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**NY ENGINEERS**  
NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

REVISIONS

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1	PERMIT SET	05.29.24

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PROJECT TITLE:

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DRAWING TITLE:  
**MECHANICAL LEGENDS,  
SYMBOLS & SCHEDULES**

PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
DRAWN BY: NYE	CHECKED BY: NYE

DRAWING NUMBER:

M100

MECHANICAL DRAWING LIST

M-100	MECHANICAL LEGENDS, SYMBOLS & SCHEDULES
M-101	MECHANICAL NOTES & SPECIFICATIONS (01 OF 03)
M-102	MECHANICAL NOTES & SPECIFICATIONS (02 OF 03)
M-103	MECHANICAL NOTES & SPECIFICATIONS (03 OF 03)
M-200	MECHANICAL FLOOR PLAN
M-400	MECHANICAL DETAILS (01 OF 02)
M-401	MECHANICAL DETAILS (02 OF 02)

SYMBOL & ABBREV.	DESCRIPTION
	SA/SUP SUPPLY AIR (RISE/DROP)
	RA/RET RETURN AIR DUCT (RISE/DROP)
	EA/EXH EXHAUST AIR DUCT (RISE/DROP)
	SG DUCT MOUNTED SUPPLY GRILLE WITH AIR SCOOP DAMPER
	SG SUPPLY GRILLE
	RG/EG RETURN GRILLE/EXHAUST GRILLE
	SD/SR SUPPLY DIFFUSER/SUPPLY REGISTER (ARROWHEAD REPRESENTS NUMBER OF THROW)
	FLEX FLEXIBLE DUCT (14'-0" MAXIMUM)
	RDE ROUND DUCT ELBOW
	RDT ROUND DUCTWORK
	BDD BACK DRAFT DAMPER
	VCD VOLUME CONTROL DAMPER
	COD CABLE OPERATED DAMPER
	DUT DUCT TRANSITION (RECTANGULAR TO ROUND)
	T-STAT PROGRAMMABLE THERMOSTAT, PROVIDED WITH HVAC PACKAGE
	TEMP SENS TEMPERATURE SENSOR (REMOTE), PROVIDED WITH HVAC PACKAGE
	HUMID SENS HUMIDITY SENSOR (REMOTE), PROVIDED WITH HVAC PACKAGE
	SD SMOKE DETECTOR, PROVIDED WITH HVAC PACKAGE, MOUNTED IN UNIT
	D CONDENSATE DRAIN
	DIA DIAMETER
	DOOR UNDERCUT

SYMBOL & ABBREV.	DESCRIPTION
A/C, AC	AIR CONDITIONING
A.F.F.	ABOVE FINISHED FLOOR
BDD	BACK DRAFT DAMPER
CB	CIRCUIT BREAKER
CLG	CEILING
CONN.	CONNECT/CONNECTION
CONT.	CONTINUATION
CFM	CUBIC FEET PER MINUTE
DISC.	DISCONNECT
EA	EXHAUST AIR
EF	EXHAUST FAN
GA	GAGE/GAUGE
GC	GENERAL CONTRACTOR
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
MFR.	MANUFACTURER
MECH.	MECHANICAL
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
RA	RETURN AIR
SA	SUPPLY AIR
S/S	STAINLESS STEEL
TYP.	TYPICAL
RTU	ROOF TOP UNIT
WH	WATER HEATER

MECHANICAL FAN SCHEDULE (PROVIDED BY LL)

TAG	FLOW RATE	STATIC PRESSURE		ELECTRIC DATA			WEIGHT	BASIS OF DESIGN			REMARKS
		EXTERNAL		MOTOR SIZE							
	CFM	IN W.G.	RPM	FLA	HP	V/HZ/PH	LBS	MANUFACTURER	MODEL		
KEF-1 (N)	400	2	1854	1.1	1/2	460/60/3	100	GREENHECK	USF-07	-	

NOTES:  
1. REUSE THE EXISTING EXHAUST FAN IF THE FAN CAN BE DIAL DOWN TO 400 CFM. IF NOT, PROVIDE NEW FAN AS PER THE SCHEDULE OR EQUIVALENT (PROVIDED BY LL). ENSURE MAINTAINING 2" W.G EXTERNAL STATIC FOR THE FAN.  
2. PROVIDE FACTORY MOUNTED AND INSTALLED DISCONNECT.  
3. INSTALL AS PER MANUFACTURERS RECOMMENDATION.  
4. COORDINATE WITH ELECTRICAL CONTRACTOR.  
5. CONTRACTOR TO PROVIDE MOUNTING FRAMES AND VIBRATION ISOLATORS FOR FAN MOUNTING . ALSO PROVIDE FLEXIBLE CONNECTION AT DUCT CONNECTION TO FAN.  
6. ALL DIRECT DRIVE FANS TO HAVE ECM MOTORS.  
7. FAN SPEED SHALL BE FIELD ADJUSTIBLE.  
8. PROVIDE MOTOR STARTERS, DISCONNECTS WITH NEMA-3R (IF NOT FACTORY PROVIDED). ALL EQUIPMENT NORMAL POWER WIRING BY ELECTRICAL CONTRACTOR. COORDINATE REQUIREMENTS.  
9. INTERLOCK KEF-1 (N) WITH AH-1

SCHEDULE OF AIR REGISTERS

TAG	TYPE	CFM RANGE	NECK SIZE (IN)	FRAME SIZE (IN)	TYPE	MAX NC	MANUFACTURE	MODEL NO
SD-1	SUPPLY DIFFUSER	200-400	10"	24X24	4 WAY SQUARE DIFFUSER	25	TITUS	OMNI
RG-1	RETURN GRILLE	500-1800	22X22	24X24	DUCT/CEILING MOUNTED GRILLE	25	TITUS	350 RL
EG-1	EXHAUST GRILLE	100-450	10X10	12X12	CEILING MOUNTED GRILLE	25	TITUS	350 RL

NOTES:  
1.CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS PLANS TO ENSURE PROPER AIR DEVICE BORDER SELECTION.  
2. COORDINATE COLOR/FINISH WITH ARCHITECT.  
3. PROVIDE AIR SCOOP DAMPER TO DUCT MOUNTED GRILLES.

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHASUT AIR
AH-1 ( E )	SEE PLAN	1800	750	1050	
KEF-1 ( N )	KITCHEN				400
TOTAL:		1800	750	1050	400
BUILDING PRESSURE:		350 POSITIVE			







B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE ELECTRONIC COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.  
END OF SECTION 0102

SECTION 078413-PENETRATION FIRE-STOPPING

- 1.1 QUALITY ASSURANCE
- A. INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.
- B. FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL
- 1.2 PENETRATION FIRESTOPPING
- A. PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
- B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479:
- C. PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.
- D. W-RATINGS: PER UL 1479.
- 1.3 INSTALLATION
- A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
- 1.4 FIELD QUALITY CONTROL
- A. INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
- 1.5 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

FOR THE FOLLOWING SYSTEMS:

METALLIC AND NON-METALLIC CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED GROUPINGS OF PENETRANTS, USE ONE OR MORE THE FOLLOWING MATERIALS:

- a. LATEX SEALANT
- b. SILICONE SEALANT
- c. INTUMESCENT PUTTY
- d. MORTAR
- h. SILICONE FOAM
- i. PILLOWS/BAGS
- j. INTUMESCENT WRAP STRIPS
- k. INTUMESCENT COMPOSITE SHEET

1.6 MANUFACTURERS

1. HILTI CONSTRUCTION CHEMICAL, INC
2. TREMCO INC.
3. 3M FIRE PROTECTION PRODUCTS

END OF SECTION 078413

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC EQUIPMENT

- 1.1 PERFORMANCE REQUIREMENTS
- A. DELEGATED DESIGN: DESIGN EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
- B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
1. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.
2. DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
- 1.2 SUBMITTALS
- A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER
- 1.3 QUALITY ASSURANCE
- A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE - STEEL."
- 1.4 COMPONENTS
- A. METAL FRAMING SYSTEMS: MFMA MANUFACTURER
- B. FIBERGLASS STRUT SYSTEMS: COOPER B-LINE
- C. THERMAL-HANGER SHIELD INSERTS:
- D. FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS
- E. EQUIPMENT SUPPORTS.
- END OF SECTION 230529

SECTION 230548 - VIBRATION AND SEISMIC CONTROLS FOR HVAC EQUIPMENT

PART 1 - GENERAL

- 1.1 PERFORMANCE REQUIREMENTS
- A. SEISMIC-RESTRAINT LOADING:
1. SITE CLASS AS DEFINED IN THE IBC: A, B
2. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC: I II III
- a. COMPONENT IMPORTANCE FACTOR: 1.0
- b. COMPONENT RESPONSE MODIFICATION FACTOR: 2.5
- c. COMPONENT AMPLIFICATION FACTOR: 2.5.
3. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND) 18%
4. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIOD: 8%
- 1.2 COMPONENTS
- A. VIBRATION ISOLATORS:
1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE-DEFLECTION TYPE.
3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
4. SPRING ISOLATORS: FREESTANDING, Laterally STABLE, OPEN-SPRING TYPE.
5. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
6. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
8. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
9. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
- B. AIR-MOUNTING SYSTEMS:
1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWES.
2. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWES.
- C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL, WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.
- D. VIBRATION ISOLATION EQUIPMENT BASES:
1. STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
2. INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE.
- E. SEISMIC-RESTRAINT DEVICES:
1. SNUBBERS: WELDED STRUCTURAL-STEEL SHAPES AND REPLACEABLE RESILIENT ISOLATION WASHERS AND BUSHINGS.
2. CHANNEL SUPPORT SYSTEM: MFMA-3 SLOTTED STEEL CHANNELS.
3. RESTRAINT CABLES: GALVANIZED OR STAINLESS STEEL CABLES.
4. ANCHOR BOLTS: MECHANICAL OR ADHESIVE TYPE, SEISMIC RATED.
5. RESILIENT ISOLATION WASHERS AND BUSHINGS: MOLDED NEOPRENE.
- 1.3 FIELD QUALITY CONTROL
- A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.
- PART-2 PRODUCTS
- 1.4 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES
- A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. COOPER B-LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
5. HILTI, INC.
6. ISOLATION TECHNOLOGY, INC.
7. KINETICS NOISE CONTROL.
8. LOOS & CO.; CABLEWARE DIVISION.
9. MASON INDUSTRIES.
10. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
11. UNISTRUT; TYCO INTERNATIONAL, LTD.
12. VIBRATION ELIMINATOR CO., INC.
13. VIBRATION ISOLATION.
14. VIBRATION MOUNTINGS & CONTROLS, INC.
- END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

1. AIR SYSTEMS: CONSTANT-VOLUME, DUAL-DUCT, VARIABLE-AIR-VOLUME, MULTI-ZONE AND INDUCTION-UNIT SYSTEMS.
2. EXISTING SYSTEMS.

1.2 QUALITY ASSURANCE

- A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION

- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

E. SEISMIC-RESTRAINT DEVICES:

1. SNUBBERS: WELDED STRUCTURAL-STEEL SHAPES AND REPLACEABLE RESILIENT ISOLATION WASHERS AND BUSHINGS.
2. CHANNEL SUPPORT SYSTEM: MFMA-3 SLOTTED STEEL CHANNELS.
3. RESTRAINT CABLES: GALVANIZED OR STAINLESS STEEL CABLES.
4. ANCHOR BOLTS: MECHANICAL OR ADHESIVE TYPE, SEISMIC RATED.
5. RESILIENT ISOLATION WASHERS AND BUSHINGS: MOLDED NEOPRENE.

1.3 FIELD QUALITY CONTROL

- A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.

PART-2 PRODUCTS

1.4 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES

- A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. COOPER B-LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
5. HILTI, INC.
6. ISOLATION TECHNOLOGY, INC.
7. KINETICS NOISE CONTROL.
8. LOOS & CO.; CABLEWARE DIVISION.
9. MASON INDUSTRIES.
10. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
11. UNISTRUT; TYCO INTERNATIONAL, LTD.
12. VIBRATION ELIMINATOR CO., INC.
13. VIBRATION ISOLATION.
14. VIBRATION MOUNTINGS & CONTROLS, INC.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

1. AIR SYSTEMS: CONSTANT-VOLUME, DUAL-DUCT, VARIABLE-AIR-VOLUME, MULTI-ZONE AND INDUCTION-UNIT SYSTEMS.
2. EXISTING SYSTEMS.

1.2 QUALITY ASSURANCE

- A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION

- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.

1.2 FIELD QUALITY CONTROL

- A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:

- A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:
- B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
- |                                       |      |
|---------------------------------------|------|
| UNCONDITIONED SPACES WITHIN BUILDING: | R-6  |
| WITHIN BUILDING ENVELOPE ASSEMBLY:    | R-12 |
| OUTSIDE OF BUILDING:                  | R-12 |

1.4 ITEMS NOT INSULATED:

1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
4. FACTORY-INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.5 PRODUCTS

THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

1. JOHNS-MANVILLE
2. OWENS-CORNING

1.6 ACOUSTICAL TREATMENT

1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED.

END OF SECTION 230713

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION

- A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 2-1/2 INCH WG PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THESE STANDARDS, REGARDLESS OF THE VELOCITY IN THE DUCT.
- B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 2" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

1. DUCTWORK SHALL BE TRANSVERSELY JOINTED BY CONNECTING SEAMS OF COMPANION ANGLES FORMED FROM 1-1/2"x1-1/2"x1/8" GALVANIZED ANGLES, TACK-WELDED OR RIVETED TO THE DUCT. THE ANGLE FRAME SHALL BE CONTINUOUSLY FLANGED UP INTO UPRIGHT OF ANGLE AND EACH CORNER SHALL BE FILLED IN AND GROUND SMOOTH. JOINTS SHALL BE GASKETED WITH 1/8" THICK REINFORCED GASKET, OVERLAPPED AT CORNERS, GASKET SIMILAR TO 3M-1202 OR APPROVED EQUAL.
2. RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL WELDED CONSTRUCTION.
3. HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6 CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.
4. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.
5. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.
6. ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.

2. RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL WELDED CONSTRUCTION.
3. HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6 CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.
4. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.
5. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.
6. ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.

- C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:

USG MAX. SIDE INCHES TRANSVERSE JOINTS AND BRACING

- 22 UP TO 12 S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
- 22 13 TO 24 1"x1"x1/8" ANGLES ON 4 FOOT CENTERS
- 20 25 TO 35 1"x1"x1/8" ANGLES ON 2 FOOT CENTERS

- D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:

1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

- E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3-6 AND AS SHOWN IN FIG. 3-1 AND 3-2 FOR ROUND DUCTWORK.

1.2 MATERIALS

- A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
- B. DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS.
1. FIBROUS-GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
2. PERFORATED INNER DUCT.
- C. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
- D. DOUBLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
1. FIBROUS-GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
2. PERFORATED INNER DUCT.

E. SHEET METAL MATERIALS:

1. GALVANIZED SHEET STEEL.
2. PVC-COATED, GALVANIZED SHEET STEEL.
3. CARBON-STEEL SHEETS.
4. STAINLESS-STEEL SHEETS.
5. ALUMINUM SHEETS.
6. FACTORY-APPLIED ANTI-MICROBIAL COATING.
- F. DUCT LINER:
1. FIBROUS GLASS, TYPE I, FLEXIBLE.
- a. WITH ANTI-MICROBIAL EROSION-RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.
- G. SEALANT MATERIALS:
1. TWO-PART TAPE SEALING SYSTEM.
2. WATER-BASED JOINT AND SEAM SEALANT.
3. SOLVENT-BASED JOINT AND SEAM SEALANT.
4. FLANGED JOINT SEALANT.
5. FLANGE GASKETS.
6. ROUND DUCT JOINT O-RING SEALS.

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NY ENGINEERS

NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
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- 1.3 SEISMIC-RESTRAINT DEVICES
- A. CHANNEL SUPPORT SYSTEM.

B. STAINLESS-STEEL RESTRAINT CABLES.

C. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED-SUPPORT-SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS OR REINFORCING STEEL ANGLE CLAMPED TO HANGER ROD.
- 1.4 DUCT CLEANING
- A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.

B. CLEAN THE FOLLOWING ITEMS:

1. AIR OUTLETS AND INLETS.

2. SUPPLY, RETURN, AND EXHAUST FANS.

3. AIR-HANDLING UNITS.

4. COILS AND RELATED COMPONENTS.

5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.

6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.

7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.
- 1.5 DUCT SCHEDULE
- A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

SHEET METAL WORK

- A. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE GALVANIZED SHEET STEEL AND SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. DUCT CONSTRUCTION STANDARDS, PRESSURE CLASSIFICATION 2 IN. W.G.
- B. DUCTWORK STATIC PRESSURE CLASSIFICATION:
- a. 2 IN OF W.G. UP TO 2 IN OF W.G.

b. 6 IN OF W.G. ABOVE 2 IN & UP TO 6 IN WG
- C. SEALING OF DUCTWORK SHALL COMPLY WITH SECTION 603.9 OF THE MECHANICAL CODE OF MASSACHUSETTS STATE OR IN MASSACHUSETTS STATE, THE MASSACHUSETTS STATE CONSTRUCTION CODES.
- D. VOLUME DAMPERS: GALVANIZED STEEL, PER SMACNA "LOW VELOCITY MANUAL," EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. INSTALL WITH LEVERS ACCESSIBLE.
- E. ACCESS DOORS: INSULATED OR UNINSULATED, SAME AS DUCT.
- 1) PROVIDE MINIMUM 20 IN. X 20 IN. (OR EQUIVALENT) ON ALL DUCTS, UNLESS OTHERWISE APPROVED, AT FIRE DAMPERS, AND AT ALL DUCT ACCESSORIES SUCH AS HUMIDIFIERS, DUCT SMOKE DETECTORS, AUTO DAMPERS, AND LOUVERS.

2) ACCESS DOORS SHALL BE LOCATED AT THE BOTTOM OF THE DUCT OR ON THE SIDE, AND NOT MORE THAN 16 INCHES FROM THE DUCT ACCESSORY THAT IT SERVES (FIRE DAMPER, FSD, ETC.).

3) WHERE DUCT SIZE DOES NOT PERMIT A 20 IN. X 20 IN. (OR EQUIVALENT AREA) ACCESS DOOR, THE ACCESS DOOR SHALL BE FABRICATED OF AN AREA EQUIVALENT TO A 20 IN. X 20 IN. WITH THE SMALLER DIMENSION BEING 2 INCHES SMALLER THAN THE DUCT SIZE WHERE IT WILL BE LOCATED, AND LOCATED NOT LESS THAN 1" FROM ANY DUCT EDGE.

4) FOR DUCTS WHICH LARGEST DIMENSION IS 12 INCHES (WIDTH AND OR HEIGHT), IT IS PERMISSIBLE TO PROVIDE A 10 IN. X 10 IN. (OR EQUIVALENT AREA) ACCESS DOOR LOCATED AT THE BOTTOM OR THE SIDE OF THE DUCT. THAN

5) ALL ACCESS DOORS TO BE HINGED, WITH LATCH SIMILAR TO VENTLOCK NO. 100.
- A. KITCHEN RANGE HOOD EXHAUST DUCT INCLUDING FAN DISCHARGE TO ATMOSPHERE SHALL BE PROVIDED AS FOLLOWS:
- NOTE: IF ALL DUCTWORK IS INSIDE BUILDING.

1. NO. 10 USSG BLACK STEEL.

NOTE: MASSACHUSETTS STATE CODE REQUIRES THAT ALL DUCTWORK MUST BE WELDED AND THICKER BLACK STEEL IF SOME DUCTWORK IS OUTDOORS. CHECK LOCAL CODE FOR OTHER AREAS.

2. BLACK STEEL OF FOLLOWING GAUGES AND THICKNESSES. INSIDE BUILDING SHALL BE NO. 10 USSG. OUTDOOR DUCTWORK TO 7 SQ FT SHALL BE 1/8 INCH, ABOVE 7 SQ FT TO 12.5 SQ FT SHALL BE 3/16 INCH, AND OVER 12.5 SQ FT SHALL BE 1/4 INCH.

3. ALL SEAMS, JOINTS AND PENETRATIONS SHALL BE LIQUIDTIGHT CONTINUOUS EXTERNAL ARC WELDED, EXCEPT WHERE THE DUCT STUB COLLAR OF THE HOOD IS CONNECTED TO THE EXHAUST DUCT. CONNECTION TO THE HOOD SHALL BE CONTINUOUS LIQUIDTIGHT EXTERNAL ARC WELDED OR IN ACCORDANCE WITH NFPA 96, 1984.

4. ANGLE REINFORCING SHALL BE MINIMUM 1-1/2 INCH X 1-1/2 INCH X 3/16 INCH AT MAXIMUM 4 FT ON CENTERS AND IN ACCORDANCE WITH SMACNA RECTANGULAR INDUSTRIAL DUCT CONSTRUCTION STANDARDS SHALL BE MOUNTED.

5. CLEANOUT DOORS ON HORIZONTAL DUCTS SHALL BE MOUNTED MAXIMUM 12 FT APART AND IN CHARGE OF DIRECTION. CLEANOUT DOORS ON HORIZONTAL DUCT SHALL BE MOUNTED ON SIDE OF DUCT. BOTTOM EDGE SHALL BE NOT LESS THAN 2 INCH ABOVE THE BOTTOM OF DUCT. CLEANOUT DOORS AT VERTICAL DUCTS SHALL BE MOUNTED AT BASE. DOOR AND FRAME SHALL BE SAME GAUGE AS DUCT. HINGES SHALL BE VENTLOCK NO. 280, EXTRA HEAVY ZINC PLATED. LATCHES SHALL BE VENTLOCK NO. 140, CAST ZINC. GASKETS SHALL BE BETWEEN DOOR AND FRAME. GASKETS SHALL BE 1/8 INCH DOUBLE THICKNESS RATED FOR 2000OF. CLEANOUT DOOR SIZE SHALL BE MAXIMUM 24 INCH X 24 INCH AND MINIMUM SHALL BE 24 INCH ONE SIDE, AND OTHER SIDE SHALL BE 2 INCH LESS THAN DUCT HEIGHT.
- G. FLEXIBLE CONNECTIONS: NEOPRENE-COATED GLASS FABRIC, 30 OZ PER SQ YD WITH SEWED AND CEMENTED SEAMS, SIMILAR TO VENT FABRICS. PROVIDE WITH METAL COLLARS. ALLOW MINIMUM MOVEMENT OF 1 IN.
- H. TURNING VANES: GALVANIZED STEEL SMALL DOUBLE-THICKNESS VANES WITH 2 IN. INSIDE RADIUS.
- I. FIRE DAMPERS: UL LISTED, GALVANIZED STEEL CONSTRUCTION, MULTIBLADED TYPE, SPRING LOADED, EQUIPPED WITH FUSIBLE LINK, CONFORMING TO NFPA STANDARD 90A AND APPROVED BY MASSACHUSETTS STATE BOARD OF STANDARDS AND APPEALS FOR MASSACHUSETTS STATE CAL-100-65-5M. SIMILAR TO AIR BALANCE MODEL 319-P, RATED AS REQUIRED. SEE INSTALLATION ON DRAWING.
- J. DUCTWORK FOR AREAS WITH HIGH HUMIDITY SHALL BE ALUMINUM FABRICATED ONE GAGE LARGER THAN GALVANIZED FOR THE SAME PRESSURE CLASSIFICATION. THESE DUCTS INCLUDE SHOWERS, OUTDOOR AIR INTAKE, HUMIDIFIERS, ETC.
- K. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR DIMENSIONS.
- L. AUTOMATIC DAMPERS: COMPLETE WITH LINKAGE AND ELECTRIC OPERATOR. OPPOSED BLADE DAMPER OR GALVANIZED STEEL MIN. 4 IN., MAX. 8 IN. WIDE WITH COMPRESSIBLE EDGE SEALS TO PREVENT LEAKAGE. FACTORY-ASSEMBLE STEEL LINKAGE AND SHAFT WITH NYLON OR OIL-IMPREGNATED BRONZE BEARINGS. MOTOR WITH SUFFICIENT POWER TO LIMIT LEAKAGE TO 10 CFM PER SQ FT. LINKAGE TO WITHSTAND LOAD EQUAL TO TWICE MAXIMUM OPERATING FORCE WITHOUT DEFLECTION. DAMPER MOUNTED IN WELDED STEEL CHANNEL FRAME.
- M. WIRE MESH SCREEN (WMS): NO. 16 USSG, 3/4 SQUARE MESH, 1 IN. WIDE GALVANIZED STEEL ENCLOSING FRAME. FLANGED DUCT OPENING TO RECEIVE FRAME.
- N. COMBINATION FIRE AND SMOKE DAMPERS: UL LISTED, GALVANIZED STEEL CONSTRUCTION MULTI-BLADED TYPE. BLADES SHALL BE AIRFOIL SHAPED, DOUBLE SKIN, SINGLE PIECE CONSTRUCTION. EQUIPPED WITH FUSIBLE LINK CONFORMING TO NFPA STANDARD 90A, 92A & 92B, AND COMPLY WITH LATEST STANDARD UL555 AND UL555S WITH LEAKAGE CLASS I SMOKE DAMPERS, BLADE SEALS. SIMILAR TO RUSKIN MODEL FSD 60, MASSACHUSETTS STATE BSA LISTING# 176-82-SM. ACTUATOR SHALL BE ELECTRICALLY POWERED, 120 V/1 PH, AND MOUNTED IN THE FACTORY AT THE TIME OF FABRICATION.
3. NOISE CONTROL
- A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.

B. PROVIDE SOUND LINING FOR THE FOLLOWING DUCTWORK:

1) ALL DUCTWORK WITHIN MECHANICAL ROOMS AND NOT LESS THAN 20 FT ON EACH SIDE OF ALL FANS AND AC UNITS.

2) AIR TRANSFER DUCTS.

3) DOWNSTREAM OF ALL VARIABLE AIR VOLUME AND CONSTANT VOLUME BOXES FOR A MINIMUM OF 15 FT.

4) ALL MIXED AIR PLENUMS, EXCEPT WHERE MOISTURE CARRYOVER FROM OUTDOOR AIR LOUVER WILL OCCUR.

5) FULL EXTENT OF SUPPLY DUCTS SERVING CONFERENCE ROOMS.

6) ALL EXPOSED INTERIOR SUPPLY DUCTWORK.

7) ALSO WHERE NOTED ON A DRAWING.
- C. SOUND LINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1 IN. THICKNESS, MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMACOTE LINA COUSTIC.
- D. ALL SOUND LINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.

Thermostatic Controls:

- A. THERMOSTATIC CONTROLS (MANDATORY)
- THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.
- EXCEPTION:
1. INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED THAT BOTH OF THE FOLLOWING CONDITIONS ARE MET:

2. THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN ± 45 DEGREES) (0.9 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).

3. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.
- C. DEADBAND (MANDATORY)
- WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.
- EXCEPTIONS:
1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.

2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.
- D. SETPOINT OVERLAP RESTRICTION (MANDATORY)
- WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION DEADBAND.
- G. OFF-HOUR CONTROLS (MANDATORY)
- EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.
- EXCEPTIONS:
1. ZONES THAT WILL BE OPERATED CONTINUOUSLY.

2. ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.
- H. THERMOSTATIC SETBACK (MANDATORY)
- THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).
- I. AUTOMATIC SETBACK AND SHUTDOWN (MANDATORY)
- AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.
- J. AUTOMATIC START (MANDATORY)
- AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

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NEARBY ENGINEERS

382 NE 191ST STREET SUITE 49674,

MIAMI, FL 33179

PH-914.257.3455

WWW.NY-ENGINEERS.COM

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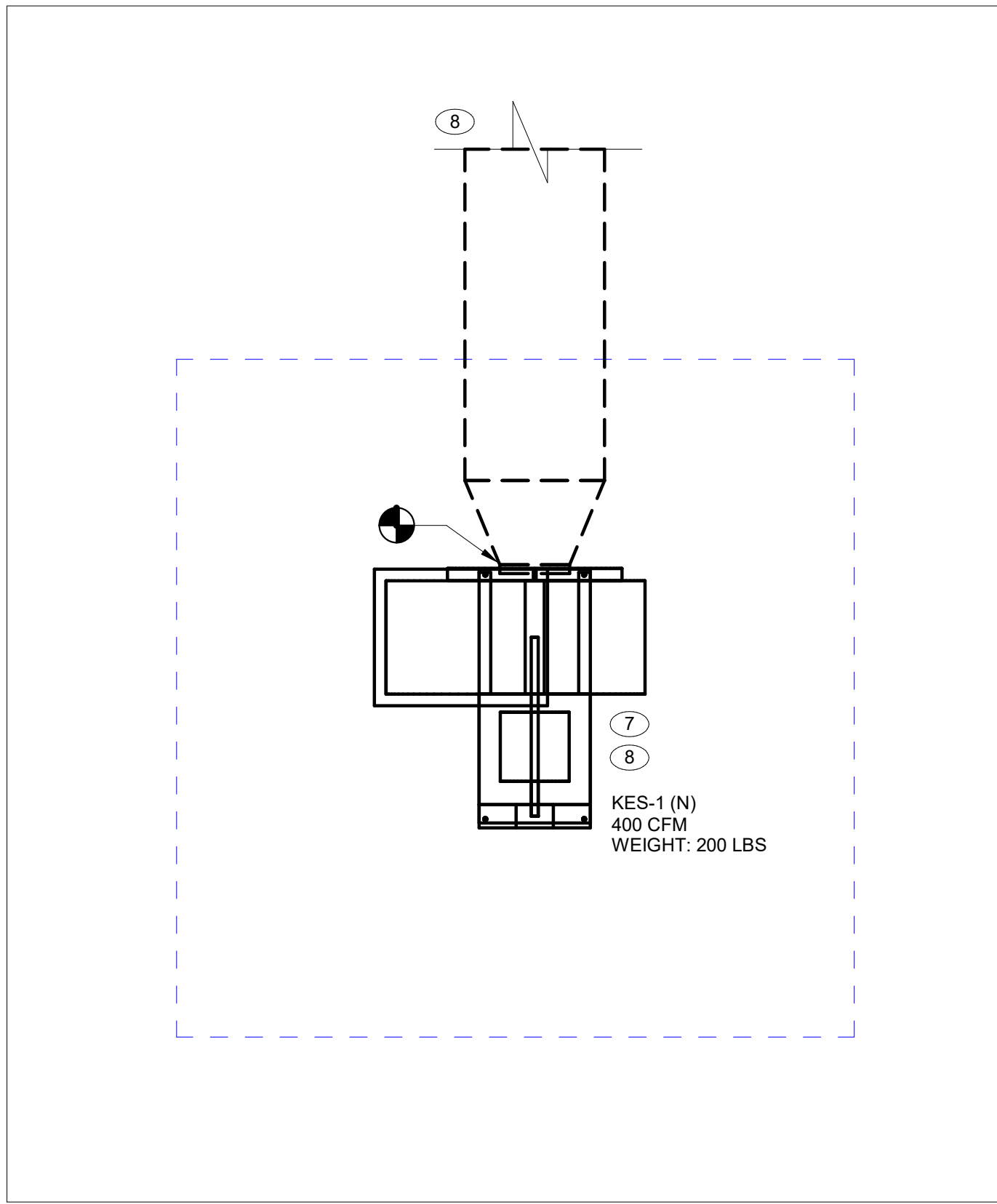
MECHANICAL NOTES & SPECIFICATIONS (03 OF 03)

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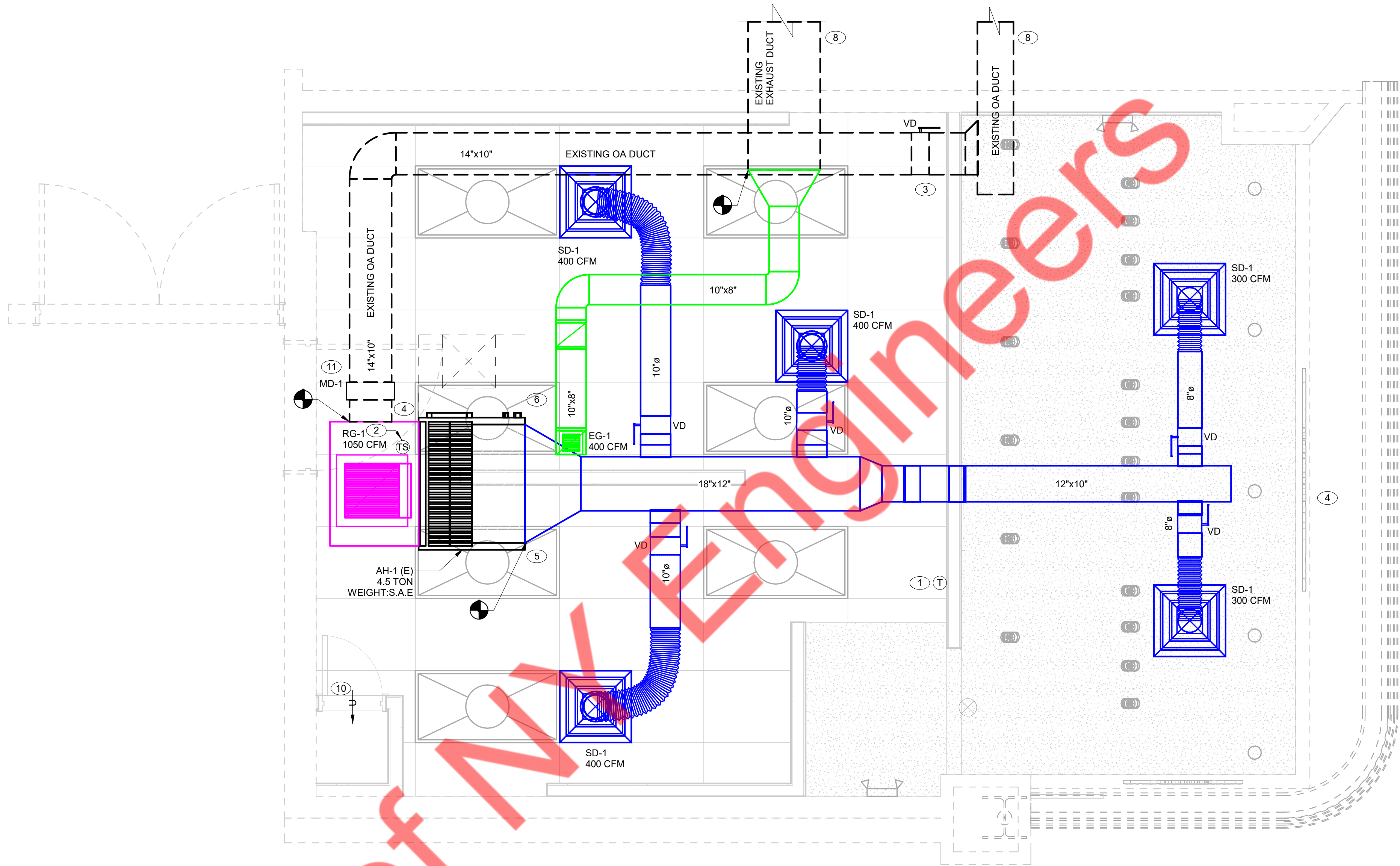
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M103





2 ROOF PART PLAN  
1/2" = 1'-0"



1 MECHANICAL FLOOR PLAN  
1/2" = 1'-0"

HVAC FLOOR PLAN 1/2" = 1'-0" A

- CONTRACTOR SHALL COORDINATE EQUIPMENT /DUCT LOCATIONS WITH STRUCTURAL DRAWINGS.
- PROVIDE WEATHER PROOF COATING FOR EXPOSED REFRIGERANT PIPING AND DUCTS.
- PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS COORDINATE WITH ELECTRICAL ENGINEER FOR POWER REQUIREMENT FOR FSD.
- THE SUSPENSION OF ANY ITEMS FROM BASE BUILDING STRUCTURE BY MEANS OF DRILLING, WELDING, SHOOTING ARE PROHIBITED. CONTRACTOR TO MAKE SURE ALL THE EQUIPMENTS, DUCTS TO BE SUPPORTED BY MEANS OF THE BEAM CLAMPS.

