- GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO
- 2. DRAWINGS ARE DIAGRAMMATIC: DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.

ALL DRAWINGS MARKED P.

- 3. NEITHER ACCURACY NOR COMPLETION OF UTILITY LOCATIONS SHOWN ON DRAWINGS IS GUARANTEED. DETERMINE EXACT LOCATIONS OF EXISTING UTILITY IN FIELD, WHETHER OR NOT SHOWN ON DRAWINGS. EXERCISE CAUTION AND IDENTIFY LOCATIONS OF UNMARKED UTILITY LINES AS NECESSARY TO PERFORM WORK OF THIS SECTION.
- 4. ALL PLUMBING WORK SHALL BE IN ACCORDANCE WITH THE CURRENT PLUMBING CODE AND ALL APPLICABLE LOCAL CODES AND DRAWINGS.
- 5. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE HIS WORK WITH THAT OF ALL OTHER TRADES, INCLUDING (BUT NOT LIMITED TO), ELECTRICAL, HVAC PROCESS PIPING, KITCHEN EQUIPMENT VENDOR, STRUCTURAL AND GENERAL ARCHITECTURE.
- 6. ANY INTERFERENCE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER, AND SHALL BE RESOLVED PRIOR TO THE INSTALLATION OF THE WORK INVOLVED.
- 7. NO WORK SHALL BE INSTALLED IN VIOLATION OF ANY GOVERNING CODES. ANY WORK SHOWN ON THE DRAWINGS WHICH IS IN VIOLATION OF SUCH CODES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND SHALL BE RESOLVED PRIOR TO THE INSTALLATION OF THE WORK INVOLVED.
- 8. ALL PIPING PENETRATING CEILING AND WALLS SHALL BE INSTALLED WITH CHROME (STAINLESS WHERE NOTED) PLATED ESCUTCHEONS AT THE PENETRATION. ALL PIPING PENETRATING EXTERIOR WALLS AND ROOFS SHALL BE FLASHED IN AN APPROVED MANNER AND SHALL BE SEALED WEATHER TIGHT. PIPING PENETRATING RATED PARTITIONS

SHALL BE PROTECTED AS REQUIRD BY LOCAL CODE AUTHORITY.

- 9. MANUFACTURER'S MODEL NUMBERS ARE SPECIFIED SOLELY TO ESTABLISH STANDARDS OF QUALITY FOR PERFORMANCE AND
- MATERIALS.

 10. PRODUCTION INSTALLATION SHALL ADHERE TO MANUFACTURERS'

 PRODUCTION INSTALLATION SHALL ADHERE TO MANUFACTURERS'
- RECOMMENDATIONS.

 11. PROVIDE ACCESS PANELS FOR EQUIPMENT THAT REQUIRES PERIODIC
- 12. TOPS OF ALL FLOOR DRAINS SHALL BE SET FLUSH WITH FINISHED FLOOR. ALL PIPING ABOVE GRADE SHALL BE PROPERLY SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILING

TILES OR CEILING STRUCTURE.

- 13. CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL PLUMBING EQUIPMENT WITH THE ELECTRICAL DRAWINGS AND SHALL FURNISH EQUIPMENT WIRED FOR THE VOLTAGES SHOWN HEREIN.
- 14. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ITS ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.
- 15. CONNECT NEW WORK TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS ARE PERMISSIBLE ONLY WITH WRITTEN CONSENT OF THE OWNER. ALARM AND EMERGENCY SYSTEMS ARE NOT TO BE INTERRUPTED.
- 16. FIRESTOPPING SHALL BE INSTALLED WHENEVER PIPING CROSSES FIRE RATED PARTITIONS. REFER TO THE ARCHITECTURAL PLANS FOR FIRE RATED PARTITION LOCATIONS. THE FIRESTOPPING SHALL MATCH OR EXCEED THE FIRE RATING OF THE PARTITION PENETRATED. ALL FIRESTOPPING SHALL BE A UL LISTED ASSEMBLY.
- 17. PROVIDE SHUTOFF VALVES ON ALL BRANCH PIPING AND ON ALL SUPPLIES TO INDIVIDUAL FIXTURES AND EQUIPMENT. PROVIDE BALL VALVES ON ALL WATER MAIN BRANCHES WHERE INDICATED ON DRAWINGS. ALL VALVES SHALL BE ACCESSIBLE.
- 18. ALL SLEEVES THROUGH CONCRETE FLOORS AND ALL CORE DRILLING OF CONCRETE FLOORS AND WALLS SHALL BE BY THIS CONTRACTOR.
- COORDINATE ROOF PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS.
- 20. RUN PIPING CONCEALED IN WALLS AND CEILING CAVITIES, UNLESS SPECIFIED OTHERWISE, AND CLEAR OF CEILING INSERTS.
- 21. PROVIDE CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING.
- 22. PROVIDE BALANCING VALVES AT SYSTEM LOOP RETURNS AND AT RETURN RISERS. PROVIDE SHUT-OFF VALVES AT SYSTEM LOOP SUPPLIES AND SUPPLY RISERS.
- 23. PROVIDE VENTS AT HIGH POINTS IN PIPING SYSTEMS AND DRAIN VALVES AT LOW POINTS.

- 24. PROVIDE GAUGE FITTINGS AND THERMOMETER WELLS AT HOT WATER SUPPLY AND RETURN BRANCHES AND AT PUMP INLETS AND OUTLETS.
- 25. VERIFY EXACT SIZES, LOCATIONS, INVERTS AND ELEVATIONS PRIOR TO RUNNING ANY PIPING. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF ALL FIXTURES AND EQUIPMENT.
- 26. PLUMBING SUBCONTRACTOR IS RESPONSIBLE FOR EXTENDING ALL REGULATOR VENTS TO ATMOSPHERE. REGULATORS ARE PART OF THIS CONTRACTORS SCOPE OF WORK.
- 27 WATER HEATERS SHALL BE INSTALLED WITH DRAIN PANS UNDER HEATERS. ROUTE PAN DRAINS TO NEAREST FLOOR DRAIN OR SAFE WASTE PIPE LOCATION.
- 28. PIPING SHALL NOT RUN OVER ELECTRICAL PANELS AND SHALL BE COORDINATED WITH WORK OF OTHER TRADES.
- 29. ALL NEW PIPING SHALL BE CONCEALED IN CEILING, WALL CAVITIES AND/OR UNDER SLAB, UNLESS OTHERWISE NOTED. EXISTING PIPING TO REMAIN BUT EXPOSED AS A RESULT OF DEMOLITION OPERATIONS SHALL BE RE-ROUTED/MODIFIED FOR CONCEALMENT IN CEILING OR WALL CAVITIES, OR UNDER SLAB, AT NO ADDITIONAL COST TO THE OWNER.
- 30. CONTRACTOR SHALL INCLUDE PATCHING OF CONCRETE FLOOR DUE TO SAWCUTTING REQUIREMENTS FOR NEW UNDERGROUND PIPING.
- 31. CONTRACTOR SHALL PROVIDE BACKFLOW PREVENTION DEVICES ON ALL WATER CONNECTED EQUIPMENT AS REQUIRED BY APPLICABLE CODE.
- 32. PC IS RESPONSIBLE TO PROVIDE ACCESS PANELS FOR ANY CONCEALED PLMBING WORK THAT MUST BE ACCESSIBLE EITHER BY CODE OR AS INDICATED IN THE DOCUMENTS. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED AND APPROVED BY ARCHITECT PRIOR TO INSTALLATION OF DEVICE REQUIRING THE ACCESS PANEL. ALL ACCESS DOORS MUST MATCH THE FIRE RATING AND CONSTRUCTION TYPE OF THE CEILING OR WALL PENETRATION AS

DESIGNATED ON THE ARCHITECTURAL DRAWINGS.

- 33. THE CONTRACTOR SHALL BRING ANY CONFLICTS IN THE DRAWINGS TO THE ATTENTION OF THE ENGINEER DURING THE BIDDING PROCESS. IF NOT BROUGHT UP TO THE ENGINEER DURING THE BIDDING PROCESS THE MORE EXPENSIVE OPTION SHALL BE CHOSEN FOR BIDDING PURPOSES.
- 34. THE CONTRACTOR SHALL PROVIDE ADJUSTABLE THERMOSTATIC MIXING VALVES FOR ALL HAND SINKS TO LIMIT THE HOT WATER TEMPERATURE COMING OUT OF THE FAUCET TO 105 DEGREES FAHRENHEIT BUT BE ADJUSTABLE UP TO 110 DEGREES FAHRENHEIT AS DIRECTED BY THE CLIENT.
- 35. THE CONTRACTOR SHALL USE THERMOSTATIC MIXING VALVES THAT COMPLY WITH ASSE STANDARDS. POINT OF USE MIXING VALVES SHALL COMPLY WITH ASSE 1070-2020 OR 1069-2020. MANIFOLD MIXING VALVES SHALL COMPLY WITH ASSE 1069-2020. FACILITY WATER DISTRIBUTION MIXING VALVES SHALL COMPLY WITH ASSE 1017-2009. EMERGENCY EYEWASH / SHOWER MIXING VALVES SHALL COMPLY WITH ASSE 1071-2012.
- 36. THE CONTRACTOR SHALL PROVIDE COVERS FOR ALL PIPING ABOVE AND BELOW GROUND AT THE END OF THE DAY AND DURING THE DAY TO ENSURE DEBRIS DOES NOT ENTER THE PIPE. FAILURE TO DO THIS WILL REQUIRE THE CONTRACTOR TO SCOPE THE PIPING AFTER FINAL INSTALLATION AND VIDEO TAPE THE SCOPING FOR RECORD TO ENSURE NO DEBRIS IS PRESENT IN THE PIPE. ANY DEBRIS WILL BE REMOVED OR THE PIPE WILL BE REPLACED AT THE CONTRACTORS EXPENSE INCLUDING THE TRENCHING AND REPAIR OF ANY FLOOR OR GRADE FINISHES. A COPY OF THE VIDEO SHALL BE GIVEN TO THE OWNER FOR THEIR RECORD.
- 37. FOR ALL FAST ACTING VALVES SUCH AS BUT NOT LIMITED TO ELECTRICALLY OPERATED VALVES, HOSE STATIONS, HOSE SPRAYERS, FLUSHOMETERS, ETC., WATER HAMMER ARRESTERS ARE TO BE PROVIDED. ARRESTER SHALL BE SIZED AS PER THE ARRESTER MANUFACTURER REQUIREMENTS AND COORDINATED WITH THE SIZE OF
- THE FAST ACTING VALVE.

 38. PLUMBING CONNECTIONS ARE SHOWN FOR DIAGRAMMATIC PURPOSES AND THE CONTRACTOR SHALL NOT BASE THEIR BID ON THE LOCATION OF THOSE CONNECTIONS. SUBMISSION OF A BID INDICATES AN UNDERSTANDING THE CONTRACTOR WILL CONNECT THE PLUMBING CONNECTIONS TO THE EQUIPMENT IN THE LOCATION SPECIFIED BY THE MANUFACTURE OR PER CONSTRUCTION RESTRICTIONS AT NO ADDITIONAL COST TO THE CLIENT.
- 39. PLUMBING CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL FINAL UTILITY CONNECTIONS WITH THE UTILITY COMPANIES. FOR EXAMPLE: IF THE PROJECT HAS NATURAL GAS SERVICE AND THE SYSTEM IS EXISTING THE CONTRACTOR SHALL CALL THE UTILITY COMPANY AND TAKE OVER AS THE LEAD CONTACT PERSON FOR THE ADDITIONAL LOAD APPLICATION AND BE THE NEW POINT OF CONTACT FOR ANY CHANGES REQUIRED FOR THE EXISTING GAS SERVICE. THIS INTRODUCTION AND CHANGE OF POINT CONTACT SHALL HAPPEN WITHIN THE FIRST TWO WEEKS OF STARTING THE PROJECT. IT IS THE PC'S RESPONSIBILITY TO COMMUNICATE WITH THE UTILITY COMPANY SERVICE START DATES AS TO NOT DELAY THE
- PROJECT WITH INADEQUATE UTILITY SERVICES.

 40. CONTRACTOR SHALL PROVIDE MANUFACTURED PROTECTIVE SHIELDING PIPE COVERS FOR HOT AND COLD WATER SUPPLY, TRAP, AND DRAIN PIPING IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS.

GENERAL NOTES

THE CONTRACTOR SHALL CONFORM TO THE LATEST BUILDING CODES:

IBC 2018 WITH NEW JERSEY AMENDMENTS

NSPC 2018 WITH NEW JERSEY AMENDMENTS

IFGC 2018 WITH NEW JERSEY AMENDMENTS

APPLICABLE CODES

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | | ABBREVIATIO | NS | |
|----------------------------------|---|-------------------------------|--|------|-------------------------|-------------|--------------------------|
| | NEW - UNLESS OTHERWISE NOTED, DARK | \bowtie | SHUT OFF VALVE | AFF | ABOVE FINISHED FLOOR | HS | HAND SINK |
| | LINE WEIGHT. EXISTING - UNLESS OTHERWISE | \bowtie | CHECK VALVE | AFG | ABOVE FINISHED GRADE | HW | HOT WATER |
| | NOTED, LIGHT LINE WEIGHT | $\overrightarrow{\mathbb{N}}$ | BACKFLOW PREVENTION | ASSY | ASSEMBLY | НСО | HORIZONTAL CLEANOUT |
| ——— s ——— | SANITARY PIPING | 7 | TEMPERING VALVE | BFC | BELOW FINISHED CEILING | HWR | HOT WATER RECIRCULATION |
| —— W—— —— | WASTE PIPING | | BALANCING VALVE | BFF | BELOW FINISHED FLOOR | IW | INDIRECT WASTE |
| CMA | COMINATION WASTE VENT PIPING | <u>k</u> | PRESS. RED. VALVE | BFG | BELOW FINISHED GRADE | MS | MOP SINK |
| | VENT PIPING (ABOVE) | | SOLENOID VALVE | BW | BOOT WASH | NTS, N.T.S. | NOT TO SCALE |
| | VENT PIPING (BELOW) | V | GAS COCK | CL | CENTER LINE | OC | ON CENTER |
| ST | STORM PIPING | | GREASE INTERCEPTOR | CLG | CEILING | PC | PLUMBING CONTRACTOR |
| G | NATURAL GAS | \otimes | HUB DRAIN | CO | CLEAN OUT | RD | ROOF DRAIN |
| | COLD WATER | \bigotimes | EXISTING HUB DRAIN | COMP | COMPARTMENT | RE | EXISTING TO BE REMOVED |
| | HOT WATER | | FLOOR SINK | CW | COLD WATER | REX | EXISTING TO BE RELOCATED |
| | HOT WATER RECIRC. | | EXISTING FLOOR SINK | DN | DOWN | SAN | SANITARY |
| GW | GREASE WASTE | 0 | FLOOR DRAIN | DOM | DOMESTIC WATER | SPR | SPRINKLER |
| W | INDIRECT WASTE | 0 | EXISTING FLOOR DRAIN | DW | DISH WASHER | SC | SCUPPER |
| | CONDENSATE | \oslash | FLOOR CLEAN OUT | DWH | DOMESTIC WATER HEATER | SD | STORM DRAIN |
| FW | FILTER WATER | \oslash | EXISTING FLOOR CLEAN OUT | EWH | ELECTRIC WATER HEATER | SF | SQUARE FEET |
| TW | TEMPERED WATER | <u> </u> | WALL CLEAN OUT | EWC | ELECTRIC WATER COOLER | SP | STAND PIPE |
| CA | COMPRESSED AIR | <u>=</u> | HORIZONTAL CLEAN OUT | EX | EXISTING TO REMAIN | SS | STAINLESS STEEL |
| STM | STEAM | | CASE DRAIN | FAI | FRESH AIR INTAKE | ST | STORM |
| | | ⊗ | STAND PIPE | FCO | FLOOR CLEAN OUT | TD | TRENCH DRAIN |
| | | | TRENCH DRAIN | FD | FLOOR DRAIN | TP | TRAP PRIMER |
| | | 20 | P TRAP | FFD | FUNNEL FLOOR DRAIN | TW | TEPID WATER |
| | | | PIPE DOWN & DROP | FP | FROST PROOF | TYP | TYPICAL |
| | | —— | PIPE UP & RISE | NFWH | NON FREEZE WALL HYDRANT | U/C | UNDER COUNTER |
| | | (| BACKWATER VALVE | FS | FLOOR SINK | V | VENT |
| | | | HOSE BIBB | G | GAS | VIF | VERIFY IN FIELD |
| NOT ALL SYMBOLS AND ABBREVIATIO | | | WASH DOWN FAUCET / HOSE BIBB | GI | GREASE INTERCEPTOR | VTR | VENT THRU ROOF |
| PLAN ARE USED IN THE FOLLOWING I | DRAWINGS. | 00 | WATER FILTER | НВ | HOSE BIBB | W | WASTE |
| | | | FLOW ARROW | HR | HOSE REEL | WF | WATER FILTER |
| | | | TRAP PRIMER | | | WP | WEATHERPROOF |
| | | | CONNECT TO EXISTING | | | WCO | WALL CLEAN OUT |
| | | X | DRAWING NOTE - 'x' DENOTES NOTE NUMBER SHOWN ON PLAN. | | | 1100 | TITLE GLE/III GOT |
| | | X | KEY NOTE - 'x' DENOTES NOTE NUMBER SHOWN FOR ALL PLUMBING PLANS. | | | | |
| | | $\langle x \rangle$ | DEMOLITION NOTE - 'x' DENOTES NOTE NUMBER SHOWN ON PLAN | | | | |

SYMBOL LEGENDS AND ABBREVIATIONS

PROJECT NOTES:

THE CONTRACTOR SHALL RECEIVE AND REVIEW ALL OF THE PROJECTS DRAWINGS AND SPECIFICATIONS SUCH AS ARCHITECTURAL, STRUCTURAL, HVAC, ELECTRICAL, PLUMBING, FIRE ALARM, SPRINKLER, SITE, ETC. TO UNDERSTAND THE FULL SCOPE OF WORK. FAILURE TO RECEIVE AND REVIEW THOSE PLANS DURING BIDDING WILL RESULT IN THE DENIAL OF EXTRA'S.

| Sheet Number | Sheet Name |
|--------------|-------------------------------|
| P-100 | PLUMBING COVER SHEET |
| P-101 | PLUMBING SPECIFICATIONS |
| P-200 | PLUMBING SANITARY PLAN |
| P-300 | PLUMBING CONDENSATE PLAN |
| P-400 | PLUMBING WATER PLAN |
| P-500 | PLUMBING COMPRESSED AIR PLAN |
| P-600 | PLUMBING GAS PLAN |
| P-700 | PLUMBING STEAM PLAN |
| P-800 | PLUMBING ROOF PLAN |
| P-900 | PLUMBING SANITARY RISER |
| P-901 | PLUMBING WATER RISER |
| P-902 | PLUMBING GAS RISER |
| P-903 | PLUMBING COMPRESSED AIR RISER |
| P-904 | PLUMBING STEAM RISER |
| P-1000 | PLUMBING DETAILS |
| P-1001 | PLUMBING DETAILS |
| P-1002 | PLUMBING DETAILS |
| P-1003 | PLUMBING DETAILS |
| P-1004 | PLUMBING DETAILS |
| P-1005 | PLUMBING DETAILS |
| P-2000 | PLUMBING SCHEDULES |
| PD-100 | PLUMBING DEMOLITION PLAN |

DRAWING LIST

GENERAL CONDITIONS NOTE: THIS DRAWING AND THE DESIGN DESCRIBED HEREIN, INCLUDING THE SPECIFICATIONS, ARE THE EXCLUSIVE PROPERTY OF **BD ENGINEERING.** WE RESERVE THE RIGHT TO HAVE THIS WORK REPRODUCED, FABRICATED, CONSTRUCTED OR MANUFACTURED. THIS DRAWING IS PLACED ON LOAN SOLELY FOR YOUR INSPECTION. ACTUAL FABRICATION, CONSTRUCTION OR MANUFACTURING, IS SPECIFICALLY **PROHIBITED** UNLESS AND/OR UNTIL ALL GOVERNMENTAL PERMITS, LICENSES, AS WELL AS INSURANCE REQUIREMENTS, HAVE BEFOR PROPERTY LIFED BY THE COMPANY OR INDIVIDIAL (CONTRACTOR). HAVE BEEN PROPERLY FILED BY THE COMPANY OR INDIVIDUAL (CONTRACTOR WHO HAS BEEN RETAINED TO PERFORM THE WORK DESCRIBED HEREIN, AND THIS DRAWING HAS BEEN ACKNOWLEDGED "FOR CONSTRUCTION". THE CONTRACTOR ASSUMES ALL RESPONSIBILITIES FOR VEHEVING THAT THE DIMENSIONS, AND/OR CONDITIONS AT THE JOB SITE ARE AS REPRESENTED ON THIS DRAWING AND ACCOMPANYING SPECIFICATIONS. IF THERE IS ANY INIS DRAWING AND ACCUMENTANTING SPECIFICATIONS. IF THERE IS ANY DISCREPANCY BETWEEN WHAT IS DESCRIBED IN THESE DOCUMENTS AND THE ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL INFORM THE ENGINEER PRIOR TO SIGNING THE CONTRACT. IT IS THE EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND COMPLY WITH ALL BUILDING AND/OR MUNICIPAL AND STATE RULES AND REGULATIONS. FAILURE OF THE CONTRACTOR TO EXERCISE THE AFOREMENTIONED PROCEDURES WILL RESULT IN THE CONTRACTOR ORDSPECTIVE AND/OR MODIFICIAL FAIR ADDRESS OF THE AFORE ON THEM IN IN THE CONTRACTOR CORRECTING AND/OR MODIFYING THE AREAS OR ITEMS IN CONFLICT AT HIS OWN EXPENSE. NO EXCEPTIONS!! copyright - BD ENGINEERING Revisions CYBUL CYBUL WILHELM ARCHITECTS 1064 River Rd. Edgewater, NJ 07020 KOESTNER ASSOCIATES P.O.BOX 514 Hackensack, NJ 07602 ALLIED ENGINEERING 730 River Road New Milford, NJ 07646 BD ENGINEERING, LLC.

