

| PLUMBING FIXTURE SCHEDULE | | | | | | | | |
|---------------------------|---------------------------|----------|------|------|--------|--------|--|---|
| designation | description | mounting | hw | CW | san | vent | model | fixture |
| fd-1 | floor drain (round) | floor | - | - | 3" | 1-1/2" | watts drainage model fd-200-b, cast iron body, adjustable 1/2" thick nickel bronze 6" round strainer | mechanical trap seal conforming to asse 1072 or trap primer |
| _S -1 | sink | counter | 1/2" | 1/2" | 1-1/2" | 1-1/2" | as provided by greenhouse manufacturer | |

remarks

1. refer to specifications.

 all plumbing fixtures shall have final approval by owner.
 provide all stops, escutcheons, traps, hangers, etc. for complete working installation.

| 5. | all public hand washing fixtures shall be equipped with a thermostatic mixing |
|----|---|
| | valve, watts guardian model lfusg-b, asse 1070, 0.5-2.5 gpm. |
| _ | |

| all public hand washing fixtures shall be equipped with a thermostatic mixing |
|---|
| valve, watts guardian model Ifusg-b, asse 1070, 0.5-2.5 gpm. |
| 6. connection sizes are as designated unless indicated other wise on plans. |
| |

| PLUMBING LEGEND | | | | | |
|--|-----------------------------------|--|--|--|--|
| ABBREVIATION | DESCRIPTION | | | | |
| N | check valve | | | | |
| ── ⋈── | shut off valve | | | | |
| —————————————————————————————————————— | union | | | | |
| | existing piping | | | | |
| | existing piping to be removed | | | | |
| - | remove to point and cap | | | | |
| | remove to point for reconnection | | | | |
| O | floor drain/sink | | | | |
| | branch piping off bottom | | | | |
| ─ | branch piping off top | | | | |
| c | pipe drop | | | | |
| | pipe rise | | | | |
| CW | cold water piping | | | | |
| G | gas piping | | | | |
| ———НW——— | hot water piping | | | | |
| ———PD ——— | pump discharge piping | | | | |
| SAN | sanitary sewer piping | | | | |
| — — SAN— — | sanitary sewer piping below floor | | | | |
| V | vent piping | | | | |
| cte | connect to existing | | | | |
| dn | down | | | | |
| dwh | domestic water heater | | | | |
| ес | electrical contractor | | | | |
| etr | existing to remain | | | | |
| fs | floor sink | | | | |
| iw | indirect waste | | | | |
| mc | mechanical contractor | | | | |
| рс | plumbing contractor | | | | |
| typ_ | typical | | | | |
| typ-3 | typical of three | | | | |

| COBINATION BOILER DOMESTIC WATER HEATER SCHEDULE | |
|---|--------------|
| mark | cbdwh-1 |
| type | tankless |
| fuel | natural gas |
| input (mbh) | 175 |
| domestic flow rate @ 45°f rise (gpm) | 7.9 |
| space heating capacity (mbh) | 140 |
| maximum working pressure (psi) | 150 |
| flue size (inches) | 3/3 |
| electrical data (voltage/phase) | 120/1 |
| manufacturer | navien |
| model number | nfc-250/175h |
| operating weight (pounds) | 170 |
| remarks | 1,2,3,4 |

remarks

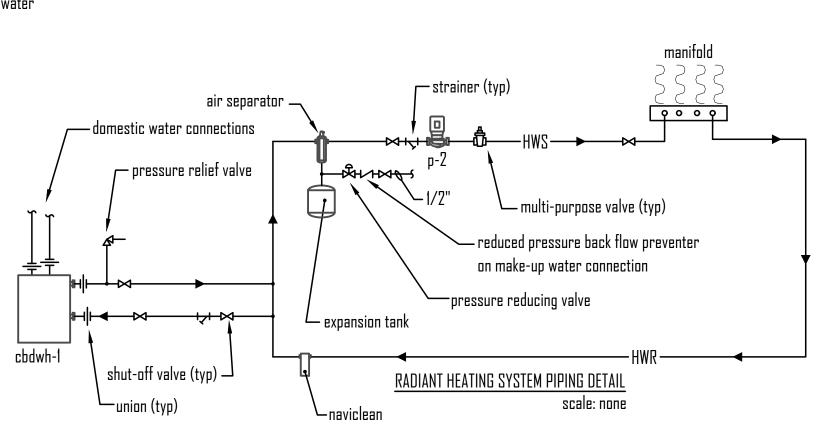
1. adjust heater such that maximum leaving water

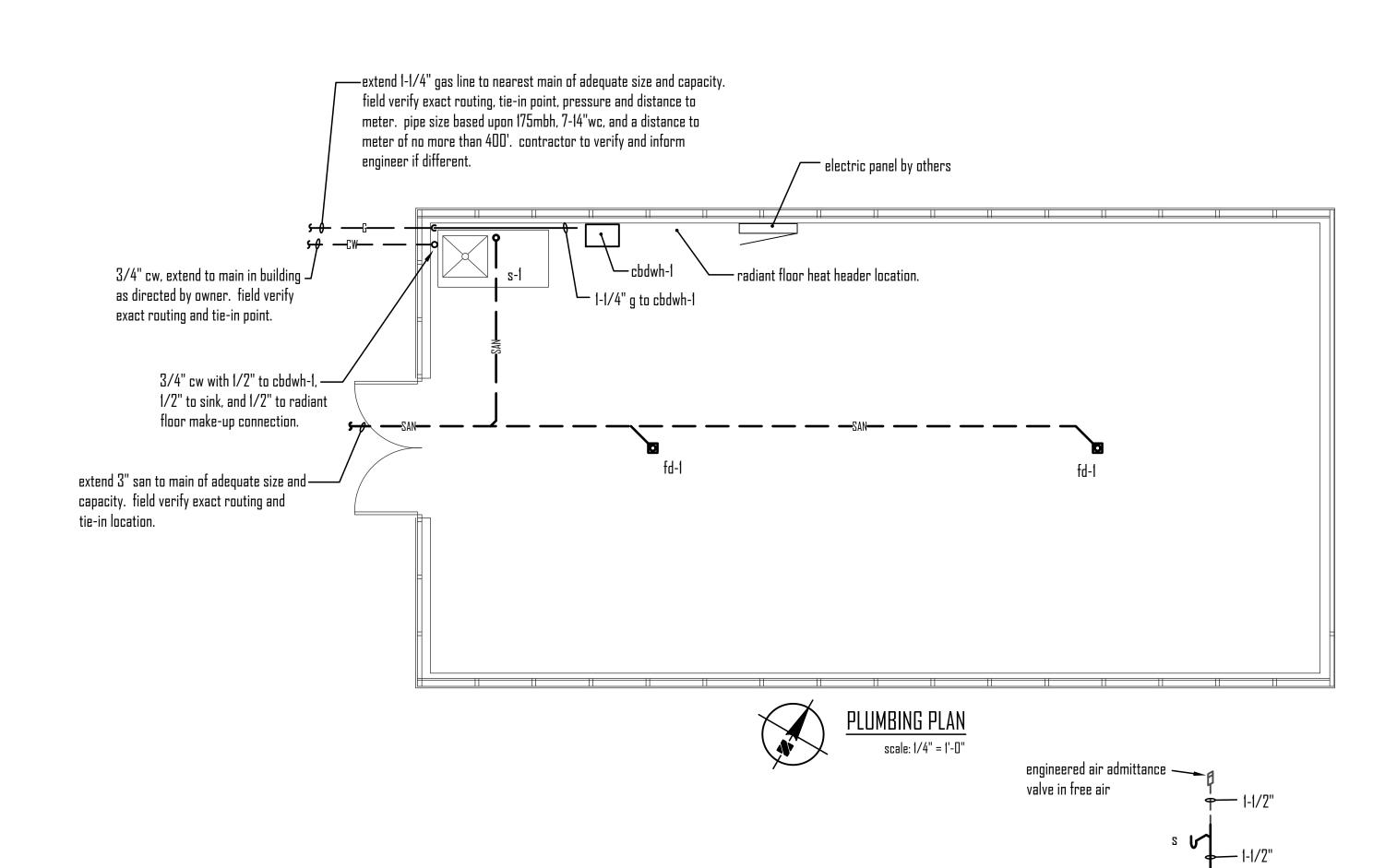
temperature is 120°f

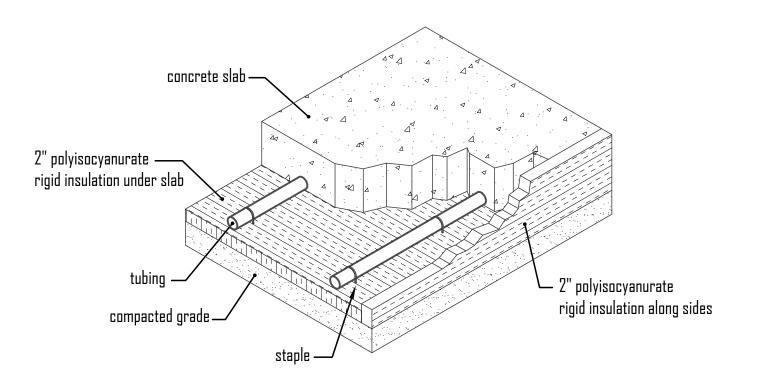
2. direct vent, sealed combustion

3. concentric vent kit

4. condensate neutralizer kit

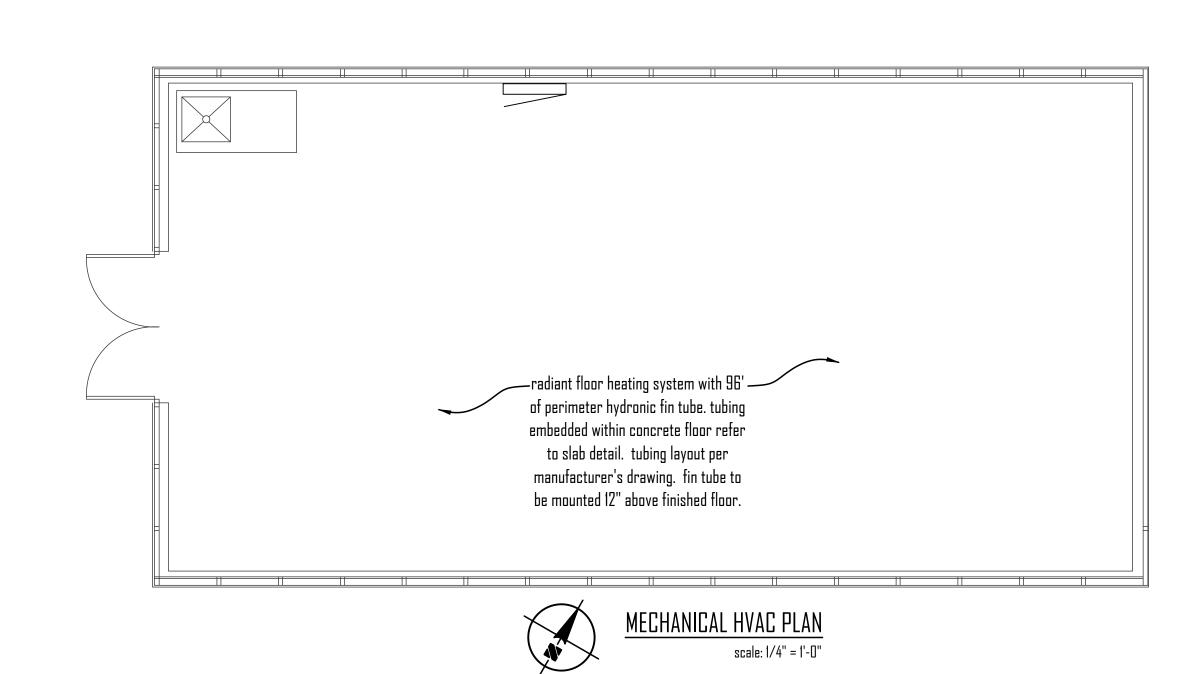






SLAB ON GRADE RADIANT FLOOR TUBING DETAIL scale: none

<u>note:</u> contractor shall secure tubing to foam by staples utilizing the manufacturer's recommended equipment and staples. secure a minimum of every three feet on straight runs; on 180° turns place one staple at the top of the arc and one 12" away on each side.





