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CODED NOTES ☐

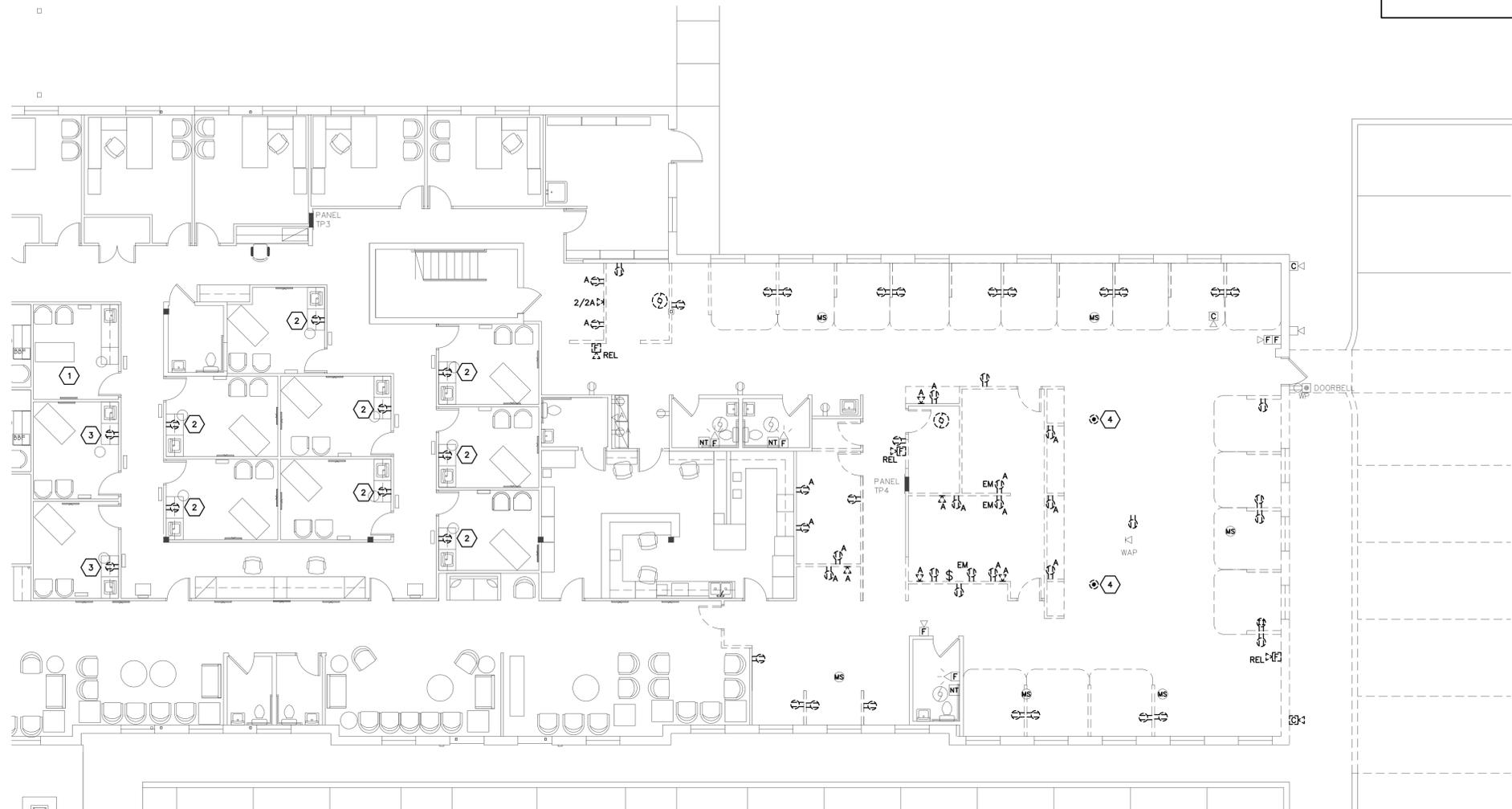
1. MAINTAIN EMERGENCY CIRCUIT SERVING PROCEDURE ROOM (PANEL LC).
2. REMOVE EMERGENCY (RED DUPLEX) RECEPTACLE AND EMERGENCY CIRCUIT BACK TO PANEL LC.
3. REMOVE EMERGENCY (RED DUPLEX) RECEPTACLE AND EMERGENCY CIRCUIT BACK TO PANEL LC. ROOMS CIRCUITED WITH PROCEDURE ROOM SHALL MAINTAIN THE EMERGENCY (RED DUPLEX) RECEPTACLE AND ASSOCIATED CIRCUIT. FIELD VERIFY ROOMS CIRCUITED WITH PROCEDURE ROOM.
4. REMOVE FURNITURE FEED FLOOR BOX. PATCH FLOOR.

LINE TYPE LEGEND

- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.
- - - - - LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.
- LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO BE FURNISHED AND INSTALLED.

DEMOLITION NOTES

1. SEE ARCH DEMO PLANS FOR WALLS AND CEILINGS TO BE REMOVED.
2. REMOVE ALL ELECTRICAL DEVICES AND EQUIPMENT IN ALL WALLS TO BE REMOVED AND IN ALL AREAS WHERE NEW DEVICES ARE SHOWN.
3. REMOVE ALL LUMINAIRES IN ALL CEILINGS TO BE REMOVED AND IN ALL AREAS WHERE NEW LUMINAIRES ARE SHOWN.
4. REMOVE ALL WIRE AND CONDUIT FROM PANELS, DEVICES AND LUMINAIRES TO BE REMOVED COMPLETELY BACK TO SOURCE OR NEXT UPSTREAM EQUIPMENT TO REMAIN. MAINTAIN ALL EXISTING CIRCUITS TO ITEMS THAT ARE TO REMAIN IN USE. PROVIDE CONDUIT AND WIRING TO PROVIDE FEED THROUGH SERVICE TO REMAINING EQUIPMENT.
5. REFER TO HVAC, PLUMBING AND FIRE PROTECTION DRAWINGS FOR ALL EQUIPMENT TO BE REMOVED BY OTHER TRADES. DISCONNECT & REMOVE ELECTRICAL CONNECTIONS TO EQUIPMENT DESIGNATED TO BE REMOVED BY OTHER TRADES.
6. ABANDONED OUTLET BOXES IN PLASTER OR MASONRY WALLS TO REMAIN SHALL BE CLOSED WITH BLANK COVERPLATES. DEVICES IN DRYWALL SHALL BE REMOVED AND PATCHED.
7. REMOVE ALL LOW VOLTAGE CABLING AND CONDUIT FROM DEVICES TO BE REMOVED COMPLETELY BACK TO SOURCE OR NEXT UPSTREAM EQUIPMENT TO REMAIN. MAINTAIN ALL EXISTING CABLING TO ITEMS THAT ARE TO REMAIN IN USE. PROVIDE CONDUIT AND CABLING TO PROVIDE FEED THROUGH SERVICE TO REMAINING EQUIPMENT.
8. DEVICES WITH SUBSCRIPT REL INDICATE DEVICES TO BE RELOCATED.