30 Park Road, Suite 4 30 Park Road, Suite 4 Tinton Falls, NJ 07724 Lorenzo Foods Teterboro 25 CENTRAL AVE TETERBORO, NJ, 07608 DOB STAMP REVIEW PLANNING BOARD BUILDING DEPT BID ____ CONSTRUCTION ផ្លី BRIAN D. TANNENHAUS NJ PROFESSIONAL ENGINEER NO. GE 45801 DATE: 02/24/2022 PLUMBING COVER SHEET 09/24/2021 P-100.00

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- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE PART OF THESE SPECIFICATIONS, AND THERE PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIAL WHICH VIOLATES ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR OWN COST.
- C. INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM THE MANUFACTURE IN SECTIONS OF A SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM THE BUILDING OWNER AND TENANT AT WHAT TIMES OF THE DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- D. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. PIPE ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS/HER PRICE FOR ROUTING OF PIPING TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED. MAINTAIN HEADROOM AND SPACE CONDITIONS.
- E. SUPPORT ALL PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES CONTENT AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER. PROVIDE SEISMIC RESTRAINTS AS REQUIRED BY CODE.
- F. INSTALL WORK AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM THE DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES, WHICH INVOLVE EXTRA COST, SHALL NOT BE MADE WITHOUT OUR OR OWNER APPROVAL.
- G. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSED.
- H. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH A MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED A NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF THE OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF THE EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.
- I. DISCONNECT. REMOVE AND/OR RELOCATE EXISTING MATERIAL. EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF
- J. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- K. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE
- L. SEAL OPENING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL. ALL PENETRATIONS THROUGH NEW AND EXISTING RATED FIRE AND SMOKE PARTITIONS AND/OR FLOORS SHALL BE COMPLETELY SEALED USING MATERIALS AND METHODS DESCRIBED IN SUBSEQUENT "FIRE STOPPING" SPECIFICATIONS SECTIONS.
- M. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPING AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED AND POSITIVELY ATTACH THE EQUIPMENT TO THE STRUCTURE BELOW.
- N. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- O. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES
- P. UNLESS OTHERWISE SPECIFICALLY NOTED OF SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- Q. PC IS RESPONSIBLE TO PROVIDE ACCESS PANELS FOR ANY CONCEALED PLUMBING WORK THAT MUST BE ACCESSIBLE EITHER BY CODE OR AS INDICATED IN THE DOCUMENTS. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED AND APPROVED BY ARCHITECT PRIOR TO INSTALLATION OF DEVICE REQUIRING THE ACCESS PANEL. ALL ACCESS DOORS MUST MATCH THE FIRE RATING AND CONSTRUCTION TYPE OF THE CEILING OR WALL PENETRATION AS DESIGNATED ON THE ARCHITECTURAL DRAWINGS.
- R. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- S. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF ALL OF THE PLANS APPLICABLE FOR THE PROJECT AND NOT JUST THE PLUMBING PLANS AND IS FAMILIAR WITH ANY PROPOSED CONDITIONS THAT WILL NEED TO BE COORDINATED IN THE FIELD. FOR EXISTING BUILDINGS: THE PORTIONS OF THE EXISTING

- BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INDICATE ANY DISCREPANCIES BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT THE CONTRACTOR HAS TOROUGHLY REVIEWED ALL OF THE DOCUMENTATION ASSOCIATED WITH THE PROJECT AND IF AN EXISTING BUILDING REVIEWED ALL OF THE EXISTING CONDITIONS. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION AND REVIEW. THE ON-SITE INSPECTION SHALL VERIFY EXISTING EQUIPMENT AND PIPING (SIZES, CLEARANCES, ETC.) AND CONDITIONS.
- T. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- U. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED AND BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- V. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

W. DEFINITIONS:

2. SCOPE OF WORK:

- 1. "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2. INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3. "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4. "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5. "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 6. "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED
- 7. "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

THE DRAWINGS AND HEREIN SPECIFIED.

- A. THE SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS. EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE NATIONAL STANDARD PLUMBING CODE OR AND ALL OTHER APPLICABLE INDUSTRY, STATE, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON
- B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.
- C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OF REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATED OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY THE OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BE DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.
- D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES FOR, AND FURNISH TO THE OWNER BEFORE BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

3. SHOP DRAWINGS:

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, THE CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT OTHER TRADES SUCH AS BUT NOT LIMITED TO HVAC AND STRUCTURAL BEAMS, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

- 1) PROJECT NAME AND LOCATION
- 2) NAME OF ARCHITECT AND ENGINEER
- 3) ITEM IDENTIFICATION
- 4) APPROVAL STAMP OF THE PRIME CONTRACTOR

C. SUBMISSIONS:

- 1) SUBMISSIONS 11 IN X 17 IN OR SMALLER. IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
- 2) SUBMISSIONS LARGER THAN 11 IN X 17 IN. SUBMIT TWO PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT TO THE

ENGINEER.

- D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING
- VALVES
- 3) INSULATION

4) FITTINGS

- 5) FIXTURES AND EQUIPMENT
- 4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS:
- A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THE CONTRACT.
- B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
- C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.
- D. REPRODUCIBLE "AS-BUILT" DRAWINGS PREPARED IN COMPUTER AIDED DRAFTED (AUTO CAD) FORMAT SHALL BE PROVIDED TO THE OWNER INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. A COMPLETE "AS-BUILT" DRAWING FILE SHALL BE PROVIDED TO THE OWNER AFTER COMPLETION OF THE INSTALLATION.

5. GENERAL PROVISIONS FOR PLUMBING WORK:

- A. QUALITY ASSURANCE
- 1. QUALITY AND GAUGE OF MATERIALS: NEW, BEST OF THEIR RESPECTIVE KINDS, FREE FROM DEFECTS AND LISTED BY UNDERWRITERS LABORATORIES, INC., OR BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
- 2. GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK.
- B. PRODUCT DELIVERY, STORAGE AND HANDLING
- 1. MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
- 2. ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.
- C. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED. RED LEAD OR ZINC CHROMATE WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT. A FIELD-APPLIED ZINC CHROMATE PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRON WORK.
- D. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED. CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT
- E. G. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL PLUMBING FIXTURES SHALL BE VERIFIED BY ARCHITECT.
- F. H. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
- 6. PLUMBING PIPING MATERIALS:
- A. SANITARY DRAINAGE AND VENT
- 1. HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH EXTRA HEAVY DUTY GASKETED HUBLESS COUPLINGS FOR FOOD SERVICE APPLICATIONS.
- 2. SCHEDULE 40 PVC PIPE WITH CEMENT TYPE SLIP FIT PIPE AND FITTINGS.
- 3. GALVANIZED SCHEDULE 40 STEEL PIPE WITH GALVANIZED THREADED MALLEABLE IRON FITTINGS.

B. DOMESTIC WATER

- 1. TYPE L HARD COPPER TUBING WITH CAST BRONZE OR WROUGHT COPPER FITTINGS AND 95/5 TIN ANTIMONY SOLDER JOINTS.
 - 2. STANDARD WEIGHT RED BRASS PIPE WITH STANDARD WEIGHT CAST BRONZE THREADED FITTINGS.
 - C. STORM PIPING
 - 1. HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH EXTRA HEAVY DUTY GASKETED HUBLESS COUPLINGS.
 - 2. SCHEDULE 40 PVC PIPE WITH CEMENT TYPE SLIP FIT PIPE AND FITTINGS.
 - 3. GALVANIZED SCHEDULE 40 STEEL PIPE WITH GALVANIZED THREADED MALLEABLE IRON FITTINGS.
 - D. STEAM PIPING
 - 1. SCHEDULE 80 BLACK STEEL WITH WELDED JOINTS
 - E. ALL EXPOSED PIPE AND FITTINGS SHALL BE CHROME PLATED BRASS.

- F. ALL EXPOSED PIPING PASSING THROUGH WALLS, FLOORS, CEILINGS, AND PARTITIONS SHALL BE PROVIDED WITH CHROME PLATED CAST BRASS ESCUTCHEONS HELD IN PLACE WITH SET SCREWS.
- A. GATE VALVES: 1. BRONZE RISING STEM, 200 PSI WOG; SIMILAR TO STOCKHAM #B-105, B-109.

B. BALL VALVES: 1. TWO PIECE, BRONZE, END ENTRY, 600 PSI WWP;

SIMILAR TO STOCKHAM #S-216 BR-R-T, #S-216 BR-R-S.

C. CHECK VALVES: 1. BRONZE, THREADED CAP, TEFLON DISC; SIMILAR TO STOCKHAM #B310T, B-320T.

8. INSULATION:

- A. ALL INSULATION (INCLUDING JACKET, FACING AND ADHESIVE) SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURES LISTED IN ASTM E-84, NFPA 255 AND UL 273; NOT EXCEEDING A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED OF 50.
- B. ON VALVES AND FITTINGS PROVIDE PRE-MOLDED FIBERGLASS FITTINGS. VAPOR SEAL INSULATION ON "CW".
- C. "CW" PIPING: PROVIDE 1/2 IN. THICK FIBERGLASS SECTION PIPE COVERING WITH VAPOR BARRIER JACKET.
- D. "HW" PIPING: PROVIDE 1 IN. THICK FIBERGLASS SECTIONAL PIPE COVERING WITH VAPOR BARRIER JACKET.
- E. STEAM PIPING: PROVIDE 3 "IN. THICK FIBERGLASS SECTION PIPE WITH VAPOR BARRIER JACKET.
- E. INTERIOR STORM PIPING: PROVIDE 1 IN. THICK FIBERGLASS SECTIONAL PIPE COVERING WITH VAPOR BARRIER JACKET.
- 9. PLUMBING FIXTURES:
- A. PROVIDE ALL FIXTURES WITH STOP VALVES AND SUPPLIES AND FIXTURE TRAPS AS REQUIRED.
- B. ALL FIXTURES SHALL BE AS INDICATED ON THE ARCHITECTURAL DOCUMENTS.
- A. SUPPORT ALL PIPING FROM BUILDING CONSTRUCTION BY PROVIDING INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY)
- B. PROVIDE TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS FOR GROUPED LINES AND SERVICES.

AND ACCEPTABLE BRACKETS. SUBMIT ALL METHODS FOR REVIEW.

- C. PROVIDE ADDITIONAL FRAMING WHERE BUILDING CONSTRUCTION IS
- D. SUSPENDED HORIZONTAL PIPING:

SADDLES FOR FLOOR-MOUNTED PIPING.

INADEQUATE. SUBMIT FOR REVIEW.

- 1. SUPPORT ALL PIPING INDEPENDENTLY FROM STRUCTURE USING HEAVY IRON-HINGED TYPE HANGERS, SIMILAR TO GRINNELL CLEVIS NO. 260.
- 2. PROVIDE ELECTROPLATED SOLID-BAND HANGERS SIMILAR TO AUTO-GRIP, FOR TWO-INCH AND SMALLER PIPE.
- 3. PROVIDE WALL BRACKETS FOR WALL-SUPPORTED PIPING, AND PROVIDE PIPE
- 4. PROVIDE SUPPORTS WITH COPPER LINING FOR UNINSULATED COPPER PIPING.
- 5. SUSPEND PIPING FROM INSERTS, USING BEAM CLAMPS WITH RETAINING CLAMP OR LOCKNUT, STEEL FISH PLATES, CANTILEVER BRACKETS OR OTHER ACCEPTED MEANS. BEAM CLAMPS SHALL BE SIMILAR TO GRINNELL FIGURES

6. SUSPEND PIPING BY RODS WITH DOUBLE NUTS.

- 7. PROVIDE ADDITIONAL STEEL FRAMING AS REQUIRED AND ACCEPTED WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING HANGER RODS IN REQUIRED LOCATIONS.
- 8. SUPPORT BRANCH FIXTURE WATER PIPING IN CHASES WITH COPPER-PLATED METAL BRACKETS, SECURED TO STUDS, SIMILAR TO HOLDRITE NOS. 102-18, 107-18, 102-26, OR 101-26.
- E. PROVIDE 180 DEGREE ARC GALVANIZED METAL COVERING SHIELDS ON HANGERS FOR INSULATED PIPING WITHOUT INCOMPRESSIBLE INSULATING BLOCK IN INSULATION AT HANGERS.
- F. MAXIMUM HANGER SPACING AS INDICATED.

1. PIPE 1 INCH AND SMALLER SHALL BE EVERY 8 FEET.

- 2. PIPE 1-1/4 INCH AND LARGER SHALL BE EVERY 10 FEET.
- 3. COPPER TUBING 1-1/4 INCH AND SMALLER SHALL BE EVERY 6 FEET.
- 4. COPPER TUBING 1-1/2 INCH AND LARGER SHALL BE EVERY 10 FEET.
- 5. CAST IRON: EVERY 5 FEET AND AT EVERY FITTING OR JOINT.
- G. EXPANSION ANCHORS:
- 1. PROVIDE SMOOTH WALL, NON-SELF-DRILLING INTERNAL PLUG EXPANSION TYPE ANCHORS CONSTRUCTED OF AISC 12L14 STEEL AND ZINC PLATED IN ACCORDANCE WITH FED. SPEC. QQ-A-325 TYPE 1, CLASS 3.
- 2. DO NOT EXCEED 1/4 OF AVERAGE VALVES FOR A SPECIFIC ANCHOR SIZE USING 2000 PSIG (13,800 KPA) CONCRETE ONLY, FOR MAXIMUM WORKING
- 3. PROVIDE SPACING AND INSTALL ANCHORS IN ACCORDANCE WITH THE

- MANUFACTURER'S RECOMMENDATIONS.
- 4. EXPANSION ANCHORS SHALL BE U.L. LISTED AND SIMILAR TO HILTI HDI.

A. DOMESTIC WATER PIPING:

B. DRAINAGE AND VENT PIPING:

AT LEAST 10 FEET ABOVE THE FLOOR.

- 1. TEST PIPING HYDROSTATICALLY AT A PRESSURE OF 125 PSI.
- 2. DURATION OF TEST SHALL BE 2 HOURS WITHOUT A LOSS IN PRESSURE.
- 1. CAP ALL OUTLETS AND FILL PIPING SYSTEM TO OVERFLOWING FROM A POINT
- 2. THE WATER LEVEL SHALL REMAIN CONSTANT THROUGHOUT THE TEST DURATION OF 2 HOURS.
- C. ARRANGE AND COORDINATE TESTS WITH OWNER 48 HOURS IN ADVANCE. NOTIFY ENGINEER AND ARCHITECT OF TEST DATE AND TIME.
- D. DEFECTS DISCLOSED BY THE TESTS SHALL BE REPAIRED OR REPLACED. TESTS SHALL BE REPEATED AS DIRECTED UNTIL ALL WORK IS PROVEN SATISFACTORY.
- BUILDING AND ITS CONTENTS AS A RESULT OF SUCH TESTS. REPAIR ANY DAMAGE CAUSED.

E. TAKE ALL PRECAUTIONS NECESSARY TO PREVENT DAMAGE TO THE

12.FLUSHING AND DISINFECTING POTABLE WATER SYSTEMS:

1. THE WATER DISTRIBUTION PIPING TO ALL FIXTURES AND OUTLETS SHALL BE FLUSHED UNTIL THE WATER RUNS CLEAR AND FREE OF DEBRIS AND PARTICLES. FAUCET AERATORS OR SCREENS SHALL BE REMOVED DURING FLUSHING OPERATIONS.

b)DISINFECTING

- 1. THE HOT AND COLD WATER DISTRIBUTION PIPING IN NEW OR RENOVATED POTABLE WATER SYSTEMS SHALL BE DISINFECTED AFTER FLUSHING AND PRIOR TO USE. THE PROCEDURE USED SHALL BE AS FOLLOWS OR AN APPROVED EQUIVALENT:
 - a. ALL WATER OUTLETS SHALL BE POSTED TO WARN AGAINST USE DURING DISINFECTING OPERATIONS.
 - b. DISINFECTING SHALL BE PERFORMED BY PERSONS EXPERIENCED IN SUCH WORK.
 - c. THE WATER SUPPLY TO THE PIPING SYSTEM OR PARTS THEREOF BEING DISINFECTED SHALL BE VALVED-OFF FROM THE NORMAL WATER SOURCE TO PREVENT THE INTRODUCTION OF DISINFECTING AGENTS INTO A PUBLIC WATER SUPPLY OR PORTIONS OF A SYSTEM THAT ARE NOT BEING DISINFECTED.
- d. THE PIPING SHALL BE DISINFECTED WITH A WATER-CHLORINE SOLUTION. DURING THE INJECTION OF THE DISINFECTING AGENT INTO THE PIPING, EACH OUTLET SHALL BE FULLY OPENED SEVERAL TIMES UNTIL A CONCENTRATION OF NOT LESS THAN 50 PARTS PER MILLION CHLORINE IS PRESENT AT EVERY OUTLET. THE SOLUTION SHALL BE

ALLOWED TO STAND IN THE PIPING FOR AT LEAST 24 HOURS.

ACCEPTABLE AND APPROVED MANNER.

- e. AN ACCEPTABLE ALTERNATE TO THE 50 PPM/24-HOUR PROCEDURE SHALL BE TO MAINTAIN A LEVEL OF NOT LESS THAN 200 PARTS PER MILLION FOR NOT LESS THAN THREE HOURS. IF THIS ALTERNATE PROCEDURE IS USED, THE HEAVILY CONCENTRATED CHLORINE SHALL NOT BE ALLOWED TO STAND IN THE PIPING SYSTEM FOR MORE THAN 6 HOURS. ALSO, SPECIAL PROCEDURES SHALL BE USED TO DISPOSE OF THE HEAVILY CONCENTRATED CHLORINE IN AN ENVIRONMENTALLY
- f. AT THE END OF THE REQUIRED RETENTION TIME, THE RESIDUAL LEVEL OF CHLORINE AT EVERY OUTLET SHALL BE NOT LESS THAN FIVE PARTS PER MILLION. IF THE RESIDUAL IS LESS THAN FIVE PARTS PER MILLION, THE DISINFECTING PROCEDURE SHALL BE REPEATED UNTIL THE REQUIRED MINIMUM CHLORINE RESIDUAL IS OBTAINED AT
- EVERY OUTLET, THE SYSTEM SHALL BE FLUSHED TO REMOVE THE DISINFECTING AGENT. FLUSHING SHALL CONTINUE UNTIL THE CHLORINE LEVEL AT EVERY OUTLET IS REDUCED TO THAT OF THE INCOMING WATER SUPPLY.

g. AFTER THE REQUIRED RESIDUAL CHLORINE LEVEL IS OBTAINED AT

h. FURNISH A WRITTEN RECORD OF THE DISINFECTING TEST RESULTS.

13.NATURAL GAS PIPING

- A. GENERAL REQUIREMENTS
- 1. QUALITY ASSURANCE: COMPLY WITH NFPA 54 AND ALL LOCAL BUILDING

B. PRODUCTS

WITH ASME B1.20.1.

- 1. PIPE, TUBE, AND SPECIALTIES a)STEEL PIPE: ASTM A 53, TYPE S (SEAMLESS), GRADE B, SCHEDULE 40,
- b)MALLEABLE IRON THREADED FITTINGS: ASME B16.3, CLASS 150. c)MANUAL VALVES: COMPLY WITH STANDARDS LISTED OR, IF APPROPRIATE,
- TO ANSI Z21.15. d)GAS STOPS: AGA CERTIFIED, BRONZE-BODY, PLUG TYPE WITH BRONZE PLUG, FOR 2-PSIG OR LESS NATURAL GAS. INCLUDE AGA STAMP, FLAT

OR SQUARE HEAD OR LEVER HANDLE, AND THREADED ENDS COMPLYING

e)GAS VALVES: 150-PSIG WOG, CAST-IRON OR BRONZE BODY, BRONZE PLUG, STRAIGHTAWAY PATTERN, SQUARE HEAD, TAPERED-PLUG TYPE. f) FLEXIBLE CONNECTORS: ANSI Z21.24, COPPER ALLOY.