STACK DIAGRAM 'A' scale: none

STEVEN J. GALA LICENSE # 65458 EXPIRATION 12-31-2025

8/28/25 For Permit

DRAWN BY: na CHECKED BY: SHEET NUMBER

Description

- the provisions of the instructions to bidders, general conditions, supplementary conditions, alternates, addendas and division I are a part of this specification. electrical, architectural, structural and all other drawings as well as the specifications for all the divisions are a part of the contract documents. the mechanical drawings and specifications are intended to be supplementary to each other.
- documents are provided for the negotiation of a guaranteed maximum price. as such, they are not considered to be complete or all inclusive. provide all materials, equipment, components, services, controls, wiring, tools, power, transportation. hoisting, permits, labor, etc. as required for a complete and operational facility whether these components and labor may not be indicated or implied. items implied or omitted, but necessary, to make the mechanical system complete and workable shall be understood to be part of the work.
- the contractor shall be responsible for coordinating all mechanical equipment locations, components and connections prior to setting of equipment or accessories. changes arising due to lack of coordination or knowledge of field conditions shall be corrected at the contractor's expense. extra costs that may arise as a result of deviation from contract drawing to avoid interference's shall be considered a field condition. no additional compensation shall be allowed. interferences shall be immediately brought to the architect/engineer's attention.
- visit the work site during the bidding period and become familiar with the conditions affecting the installation. submission of a proposal shall presume knowledge of such conditions and no additional compensation shall be allowed where extra labor or materials are required.
- items and such labeled as "by others" shall become the responsibility of the general contractor. the general contractor shall then be responsible to coordinate the work such that it is accounted for in the bid to the client. if no general contractor exists then it shall become the responsibility of the trade whose equipment/work/installation is affected most by it.
- it is the purpose of the mechanical drawings to indicate the approximate location of all equipment, piping, etc. determine exact locations of equipment and arrange work accordingly. the right is reserved to effect reasonable changes in the location of equipment, piping, etc., up to the time of roughing-in, without additional cost to the owner. in addition, this contractor shall coordinate his work with all other trades and utilities before commencing such work.

Permits and Code

- secure and pay for permits and inspections required for the mechanical work. make payments to all public utilities for work required by the utility, including tap-in fees. it is the contractor's responsibility to make all contacts with the proper utilities and perform all application requirements to obtain any service.
- it is the contractors responsibility to conform the system to all local codes and legal requirements. no extra compensation will be allowed for any changes to make the system conform regardless of what is shown on the contract documents.
- install work in accordance with all applicable provisions of local and state codes, as well as the nfpa as interpreted by the local authority having jurisdiction. comply with the latest editions of ashrae and smacna standards.

Part 2 Execution

Equipment and Material

- a warrant that equipment and all work is installed in accordance with good engineering practice and that all equipment will meet the requirements specified. guarantee against defects in workmanship and materials; provide labor and repair or replace any defective work, material or equipment within one year from date of formal written acceptance by the owner. refrigeration compressors shall have a five year
- base bids upon the specified products or listed alternatives. the drawings and specifications are based on the products specified by type, model and size and thus establish minimum qualities which substitutes must meet to qualify for review. where only one make is named, it shall be provided. verbal requests or approvals shall not be binding on the architect, engineer or owner. should materials and equipment other than those specified be proposed, submit a written request for substitutions to the architect in accordance with division I requirements. indicate any additions or deductions to the contract price. the contractor is to bear the cost of any approved changes for installation and shall coordinate this change with all other trades.
- equipment and materials used on this project shall be new and ul labeled (as required) for the
- equipment service and operating clearances recommended by the manufacturer shall be noted prior to installation and maintained by all trades throughout construction.
- provide to owner after all equipment is in operation, competent instructors for the purpose of training owner's personnel in all phases of operation and maintenance of equipment and systems. training shall consist of up to a total of eight hours of instructions. instructions shall be allowed to be split between two days and accommodate any personnel the building owner sees fit. the building owner shall provide the facilities.
- install and connect equipment, services and materials in accordance with the best engineering practice and with various manufacturers written instructions and recommendations. where manufacturers written instructions and engineered drawings differ in the method of installation, the contractor shall inform the engineer of such discrepancy prior to the start of such work. furnish and install complete auxiliary piping, valves, water seals, electric connections, supports, safety devices, etc., recommended by manufacturer for proper installation.
- all line voltage wiring of mechanical equipment shall be done by electrical contractor. this contractor shall furnish the electrical contractor with a complete set of wiring diagrams for all electrically powered equipment provided within the contract which shall indicate required service. low voltage and control wiring shall be provided and installed by mechanical contractor and shall include all conduit as required.

2.2 Field Requirements

- plan work to permit the carrying on of normal business functions unless specified otherwise on drawings. any service shutdowns that may be required shall be scheduled through the owner and shall be done at a time as directed by the owner. no additional compensation shall be allowed for these shutdown periods even though premium-time work may be required. provide temporary service to equipment or systems that cannot be shutdown, as determined by owner. provide a minimum of one week's notice to the owner before any service shutdown is scheduled.
- any requests for field administration not originally part of the scope of work provided, will be billable as additional services. all costs associated with the request shall be billable to the individual making such request. verbal requests to proceed shall constitute approval to proceed and bill at the normal billable
- all contractor personnel who perform installation, maintenance or repair work who might have the opportunity to release cfc's or hcfc's into the atmosphere shall have a universal certification as required by the environmental protection agency.

- d at all times keep premises and building in neat and orderly condition; follow explicitly any instructions of architect in regard to storing of materials, protective measures and disposing of debris.
- e provide all cutting and patching in existing construction as necessary for installation of this work. have cutting done by skilled mechanics in the trade. this shall be done carefully as to not injure any of the structure, as little material as possible will be removed. in no case shall reinforced steel be cut without written permission from the architect. building and surface damage shall be repaired, replaced and/or restored to the original condition before the completion of the project and before final acceptance by
- f all cutting, patching, sealing, etc. of roofing system shall be performed under the direct supervision of the greenhouse supplier representative...
- any discrepancies between what is shown on the drawings and what is actually in the field shall be brought to the architect's attention before the contractor is to proceed with that portion of the work
- h before any digging call, 811, at least 48 hours but not more than ten working days in advance to ohio utilities protection service. provide location of planned work, nearest cross street, distance and direction off the road, date excavation to begin, and type of work. for more info go to www.oups.org.

2.3 Testing and Balancing

a test piping for leaks; repair leaks in copper tubing by sweating out joints, thoroughly cleaning both tube and fitting, and resoldering; correct leaks in screwed joints by replacing thread or fitting or both. provide chemical cleaning for all piping systems with approved detergent.

SECTION 15050 - BASIC MATERIALS AND METHODS

Part 1 General

1.1 Pipe and Fittings

- a domestic water type "I" hard copper or wirsbo aquapex tube or equal that meets astm f876 and f877. and is certified to nsf standards 14 and 61. underground piping shall be type 'k' hard drawn seamless copper tube (astm b88).
- b a/c condensate drain type "I" hard copper.
- c natural gas schedule 40 black steel. (interior), schedule 40 black steel pvc coated (exterior). all gas piping materials, components, installation, inspection, and purging shall be in full conformance with nfpa 54 "national gas code" and the international fuel gas code. contractor shall also utilize tracpipe flexible gas piping by omega flex (interior) or tracpipe ps (underground).
- d refrigerant type "l" hard copper.
- e heating hot water schedule 40 black steel or type 'l' hard drawn seamless copper tube (astm b88).
- fittings for gas piping: 150 wsp malleable iron screwed fittings through 4 inch size, factory formed welding fittings for sizes over 4 inch. all gas piping materials, components, installation, inspection, and purging shall be in full conformance with nfpa 54 "national gas code" and the international fuel gas code. fittings for tracpipe shall be as approved by manufacturer.
- fittings for copper pipe: wrot copper solder joint type with 95-5 solder, except for refrigerant piping where silver brazing alloy shall be used.
- soil, waste, vent, and drain piping (above ground interior) no-hub cast iron pipe and fittings. provide neoprene gasket (astm c-564) and stainless steel clamp assembly (astm a-888), 3 inches wide for pipe 1-1/2 to 4 inches, 4 inches wide for pipe sizes 5 to 10 inches and 5-5/8 inches for pipe sizes 12 and 15 inches. shields shall be type 304 stainless steel and have a minimum thickness of 0.015 inches. provide worm drive clamps of type 304 stainless steel. clamp-all products model hi-torg 125 and hi-torg 80. where permissible by code, schedule 40 pvc solid core dwv (astm d 2665) may be substituted for above soil, waste, vent and drain piping. all piping located within the confined walls of a kitchen including under floor sanitary to a distance of twenty feet downstream shall not be pvc.
- building sewers and drains "underground" storm and sanitary sewers to 5'-0" outside building walls shall be service weight cast iron, bell and spigot, soil pipe, and fittings. provide neoprene gasket (astm c-564) and stainless steel clamp assembly (astm a-888), 3 inches wide for pipe 1-1/2 to 4 inches, 4 inches wide for pipe sizes 5 to 10 inches and 5-5/8 inches for pipe sizes 12 and 15 inches. shields shall be type 304 stainless steel and have a minimum thickness of 0.024 inches. provide worm drive clamps of type 304 stainless steel. clamp-all products model hi-torg 125. where permissible by code, schedule 40 pvc solid core dwv (astm d 2665) may be substituted for underground soil, waste, and storm piping.
- plastic piping shall not be installed in areas being used as return air plenums or paths. in areas being renovated where plastic piping already exists in return air plenums or paths, it shall be replaced or encased by code approved material.
- grooved or mechanically sealed "engineered" piping systems shall be permissible at the engineers discretion. written approval shall be obtained prior to start of work with the requesting contractor providing a written statement indicating type, make and manufacturer of system, increase or decrease in project cost and any effect on the project timeline.

- a all valves shall be of the same manufacturer where possible and shall be as manufactured by grinnell, milwaukee, nibco, stockham, hammond or watts. all valves shall be of domestic manufacturer.
- b shutoff valve in water piping two inch and smaller: bronze ball valve, minimum 150 psig swp, 600 wog, milwaukee ba-150 or approved equal. valves used for balancing shall be equipped with memory stop. pvc valve shall be full port all pvc construction with 150 psi working pressure at 73 degrees fahrenheit water temperature with a maximum service temperature of 140 degrees fahrenheit, socket or threaded ends, epdm seals, nibco 4660 series, watts or approved equal.
- shutoff valve for natural gas piping two inch and smaller: ball valve, 150 psi wsp, 600 psig wog, csa and ul rating for natural gas, full port, full flow, bronze body, stainless steel ball and stem, ptfe seat and seal, watts model b6000 series or approved equal.

1.3 Unions

a provide unions at all equipment, specialty connections and where indicated on plans for ease of maintenance and removal.

1.4 Dielectric Fittings

- a provide dielectric connections between copper and ferrous metal piping materials in all systems.
- 1.5 Inserts, Hangers, Supports and Sleeves
- a provide inserts into concrete construction for proper support of work.
- provide all inserts, hangers, anchors, rollers, double lock nut, threaded rod, turnbuckles, saddles, insulation protectors, guides and all other miscellaneous specialties to properly support and retain piping, ductwork, conduits and equipment; to control expansion, contraction, anchorage, drainage and prevent sway and vibration. piping shall be so supported as not to place a strain on valves or equipment.
- trapeze support may be utilized for multiple pipe runs.

- d do not support work from another divisions or same work.
- e hanger spacing shall be per code or manufacturer's requirements, which ever is more stringent.
- f provide added structural steel angles, channels or plates where support is required between building structural steel spans. attach such by welding, bolting or anchors.
- where pipes pass through masonry or concrete walls, provide machine cut steel pipe sleeve 1 inch larger than outside diameter of pipe. where floors or walls are core drilled, steel sleeves are not required. where pipes are insulated provide a sleeve large enough for insulation to pass thru. pipe shall be
- h provide fire stopping where pipes pass thru fire rated structure so as to maintain fire rating of
- where pipes pass thru foundation below grade, provide waterproofing and sleeves.

1.6 Vibration Control

- a vibration or noise created in any part of the building by the operation of any equipment furnished and/or installed under this contract will be prohibited. take all precautions by isolating the various items of equipment from the building structure.
- b contractor shall guarantee the operation of all equipment installed to be free from objectionable noise. contractor shall alter, change connections to, or replace any and all apparatus that creates objectionable noise. adjustments and changes shall be made without any additional costs to the owner. the engineer shall be the sole judge as to what constitutes objectionable noise.

