ADDENDUM No. 4

Date:	21 March, 2024
To:	All Bidders
From:	**Jenkins•Peer** *Architects* Charlotte, N.C.
Re:	NC Department of Natural and Cultural Resources North Carolina Transportation Museum **Powerhouse & Car Repair Sheds Renovation and Addition** SCO ID#: 22-25306-01A JPA #: 22NCT542

NOTICE to BIDDERS:

Bidder is hereby notified that this Addendum shall hereby become a part of the Construction Documents and the official Contract Documents, and shall be attached to the Project Manual for the Project.

The following items are intended to revise and clarify the Drawings and the Project Manual.

The bidder shall see that their Sub-Bidders are in full receipt of the information contained herein.

General Note:

This Addendum includes the following groups and subsequent "items" referring to various parts of the Contract Documents. Note that some "items" may refer to Bulletin Drawings or new Specification Sections which are attached at the back of the Addendum.

GENERAL INFORMATION: (SECTION NOT USED)

PROJECT MANUAL & TECHINCAL SPECIFICATIONS: (SECTION NOT USED)

DRAWING SHEETS:

1) Replaced drawing sheet M-001 - MECHANICAL LEGEND AND NOTES – POWERHOUSE with the attached, revised sheet.
2) Replaced drawing sheet P-001 - PLUMBING LEGEND INDEX AND NOTES with the attached, revised sheet.

RFI RESPONSES:

3) If possible, could the design team share a list of subcontractors who have provided railroad track installation and repair services for the NC Transportation Museum in the past?
    a. **Answer: We reached out to one of the museum's representatives who has been involved in trackwork projects at the museum and they gave me the following list of companies that have done trackwork for them in the past:**
        1. **American Track**
        2. **Benfield Railroad Construction (might also be known as Keith Benfield Contractor, Inc.)**
        3. **Bundrick Rail Services (BRS)**
        4. **North Stanly Construction Company**

4) S002 Existing Conditions Note 3 – This indicates that “contractor to perform a survey of the existing structural slab using non-destructive testing techniques, such as GPR, prior to installing items into the floor slab.” Would this survey also apply to cutting of existing slabs schedule for removal and at locations of new footings (ref. S111), areas where we are attaching new concrete walls to existing (ref. S402), etc.?
    a. **Answer: The note is mainly to protect reinforcement in existing structured slabs. This note does not apply to cutting existing slabs on ground for removal or installing new footings. The survey before installing embedded items into existing powerhouse walls, for wall extensions and base plates, should be done. The existing concrete will be damaged by repeated attempts of drilling anchors.**
5) P001/M001 Please verify the PME commissioning responsibilities, 3rd party by owner or contractor, or both? P001 notes 3rd party and 2018 NCECC C408 code. M001 notes by owner.
    a. **Answer: See attached, revised drawings sheets P-001 and M-001 for corrected notes clarifying that the owner is responsible for hiring commissioning engineer. The contractor will be responsible for working with them to perform the identified tasks and procedures.**
6) M001 – Please confirm if BIM is required for coordination drawings. It’s only noted on this sheet, there’s no additional information in the specs.
    a. **Answer: The requirement to use “BIM” for coordination drawings is not necessary for this project. Coordination drawings can be done in either 2D CADD or 3D BIM formats.**
7) Please clarify the need for 085123 Steel Windows. Are there new Steel Windows or Doors on this project?
    a. **Answer: All existing windows are steel windows. The above spec section is for modifications to the existing steel windows. New doors, including transom, are hollow metal as per door schedule on A-601. All new windows are Aluminum.**
8) Please clarify intent/material type of door type D/Door Mark 101A. Looking at the transom, this could be reason for 085123 Steel Windows.
    a. **Answer: Door 101A is hollow metal including transom window.**
9) Please clarify intent/material type of W1-3 Windows: Specifically, the muntins aka grids. Assuming 084113 Aluminum Storefront speaks for these openings, Muntins nor grids are specified within. They are, however, mentioned in 085123 Steel Windows.
    a. **Answer: All new windows are Aluminum. Muntins are required on all new windows, but on Applied Exterior only.**
10) Please clarify intent of muntins drawn on W1-3 Windows.
    a. Muntins applied to Aluminum Storefront can be classified multiple ways in order of expense: Drawn Spandrel, Internal, Applied Exterior, Applied Interior, Both, Both with internal bar.
        1. **Answer: Muntins are required and shall be Applied Exterior.**
    b. Muntins applied to 085123 Steel Windows would be true divided lites.
        1. **Answer: Yes, they should be true divided lites (to match the existing)**

End of ADDENDUM No. 4

Attachments:

- Revised drawing sheet M-001 - MECHANICAL LEGEND AND NOTES – POWERHOUSE
- Revised drawing sheet P-001 - PLUMBING LEGEND INDEX AND NOTES

