

													GAS-	-ELECT	RIC PA	CKAG	ED RC	OFTO	P UNI	T SCH	EDULI	<b>-</b>														
t Service	Manuf.	. Model	Orientation		Supply /	Air	Dutdoor	Co	oling Desig	n Conditior	15			0	Cooling Perfor	rmance			Def	unidification	Design			Hu	miditrol Perfo	rnance		-	Heating	Performance		Electr	cal Data		Max	I
t Service				Flow	ESP	Blower	Flow	Dutdoor		Mixed	Mixed	System	System	System	Discharge	Discharge	DX Co	oling	Dutdoor	Dutdoor	Mixed	Mixed	Syst	em – First S		Syster			System	System	Mech	Volt/ph/hz	MCA	Max		See Notes
				(CFM)	(in. WC)	Motor (hp)	(CFM)	(°F )	V.B.	D.B (°F )	V.B. (°F )	Total (BTUH)	Sensible (BTUH)	Molst Rem (lb/hr)	D.B (°F )	(°F)	Effic (S)EER	lency IPLV	DB (°F)	V.B. (°F )	D.B (°F)	V.B.   1	Moist Ren (lb/hr)	Discharge D.B. (°F )	Discharge W. B. (*F )	Moist Ren (lb/hr)	Discharge D.B. (°F )	Discharge V. B. ("F")	Input (BTUH)	Output (BTUH)	Thermal Eff%			Fuse	Vt (lbs)	
U−1 REHAB ETC. I	LENNOX	LGH060S47	HORIZONTAL	2100	1.0	2	525	95	74	79.8	65.9	62,847	51,154	11.0	56.5	55.8	15.5	- ,	72	70	74.3	64.9	24.8	67.1	58.3	24.8	67.1	58.3	105,000	84,000	80	460/3/60	16	20	931	1,3,4,6,7,8,9,11,12,13,14,15
U-2 LOUNGE ETC. 1	LENNOX	LGH150S4E	DOWNFLOW	3650	1.0	3	1825	95	74	84.8	69.7	143,588	105,483	35.9	56.9	55.7	10.8	-	72	70	73.5	66.6	43.9	70.6	61.8	70.0	59.1	54.9	240,000	192,000	80	460/3/60	31	40	1531	1,2,3,4,5,7,8,9,10,11,12,13,14,
U-3 FITNESS CTR.	LENNOX	LGH120H4E	DOWNFLOW	4000	1.0	5	600	95	74	78.0	64.8	120,929	94,354	25.1	55.4	54.3	12.0	_	72	70	74.6	64.1	31.2	69.4	59.7	45.9	59.9	54.6	180,000	144,000	80	460/3/60	30	35	1437	1,3,4,5,7,8,9,11,12,13,14,15

HUMIDITROL — FACTORY INSTALLED
STAINLESS STEEL HEAT EXCH. — FACTORY INSTALLED 2 IN MERV8 FILTER - FACTORY INSTALLED ECONOMIZER - FACTORY INSTALLED POWER EXHAUST - FACTORY INSTALLED . POWER EXHAUST ON RETURN DUCT — FIELD INSTALLED SF BELT AUTO TENSIONER - FACTORY INSTALLED

SYSTEM STANDARD FEATURES: 1. HIGH PRESSURE SWITCH (MANUAL RESET) 2. CRANKCASE HEATER

S.P. IN

INCHES

OF W.G.

FAN

1170

780

RPM HP /

MOTOR

OF FAN

BELT

RTU-2

MAU-1 & ©

120/1/60

120/1/60

EWH-A

EWH-B

GREENHECK

GREENHECK

8. DISCONNECT - FACTORY INSTALLED 9. STANDARD CAP - FACTORY INSTALLED 10. FRESH AIR TEMPERING - FACTORY INSTALLED 11. SEISMIC ROOF CURB - FIELD INSTALLED 12. HUMIDITY SENSOR AND WALL MTG KIT - FIELD INSTALLED 13. GFCI - FACTORY INSTALLED/FIELD WIRED

LOCATION

ROOF

500

14. T'STAT TOUCHSCREEN - FIELD INSTALLED

15. CO2 SENSOR - FIELD INSTALLED

									CF	M RANGE	
									0	- 400	
									40	1 - 1000	
SCHED	ULE										
Type of fan	TYPE INTERLOCK OF DRIVE WITH	VOLTS/PH/HZ	MANUFACTURER	MODEL No.	see notes						

GB-091

GB-180

NOTES: I. MOTORIZED DAMPER 2. PREFABRICATED ROOF CURB

EF-1 TOILET EXHAUST

SERVICE

	•		<u> </u>				The state of the s	
	ELEC	TRIC BASE	BOARD	RADIATIO	N SCHE	DULE	NOTE : PROVIDE UNI INTEGRAL STA	T WITH AT. & DISCONNECT
SYMBOL	AREAS	HEIGHT	LENGTH	V-ø-C	B.T.U.H	WATTS	MANUFACTURER/MODEL	REMARKS
 EBB-1	PRO SHOP	6 <sup>3</sup> / <sub>4</sub> "	6'-0"	277-1-60	5100	1500	QMARK/QMKC2576W	MULTIPLE UNITS
EBB-2	LOUNGE	6 <sup>3</sup> / <sub>4</sub> "	8'-0"	277-1-60	6800	2000	QMARK/QMKC25708W	SEE PLAN

		C	GAS FIRED MAKI	E-UP AIR U	NIT SCHE	DULE		
NO.	AREA SERVED	TOT.CFM (100%O.A.)	S.P. HP	V-ø-C	FUEL	BTUh INPUT	MFR/MODEL	see notes
MAU-1	INDOOR SOCCER FIELD	2000	1.0	460-3-60	GAS	150,000	REZNOR RDH-150	

PROVIDE UNIT WITH:

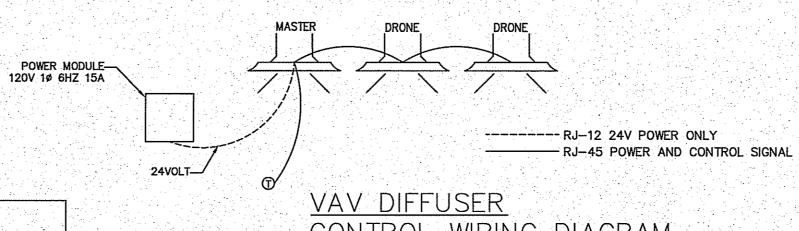
1. 409 STAINLESS STEEL HEAT EXCHANGER MOTOR CONTACTOR, 24V COIL
 DOWNTURN PLENUM 4. 100% O/A RAIN BAFFLED INTAKE HOOD 5. FILTER RACK W/2" PLEATED FILTERS
5. DOUBLE WALL INSULATED CABINET FLUSH MTD NONFUSED LOCKABLE DISCONNECT . DISCHARGE TEMP LOW LIMIT (FREEZESTAT) D. UNIT START RELAY 10. RELAY CONTACTS TO START EXHAUST FAN 11. 16" CURB BASE UNIT + 2 SECTIONS 12. DIGITAL H/C MODUL DISCH TMP W/REMOTE
13. 2 POS. MOTORIZED 100% O.A. DAMPER
14. RUBBER-IN-SHEAR VIBRATION ISOLATION

15. 5 YEAR HEAT EXCHANGER WARRANTY

'						14 (14 H) 11 (14 H)
			SCHEDULE 1	FOR CEILING		
		MOL	INTED RETU	RN AIR GRILLES		
	CFM RANGE	NECK SIZE W X H INCHES	MAXIMUM DUCT VELOCITY FPM	NOMINAL LOUVERED AREA SIZE W X H INCHES	MANUFACTURER	MODEL No.
. ¥	0 - 400	24 X 12	250	23-3/4 X 11-3/4	TITUS	355 RL
	401 - 1000	24 X 24	250	23-3/4 X 23-3/4	TITUS	355 RL

LE FOR VAF	RIABLE VOLU	ME SUPF	PLY AIR DIFF	USERS
NECK SIZE INCHES	MAXIMUM NECK VELOCITY FPM *	OVERALL SIZE INCHES	MANUFACTURER	MODEL No.
10 <b>"</b> ø	600	24"X24"	TITUS	T <sub>3</sub> SQ
12"ø			•	
	NECK SIZE INCHES 10"ø	NECK SIZE MAXIMUM NECK VELOCITY FPM *  10"ø 600	NECK SIZE MAXIMUM NECK OVERALL SIZE INCHES 10"ø 600 24"X24"	INCHES VELOCITY SIZE MANUFACTURER INCHES 10" 600 24" X24" TITUS

VAV DIFFUSERS TO HAVE RELIEF RINGS. \* NECK VELOCITY WITH RELIEF RING. PROVIDE POWER MODULE AND THERMOSTAT.



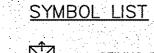
CONTROL WIRING DIAGRAM NOT TO SCALE

SCH	HEDULE FOR	DUCTED RET	URN/EXHAUST AI	IR REG	ISTERS	3	
CFM RANGE	NECK SIZE W X H INCHES	MAXIMUM NECK VELOCITY FPM	OVERALL SIZE W X H INCHES	MANUFA	CTURER	MODEL	No.
0-75	6"X6"	400	7-3/4" X 7-3/4"	ווד	US	355R	L
76-140	8*X8*		9-3/4" X 9-3/4"				:
141-300	12"X12"		13-3/4" X 13-3/4"				
301-500	16"X16"		17-3/4" X 17-3/4"				
501-800	18"X18"		19-3/4" X 19-3/4"		1 255	V	

ALL SUPPLY REGISTERS TO BE TITUS MODEL 300 RL DOUBLE DEFLECTION ADJUSTABLE VERTICAL BLADES IN REAR

	USERS	LY AIR DIFI	D SUPP	NG MOUNTE	FOR CEILI	SCHEDULE
	MODEL No.	MANUFACTURER	OVERALL SIZE INCHES	MAXIMUM NECK VELOCITY FPM	NECK SIZE INCHES	CFM RANGE
	TMS	TITUS	24x24	500	6	0-95
7	TMS	TITUS	24x24	600	8	96-200
	TMS	TITUS	24x24	600	10	201-325
1	TMS	TITUS	24x24	600	12	326-450
7						

ALL DIFFUSERS TO HAVE EQUALIZING GRID; NO DAMPER 2 WAY AND 3 WAY DIFFUSERS TO HAVE 12" NECK REGARDLESS OF CFM.



CEILING DIFFUSER CEILING REGISTER

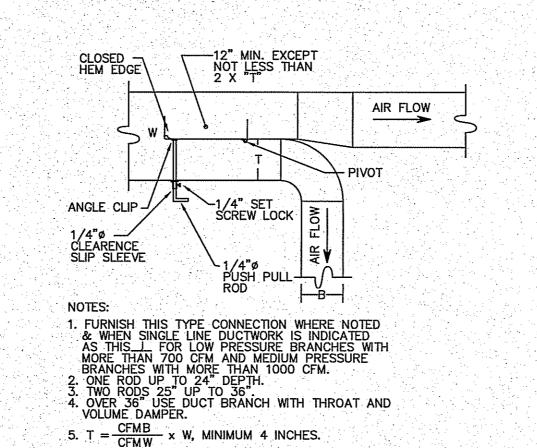
CEILING EXHAUST FAN

VOLUME CONTROL DAMPER THERMOSTAT

TEMPERATURE SENSOR HUMIDISTAT

CARBONMONOXIDE SENSOR ACOUSTICALLY LINED DUCTWORK

FLEXIBLE DUCTWORK



ELECTRIC WALL HEATER SCHEDULE

RECESSED

SURFACE

TOTAL RATED VOLT/PH

6826

1. PROVIDE SURFACE MOUNTING FRAME WHERE REQUIRED

277/1

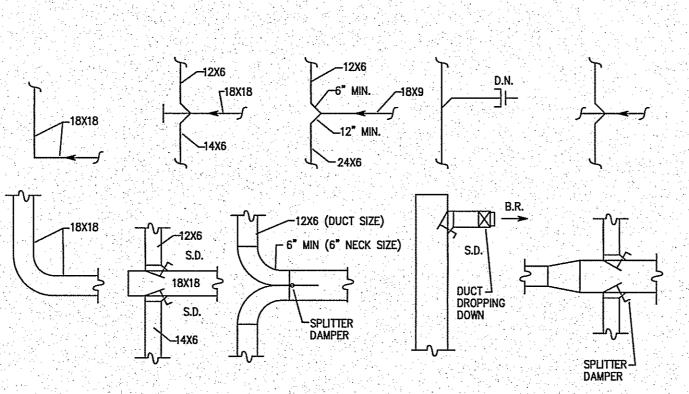
277/1

MOUNTING CONTROLS MANUFACTURER UNIT MODEL REFER TO 8 SIZE NOTES

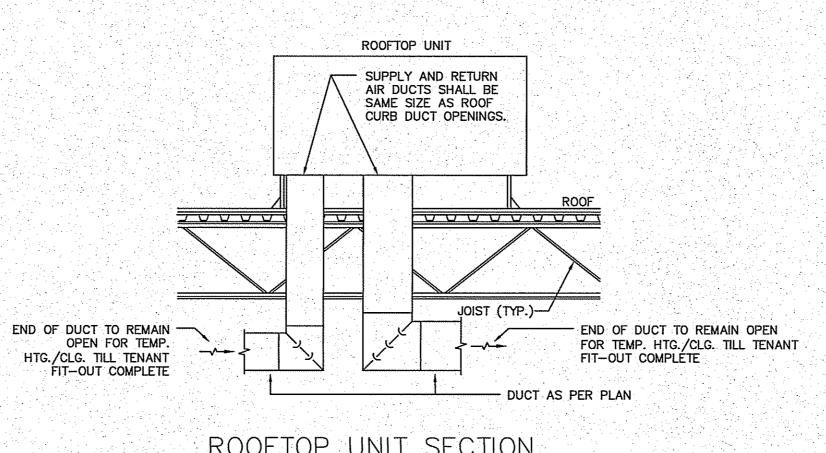
QMARK

AWH 4407

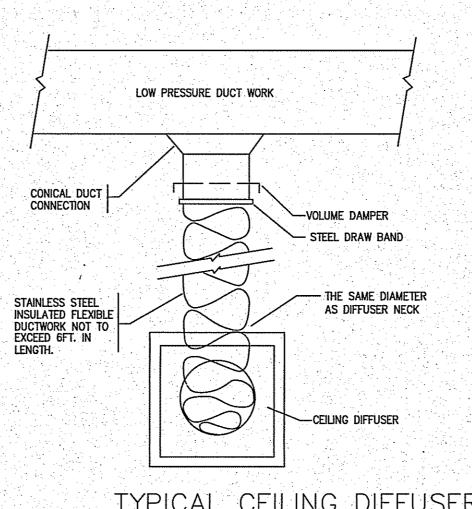
RECTANGULAR DUCT BRANCH WITH THROAT & SPLITTER DAMPER NOT TO SCALE:



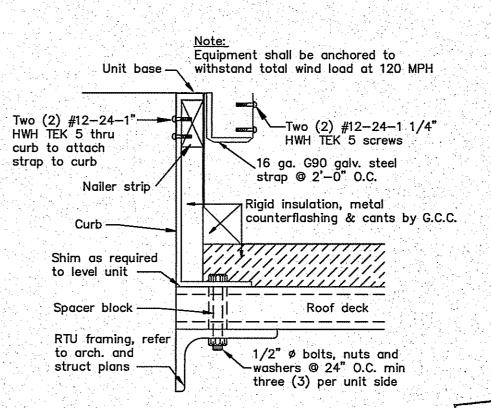
TYPICAL SINGLE LINE DUCT DETAILS



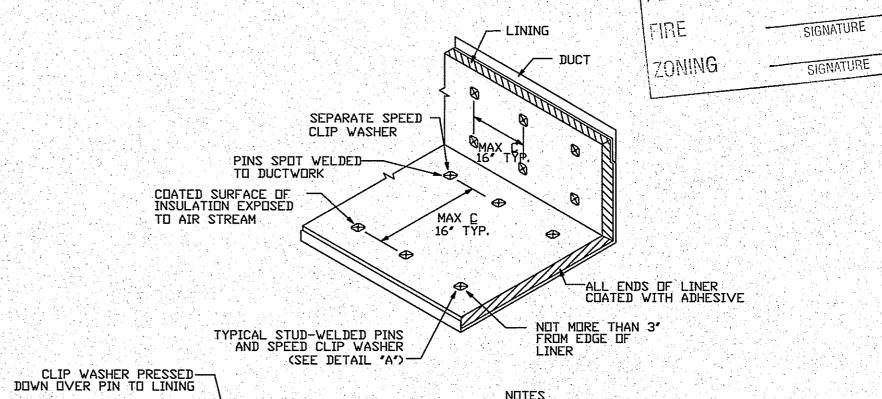
ROOFTOP UNIT SECTION N.T.S.



TYPICAL CEILING DIFFUSER TAKE-OFF DETAIL NOT TO SCALE



PLANTRELEASE EQUIPMENT/CURB ANCHORING\_ N.T.S. PROVIDE BLOCKING AND/OR OTHER LEVELING METHOD FOR PITHED ROOF. SIGNATURE SIGNATURE



NOTES

1. FOR NOSING JOINT DETAILS AT DAMPER
AND TURNING VANES, SEE SOUND LINING
HOUSING DETAILS SPECIFIED) PRESSED TO 2. NOT LESS THAN TWO PINS ON EACH DOWN OVER GRIP PIN FACE OF DUCT. DUCT VELD-PIN STUD WELDED

TO DUCT (PINS FASTENED

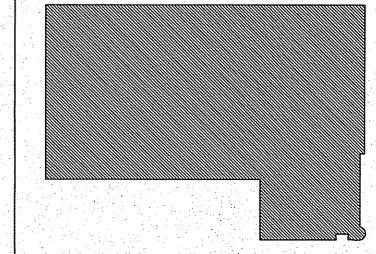
TO DUCT WITH ADHESIVE

ADHESIVE OVER COMPLETE SURFACE OF DUCT. ACOUSTIC LINING DETAIL NOT TO SCALE:

PLAN RELEASE checked by: LECTRICAL . PLUMBING SIGNATURE

SIGNATURE

SIGNATURE



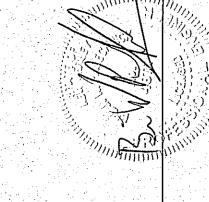
**KEY PLAN - IST FL.** 

W INNOVATIVE ENGINEERING, INC. 21 Cross Avenue, - Midland Park, New Jersey 07432 Phone: (201) 670-7882 Fax: (201) 444-4982

Edward J. Galto, PE NJ #26166 NY #57012 Va #016807 De #11776 Md #14827 CT #14789 PA #PE07588 OH #E051620 Minn #0187499 Mass #33515-HV, #33899-E #33634-M NC #16973 SC #20205 NH #8242

Milton A. Azous, PE NJ #21057 NY #48388 PA #PE021148E CT #10684 FL #44942

Brian W. Pasechnick, PE NJ #48111



1 03.12.10 ISSUED FOR BIDDING NO. ISSUE DATE ISSUE DESCRIPTION

**Poskanzer Skott Architects** 

550 North Maple Ave Ridgewood, NJ 07450 201-445-2322 201-445-3053 E-mail poskott@psaia.com



12 WRIGHT WAY OAKLAND, NEW JERSEY 07436 TEL 201-447-9999 FAX 201-447-9998

drawing title: HVAC DETAILS & SCHEDULES

drawing number: AS NOTED

03.12.10 file # 05915 011938 B 7813 4823

12822

#### 1.1 GENERAL CONDITIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections apply to work specified in these Sections; consult them in detail for applicable instructions.

B. Manufacturers referenced in the technical specifications are for the purpose of establishing a standard of quality. Alternate manufacturers providing the same quality equipment will be given consideration by the Engineer and Architect if they are notified in writing at the time of bid.