- LOCATE THERMOSTAT CONTROLS ON WALL AT 48" A.F.F. COORDINATE LOCATION WITH LIGHT SWITCHES AND OTHER WALL MOUNTED ACCESSORIES. RUN 24 VAC POWER AND SIGNAL CONDUCTORS IN TWO (2) SEPARATE (2) CONDUCTOR CABLES, 18 AWG.
- CONTRACTOR TO PROVIDE NEW REMOTE TEMPERATURE SENSOR IN RETURN AIR PATH AND WIRE BACK TO T-STAT.
- CONTRACTOR TO BALANCE THE OA CFM TO 750.
- CONNECT THE EXISTING DUCT WITH THE RETURN AIR DUCT PLENUM. EXTENT/ MODIFY THE DUCT ROUTING AS PER THE SITE CONDITION.
- EXISTING CEILING MOUNTED AIR HANDLER INDOOR UNIT TO REMAIN SAME ALONG WITH ALL ASSOCIATED SUPPORTS. VERIFY IN FIELD THE LOCATION AND ENSURE THE UNIT IS DELIVERING 1800 CFM SUPPLY AIR.
- 1" CD WITH CONDENSATE DRAIN PUMP TO NEAREST SINK OR LAV. COORDINATE W/PLUMBING CONTRACTOR.
- FAN PROVIDED BY LL. CONTRACTOR TO COORDINATE WITH LL FOR THE FINAL LOCATION, DISTANCE & CONNECTION POINT IN FILED. EXTENT/ MODIFY THE DUCTWORK AS REQUIRED.
- EXISTING DUCTWORK TO REMAIN SAME. CONTRACTOR TO EXTENT/ MODIFY THE EXISTING DUCTING IF REQUIRED.
- REUSE THE EXISTING EXHAUST FAN IF THE FAN CAN BE DIAL DOWN TO 400 CFM. IF NOT, PROVIDE NEW FAN AS PER THE SCHEDULE OR EQUIVALENT (PROVIDED BY LL). ENSURE MAINTAINING 2" W.G. EXTERNAL STATIC FOR THE FAN.
- PROVIDE MINIMUM 1" DOOR UNDERCUT.
- MD-1 TO BE INTERLOCKED WITH AH-1(E). COORDINATE WITH ELECTRICAL CONTRACTOR.

GENERAL NOTES - HVAC NTS C

KEY NOTES - HVAC NTS B

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NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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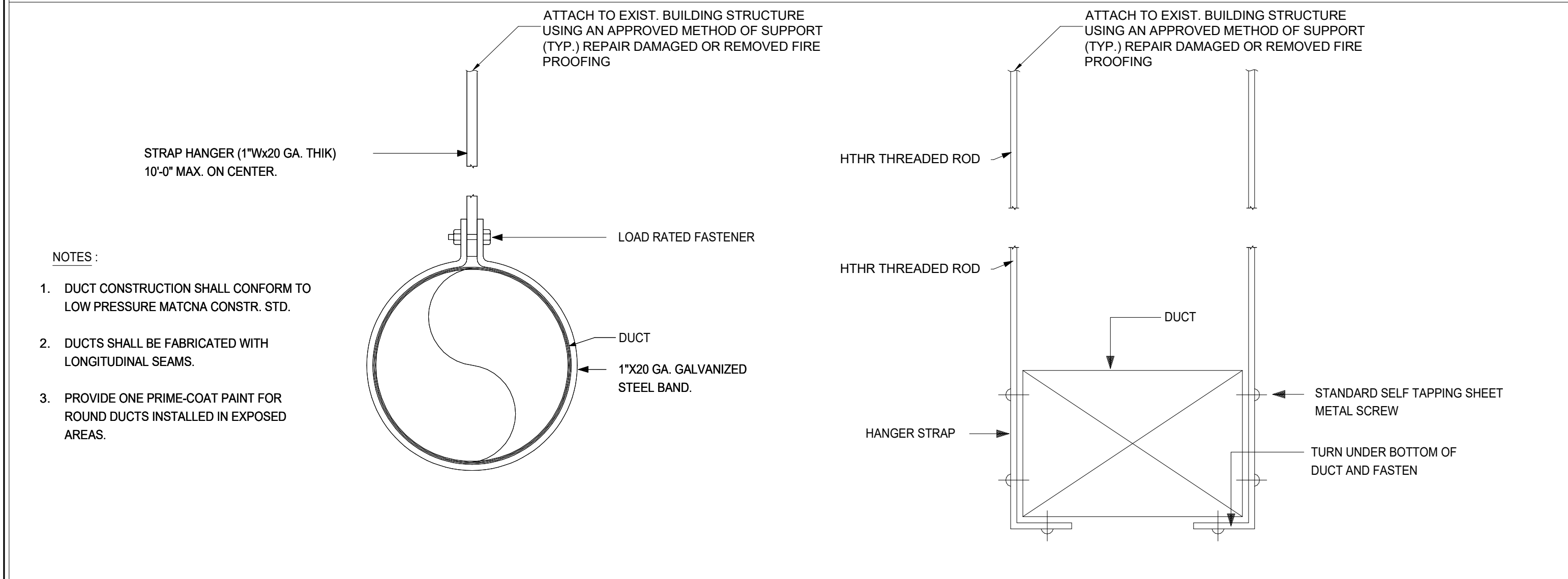
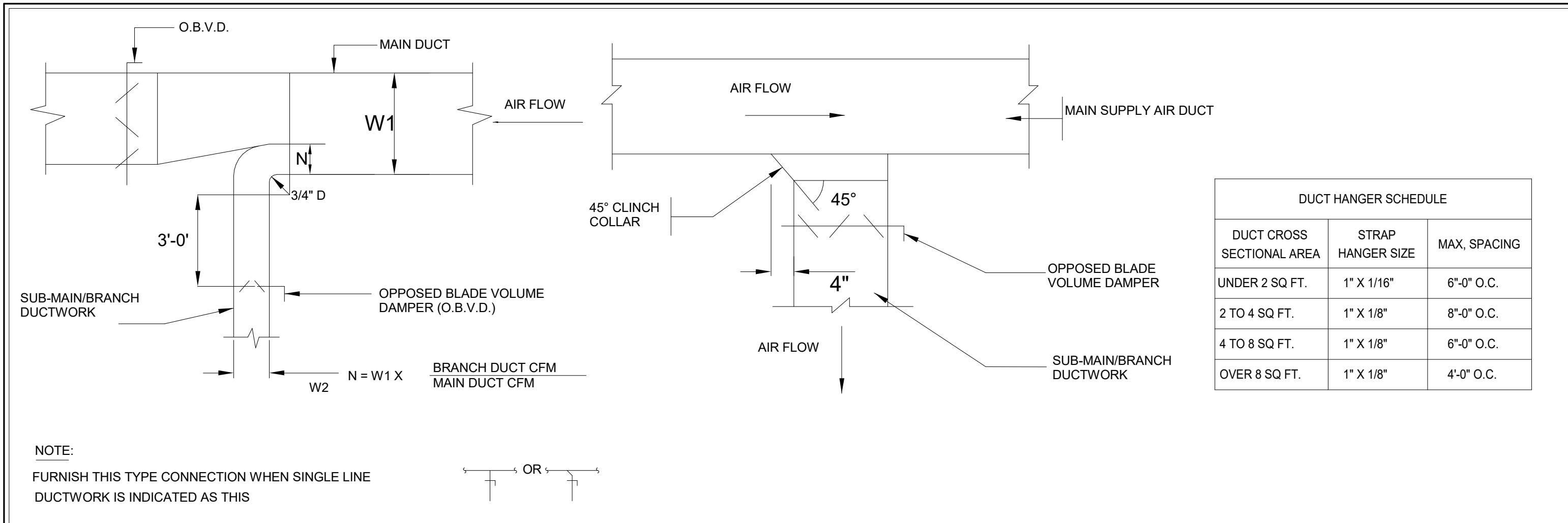
MECHANICAL FLOOR PLAN

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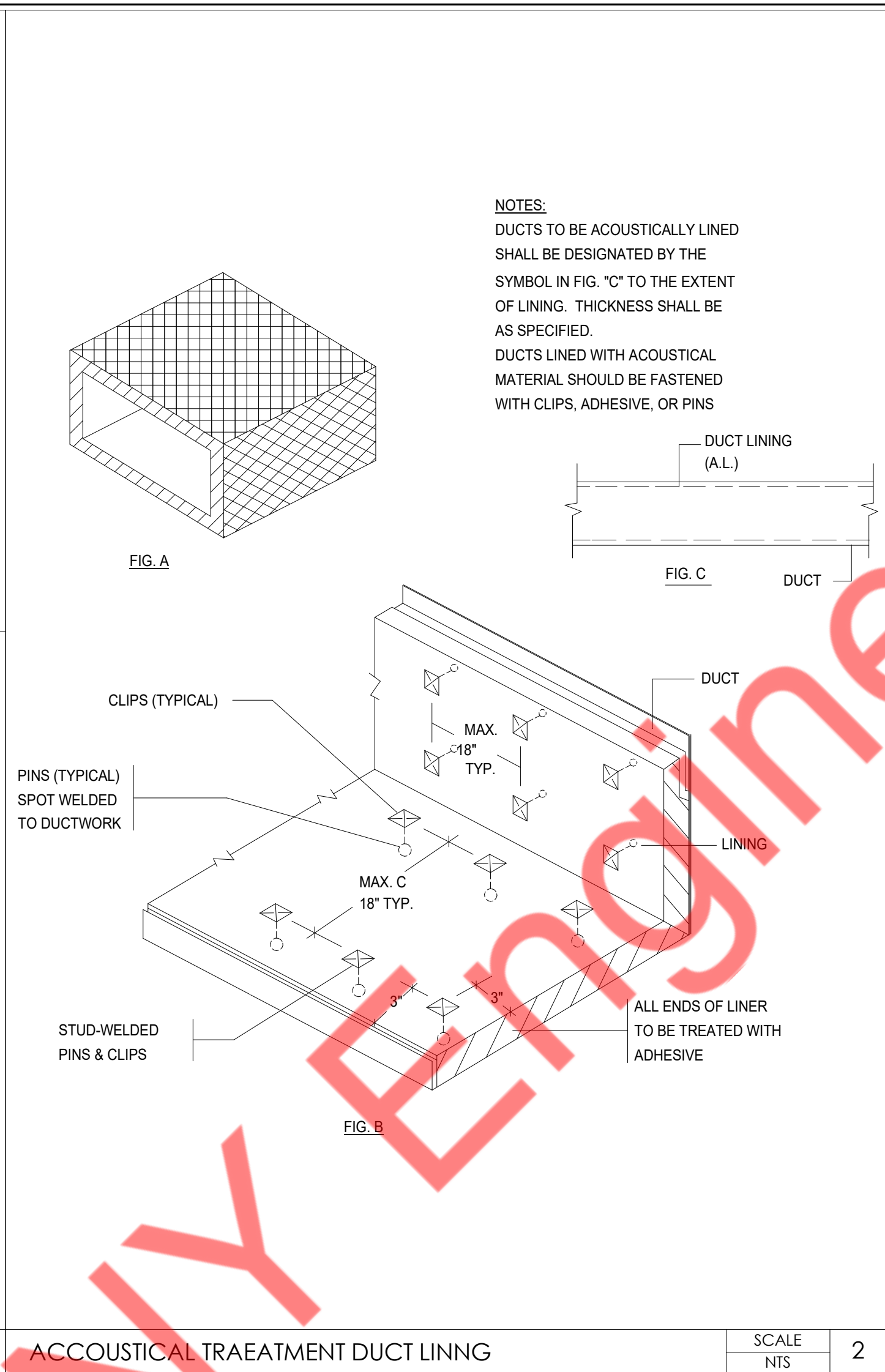
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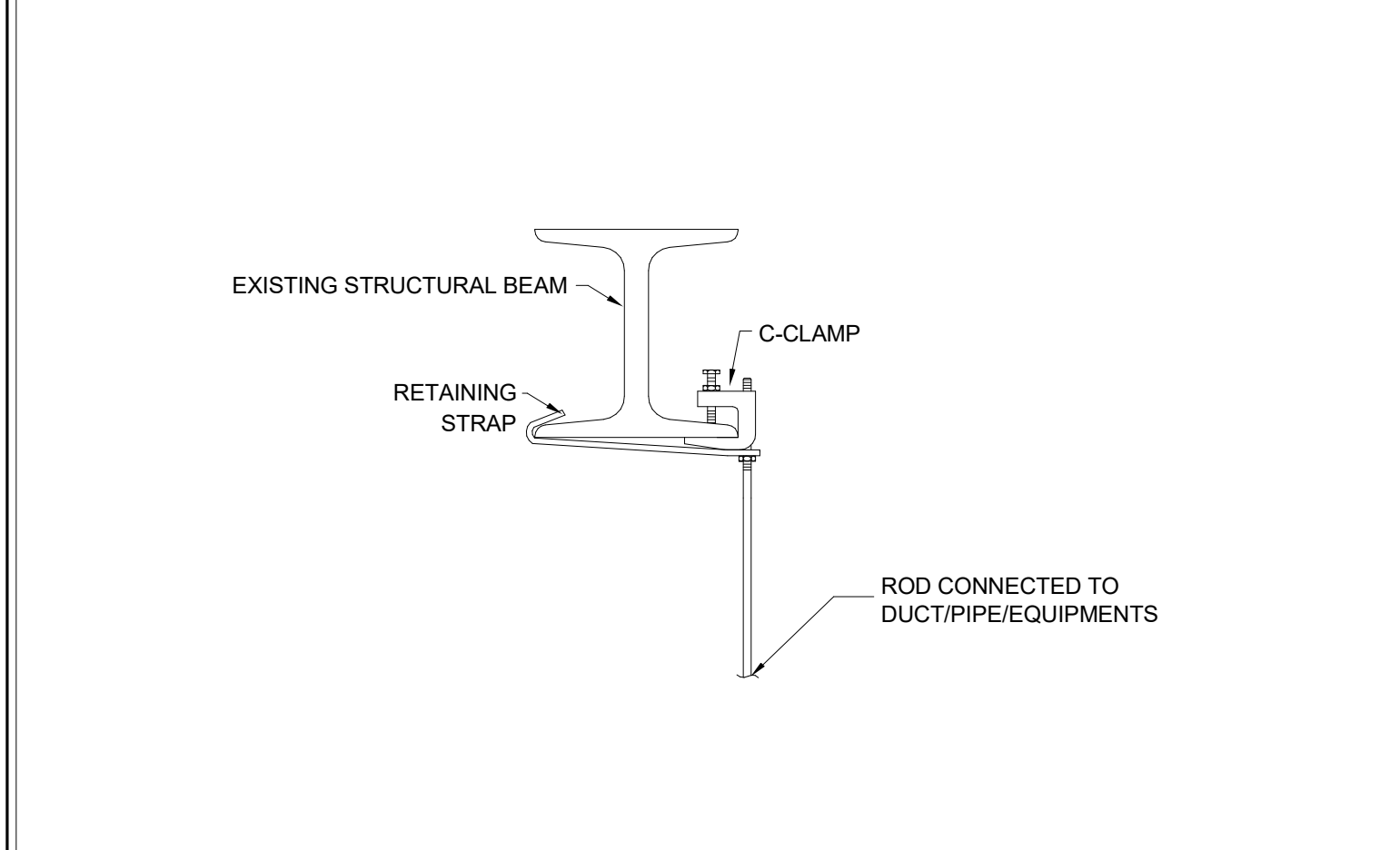




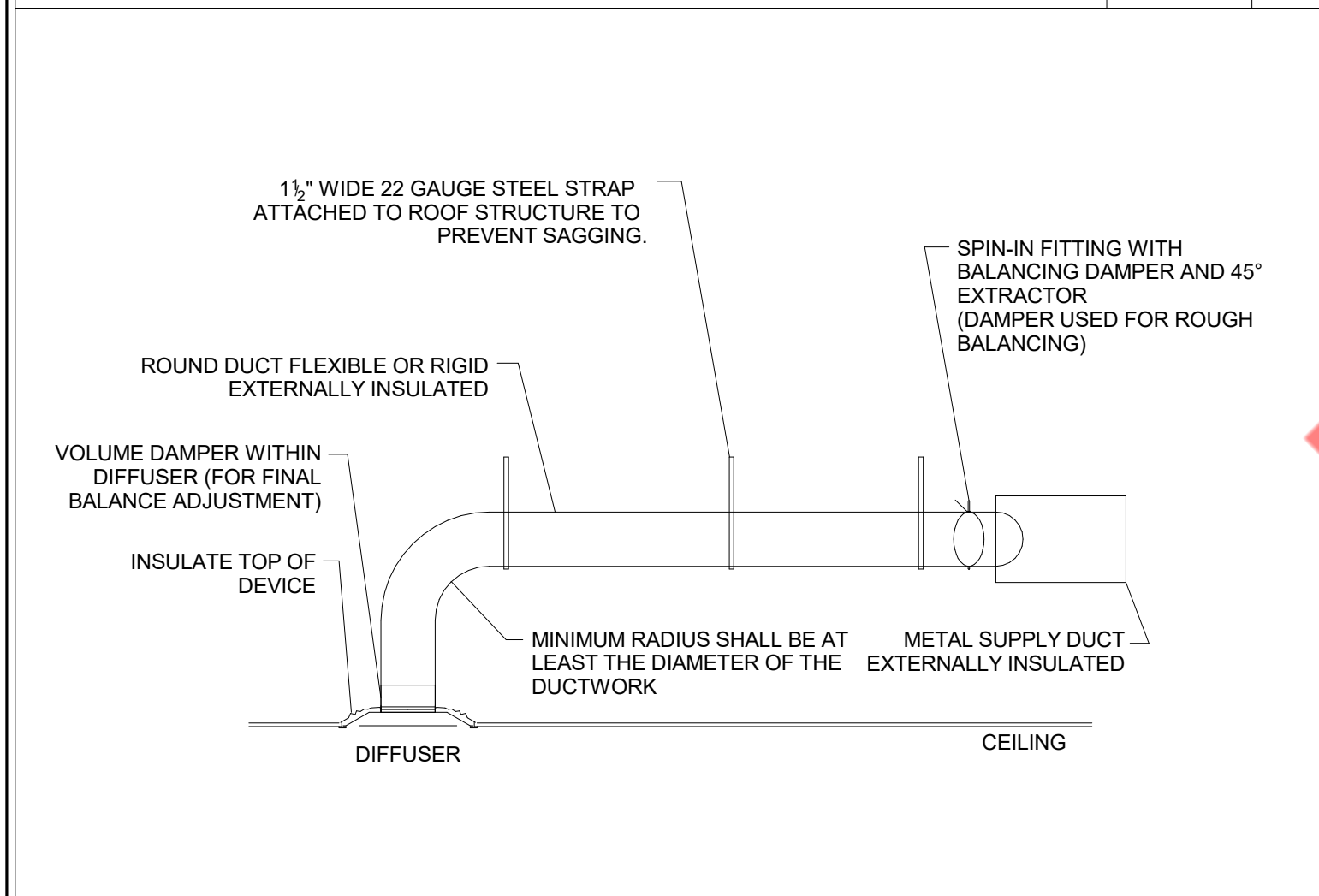
DUCT HANGING AND SUB-MAIN/BRANCH DUCT DETAILS



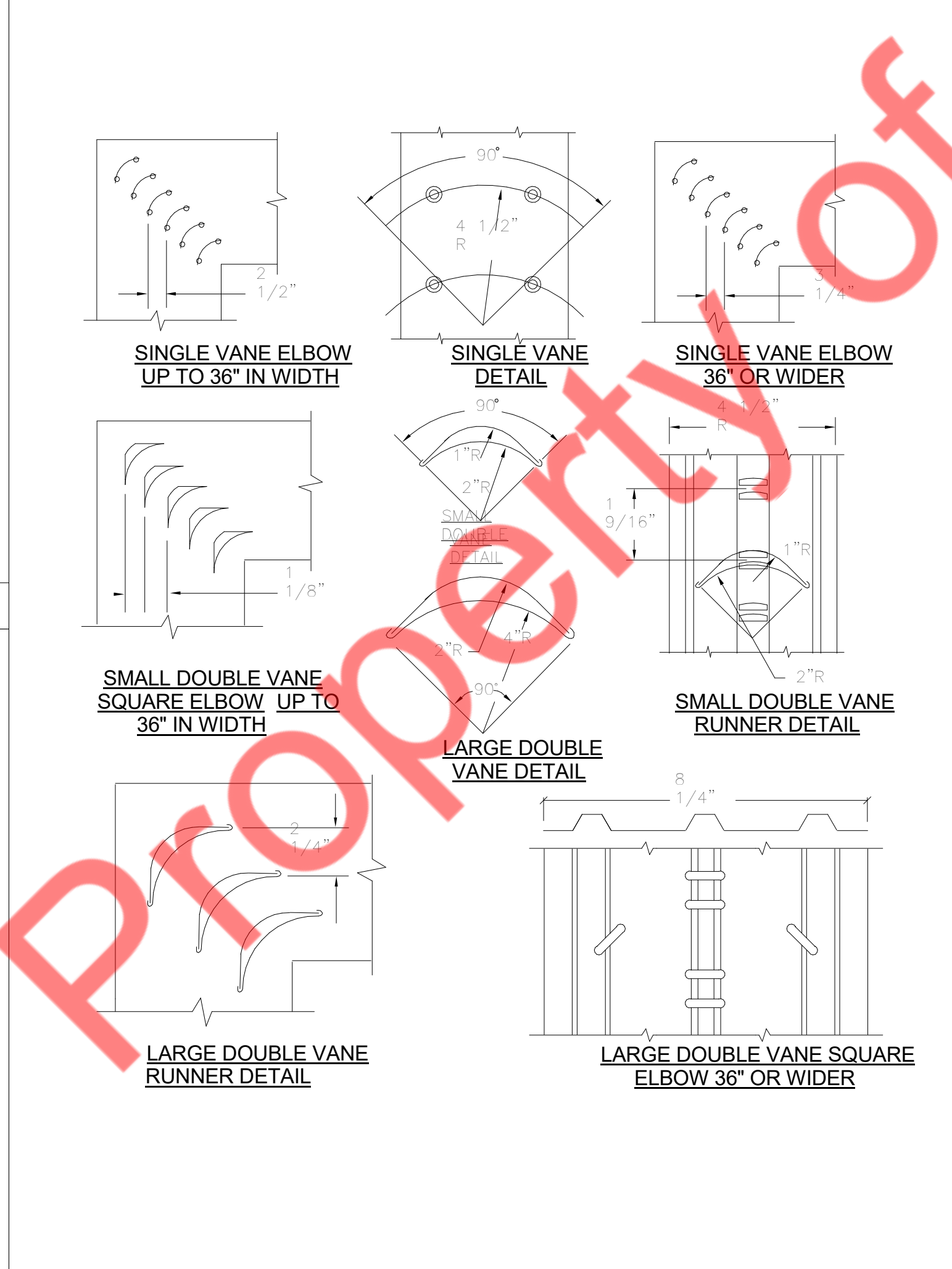
ACCOUSTICAL TREATMENT DUCT LINING



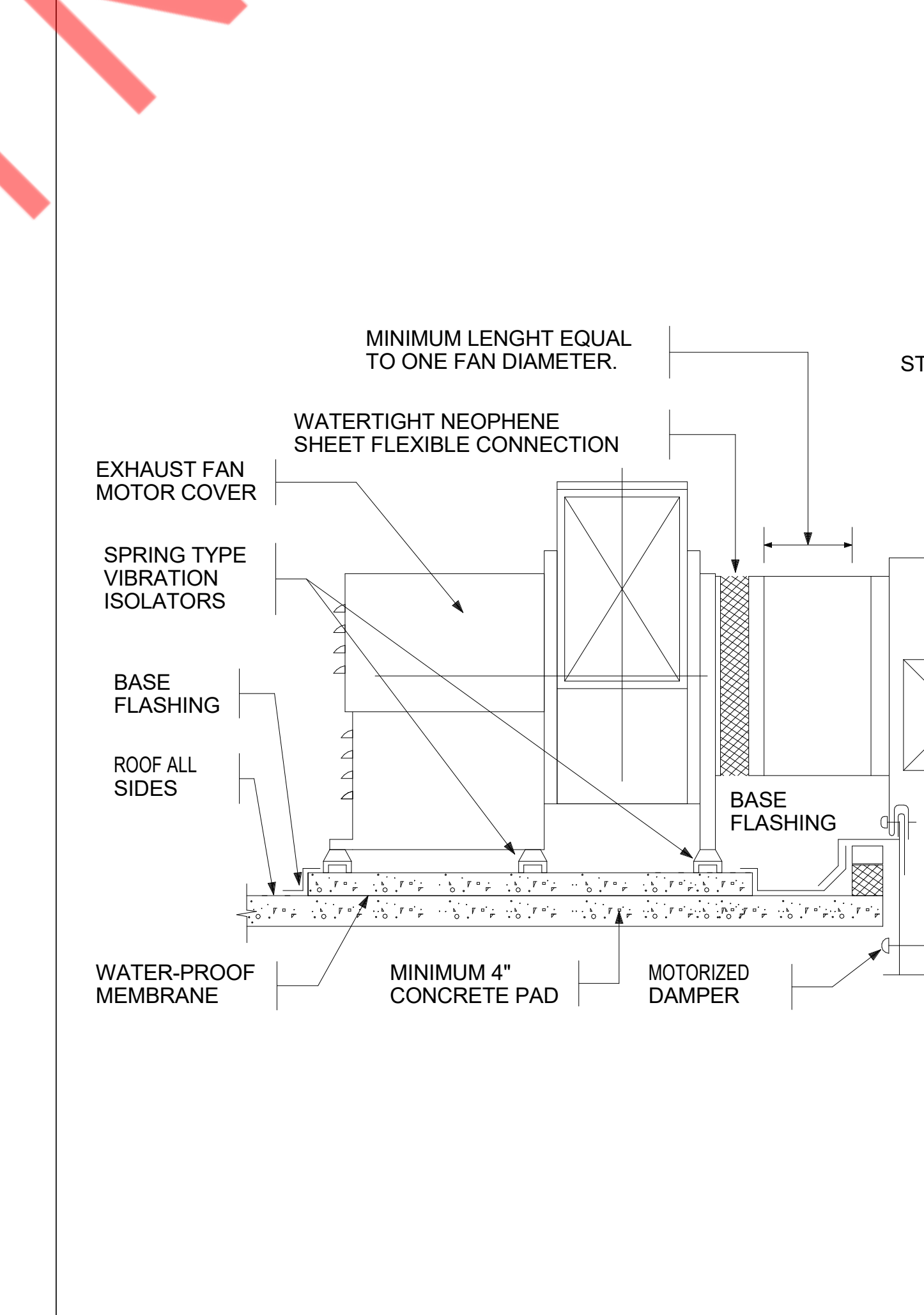
BEAM CLAMP SUPPORT DETAIL



HOOD DUCT TRANSITION



LOW VELOCITY DUCT ELBOW



ROOF MOUNTED UTILITY FAN



ACCOUSTICAL TREATMENT DUCT LINING

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1	PERMIT SET	05.29.24

ISSUED FOR:	DATE ISSUED:
-	08/11/23

PROJECT TITLE:

**CAFFÈ NERO**

DRAWING TITLE:

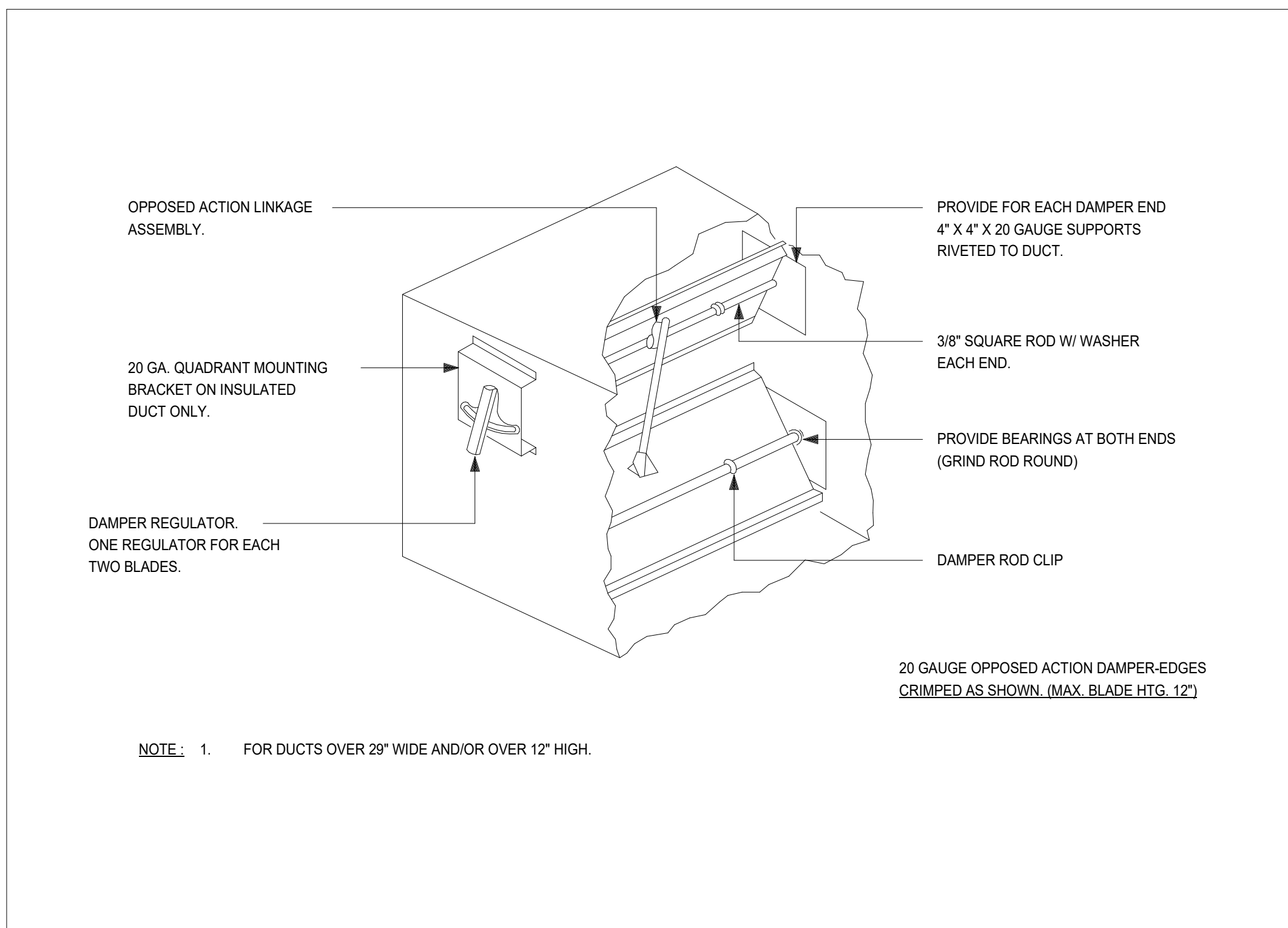
**MECHANICAL DETAILS (01 OF 02)**

PERMIT DWG DATE:	PROJECT NUMBER:
05-29-24	

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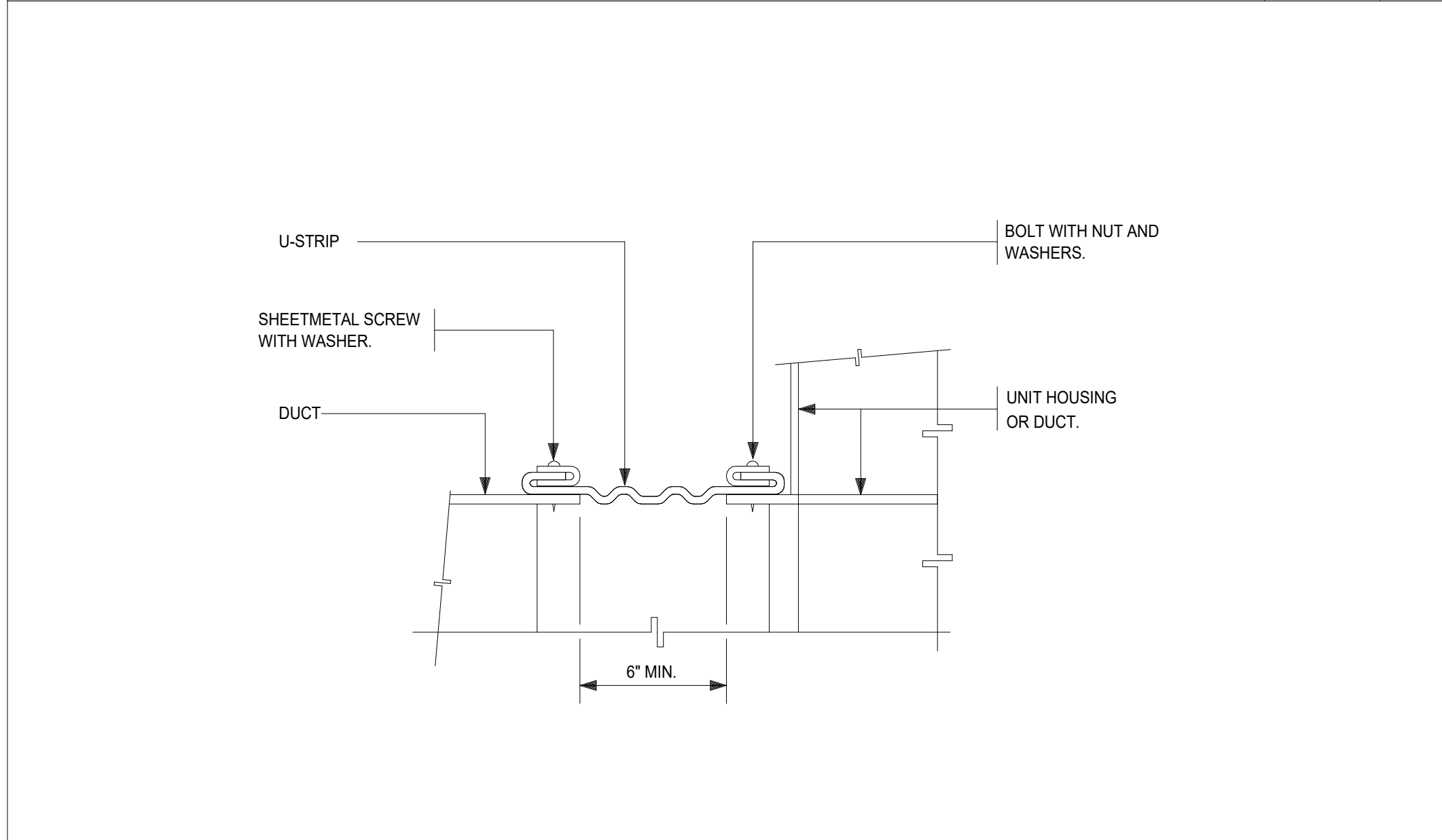
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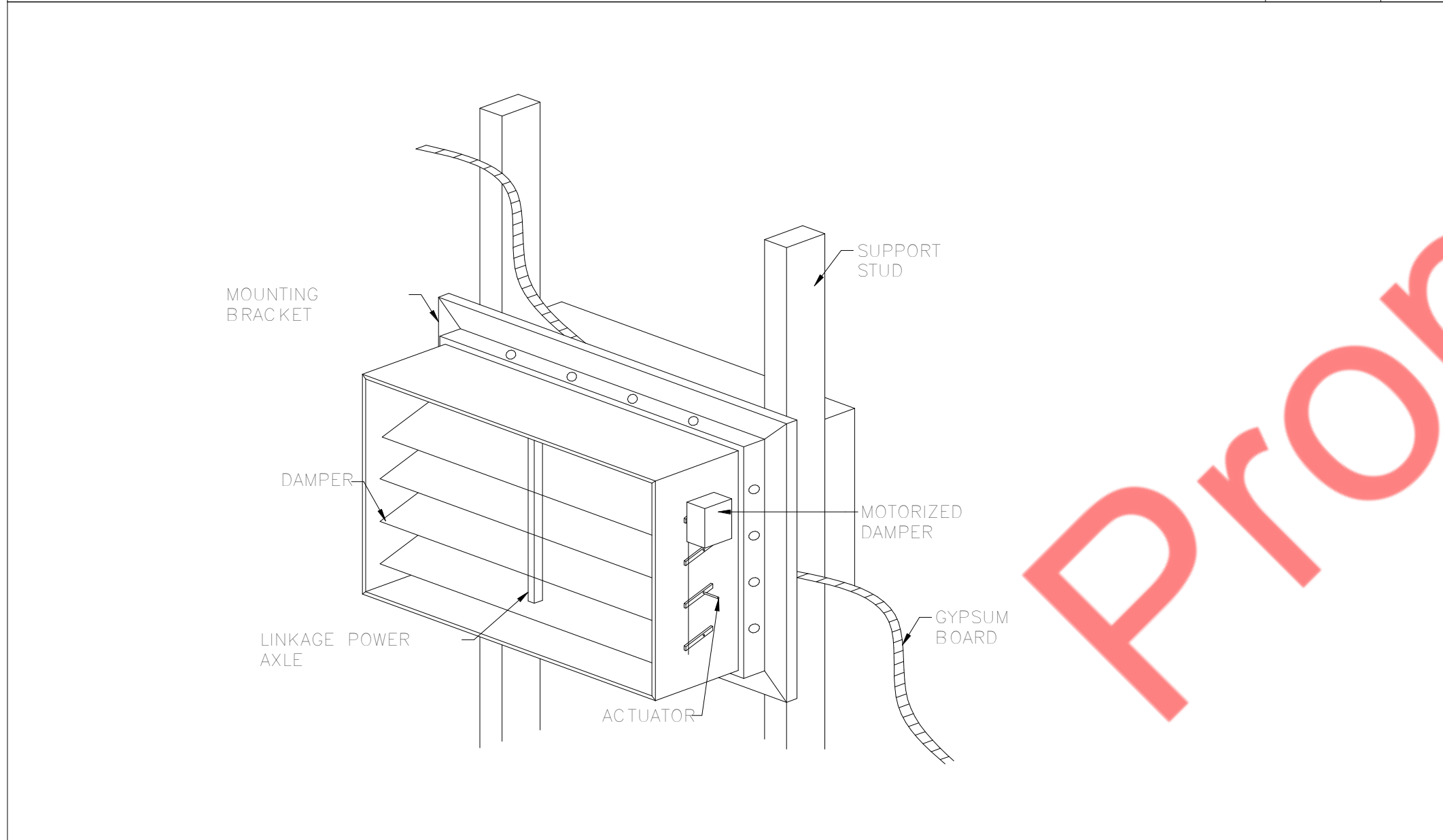
LOW PRESSURE BALANCING DAMPER

SCALE	1
NTS	



FLEXIBLE CONNECTION (DUCT EQUIPMENT)

SCALE	2
NTS	



MOTORIZED DAMPER

SCALE	3
NTS	

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**NY ENGINEERS**  
NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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
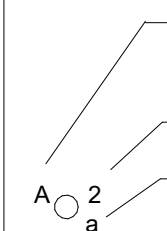











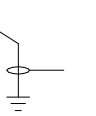


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**MECHANICAL DETAILS (02 OF 02)**

PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
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DRAWING NUMBER:

**M402**



ELECTRICAL SYMBOLS LIST						GENERAL NOTES ( APPLY TO ALL "E" DRAWINGS)	
LIGHTING		POWER AND TELECOMMUNICATION		ELECTRICAL ABBREVIATIONS		<div>1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE, 2023 NEC WITH 527 CMR 12.00 (MASSACHUSETTS ELECTRICAL CODE BASED ON THE 2023 EDITION OF NFPA 70 NEC) AMENDMENTS, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.</div> <div>2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.</div> <div>3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.</div> <div>4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.</div> <div>5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK), NAILS, RAW PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.</div> <div>6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED. FURNISH FISH WIRE.</div> <div>7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT. EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.</div> <div>8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.</div> <div>9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.</div> <div>10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.</div> <div>11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.</div> <div>12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.</div> <div>13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVIDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CONCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL &amp; JUNCTION BOXES SHALL BE READILY ACCESSIBLE.</div> <div>14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.</div> <div>15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.</div> <div>16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAIN/TIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.</div> <div>17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.</div> <div>18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.</div> <div>19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED.</div> <div>20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.</div> <div>21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.</div> <div>22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.</div> <div>23. LIGHTING FIXTURES DESIGNATED AS EMERGENCY TYPE SHALL BE WIRED AHEAD OF ANY CONTROL DEVICES.</div> <div>24. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.</div> <div>25. PROVIDE RACEWAY, BACK-BOXES, GROUNDING PROVISIONS AND 120V POWER AS NECESSARY FOR LOW VOLTAGE SYSTEMS (SECURITY, TELEPHONE DATA, CABLE TELEVISION, PAGING, INTERCOM, ETC. AS APPLICABLE TO PROJECT). REFER TO ASSOCIATED CONSULTANT'S DRAWING FOR EXACT REQUIREMENTS AND LOCATIONS OF DEVICES.</div> <div>26. PROVIDE HANDLE TIES TO ALLOW FOR SIMULTANEOUS DISCONNECTION OF CONDUCTORS IN ANY MULTI-BRANCH CIRCUITS WITH A SHARED NEUTRAL.</div>	
	LIGHTING FIXTURE, HALF SHADED FIXTURE OR "EM" INDICATES EMERGENCY FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.		JUNCTION BOX WITH BLANK COVER PLATE	A	AMPERES	EA	EACH
	LUMINAIRE TYPE : INDICATE BY UPPERCASE LETTER SEE LIGHTING FIXTURE SCHEDULE.		DUPLEX CONVENIENCE RECEPTACLE	A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
	CIRCUIT NUMBER : INDICATED BY NUMBER		DUPLEX DEDICATED RECEPTACLE	AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
	SWITCHING INDICATED BY LOWER CASE LETTERS.		DATA OUTLET - (1) PORT U.O.N. TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH 1 1/4" DIAMETER GROMMETED OPENING.	AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
		MOTORS AND CONTROLS		AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
				AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
				AT	AMP TRIP	ER	EXISTING TO BE RELOCATED
				ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN
				AUTO	AUTOMATIC	EWf	ELECTRIFIED WORKSTATION FURNITURE
				AWG	AMERICAN WIRE GAUGE	EWH	ELECTRIC WATER HEATER
				C	CONDUIT	FA	FIRE ALARM
				C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
				CKT	CIRCUIT	FDR	FEEDER
				CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
				COMM	COMMUNICATION	FIXT	FIXTURE
				CT	CURRENT TRANSFORMER	FL	FLOOR
				CU	COPPER	FLUOR	FLUORESCENT
				°C	DEGREE CELSIUS	G	GROUND
				°F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER
				DIA	DIAMETER	GP	GENERAL PURPOSE
				DISC	DISCONNECT	HG	HUNG CEILING
				DN	DOWN	HP	HORSEPOWER
				DP	DISTRIBUTION PANEL	HWH	HOT WATER HEATER
				DWH	DOMESTIC WATER HEATER	HZ	HERTZ
				DWG	DRAWING	IC	INTERRUPTING CAPACITY
				JB	JUNCTION BOX	PP	POWER PANEL
				KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE
				KV	KILOVOLT	PWR	POWER
				KVA	KILOVOLT-AMPERES	R	REMOVE
				KW	KILOWATTS	RE	RELOCATED EXISTING
				LP	LIGHTING PANEL	REC	RECEPTACLE
				LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL
				MAX	MAXIMUM	RR	REMOVE & RELOCATE
				MC	MOTOR CONTROLLER	SECT	SECTION
				MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW
				MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW
				MIN	MINIMUM	SPEC	SPECIFICATION
				MLO	MAIN LUGS ONLY	SW	SWITCH
				MTD	MOUNTED	SWBD	SWITCHBOARD
				MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL
				N	NEUTRAL	SYS	SYSTEMS
				NE	NEW DEVICE TO REPLACE EXISTING	TELE	TELEPHONE
				NIC	NOT IN CONTRACT	TEMP	TEMPERATURE
				NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN
				NTS	NOT TO SCALE	TYP	TYPICAL
				OC	ON CENTER	U.O.N.	UNLESS OTHERWISE NOTED
				P	POLES	V	VOLT/VOLTAGE
				PB	PULLBOX	VA	VOLT AMPERE
				PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME
				Ø	PHASE	VFD	VARIABLE FREQUENCY DRIVE
				PNL	PANEL	VP	VAPORPROOF
				W	WATT	WP	WEATHERPROOF
				W	WIRE	XFMR	TRANSFORMER
				WH	WALL HEATER	ZRT	ZONE REGISTER TERMINALS
				E	EXISTING	IG	ISOLATED GROUND
SWITCHES AND CONTROLS		ANNOTATION					
	LIGHT SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.		KEYED NOTE REFERENCE				
	TIME CLOCK/LIGHTING CONTACTOR						
WIRING SYSTEMS							
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 Ø, 1#12 N. & 1#12 G. IN ¾"C, UNLESS OTHERWISE NOTED.		ELECTRICAL STEP DOWN TRANSFORMER				
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 2#12 N. & 2#12 G. IN ¾"C, UNLESS OTHERWISE NOTED.		DISTRIBUTION PANELBOARD, SURFACE OR FLUSH MOUNTED				
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 Ø, 3#12 N. & 3#12 G. IN ¾"C, UNLESS OTHERWISE NOTED.						
	CONDUIT AND WIRE TO BUILDING GROUND.						
	EXISTING						
	NEW						
ELECTRICAL DRAWING LIST							
E100	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES						
E101	ELECTRICAL SPECIFICATIONS (1 OF 2)						
E102	ELECTRICAL SPECIFICATIONS (2 OF 2)						
E200	ELECTRICAL POWER PLAN						
E300	ELECTRICAL LIGHTING PLAN						
E400	ELECTRICAL DETAILS						
E500	ELECTRICAL RISER DIAGRAM & PANEL SCHEDULES						

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**NY ENGINEERS**  
  
NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
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DRAWING TITLE:  
**ELECTRICAL SYMBOLS & ABBREVIATIONS**

PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
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DRAWN BY: NYE	CHECKED BY: NYE
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DRAWING NUMBER:

E100







ELECTRICAL SPECIFICATIONS (CONT.)

3) BOXES:

a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER, OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION. Manufacturer shall be Appleton, Raco or Steel City.

b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE ADJUSTABLE CONCRETE TIGHT PRESSED STEEL WITH BRASS FLANGE AND COVERS. FLUSH FLOOR BOXES SHALL INCLUDE BRASS TRIM AND HINGED OUTLET OPENING COVERS. FIRE RATED POKE-THROUGH FLOOR FITTINGS SHALL BE UL LISTED AND APPROVED FOR THE FLOOR SLAB FIRE RATING. FLOOR MOUNTED SERVICE FITTING FOR SERVICE FITTINGS FOR CONNECTION TO UNDER-FLOOR ELECTRIFIED METAL DECK SHALL BE COMPATIBLE WITH THE DECK MANUFACTURER. ACCESS FLOOR MOUNTED FITTINGS FOR USE WITH RAISED FLOOR SHALL BE FLUSH WITH SPACE FOR EQUIPMENT CORD PLUG DEVICES AND SUITABLE FLIP TYPE COVER. MANUFACTURER SHALL BE HUBBELL, WIREMOLD, OR STEEL CITY.

c. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB, FOR THROUGH-THE-FLOOR SYSTEMS. UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY. EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK. MACHINE SCREWS ON METAL. BEAM CLAMPS ON FRAMEWORK. WOOD SCREWS ON WOOD. AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND CUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, ORC-COLD GALVANIZED. EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS. FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH BLACK. CONNECT GROUND CONDUIT TO ENCLOSURE OR RACEWAY AT EACH END, FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

d. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.

INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN NEC TABLE 300.19(A).

e. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

f. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES, CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES, WHERE NECESSARY. REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDINGS STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

g. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.

h. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

14. WIRE AND CABLE:
- A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.
- B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. MANUFACTURER SHALL BE AMERICAN INSULATED WIRE CORP., CERRO, COLLYER, CAPITOL WIRE AND CABLE, OKONITE, SENETOR, SOUTH WIRE OR TRIANGLE.
- C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.
- D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCBA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).
- E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS, WHEN USED IN LIEU OF WIRING IN CONDUIT. STATE IN PROPOSAL WHAT PRICE IS BASED UPON THE USE OF HOSPITAL GRADE BX.
- F. METAL-CLAD CABLE, NFPA 70 ARTICLE 330 TYPE MC:
- 1) INTERLOCKED FLEXIBLE GALVANIZED STEEL ARMOR SHEATH, CONFORMING TO UL REQUIREMENTS FOR TYPE MC METAL CLAD CABLE.
- 2) INSULATED COPPER CONDUCTORS, SUITABLE FOR 600 VOLTS, RATED 90°C, ONE OF THE TYPES LISTED IN NFPA 70 TABLE 310.13(A) OR OF A TYPE IDENTIFIED FOR USE IN TYPE MC CABLE.
- 3) INTERNAL FULL SIZE COPPER GROUND CONDUCTOR WITH GREEN INSULATION.
- 4) ACCEPTABLE COMPANIES: AFC CABLE SYSTEMS INC., SOUTHWIRE, GENERAL CABLE.
- 5) CONNECTORS FOR MC CABLE: AFC FITTING INC.'S AFC SERIES, ARLINGTON INDUSTRIES INC.'S SADDLE GRIP, OR THOMAS & BETTS CO.'S TITE-BITE WITH ANTI-SHORT BUSHINGS.
- G. COLOR CODING SHALL BE AS FOLLOWS:
- 120/208 VOLT SYSTEM: 277/480 VOLT SYSTEM:  
BLACK FOR A PHASE BROWN FOR A PHASE  
RED FOR B PHASE ORANGE FOR C PHASE  
BLUE FOR C PHASE YELLOW FOR C PHASE
- 1) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.
- WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.
- H. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.
- I. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.
- J. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. RULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 60 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
- K. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
- L. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.
- PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.
15. WIRING DEVICES:
- A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.
- B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).
- C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.
- 1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE, TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING: 15A, 125V, NEMA 5-20R, LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
- D. INSERTION RECEPTACLES SHALL BE HOSPITAL GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, GROUNDED, EXCEPT AS NOTED.
- 2) HEALTH CARE FACILITIES:
- a) DUPLEX, 20 AMP, 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8300 HOSPITAL GRADE.
- b) SINGLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8310 HOSPITAL GRADE.
- 3) GROUND FAULT INTERRUPTER RECEPTACLES:
- a. 20 AMP DUPLEX FEED-THROUGH TYPE. SIMILAR TO NO. GF8300.
- E. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.
- F. COLORS: COORDINATE COLORS WITH ARCHITECT.
- G. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL), COORDINATE WITH ARCHITECT.
16. LIGHTING FIXTURES:
- A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT U.O.N. AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE

- AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.
- B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.
- C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK UNIVERSALS OR EQUAL.
- D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAY'S OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF 74" HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.
- E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE. DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.
- F. FLUORESCENT LIGHTING FIXTURES, INCLUDING GENERAL CONSTRUCTION, LAMPS AND BALLASTS SHALL CONFORM TO THE ENERGY EFFICIENCY REQUIREMENTS OF CONSOLIDATED EDISON CO. AND QUALITY FOR A UTILITY REBATE TO OWNER UNDER CON EDISON'S ENLIGHTENED ENERGY LIGHTING REBATE PROGRAM. CONTRACTOR SHALL COORDINATE REBATE PROGRAM WITH CON EDISON AND ARRANGE FOR CON EDISON TO PERFORM A SURVEY TO INVENTORY ALL EXISTING FIXTURES PRIOR TO DEMOLITION.
- G. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED FOR USE IN NEW YORK CITY. AC POWERED WITH PREMIUM LONG-LIFE NIKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.
17. VOICEDATA CONDUIT SYSTEM:
- A. PROVIDE COMPLETE SYSTEM OF RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.
- B. OUTLETS SHALL BE:
- 1) PROVIDE A TWO-GANG J-BOX AND SINGLE OR DOUBLE GANG FLUSH WALL OPENING AS REQUIRED FOR EACH VOICEDATA OUTLET.
- D. PROVIDE PULLSTRINGS, IN RACEWAYS OVER 10 FT LONG.
- E. CONDUIT SHALL BE 3/4 IN. MINIMUM.
18. GROUNDING AND BONDING:
- A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH 2023 NATIONAL ELECTRICAL CODE WITH AMENDMENTS, AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM.
- B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.
- C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.
- D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.
- E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:
- 1) CIRCUITS SERVING ANY WALL BOX DIMMER.
- 2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE, OR AS OTHER WISE NOTED ON DRAWINGS.
- 3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES
- 4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.
19. TRANSFORMERS:
- A. TRAPEZE MOUNTED TRANSFORMERS SHALL BE SUPPORTED BY HANGER ROD ISOLATORS WITH NEOPRENE-IN-SHEAR ELEMENT ENCASED IN A STEEL RETAINER HOUSING, SELECTED FOR 3/8 INCH STATIC DEFLECTION AS MADE BY MASON INDUSTRIES, INC. TYPE HD; KORFUND DYNAMICS CORP. TYPE H, VIBRATION ELIMINATOR CO. TYPE SNRC OR APPROVED. FLOOR MOUNTED TRANSFORMERS SHALL BE DIRECTLY MOUNTED ON DOUBLE DEFLECTION NEOPRENE-IN-SHEAR ISOLATORS, U.O.N. SELECTED FOR MINIMUM 3/8 INCH STATIC DEFLECTION AND SHALL BE MASON INDUSTRIES, INC. TYPE ND, KORFUND DYNAMICS CORP., TYPE F, VIBRATION ELIMINATOR TYPE 386 50 OR APPROVED EQUAL.
- B. LINE, LOAD AND GROUND CONDUCTORS SHALL BE INSTALLED IN LIQUID TIGHT FLEXIBLE CONDUIT NOT LESS THAN 18 INCHES LONG FOR FINAL CONNECTION TO TRANSFORMERS.
- C. TRANSFORMER SECONDARY NEUTRAL SHALL BE CONNECTED TO A LUG AND BOLT INSIDE THE ENCLOSURE.
- D. AFTER PERMANENT SERVICE TO THE TRANSFORMER IS ENERGIZED, THE CONTRACTOR SHALL DETERMINE THE VOLTAGE SUPPLIED AND SELECT TRANSFORMER TAPS TO PROVIDE THE VOLTAGE SPECIFIED ON THE DRAWINGS. CONTRACTOR SHALL RECHECK VOLTAGE AFTER BUILDING LOADS ARE BEING SERVED BY TRANSFORMER AND CHANGE TAPS WHERE REQUIRED TO PROVIDE THE SPECIFIED VOLTAGE ON THE DRAWINGS. TRANSFORMER TAPS SHALL BE ADJUSTED TO PROVIDE NOMINAL VOLTAGE WITH TOLERANCE OF +1% DURING OFF PEAK LOADS.
- E. TRAPEZE MOUNTED TRANSFORMERS SHALL BE SUPPORTED FROM AUXILIARY SUPPORT STEEL BEAMS SECURED TO THE BUILDING SUPPORT BEAMS.

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NY ENGINEERS

NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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1	PERMIT SET	06.29.24

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PROJECT TITLE:

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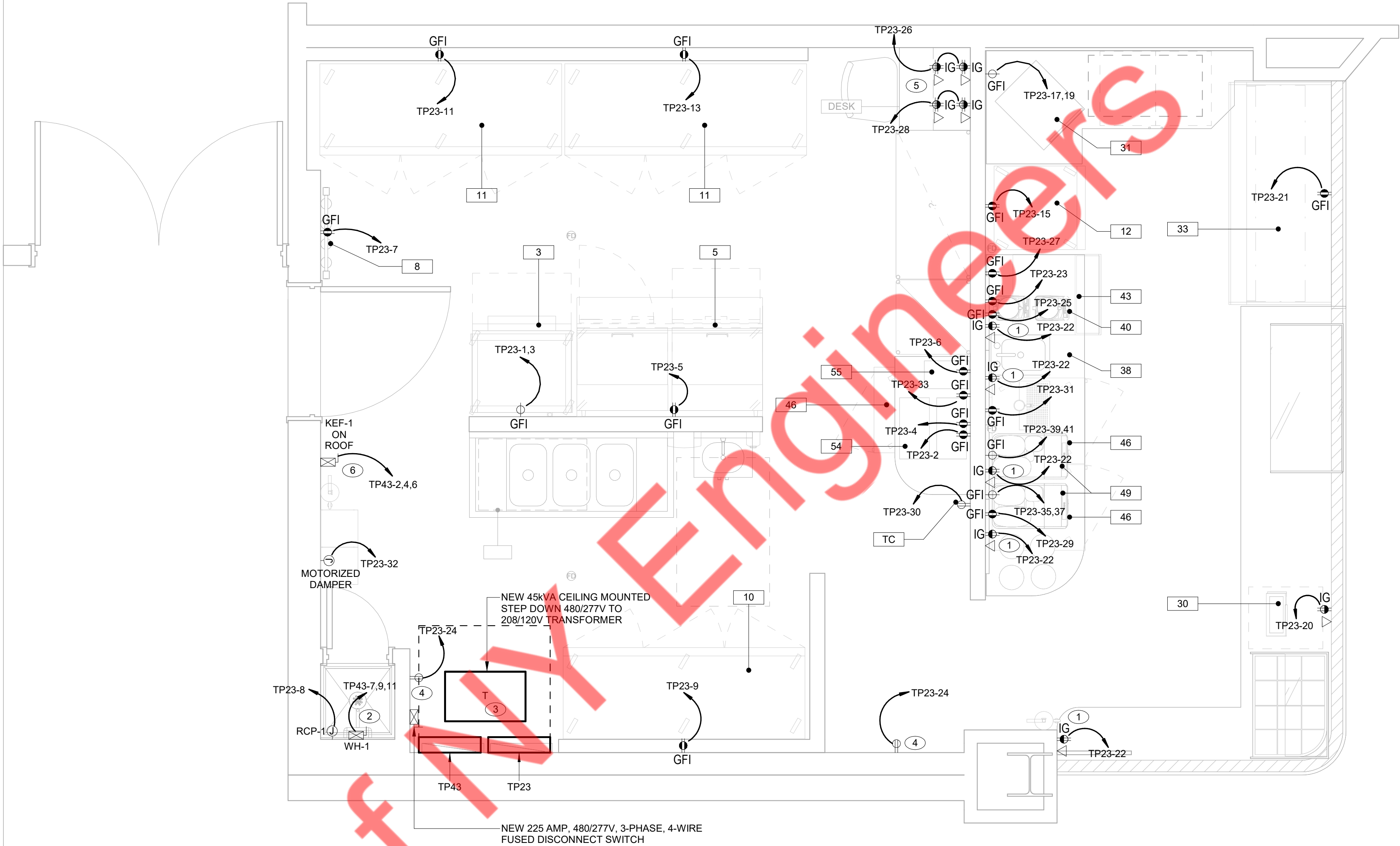
DRAWING TITLE:	
ELECTRICAL SPECIFICATIONS (2 OF 2)	
PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
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DRAWING NUMBER:

E102



- NOTES:
- 5mA GFCI BREAKERS MUST BE USED WHERE OUTLETS REQUIRING GFCI PROTECTION ARE NOT ACCESSIBLE FOR COMPLIANCE WITH NEC 210.8. WHERE GFCI PROTECTION SHUNT TRIP IS REQUIRED, THE CIRCUIT SHALL HAVE A GFCI BREAKER.
  - ALL SINGLE PHASE RECEPTACLE 50A OR LESS AND THREE PHASE RECEPTACLES RATED 100A OR LESS INSTALLED WITHIN THE KITCHEN AREA SHALL BE PROVIDED WITH GFCI PROTECTION AS PER NEC 210.8.
  - E.C. SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT LOCATION, MOUNTING DETAILS AND POWER REQUIREMENT AND ACCORDINGLY PROVIDE THE ELECTRICAL POWER CONNECTION TO EQUIPMENTS.