C. EXECUTION

1. INSTALLATION

TO FREEZING.

- a. CLOSE EQUIPMENT SHUTOFF VALVES BEFORE TURNING OFF GAS TO SECTION OF PIPING. PERFORM LEAKAGE TEST AS SPECIFIED TO DETERMINE THAT ALL EQUIPMENT IS TURNED OFF IN AFFECTED PIPING
- b. LOW-PRESSURE, 0.5 PSIG OR LESS, NATURAL GAS SYSTEMS: USE THE FOLLOWING: NPS 2" AND SMALLER: STEEL PIPE, MALLEABLE
- c. INSTALL GAS STOPS FOR SHUTOFF TO APPLIANCES WITH NPS 2" OR

IRON THREADED FITTINGS, AND THREADED JOINTS.

- d. DRIPS AND SEDIMENT TRAPS: INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT. INCLUDE OUTLETS OF GAS METERS. LOCATE WHERE READILY ACCESSIBLE TO PERMIT CLEANING AND EMPTYING. DO NOT INSTALL WHERE CONDENSATE WOULD BE SUBJECT
- e. INSTALL GAS PIPING AT UNIFORM SLOPE OF 0.1 PERCENT UPWARD
- TOWARD RISERS. f. USE ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE

SIZES. INSTALL FITTINGS WITH LEVEL SIDE DOWN.

- g. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.
- h. INSTALL STRAINERS ON SUPPLY SIDE OF EACH CONTROL VALVE, GAS PRESSURE REGULATOR, SOLENOID VALVE, AND ELSEWHERE AS
- i. INSTALL VALVES IN ACCESSIBLE LOCATIONS, PROTECTED FROM DAMAGE. TAG VALVES WITH METAL TAG INDICATING PIPING SUPPLIED. ATTACH TAG TO VALVE WITH METAL CHAIN.
- j. CONNECT GAS PIPING TO EQUIPMENT AND APPLIANCES WITH SHUTOFF VALVES AND UNIONS.

k. INSTALL GAS VALVE UPSTREAM FROM AND WITHIN 72 INCHES OF

EACH APPLIANCE USING GAS. INSTALL UNION OR FLANGED CONNECTION DOWNSTREAM FROM VALVE.

D. GAS PIPING INSPECTION, TESTING, AND PURGING

- 1. INSPECT, TEST, AND PURGE PIPING ACCORDING TO NFPA 54 AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- 14.SEISMIC RESTRAINTS A. A. ALL FUEL OIL, GASOLINE, NATURAL GAS, STEAM OR ANY PIPING

CONTAINING HAZARDOUS, FLAMMABLE, COMBUSTIBLE, TOXIC OR CORROSIVE

1. SEISMIC RESTRAINED PIPES SHALL NOT BE ISOLATED FROM THE BUILDING STRUCTURE

2. ALL GAS PIPING SHALL BE SEISMIC ALLY RESTRAINED OR BRACED. TYPE V

SEISMIC CABLES RESTRAINTS OR RESILIENT SINGLE ARM BRACES SHALL BE

B. TYPE V: SEISMIC CABLE RESTRAINTS VMC: SCR AB: ERS

- 1. SEISMIC CABLE RESTRAINTS SHALL CONSIST OF GALVANIZED STEEL AIRCRAFT CABLES SIZED TO RESIST SEISMIC LOADS WITH A MINIMUM SAFETY FACTOR OF TWO AND ARRANGED TO PROVIDE ALL-DIRECTIONAL RESTRAINT. CABLE END CONNECTIONS SHALL BE STEEL ASSEMBLIES THAT SWIVEL TO FINAL INSTALLATION ANGLE AND UTILIZE TWO CLAMPING BOLTS TO PROVIDE PROPER CABLE ENGAGEMENT. CABLES MUST NOT BE ALLOWED TO BEND
- BE SUBSTITUTED FOR SEISMIC CABLE RESTRAINTS. C. TYPE VI: RIGID ARM BRACE VMC: SAB AB: SAB
- 1. SEISMIC SOLID BRACES SHALL CONSIST OF STEEL ANGLES OR CHANNELS TO RESIST SEISMIC LOADS WITH A MINIMUM SAFETY FACTOR OF TWO AND ARRANGED TO PROVIDE ALL DIRECTIONAL RESTRAINT. SEISMIC SOLID BRACE END CONNECTORS SHALL BE STEEL ASSEMBLIES THAT SWIVEL TO THE FINAL INSTALLATION ANGLE AND UTILIZE TWO THROUGH BOLTS TO PROVIDE

PROPER ATTACHMENT SPACED TO ICBO STANDARDS FOR ATTACHMENT TO

ACROSS SHARP EDGES. SINGLE ARM BRACES WITH RESILIENT BUSHINGS CAN

- D. TYPE VIII: SEISMIC WATERPROOF FOUNDATION WALL SLEEVE VMC: SWFWS
- 1. SEISMIC WATERPROOF FOUNDATION WALL SLEEVES SHALL CONSIST OF TWO ELASTOMERIC SLEEVES THAT SHALL BE MOUNTED BOTH INSIDE AND OUT OF THE VERTICAL FOUNDATION WALL. THE CONICAL DESIGN SHALL HAVE A SUITABLY WATERPROOF MEANS OF FASTENING TO BOTH CONCRETE AND TO ITS CONCENTRIC UTILITY PIPE. ALLOWABLE VERTICAL DRIFT SHALL BE PLUS

OR AXIS. ALL FITTINGS "Y" FROM THE INSTALLED NEUTRAL POINT ALONG

THE VERTICAL "MINUS 2 SHALL BE STAINLESS STEEL OR GALVANIZED.

3.1 EXAMINATION

PART 3- EXECUTION

CONCRETE.

AB: SWFWS

- A. ALL AREAS THAT WILL RECEIVE COMPONENTS REQUIRING VIBRATION CONTROL, SEISMIC OR WIND LOAD BRACING SHALL BE THOROUGHLY EXAMINED FOR DEFICIENCIES THAT WILL AFFECT THEIR INSTALLATION OR PERFORMANCE. SUCH DEFICIENCIES SHALL BE CORRECTED PRIOR TO THE
- B. EXAMINE ALL ROUGH INS "INCLUDING ANCHORS AND REINFORCING PRIOR TO PLACEMENT.
- 3.2 COMPONENT INSTALLATION, (GENERAL)

SUBMITTAL DATA.

INSTALLATION OF ANY SUCH SYSTEM.

- A. ALL SEISMIC SYSTEMS MUST BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND ALL CERTIFIED
- B. INSTALLATION OF SEISMIC RESTRAINTS MUST NOT CAUSE ANY CHANGE OF POSITION OF EQUIPMENT, PIPING OR DUCTWORK RESULTING IN STRESSES OR MISALIGNMENT.
- C. NO RIGID CONNECTIONS BETWEEN EQUIPMENT AND THE BUILDING

- STRUCTURE SHALL BE MADE THAT DEGRADES THE NOISE AND VIBRATION CONTROL SYSTEM SPECIFIED HEREIN.
- D. COORDINATE WORK WITH OTHER TRADES TO AVOID RIGID CONTACT WITH THE BUILDING.
- E. OVER STRESSING OF THE BUILDING STRUCTURE MUST NOT OCCUR SUBMIT LOADS TO THE STRUCTURAL ENGINEER OF RECORD FOR APPROVAL. GENERAL BRACING MAY OCCUR FROM FLANGES OF STRUCTURAL BEAMS, UPPER TRUSS CORDS IN BAR JOIST CONSTRUCTION AND CAST IN PLACE INSERTS OR WEDGE TYPE DRILL-IN CONCRETE

- - INSIDE NUTS IF REQUIRED BY SEISMIC ACCELERATION LEVELS.
- 3.4 PIPING AND ISOLATION
- 1. GAS LINES SHALL NOT BE ISOLATED
- 1. ALL HIGH HAZARD AND LIFE SAFETY PIPE REGARDLESS OF SIZE SUCH AS FUEL OIL PIPING, GAS PIPING SHALL BE SEISMIC ALLY RESTRAINED OR BRACED. TYPE V SEISMIC CABLES RESTRAINTS OR RESILIENT SINGLE ARM BRACES SHALL BE USED IF PIPING IS ISOLATED. TYPE V SEISMIC CABLE RESTRAINTS OF TYPE VI SINGLE ARM BRACES MAY BE USED ON

NON-ISOLATED PIPING. THERE ARE NO EXCLUSIONS FOR SIZE OR DISTANCE

- SINGLE ARM BRACES SHALL BE USED IF PIPING IS ISOLATED. TYPE V SEISMIC CABLE RESTRAINTS OR TYPE VI SINGLE ARM BRACES MAY BE USED
- 3. SEE TABLE D FOR MAXIMUM SEISMIC BRACING DISTANCES

ON UNISOLATED PIPING.

- 4. MULTIPLE RUNS OF PIPE ON THE SAME SUPPORT SHALL HAVE DISTANCE DETERMINED BY CALCULATION. " E. "
- CONTRACTION.

LOADS IN ADDITION TO THE LOADS INDUCED BY EXPANSION OF

THEY HAVE A CAPACITY EQUAL TO OR GREATER THAN THE RESTRAINT

- 20' MAXIMUM AND LONGITUDINAL RESTRAINTS AT 40' MAXIMUM SPACING. 9. TRANSVERSE RESTRAINT FOR ONE PIPE SECTION MAY ALSO ACT AS LONGITUDINAL RESTRAINT FOR A PIPE SECTION OF THE SAME SIZE
- 11.BRANCH LINES MAY NOT BE USED TO RESTRAIN MAIN LINES. 12. WHERE PIPE PASSES THROUGH A TWO-SIDED SHEETROCK WALL, THE WALL, IF TIGHT TO THE, "PIPE, SHALL ACT AS A LATERAL/TRANSVERSE BRACE
- 13. WHERE HORIZONTAL PIPE CROSSES A BUILDING'S DRIFT EXPANSION JOINT. ALLOWANCE SHALL BE PART OF THE DESIGN TO ACCOMMODATE

BECAUSE OF OVERHEAD SUPPORT OF EQUIPMENT. CONTRACTOR MUST

- F. SEISMIC CABLE RESTRAINTS SHALL BE INSTALLED SLIGHTLY SLACK TO AVOID SHORT CIRCUITING THE ISOLATED SUSPENDED EQUIPMENT OR
- G. SEISMIC CABLE ASSEMBLIES ARE INSTALLED TAUT ON NON-ISOLATED SYSTEMS. SEISMIC SINGLE ARM BRACES MAY BE USED IN PLACE OF CABLES ON RIGIDLY ATTACHED SYSTEMS BUT CAN ALSO BE USED ON ISOLATED SYSTEMS WHEN INCORPORATING RESILIENT BUSHINGS.
- H. AT LOCATIONS WHERE SEISMIC CABLE RESTRAINTS OR SEISMIC SINGLE ARM BRACES ARE LOCATED, THE SUPPORT RODS MUST BE BRACED WHEN NECESSARY TO ACCEPT "E. "COMPRESSIVE LOADS. SEE TABLE

I. AT ALL LOCATIONS WHERE SEISMIC CABLE BRACES AND SEISMIC CABLE

BE REINFORCED WITH PIPE CLEVIS CROSS BOLT BRACES OR DOUBLE

RESTRAINTS ARE ATTACHED TO THE PIPE CLEVIS, THE CLEVIS BOLT MUST

- A. VIBRATION ISOLATION OF PIPING
- B. SEISMIC RESTRAINT OF PIPING
- IN THIS CATEGORY. 2. SEISMIC ALLY RESTRAIN PIPING LOCATED IN BOILER ROOMS, MECHANICAL EQUIPMENT ROOMS I.D. AND LARGER. TYPE V SEISMIC CABLES " AND REFRIGERATION EQUIPMENT ROOMS THAT IS 1 1/4 RESTRAINTS OR RESILIENT

5. ROD BRACES SHALL BE USED FOR ALL ROD LENGTHS AS LISTED IN TABLE

- 6. CLEVIS HANGERS SHALL HAVE BRACES PLACED INSIDE OF HANGER AT SEISMIC BRACE LOCATIONS. 7. WHERE THERMAL EXPANSION IS A CONSIDERATION, GUIDES AND ANCHORS MAY BE USED AS TRANSVERSE AND LONGITUDINAL RESTRAINTS PROVIDED
- 8. FOR FUEL OIL AND ALL GAS PIPING, TRANSVERSE RESTRAINTS MUST BE AT
- CONNECTED PERPENDICULAR TO IT IF THE OF THE ELBOW OR TEE OR COMBINED STRESSES ARE WITHIN "RESTRAINT IS INSTALLED WITHIN 24

ALLOWABLE LIMITS AT LONGER DISTANCES.

WITH METAL CORNER BEAD.

DIFFERENTIAL MOTION.

- 10.HOLD DOWN CLAMPS MUST BE USED TO ATTACH PIPE TO ALL TRAPEZE MEMBERS BEFORE LONG. "APPLYING RESTRAINTS. USE TYPE V OR VI RESTRAINT, IF TRAPEZE IS SMALLER THAN 48

FOR PIPE SIZES UP TO AND INCLUDING 4 PROVIDED HOLE IS REINFORCED

Revisions

<u>ENERAL CONDITIONS NOTE</u>

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IN THE CONTRACTOR CORRECTING AND/OR MODIFYING THE AREAS OR ITEMS IN CONFLICT AT HIS OWN EXPENSE. **NO EXCEPTIONS!!**