**FIRST FLOOR
 POWER DEMOLITION PLAN**
 SCALE: 1/8"=1'-0"



E100-19258.DWG 01/24/2020

PRATER
 Engineering Associates, Inc.

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 Dublin, Ohio 43016 FAX: (614) 766 2354

DESIGNED BY G. OWENS	DRAWN BY CSO	CHECKED BY DLP	JOB NUM. 19258
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Consultants:

Project Reference: #19004
**COLUMBUS ONCOLOGY &
 HEMATOLOGY INFUSION
 LAB ADDITION**
 810 JASONWAY AVE.
 COLUMBUS, OH 43214

Date: 01/24/2020

Project Status:
 Planning
 Programming
 Schematic Design
 Design Development
 Construction Documents

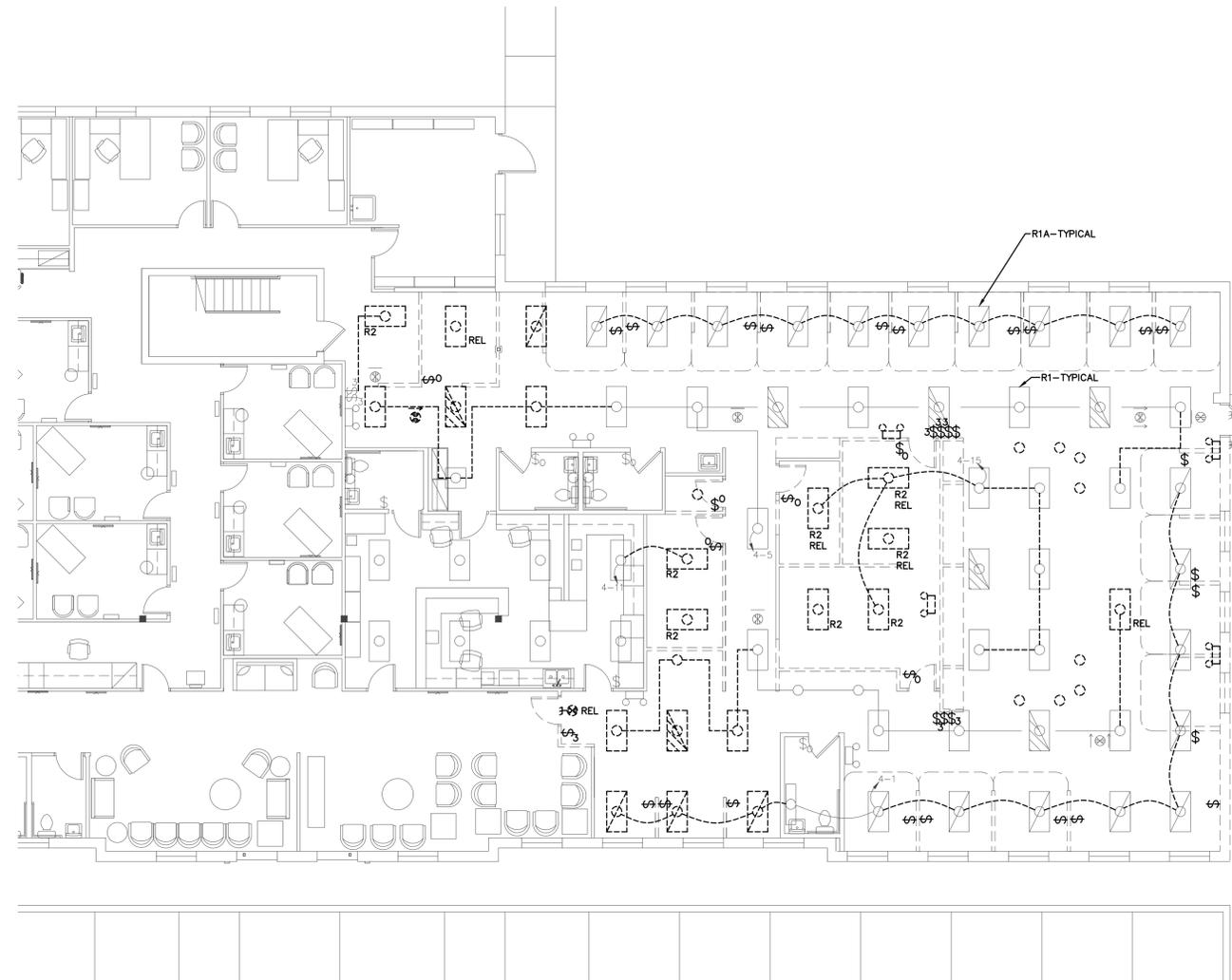
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DEMOLITION NOTES

1. SEE ARCH DEMO PLANS FOR WALLS AND CEILING TO BE REMOVED.
2. REMOVE ALL ELECTRICAL DEVICES AND EQUIPMENT IN ALL WALLS TO BE REMOVED AND IN ALL AREAS WHERE NEW DEVICES ARE SHOWN.
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4. REMOVE ALL WIRE AND CONDUIT FROM PANELS, DEVICES AND LUMINAIRES TO BE REMOVED COMPLETELY BACK TO SOURCE OR NEXT UPSTREAM EQUIPMENT TO REMAIN. MAINTAIN ALL EXISTING CIRCUITS TO ITEMS THAT ARE TO REMAIN IN USE. PROVIDE CONDUIT AND WIRING TO PROVIDE FEED THROUGH SERVICE TO REMAINING EQUIPMENT.
5. REFER TO HVAC, PLUMBING AND FIRE PROTECTION DRAWINGS FOR ALL EQUIPMENT TO BE REMOVED BY OTHER TRADES. DISCONNECT & REMOVE ELECTRICAL CONNECTIONS TO EQUIPMENT DESIGNATED TO BE REMOVED BY OTHER TRADES.
6. ABANDONED OUTLET BOXES IN PLASTER OR MASONRY WALLS TO REMAIN SHALL BE CLOSED WITH BLANK COVERPLATES. DEVICES IN DRYWALL SHALL BE REMOVED AND PATCHED.
7. REMOVE ALL LOW VOLTAGE CABLING AND CONDUIT FROM DEVICES TO BE REMOVED COMPLETELY BACK TO SOURCE OR NEXT UPSTREAM EQUIPMENT TO REMAIN. MAINTAIN ALL EXISTING CABLING TO ITEMS THAT ARE TO REMAIN IN USE. PROVIDE CONDUIT AND CABLING TO PROVIDE FEED THROUGH SERVICE TO REMAINING EQUIPMENT.
8. DEVICES WITH SUBSCRIPT REL INDICATE DEVICES TO BE RELOCATED.



