pads, bases and piers required for all equipment, piping, pumps, water heaters and for all other equipment furnished under this contract. For pumps, and other rotating machinery, and for all equipment where foundations are indicated, furnish and install concrete pads as shown. All pads shall be extended 4" beyond machine base all directions with top edge chamfered. Inset 6" long steel dowel rods into floors to anchor pads.

PAINTING AND COLOR CODING:

All new equipment, piping and materials exposed to view shall be painted as required except equipment furnished with factory-painted finishes. All new equipment and materials shall be completely sanded, primed and repainted where factory-paint has been scratched. Paint shall be as recommended by equipment manufacturer. Paint all supports, hangers, angles, and all other unpainted metal with two coats of high heat aluminum paint.

WORKMANSHIP:

Workmen shall be thoroughly experienced and fully capable to installing assigned work. Work shall be in accordance with the best practice of the trade, as recommended by the manufacturer and/or as approved by the Engineer. Work that is not of good quality in the opinion of the Engineer shall be removed and reinstalled. An experienced superintendent shall be continuously in attendance on the job during all phases of construction of the building, to coordinate and supervise the work.

COORDINATION:

Prior to starting work, coordinate with all other trades and building features to avoid interference and establish necessary space requirements and tie-ins for each trade. Prior to starting installation, furnish to the General Contractor and all contractors concerned, copies of layout shop drawings and approved shop drawings showing location of equipment, piping, etc. Schedule periodic meetings with other trades before and during installation to avoid conflicts and assure that pipes and equipment are installed in the best manner, taking into consideration headroom, maintenance, appearance, replacement and space requirements. No work shall be performed on this project before coordinating all space requirements for ducts, pipes, conduits, etc. with all contractors concerned. Locate and provide all holes and sleeves required for the installation of the materials installed under this Section. Any holes or sleeves not installed while floors, walls and ceilings are being constructed shall be cut and patched by this Contractor under the supervision of the General Contractor.

CUTTING AND PATCHING:

Provide all cutting and patching necessary to install the work specified in this Section. Patching shall match adjacent surfaces. Lay out work in advance and establish location of chases, inserts, sleeves, access panels, etc. Provide inserts, sleeves, access panels, supports, etc and check for proper installation.

PLUMBING MAINTENANCE:

Provide the necessary skills and labor to assure the proper operation and to provide all required current and preventative maintenance for all equipment and controls provided for a period of one (1) year after final completion and acceptance of the work. Contractor shall receive calls for any and all problems experienced in the operation of the equipment and shall take steps to correct any deficiencies that may exist. Contractor shall provide quarterly inspections of all equipment and record the findings on a checklist hereinafter specified. Contractor shall provide a checklist and shall post a copy of it in the main mechanical room. The checklist shall be a list ofeach piece of equipment found in these specifications. All equipment
that requires repairing shall be immediately serviced and repaired. Since the period of maintenance runs for one (1) year concurrently with the warranty and guarantee, all parts and labor shall be furnished at no extra cost to owner. Once each quarter, the Contractor shall check all plumbing fixtures in the building to ascertain that they are functioning as designed. This shall apply to all fixtures, aquastats, freezestats, plumbing equipment and piping. This portion of the work shall be performed by the Plumbing Contractor on this project. When emergency service is required beyond regular working hours to maintain the system in operation, the Plumbing Contractor shall furnish such service.

EVACUATION AND BACKFILLING:

Perform all excavation and backfilling required for work under this Division of the specifications. Install sewer and water pipes in separate trenches, graded uniformly to provide solid bearing and required fall. Dig bell holes at hubs. Remove rock for one (1) foot below pipe and replace with sand. Upon completion of tests and inspections, backfill with approved material, placed and tamped in 6" layers to prevent excessive settlement.

RECORD DRAWINGS:

The Contractor shall maintain on the job site one (1) complete set of drawings for this project. All changes as to the locations, sizes, substituted material and equipment, etc., of piping, fixtures and all other material and equipment shall be indicated in red pencil on the drawings as the work progresses. Before substantial completion, the Contractor shall obtain, at his/her expense, a set reproducible plastic (mylar) drawings, on which shall be indicated the information outlined above. Drawings (including schedules, details and sections) shall be corrected to depict all substituted material and equipment.

PRE-CONSTRUCTION CONFERENCE:

The Contractor shall plan a pre-construction conference after he/she has thoroughly reviewed the plans, specifications and site. Conference shall be held at the Engineer's office (or at an agreed upon location) at a time agreeable to both parties. Proposed lists of equipment to be used along with manufacturer's recommended installation details should be brought to the conference.

CONCEALED WORK:

Unless otherwise approved, no work shall be covered or concealed without notifying the Architect or Engineer in writing at least three (3) days in advance. Any work covered or concealed without such notice may require uncovering for examination at the Contractor's expense.

VIBRATION ISOLATION AND SEISMIC RESTRAINT:

The work in this section consists of furnishing engineering, labor, equipment, materials, appliances, tools, permits, and in performing all operations and services necessary for and/or incidental to vibration isolation and seismic restraints and other related equipment for the subject project. Unless otherwise specified, all mechanical equipment, piping, and ductwork shall be restrained to resist seismic forces. Restraints shall maintain equipment, piping, and ductwork in a captive position. Restraint devices shall be designed and selected to meet the seismic requirements as defined in the latest issue of the 2018 International Building Code and to SMACNA Seismic Restraint Manual Guidelines for Mechanical Systems Latest Edition.
The isolators and seismic restraint systems shall be manufactured by Amber/Booth.
Approved equals by Mason Ind., or Vibration Mountings and Controls, who meet all the requirements of the specifications are acceptable. All isolation materials, flexible connectors and seismic restraints shall be of the same manufacturer and shall be selected and certified using published or factory certified data. Any variance or noncompliance with these specification requirements shall be corrected by the contractor in an approved manner. The contractor and manufacturer of the isolation and seismic equipment shall refer to the isolator and seismic restraint schedule which lists isolator types, isolator deflections and seismic restraint type.

MANUFACTURER RESPONSIBILITIES

Manufacturer of vibration and seismic control products shall have the following responsibilities: Determine vibration isolation and seismic restraint sizes and locations. Provide piping, and equipment isolation systems and seismic restraints as scheduled or specified. Provide installation instructions and shop drawings in accordance with other provisions of this section of the specifications. Provide calculations to determine restraint loads resulting from seismic forces presented in the International Building Code 2015, Chapter 16. Seismic calculations shall be certified by an engineer licensed in the locality of this project and in the employ of the seismic equipment supplier. Anchor bolt calculations, certified by a qualified licensed engineer shall be submitted showing adequacy of bolt sizing and type. Calculations or testing shall be furnished for anchors on restraint devices, cables, and rigidly mounted equipment. Calculations and restraint device submittal drawing shall specify anchor bolt type, embedment, concrete compressive strength, minimum spacing between anchors and minimum distances of anchors from concrete edges.

PIPING MATERIALS AND FITTINGS:

WASTE, STORM AND VENT PIPING:

Cast iron ASTM A74 pipe for all pipe and fittings with ASTM C-564 gaskets.

(OPTION): Cast iron CISPI 301, ASTM A888 hubless pipe with ASTM C-1277 shielded hubless couplings.

All pipe and fittings shall be marked with the collective trade marks of CISPI and NSF.

CISPI Designation 310-11, CISPI Designation 301-09, large diameter no-hub cast iron fittings, over 4 inches in size, shall be provided with supplemental support to minimize the risk of joint separation under high thrust conditions. Auxiliary restraint products used shall be manufactured assemblies with thrust pressure rating adequate for the specific installation. Field devised methods and materials shall not be used to accomplish this application solution. Basis of design subject to compliance with requirements shall be Holdrite 117 Series No Hub Fittings Restraints.

(OPTION EXCEPT KITCHEN DRAINS): PVC SCHEDULE 40 DWV pipe and fittings with solvent joints.

All buried PVC pipe shall be installed per ASTM D-2321.

Kithen Drainage Piping at and beneath Kitchen Floor (Buried or suspended)

Kitchen drainage systems shall be manufactured from CPVC Type IV, minimum ASTM Cell Classification 23447. System piping and fittings shall be manufactured in accordance with ASTM F 2618 and certified by NSF International for use corrosive and/or high temperature environment. Pipe and fittings shall be listed by ICC-ES PMG to ASTM E84/UL723 having a flame spread of less than 25 and smoke developed index of less than 50 and listed by UL.
Pipe and Fittings shall be equal to Spears LabWaste CPVC Corrosive Waste Drainage Systems.

WATER PIPING (BURIED OR BELOW GRADE):

ASTM B88, TYPE K, hard drawn copper tubing with cast brass or copper fittings and Grade 95TA solder joints.

(OPTION): ASTM D, SCHEDULE 40 PVC pipe, minimum 150 PSIG pressure rating with solvent joints. (COLD WATER ONLY). All buried PVC pipe shall be installed per ASTM D-2321.

(OPTION): ASTM F876, PEX-a pipe, minimum 100 PSIG pressure rating with cold expansion ASTM F1960 fittings. Install in strict accordance with manufacturer's written instructions. PEX-b and PEX-c products are not acceptable.

WATER AND RIVER WATER PIPING (ABOVE GRADE OR WITHIN BUILDING):

ASTM B88, TYPE L, hard drawn copper tubing with cast brass or copper fittings and GRADE 95TA solder joints.

(OPTION): ASTM D2846, SCHEDULE 40 CPVC pipe, minimum 150 PSIG pressure rating with solvent joints.

(OPTION): ASTM F876, PEX-a pipe, minimum 100 PSIG pressure rating with cold expansion ASTM F1960 fittings. Install in strict accordance with manufacturer's written instructions. PEX-b and PEX-c products are not acceptable.

NATURAL GAS PIPING (BURIED):

ASTM A-53 OR A-120 black steel with polyethylene jacket with welded or screwed joints. provide manufacturer's tape for joints and fittings.

NATURAL GAS PIPING (ABOVE GRADE):

ASTM A-53 OR A-120 SCHEDULE 40 black steel with malleable iron or forged steel fittings, screwed or welded.

INSULATION:

Insulate all hot, cold and river water piping with 1" thick fiberglass insulation with Kraft paper moisture barrier. Seal all joints and seams with plastic mastic with fiberglass tape. Provide saddles at harness points. Insulation exposed to weather to have aluminum jacket including fittings.

(OPTION): Insulate all hot, coldand river water piping with 1" thick ARMAFLEX flexible closed cell expanded foam insulation installed according to manufacturer's recommendations. Seal all joints air tight. Provide saddles at hanger points.

Insulate all horizontal components of roof drains and roof drain bodies with 2" thick fiberglass insulation with Kraft paper moisture barrier. Seal all joints and seams with heavy mastic with fiberglass tape. Provide saddles at hanger points.

VALVES:

SWING CHECK VALVES:

NIBCO MODEL T433 / S433, HAMMOND Model IB945 or POWELL MODEL 1841.
Units up to 2" shall be bronze swing disc, solder or screw ends.

SPRING LOADED CHECK VALVES:

Iron body, bronze trim, spring loaded, renewable composition disc, soldered, screwed, wafer or flanged.

WATER PRESSURE REDUCING VALVES:

WATTS, HONEYWELL, BRAUKMANN OR A.W. CASH VALVE MANUFACTURING COMPANY up to 2", bronze body, stainless steel and thermoplastic internal parts, fabric reinforced diaphragm, strainer and double union ends. Above 2", cast iron body, bronze fitted, elastomeric diaphragm and seat disc, flanged.

RELIEF VALVES:

WATTS, A.W. CASH MANUFACTURING CORP. or CONBRACO INDUSTRIES, INC. bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities and ASME CERTIFIED AND LABELED.

BALL VALVES:

NIBCO MODEL T585-7066 / S585-7066, MILWAUKEE VALVE MODEL BA-100S / BA-05S or WATTS MODEL B-6000SS / B-6001SS or Jomar T-100NE

Up to 2", bronze or stainless steel body, stainless steel ball, Teflon seats and stuffing box ring, lever handled and solder or screwed ends.

HANGERS:

PERFORATED STRAP HANGERS, CHAIN, OR WIRE WILL NOT BE PERMITTED ON THE JOB.

Support horizontal steel or cast iron piping where run above ground with split ring hangers, turnbuckles and threaded rod as manufactured by FEE & MASON or APPROVED EQUAL. Hangers shall be securely fastened to structure and spaced not more than 5'-0" for cast iron pipes, 8'-0" apart for steel piping and 4'-0" for PVC piping.

Support horizontal copper pipes where run above ground with copper or copper plated hangers as manufactured by GRINNELL CO., FEE & MASON or APPROVED EQUAL. Hangers shall be spaced no more than 6'-0" apart for 1/2" and not over 8'-0" apart for larger pipes..

Provide intermediate and supplementary steel where required for proper support of piping and installation of hangers. Group parallel runs of pipe and support by common steel trapeze hangers of adequate dimensions

Increase hanger size to accommodate insulation and shield size.

INSTALLATION AND EXECUTION:

ALL MATERIALS AND WORK SHALL COMPLY WITH THE LATEST EDITION OF THE INTERNATIONAL PLUMBING CODE 2018, INTERNATIONAL BUILDING CODE 2018, SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL REQUIREMENTS, AND APPLICABLE LOCAL CODES AND OR ORDINANCES.

PLUMBING FIXTURES FOR THE HANDICAPPED SHALL MEET THE REQUIREMENTS OF ANSI A117.1 AND THE AMERICANS WITH DISABILITIES ACT (ADA).
THIS SHALL INCLUDE PLUMBING FAUCETS, VALVES, DRAINS, ETC.

Plumbing fixtures shall be as specified or as approved by the owner.
Provide stop valves and P-traps for all fixtures. Install level and in the best practice of the trade. Caulk, clean and adjust all fixtures as recommended by the installation instructions of the manufacturer. Complete operating plumbing system to be turned over to the owner. The entire system shall be warranted for one year from the date of the CERTIFICATE OF OCCUPANCY except for the water heater(s) and/or the water cooler which may carry their own longer factory warranty. Return to the job site as often as necessary to make adjustments or correct defects for the one year period without cost to the owner.

Coordinate electrical requirements with the electrical contractor as required.

Sterilize all water piping in accordance with the local codes and building officials prior to acceptance by owner and Certificate of Occupancy.
Deliver test results from independent testing laboratory to owner.

Pressure and leak test all water piping at a minimum of 150 PSIG for a period of 4 hours and in accordance with local requirements. Test entire waste and sanitary drainage system vent piping by plugging all necessary openings and filling with a minimum of 10'-0" water column or to the top of highest vent.

Deliver complete set of operating instructions, warranties and equipment data to owner. Information shall be in three ring binders and clearly labeled.

WATER PRESSURE:

This Contractor shall obtain static and residual pressure readings at the site before beginning construction. Maximum pressure allowed within the building shall be 80 psig. If site conditions apply, plumbing contractor shall provide within the scope of the original bid, a pressure reducing valve to limit building water pressure to 80 psig. Pressure reducing valve, if required, shall be located in a serviceable location within the mechanical room or other service room, or located in a valve box outside the building structure. Install valve within strict recommendations of unit manufacturer.

INVERT ELEVATIONS:

Ascertain, before beginning construction, the invert elevations of existing sanitary and/or storm drains, manholes, lift station sumps, etc. Produce "Lay Out" drawings as specified and bring to the attention of the engineer, any discrepancies with existing elevations and inverts before beginning work. Failure to provide this information shall not relieve the contractor of responsibility to provide a working plumbing system in accordance with the plans and specifications.

RETURN AIR PLENUM:

Coordinate with HVAC contractor and consult Architectural Drawings to determine if this project incorporates a rated return air plenum. If a plenum is used, all piping and associated insulation will have to be plenum rated for fire and smoke generation levels including ASTM-E84 for both pipe and flat sheet presentations.

LEAD LEVELS:

Lead levels for wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures shall have a weighted average of not more than 0.25%. No person shall introduce into commerce any pipe, pipe or plumbing fitting, or fixture intended to convey or dispense water for human consumption through drinking or cooking that is not lead free. Content for solder and flux shall be not more than 0.20%.

VISTA ENGINEERING LLC.
CONSULTING MECHANICAL ENGINEERING
530 S. SALUDA AVE. COLUMBIA, SC 29205
TEL: (803) 790-8900 FAX: (803) 790-8960
E-MAIL: rcottrell@vistaengineering.net

DESIGN
RDS DESIGN, LLC
ARCHITECTURE
821 KINLOCK CT.
COLUMBIA, SOUTH CAROLINA 29223
803.447.4817 Sirkins@aol.com

Raymond Rittrell
SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 28429
REGISTERED
02.24.2022

SEAL
SOUTH CAROLINA
VISTA ENGINEERING LLC
No. C01952
CERTIFICATE OF AUTHORIZATION

RIVERBANKS ZOO - HAY BARN
500 WILDLIFE PARKWAY
COLUMBIA, SC

SHEET TITLE:
PLUMBING SPECIFICATIONS

DRAWN BY RRC
DATE 2/24/2022

SHEET NO. P4
OF

STRUCTURAL DESIGN CRITERIA:

1. APPLICABLE BUILDING CODES:

2018 INTERNATIONAL BUILDING CODE
ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

2. RISK FACTOR: II

3. LIVE LOADS: LIGHT STORAGE ..... 125 PSF

NOTE: IT IS UNLAWFUL TO PLACE, CAUSE OR PERMIT TO BE PLACED, ON ANY FLOOR OR ROOF OF A BUILDING, STRUCTURE, OR PORTION THEREOF, A LOAD GREATER THAN PERMITTED BY THESE REQUIREMENTS AND THE APPLICABLE BUILDING CODE(S).