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ALLIED ENGINEERING

New Milford, NJ 07646

730 River Road



25 CENTRAL AVE TETERBORO, NJ, 07608 DOB STAMP

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ISSUED FOR REVIEW

PLANNING BOARD

BUILDING DEPT

CONSTRUCTION BRIAN D. TANNENHAUS

NJ PROFESSIONAL ENGINEER

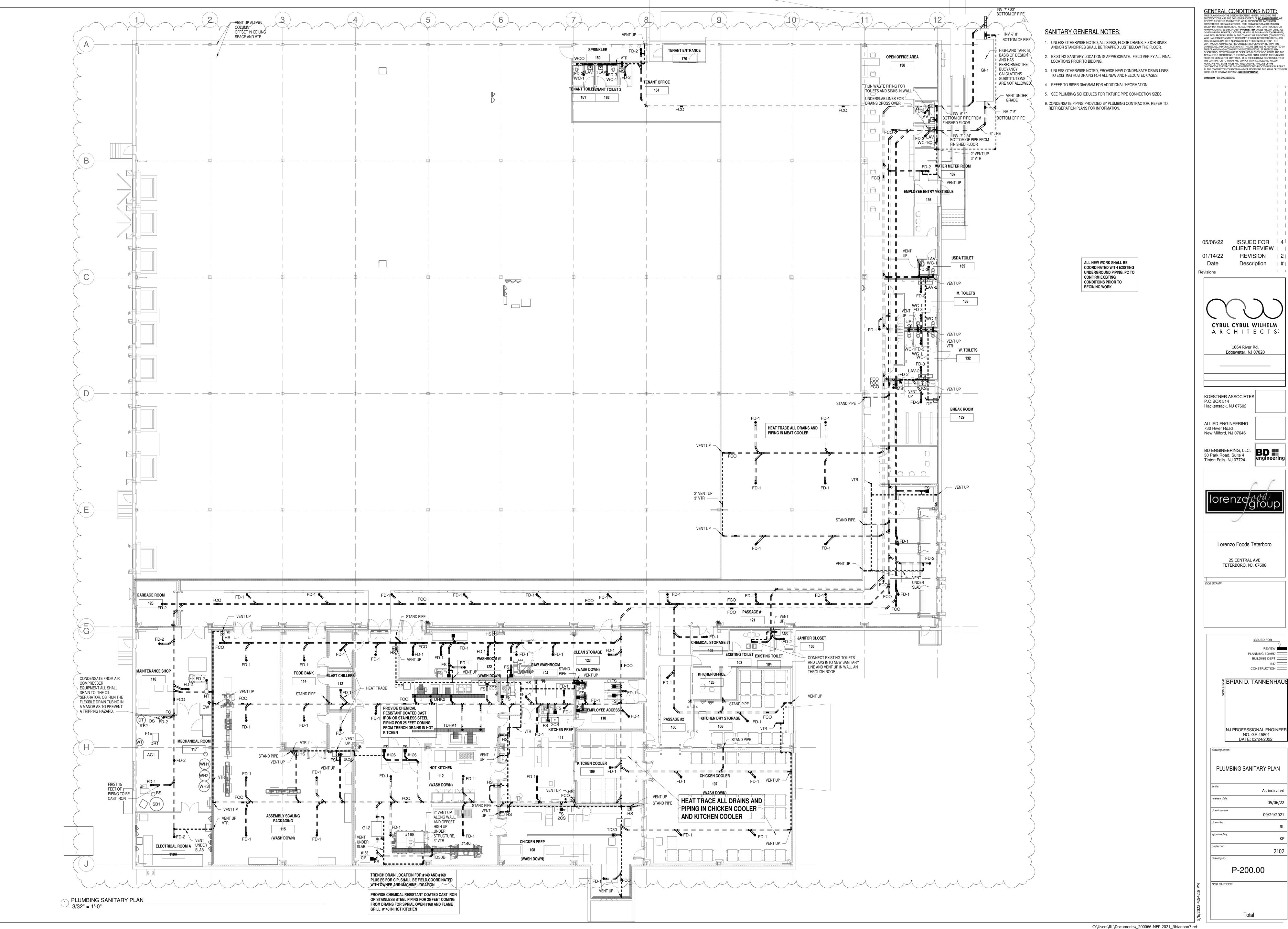
NO. GE 45801 DATE: 02/24/2022

PLUMBING SPECIFICATIONS

09/24/2021

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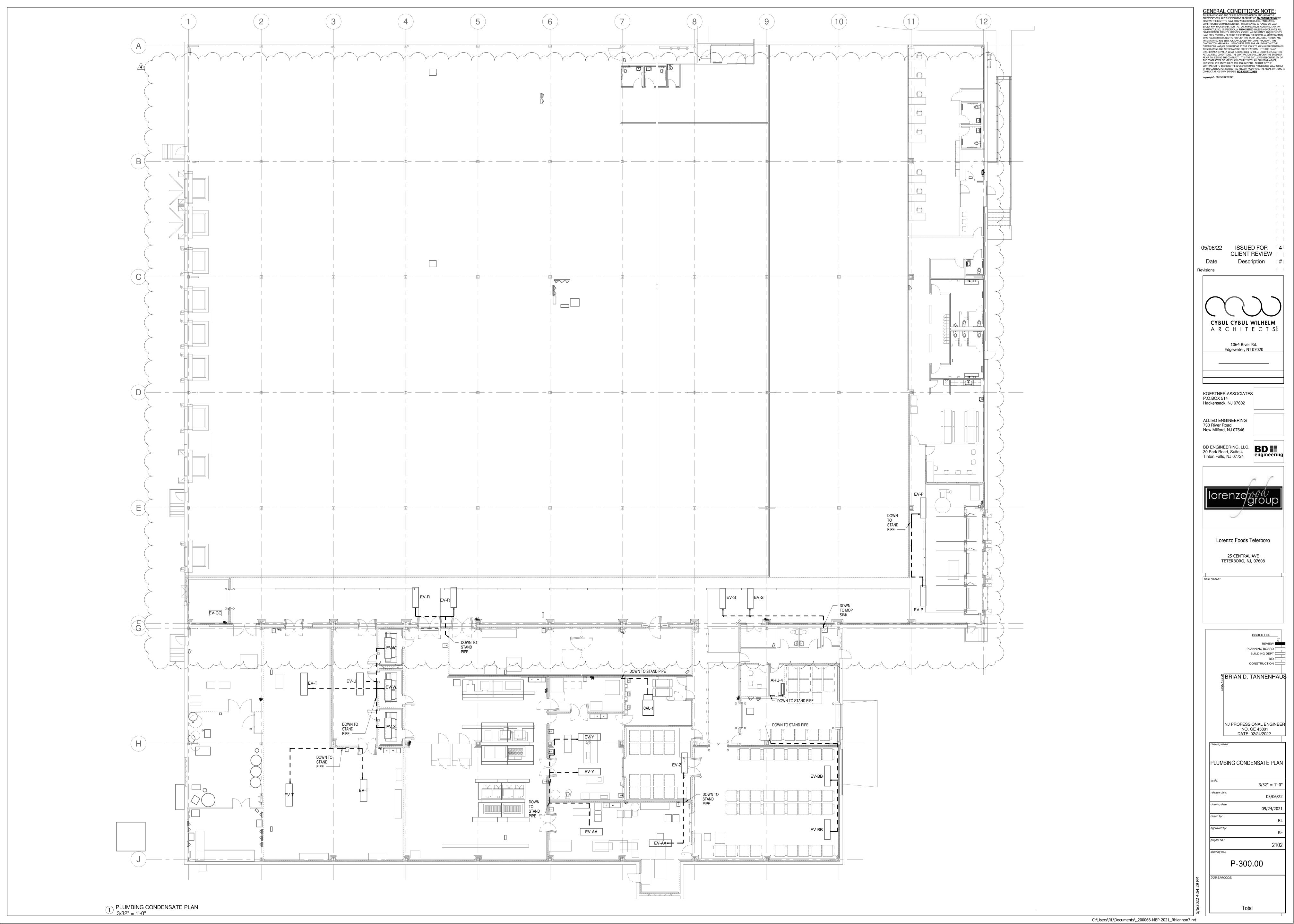
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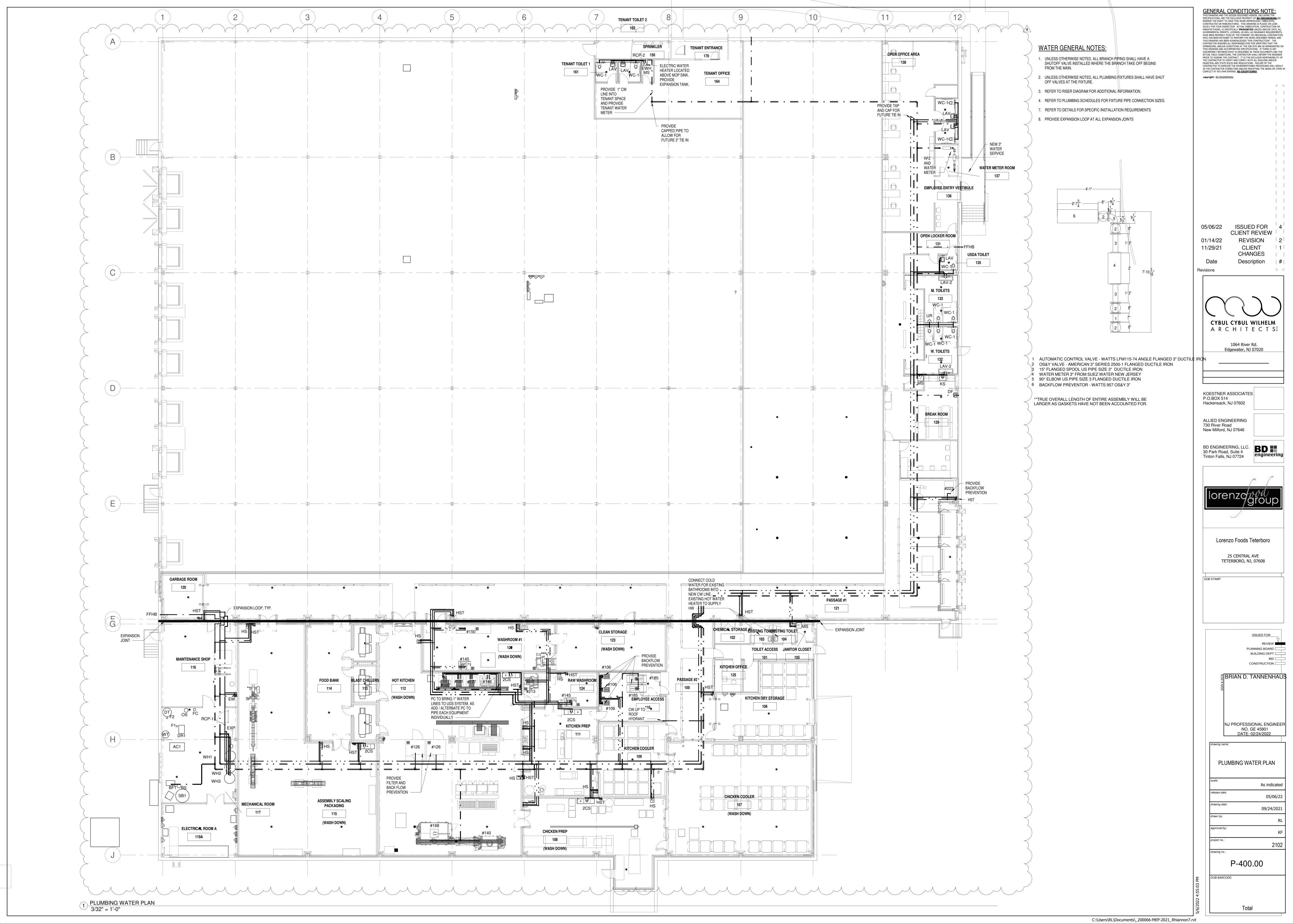
PLANNING BOARD . BUILDING DEPT CONSTRUCTION ផ្លី BRIAN D. TANNENHAUS

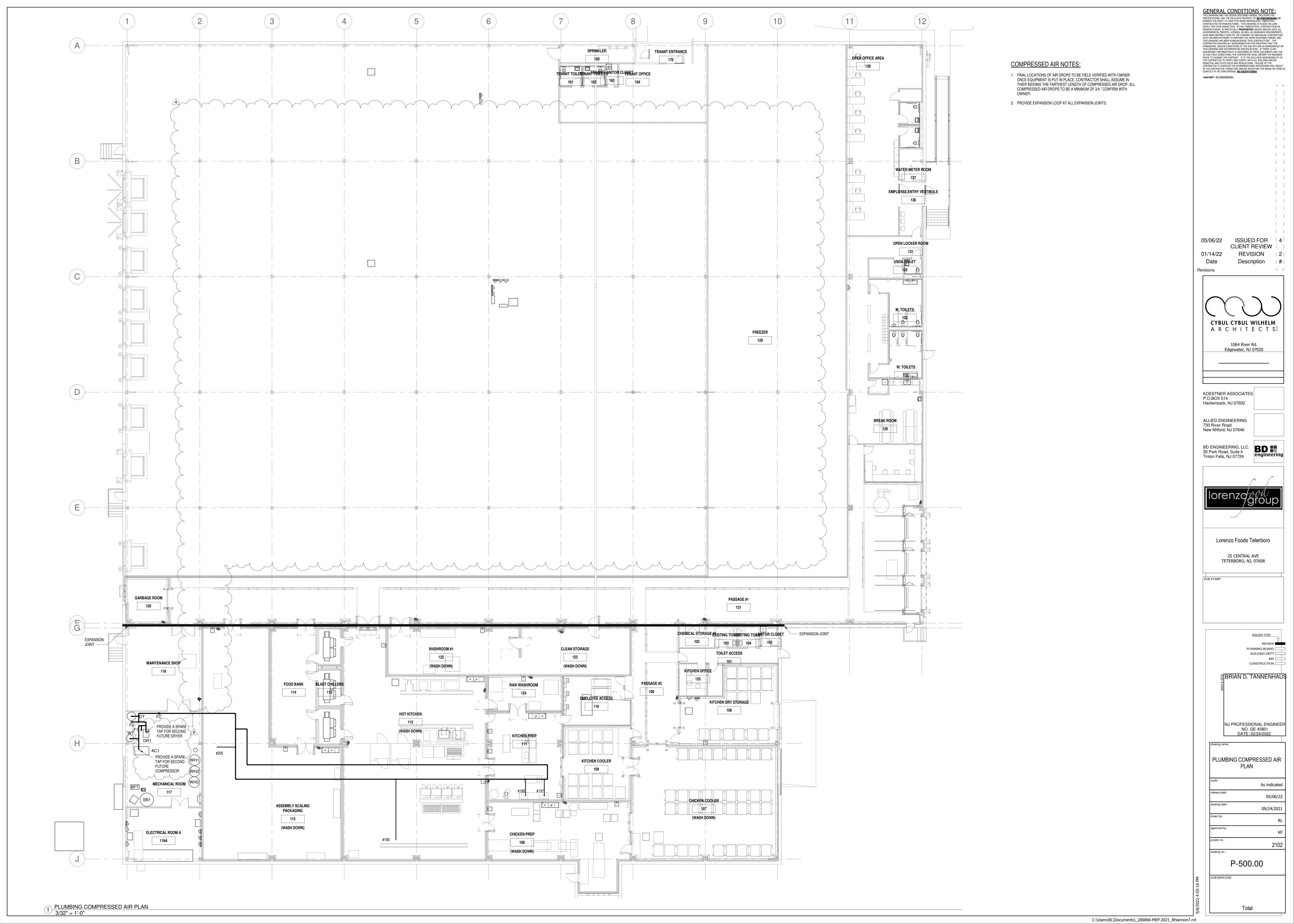
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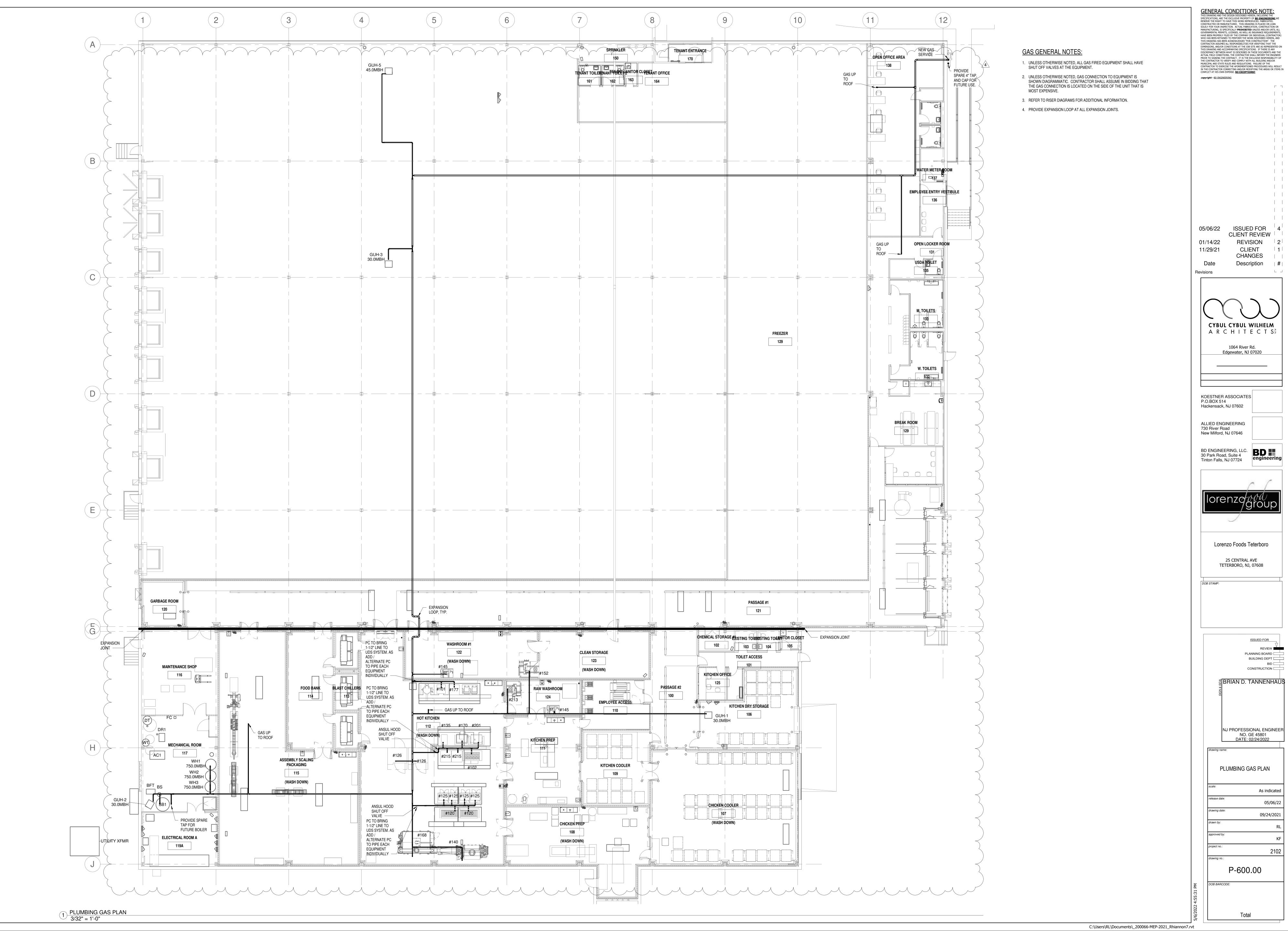
PLUMBING SANITARY PLAN

As indicated 05/06/22 09/24/2021









CLIENT REVIEW

CHANGES Description | # |

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PLANNING BOARD BUILDING DEPT CONSTRUCTION ____

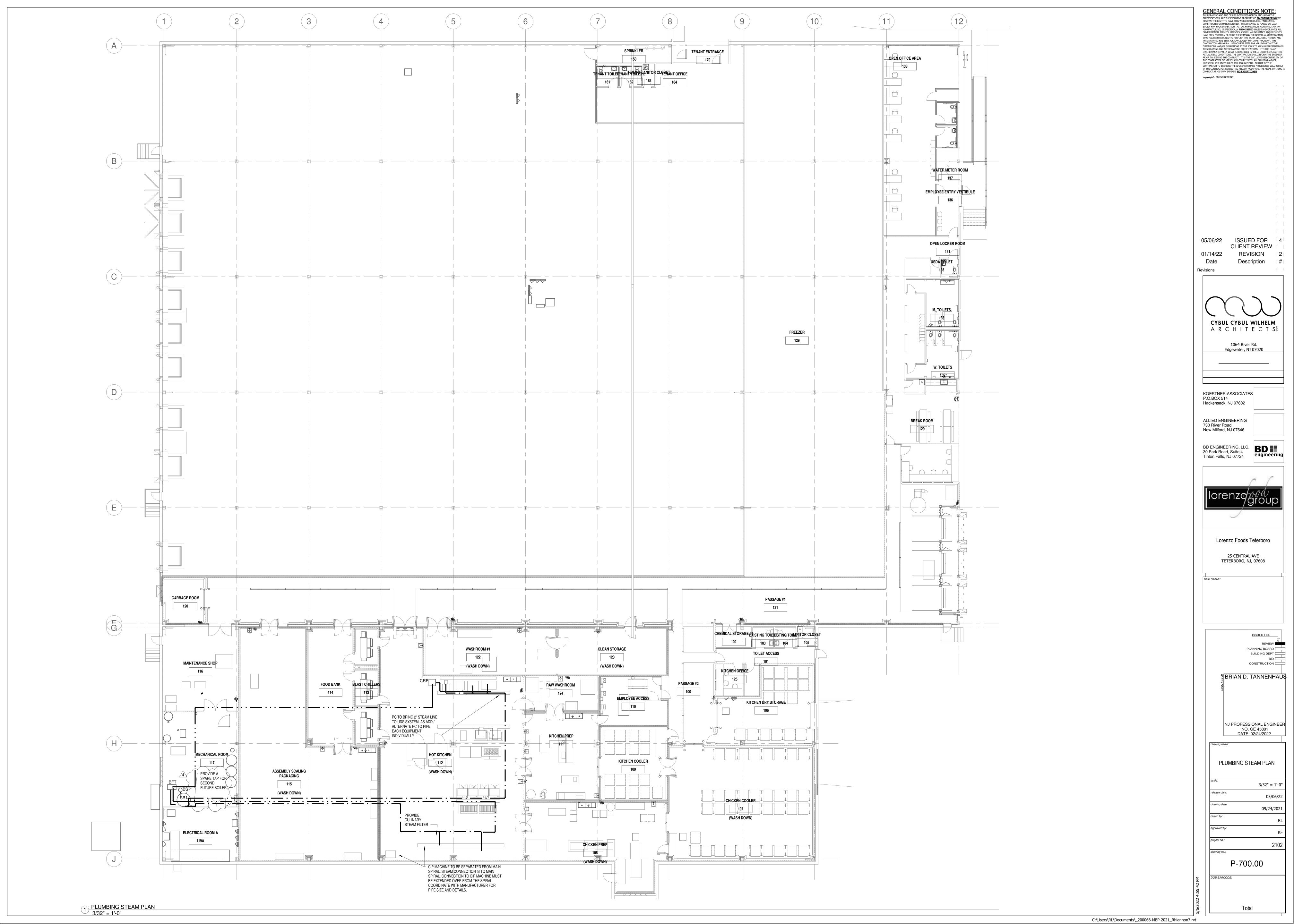
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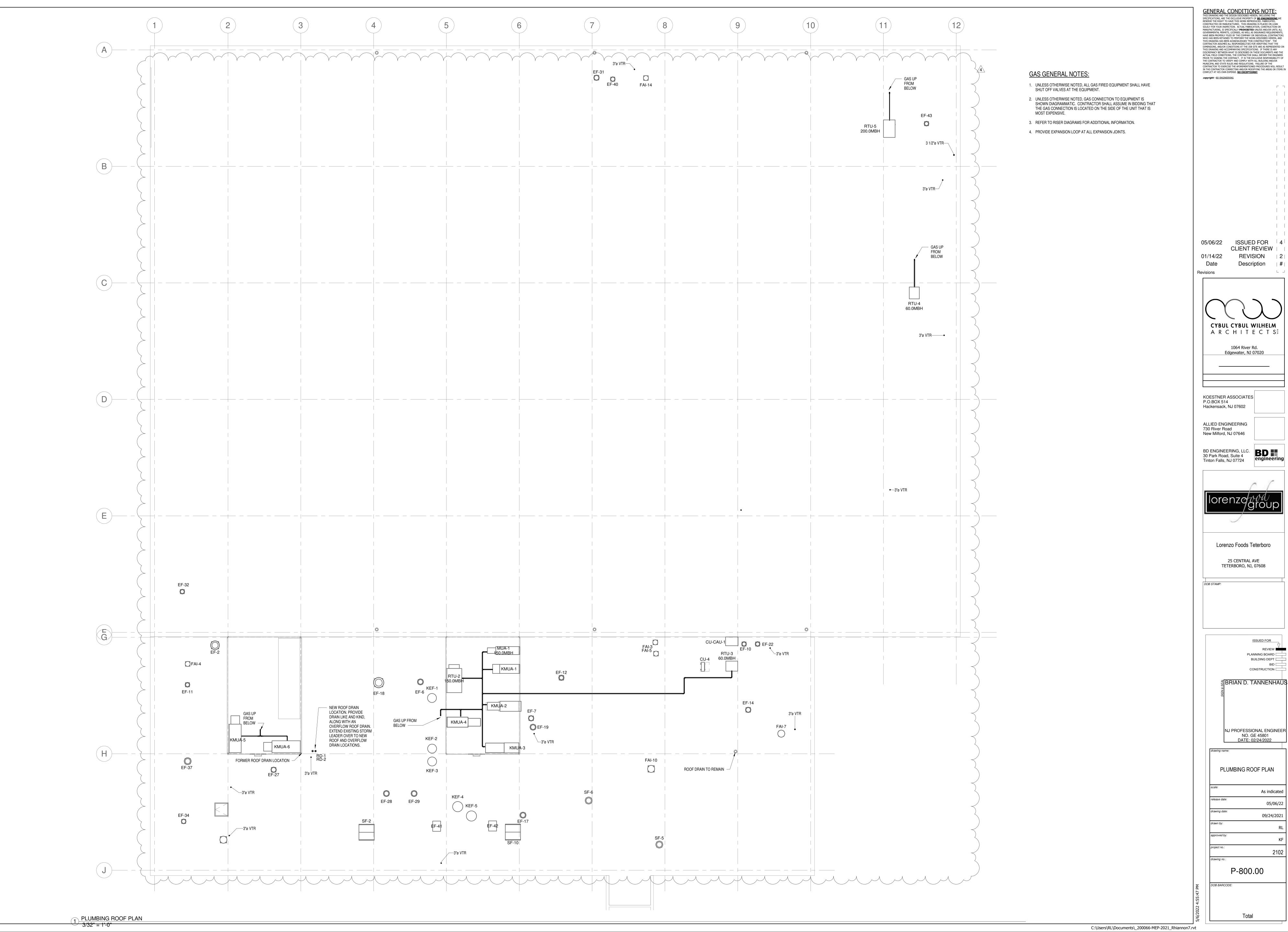
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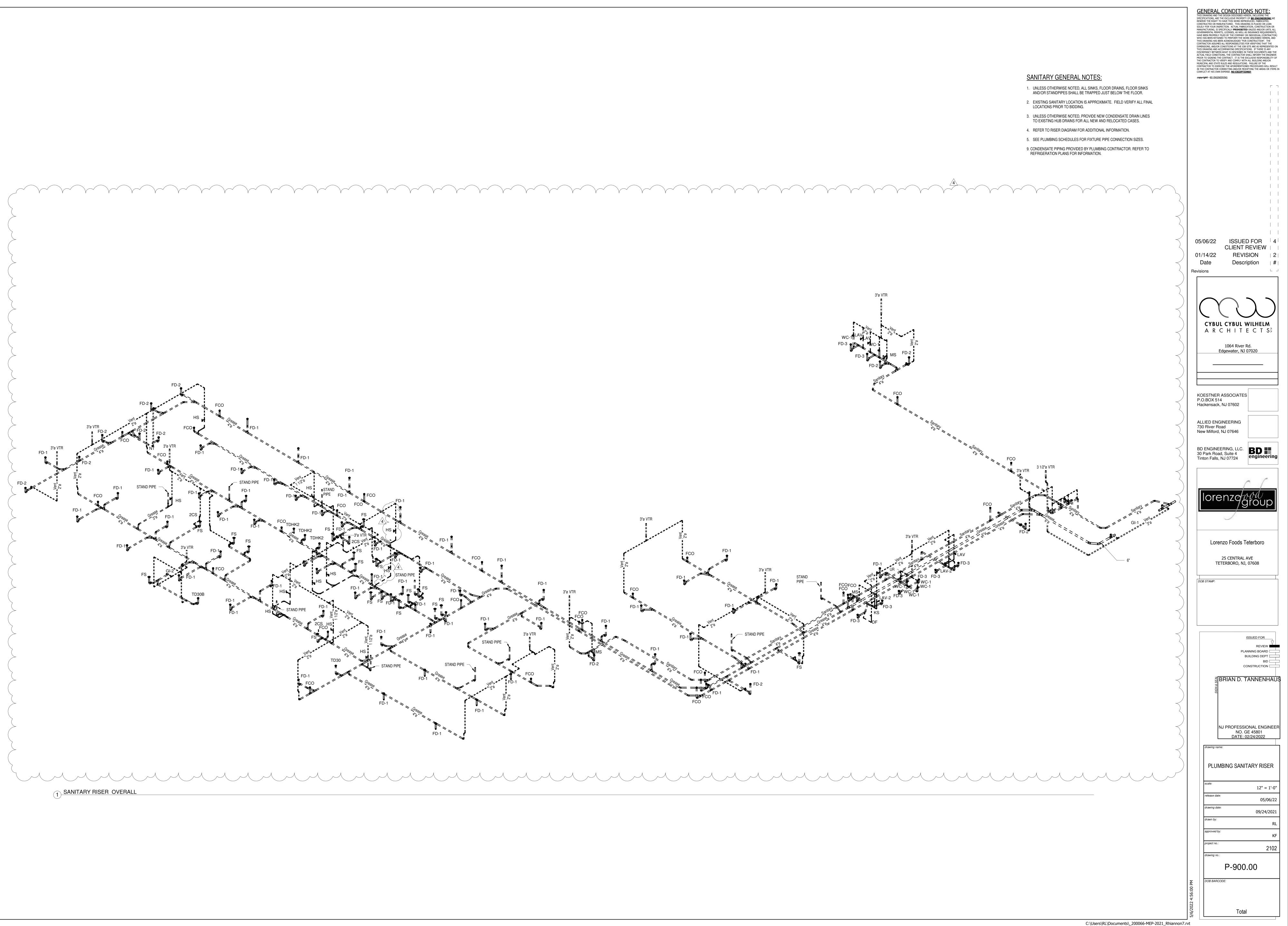
ARCHITECTS\$