FIRST FLOOR
LIGHTING DEMOLITION PLAN
 SCALE: 1/8"=1'-0"

E150-19258.DWG



01/24/2020

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LINE TYPE LEGEND

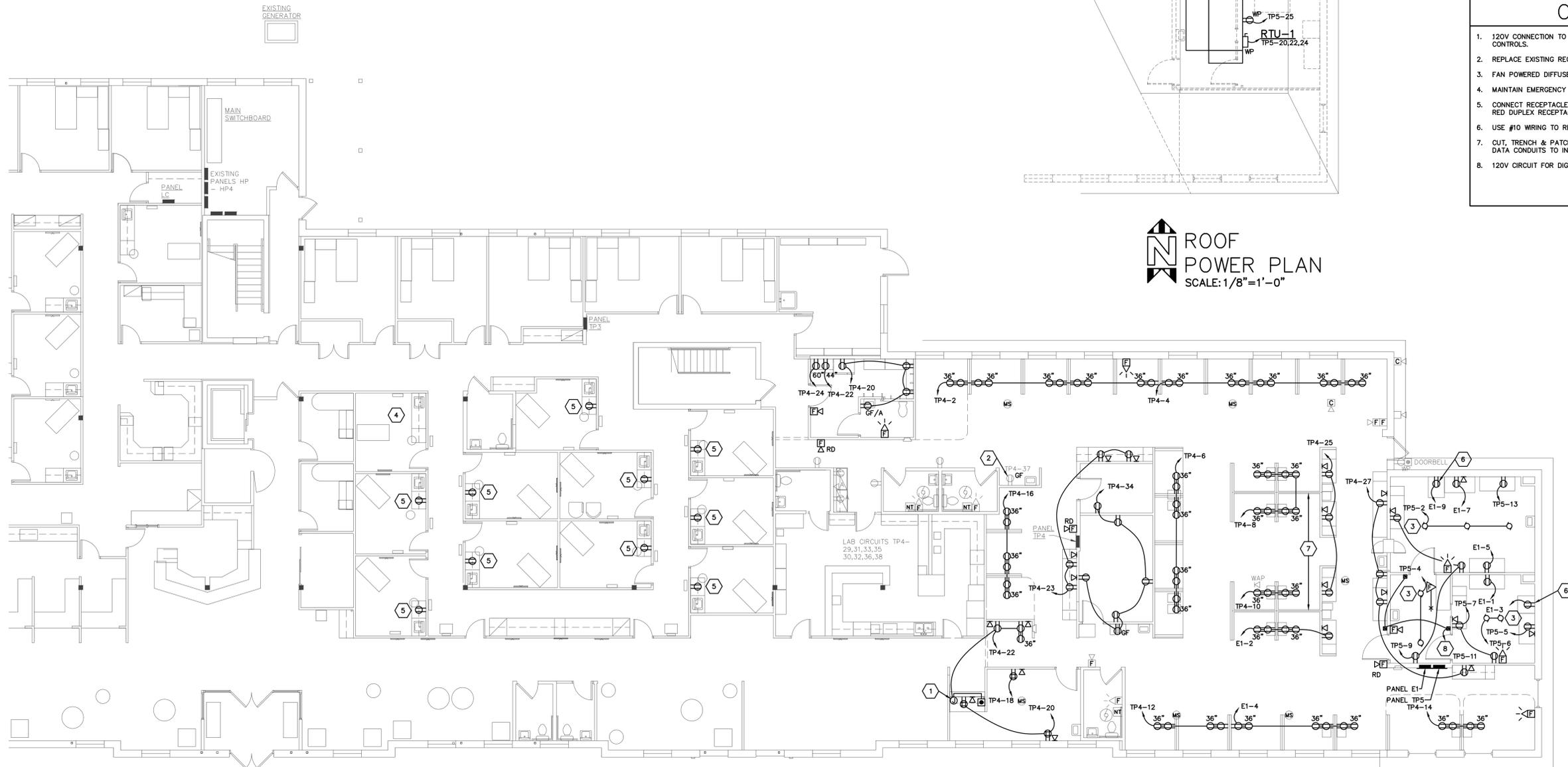
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- LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO BE FURNISHED AND INSTALLED.

GENERAL NOTES

1. DEVICES WITH SUBSCRIPT RD INDICATE RELOCATED DEVICES.

CODED NOTES

1. 120V CONNECTION TO POWERED SHUTTER. INSTALL AND WIRE RAISE LOWER CONTROLS.
2. REPLACE EXISTING RECEPTACLE WITH GROUND FAULT TYPE.
3. FAN POWERED DIFFUSER.
4. MAINTAIN EMERGENCY CIRCUIT SERVING PROCEDURE ROOM (PANEL LC).
5. CONNECT RECEPTACLE TO NORMAL POWER CIRCUIT SERVING ROOM. REPLACE RED DUPLEX RECEPTACLE WITH WHITE OR IVORY RECEPTACLE TO MATCH COVERPLATE.
6. USE #10 WIRING TO REFRIGERATOR FOR FUTURE FLEXIBILITY.
7. CUT, TRENCH & PATCH EXISTING FLOOR SLAB FOR INSTALLATION OF POWER AND DATA CONDUITS TO INFUSION BAYS.
8. 120V CIRCUIT FOR DIGITAL PRESSURE (HVAC) SENSOR.