#### 1.2 CODES AND STANDARDS

A. All workmanship and material shall conform to the rules and regulations of the current editions of the regulating agencies listed below and regulations of the local utility companies. These rules, regulations and codes shall govern as a minimum standard. In the event of conflict with the Contract drawings or specifications requiring workmanship or material of a higher quality than required by the above mentioned rules, regulations and codes, the most stringent shall

UCC - New Jersey Uniform Construction Code. ADA - Americans with Disabilities Act 2006 International Fuel Gos Code 2006 International Mechanical Code National Standard Plumbing Code NFPA - National Fire Protection Association

AMCA - Air Movement and Control Association, Inc. SMACNA — Sheet Metal and Air Conditioning Contractors National Association,

ASHRAE - American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. IPCEA - Insulated Power Cables Engineers Association NEC — National Electrical Code of the NFPA NEMA — National Electric Manufacturers Association National Board of Fire Underwriters AABC - Associated Air Balance Council ARI — Air Conditioning and Refrigeration Institute UL - Underwriter's Labs. Local Utility Requirements PDI Plumbing and Drainage Institute ASSE American Society of Sanitary Engineering

ASTM American Society for Testing Materials

The Owner's Insurance Underwriter

During this work, this Contractor shall be responsible for maintaining safety among persons in his employ in accordance with the standards set by the OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. The Engineer shall be held harmless for any accident, injury, or any other incident resulting from non conformance with these or any other standards.

### 1.3 QUALITY ASSURANCE

A. The Contractor shall use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of these Sections.

B. Without additional cost to the Owner, the Contractor shall provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents

C. Engineering Drawings are symbolic and diagrammatic in nature and are intended to show only the general scheme, equipment involved, and the approximate locations and dimensions of the equipment. For exact locations and dimensions, the Contractor shall review all Drawings provided; including, Architectural and Structural Drawings, Reflected Ceiling Plans, Plumbing, Fire Protection, Electrical and HVAC Drawings to confirm all requirements. It is the Contractor's responsibility to confirm that all equipment will fit. Any discrepancies or inconsistencies are to be reported immediately to the Architect and the Engineer for clarification. No extras or allowances will be made for such items after bid submission.

D. Prior to bid, an examination of the site shall be made by the Contractor, who shall compare it with the Drawings and Specifications and who shall satisfy himself as to the conditions under which the Work is to be performed. No allowance shall subsequently be made for any extra expense incurred due to failure or neglect to make such examination.

E. During the execution of work under this Contract, the Contractor shall be responsible for protecting any equipment or structures in the work areas.

F. All Work shall be guaranteed to be free from leaks or defects. Any defective materials or workmanship as well as damage to the work of all trades resulting from the same shall be replaced or repaired as directed for the duration of stipulated guarantee periods.

### 1.4 SUBMITTALS

A. Comply with pertinent provisions of General Documents.

B. PRODUCT DATA: Within the designated time period after the Contractor has received the Owner's Notice to Proceed, submit: 1. Materials list of items proposed to be provided under this Section with sources of supply and manufacture.

2. Manufacturer's specifications, catalog cuts, and other data needed to prove compliance with the specified requirements. 3. Product substitutions are to be requested in writing, and only in conformance with General Conditions procedures. At the time of submission of cuts for review for all substitutions, clearly indicate Specification Section, provide complete information on the original product and the proposed product for review, and all deviations.

a. Any substitutions requested by a contractor are to include all costs for related changes by other contractors. It is the responsibility of the contractor requesting the change to coordinate with any other trade impacted by the substitution.

## C. SAMPLES

1. When so requested by the Engineer, promptly provide samples of items scheduled to be exposed in the final structure. 2. When specifically so requested by the Contractor and authorized by the Engineer, authorized samples will be returned to the Contractor for installation on

# the Work.

D. SHOP DRAWINGS 1. Prepare and submit Shop Drawings, showing at a scale not smaller than 3/8" = 1'0" all details of items to be shop fabricated, field coordinated or which interface with existing conditions, under this Contract.

2. Clearly identify by circle and by note "DEVIATION" and by note "INTERFERENCE", in large, bold lettering, any deviations from Drawings and Specifications and any potential or unresolved interference condition and assume full responsibility for failure to do so. 3. Submittal shall confirm fabrication and installation is in accordance with

recommendations and applicable codes E. Corrections or comments made on shop drawings and submittals during review do not relieve the Contractor from compliance with requirements of the drawings and specifications. This check will only be for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor shall be responsible for; confirming and correlating all quantities and dimensions, selecting fabrication process and techniques of construction, coordinating his work with that of all other trades, and performing his work in a safe and satisfactory

F. STERILIZATION CERTIFICATE: Upon completion of water line sterilization. deliver two copies of an acceptable "Certificate of Performance" to the Engineer.

G. MANUALS: Upon completion of the work of this Section, the Contractor shall deliver to the Architect four copies of an operation and maintenance manual compiled in accordance with the provisions of General Conditions, and these Specifications.

1. Include within each manual a copy of the Project Record Documents showing all work of the Section.

2. Include detailed operating and maintenance instructions.

H. AS-BUILT DRAWINGS: concurrent with the progress of the work, the Contractor shall maintain a set of as built record sepia drawings noting in red all changes in the work. Upon completion of the work this sepia set is to be turned over to the Owner for his records.

I. All required permits, fees and inspections shall be arranged and paid for by the Contractor. The Contractor shall present to the Owner, properly signed, all required certificates of final inspection and approval before the work will be accepted as complete.

J. COORDINATION: Each Contractor shall be responsible for coordinating their work with that of all other trades. No installation shall take place without approval of onsite entity (General Contractor, Construction Manager, etc.) responsible for coordination. Any work installed without approval and which interferes with the work of other trades that have been approved shall be removed and replaced at the Contractor's expense.

#### 1.5 INSTRUCTION

A. After all work is completed, the Contractor shall instruct employees designated by the Owner in the proper operation and maintenance of the equipment and systems installed under this Contract.

#### 1.6 GUARANTEE

A. The Contractor shall guarantee his work for a period of one year after date of completion as witnessed by receipt of final payment. The Contractor shall promptly repair and make good any damage to the work of any other Contractor, during that period, that may be caused by defective materials or workmanship. Any defects in materials and workmanship shall be corrected by the Contractor without further expense to the Owner. He shall deliver to the Architect or Owner said written guarantee upon receipt of final payment.

### 1.7 DEBRIS REMOVAL

A. Routinely remove, in an orderly and efficient manner (and cart away and dispose of, by legal means, off the site and premises), all debris related to work of this Section: work site and staging greas shall be kept clear of all debris on a daily basis; permit no debris accumulation which poses any threat to life, safety or property. Non-conformance with the foregoing Contract requirements will be subject to all remedies established by the Owner and Architect.

#### SECTIONS 15600 HVAC SPECIFICATIONS

#### 1. GENERAL

A. It is not intended that the plans or specifications show or state every detailed requirement of the work, but rather that they furnish adequate information for the Contractor to make a completely approved installation. The Architectural General Conditions and Special Requirements for Mechanical work (Section 15000) form a part of these specifications whether attached hereto or not and shall be carefully examined before submitting proposal. Where General Conditions clauses are repeated in this section, it shall be understood as calling special attention to them, or as a further qualification and shall not be assumed as omitting any other clauses. No General Conditions referring to work included herein shall be considered as waived unless specifically stated herein.

B. Before submitting proposal, examine all plans relating to this work, verify all governing conditions at the site, become fully informed as to the extent and character of the work required and its relation to existing conditions and work of others. No consideration or additional payments will be granted for any alleged misunderstanding of the materials to be furnished or work to be done, it being understood that the submission of a proposal is an agreement to all conditions referred to herein or indicated on the plans. All work shall be carefully coordinated and scheduled to prevent undue inconveniences. All work which will not be permitted during normal working hours due to scheduling, etc., shall be scheduled to be performed on overtime at no

C. Proposal must include everything required to provide a complete installation as contemplated in the specifications and plans, whether specifically shown and specified or not. Included are all labor, equipment, materials, light, tools, scaffolding, transportation, Insurance, sales tax, permits, certificates, inspections, testing equipment, etc., necessary for the complete installation of every-thing described, shown or reasonably implied.

D. Review all plans and specifications relative to this work, and become familiar with work called for therein. At the conclusion of the work be responsible for the proper mechanical installation furnished and/or installed under this contract. It is the intention of these specifications and plans to furnish enough information for the Contractor to provide and place in service a complete HVAC system and

E. Bidders, before submitting proposals, shall visit and carefully examine those portions of the site and/or present buildings affected by this work so as to familiarize themselves with existing conditions and difficulties that will attend the execution of the work. These difficulties include availability of the equipment and materials.

. Submission of a proposal will be construed as evidence that such examination has been made and later claims for labor, equipment or materials required because of difficulties encountered, which could have been foreseen had such examination been made, will not be

#### recognized. 2. SCOPE OF WORK

A. The work shall include but not be limited to the following -

1. Furnish and Install constant volume Rooftop units with gas heat

and DX cooling. 2. Furnish and install Gas Fired Makeup Air unit to provide ventilation air to the indoor Soccer Field.

3. Furnish and install all ductwork, duct insulation, acoustic lining, and

air outlets as shown on the drawings or as specified. 4. Furnish & install Soccer Field exhaust fan and toilet exhaust fan

5. Furnish and install volume dampers as shown on the drawings and/or as

required to balance system.

6. Provide fire dampers where indicated or required by code whether or not shown on drawings (in 2 hour rated walls)

7. Furnish and install all necessary hangers and supports. 8. Furnish & install all new roof curbs on roof

9. Furnish & install electric baseboard heaters.

10. Furnish and install a complete electronic automatic temperature control system including all wiring as specified.

11. Engage the services of an approved air balancing company to balance the systems and issue a water and air balancing report.

12. Alterations, removals and disposals.

13. Cutting and rough patching.

14. Obtaining and paying for all necessary permits, inspections and certificates required in connection with this work.

15. Guarantee all work for a period of one year from the final date of acceptance.

16. Controlled inspection if required by Local or State authorities.

17. Provide reg'd. vibration isolation and seismic restraints for all mech. equipment & systems specified and as required by the International Building Code.

18. As built drawings

# 3. WORK NOT INCLUDED

A. The following items of work shall be provided under other contracts:

1. Finished patching and painting.

### 4. SHOP DRAWINGS

A. Submit shop drawings covering the following items:

## 1. Air outlets.

2. Hangers and supports. 3. Sheetmetal ductwork, dampers, fire dampers.

4. Air balancing report.

5. All HVAC equipment specified on the schedules.

6. Roof Curbs 7. Insulation

8. Vibration Isolation and Seismic Restraints. 9. Automatic Temperature controls.

### 5. INSTALLATION

A. All work and materials shall be provided as shown and herein specified and shall be in accordance with the latest applicable edition of the New Jersey 2006 International Building Code, 2006 International Mechanical Code and all authorities having iurisdiction.

B. This Contractor shall provide proof of adequate insurance to hold Owner, Architect, and Engineer harmless for any liability claims arising from performance of his work.

C. This Contractor shall take all necessary precautions to prevent unnecessary damage to building structure and protect building contents and occupants.

D. For exact location of partitions, soffits, etc., refer to the architectural drawings.

E. The work under this contract shall be performed simultaneously with work of other trades, so as not to delay the overall progress of work. The work of all trades shall be phased in accordance with phasina notes

F. The systems shall be left in perfect working order upon completion of work.

G. All ductwork gauges, and installation shall conform to the latest edition of SMACNA standards.

H. This Contractor shall not interrupt any of the services of the existing building nor interfere with the services in any way without the expressed permission of the Owner. Such interruptions and interferences shall be made as brief as possible and only at the time stated by the Landlord.

I. Unnecessary noise shall be avoided at all times and necessary noise shall be reduced to a minimum.

J. This Contractor shall arrange the work continuously including over time, if required, to assure that service will be shut—down only during the time actually required to make the necessary connections to existing work.

K. This Contractor shall give ample written notice in advance to the Owner of any requested shutdowns.

L. The breaking into existing work shall be done only after approval has been received from the Owner.

6. TESTS AND BALANCING A. The work of this Contractor shall include the furnishing of all testing instruments, gauges, and other equipment required for necessary tests, required by law, rules and regulations and as specified.

B. Hotwater piping shall be tested hydrostatically at 100 psi for 4 hours. No visible leaks shall occur during test period

C. Provide all other test required by Building Department, Fire Department and all other public agencies having jurisdiction.

D. Tests shall be performed in the presence and to the satisfaction of the Architect and such other parties that may have legal jurisdiction. E. Operate the installation after completion for period necessary to make

all required adjustments for automatic controls, air outlets and fans,

until all performance characteristics are met.

F. Engage the services of approved air balancing company to balance all existing report should be certified by a New Jersey State registered professional engineer and the test should be performed by a person having a minimum

of 5 years experience in testing and balancing air systems. G. Upon completion of the installation, the air balance and testing subcontractor shall make the necessary adjustments to balance the system. Provide any extra manual volume damper required for proper air

H. At the completion of the test, the Contractor shall furnish the Architect seven copies of the final test report, these copies shall be complete with single line diagrams and all required traverse airflow readings at main ducts and branches.

### 7. INTERNAL ACOUSTIC LINING

Furnish and install sound absorptive lining in ductwork for locations and lengths as indicated and/or hereinafter specified. All soundproof material, installation and arrangement, shall be as authorized. Where ducts are acoustically lined, insulation shall be omitted for extend of acoustic lining. Dimensions noted for lined ducts are inside clear dimensions. Duct sizes shall be increased for liner.

Sound Absorbent Duct Lining for low pressure ductwork — Furnish and install as herein specified and/or shown on the drawings (except where otherwise noted) 2" or 1" thick as indicated herein or on the drawings 1-1/2 lb. density, fibrous glass duct lining meeting the requirements of NFPA 90A.

Liner shall be adhered to all interior sides of duct with minimum 100% coverage of fire-retardant adhesive similar to Benjamin Foster 4 and with weld pins and washers or equivalent mechanical fastening starting 3" from edges and sides, 12" on center all sides. Minimum one row per side for duct size of 12" or less. Mechanical fasteners shall be toward air stream. Before installing liner, seal all butting edges and final edges with heavy coat of adhesive to seal off air between lining and duct. All exposed edges of lining shall be installed with sheet metal nosing 1-1/2" wide, two gauges heavier than duct. Installation shall be suitable for duct velocities up to 3,500 fpm. Low pressure duct lining shall be provided where specified and/or where shown and noted on the drawings.

D. Duct sizes indicated on drawings are clear inside dimensions. Increase sheet metal sizes as required to accomodate thickness of acoustic lining.

The following ductwork shall be acoustically lined whether or not shown on drawings. 1. All supply and return ductwork from all rooftop units not less than 20 ft. from supply fan discharge and 20 ft. from return fan inlets shall have 1" thick lining.

## 8. SHEET METAL WORK

A. All rectangular ductwork, unless otherwise noted, shall be built from galvanized sheet steel and thoroughly braced and stiffened. All ductwork shall be constructed as low pressure ductwork (2" w.g.).

B. The construction for sheet metal ducts shall be made in accordance with recommendations of ASHRAE Guide, Latest Edition, or as per SMACNA Manual. All branches and take-offs shall have volume dampers.

C. The first 15 ft. of supply and return ductwork from rooftop HVAC units shall be 18GA.

D. Contractor shall seal all the ductwork at joints with 3M EC-800.

E. Provide volume dampers at all branch take offs.

### 9. DUCTWORK INSULATION

SERVICE

Supply air

A. Insulation for Concealed Duct

1. The following ductwork shall be insulated (except where acoustically lined) THICKNESS 1-1/2" with vapor barrier

2. Except where otherwise noted, all concealed rectangular and round ductwork shall be covered with flexible duct insulation with vapor barrier and of the thickness indicated below.

glass fiber with a maximum K factor of 0.29 at 75 Deg. F. mean temperature, with reinforced foil-faced, flame resistant kraft vapor barrier. 4. Insulation with vapor barrier shall be duct wrap insulation FRK-25, type 100 as made by Owens—Corning or Manville Microlite with FRK vapor barrier facing or standard duct insulation as made by CGG with FRK

Flexible duct insulation with vapor barrier shall be 1 lb. per cu. ft. density

5. Adhere insulation to duct with Foster fire resistant vapor barrier adhesive or approved equal and joints without tabs shall be firmly sealed with aluminum foil tape adhered with same adhesive. Secure insulation with 18 gauge corrosion resistant wire spaced not more than 18 inches on

weather proofed with .016 smooth aluminum facing by

6. Additionally, secure insulation to bottom of rectangular ducts over 24" wide with welded pins or stick clips on 18" centers. 7. All ductwork exposed on roof shall be insulated and

Childers with baked enamel finish.

10. CONTROLLED INSPECTION

A. HVAC Contractor shall engage and pay for the services of a Virginia State registered professional engineer to perform controlled inspection of the mechanical installation and ventilation system, if required by the Borough of Oakland, N.J. File and pay for all required forms.

A. All installation shall be in a manner that the N.C. level in the space shall not exceed 35 dBA. Noise levels above this limit will not be acceptable and should be corrected by this Contractor at no expense to the owner.

### 12. RECORD DRAWINGS

A. Maintain a careful and complete record of all items installed and upon completion of work, deliver to the owner a complete set of (producible) "as—built" drawings.

#### 13. GUARANTEE

A. The Contractor guarantees by his acceptance of the contract that all work installed will be free from any and all defects for a period of one year from date of completion and acceptance of work.

14. AUTOMATIC TEMPERATURE CONTROLS (All wiring by HVAC contractor)

A. SEQUENCE OF OPERATIONS BASED ON LENNOX "L-Series" UNITS

RTU-1 THRU 3 are gas fired rooftop units.

1. Units are to operate off programmable thermostats. Units shall be automatically started/stopped by means of a Lennox Touchscreen Commercial Thermostat.

2. The thermostats shall be operated in the Auto Changeover

3. Humiditrol Units shall maintain a space humidity level of 50%. The remote humidity sensor shall be located in the space. The L-Series Unit's Integrated Modular Controller (IMC) shall control the units dehumidification function.

4. During "Occupied" period the fan shall operate constantly and the Outdoor Air Damper shall go to minimum position. In the "Unoccupied" periods the fan shall cycle with cooling and heating demands. Outdoor Air Damper on recirculating units shall remain closed. During occupied periods the Outdoor Air damper on RTU's to be set to 700 cfm each. The CO2 sensors located in the space shall override minimum position. Minimum position override shall start at 500 ppm CO2 and shall have the Outdoor Air Damper at the scheduled ventilation rate when the CO2 levels reach 1000 ppm

5. When the unit is in "Cool" mode the compressors will cycle to meet occupied cooling set point of 74°F and an unoccupied cooling set point of 78°F

6. When the unit is in "Heat" mode the integral Gas Furnaces will cycle to meet occupied heating set point of 70°F and an unoccupied heating set point of 60°F

7. When the thermostat is not calling for heating or cooling (Ventilation Mode) the gas heat in the RTU shall temper outside air and meet discharge air heating set point of 62-70°F, The unit will maintain a fresh air cooling setpoint of 73-80°F via the internal unit controller using a field installed discharge air probe.

8. Units must be programmed for morning warm up a minimum of 1 hour prior to occupy mode. 9. The factory installed comparative enthalpy sensors shall

provide inputs for economizer control on units with conomizer

cycle based upon comparison of the enthalpies of the return

10. The Enthalpy Control will enable economizer mode for free 11. MAU-1 (100% O.A.) shall be interlocked with EF-2 and manually started and stopped via "occupied/unoccupied" switch. Unit shall be provided with it's own controls, this unit shall be single zone unit and duct t'stat shall modulate the units gas

heating to achieve set point. Upon unit shut down the outside

B. EXHAUST FAN EF-1 (Toilet Exhaust)

1. Fan shall be on same schedule as RTU-2.

air damper shall close completely.

are to be extended in conduit.

low voltage control wiring in conduit.

and outdoor air streams.

ELECTRICAL WIRING AND MATERIALS Install, connect and wire the items included under this Section This work includes providing required conduit, wire, fittings, and related wiring accessories. All wiring shall be installed in conduit in accordance with the Division 16 specifications. B.B. Provide wiring between thermostats, aquastats and unit heater motors, all control and alarm wiring for all control and

alarm devices for all Sections of Specifications. Provide 120 volt, single phase, 60 hertz power to every BMS panel, VAV box controller, BMS console, CRT, CPtantsmission power supplies, audio/visual annunciator modules, modems, printers and to other devices as required. The power supplies

D.D. Provide status function conduit and wiring for equipment covered under this Section. E.E. Provide conduit and wiring between the BMS panels and the temperature, humidity, or pressure sensing elements, including

All wiring to be compliant to local building code, the NEC and Division 16 specifications. 4. Provide electrical wall box and conduit sleeve for all wall

mounted devices. 5. All exposed wiring not installed above accessible hung ceilings shall be installed in conduit.