Lorenzo Foods Teterboro

PLANNING BOARD BUILDING DEPT BID ____ CONSTRUCTION

্লু BRIAN D. TANNENHAUS NJ PROFESSIONAL ENGINEER NO. GE 45801 DATE: 02/24/2022

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Description | # |

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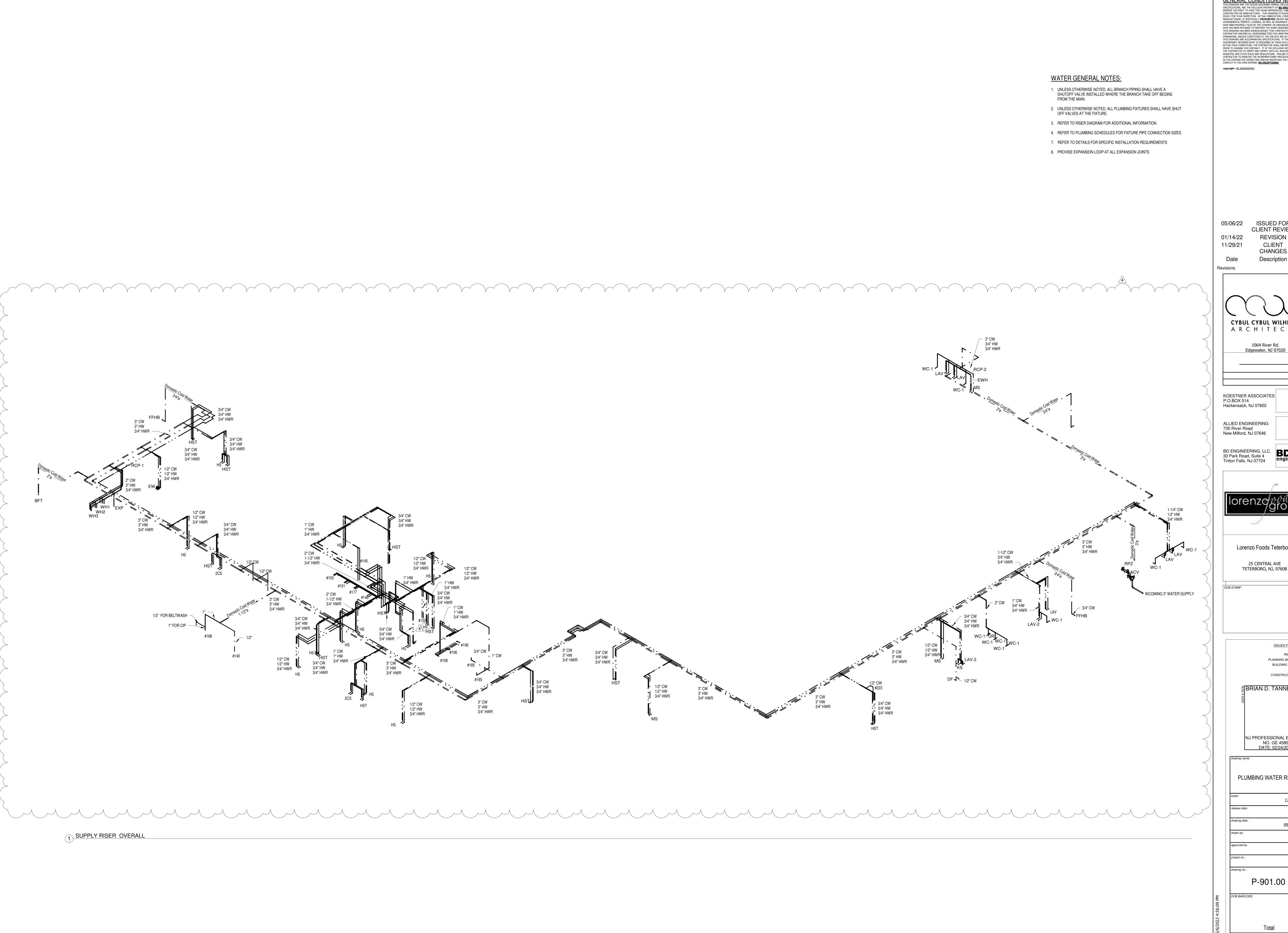
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PLANNING BOARD BUILDING DEPT

NJ PROFESSIONAL ENGINEER

NO. GE 45801 DATE: 02/24/2022

12" = 1'-0" 05/06/22 09/24/2021



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KOESTNER ASSOCIATES P.O.BOX 514 Hackensack, NJ 07602

BD ENGINEERING, LLC.
30 Park Road, Suite 4
Tinton Falls, NJ 07724

BD III
engineering

Lorenzo Foods Teterboro

25 CENTRAL AVE TETERBORO, NJ, 07608

PLANNING BOARD BUILDING DEPT CONSTRUCTION

্লু BRIAN D. TANNENHAUS

NJ PROFESSIONAL ENGINEER

NO. GE 45801 DATE: 02/24/2022

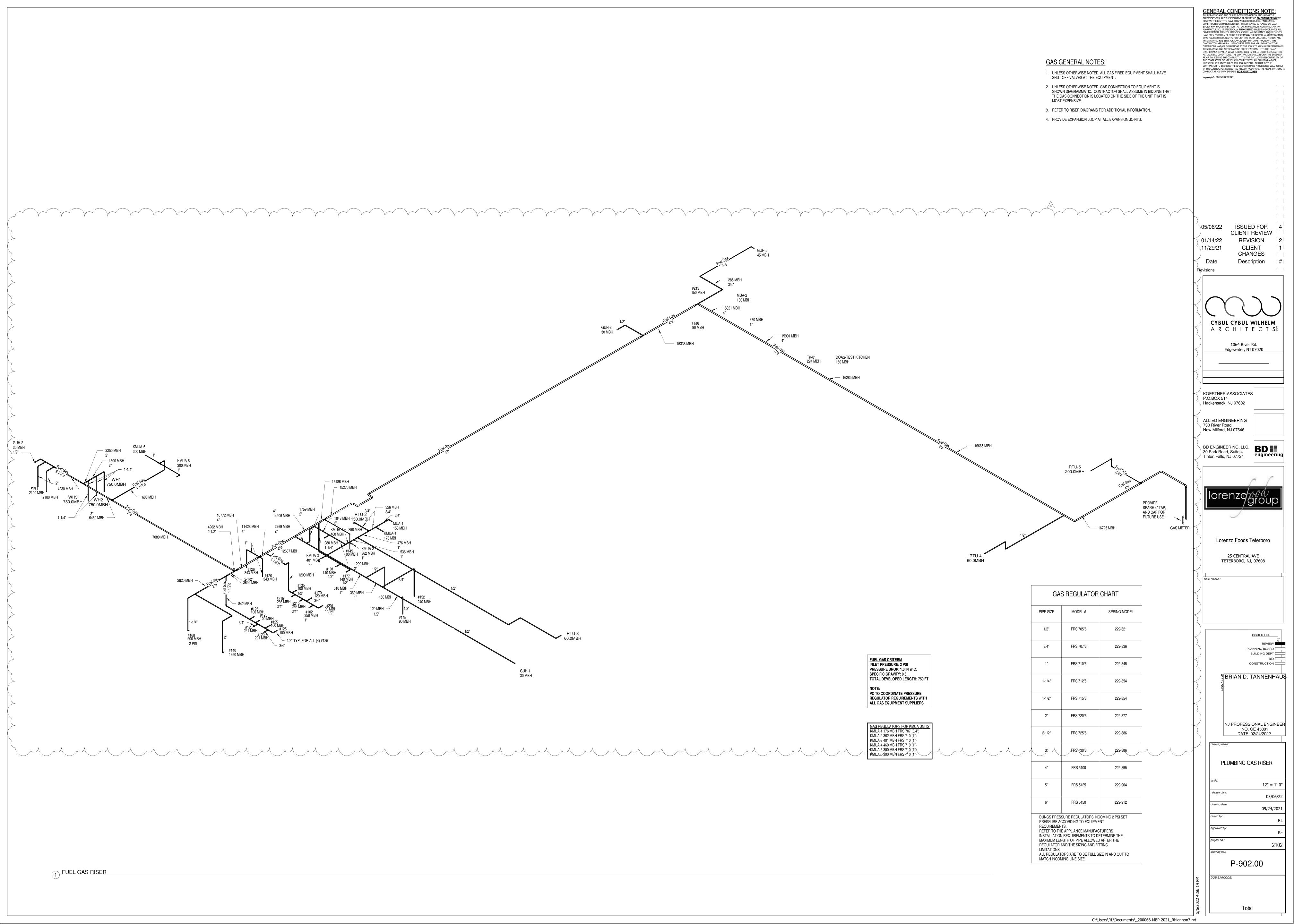
PLUMBING WATER RISER

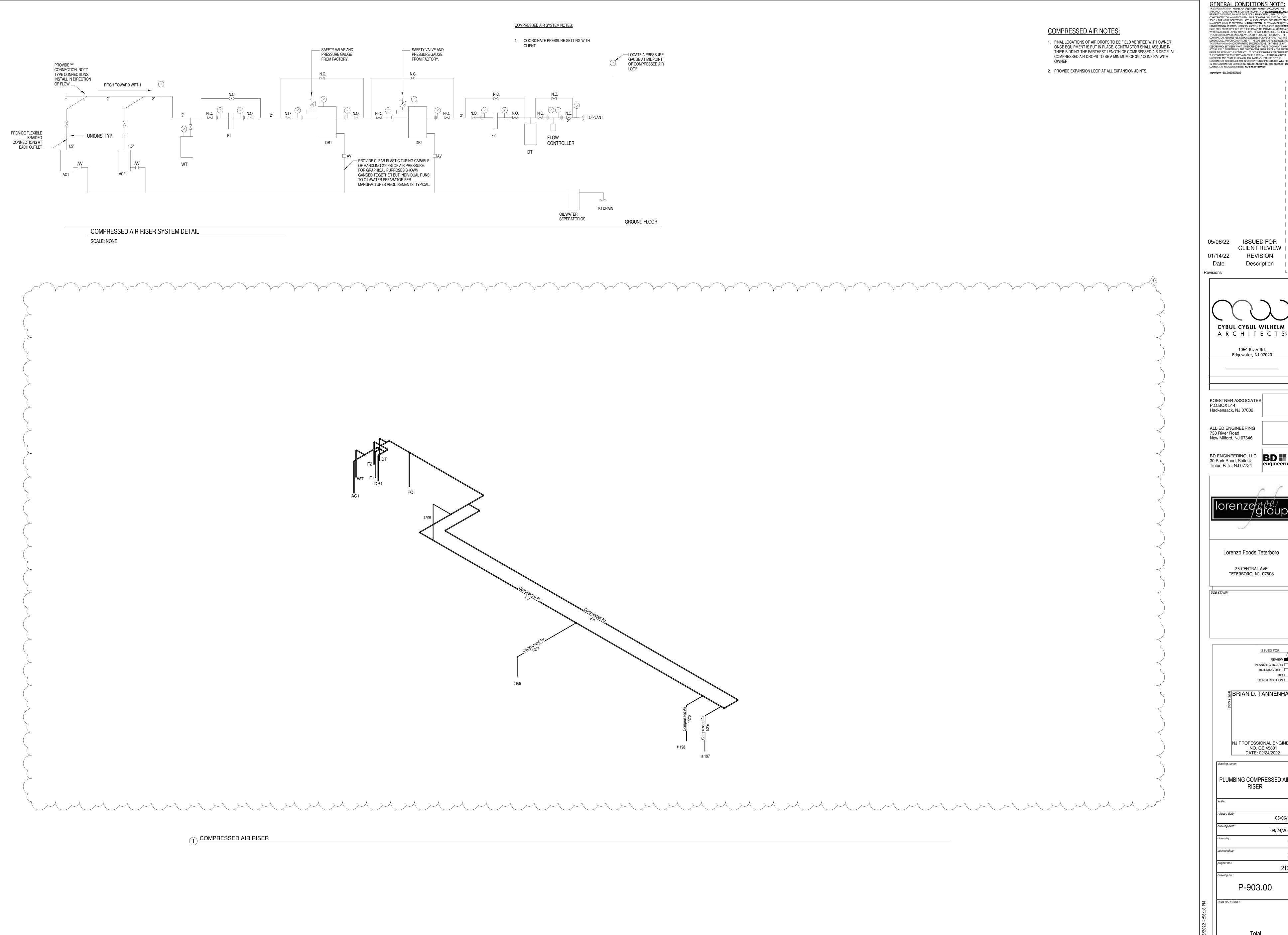
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REVISION | 2 |

Description | # |

CYBUL CYBUL WILHELM

1064 River Rd. Edgewater, NJ 07020

KOESTNER ASSOCIATES P.O.BOX 514 Hackensack, NJ 07602

ALLIED ENGINEERING 730 River Road New Milford, NJ 07646

BD ENGINEERING, LLC.
30 Park Road, Suite 4
Tinton Falls, NJ 07724

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engineering

Lorenzo Foods Teterboro

25 CENTRAL AVE TETERBORO, NJ, 07608

PLANNING BOARD BUILDING DEPT BID ____

CONSTRUCTION ____ ্লু BRIAN D. TANNENHAUS

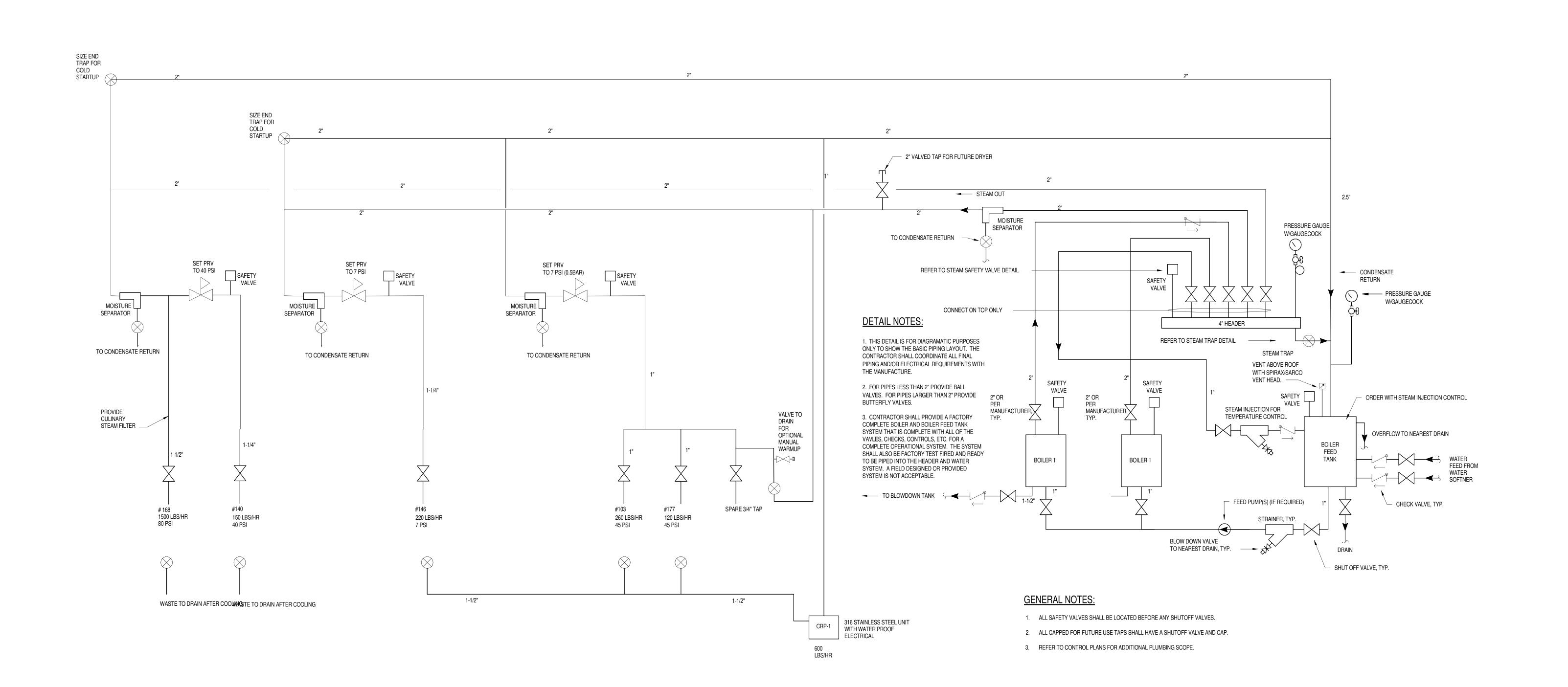
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PLUMBING COMPRESSED AIR