ROOF POWER PLAN
 SCALE: 1/8"=1'-0"

FIRST FLOOR POWER PLAN
 SCALE: 1/8"=1'-0"

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 810 JASONWAY AVE.
 COLUMBUS, OH 43214

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E200

LINE TYPE LEGEND

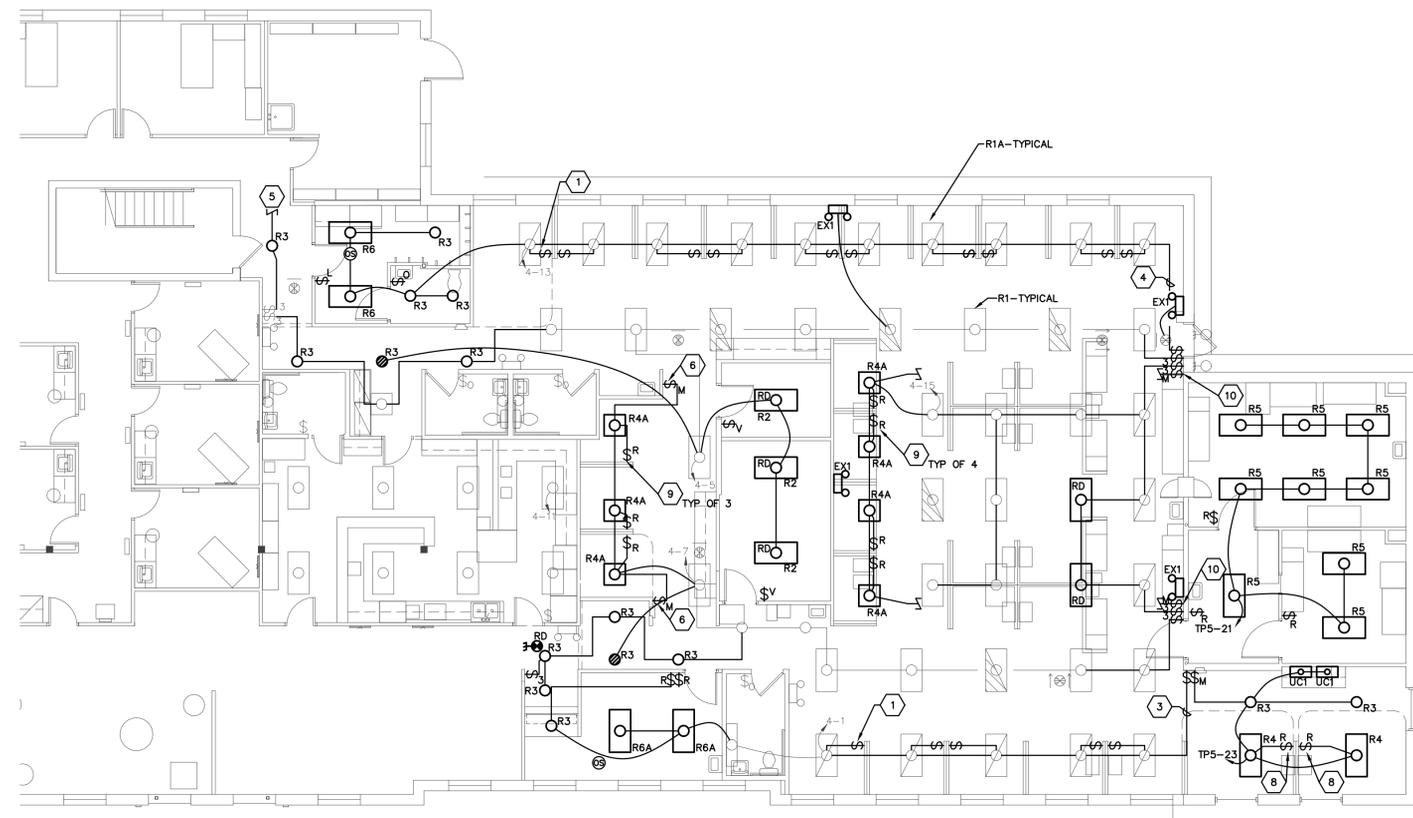
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- LINE TYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO BE FURNISHED AND INSTALLED.

GENERAL NOTES

1. DEVICES WITH SUBSCRIPT RD INDICATE RELOCATED DEVICES.

CODED NOTES

1. SWITCH WIRED TO CONTROL 2 OUTBOARD LAMPS OF (1) R1A LUMINAIRE. TYPICAL ALL BAYS WITH R1A LIGHTS.
2. MANUAL LOW VOLTAGE SWITCH WIRED TO TURN ON (5) R4A TO 100%.
3. SWITCH (5) R1A SINGLE INBOARD LAMP WITH SWITCH LEG SHOWN.
4. SWITCH (10) R1A SINGLE INBOARD LAMP WITH SWITCH LEG SHOWN.
5. CONNECT TO EXISTING CIRCUIT SERVING R2 LUMINAIRE REMOVED FROM THIS AREA.
6. MANUAL LOW VOLTAGE SWITCH WIRED TO TURN ON (3) R4A TO 100%.
7. MANUAL LOW VOLTAGE SWITCH WIRED TO TURN ON (2) R3 & (2) R4 TO 100%.
8. MANUAL LOW VOLTAGE SWITCH FOR ON/OFF RAISE LOWER OF (1) R4 LIGHT.
9. MANUAL LOW VOLTAGE SWITCH FOR ON/OFF RAISE LOWER OF (1) R4A LIGHT.
10. MANUAL LOW VOLTAGE SWITCH WIRED TO TURN ON (4) R4A TO 100%.



FIRST FLOOR
LIGHTING PLAN
 SCALE: 1/8"=1'-0"

Consultants:

Project Reference: #19004
COLUMBUS ONCOLOGY & HEMATOLOGY INFUSION LAB ADDITION
 810 JASONWAY AVE.
 COLUMBUS, OH 43214

Date: 01/24/2020

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DESIGNED BY G. OWENS	DRAWN BY CSO	CHECKED BY DLP	JOB NUM. 19258
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E250