ROOF:
ORDINARY, PITCHED AND CURVED ROOFS ..... 20 PSF
AWNINGS:
FABRIC WITH SKELETON STRUCTURE ..... 5 PSF
ALL OTHER AWNINGS ..... 20 PSF

4. BASIC LATERAL SYSTEM:

BEARING WALL SYSTEM,
ORDINARY REINFORCED MASONRY SHEAR WALLS R=2

5. DEAD LOADS: USE ACTUAL LOADS OF ALL BUILDING MATERIALS

6. WIND LOADS:

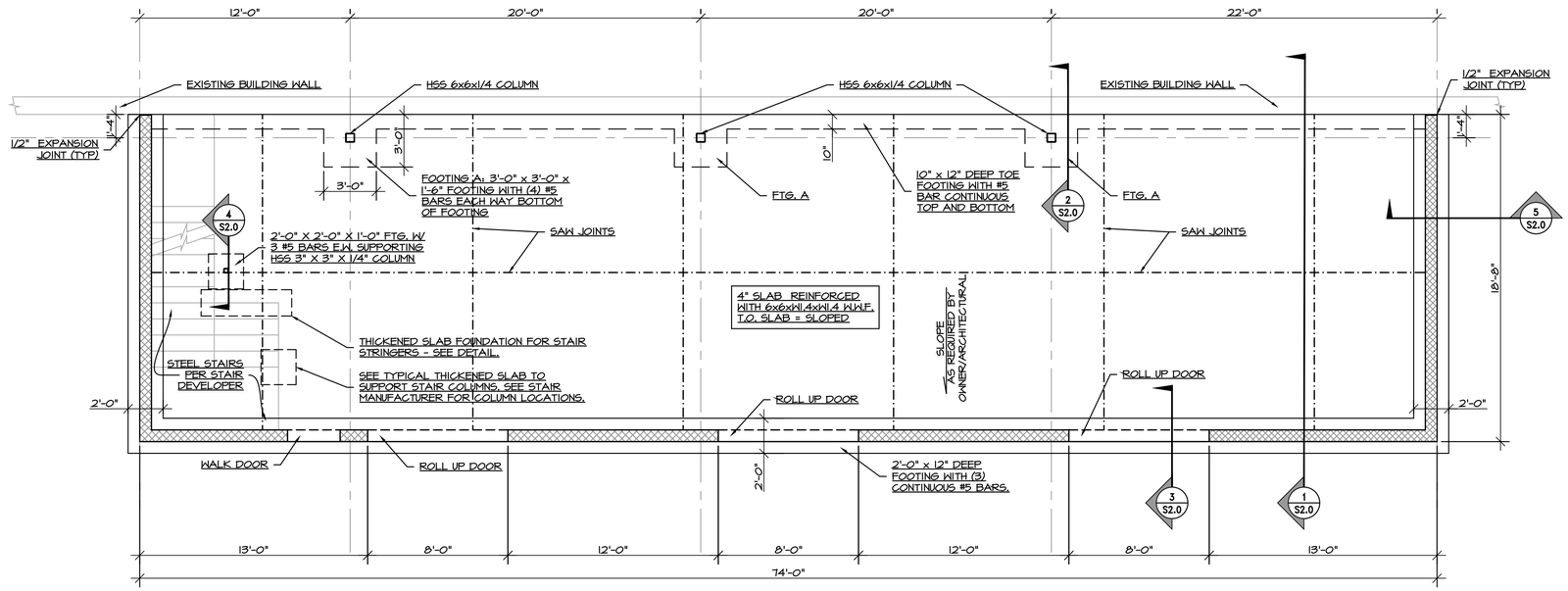
BASIC DESIGN WIND VELOCITY .... V = 130 MPH (Vasd = 101 MPH)
WIND IMPORTANCE FACTOR (Iw) 1.0
WIND EXPOSURE CATEGORY ..... B
INTERNAL PRESSURE COEFFICIENTS:
ENCLOSED BUILDING +/- 18%
PARTIALLY ENCLOSED +/- 55%
OPEN BUILDING +/- 0

7. SNOW LOADS:

GROUND SNOW LOAD (PSF) .... Pg = 10 PSF

8. SEISMIC LOADS:

SOIL SITE CLASS ..... D
IMPORTANCE FACTOR (Ie) ..... 1.0 [FOR RISK II]
SPECTRAL RESPONSE ACCELERATIONS .... Ss = 0.43 S1 = 0.15
SPECTRAL RESPONSE COEFFICIENTS ..... Sds = 0.42 Sd1 = 0.22
SEISMIC BUILDING DESIGN CATEGORY ... D
RESPONSE MODIFICATION FACTOR ... R = 2
SEISMIC RESPONSE COEFFICIENT ... Cs = 0.21
DESIGN BASE SHEAR ..... V = 42 KIPS
SEISMIC ANALYSIS .... EQUIVALENT FORCE PROCEDURE



SEE OWNER/ARCHITECT REQUIREMENTS FOR CONCRETE SLABS, WALKS, AND EQUIPMENT PADS.

FOUNDATION / SLAB PLAN
SCALE: 1/4" = 1'-0"

FOR CONSTRUCTION

Revisions

Revision	By

Seal

SOUTH CAROLINA TIMMERMAN STRUCTURAL ENGINEERING GROUP No. 5537 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 11150 02/25/22 REGISTERED KRISTEN WILLIAM TIMMERMAN

Job Title:

RIVERBANKS ZOO & GARDEN BARN ADDITION
500 WILDLIFE PARKWAY
COLUMBIA, SOUTH CAROLINA 29210

TIMMERMAN Structural Engineering Group
380 Chris Dr. West Columbia S.C. 29169
Ph. (803)791-4511 Fax (803)791-4522

Drawing Title:

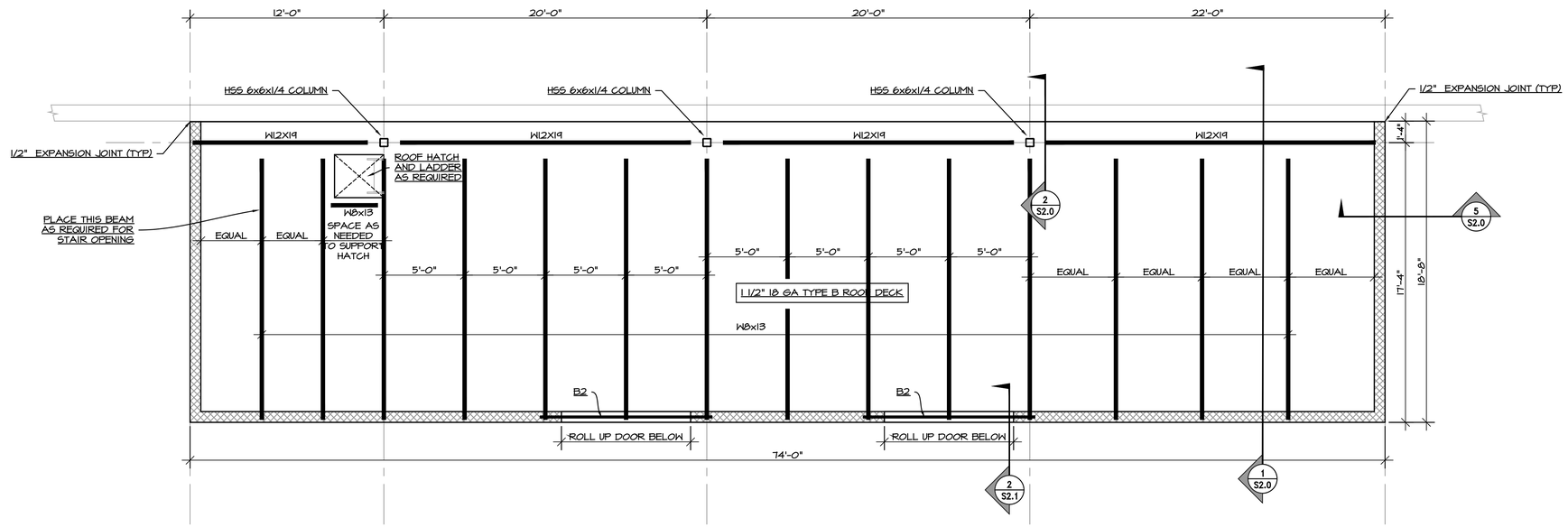
FOUNDATION PLAN

Scale:	AS NOTED
Job Number:	22-102
Designed By:	KWT
Drawn By:	TJD
Checked By:	KWT
Date:	02/25/2022

Sheet Number

S1.0

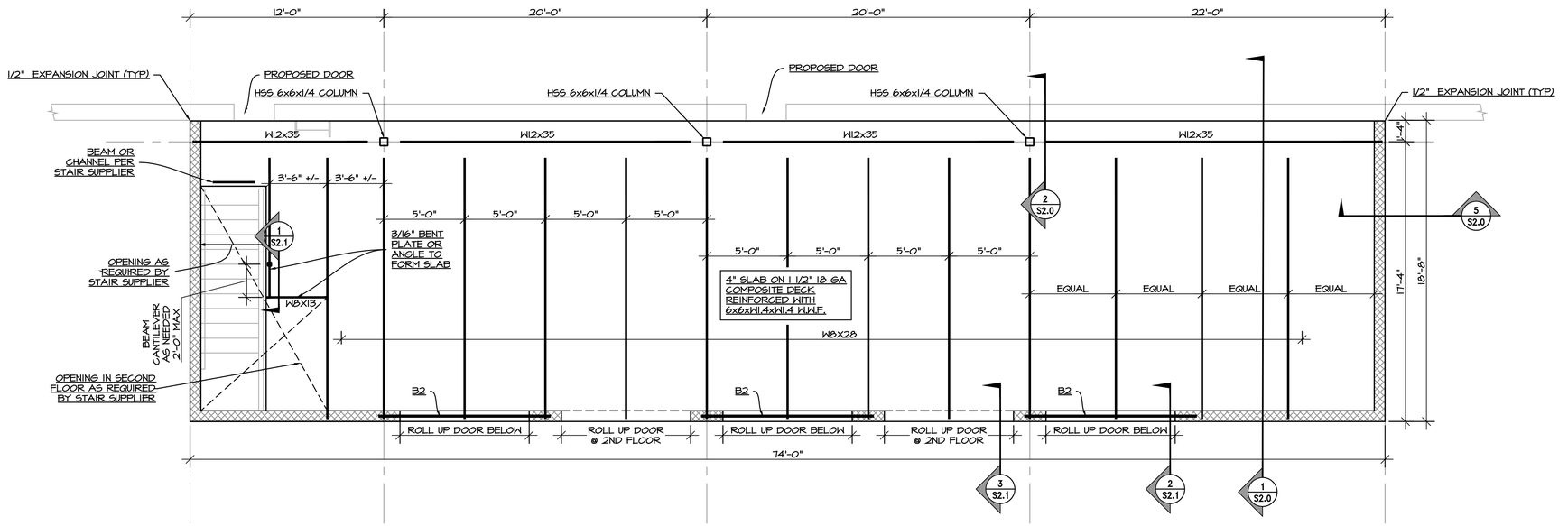
Sheet 1 of 7



NOTE: SEE ARCHITECTURAL DRAWINGS FOR HATCH DETAILS & ROOF RAILS AS REQUIRED

ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"



NOTE: CONTRACTOR SHALL INSTALL A "BI" LINTEL OVER WALK DOORS & VENT OPENINGS

SECOND FLOOR FRAMING PLAN

SCALE: 1/4" = 1'-0"

FOR CONSTRUCTION

Revisions

Revision	By

Seal

SOUTH CAROLINA — TIMMERMAN STRUCTURAL ENGINEERING GROUP — No. 5537 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 11150 — 02/25/22 — KENNETH WILLIAM TIMMERMAN

Job Title:

RIVERBANKS ZOO & GARDEN BARN ADDITION

500 WILDLIFE PARKWAY
COLUMBIA, SOUTH CAROLINA 29210

IMMERMAN
Structural Engineering Group
580 Chris Dr. West Columbia S.C. 29169
Ph. (803)791-4511 Fax (803)791-4522

Drawing Title:

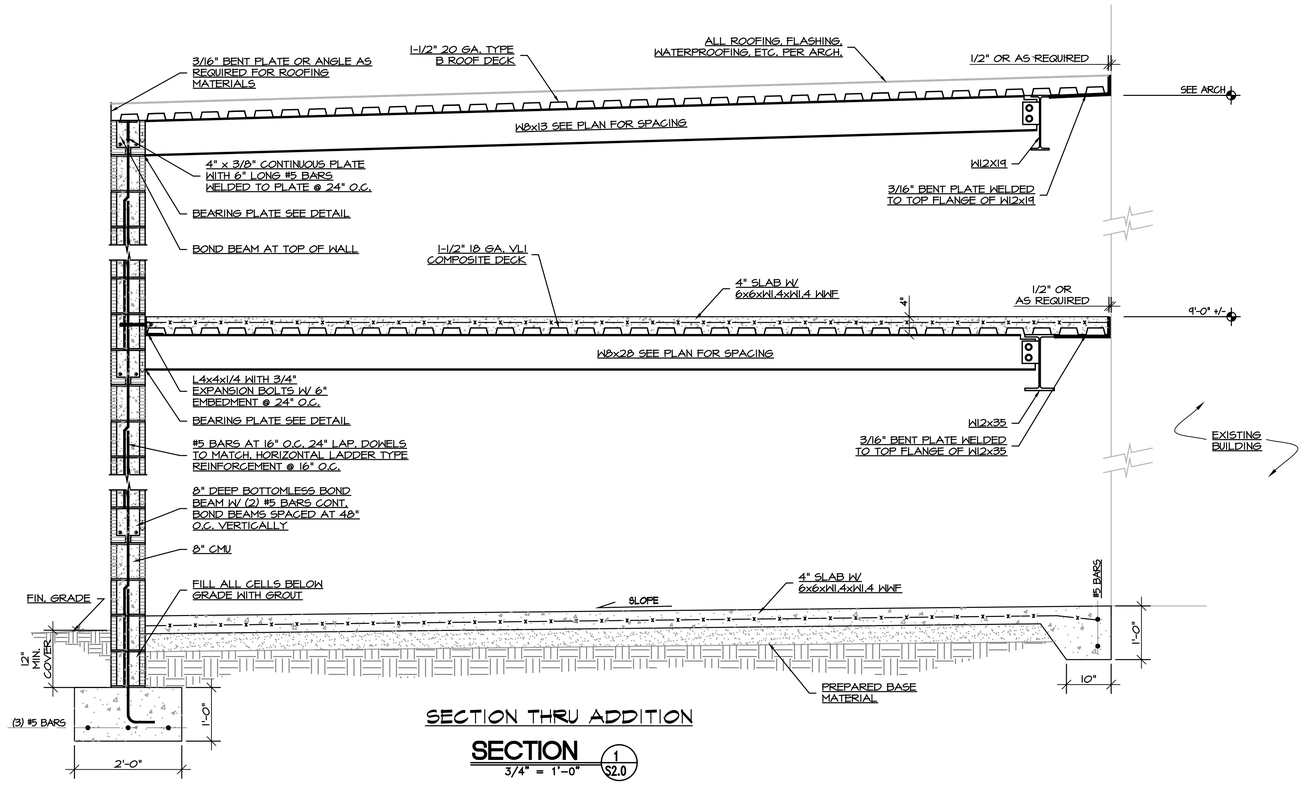
FRAMING PLAN

Scale:	AS NOTED
Job Number:	22-102
Designed By:	KWT
Drawn By:	TJD
Checked By:	KWT
Date:	02/25/2022

Sheet Number

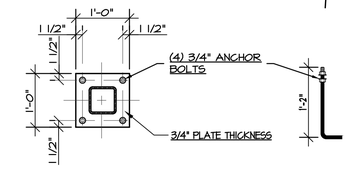
S1.1

Sheet 2 of 7

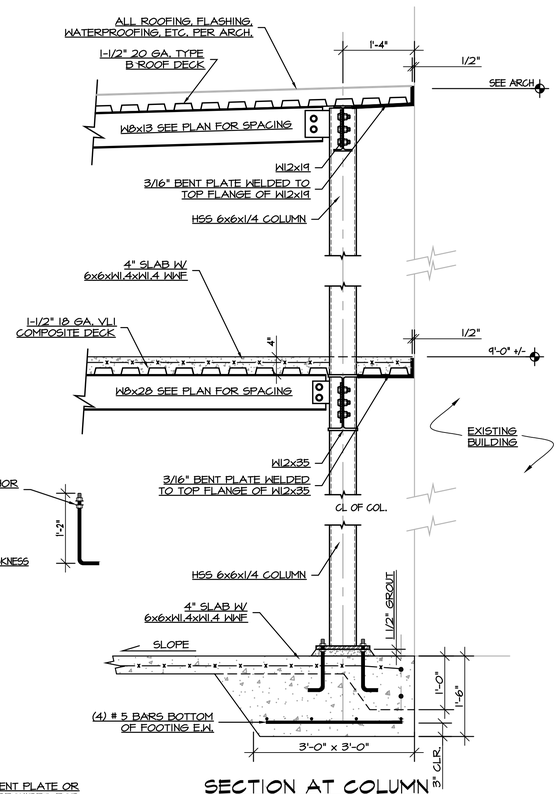


SECTION THRU ADDITION

SECTION 1 S2.0
3/4" = 1'-0"