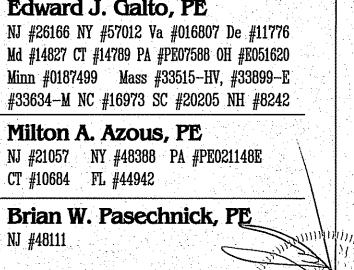
**KEY PLAN - IST FL** 

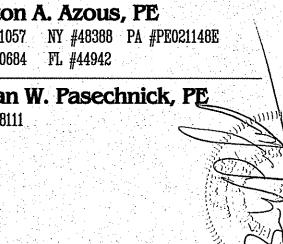


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550 North Maple Ave Ridgewood, NJ 07450 201-445-2322 201-445-3053 E-mail poskott@psaia.com



OAKLAND, NEW JERSEY 07436

FAX 201-447-9998 drawing title: HVAC SPECIFICATIONS

12 WRIGHT WAY

TEL 201-447-9999

drawing number: AS NOTED

lob number: drawn by: checked by:

NJ 05915 NY 011938 PA B 7813

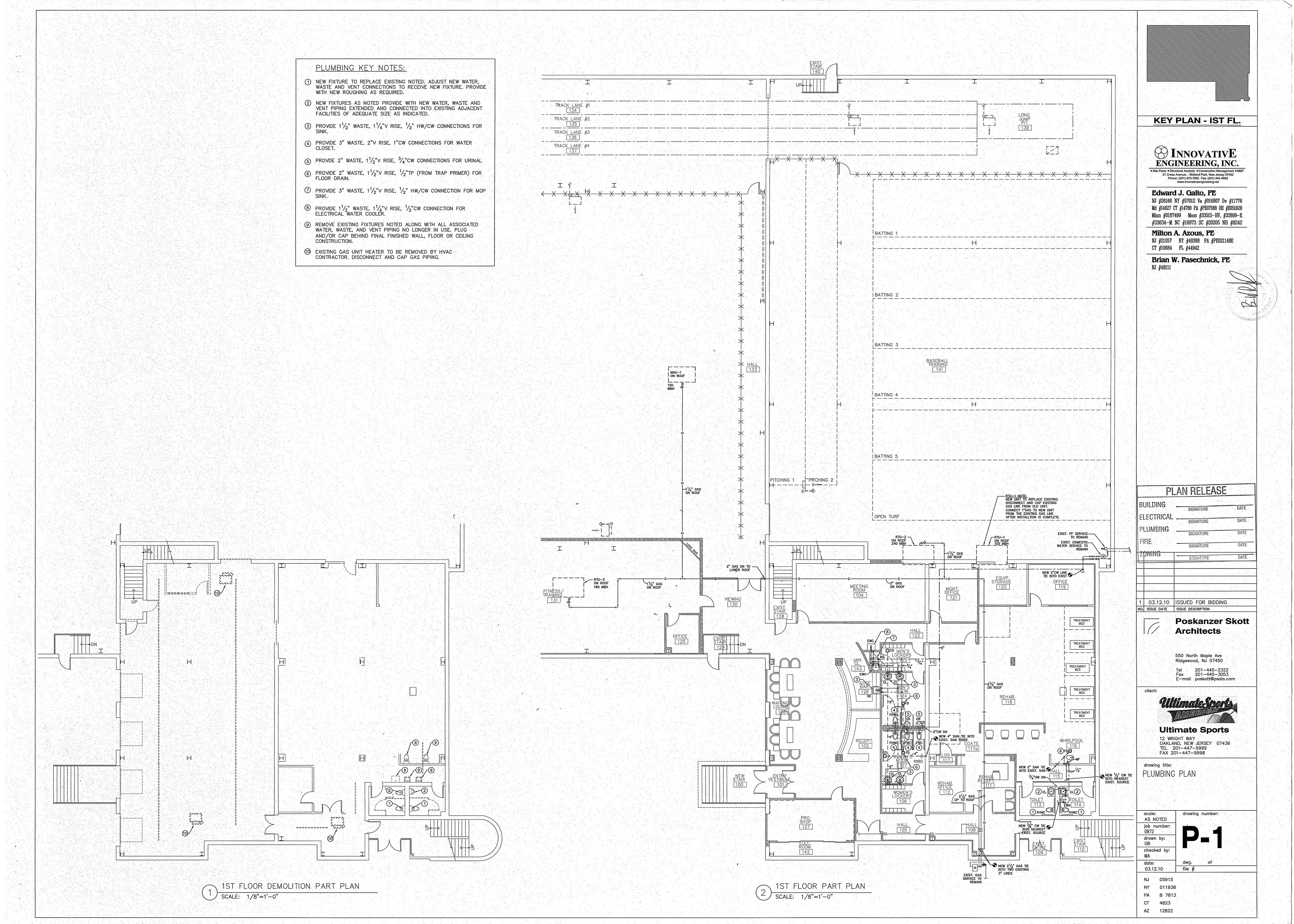
CT 4823

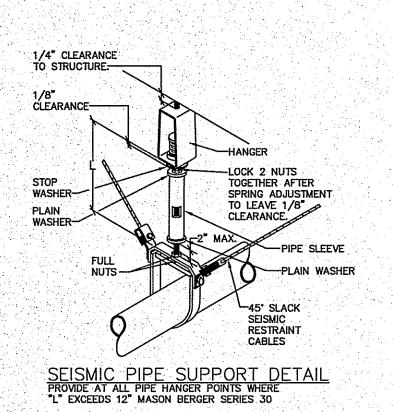
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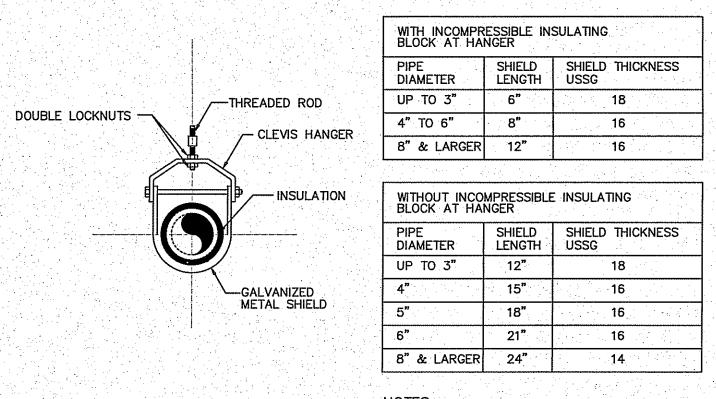
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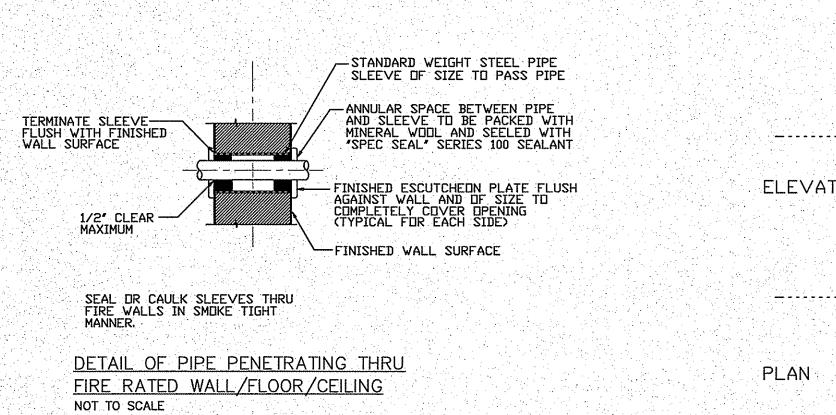
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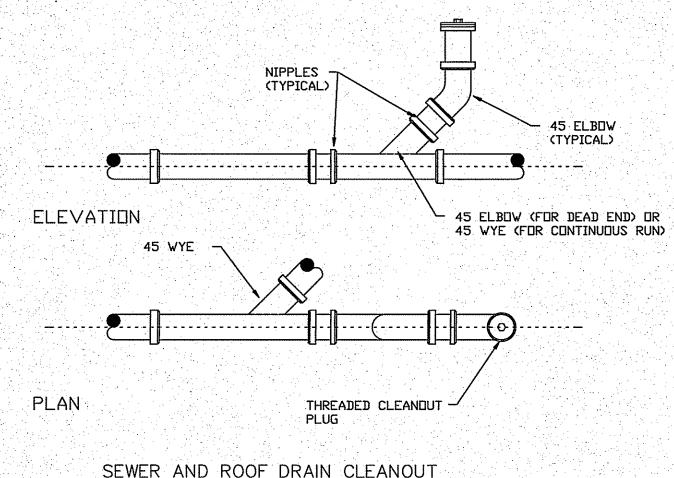


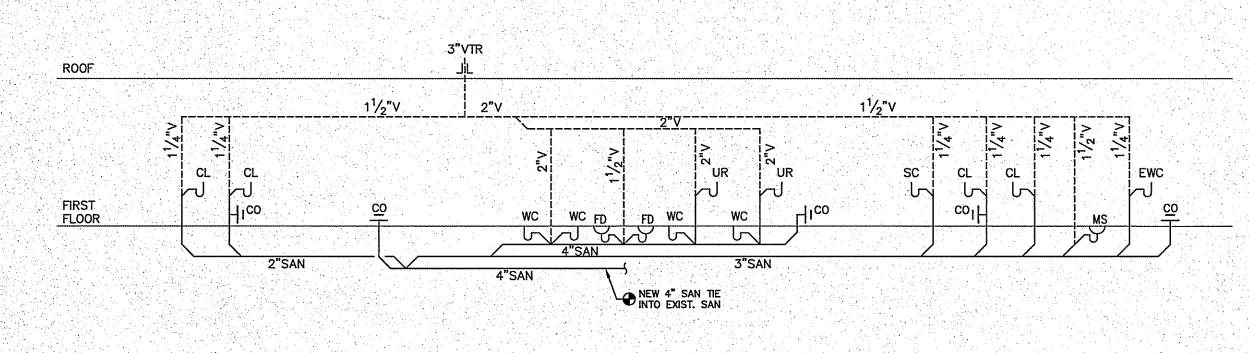


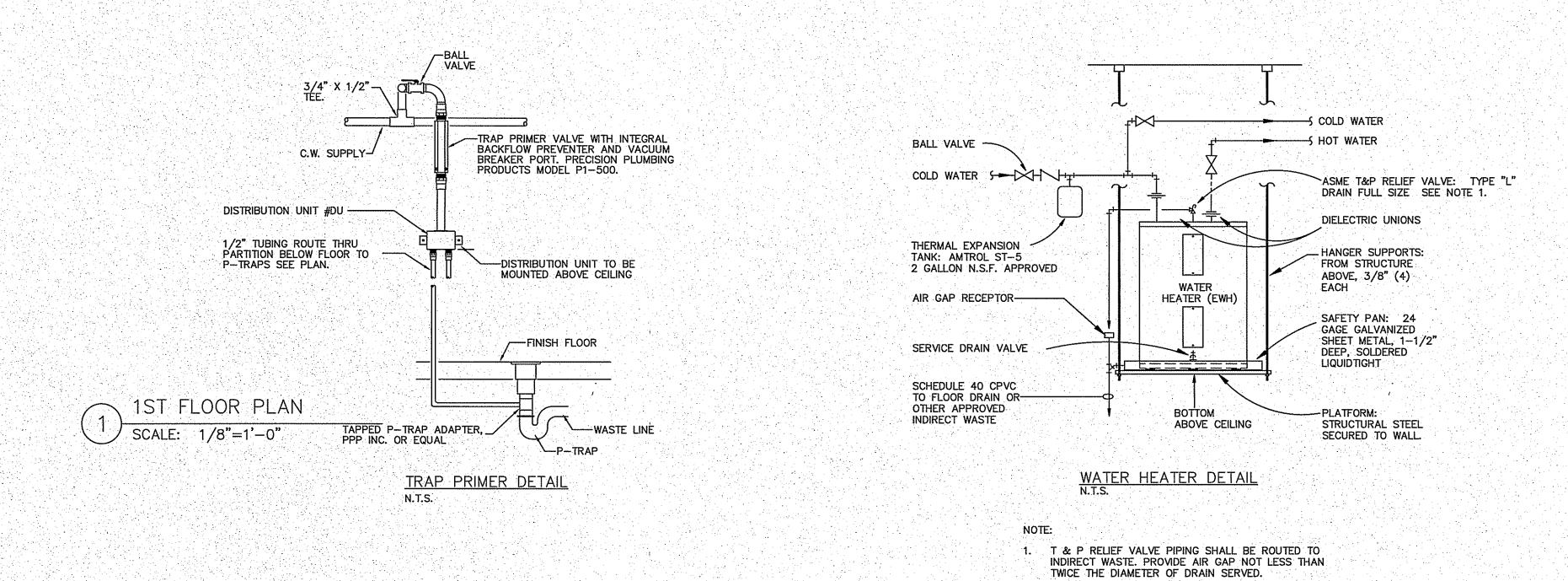


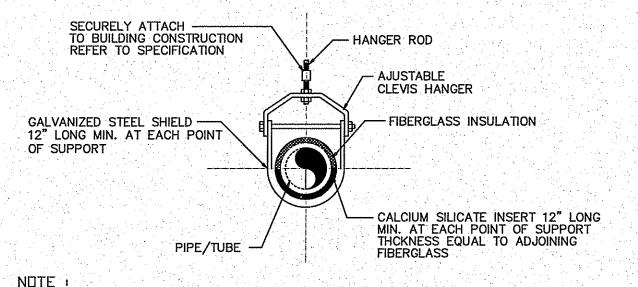
NOTES:
HANGER, ROD & INSERT SHALL BE DIPPED IN ZINC CHROMATE PRIMER PRIOR TO INSTALLATION TYPICAL INSULATED PIPE SUPPORT NOT TO SCALE





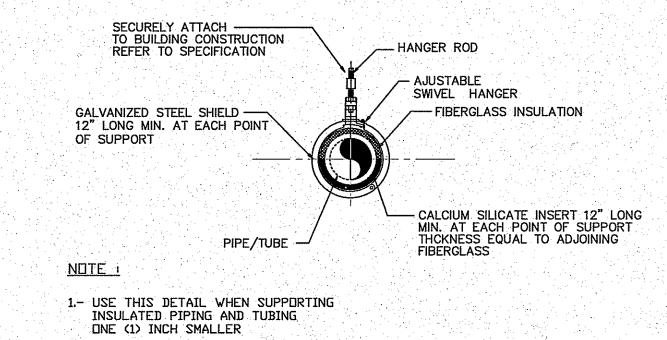






1.- USE THIS DETAIL WHEN SUPPORTING INSULATED PIPING AND TUBING LARGER THAN DNE (1) INCH.

ADJUSTABLE CLEVIS PIPE SUPPORT NOT TO SCALE



ADJUSTABLE SWIVEL PIPE SUPPORT NOT TO SCALE

		PLUME	BING FIXTURE S	CHED	ULE			
SYMBOL	FIXTURE/ITEM	MODEL	VALVE/FAUCET	HOT WTR	FIXTURE CO COLD WTR		VENT	COMMENTS
FHWC	FLOOR MOUNTED HANDICAPPED WATER CLOSET	KOHLER HIGHCREST K-4302 W/ K-4670 SEAT	SLOAN 111-SMO BATTERY POWERED FLUSHOMETER	_	1"	3"	2"	
FWC	FLOOR MOUNTED STD WATER CLOSET	KOHLER WELLCOMME K-4350 W/K-4670 SEAT	SLOAN 111-SMO BATTERY POWERED FLUSHOMETER		1	3"	2"	
UR	URINAL	KOHLER BARDON K-4960 ET	SLOAN 186-1.0-SMO BATTERY POWERED FLUSHOMETER	_	3/4"	2"	11/2"	REFER TO ARCH. FOR MOUNTING HTS.
CL	COUNTER-MOUNTED LAVATORY	KOHLER PENNINGTON K-2196-1	SLOAN OPTIMA EBF-85-4-BDT BATTERY POWERED HAND WASHING FAUCET	1/2"	1/2"	11/2"	11/4"	W/ THERMOSTATIC MIXING VAL & ETF-460-A STRAINER, REFI TO ARCH. FOR MOUNTING HTS.
FD	FLOOR DRAIN	JR SMITH 2005-A	PRECISION PLUMBING PRODUCTS MODEL P1-500		1/2"	2"	11/2"	
MFD	FLOOR DRAIN	JR SMITH 2210 MEDIUM DUTY W/ SEDIMENT BUCKET	PRECISION PLUMBING PRODUCTS MODEL P1-500		1/2"	4"	11/2"	
sc	SINGLE COMPARTMENT SS SINK	ELKAY LRAD2522 6" DEEP BOWL	LKLFE4100 SINGLE HANDLE 1.5 GPM, NO SPRAY	1/2"	1/2"	11/2"	11/4"	
MS	MOP SINK	FLORESTONE MSR-24x24	SPEAKMAN MR371 WALL MOUNT & MR-370 HOSE & CLAMP	1/2"	1/2"	3"	11/2"	
WF	WALL MOUNT FAUCET		SPEAKMAN SC-5814 WALL MOUNT	1/2"	1/2"	-	-	
EWC	ELECTRIC WATER COOLER	ELKAY COOLER/BOTTLE FILLING STATION LZS8WSVRSK		_	1/2"	11/2"	11/4"	
EWH	CEILING ELECTRIC WATER HEATER	RUUD EGSP20, 20 GAL. 3 KW, 277V		3/4"	3/4"			

NOTES:

1. COORDINATE ALL COLORS & FINISHES WITH ARCHITECT
2. PROVIDE MCCHIRE PRO-WRAP INSULATING KIT ON TRAPS AND DOMESTIC WATER SUPPLIES TO ALL LAVATORIES.

PL	UMBING GENERAL NOTES:
1.	RUN HOT AND COLD WATER LINES DOWN IN WALLS OR CHASES -
_	BRANCH TO FIXTURES AS REQUIRED.
Z.	ALL DOMESTIC WATER LINES ABOVE GROUND, TYPE "L" COPPER UNLESS NOTED OTHERWISE.
3.	INSULATE ALL HOT AND COLD WATER LINES ABOVE GROUND AND
	CEILINGS WITH 1" THICK GLASS FIBER INSULATION WITH A FACTORY
	APPLIED VAPOR BARRIER UNLESS NOTED OTHERWISE.
4.	INSTALL STOPS ON EACH WATER LINE AT EACH FIXTURE.
5.	CONTRACTOR SHALL COORDINATE ALL WORK WITH THE LOCAL CODE
	OFFICIAL PRIOR TO EXECUTION OF ANY WORK OR PURCHASE OF ANY
6.	EQUIPMENT. INSTALL PIPING AFTER DUCTWORK HAS BEEN PLACED.
	COORDINATE ALL WORK WITH THAT OF OTHER TRADES; ELECTRICAL, ETC
8.	DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL ARRANGEMENT OF
	PIPING AND EQUIPMENT.
9.	PROVIDE PRESSURE REDUCING VALVES ON DOMESTIC WATER LINES AS
40	REQUIRED COORDINATE WITH LOCAL UTILITIES.
10.	PROVIDE WATER HAMMER ARRESTORS IF NECESSARY. NO SITE BUILT ARRESTORS ARE ALLOWED.
11	PROVIDE ALL REQUIRED CUTTING AND TRENCHING OF EXISTING FLOOR.
	BACKFILL AND PATCH FLOOR TO MATCH EXISTING.
12.	EXACT LOCATIONS OF ITEMS NOTED AS BEING EXISTING SHALL BE
	VERIFIED IN THE FIELD.
13.	APPROXIMATE LOCATIONS OF EXISTING HW, CW, HWR, VENTS, WASTE, GAS, AND STORM WATER PIPING IN CEILING. WHERE REQUIRED IN ORDER
	TO ACCOMMODATE NEW WORK, RAISE OR LOWER OR RELOCATE PIPING
	TO SUIT NEW CONDITIONS.
14.	OFFSET VTR AT LEAST 5'-0" FROM EXTERIOR WALL BEFORE
	PENETRATING ROOF.
15.	
	FOR PROPER CONSTRUCTION OF ANY PART OF THE WORK SHALL BE
	INCLUDED AS IF THEY WERE INDICATED ON THE DRAWINGS.