GRILLE AND DIFFUSER SCHEDULE

SYMBOL	SERVICE	CFM RANGE	FACE SIZE	NECK SIZE	TYPE	OBD	PRICE
A**	SUPPLY	0-100	12x12	6"	SQUARE PLAQUE	YES	SPD
B**	SUPPLY	0-100	24x24	6"	SQUARE PLAQUE	YES	SPD
		105-175	24x24	8"	SQUARE PLAQUE	YES	SPD
		180-270	24x24	10"	SQUARE PLAQUE	YES	SPD
		275-390	24x24	12"	SQUARE PLAQUE	YES	SPD
		395-535	24x24	14"	SQUARE PLAQUE	YES	SPD
C	SUPPLY	0-100	13x3	--	SPIRAL SIDEWALL	YES	LINX RGS-3
		105-200	21x3	--	SPIRAL SIDEWALL	YES	LINX RGS-3
		205-295	17x6	--	SPIRAL SIDEWALL	YES	LINX RGS-3
		300-350	21x6	--	SPIRAL SIDEWALL	YES	LINX RGS-3
		355-400	25x6	--	SPIRAL SIDEWALL	YES	LINX RGS-3
		405-500	21x9	--	SPIRAL SIDEWALL	YES	LINX RGS-3
		505-600	25x9	--	SPIRAL SIDEWALL	YES	LINX RGS-3
D**	SUPPLY	SEE PLANS FOR SIZE AND AIRFLOW			DBLE DEFLECT.	YES	620
E**	RETURN	0-100	24x24	6"	PERFORATED	NO	PDDR
		105-175	24x24	8"	PERFORATED	NO	PDDR
		180-270	24x24	10"	PERFORATED	NO	PDDR
		275-390	24x24	12"	PERFORATED	NO	PDDR
		395-500	24x24	12x12	PERFORATED	NO	PDDR
		505-885	24x24	16x16	PERFORATED	NO	PDDR
		885-1800	24x24	22x22	PERFORATED	NO	PDDR
F**	EXHAUST	0-100	12x12	6"	PERFORATED	NO	PDDR
G**	EXHAUST	0-100	24x24	6"	PERFORATED	NO	PDDR
		105-175	24x24	8"	PERFORATED	NO	PDDR
		180-270	24x24	10"	PERFORATED	NO	PDDR
		275-390	24x24	12"	PERFORATED	NO	PDDR
		395-500	24x24	12x12	PERFORATED	NO	PDDR
		505-885	24x24	16x16	PERFORATED	NO	PDDR
H	EXHAUST	SEE PLANS FOR SIZE AND AIRFLOW			SINGLE DEFLECT.	NO	520

NOTES:

1. ALL DEVICES SHALL BE FURNISHED WITH AN ENAMEL OFF-WHITE FINISH, COLOR TO BE COORDINATED WITH ARCH.
2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR TYPE OF INSTALLATION REQUIRED.
3. ALL AIR TERMINALS THAT SERVE TOILETS OR KITCHEN SPACE SHALL BE ALUMINUM.
4. ALL DOUBLE DEFLECTION SUPPLY GRILLES SHALL HAVE DAMPER BLADES ADJUSTED TO PROVIDE AIRFLOW PATTERN INDICATED BY THE FLOW ARROWS ON PLANS. DAMPERS SHALL BE ADJUSTED TO 30 DEGREE POSITION UNLESS OTHERWISE NOTED ON PLANS.

* RETURN AIR GRILLE AIRFLOW BASED OFF SUPPLY AIRFLOW PROVIDED TO ROOM

** DIFFUSER TYPE NOT USED ON PLANS

EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS, PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED.

FANS: COOK, GREENHECK, PENN, TWIN CITY, AIRUS
AIR DISTRIBUTION: CARNES, METAL*AIRE, NAILOR, PRICE, TITUS
DDC CONTROLS PLATFORM: NIAGARA (N4) (OPEN SOURCE, NON-PROPRIETARY CONTROLLERS)
ROOF TOP UNITS: TRANE, DAIKIN, JCI, GREENHECK
SPIRAL DUCTWORK: EASTERN SHEET METAL, LINDAB, UNITED MCGILL, HAMLIN
CONTROLS ACCESSORIES: ONICON, FLEXIM, JCI, EBTRON, ACI, CLEVELAND, SEIMENS, SCHNEIDER, FUNCTIONAL DEV., BELIMO
INFRARED RADIANT HEATERS: SPACE RAY, RE-VERBER-RAY, ROBERTS GORDON
ELECTRIC WALL HEATERS: BERKO, MARKEL, RAYWALL, QMARK

NOTE:
ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

OWNER TRAINING

ALL EQUIPMENT SHALL BE PROVIDED WITH OWNER TRAINING FROM FACTORY AUTHORIZED AND CERTIFIED TRAINING PERSONNEL. TRAINING SHALL BE PROVIDED WITHIN 5 DAYS OF OWNER ACCEPTACE OF OPERATIONAL EQUIPMENT. DURATION AND FORMAT OF TRAINING SHALL BE COORDINATED WITH OWNER, BUT SHALL BE A MINIMUM OF 8 HRS (2) 4 HR SESSIONS OF ONSITE TRAINING WITH THE REQUIRED OWNER PERSONNEL. MECHANICAL CONTRACTOR SHALL DOCUMENT TRAINING WITH DATE/TIME, DURATION, AND OWNER SIGNATURE.

TESTING, ADJUSTING, AND BALANCING

1. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.
2. CONDUCT TEST AND BALANCING IN ACCORDANCE WITH TECHNICAL PORTIONS OF THE AABC "NATIONAL STANDARDS FOR TESTING AND BALANCING HVAC SYSTEMS", LATEST EDITION.
3. INSTRUMENTS USED FOR BALANCING MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX (6) MONTHS PRIOR TO BALANCING. SUBMIT SERIAL NUMBERS, AND SATES OF CALIBRATION OF ALL INSTRUMENTS TO BE USED PRIOR TO THE START OF WORK.
4. SET HVAC SYSTEM AIRFLOW RATES WITHIN THE FOLLOWING TOLERANCES:
    - 4.1. AIR OUTLETS AND INLETS: 0 TO MINUS 10 PERCENT.

ELECTRICAL/MECHANICAL DEMARCATION

REFER TO DETAIL 12/M-501 FOR MECHANICAL CONTRACTOR'S RESPONSIBILITIES RELATED TO ELECTRICAL DISCONNECTS, STARTERS AND WIRING OF MECHANICAL EQUIPMENT. ALL DISCONNECTS, STARTERS AND WIRING (LOAD SIDE OF DISCONNECTS) SHALL BE FURNISHED AND INSTALLED BY M.C. UNLESS OTHERWISE NOTED IN DETAIL 12/M-501. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH E.C. PRIOR TO ASSEMBLING SHOP DRAWING SUBMITTALS OR ORDERING EQUIPMENT.

COMMISSIONING NOTE - 2018 NCECC C408

THIS PROJECT INCLUDES A THIRD PARTY COMMISSIONING AGENT CONTRACTED BY THE OWNER. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT. SEE COMMISSIONING REQUIREMENTS IN THE PROJECT MANUAL FOR FURTHER INFORMATION.