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Total

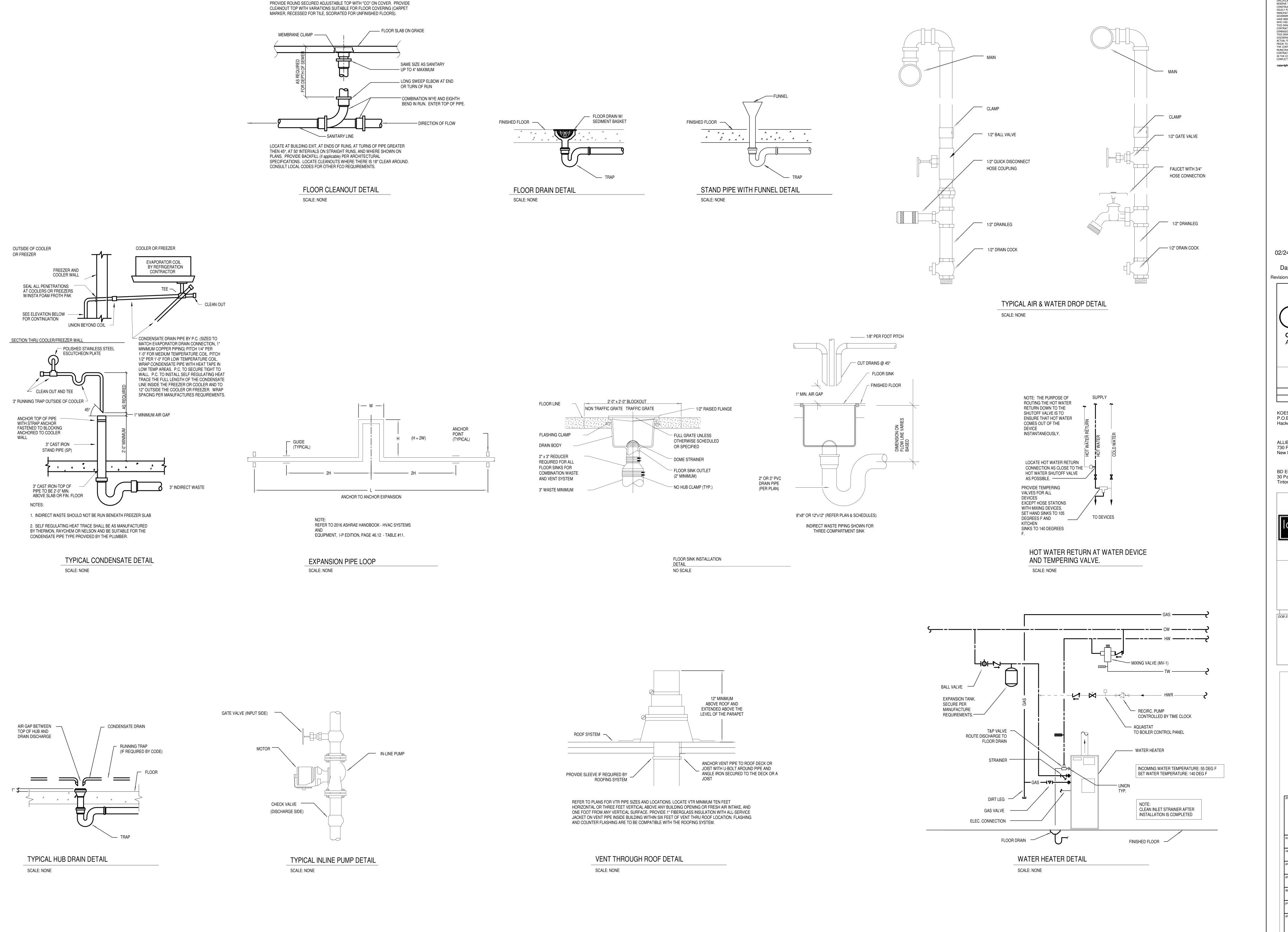
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01/14/22

09/24/2021

PLUMBING STEAM RISER

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PLANNING BOARD BUILDING DEPT BID ____

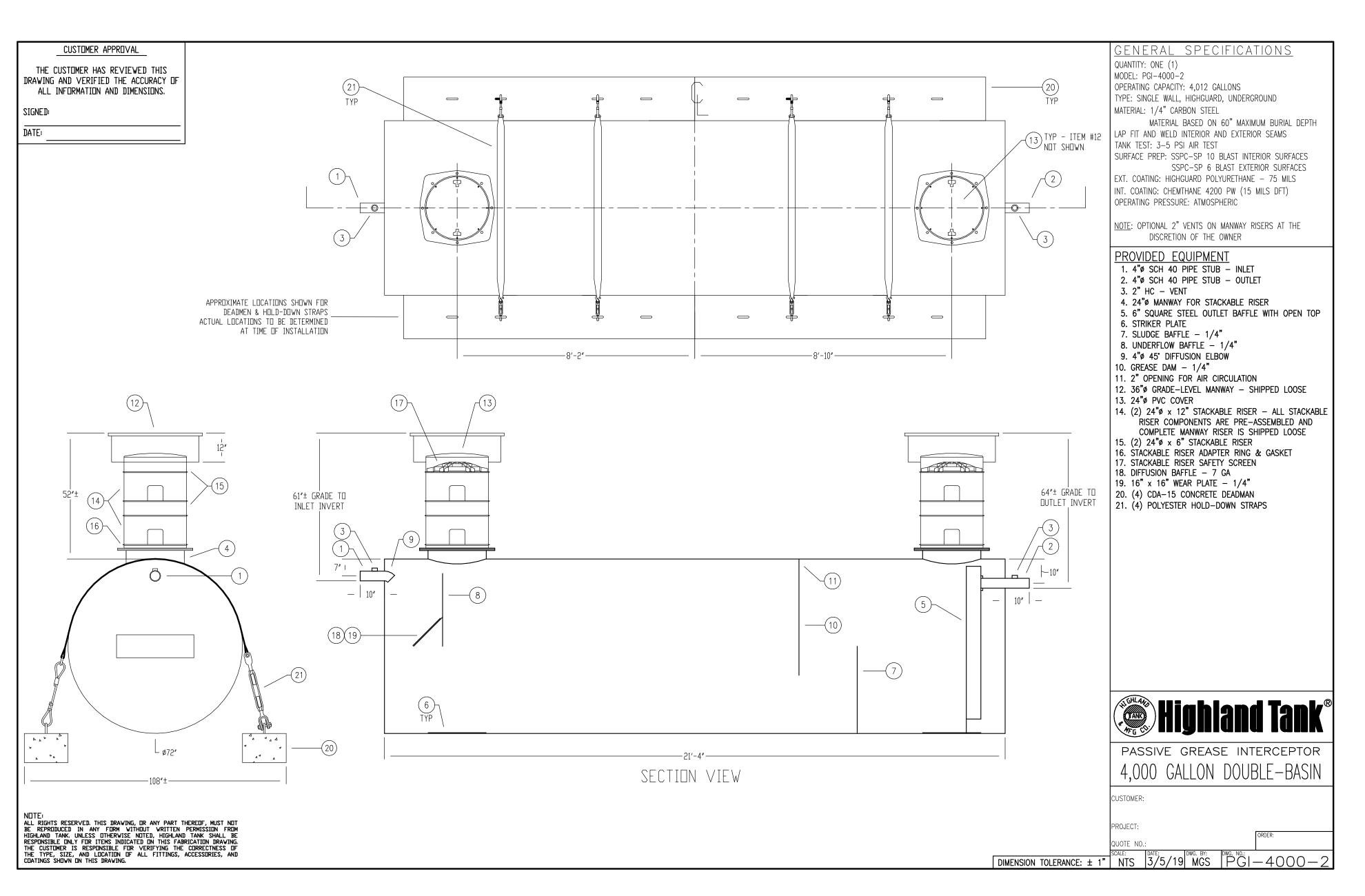
CONSTRUCTION ____ ដីBRIAN D. TANNENHAUS NJ PROFESSIONAL ENGINEER NO. GE 45801 DATE: 02/24/2022

PLUMBING DETAILS

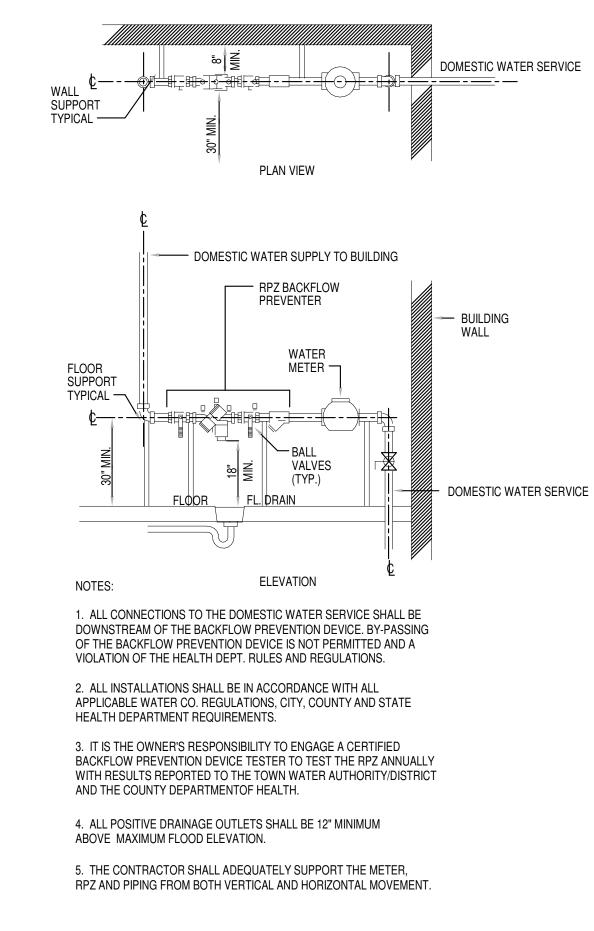
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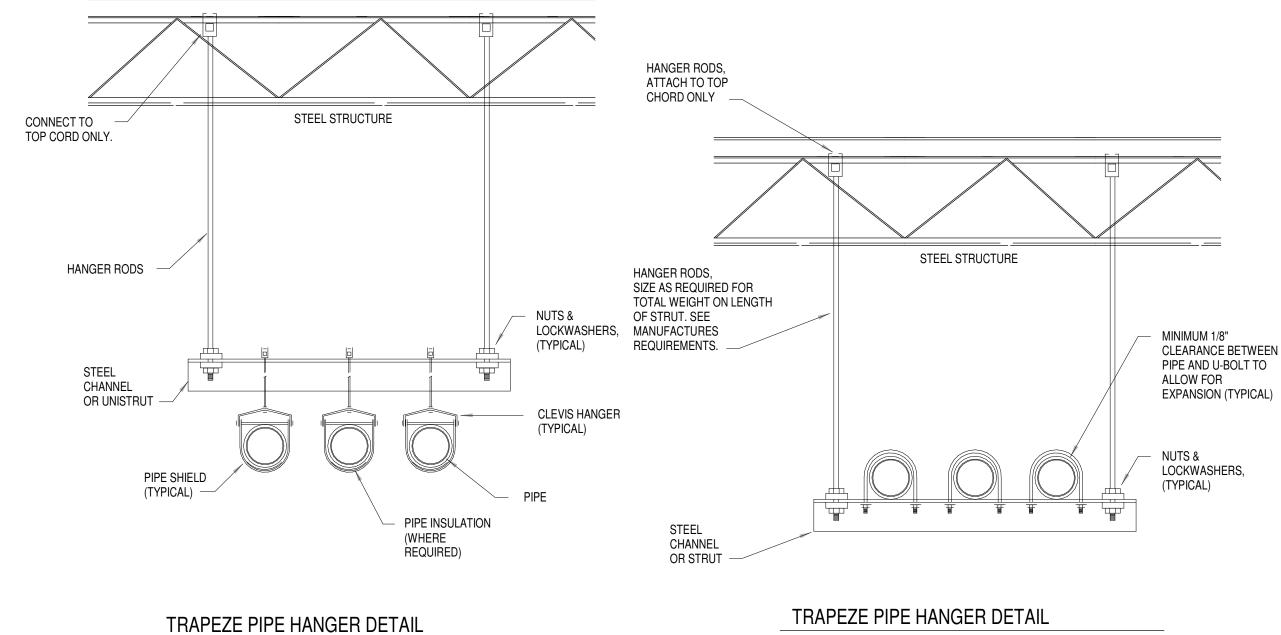
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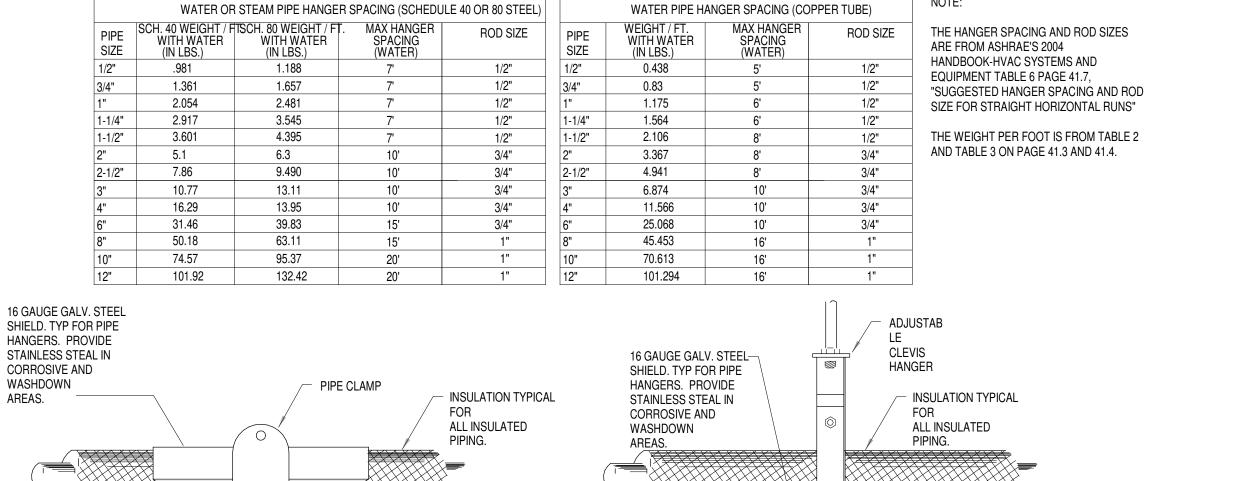


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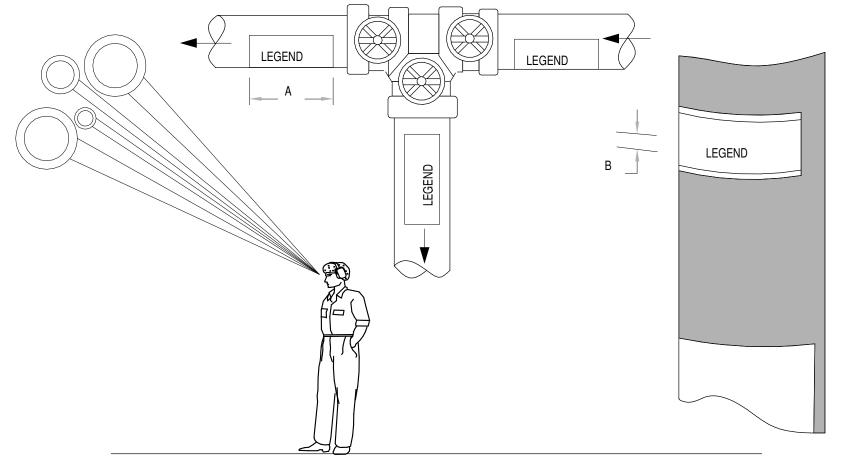
TYPICAL DOMESTIC WATER SERVICE DETAIL SCALE: NONE





SHIELD. TYP FOR PIPI HANGERS. PROVIDE STAINLESS STEAL IN CORROSIVE AND WASHDOWN AREAS. PIPE HANGER SPACING REQUIREMENTS

SCALE: NONE



SCALE: NONE

| 5 | SIZE OF LEGEND LE | TTERS |
|--|-------------------------------|-------------------------|
| OUTSIDE DIAMETER OF PIPE COVERING (IN.) | LENGTH OF COLOR FIELD, (A) | SIZE OF LETTERS, (B) |
| 3/4" TO 1-1/4" | 8" | 1/2" |
| 1-1/2" TO 2" | 8" | 3/4" |
| 2-1/2" TO 6" | 12" | 1-1/4" |
| 8" TO 10" | 24" | 2-1/2" |
| OVER 10" | 32" | 3-1/2" |

| | _ | | | | | | | | | | | |
|-----|---|--|---------------------|-------------|--|--|--|--|--|--|--|--|
| | | DESIGNATION OF COLORS | | | | | | | | | | |
| (B) | | FLUID SERVICE | BACKGROUND COLOR | LETTER COLO | | | | | | | | |
| | | FIRE QUENCHING LIQUIDS | SAFETY RED | WHITE | | | | | | | | |
| | | TOXIC AND CORROSIVE FLUIDS | SAFETY ORANGE | BLACK | | | | | | | | |
| " | | FLAMMABLE FLUIDS | SAFETY YELLOW | BLACK | | | | | | | | |
| " | | COMBUSTIBLE FLUIDS | SAFETY BROWN | WHITE | | | | | | | | |
| " | | POTABLE, COOLING, BOILER FEED AND OTHER WATER | SAFETY GREEN | WHITE | | | | | | | | |
| | | COMPRESSED AIR | SAFETY BLUE | WHITE | | | | | | | | |
| | | | | | | | | | | | | |

- 1. ALL PIPE MARKINGS SHALL CONFORM TO 2007 EDITION OF THE ANSI/ASME A13.1 STANDARD.
- FIELD VERIFY THE PROPOSED PIPE MARKING COLORS WITH THE CLIENT PRIOR TO STARTING THE
- 2. REFER TO PLANS FOR PIPE SERVICE, SIZES AND LOCATIONS.
- 3. PIPE MARKING LABELS MUST EFFECTIVELY COMMUNICATE THE CONTENTS OF THE PIPES AND GIVE ADDITIONAL DETAIL IF SPECIAL HAZARDS (SUCH AS EXTREME TEMPERATURES OR PRESSURES) EXIST.
- 4. AN ARROW SHOULD BE USED IN CONJUNCTION WITH THE LEGEND TO SHOW WHICH DIRECTION THE MATERIAL FLOWS. IF FLOW CAN BE IN BOTH DIRECTIONS, ARROWS IN BOTH DIRECTIONS SHALL BE DISPLAYED.

PIPE MARKING DETAIL SCALE: NONE

Total

Revisions CYBUL CYBUL WILHELM ARCHITECTS 1064 River Rd. Edgewater, NJ 07020 KOESTNER ASSOCIATES P.O.BOX 514 Hackensack, NJ 07602 ALLIED ENGINEERING 730 River Road New Milford, NJ 07646 BD ENGINEERING, LLC.
30 Park Road, Suite 4 30 Park Road, Suite 4 Tinton Falls, NJ 07724 Lorenzo Foods Teterboro 25 CENTRAL AVE TETERBORO, NJ, 07608 PLANNING BOARD BUILDING DEPT CONSTRUCTION **BRIAN D. TANNENHAUS** NJ PROFESSIONAL ENGINEER NO. GE 45801 DATE: 02/24/2022 PLUMBING DETAILS 09/24/2021 P-1001.00

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SCALE: NONE

THE MANUFACTURES SHOP DRAWINGS, DETAILS AND INSTALLATION INSTRUCTIONS FOR FINAL REQUIREMENTS.

- SILICON SEAL STANDOFF

TO WALL.

1. ALL EXPOSED PIPE SHALL BE SECURED USING A STAINLESS

SHALL PROVIDE A MINIMUM CLEARANCE OF 1" BETWEEN PIPE AND

WITH THE PIPE MATERIAL. PLASTIC STANDOFFS ARE NOT ALLOWED.

WALL OR CEILING. THE BRACKET METAL SHALL BE COMPATIBLE

2. ALL EXPOSED METAL PIPE IN FOOD PROCESSING AREAS AND

FOOD STORAGE COOLERS SHALL BE WRAPPED IN A WASHABLE

3. THE BRACKET SHOWN IS FOR DIAGRAMMATIC PURPOSES ONLY.

THE CONTRACTOR SHALL HAVE THE OPTION TO SUBMIT

4. ALL PIPING IN PROCESS AND WASHDOWN AREAS SHALL BE

TYPICAL PIPE STAND-OFF DETAIL

ALTERNATE STANDOFFS FOR APPROVAL PRIOR TO BID.