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ELECTRICAL POWER PLAN 1/2" = 1'-0" A

- A. ALL CONDUIT DROPS ARE INSIDE WALLS U.O.N. SEE ARCH. DWGS FOR WALL DIMS.
- B. FOR EXACT LOCATIONS OF KITCHEN EQUIPMENT, MECHANICAL EQUIPMENT AND POINTS OF CONNECTION, REFER TO KITCHEN & MECHANICAL DRAWINGS AND MANUFACTURER'S SHOP DRAWINGS.
- C. ALL CIRCUIT FEEDERS AND DISCONNECTS SHALL BE SIZED BY NEC.
- D. CONTRACTOR SHALL VERIFY CIRCUIT BREAKER, DISCONNECT SWITCH, STARTER AND FUSE SIZES WITH SELECTED EQUIPMENT MANUFACTURER'S SHOP DRAWINGS/SPECIFICATION SHEET PRIOR TO PLACING ORDER AND PROVIDE AS REQUIRED.
- E. ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE NEMA-1 FOR INTERIOR AND NEMA 3R FOR EXTERIOR. IN COASTAL REGIONS THE STANDARD FOR OUTSIDE SHALL BE NEMA-4X.
- F. PER SECTION 210.8(B)(2) NEC, ALL 15 AND 20A, 120V RECEPTACLES IN COMMERCIAL KITCHEN ARE REQUIRED TO BE GFCI PROTECTED. THIS INCLUDES ISOLATED GROUND RECEPTACLES.
- G. E.C. SHALL PROVIDE A PREPRINTED SELF-ADHESIVE LABEL ON ALL POS RECEPTACLES STATING "POS USE ONLY".
- H. G.C. TO COORDINATE ALL LOW VOLTAGE LOCATIONS AND REQUIREMENTS WITH TENANT & TENANT LV SUBCONTRACTOR.
- I. COORDINATE FOR THE MECHANICAL SCHEME WITH ARCHITECT/OWNER IN FIELD.

- PROVIDE WALL MOUNTED ISOLATED GROUND RECEPTACLE & DATA FOR DIGITAL SCREENS. COORDINATE EXACT LOCATION, MOUNTING HEIGHT AND ELECTRICAL REQUIREMENTS WITH ARCHITECT/OWNER.
- E.C. SHALL COORDINATE THE EXACT LOCATION OF WATER HEATER (WH-1) AND RCP WITH PLUMBING CONTRACTOR IN FIELD. PROVIDE ELECTRICAL CONNECTION FOR WATER HEATER AND RCP PER MANUFACTURER'S REQUIREMENTS. COORDINATE THE EXACT MOUNTING HEIGHT OF OUTLET WITH PLUMBING CONTRACTOR/OWNER IN FIELD.
- LOCATION OF NEW ELECTRICAL PANELS & CEILING MOUNTED TRANSFORMER. REFER TO ELECTRICAL RISER DIAGRAM & PANEL SCHEDULES FOR ADDITIONAL INFORMATION. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT LOCATION IN FIELD. MAINTAIN CLEARANCE AS PER NEC 110.26.
- E.C. SHALL COORDINATE EXACT LOCATION FOR CONVENIENCE OUTLETS WITH ARCHITECT AND CONSTRUCTION MANAGER.
- E.C. SHALL COORDINATE EXACT ELECTRICAL REQUIREMENTS, PLACEMENT AND MOUNTING HEIGHT FOR THE OFFICE WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN. PROVIDE ELECTRICAL OUTLET/DATA OUTLETS AS REQUIRED IN FIELD.
- E.C. SHALL COORDINATE THE EXACT LOCATION OF KEF-1 WITH MECHANICAL CONTRACTOR/OWNER IN FIELD. PROVIDE ELECTRICAL CONNECTION FOR KEF-1 PER MANUFACTURER'S REQUIREMENTS. COORDINATE THE EXACT MOUNTING HEIGHT OF DISCONNECT SWITCH WITH MECHANICAL CONTRACTOR/OWNER IN FIELD.

ELECTRICAL LEGENDS & ABBREVIATIONS	
	120V DUPLEX OUTLET
	120V ISOLATED GROUND QUADPLEX OUTLET
	120V ISOLATED GROUND DUPLEX OUTLET
	208V HIGH VOLT DEDICATED SINGLE OUTLET
	120V DEDICATED DUPLEX OUTLET
	JUNCTION BOX
	ELECTRICAL DISCONNECT SWITCH
	DATA OUTLET
	GROUND FAULT INTERRUPTER
	ISOLATED GROUND
	WATER HEATER
	RECIRCULATION PUMP
	TIME CLOCK

ELECTRICAL EQUIPMENT SCHEDULE										
ITEM NO.	QTY	ITEM DESCRIPTION	MFR	MODEL	ELECTRICAL					
					VOLTS	PHASE	AMPS	KW	HP	CONN. NEMA
3	1	CONVECTION OVEN	MOFFAT	E27M2	208	1	13.0	2.7		SP 6-15P
5	1	REFRIGERATED SANDWICH PREP TABLE	BEVERAGE AIR	SPED60HC-24M-2	115	1	4.8		1/3	DR 5-15P
8	1	WATER FILTER SYSTEM	CUSTOM	SLB-4PL						
10	1	UPRIGHT REFRIGERATOR	TRUE	598 T72	115	1	1.6			5-15P
11	2	UPRIGHT FREEZER	TRUE	598 T72F	115	1	3.7			5-15P
12	1	UPRIGHT REFRIGERATOR (BOTTLE FRIDGE)	TRUE	T-19	115					
15	1	SELF-SERVE CONDIMENT STATION RECESSED IN COUNTER W/ISNEEZEGUARD	CUSTOM							
30	1	POS SYSTEM			120	1	15.0			SP
31	1	CONVECTION OVEN, ELECTRIC	PANASONIC	NE-SCV2NAPR	208/240	1	20.0	1.15		SP 6-20P
33	1	SELF-SERVICE REFRIGERATED OPEN AIR SCREEN CASE	STRUCTURAL CONCEPTS	NR7240RSV						
40	2	BAR BLENDER	BLENDETEC	S988C2901-81GB1D	120	1	15.0	1.8	3-4/5	DR 5-15P
43	1	ICE CUBER WITH BIN	MANITOWOC	UY-3316A	115	1	10.0			DR 5-15P
46	3	REACH-IN UNDERCOUNTER REFRIGERATOR (LEFT HAND)	TRUE	TUC-27-LP-HC-LH	115	1	2.0		1/6	DR 5-15P
49	2	ESPRESSO MAKER	LACIMBALI	S30 (B2C)	208/240	1	23.0	5.7		JBW
51	4	COFFEE DISPENSER	FETCO LAS-10 LUXUS	D451						
54	2	COFFEE BREWER	FETCO	CBS-2131-XTS	100-120	1	19.7	2.4		DR 5-20P
55	1	COFFEE GRINDER	FETCO	GR-2.2 (G02012)	120	1	5.7	0.37	1/2	DR 5-20P

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PROJECT TITLE:

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DRAWING TITLE:

ELECTRICAL POWER PLAN

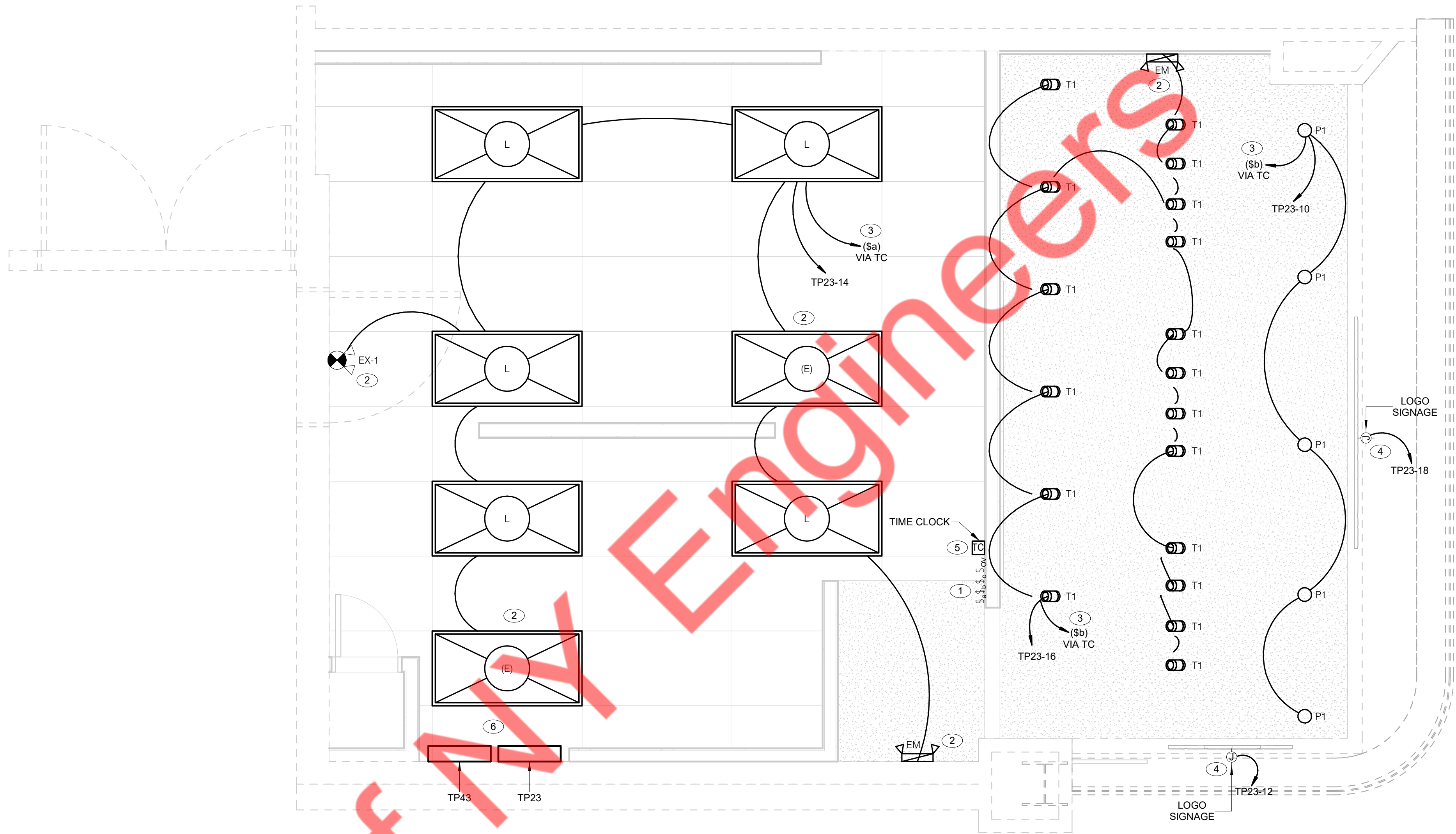
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**NY ENGINEERS**  
NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
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NUMBER	REMARKS	DATE
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ELECTRICAL LIGTHING PLAN 1/2" = 1'-0" A

LIGHTING FIXTURE SCHEDULE				
TYPE	DESCRIPTION	WATTS	VOLTAGE	QUANTITY
(E)	2X4 LED TROFFER - (EMERGENCY BATTERY PACK)	38 VA	120 V	2
EM	WALL MOUNT EMERGENCY LIGHT	5 VA	120 V	2
EX-1	NEW EXIT SIGN - MATCH EXISTING	5 VA	120 V	1
L	2X4 LED TROFFER	38 VA	120 V	5
P1	PENDANT LIGHTING	11 VA	120 V	5
T1	LED TRACK LIGHT	10 VA	120 V	18

- E.C. TO VERIFY FINAL LOCATION OF SWITCH BANK WITH ARCHITECT/OWNER.
- WIRE ALL EMERGENCY AND EXIT LIGHT TO THE NEAREST CIRCUIT AHEAD OF ALL CONTROLS & SWITCHING FOR CONTINUOUS OPERATION.
- LIGHTING CONTROL VIA TIME CLOCK/LIGHTING CONTACTOR.
- PROVIDE ACCESSIBLE WEATHERPROOF JUNCTION WITH SERVICE DISCONNECT SWITCH FOR LOGO SIGN. FINAL LOCATION AND NUMBER OF JUNCTION BOX TO BE COORDINATED WITH SIGN VENDOR PRIOR TO START OF WORK. VERIFY MOUNTING HEIGHT FOR SIGN POWER WITH ARCHITECTURAL ELEVATIONS AND SIGN VENDOR.
- E.C. SHALL COORDINATE THE EXACT LOCATION OF TIME CLOCK/LIGHTING CONTACTOR WITH ARCHITECT/OWNER IN FIELD.
- PROVIDE CEILING MOUNTED ISOLATED GROUND RECEPTACLE & DATA FOR DIGITAL SCREEN. COORDINATE EXACT LOCATION AND ELECTRICAL REQUIREMENTS WITH ARCHITECT/OWNER.
- REFER TO RISER DIAGRAM ON SHEET E500 FOR ADDITIONAL INFORMATION OF ELECTRICAL PANELS.

- CONFIRM LIGHTING FIXTURE QUANTITIES WITH SUPPLIER.
- EMERGENCY LIGHTING MARKED WITH LIGHT TAG "EM" SUBSCRIPT SHALL OPERATE CONTINUOUSLY.
- CONTRACTOR TO FIELD VERIFY CEILING TYPE AND PROVIDE PROPER MOUNTING HARDWARE.
- ALL EXTERIOR BUILDING SIGNS AND EXTERIOR SIGNS SHALL BE CONTROLLED THROUGH TIME CLOCK/PHOTO CELL.
- CONTRACTOR SHALL PROVIDE DIMMING SYSTEM WHEN REQUIRED BY LOCAL ENERGY CODE. BASE BID ACCORDINGLY.
- E.C. SHALL COORDINATE WITH ARCHIECT/OWNER FOR FINAL LIGHT FIXTURE AND MODEL PRIOR TO ROUGH-IN.
- E.C. SHALL PROVIDE ADDITIONAL LIGHTING CONTROLS AS PER AHJ REQUIREMENTS IF ANY TO COMPLETE THE PERMIT REQUIREMENTS.
- ALL DIMMING SWITCHES SHALL BE 0-10V.
- REFER TO DRAWING E100 FOR GENERAL NOTES, SYMBOL LIST AND ABBREVIATIONS AND E101 & E102 FOR ELECTRICAL SPECIFICATIONS.

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ELECTRICAL LIGHTING PLAN

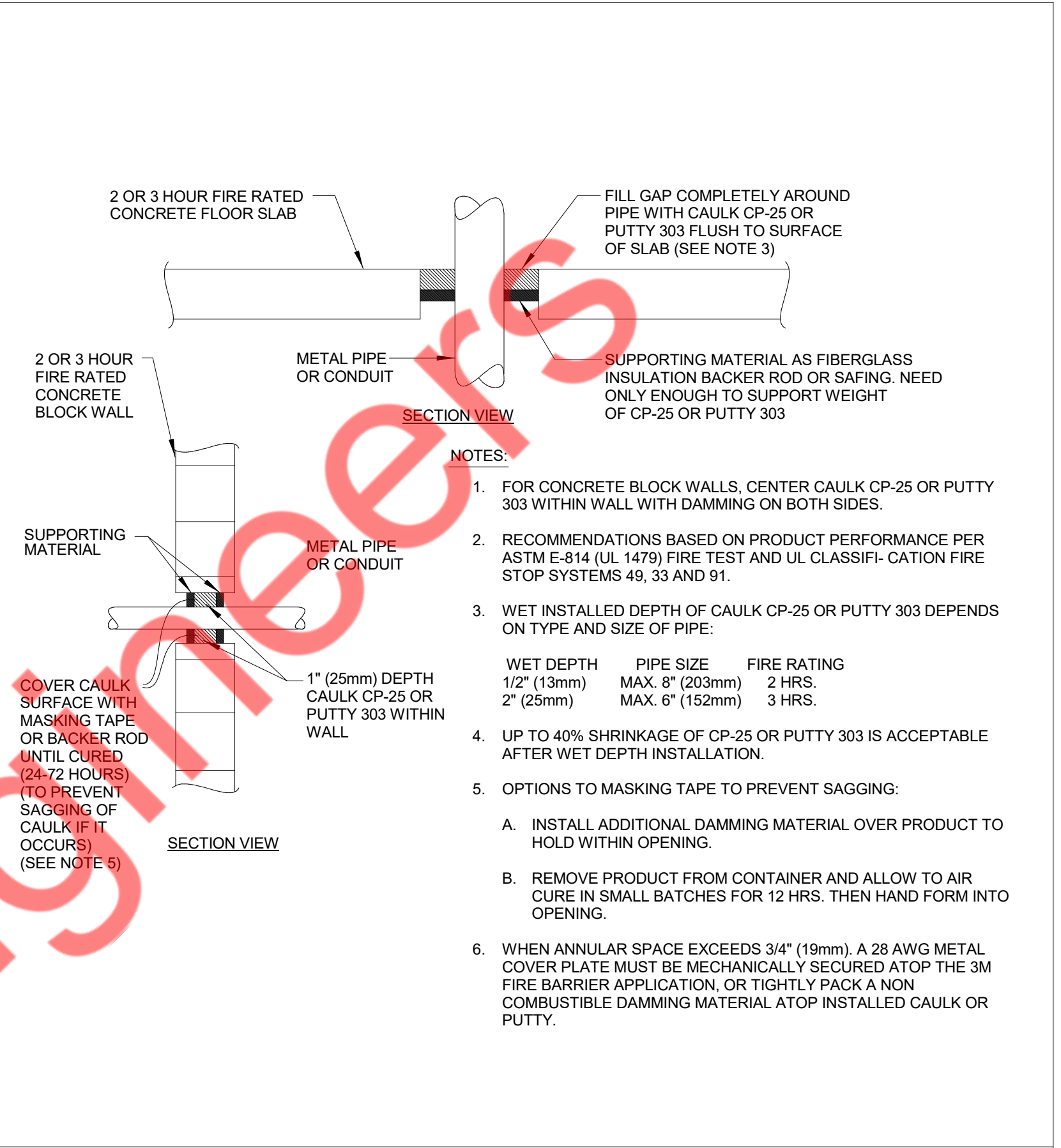
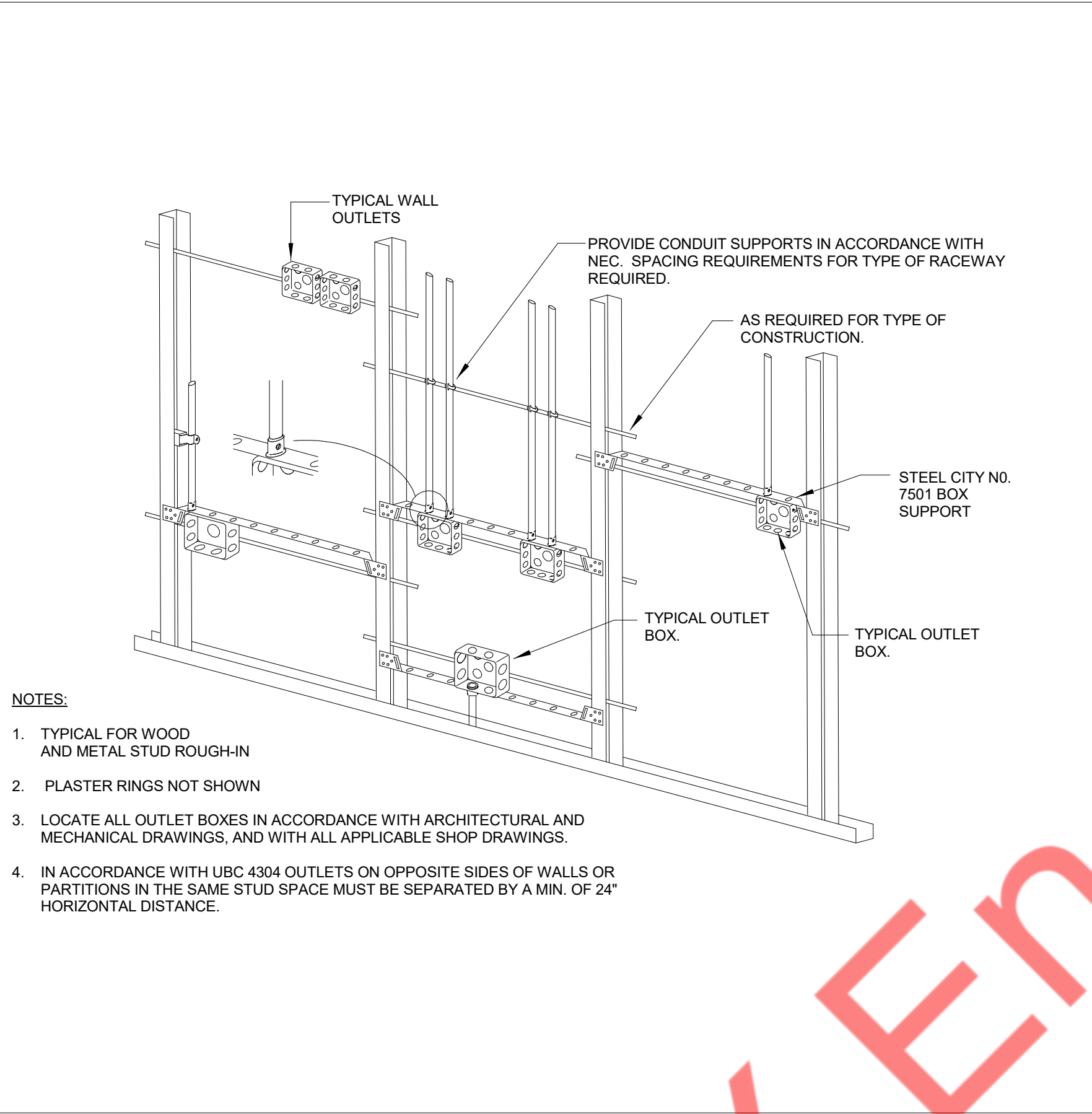
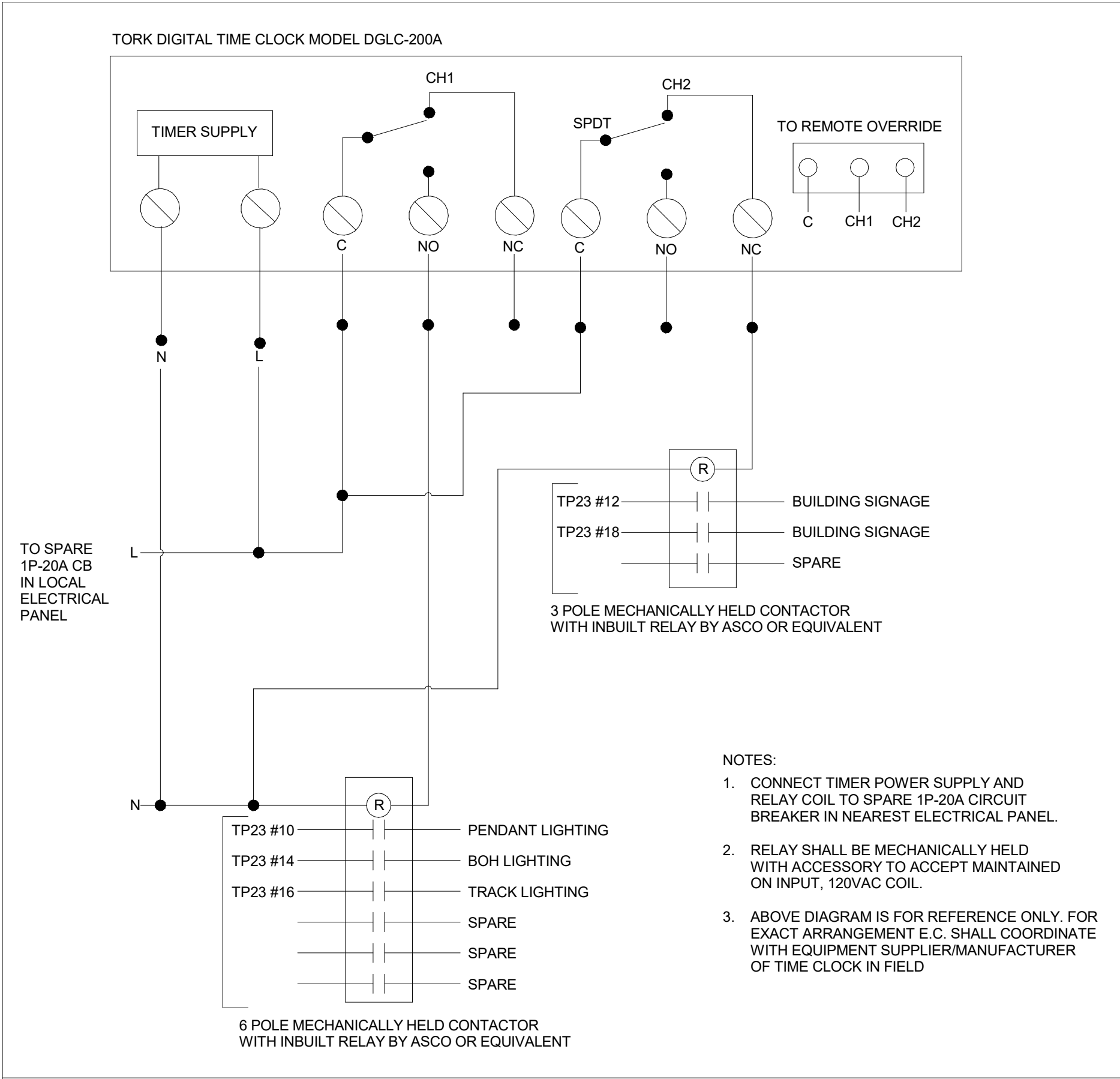
PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
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DRAWN BY: NYE	CHECKED BY: NYE
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DRAWING NUMBER:

E300

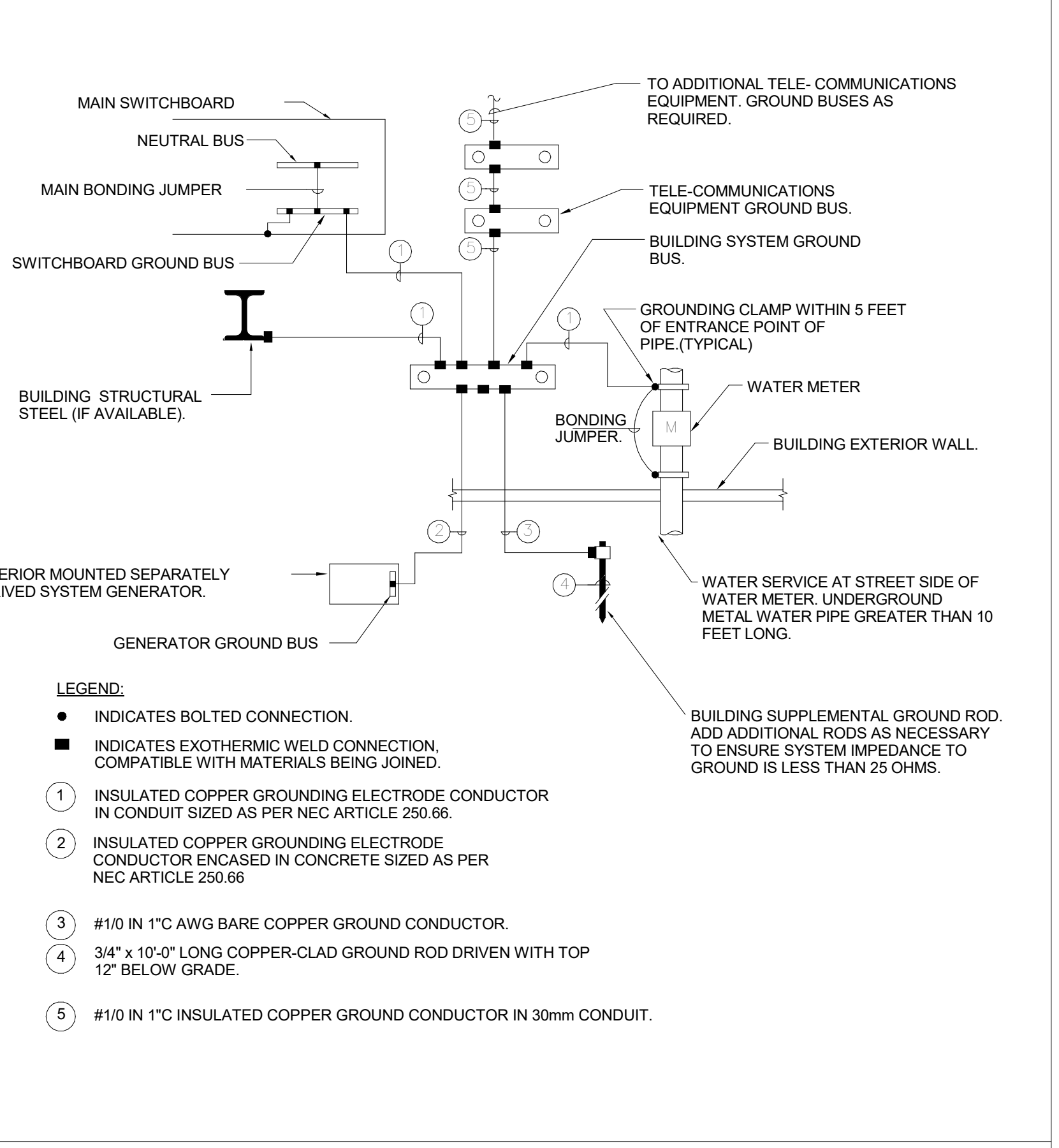
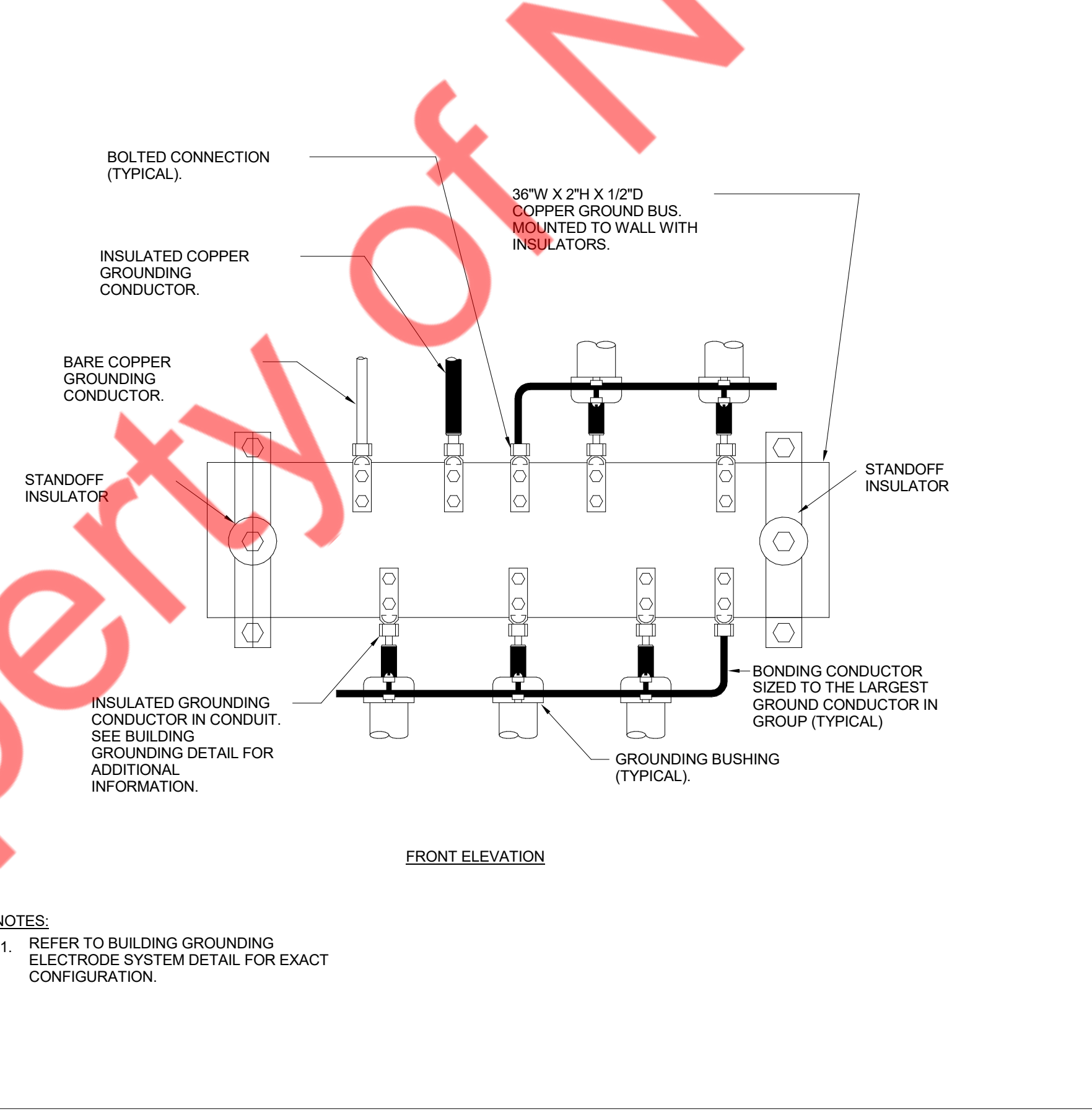
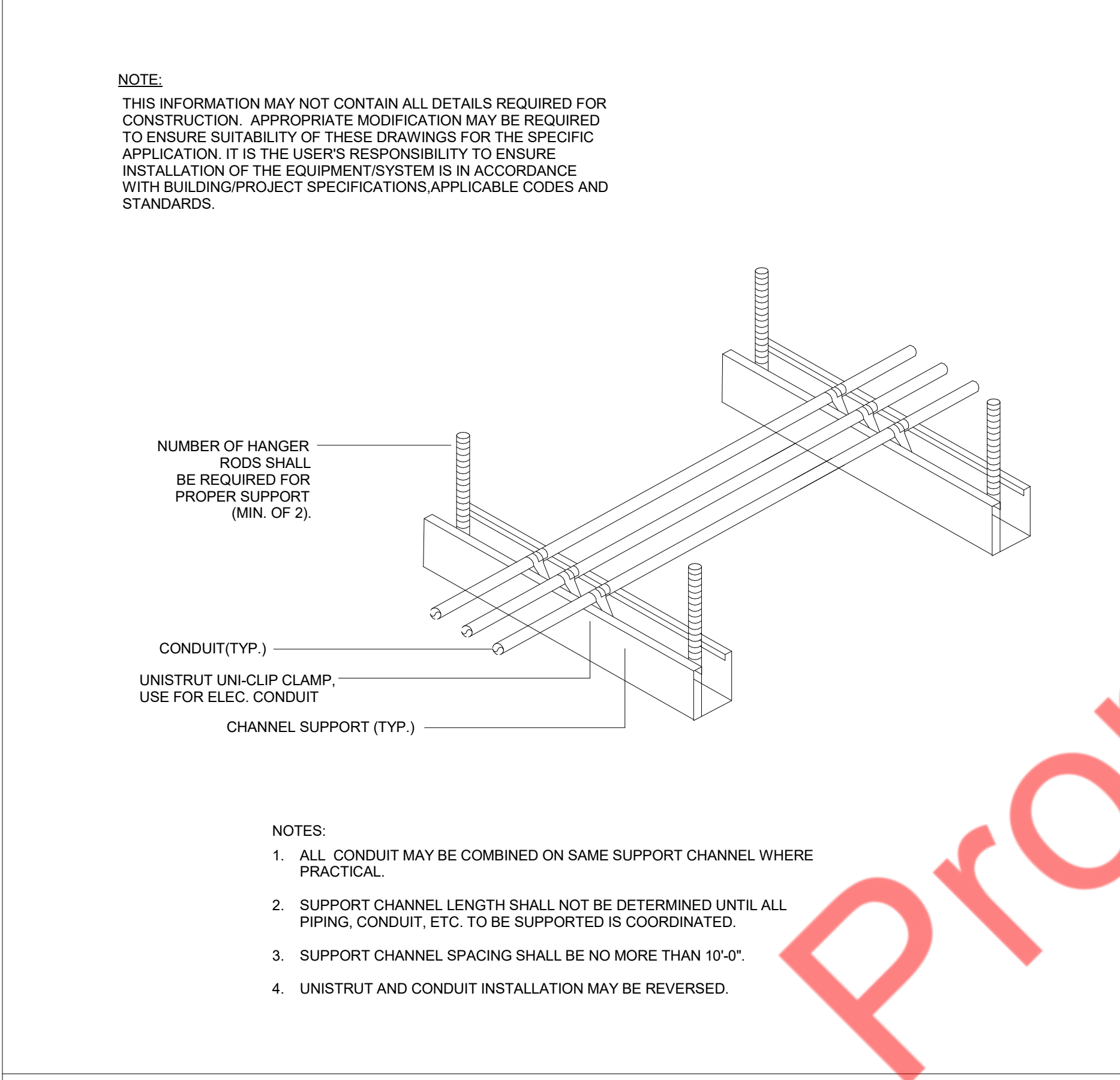