1

RETURN AIR PLENUM NOTE

THIS PROJECT WILL UTILIZE THE ABOVE CEILING SPACE FOR A RETURN AIR PLENUM, ALL ABOVE CEILING UTILITIES PROVIDED UNDER THIS PROJECT SHALL BE PLENUM RATED AND HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50

2018 NORTH CAROLINA ENERGY CONSERVATION CODE COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

501.1 METHOD OF COMPLIANCE

☒ 2018 NCECC CHAPTER 5
☐ ASHRAE 90.1-2010 PRESCRIPTIVE
☐ ASHRAE 90.1-2010 PERFORMANCE
☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)
☐ COMCHECK PROVIDED (2012 NCECC)
☐ COMCHECK PROVIDED (90.1-2010)
☐ ENERGY MODELING DATA PROVIDED

501.2 APPLICATION COMPLIANCE

☐ 506.2.1 EFFICIENT MECH EQUIPMENT
☒ 506.2.2 REDUCED LTG DENSITY
☐ 506.2.3 ENERGY RECOVERY SYSTEMS
☐ 506.2.4 HI EFFICIENCY DOMESTIC HW
☐ 506.2.5 ONSITE RENEWABLE ENERGY
☐ 506.2.6 DAYLIGHTING CONTROLS

301.1 CLIMATE ZONE

3A - SALISBURY, NC

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	18° F.
summer dry bulb	92° F.
summer wet bulb	74° F.

INTERIOR (2018 NCECC SECTION 302.1)

winter dry bulb	72° F.
summer dry bulb	75° F.

503.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	REFER TO SCHEDULES
BUILDING COOLING LOAD	REFER TO SCHEDULES
INSTALLED HEATING CAPACITY	REFER TO SCHEDULES
INSTALLED COOLING CAPACITY	REFER TO SCHEDULES

503.2.3 & 506.2.1 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION - DX VAV PACKAGED RTUS AND EXHAUST FANS

☒ MINIMUM HVAC EQUIPMENT EFFICIENCY COMPLIANCE - TABLE 503.2.3
☐ INCREASED HVAC EQUIPMENT EFFICIENCY COMPLIANCE - TABLE 506.2.1

EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	C403.2.3 MINIMUM EFFICIENCY (a)	10% INCREASED EFF. (a)	DESIGN EFFIC.
TABLE C403.2.3(1) - UNITARY AIR CONDITIONERS AND CONDENSING UNITS					
AIR COND, AIR COOLED	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	13.0 SEER	14.3 SEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 65,000 & < 135,000	SPLIT SYSTEM & SINGLE PACKAGE	11.2 EER 12.8 IEER	12.3 EER 14.1 IEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 135,000 & < 240,000	SPLIT SYSTEM & SINGLE PACKAGE	11.0 EER 12.4 IEER	12.1 EER 13.6 IEER	SEE SCHEDULE

503.2.4 THRU 503.2.9

☒ HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.

503.2.10 - AIR SYSTEM DESIGN AND CONTROL

☒ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.
☐ FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 2 - FAN SYSTEM MOTOR BRAKE HP - TABLE 503.2.10.1(1)

SYSTEM/UNIT	ALLOWABLE MOTOR BRAKE HP	DESIGN MOTOR BRAKE HP	DESIGN CFM
RTU-1 SUPPLY	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-1 RETURN	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-2 SUPPLY	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-2 RETURN	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-3 SUPPLY	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-3 RETURN	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-4 SUPPLY	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-4 RETURN	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-5 SUPPLY	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-5 RETURN	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-6 SUPPLY	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
RTU-6 RETURN	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE
EFs	SEE SCHEDULE	SEE SCHEDULE	SEE SCHEDULE

IF YOU DONT MEET THESE REQUIREMENTS, CHECK THE CODE AND USE OPTION 2

503.3 - SIMPLE HVAC SYSTEMS AND EQUIPMENT (PRESCRIPTIVE)

☐ PROJECT CONSISTS OF ONLY DX SINGLE ZONE SYSTEMS FULLY COMPLIANT WITH THE SIMPLE PRESCRIPTIVE REQUIREMENTS OF 503.3.

503.4 - COMPLEX HVAC SYSTEMS AND EQUIPMENT (PRESCRIPTIVE)

☒ PROJECT CONSISTS OF HVAC SYSTEMS FULLY COMPLIANT WITH THE COMPLEX PRESCRIPTIVE REQUIREMENTS OF 503.4.

COORDINATION DRAWINGS

THE CONSTRUCTION MANAGER SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF BIM COORDINATION DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA). THE CM WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS.

THE MECHANICAL CONTRACTOR SHALL PRODUCE THE ORIGINAL DRAWINGS AND FORWARD THE DRAWINGS TO EACH OF THE OTHER CONTRACTORS FOR THEM TO ADD THEIR SYSTEMS TO THIS SET OF COORDINATION DRAWINGS. THE CONTRACTORS WILL DEVELOP THE DRAWINGS IN THIS ORDER: MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, IT/DATA, AND GENERAL. THIS SHALL ALSO BE THE ORDER OF PRECEDENCE FOR INSTALLATION OF SYSTEMS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS AND COORDINATION DRAWINGS:

1. ALL COORDINATION DRAWINGS WILL BE PRODUCED IN REVIT AT 1/4"= 1'-0" SCALE
2. COORDINATION DRAWINGS WILL BE DISTRIBUTED ON REPRODUCIBLE MATERIAL 48"x36"
3. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.
4. ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPILED, THE MECHANICAL CONTRACTOR WILL DISTRIBUTE ONE SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: ELECTRICAL, PLUMBING, FIRE PROTECTION, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

THE USE OF BUILDING INFORMATION MODELING (BIM) THROUGHOUT THE CONSTRUCTION PROCESS IS A REQUIREMENT FOR THIS PROJECT TO HELP REDUCE OR ELIMINATE FIELD DETECTED CONFLICTS, IMPROVE CONSTRUCTION QUALITY AND MAINTAIN AN AGGRESSIVE SCHEDULE. THE CONTRACTOR WILL BE RESPONSIBLE FOR CREATING THE MODEL AND MANAGING THE COORDINATION AND COLLISION DETECTION PROCESS. THE MODEL MUST CONTAIN COMPLETE ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION SYSTEMS CONSISTENT WITH THE DESIGN AND FABRICATION DRAWINGS.