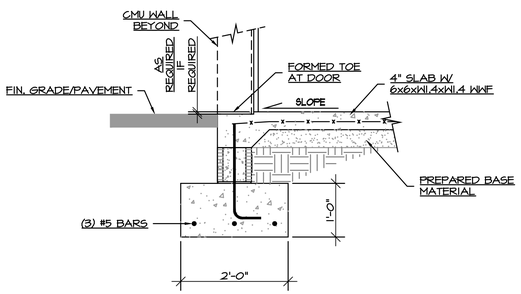


HSS 6x6x1/4 COLUMN BASE PLATE



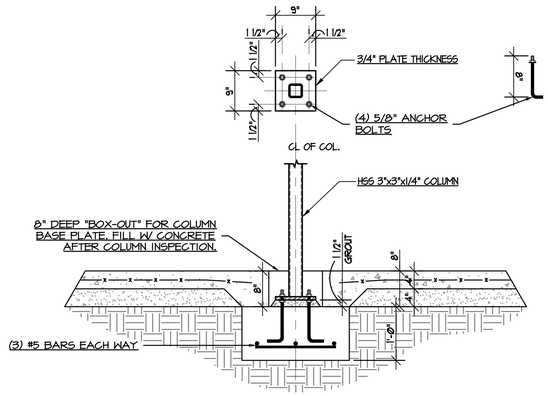
SECTION AT COLUMN

SECTION 2 S2.0
3/4" = 1'-0"



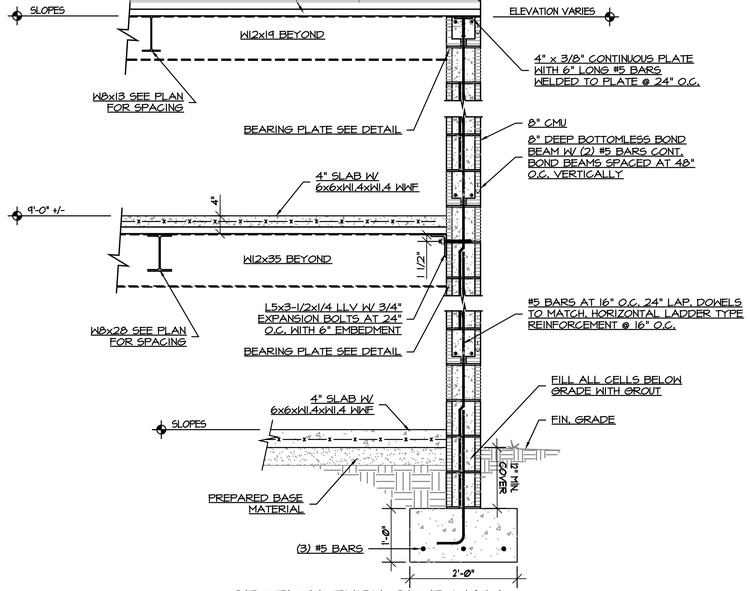
SECTION @ FIRST FLOOR DOORWAY

SECTION 3 S2.0
3/4" = 1'-0"



SECTION @ HSS 3X3X1/4 TO SUPPORT SECOND FLOOR FRAMING AT STAIR

SECTION 4 S2.0
3/4" = 1'-0"



SECTION THRU SIDE WALL

SECTION 5 S2.0
3/4" = 1'-0"

FOR CONSTRUCTION

Revisions	
Revision	By

Seal

SOUTH CAROLINA — TIMMERMAN STRUCTURAL ENGINEERING GROUP — No. 5537 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 11150 — 02/25/22 — KENNETH WILLIAM TIMMERMAN

Job Title:

RIVERBANKS ZOO & GARDEN BARN ADDITION
500 WILDLIFE PARKWAY
COLUMBIA, SOUTH CAROLINA 29210

TIMMERMAN Structural Engineering Group
580 Chris Dr. West Columbia S.C. 29169
Ph. (803)791-4511 Fax (803)791-4522

Drawing Title:

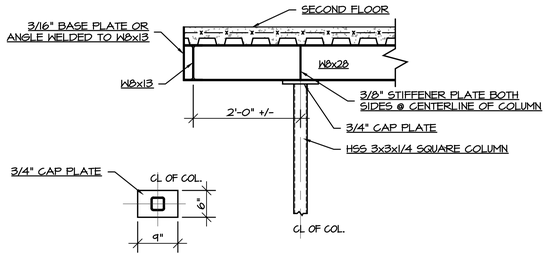
FOUNDATION SECTIONS

Scale:	AS NOTED
Job Number:	22-102
Designed By:	KWT
Drawn By:	TJD
Checked By:	KWT
Date:	02/25/2022

Sheet Number

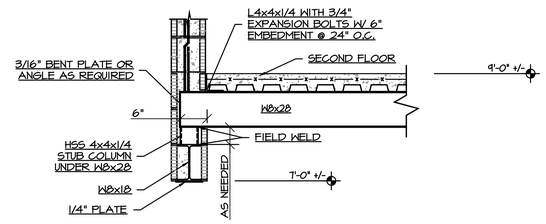
S2.0

Sheet 3 of 7



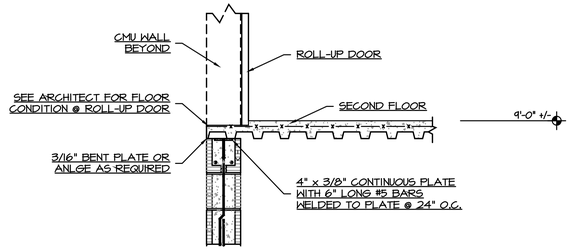
CONNECTION @ HSS 3x3x1/4 & W8x28

SECTION 1/S2.1
3/4" = 1'-0"



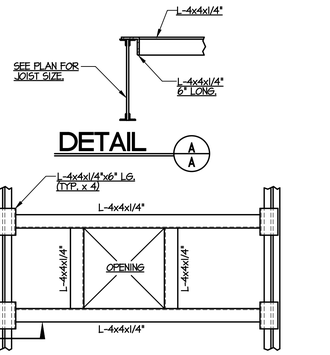
LINTEL DETAIL

SECTION 2/S2.1
3/4" = 1'-0"



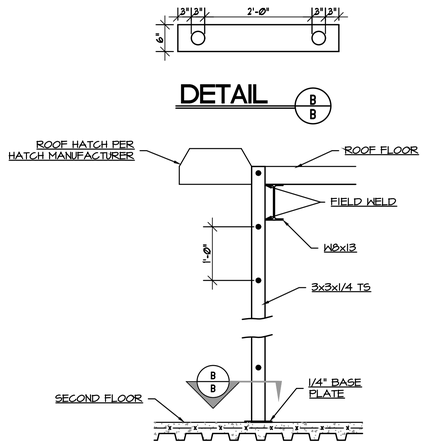
SECTION THROUGH SECOND FLOOR DOORWAY

SECTION 3/S2.1
3/4" = 1'-0"



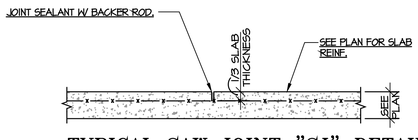
TYP. ROOF PENETRATION FRAMING

NOTE:
CONTRACTOR SHALL INSTALL A 1/4" THICK PLATE FOR FULL WIDTH OF THE SUPPORTING BARJOIST(S) AND BEAM(S) AS NEEDED TO PROVIDE CONTINUOUS BEARING FOR SUPPORT CURBS. FRAMING NOT REQUIRED FOR PENETRATIONS 12"x12" OR 12" DIAMETER AND SMALLER.

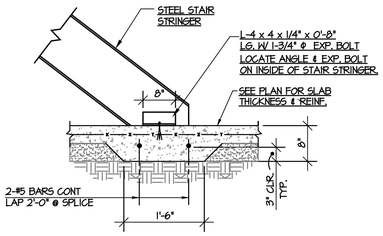


LADDER @ ROOF HATCH SECTION

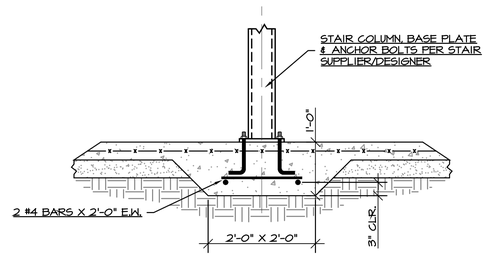
TOP VIEW



TYPICAL SAW JOINT "SJ" DETAIL



TYP. SECTION @ STAIR FOUNDATION



TYPICAL COLUMN FOUNDATION AT STAIR

NOTE: THIS DETAIL MAY BE AT SEVERAL LOCATIONS. SEE STAIR SUPPLIERS DRAWINGS FOR LOCATIONS.

FOR CONSTRUCTION

Revisions	
Revision	By

Seal

SOUTH CAROLINA — TIMMERMAN STRUCTURAL ENGINEERING GROUP — No. 5537 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — KENNETH WILLIAM TIMMERMAN — No. 11150 — 02/25/22

Job Title:

RIVERBANKS ZOO & GARDEN BARN ADDITION
500 WILDLIFE PARKWAY
COLUMBIA, SOUTH CAROLINA 29210

IMMERMAN
Structural Engineering Group
580 Chris Dr. West Columbia S.C. 29169
Ph. (803)791-4511 Fax (803)791-4522

Drawing Title:
SECTIONS CONTINUED

Scale:	AS NOTED
Job Number:	22-102
Designed By:	KWT
Drawn By:	TJD
Checked By:	KWT
Date:	02/25/2022

Sheet Number
S2.1
Sheet 4 of 7

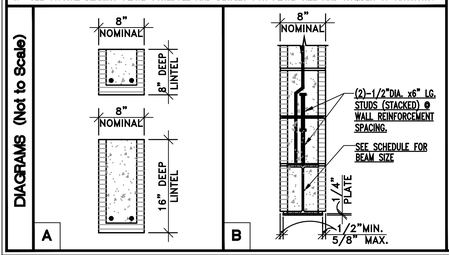
8" MASONRY BLOCK LINTEL SCHEDULE

MARK	LINTEL DISCRIPTION	OPENING WIDTH FOR NON-LOAD BEARING WALL	REFERENCE DIAGRAM
B1	8" DEEP BOND BEAM W/ 2-#5 BARS CONT.	6'-0" WIDE MAX.	DIAGRAM A
B2	W 8x18 W/ 1/4" PLATE CONT.	14'-0" WIDE MAX.	DIAGRAM B

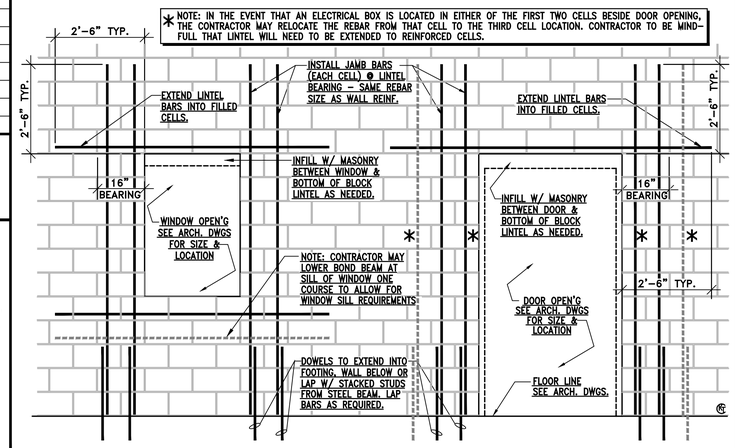
CONTRACTOR'S NOTES:

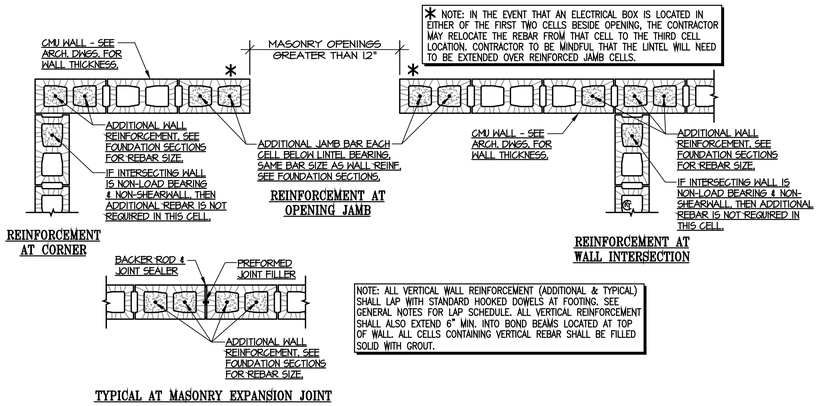
1. SOME LINTELS IN THIS SCHEDULE MAY NOT BE USED. CONTRACTOR MAY SELECT APPROPRIATE LINTEL ACCORDING TO OPENING SIZE AND WALL CONSTRUCTION, UNLESS NOTED OTHERWISE.
2. ALL MASONRY LINTEL BEARING TO BE 16" MIN. ON EACH SIDE.
3. SEE STRUCTURAL PLAN AND ADDITIONAL WALL SECTIONS FOR WALL REINFORCEMENT AND SPACING.
4. SEE TYPICAL BEARING PLATE SCHEDULE AND DETAILS FOR PLATE SIZE AND NUMBER OF ANCHORS.

DIAGRAMS (Not to Scale)



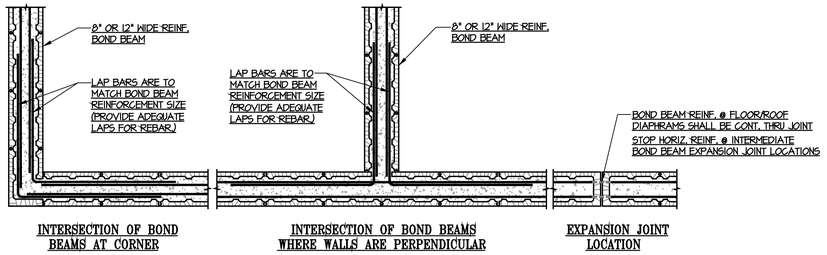
MASONRY OPENING REINFORCEMENT DETAIL (Not to Scale)





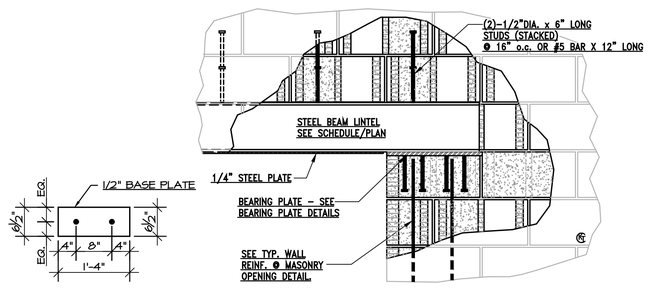
ADDITIONAL REINFORCEMENT DETAILS FOR LOAD-BEARING MASONRY WALLS

NO SCALE



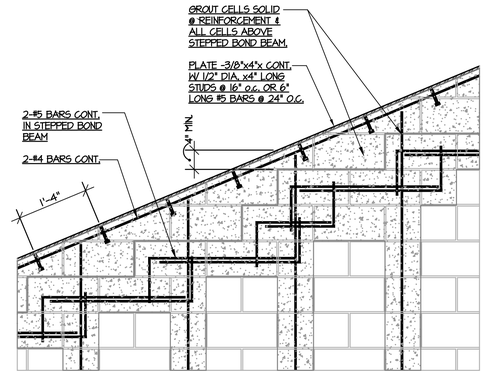
TYPICAL BOND BEAM INTERSECTION DETAILS

NO SCALE



STEEL BEAM BEARING DETAIL

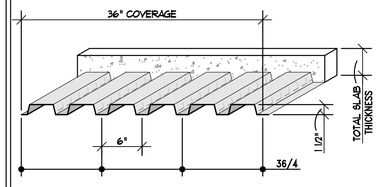
NO SCALE



TYPICAL STEPPED BOND BEAM @ SLOPED ROOF

1-1/2" 18 GAUGE TYPE "VL" COMPOSITE FLOOR DECK

TOTAL SLAB SLAB THICKNESS = 4"
CONCRETE STRENGTH / TYPE = 4000 PSI / LIGHTWEIGHT



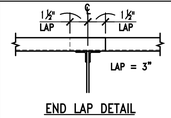
DECK PROPERTIES
Ip = 0.282 in⁴/ ft.
In = 0.295 in⁴/ ft.
Sp = 0.315 in³/ ft.
Sn = 0.327 in³/ ft.
Fy = 40 KSI
G60 GALVANIZED

SUPPORT ATTACHMENT

ATTACH DECK TO ALL SUPPORTS WITH 5/8" PUDDLE WELDS USING PATTERNS / SPACING INDICATED:
INTERMEDIATE: 36/4
ENDS / END LAPS: 36/4
FLOOR PERIMETER: 8" o.c. WITH 5/8" PUDDLE WELDS
ATTACH PARITAL SHEETS IN ALL FLUTES

SIDE LAP ATTACHMENT

SIDE LAPS TO BE ATTACHED BETWEEN SUPPORTS WITH (5) #10 TEK SCREWS OR (5) WELDS EQUALLY SPACED BETWEEN SUPPORTS



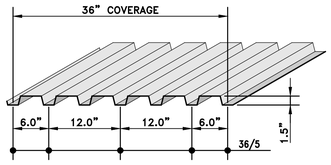
END LAP DETAIL

END LAPS ARE TO OCCUR AT SUPPORTS ONLY.