Part 2 Execution

2.1 General

- a refer to those portions of the electrical drawings and specifications which establish characteristics of electrical service and furnish equipment to operate on the service
- b where utilizing tracpipe flexible gas piping by omega flex, the contractor shall be responsible for the complete redesign of distribution system. including but not limited to pipe sizes, gas pressures, piping runs, and clearance coordination. provide pressure regulators where required and install system per manufacturer's recommendations. all equipment connection details shall be adhered to as shown on
- c provide shutoff valves at all branch connections to main, all equipment, in mains so as to compartmentalize the system and as indicated on drawings.
- install valves such that their operation is easily accessible. ball valves with handles in the open position shall be pointing in the direction of flow.
- e provide pipe caps or plugs as required to keep dirt, dust and debris from entering pipe and equipment.
- f arrange piping to maintain service and maintenance clearances of all equipment.
- g provide threaded hose end drain valves with cap at all low points and valves at high points to permit drainage or venting of liquid systems for maintenance.
- h thermostats shall not be mounted above any heat producing equipment located within a room or where affected by direct sunlight. (i.e. computer monitor, computer console, copier, fax machine, etc.)

SECTION 15250 - INSULATION

Part 1 Products

- a all insulation material (insulation, jackets, adhesives, cements, mastics, sealers coatings and finishes) shall have composite fire and smoke hazard ratings as tested under procedure astm e-84, nfpa 255 and ul 723, not exceeding a flame spread rating of 25 and smoke developed rating of 50.
- b provide insulation products as manufactured by owens-corning, armstrong or knauf. adhesives shall be benjamin foster or equal.

1.2 Piping

a the following pipe systems shall be insulated with owens-corning fiberglass 25: asj/ssl-11 heavy density pipe insulation. thickness of insulation shall be as noted.

| <u>service</u> | pipe size | insulation thickness |
|--|----------------|-------------------------|
| domestic cold water | all sizes | 1/2" |
| domestic hot water | 2" and smaller | 1" |
| heating hot water supply and return | all sizes | 1-1/2" |

insulate refrigerant suction lines, outdoor refrigerant liquid lines, heating water (buried below floor), and domestic water (buried below floor) with 1/2 inch thick ap armaflex. insulation installed outdoors shall have two coats of armaflex wb finish applied.

Part 2 Execution

2.1 General

- a install all products in accordance with manufacturer's written instruction, recommendations, and this specification. the workmanship shall be first class and all joints shall be made tight, smooth and even.
- b all insulation shall be installed over clean dry surfaces. insulation must be dry and in good condition. wet or damaged insulation will not be acceptable. no insulation shall be applied prior to installation of heat trace tape, painting, or pressure test completion of the respective piping systems.
- install all insulation continuous thru all wall, ceiling and countertop openings, sleeves, pipe hangers, etc. except through fire rated wall and floors. where insulation is exposed to moisture or damage it shall be adequately protected.

2.2 Piping

- a insulate valve bonnets, unions, strainers on domestic water and refrigerant piping.
- insulate all valves and fitting to match adjacent piping.

SECTION 15410 - PLUMBING FIXTURES

Part 1 Products

a for fixture specification refer to drawings. listed model number and manufacturer for each individual item shall be the basis of design and determine standard of quality whether each requirement is indicated or not.

Part 2 Execution

2.1 Installation

- a provide all stops, traps, escutcheons, connections, flush valves, carriers, etc., for all fixtures as necessary to complete the installation of each fixture, whether such items are listed or not.
- b contractor shall coordinate fixture rough-in dimensions with gc.
- c refer to architectural plans for all mounting heights.
- d all finished exposed faucets, traps, connecting piping, stops, flush valves and other fixture trim shall be chromium-plated brass unless otherwise specified and shall be supported rigidly to fixtures and to walls with matching brackets at not more than 24 inch centers. all fastening shall be chromium-plated brass or may be 302 stainless steel if of matching color and finish.
- e all public hand washing fixtures shall be equipped with a thermostatic mixing valve, watts guardian model Ifusg-b, asse 1070, 0.5-2.5 gpm..
- clean all fixtures removing stains, labels, packing material, etc..
- adjust faucet handles to be perpendicular to faucet neck.

SECTION 15430 - PLUMBING PIPING AND EQUIPMENT

Part 1 Products

1.1 Water Hammer Arrestor

a water shock absorbers to be furnished and installed on all domestic waterlines where required per ohio plumbing code or where indicated on drawings. locate and size absorbers at locations recommended by manufacturer. pdi approved and listed, asse 1010 approved. watts series 15 or approved equal.

1.2 Gas Pressure Regulator

a spring loaded, general purpose, self-operating service regulator which includes an internal relief type diaphragm assembly and vent valve. asa code b31.8 for temperatures from minus twenty degrees fahrenheit to 160 degrees fahrenheit. spring case vent with removable cover. internal relief out of spring case for exhaust of excessive outlet pressure. cast iron body, aluminum case, nitrile rubber o-rings disc and diaphragm, composition gaskets.

1.3 Additional Items

a listed model number and manufacturer for each individual item shall be the basis of design and determine standard of quality whether each requirement is indicated or not.

Part 2 Execution

2.1 General

- a the pipe runs shown are approximate and diagrammatic in nature. exact location to be determined by this contractor to suit field conditions. conceal all piping in walls, pipe chases, above ceilings, below grade, etc. unless indicated otherwise.
- b the plumbing contractor to verify the locations and elevations of all existing underground utilities at the tie in points in coordination with the general contractor. should the new system arrangement need to be reconfigured in order to tie into the existing conditions, the plumber shall do so at his expense in order to make a functional system.
- c the plumbing contractor shall take all precautions to protect water piping from freezing, including
- d all piping, fittings and equipment to be new.
- e for additional plumbing equipment refer to drawings.

providing proper insulation and/or heat trace system.

2.2 Domestic Water Supply

- a install water pipes and equipment as indicated on drawings with hot and cold water supplies to all fixtures and equipment. final connection to all plumbing equipment by pc. pitch all water piping to drainage points, provide hose end drain valves at such points.
- provide water hammer arrestor at all quick closing valve locations. (ie washing machine, dishwasher,
- c provide pressure reducing valves for all specialized equipment as required.
- d provide mechanical trap seal conforming to asse 1072 for all floor drain, trench drains, floor sinks, mop basins, showers, hub drains and slop sinks.
- e new or repaired potable water systems shall be purged of deleterious material and disinfected prior to use, per ohio plumbing code requirements.
- water supply sterilization shall be that as prescribed by the health authority or water purveyor having jurisdiction. in the absence of a prescribed method and a chlorinated municipal water supply the procedure shall be as described. flush out system first then hold solution of 50 ppm of chlorine in the system water for a period of 24 hours. drain system then flush again. after flushing again, chlorine residual shall not be in excess of 0.5 ppm at widely spaced check points. chlorination procedures shall conform to awwa c651 or awwa c652 specifications and be acceptable to the local health department. repeat chlorination, if necessary, until acceptable.
- connect to existing water main as indicated on plan. exact location to be determined in field.

2.3 Sanitary/Storm Drainage and Vent Piping

- a all drainage piping 2-1/2 inch or less shall be sloped at a minimum pitch of 1/4 inch per foot where piping 3 inch or larger shall be sloped at a minimum pitch of 1/8 inch per foot or per ohio plumbing code table 704.1. all horizontal vent piping shall be sloped back toward plumbing fixture being served.
- run all drainage and vent piping as direct as possible. actual location of drains, soil, waste, and storm piping shall meet the various building conditions. do any work necessary to conceal piping or clear piping and ductwork of other trades.
- c provide clean outs at base of stacks and downspouts, at changes in direction, as indicated on plan, and as required by code. provide clean outs every fifty feet of developed length of drainage piping. extend clean out to finished floor or grade.

2.4 Natural Gas Piping

- a provide anti-corrosion protection for underground piping as per utility companies requirements, where polyethylene piping is installed provide a number twelve gauge copper wire in bottom of trench to "trace" plastic pipe.
- b provide service and connect to all equipment requiring natural gas within project scope. install a full size dirt leg with a minimum length of four inches, shutoff valve and union prior to all equipment and reduction to equipment connection
- c provide pressure reducing valve and vent where required.
- d connect to existing gas service at meter, provide new meter if required by utility company, coordinate exact location in field. verify with utility company if main from street to building is adequate to support new load. provide new main

radiant floor space heating system

- a. furnish all labor, materials, tools, equipment, appliances and services necessary and required to deliver and install a complete operating radiant floor space heating system.
- b. provide design and analysis information from manufacturer of tubing system specifically for the design conditions of this project. provide design information with submittals for engineer's evaluation and approval.
- c. coordinate layout and installation of radiant heating piping and manifolds with building and structural components. coordinate size and location of access panels to allow access to manifolds concealed in ceilings, walls, or floors as indicated on the plans.
- provide tubing layout drawings from system supplier for installers use in installation and for as-builts. drawings shall clearly identify routing, length, and identity of each loop to be installed. zones shall be split out as indicated on the
- e. piping installed in the slab shall be engineer approved pex cross-linked piping with protective oxygen diffusion barrier. alternates shall be considered if equal or exceed base manufacturer in all aspects. tubing shall have cross-linked molecular structure using the engel method of cross-linking with a minimum diameter of $\frac{1}{2}$ " nominal for indoor radiant floor heating, or as scheduled on the contract documents. tubing shall have ratings of 200 of at 80 psig, 180 of at 100 psig, and 73.4 of at 160 psig operating temperature and operating pressures respectively, tubing shall be cross-linked polyethylene manufactured to astm f876 standard specifications. both astm and din approvals shall be clearly marked on all tubing.
- tubing shall be provided with a manufacturers twenty-five year (25) warranty. for first ten years (10), tubing manufacturer shall provide a consequential damage warranty that shall cover all cost for replacing tubing as needed. provide evidence of warranty within system submittals. products that provide replacement tubing only shall not be considered equal for owners protection.
- distribution manifolds shall be manufactured by tubing manufacturer and supplied as a complete system. distribution manifolds shall be stainless steel design with isolation shut off and flow balancing indicators for each loop. each manifold shall be equipped with supply and return thermometers and main isolation ball valves. fittings to connect pex tubing to manifold shall be brass compression, removable and adjustable, with triple ring protection.
- h. identification tags: manifold tags shall identify room served and loop number. if more than one loop serves a room, provide identification on manifolds to identify rooms served.
- controls and tubing system shall be supplied from one source for compatibility and design integration.
- install piping in floor from manifolds without any joints. no loop length is to exceed the design parameters on the plans or as approved by the engineer. tubing shall be marked every 3' for installation measurements. maximum length shall be determined by design documents or tubing diameter. one-half inch (1/2") tubing loops shall not exceed 175
- k. secure piping in concrete floors over 4" by attaching tubing to concrete steel re-bar or webbing reinforcement using lastic tie straps. no metal wiring shall be used. spacing shall be as shown on design plans or as approved by engineer within submittals. for floor sections of 4" or less, provide manufacturers plastic tracking strips for positive spacing and securing of tubing before pour.
- where tubing passes through an expansion joint within the concrete floor, install a sleeve of rubber foam-type insulation around tubing and extending for a minimum of 6 inches on each side of the slab penetration to prevent
- m. install manifolds in accessible locations. refer to plan view drawings. install manifolds with all parts accessible for maintenance and replacement in the future as may be necessary. n. before any part of the tubing is covered for any reason, entire manifold and tubing system shall be pressure-tested
- as required by the manufacture for warranty protection. in the absence of manufacturers instruction, pressurize the entire radiant system with compressed air. fit manifold connections with a suitable pressure gauge and charging connection. if manifold location is not permanent, properly support manifold on uni-strut frame in the intended and designated permanent location. charge system to a pressure of not less than 80 psig or more than 100 psig. pressure test shall last for 24 hours with not less than a 2 psig drop. with system air charged, soap test all joint on
- o. after hydrostatic test pressure has been applied, examine piping, joints and connections for leakage. eliminate leaks by tightening, repairing, or replacing components and repeat hydrostatic test until there are no leaks. prepare a written report of testing. any portion of tubing layout that rise as a result of being pressurized shall be re-secured to be at the proper level within the slab structure when poured.
- entire radiant system shall be left pressurized with monitoring pressure gauge throughout pour of floor materials. continually monitor pressure on system to make certain tubing system remains intact with no leaks or punctures.
- q. prior to final system fill and commissioning the pex tubing system and manifolds shall be chemically cleaned as prescribed by the tubing manufacturer. supply all tools, connections, labor, and accessories necessary to properly remove all foreign material, chemical, and residue within the tubing system before permanently charging system and placing into operation.
- r. after system has been properly cleaned and flushed, fill system with clean water and 30% glycol solution to proper cold fill pressure. purge each individual loop to eliminate air pockets in the system. after purging install automatic vent on the manifold return to maintain good flow and eliminate air.

balancing has been done, mark balancing valves to permanently indicate final balanced position.

t. perform the following adjustments before operating the system:

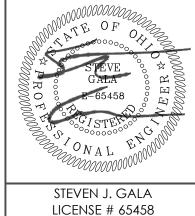
and within the manifolds.

set temperature controls so all zones call for full flow, driving automatic control valves to fully open position.

s. operate system with all balance valves in the full open position. balance system by return water temperature of each

loop across manifold to be certain of even flow. adjust individual loop balance valves as needed. after system

- operate system to ensure flow through all loops in all manifolds simultaneously. reset temperature controls to normal space temp (70-72f) to allow valves to close. check operation of automatic valves.
- u. provide the services of a factory authorized local representative to supervise initial startup of the radiant system at the jobsite. contractor shall submit a letter of compliance with all manufacturers installation recommendations from the manufacturers representative with final operating and instruction manuals.