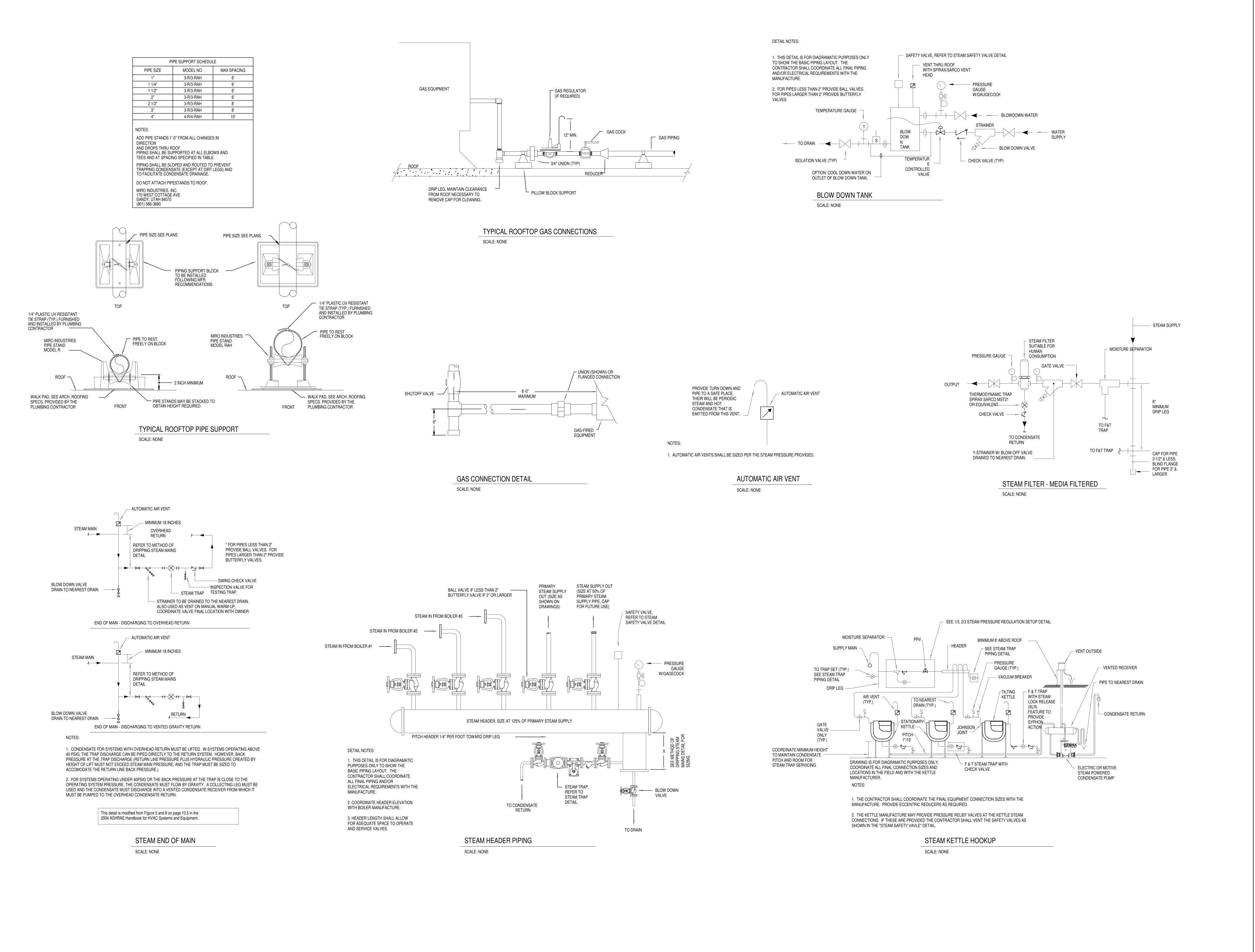
WATERPROOF PVC JACKET.

STAINLESS STEEL TYPE.

SCALE: NONE

STEEL OR BRASS STANDOFF TYPE PIPE BRACKET. BRACKET

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BD ENGINEERING, LLC.
30 Park Road, Suite 4 30 Park Road, Suite 4 Tinton Falls, NJ 07724



Lorenzo Foods Teterboro 25 CENTRAL AVE TETERBORO, NJ, 07608

DOB STAMP

PLANNING BOARD BUILDING DEPT BID ____ CONSTRUCTION ដីBRIAN D. TANNENHAUS

NJ PROFESSIONAL ENGINEER

NO. GE 45801

DATE: 02/24/2022

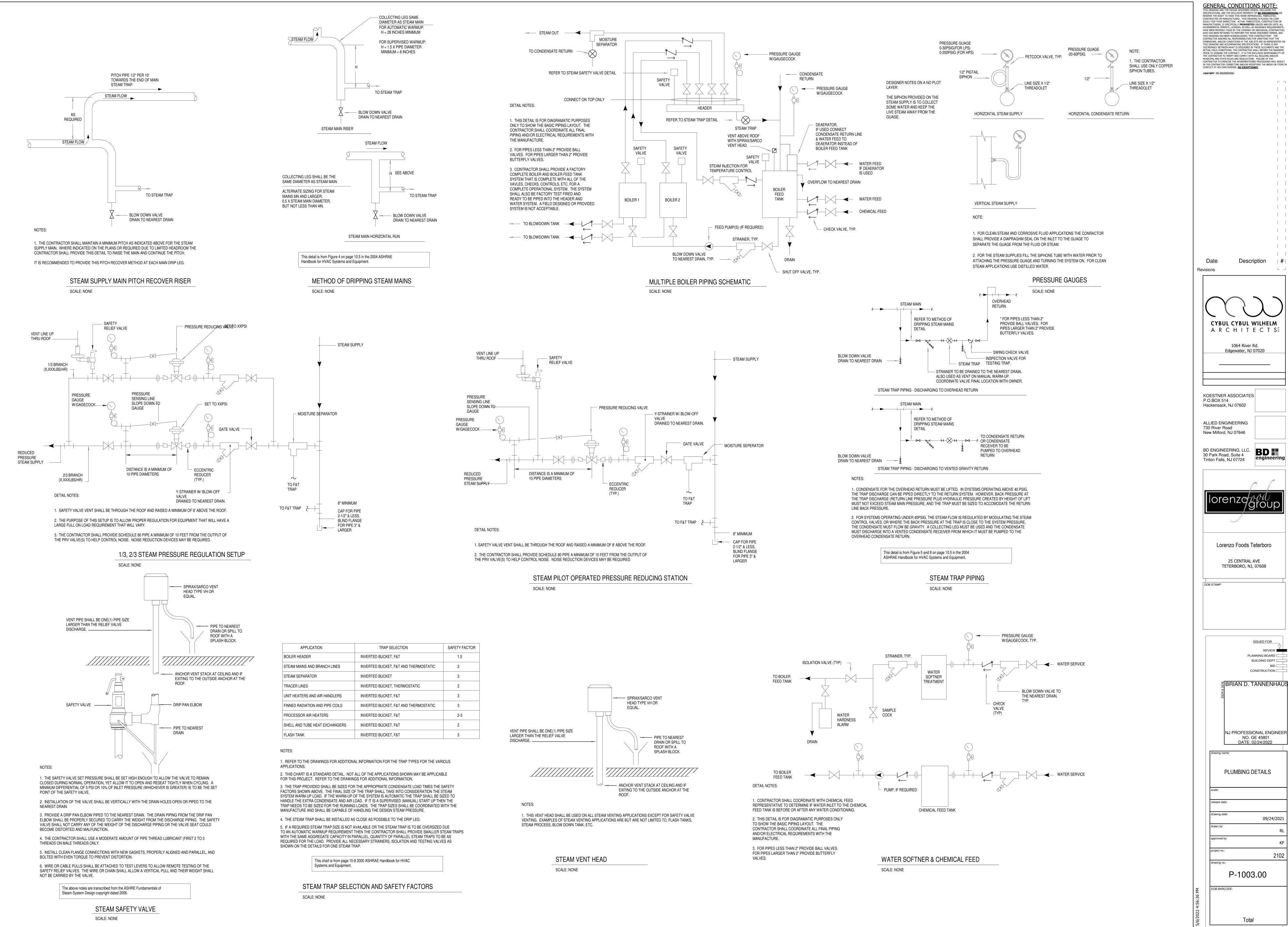
01/14/22

PLUMBING DETAILS

09/24/2021

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PLANNING BOARD

BUILDING DEPT

CONSTRUCTION

NO. GE 45801

BID ____

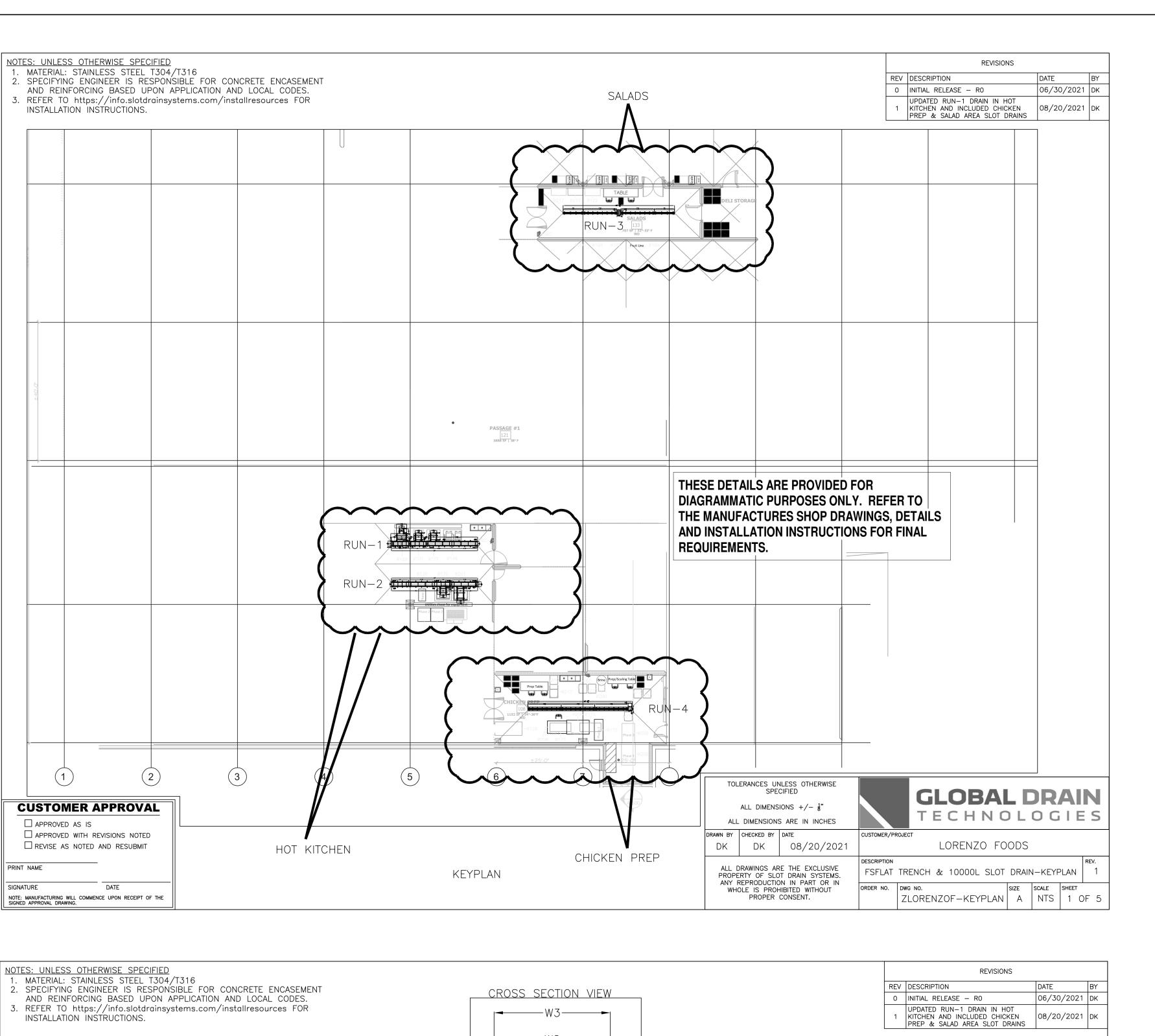
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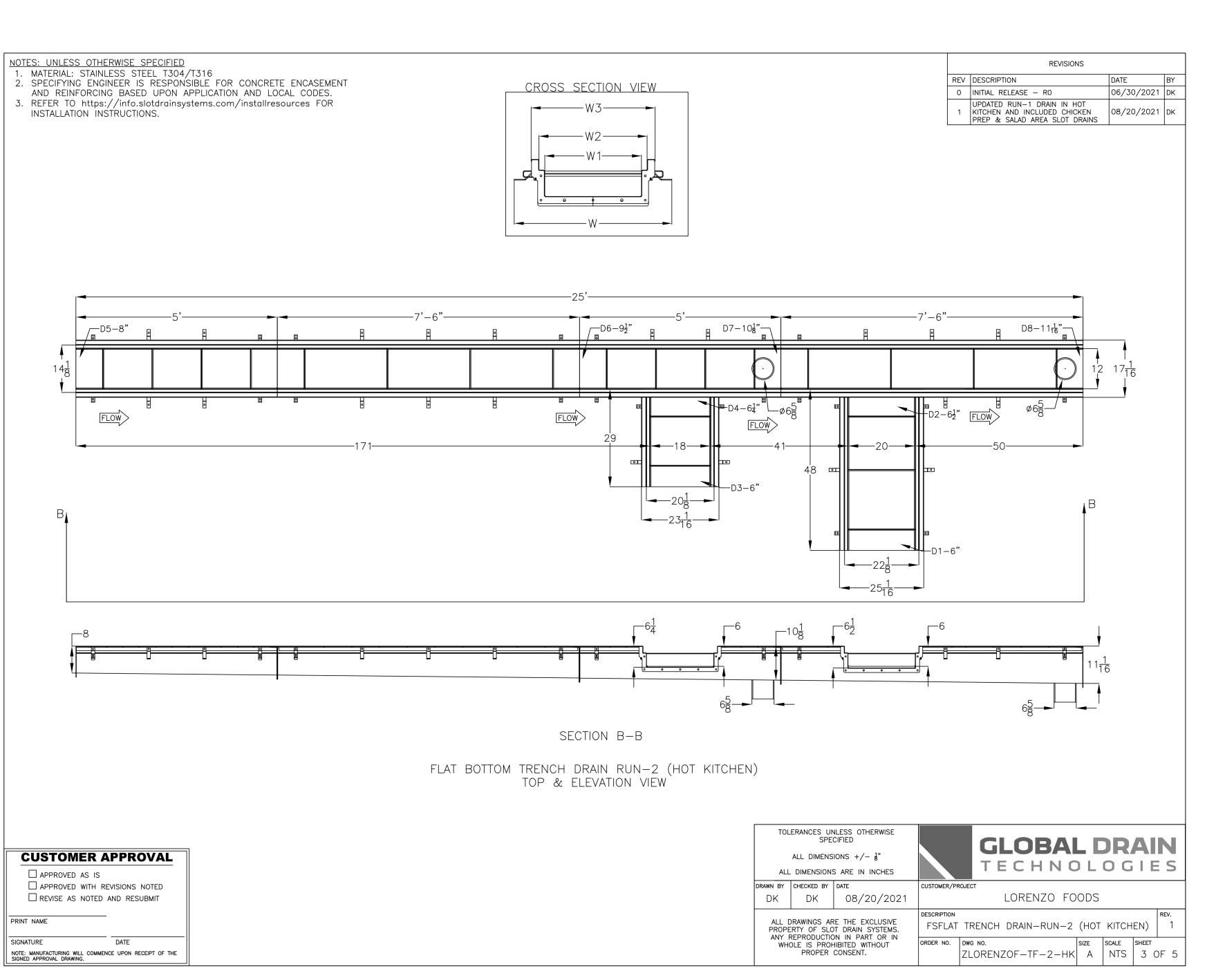
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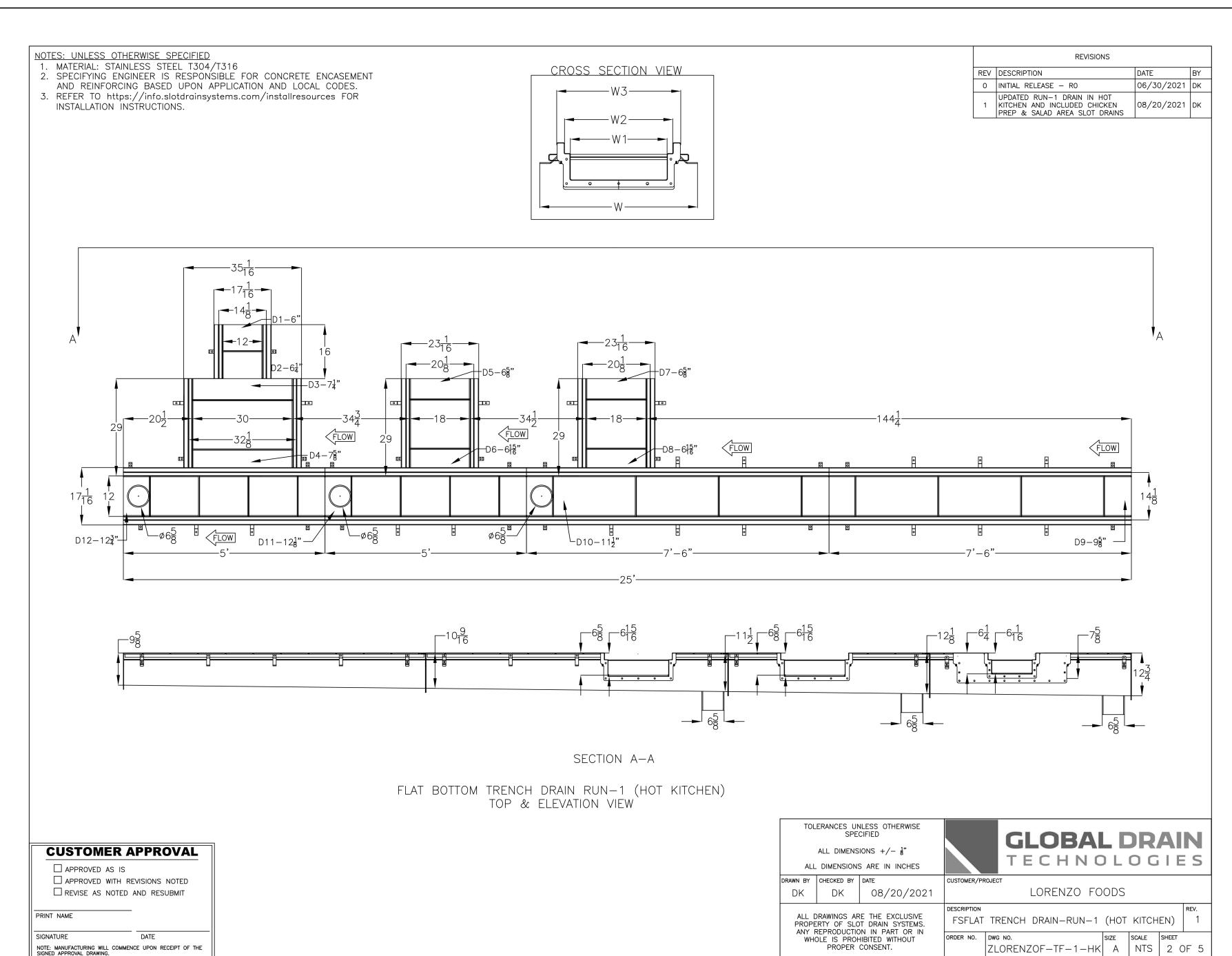
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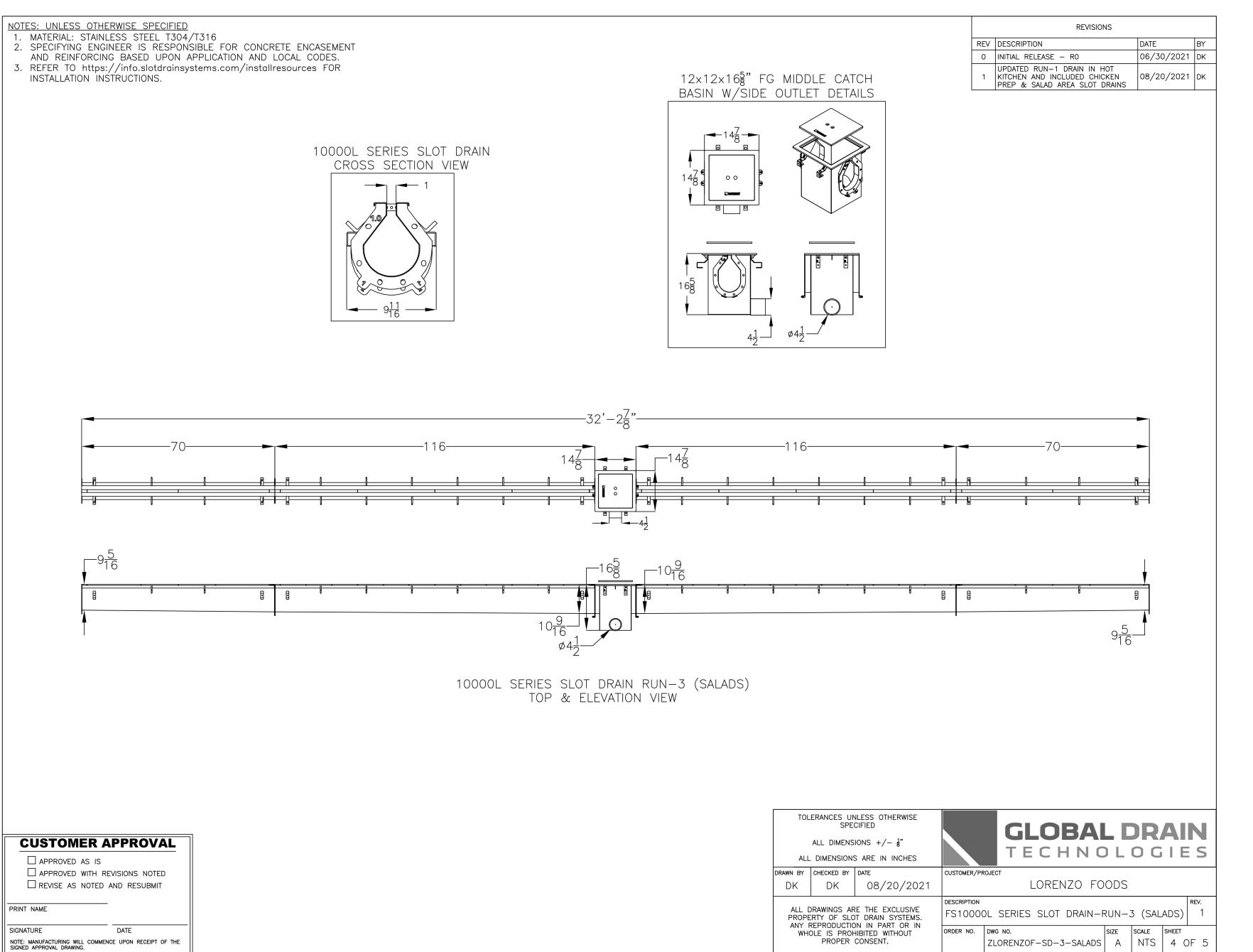
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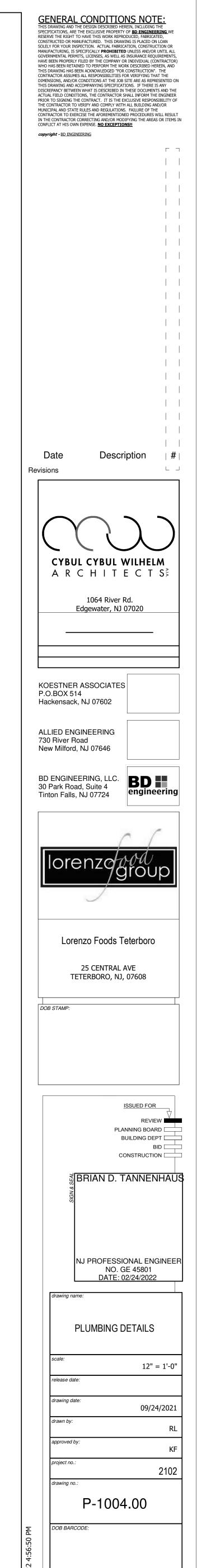
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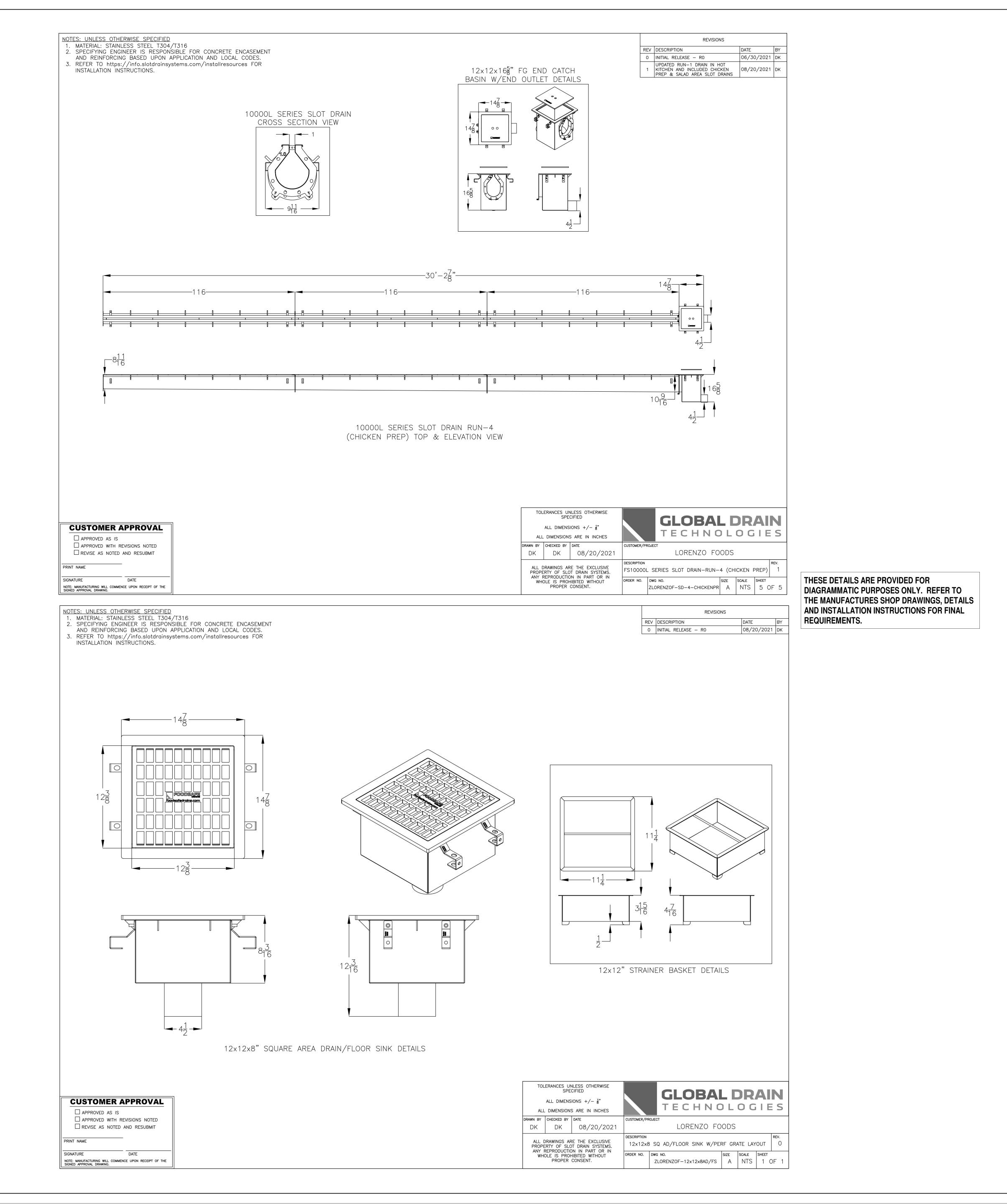