CONTRACTOR NOTE:

IN ORDER TO PREVENT FIELD FIT-UP AND PLACEMENT ISSUES THE STRUCTURAL STEEL SHOP DRAWINGS SHALL BE CAREFULLY COORDINATED WITH ANY OTHER COMPONENT DRAWINGS, INCLUDING BARJOIST AND STRUCTURAL STEEL. THIS DETAILED COORDINATION IS TO BE PROVIDED BY THE CONTRACTOR AND SUB-CONTRACTORS FOR THE PROJECT.

1-1/2" 20 GAUGE TYPE "B" ROOF DECK



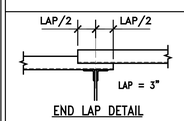
DECK PROPERTIES
I = 0.212 in⁴/ ft.
Sp = 0.234 in³/ ft.
Sn = 0.247 in³/ ft.
Fy = 33 KSI
G60 GALVANIZED

SUPPORT ATTACHMENT

ATTACH DECK TO ALL SUPPORTS WITH #12 TEK SCREWS OR 5/8" PUDDLE WELDS USING PATTERNS / SPACING INDICATED:
INTERMEDIATE: 36/5
ENDS / END LAPS: 36/5
ROOF EDGE: 6" o.c. WITH #10 TEK SCREWS OR 5/8" PUDDLE WELDS
ATTACH PARITAL SHEETS IN ALL FLUTES

SIDE LAP ATTACHMENT

SIDE LAPS TO BE ATTACHED BETWEEN SUPPORTS WITH (8) #10 TEK SCREWS



END LAP DETAIL

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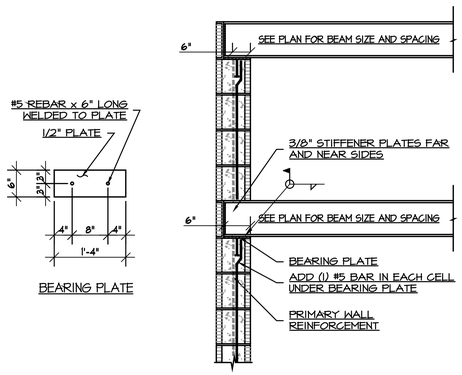
IN ORDER TO PREVENT FIELD FIT-UP AND PLACEMENT ISSUES THE STRUCTURAL STEEL SHOP DRAWINGS SHALL BE CAREFULLY COORDINATED WITH ANY OTHER COMPONENT DRAWINGS, INCLUDING BARJOIST AND STRUCTURAL STEEL. THIS DETAILED COORDINATION IS TO BE PROVIDED BY THE CONTRACTOR AND SUB-CONTRACTORS FOR THE PROJECT.



BEARING PLATE IN MASONRY WALL

FOR CONSTRUCTION

Revisions

Revision	By

Seal

SOUTH CAROLINA — TIMMERMAN STRUCTURAL ENGINEERING GROUP — No. 5537 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 11150 — 02/25/22 — WILLIAM TIMMERMAN

Job Title:

RIVERBANKS ZOO & GARDEN BARN ADDITION
500 WILDLIFE PARKWAY
COLUMBIA, SOUTH CAROLINA 29210

IMMERMAN
Structural Engineering Group
580 Chris Dr. West Columbia S.C. 29169
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Drawing Title:

TYPICAL DETAILS

Scale:	AS NOTED
Job Number:	22-102
Designed By:	KWT
Drawn By:	TJD
Checked By:	KWT
Date:	02/25/2022

Sheet Number

S2.2

Sheet 5 of 7

STRUCTURAL/GENERAL NOTES:

1. THE LEAD (ARCHITECTURAL) DRAWINGS SHALL BE CONSIDERED "THE ORIGINAL SOURCE" FOR THE DIMENSIONING FOR THE PROJECT AND THEREBY WILL NORMALLY TAKE PRECEDENCE OVER THE DRAWINGS BY OTHERS ON THE DESIGN TEAM. THE DIMENSIONS INDICATED IN THESE STRUCTURAL DRAWINGS ARE TO DOCUMENT AND AID THE STRUCTURAL DESIGNER WITH THE DIMENSIONS USED FOR THE BASIC DESIGN OF THE STRUCTURAL SYSTEM. CONSTRUCTION AND DETAILING DIMENSIONS SHALL BE TAKEN (OR DERIVED) FROM THE "ORIGINAL SOURCE" DRAWINGS BY THE ARCHITECT OR LEAD DESIGNER.

2. AS PART OF MEANS AND METHODS, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN AND ERECTION OF TEMPORARY BRACING AND SHORING AS REQUIRED FOR STABILITY OF THE STRUCTURAL SYSTEM AND STRUCTURAL COMPONENTS DURING ALL PHASES OF CONSTRUCTION.

3. IT IS UP TO THE CONTRACTOR TO BE AWARE OF ANY EXISTING AND/OR NEIGHBORING SITE CONDITIONS WHICH MAY HAVE A BEARING ON THE CONSTRUCTION COST, MEANS AND METHODS, AND WORKING CONDITIONS FOR THIS PROJECT.

4. ALL HANDRAILS, SKYLIGHTS, STAIRS, STAIR LANDINGS, ELEVATOR HOIST BEAMS, ELEVATOR RELATED STEEL, OTHER ARCHITECTURAL/STRUCTURAL ITEMS & THEIR CONNECTIONS (SHOWN OR NOT) ON THE STRUCTURAL AND/OR CONSTRUCTION DOCUMENTS SHALL BE DESIGNED BY A REGISTERED ENGINEER, REGISTERED IN THE PROJECT STATE, TO RESIST ALL LOADS PER THE LATEST EDITION OF THE APPLICABLE BUILDING CODE(S) AND AS SPECIFIED IN THE CONTRACT DOCUMENTS. ANY ENGINEERING, DETAILING FEES, MATERIAL AND LABOR COSTS FOR THESE ITEMS ARE CONSIDERED PART OF THE CONTRACT.

5. THE CONTRACTOR SHALL DETERMINE SIZES AND LOCATIONS OF ALL SLOTS, PIPE SLEEVES, ANCHOR BOLTS, ETC. AS REQUIRED FOR ALL TRADES PRIOR TO CONSTRUCTING THAT PORTION OF THE PROJECT.

6. CONTRACTOR SHALL MAKE NO DEVIATIONS FROM DESIGN DRAWINGS AND SPECIFICATIONS WITHOUT WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER.

7. THE CONTRACTOR SHALL CONSTRUCT THIS PROJECT IN ACCORDANCE TO ALL APPLICABLE BUILDING CODES AND SAFETY STANDARDS AND/OR REGULATIONS.

8. THE DESIGN PROFESSIONALS DO NOT CONTROL, OR HAVE TRAINING FOR, THE CONTRACTOR'S MEANS, METHODS, SEQUENCE, TECHNIQUES, PROCEDURES AND/OR QUALITY CONTROL IN PERFORMING THE WORK, SITE SAFETY OR SAFETY PROGRAMS IN CONNECTION WITH THIS PROJECT. THESE DUTIES ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR AND HIS STAFF. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL REGULATORY AGENCIES.

9. THESE STRUCTURAL DRAWINGS ARE FOR DESCRIBING THE STRUCTURAL DESIGN FOR THE PROJECT. IN AN EFFORT TO PREVENT FINISH ISSUES, FLOOR AND WALL FINISHES (PAINT, ETC.), TILE, FIXTURES AND ALL OTHER NON-STRUCTURAL COMPONENTS SHALL BE DESIGNED AND/OR SELECTED BY OTHER PROFESSIONALS.

10. ALL SUSPENDED CEILING/SOFFIT SYSTEMS (INCLUDING LIGHT FIXTURES) SHALL BE SUPPORTED AS REQUIRED BY THE SPECIFIC PRODUCT MANUFACTURER. ATTACHMENTS, WIRES, STRUTS AND OTHER SUPPORTS SHALL BE DESIGNED TO RESIST THE CODE REQUIRED WIND (BOTH NEGATIVE AND POSITIVE PRESSURES) AND SEISMIC LOADS PER THE APPLICABLE EDITION OF THE APPROPRIATE BUILDING CODE(S). THE DESIGN OF THESE SYSTEMS SHALL BE CERTIFIED BY A LICENSED DESIGN ENGINEER REGISTERED IN THE PROJECT STATE.

11. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS (LEAD DRAWINGS) FOR ALL WALL OPENINGS (INCLUDING DOORS AND WINDOWS) AS WELL AS BUILDING CONFIGURATION AND ASSOCIATED DETAILS. REFER TO ELECTRICAL AND MECHANICAL PLANS AND/OR REQUIREMENTS FOR SIZE AND LOCATION OF ALL OPENINGS FOR DUCTS, PIPING, CONDUCTS, ETC.

12. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND/OR VENDER DRAWINGS FOR LOCATIONS OF DEPRESSED FLOOR AREAS, FLOOR DRAINS, FLOOR TOPPINGS, CMU COURSING AND ANY OTHER DETAILS NOT INDICATED IN THE STRUCTURAL DRAWINGS.

13. THESE STRUCTURAL DRAWINGS ARE BASED ON THE LATEST INFORMATION/ARCHITECTURAL DRAWINGS PRIOR TO THE SUBMITTAL DATE. SOME DIMENSIONS FOUND IN THESE DRAWINGS MAY HAVE BEEN VERBALLY COMMUNICATED BY THE ARCHITECT OR TAKEN DIRECTLY FROM ELECTRONIC FILES SUPPLIED BY THE ARCHITECT.

14. AS REQUIRED BY CODE, THE CONTRACTOR SHALL DETERMINE AND POST APPROPRIATE SIGNS PERTAINING TO RESTRICTIONS OF LIVE LOAD AND/OR STACKING LIMITATIONS.

15. QUESTIONS RELATING TO THESE STRUCTURAL DRAWINGS MAY BE SUBMITTED IN WRITING, THROUGH THE ARCHITECT OR PRIME PROFESSIONAL TO THE STRUCTURAL ENGINEER. THE STRUCTURAL ENGINEER SHALL BE COPIED AT:

TIMMERMAN STRUCTURAL ENGINEERING GROUP
580 CHRIS DRIVE
WEST COLUMBIA, SC 29169
(803) 791-4511

GEOTECHNICAL:

1. THIS FOUNDATION DESIGN IS BASED ON AN ASSUMED ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.

2. A GEOTECHNICAL ENGINEER AND/OR TESTING LABORATORY SHALL BE RETAINED FOR THE PURPOSES OF ASSURING ADEQUATE SOIL SUPPORT FOR FOUNDATION AND SLABS-ON-GRADE. A COPY OF ALL TEST REPORTS SHALL REMAIN ON FILE AT THE JOB SITE AVAILABLE FOR THE DESIGN TEAM. ANY TESTS DEEMED UNACCEPTABLE SHALL BE COPIED AND SENT TO THE ARCHITECT OR LEAD DESIGN PROFESSIONAL. THE CONTRACTOR SHALL FORWARD COPIES OF ALL REPORTS TO THE OWNER AS REQUIRED BY THEIR AGREEMENT. THE PROJECT STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ANY SITE CONDITIONS OR FOUNDATION CONSTRUCTION ISSUES DISCOVERED AT THE SITE.

3. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXCAVATIONS AND SLOPES.

4. TIMMERMAN STRUCTURAL ENGINEERING GROUP SHALL BE NOTIFIED OF ANY TRASH, DEBRIS, SOFT AREAS FOR ANY OTHER SUBSURFACE ANOMALY FOUND UNDER THE BUILDING SITE WHETHER PLACED THERE OR NATURALLY OCCURRING. THESE STRUCTURAL DRAWINGS WILL NOT REFLECT FIELD CONDITIONS PERTAINING TO TRASH, DEBRIS, ANOMALIES, ETC. THE CONTRACTOR SHALL REMOVE AND/ OR MODIFY EXISTING SOILS AS DIRECTED BY A GEOTECHNICAL ENGINEER.

CONCRETE:

1. ALL CONCRETE AND REINFORCING BARS SHALL BE INSTALLED IN ACCORDANCE TO STANDARDS SET FORTH BY THE LATEST EDITION OF ACI-318.

2. REINFORCEMENT SHALL BE HELD IN PLACE DURING CONCRETE PLACEMENT. IF REQUIRED, ADDITIONAL BARS SHOULD BE INSTALLED AS NEEDED BY THE CONTRACTOR TO PROVIDE TO HOLD REINFORCING BARS IN PLACE WHILE CONCRETE IS PLACED.

3. 28 DAY MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:

FOOTINGS	3000 PSI
SLABS ON GRADE	3000 PSI
FILL FOR STAIR TREAD PANS	4000 PSI
SLABS ON FORM DECK	4000 PSI

NO CALCIUM CHLORIDE SHALL BE USED IN MIX.

4. SPECIFIED CONCRETE COVER FOR CONVENTIONAL REINFORCEMENT SHALL BE AS FOLLOWS:

- CONCRETE CAST AGAINST AND EXPOSED TO EARTH.. 3 INCHES
- CONCRETE EXPOSED TO EARTH OR WEATHER:
  #6 THRU #18 BARS..... 2 INCHES
  #5 BARS AND SMALLER..... 1-1/2 INCHES
- CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT IN EARTH:
  SLABS, WALLS, JOISTS:
  #14 AND #18 BARS ..... 1-1/2 INCHES
  #11 BARS AND SMALLER ..... 3/4 INCHES

5. THE CONTRACTOR SHALL TAKE ADDITIONAL PRECAUTIONS WHEN CONCRETE IS TO BE PLACED AND CURED DURING COLD OR HOT WEATHER. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDATIONS PRESCRIBED BY THE AMERICAN CONCRETE INSTITUTE FOR COLD OR HOT WEATHER CONSTRUCTION.

6. WELDED WIRE FABRIC SHALL BE LAPPED A MINIMUM OF 12".

7. ALL PLUMBING SLOTS SHALL BE FILLED WITH CONCRETE TO THE SAME DEPTH AS THE FLOOR SLAB AFTER PIPING IS INSTALLED.

8. EXTERIOR CONCRETE PADS SHALL BE SIZED AND LOCATED PER THE CONTRACT DOCUMENTS AND/OR EQUIPMENT SPECIFICATIONS/ REQUIREMENTS. SEE DRAWINGS BY ARCHITECT AND/OR MECHANICAL/ELECTRICAL ENGINEERS IN ADDITION TO THE STRUCTURAL AND CIVIL DRAWINGS.

9. THE GENERAL CONTRACTOR SHALL SUBMIT REBAR SHOP DRAWINGS SHOWING NUMBER, SIZE AND LOCATION, INCLUDING BAR LISTS AND DIAGRAMS, TO THE DESIGN TEAM FOR APPROVAL.

10. REBAR DOWELS SHALL MATCH VERTICAL REINFORCING (UNO).

11. SEE ARCHITECTURAL DRAWINGS OR OWNER REQUESTS FOR REQUIRED CONCRETE FINISH/COLOR, SPECIAL FLATNESS REQUIREMENTS, ETC. ALL CONCRETE SHALL BE PROPERLY CURED IMMEDIATELY AFTER FINISHING.

12. A QUALIFIED TESTING LABORATORY SHALL BE RETAINED TO COLLECT CYLINDERS AND PERFORM THE NECESSARY CONCRETE TESTS. A MINIMUM OF FOUR CYLINDERS SHALL BE TAKEN FOR EVERY 50 CUBIC YARDS (OR FRACTION THEREOF) OF EACH CONCRETE TYPE/STRENGTH SUPPLIED. THE CONCRETE CYLINDERS SHALL BE TAKEN AFTER WATER AND ADMIXTURES (IF ANY) ARE ADDED TO THE MIX. IT IS RECOMMENDED THAT ONE CYLINDER SHALL BE TESTED AT 7 DAYS, TWO AT 28 DAYS AND HOLD THE FINAL CYLINDER IN RESERVE. IT IS RECOMMENDED FOR TEST REPORTS SHALL BE SENT DIRECTLY TO THE GENERAL CONTRACTOR WITH COPIES TO THE OWNER, ARCHITECT AND STRUCTURAL ENGINEER. ANY NONCONFORMING CYLINDER BREAKS (INCLUDING 7 AND 14 DAY BREAKS) SHALL BE FLAGGED AND BROUGHT TO THE ATTENTION OF THE APPROPRIATE DESIGN PROFESSIONAL.

13. REPAIR AND PATCH DEFECTIVE AREAS IMMEDIATELY AFTER REMOVAL OF FORMS. ALL CONCRETE REPAIR MATERIAL AND PROCEDURES SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

14. 4" SLAB ON GRADE SHALL BE REINFORCED WITH W6X6-W1.4 x W1.4 WWF ON PROPERLY PREPARED BASE MATERIAL WITH VAPOR BARRIER. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS FOR SPECIFICS RELATING TO SLAB SUPPORT, LOCATION OF VAPOR BARRIER AND ANY OTHER "UNDER SLAB" REQUIREMENTS. A 4" SLAB IS TYPICALLY FOR "DOMESTIC OR LIGHT COMMERCIAL" APPLICATIONS WITH FLOOR LOADINGS UP TO 100 PSF. SLAB THICKNESS SHOULD BE INCREASED IN THE EVENT THERE IS A NEED FOR HEAVIER FLOOR LOADINGS- CONTRACTOR SHALL VERIFY FLOOR LOADS WITH OWNER AND EQUIPMENT SUPPLIERS, ETC. PRIOR TO BASE AND SLAB PLACEMENT. IN THESE AREAS THE SLAB SHALL BE THICKENED TO ACCOMMODATE THE LOADS. SEE CONSTRUCTION DOCUMENTS FOR LOCATIONS OF SLABS AND "BASIC" OR MINIMUM SLAB THICKNESS.