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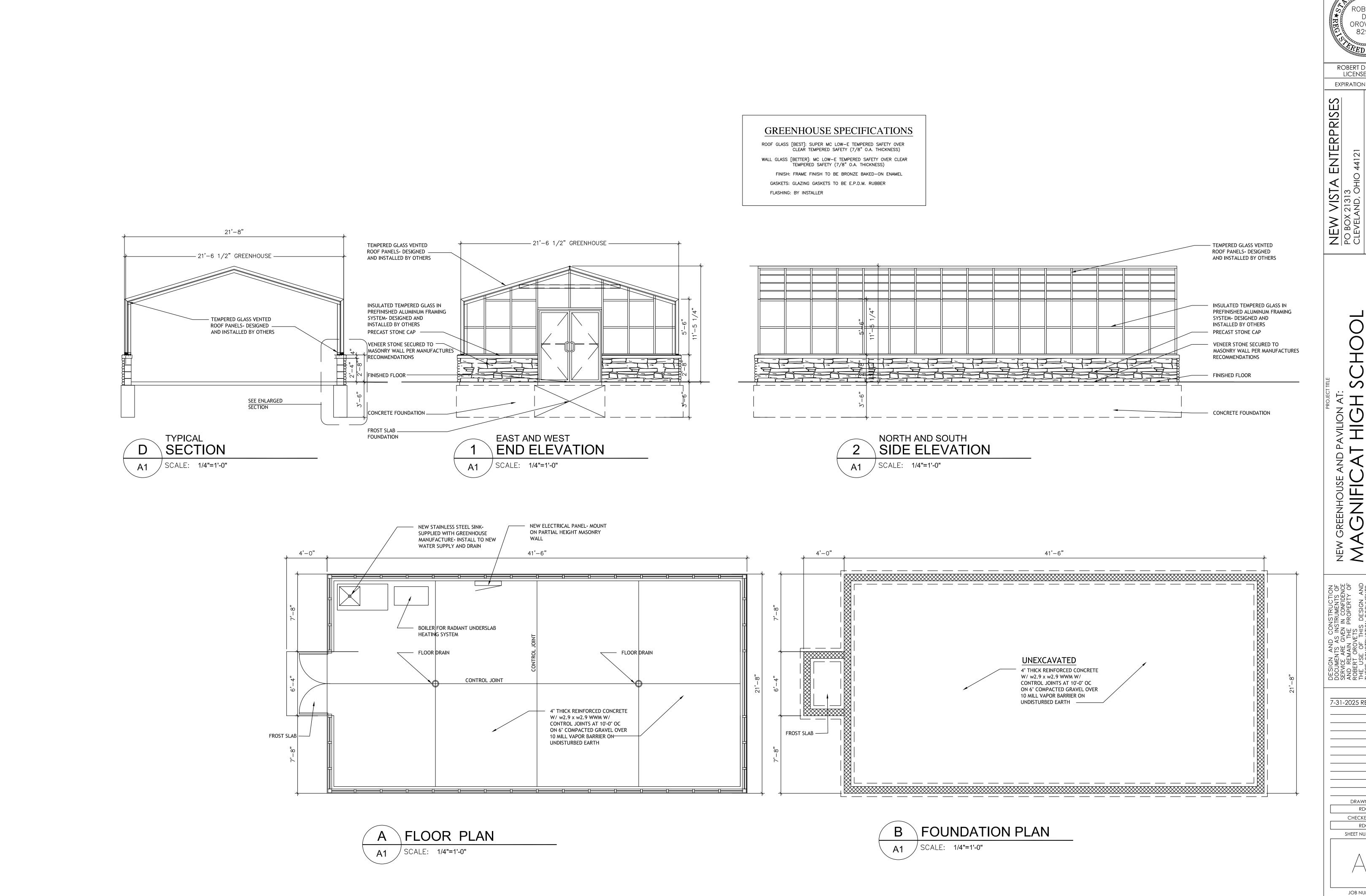
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OROVETS 8293

ROBERT D. OROVETS LICENSE # 8293

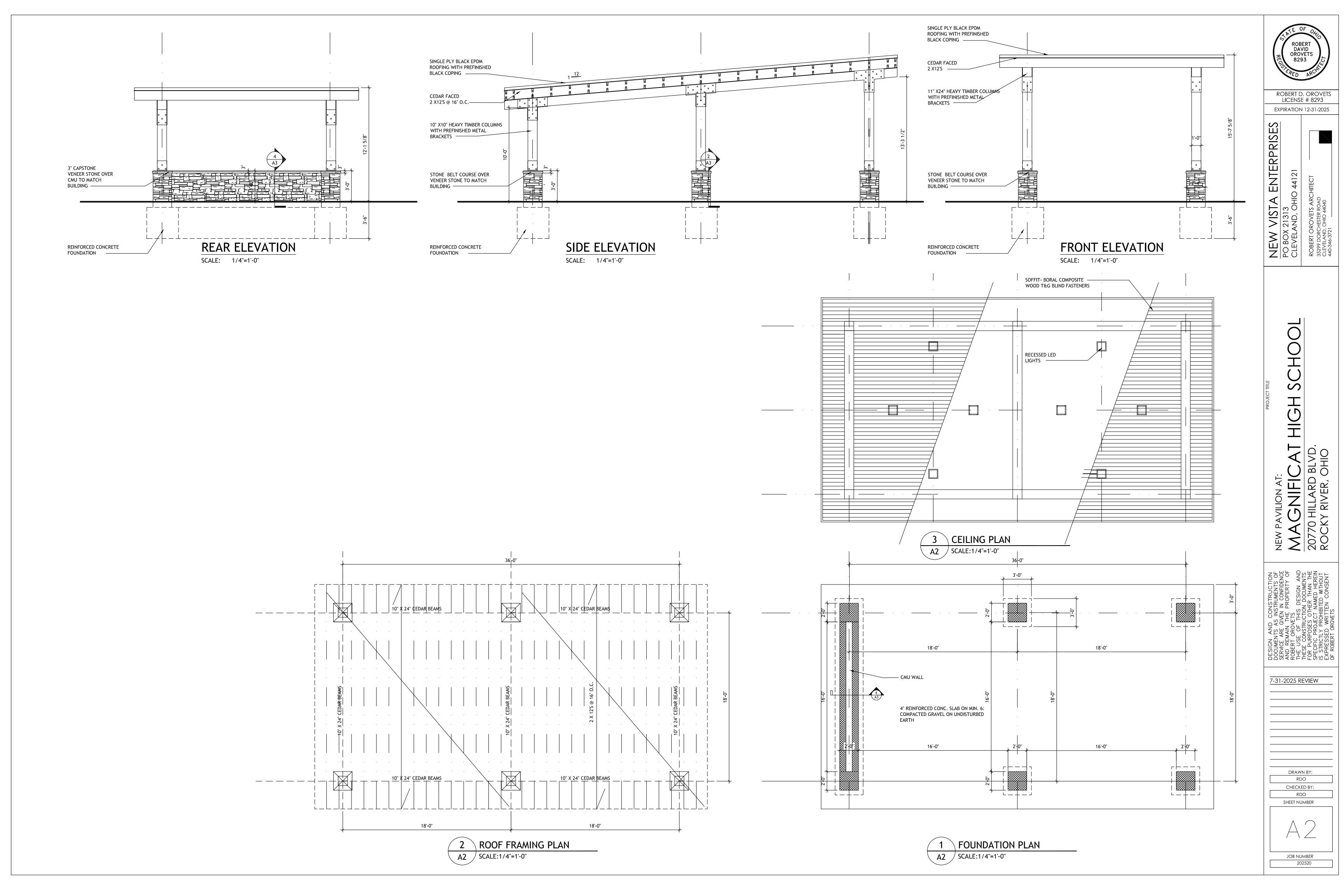
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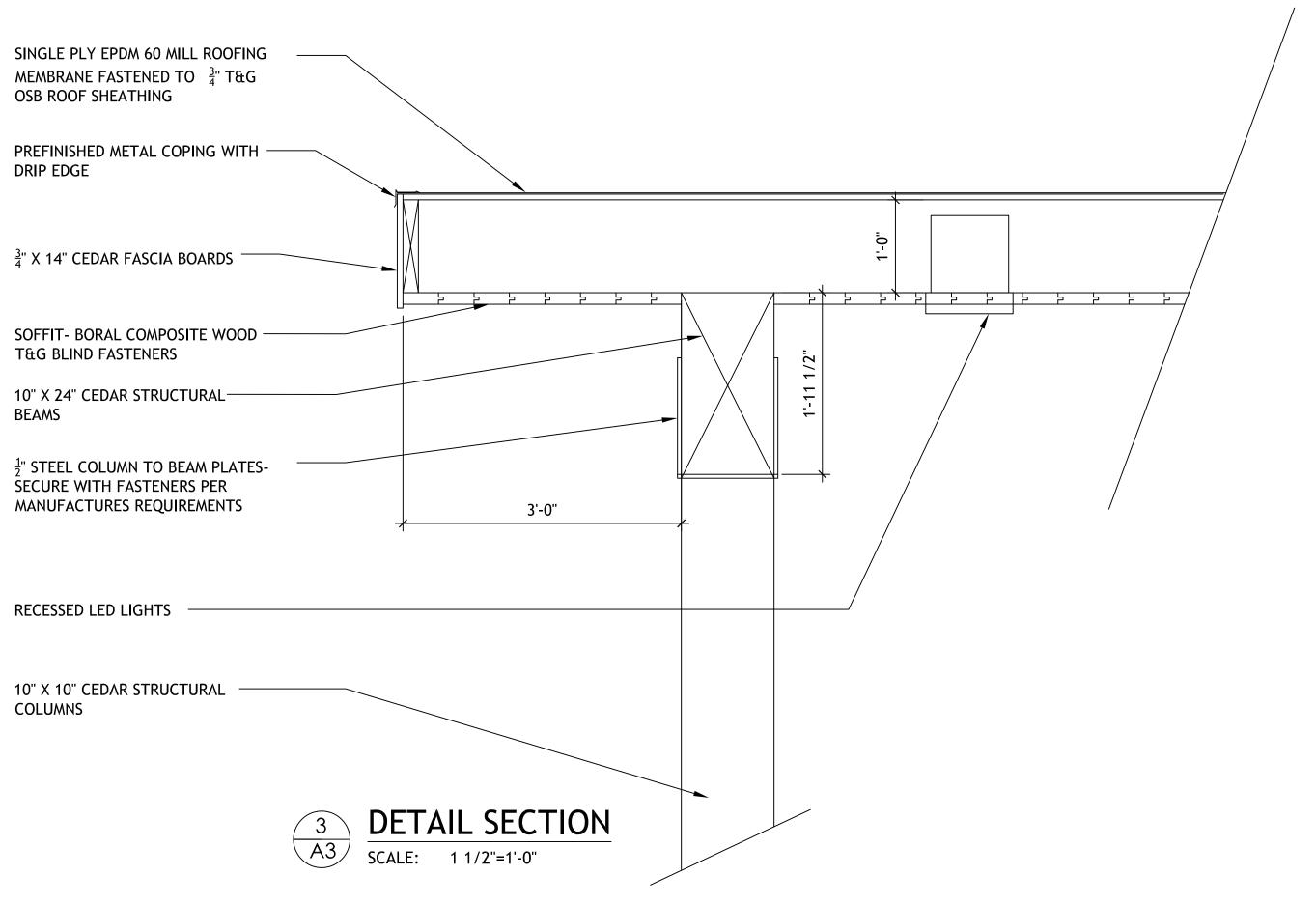
S NEW GREENHOUSE AN MAGNIFICA
20770 HILLARD BLV
ROCKY RIVER, OHI