ELECTRICAL SPECIFICATIONS

- GENERAL CONDITIONS: THE BIDDERS WILL EXAMINE ALL DRAWINGS AND READ ALL PARTS OF THE SPECIFICATIONS TO AVOID OMISSIONS, DUPLICATIONS, AND TO ENSURE COMPLETE EXECUTION OF ALL WORK FOR ELECTRICAL CONSTRUCTION.
- GENERAL: THE WORK UNDER THIS CONTRACT SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT AND INCIDENTAL COSTS NECESSARY TO FURNISH AND INSTALL ALL ELECTRICAL WORK, EQUIPMENT, LAMPS, ETC. INDICATED IN THE DRAWINGS AS SPECIFIED HEREIN, OR BOTH.
- SCOPE: FURNISH LABOR, MATERIALS, TOOLS, EQUIPMENT, ETC. REQUIRED FOR A COMPLETE INSTALLATION OF ELECTRICAL SYSTEMS AND WORK IN ACCORDANCE WITH LOCAL CODES, AND GOVERNING BODIES HAVING JURISDICTION, AS SHOWN ON THE DRAWINGS, AND AS SPECIFIED.
- APPLY FOR, SECURE AND PAY FOR ALL REQUIRED PERMITS, FEES, LICENSES AND ROYALTIES TO ACCOMPLISH THE WORK. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED TESTS AND INSPECTIONS TO ACCOMPLISH THE WORK IN CONFORMANCE WITH ALL CODES AND JURISDICTIONS. COMPLY WITH RULES AND REGULATIONS OF JURISDICTIONAL AUTHORITIES AND/OR OWNER SPECIFICATIONS AND REPORT ANY DEVIATIONS ON DRAWINGS TO THE OWNER.
- THE ELECTRICAL SUB-CONTRACTOR SHALL FURNISH, WITHOUT EXTRA CHARGE, ANY ADDITIONAL MATERIALS AND LABOR THAT MAY BE REQUIRED FOR COMPLIANCE WITH ALL GOVERNING LAWS, RULES AND REGULATIONS, EVEN THROUGH THE WORK IS NOT MENTIONED IN THESE SPECIFICATIONS OR SHOWN ON THE DRAWINGS. NOTHING IN THE SPECIFICATIONS OR DRAWINGS SHALL BE DEEMED AS AUTHORITY TO VIOLATE ANY GOVERNING CODE.
- FURNISH A WRITTEN CERTIFIED GUARANTEE, IN ACCEPTABLE FORM TO THE OWNER, AGAINST ANY DEFECTIVE WORKMANSHIP, MATERIAL AND OPERATING EQUIPMENT. THIS GUARANTEE SHALL BE IN FORCE AND EFFECTIVE FOR A PERIOD OF ONE (1) YEAR AFTER ACCEPTANCE OF THE INSTALLATION.
- ALL WIRING 100 VOLTS OR OVER SHALL BE RUN IN CONCEALED EMT CONDUIT OR SHALL BE HFC CABLE AS SPECIFIED BELOW.
- ALL CIRCUITS 100 VOLTS OR OVER SHALL INCLUDE A WIRED GROUND SIZED PER NEC.
- WIRING SHALL BE STRANDED COPPER, XHHW, THHN, THWN OR THW #12 AWG MINIMUM, AND BE UL LABELED. STRANDED HFC CABLE MAY BE USED WHERE PERMITTED BY CODE AND SHALL INCLUDE AN INSULATED GROUND WIRE. EACH CIRCUIT SHALL HAVE A SEPARATE, INDIVIDUAL NEUTRAL.
- DUPLEX GROUNDING TYPE RECEPTACLES SHALL BE HUBBELL 5362 OR EQUAL. COLORS: WHITE FOR NORMAL POWER, RED FOR EMERGENCY/STANDBY POWER.
- LIGHT SWITCHES SHALL BE HUBBELL 1221 OR EQUAL.
- ALL PLATES SHALL BE WHITE PLASTIC.
- FILL IN DIRECTORIES OF ALL PANELS. UPDATE EXISTING PANEL SCHEDULES.
- OUTLETS SHALL NOT BE INSTALLED BACK TO BACK TO PREVENT NOISE PASS-THROUGH.
- ALL EMPTY CONDUITS SHALL BE PROVIDED WITH PULL STRING.
- ALL PANELS AND DISCONNECTS SHALL BE LABELED. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK FACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND. MINIMUM 1/4" HIGH PLATES SHALL BE DRILLED ON EACH END FOR SHEET METAL SCREW ATTACHMENT.
- FURNISH AND INSTALL ALL LIGHT FIXTURES SHOWN ON DRAWINGS. ALL FIXTURES SHALL HAVE ELECTRONIC, NON-DIMMING, RAPID START HPF BALLASTS AND T-8 LAMPS. PROVIDE NEW LUMINAIRES AND LUMINAIRES SHOWN TO BE RELOCATED OR RE-INSTALLED WITH BALLAST DISCONNECTING MEANS SIMILAR TO IDEAL 102 FOR 2 WIRE CONNECTION AND 103 FOR 3 WIRE CONNECTION.
- VOICE/DATA BOXES SHALL BE 4" SQUARE, RUN (1) 1" CONDUIT FROM EACH BOX AND STUB INTO CEILING SPACE ABOVE, REAM & BUSH.
- WIRING SHALL BE COLOR CODED TO MATCH EXISTING BUILDING STANDARDS.
- PATIENT CARE AREAS (EX. EXAM ROOMS, INFUSION BAYS ETC.) SHALL USE HFC CABLE (OR CONDUIT AND WIRE) WITH GROUNDING MEANS AS REQUIRED TO MEET NEC 517.13.
- LABEL ALL EMERGENCY/STANDBY RECEPTACLES AND LIGHT SWITCHES WITH PANEL ID AND CIRCUIT NUMBER.
- PANELBOARDS SHALL BE EQUAL TO TYPES LISTED ON DRAWINGS.
- FUSES SHALL BE DUAL ELEMENT TIME DELAY TYPE.
- DISCONNECTS SHALL BE NEMA HEAVY DUTY TYPE, WITH RATING, CAPACITY AND NUMBER OF POLES FOR THE SERVICE CONNECTED. DISCONNECTS IN EXTERIOR LOCATIONS SHALL BE NEMA 3R.

FIRE ALARM SPECS

- FURNISH AND INSTALL ALL EQUIPMENT AND ACCESSORIES TO EXPAND THE EXISTING FIRE-LITES FIRE ALARM SYSTEM TO FIRE ALARM DEVICES ADDED.
- FIRE ALARM INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE THE OHIO BUILDING CODE, AND LOCAL CODE AND BUILDING AUTHORITY REQUIREMENTS.
- PROVIDE FIRE ALARM SYSTEM MODIFICATION SHOP DRAWINGS SIGNED AND SEALED BY THE SYSTEM DESIGNER FOR PLAN REVIEW AND PERMITTING.
- IN THE EVENT OF AN OPEN OR GROUNDED CIRCUIT IN THE SYSTEM, A TROUBLE SIGNAL AND TROUBLE LAMP SHALL BE ACTIVATED UNTIL THE SYSTEM IS RESTORED TO NORMAL.
- EACH NEW DEVICE CONNECTED TO THE FIRE ALARM CONTROL PANEL SHALL BE INDIVIDUALLY TESTED AS INSTALLED IN THE BUILDING UNDER THE SUPERVISION OF AN AUTHORIZED MANUFACTURER'S REPRESENTATIVE.
- COMBINATION AUDIBLE VISUAL DEVICES SHALL BE WALL/CEILING MOUNT AS SHOWN ON DRAWINGS AND HAVE 15/75 CANDELA 24 VDC XENON FLASH UNIT, CLEAR TAMPER RESISTANT LEXAN LENS, WHITE SEMI-FLUSH BASE ASSEMBLY STATING "FIRE", MINIMUM 88 DBA (AT 10 FT.)
- VISUAL DEVICES SHALL BE WALL/CEILING MOUNT AS SHOWN ON DRAWINGS AND HAVE 15/75 CANDELA 24 VDC XENON FLASH UNIT, CLEAR TAMPER RESISTANT LEXAN LENS, WHITE SEMI-FLUSH BASE ASSEMBLY STATING "FIRE".
- ALL WIRING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. THIS CONTRACTOR SHALL PROVIDE FOR THE SERVICES OF THE EQUIPMENT MANUFACTURER'S REPRESENTATIVE TO ASSIST IN FINAL CONNECTIONS, ADJUSTMENTS, AND TESTS.
- WIRE AND CABLE SHALL BE SIZED AND INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