15. IN MANY CASES SPECIAL SLAB DESIGNS MAY BE NEEDED TO SUPPORT FORKLIFT AND VEHICLE WHEEL LOADS. THE CONTRACTOR SHALL SUBMIT FORKLIFT MAKE AND MODEL TO LEAD DESIGNER IN THE EVENT FORKLIFTS ARE TO BE USED IN THE FINISHED BUILDING.

16. THE CONTRACTOR, CONCRETE SUPPLIERS AND ALL RELATED SUBCONTRACTORS SHALL BE EXPERIENCED IN THE USE OF CONCRETE ADMIXTURES, SEALERS, CURING COMPOUNDS, ETC. AS NEEDED PER FIELD CONDITIONS.

MASONRY:

1. THE MASONRY DIMENSIONS ON THIS PROJECT ARE CONSIDERED AS NOMINAL DIMENSIONS. THE SHAPE AND ACTUAL SIZE OF THE MASONRY UNITS AND SPECIAL UNITS SHALL BE CONSIDERED IN THE BUILDING AND WALL LAYOUT PLAN. REFERENCE IS MADE TO ARCHITECTURAL DRAWINGS FOR BUILDING LAYOUT.

2. FILL ALL CELLS BELOW FLOOR (AND GRADE) LEVEL OR CONTAINING REBAR WITH 2500 PSI GROUT. GROUT SHALL BE PLACED IN LIFTS NO HIGHER THAN 5 FEET. MASONRY UNITS SHALL BE CLEAN AND DRY. FIRE RATED MASONRY WALLS SHALL HAVE ALL CELLS GROUT FILLED.

3. THE CONTRACTOR SHALL INSTALL SUFFICIENT REBAR PLACEMENT WALL TIES TO ENSURE THE PROPER PLACEMENT OF ALL HORIZONTAL AND VERTICAL REBAR.

4. ALL MASONRY ACCESSORIES (INCLUDING LINTEL PLATES AND ANGLES) SHALL BE GALVANIZED. HORIZONTAL BED JOINT REINFORCEMENT SHALL BE GALVANIZED AS REQUIRED BY APPLICATION, MANUFACTURER'S RECOMMENDATIONS AND APPLICABLE BUILDING CODES. ALL LINTEL PLATES AND ANGLES SHALL HAVE A MINIMUM THICKNESS OF 3/8" THICK UNLESS OTHERWISE NOTED IN STRUCTURAL DRAWINGS.

5. MASONRY REBAR LAP SPLICES SHALL BE AS FOLLOWS:

BAR SIZE	CENTERED BARS		FACE BARS
	8" BLOCK	12" BLOCK	
#4 BAR	15" LAP	15" LAP	22" LAP
#5 BAR	24" LAP	16" LAP	35" LAP
#6 BAR	38" LAP	24" LAP	54" LAP
#7 BAR	52" LAP	33" LAP	63" LAP
#8 BAR	72" LAP	50" LAP	72" LAP

6. CONCRETE MASONRY TO HAVE A MINIMUM F'm OF 1500 PSI. THIS IS TO BE ACHIEVED BY USING A CONCRETE BLOCK MASONRY UNIT WITH A NET AREA COMPRESSIVE STRENGTH OF 2000 PSI WHEN USED IN CONJUNCTION WITH TYPE M OR S MORTAR.

7. ALL MASONRY SHALL BE PLACED IN FULL MORTAR BED. ALL MORTAR SHALL BE TYPE "M" OR "S".

8. THE INTERSECTION OF ALL LOAD BEARING MASONRY WALLS SHALL BE TIED OR ATTACHED AT WALL INTERSECTIONS OR WHERE THEY MEET BY ONE OF THE FOLLOWING METHODS:

   A. STEEL CONNECTIONS: WALLS SHALL BE ANCHORED AT INTERSECTIONS USING 2" WIDE X 0.25" THICK BY 24" LONG STRAPS (GALVANIZED) PLUS A 2"-90 DEGREE BEND AT EACH END. STEEL STRAPS SHALL BE PLACED IN MORTAR BEDS AT 48" ON CENTER VERTICALLY.

   B. BONDING OF UNITS: FIFTY PERCENT OF THE MASONRY UNITS SHALL BE LAID IN AN OVERLAPPING PATTERN. MASONRY UNITS FORMING THE BONDING PATTERN SHALL BEAR NO LESS THAN 3 INCHES ON THE UNITS BELOW.

   C. JOINT REINFORCEMENT: INTERSECTING WALLS MAY BE JOINED USING MASONRY WALL REINFORCEMENT SPACED AT 8 INCHES ON CENTER VERTICALLY. THE WIRE SIZE SHALL BE AT LEAST W1.7 AND EXTEND AT LEAST 30 INCHES FROM THE INTERSECTION.

   NOTE: FOR APPLICATIONS WHERE INDEPENDENT FIRE WALLS ARE USED, INTERSECTING WALLS SHALL NOT BE TIED TO THESE FIRE WALLS TO ALLOW THE FREESTANDING FIRE WALLS TO REMAIN INTACT IN THE EVENT OF A FIRE.

   NOTE: NON-LOAD BEARING MASONRY PARTITION WALLS SHALL BE TIED TO ONE ANOTHER BUT NOT TIED TO LOAD BEARING MASONRY WALLS.

9. THE CONTRACTOR SHALL TAKE ADDITIONAL PRECAUTIONS WHEN MASONRY IS TO BE CONSTRUCTED DURING COLD WEATHER (AMBIENT TEMPERATURE BELOW 40 DEGREES FAHRENHEIT). DURING HOT CONDITIONS (ABOVE 90 DEGREES) PRECAUTIONS SHALL BE TAKEN TO MINIMIZE EXCESS HEAT IN THE MASONRY UNITS, WATER AND MORTAR. IT IS ADVISED THAT THE CONTRACTOR FOLLOW THE RECOMMENDATIONS PRESCRIBED BY AMERICAN CONCRETE ASSOCIATION FOR COLD OR HOT WEATHER CONSTRUCTION.

10. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF MASONRY CONTROL JOINTS & BRICK EXPANSION JOINTS. ALL CONTROL JOINTS AND EXPANSION JOINTS SHALL BE INSTALLED IN ACCORDANCE TO THE STANDARDS SET FORTH BY THE NATIONAL CONCRETE MASONRY ASSOCIATION. IN NO CASE SHALL EXTERIOR WALL JOINTS BE SPACED GREATER THAN 25 FEET ON CENTER AND INTERIOR WALL JOINTS SHALL NOT EXCEED 30 FEET ON CENTER. REINFORCED BOND BEAMS LOCATED AT ROOF AND FLOOR DIAPHRAGMS SHALL BE CONTINUOUS THROUGH MASONRY JOINTS UNLESS OTHERWISE SPECIFIED IN THE STRUCTURAL DRAWINGS.

11. RUNNING BOND MASONRY TO HAVE 9 GAGE LADDER TYPE JOINT REINFORCEMENT @ 16" ON CENTER VERTICALLY. PREFORMED BED JOINT REINFORCEMENT SHALL BE USED AT ALL WALL CORNERS AND INTERSECTIONS. ALL GAGE WIRE LADDER TYPE BED JOINT REINFORCEMENT SHALL BE LAPPED A MINIMUM OF 8 INCHES.

12. FOR ALL LOAD BEARING WALLS (AND SHEAR WALLS) THE CONTRACTOR SHALL INSTALL BOND BEAMS AT A MAXIMUM SPACING OF 4 FEET ON CENTER AS MEASURED FROM THE TOP OF FOUNDATION.

    IN SOME CASES, BOND BEAMS MAY HAVE TO BE CUT DOWN FROM 16 INCH DEEP BOND BEAMS IN ORDER TO ACHIEVE THE PROPER ELEVATION FOR JOIST BEARING ELEVATIONS. 8" WIDE BOND BEAMS SHALL CONTAIN TWO #5 BARS.

    THE CONTRACTOR MAY PLACE ELECTRICAL BOXES IN BOND BEAMS PROVIDED THE REBAR IS CONTINUOUS. THE CONTRACTOR MAY ALSO SPACE BOND BEAMS AS NEEDED TO MISS ELECTRICAL BOXES PROVIDED THE BOND BEAM MAXIMUM SPACING IS MAINTAINED. REINFORCED BOND BEAMS LOCATED AT ROOF AND/OR FLOOR DIAPHRAGMS SHALL BE CONTINUOUS THROUGH MASONRY EXPANSION JOINTS UNLESS OTHERWISE SPECIFIED IN THE STRUCTURAL DRAWINGS.

13. WALL SLEEVES FOR UTILITIES SHALL BE CAREFULLY PLACED TO PREVENT CONFLICT WITH WALL AND FOUNDATION REINFORCEMENT. TO PREVENT LOAD TRANSFER TO THE UTILITY, ALL PIPES SHALL BE SLEEVED WITH STEEL OR DUCTILE IRON TO PROVIDE A 1 INCH CLEARANCE BETWEEN THE SLEEVE AND UTILITY PIPE.

STRUCTURAL AND MISCELLANEOUS STEEL:

1. THE CONTRACTOR SHALL SUBMIT DETAILED STRUCTURAL STEEL SHOP DRAWINGS TO INCLUDE (BUT NOT LIMITED TO) COLUMNS, BEAMS, DECKING, STAIRS, STAIR LANDINGS AND ALL CONNECTIONS. AS PART OF THE SHOP DRAWINGS, THE CONTRACTOR SHALL SUPPLY EMBEDDED STEEL PLATE AND BRACKET LOCATION DRAWINGS.

2. SPECIAL STAIR/RAIL NOTE: STRUCTURAL STAIRS, HANDRAILS AND GUARDRAILS MUST BE DESIGNED BY A REGISTERED ENGINEER, LICENSED IN THE PROJECT STATE. THE DESIGN DRAWINGS (SHOP DRAWINGS) MUST BE SEALED BY THE DESIGN ENGINEER RETAINED BY THE CONTRACTOR/ SUBCONTRACTOR IN ORDER TO COMPLETE THE SHOP DRAWING PROCESS.

3. ALL STEEL DETAILS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF A.I.S.C. SPECIFICATIONS.

4. FIELD SPLICES SHALL BE DESIGNED AND CONSTRUCTED TO DEVELOP THE FULL CAPACITY OF THE MEMBER IN BENDING, SHEAR AND AXIAL LOADS.

5. IN THE ABSENCE OF SPECIFIC CAMBER REQUIREMENTS, THE STEEL SHALL BE FABRICATED AND ERECTED WITH MILL CAMBER UP.

6. ALL FRAMING AND MISCELLANEOUS STEEL SHALL BE FILLET WELDED ALL AROUND UNLESS OTHERWISE NOTED. WELD SIZE SHALL BE THE MAXIMUM AS ALLOWED BY THE LATEST EDITION OF THE "MANUAL OF STEEL CONSTRUCTION" BASED ON THE MATERIAL THICKNESS. ALL WELDING SHALL BE DONE WITH E-70 ELECTRODES.

7. ALL CAP PLATES FOR STEEL COLUMNS SHALL HAVE A MINIMUM THICKNESS OF 3/4" THICK UNLESS OTHERWISE NOTED IN THE DETAILS.

8. SHOP AND FIELD CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS MAY BE WELDED OR BOLTED. ALL WELDING SHALL BE DONE WITH E-70 ELECTRODES. CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES, ROOF LINES OR BUILDING GEOMETRY SHALL BE SHOWN ON THE STRUCTURAL STEEL SHOP DRAWINGS AND FABRICATED IN THE SHOP. FIELD CUTTING AND/OR BURNING IS NOT PERMITTED WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD FOR THE PROJECT OR A STRUCTURAL ENGINEER REGISTERED IN THE PROJECT STATE.

9. A SUITABLE NON-SHRINK GROUT (7000 PSI) SHALL BE USED UNDER BASE PLATES REQUIRING GROUT. GROUT SHALL BE PLACED UNDER THE BASEPLATE ONCE THE STEEL COLUMN IS IN PLACE & PLUMB. THOUGH THE DETAILS AND DRAWINGS MAY (OR MAY NOT) INDICATE, THE CONTRACTOR MAY OPT TO USE LEVELING PLATES AND LEVELING NUTS BELOW THE BASE PLATES TO PLUMB THE STEEL COLUMNS. THE CONTRACTOR SHALL ADJUST THE FOOTING ELEVATION(S) AND CONSIDER THE FLOOR ELEVATION FOR COLUMNS SUBJECT TO GROUT, LEVELING NUTS, ETC.

10. ALL WELDS IN EXPOSED STEEL SHALL BE FIELD COATED W/ ZINC-RICH PAINT.

11. STEEL DETAILERS TO VERIFY/DETERMINE JOIST AND BEAM BEARING ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS TO ENSURE PROPER ROOF SLOPES FOR DRAINAGE AND CORRECT FLOOR ELEVATIONS. SEE ARCHITECTURAL DRAWINGS FOR FLASHING AND ROOF RELATED DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.

12. ALL STEEL REQUIRING PAINT SHALL BE PROPERLY CLEANED AND PREPARED TO ACCEPT THE APPROPRIATE PAINT FOR THE PROJECT. THE PAINT TYPE, COLOR AND THICKNESS SHALL BE SELECTED ACCORDING TO THE LOCATION OF THE STEEL, TYPE OF BUILDING AND OWNER'S REQUIREMENTS FOR COLOR, ETC. DECISIONS INVOLVING PAINT, COLOR AND SO ON SHALL BE PER OWNER.

13. 1/4" THICK STEEL PLATES SHALL BE INSTALLED TO THE TOP OR BOTTOM FLANGES OF ALL STEEL BEAMS SUPPORTING MASONRY WALLS. THE PLATE WIDTH SHALL BE ON LESS THAN 1 INCH NARROWER THAN THE MASONRY WALL WIDTH UNO.

METAL DECKING:

1. DECKING INSTALLER SHALL EXAMINE SUPPORT FRAMING AND FIELD CONDITIONS FOR COMPLIANCE WITH REQUIREMENTS FOR DECKING INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING DECK INSTALLATION. CONTRACTOR SHALL DETERMINE REQUIRED DECK OPENING LOCATIONS AND SIZES FOR ALL TRADES REQUIRING DECK PENETRATIONS.

2. 1-1/2" DEEP ROOF DECK, 20 GAGE, TYPE "B", G60 GALVANIZED (SEE BUILDING PLAN) TO BE MECHANICALLY FASTENED INSTALLED WITH A 36/5 FASTENER PATTERN WITH #12 TEK SCREWS, OR 5/8" PUDDLE WELDS) AT ALL ENDS (3" LAP) AND INTERMEDIATE SUPPORTS. INSTALL 8 #10 TEK SCREWS ALONG SIDE LAPS BETWEEN SUPPORTS. ATTACH DECKING AT 6 INCHES ON CENTER ALONG THE ROOF PERIMETER WITH #10 TEK SCREWS OR 5/8" PUDDLE WELDS. CONTRACTOR MAY PUDDLE WELD DECK TO SUPPORTS PROVIDED APPROVED WELD WASHERS WITH A 3/8" DIAMETER HOLE ARE USED.

3. 1-1/2" COMPOSITE FLOOR DECK, TYPE "1.5 VLI" - 18 GAUGE (GALVANIZED) COMPOSITE METAL FLOOR DECKING SHALL BE FASTENED WITH 4- 5/8" PUDDLE WELDS AT EACH SUPPORT AND LAPS. DECKING MUST BEAR AT LEAST 1-1/2" ON ALL SUPPORTS INCLUDING LAPS (LAP DECK 3" MINIMUM). INSTALL 5 EQUALLY SPACED #10 TEK SCREWS OR WELDS FOR SIDE LAPS BETWEEN SPANS AND ATTACH DECKING TO PERIMETER FLOOR STEEL WITH 5/8" PUDDLE WELDS AT 8 INCHES ON CENTER. CONCRETE COVER OF AT LEAST 2" SHALL BE PROVIDED ABOVE THE TOP OF THE STEEL DECK. SEE PLAN FOR ADDITIONAL INFORMATION.

4. FOR CONCRETE SLABS PLACED ON STEEL DECKING - THE CONTRACTOR SHOULD REPAIR/PATCH ONLY THOSE RANDOM CRACKS WHICH AFFECT THE SERVICEABILITY OF THE FLOOR.

5. PROVIDE 4 X 4 X 1/4 ANGLES SURROUNDING ALL METAL DECK PENETRATIONS UNLESS OTHERWISE NOTED.

6. THE INSTALLATION OF ALL FLOOR AND ROOF DECK SHALL INCLUDE DECK ANGLES TO FORM AN ATTACHMENT TO ALL MASONRY AND CONCRETE WALLS. DECK SUPPORT ANGLES SHALL BE 5 X 3.5 X 1/4" (LONG LEG VERTICAL) WITH 3/4" (6" EMBEDMENT) EPOXY BOLTS AT 2'-0" ON CENTER SHALL BE USED AT ALL MASONRY AND CONCRETE WALLS UNLESS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. A 5 X 5 X 5/16" ANGLE SHALL BE USED AT LOCATIONS IN WHICH THE DECK SUPPORT MUST SPAN BETWEEN STEEL JOISTS AND/OR BEAMS. IN THE EVENT THE STEEL DECK CHANGES DIRECTION, STEEL TUBES SHALL BE INSTALLED TO SHIM AND PROVIDE CONTINUOUS SUPPORT FOR THE DECK. THESE TUBES MAY OR MAY NOT BE INDICATED IN THE DETAILS (FOR CLARITY.