1 AUTOMATIC LIGHTING CONTROL DETAIL (TIME CLOCK)  
E400 N.T.S

2 DETAIL TYPICAL ROUGH-IN REQUIREMENTS  
E400 N.T.S

3 FIRE STOP DETAIL  
E400 N.T.S



4 CONDUIT SUPPORT DETAIL  
E400 N.T.S

5 BUILDING ELECTRICAL SYSTEM GROUND BUS  
E400 N.T.S

6 BUILDING GROUNDING ELECTRODE SYSTEM  
E400 N.T.S

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382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
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REVISIONS		
NUMBER	REMARKS	DATE
1	PERMIT SET	05.29.24

ISSUED FOR:	DATE ISSUED:
-	-

PROJECT TITLE:

**CAFFÈ NERO**

DRAWING TITLE:

**ELECTRICAL DETAILS**

PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
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DRAWN BY: NYE	CHECKED BY: NYE
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DRAWING NUMBER:

**E400**



## Branch Panel: TP43

Location: BOH AREA  
Supply From: 225 AMP DISCONNECT SWITCH  
Mounting: SURFACE  
Enclosure: TYPE 1

Volts: 480/277 Wye  
Phases: 3  
Wires: 4

A.I.C. Rating: FEILD VERIFY  
Mains Type: MLO  
Mains Rating: 225 AMP  
MCB Rating: N/A

Notes:

CKT	Load Name	Load Type	Wire Size	Trip	Poles	A		B		C		Poles	Trip	Wire Size	Load Type	Load Name	CKT
1	45KVA CEILING MOUNTED TRANSFORMER (PANEL TP23)	O	6	60 A	3	12771	387					3	20 A	12	M	KEF-1	2
3	--	--	--	--	--			12771	387			--	--	--	--		4
5	--	--	--	--	--					12771	387	--	--	--	--		6
7	WATER HEATER (WH-1)	O	12	20 A	3	4100	--					1	--		--	SPACE	8
9	--	--	--	--	--			4100	--			1	--		--	SPACE	10
11	--	--	--	--	--					4100	--	1	--		--	SPACE	12
13	SPARE	--		20 A	1	0	--					1	--		--	SPACE	14
15	SPARE	--		20 A	1			0	--			1	--		--	SPACE	16
17	SPARE	--		20 A	1					0	--	1	--		--	SPACE	18
19	SPARE	--		20 A	1	0	--					1	--		--	SPACE	20
21	SPARE	--		20 A	1			0	--			1	--		--	SPACE	22
23	SPARE	--		20 A	1					0	--	1	--		--	SPACE	24
25	SPARE	--		20 A	1	0	--					1	--		--	SPACE	26
27	SPARE	--		20 A	1			0	--			1	--		--	SPACE	28
29	SPARE	--		20 A	1					0	--	1	--		--	SPACE	30
31	SPARE	--		20 A	1	0	--					1	--		--	SPACE	32
33	SPARE	--		20 A	1			0	--			1	--		--	SPACE	34
35	SPARE	--		20 A	1					0	--	1	--		--	SPACE	36
37	SPARE	--		20 A	1	0	--					1	--		--	SPACE	38
39	SPARE	--		20 A	1			0	--			1	--		--	SPACE	40
41	SPARE	--		20 A	1					0	--	1	--		--	SPACE	42
						Total Load:	17258 VA		17258 VA		17258 VA						
						Total Amps:	62 A		62 A		62 A						

Legend:

O = OTHER, M = MOTOR

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Motor	1160 VA	100.00%	1160 VA	<b>Total Conn. Load:</b> 51774 VA <b>Total Est. Demand:</b> 51774 VA <b>Total Conn.:</b> 62 A <b>Total Est. Demand:</b> 62 A
Other	50614 VA	100.00%	50614 VA	

Notes:

Branch Panel: TP23

Location: BOH AREA  
Supply From: 45kVA TRANSFORMER  
Mounting: SURFACE  
Enclosure: TYPE 1

Volts: 120/208 Wye  
Phases: 3  
Wires: 4

A.I.C. Rating: FEILD VERIFY  
Mains Type: MCB  
Mains Rating: 225 AMP  
MCB Rating: 175 AMP

Notes:

CKT	Load Name	Load Type	Wire Size	Trip	Poles	A		B		C		Poles	Trip	Wire Size	Load Type	Load Name	CKT
1	3_CONVECTION OVEN	K	12	20 A	2	1350	2370					1	30 A	10	K	54_COFFEE BREWER	2
3	--	--	--	--	--			1350	2370			1	30 A	10	K	54_COFFEE BREWER	4
5	5_REFRIGERATED SANDWICH PREP TABLE	K	12	20 A	1					576	690	1	20 A	12	K	55_COFFEE GRINDER	6
7	8_WATER FILTER SYSTEM	K	12	20 A	1	180	180					1	20 A	12	M	RECIRCULATION PUMP (RCP-1)	8
9	10_UPRIGHT FREEZER	K	12	20 A	1			190	375			1	20 A	12	L	PENDANT LIGHTING	10
11	11_UPRIGHT FREEZER	K	12	20 A	1					444	1200	1	20 A	12	L	LOGO SIGNAGE (LEFT)	12
13	11_UPRIGHT FREEZER	K	12	20 A	1	444	266					1	20 A	12	L	BOH AREA LIGHTING	14
15	12_UPRIGHT FREEZER	K	12	20 A	1			180	180			1	20 A	12	L	TRACK LIGHTING	16
17	31_CONVECTION OVEN (ELECTRIC)	K	10	30 A	2					1875	1200	1	20 A	12	L	LOGO SIGNAGE (FRONT)	18
19	--	--	--	--	--	1875	360					1	20 A	12	R	30_POS SYSTEM	20
21	33_SELF SERVICE REFRIGERATED SCREEN CASE	K	12	20 A	1			1200	900			1	20 A	12	R	DIGITAL SCREEN	22
23	40_BAR BLENDER	K	12	20 A	1					1800	360	1	20 A	12	R	CONVENIENCE RECEPTACLES	24
25	40_BAR BLENDER	K	12	20 A	1	1800	720					1	20 A	12	R	OFFICE QUAD RECEPTACLE	26
27	43_ICE CUBER	K	12	20 A	1			1200	720			1	20 A	12	R	OFFICE QUAD RECEPTACLE	28
29	46_REACH-IN UC REFRIGERATOR	K	12	20 A	1					240	180	1	20 A	12	R	TIME CLOCK	30
31	46_REACH-IN UC REFRIGERATOR	K	12	20 A	1	240	180					1	20 A	12	L	MOTORIZED DAMPER	32
33	46_REACH-IN UC REFRIGERATOR	K	12	20 A	1			240	0			1	20 A		--	SPARE	34
35	49_ESPRESSO MAKER	K	10	30 A	2					2395	0	1	20 A		--	SPARE	36
37	--	--	--	--	--	2395	0					1	20 A		--	SPARE	38
39	49_ESPRESSO MAKER	K	10	30 A	2			2395	0			1	20 A		--	SPARE	40
41	--	--	--	--	--					2395	0	1	20 A		--	SPARE	42
						Total Load:	12347 VA	11282 VA		13355 VA							
						Total Amps:	104 A	94 A		113 A							
Legend:																	
K = KITCHEN EQUIPMENT, M = MOTOR, O = OTHER, R = RECEPTACLE, L = LIGHTING																	
Load Classification		Connected Load		Demand Factor		Estimated Demand		Panel Totals									
Kitchen Equipment		30194 VA		65.00%		19626 VA											
Motor		180 VA		100.00%		180 VA		Total Conn. Load: 36984 VA									
Receptacle		3240 VA		100.00%		3240 VA		Total Est. Demand: 27259 VA									
Lighting		3374 VA		125.00%		4217 VA		Total Conn.: 103 A									
								Total Est. Demand: 76 A									
Notes:																	

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<div>DRAWING TITLE:</div> <div>ELECTRICAL RISER DIAGRAM &amp; PANEL SCHEDULES</div>																										
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<div>DRAWN BY: NYE</div>	<div>CHECKED BY: NYE</div>																									
<div>DRAWING NUMBER:</div> <div>E500</div>																										

<div>1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. INFORM ENGINEER FOR ANY DISCREPANCY BEFORE PURCHASE OF ANY EQUIPMENTS/WIRES OR DIVECES.</div> <div>2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.</div> <div>3. REFER TO ARCHITECTURAL SHEET FOR KITCHEN EQUIPMENT PLAN &amp; SCHEDULE. E.C. SHALL VERIFY THE BREAKER, CABLE, ELECTRICAL LOAD, PLUG, CORD, RECEPTACLES AND CONDUIT REQUIREMENTS/SIZES/RATING FOR ALL THE KITCHEN EQUIPMENTS WITH EQUIPMENT SUPPLIER/MANUFACTURER AND PROVIDE THE ELECTRICAL CONNECTION PER MANUFACTURER RECOMMENDATIONS/REQUIREMENTS. BASE BID ACCORDINGLY.</div> <div>4. E.C. SHALL COORDINATE WITH PLUMBING CONTRACTOR/EQUIPMENT MANUFACTURER FOR EXACT ELECTRICAL REQUIREMENTS FOR CABLE AND BREAKERS. PROVIDE THE ELECTRICAL BREAKER AND CABLES IN FIELD AS REQUIRED. BASE BID ACCORDINGLY.</div> <div>5. 5mA GFCI BREAKERS MUST BE USED WHERE OUTLETS REQUIRING GFCI PROTECTION ARE NOT ACCESSIBLE FOR COMPLIANCE WITH NEC 210.8.</div>		<div>1 LANDLORD SHALL PROVIDE NEW 225 AMPS, 480/277V, 3-PHASE ELECTRICAL SERVICE FOR THE PROJECT. E.C. SHALL COORDINATE WITH LANDLORD FOR THE EXACT LOCATION OF EXISTING SPLICE/CONNECTION IN FIELD. E.C. SHALL MAKE THE ELECTRICAL CONNECTION &amp; PROVIDE THE FEEDER UPTO THE ELECTRICAL PANEL. BASE BID ACCORDINGLY.</div> <div>2 E.C. SHALL PROVIDE NEW 225 AMPS, 480/277V, 3-PHASE FUSED DISCONNECT SWITCH FOR THE PROJECT SPACE. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER IN FIELD.</div> <div>3 E.C. SHALL PROVIDE NEW 225 AMPS (MLO), 480/277V, 3-PHASE ELECTRICAL PANEL "TP43" FOR THE PROJECT SPACE. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER IN FIELD.</div> <div>4 E.C. SHALL PROVIDE NEW 225 AMPS (175 AMP BREAKER), 208/120V, 3-PHASE ELECTRICAL PANEL "TP23" FOR THE PROJECT SPACE. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER IN FIELD.</div> <div>5 E.C. SHALL PROVIDE NEW GEALING MOUNTED 45KVA, 480/277V TO 208/120V STEP DOWN DRY TYPE TRANSFORMER FOR THE PROJECT SPACE. E.C. SHALL COORDINATE THE EXACT LOCATION WITH ARCHITECT/OWNER IN FIELD.</div>		<div>1. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSE ONLY. E.C TO VERIFY EXACT POWER DISTRIBUTION IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY.</div> <div>2. E.C. SHALL VERIFY THE INCOMING SERVICE AMPERAGE, VOLTAGE, NUMBER OF PHASES, WIRE SIZE AND DISTRIBUTION IN FIELD.</div> <div>3. E.C. TO COORDINATE FAULT CURRENT (ISC) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.</div> <div>4. E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION &amp; INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.</div>		<div></div>					
PANEL SCHEDULES GENERAL NOTESNTS		E	RISER DIAGRAM KEY NOTESNTS		D	RISER DIAGRAM GENERAL NOTESNTS		C	ELECTRICAL RISER DIAGRAMNTS		B



PROJECT DATA									
PROJECT DESCRIPTION		BUILDING OCCUPANCY			PROJECT DESCRIPTION			FIRE ALARM SYSTEM FEATURES	
	NEW BUILDING		ASSEMBLY GROUP A (A1,A2,A3,A4 AND A5)		RESIDENTIAL GROUP R (R1,R2 AND R3)	1	TOTAL NUMBER OF LEVELS		NON-VOICE EVACUATION
	FIRE ALARM SYSTEM UPGRADE		BUSINESS GROUP B		STORAGE GROUP S (S1 AND S2)	1	ABOVE GROUND LEVELS		VOICE EVACUATION
	LIFE SAFETY SYSTEM UPGRADE		EDUCATIONAL GROUP E		UTILITY AND MISCELLANEOUS GROUP U	0	BELOW GROUND LEVELS	X	PARTIAL/SELECTIVE EVACUATION
X	RENOVATION		FACTORY INDUSTRIAL GROUP F (F1 AND F2)		OTHER:	0	NUMBER OF ELEVATOR BANKS		GENERAL EVACUATION
	EMERGENCY REPAIR		HIGH-HAZARD GROUP H (H1,H2,H3,H4 AND H5)			0	NUMBER OF EGRESS STAIRS		DIGITAL ALARM COMMUNICATOR
	TENANT ADDITION		INSTITUTIONAL GROUP I (I1,I2 AND I3)						PRE-SIGNAL SYSTEM
	OTHER:	X	MERCANTILE GROUP M						FIRE FIGHTER'S TELEPHONE SYSTEM

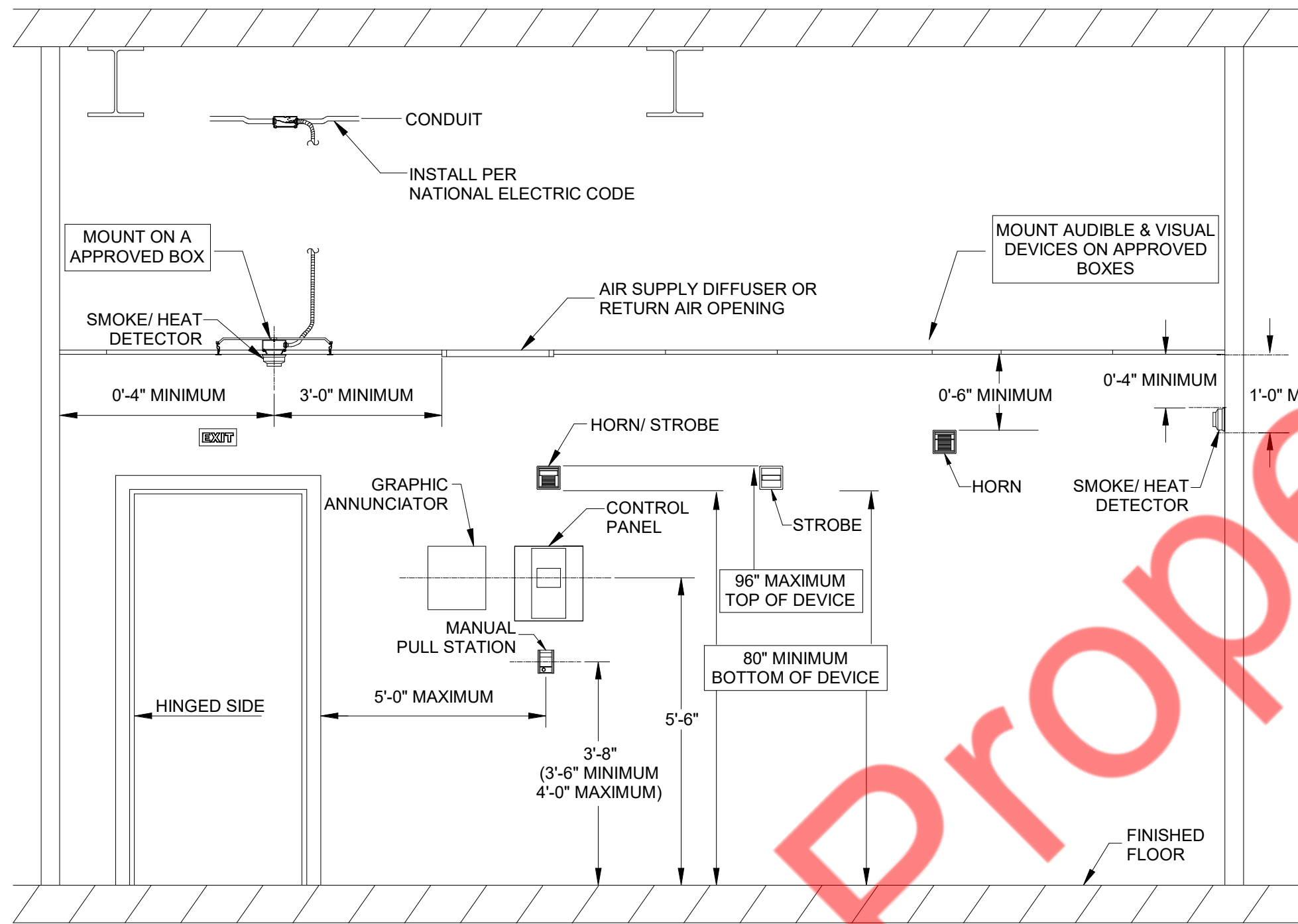
SYSTEM INPUTS INITIATING DEVICES	SYSTEM OUTPUTS  INDICATING/CONTROLLED DEVICES	CONTROL UNIT ANNUNCIATION				NOTIFICATION			
		ACTIVATE COMMON ALARM SIGNAL INDICATOR ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS	SOUND INTERNAL BUZZER AT FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS	TEXT MESSAGE DISPLAY DEVICE TYPE & LOCATION OF THEACTIVATING DEVICES ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS	ACTIVATE EVACUATION SIGNAL THROUGH HORNS AND FLASH THE STROBES THROUGHOUT THE BUILDING	TRANSMIT "MANUAL" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY	TRANSMIT "SMOKE/HEAT/CO" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY	
		A	B	C	D	E	F	G	H
1	MANUAL PULL STATION	●		●	●	●	●		1
2	AREA SMOKE DETECTOR	●		●	●	●		●	2
3	ALARM ACTIVATION OF OTHER SUBSYSTEM	●		●	●	●		●	3
4	FIRE ALARM AC POWER FAILURE		●	●	●				4
5	FIRE ALARM SYSTEM LOW BATTERY		●	●	●				5
6	OPEN CIRCUIT		●	●	●				6
7	GROUND CIRCUIT		●	●	●				7
8	NOTIFICATION APPLIANCE CIRCUIT SHORT		●	●	●				8

FIRE ALARM NOTES :

- ALL EQUIPMENT AND WIRING INDICATED ON THESE PLANS IS NEW (U.O.N.).
- PROVIDE WIRING AS REQUIRED BETWEEN ALL DEVICES AND EQUIPMENT AS REQUIRED TO PERFORM FIRE ALARM SYSTEM FUNCTIONS.
- WIRING FOR FIRE ALARM DEVICES IN FINISHED SPACES WITHOUT HUNG CEILING SHALL BE INSTALLED IN EMT CONDUIT.
- ALL STROBES AND HORN/STROBES SHALL BE FLUSH WALL MOUNTED APPROVED BY ARCHITECT, APPROVED FOR USE IN AUTHORITY HAVING JURISDICTION (AHJ).
- FOR WALL MOUNTED DEVICES PROVIDE 3/4" CONDUIT TERMINATED IN NEAREST ACCESSIBLE CEILING.
- WIRING FOR FIRE ALARM DEVICES IN UNFINISHED SPACES SHALL BE INSTALLED IN RGS CONDUIT UP TO 8'-0" AFF AND THEN IN EMT CONDUIT ABOVE 8'-0" AFF.
- CONTRACTOR SHALL VERIFY ALL WIRING WITH FIRE ALARM VENDOR AND OBTAIN WIRING DIAGRAMS BEFORE PROCEEDING WITH THE START OF ANY WORK.
- ALL WIRING SHALL BE IN ACCORDANCE WITH THE AHJ.
- PROVIDE ALL REQUIRED EXPANSION PANELS, PC BOARDS, POWER SUPPLIES, BATTERIES, FUSE CUTOUTS AND BRANCH CIRCUITS, ETC. FOR A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM.
- STROBES AND HORNS SHALL BE WIRED ON ALTERNATING A-B CIRCUITING IN ALL AREAS, AS INDICATED ON THE RISER DIAGRAM.
- CONTRACTOR SHALL PERFORM ALL LOCAL BUILDING DEPT. FILINGS AND OBTAIN ALL APPROVALS. CONTRACTOR SHALL OBTAIN ALL REQUIRED SIGNED & SEALED LOCAL BUILDING DEPT. FORMS AND ALL REQUIRED SETS OF DRAWINGS FROM ENGINEER OF RECORD AND BUILDING DEPT. EXPEDITOR.
- UPON COMPLETION OF INSTALLATION THE SYSTEM SHALL BE 100% PRE-TESTED BY THE FIRE ALARM VENDOR AND THE LICENSED ELECTRICAL CONTRACTOR PRIOR TO LOCAL FIRE DEPARTMENT INSPECTION.
- CONTRACTOR SHALL VERIFY THE EXISTING FIRE ALARM PANEL AND PROCURE NEW FIRE ALARM DEVICES PER THE EXISTING EQUIPMENTS COMPATIBILITY.

SCOPE OF WORK

INSTALLATION OF FIRE ALARM SYSTEM WITH NEW FIRE ALARM ANNUNCIATOR PANEL ALONG WITH NEW DEVICES.



TYPICAL DEVICE MOUNTING DETAIL  
N.T.S

DIVISION 16 - FIRE ALARM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. WORK UNDER THIS SECTION INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, FURNISHING AND INSTALLING THE FOLLOWING:
- FIRE ALARM PANEL, WIRING AND DEVICES
- B. ALL WORK SHALL BE COMPLETE AND ITEMS, EQUIPMENT, ETC., SHALL BE ELECTRICALLY CONNECTED FOR PROPER AND CORRECT OPERATION.
- C. ALL WORK UNDER THIS CONTRACT SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE FOLLOWING CODES AND STANDARDS IN SO FAR AS THEY APPLY:
- NATIONAL ELECTRICAL CODE
  - NFPA 72
  - UNDERWRITER'S LABORATORIES, INC., STANDARDS AND APPROVED LISTINGS.
  - ELECTRICAL TESTING LABORATORIES STANDARDS.
  - MASSACHUSETTS BUILDING CODE, LATEST EDITION AND REVISIONS.
  - ALL LOCAL CODES AND ORDINANCES.
- D. THE FIRE ALARM CONTRACTOR SHALL BE LICENSED IN THE LOCAL STATE AND HAVE ALL LICENSES REQUIRED FOR THE WORK.
- E. OBTAIN ALL PERMITS, LICENSES, INSPECTIONS, ETC. REQUIRED FOR THE WORK AND PAY FOR THE SAME. FURNISH FINAL CERTIFICATE OF INSPECTION AND APPROVAL FROM THE ELECTRICAL INSPECTOR HAVING JURISDICTION PRIOR TO ACCEPTANCE OF THE WORK.
- F. ALL WORK SHALL BE DONE BY SKILLED MECHANICS AND SHALL PRESENT A NEAT, TRIM, WORKMANLIKE CONDITION WHEN COMPLETED.

1.2 INTENT

- A. THE INTENT OF THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS IS TO CONVEY AS REASONABLY AS POSSIBLE THE REQUIREMENTS FOR A COMPLETE JOB READY FOR THE BUILDING TO OPERATE. THE FIRE ALARM CONTRACTOR SHALL TAKE THIS INTO CONSIDERATION AND INCLUDE IN HIS BASE BID ALLOWANCE FOR CONTINGENCIES AS WILL ALLOW HIM TO PROVIDE MINOR PIECES OF EQUIPMENT AND LABOR NOT SPECIFICALLY INDICATED BUT REQUIRED FOR THE JOB TO OPERATE PROPERLY, AT NO ADDITIONAL COST TO THE OWNER.
- 1.3 COORDINATION
- A. COORDINATE WORK WITH OTHER CONTRACTORS. NOTIFY ARCHITECT OF APPARENT CONFLICT EARLY TO EXPEDITE CONSTRUCTION. IF STRUCTURAL DAMAGE APPEARS IMMINENT, STOP WORK AND NOTIFY ARCHITECT FOR A DECISION BEFORE RESUMING OPERATIONS.
- B. LOCATIONS SHOWN ARE APPROXIMATE. THE DRAWINGS DO NOT GIVE EXACT DETAILS AS TO ELEVATIONS AND LOCATIONS OF VARIOUS PIPES, FITTINGS, DUCTS, CONDUITS, ETC., AND DO NOT SHOW ALL OFFSETS AND OTHER INSTALLATION DETAILS WHICH MAY BE REQUIRED. COORDINATE ALL LOCATIONS WITH ARCHITECT BEFORE ANY ROUGH-IN.

1.4 SHOP DRAWINGS

- A. PROVIDE COMPLETE SHOP DRAWINGS PER SECTION 907.1 TO THE LOCAL FIRE MARSHAL INCLUDING:
- FLOOR PLAN WITH ROOM NAMES
  - LOCATION OF ALL FA DEVICES
  - LOCATION OF PANELS
  - POWER CONNECTIONS
  - BATTERY CALCULATIONS
  - CONDUCTOR TYPES AND SIZES
  - VOLTAGE DROP CALCULATIONS
  - EQUIPMENT CUT-SHEETS, MODEL, NUMBERS, ETC.

PART 2 - PRODUCTS AND MATERIALS

2.1 GENERAL

- A. ALL MATERIAL SHOULD BE NEW AND SHALL BEAR THE MANUFACTURER'S NAME TRADE, AND UL LABEL WHERE SUCH STANDARD HAS BEEN ESTABLISHED FOR THE PARTICULAR MATERIAL. MATERIALS SHALL BE STANDARD PRODUCTS OF MANUFACTURER'S REGULARLY ENGAGED IN MANUFACTURER OF THE REQUIRED TYPE OF EQUIPMENT AND THE MANUFACTURER'S LATEST APPROVED DESIGN.
- BOXES INSTALLED IN CONCEALED LOCATIONS SHALL BE SET FLUSH WITH THE FINISHED SURFACES.
  - PROVIDE RATED BOXES ON ALL FIRE BARRIERS AND WALLS INSTALLED PER CODE.

PART 3 - EXECUTION

3.1 FIRE ALARM SYSTEM EQUIPMENT

- A. PROVIDE A COMPLETE OPERABLE FIRE ALARM SYSTEM AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY STATE AND LOCAL CODES.
- B. ALL FIRE ALARM SYSTEM CABLES SHALL BE INSTALLED IN CONDUIT. SIZE AS REQUIRED BY THE EQUIPMENT SUPPLIER. PROVIDE A SUBMITTAL OF ALL DEVICES AND A RISER DIAGRAM FOR APPROVAL BEFORE INSTALLATION OF ANY EQUIPMENT.

3.2 CLEAN UP

- A. DURING CONSTRUCTION, KEEP THE SITE CLEAN OF DEBRIS. UPON COMPLETION, AND BEFORE FINAL INSPECTION, CLEAN UP THE PREMISES TO REMOVE ALL EVIDENCE OF WORK. IN ADDITION UPON COMPLETION OF CONSTRUCTION LEAVE EQUIPMENT CLEAN.

3.3 GUARANTEE

- A. GUARANTEE ALL MATERIALS AND LABOR INCLUDED IN THE FIRE ALARM WORK FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER. ANY PART OR PARTS OF THE WORK OR EQUIPMENT WHICH PROVE TO BE DEFECTIVE DURING THE GUARANTEE PERIOD SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.