LIGHTING FIXTURE SCHEDULE

NOTE: FIXTURE NUMBER, LETTER PREFIX INDICATES TYPE OF MOUNTING AS FOLLOWS:
 CL-CEILING MOUNTED; S-STEM SUSPENDED; W-WALL MOUNTED; R-CEILING RECESSED;
 WR-WALL RECESSED; CV-COVE MOUNTED; UC-UNDER CABINET; RF-ROOF MOUNTED;
 P-POST; GR-GROUND; H-MOUNTED IN HOOD; CH-CHAIN MOUNTED.

FIXTURE NUMBER	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	LAMPS	REMARKS
EX1	EMERGENCY BATTERY UNIT ADJUSTABLE OPTICS	LITHONIA	ELM4L UVOLT LTP	LED W/FIXTURE 6.6W, 640 LUMEN	
R3	6" DIA LED DOWNLIGHT, SEMI SPECULAR REFLECTOR, CLEAR TRIM	LITHONIA	LDN6 35 15 L06 LSS MVOLT G210	17.5W LED W/FIXTURE 1500 LUMENS 3500K, 80 CRI	G210 GEN 10% DIM
R4	2'X4' LED VOLUMETRIC DIRECT/INDIRECT, PERF METAL DIFFUSER, GRID MTD	COLUMBIA	LSTE24 35 ML G MPO ED U	50W LED W/FIXTURE 4800 LUMENS 3500K, 80 CRI	ED 10% DIM
R4A	2'X2' LED VOLUMETRIC DIRECT/INDIRECT, PERF METAL DIFFUSER, GRID MTD	COLUMBIA	LSTE22 35 VL G MPO ED U	52W LED W/FIXTURE 4500 LUMENS 3500K, 80 CRI	ED 10% DIM
R5	2'X4' LED CLEAN ROOM FIXTURE, GYP CEILING	KENALL	CSEDO 24 55CD43K DIM1 120 5F 4H 5YM	58W LED W/FIXTURE 6500 LUMENS 4300K, 80 CRI	8.4W EM BATTERY PACK
R6	2'X4' LED FLAT PANEL GRID MTD	LITHONIA	EPANL 24 40L 80CRI 35K MINIO ZT 120V	39W LED W/FIXTURE 4000 LUMENS 3500K, 80 CRI	ZT GEN 10% DIM R6A-GYP CEILING, DGA-24
UC1	2' LED UNDERCABINET LIGHT W/INTEGRAL ROCKER SWITCH	LITHONIA	UCEL 24IN 30K 90CRI SWR WH	10.2W LED W/FIXTURE 700 LUMENS 3000K, 90 CRI	

LIGHTING CONTROL LEGEND

- LOW VOLTAGE CEILING MOUNTED SELF-ADJUSTING 2000 SQ. FT. DUAL TECH. MOTION SENSOR WITH 360° FIELD OF VIEW. nLIGHT nCOM PDT 10 RBJ.
 - AUTO ON LOW VOLTAGE 2 BUTTON ON/OFF WALL SWITCH. MANUAL CONTROL FOR CEILING MOUNTED OCCUPANCY SENSOR(S). nLIGHT nPODM. USED FOR AUTO ON/AUTO OFF OF 1 ZONE.
 - MANUAL ON LOW VOLTAGE 2 BUTTON ON/OFF WALL SWITCH. 3 WAY MANUAL CONTROL FOR CEILING MOUNTED OCCUPANCY SENSOR(S). nLIGHT nPODM. USED FOR MANUAL ON/AUTO OFF OF 1 ZONE.
 - RAISE/LOWER LOW VOLTAGE 3 BUTTON ON/OFF RAISE/LOWER WALL SWITCH. MANUAL CONTROL FOR CEILING MOUNTED OCCUPANCY SENSOR(S). nLIGHT nPODM DX 1-ON/OFF, 1-RAISE, 1-LOWER. USED FOR AUTO ON 50%, AUTO OFF, MANUAL DIM OF 1 ZONE WHERE SHOW WITH MOTION SENSOR. MANUAL ON/OFF DIM WITHOUT MOTION SENSOR.
 - JUNCTION BOX MOUNTED POWER PACK. 120/277 VOLT INPUT, 16A LOAD RATING, 15VDC, 40 mA OUTPUT. INSTALL ABOVE ACCESSIBLE CEILING. nLIGHT nPP16 D. -SA = FACTORY PROGRAMMED FOR MANUAL ON. -PO = FACTORY PROGRAMMED FOR PARTIAL ON (50%).
 - OCCUPANCY SENSOR. LOW VOLTAGE WALL MOUNTED, SELF ADJUSTING 300 SQ. FT. DUAL TECH. SENSOR WITH 180° FIELD OF VIEW. SET FOR AUTO ON, AUTO OFF. nLIGHT nWSX PDT LV.
 - VACANCY SENSOR. LOW VOLTAGE WALL MOUNTED, SELF ADJUSTING 300 SQ. FT. DUAL TECH. SENSOR WITH 180° FIELD OF VIEW. SET FOR MANUAL ON, AUTO OFF. nLIGHT nWSX PDT LV.
- NOTES:
- REFER TO WIRING DIAGRAMS ON THIS SHEET.
 - SET SENSORS FOR MAXIMUM SENSITIVITY AND TIME DELAYS AS FOLLOWS: RESTROOMS 30 MINUTES, ALL OTHER AREAS 15 MINUTES. SET DAYLIGHT SENSORS IN AUTOMATIC SET POINT PROGRAMMING MODE. COORDINATE FINAL SETTINGS WITH OWNER/TENANT.
 - INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
 - APPROVED EQUALS SHALL BE BY WATTSTOPPER DLM AND LUTRON. CONTROLS SHALL BE WIRED, BATTERY OPERATION IS NOT ACCEPTABLE.
 - AUTOMATIC CONTROLS SHALL INCLUDE FACTORY START-UP AND CONTRACTOR COMMISSIONING. CONTROLS SHALL BE FIELD TESTED TO ENSURE DEVICES ARE CALIBRATED, ADJUSTED, AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS. FIELD TESTING SHALL OCCUR WHEN FURNITURE AND OWNER EQUIPMENT IS INSTALLED AND WHEN HVAC EQUIPMENT IS OPERATIONAL.