	PLUMBING LEGEND
	4" San roughing in Floor
	COLD WATER PIPING
E CW	EXISTING COLD WATER PIPING
HW	HOT WATER PIPING
SAN — — —	— NEW SAN PIPING
E SAN — — -	— EXISTING SAN PIPING
V	VENT PIPING
E V	Existing vent piping
G	NEW GAS PIPING
EG	EXISTING GAS PIPING
g	VALVE
co <sup>©</sup>	CLEAN OUT (FLOOR MOUNTED)
wcol	CLEAN OUT (WALL MOUNTED)
•	NEW CONNECTION TO EXISTING
0!	ELBOW UP
O+	ELBOW DOWN  WENT MIROUGH ROOF EASE

ELBOW DOWN  PYENT AHROUGE ROOF EASE	
JILDING SIGNATURE DATE	
LECTRICAL SIGNATURE DATE	
LUMBING - SIGNATURE DATE	_
IRE SIGNATURE DATE	
ZONING SIGNATURE DATE	$\exists \parallel$

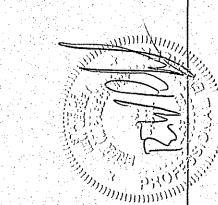
**KEY PLAN - IST FL.** 

**⊗** INNOVATIVE ENGINEERING, INC. 21 Cross Avenue, - Midland Park, New Jersey 07432 Phone: (201) 670-7882 Fax: (201) 444-4982 www.innovativeengineering.net

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Milton A. Azous, PE NJ #21057 NY #48388 PA #PE021148E CT #10684 FL #44942

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**Ultimate Sports** 12 WRIGHT WAY OAKLAND, NEW JERSEY 07436 TEL 201-447-9999 FAX 201-447-9998

drawing title: PLUMBING DETAILS

scale:	drawing number:
AS NOTED	
job number: 0972	BA
drawn by: GB	
checked by: MA	
date:	dwg. of
03.12.10	file #

NJ 05915 NY 011938

CT 4823

PA B 7813 AZ 12822

SECTIONS 15000 & 16000 MECHANICAL/ELECTRICAL GENERAL CONDITIONS

1.1 GENERAL CONDITIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections apply to work specified in this Section; consult them in detail for applicable instructions.

B. Manufacturers referenced in the technical specifications are for the purpose of establishing a standard of quality.

1.2 CODES AND STANDARDS

A. All workmanship and material shall conform to the rules and regulations of the current editions of the regulating agencies listed below and regulations of the local utility companies. These rules, regulations and codes shall govern as a minimum standard. In the event of conflict with the Contract drawings or specifications requiring workmanship or material of a higher quality than required by the above-mentioned rules, regulations and codes, the most stringent shall

ADA - Americans with Disabilities Act New Jersey Uniform Construction Code International Mechanical Code National Standard Plumbing Code

NFPA - National Fire Protection Association AMCA — Air Movement and Control Association, Inc. SMACNA — Sheet Metal and Air Conditioning Contractors National Association,

ASHRAE - American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. IPCEA - Insulated Power Cables Engineers Association NEC — National Electrical Code of the NFPA NEMA - National Electric Manufacturers Association National Board of Fire Underwriters AABC - Associated Air Balance Council

ARI — Air Conditioning and Refrigeration Institute UL - Underwriter's Labs. Local Utility Requirements PDI - Plumbing and Drainage Institute ASSE - American Society of Sanitary Engineering

ASTM - American Society for Testing Materials

The Owner's Insurance Underwriter

During this work, this Contractor shall be responsible for maintaining safety among persons in his employ in accordance with the standards set by the OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. The Engineer shall be held harmless for any accident, injury, or any other incident resulting from non-conformance with these or any other standards.

1.3 QUALITY ASSURANCE

A. The Contractor shall use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of these Sections.

B. Without additional cost to the Owner, the Contractor shall provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

C. Engineering Drawings are symbolic and diagrammatic in nature and are intended to show only the general scheme, equipment involved, and the proximate locations and dimensions of the equipment. For exact locations and dimensions, the Contractor shall review all Drawings provided: including. Architectural and Structural Drawings, Reflected Ceiling Plans, Plumbing, Fire Protection, Electrical and HVAC Drawings to confirm all requirements. It is the Contractor's responsibility to confirm that all equipment will fit. Any discrepancies or inconsistencies are to be reported immediately to the Architect and the Engineer for clarification. No extras or allowances will be made for such items after bid submission.

D. Examination of the site shall be made by the Contractor, who shall compare it with the Drawings and Specifications and who shall satisfy himself as to the conditions under which the work is to be performed. No allowance shall subsequently be made for any extra expense incurred due to failure or neglect to make such examination.

\_E. During the execution of work under this Contract the Contractor shall be responsible for protecting any equipment or structures in the work and adjacent

F. Secure and pay for required authorizations from governmental agencies

G. All Work shall be guaranteed to be free from leaks or defects. Any defective materials or workmanship as well as damage to the work of all trades resulting from the same shall be replaced or repaired as directed for the duration of stipulated guarantee periods.

H. COORDINATION: Each Contractor shall be responsible for coordinating their work with that of all other trades. No installation shall take place without approval of onsite entity (General Contractor, Construction Manager, etc.) responsible for coordination. Any work installed without approval and which interferes with the work of other trades that have been approved shall be removed and replaced at the Contractor's expense.

I. EXPOSED PIPING, DUCTWORK AND CONDUIT: There shall be no exposed piping, ductwork or conduit of any sort; plumbing, fire protection, HVAC or electrical, whether implied by the MEP drawings or not, unless expressly approved by the Architect.

1.4 SUBMITTALS

Shop Drawings:

A. Comply with pertinent provisions of General Documents.

B. PRODUCT DATA: Within the designated time period after the Contractor has received the Owner's Notice to Proceed, submit: 1. Materials list of items proposed to be provided under this Section with sources of supply and manufacture.

2. Manufacturer's specifications, catalog cuts, and other data needed to prove compliance with the specified requirements. 3. Product substitutions are to be requested in writing, within 20 calendar days of the Notice to Proceed (NTP). At the time of submission of cuts for review for all substitutions, clearly indicate Specification Section, provide complete information on the original product and the proposed product for approval, and all deviations.

a. Any substitutions requested by a contractor are to include all costs for related changes by other contractors. It is the responsibility of the contractor requesting the change to coordinate with any other trade impacted by the substitution.

1. When so requested by the Engineer, promptly provide samples of items scheduled to be exposed in the final structure. 2. When specifically so requested by the Contractor and authorized by the Engineer, authorized samples will be returned to the Contractor for installation on the Work.

1. PLUMBING: Before fabrication or purchase of any equipment or controls,

prepare and submit for review, shop drawings of layout and design of the

complete hot and cold domestic water piping systems, vents, sanitary and storm piping systems, and equipment, for approval before starting any work, at a scale not smaller than 1/4" = 1'-0". Include <u>all</u> access provisions, etc. Coordinate all of the above with all other trades. 2. HVAC: Before fabrication or purchase of any work, major equipment or controls, prepare and submit for review, shop drawings of all equipment with ductwork, at a scale not smaller than 1/4" = 1'-0". Include all fire dampers. access provisions, etc. Coordinate all of the above with all other trades. 3. ELECTRICAL: Prepare and submit Shop Drawings, showing at a scale not smaller than 1/4" = 1'-0" all details of items to be shop fabricated under this Section, including access provisions, etc. Maximum sheet size 30" x 42" Coordinate all of the above with all other trades.

4. Clearly identify by circle and by note "DEVIATION" and by note "INTERFERENCE". in large bold lettering, and deviations from Drawings and Specifications and any potential or unresolved interference condition and assume full responsibility for failure to do so.

5. Submittal shall confirm fabrication and installation is in accordance with recommendations and applicable standards. 6. For mandatory coordination of all work, including that which penetrates structural members, consult General Conditions.

E. Corrections or comments made on shop drawings and submittals during review do not relieve the Contractor from compliance with requirements of the drawings and specifications. This check will only be for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor shall be responsible for; confirming and correlating all quantities and dimensions, selecting fabrication process and techniques of construction, coordinating his work with that of all other trades, and performing his work in a safe and satisfactory manner.

F. STERILIZATION CERTIFICATE: Upon completion of water line sterilization. deliver two copies of an acceptable "Certificate of Performance" to the

G. MANUALS: Upon completion of the work of this Section, the Contractor shall deliver to the Architect four copies of an operation and maintenance manual compiled in accordance with the provisions of General Conditions, and these Specifications. 1. Include within each manual a copy of the Project Record Documents showing all work of the Section. 2. Include detailed operating and maintenance instructions.

H. AS-BUILT DRAWINGS: concurrent with the progress of the work, the Contractor shall maintain a set of as—built record sepia drawings noting in red all changes in the work. Upon completion of the work this sepia set is to be turned over to the Owner for his records.

I. All required permits, fees and inspections shall be arranged and paid for by the Contractor. The Contractor shall present to the Owner, properly signed, all required certificates of final inspection and approval before the work will be accepted as complete.

1.5 TRENCHING AND BACKFILLING

A. Perform trenching, backfilling and compaction in strict accordance with applicable codes and standards.

B. Cut bottom of trenches to grade. Make trenches 12" wider than the greatest dimension of the pipe.

Backfill remainder with native soil placed in 6" layers, then compacted.

C. Bedding and backfilling: 1. Install piping promptly after trenching. Keep trenches open as short a time as practicable. 2. Under the building, install pipes on a 6" bed of damp compacted sand. Backfill to bottom of slab with damp sand, compacted in 6" layers. 3. Outside the building, install underground piping on a 6" bed of damp sand,

compacted. Backfill to within 12" of finish grade with damp sand, compacted.

4. Do not backfill until installation has been authorized and until Project

Record Documents have been properly annotated. 1.7 GAS EQUIPMENT SEISMIC CONNECTIONS

Final connection of gas piping to any equipment subject to vibration or movement shall utilize flexible stainless steel high BTU application gas connectors with PVC coating, Dormont Series 40, 50 or 60 by Dormont Mfg. Co., Export, PA or authorized equivalent.

1.8 SMOKE DETECTORS

Where applicable, duct smoke detectors shall be installed in the return ductwork only in accordance with 1996 International Mechanical BOCA Code Section 606.

1.9 INTUMESCENT FIRE BARRIER PLASTIC PIPE CAULKING

\_A. Provide where plastic pipe penetrates a rated wall, intumescent—type sealant complying with UL Fire Resistance Directory and ULC Volume 3 Fire Resistance Ratings, UL classified for use with PVC, CPVC, CCPVC, ABS, CCABS, PVDF, PP, PB and FRPP, HILTI FS-ONE or authorized equal. 1.10 INSTRUCTION

\_A. After all work is completed, the Contractor shall instruct employees designated by the Owner in the proper operation and maintenance of the equipment and systems installed under this Contract.

1.11 GUARANTEE The Contractor shall augrantee his work for a period of one year after date of completion as witnessed by receipt of final payment. The Contractor shall promptly repair and make good any damage to the work of any other Contractor, during that period, that may be caused by defective materials or workmanship. Any defects in materials and workmanship shall be corrected by the Contractor without further expense to the Owner. He shall deliver to the Architect or Owner said written guarantee upon receipt of final payment.

Routinely remove, in an orderly and efficient manner, (and cart away and dispose of, by legal means, off the site and premises), all debris related to work of this Section; worksite and staging areas shall be kept clear of all debris on a daily basis; permit no debris accumulation which poses any threat to life, safety or property. Non-conformance with the foregoing Contract requirements will be subject to all remedies established by the Project General Conditions.

END OF SECTION

1.12 DEBRIS REMOVAL

SECTION 15400 PLUMBING

PART 1 - GENERAL 1.1 SECTION REQUIREMENTS

A. WORK INCLUDED: Provide all labor, materials, equipment, plant, tools, and management services for proper and complete execution of all Plumbing work. Without restricting the generality of the foregoing, the following items of work are included:

1. Remove existing fixtures and cap and seal piping. 2. Provide all domestic water piping for new fixtures from existing sources. 3. Complete drain, waste and vent systems; connections including escutcheons, connections, cleanouts and connection to building sanitary. 4. Purchase, installation and connection/piping of Plumbing Fixtures as specified on the drawings, with fittings, dielectric fittings, stops and traps, in the locations and quantities shown on the Drawings. 5. Insulation of hot and cold water piping, as well as exposed P-traps and

drain piping. 6. Perform all cutting & patching, and fire caulking/sealing for plumbing installation. 7. Plumbing Contractor shall be responsible for coordination of all work with all other trades to avoid conflicts.

9. Sleeves for pipes passing through walls and partitions. 10. Perform cleaning and protection of your work. 11. Access doors where required in walls and ceilings for installation by appropriate surface Contractor. 12. Seismic provisions, as required by code, for ALL plumbing systems and

13. Removal of all debris and rubbish related to this work. 14. gas piping from existing gas service to new rooftop units.

8. Temporary water service as required to perform the Work.

PART 2 - PRODUCTS

2.1 PLUMBING FIXTURES

A. Provide plumbing fixtures as shown on the Drawings with all hangers. supports and stops as required by code for a complete installation.

B. Provide handicapped flush valves to wide side of stalls as required by code. 2.2 SERVICE CONNECTIONS/METERS

A. Provide all water and sanitary utility connections.

B. Provide and install meters and pressure regulators if not provided by local

C. Coordinate all work with local utilities. D. Provide controls and control wiring if applicable, coordinate with Electrical

2.3 MATERIALS

A. All materials entering into this work shall be new and shall be of the best of their respective kinds and shall be installed in a neat and workmanlike manner. The Contractor shall be entirely responsible for all apparatus. equipment, and appurtenances furnished by him or his Sub-Contractors in connection with this work and special care shall be taken to protect all parts thereof in such manner as may be necessary or as directed. This protection shall include covers, crating, sheds, or other means to prevent dirt, plaster, grit or other foreign substances from entering piping, fixtures or equipment. Special care shall be taken to keep all open ends of pipes, etc. closed while in storage or during installation. The Contractor shall be responsible for and shall make good any damages without additional cost.

B. SOIL. VENT AND WASTE PIPING 1. All above ground sanitary piping shall be cast iron "No Hub" pipe (Cast Iron Soil Pipe Standard 301), with neoprene gasket, stainless steel band, and clamp (Cast Iron Soil Pipe Institute Standard 310). 2. All below ground sanitary piping shall be cast iron hub and spigot pipe (ASTM A-74) with double seal compression-type gasket (ASTM C-564), similar to Tyler Pipe "TY-SEAL".

C. GALVANIZED OR BLACK STEEL PIPE 1. Provide standard weight complying with ASTM-A-12. 2. Provide Service weight fittings complying with ASTM-A-126 or

D. COPPER HOT AND COLD WATER DOMESTIC SERVICE 1. Provide type L complying with ASTM-B-88. 2. Fittings shall be 150 psi rated cast brass soldered type. 3. Soldered joints shall be made with a LEAD FREE SOLDER. 4. All under-slab copper piping shall be soft, type K with NO JOINTS.

E. DIELECTRIC PIPE FITTINGS 1. Provide at all connections between dissimilar metals (e.g. steel, copper, iron), nylon insulator, Buna-N gasket, maximum temperature 210° F, 250 psig pressure rating, conforming to ANSI B16.39, B2.1 and B1.201 and Federal Specification WWU-531E and WWU-516B.

1. Provide black steel, schedule 40, minimum 150 PSI, screwed malleable iron fittings, ASTM-A-120, (Standards are in 2000 International Mechanical Code). 2. Provide seismicrestraints for all piping hangers longer than 12". All seismic restraints shall be in accordance with 2000 International Mechanical

3. Construction must meet National Fuel Gas Code. American Gas Association. OSHA. UL and all other local and applicable codes. 2.4 VALVE AND PIPING IDENTIFICATION

A. Identify piping with pipe identification labels.

B. Valves shall be designated by distinguishing numbers and/or letters on required chart(s) and/or diagram(s). 2.5 VALVES

A. GATE VALVES: Provide solid wedge disc, rising stem, 200# WOG; non-rising stem valves may be used only where there is insufficient clearance. 1. 3" and smaller, rising stem: Provide Crane #428, bronze, screwed. 2. 3" and smaller, non-rising stem: Provide Crane #438, bronze, screwed. 3. 4" and larger: Provide Crane #465-1/2, IBBM, flanged, non-rising stem.

B. GLOBE VALVES: Provide replaceable composition disc suitable for 200° F 1. 2" and smaller: Provide Crane #7, bronze, screwed. 2. 2-1/2" and larger: Provide Crane #359, iron body, flanged, 200# WOG.

C. CHECK VALVES: 1. 3" and smaller: Provide Crane #37, bronze, screwed, Y-pattern, 200# WOG, swing check type. 2. 4" and larger: provide Crane #373, IBBM, flanged, 200# WOG.

D. STRAINERS: Provide Y-pattern, 200# WOG, 20 mesh monel screen: 1. 3" and smaller: Provide Crane #988-1/2, screwed. 2. 4" and larger: Provide Crane #989-1/2, flanged.

E. PARTITION STOP VALVES: Provide Chicago Faucet #1771, loose key type. F. BALANCING COCKS: Provide DeZurick #400.

G. CLEANOUTS: Provide cleanouts on all soil, waste and roof drain lines, at ends of all lines, at all changes in direction exceeding 45 degrees, where leaving the building, and not over 50 ft. apart at all horizontal or vertical runs.

a. Provide Smith #4023 or Josam #8330 with round nickel-bronze top in finished room floors. b. Provide Smith #4223 or Josam #8090—CAL with round cast iron top in unfinished room floors. c. Provide "flush-with-floor" type cleanouts, with adjustable watertight covers and integral anchoring flange with clamping collar where waterproofing membrane is used

2. Finished walls: a. Provide Smith #4532 or Josam #8790-4 with round chrome plated or stainless steel access plate and screw. 3. Provide cleanout plugs of extra heavy bronze.

H. VENT LINES: Where small vent lines pass through roof structures, provide pipe increasers as required by local code. 2.6 PIPE HANGERS

A. WATER PIPING 1. Provide VMC (Vibration Mountings & Controls Inc.) Series SH spring flex hangers with appropriate split ring or trapeze type connectors. 2. Provide seismic restraints for all hangers longer than 12" as required by

2.7 INSULATION

A. Insulate ALL hot and cold water lines, ALL internal drain lines, ALL horizontal roof drain lines, and ALL exposed drain lines under lavatories and sinks with 1" thick Owens-Corning Fibreglas "25ASJ/SSL".

B. For exposed water piping and drains in lavatories, provide "Handy Shield" or authorized equal prefabricated insulation. 2.8 SLEEVES

A. Where pipes pass through concrete, masonry, or stud walls, provide "Sperzel" rustproof "Crete-Sleeve" of the size required. 2.9 WATER HAMMER ARRESTORS

A. Provide water hammer arrestors on hot and cold water lines. Smith Hydrotrol 5000 series. 1. Install in upright position at all quick closing valves, solenoids, isolated plumbing fixtures, and supply headers at plumbing fixture groups. 2. Locate and size in accordance with Plumbing and Drainage Institute Standard WH-201. 3. Install water hammer arrestors behind access panels.

2.10 FLOOR DRAINS

A. Provide 3 inch of the size, type and location shown on the Drawings, and connect to cast iron "P" traps. All floor drains shall include trap primer option. 2.11 ACCESS DOORS

A. Access panels in ceramic tile, gypsum wallboard, or other finished surface, required for access to valves, etc. on plumbing lines, will be furnished by this Contractor and installed by the Contractor for the applicable surface.

B. It shall be the Plumbing Contractor's responsibility to take a count of all such panels required, transmit this information to the respective Contractor and see that they are installed where required, so that no plumbing equipment is

2.12 OTHER MATERIALS

left in an inaccessible location.