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NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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1	PERMIT SET	05.29.24

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PROJECT TITLE:

**CAFFÈ  
NERO**

DRAWING TITLE:

**FIRE ALARM NOTES AND  
SPECIFICATIONS**

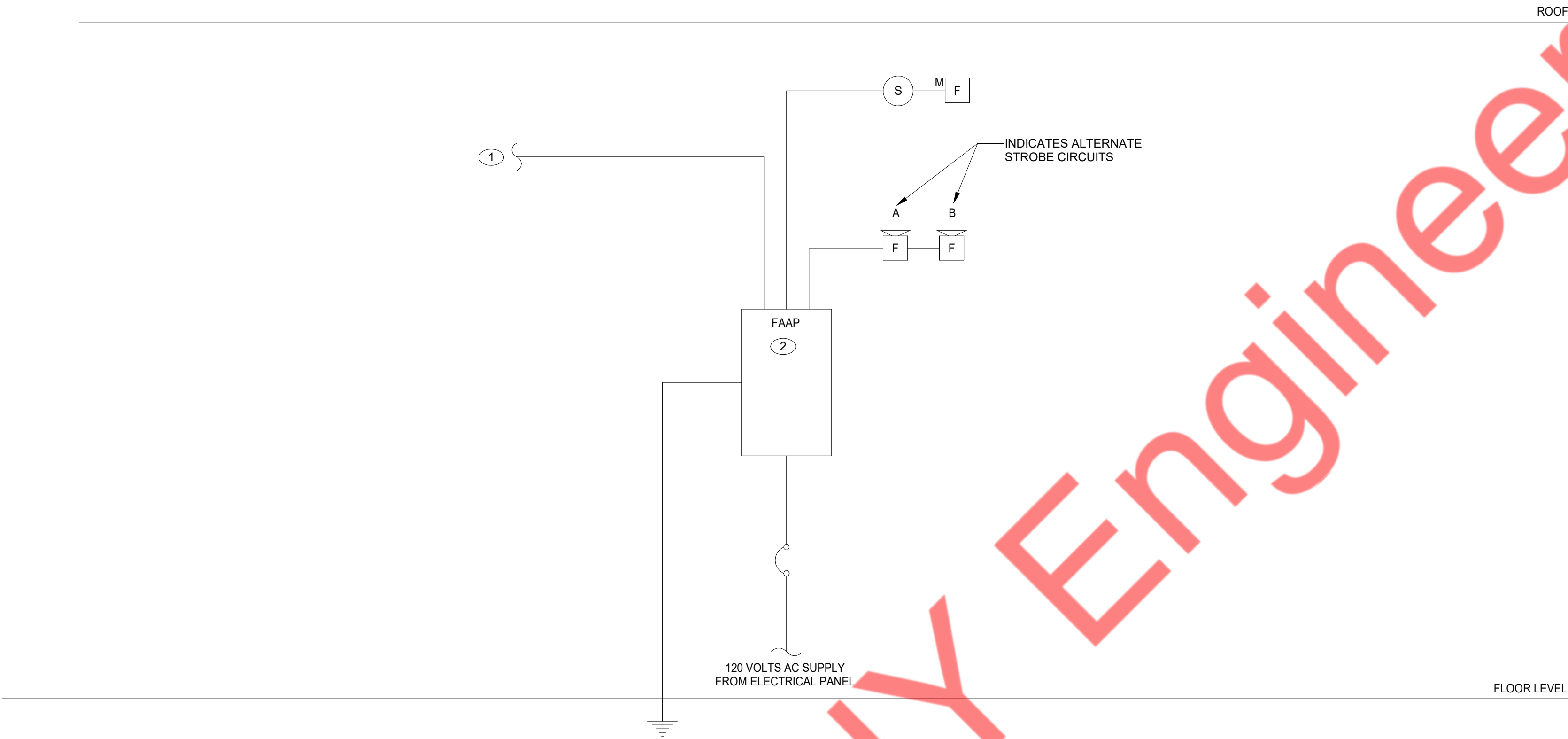
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NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
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**FIRE ALARM RISER DIAGRAM** N.T.S **A**

SYMBOL	DESCRIPTION
	WALL MOUNTED HORN-STROBE COMBINATION DEVICE
	FIRE ALARM MANUAL PULL STATION, WALL MOUNTED
	CEILING MOUNTED AREA SMOKE DETECTOR
	FIRE ALARM ANNUNCIATOR PANEL

- ALL COMPONENTS REQUIRED TO MAKE SYSTEM WORKABLE SHALL BE INCLUDED IN BID PRICE.
- EACH FA RELAY SHALL HAVE MINIMUM OF THREE SETS OF 2 CONTACT 10A RATED @ 120V (TYPICAL), APPLICABLE IF ANY UPDATE IS REQUIRED.
- COORDINATE WIRING DIAGRAM WITH FIRE ALARM VENDOR SHOP DRAWINGS. FOR STROBES MAXIMUM CURRENT PER ZONE SHALL NOT EXCEED 1.5A. ZONES FOR STROBES & STROBE/HORNS AS PER FIRE ALARM VENDOR SHOP DRAWINGS (TYPICAL).
- ALL FIRE ALARM WIRING SHALL BE INSTALLED IN CONDUIT WHERE REQUIRED BY AHJ.
- THIS RISER DIAGRAM IS A SCHEMATIC REPRESENTATION OF THE FIRE ALARM SYSTEM. ALL WIRING SHALL BE AS PER APPROVED MANUFACTURER SHOP DRAWINGS.
- EACH FIRE ALARM INDICATING DEVICES CIRCUIT TO HAVE A MAXIMUM OF 14 DEVICES PER CIRCUIT. CONTRACTOR TO SUPPLY REQUIRING NUMBER OF INDICATING CIRCUIT TO PROVIDE REDUNDANT CIRCUITING (A,B) SCHEME.
- ALL FIRE ALARM CONDUITS SHALL BE MINIMUM 3/4".
- ALL WATER FLOW AND TAMPER SWITCH DEVICES SHALL BE CONNECTED TO EXISTING FIRE ALARM CONTROL PANEL (FACP), COORDINATE EXACT LOCATION AND QUANTITIES WITH FIRE PROTECTION CONTRACTOR.
- ALL STROBES, PULL STATIONS AND DETECTORS SHALL CONNECTED TO NEW FIRE ALARM ANNUNCIATOR PANEL (FAAP), COORDINATE EXACT REQUIREMENT IN FIELD.

- EXISTING FIRE ALARM SYSTEM OF BASE BUILDING SHALL REMAIN. CONNECT THE NEW FIRE ALARM ANNUNCIATOR PANEL WITH BASE BUILDING FIRE ALARM SYSTEM. COORDINATE THE EXACT LOCATION AND ROUTING IN FIELD IN COORDINATION WITH ARCHITECT/OWNER. BASE BID ACCORDINGLY.
- PROVIDE NEW FIRE ALARM ANNUNCIATOR PANEL AND CONNECT TO BASE BUILDING FIRE ALARM SYSTEM. COORDINATE THE EXACT LOCATION OF BASE BUILDING FIRE ALARM SYSTEM WITH LANDLORD IN FIELD. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF FIRE ALARM ANNUNCIATOR PANEL PRIOR TO ROUGH-IN. THE FIRE ALARM ANNUNCIATOR PANEL SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. VERIFY THE EXACT REQUIREMENT WITH BASE BUILDING OWNER.

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PROJECT TITLE:

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DRAWING TITLE:  
**FIRE ALARM RISER DIAGRAM**

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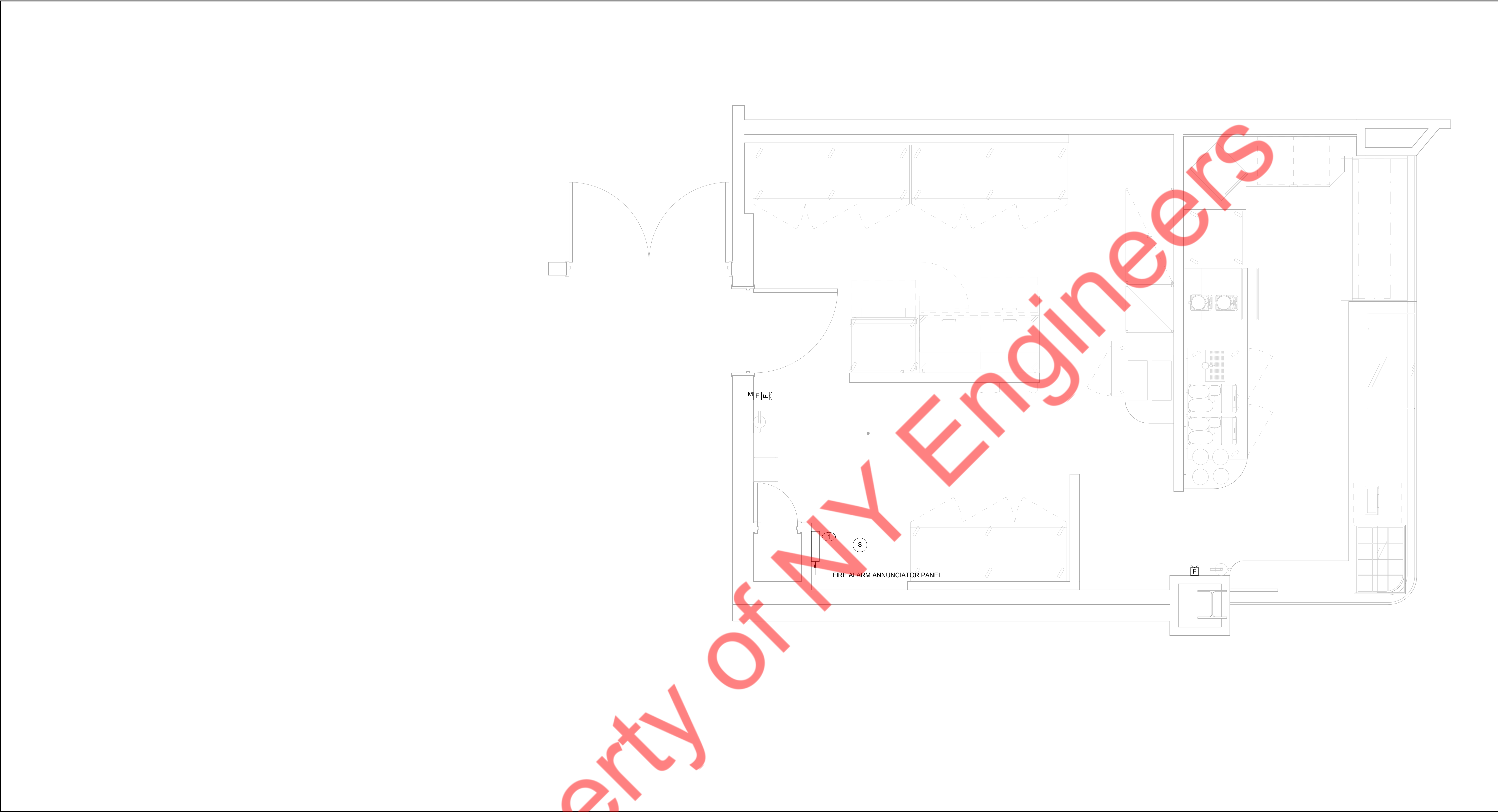
**FA200**

**FIRE ALARM LEGENDS** NTS **D**

**GENERAL NOTES - FIRE ALARM RISER DIAGRAM** NTS **C**

**KEY NOTES - FIRE ALARM RISER DIAGRAM** NTS **B**





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FIRE ALARM PLAN1/2" = 1'-0" A

1 PROVIDE NEW FIRE ALARM ANNUNCIATOR PANEL AND CONNECT TO BASE BUILDING FIRE ALARM SYSTEM. COORDINATE THE EXACT LOCATION OF BASE BUILDING FIRE ALARM SYSTEM WITH LANDLORD IN FIELD. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF FIRE ALARM ANNUNCIATOR PANEL PRIOR TO ROUGH-IN. THE FIRE ALARM ANNUNCIATOR PANEL SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. VERIFY THE EXACT REQUIREMENT WITH BASE BUILDING OWNER.

KEY NOTES - FIRE ALARM PLAN NTS B

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FIRE ALARM PLAN

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FA300



1. SOIL AND WASTE PIPE SHALL SLOPE 2% MINIMUM, UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
2. ALL DRAWN WATER & GAS LINES SHALL BE KEPT TIGHT TO UNDERSIDE OF EQUIPMENT & SECURED IN PLACE.
3. VERIFY LOCATION OF SANITARY SEWER ON SITE PLAN AND REVISE SEWER SYSTEM AS REQUIRED.
4. PROVIDE TRAP PRIMERS FOR FLOOR DRAINS IN RESTROOMS, WHERE REQUIRED BY CODE. PROVIDE DEEP SEAL TRAPS FOR FLOOR DRAINS WITHOUT TRAP PRIMERS.
5. CLEANOUTS SHALL BE INSTALLED WHERE READILY ACCESSIBLE. COORDINATE ALL CLEANOUT LOCATIONS WITH EQUIPMENT, CABINETS, ETC. AND OWNERS REPRESENTATIVE PRIOR TO INSTALLATION.
6. VALVES, TRAP PRIMERS, WATER HAMMER ARRESTORS AND OTHER EQUIPMENT SHOWN IN WALLS OR ABOVE NON-ACCESSIBLE CEILING SHALL BE INSTALLED BEHIND AN ACCESS PANEL.
7. PLUMBING FIXTURE VENTS SHALL TERMINATE MINIMUM OF 12 INCHES FROM VERTICAL SURFACES AND 10 FEET FROM OUTSIDE AIR INTAKES.
8. PROVIDE GAS PIPING TO UNITS AND MAKE FINAL CONNECTIONS REQUIRED FOR OPERATION.
9. PROVIDE SHUT-OFF VALVES ON HOT & COLD WATER LINES TO FIXTURES AND APPLIANCES. ALL EXPOSED WATER AND WASTE LINES SHALL BE CHROME PLATED.
10. PROVIDE LEVER HANDLE GAS SHUT-OFF VALVE IN BRACH PIPING OF EACH APPLIANCE. INSTALL OWNER FURNISHED QUICK DISCONNECT, FLEXIBLE PIPE (IF ALLOWED BY CODE) AND RESTRAINING DEVICE. PROVIDE PRESSURE REDUCING VALVES AT EACH PIECE OF EQUIPMENT OR APPLIANCE IF GAS PRESSURE IS GREATER THAN 10" WC DOWSTREAM OF THE GAS METER.
11. VALVES, UNIONS, ETC. SHALL BE SAME SIZE AS PIPE UNLESS OTHERWISE INDICATED.
12. REFER TO KITCHEN EQUIPMENT DRAWINGS FOR PLUMBING ROUGH-IN REQUIREMENTS. MAKE ALL ROUGH-IN AND FINAL CONNECTIONS TO KITCHEN EQUIPMENT UNLESS OTHERWISE NOTED.
13. REFER TO MECHANICAL DRAWINGS FOR HVAC AND HOOD PLUMBING REQUIREMENTS.
14. GAS LINES SHALL BE SUPPORTED.
15. FLOOR SINKS AND FLOOR DRAINS IN TRAFFIC AREAS SHALL BE INSTALLED FLUSH WITH FLOOR SURFACE.
16. PROVIDE WATER HAMMER ARRESTOR FOR ALL HAND SINKS AND WATER CLOSET WATER LINES
17. PROVIDE AIR GAPS FOR INDIRECT DRAINS AS REQUIRED BY CODE. AIR GAP SHALL BE MINIMUM 2 TIMES DIAMETER OF INDIRECT DRAIN.
18. VERIFY DEPTH, SIZE, LOCATION, AND CONDITION OF ALL EXISTING UTILITIES IN THE FIELD PRIOR TO COMMENCING WORK ON PROJECT. NOTIFY OWNER IMMEDIATELY OF CONDITIONS THAT EXIST WHICH WOULD CAUSE THE DESIGN TO BE ALTERED..
19. COORDINATE INSTALLATION OF PLUMBING WORK WITH OTHER TRADES SO AS TO AVOID UNNECESSARY DELAY OR INTERFERENCES.REVIEW ARCHITECTURAL AND EQUIPMENT SHEETS.
20. PROVIDE BACKFLOW PROTECTION DEVICES REQUIRED BY AGENCIES HAVING JURISDICTION. BACKFLOW DEVICES REQUIRING TESTING SHALL BE INSTALLED NO HIGHER THAN 5'-0" A.F.F.
21. PROVIDE CONDENSATE DRAIN FROM A/C UNITS TO APPROVED DRAIN. PROVIDE GAS PIPING TO UNITS. MAKE FINAL CONNECTIONS REQUIRED FOR OPERATION.
22. THE OWNER OR KITCHEN EQUIPMENT SUPPLIER MAY SUBSTITUTE EQUIPMENT OR EQUIPMENT MAY VARY FROM WHAT IS SHOWN. THEREFORE, VERIFY ALL CRITICAL DIMENSIONS WITH OWNER PRIOR TO CONSTRUCTION. FAILURE OF CONTRACTOR TO VERIFY THESE DIMENSIONS SHALL PLACE RESPONSIBILITY FOR SUBSEQUENT RELOCATION DIRECTLY UPON CONTRACTOR.
23. ALL WATER LINES SHALL BE RUN OVERHEAD UNLESS OTHERWISE NOTED.
24. ALL WATER LINES SHALL BE FLUSHED PRIOR TO CONNECTING FIXTURES OR EQUIPMENT.
25. PROVIDE ESCUTCHEON PLATES AND SILICONE SEALANT AT UTILITY PENETRATIONS INTO WALLS, CEILINGS, AND FLOORS. DO NOT USE CAULKS OR EXPANDING FOAMS FOR SEALANT.
- 26.PVC SCHEDULE 40 WASTE PIPE CAN BE SUBSTITUTED FOR BLACK IRON WASTE PIPE WHERE ALLOWED BY LOCAL MUNICIPALITIES.

GENERAL NOTES - PLUMBING

NTS

5

SYMBOLS	ABBREV.	DESCRIPTION
	A.P.	ACCESS PANEL
	C.I.	CAST IRON
	(TYP.)	TYPICAL
	(N)	NEW
	(E)	EXISTING
	F.D.	FLOOR DRAIN
	A.F.F.	ABOVE FINISHED FLOOR
	F.S.	FLOOR SINK
	X   00	PLUMBING EQUIPMENT DESIGNATION
	XXX	KITCHEN EQUIPMENT NUMBER: REFER TO KITCHEN EQUIPMENT DRAWINGS FOR DESCRIPTION.
	W.C.O.	WALL CLEANOUT
		SHUT- OFF VALVE
	GW	SOIL OR WASTE (GREASE WASTE)/WASTE STUB-UNDERGROUND
	CW	COLD WATER/ CW STUB
	HW	HOT WATER / HW STUB
	HWR	HOT WATER RETURN
	FW	FILTERED WATER
	V	SANITARY VENT
	TW	PREMIXED TEMPERATURE WATER
	S.O.V.	SHUT-OFF GATE VALVE
	S.O.C.	SHUT-OFF GAS COCK
	C.V.	CHECK VALVE
	P.T.R.V.	PRESS-TEMPERATURE RELIEF VALVE
	B.V.	BALL VALVE
	C.W.	COLD WATER BELOW GRADE
	BFP	BACK FLOW PREVENTER
	FU	FIXTURE UNIT
		BALANCING VALVE
		POINT OF CONNECTION
	HS	HAND SINK
	3-CS	3-COMPARTMENT SINK
	1-CS	1-COMPARTMENT SINK
	MS	MOP SINK
	MV	MIXING VALVE

PLUMBING LEGEND

NTS

3

FIXTURE	NO.	DRAIN		COLD WATER		HOT WATER	
		D.F.U.	TOTAL D.F.U.	F.U. C.W.	TOTAL C.W.	F.U. H.W.	TOTAL H.W.
DROP-IN SINK *	1	--	--	2.0	2.0	2.0	2.0
3 - COMPARTMENT SINK	1	6	6	6.0	6.0	6.0	6.0
3" FLOOR DRAIN	1	5	5	--	--	--	--
3" FUNNEL FLOOR DRAIN	1	5	5	--	--	--	--
FLOOR SINK	1	5	5	--	--	--	--
MOP SINK	1	5	5	2	2	2	2
HAND SINK	1	1	1	1.0	1.0	1.0	1.0
MISCELLANEOUS**	5	--	--	0.5	2.5	--	--
TOTAL	--	--	27	--	13.5	--	11

PROBABLE DEMANDS/ AND PIPE SIZING REQUIREMENTS:	DRAIN: GW	22 DFU	USE 4" GREASE WASTE
	TOTAL	13.5 WSFU	USE 1" WATER SUPPLY
	SUPPLY: CW SUPPLY: HW	11 WSFU 11WSFU	USE 1" WATER SUPPLY USE 3/4" WATER SUPPLY
BASED ON MASSACHUSETTS PLUMBING CODE. *FIXTURE HAS INDIRECT WASTE TO FLOOR SINK **ICE CUBER, COFFEE BREWER & ESPRESSO MAKER			

PLUMBING FIXTURE COUNT

NTS

4

ITEM	FIXTURE	SOIL OR WASTE	VENT	COLD WATER	HOT WATER	TEMP'D WATER	WASTE FU	WATER FU	DESCRIPTION	MANUFACTURER / MODEL NUMBER
FS	1	FLOOR SINK	3"	2"	--	--	5	--	PVC 12" SQUARE FLOOR SINK, 8" DEEP, WITH ALUMINUM OR PVC DOME STRAINER AND LOOSE SET PVC SLOTTED TOP GRATE. SET FLOOR SINK LIP FLUSH WITH FLOOR TILE	SIoux CHIEF / MODEL: 861 ZURN / MODEL: Z-1901 OR Z-1900
FD	1	FLOOR DRAIN	3"	2"	--	--	5	--	CAST IRON FLOOR DRAIN WITH FLANGE, INTEGRAL REVERSIBLE CLAMPING COLLAR, SEEPAGE OPENINGS, AND 6" DIA. NICKEL BRONZE STRAINER WITH VANDAL PROOF SCREWS, TRAP PRIMER CONNECTION. SUPPLY WITH DEEP SEAL TRAP. SIZE AS INDICATED ON FLOOR PLANS. PROVIDE (TP) TRAP PRIMER OR (TS) PROSET TAP SEAL AS NOTED.	ZURN / MODEL: ZN415-NH-6H-P
FFD	1	FUNNEL FLOOR DRAIN	3"	2"	--	--	5	--	CAST IRON FUNNEL FLOOR DRAIN WITH FLANGE, INTEGRAL REVERSIBLE CLAMPING COLLAR, SEEPAGE OPENINGS, AND 6" DIA. NICKEL BRONZE STRAINER WITH VANDAL PROOF SCREWS, TRAP PRIMER CONNECTION. SUPPLY WITH DEEP SEAL TRAP. SIZE AS INDICATED ON FLOOR PLANS. PROVIDE (TP) TRAP PRIMER OR (TS) PROSET TAP SEAL AS NOTED.	ZURN / MODEL: Z415E
HS	1	HAND SINK	2"	1-1/2"	1/2"	--	1/2"	1.0	SINK, FAUCET & DRAIN, INSTALL OWNER PROVIDE FIXTURE AND ACCESSORIES.	CENTAUR MODEL: SSHAND-2SSNO
MS	1	MOP SINK	3"	2"	3/4"	3/4"	--	5	2	--
MV	1	MIXING VALVE	--	--	1/2"	1/2"	--	--	THERMOSTATIC, 125 P516, 200VBF BRONZE BODY, STAINLESS STEEL PISTON LINER, CHECK VALVES SIZE PER PIPE CONNECTIONS.	POWERS SERIES LFLM495 LAWLER SERIES 310 LEONARD SERIES 170
WH	1	WATER HEATER	--	--	3/4"	3/4"	--	--	ELECTRIC STORAGE WATER HEATER, 40 GAL. STORAGE TANK, 55 GPH @ 90 DEG. RISE, DIMENSIONS: 54.75" H X 22" DIA. ELECTRICAL DATA: 12.3 KW, 3-PHASE, 480 V, 14.8 AMPS	MODEL: STATE WATER HEATER SSE-40A --
ET	1	EXPANSION TANK	--	--	3/4"	--	--	--	EXPANSION TANK, STEEL, EXPANSION MEMBRANE 150 PSI, 180" F.	AMTROL SERIES ST-5
3	CS	3-COMP. SINK	DIRECT	3/4"	3/4"	--	--	6	SINK, FAUCET & DRAIN, INSTALL OWNER PROVIDE FIXTURE AND ACCESSORIES.	EAGLE GROUP / MODEL: 312-12-3-12 --
1	CS	DROP-IN SINK	INDIRECT	--	1/2"	1/2"	--	2	SINK, FAUCET & DRAIN, INSTALL OWNER PROVIDE FIXTURE AND ACCESSORIES.	EAGLE GROUP / MODEL: SR10-14-9.5-1 --
RCP	1	RECIRCULATION PUMP	--	--	3/4"	--	--	--	RE-CIRCULATION PUMP, BRONZE, FLOW RATE 2 GPM @ 10 FT HEAD. ELECTRICAL - 85W, 1PH / 115V	GRUNDFOS UP15-18 B7
GI	1	GREASE INTERCEPTOR	3"	2"	--	--	--	--	GREASE INTERCEPTOR 20 GPM / 70 LBS. PROVIDE RISER AS PER FIELD AND PIPE INVERT.	SCHIER GB-1

PLUMBING FIXTURE SCHEDULE

NTS

1

PLUMBING SCHEDULE											
ITEM NUMBER	COUNT	EQUIPMENT DESCRIPTION	CONNECTION DESCRIPTION	COLD WATER SIZE	HOT WATER SIZE	FILTERED WATER SIZE	INDIRECT WASTE SIZE	DIRECT WASTE SIZE	PLUMBING REMARKS		
1	1	HAND SINK	DIRECT DRAIN					1 1/2"	G.C. SHALL PROVIDE WALL BLOCKING AS REQUIRED.		
1A	1	WALL / SPLASH MOUNT FAUCET	HOT & COLD	1/2"	1/2"				-		
4	1	3 COMPARTMENT SINK (SMALLER SINKS W/ 2DRAINBDS)	DIRECT DRAIN					2"	-		
4A	1	3 BAY FAUCET	HOT & COLD	3/4"	3/4"				PRERINSE UNIT COMPLETE SPLASH MOUNT W/ BRACKET B-0156-OR ADD-ON FAUCET, FOR PRE-RINSE UNITS, 12" NOZZLE, INCLUDES 3"NIIPLE		
6	1	MOP SINK	DIRECT DRAIN, HOT & COLD	3/4"	3/4"			3"	-		
8	1	WATER FILTER SYSTEM	COLD WATER, DRAIN INDIRECT	3/4"		3/4"	1/2"		INDIRECT WASTE, MAINTAIN APPROVED AIR GAP AS PER CODE		
38	1	DROP-IN SINK	INDIRECT DRAIN, HOT & COLD	1/2"	1/2"				INDIRECT WASTE, MAINTAIN APPROVED AIR GAP AS PER CODE		
43	1	ICE CUBER WITH BIN	INDIRECT DRAIN, FILTERED WATER			1/2"	1/2"		INDIRECT WASTE, MAINTAIN APPROVED AIR GAP AS PER CODE		
49	2	ESPRESSO MAKER	INDIRECT DRAIN, FILTERED WATER			1/2"	1/2"		INDIRECT WASTE, MAINTAIN APPROVED AIR GAP AS PER CODE		
54	2	COFFEE BREWER	INDIRECT DRAIN, FILTERED WATER			1/2"	1/2"		INDIRECT WASTE, MAINTAIN APPROVED AIR GAP AS PER CODE		

KITCHEN EQUIPMENT PLUMBING SCHEDULE

NTS

2

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382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
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PLUMBING ABBREVIATIONS & SCHEDULES

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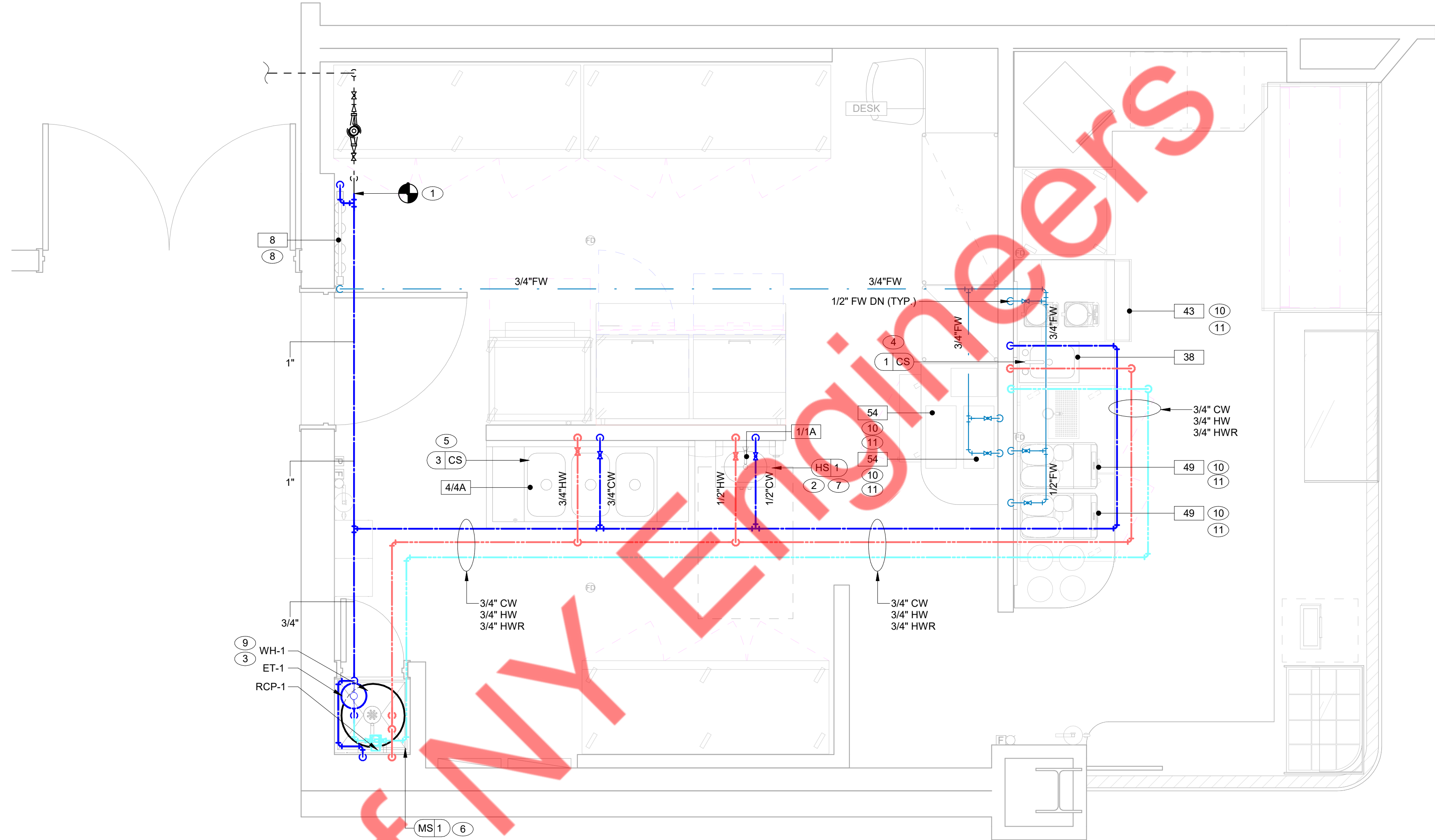
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P100



# P101





1 PLUMBING WATER PLAN  
1/2" = 1'-0"

WATER SUPPLY PIPING PLAN 1/2" = 1'-0" A

1. ANY WORK SHOWN ON THE DRAWINGS AND NOT PARTICULARLY DESCRIBED IN THE SPECIFICATIONS OR DETAILS, OR ANY WORK WHICH MAY BE DEEMED NECESSARY TO COMPLETE THE CONTRACT SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS CONTRACT.
2. CW/ HW PIPING TO BE PROVIDED WITH INSULATION AS PER INTERNATIONAL ENERGY CONSERVATION CODE.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF FLOOR SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
5. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR.
6. CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
7. FOR SINK PROVIDE HOT WATER AT 110°F. PROVIDE POINT OF USE MIXING VALVE IF REQUIRED.
8. PROVIDE BRANCH PRV IF PRESSURE INCREASES 80 PSI.
9. PROVIDE HOT WATER RETURN AS PER MAXIMUM PIPE LENGTH.
10. EXISTING STORM WATER SYSTEM WITH ALL ASSOCIATED PIPING & EQUIPMENT TO REMAIN.