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Lorenzo Foods Teterboro

25 CENTRAL AVE TETERBORO, NJ, 07608

PLANNING BOARD BUILDING DEPT BID 🗀 CONSTRUCTION ____ ផ្លី BRIAN D. TANNENHAUS NJ PROFESSIONAL ENGINEER NO. GE 45801 DATE: 02/24/2022

PLUMBING DETAILS

12" = 1'-0"

09/24/2021

P-1005.00

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FOR ALL PROCESS EQUIPMENT REFER TO THE ARCHIECTURAL SCHEDULES ON THE ARCHITECTS DRAWINGS

| | PLUMBING FIXTURE SCHEDULE | | | | | | | | | | | |
|------------|---------------------------|------------------|---------------------------|------------|---|--|------|----------|--------|---------|--|--|
| | | | | | MISC. SECTION | | PLU | MBING CO | NECTIO | N SIZES | | |
| <u>TAG</u> | <u>FIXTURE</u> | MANUFACTURER | MODEL | MOUNT TYPE | MATERIAL/COLOR | FIXTURE ACCESSORIES | CW | HW | SAN | VENT | <u>NOTES</u> | |
| 2CS | 2 COMPARTMENT SINK | ELKAY | WNSF8320R2 | DROP IN | STAINLESS STEEL | FAUCET LK943AF14LC | 1/2" | 1/2" | 3-1/2" | 1-1/2" | | |
|)F | DRINKING FOUNTAIN | ELKAY | LZSG8S | WALL | STAINLESS STEEL | | 1/2" | - | 1-1/2" | 1-1/2" | 115 V | |
| W | EYE WASH STATION | GUARDIAN | G1814 | WALL | STAINLESS STEEL | | 1/2" | 1/2" | 1 1/4" | - | PROVIDE G6020 THERMOSTATIC MIXING VALVE | |
| CO | FLOOR CLEANOUT | FOOD SAFE DRAINS | FSFCO-84 | FLOOR | 316 STAINLESS STEEL | PTRAP-54 316 TRAP | - | - | 4" | - | PROVIDE FORLIFT GRADE. MOUNT FLUSH TO TOP OF FLOOR. | |
| -D-1 | FLOOR DRAIN | FOOD SAFE DRAINS | FSD AREA-ROUND | FLOOR | 316 STAINLESS STEEL | PTRAP-54 316 TRAP, MAGNETIC LOCK | - | - | 4" | 2-1/2" | PROVIDE WITH FORKLIFT DUTY TOPWITH MAGNETIC LOCK AND REMOVEABLE SEDIMENT BASKET | |
| D-2 | FLOOR DRAIN | WATTS | FD-1100-B | FLOOR | EPOXY COATED CAST IRON WITH STAINLESS TOP | | - | - | 4" | 2-1/2" | HEAVY DUTY | |
| -D-3 | FLOOR DRAIN | WATTS | FD-100-A | FLOOR | EPOXY COATED CAST IRON | | - | - | 2" | 1-1/2" | | |
| FHB | HOSE BIB | JR SMITH | 5519 | WALL | BRONZE, STAINLESS | STAINLESS STEEL RECESSED BOX WITH LOCK KEY | 3/4" | - | - | - | INTEGRAL VACCUUM BREAKER AND DUAL CHECK VALVE W/ 1" GARDEN HOSE THREAD | |
| S | FLOOR SINK | FOOD SAFE DRAINS | 12x12x8" FLOOR SINK | FLOOR | 316 STAINLESS STEEL | PTRAP-54 316 TRAP, SQ AD/FLOOR SINK W/ PERF GRATE LAYOUT | - | - | 4" | 2" | 12X12x8 DEEP. PROVIDE USDA COMPLIANT SS DOME BOTTOM, 1/2 GRATE, SEDIMENT BUCKET. ZLORENZOF-12x12x8AD/FS | |
| GI-1 | GREASE INTERCEPTOR | HIGHLAND TANK | PGI-4000 | RECESSED | CARBON STEEL WITH HI-TEMP COATING | MANHOLE EXTENSIONS AS REQUIRED | - | - | 4" | 2" | PROVIDE CHEMLINE4000 EPOXY INTERIOR COATING. SUBSTITUTIONS ARE NOT ALLOWED AS HIGHLAND TANK IS BASIS OF DESIGN AND HAS PERFORMED THE BUOYANCY CALCULATIONS | |
| al-2 | GREASE INTERCEPTOR | ZURN | Z1172-1300 | RECESSED | ACID RESISTANT STEEL | | - | - | 4" | 2" | 270 GALLON CAPACITY | |
| HS | KNEE VALVE SINK | ADVANCED TABCO | 7-PS-30 | WALL | STAINLESS STEEL | | 1/2" | 1/2" | 1-1/2" | 1-1/2" | | |
| HST | HOSE STATION | ARMSTRONG | 3032 | WALL | | | 3/4" | 3/4" | - | - | | |
| (S | KITCHEN SINK | KOHLER | K-3348-3 | COUNTER | STAINLESS STEEL | FAUCET 15171-F | 1/2" | 1/2" | 1-1/2" | 1-1/2" | | |
| _AV | BATHROOM SINK | KOHLER | K-2005 | WALL | WHITE/ VITREOUS CHINA | BACKSPLASH, FAUCET 15182-4NDRA | 1/2" | 1/2" | 1-1/2" | 1-1/2" | | |
| AV-2 | BATHROOM SINK | BRADLEY | LVGD2 | WALL | QUARTZ | FAUCET S53-3700 | 1/2" | 1/2" | 1-1/2" | 1-1/2" | BATTERY POWERED FAUCET | |
| ИS | MOP SINK | FIAT | TSB-700 SERIES | FLOOR | TERRAZZO | FAUCET K-8907 | 1/2" | 1/2" | 3" | 1-1/2" | | |
| ١T | ACID NUETRALIZATION TANK | MIFAB | MI-NEUT-30-HD3000 | RECESSED | POLYETHYLINE | HEAVY DUTY COVER | - | - | 3" | 3" | | |
| RD-1 | ROOF DRAIN | JR SMITH | 1010 | ROOF | CAST IRON | OPTIONAL 1020 SIDE OUTLET ATTACHMENT | - | - | - | - | MATCH SIZE OF EXISTING ROOF DRAIN | |
| RD-2 | OVERFLOW ROOF DRAIN | JR SMITH | 1080 | ROOF | CAST IRON | | - | - | - | - | MATCH SIZE OF EXISTING ROOF DRAIN | |
| ΓD30 | SLOT DRAIN | FOOD SAFE DRAINS | FS10000L SERIES | FLOOR | 316 STAINLESS STEEL | RUNTRAP-54, 12x12x16-5/8" END CATCH BASIN W/ SIDE OUTLET | - | - | 4" | 2" | SIDE OUTLET CATCH BASIN, CATCH BASIN LOCATED END OF SLOT DRAIN. ZLORENZOF-SD-4-CHICKENPR | |
| TD30B | FLOOR DRAIN | FOOD SAFE DRAINS | 30 FT LONG | FLOOR | 316 STAINLESS STEEL | RUNTRAP-54 | - | - | 4" | 2" | 30 FOOT LONG BY 1 FT WIDE WITH 14 INCH WIDE GRATE, 8 INCHES DEEP | |
| TDHK1 | TRENCH DRAIN | FOOD SAFE DRAINS | FSFLAT TRENCH DRAIN-RUN-1 | FLOOR | 316 STAINLESS STEEL | RUNTRAP-54 | - | - | 4" | 2" | BOTTOM OUTLET. ZLORENZOF-TF-1-HK | |
| TDHK2 | TRENCH DRAIN | FOOD SAFE DRAINS | FSFLAT TRENCH DRAIN-RUN-2 | FLOOR | 316 STAINLESS STEEL | RUNTRAP-54 | - | - | 4" | 2" | BOTTOM OUTLET. ZLORENZOF-TF-2-HK | |
| JR | ADA URINAL | KOHLER | K-4991-ET | WALL | WHITE / VITREOUS CHINA | FLUSHOMETER K-13520 | 3/4" | - | 2" | - | | |
| NC-1 | WATER CLOSET | KOHLER | K-84325 | WALL | WHITE / VITREOUS CHINA | FLUSHOMETER K-76321 | 1" | - | 4" | 2" | | |
| VCO | WALL CLEANOUT | ZURN | 71441 | WALL | CAST IRON | STAINLESS STEEL ACCESS COVER | 1_ | 1_ | 4" | - | | |

| | PLUMBING EQUIPMENT SCHEDULE | | | | | | | | | | | | |
|-------------|--|-----------------------|----------|-----------|-----------------|---------------|---|-------|------|-----|---|--------------|--|
| | TAG EQUIPMENT MANUFACTURER MODEL SERVICE PUMP TYPE FLOW RATE (GPM) FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLOW | | | | | | | | | | | <u>NOTES</u> | |
| 4 | EWH | ELECTRIC WATER HEATER | AO SMITH | DEL-6 | TENANT BATHROOM | | | | | 208 | 1 | | 2KW. 6 GALLON. 10 GPH RISE @ 100 DEGF RISE |
| ` | EXP | EXPANSION TANK | TACO | PAX84-150 | MECHANICAL ROOM | | | | | | | | |
| \bigwedge | RCP-1 | RECIRCULATION PUMP | TACO | 0034e | MECHANICAL ROOM | RECIRCULATION | 3 | 19.10 | 0.33 | 208 | 1 | 1.5 | |
| 4 | RCP-2 | RECIRCULATION PUMP | TACO | 006e3 | TENANT BATHROOM | RECIRCULATION | 2 | 1.34 | 0.05 | 120 | 1 | 0.5 | |

| | PLUMBING COMPRESSED AIR EQUIPMENT SCHEDULE | | | | | | | | | | | | | |
|------------|--|-----------------|-------------------|-------|-----|---|------|--|--|--|--|--|--|--|
| <u>TAG</u> | EQUIPMENT MANUFACTURER MODEL HP VOLTAGE PHASE AMPS | | | | | | | | | | | | | |
| AC1 | AIR COMPRESSOR | SULLAIR | 3009V-V05 | 40.00 | 460 | 3 | 57.8 | OUTLET CONNECTION 1-1/2", SAFETY RELEIF VALVE 1/2" 150 PSIG 300CFM FULL LOAD 125PSI. VALVE-3, 2.5" BACK MNT 200 PSIG DRY GAUGE-3 PRESSURE GUAGE, ELECTRONIC TIMER DRAIN VALVE 90900-04 | | | | | | |
| DR1 | DRYER | SULLIAR | DHL-200-VO1 | | 115 | 1 | 2.0 | 200 SCFM TO -40 DEG F | | | | | | |
| DT | DRY TANK | STEEL FAB | 200 GAL VERT TANK | | | | | | | | | | | |
| F1 | PRE-FILTER | SULLAIR | SXTF-025F | | | | | PIPE CONNECTION 1-1/2" | | | | | | |
| F2 | FILTER | SULLAIR | SXTH-0250F | | | | | PIPE CONNECTION 1-1/2" | | | | | | |
| FC | FLOW CONTROLLER | OPTIFLO | OP-200-GRN-RL | | | | | MAX FLOW 200 SCFM. SET TO 115 PSI | | | | | | |
| OS | OIL SEPARATOR | CLEAN RESOURCES | IDC 500 | | | | | INSTALL IN RECESSED PIT | | | | | | |
| WT | WET TANK | STEEL FAB | 400 GAL VERT TANK | | | | | | | | | | | |

| | PLUMBING STEAM EQUIPMENT SCHEDULE | | | | | | | | | | | | |
|-----|--|----------------|-------|----|-------------------|----|------|-----|---|------|---|--|--|
| TAG | AG EQUIPMENT MANUFACTURER MODEL FLOW RATE (GPM) PUMP TYPE HEAD HP VOLTAGE PHASE AMPS NOTES | | | | | | | | | | | | |
| BFT | FEED TANK | COLUMBIA | CRT-5 | | | | 2.00 | 460 | 3 | 3.4 | | | |
| BS | BLOWDOWN SEPARATOR | COLUMBIA | BS-2 | | | | | | | | | | |
| CRP | CONDENSATE RETURN PUMP | BFS INDUSTRIES | LPS2 | 13 | CONDENSATE RETURN | 46 | 0.33 | 120 | 1 | 7.5 | PROVIDE 316 STAINLESS STEEL, WATERTIGHT NEMA 4X, FOR 600LBS/HR, 25 GAL CAPACITY | | |
| SB1 | STEAM BOILER | COLUMBIA | CT-50 | | | | | 115 | 1 | 20.0 | 2100 MBH SET BOILER TO 80 PSI. 20 AMP SERVICE | | |

| | PLUMBING GAS WATER HEATER SCHEDULE | | | | | | | | | | | |
|-----|------------------------------------|--------------|-----------|------------------|-----------|--------------|----------------|-------------|-------|---------------------------|------------|---|
| TAG | SERVICE | MANUFACTURER | MODEL | STORAGE CAPACITY | INPUT MBH | GAS PRESSURE | <u>VOLTAGE</u> | <u>AMPS</u> | PHASE | RECOVERY | EFFICIENCY | <u>NOTES</u> |
| | | | | | | | | | | | | |
| WH1 | MECHANICAL ROOM | AO SMITH | BTHS-750A | 120 | 750.0 | 3.5"-14" WC | 120 | 5 | 1 | 882 USGH @ 100 DEG F RISE | 0.97 | PROVIDE CONDENSATE NEUTRALIZATION KIT 100289340 |
| WH2 | MECHANICAL ROOM | AO SMITH | BTHS-750A | 120 | 750.0 | 3.5"-14" WC | 120 | 5 | 1 | 882 USGH @ 100 DEG F RISE | 0.97 | PROVIDE CONDENSATE NEUTRALIZATION KIT 100289340 |
| WH3 | MECHANICAL ROOM | AO SMITH | BTHS-750A | 120 | 750.0 | 3.5"-14" WC | 120 | 5 | 1 | 882 USGH @ 100 DEG F RISE | 0.97 | PROVIDE CONDENSATE NEUTRALIZATION KIT 100289340 |
| EWH | TENANT BATHROOM | AO SMITH | DEL-6 | | | | | | | | | 2KW. 6 GALLON. 10 GPH RISE @ 100 DEGF RISE |

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30 Park Road, Suite 4
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BD III
engineering Lorenzo Foods Teterboro 25 CENTRAL AVE TETERBORO, NJ, 07608 ISSUED FOR PLANNING BOARD BUILDING DEPT CONSTRUCTION ____ ផ្លី BRIAN D. TANNENHAUS NJ PROFESSIONAL ENGINEER NO. GE 45801 DATE: 02/24/2022 PLUMBING SCHEDULES

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05/06/22

09/24/2021