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the authorization of the Engineer.

B. Provide flashing and counter-flashing for all vent piping extended to

PART 3 - EXECUTION

3.1 TEMPORARY POWER AND LIGHTING

A. It is the Contractor's responsibility to run power from point of availability as provided in the Electrical Contract, to the point of use. Provide local temporary lighting as required for performance of the work in this section. 3.2 EXISTING CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected. 3.3 PREPARATION

A. Coordination:

(1) Coordinate as necessary with other Sections to assure proper and adequate provision in the work of those Sections for interface with the work of this Section. (2) Coordinate the installation of items with the schedule for work of other trades to prevent unnecessary delays in the total work.

B. Data indicated on the Drawings and in these Specifications intended to convey the Engineer's intentions only, as such their accuracy is not warranted. The exact locations, distances, levels, and other conditions will be governed by actual construction and the Drawings and Specifications should be used only for quidance in such regard.

C. Where devices are not specifically located on the Drawings, locate as determined in the field by the Engineer. Where devices are installed without such specific direction, relocate as directed by the Engineer, at no additional cost to the Owner.

3.4 INSTALLATION OF PIPING AND EQUIPMENT

1. Thoroughly clean items before installation. Cap pipe openings to exclude dirt until fixtures are installed and final connections have been made. 2. Cut pipe accurately, and work into place without springing or forcing, properly clearing windows, doors, and other openings. Excessive cutting or other weakening of the building will not be permitted.

connections from fixtures. Tape all finished surfaces to prevent damage during 4. Make changes in directions with fittings; make changes in main sizes with eccentric reducing fittings. Unless otherwise noted, install water supply and return piping with straight side of eccentric fittings at top of the pipe. 5. All drainage piping shall be run as straight as possible. Run horizontal sanitary and storm drainage piping at a uniform grade of 1/8" per ft. unless otherwise noted. Make change in direction of drainage piping by appropriate use of 45' wyes, long turn tee wyes, long sweep quarter, sixth, eight, or sixteenth bends except where space conditions require, short turn sanitary tees may be used on vertical lines only. 6. Provide sufficient swing joints, ball joints, expansion loops, and devices necessary for a flexible piping system.

3. Show no tool marks or threads on exposed plated, polished, or enameled

7. Support piping independently at pumps, coils, tanks, and similar locations. so that weight of pipe will not be supported by the equipment. 8. Securely bolt all equipment, isolators, hangers, and similar items in place. 9. Support each item independently from other pipes. Do not use wire for hanging or strapping pipes. 10. Provide complete dielectric insulating couplings between ferrous and non-ferrous metals. 11. Provide union and shut off valves suitably located to facilitate

maintenance and removal of equipment and apparatus, and 12. All water piping shall be concentrated and run as direct as possible but parallel to construction and ABOVE CEILING in all finished rooms. Water supply lines to wall hung fixtures, or to fixtures set near or against the wall shall be stubbed through the wall and not up through the floor. 13. Water supply pipes throughout the building shall be located within the building in such a manner as to provide thorough protection from freezing. 14. All water piping shall be run level and generally free of traps and unnecessary bends arranged to conform to the building requirements and to suit the necessities of clearances for other mechanical and electrical work. 15. All piping shall have reducing or increasing fittings where any change in the pipe sizes occur. No bushings of any nature will be allowed.

16. No valve stems shall be installed below the centerline of the piping it

17. Run vent piping with elbows at changes of direction or grade to drain out condensation. 18. Cleanouts shall be provided where required by code. Cleanouts shall be installed at all changes in direction, at the base of all leaders and where shown on the Drawings. 19. Underground cleanouts shall be extended to the finished floor with long radius fittinas.

B. CHASES, SLOTS, AND OPENINGS 1. Chases, slots and openings in floor, walls, or partitions will be built in by each Contractor in his respective material as shown on the drawings and as directed as the work progresses. This Contractor shall familiarize himself with the size of chases, slots, and openings to be provided by other Contractors, to receive his work and shall see that they are properly located and of proper size. This Contractor shall provide all chase access doors for installation by Drywall or Masonry Contractor. If these chases have to be cut after walls are built he shall provide same as required. This Contractor shall install his work sufficiently in advance of the building construction to permit his work to be built into walls, floors, and partitions to eliminate unnecessary cutting of construction work. 2. He shall not cut any chases or any structural members without first securing the approval of the Architect and Engineer.

C. EQUIPMENT ACCESS: Install piping, equipment, and accessories to permit access for maintenance. Relocate items as necessary to provide such access. and without additional cost to the Owner. 3.5 PIPE JOINTS

A. COPPER TUBING 1. Cut square, remove burrs, and clean inside of female fitting to a bright

a. Apply solder flux with brush to tubing. b. Remove internal parts of solder—end valves prior to soldering. 2. Provide dielectric unions at points of connection of copper tubing to ferrous piping and equipment.

3. For joining copper tubing, use: a. Water piping 3" and smaller: 95-5 solder. b. Water piping larger than 3": Sil—fos" brazing.4. Use only LEAD—FREE SOLDER.

B. SCREWED PIPING

1. Deburr cuts. a. Do not ream exceeding internal diameter of the pipe. b. Thread to requirements of ANSI B2.1. 2. Use teflon tape on male thread prior to joining other services.

3. Do not use thread cement or sealant to tighten joints.

C. LEAKY JOINTS 1. Remake with new material. 2. Remove leaking section and/or fitting as directed.

3.6 PIPE SUPPORTS \_A. Support suspended piping with clevis or trapeze hangers and rods.

B. Space hangers and support for horizontal steel pipes according to the following schedule: Maximum spacing on centers: Pipe size: 3/4" and smaller: 10'-0"

12'-0" 1" and greater C. Space hangers and supports for horizontal copper tubing according to the following schedule: Tube size: Maximum spacing on centers:

\_1 1/4" and smaller: 6'-0" 1-1/2" and over 10'-0" D. Cast Iron Soil Pipe: at 5 foot intervals and behind every hub.

E. Space hangers and supports for horizontal PVC pipe six feet maximum for F. Provide sway bracing on hangers longer than 18".

G. Support vertical piping with riser clamps secured to the piping and resting on the building structure. H. Provide insulation continuous through hangers and rollers. Protect

insulation by galvanized steel shields. I. Arrange pipe supports to prevent excessive deflection, and to avoid excessive

J. It is the option of the Contractor to fasten piping directly to walls above ceilings, support from walls above ceilings or support it from building structures above ceilings.

1. All hangers and supports shall be as manufactured by the F & S Company a. All bare horizontal piping shall be hung with fig. #86 or Fig. #86F adjustable galvanized steel clevis hanger. b. All insulated horizontal piping shall be hung with Fig. #86S adjustable

galvanized steel clevis hanger. c. All hangers, clamps and anchors for copper pipe shall be copper clad. d. Beam clamps and C clamps shall have steel retaining clips. e. All vertical lines shall be supported by means of authorized galvanized steel clamps.

L. Support gas piping on roof with pre-fabricated pillow block pipestands, one piece molded plastic with rounded base edges vented to prevent condensate buildup, round cradle with roller in Teflon base, by Miro Industries, sized to fit individual pipe diameters.

3.7 SLEEVES AND OPENINGS

B. FINISH AND ESCUTCHEONS

A. Provide sleeves for each pipe passing through walls, partitions, floors and 1. For uninsulated pipe, provide sleeves two pipe sizes larger than the pipe passing through, or provide a minimum of 1/2" clearance between inside and outside of the pipe. 2. For insulated pipe, provide sleeves of adequate size to accommodate the full thickness of pipe covering, with clearance for packing and caulking.

2.d Provide 1" wide chrome or nickel plated escutcheons on all pipes

1. Smooth up rough edges around sleeves with plaster or spackling compound.

exposed to view where passing through walls, floors, partitions, ceilings, and similar locations. a. Size the escutcheons to fit pipe and a covering. b. Hold escutcheons in place with set screws.

C. Provide all cutting and patching, and fire caulking/sealing. Caulk the space between sleeve and pipe or pipe covering, using a non-combustible, permanently plastic, waterproof, non-staining compound which leaves a smooth finished appearance, or pack with noncombustible cotton, rope, or fiberglass to within 1/2" of both wall faces.

3.8 CLEANOUTS A. Secure the Architect's approval of locations for cleanouts in finished greas prior to installation.

B. Provide cleanouts of same nominal size as the pipes they serve; except where cleanouts are required in pipes 4" and larger, provide 4" cleanouts. C. Make cleanouts accessible. After pressure tests are made and authorized,

thoroughly graphite the cleanout threads. D. Provide cleanouts every 50' on 5" pipe and under, and every 100' on 6" pipe and larger.

3.9 VALVES A. Provide valves in water and gas systems. Locate and arrange so as to give complete regulation of apparatus, equipment, and fixtures.

B. Provide valves in at least the following locations: 1. In branches and/or headers of water piping servicing a group of fixtures.

2. On both sides of all apparatus and equipment. 3. For shutoff of risers and branch mains. 4. For flushing and sterilizing the system.

5. Where shown on the Drawings. 6. At all low points of each water system.

3.10 BACKFLOW PREVENTION

3.12 OTHER TESTING AND ADJUSTING

C. Locate valves for easy accessibility and maintenance. D. Identify all valves with brass, die stamped identification tags.

A. General: Provide backflow preventers for domestic water system.

equipment having plumbing connections, against possible back-siphonage. C. Arrange for testing of backflow devices as required by the governmental

B. Protect plumbing fixtures, faucets with hose connections, and other

agencies having jurisdiction. D. For flush valves, provide diaphragm type, complete with authorized vacuum

breaker provided by the manufacturer of the valve. 3.11 DISINFECTION AND STERILIZATION OF WATER SYSTEMS

A. DISINFECT HOT AND COLD WATER SYSTEMS 1. The domestic water system shall be filled with a water solution containing 200 parts per million of available chlorine and allowed to stand for 1 hour before thoroughly flushing and returning to service. 2. Perform disinfecting under the Engineer's observation. Notify the

3. Upon completion of disinfecting, secure and submit the Certificate of Performance, stating system capacity, disinfectant used, time and rate of disinfectant applied, and resultant residuals in ppm at completion. B. When disinfecting operation is completed, and after final flushing, secure

Construction Manager at least 48 hours prior to start of the disinfecting

system, showing test negative for coli-aerogene organisms. Provide a total plate count of less than 100 bacteria per cc, or equal to the control sample. C. If analysis results are not satisfactory, repeat the disinfection procedures and retest until specified standards are achieved.

analysis by laboratory authorized by Engineer, based on water samples from the

A. Provide personnel and equipment, and arrange for and pay the costs of, all required tests and inspections required by governmental agencies having

B. Where tests show materials or workmanship deficient, replace or repair as necessary, and repeat the tests until the specified standards are achieved at no extra cost to Owner.

C. Adjust the system to optimum standards of operation. D. TESTING OF SANITARY DRAINAGE SYSTEM 1. Upon completion of all rough plumbing, wastes and vents, this Contractor shall test same to roof. The entire new drainage system must be tested by the Plumbing Contractor who shall close the end of the house drain, all vertical lines and branches, to fixtures to points above the finished floors and beyond the finished face of the walls and partitions. If the drain or any part of the

system is to be tested separately, there must be a head of water at least 10

feet above all parts of the work so tested, held for a minimum of one (1)

hour, and special provision must be made for all parts including all joints and connections in at least one test. E. TESTING OF WATER PIPING 1. All water piping shall be thoroughly flushed to remove all foreign material

after the roughing—in is completed. After the fixtures have been connected, the supply line shall be flushed again. 2. Piping shall be hydrostatically tested at a pressure of 150 psi. Test pressure shall be maintained for a period of 4 hours with a pressure drop not to exceed 5 psi. This test shall be made before fixtures are connected. The test shall be repeated at 60 psi after the fixtures have been connected. During the tests, all valves shall be carefully checked for leakage around the stem. 3. Relief and regulating valves shall be set and checked to see that they operate properly. Relief valves shall be tested to determine that they open at the proper pressure and temperature.

4. Water heaters shall be tested and checked to determine that they operate in compliance with the specifications. All controls shall be properly adjusted. F. GENERAL REQUIREMENTS FOR TESTING 1. Should a leak occur during any test, the system shall be drained, the

leaking fitting removed, the pipe thoroughly cleaned, and new fittings installed

according to these specifications. Reheating leaking fittings in the line will not be permitted. 2. All defects disclosed as the result of tests shall be remedied and defective work or material shall be replaced and tests repeated. 3. All tests shall be performed as required and until satisfactory results are achieved, and no pipe shall be concealed until authorized by the Architect. 4. Expense involved in making a separate test or tests shall be paid for by the PC when it is required to separately test any of the plumbing system so as to advance the progress of the construction work. Any test made will not be construed as an acceptance of any material so tested or will it affect the guarantee of the work. All leaks which appear because of these tests shall be repaired by the Plumbing Contractor.

PLAN RELEASE

All testing shall be completed before insulation is applied, and underground

piping shall be tested before any backfilling.

END OF SECTION

**KEY PLAN - IST FL.** 



Edward J. Galto. PE NJ #26166 NY #57012 Va #016807 De #11776 Md #14827 CT #14789 PA #PE07588 OH #E051620 Minn #0187499 Mass #33515-HV, #33899-E #33634-M NC #16973 SC #20205 NH #8242