1. CONNECT NEW 1" CW LINE TO EXISTING COLD WATER IN THE SPACE. CONTRACTOR TO FIELD VERIFY EXACT POINT OF CONNECTION & LOCATION OF WATER METER.
2. PROVIDE THERMOSTATIC MIXING VALVE SET TO 110 F AT EACH HAND SINK.
3. CONNECT 3/4" HW/CW & 3/4" HWR WATER LINES TO STORAGE WATER HEATER WH-1.
4. 1/2" HOT AND COLD WATER LINES DOWN IN WALL 1-COMPARTMENT SINK
5. 3/4" COLD AND HOT WATER LINES DOWN IN WALL TO THREE COMPARTMENT SINK. PROVIDE MIXING VALVE ABOVE SUSPENDED CEILING
6. 3/4" COLD AND HOT WATER DOWN IN WALL TO MOP SINK.
7. 1/2" HOT AND COLD WATER DOWN IN WALL TO HANDSINK.
8. 3/4" COLD WATER PIPE DOWN IN WALL TO FILTER AND 3/4" FILTER WATER SUPPLY FROM THE FILTRATION.
9. T&P RELIEF VALVE AND DRAIN LINE. EXTEND DRAIN LINE TO MOP SINK AND SPILL. DRAIN LINE TO BE MIN OF 2" ABOVE THE FLOOD RIM LEVEL OF MOP SINK
10. 1/2" FILTER WATER DN TO ICE MAKER, ESPRESSO MAKER & COFFEE DISPENSER.
11. PROVIDE APPROVED SECONDARY BACKFLOW PREVENTER FOR COFFEE MACHINE, ESPRESSO MAKER & ICE MACHINE

GENERAL NOTES - WATER SUPPLY NTS C

KEY NOTES - WATER SUPPLY NTS B

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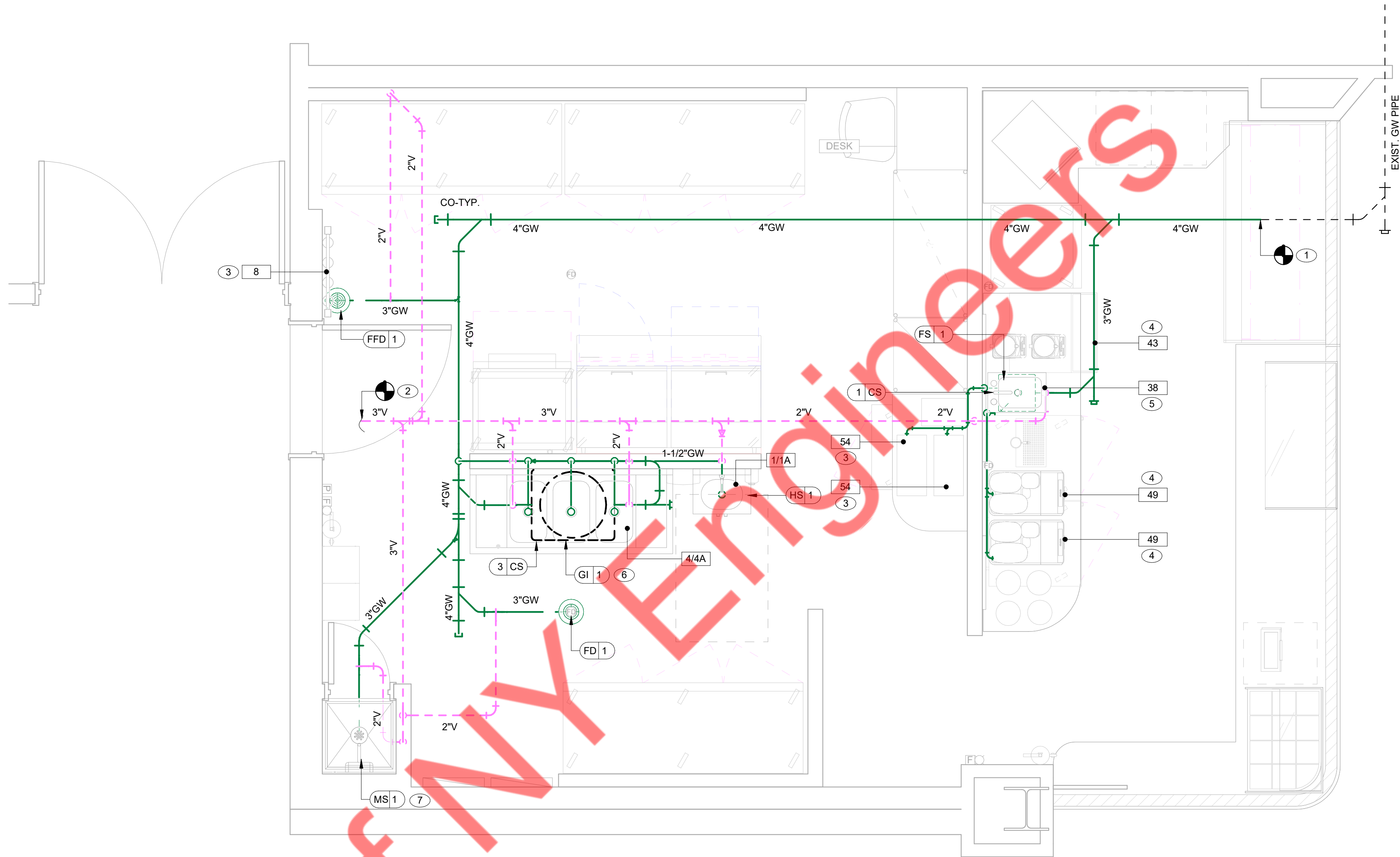
WATER SUPPLY PIPING PLAN

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DRAWING NUMBER:

P200





1 PLUMBING DRAINAGE PLAN  
1/2" = 1'-0"

WASTE AND VENT PIPING PLAN

1/2" = 1'-0"

A

- ALL PIPING SHALL BE SNAKE CLEAN PRIOR TO CONNECTION.
- ANY CHANGES AND/OR UPGRADES TO TENANT'S EXISTING PLUMBING SYSTEMS SHALL COMPLY WITH ALL CODES. EXISTING SYSTEMS SHALL POSSESS THE CAPACITY TO HANDLE ANY AND ALL CHANGES IN LOAD.
- PLUMBING IS NOT PERMITTED IN ANY DEMISING PARTITIONS. FURROUT THE WALL AS NECESSARY.
- EXHAUST AND PLUMBING VENTS SHALL BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ANY OUTSIDE AIR INTAKE, AND 5'-0" FROM ANY DEMISING WALL VERTICAL PLANE.
- ALL FLOOR PENETRATIONS MUST BE CORE BORED, SLEEVED, GROUTED, SEALED AND MADE WATERPROOF. SLEEVES MUST EXTEND A MINIMUM OF 4" AFF.
- TENANT IS REQUIRED TO INSTALL A WATERPROOF MEMBRANE IN ALL WET AREAS OF THE SPACE. TENANT SHALL USE A 30 MIL.
- POLYETHYLENE CLEAVAGE MEMBRANE (EQUAL TO NOBLESEAL TS) INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND ANSI A108. MEMBRANE MUST BE EXTENDED UP THE WALL A MINIMUM OF 6" OR EQUAL TO THE HEIGHT OF THE FLOOR BASE.
- SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE 3" AND ABOVE. 1/4" PER FOOT OF RUN FOR PIPE LESS THAN 3". VENT PIPING SHALL BE PITCHED TO DRAIN.
- PROVIDE ACCESS PANEL FOR CLEANOUTS AND ALL CONCEALED EQUIPMENTS THAT REQUIRE MAINTENANCE ACCESS. CONTRACTOR TO COORDINATE WITH ARCHITECT FOR LOCATION.
- PROVIDE WALL CLEANOUTS WHEREVER POSSIBLE FOR EACH CHANGE IN DIRECTION OF MORE THAN 45DEG.
- EXISTING STORM WATER SYSTEM WITH ALL ASSOCIATED PIPING & EQUIPMENT TO REMAIN.

GENERAL NOTES - WASTE AND VENT

NTS

C

- CONTRACTOR SHALL CONNECT NEW 4" GREASE WASTE LINE TO THE EXISINTG GREASE WASTE PIPE. VERIFY EXACT LOCATION, SIZE, INVERT, DIRECTION OF FLOW AND CONNECTION POINT PRIOR TO BID.
- CONTRACTOR SHALL CONNECT NEW 3" VENT LINE TO THE EXISINTG VENT LINE IN THE SPACE. VERIFY EXACT LOCATION, SIZE, ROUTING AND CONNECTION POINT PRIOR TO BID. NOTIFY THE ENGINEER / ARCHITECT WITH ANY DISCREPANCIES PRIOR TO BID.
- ROUTE INDIRECT DRAIN LINES FROM COFFEE BREWER TO FLOOR SINK WITH APPROVED AIR GAP AS PER LOCAL CODE.
- ROUTE INDIRECT DRAIN LINES FROM ESPRESSO MACHING AND ICE MAKER TO FLOOR SINK WITH APPROVED AIR GAP AS PER LOCAL CODE.
- PIPE 1-COMPARTMENT SINK TO FLOOR SINK WITH AIR GAP PER CODE
- SCHIER GB-1 FLOOR MOUNTED GREASE INTERCEPTOR. CONTRACTOR TO FILED VERIFY INTALLATION REQUIREMENTS AS PER MANUFACTURERS RECOMMENDATIONS.
- SPILL WATER HEATER (WH-1) T&P DISCHARGE AND DRAIN PAN TO MOP SINK WITH AIR GAP.
- ROUTE INDIRECT DRAIN LINES FROM FILTRATION UNIT TO FUNNEL FLOOR DRAIN WITH APPROVED AIR GAP AS PER LOCAL CODE.

KEY NOTES - WASTE AND VENT

NTS

B

DISCLAIMER

OWNERSHIP AND USE OF DOCUMENTS, DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF PROFESSIONAL SERVICE AND SHALL REMAIN THE PROPERTY OF THE ARCHITECT. THESE DOCUMENTS ARE NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECTS OR PURPOSES OR BY ANY OTHER PARTIES THAN THOSE PROPERLY AUTHORIZED BY CONTRACT WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF THE ARCHITECT.

NY ENGINEERS

NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

REVISIONS

NUMBER	REMARKS	DATE
1	PERMIT SET	05.29.24

ISSUED FOR:	DATE ISSUED:
-	08/11/23

PROJECT TITLE:

CAFFÈ  
NERO

DRAWING TITLE:

WASTE AND VENT PIPING  
PLAN

PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
DRAWN BY: NYE	CHECKED BY: NYE

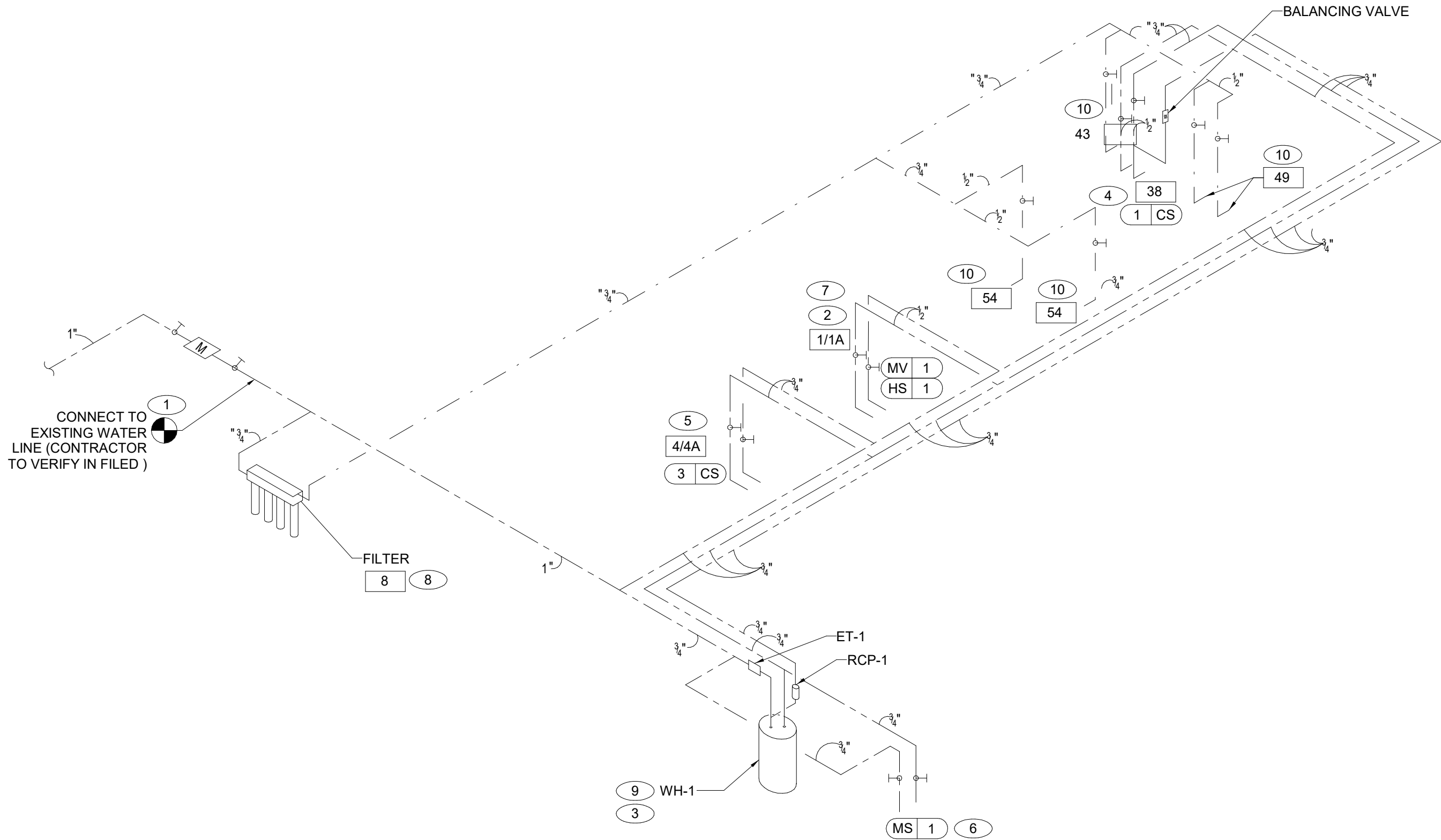
DRAWING NUMBER:

P201





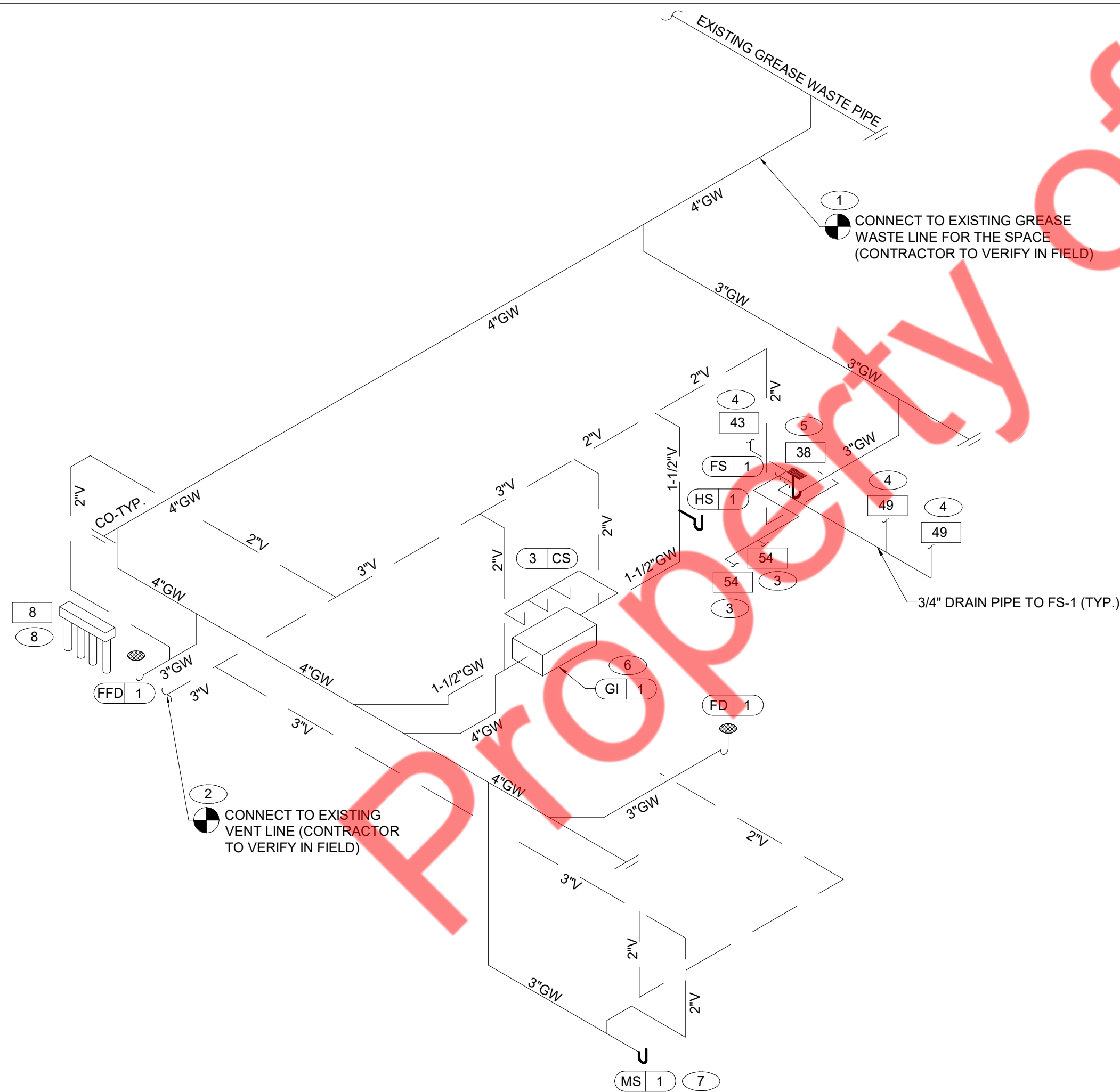




- CONNECT NEW 1" CW LINE TO EXISTING COLD WATER IN THE SPACE. PROVIDE BFP. CONTRACTOR TO TO FIELD VERIFY EXACT POINT OF CONNECTION & LOCATION OF WATER METER.
- PROVIDE THERMOSTATIC MIXING VALVE SET TO 110 F AT EACH HAND SINK.
- CONNECT 3/4" HW/CW & 3/4" HWR WATER LINES TO STORAGE WATER HEATER WH-1.
- 1/2" HOT AND COLD WATER LINES DOWN IN WALL 1-COMPARTMENT SINK
- 3/4" COLD AND HOT WATER LINES DOWN IN WALL TO THREE COMPARTMENT SINK. PROVIDE MIXING VALVE ABOVE SUSPENDED CEILING
- 3/4" COLD AND HOT WATER DOWN IN WALL TO MOP SINK.
- 1/2" HOT AND COLD WATER DOWN IN WALL TO HANDSINK.
- 3/4" COLD WATER PIPE DOWN IN WALL TO FILTER AND 3/4" FILTER WATER SUPPLY FROM THE FILTRATION.
- T&P RELIEF VALVE AND DRAIN LINE, EXTEND DRAIN LINE TO MOP SINK AND SPILL. DRAIN LINE TO BE MIN OF 2" ABOVE THE FLOOD RIM LEVEL OF MOP SINK
- 1/2" FILTER WATER DN TO ICE MAKER, ESPRESSO MAKER & COFFEE DISPENSER .

#### WATER ISOMETRIC NTS 1

#### KEYNOTES - WATER SUPPLY4 NTS 2



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#### WASTE AND VENT ISOMETRIC NTS 3

#### KEYNOTES - WASTE AND VENT NTS 4

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**NY ENGINEERS**

NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

#### REVISIONS

NUMBER	REMARKS	DATE
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ISSUED FOR:	DATE ISSUED:
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PROJECT TITLE:

**CAFFÈ  
NERO**

DRAWING TITLE:

PLUMBING RISER DIAGRAMS

PERMIT DWG DATE: 05-29-24	PROJECT NUMBER:
DRAWN BY: NYE	CHECKED BY: NYE

DRAWING NUMBER:

P400



<div><div>SPRINKLER GENERAL NOTES</div><div><div><div>1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13 AND ALL LOCAL AUTHORITIES.</div><div>2. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.</div><div>3. ALL SPRINKLER HEADS SHALL BE INSTALLED AT CENTER OF TILE IF CEILING IS PROVIDED.</div><div>4. GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED WHEN FURNITURE/EQUIPMENT IS LESS THAN 18" TO UNDERSIDE OF CEILING.</div><div>5. THE SPRINKLER SYSTEMS ARE TO BE HYDROSTATIC TESTED FOR A (1) HOUR MINIMUM AT 200 PSI. PRESSURE AND ARE TO BE WITNESSED BY AUTHORIZED BUILDING PERSONNEL. COORDINATE ALL TESTING WITH BUILDING MANAGER.</div><div>6. PIPES SIZES SHOWN ARE BASED ON DESIGN PIPING LAYOUTS ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATIONS BASED ON HIS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN HIS CONTRACT PRICE.</div><div>7. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.</div><div>8. G.C. SHALL BE RESPONSIBLE FOR ALL FINAL TESTS AND INSPECTIONS OF COMPLETED WORK REQUIRED BY THE BUILDING MANAGEMENT PRIOR TO OCCUPANCY OF SPACE.</div><div>9. ALL SPRINKLER WORK SHALL BE TESTED AND MADE OPERATIONAL PRIOR TO CARPET AND FURNITURE INSTALLATION. G.C. SHALL REPAIR AND/OR REPLACE ALL FINISHES DAMAGED BY DEFECTIVE SPRINKLER WORK AT HIS EXPENSE.</div><div>10. ALL BURNING, CUTTING, SOLDERING AND WELDING SHALL BE COORDINATED WITH BUILDING FIRE SYSTEMS WITH BUILDING MANAGEMENT, AS REQUIRED.</div><div>11. G.C. SHALL BE RESPONSIBLE FOR OBTAINING PERMITS AND APPROVALS REQUIRED BY BUILDING INSPECTOR AND FIRE MARSHALL IN CONJUNCTION WITH CHANGES TO EXISTING SPRINKLER SYSTEM.</div><div>12. REFER TO ENGINEERING DRAWINGS FOR SPRINKLER HEADS, LIGHT SENSORS AND FIRE DETECTION DEVICES.</div><div>13. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER.</div><div>14. UPON COMPLETION OF ALL SPRINKLER WORK, CONTRACTOR SHALL TEST AND INSPECT ENTIRE SPRINKLER SYSTEM. ENTIRE SYSTEM SHALL BE FULLY OPERATIONAL AND APPROVED IN COMPLIANCE WITH ALL AHJ.</div><div>15. UPON SUCCESSFUL COMPLETION OF ALL TESTING, CONTRACTOR SHALL PRIME AND PAINT ALL EXPOSED SPRINKLER PIPING. COLOR AND FINISH SHALL BE AS PER ARCHITECT.</div><div>16. CONTRACTOR SHALL INCLUDE IN HIS BID THE COST TO PROVIDE (5) FIVE ADDITIONAL SPRINKLERS INSTALLED. EXACT LOCATIONS OF THESE SPRINKLER HEADS SHALL BE DETERMINED IN FIELD.</div><div>17. FOR SPRINKLER WORK DONE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13, HYDROSTATIC TESTS IN ACCORDANCE WITH REFERENCE STANDARD NFPA 13-2013, AS MODIFIED FOR COMMONWEALTH OF MASSACHUSETTS, ARE NECESSARY.</div><div>18. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SHALL INSTALL NEW WORK TO CLEAR DUCTWORK AND LIGHTING FIXTURES.</div><div>19. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.</div><div>20. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.</div><div>21. PIPES SIZES SHOWN ARE BASED ON SCHEDULE OF PIPE SIZE PIPING LAYOUTS ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATIONS BASED ON HIS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN HIS CONTRACT PRICE.</div><div>22. PROVIDE AUXILIARY DRAINS AT TRAPPED SECTIONS OF PIPING AS REQUIRED BY NFPA.</div><div>23. GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/ EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED WHEN FURNITURE/EQUIPMENT IS LESS THAN 18" TO UNDERSIDE OF CEILING PRIOR TO INSTALLATION.</div><div>24. COMPOSITE DRAWINGS CONTRACTOR SHALL BE GIVEN A SEPIA TRANSPARENCIES TO IMPOSE THEIR WORK FOR A COORDINATED ALLOCATION OF SPACE. PROCEDURE SHALL INCLUDE HVAC CONTRACTOR TO INDICATE DUCT WORK, PIPING, STRUCTURAL AND ARCHITECTURAL DETAILS. SEPIAS SHALL BE GIVEN TO PLUMBING, SPRINKLER AND ELECTRICAL TRADES WHO WILL DRAW HIS WORK ON DRAWINGS. HVAC CONTRACTORS SHALL HOLD A COORDINATION MEETING WITH ALL CONTRACTORS TO ELIMINATE INTERFERENCE OR CONFLICTS IN INSTALLING WORK. IF UNABLE TO EACH AGREEMENT ISSUE, ARCHITECT SHALL MAKE BINDING DECISION.</div><div>25. CONTRACTOR SHALL COORDINATE SPRINKLER MAIN AND BRANCHES WITH NEW CONSTRUCTION TO AVOID CONFLICTS WITH CEILING HEIGHTS, DUCTWORK, LIGHTING FIXTURES, BEAMS. CONTRACTOR TO ADJUST PIPING ACCORDINGLY TO ACCOMMODATE NEW CONSTRUCTION.</div><div>26. WET SPRINKLER SYSTEM SUBJECTED TO FREEZING SHOULD COMPLY WITH CMR 780 MASSACHUSETTS STATE BUILDING CODE, 9TH EDITION AMENDED TO 2015 INTERNATIONAL BUILDING CODE, SECTION 903.</div></div></div><div><div>BUILDING DEPARTMENT SPRINKLER NOTES</div><div><div>1. THE INSTALLATION, COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION AND TYPE OF SYSTEMS SHALL CONFORM TO THE CMR 780 MASSACHUSETTS STATE BUILDING CODE, 9TH EDITION AMENDED TO 2015 INTERNATIONAL BUILDING CODE, SECTION 903.</div><div>2. ONLY APPROVED MATERIALS SHALL BE USED AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>3. DIRECT CONNECTION OF SPRINKLERS TO THE PUBLIC WATER SYSTEM SHALL CONFORM TO 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>4. SPRINKLER SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>5. INSPECTION AND TESTS OF SPRINKLERS SHALL BE CONDUCTED AS SEC. 901.5 AND 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE, SECTION 1.05.</div><div>6. THE OCCUPANCY OF THE AREAS TO BE SPRINKLER IN ACCORDANCE WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05, CHAPTER 4.</div><div>7. WATER SUPPLY TEST PIPES AND GAUGES SHALL BE PROVIDED AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>8. PIPING, FITTINGS, SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION, DAMAGE, VALVES, HANGERS, SPRINKLERS GUARDS AND SHIELDS SHALL BE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>9. STOCK OF EXTRA SPRINKLERS WILL BE FURNISHED AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05. (REQUIRED FOR EACH TEMPERATURE RATING).</div><div>10. SPRINKLER ALARM SHALL BE IN ACCORDANCE WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>11. SPACING, LOCATION AND POSITION OF SPRINKLER WILL BE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>12. ALL BLIND SPACES EXCEEDING 6" IN WIDTH OR DEPTH WHICH CONTAIN COMBUSTIBLE MATERIAL WILL BE SPRINKLERED.</div><div>13. ALL PIPE PASSING THROUGH WALLS WILL COMPLY WITH SECTION BC711.2</div><div>14. THERE IS NO HIGH PILED STORAGE AS DEFINED IN 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>15. THIS APPLICATION IS NOT FILED AS A RESULT OF ACTION BY THE FIRE COMMISSIONER AS AUTHORIZED BY BS &amp; A TO MODIFY THE CERTIFICATE OF OCCUPANCY NOR IS SUCH ACTION PENDING.</div><div>16. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>17. DRAINAGE SHALL CONFORM TO 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>18. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IS MADE IN THE SIZE OF PIPE, AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>19. ALL VALVES ON CONNECTIONS TO WATER SUPPLIES TO SPRINKLER SHALL BE APPROVED O.S. &amp; Y. OR APPROVED INDICATOR TYPE.</div><div>20. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>21. HANGERS SHOULD BE SUPPORTED BY WROUGHT IRON U TYPE OR APPROVED ADJUSTABLE HANGERS. HANGERS SHALL BE OF THE TYPE APPROVED FOR USE WITH THE PIPE OR TUBE INVOLVED, AS PER CHAPTER 9.</div><div>22. PROVISIONS SHOULD BE MADE TO FACILITATE FLUSHING SYSTEM PIPING BY PROVIDING FLUSHING CONNECTIONS CONSISTING OF A CAPPED NIPPLE 4" LONG ON END OF A CROSS MAIN AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>23. SPRINKLER SHALL BE AN APPROVED TYPE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>24. TEMPERATURE RATING SHALL COMPLY WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>25. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>26. SPACING AND LOCATION OF SPRINKLERS SHALL COMPLY WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>27. SPRINKLER SYSTEM COMPLIES WITH NFPA 13-2013 AS MODIFIED BY 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>28. SOURCES OF WATER SUPPLY FOR SPRINKLER SYSTEMS AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.</div><div>29. PIPE SCHEDULE SYSTEMS SHALL BE IN ACCORDANCE WITH CHAPTER 9, SECTION 903.3.</div><div>30. HYDRAULICALLY DESIGNED SYSTEMS SHALL BE IN ACCORDANCE WITH CHAPTER 9 SECTION 903.3.</div><div>31. MINIMUM BRANCH PIPE SIZE TO BE ONE INCH (1").</div><div>32. THIS APPLICATION IS MADE ONLY FOR WORK INDICATED ON THE SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.</div></div></div><div><div>SPRINKLER LEGEND</div><div><div><div>---</div><div>EXISTING SPRINKLER PIPE</div></div><div><div>---</div><div>SPRINKLER PIPE</div></div><div><div>●</div><div>CONCEALED SPRINKLER HEAD</div></div><div><div>⊙</div><div>UPRIGHT SPRINKLER HEAD</div></div><div><div>(RL)</div><div>RELOCATED SPRINKLER HEAD</div></div><div><div>(E)</div><div>EXISTING SPRINKLER HEAD</div></div><div><div>(N)</div><div>NEW SPRINKLER HEAD</div></div><div><div>SP</div><div>SPRINKLER PIPE</div></div></div><div><div>SPRINKLER DRAWING LIST</div><div><div>SP100 SPRINKLER NOTES, ABBREVIATIONS, SYMBOLS. AND SPRINKLER SPECIFICATIONS</div><div>SP200 SPRINKLER PLAN</div><div>SP300 SPRINKLER DETAILS</div></div></div><div><div>SPACING BETWEEN SPRINKLER HEADS</div><div><div>LIGHT HAZARD: 15' MAX. ORDINARY HAZARD: 15' MAX</div><div>NOTE: MAXIMUM DISTANCE BETWEEN SPRINKLER HEADS &amp; WALLS IS 1/2 THE DISTANCE BETWEEN HEADS.</div></div></div><div><div>PROTECTION AREA OF SPRINKLER HEADS</div><div><div>LIGHT HAZARD : 225 SQ. FT. ORDINARY HAZARD : 130 SQ. FT.</div></div></div><div><div>GENERAL NOTES:</div><div><div>1. FOR SPRINKLER WORK ONLY.</div><div>2. ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.</div></div></div><div><div>MASSACHUSETTS THREE TIER PROCESS</div><div><div>THIS PROJECT SHALL BE DESIGNED AND CONSTRUCTED UNDER THE THREE TIER SYSTEM, PER THE MASSACHUSETTS BUILDING CODE, 780 CMR, CHAPTER 9. A. TIER ONE, CONSTRUCTION DOCUMENTS  1. PRIOR TO ISSUANCE OF A BUILDING PERMIT, CONSTRUCTION DOCUMENTS FOR THE FIRE PROTECTION SYSTEM MUST BE SUBMITTED AND A BUILDING PERMIT OBTAINED PRIOR TO THE INSTALLATION OF FIRE PROTECTION SYSTEMS OR MODIFICATIONS, ALTERATIONS, ADDITIONS OR DELETIONS TO AN EXISTING FIRE PROTECTION SYSTEM.  2. THE CONSTRUCTION DOCUMENTS SHALL CONTAIN CONFORM TO ALL REQUIREMENTS LISTED IN THE BUILDING CODE.  B. TIER TWO, SHOP DRAWINGS  1. PRIOR TO INSTALLATION OF FIRE PROTECTION SYSTEMS, SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE PREPARED BY THE CONTRACTOR.  2. DRAWINGS AND HYDRAULIC CALCULATIONS SHALL CONFORM TO ALL REQUIREMENTS LISTED IN THE BUILDING CODE. THE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL THEN BE SUBMITTED TO THE ENGINEER OF RECORD, WHEN THE ENGINEER OF RECORD IS SATISFIED WITH THE DRAWINGS AND HYDRAULIC CALCULATIONS, THEY WILL BE SEALED.  3. THE CONTRACTOR SHALL THEN SUBMIT DRAWINGS AND HYDRAULIC CALCULATIONS TO THE BUILDING OFFICIAL AND FIRE OFFICIAL, AND OBTAIN APPROVAL.  C. TIER THREE, RECORD DRAWINGS  1. AS BUILT PLANS SHALL BE PROVIDED TO THE BUILDING OWNER FOR ALL FIRE PROTECTION AND LIFE SAFETY SYSTEMS THAT ARE SEALED AS REVIEWED AND APPROVED BY THE ENGINEER OF RECORD, PERFORMING CONSTRUCTION CONTROL.  2. SHOP DRAWINGS SHALL BE MODIFIED AS NECESSARY, WITH ANY FIELD CHANGES IDENTIFIED BY CLOUDS ON THE DRAWINGS.  3. WHEN THE ENGINEER OF RECORD IS SATISFIED WITH THE DRAWINGS AND HYDRAULIC CALCULATIONS, THEY WILL BE SEALED. THESE COMPLETED DOCUMENTS WILL THEN BE INCORPORATED INTO THE OPERATION &amp; MAINTENANCE MANUALS, AND DELIVERED TO THE OWNER.</div></div></div><div><div>FIRE PROTECTION SYSTEM INTENT</div><div><div>ALL WORK SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 13.</div><div>PERFORM A NEW FLOW TEST OR OBTAIN A RECENT FLOW TEST AND USE THE RESULTS WHEN PREPARING HYDRAULIC CALCULATIONS.  PREPARE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS AS PRESCRIBED BY NFPA 13. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE SEALED BY AN ENGINEER REGISTERED IN MASSACHUSETTS.  SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE SUBMITTED BY A STATE LICENSED CONTRACTOR AND A PERMIT OBTAINED FROM THE BOSTON FIRE DEPARTMENT PRIOR TO THE COMMENCEMENT OF WORK.  PROVIDE A COMPLETE WET SPRINKLER SYSTEM, IN ACCORDANCE WITH NFPA 13.</div></div></div></div></div>	<div><div>PART 1 - GENERAL</div><div>1.01 REQUIREMENTS  A. THE SPRINKLER CONTRACTOR SHALL BE A LICENSED, AUTHORIZED INSTALLER OF SPRINKLER SYSTEMS AND SHALL HAVE HAD A MINIMUM OF FIVE YEARS EXPERIENCE IN THE INSTALLATION OF SPRINKLER SYSTEMS IN THE CITY CODE.  B. BEFORE SUBMITTING HIS BID, THE SPRINKLER CONTRACTOR SHALL VISIT THE SITE AND SHALL FULLY FAMILIARIZE HIMSELF WITH, AND BECOME FAMILIAR WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. CONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.  C. UPON REVIEW OF THE DRAWINGS AND SPECIFICATIONS, PRIOR TO SUBMITTING HIS PROPOSAL, THE SPRINKLER CONTRACTOR SHALL INFORM ARCHITECT AND/OR ENGINEER OF ANY DISCREPANCIES OR REQUEST CLARIFICATION IN WRITING, IF NECESSARY, CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE SPRINKLER SYSTEM INSTALLATION. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OF MATERIALS SHOULD SUCH PROCEDURE NOT BE FOLLOWED.  D. THE SCHEDULING OF THE SPRINKLER WORK SHALL BE COORDINATED WITH BUILDING MANAGEMENT, WITH OTHER CONTRACTORS AND WITH THE ENGINEER.  E. NECESSARY SHUT-DOWNS OF BASE BUILDING SPRINKLER SYSTEM MUST BE COORDINATED WITH BUILDING MANAGEMENT. SHUT-DOWNS OF BASE BUILDING SYSTEMS SHALL TAKE PLACE AFTER OR BEFORE NORMAL BUSINESS HOURS AND SHALL BE CONSIDERED OVERTIME WORK. THE CONTRACTOR MUST GIVE BUILDING MANAGEMENT AND CITY FIRE DEPARTMENT 48 HOURS NOTICE PRIOR TO SHUT-DOWN OF SPRINKLER, OR OTHER SYSTEMS.</div><div>1.02 WORK INCLUDED  A. WORK SHALL INCLUDE ALL SPRINKLER WORK FURNISHED AND INSTALLED AS INDICATED ON THE PLANS AND AS SPECIFIED HEREIN.  1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE CITY BUILDING CODE, N.F.P.A. STANDARD 13-2013, MASSACHUSETTS FIRE DEPARTMENT AND OWNERS INSURANCE RATING ORGANIZATION.  2. PROVIDE COMPLETE NEW SPRINKLER SYSTEM CONNECTING TO EXISTING SPRINKLER SYSTEM ALARM CHECK VALVE ASSEMBLY.  3. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. ANY DIMENSIONS NOT SHOWN SHALL BE OBTAINED FROM FIELD MEASUREMENTS.  4. PROVIDE COMPUTER GENERATED HYDRAULIC CALCULATIONS IN ACCORDANCE WITH MASSACHUSETTS BUILDING DEPARTMENT AND NFPA STANDARDS.</div><div>1.03 SHOP DRAWINGS AND SUBMITTALS  A. THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, FULLY COORDINATED SHOP DRAWINGS, CAPACITY, DATA, AND CATALOG CUTS OF THE FOLLOWING:  1. PIPE AND FITTINGS 2. VALVES 3. HANGERS AND SUPPORTS 4. SPRINKLER PIPING LAYOUT 5. TESTS 6. SPRINKLER HEADS 7. HYDRAULIC CALCULATIONS  A. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED. CONTRACTOR SHALL SUBMIT CALCULATIONS WITH SHOP DRAWINGS. CALCULATIONS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF NFPA 13-2013, AND MASSACHUSETTS BUILDING CODE.  B. ADD APPROPRIATE HOSE ALLOWANCE.  C. THE SPRINKLER CONTRACTOR SHALL OBTAIN THE LATEST FIRE PUMP TEST AT THE SITE TO VERIFY THE AVAILABLE WATER SUPPLY.</div><div>1.04 BUILDING DEPARTMENT FILING, PERMITS AND CERTIFICATES  A. THE SPRINKLER CONTRACTOR SHALL FILE ALL REQUIRED DRAWINGS AND HYDRAULIC CALCULATIONS WITH THE BUILDING DEPARTMENT AND BE RESPONSIBLE FOR OBTAINING FINAL APPROVAL.  B. ARRANGE FOR INSPECTION AND TESTS OF ANY AND ALL PARTS OF THE WORK AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND PAY ALL CHARGES FOR SAME.</div><div>1.05 INSPECTION AND TESTING  A. THE SPRINKLER SYSTEM SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY BUILDING CODE FIRE DEPARTMENT INSPECTOR.  B. THE SPRINKLER SYSTEM SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE TEST FOR A PERIOD OF TWO HOURS AT A PRESSURE OF AT LEAST 200 PSIG OR 50 PSI IN EXCESS OF THE MAXIMUM PRESSURE TO BE MAINTAINED WHEN THE MAXIMUM PRESSURE IN THE SYSTEM IS IN EXCESS OF 150 PSI AS PER NFPA.  C. THE BUILDING DEPARTMENT SHALL BE NOTIFIED THAT THE SYSTEM IS READY FOR REINSPECTION AND TESTING. THE BUILDING DEPARTMENT INSPECTOR SHALL WITNESS THE TEST. FINAL APPROVAL OF THE SPRINKLER SYSTEM SHALL BE OBTAINED FROM BUILDING DEPARTMENT, AND FIRE DEPARTMENT.</div></div> <div><div>PART 2 - MATERIALS</div><div>2.01 GENERAL  A. THE SPRINKLER SYSTEM SHALL BE COMPLETE WITH ALL PIPE, FITTINGS, VALVES, DRAINAGE SYSTEM AND VALVES, HANGERS AND SUPPORTS. ALSO, MISCELLANEOUS WORK ITEMS, SUCH AS, SIGNS AS REQUIRED, VALVE TAGS, ETC., AND ALL OTHER RELATED EQUIPMENT, APPARATUS AND MATERIAL ITEMS NECESSARY FOR COMPLETE, APPROVED TYPE SYSTEM, READY FOR FUTURE EXTENSION.  B. ALL PIPE, FITTINGS, HANGERS, SUPPORTS, SPRINKLER HEADS, ETC. SHALL CONFORM TO THE CITY BUILDING CODE AND NATIONAL FIRE PROTECTION ASSOCIATION'S REQUIREMENTS AS TO TYPES OF MATERIALS, ARRANGEMENT, SIZES AND INSTALLATION. PIPING PENETRATING FIRE RATED PARTITIONS SHALL HAVE OPENING SEALED WITH U.L. APPROVED FIREPROOF SEALANT.  2.02 SPRINKLER PIPING  A. ALL SPRINKLER PIPING SHALL BE SCHEDULE 40 IN ACCORDANCE WITH NFPA 13. PIPE SHALL BE UL/FM APPROVED.  B. STEEL PIPE SHALL BE BETHLEHEM STEEL CO. ALLIED TUBE, BERGER INDUSTRIES OR APPROVED.  C. AS PER NFPA 13 MODIFIED BY APPENDIX Q, PIPE OR TUBE USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS SPECIFIED IN TABLE 6.3.1.1.  D. AS PER NFPA 13, FITTINGS USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS LISTED IN TABLE 6.4.1. FITTING SHALL BE UL/FM APPROVED, CONTRACTOR.  E. NONMETALLIC PIPES &amp; FITTINGS USED IN MULTIPURPOSE PIPING SYSTEMS NOT EQUIPPED WITH A FIRE DEPARTMENT CONNECTION SHALL BE DESIGNED TO WITHSTAND A WORKING PRESSURE OF NOT LESS THAN 130PSI AT 120°F.  2.03 CUTTING AND PATCHING  DO ALL CUTTING AND CORE DRILLING NECESSARY FOR THE INSTALLATION OF SPRINKLER WORK. ACCURATELY LAYOUT WORK FOR WHICH CUTTING IS REQUIRED, PATCH AND RESTORE ANY DAMAGE WORK TO LIKE NEW CONDITION.  2.04 CUTTING AND PATCHING  1. DO ALL CUTTING AND CORE DRILLING NECESSARY FOR THE INSTALLATION OF SPRINKLER WORK. ACCURATELY LAYOUT WORK FOR WHICH CUTTING IS REQUIRED. PATCH AND RESTORE ANY DAMAGE WORK TO LIKE NEW CONDITION.  2. FOR REPLACEMENT OF THE WORK REMOVED, MATCH EXISTING IN NATURE, CONSTRUCTION AND FINISH.  3. MAINTAIN THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH COVERED BY THE WORK. REMOVE ALL SURPLUS MATERIALS, TOOLS ETC. AND LEAVE PREMISES CLEAN.  2.05 FIRE STOPPING  INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURERS PUBLISHED DIRECTIONS AND PER FIRE TESTED DESIGNS THAT HAVE BEEN ACCEPTED BY THE APPROPRIATE CODE AUTHORITY HAVING JURISDICTION.  2.06 PHASING  PHASING SHALL BE COORDINATED BETWEEN THE SPRINKLER CONTRACTOR AND GENERAL CONTRACTOR. SPRINKLER INSTALLATION SHALL BE PHASED IN A MANNER WHICH WILL ALLOW FULL OCCUPANCY OF THE EXISTING FACILITY WHILE THE INSTALLATION IS IN PROGRESS.  2.06 ALTERNATES/SUBSTITUTIONS  CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY CONTRACTOR PROPOSED SUBSTITUTIONS OF THE MATERIALS OR METHODS OF INSTALLATION FROM THAT SPECIFIED. THESE ALTERATIONS SHALL BE LISTED ON THE PROPOSAL AS CONTRACTOR ALTERNATIVE.  2.07 LEAK DAMAGE  THE SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE DURING THE INSTALLATION AND TESTING PERIODS OF THE SPRINKLER SYSTEM FOR ANY LOSS OR DAMAGE TO THE WORK OF OTHERS, TO THE BUILDING, IT'S CONTENTS ETC. CAUSED BY LEAKS IN THE EQUIPMENT, BY UNPLUGGED OR DISCONNECTED PIPES, FITTINGS ETC. OR BY OVERFLOW, AND SHALL PAY FOR THE NECESSARY REPLACEMENTS OR REPAIRS TO THE WORK OF OTHERS, DAMAGED BY SUCH LEAKAGE.  2.08 INSERTS, HANGERS, ETC.  A. ALL SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED AND SHALL COMPLY WITH THE STANDARDS FOR THE NATIONAL FIRE PROTECTION ASSOCIATION FOR THE INSTALLATION OF SPRINKLER SYSTEMS AND AS REQUIRED BY THE CITY BUILDING CODE.  B. HANGERS AND THEIR COMPONENTS SHALL BE FERROUS. HANGERS SHALL BE ADJUSTABLE FLAT IRON TYPE OF CLEVIS TYPE.  C. SPRINKLER PIPING OR HANGERS SHALL NOT BE USED TO SUPPORT NON-SYSTEM COMPONENTS.  D. SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE WHICH MUST SUPPORT THE ADDED LOAD OF THE WATER-FILLED PIPE PLUS A MINIMUM OF 250 LBS. APPLIED AT THE POINT OF HANGING. CONTRACTOR SHALL SUBMIT DETAIL OF SUPPORT FOR REVIEW AND APPROVAL.  E. SPRINKLER PIPING SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SHEATHING.</div><div>F. WHEN SPRINKLER PIPING IS INSTALLED BELOW DUCTWORK, PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE, NOT FROM THE DUCTWORK.  G. MAXIMUM DISTANCE BETWEEN HANGERS SHALL NOT EXCEED 12 FT. FOR 1 AND 1-1/4" SIZES NOR 15' FOR SIZES 1-1/2" AND LARGER.  H. EXPANSION SHIELDS FOR SUPPORTING PIPES UNDER CONCRETE CONSTRUCTION MAYBE USED IN A HORIZONTAL POSITION IN THE SIDES OF BEAMS. IN CONCRETE HAVING GRAVEL OR CRUSHED STONE AGGREGATE, EXPANSION SHIELDS MAY BE USED IN THE VERTICAL POSITION TO SUPPORT PIPES 4" OR LESS IN DIAMETER.  2.09 ESCUTCHEONS  PROVIDE ESCUTCHEONS ON ALL EXPOSED PIPING PASSING THROUGH WALLS, PARTITIONS, FLOORS AND CEILINGS. ESCUTCHEON SHALL BE HELD IN PLACE BY INTERNAL TENSION OR SET SCREW.  2.10 AS-BUILT DRAWINGS  PREPARE AND SUBMIT "AS BUILT" DRAWINGS AT THE COMPLETION OF THE PROJECT.  2.11 SPRINKLER HEADS  A. SPRINKLERS SHALL BE RATED FOR ORDINARY TEMPERATURES (155 DEG. F) EXCEPT AS REQUIRED NEAR HEATERS OR LOCATIONS WHERE ELEVATED TEMPERATURES MAY NORMALLY BE EXPECTED OR AS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS.  B. SPRINKLER HEADS SHALL BE BY TYCO SPRINKLER CO., INC. MANUFACTURE OR APPROVED EQUAL, UL AND FM APPROVED, AS FOLLOWS:  1. SPRINKLER HEADS IN FINISHED CEILINGS WITH CONCEALED PIPING SHALL BE SAME AS EXISTING OR AUTOMATIC TYCO MODEL TY3531.  2. UPRIGHT SPRINKLER HEADS SHOULD BE AUTOMATIC TYCO MODEL TY3121.  4. PROVIDE SPARE SPRINKLER EMERGENCY CABINETS CONFORMING TO NFPA 13.  5. SPRINKLER EMERGENCY CABINETS SHALL BE OF TYCO SPRINKLER CO., INC. OR APPROVED EQUAL, UL AND FM APPROVED.  6. CABINET SHALL BE CONSTRUCTED OF 22 GAUGE STEEL WITH PRIME COAT AND MANUFACTURER'S BAKED ENAMEL FINISH IN COLOR SELECTED BY THE ARCHITECT.  7. CABINET SHALL CONTAIN A MINIMUM OF 6 SPRINKLER HEADS OF EACH TYPE EMPLOYED.  2.12 PRESSURE GAUGE  A. ASHCROFT SERIES 1079, OR APPROVED OTHER, 4-1/2" DIAMETER, 0-300 P.S.I. RANGE, 5 P.S.I. INTERVALS.</div><div>PART 3 - EXECUTION  3.01 GUARANTEE  A. GUARANTEE FOR A PERIOD OF ONE (1) YEAR FORM THE DATE OF ACCEPTANCE BY THE OWNER. ALL MATERIALS, APPARATUS AND WORKMANSHIP WHETHER FURNISHED BY HIMSELF OR BY HIS SUBCONTRACTORS AND HE SHALL REPLACE OR REPAIR IN A MANNER APPROVED BY THE ARCHITECTS, WITHOUT COST TO THE OWNER, ANY PART OR PARTS OF THE WORK WHICH MAY PROVE DEFECTIVE OR UNSATISFACTORY WITH IN THE PERIOD OF THE GUARANTEE.  3.02 INSTALLATION  A. PIPING  1. INSTALL PIPING AS SHOWN ON THE CONTRACT DRAWINGS AND STRAIGHT AND DIRECT AS POSSIBLE, FORMING RIGHT ANGLES OR PARALLEL LINES WITH BUILDING WALLS, NEATLY SPACED, WITH RISERS PLUMB AND TRUE.  2. SPRINKLER PIPING SHALL BE INSTALLED SO THAT THE SYSTEM CAN BE DRAINED.  3. PIPE SHALL BE REMOVED BY REAMING.  4. BEFORE INSTALLING PIPE, THOROUGHLY CLEAN THE INSIDE FREE OF CUTTING AND FOREIGN MATTER. CUT ALL PIPE SQUARE AND SMOOTH AND MAKE UP ALL JOINTS TO REQUIRED LIMITS.  B. PIPE JOINTS  1. THREADED JOINTS SHALL BE MADE UP OF TIGHT USING PIPE JOINT TEFLON COMPOUND OR TAPE, APPLIED ON THE MALE THREADS ONLY.</div></div>
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**NY ENGINEERS**

NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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-	05/24/24

PROJECT TITLE:

**CAFFÈ NERO**

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**SPRINKLER NOTES**

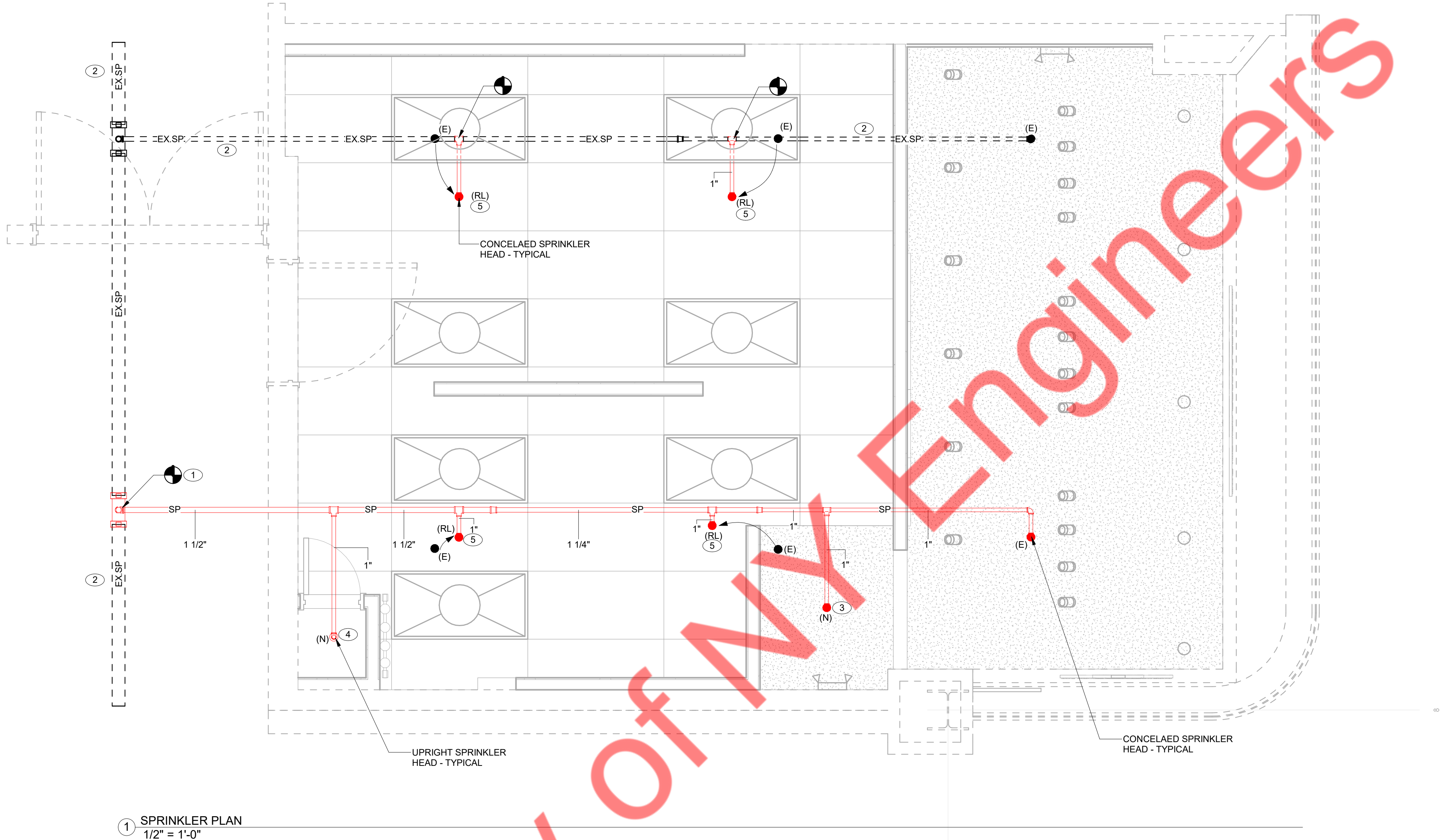
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**SP100**



HAZARD CLASSIFICATION AND DESIGN DENSITY: AREA : KITCHEN AREA AND SERVICE AREA.	
OCCUPANCY: ORDINARY HAZARD MINIMUM DESIGN DENSITY: 0.15 GPM/SQ. FT.	
SPRINKLER HEAD COUNTS	
SPRINKLER HEAD TYPE	QTY.
NEW CONCEALED PENDENT	01
NEW UPRIGHT	01
EXISTING CONCEALED PENDENT	02
RELOCATED CONCEALED PENDENT	04
TOTAL	08



1 SPRINKLER PLAN  
1/2" = 1'-0"

SPRINKLER FLOOR PLAN 1/2" = 1' 0"

A

GENERAL NOTES:

- CONTRACTOR TO FIELD VERIFY TO INSTALL ALL SPRINKLER HEADS TO BE MAX. 12" FROM CEILING.
- ALL NEW SPRINKLER HEADS LOCATION TO BE COORDINATED WITH LIGHTING AND DIFFUSERS TO AVOID CONFLICT.
- ALL SPRINKLER HEADS & PIPING TO BE COORDINATED OTHER TRADES.
- ANY WORK SHOWN ON THE DRAWINGS AND NOT PARTICULARLY DESCRIBED IN THE SPECIFICATIONS OR DETAILS, OR ANY WORK WHICH MAY BE DEEMED NECESSARY TO COMPLETE THE CONTRACT SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS CONTRACT.
- FOR PURPOSES OF CLEARNESS AND LEGIBILITY, SPRINKLER DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND SIZE AND LOCATION OF EQUIPMENT ARE DRAWN TO SCALE WHEREVER POSSIBLE. THE DRAWINGS INDICATE SIZE, CONNECTION POINTS, AND ROUTED OF PIPES. IT IS NOT INTENDED, HOWEVER, THAT ALL OFFSETS, RISES AND DROPS ARE SHOWN. PROVIDE PIPING AS REQUIRED TO FIT STRUCTURE, AVOID OBSTRUCTIONS, AND RETAIN CLEARANCES, HEADROOM OPENINGS AND PASSAGEWAYS.  
ALL PENDANT SPRINKLERS MUST BE SPACED AS FOLLOWS -  
MAXIMUM 7.5' FROM WALL  
MAXIMUM DISTANCE BETWEEN 2 SPRINKLER HEADS IS 15'.  
MINIMUM DISTANCE BETWEEN 2 SPRINKLER HEADS IS 6'.
- COVERAGE AREA PER SPRINKLER SHALL BE MAX. 225 SQ.FT FOR LIGHT HAZARD AND 130 SQ.FT. FOR ORDINARY HAZARD.
- ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.
- AUXILIARY DRAIN SHALL BE PROVIDED AT THE TRAPPED SECTIONS.
- FOR SPRINKLER WORK ONLY.

SPRINKLER KEYED NOTES:

- CONNECT NEW 1-1/2" SPRINKLER BRANCH PIPE TO EXISTING SPRINKLER MAIN PIPING IN THE SPACE. CONTRACTOR TO FIELD VERIFY AND MODIFY THE EXISTING PIPE AS REQUIRED TO MAKE NEW BRANCH PIPE CONNECTION PRIOR TO BID.
- EXISTING SPRINKLER PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY AND COORDINATE EXACT ROUTING, SIZING AND PIPE ELEVATION ON FIELD AND ADJUST/UPGRADE AS PER NEW PROPOSED CEILING.
- PROVIDE NEW CONCEALED PENDENT SPRINKLER AS PER THE NEW CEILING LAYOUT. CONTRACTOR TO FIELD VERIFY AND CO-ORDINATE EXISTING PIPING ROUTING, SIZING AND ELEVATION ON FILED
- PROVIDE NEW UPRIGHT SPRINKLER AS PER THE NEW CEILING LAYOUT. CONTRACTOR TO FIELD VERIFY AND CO-ORDINATE THE PIPE ROUTING, SIZING AND ELEVATION ON FILED.
- EXISTING RELOCATED CONCEALED PENDENT SPRINKLER HEAD. EXTEND PIPING AS REQUIRED. COLOR TO MATCH AS PER EXISTING (TYPICAL).

SPRINKLER GENERAL NOTES NTS

C

KEY NOTES - SPRINKLER PLAN NTS

B

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NY ENGINEERS

NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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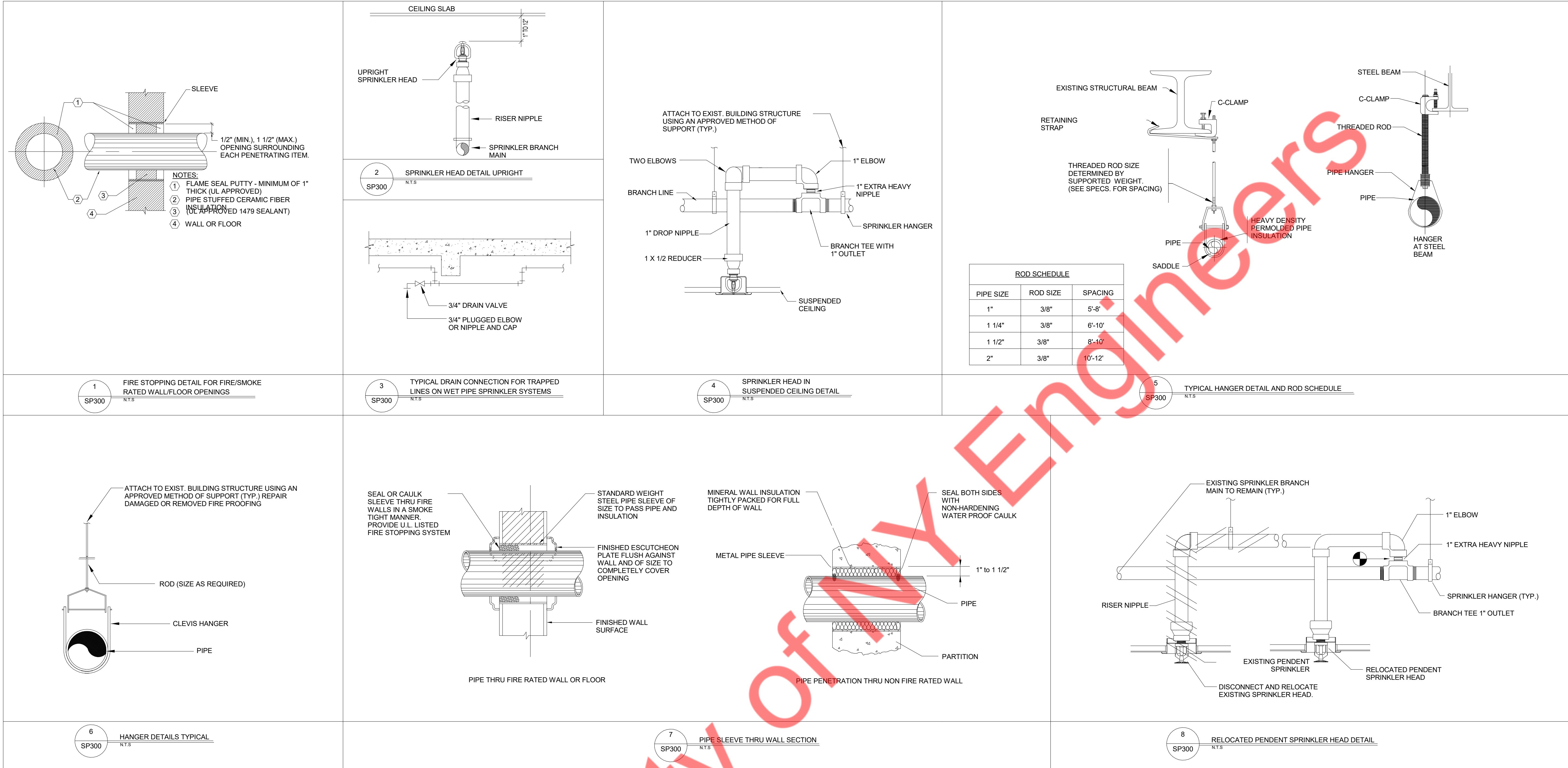
SPRINKLER PLAN

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**NY ENGINEERS**  
NEARBY ENGINEERS  
382 NE 191ST STREET SUITE 49674,  
MIAMI, FL 33179  
PH-914.257.3455  
WWW.NY-ENGINEERS.COM

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**CAFFÈ NERO**

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**SPRINKLER DETAILS**

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