MECHANICAL GENERAL NOTES

SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT THE SPECIFICATIONS. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED BEFORE BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL DUCTWORK SHALL BE GALVANIZED UNLESS NOTED TO BE ALUMINUM OR STAINLESS STEEL (SEE PLANS). CONSTRUCTION IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0 (INSIDE BLDG) AND 8.0 (OUTSIDE BLDG). AIR HANDLING UNIT RETURN DUCTWORK AND TRANSFER DUCTS SHALL BE LINED WITH 1" THICK FLEXIBLE ELASTOMERIC DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE. EXPOSED DUCTWORK IN MECH. ROOMS SHALL BE PROVIDED WITH CANVAS WRAP WITH MASTIC COATING.
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE 2018 NCMC & NCECC. SEAL MEDIUM PRESSURE SUPPLY DUCTWORK FOR POSITIVE 3" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.
5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
7. THE MECHANICAL CONTRACTOR SHALL HAVE THE MECHANICAL SYSTEMS BALANCED TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR (AABC OR NEBB).
8. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS.
9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
11. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE TYPE "L" HARD DRAWN COPPER AND SHALL BE INSULATED PER THE SPECIFICATIONS. DRAINS FROM ALL COOLING COILS SHALL BE TRAPPED. DRAIN SIZE SHALL BE EQUIPMENT DRAIN CONNECTION SIZE (3/4" MINIMUM) WITH A MINIMUM DEPTH OF 4" OR 1.5 TIMES THE UNIT FAN TSP, WHICHEVER IS GREATER
12. ANY DEVICE REQUIRING A TEMP SENSOR FOR CONTROL SHALL BE FURNISHED WITH A TEMP SENSOR WHETHER INDICATED ON THE DRAWINGS OR NOT.
13. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
14. MECHANICAL CONTRACTOR SHALL VERIFY LOCATION OF ROOF PENETRATIONS FOR RELIEF HOODS WITH ARCHITECT & ENGINEER PRIOR TO INSTALLATION.
15. MECHANICAL CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 15'-0" FROM ANY OUTSIDE AIR INTAKE.
16. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
17. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
18. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER. CHANGE OUT MEDIA AS NECCESSARY TO PROTECT NEW EQUIPMENT
19. MECHANICAL CONTRACTOR SHALL PROVIDE FUSED DISCONNECTS AND STARTERS FOR ALL MECHANICAL EQUIPMENT REQUIRED FOR A COMPLETE AND FUNCTIONING SYSTEM. REFER TO DIVISION 23 & 26 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS (SEE 12/M-501)
20. ALL EQUIPMENT CONCRETE PAD SIZES FOR MECHANICAL EQUIPMENT SHALL BE CONFIRMED WITH APPROVED SHOP DRAWING SUBMITTALS AND ASSOCIATED UNIT MANUFACTURER ANCHOR LOCATIONS PRIOR TO FABRICATION/INSTALLATION. MINIMUM PAD THICKNESS SHALL BE 6" FOR AHU'S OR AS REQUIRED FOR CONDENSATE P-TRAP DEPTH (WHICHEVER IS GREATER). ALL OTHER PADS (PUMPS, BOILERS, TANKS, ETC.) SHALL BE 4" THICK (UNLESS OTHERWISE NOTED). REFER TO STRUCTURAL PLANS FOR CONCRETE PAD REQUIREMENTS
21. PROVIDE YOUNG REGULATOR ON ALL DAMPERS INSTALLED ABOVE INACCESSIBLE CEILINGS
22. ALL EQUIPMENT SHALL BE U.L. LISTED AND LABELED
23. MINIMUM GAS PIPING SIZE SHALL BE 3/4".
24. GAS PIPING AND FITTINGS SHALL BE BLACK STEEL, SCHEDULE 40, IN ACCORDANCE WITH ASTM SPECIFICATION A 106, WITH 150 PSI BLACK MALLEABLE IRON FITTINGS IN ACCORDANCE WITH ASTM SPECIFICATION A 47, GRADE 32510, AND ASA SPECIFICATION B16.3, 125 LB.
25. GAS PIPING SHALL BE INSTALLED TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND NFPA STANDARD NO. 54. ALL PIPING TO BE SUPPORTED BY CLEVIS HANGERS WITH GALVANIZED ROD A MAXIMUM OF 8' ON CENTER. PIPING SHALL BE SUPPORTED BY ROD HANGERS IN THE PIPE RUN 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE PER THE STATE BUILDING CODE AND ASCE 7.

MECHANICAL GENERAL NOTES

26. GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN NFPA NO 54. ANY OTHER TEST AS REQUIRED BY THE LOCAL GAS INSPECTION DEPARTMENT OR GAS COMPANY SHALL ALSO BE PERFORMED.
27. NATURAL GAS PIPING AND FITTINGS ABOVE GRADE: SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2-1/2" AND LARGER.
28. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
29. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). PROVIDE PRE- PRINTED LABELS WITH BLACK LETTERING INDICATING THE GAS PRESSURE AND THE WORD "GAS" ON THE PIPE AT 5'-0" CENTERS FOR ALL GAS PIPING.
30. ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL INSULATED DUCTWORK (TYP.)