Milton A. Azous, PE NJ #21057 NY #48388 PA #PE021148E CT #10684 FL #44942

Brian W. Pasechnick, PE

NJ #48111



1 03.12.10 ISSUED FOR BIDDING

NO. ISSUE DATE ISSUE DESCRIPTION



550 North Maple Ave Ridgewood, NJ 07450 Tel 201-445-2322 Fax 201-445-3053 E-mail poskott@psaia.com



OAKLAND, NEW JERSEY 07436

FAX 201-447-9998 drawing title: PLUMBING SPECIFICATIONS

TEL 201-447-9999

12 WRIGHT WAY

AS NOTED job number: 0972 drawn by: GB checked by: 03.12.10

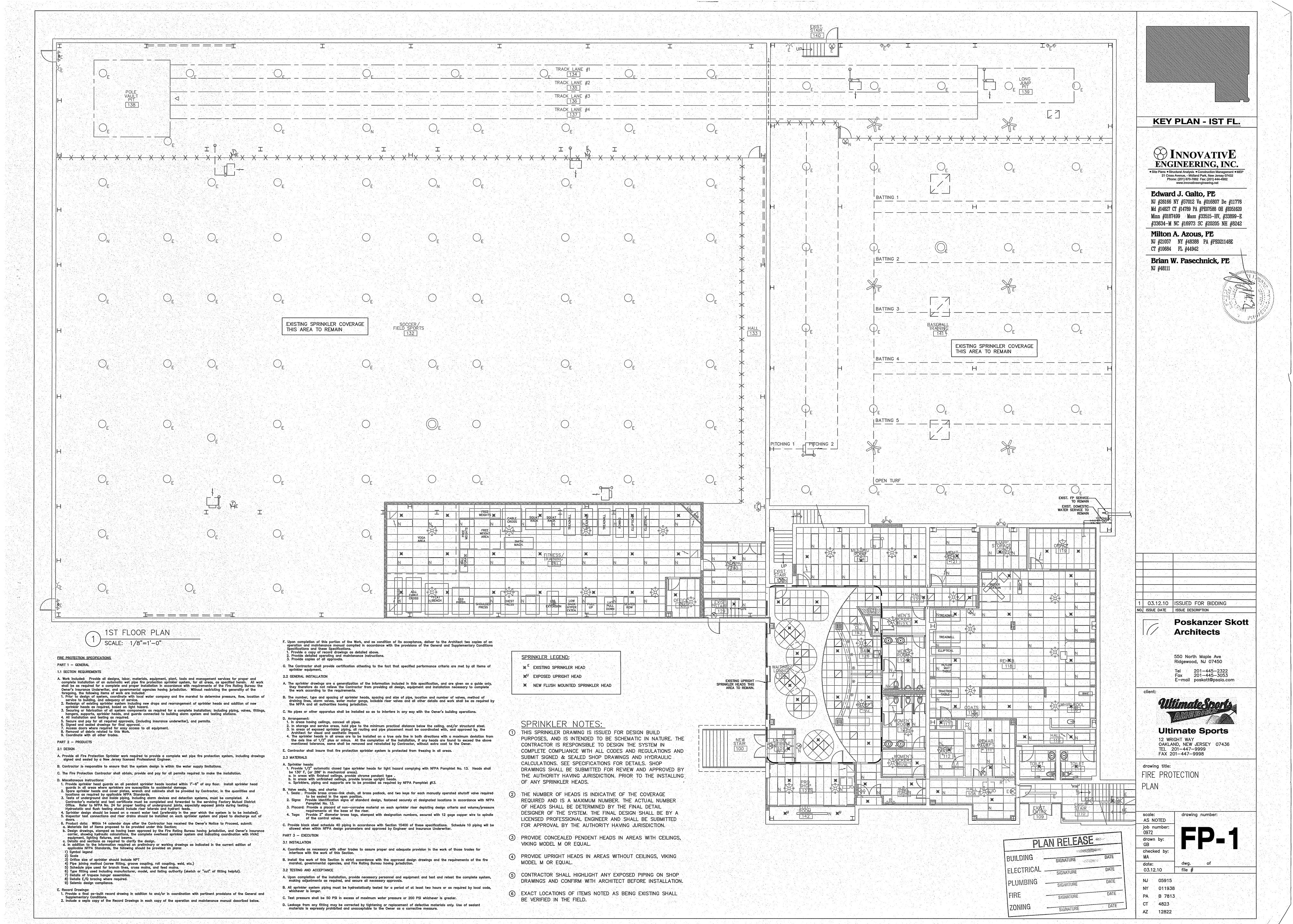
NJ 05915

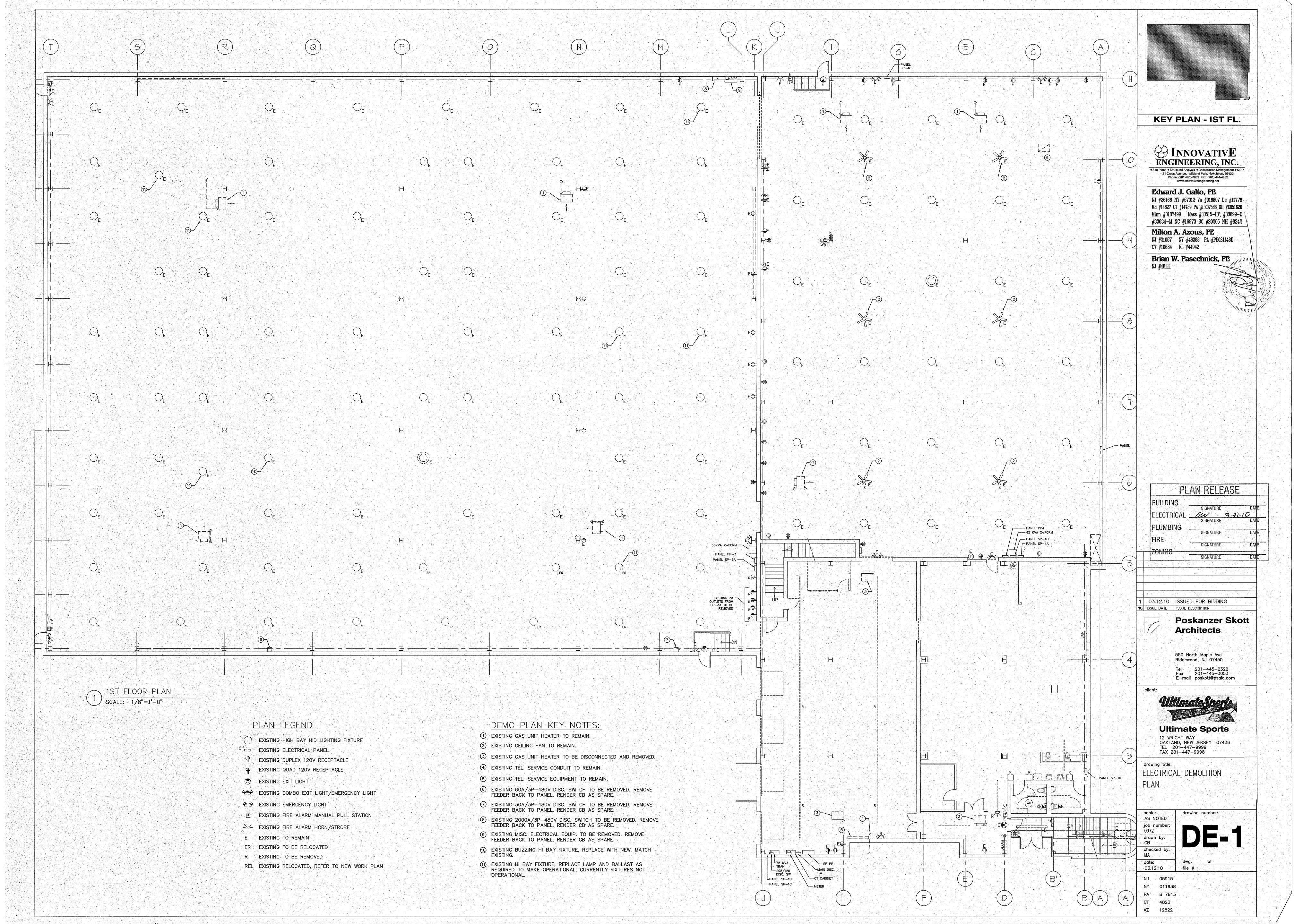
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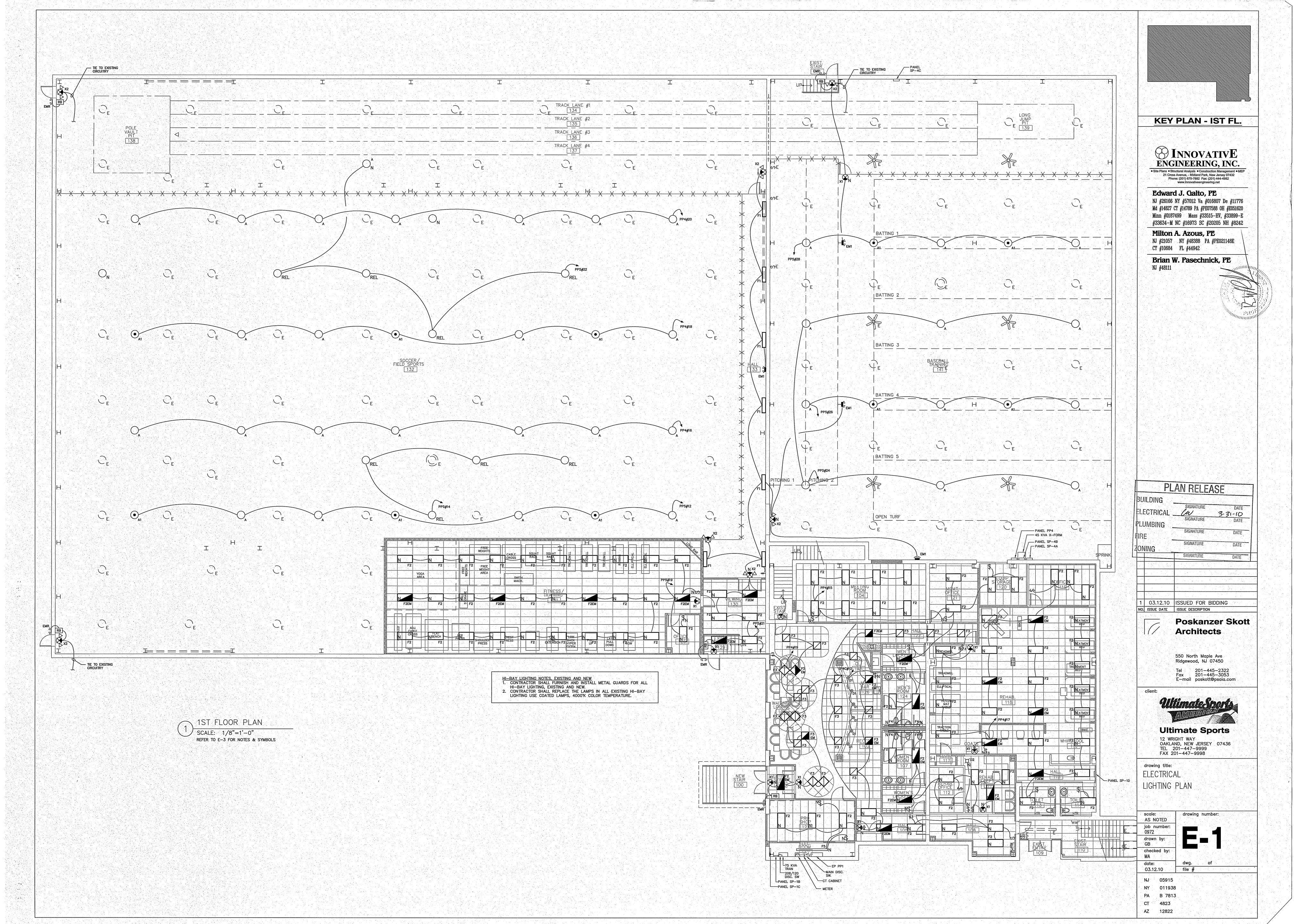
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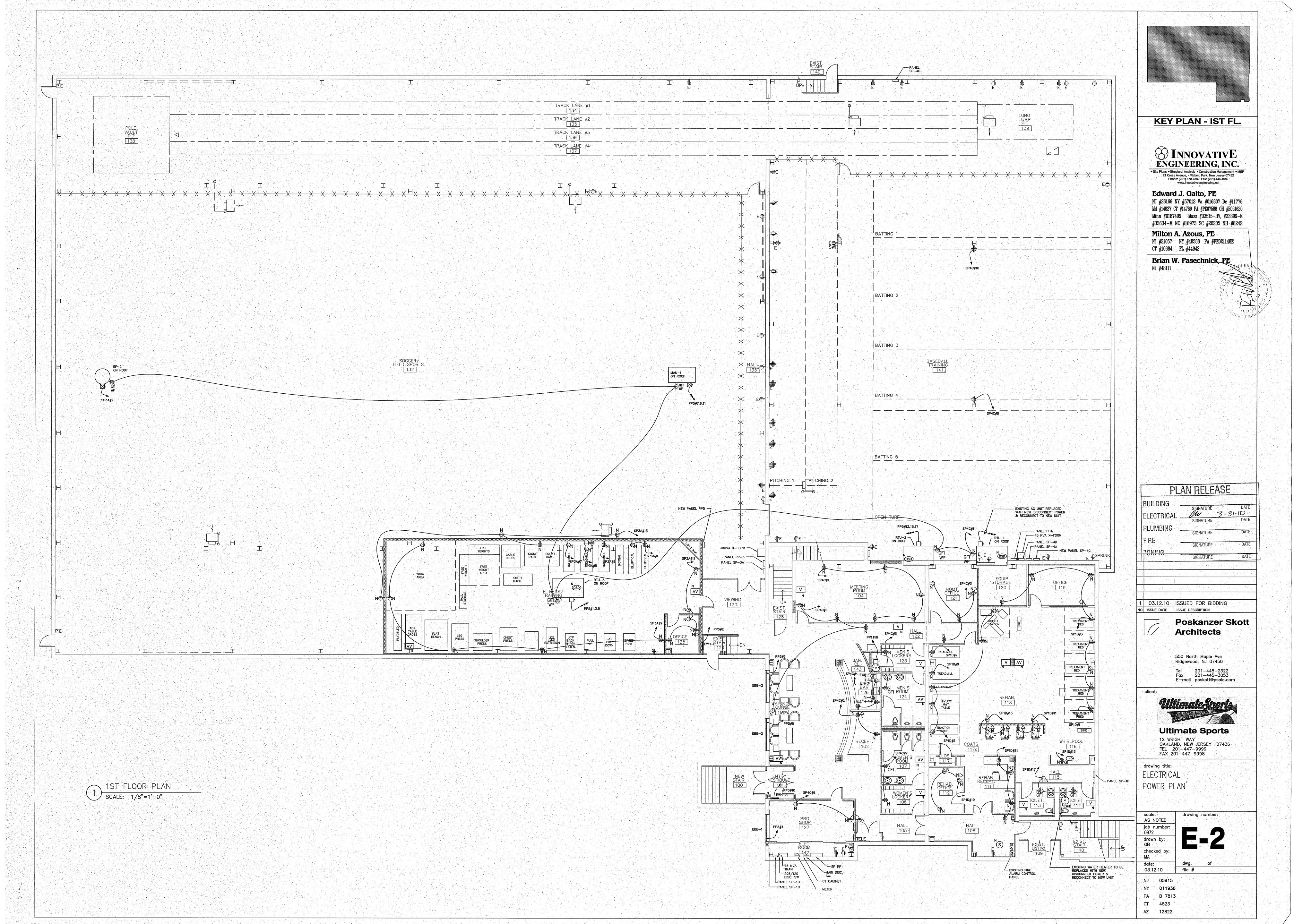
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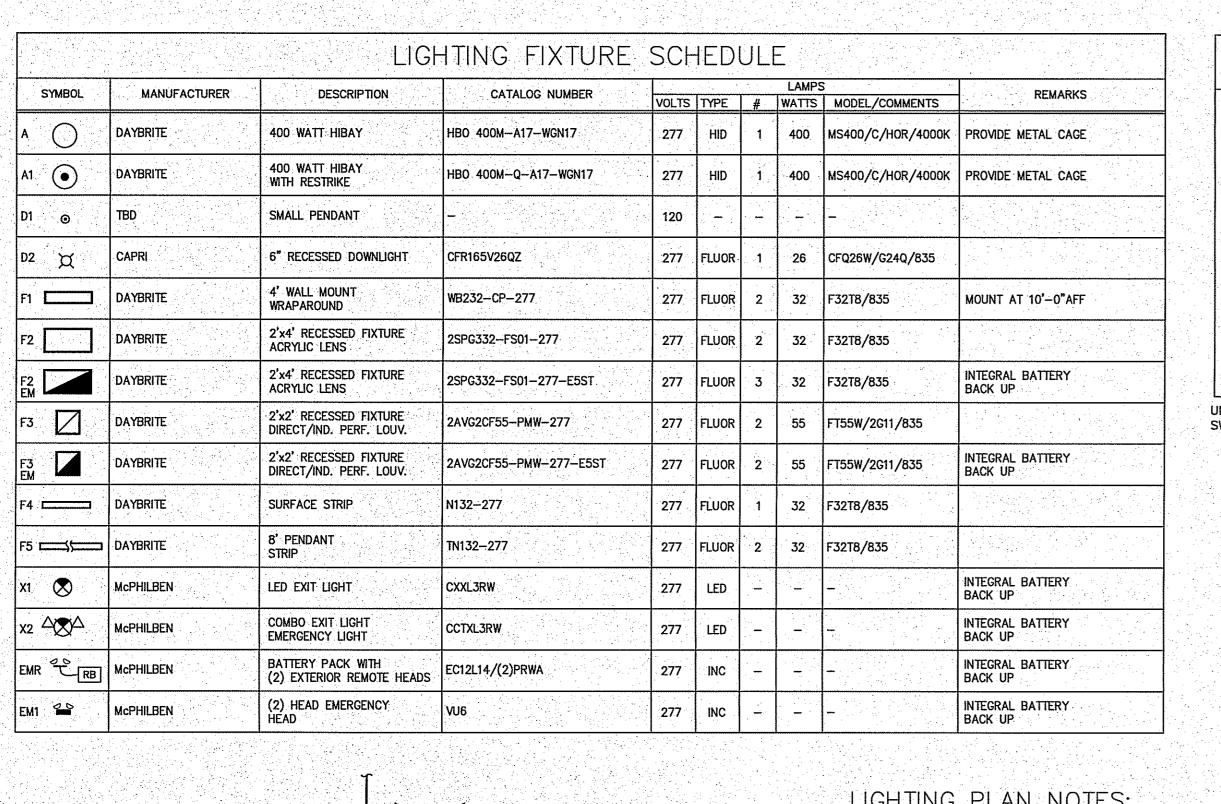
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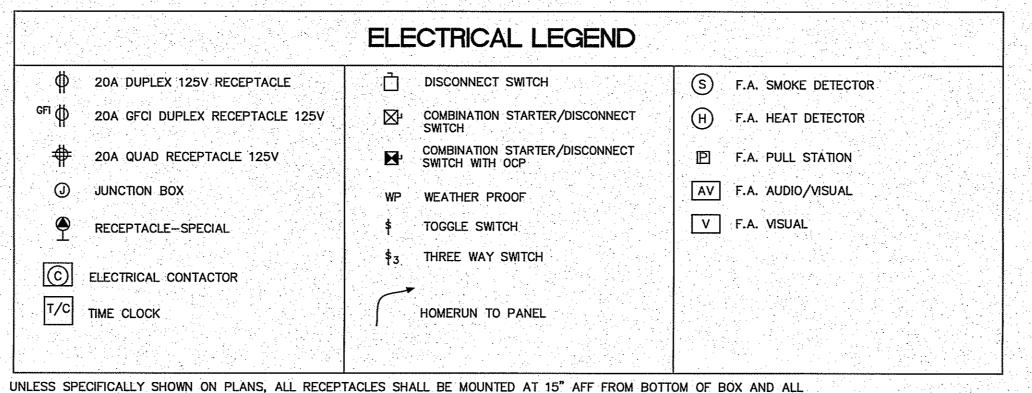




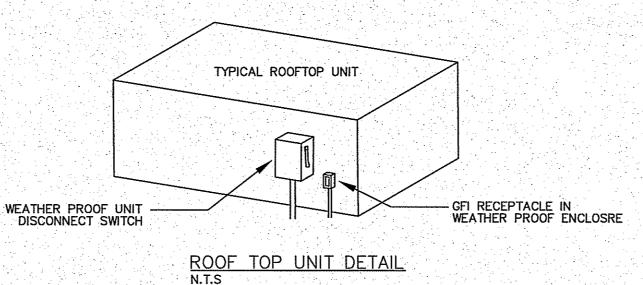


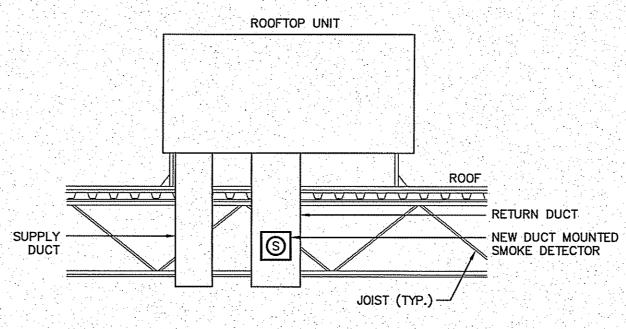




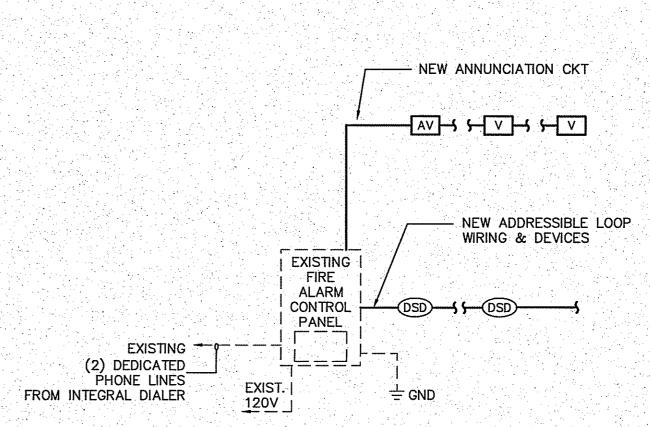


SWITCHES MOUNTED 44" AFF TO CENTERLINE OF BOX.





ROOFTOP UNIT SECTION



# FIRE ALARM SCHEMATIC DIAGRAM

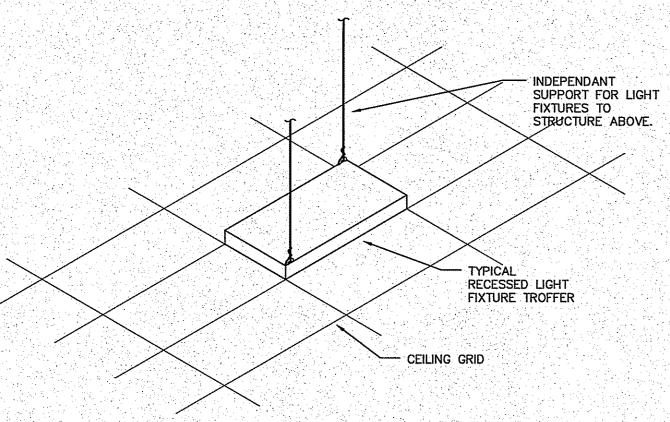
NOTES:

1. FOR EXACT QUANTITY AND LOCATION OF ALL NEW DEVICES REFER TO FLOOR PLANS.

2. EXACT WIRE SIZE & QUANTITY SHALL BE PER SYSTEM MANUFACTURERS RECOMMENDATIONS. ALL WIRING SHALL BE RUN CONCEALED ABOVE THE CEILING AND/OR IN WALLS. SHALL HAVE INSULATION TYPE FPLP AS A MINIMUM. WHERE RUN IN EXPOSED AREAS ie. MECHANICAL ROOMS, WIRING SHALL BE RUN IN EMT CONDUIT.

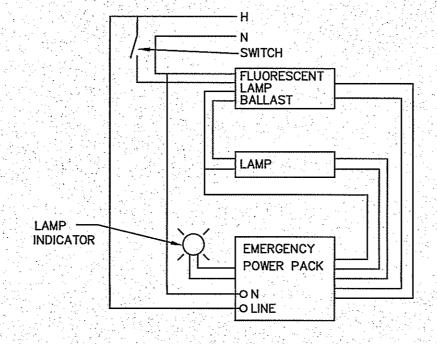
3. ENTIRE INSTALLATION SHALL BE IN CONFORMANCE WITH NFPA, NEC.

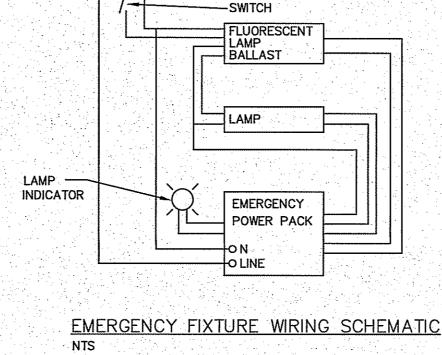
4. CONTRACTOR SHALL FURNISH AND INSTALL THE REQUIRED CONNECTIONS TO EXISTING FIRE ALARM SYSTEM AS SHOWN ON PLANS. FIRE ALARM WORK SHALL INCLUDE ALL DEVICES, WIRING, CONDUIT, BOXES, PROGRAMMING ETC.



LIGHTING PLAN NOTES:

- (1) COORDINATE EXACT LOCATION & MOUNTING OF ALL LIGHTNG FIXTURES WITH ARCHITECTURAL REFLECTED CEILING PLANS.
- (2) PROVIDE SEPERATE HOT LEG TO ALL LIGHTING FIXTURES CONTAINING EMERGENCY BATTERY INVERTER. REFER TO DETAILS FOR SWITCHING THE
- 3 EM DESIGNATES EMERGENCY LIGHTS EQUIPPED WITH 90 MINUTE EMERGENCY BATTERY BALLAST PACKS.
- (4) ALL BULBS 3500'K, 82 TO 85 CRI UNLESS OTHERWISE SPECIFIED.
- (5) ALL FLUORESCENT FIXTURES TO HAVE ELECTRONIC BALLASTS MATCHED TO SELECTED BULB AND IN COMPLIANCE WITH ASHRAE/IES 90.1.
- 6 N.A. PHILIPS BULB NUMBER UNLESS OTHERWISE NOTED.
- (7) ELECTRICAL CONTRACTOR TO COORDINATE ALL LIGHTING FIXTURE TRIMS WITH CEILING TYPES. SEE ARCHITECTURAL DRAWINGS FOR CEILING INFORMATION.
- 8 PROVIDE ALL SEISMIC CLIPS AND/OR BRACING AS REQUIRED.