CONDUIT & WIRE SCHEDULE BRANCH CIRCUITS

WIRE SIZE	2 WIRE+GROUND	3 WIRE+GROUND	4 WIRE+GROUND
15A #12 WIRE, #12 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
20A #12 WIRE, #12 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
25A #10 WIRE, #10 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
30A #10 WIRE, #10 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
35A #8 WIRE, #10 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
40A #8 WIRE, #10 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
45A #8 WIRE, #10 GROUND	3/4" CONDUIT	3/4" CONDUIT	3/4" CONDUIT
50A #8 WIRE, #10 GROUND	3/4" CONDUIT	3/4" CONDUIT	1" CONDUIT
60A #4 WIRE, #10 GROUND	1" CONDUIT	1" CONDUIT	1-1/4" CONDUIT
70A #4 WIRE, #8 GROUND	1" CONDUIT	1" CONDUIT	1-1/4" CONDUIT
80A #3 WIRE, #8 GROUND	1-1/4" CONDUIT	1-1/4" CONDUIT	1-1/4" CONDUIT
90A #2 WIRE, #8 GROUND	1-1/4" CONDUIT	1-1/4" CONDUIT	1-1/4" CONDUIT

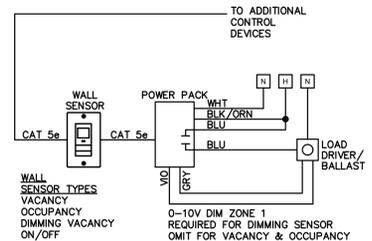
NOTES:
 WIRE SIZE BASED UPON THHN COPPER WIRING, EMT CONDUIT.
 PROVIDE WIRE FOR EACH PHASE, NEUTRAL, AND GROUND AS NOTED.
 BRANCH CIRCUIT WIRING SHALL MATCH CIRCUIT BREAKER/FUSE SIZE.
 VOLTAGE DROP:
 20A, 120V BRANCH CIRCUITS (3% VD) - USE #12 FOR UP TO 60 FT, #10 FROM 61 FT TO 100 FT, #8 FROM 101 FT TO 150 FT.
 20A, 277V BRANCH CIRCUITS (3% VD) - USE #12 FOR UP TO 130 FT, #10 FROM 131 FT TO 200 FT, #8 FROM 201 FT TO 320 FT.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION	MOUNTING HGT. TO CENTER UNLESS OTHERWISE NOTED
○	CEILING OUTLET	
⊕	WALL OUTLET	SEE DRAWINGS
⊕	SPECIAL OUTLET AS REQUIRED	SEE DRAWINGS
⊕	WIRED JUNCTION BOX	SEE DRAWINGS
⊕	BLANK OUTLET BOX	SEE DRAWINGS
⊕	DUPLEX RECEPTACLE	18"
⊕	POWER AND VOICE/DATA FLOOR BOX	FLOOR MTD.
⊕ WP	DUPLEX RECEPTACLE WEATHERPROOF / GROUND FAULT	18"
⊕ GF	DUPLEX RECEPTACLE W/ GROUND FAULT INTERRUPTER	18"
⊕	220V RECEPTACLE	18"
⊕	DOUBLE DUPLEX RECEPTACLE	18"
⊕	SIMPLEX RECEPTACLE	18"
⊕	TOGGLE SWITCH - SINGLE, 3-WAY & 4-WAY	42"
⊕	VOICE/DATA OUTLET ROUGH IN	18"
⊕ WAP	WIRELESS ACCESS POINT	CLG MTD
⊕	GROUND BAR	96"
⊕	CONTROL PANEL FURNISHED W/EQUIP (DIV 22-25)	AS REQUIRED
⊕	MOTOR - 1 PHASE	AS REQUIRED
⊕	MOTOR - 3 PHASE	AS REQUIRED
⊕	MOTORIZED DAMPER - 1 PHASE	AS REQUIRED
⊕	CEILING MOUNTED EXIT LIGHT	
⊕	WALL MTD. EXIT LIGHT	AB DOOR
⊕	CEILING MOUNTED EXIT LIGHT W/ DIRECTIONAL ARROWS	
⊕	ELECTRICAL PANEL - SURFACE MOUNT, FLUSH MOUNT	6"-0" TO TOP
⊕	PLYWOOD TELEPHONE BACKBOARD	SEE DRAWINGS
⊕	SAFETY SWITCH	AS REQUIRED
⊕	COMBINATION MOTOR STARTER	AS REQUIRED
⊕	MANUAL MOTOR STARTING SWITCH W/ PILOT LIGHT	42"
⊕	MANUAL MOTOR CONTROLLER/DISCONNECT	42"
⊕	LINE VOLTAGE THERMOSTAT	60"
⊕	WALL BOX DIMMER	42"
⊕	EMERGENCY BATTERY UNIT	90"
⊕	FIRE ALARM MANUAL PULL STATION	42"
⊕	FIRE ALARM SIGNAL - AUDIO VISUAL	80"
⊕	FIRE ALARM SIGNAL - STROBE ONLY	80"
⊕	SMOKE DETECTOR - DUCT MOUNTED	SEE DRAWINGS
⊕	FIRE ALARM CONTROL RELAY	AS REQ'D
⊕	CCTV CAMERA	SEE DRAWINGS
⊕	NURSE CALL - PULL CORD STATION	
⊕	SECURITY MOTION SENSOR	CLG. MTD.

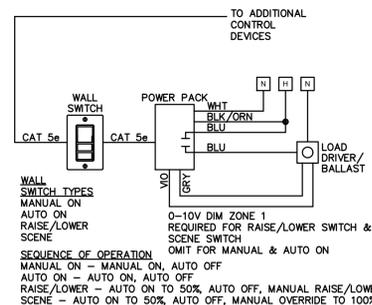
ELECTRICAL LEGEND NOTES

- DEVICES WITH SUBSCRIPT "A" INDICATE DEVICES INSTALLED ABOVE COUNTER UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHT, OTHERWISE INSTALL AT 6" ABOVE COUNTER OR BACKSPASH.