DRAWING LIST

MECHANICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
M-001	MECHANICAL LEGEND AND NOTES - POWERHOUSE
M-002	MECHANICAL SCHEDULES - POWERHOUSE
M-003	MECHANICAL SEQUENCE OF OPERATIONS AND POINTS LIST
M-101	FIRST FLOOR MECHANICAL PLAN - POWERHOUSE
M-102	MECHANICAL ROOF PLAN - POWERHOUSE
M-501	MECHANICAL DETAILS - POWERHOUSE

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBR.
—— G ——	NATURAL GAS	G
—— D ——	CONDENSATE DRAIN	D
—— PD ——	PUMPED CONDENSATE	PD
Ⓣ	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)	
(TC)	COMBINATION TEMPERATURE & CO2 ROOM SENSOR	
Ⓗ	HUMIDISTAT (4'-0" AFF TO TOP)	
Ⓢ	MANUAL REMOTE SPEED CONTROLLER (4'-0" AFF TO TOP)	
Ⓟ	BUILDING PRESSURE SENSOR (4'-0" AFF TO TOP)	
⊠	SUPPLY AIR DIFFUSER (4-WAY)	
⧅	RETURN AIR GRILLE	
⧅	RETURN AIR GRILLE WITH SOUND ATTENUATION (SEE DETAIL)	
⧄	EXHAUST AIR GRILLE	
	DOUBLE LINE DUCTWORK	
	SINGLE LINE DUCTWORK	
FD	FIRE DAMPER DAMPER W/ ACCESS DOOR (SEE DETAIL)	
FSD	COMBINATION FIRE/SMOKE DAMPER W/ ACCESS DOOR (SEE DETAIL)	
20/14∅	20"x14" FLAT OVAL DUCT	
20x14	20"x14" RECTANGULAR DUCT	
20x14L	20"x14" RECTANGULAR DUCT LINED	
8∅	8" DIAMETER ROUND DUCT	
(DD)	DUCT MOUNTED SMOKE DETECTOR W/ ACCESS DOOR	
SP	STATIC-PRESSURE SENSOR (DUCT MOUNTED)	
A	AIRFLOW MONITORING STATION	
M	MOTORIZED DAMPER	
BD	BACKDRAFT DAMPER	
Ⓒ	CARBON DIOXIDE SENSOR (4'-0" AFF TO TOP)	
CO	CARBON MONOXIDE SENSOR	
M.C.	MECHANICAL CONTRACTOR	
E.C.	ELECTRICAL CONTRACTOR	
P.C.	PLUMBING CONTRACTOR	
N.I.C.	NOT IN CONTRACT	
AFF	ABOVE FINISHED FLOOR	
DN	DOWN	
UP	UP	

Jenkins · Peer *Architects*
112 South Tryon Street, Suite 1300
Charlotte, North Carolina 28284
(t) 704/372-6665

KENNERLY ENGINEERING & DESIGN
NC License Number - C-3900
Civil Engineer
12133 N Highway 150, Suite F
Winston Salem, North Carolina 27127
(t) 336/775-2115

SURFACE 678
NC License Number - C-098
Landscape Architect
215 Morris Street, Suite 150
Durham, North Carolina 27701
(t) 919/419-1199

STANLEY D. LINDSEY AND ASSOCIATES, LTD
NC License Number - C-3232
Structural Engineer
1347 Harding Place, Suite 201
Charlotte, North Carolina 28204
(t) 704/333-3122

OPTIMA ENGINEERING, P.A.
NC License Number - C-0914
Mechanical, Plumbing & Fire Protection Engineers
1927 South Tryon Street, Suite 300
Charlotte, North Carolina 28203
(t) 704/338-1292

DESIGN ENGINEERING
NC License Number - C-0657
Electrical Engineer
PO Box 1256
Lexington, North Carolina 27292
(t) 336/224-0100

17228
RONALD V. ALMOND

03/21/2024
Seal Date:

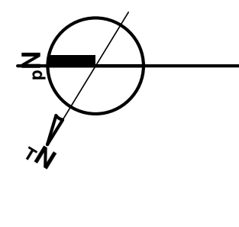
NORTH CAROLINA TRANSPORTATION MUSEUM
130 SALISBURY AVE, SPENCER
NORTH CAROLINA - 28159

POWER HOUSE AND CAR REPAIR SHEDS - RENOVATION AND ADDITION
SCO ID: 22-25306-01A

TAG	DESCRIPTION	DATE
1	Addendum #4	03/21/2024

Project: 22NCT542
Drawn By: SMP
Checked By: CAH
Date: 02/22/2024

MECHANICAL LEGEND AND NOTES - POWERHOUSE



BID SET

M-001

NATURAL GAS PIPING

1. BELOW GRADE PIPING AND FITTINGS (OUTSIDE): PROVIDE SCHEDULE 40 BLACK STEEL, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND FORGED STEEL WELDING TYPE FITTINGS (ASTM A234) WITH (AWWA C105) POLYETHYLENE JACKET OR DOUBLE LAYER, HALF LAPPED 10 MIL POLYETHYLENE TAPE. PROVIDE WELDED JOINTS (ASME B31.9) FOR ALL UNDERGROUND PIPE. PROVIDE METALIZED WARNING TAPE BETWEEN GRADE AND ALL UNDERGROUND GAS PIPING.
2. ABOVE GRADE PIPING AND FITTINGS : PROVIDE SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2-1/2" AND LARGER.
3. SPACE GAS PIPING HANGER RODS 7'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.
4. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
5. GAS PRESSURE REGULATORS SHALL COMPLY WITH ANSI Z21.80. REGULATORS SHALL BE CAST IRON OR DIE-CAST ALUMINUM CONSTRUCTION WITH INTERCHANGEABLE ZINC-PLATED STEEL SPRINGS, ZINC-PLATED STEEL DIAPHRAGM PLATE, NITRILE RUBBER SEAT DISC, INTERCHANGEABLE ALUMINUM ORIFICE, AND ULTRAVIOLET-STABILIZED MINERAL FILLED NYLON SEAL PLUG. REGULATOR SHALL BE SINGLE-PORT SELF-CONTAINED WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF. OVERPRESSURE PROTECTION DEVICE SHALL BE FACTORY MOUNTED ON REGULATOR. WHEN USING VENTLESS REGULATORS, MOUNT REGULATOR IN A HORIZONTAL UPRIGHT POSITION. IF VENTED TYPE REGULATORS ARE USED, INSTALL VENT PIPING (FULL SIZE OPENING) FROM GAS PRESSURE REGULATORS TO OUTDOORS AND TERMINATE IN WEATHERPROOF HOOD.
6. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). LABEL ALL GAS PIPING ON 5'-0" CENTERS INDICATING THE GAS PRESSURE.
   5 PSI GAS PIPING SHALL BE LABELED "5-PSI GAS".
   2 PSI GAS PIPING SHALL BE LABELED "2-PSI GAS"
   LOW PRESSURE GAS PIPING SHALL BE LABELED "GAS"
7. CONTACT LOCAL GAS UTILITY TO PROVIDE GAS SERVICE AND GAS METER WITH A PULSE OUTPUT COMPATIBLE WITH THE BUILDING AUTOMATION SYSTEM. COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR AND LOCAL GAS UTILITY.