GRID MOUNTED LIGHT FIXTURES DETAIL NTS

480 / 277 VOLTS

ACTIVE EXIST.

2.5 LTG. MEETING

2.7 LTG. REHAB.

3.5 LTG. LOUNGE

SPARE

SPARE

SPARE SPARE

3 Ø 4 WIRE+GND

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.9	RECEPS. OFFICE	3	20A	<del> </del>	H		_	20A		ACTIVE EXIST.	-
.7	RECEPS. BIODEX	5	20A		$\Box$		<u> </u>	20A	6	ACTIVE EXIST.	_
1.0	RECEPS. TREADMILL	7	20A				}	20A	8	ACTIVE EXIST.	-
1.0	RECEPS. TREADMILL	9	20A					20A	10	ACTIVE EXIST.	-
.5	RECEPS. WORK STA.	11	20A	<u> </u>				20A	12	ACTIVE EXIST.	<u> </u>
.5	RECEPS. WORK STA.	13	20A			<u> </u>	\	20A	14	ACTIVE EXIST.	-
1.0	RECEPS. WHIRLPOOL	15	20A		H		_	20A	16.	ACTIVE EXIST.	_
.5	RECEPS. TOILET	17	20A		Н	_		20A	18	ACTIVE EXIST.	-
.5	RECEPS. OFFICE	19	20A	<u> </u>	Н			20A	20	ACTIVE EXIST.	-
.7	RECEPS. RECEPTION	21	20A		H		_	20A	22	ACTIVE EXIST.	<u> </u>
_	SPARE	23	20A	-	Н	$\exists$		20A	24	SPARE	
_	SPARE	25	20A		日			20A	26	SPARE	-
. <del>-</del> .	SPARE	27	20A					20A	28	SPARE	-
-	SPARE	29	20A		日			20A	30	SPARE	-

**EXISTING PANEL PP4** 

9 20A -

7 20A — ~

SURFACE 150 AMP 3 POLE INTEGRATED EQUIPMENT

MOUNTING ☐ MCB ■ MLO RATING EXIST. A. SYM.

20A 8

\_\_\_\_\_\_\_ 20A 10

ACTIVE EXIST.

SPARE

SPARE

SPARE

SPARE SPARE

SPARE SPARE

		E)	(IS	TING	P	Al	VEL (	SP(	<b>3A</b>		
	/ 208         VOLTS         SURFA           4         WIRE+GND         MOUNT			100 A		. —	POLE I MLO			GRATED EQUIPMENT ING <u>10,000</u> A. SYM.	
KVA	LOAD SERVED	NO.	OCP	ø	Αø	Βø	С	0CP	NO.	LOAD SERVED	KVA
.8	RECEPS. ELLIP.	1	20A	<u> </u>			_	20A	2	EXHAUST FAN	1.0
1.0	RECEPS. TREADMILL	3	20A	{			₹	20A	4	SPARE	_
1.0	RECEPS. TREADMILL	5	20A					20A	6	SPARE	_
1.0	RECEPS. TREADMILL	-7	20A					20A	8	SPARE	_
.9	RECEPS. FITNESS	9	20A					20A	10	ACTIVE EXIST.	_
.9	RECEPS. OFFICE	11:	20A					20A	12	ACTIVE EXIST.	
.5	RECEPS. CONV.	13	20A	_				20A	14	ACTIVE EXIST.	-
	SPARE	15	20A					20A	16	ACTIVE EXIST.	_
·	SPARE	17	20A		Е	Ш		20A	18	ACTIVE EXIST.	L-
· —	SPARE	19	20A	<u> </u>				20A	20	ACTIVE EXIST.	_
_	ACTIVE EXIST.	.21	20A		Н			20A	22	ACTIVE EXIST.	_
	ACTIVE EXIST.	23	20A			Н		20A	24	ACTIVE EXIST.	-
_	ACTIVE EXIST.	25	20A	_~_				20A	26	ACTIVE EXIST.	_
_	ACTIVE EXIST.	27	20A	_^_	Н			20A	28	ACTIVE EXIST.	_
_	ACTIVE EXIST.	29	20A			Н	<u> </u>	20A	30	ACTIVE EXIST.	_

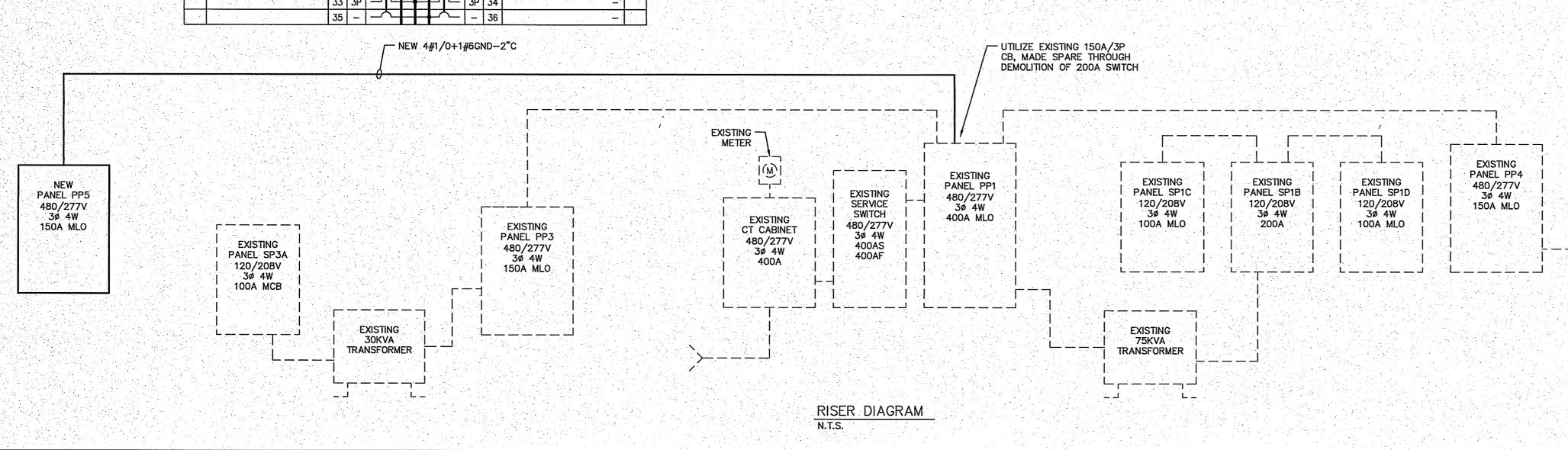
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480					) A	÷.,		POLE	1		GRATED EQUIPMENT	
<u>3</u> Ø	4 WRE+GND MOUNT	ING.		Ш	MC	В.		MLO		KAI	ING <u>EXIST.</u> A. SYM.	
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	TRANSFORMER	1	00A	1	acksquare			$ \uparrow$	125/	2	SPARE	-
		3	3P		<b>\</b> _			<del>-</del>	3P	4	+	-
. 1		5	,	_	5_		F			. 6		_
	LTG. BASEBALL	7	20A	_	$\overline{}$			7	20A	8	LTG. BASEBALL	
	LTG. BASEBALL	9	20A		7_			<u> </u>	20A	10	LTG. BASEBALL	
*	LTG. BASEBALL	11	20A		<u> </u>		H	_	20A	12	WH LOBBY	
	LTG. BASEBALL	13	20A	_	$\mathcal{L}$	F	F	\	20A	14	TOILET HTR.	
	LTG. BASEBALL	15	20A	_	<u> </u>		$\vdash$	7	20A	16	WATER HEATER	
	LTG. BASEBALL	17	20A	_	$\overline{}$	F	$\Box$	$\sim$	20A	18	STAIRWELL LTG.	
	SPARE	19	60A	_	<u> </u>			<u></u>	150/	20	NEW PANEL PP5	
		21	ЗР		$\overline{}$			<del></del>	.3P	22		
		23	_		┖		$\Box$	$\bot \land \bot$		24		
	EXIST.	25	80A		$\overline{\Gamma}$			<u></u>	150A	26	PP3	
		27	3P		二			<b> </b> 木	3P	28		<b> </b>
 		29	_	_	┖				1-	30		<u> </u>
	EXIST.	-	100A		<u> </u>			<u> </u>	1504	32	PANEL PP4	
		33	ļ		乀				30	├		<b></b>

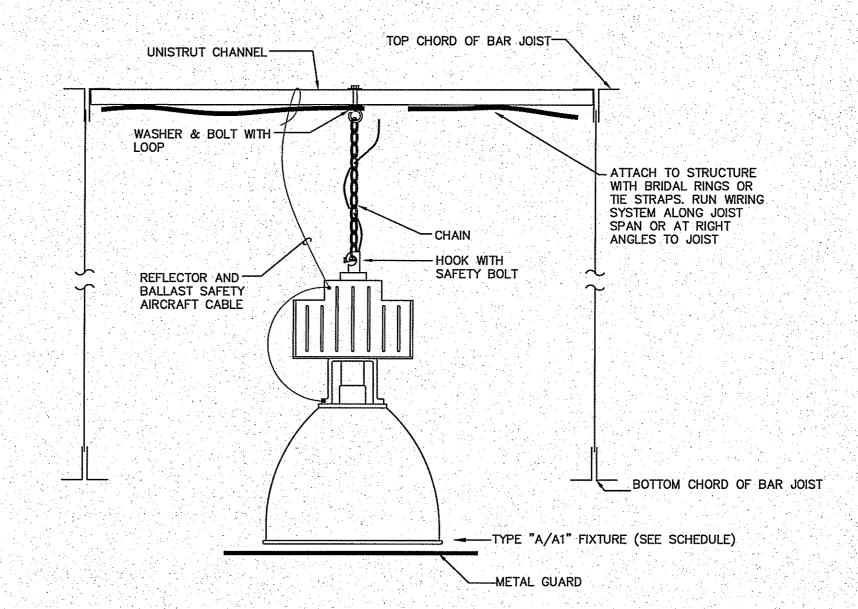
480 3 ø	· /				MC			POLE MLO			GRATED EQUIPMENT ING <u>44,000</u> A. SYM.	
KVA	LOAD SERVED	NO.	OCP		ø	A ØE	øC		OCP	NO.	LOAD SERVED	ΚV
6.0	RTU-3	1	35A	_	7		$\blacksquare$		20A	2	WALL HEATER	2.0
6.0	3#8+1#10GND	3	3P	1	$\overline{}$	$\vdash$	$\blacksquare$	<u> </u>	20A	4	EBB	2.0
6.0		5	_	1	/		1		20A	6	EBB	1.5
.4	MAU-1	7	20A		<u> </u>		$\blacksquare$	<u>-</u>	20A	8	EBB.	2.0
.4	3#12+1#12GND	9	3P	1	$\overline{}$			<u> </u>	20A	10	WALL HEATER	4.0
.4	<u>-</u>	11	-	٦	Ź		1	7	20A	12	LTG. SOCCER	3.2
7.5	RTU-2	13	40A	1	了	$oxed{H}$	$\blacksquare$		20A	14	LTG. SOCCER	2.3
7.5	3#8+1#10GND	15	3P	٦	7	$\vdash$	-	<u> </u>	20A	16	LTG. SOCCER	3.2
7.5	•••	17	_		7		1	<u> </u>	20A	18	LTG. SOCCER	3.2
1.2	LTG. FITNESS	19	20A		Ĺ	$\blacksquare$	-	<u> </u>	20A	20	LTG. SOCCER	3.2
1.2	LTG. VIEWING	21	20A		$\overline{}$	$oxed{oxed}$	$\exists$		20A	22	LTG. SOCCER	2.3
— ··	SPARE	23	20A		<u> </u>	$\Box$	1		20A	24	LTG. BASEBALL	2.7
-	SPARE	25	20A				$\exists$		20A	26	LTG. BASEBALL	2.7
_	SPARE	27	20A			H	$\mp$		20A	28	LTG. BASEBALL	2.7
- 1	SPARE	29	20A		/		1	$\overline{}$	20A	30	SPARE	_

			NE	W P	41	ΙE	L SP	4C			
<u>120</u> <u>3</u> ø		RFACE UNTING			-		POLE I MLO			GRATED EQUIPMENT ING 10,000 A. SYM.	
KVA	LOAD SERVED	NO.	OCP	ø	Αø	Βø	C .	OCP	NO.	LOAD SERVED	KVA
.9	RECEPS. MEETING ROOM	1 1	20A	>			4	20A	-2	RECEPS. RECEPTION	.7
<b>.</b> 5.	RECEPS. MNG. OFFICE	3	20A	>				20A	4	RECEPS. JUICE	.5
.5	RECEPS. TOILET	5	20A	>		Ι	_	20A	6	RECEPS. CONVEN.	.7
.5	RECEPS. TOILET	7	20A	}	Ш			20A	8	RECEPS. BATTING	.4
.5	RECEPS. PRO SHOP	9	20A	_~	$\vdash$			20A	10	RECEPS. BATTING	.4
.7	RECEPS. RTU	11	20A			H		20A	12	PENDANT LIGHTS	.6
1	SPARE	13	20A	7				20A	14	SPARE	T -
'	SPARE	15	20A					20A	16	SPARE	_
	SPARE	17	20A				$- \sim$	20A	18	SPARE	-
_	SPARE	19	20A	$-\sim$				20A	20	SPARE	-
-	SPARE	21	20A		H			20A	22	SPARE	T =
	SPARE	23	20A		Н	$\Box$	-	20A	24	SPARE	-

VENTILATION 8KVAx1.0=8.0KVA AIR COND. <u>26.3KVAx1.0-26.3KVA</u> TOTAL 81.5KVA

@480V 3ø 4W=98.0AMPS



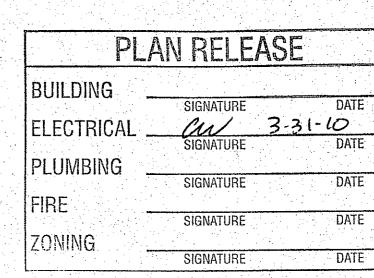


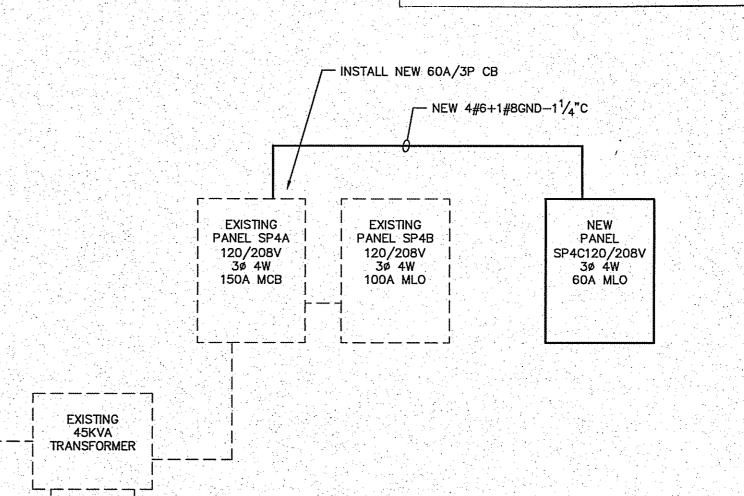
1. BOLT HOOK TO UNISTRUT. DOUBLE NUT ALL THREADED CONNECTIONS. PROVIDE HOOK AND LOOP TO SUPPORT FIXTURE BY MEANS OF STEEL CHAIN. SUPPORT FIXTURE FROM UNISTRUT, COORDINATE METHOD OF FASTENING UNISTRUT TO TOP CHORD OF JOIST WITH STRUCTURAL ENGINEER PRIOR TO INSTALLATION. DO NOT DRILL OR WELD TO JOIST. ASSEMBLY SHALL SUPPORT FOUR TIMES THE FIXTURE WEIGHT.

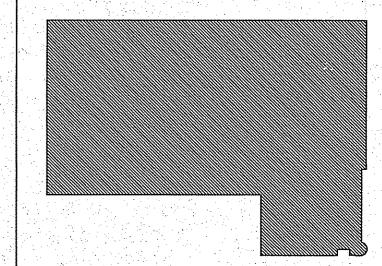
2. WHERE FIXTURES OCCUR DIRECTLY BELOW BAR JOIST I.E. MAIN CENTER AISLE, PROVIDE JOIST CLAMP WITH HOOK AND CHAIN FOR FIXTURE MOUNTING TO JOIST.

3. CONTRACTOR SHALL PROVIDE ALL HID DOWN LIGHTING IN ACCORDANCE WITH N.E.C. ARTICLES 410.3 a, b, AND c.

TYPE A/A1 DETAIL







**KEY PLAN - IST FL.** 

**⊗** InnovativE ENGINEERING, INC. 

Edward J. Galto, PE NJ #26166 NY #57012 Va #016807 De #11776 Md #14827 CT #14789 PA #PE07588 OH #E051620 Minn #0187499 Mass #33515-HV, #33899-E #33634-M NC #16973 SC #20205 NH #8242

Milton A. Azous. PE NJ #21057 NY #48388 PA #PE021148E CT #10684 FL #44942

Brian W. Pasechnick, PE NJ #48111

1 03.12.10 ISSUED FOR BIDDING NO. ISSUE DATE ISSUE DESCRIPTION

> **Poskanzer Skott Architects**

550 North Maple Ave Ridgewood, NJ 07450 Tel 201-445-2322 Fax 201-445-3053 E-mail poskott@psaia.com



12 WRIGHT WAY OAKLAND, NEW JERSEY 07436 TEL 201-447-9999 FAX 201-447-9998

drawing title: ELECTRICAL SCHEDULES & RISER DIAGRAM

AS NOTED job number: 0972 drawn by: GB checked by: date: 03.12.10 file #

NJ 05915 NY 011938

PA B 7813 CT 4823 AZ 12822

#### ELECTRICAL SPECIFICATIONS

#### 1.GENERAL CONDITIONS

A. It is not intended that the plans or specifications show or state every detailed requirement of the work, but rather that they furnish adequate information for an experienced Contractor to make a completely acceptable installation. B. The Architectural General Conditions form a part of these specifications whether attached

hereto or not and shall be carefully examined before submitting proposal. Where General Conditions clauses are repeated in this section, it shall be understood as calling special attention to them, or as a further gualification and shall not be assumed as omitting any other clauses. No General Conditions referring to work included herein shall be considered as waived unless specifically stated herein.

#### 2. NOTICE TO BIDDERS (CONTRACTORS)

A. No Utility Company Involved: Before submitting proposal, examine all plans relating to this work, verify all governing conditions at the site, become fully informed as to the extent and character of the work required and its relation to existing conditions and work of others. No consideration will be granted for any alleged misunderstanding of the materials to be furnished or work to be done, it being understood that the submission of a proposal is an agreement to all conditions referred to herein or indicated on the plans.

B. Special attention shall be given to the fact that the building will remain occupied during the entire course of the work. All work shall be carefully coordinated and scheduled to prevent undue inconveniences on any persons, etc. All work which will not be permitted during normal working hours due to scheduling, disruption of building occupancy, the nature of same, the disturbance caused by same, the interruption of service to accomplish same, etc., shall be scheduled to be performed on overtime at no additional cost.

#### 3. PROPOSAL

A. Proposal must include everything required to provide a complete installation as contemplated in the specifications and plans, whether specifically shown and specified or not. Included are all labor, equipment, materials, light, tools, scaffolding, transportation, insurance, sales tax, permits, certificates, inspections, testing equipment, etc., necessary for the complete installation of everything described, shown or reasonably implied.

#### 4. SCOPE OF WORK

A. Review all plans and specifications relative to this work, particularly those sections describing electrically operated equipment and become familiar with work called upon therein to do. At the conclusion of the work, be responsible for the proper wiring up and functioning of all electrically operated equipment furnished and/or installed under this contract.

B. It is the intention of these specifications and plans to furnish enough information for the Contractor to provide and place in service a complete electric system and installation which shall include but not necessarily be limited to the following: -Obtaining and paying for all necessary permits, inspections and certificates required in

connection with this work. -All delivery costs for materials, etc., either during or after normal working hours.

-Temporary light and power. -Modifications to existing distribution equipment.