7. CONCRETE (INCLUDING TOPPINGS) IS NOT WATERTIGHT OR A WATERPROOF MATERIAL. WATER PERMEABILITY MAY POSSIBLY BE REDUCED DEPENDING ON A NUMBER OF FACTORS INCLUDING SURFACE SLOPE. STANDING WATER ON THE SURFACE OF CONCRETE WILL EVENTUALLY SEEP INTO THE CONCRETE MATERIAL THROUGH VIRTUALLY INVISIBLE CRACKS WHICH EXISTS IN ALL CURED CONCRETE. FOR THIS REASON CONCRETE MUST BE PROPERLY SEALED AND PROTECTED FROM WATER INTRUSION. AN ADEQUATE LONG TERM CONCRETE MAINTENANCE PLAN SHOULD BE USED FOR ALL CONCRETE SYSTEMS. REFERENCE IS MADE TO A WATERPROOFING PROFESSIONAL FOR PROPER DETAILS.

8. ALL STEEL REQUIRING PAINT SHALL BE PROPERLY CLEANED AND PREPARED TO ACCEPT THE APPROPRIATE PAINT FOR THE PROJECT. THE PAINT TYPE, COLOR AND THICKNESS SHALL BE SELECTED ACCORDING TO THE LOCATION OF THE STEEL, TYPE OF BUILDING AND OWNER'S REQUIREMENTS FOR COLOR, ETC. DECISIONS INVOLVING PAINT, COLOR AND SO ON SHALL BE PER OWNER.

FOR CONSTRUCTION

Revisions

Revision	By

Seal

SOUTH CAROLINA — TIMMERMAN STRUCTURAL ENGINEERING GROUP — No. 5537 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 11150 — 02/25/22 — WILLIAM TIMMERMAN

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NOTES

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STATEMENT OF SPECIAL INSPECTIONS (PER CHAPTER 17, 2018 IBC)

SPECIAL INSPECTION COMPANY / COORDINATOR – TO BE RETAINED BY OWNER

BUILDING SYSTEM OR COMPONENT	MATERIAL SUBMITTAL	TESTING			INSPECTION (PER IBC)			QUALITY ASSURANCE (PER IBC)	
		REQUIREMENTS	FREQUENCY	AGENCY	MONITORING	FREQUENCY	AGENCY	PART OF WIND	PART OF SEISMIC
SOILS (COMPACTED FILL) NOTE: THIS SECTION MAY BE MODIFIED BY PROJECT GEOTECHNICAL ENGINEER BASED ON PROJECT SOIL CONDITIONS.	N/A	1. TEST IN PLACE DRY DENSITY OF COMPACTED FILL.	1. AS APPROVED GEOTECHNICAL ENGINEER.	TESTING LAB TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL	AS EXCAVATION AND FILL PLACEMENT BEGINS, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE WITH GEOTECHNICAL REPORT: 1. MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY AS SPECIFIED IN SOILS REPORT. 2. EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL. 3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS. 4. USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL. 5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	1. PERIODIC 2. PERIODIC 3. PERIODIC 4. CONTINUOUS 5. PERIODIC	INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL	1. COLUMNS AND SHEARWALLS ACCORDANCE WITH APPROVED SOILS REPORT PRIOR TO PLACEMENT OF FILL.	1. COLUMNS AND SHEARWALLS ACCORDANCE WITH APPROVED SOILS REPORT PRIOR TO PLACEMENT OF FILL.
CONCRETE FOUNDATIONS	1. SUBMIT CONCRETE MIX DESIGN. 2. SUBMIT FOUNDATION REINFORCEMENT SHOP DRAWINGS. 3. VERIFY PROPER CONCRETE STRENGTH.	1. TEST CONCRETE STRENGTH.	1. A MINIMUM OF (4) CYLINDERS SHALL SHALL BE TAKEN FOR EVERY 50 CUBIC YARDS (OR FRACTION THEREOF) OF EACH TYPE AND STRENGTH OF CONCRETE PER DAY.	TESTING LAB TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL	AS CONCRETE AND REINFORCING STEEL CONSTRUCTION BEGINS, THE FOLLOWING SHALL BE INSPECTED TO ENSURE COMPLIANCE: 1. VERIFY REINFORCING SIZE, QUANTITY & PLACEMENT 2. ANCHORS CAST IN CONCRETE 3. ANCHORS POST INSTALLED IN HARDENED CONCRETE 4. VERIFYING USE OF REQUIRED DESIGN MIX 5. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TEST, AND DETERMINE THE TEMPERATURE OF CONCRETE 6. CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES 7. INSPECT FORMWORK FOR; SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	1. PERIODIC 2. PERIODIC 3. PERIODIC 4. PERIODIC 5. CONTINUOUS 6. CONTINUOUS 7. PERIODIC	INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL	1. SPREAD FOOTINGS AT BEARING WALLS AND SHEARWALL.	1. SPREAD FOOTINGS AT BEARING WALLS AND SHEARWALL.
CONCRETE MASONRY UNITS	1. SUBMIT TEST DATA ON CMU UNITS NET AREA OF COMPRESSIVE STRENGTH 2. SUBMIT MORTAR & GROUT MIX DESIGNS	1. TEST COMPRESSIVE STRENGTH OF MORTAR & GROUT.	1. (1) SET OF GROUT CUBES FROM EACH FLOOR AND/OR (1) SET OF CUBES FOR EACH 20 YARDS (OR FRACTION THEREOF) PER DAY	TESTING LAB TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL PER IBC	SEE MASONRY INSPECTION CHART	SEE MASONRY INSPECTION CHART	INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL PER IBC	1. YES	1. YES
STRUCTURAL STEEL	1. SUBMIT MANUFACTURER'S CERTIFIED MILL TEST REPORTS FOR STRUCTURAL STEEL.	N/A	N/A	N/A	1. INSPECT STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH CONSTRUCTION DOCUMENTS.	1. PERIODIC	INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL PER IBC	1. FLOOR AND ROOF SYSTEM FRAMING	1. FLOOR AND ROOF SYSTEM FRAMING
STRUCTURAL STEEL HIGH – STRENGTH BOLTING (AND MECHANICAL FASTENING OF METAL DECK)	1. SUBMIT MANUFACTURER'S CERTIFICATE OF COMPLIANCE FOR HIGH-STRENGTH BOLTS, NUTS, WASHERS AND/OR FASTENERS.	N/A	N/A	N/A	1. VERIFY BOLTING IN BEARING-TYPE CONNECTIONS ARE INSTALLED IN ACCORDANCE WITH AISC SPECIFICATIONS. 2. VERIFY BOLTING IN SLIP-CRITICAL CONNECTIONS ARE INSTALLED IN ACCORDANCE WITH AISC SPECIFICATIONS. 3. VERIFY IDENTIFICATION MARKING ON HIGH-STRENGTH BOLTS, NUTS AND WASHERS CONFORMING TO ASTM STANDARDS SPECIFIED. 4. VERIFY FASTENER TYPE AND ADHERENCE TO SPECIFIED FASTENER ATTACHMENT PATTERN. 5. VERIFY PROPER STORAGE AND HANDLING OF BOLTS, NUTS, WASHERS.	1. PERIODIC 2. CONTINUOUS (MAY BE PERIODIC IF TURN-OF-NUT WITH MATCH MARKING METHODS, DIRECT TENSION INDICATOR OR ALTERNATE DESIGN FASTENER (TWIST-OFF) METHODS ARE USED) 3. PERIODIC 4. PERIODIC 5. PERIODIC	INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL PER IBC	1. FLOOR AND ROOF SYSTEM BOLTING	1. FLOOR AND ROOF SYSTEM BOLTING
STRUCTURAL STEEL WELDING	1. SUBMIT MANUFACTURER'S CERTIFICATE OF COMPLIANCE FOR WELD FILLER MATERIAL.	N/A	N/A	N/A	VERIFY WELDING IS IN COMPLIANCE WITH AWS D1.1 1. COMPLETE AND PARTIAL PENETRATION GROOVE WELDS. 2. MULTIPASS FILLET WELDS 3. SINGLE-PASS FILLET WELDS > 5/16" 4. SINGLE-PASS FILLET WELDS < OR = 5/16" 5. FLOOR AND DECK WELDS	1. CONTINUOUS 2. CONTINUOUS 3. CONTINUOUS 4. PERIODIC 5. PERIODIC	INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL PER IBC	1. FLOOR AND ROOF SYSTEM WELDING	1. FLOOR AND ROOF SYSTEM WELDING

NOTE: ALL TESTING, INSPECTION & RELATED REPORTS SHALL BE SENT TO THE SPECIAL INSPECTION COORDINATOR & THE OWNER. ANY DEFICIENCIES SHALL BE CLEARLY NOTED & BROUGHT TO THE ATTENTION OF THE SPECIAL INSPECTION COORDINATOR BEFORE THE END OF THE INSPECTOR'S SHIFT.

DEFINITIONS:
- SPECIAL INSPECTOR: PER IBC "A QUALIFIED PERSON EMPLOYED OR RETAINED BY AN APPROVED AGENCY AND APPROVED BY THE BUILDING OFFICIAL AS HAVING THE COMPETENCE NECESSARY TO INSPECT A PARTICULAR TYPE OF CONSTRUCTION REQUIRING SPECIAL INSPECTION".
- PERIODIC SPECIAL INSPECTION: PER IBC "SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS INTERMITTENTLY PRESENT WHERE THE WORK TO BE INSPECTED HAS BEEN OR IS BEING PERFORMED".
- CONTINUOUS SPECIAL INSPECTION: PER IBC "SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS PRESENT WHEN AND WHERE THE WORK TO BE INSPECTED IS BEING PERFORMED". THIS IS INTENDED TO BE A CONTINUOUS INSPECTION.

FOR CONSTRUCTION

Revisions

Revision	By

Seal

SOUTH CAROLINA PROFESSIONAL ENGINEER
TIMMERMAN STRUCTURAL ENGINEERING GROUP
No. 5537
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 11150
02/25/22
REGISTERED
WILLIAM TIMMERMAN

Job Title:

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SPECIAL INSPECTIONS

Scale:	AS NOTED
Job Number:	22-102
Designed By:	KWT
Drawn By:	TJD
Checked By:	KWT
Date:	02/25/2022

Sheet Number
S3.1
Sheet 7 of 7

ELECTRICAL SPECIFICATIONS

A. GENERAL:

1. PROVIDE ALL WORK, EQUIPMENT, SERVICES, LABOR AND MATERIALS NECESSARY TO INSTALL COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS AS DESCRIBED OR IMPLIED BY THE CONTRACT DOCUMENTS.
2. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST APPLICABLE RULES OF THE LATEST ADOPTED EDITIONS OF THE NATIONAL ELECTRICAL CODE – NFPA–70, NATIONAL ELECTRIC SAFETY CODE – ANSI–C2, LIFE SAFETY CODE – NFPA–101, STATE AND LOCAL CODES, THE AMERICANS WITH DISABILITIES ACT, INTERNATIONAL ENERGY CONSERVATION CODE – IECC, AND THE INTERNATIONAL BUILDING CODE –IBC.
3. APPLY AND PAY FOR ALL PERMITS AND INSPECTIONS.
4. MATERIALS SHALL BE NEW AND AS SPECIFIED AND SHALL NOT BE SUBSTITUTED UNLESS WRITTEN AUTHORITY IS OBTAINED FROM THE ENGINEER. ALL MATERIALS SHALL BE UNDERWRITERS APPROVED AND BEAR THE UL LABEL, BE STANDARD PRODUCTS AND BE THE MANUFACTURERS LATEST DESIGN. ALL ITEMS OF THE SAME TYPE OR RATING SHALL BE IDENTICAL AND OF THE SAME MANUFACTURER.
5. PREPLAN ALL WORK PRIOR TO ORDERING, PURCHASING OR FABRICATION ANY PART OF THE WORK DESCRIBED BY THIS DRAWING.
6. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE NAMEPLATE RATINGS OF ALL EQUIPMENT THAT IS SUPPLIED AND/OR INSTALLED BY OTHERS.
7. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION, SIZE AND TYPE OF ELECTRICAL CONNECTIONS TO MECHANICAL EQUIPMENT AND MAKE CONNECTIONS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
8. MECHANICAL EQUIPMENT SHALL BE WIRED THROUGH A FUSED DISCONNECT SWITCH LOCATED ON OR IMMEDIATELY ADJACENT TO THE EQUIPMENT BEING SERVED, SUCH SWITCH SHALL BE RATED ACCORDING TO THE MECHANICAL EQUIPMENT MANUFACTURERS RECOMMENDATIONS.
9. IMMEDIATELY NOTIFY THE ENGINEER OF ANY CONFLICTS WITH EXISTING FIELD CONDITIONS OR THE WORK OF OTHER TRADES.
10. RESOLVE ALL CONFLICTS PRIOR TO INCURRING ANY MATERIAL OR LABOR EXPENSES.
11. LOCATE ALL WORK GENERALLY AS SHOWN ON THIS DRAWING; HOWEVER COORDINATE EQUIPMENT, LIGHT FIXTURE, AND DEVICE LOCATIONS WITH ACTUAL FIELD CONDITIONS TO OBTAIN CODE–REQUIRED AND MANUFACTURER–DICTATED SERVICE CLEARANCES.
12. COMPLY WITH THE MANUFACTURERS TECHNICAL INSTRUCTIONS WHEN INSTALLING ELECTRICAL EQUIPMENT, LIGHT FIXTURES, DEVICES AND MATERIALS.
13. PROVIDE ALL APPURTENANCES NECESSARY TO PROPERLY INSTALL EQUIPMENT, LIGHT FIXTURES, DEVICES, MATERIALS, ETC.
14. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WORK AND COSTS REQUIRED TO MAKE CONNECTION TO ELECTRIC AND TELEPHONE UTILITIES, CONSULT CIVIL PLAN FOR TIE–IN LOCATIONS AND VERIFY INTENDED LOCATIONS WITH ENGINEER AND OWNER PRIOR TO INSTALLATION.
15. EQUIPMENT SHALL BE SUITABLE FOR ITS APPLICATION (E.G. WHEN INSTALLED OUTDOORS, IT SHALL BE WEATHERPROOF ETC.).
16. THE ELECTRICAL INSTALLATION SHALL COMPLY WITH THE INTERNATIONAL BUILDING CODE –IBC – CHAPTER 16–REFERENCE TO–ASCE CHAPTER 13 SECTION.
SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS.
NONSTRUCTURAL COMPONENTS INCLUDE MECHANICAL AND ELECTRICAL SYSTEMS.
1. SPRINKLER SYSTEMS
2. ESCALATORS AND ELEVATORS
3. VESSELS
4. PIPING
5. HVAC DUCTING
6. LIGHTING FIXTURES
7. ELECTRICAL EQUIPMENT

B. RACEWAYS:

1. ALL CONDUCTORS AND CABLES SHALL BE INSTALLED IN RACEWAYS. TYPE MC CABLE WILL BE CONSIDERED TO MEET THIS REQUIREMENT AND THE INTENT OF THIS SPECIFICATION. TYPE NMC CABLE CAN BE USED AS SPECIFIED BELOW.
2. ALL CONDUIT SHALL BE ½ INCH MINIMUM SIZE AND ZINC–COATED EMT, EXCEPT IN WET, DAMP OR WASH DOWN AREAS WHERE ZINC–COATED RIGID STEEL (GRS) OR IMMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED.
3. EMT FITTINGS SHALL BE STEEL SET SCREW TYPES. FLEXIBLE CONDUIT CONNECTORS SHALL BE STEEL COMPRESSION TYPES.
4. SECURE CONDUITS USING MANUFACTURED, GALVANIZED STRAPS. TIE WIRE IS NOT ALLOWED.
5. IN FINISHED AREAS, ROUTE ALL CONDUIT CONCEALED ABOVE CEILINGS, IN WALLS OR CASEWORK, OR BELOW GRADE.
6. THOROUGHLY COAT ALL UNDERGROUND METALLIC CONDUITS WITH TWO COATS OF ASPHALTUM OR BITUMASTIC PAINT. CONDUITS INSTALLED UNDERGROUND ON THE EXTERIOR OF THE BUILDING SHALL BE BURIED 2–FEET 0–INCHES MINIMUM UNDER ROADWAYS AND PARKING AREAS.
7. RIGID NONMETALLIC CONDUIT MAY BE USED CONCEALED IN WALLS, FLOORS AND CEILINGS, FOR THE SECONDARY UNDERGROUND SERVICE, THE UNDERGROUND TELEPHONE SERVICE CONDUIT, BRANCH CIRCUITS AND TELEPHONE SYSTEM CONDUITS LOCATED BELOW THE CONCRETE FLOOR SLAB ON GRADE OR BURIED ON THE EXTERIOR OF THE BUILDING. ALL PCV SHALL BE SCHEDULE 40 (UNLESS NOTED OTHERWISE) POLYVINYL CHLORIDE UL LISTED FOR USE WITH 75C CONDUCTORS. INSTALLATION SHALL COMPLY WITH ALL CODES, THE UTILITY COMPANY REGULATIONS, AND THE MANUFACTURERS INSTRUCTIONS. INSTALL SEPARATE BONDING CONDUCTOR IN ALL PVC RACEWAYS.
8. ALL PVC COMPONENTS OF THE PVC CONDUIT SYSTEM SHALL BE FURNISHED FROM THE SAME MANUFACTURER AND USED SPECIFICALLY FOR THEIR INTENDED PURPOSE.
9. RIGID NONMETALLIC CONDUIT SHALL NOT BE INSTALLED IN PATIENT CARE AREAS OF HEALTH CARE FACILITIES.
10. PROVIDE PULL CORDS IN ALL EMPTY CONDUITS. INSTALL GREEN GROUNDING CONDUCTOR IN ALL FLEXIBLE RACEWAYS.
11. ALL OUTLET BOXES SHALL BE GALVANIZED STEEL EXCEPT THAT CAST BOXES WITH GASKETED COVERS SHALL BE REQUIRED IN ALL INTERIOR WET AREAS AND ON THE EXTERIOR OF THE BUILDING. OUTLET BOXES SHALL BE NO LESS THAN 4 IN X 4 IN. X 2 IN. DEEP.