COMMISSIONING NOTE - 2018 NCECC C408

THIS PROJECT INCLUDES A THIRD PARTY COMMISSIONING AGENT CONTRACTED BY THE OWNER. THE PLUMBING CONTRACTOR SHALL COORDINATE WITH OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT. SEE COMMISSIONING REQUIREMENTS IN THE PROJECT MANUAL FOR FURTHER INFORMATION.

1

SUMP PUMP DRAIN PIPING

1. SUMP PUMP DISCHARGE PIPING: PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8). SLOPE SUMP DISCHARGE LINE AT 1% SLOPE AWAY FROM SUMP PUMP.

SANITARY WASTE, VENT & STORM DRAIN PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON HUB AND SPIGOT PIPE (ASTM A 74) WITH COMPRESSION JOINTS (CISPI HSN) AND NEOPRENE GASKETS (ASTM C 564) OR NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). INSTALL PLASTIC PIPE BELOW GRADE PER ASTM D2321. FOAM CORE PVC PIPING IS NOT APPROVED. NOTE: PROVIDE CAST IRON PIPING SPECIFIED ABOVE FOR ALL KITCHEN GREASE WASTE PIPING UPSTREAM OF THE GREASE INTERCEPTOR AND FOR MECHANICAL ROOM DRAIN PIPING, PVC IS NOT ACCEPTABLE IN THESE AREAS.
2. ABOVE GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). FOAM CORE PIPE IS NOT APPROVED. DO NOT INSTALL PVC PIPING IN RETURN AIR PLENUMS.
3. SLOPE WASTE AND STORM DRAIN PIPING AT 1/4" PER FOOT MINIMUM FOR PIPING 2-1/2" AND SMALLER AND 1/8" PER FOOT MINIMUM FOR PIPING 3" AND LARGER UNLESS NOTED OTHERWISE. SLOPE ALL KITCHEN GREASE WASTE PIPING AT 1/4" PER FOOT MINIMUM.
4. PROVIDE CLEAN-OUTS AT THE BASE OF WASTE STACKS, STORM RISERS, AND AT EVERY TURN IN PIPING IN EXCESS OF 45° AND SPACED WITH-IN 100'-0" APART IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
5. PROVIDE FLOOR CLEANOUTS WITH TOPS DESIGNED TO MATCH SPECIFIC FLOOR FINISHES SUCH AS CARPET, TILE, ETC. YARD CLEANOUTS SHALL BE PROVIDED IN AN 18"x18"x6" CONCRETE PAD.
6. WHERE WASTE PIPING IS EXPOSED IN REST ROOM AREAS, PROVIDE CHROME PLATED BRASS PIPING, REMOVABLE P-TRAPS, MATCHING STOPS AND ESCUTCHEONS FOR ALL LAVATORIES.
7. WASTE AND VENT SYSTEMS SHALL BE TESTED AND PROVED WATER TIGHT UNDER A HEAD PRESSURE OF NO LESS THAN 10 FT. THIS PRESSURE SHALL BE HELD FOR A PERIOD OF NO LESS THAN 15 MINUTES.
8. WHERE MECHANICAL ROOM FLOOR DRAINS ARE INSTALLED ABOVE GRADE, PROVIDE 1"THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND JACKET ON THE FLOOR DRAIN BODY, THE ASSOCIATED P-TRAP AND HORIZONTAL DRAIN PIPING ABOVE GRADE.
9. INSULATE ROOF DRAIN BODIES AND HORIZONTAL DRAIN PIPING ABOVE GRADE WITH 1" THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND JACKET.
10. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.

DOMESTIC WATER PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE TYPE 'K' SOFT ANNEALED SEAMLESS COPPER TUBING (ASTM B 88) WITH NO JOINTS FOR PIPING 2-1/2" AND SMALLER. PROVIDE DUCTILE IRON PIPE AND FITTINGS (AWWA C151, AWWA C110) WITH RUBBER GASKET JOINTS AND RODS (AWWA C111) FOR PIPING 3" AND LARGER.
2. ABOVE GRADE PIPING AND JOINTS: PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8). ALTERNATELY PROVIDE COPPER PIPE AND FITTINGS AS SPECIFIED ABOVE EXCEPT WITH GROOVED ENDS (ASTM B 88, ASME B16.18) AND JOINTS UTILIZING GROOVED MECHANICAL COUPLINGS MEETING (ASTM F1476).
3. INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET. PIPE INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.27 BTUH x SQ. FT., SEE LIST BELOW FOR INSULATION THICKNESS:
   - PROVIDE 1" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER & CIRCULATON PIPING SIZES 1-1/2" THRU 4".
   - PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".
4. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD AND SHALL BE PLENUM RATED. PROVIDE PVC INSULATION JACKET FOR EXPOSED PIPING IN MECHANICAL ROOMS. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.
5. PROVIDE A CHROME FINISH ON EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
6. PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH DISSIMILAR OTHER METALS.
7. PROTECT COPPER PIPING AGAINST CONTACT WITH MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND 15# ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.
8. PERFORM A PRESSURE TEST ON ALL WATER PIPING. FILL PIPING WITH POTABLE WATER, CAP AND SUBJECT PIPING TO A STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS OR PRESSURIZE PIPING WITH AIR TO AT LEAST ONE-HUNDRED (100) PSI. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED
9. STERILIZE THE DOMESTIC WATER SYSTEM IN PER THE AMERICAN WATER WORKS ASSOCIATION'S INSTRUCTIONSSPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
10. SLOPE WATER PIPING FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.