7-31-2025 REVIEW

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SPECIFICATIONS

SITE GRADING

- 1. THE AREA TO BE GRADED AND AREA TO BE OCCUPIED BY NEW STRUCTURE INCLUDING WALKS AND DRIVES SHALL BE CLEARED OF TREES AND ALL PERISHABLE OR OBJECTIONABLE MATTER. STUMPS AND ROOTS SHALL BE REMOVED TO A DEPTH OF 18" BELOW SUBGRADE IN PAVED AREAS AND TO SUBGRADE IN TURF AREAS.
- 2. STOCKPILE ALL CLEAN TOPSOIL AT AREA DESIGNED ON DRAWINGS FOR FINAL GRADING. TOPSOIL (FINISH) TO BE MINIMUM DEPTH OF 4", FREE OF ALL CONSTRUCTION DEBRIS. 3. PROTECT ALL TREES NOT INDICATED TO BE REMOVED WITH SNOW FENCING
- AT THE PERIMETER OF THE TREE'S CANOPY. 4. CONTRACTOR IS TO REMOVE ALL EXCAVATED MATERIAL FROM SITE.
- LANDSCAPING AND EXTERIOR IRRIGATION SYSTEM (IF APPLICABLE).
- 5. COORDINATE WORK WITH LANDSCAPE CONTRACTOR AND HIS INSTALLATION OF

CONCRETE

- 1. CONCRETE CONSTRUCTION TO COMPLY WITH RECOMMENDED PRACTICE AND STANDARD SPECIFICATIONS FOR CONCRETE AND REINFORCED CONCRETE. PUBLISHED BY THE AMERICAN CONCRETE INSTITUTE, LATEST EDITION. READY MIXED CONCRETE TO CONFORM WITH ASTM C94-78.
- POROUS UNDERBED UNDER ALL CONCRETE SLABS ON SUBGRADE TO BE 4"MINIMUM DEPTH; SAND, WASHED GRAVEL, OR CRUSHED STONE (1" MAXIMUM
- 3. CONCRETE SHALL BE COMPOSED OF PORTLAND CEMENT, COARSE AGGREGATE, FINE AGGREGATE, AND POTABLE WATER. AN AIR ENTRAINING ADMIXTURE SHALL BE USED PER MANUFACTURER'S SPECIFICATIONS FOR EXTERIOR CONCRETE, 4% TO 6% CONTENT. MINIMUM CEMENT CONTENT IN CONCRETE TO BE: 5 SACK/CU. YD. PROTECTED
- 5 1/2 SACK/CU. YD. EXPOSED MAXIMUM WATER/6 GALLON PER SACK
- CLASSIFICATION OF CONCRETE: FOUNDATION 4000 PSI - 1 1/2" TO 3" CRUSHED STONE - 3" TO 5" SLUMP; SLAB ON HEIGHT EXCEEDING 8'-0". GRADE 4000 PSI 3/4" TO 1 1/2" CRUSHED STONE - 2" TO 4" SLUMP.
- ALL INTERIOR CONCRETE SLABS TO HAVE 6 MIL PLASTIC VAPOR BARRIER. 6. SEE DRAWINGS FOR REINFORCING BAR SIZE AND PLACEMENT AS REQUIRED. ALL WORK TO BE IN CONFORMANCE WITH AMERICAN CONCRETE INSTITUTE STANDARDS. PROVIDE 3" MINIMUM CONCRETE COVERAGE OVER REBARS.

FOUNDATION

- 1. DESIGN BEARING PRESSURE HAS BEEN ASSUMED TO BE 1,500 PSF ON NATURAL UNDISTURBED SOIL AND/OR ENGINEERED BACKFILL. GENERAL CONTRACTOR MUST RETAIN AN APPROVED SOILS TESTING LABORATORY TO VERIFY SOIL BEARING CAPACITY AND SETTLEMENT CHARACTERISTICS OF SOIL PRIOR TO THE PLACEMENT OF ANY CONCRETE. SUBMIT REPORTS TO ARCHITECT.
- 2. NOTIFY ARCHITECT OF ANY UNUSUAL SOIL CONDITIONS BEFORE PROCEEDING FOOTINGS STEPS MAY BE ONE (1) VERTICAL TO TWO (2) HORIZONTAL WITH
- MAXIMUM STEP OF TWO (2) FEET.
- 4. MATERIAL IN CONTACT WITH FOUNDATION WALLS MUST BE FREELY DRAINED
- 5. BOTTOM OF ALL FOOTINGS MUST BE A MINIMUM OF 3'-6" BELOW FINISHED EXTERIOR GRADE FOR PROTECTION FROM FROST.

- 1. STRUCTURAL FRAMING LUMBER (STUDS, JOISTS, RAFTERS, AND TRUSSES) TO BE KILN DRIED DOUGLAS FIR, 1500 PSI FIBER STRESS (NO YELLOW PINE OR
- 2. ALL EXTÉRIOR PLYWOOD WALL SHEATHING TO BE 1/2" CDX TYPE, OR WAFERBOARD. ROOF SHEATHING TO BE 3/4" CDX PLYWOOD, OR WAFERBOARD. FLOOR SHEATHING TO BE 3/4" T & G WAFERBOARD OR CDX PLYWOOD WITH 1/2" PLYWOOD UNDERLAYMENT, STAGGERED JOINTS, FOR FINISH (GLUED AND
- TJI & TJL JOIST SPECIFICATION
- FLANGE MEMBERS, WEB MEMBERS AND ADHESIVES SHALL CONFORM TO THE PROVISIONS OF NES REPORT NO. NER-200. THE TJI & TJL JOISTS, IF STORED PRIOR TO ERECTION, SHALL BE STORED IN A VERTICAL POSITION AND PROTECTED FROM THE WEATHER. THEY SHALL BE HANDLED WITH CARE SO THAT THEY ARE NOT DAMAGED. THE TJI & TJL JOISTS ARE TO BE ERECTED AND INSTALLED IN ACCORDANCE WITH THE PLANS. TEMPORARY CONSTRUCTION LOADS WHICH CAUSE STRESSES BEYOND DESIGN LIMITS ARE NOT PERMITTED. ERECTION BRACING IS TO BE PROVIDED TO KEEP TJI & TJL JOISTS STRAIGHT AND PLUMB AS REQUIRED AND TO ASSURE ADEQUATE LATERAL SUPPORT FOR THE INDIVIDUAL TJI & TJL JOISTS AND THE ENTIRE SYSTEM, UNTIL THE SHEATHING MATERIAL HAS BEEN APLIED.

ROUGH CARPENTRY

- 1. WOOD FRAMING TO BE SIZED AS SHOWN ON DRAWINGS. ALL MEMBERS TO BE
- 2. ALL PARTITIONS AND WALLS TO HAVE SOLE PLATES AND CAPS. CORNERS AND ANGLES TO BE FORMED, BLOCKED AND SET SQUARE AND PLUMB. STUDS TO BE DOUBLED AT ALL OPENINGS. HEADS OF OPENINGS OVER 4'-0" WIDE TO BE
- EXCEEDING 8'-0" WITH (ONE) 1/2" X 3" CROSS BRIDGING, DOUBLE NAILED AT EACH JOIST. ONE ROW OF HORIZONTAL BRIDGING TO BE PROVIDED FOR STUD
- PIPE AND DUCT PASSAGES. WHERE PIPES INTERSECT DOUBLE JOIST, BLOCK APART SUFFICIENTLY, BUT NOT OVER 6" TO PERMIT CLEARANCE. BLOCKS TO BE SPACED 10" APART.
- AND ANCHORED WITH 5/8" BOLTS AT 4'-0" O.C. SET ON COMPRESSIBLE

FINISH CARPENTRY

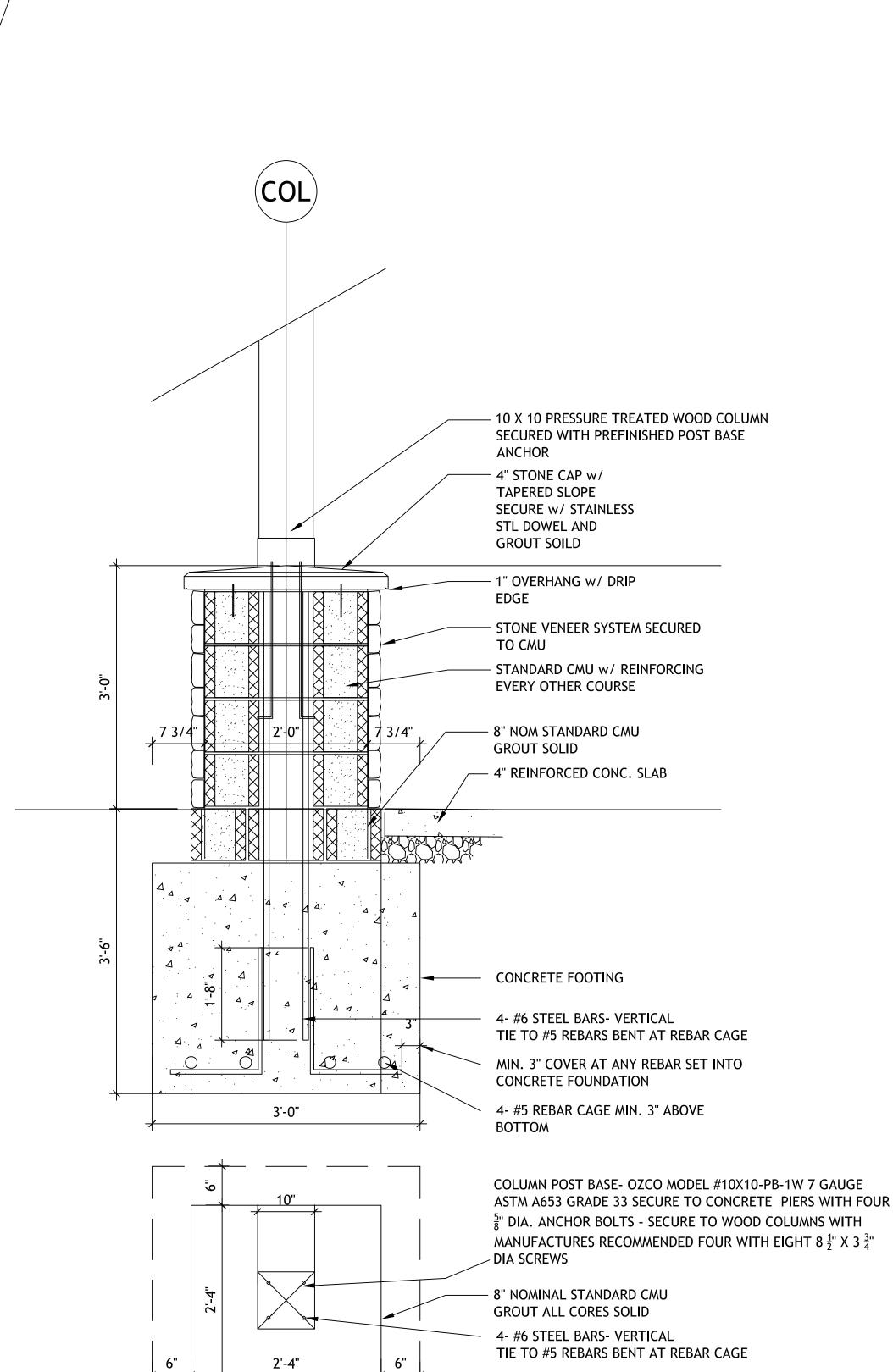
- ALL BATHROOM ACCESSORIES (TOWEL BARS, PAPER HOLDERS, ETC.) TO BE
- 5. CLOSET SHELVES & HANGRAIL
- 7. COORDINATE WORK WITH OTHER TRADES AND ARCHITECT.

<u>LUMBER</u>

- SPRUCE), #2 CONSTRUCTION GRADE. SIZED AND FRAMED TO DRAWING.
- SCREWED INSTALLATION). VERIFY UNDERLAYMENT REQUIRED FOR FLOOR MATERIAL. ROOF FRAMING TO BE AS SHOWN ON DRAWINGS.