C. WIRING:

1. CONDUCTORS SHALL BE COPPER, THHN/THWN 90 DEGREE C, 600 VOLTS, SOLID FOR #10 AWG OR #12 AWG, AND STRANDED FOR ALL LARGER SIZES. CONTROL CIRCUIT CONDUCTORS MAY BE #14 AWG SOLID. ALL 208Y/120 VAC CONDUCTORS SHALL BE COLOR–CODED BLACK, RED, BLUE, WHITE, AND GREEN FOR PHASES A, B, C, NEUTRAL AND GROUND RESPECTIVELY. ALL 480Y/277 VAC CONDUCTORS SHALL BE COLOR–CODED BROWN, ORANGE, YELLOW, NATURAL GRAY, AND GREEN FOR PHASES A, B, C, NEUTRAL, AND GROUND RESPECTIVELY.
2. ALL CONDUCTORS AND CABLES SHALL BE INSTALLED IN CONDUITS AND TESTED FOR CONTINUITY AND GROUND BEFORE BEING ENERGIZED. ALL FAULTY CONDUCTORS SHALL BE REPLACED.
3. NO WIRE SMALLER THAN #12 SHALL BE INSTALLED UNLESS INDICATED.
4. VERIFY THAT THE ELECTRICAL CHARACTERISTICS OF CIRCUITS ARE CORRECT PRIOR TO ENERGIZING THE EQUIPMENT.
5. FULLY COORDINATE WITH THE OTHER TRADES TO DETERMINE THE POWER REQUIREMENTS AND CONNECTION POINTS FOR EQUIPMENT FURNISHED BY OTHERS. PROVIDE ELECTRICAL POWER TO EACH PIECE OF EQUIPMENT BASED UPON THE MANUFACTURERS WIRING DIAGRAMS AND UNIT MOUNTED NAMEPLATES.
6. THE CONDUIT AND NEUTRAL CONDUCTORS OF THE ELECTRICAL SYSTEM AND ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDED. PROVIDE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH EVERY ISOLATED CIRCUIT. THE CONDUIT SYSTEM AND NEUTRAL CONDUCTORS SHALL BE BONDED TOGETHER ONLY AT THE SERVICE ENTRANCE EQUIPMENT. GROUNDING AT THE SERVICE ENTRANCE SHALL COMPLY WITH NEC ARTICLE 250.
7. WHERE TYPE AC OR MC CABLE IS INSTALLED IN HEALTH CARE FACILITIES, INCLUDING DOCTOR'S OFFICES, THE METAL SHEATH SHALL BE LISTED AS AN EGC. IT SHALL ALSO HAVE AN INTERNAL INSULATED EQUIPMENT GROUNDING CONDUCTOR.
8. BRANCH CIRCUITS IN PATIENT CARE AREAS SHALL PROVIDE REDUNDANT GROUNDING FOR RECEPTACLES AND ELECTRICAL EQUIPMENT. THE WIRING SHALL BE INSTALLED IN METAL RACEWAYS PROPERLY INSTALLED TO ACT AS AN EQUIPMENT GROUNDING CONCUCTOR OR METAL CLAD CABLES WHOSE METAL SHEATHS ARE LISTED FOR USE AS AN EQUIPMENT GROUNDING CONDUCTOR. THE SYSTEM SHALL ADDITIONALLY INCLUDE AN INSULATED COPPER EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH 250.122.
9. TYPE NMC CABLE CAN BE USED FOR CONCEALED WORK IN NORMALLY DRY LOCATIONS. IT SHALL BE CONCEALED WITHIN WALLS, FLOORS OR CEILINGS THAT HAVE AT LEAST A 15 MINUTE FIRE RATING. IT SHALL NOT BE INSTALLED EXPOSED IN DROPPED OR SUSPENDED CEILINGS. TYPE NMC CABLE SHALL NOT BE USED IN PATIENT CARE AREAS OF HEALTH CARE FACILITIES.

D. POWER EQUIPMENT:

1. PANEL BOARDS SHALL BE DEAD–FRONT SAFETY TYPE WITH FULL HEIGHT, ALUMINUM OR COPPER BUSSING AND A NOMINAL 22 INCHES WIDE CABINET. ALL CIRCUIT BREAKERS SHALL BE MOLDED CASE, BOLT–ON, AUTOMATIC THERMAL MAGNETIC TYPE, CALIBRATED FOR 40C OR AMBIENT COMPENSATING. ALL DIRECTORIES SHALL BE TYPED.
2. SAFETY SWITCHES SHALL BE GENERAL DUTY, QUICK–MAKE, QUICK–BREAK, TYPES OF THE SIZE AND FUSE AMPACITY AS DENOTED ON THE DRAWINGS. PROVIDE GROUND BUS, SOLID NEUTRAL (WHEN CIRCUIT HAS A NEUTRAL), CLASS RK–5 DUAL ELEMENT TIME DELAY FUSES, REJECTION TYPE FUSE HOLDERS AND NEMA RATED ENCLOSURE.
3. SERVICE ENTRANCE EQUIPMENT SHALL BE IN ACCORDANCE WITH NEC–230 AND APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION. THE ELECTRICAL CONTRACTOR SHALL COORDINATE SHORT CIRCUIT RATING WITH THE LOCAL SERVING UTILITY, AND PROVIDE EQUIPMENT THAT EXCEEDS THE INTERRUPTING DEMAND OF THE AVAILABLE SHORT CIRCUIT CURRENT. ELECTRICAL CONTRACTOR SHALL CO–ORDINATE METERING REQUIREMENTS WITH THE SERVING ELECTRICAL UTILITY. FURNISH ANY EQUIPMENT REQUIRED BY UTILITY FOR CT METERING OR METER CANS AND OBTAIN APPROVAL FROM UTILITY PRIOR TO START OF ELECTRICAL WORK.
4. ALL ELECTRICAL EQUIPMENT SHALL BE PERMANENTLY MARKED TO CONFORM TO DESIGNATIONS ON THE DRAWINGS AND ALSO PER THE INSTRUCTIONS OF THE AUTHORITY HAVING JURISDICTION.

E. DEVICES:

1. EXCEPT IN HEALTH CARE FACILITIES, ALL WIRING DEVICES SHALL BE SPECIFICATION GRADE. THE COLOR SHALL BE SELECTED BY THE ARCHITECT FROM THE MANUFACTURERS STANDARD COLORS.
2. RECEPTACLES AT PATIENT BED LOCATIONS IN HEALTH CARE FACILITIES SHALL BE HOSPITAL GRADE AND SHALL BE IDENTIFIED WITH A GREEN DOT ON THE FACE OF THE RECEPTACLE, AND THE WORDS "HOSPITAL–GRADE" STAMPED ON THE DEVICE'S MOUNTING STRAP.
3. SWITCHES SHALL BE QUIET OPERATING TYPES RATED 20A.
4. RECEPTACLES SHALL BE NEMA 5–20R TYPES UNLESS OTHERWISE NOTED.
5. PROVIDE A SINGLE MULTI–GANG BOX AND DEVICE PLATE FOR ALL GROUP MOUNTED WIRING DEVICES.
6. ALL COVER PLATES SHALL BE PLASTIC TYPE UNLESS OTHERWISE NOTED.
7. GFI RECEPTACLES SHALL BE INSTALLED IN AREAS OUTLINED IN NEC. ALL RECEPTACLES LOCATED WITHIN SIX FEET OF A SINK OR OTHER SOURCE OF WATER SHALL BE GFI. ALL RECEPTACLES LOCATED IN WET AREAS SHALL BE GFI.

F. LIGHTING EQUIPMENT:

1. ALL LIGHT FIXTURES SHALL BE PROVIDED COMPLETE WITH LAMPS, ALL NECESSARY ACCESSORIES AND AS DESCRIBED ON THE DRAWINGS. COORDINATE ALL CONSTRUCTION DETAILS SUCH AS PROPER FIXTURE TRIM WITH CEILING CONSTRUCTION.
2. CEILING MOUNTED AND SUSPENDED LIGHT FIXTURES SHALL BE SUPPORTED BY A METHOD RATED AT LEAST FIVE TIMES THE SUPPORT WEIGHT. THE METHOD SHALL ALSO COMPLY WITH ARTICLES 410–15 AND 410–16 AS APPROPRIATE OF THE NEC.
3. MAGNETIC BALLAST SHALL BE ENERGY SAVING, 90% OR BETTER POWER FACTOR, CLASS P, A SOUND–RATED TYPES WITH NO PCB MATERIALS.
4. ELECTRONIC BALLASTS SHALL BE SOLID–STATE, NO FLICKER, 99% POWER FACTOR, WITH THD 10%–15%. CLASS A SOUND–RATED OR BETTER TYPES WITH NO PCB MATERIALS.
5. VERIFY EACH LIGHT FIXTURE AGAINST THE ARCHITECTS ROOM FINISHES AND RESOLVE ALL CONFLICTS BEFORE ORDERING LIGHT FIXTURES.
6. EXIT SIGNS SHALL HAVE DIRECTIONAL ARROWS AS SHOWN ON THE DRAWING.
7. EMERGENCY EGRESS LIGHT FIXTURES SHALL BE INSTALLED 8 FT. – 0 IN. AFF OR 1 FT. – 0 IN. BELOW FINISHED CEILING HEIGHT.
8. CONNECT EXIT SIGNS AND EGRESS LIGHT FIXTURES DIRECTLY TO THE LOCAL LIGHT CIRCUIT BUT AHEAD OF ANY SWITCHES OR DIMMERS.
9. PROVIDE LOW TEMPERATURE LAMPS AND BALLASTS FOR FIXTURES INSTALLED IN UNHEATED AREAS.
10. PATHS OF EGRESS HEADROOM. OBJECTS PROTRUDING FROM THE CEILINGS OF PATHS OF EGRESS SHALL PROTRUDE ONLY TO 80" ABOVE THE FLOOR.

ELECTRICAL SYMBOLS LEGEND

S_2	TWO–POLE WALL SWITCH
S_3	3–WAY WALL SWITCH
S_{3D}	3–WAY DIMMER SWITCH
S_4	FOUR–POLE WALL SWITCH
S_M	MOTOR SWITCH
S_{MC}	MOMENTARY CONTACT, LOW VOLTAGE SWITCH
S_{MS}	MOTION SENSOR SWITCH
S_{OC}	OCCUPANCY SENSOR SWITCH, DUAL TECHNOLOGY, ON/OFF/AUTO
S_D	DIMMER SWITCH, SINGLE POLE
S_{D} KEY	DIMMER SWITCH, SINGLE POLE, KEY OPERATED.
S_{MC} 3	MOMENTARY CONTACT, LOW VOLTAGE SWITCH WITH LOW VOLTAGE CIRC'UIT TO LIGHTING RELAY PANEL CONTROL. NUMERAL INDICATES CIRCUIT CONTROLLED. OVERIDES AUTO SHUT OFF PER IECC.
◀	*TELEPHONE SYSTEM CABLE OUTLET – STUB 3/4" C TO ABOVE CEILING INSTALL CABLE TO COMM. DEMARC POINT.*
◀	*TELEPHONE SYSTEM CABLE OUTLET – MOUNTED ABOVE COUNTER HEIGHT, STUB 3/4"C TO ABOVE CEILING INSTALL CABLE TO COMM. DEMARC POINT.*
◁	*COMMUNICATION/DATA SYSTEM CABLE OUTLET – STUB 3/4" C TO ABOVE CEILING INSTALL CABLE TO COMM. DEMARC POINT.*
◁	*RG6 COAXIAL CABLE OR AS REQUIRED BY TELEVISION SYSTEM OUTLET CONFIGURED ON WALL PLATE. INSTALL CABLE TO TELEVISION SYSTEM DEMARC POINT.*
◀	*DUAL JACK OUTLET, ONE RJ11 OR AS REQUIRED BY TELEPHONE SYSTEM AND ONE RJ45S OR AS REQUIRED BY COMPUTER SYSTEM OR HDMI AS REQUIRED BY VIDEO. CONFIGURED ON WALL PLATE. INSTALL CABLE TO COMM. DEMARC POINT.*
◀	*DUAL JACK OUTLET, ONE RJ11 OR AS REQUIRED BY TELEPHONE SYSTEM AND ONE RJ45S OR AS REQUIRED BY COMPUTER SYSTEM OR HDMI AS REQUIRED BY VIDEO. CONFIGURED ON WALL PLATE. INSTALL CABLE TO COMM. DEMARC POINT. ABOVE COUNTER HEIGHT.*
◭	FLOOR TELEPHONE SYSTEM CABLE OUTLET. INSTALL 3/4" C TO WALL AND STUB TO ABOVE CEILING INSTALL CABLE TO COMM. DEMARC POINT.
J	JUNCTION BOX WITH SUSPENDED FLEXIBLE CABLE. THE CABLE SHALL HAVE A STRAIN RELIEF CORD GRIP AT THE TOP AS MANUFACTURED BY WOODHEAD OR EQUAL. CABLE SHALL BE ROUND PENDANT CABLE, MULTICONDUCTOR WITH PVC JACKET, SIZE AND CONFIGURATION AS NOTED. CONNECT TO EQUIPMENT BELOW, RECEPTACLES AS NOTED.
TV	TV SYSTEM CABLE OUTLET/120V DUPLEX RECEPTACLE, 84"AFF. STUB 3/4"C TO ABOVE CEILING. INCLUDES COMM. CONDUITS. CONDUITS FOR HDMI CABLES SHALL BE 2"C MINIMUM.
TV	TV SYSTEM CABLE OUTLET/120V DUPLEX RECEPTACLE, CEILING MOUNTED. STUB 3/4"C TO ABOVE CEILING. INCLUDES COMM. CONDUITS. CONDUITS FOR HDMI CABLES SHALL BE 2"C MINIMUM.
	MASS NOTIFICATION SPEAKER WITH AMBER STROBE.
ACU	AUTONOMIUS CONTROL UNIT FOR MASS NOTIFICATION SYSTEM
S	*MASS NOTIFICATION SPEAKER EXTERIOR WALL MOUNTED NEMA3R*
VS	DUAL TECHNOLOGY PASSIVE INFRARED (PIR) AND ULTRASONIC (US) CEILING MOUNTED VACANCY SENSOR LIGHTING CONTROL. ALL SPACES WITH VACANCY SENSORS SHALL BE SET FOR MANUAL ON, AUTOMATIC AND MANUAL OFF CONTROL
Svs	DUAL TECHNOLOGY PASSIVE INFRARED (PIR) AND ULTRASONIC (US) VACANCY SENSOR SWITCH. ALL SPACES WITH VACANCY SENSORS SHALL BE SET FOR MANUAL ON, AUTOMATIC AND MANUAL OFF CONTROL
MD	*MOTION DETECTOR*
BMS	BALANCED MAGNETIC SWITCH
	CEILING MOUNTED CCTV CAMERA LOCATION FOR AUDIO/VISUAL SYSTEM.
M	*MASS NOTIFICATION SPEAKER CEILING MOUNTED.*
	SIPR, PHONE & DATA DROPS IN HOLOCOM DROP BOX WITH HOLOCOM MINI DUCT TUBE UP TO HOLOCOM 2'X2' SECURE RACEWAY. INSTALL COMM CABLES. SIPR CABLES ARE NOT A PART OF THIS CONTRACT.
A	*ANSUL PULL STATION*
	3 WIRE RECEPTACLE TO MATCH EQUIPMENT PLUG OR AS NOTED.