PLUMBING LOAD SUMMARY

LOAD	FIXTURE UNITS	FLOW
SANITARY WASTE	60 DFU	-
DOMESTIC WATER	130.8 FU	50 GPM

PLUMBING GENERAL NOTES

1. GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE PLUMBING SCOPE OF WORK. THE PLUMBING DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.
2. PLUMBING WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 NORTH CAROLINA STATE PLUMBING CODE AND WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
3. SCOPE: PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL PLUMBING SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES.
4. PERMITS: APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.
5. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE TIME PERIOD SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.
6. COORDINATE ALL PLUMBING PIPING LOCATIONS, ROUGH-IN LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.
7. FIELD VERIFY PROPER OPERATION OF EXISTING SYSTEMS BEFORE STARTING CONSTRUCTION. NOTIFY THE ARCHITECT / ENGINEER OF RECORD OF ANY PROBLEMS OR DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS AND/OR ANY POTENTIAL PROBLEMS OBSERVED BEFORE CONTINUING WORK IN THE AFFECTED AREAS.
8. PLUMBING PLANS SHALL NOT BE SCALED. REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL LOCATIONS OF PLUMBING FIXTURES, FLOOR DRAINS, COLUMNS, WALLS, DOORS, ETC.
9. WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.
10. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
11. ALL VALVES, BACKFLOW PREVENTERS, BOOSTER PUMPS, ETC. SERVING THE DOMESTIC WATER SYSTEM SHALL MEET LEAD FREE STANDARDS PER ANSI/NSF 372 AND NSF 61, ANNEX G.
12. PROVIDE COMPLETE PLUMBING FIXTURES AND EQUIPMENT. INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC. AND INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
13. CUT WALLS, FLOORS AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. PATCH AND FINISH SURFACES TO MATCH ADJOINING SURFACES.
14. PIPING AND SPECIALTIES SHALL BE LOCATED CONCEALED IN WALLS, PARTITIONS OR ABOVE CEILINGS UNLESS NOTED OTHERWISE. PIPING IN EXPOSED AREAS SHALL BE RUN TIGHT TO UNDERSIDE OF STRUCTURE.
15. PIPE PENETRATIONS THRU WALLS, PARTITIONS AND FLOORS SHALL BE SLEEVED. CORE DRILLING THRU WALLS AND PARTITIONS IS PERMITTED IF PERFORMED IN A NEAT CRAFTSMAN LIKE MANNER. OPENINGS THRU WALLS, PARTITIONS, AND FLOORS SHALL BE LARGE ENOUGH FOR PIPE INSULATION TO REMAIN CONTINUOUS. PIPES PENETRATING THRU EXTERIOR WALLS SHALL BE SEALED WATER TIGHT. INSTALL ESCUTCHEONS IN ALL EXPOSED AREAS.
16. PROVIDE ACCESS DOORS FOR ALL SPECIALTIES, VALVES, WATER HAMMER ARRESTORS, TRAP PRIMERS, ETC., CONCEALED BEHIND WALLS OR CEILINGS THAT REQUIRE MAINTENANCE ACCESS.
17. DO NOT INSTALL PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSTALL PIPING SHOWN IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.
18. PIPING, VENTS, ETC. EXTENDING THROUGH EXTERIOR WALLS AND/OR THE ROOF SHALL BE FLASHED AND COUNTER FLASHED IN A WATERPROOF MANNER. COORDINATE FLASHING WITH THE GENERAL CONTRACTOR.
19. PROVIDE A CHROME FINISH FOR ALL EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
20. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
21. REFER TO THE STRUCTURAL PLANS AND DETAILS FOR ACCEPTABLE LOCATIONS TO ATTACH HANGERS AND SUPPORTS TO THE BUILDING STRUCTURE. HANGERS SHALL NOT ATTACH TO THE ROOF DECK.
22. PROVIDE MANUFACTURERS RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.
23. VALVES AND OTHER PIPING ACCESSORIES REQUIRING ACCESS SHALL BE INSTALLED IN ACCESSIBLE LOCATION NO MORE THAN 18" ABOVE THE CEILING, PROVIDE OFFSETS IN PIPING AS NEEDED.
24. PLUMBING SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: PLUMBING FIXTURES AND EQUIPMENT, FIRE STOPPING, SEISMIC BRACING, PIPE IDENTIFICATION, DOMESTIC WATER SYSTEM, SANITARY WASTE AND VENT SYSTEM, STORM DRAIN SYSTEM, NATURAL GAS SYSTEM.

FIRE STOPPING:

1. FIRE STOP ALL PENETRATIONS, BY PIPING OR CONDUITS, OF FIRE RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.

SEISMIC BRACING:

1. PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE PLUMBING SYSTEM(S) IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE AND ASCE 7-10, CHAPTER 13. REFER TO THE APPENDIX B ON THE ARCHITECTURAL DRAWINGS FOR THE SITE'S SEISMIC DESIGN CATEGORY.
2. PROPERLY SUPPORT AND BRACE VERTICALLY AND HORIZONTALLY ALL PIPING, APPARATUS, EQUIPMENT, ETC. IN ACCORDANCE WITH APPLICABLE CODES TO PREVENT EXCESSIVE MOVEMENT DURING SEISMIC CONDITIONS.