- IN SINGLE LENGTHS BETWEEN SUPPORTS. ALL MEMBERS TO BE BOLTED OR SPIKED AND ERECTED IN SUBSTANTIAL MANNER.
- TRUSSED. ALL STUDDING TO BE AT 16" O.C. 3. FLOOR AND CEILING JOISTS TO BE RIGIDLY BRIDGED AT INTERVALS NOT
- JOISTS TO BE DOUBLED OR TRIPLED UNDER PARTITIONS WHICH PARALLEL THEM. DOUBLE HEADERS AND TRIMMERS TO BE PROVIDED FOR OPENINGS.
- 5. SILLS AND PLATES RESTING ON MASONRY TO BE PRESSURE TREATED
- MATERIAL (CELOTEX OR FLEXCELL). 6. TERMITE SHIELDS TO BE PLACED UNDER ALL WOOD PLATES ON MASONRY

- 1. TRIM TO BE SELECT #1 KILN-DRIED MATERIAL, POPLAR OR BIRCH, PROFILE TO BE PER DETAILS.
- ALL BUILT-IN CABINETRY AND TOPS PROVIDED BY OWNER & INSTALLED BY G.C..
- PROVIDED BY OWNER & INSTALLED BY GENERAL CONTRACTOR.
- 4. ALL CORNERS TO BE MITERED OR CODED AND GLUED TIGHT. ALL NAILS TO BE SET ALL WORK TO BE TRUE AND STRAIGHT. INSTALL IN ACCORDANCE WITH INDUSTRY STANDARDS OF WORKMANSHIP. NO SPLIT, CHECKED, AND KNOTHOLE MATERIALS IS TO BE USED.
- 8. INSTALL OWNER SUPPLIED LIGHT FIXTRES.
- 9. GUARANTEE ALL WORK AND MATERIAL FOR A PERIOD OF ONE YEAR FROM FINAL COMPLETION.

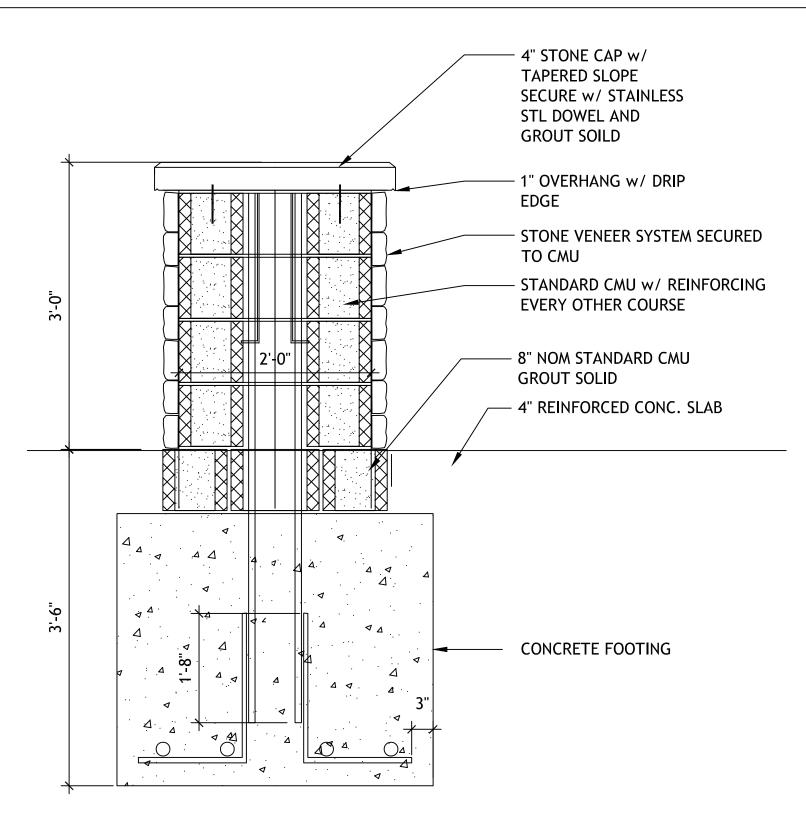


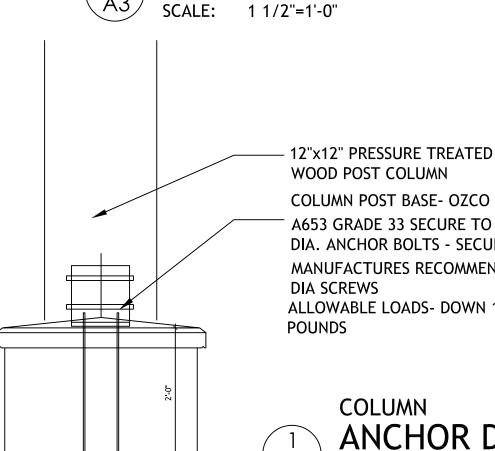
CONCRETE FOOTING

BELOW

DETAIL SECTION

1 1/2"=1'-0"





DETAIL SECTION

COLUMN POST BASE- OZCO MODEL #8X8-PB-1W 7 GAUGE ASTM A653 GRADE 33 SECURE TO CONCRETE PIERS WITH FOUR 58 DIA. ANCHOR BOLTS - SECURE TO WOOD COLUMNS WITH MANUFACTURES RECOMMENDED FOUR WITH EIGHT 8 $\frac{1}{2}$ " X 3 $\frac{3}{4}$ " DIA SCREWS

ALLOWABLE LOADS- DOWN 18,560 POUNDS, UPLIFT 2,598 POUNDS



DESIGN CRITERIA

PAVILION COMPLIES WITH 2024 OBC WITH AMENDMENTS USE GROUP = U (UTILITY) OPEN ALL SIDES CONSTRUCTION TYPE 5B AREA= 760 SF

LUMBER ALLOWABLE STRESSES

Fb=1000 PSI E=1,700,000Fv=95 PSI

FLOOR LOADS

ROOF LOADS

40 PSF LIVE LOAD 15 PSF DEAD LOAD

15 PSF DEAD LOAD

WIND LOADS-115 MPH- WIND PRESSURE FOR EXPOSURE B PER IMPORTANCE FACTOR FOE CATEGORY II= 1.0

SOIL BEARING PRESSURE

1,500 PSF

ROOF SNOW LOAD 30 PSF SNOW EXPOSURE FACTOR FOR TERRAIN CATEGORY B PER TABLE 7-2=1.0

SEISMIC DESIGN S5=15, S1= 6, SITE CLASS= D, DESIGN USING SIMPLIFIED LATERAL FORCE ANALYSIS PROCEDURES, F=1.0, Fa= 1.4, Sds= 1.0, R= 7 ROBERT DAVID OROVETS 8293

ROBERT D. OROVETS LICENSE # 8293 EXPIRATION 12-31-2025

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7-31-2025 REVIEW

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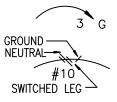
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GENERAL NOTES AND SPECIFICATIONS:

- 1. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT SERVICES AND RELATED ACCESSORIES FOR A COMPLETE INSTALLATION OF ALL ELECTRICAL WORK, AS INDICATED ON THESE DRAWINGS. ALL WORK IS SUBJECT TO THE APPROVAL OF THE OWNER OR HIS REPRESENTATIVE.
- 2. THIS INSTALLATION SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) 2017, AND ALL APPLICABLE FEDERAL, STATE & LOCAL CODES.
- 3. ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE SUITABLE FOR INSTALLATION IN ACCORDANCE WITH THE PROVISIONS OF NEC ARTICLE 110.3(A)(1). 4. ALL ELECTRICAL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW UNLESS SPECIFICALLY NOTED OTHERWISE AND SHALL COMPLY WITH ALL REQUIREMENTS OF THE UNDERWRITERS LABORATORY (UL), AND SHALL BEAR THE UL LABEL.
- 5. ALL EQUIPMENT FURNISHED AND WORK PERFORMED SHALL BE GUARANTEED AGAINST DEFECTS IN WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER OR HIS REPRESENTATIVE.
- 6. ALL PERMITS REQUIRED TO PERFORM THIS WORK SHALL BE OBTAINED AND PAID FOR BY THIS CONTRACTOR. SCHEDULE ALL INSPECTIONS WITH THE LOCAL AUTHORITY. NOTIFY THE OWNER OR HIS REPRESENTATIVE OF ALL SCHEDULED INSPECTIONS AT LEAST 48 HOURS IN ADVANCE.
- 7. GROUND ALL ELECTRICAL EQUIPMENT INCLUDING LIGHTING FIXTURES, RECEPTACLES, PANELS, ETC., IN ACCORDANCE WITH ALL PROVISIONS OF ARTICLE 250 OF THE NEC. PROVIDE A GROUND WIRE IN ALL CONDUITS.
- 8. FURNISH A TYPED DIRECTORY FOR ALL ELECTRICAL PANELS PER NEC 408.4(A) AT THE COMPLETION OF THIS PROJECT. PROVIDE NAMEPLATE, WHERE REQUIRED, FOR PANELS INDICATING WHERE THE POWER ORIGINATES PER NEC ARTICLE 408.4(B).
- 9. ALL WIRE FURNISHED SHALL BE 1/C COPPER, 90° C, TYPE THHN, THWN OR XHHW, #12 AWG MINIMUM, UNLESS OTHERWISE NOTED.
- 10. ALL EXPOSED CONDUIT SHALL BE EMT, 1/2" MINIMUM SIZE. (RGS WHERE NOTED ON PLANS) CONDUIT RUN CONCEALED IN WALLS OR ABOVE DROP CEILINGS SHALL BE EMT, FLEXIBLE METAL CONDUIT OR MC CABLE WHERE PERMITTED BY NEC. PROVIDE ALL REQUIRED CONDUIT SUPPORTS.
- 11. ALL RECEPTACLES AND LIGHT SWITCHES AND COVER PLATE COLORS AND FINISHES SHALL BE APPROVED BY THE OWNER OR ARCHITECT.
- 12. ALL EXIT SIGNS AND EMERGENCY LIGHTS SHALL BE WIRED DIRECT FROM A BREAKER, AHEAD OF ALL SWITCHES.
- 13. PROVIDE FIRESTOP MATERIAL AT ALL PENETRATIONS THROUGH FLOORS OR FIRE WALLS PER NEC 300.21.
- 14. ALL DISCONNECTING MEANS SHALL BE LEGIBLY MARKED IN ACCORDANCE WITH N.E.C. ARTICLE 110.22(A).
- 15. RACEWAY PASSING FROM INTERIOR TO EXTERIOR OF THE SHALL BE FILLED WITH APPROPRIATE MATERIAL TO PREVENT THE CIRCULATION OF WARM AIR TO A COLDER SECTION OF THE RACEWAY (NEC 300.7 (A)).
- 16. ALL BRANCH CIRCUIT WIRING SHALL BE COLOR CODED AND IN COMPLIANCE WITH N.E.C. ARTICLE 210.5.

ELECTRICAL SYMBOL LEGEND



HOMERUN TO PANEL G WITH 2-#12&1-#12 GND.,3/4" CONDUIT MINIMUM U.O.N. #3 = CIRCUIT BREAKER NUMBER IN PANEL G

WIRE IN CONDUIT, HASH MARKS INDICATE QUANTITY OF WIRES, NUMBER INDICATED WIRE SIZE IF OTHER THAN #12 AWG, ALL UNMARKED CONDUITS SHALL CONTAIN 2-#12&1-#12 GROUND WIRE

SWITCH SINGLE POLE 20 AMP, 120 VOLT, MOUNTED 4'-0" A.F.F. HUBBELL CAT. 1201-I OR EQUAL

277 VOLT, 1P, HORSEPOWER RATED SWITCH WITH SINGLE OVERLOAD. SIZE OVERLOAD TO MATCH MOTOR

20 AMP DUPLEX RECEPTACLE MTG. @ 18" A.F.F., UON VERIFY WITH ARCH. PRIOR TO ROUGH-IN HUBBELL CAT. #5363 OR EQUAL

DUPLEX GROUND FAULT RECEPTACLE 20 AMP, 120 VOLT, 2-POLE, 3-WIRE, MOUNTED 42" A.F.F. TO BOTTOM INDOOR AND 24" ABOVE GRADE OUTDOOR U.O.N. HUBBELL CAT. #20WLA OR EQUAL. "WP" INDICATES WEATHERPROOF COVER

15 AMP TWIST-LOCK TYPE DUPLEX RECEPTACLE CEILING MOUNTED FOR CORD & PLUG CONNECTED LIGHTING

JUNCTION BOX-MOUNTING HEIGHT AND SIZE AS REQUIRED

EXHAUST FAN-50 WATTS-120 VOLT -U.O.N.