	2#12 AWG, CU PHASE AND NEUTRAL CONDUCTORS IN CONDUIT OR CABLE. AN ADDITIONAL GROUNDED CONDUCTOR IS REQUIRED.
	CONDUCTORS IN CONDUIT OR CABLE. CROSSMARKS INDICATE NUMBER OF #12 AWG CU PHASE AND NEUTRAL CONDUCTORS. AN ADDITIONAL GROUNDED CONDUCTOR IS REQUIRED.
	HOMERUN TO PANEL. CONDUCTORS IN CONDUIT OR CABLE, CROSSMARKS INDICATE NUMBER OF #12 AWG CU PHASE AND NEUTRAL CONDUCTORS. AN ADDITIONAL GROUNDED CONDUCTOR IS REQUIRED.
3#10,1#10G, 3#4"C	HOMERUN TO PANEL, SIZE AS NOTED
	LIGHTING FIXTURE, CEILING MOUNTED
	LIGHTING FIXTURE, WALL MOUNTED
	LIGHTING FIXTURE SEE SCHEDULE
	STRIP LIGHTING FIXTURE
	LIGHTING FIXTURE, RECESSED
	EXIT LIGHT FIXTURE, CEILING MOUNTED
	EXIT LIGHT FIXTURE, WALL MOUNTED
	COMBINATION EXIT LIGHT AND EMERGENCY LIGHTING
	COMBINATION EXIT AND EMERGENCY LIGHT WITH REMOTE HEAD
	SOLID STATE BATTERY PACK EMERGENCY LIGHTING UNIT
	EMERGENCY LIGHT, DECORATIVE
	DUPLEX RECEPTACLE MOUNTED 18" AFF UNLESS NOTED OTHERWISE.
	TANDEM DUPLEX RECEPTACLES IN ONE BOX MOUNTED 18" AFF UNLESS NOTED OTHERWISE.
	DUPLEX RECEPTACLE ABOVE COUNTER MOUNTED 42" AFF UNLESS NOTED OTHERWISE.
	DUPLEX RECEPTACLE, HALF HOT, HALF SWITCHED, OR SPLIT WIRED MOUNTED 18" AFF UNLESS NOTED OTHERWISE.
GFI	GROUND FAULT INTERRUPTING DUPLEX RECEPTACLE MOUNTED 18" AFF UNLESS NOTED OTHERWISE.
	POWER RECEPTACLE, CONFIGURATION AND/OR AMPS AS NOTED MOUNTED 18" AFF UNLESS NOTED OTHERWISE.
	DUPLEX RECEPTACLE 12" BELOW CEILING
	FLOOR MOUNTED DUPLEX CONVENIENCE OUTLET, FLANGE AS REQUIRED
	TWO (2) DUPLEX RECEPTACLES MOUNTED IN DOUBLE GANG BOX. 20A,120V,2P,3W, GROUNDING, 5–20R. FLANGE AS REQUIRED.
	CLOCK OUTLET, 120V,2P,3W
	DUAL JACK OUTLET, ONE RJ11 OR AS REQUIRED BY TELEPHONE SYSTEM AND ONE RJ45S OR AS REQUIRED BY COMPUTER SYSTEM. FLOOR MOUNTED
J	JUNCTION BOX
T	THERMOSTAT
M	MOTOR
	DISCONNECT SWITCH, NON–FUSED OR FUSED AS SHOWN OR REQUIRED
S	SINGLE POLE WALL SWITCH
SS	TANDEM SINGLE POLE SWITCHES TO SWITCH OUTER AND INNER LAMPS SEPARATELY
S3S3	TANDEM THREE POLE SWITCHES TO SWITCH OUTER AND INNER LAMPS SEPARATELY
SaSb	TANDEM SINGLE POLE SWITCHES LOWER CASE LETTERS INDICATE LUMINAIRES SWITCHED
PA	PUBLIC ADDRESS SPEAKER

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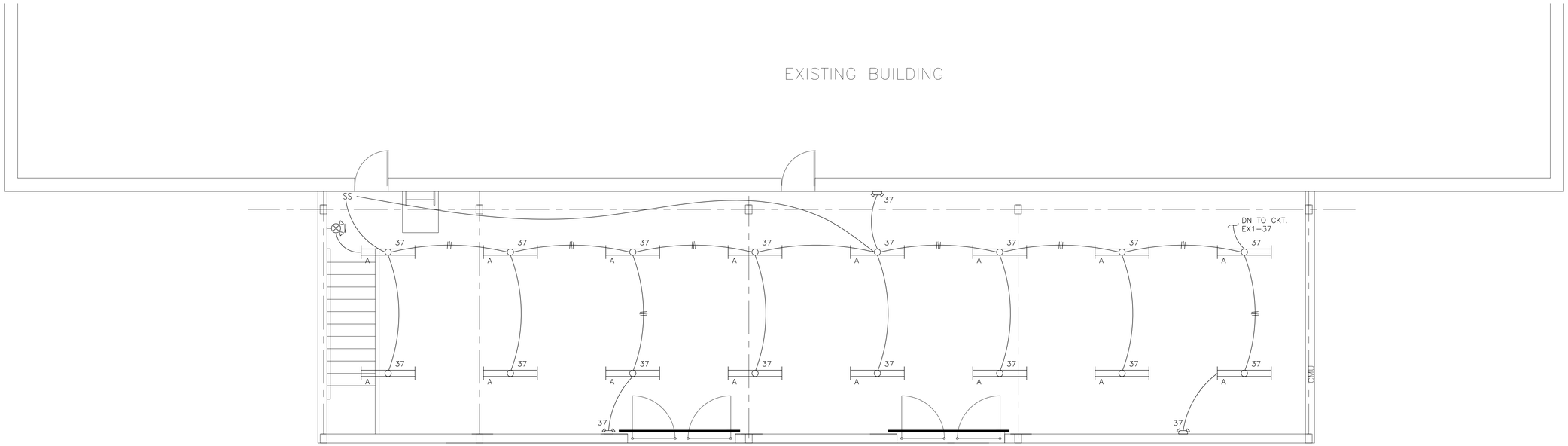
ZOO HAY BARN ADDITION

SHEET TITLE: LEGEND

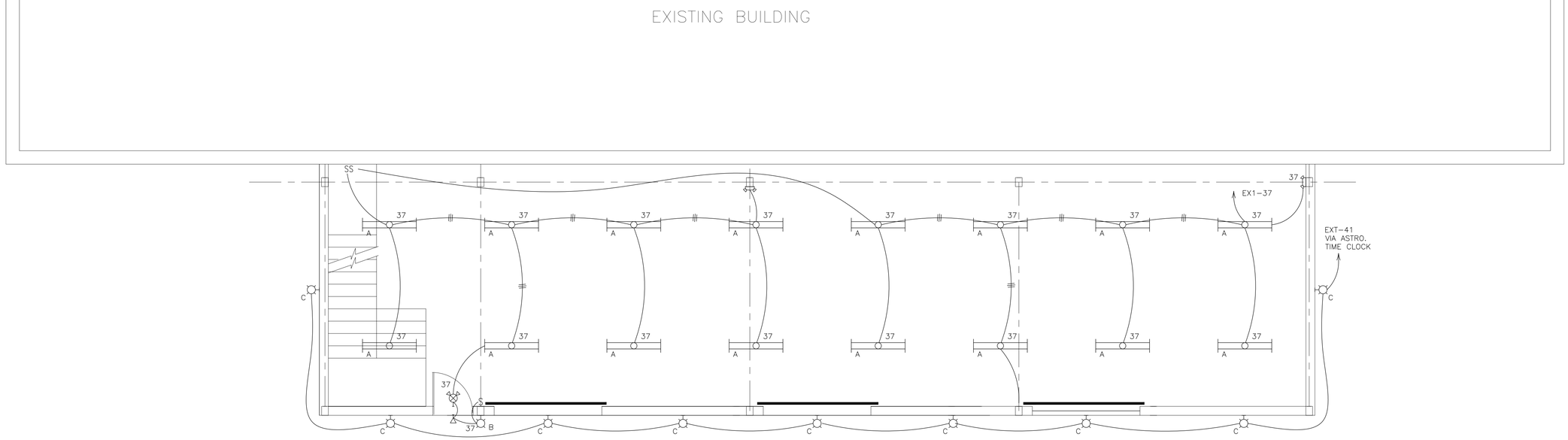
DRAWN BY HOL
DATE 3/2/2022

SHEET NO. E1 OF 4



SECOND FLOOR LIGHTING PLAN

1/4"=1'-0"



FIRST FLOOR LIGHTING PLAN

1/4"=1'-0"

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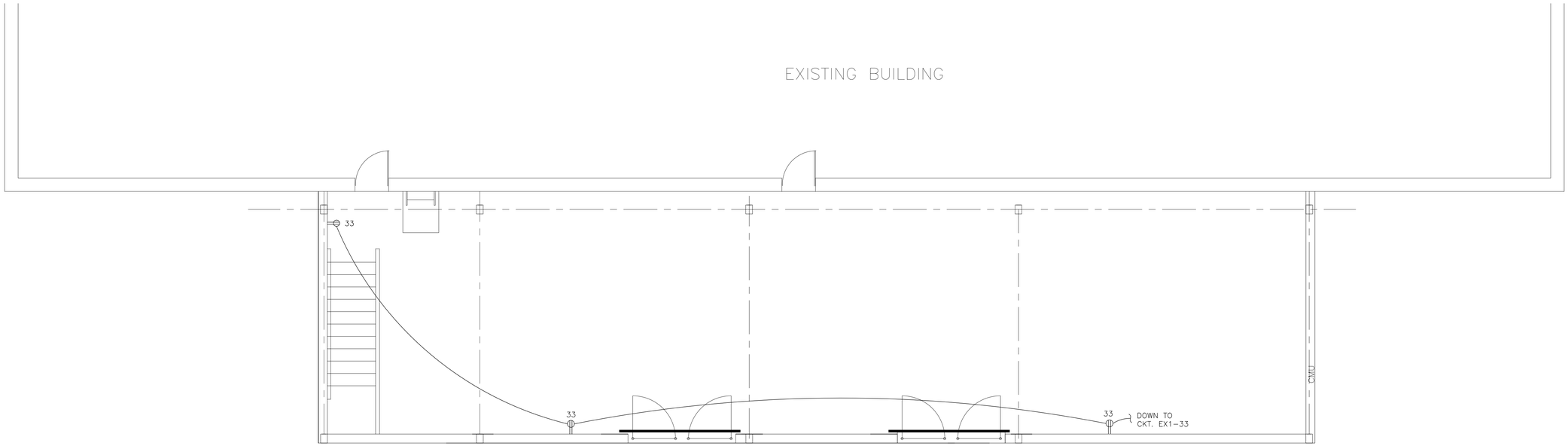
ZOO HAY BARN ADDITION

SHEET TITLE: LIGHTING PLANS

DRAWN BY HOL

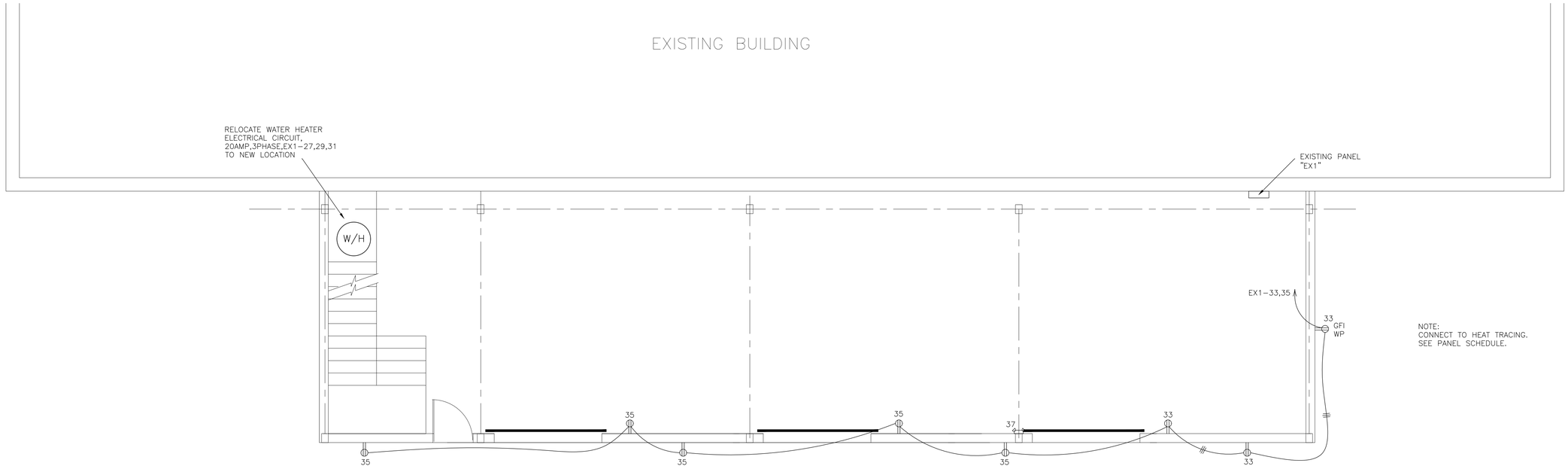
DATE 3/2/2022

SHEET NO.	OF
E2	4



SECOND FLOOR POWER PLAN

1/4"=1'-0"



FIRST FLOOR POWER PLAN

1/4"=1'-0"

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ZOO HAY BARN ADDITION

SHEET TITLE: POWER PLANS

DRAWN BY HOL

DATE 3/2/2022

SHEET NO. E3

OF 4

Interior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: Zoo Hay Barn
Project Type: New Construction

Construction Site:	Owner/Agent:	Designer/Contractor:
Columbia, SC	Columbia Riverbanks Zoo	Harvey O. Lucas Jr. PE

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Warehouse	2616	0.8	2093
Total Allowed Watts =			2093

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)
Warehouse (2616 sq.ft.)				
LED 1: LED Panel 60W:	1	32	58	1856
Total Proposed Watts =				1856

Section 4: Requirements Checklist

Interior Lighting PASSES: Design 11% better than code.

Lighting Wattage:
☑ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
2093	1856	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.

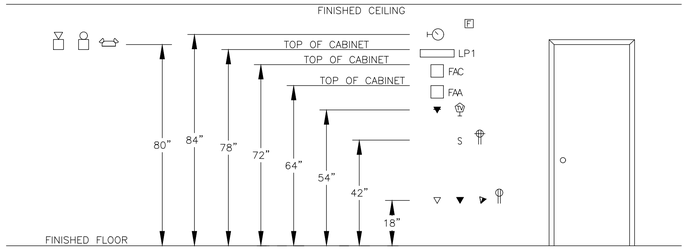
☑ 4. Independent controls for each space (switch/occupancy sensor).
Exceptions:
Areas designated as security or emergency areas that must be continuously illuminated.
Lighting in stairways or corridors that are elements of the means of egress.

☐ 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.

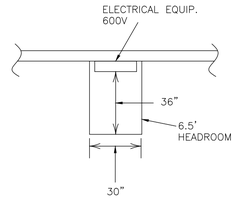
Section 5: Compliance Statement

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 COM*check* Version 4.1.1.0 and to comply with the mandatory requirements in the Requirements Checklist.

Harvey O. Lucas Jr. PE	Harvey O Lucas	3/2/2022
Name - Title	Signature	Date



NOTES:
1. HEIGHTS SHOWN ARE TYPICAL TO CENTERLINE OF BOX UNLESS NOTED OTHERWISE.
2. WHERE DEVICES ARE INDICATED TO BE ABOVE DOORS, THEY SHALL BE CENTERED BETWEEN TOP OF DOOR TRIM & CEILING—LINE.
3. MOUNTING HEIGHTS SHOWN ON ARCHITECTURAL ELEVATIONS SHALL GOVERN OVER THOSE SHOWN HERE.



WORKING SPACE AROUND ELECTRICAL EQUIPMENT
NO SCALE

"EX1"

ROOM:	VOLTS: 208Y/120V	AIC:
MOUNTING:	BUS AMPS:	MAIN BKR:
FED FROM:	NEUTRAL:	LUGS:
NOTE: THIS PANEL IS EXISTING		

CKT #	CKT BKR	LOAD KVA φ a	LOAD KVA φ b	LOAD KVA φ c	CIRCUIT DESCRIPTION	φ	CKT #	CKT BKR	LOAD KVA φ a	LOAD KVA φ b	LOAD KVA φ c	CIRCUIT DESCRIPTION
1						a	2					
3						b	4					
5						c	6					
7						a	8					
9						b	10					
11						c	12					
13						a	14					
15						b	16					
17						c	18					
19						a	20					
21						b	22					
23						c	24					
25						a	26					
27	20/3		1920		WATER HEATER	b	28					
29	=			1920	=	c	30					
31	=	1920				a	32					
33	20/1		1500		RECEPTACLES	b	34					
35	20/1			1500	RECEPTACLES	c	36					
37	20/1	1792			LIGHTING	a	38					
39	20/1		1500		HEAT TRACE	b	40					
41	20/1			225	SECURITY LIGHTING	c	42					
TOTAL		2816	3920	2816					####	####	####	

EXISTING CKT. BKR

CONNECTED LOAD: 9552 27A

CALCULATED LOAD

CHANGES FOR THIS JOB

NOTE:
LOCATE NEW HEAT TRACING AND CONNECT TO CIRCUIT 39 WITH 2#12,1#12G,3/4"C

FIXTURE SCHEDULE				
TYPE	DESCRIPTION	LAMPS	WATTS	BALLAST
A	8' LED STRIP, 6000 LUMENS, 4000 K, LITHONIA # TZL1F L96 6000LM MDD MVOLT 40K 90 CRI OR EQUAL	LED	56W	N/A
B	WALL MOUNTED EXTERIOR LIGHT, LITHONIA WDGE2 LED P3 40K 80CRI VW MVOLT OR EQUAL	LED	25W	N/A
C	WALL MOUNTED EXTERIOR LIGHT, LITHONIA WDGE2 LED P3 40K 80CRI VW MVOLT OR EQUAL	LED	25W	N/A
⊗	CEILING MOUNTED EXIT LIGHT, BATTERY BACKUP, LITHONIA # LQC W R ELN 120/277 OR EQUAL	LED	7.2W	
→⊗	WALL MOUNTED EXIT LIGHT, BATTERY BACKUP, LITHONIA #LQC W R ELN 120/277 OR EQUAL	LED	7.2W	
→⊗	LED EXIT LIGHT WITH EMERGENCY LIGHTS, LITHONIA # ECR LED M6 LED EXIT/UNIT COMBO OR EQUAL	LED	3.8w	
⋈⊗⋈	LED EXIT LIGHT WITH EMERGENCY LIGHTS & SINGLE REMOTE HEAD, LITHONIA # ECR LED M6 LED EXIT/UNIT COMBO WITH ERE GY SGL WP SQ M12 SINGLE LED WEATHER PROOF REMOTE HEAD OR EQUAL	LED	4.8W	
⊏	EMERGENCY LIGHT, BATTERY BACKUP, LITHONIA # ELM6LED 120/277 W LP03VS LAMPS OR EQUAL	LED	1.5W	

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ZOO HAY BARN ADDITION

SHEET TITLE: SCHEDULES & DETAILS

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DATE 3/2/2022

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