PIPE IDENTIFICATION:

1. PIPE IDENTIFICATION SHALL MATCH THE FACILITY'S EXISTING STANDARD. IF NO STANDARD EXISTS, THEN THE PIPE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI A13.1.
2. PROVIDE PIPING LABELS FOR ALL PLUMBING PIPING. PIPING LABELS SHALL BE ACRYLIC FACED, WRAP-AROUND TYPE. EACH LABEL SHALL INDICATE THE PIPING CONTENTS, DIRECTION OF FLOW AND SHALL BEAR THE MANUFACTURER'S STANDARD COLOR FOR THE SERVICE INDICATED.

SUBMITTALS:

1. PROVIDE SUBMITTALS BEARING THE CONTRACTORS REVIEW STAMP FOR ALL PLUMBING FIXTURES, PIPING, EQUIPMENT AND ACCESSORIES IN ELECTRONIC FORMAT (PDF).
2. NO PRIVATE LABELED MATERIALS WILL BE ACCEPTED AS EQUALS TO PRODUCTS SPECIFIED HEREIN.
3. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS TO ASSOCIATED MECHANICAL, ELECTRICAL OR PLUMBING SYSTEMS REQUIRED BY THE EQUIPMENTS INSTALLATION INSTRUCTIONS. ALL COSTS ASSOCIATED WITH SUBSTITUTIONS SHALL BE INCLUDED IN THE ORIGINAL BASE BID.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
— - — - —	CW	COLD WATER PIPING
—— - - ——	HW	HOT WATER PIPING
—— - - - ——	HWR	HOT WATER RETURN PIPING
————	W	SANITARY WASTE PIPING
- - - - - - -	V	SANITARY VENT PIPING
—— PD ——	PD	PUMP DISCHARGE (SUMP PUMP)
—— G ——	G	NATURAL GAS PIPING
—— D ——	D	DRAIN PIPING (INDIRECT)
——⊃	-	PIPING ELBOW DOWN
——○	-	PIPING ELBOW UP
——}	-	PIPING CONTINUES
——⋈——	-	SHUT-OFF VALVE
——⋈——	-	CHECK VALVE
——⋈——	-	BALANCING VALVE
——⋈——	PRV	PRESSURE REDUCING VALVE
——⋈——	-	SOLENOID VALVE
——▭——	RPZ	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
——⊙——	-	IN-LINE PUMP
——▷——	-	PIPING REDUCER
——◎	FCO	FLOOR CLEANOUT
——▣	YCO	YARD CLEANOUT
——⊣	WCO	WALL CLEANOUT
——⊣	CO	PLUG CLEANOUT
——⊗	FD	FLOOR DRAIN
——⊞	FS	FLOOR SINK
— - —⊃+	HB	HOSE BIBB / WALL HYDRANT
— - —●— - —	SA-#	SHOCK ARRESTOR - SUFFIX INDICATES PDI SIZE

ADDITIONAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MFG	MANUFACTURER
AFG	ABOVE FINISHED GRADE	PSI	POUNDS PER SQUARE INCH
AVTR	ACID VENT THRU ROOF	T&P	TEMPERATURE AND PRESSURE
BAS	BUILDING AUTOMATION SYSTEM	TW	TEMPERED WATER
BFF	BELOW FINISHED FLOOR	TYP	TYPICAL
CFH	CUBIC FEET PER HOUR	UG	UNDERGROUND
CLG	CEILING	VTR	VENT THRU ROOF
CONT	CONTINUATION	WSV	WASTE STACK VENT
DN	DOWN	WC	WATER COLUMN
GPF	GALLONS PER FLUSH		
GPM	GALLONS PER MINUTE	EC	ELECTRICAL CONTRACTOR
HP	HORSE POWER	FSC	FOOD SERVICE CONTRACTOR
INV	INVERT ELEVATION	GC	GENERAL CONTRACTOR
KW	KILOWATT	MC	MECHANICAL CONTRACTOR
MBH	1,000 BRITISH THERMAL UNIT / HOUR	PC	PLUMBING CONTRACTOR

PLUMBING SHEET INDEX

SHEET NUMBER	SHEET NAME
P-001	PLUMBING LEGEND, INDEX, AND NOTES
P-002	PLUMBING SCHEDULES
P-003	PLUMBING DETAILS
P-101	FIRST FLOOR DRAINAGE PIPING PLAN - POWER HOUSE
P-102	DRAINAGE PIPING ROOF PLAN - POWER HOUSE
P-201	FIRST FLOOR SUPPLY PIPING PLAN - POWER HOUSE
P-301	FIRST FLOOR PLUMBING GAS PIPING PLAN - POWER HOUSE
P-302	PLUMBING GAS PIPING ROOF PLAN - POWER HOUSE
P-501	ENLARGED PLUMBING PLANS
SHEET TOTAL: 9	

Jenkins · Peer *Architects*
112 South Tryon Street, Suite 1300
Charlotte, North Carolina 28284
(t) 704/372-6665

KENNERLY ENGINEERING & DESIGN
NC License Number - C-3900
Civil Engineer
12133 N Highway 150, Suite F
Winston Salem, North Carolina 27127
(t) 336/775-2115

SURFACE 678
NC License Number - C-098
Landscape Architect
215 Morris Street, Suite 150
Durham, North Carolina 27701
(t) 919/419-1199

STANLEY D. LINDSEY AND ASSOCIATES, LTD
NC License Number - C-3232
Structural Engineer
1347 Harding Place, Suite 201
Charlotte, North Carolina 28204
(t) 704/333-3122

OPTIMA ENGINEERING, P.A.
NC License Number - C-0914
Mechanical, Plumbing & Fire Protection Engineers
1927 South Tryon Street, Suite 300
Charlotte, North Carolina 28203
(t) 704/338-1292

DESIGN ENGINEERING
NC License Number - C-0657
Electrical Engineer
PO Box 1256
Lexington, North Carolina 27292
(t) 336/224-0100

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26023

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SCO ID: 22-25306-01A

TAG	DESCRIPTION	DATE
1	Addendum #4	03/21/2024

Project: 22NCT542
Drawn By: LLS
Checked By:
Date: 02/22/2024

PLUMBING LEGEND, INDEX, AND NOTES

BID SET

P-001