CIRCUIT BREAKER PANEL-REFER TO PLAN FOR DESCRIPTION

45 KVA FLOOR MOUNTED STEP DOWN TRANSFORMER

FUSED DISCONNECT SWITCH

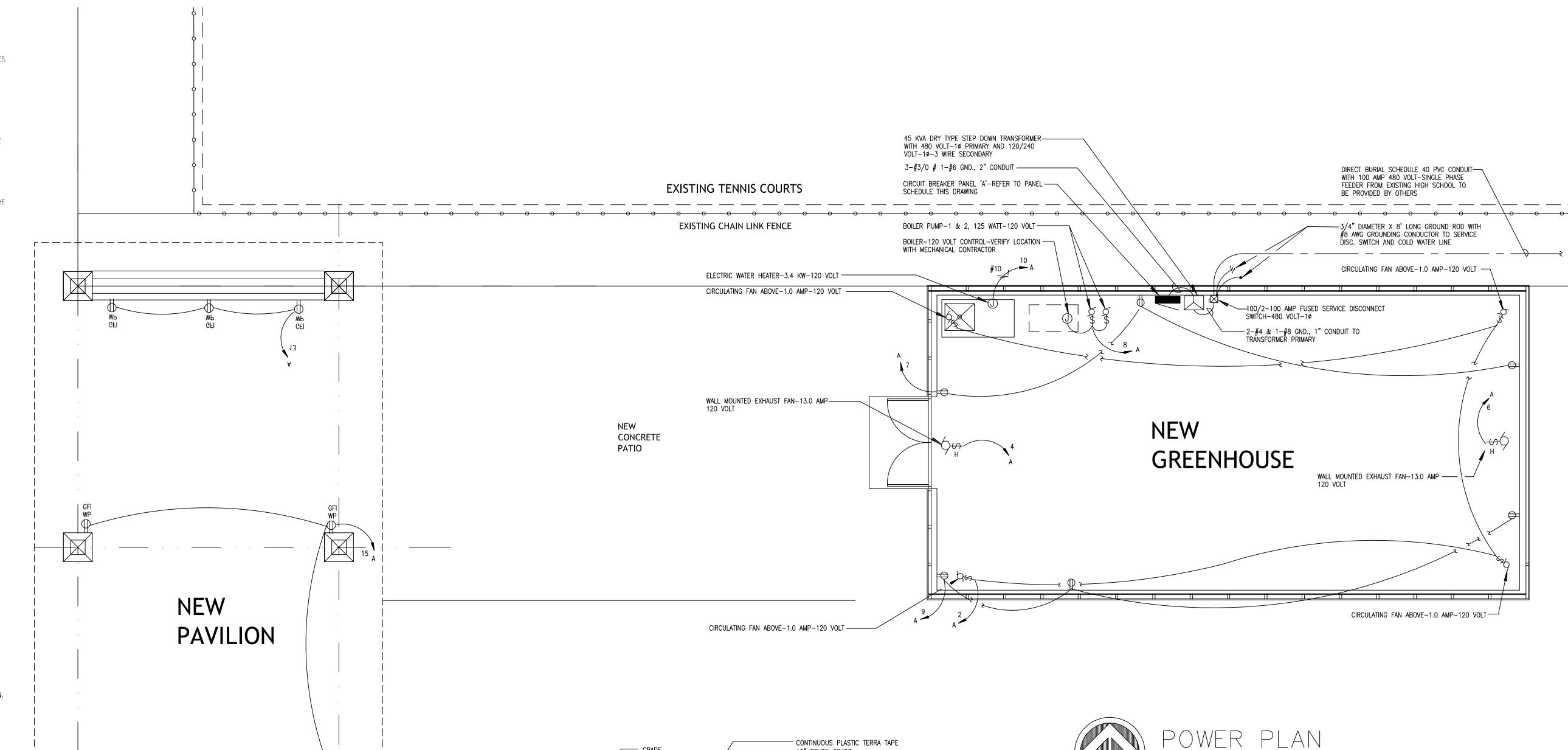
 $\square = \square = \square$ Led light fixture with cord and trist-lock plug provided by others LED RECESSED SQUARE WITH 3000K LAMPS, 2000 LUMENS, 14 WATT INPUT, 120 VOLT DRIVER, SYMETRICAL LIGHT DISTRIBUTION AND U.L. LISTED FOR

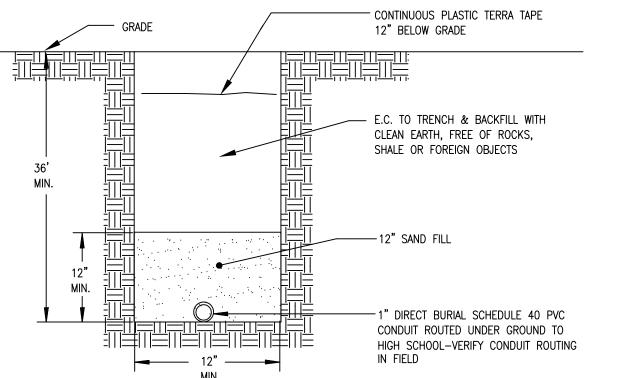
WET LOCATION LITHONIA #RCNYLED-AL01-30K-80CRI-SYMC-MVOLT-B25-DWHXD OR EQUAL

ABOVE FINISHED FLOOR

UNLESS OTHERWISE NOTED

ELECTRICAL CONTRACTOR

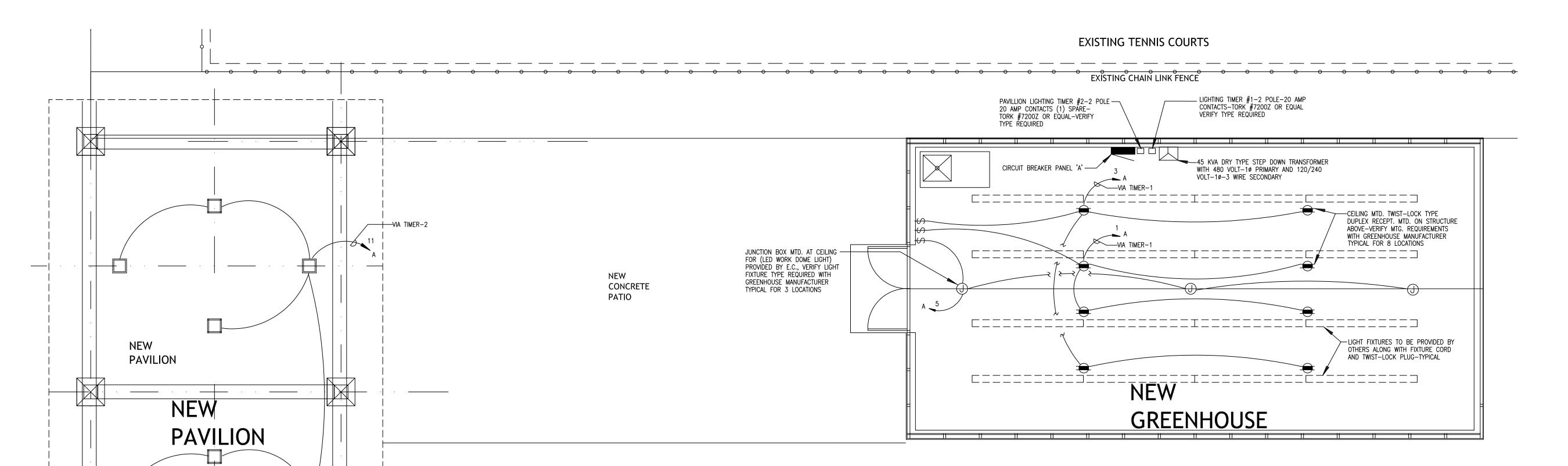




UNDERGROUND CONDUIT DETAIL

GENERAL NOTE UNDERGROUNG 480 VOLT-SINGLE PHASE CONDUIT, WIRING AND TRENCHING AND BACKFILL TO BE PROVIDED BY OTHERS, FIELD VERIFY CONDUIT ROUTING AND CONNECTION INSIDE OF HIGH SCHOOL

PANEL LEGEND G – GROUND FAULT TYPE CIRCUIT BREAKER







ROBERT D. OROVETS LICENSE # 8293 EXPIRATION 12-31-2025

RIS

RP

CAT HIGH SCHOOL BLVD.

DHIO NEW PAVILION AT:

MAGNIFIC

20770 HILLARD BLY

ROCKY RIVER, OH

08-28-2025 PERMIT

DRAWN BY: RDO CHECKED BY: SHEET NUMBER

MEMBERS EXCEPT CONCRETE ULTIMATE

CONCRETE MEMBERS

STRENGTH DESIGN (USD) FOR REINFORCED

GENERAL

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES. IN CASE OF CONFLICT, MORE COSTLY REQUIREMENTS GOVERN FOR BIDDING, SUBMIT CLARIFICATION REQUEST PRIOR TO PROCEEDING WITH

2. ALL DRAWINGS ARE CONSIDERED TO BE A PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO START OF CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE.

NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK. UNLESS NOTED OTHERWISE, DETAILS IN STRUCTURAL DRAWINGS ARE TYPICAL AS INDICATED BY CUTS, REFERENCES, OR

4. ALL WORK SHALL CONFORM TO THE MINIMUM STANDARDS OF THE FOLLOWING CODES: OHIO BLDG CODE AND LATEST REVISIONS REFERRED TO HERE AS "THE CODE", AND ANY OTHER REGULATING AGENCIES WHICH HAVE AUTHORITY OVER ANY PORTION OF THE WORK.

5. SEE ARCHITECTURAL DRAWINGS FOR THE FOLLOWING: SIZE AND LOCATION OF ALL DOOR AND WINDOW OPENINGS, EXCEPT AS NOTED. SIZE AND LOCATION OF ALL INTERIOR AND EXTERIOR NON-BEARING PARTITIONS. SIZE AND LOCATION OF ALL CONCRETE CURBS, EQUIPMENT PADS, PITS, FLOOR DRAINS, SLOPES, DEPRESSED AREAS, CHANGE IN LEVEL, CHAMFERS, GROOVES, INSERTS, ETC. SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS EXCEPT AS SHOWN. FLOOR AND ROOF FINISHES. DIMENSIONS NOT SHOWN ON STRUCTURAL DRAWINGS.

SEE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR THE FOLLOWING: PIPE RUNS, SLEEVES, HANGERS, TRENCHES, WALL AND SLAB OPENINGS, ETC., EXCEPT AS SHOWN OR NOTED. ELECTRICAL CONDUIT RUNS, BOXES, OUTLETS IN WALLS AND SLABS. CONCRETE INSERTS FOR ELECTRICAL, MECHANICAL, OR PLUMBING FIXTURES. SIZE AND LOCATION OF MACHINE OR EQUIPMENT BASES, ANCHOR BOLTS FOR MOTOR MOUNTS.

THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE BUT NOT BE LIMITED TO BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

ASTM SPECIFICATIONS ON THE DRAWINGS SHALL BE OF THE LATEST REVISION. CONTRACTOR SHALL INVESTIGATE SITE DURING CLEARING AND EARTHWORK OPERATIONS FOR FILLED EXCAVATIONS OR BURIED STRUCTURES, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC. IF ANY SUCH STRUCTURES ARE FOUND, ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

10. CONSTRUCTION MATERIAL SHALL BE SPREAD OUT IF PLACED ON FRAMED ROOF. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT. PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.

CONCRETE

1. ALL CONCRETE CONSTRUCTION SHALL CONFORM WITH CHAPTER 19 OF THE CODE AND WITH THE PROVISIONS OF ACI 318, LATEST EDITION. REINFORCED CONCRETE IS DESIGNED BY THE "ULTIMATE STRENGTH

DESIGN METHOD". CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND APPROVED BY THE STRUCTURAL ENGINEER. MIX DESIGN METHODS (TEST HISTORY OR TRIAL BATCH METHOD) PER ACI SECTION 5.3 SHALL BE USED TO PROPORTION CONCRETE. SUBMIT MIX DESIGN METHOD DATA. IF 3-POINT CURVES ARE USED, GC TO CLEARLY IDENTIFY WHICH POINT ON CURVE IS USED AND MIX DESIGN ON 3-POINT

4. SCHEDULE OF STRUCTURAL CONCRETE 28-DAY STRENGTH AND TYPES (SLUMP LISTED IS MAX):

LOCATION IN STRUCTURE STRENGTH W/C RATIO SLUMP DENSITY FOUNDATIONS 3000 PSI 0.55 4" 145 PCF • SLABS ON GRADE 4000 PSI 0.45 4" 145 PCF

CONTRACTOR AT HIS OPTION MAY INCREASE SLUMP WITH USE OF HRWR ADMIXTURE. LIMIT SLUMP INCREASE TO 2" GREATER THAN THAT ALLOWED WITHOUT HRWRA.

PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE I OR II. AGGREGATE FOR CONCRETE SHALL CONFORM TO ALL REQUIREMENTS

AND TESTS OF ASTM C-33 AND PROJECT SPECIFICATIONS. CONCRETE MIXING OPERATION, ETC. SHALL CONFORM TO ASTM C-94.