-New panels as indicated in schedules on plans.

-Modifications to existing panels as noted and/or required.

-Feeders, connections and circuits. -All outlets, devices, wires, plates, etc.

-Connection and proper operation of all motors, machines, controllers, etc., furnished by others and installed under this contract.

-New lighting fixtures and lamps.

-Relocation and/or retention of existing lighting, outlets, devices, circuits, etc., as required.

-Exit and night light circuits. -Telephone empty raceways, sleeves and power supply outlets as noted and/or required by the telephone company.

-Alarm system raceways, cables, outlets, power supplies, etc. -Grounding.

-Cutting and penetrating the structure.

-Demolition and removal of existing electrical equipment not indicated or required for reuse. -Written guarantee and warranty for all materials and workman ship.

#### 5. WORK NOT INCLUDED

A. The following items are related to this contract but are not part of the scope of work: Furnishing of all appliances, machines and other special equipment

-Furnishing and installing of telephone cables and equipment. -Furnishing and installing of signal systems cables and equipment. -Furnishing and installing of computer system control cables.

-Furnishing of all motors, fans and motor controllers. -All mechanical system control wiring, except as otherwise noted on plans.

### 6. STAGING

A. The work of this Contractor will be performed in stages as determined by the Architect. Certain portions of the work and areas in which the work will progress may require the installation of circuits and outlets to be utilized to facilitate such staging. This Contractor shall be required to install, maintain, disconnect and remove all such temporary items in accordance with the progress and development of the project. In no way shall such temporary facilities be permitted to interfere with the permanent installation of any trade or to relieve this Contractor of any responsibility to perform any of the other work required under these specifications or the accompanying plans.

### 7. LAWS. ORDINANCES AND REGULATIONS

A. Nothing contained in these specifications or plans shall be so construed as to conflict with any local, municipal, state, utility company and National Board of Fire Underwriters' regulations governing the installation of the work specified herein. All such laws, ordinances and regulations, where they apply to this work, are hereby incorporated into and made a part of these specifications. All such requirements shall be satisfied at no additional expense to the Owner.

### 8. APPROVALS, SUBSTITUTIONS, ETC.

A. Any discrepancies between these specifications and the accompanying plans, or these specifications and plans and the specifications and plans of other trades, shall be brought to the attention of the Architect prior to the submitting of a bid. Failure to comply with the above shall allow the Architect to make a final and binding decision at a later date and no allowance will be given if the more expensive of the items in question is selected.

B. If substitutions for specified equipment are desired, a list of such requests shall be submitted with the base bid, including the credit or extra involved. If no such list is submitted, it shall be understood that all materials and equipment specified will be furnished

C. All information pertinent to the adequacy and adaptability of the proposed substitute items shall be submitted to the Architect for approval. No proposed substitute items shall be ordered or constructed prior to receiving written approval from the Architect D. "Approved equal" means any device, materials or equipment considered by the Architect to be

equivalent in quality, construction, performance, finish and appearance to the specified. E. "Furnish and install" means purchase, arrange delivery, unload, install connect, test and leave ready for operation. F. Six sets of shop drawings shall be submitted to the Architect for approval prior to ordering or fabrication for all, panels, transformers, lighting fixtures, time clocks, dimmers, smoke

### 9. COORDINATION OF WORK (AND TRADES)

detection system, fire alarm system, generator, ATS, UPS, etc.

A. The work called for in these plans and specifications shall be coordinated with work of all other trades, and shall be so arranged that there will be no delay in the proper installation and completion of any part or parts of each respective work wherein it may be interrelated with that of this contract so that generally all work can proceed in its natural sequence without

unnecessary delay B. Exposed piping shall be installed to provide the maximum headroom but in no case shall piping be installed no less than seven feet above the finished floor. Piping installed in areas where hung ceilings or other furred spaces are indicated shall be installed concealed.

(Contractor is referred to the architectural plans for locations of hung ceilings.) C. Where work is to be concealed, care shall be taken to insure that it does not project beyond the finished lines of floors, ceilings or walls.

D. Should any work require subsequent modification or relocation to avoid interferences or conflicts with other work, such changes shall be made without additional cost to the Owner. E. Exact location of all equipment, panels, pull-boxes, transformers, feeders, fixtures, etc., shall be approved by the, Architect, and Owner prior to the installation of same.

F. Exact location and method of connection into existing risers, panels, feeders, pull-boxes, etc., shall be approved by the Architect and Landlord prior to the installation of same.

#### 10. COOPERATION WITH OTHER CONTRACTORS

A. Confer with all other Contractors engaged in the construction of the project whose work might in any way affect this installation and arrange all parts of this installation in proper relation to the installation of other Contractors, with the building construction and with the Architectural finish so that it will harmonize in service and appearance and so that there will be no interference with the work of other Contractors.

B. Wherever interferences might occur, before any of the work in question is installed, consult the other Contractors involved and come to an agreement with them as to the exact location and level of piping and/or other parts of this equipment. In the event that a satisfactory agreement cannot be reached, the matter shall be referred to the Architect for settlement and his decision shall be binding.

#### 11. INSPECTIONS, TESTS AND CERTIFICATES

A. After all wiring systems are complete and continuous, they shall be thoroughly tested and all defects shall be corrected prior to installation of lighting fixtures and/or apparatus. B. Make all tests of the various systems as required by the several authorities having jurisdiction over this work and any part of the system which appears faulty shall be put in satisfactory

C. Each entire wiring system shall be made to test free from all short circuits and from grounds and must have insulation resistance between conductors and between conductors and grounds, based upon maximum load, not less than that required by all agencies governing the installation

D. All necessary testing equipment shall be provided under this contract and all tests shall be conducted under the direction of the Architect

#### E. Obtain all certificates of completion and approval required in connection with this work. Pay all costs for such certificates.

#### 12. RECORD DRAWINGS

A. Maintain a careful and complete record of all items installed including exact sizes, locations and circuits, and upon completion of work, deliver to the Owner, a complete set of (reproducible mylars) "as built" drawinas.

#### 13. MATERIALS

A. All materials and equipment shall be new and in good condition and have Underwriter's Laboratories labels.

B. Any materials and/or equipment which the Architect regards as unsatisfactory shall not be installed: other materials or equipment shall be submitted and if it is considered necessary to request particular items by name and/or catalog number, such requests shall be complied with without additional charge.

C. Materials and equipment shall be specified in other paragraphs, noted on plans, or subject to approval, based upon adaptability for intended use.

#### 14. WORKMANSHIP

A. Install conduits carefully and protect against damage, removing all crushed or damaged conduits. Cap or plug ends to protect against dirt or moisture before pulling wires. B. All conduits shall be supported with appropriate hangers at not over 8 foot intervals. Run exposed conduits parallel or perpendicular to walls. Use appropriate fittings for all bends,

C. Provide all locknuts and bushings as required where conduits enter boxes, cabinets, etc. D. Not more than four right—angle bends, or their equivalent, shall be made in conduit between

Leave a drag wire in every spare or empty conduit. F. Nothing shall be done which will in any manner endanger or undermine the structure or any

part thereof G. Provide pull-boxes where indicated and wherever necessary for good workmanship. All unused holes or openings in pull-boxes shall be closed in an approved manner. H. All exterior outlets, devices, fixtures, etc., shall be weatherproof, with gaskets and

non-corrosive parts.

A. All equipment and devices shall be installed so that adequate space is provided for inspection, operation and maintenance. B. Minor deviations from the plans may be required to accomplish this but shall be subject to

approval of the Architect C. Care shall be taken to maintain clearances as required. D. All outlets in equipment rooms shall be located so they are not concealed by equipment or

#### 16. GROUNDING

A. Grounding connections shall be made to the non-conductive carrying parts of all electrical equipment as required. B. Raised floor pedestals and system shall be grounded and bonded per code and manufacturer's recommendations and requirements.

#### C. Transformer and panel grounding conductors shall be firmly secured to building steel by means of approved ground clamps.

### 17. LOSS AND DISTURBANCE

A. Wiring when installed shall not have voltage drop in excess of limitations as established by the several agencies having jurisdiction over this work. Feeder sizes indicated may require increase at various locations if it is determined that actual load is greater than calculated load. B. Total electric load shall be balanced within 10 percent on feeder conductors. Make such adjustments of circuits after systems are put in operation as required to attain said balance. C. Care shall be taken to assure that all equipment with special voltage tolerances are supplied

with service within these limitations. D. Recording voltage and amperage readings shall be taken for a minimum of 24 hours to assure compliance with the above. Charts shall be properly identified including the period of time monitored, the phase of each and the point at which monitoring was accomplished. Such charts shall be delivered to the Architect immediately upon completion.

### 18. ELECTRIC SERVICE

A. Arrangements shall be made for the installation of service enough in advance so that delays in construction or occupancy will not be encountered. B. Current will be supplied from the building system at 277/480 volts, 3 phase, 4 wire, 60

C. Furnish and install all conduits, cables, boxes, cabinets, troughs, splice boxes, connections, etc.. as indicated in plans, or required.

D. The maximum height of any equipment, distribution equipment or panels shall be 7'6" to the top of cabinet and the bottom of any electrical equipment shall not be less than 12" above the finished floor. E. Existing building incoming electric service shall be utilized for this work.

F. Make all necessary modifications, extensions, etc., as noted on plans and/or required.

### 19. TELEPHONE SERVICE

A. Provide all power supply outlets as noted and required by the telephone company for use with its equipment.

B. Provide all empty conduits, sleeves and green-field for telephone company wiring as indicated on plans and as directed in the field by the telephone company authorized Representative. C. Provide all bushings on each end of telephone conduits.

D. Exact extent of work required shall be determined from the Telephone Company Representative prior to commencing work.

### 20. JOB CONDITIONS

A. Where existing wiring and circuiting which is to remain is left exposed by the demolition and removal of partitions and/or hung ceilings, reroute such wiring as required to maintain the circuit continuity.

B. Where existing wiring and circuiting which is to remain is left stubbed up from floor by the demolition and removal of partitions reroute such wiring as required to maintain circuit continuity and cut back conduit below top of finished slab to permit patchina. C. Where existing circuiting is being utilized for connection of new load or is being retained for existing loads and such circuiting is not exactly as indicated on plans, make such modifications

D. Where existing lighting, equipment, wiring, etc., is indicated as remaining and such items interfere with the installation or demolition work of other trades, disconnect, remove, relocate to avoid conflicts, reinstall and reconnect such items as required. E. Where existing lighting, equipment, wiring, etc., is to remain and such is found to be

as may be required to wiring to accomplish the design intent.

defective, make all corrections and replacements necessary to eliminate the defect and put such items in satisfactory operating condition. F. Where existing fixtures are being removed and such removals disturb the circuiting to fixtures which are to remain, provide all necessary modifications and additions to wiring as required to retain service and switch control for remaining fixtures.

### 21. CUTTING AND PATCHING

A. Do all the required cutting of the structure necessary for the installation of this work. No cutting likely to weaken the structure or any part thereof shall be done without the written B. Patching shall be done by the General Contractor.

#### 22. DEMOLITION

A. Do all necessary demolition and removal of existing lighting and electrical equipment as

B. Demolition to be performed after normal working hours where required, due to work of others. or to maintain temporary light and power. C. Reroute and reconnect all circuiting to existing loads which are to remain if same is disturbed by demolition work. Provide new homeruns, if required.

D. Conduits coming up out of floor slab which are to be removed shall be cut back below top

of finished slab to permit patching. E. Disconnect and remove all existing wiring and exposed conduits not being retained or reused. F. Install blank plates on all existing outlets which are to remain but have no devices. Remove all wiring from existing outlets being abandoned as indicated on plans, rerouting same if required, to permit patching over of the architectural surface.

G. Provide extension collars on existing outlets where existing walls, columns, etc., are being laminated or furred-out. H. Relocate existing active outlet boxes, junction boxes, etc., which are rendered inaccessible by new construction.

### 23. TEMPORARY LIGHT AND POWER

A. Provide and maintain all facilities for temporary light and power within the premises and in the construction area during the entire building period.

B. Power shall be obtained from the existing building distribution system.

C. Power shall be obtained from the utility company and installed in compliance with all its requirements. D. Provide necessary materials and labor to make power connections for machines, portable tools, etc., as used by other trades, regardless of size. E. Furnish all labor needed to keep this temporary system energized during the entire standard

period of working time of all trades, plus 15 minutes before and 15 minutes after this time and

overtime as required for any and all trades. F. All materials and equipment of the temporary system shall be removed from the premises progressively as they are no longer needed. G. No outages on any existing lighting and/or power circuits shall be permitted without prior consent of the Owner and Landlord.

### 24. EXISTING PANELS

A. Make all modifications to existing panel bus, bus extensions, feeders, branches, circuits, wiring, connections, etc., as indicated on plans and/or required.

C. Tie-bars shall not be used to create multi-pole circuits. D. Install accurate typewritten directory inside (each) panel door indicating the nature and location of all items.

# 25. NEW PANELS

A. Furnish and install lighting and appliance panels as indicated in schedules on plans, of the circuit breaker type, constructed for a 3 phase. 4 wire, solid neutral, 120/208 OR 277/480 volt systemS.

B. Tie-bars shall not be used to create multi-pole circuits.

G. Install accurate typewritten directory inside each panel door.

B. Replace all defective circuit breakers with new as required.

C. Only one wire shall be installed under each circuit breaker. D. Panel boards shall be mounted in code gauge and size boxes for mounting as indicated on plans, complete with trim, doors and locks, all locks shall be keyed alike. E. All circuit breakers shall be bolt—on type and sitch rated. F. All branch circuits shall be single pole unless specifically noted otherwise on plans.

### 26. EXISTING LIGHTING FIXTURES

A. Retain all existing lighting in greas where no new lighting is indicated. B. Modify existing lighting as noted on plans and/or required where architectural revisions are

being made in existing portions of the premises. C. All existing fixtures which are to remain in place and relocated fixtures shall be thoroughly examined, tested and cleaned. D. Repair and/or replace all broken or defective sockets, ballasts, wiring, diffusers, etc.

E. Replace all existing ballasts in existing fluorescent fixtures being relocated with new electronic type where same do not presently exist, in accordance with code requirements. F. Install new lamps in all relocated fixtures and in all existing fixtures remaining in place. Fluorescent lamps shall be warm white. Incandescent lamps shall be of wattages and types as

G. Provide all new circuits, switches and connections as required to retain service to existing H. All removed fixtures not required for reinstallation shall be delivered to the Landlord at a place within the building as determined by the Landlord. I. This Contractor shall be responsible for the storing and safekeeping of all removed fixtures

original fixture requirements regardless of present lamping.

#### required for reinstallation. 27. NEW LIGHTING FIXTURES

A. All lighting fixtures, canopies, stems, lamps and accessories shall be furnished and installed under this contract in accordance with schedule on plans. B. This Contractor shall be responsible for the unloading, storing and safekeeping of fixtures until required for installation. C. Fluorescent lamps shall have color index temperature of 3500 degree K. Incandescent and other lamps shall be as noted or as recommended by the fixture manufacturers.

# 28. FEEDERS AND CIRCUITS

A. Provide any and all materials, equipment, labor, etc., necessary for the complete installation of all branch circuits to equipment, receptacles and lighting outlets, and wiring for control equipment furnished by others, etc. B. Where required, furnish and install safety type disconnect switches, fused or un-fused, with

proper poles and neutrals, as each case requires, if the equivalent is not existing or furnished by others, and is necessary to conform to code. C. Provide matching receptacles for all equipment furnished with cord and plug. D. Make direct connections as required to all equipment not furnished with cord and plug. E. Where starting switches are located at places remote from the machines they control, provide indicating lights at these starting switches and identify them with permanent name plates. F. Where new pull—boxes are indicated as being installed in existing feeders cut existing conduits

and cables and provide all new supports, mechanical connections and splices as required.

### 29. CONDUITS

A. All conduits in slabs and outdoors in trenches shall be PVC Schedule 40.

B. Conduits run exposed shall be EMT C. MC Cable shall be used in hung ceilings and partitions as permitted by code, labor agreements, the Owners, etc. D. Conduits and branch wiring shall be run concealed in hung ceilings and partitions where

E. Seal-tight shall be used under raised floor.

### 30. CONDUCTORS

water-tight joint.

A. All conductors may be type THWN. All sizes indicated on plans are based upon THW copper

B. No aluminum conductors shall be used.

C. All conductors and phase legs including neutrals and ground shall be properly color—coded in all panels, troughs, cabinets, and boxes. D. All conductors shall be minimum No. 12 unless specifically noted otherwise on plans or

elsewhere in these specifications. All 120 volt branch circuits in excess of 100 feet from the panel to the furthest outlet shall be No. 10 throughout. E. All conductors No. 8 and smaller shall be solid: No. 6 and larger shall be stranded. F. Install cable supports in all vertical cable runs per code requirements.

#### G. Install fire—stops on all vertical cables penetrating floor slabs. 31. PIPE SLEEVES, SUPPORTS AND INSERTS

A. Where pipes pass through masonry, concrete walls or floors, set such sleeves as are necessary for the passage of the pipes. B. Sleeves shall not be used in any portion of the building where the use of same would impair the strength of construction features of the building. C. Sleeves passing through walls where subject to leakage shall be caulked to obtain a

### 32. DEVICES

knockouts.

A. All devices shall be firmly screwed to the boxes and shall not depend on the cover to pull them tight.

B. Duplex receptacles shall be specification grade, parallel slot, grounding type. C. Switches shall be specification grade, AC rated quiet type.

D. Lighting switches shall be located on the "strike" side of doors unless specifically directed otherwise.

E. Special receptacles, connectors, etc., shall be as indicated on plans and/or compatible with the plugs intended for use with same.

#### 33. OUTLET BOXES AND COVERS

A. All outlet boxes for interior use shall be galvanized stamped steel furnished with

B. All boxes intended to support lighting fixtures shall be provided with proper means for their attachment.

. Boxes and covers shall be as required by the construction and devices. D. Plates in bathrooms shall be non-metallic. All others shall be as directed by the

. All multi-gang outlets shall be provided with a single plate. Outlets for switches and receptacles in finished spaces shall be recessed.

G. Outlet locations as indicated on plans are only approximately correct and shall be adjusted to architectural details, job conditions or as directed.

H. Boxes for exterior use shall be of the weatherproof cast type with threaded openings. 34. IDENTIFICATION AND TAGGING

A. All safety switches, disconnect switches, panels, cabinets, etc., shall be properly identified with permanent name plates mechanically fastened to front of equipment. B. "Stick-on" type letters or plates shall not be used.

C. All conductors in troughs, pull-boxes, gutters, etc., shall be identified by means of

### 35. CONTROL WIRING

tags indicating both termination points.

furnished by others and requiring same.

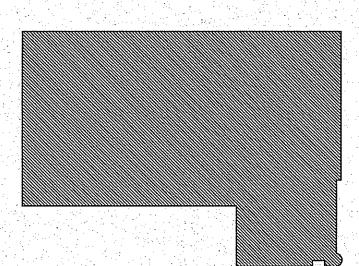
A. All control wiring for various mechanical systems and trades, shall be furnished and

installed by the trades affected. B. Power supplies to operate control devices shall be taken from spare circuits, or nearest twenty—four hour outlet, as determined by the trade involved. C. Furnish and install all necessary control wiring for the proper operation of all equipment

D. Refer to the plans, specifications, detail drawings and Contractors for other trades to determine the exact extent of work required. E. Utilize spare circuits in panels to provide power supplies for control wiring circuits as required.

#### 36. GUARANTEE

Furnish to the Owner, a written guarantee covering all labor, equipment and materials for a period of one (1) year from date of final acceptance of this work, including an gareement to repair and make good any and all defects which may appear in this work or materials during that time which arise from defective, imperfect and inferior materials.



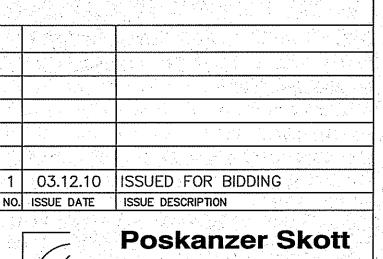
**KEY PLAN - IST FL.** 



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PLAN RELEASE drawing number: file # SIGNATURE 05915

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