8. PLACEMENT OF CONCRETE SHALL CONFORM TO ACI CODE CHAPTER 5 AND PROJECT SPECIFICATIONS.

9. CLEAN AND ROUGHEN TO 1/4" AMPLITUDE ALL CONCRETE SURFACES AGAINST WHICH NEW CONCRETE IS TO BE PLACED.

10. ALL REINFORCING BARS, ANCHOR BOLTS, AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING CONCRETE. 11. CUT JOINTS FOR SLABS ON GRADE A MAXIMUM OF 12'-0" O.C., UNLESS

NOTED OTHERWISE ON THE CONTRACT DOCUMENTS. CUT JOINTS WITHIN 8 (EIGHT) HOURS AFTER PLACING CONCRETE. 12. CONCRETE EXPOSED TO THE WEATHER, FREEZE-THAW, DEICING

CHEMICALS, AND OR PARKED VEHICLES SHALL CONTAIN 6% (+/-1%) ENTRAINED AIR EITHER BY USING TYPE "A" PORTLAND CEMENTS OR ADMIXTURES CONFORMING TO ASTM C-260. 13. CURE CONCRETE BY WET CURING OR LIQUID SPRAY CONFORMING TO

ASTM C-309. CONTRACTOR TO VERIFY CURING AGENT IS COMPATIBLE WITH ANY FLOOR ADHESIVES SPECIFIED WITHIN THE CONTRACT DOCUMENTS. 14. ALL ADMIXTURES SHALL BE COMPATIBLE WITH ONE ANOTHER. PREFERABLY ONE MANUFACTURER SHALL BE USED FOR ALL ADMIXTURES.

15. MOISTURE VAPOR REDUCING ADMIXTURE: ADD "BARRIER 1" OR ISELOGIK "MVRA 900" IN ACCORDANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS TO ALL INTERIOR CONCRETE SLABS THAT RECEIVE VOC COMPLIANT FINISHES. 16. CALCIUM CHLORIDE OR CHLORIDE CONTAINING ADMIXTURES WILL NOT BE

PERMITTED UNDER ANY CIRCUMSTANCES. 17. FLYASH CONTENT, IF APPROVED IN ADVANCE BY ENGINEER, SHALL BE LIMITED TO 20% OF TOTAL CEMENTITIOUS MATERIAL OR 25% OF PORTLAND CEMENT CONTENT. IF FLYASH IS USED, CONTRACTOR SHALL TAKE

ADDITIONAL CONCRETE TEST CYLINDERS FOR 56 DAY BREAKS.

18. DURING HOT WEATHER PLACE CONCRETE IN ACCORDANCE WITH ACI 305. DURING COLD WEATHER PLACE CONCRETE IN ACCORDANCE WITH ACI 306.

CODE DATA

OHIO BUILDING CODE 2024 W/ UPDATES OHIO PLUMBING CODE 2024 W/ UPDATES OHIO MECHANICAL CODE 2024 W/ UPDATES NATIONAL ELECTRIC CODE (NEC) CURRENT EDITION ADAAG ADA ACCESSIBLITY GUIDELINES

NEW UTILITY BUILDING-GREENHOUSE 892 SF NEW UTILITY BUILDING- OPEN PAVILION 760 SF

CHAPTER 3 USE AND OCCUPANCY CLASSIFICATION

NEW GREENHOUSE SECTION 304 USE GROUP U -UTILITY

CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS 508.3.2 NONSEPARATED OCCUPANCIES

CHAPTER 6 TYPES OF CONSTRUCTION SECTION 602 CONSTRUCTION CLASSIFICATION 602.3 TYPE 3B BUILDING

CHAPTER 7 FIRE-RESISTANCE-RATED CONSTRUCTION SECTION 706 FIRE BARRIERS

> SECTION 708 FIRE PARTITIONS 708.3 FIRE-RESISTANCE RATING. FIRE PARTITIONS SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 1 HOUR.

CHAPTER 8 INTERIOR FINISHES WALL AND CEILING FINISHES

> CLASS A: FLAME SPREAD 0-25; SMOKE-DEVELOPED 0-450 CLASS B: FLAME SPREAD 26-75; SMOKE-DEVELOPED 0-450 CLASS C: FLAME SPREAD 76-200; SMOKE-DEVELOPED 0-450 INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY

COMPLY WITH ADAAG ADA ACCESSIBLITY GUIDELINES.

CHAPTER 10 MEANS OF EGRESS SECTION 1004 OCCUPANT LOAD.

OCCUPANT LOAD AT ACCESSORY USE-(TABLES AND CHAIRS) 892 / 300= 3 OCCUPANTS

TOTAL OCCUPANTS = 3 OCCUPANTS

SECTION 1005 EGRESS WIDTH TABLE 1005.1 EGRESS WIDTH PER OCCUPANT SERVED

3 X 0.20 = .6 INCHES REQUIRED 72 INCHES PROVIDED

SECTION 1011 EXIT SIGNS 1011.1 WHERE REQUIRED. EXITS AND EXIT ACCESS DOORS SHALL BE MARKED BY AN APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. ACCESS TO EXITS SHALL BE MARKED BY READILY VISIBLE EXIT SIGNS IN CASES WHERE THE EXIT OR THE PATH OF EGRESS TRAVEL IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS. EXIT SIGN PLACEMENT SHALL BE SUCH THAT NO POINT IN A CORRIDOR IS MORE THAN 100 FEET OR THE LISTED VIEWING DISTANCE FOR

THE SIGN, WHICHEVER IS LESS, FROM THE NEAREST VISIBLE

SECTION 1016 EXIT ACCESS TRAVEL DISTANCE. TABLE 1016.1 EXIT ACCESS TRAVEL DISTANCE

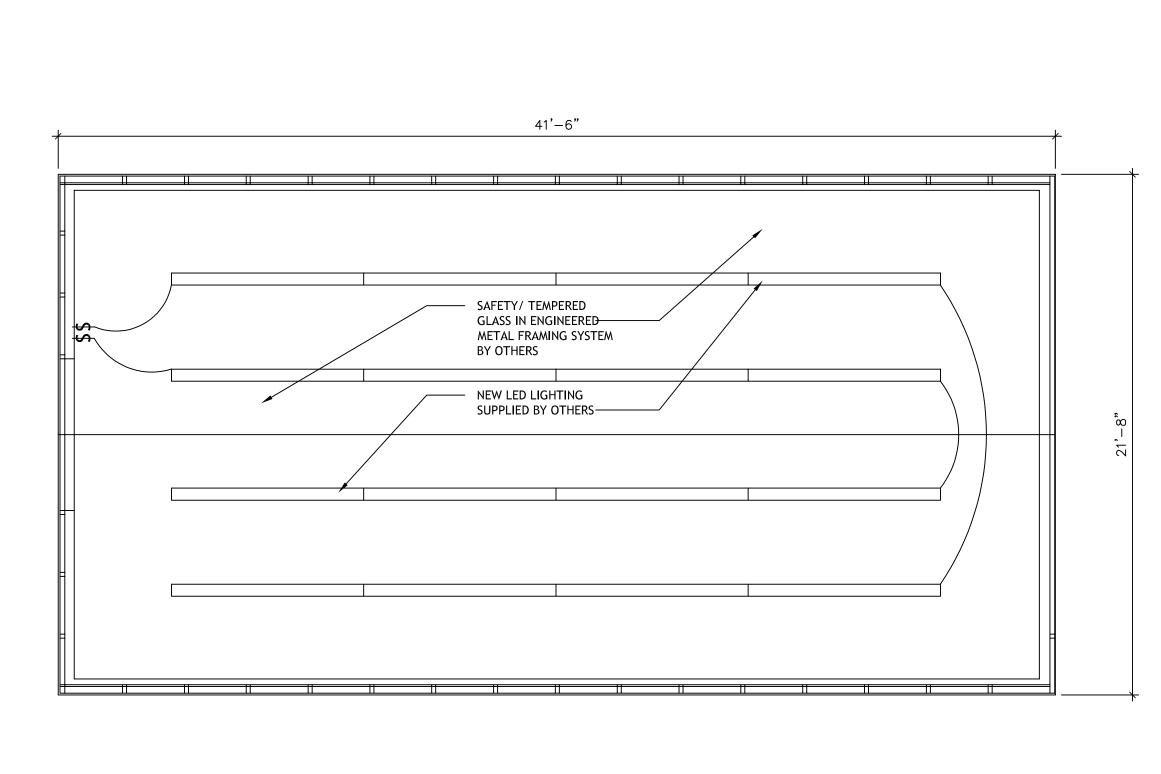
EXIT SIGN.

SECTION 1019 NUMBER OF EXITS AND CONTINUITY- 1 EXITS REQUIRED; 1 EXIT PROVIDED.

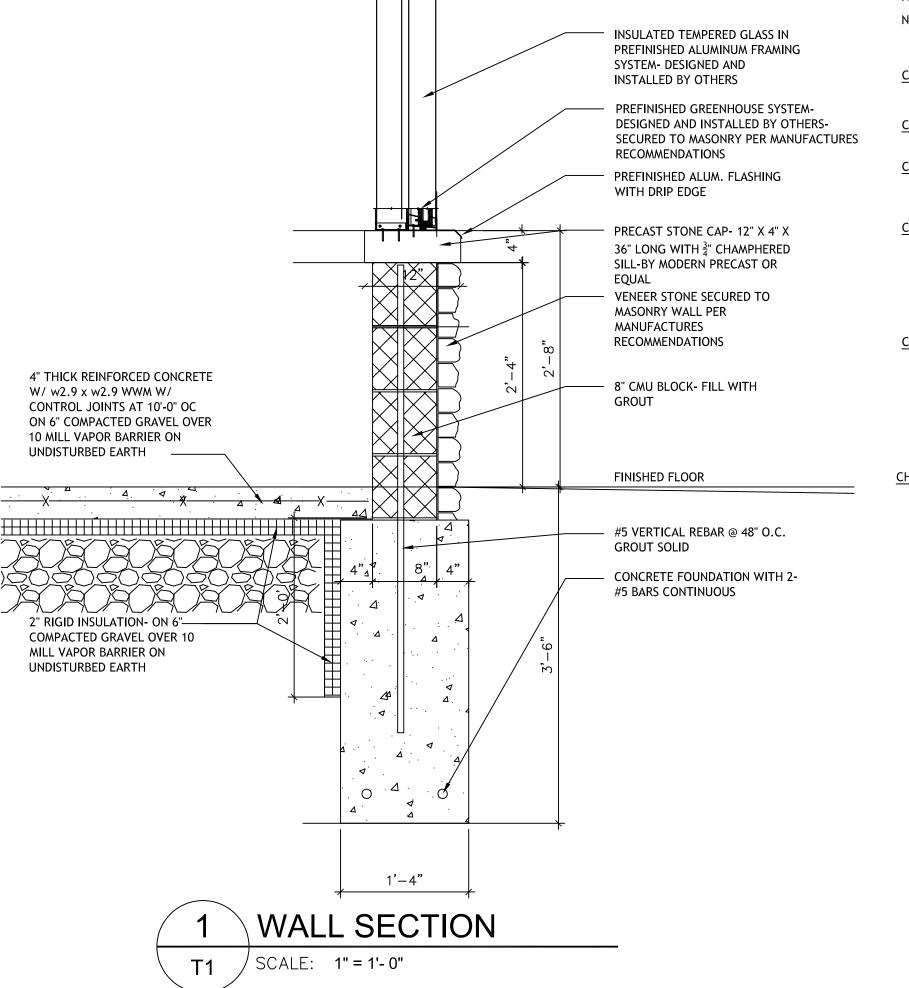
CHAPTER 29 PLUMBING SYSTEMS EXITING BATHROOMS, DRINKING FOUNTAINS AND JANITORS SINKS TO BE USED FOR GREENHOUSE

DRAWING INDEX

| NO. | TITLE |
|-----|---|
| T1 | SPECIFICATIONS, DETAILS, CODE DATA |
| SP1 | SITE PLAN, ENLARGED SITE PLAN, CODE DATA |
| A1 | GREENHOUSE FOUNDATION, FLOOR CEILING PLAN, ELEVATIONS |
| A2 | PAVILION FOUNDATION, FLOOR CEILING PLAN, ELEVATIONS |
| А3 | PAVILION DETAILS |
| E1 | ELECTRICAL POWER PLAN, DETAILS |
| E2 | ELECTRICAL LIGHTING PLAN, DETAILS |
| M1 | MECHANICAL PLAN |
| M2 | MECHANICAL SPECIFICATIONS |



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



OROVETS 8293

> ROBERT D. OROVETS LICENSE # 8293 EXPIRATION 12-31-2025

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AGNIFICA 770 HILLARD BLACKY RIVER, OH

7-31-2025 REVIEW DRAWN BY: RDO CHECKED BY: RDO SHEET NUMBER

JOB NUMBER

202520