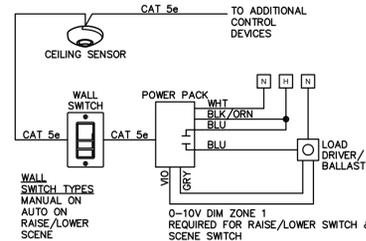
WALL CONTROL

CAT 5e NON-BOOED PLENUM CABLES, 2 CAT 5e PORTS PER DEVICE APPROX. 16 DEVICES MAX PER POWER PACK ADDITIONAL SWITCHES & SENSORS DAISY CHAINED



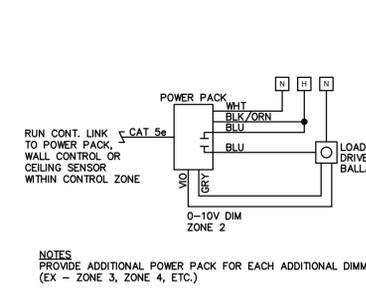
WALL CONTROL

CAT 5e NON-BOOED PLENUM CABLES, 2 CAT 5e PORTS PER DEVICE APPROX. 16 DEVICES MAX PER POWER PACK ADDITIONAL SWITCHES & SENSORS DAISY CHAINED



CEILING MOTION SENSOR

CAT 5e NON-BOOED PLENUM CABLES, 2 CAT 5e PORTS PER DEVICE APPROX. 16 DEVICES MAX PER POWER PACK ADDITIONAL SWITCHES & SENSORS DAISY CHAINED



MULTIPLE DIMMING ZONES

ADD TO WALL/CEILING SENSOR DIAGRAM
 CAT 5e NON-BOOED PLENUM CABLES, 2 CAT 5e PORTS PER DEVICE



Consultants:

Project Reference: #19004

Date:

□ □ □ □ □ □

Project Status:
 Planning
 Programming
 Schematic Design
 Design Development
 Construction Documents

Sheet Reference:

E 300

E300-19258.DWG

01/24/2020

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DESIGNED BY G. OWENS
 DRAWN BY CSO
 CHECKED BY RLP
 JOB NUM. 19258

Panel ID: E1		Voltage: 240 / 120		Panel Type: SQUARE D NQ			
Location: CORRIDOR		Phase: 1		Enclosure: NEMA 1			
Mounting: FLUSH		Wire: 3		Main Size: 100 Amps			
Main Type: M.L.O.							
BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CONN. LOAD (KVA)	CTK NO.	PHASE	CONN. LOAD (KVA)	CTK NO.	BRANCH CIRCUIT DESCRIPTION
LAFW HOOD	20/1	0.460	1	A	2	0.900	TREATMENT BAYS
NHD R	20/1	0.600	3	B	4	1.080	TREATMENT BAYS
BSC HOOD	20/1	0.460	5	A	6	0.000	SPARE
BSC HOOD	20/1	0.460	7	B	8	0.000	SPARE
HD R	20/1	0.600	9	A	10	0.000	SPACE
SPARE	20/1	0.000	11	B	12	0.000	SPACE
SPARE	20/1	0.000	13	A	14	0.000	SPACE
SPARE	20/1	0.000	15	B	16	0.000	SPACE
SPARE	20/1	0.000	17	A	18	0.000	SPACE
SPARE	20/1	0.000	19	B	20	0.000	SPACE
SPACE	20/1	0.000	21	A	22	0.000	SPACE
SPACE	20/1	0.000	23	B	24	0.000	SPACE

Connected Load Panel Summary
Phase A: 2.4 KVA 20.2 AMPS
Phase B: 2.1 KVA 17.8 AMPS
Total: 4.6 KVA

Breaker Options (If Used):
TC - Time Clock Control
LO - Lock-On Device
GF - GND Fault CKT Interrupter
EX - Existing to Remain
SH - Shunt Trip Breaker

Panel ID: LC		Voltage: 240 / 120		Panel Type: SQUARE D NQ			
Location: CLOSET		Phase: 3		Enclosure: NEMA 1			
Mounting: SURFACE		Wire: 1		Main Size: 150 Amps			
Main Type: M.L.O.							
BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CONN. LOAD (KVA)	CTK NO.	PHASE	CONN. LOAD (KVA)	CTK NO.	BRANCH CIRCUIT DESCRIPTION
LTG EXAM ROOMS 1-10	20/1	1.700	1	A	2	0.180	LAB COUNTER
LTG EXAM ROOMS 11-20	20/1	1.700	3	B	4	0.180	LAB COUNTER
RECEPTION	20/1	0.180	5	A	6	0.540	EXAM ROOM
SCHEDULING RECORDS	20/1	0.180	7	B	8	0.000	SPARE
LAB REF	20/1	0.600	9	A	10	0.360	IT ROOM REC
LAB REF	20/1	0.600	11	B	12	0.360	IT ROOM REC
MIXING REF	20/1	0.600	13	A	14	0.000	GENERATOR CHARGER HEAT
SPARE	20/1	0.000	15	B	16	0.048	IT ROOM SPLIT
SPARE	20/1	0.000	17	A	18	0.660	ANALYZER
SPARE	20/1	0.000	19	B	20	1.272	COMPRESSOR
OFFICE REC	20/1	0.180	21	A	22	2.420	NEW 60/2 PANEL E1
OFFICE REC	20/1	0.180	23	B	24	2.140	

Connected Load Panel Summary
Phase A: 7.4 KVA 61.8 AMPS
Phase B: 6.7 KVA 55.5 AMPS
Total: 14.1 KVA

Breaker Options (If Used):
TC - Time Clock Control
LO - Lock-On Device
GF - GND Fault CKT Interrupter
EX - Existing to Remain
SH - Shunt Trip Breaker

Panel ID: TP5		Voltage: 208 / 120		Panel Type: SQ D NQOD			
Location: CORRIDOR		Phase: 3		Enclosure: NEMA 1			
Mounting: FLUSH		Wire: 4		Main Size: 100 Amps			
Main Type: M.L.O.							
BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CONN. LOAD (KVA)	CTK NO.	PHASE	CONN. LOAD (KVA)	CTK NO.	BRANCH CIRCUIT DESCRIPTION
SPARE	20/1	0.000	1	A	2	0.660	HD FAN DIFF
SPARE	20/1	0.000	3	B	4	0.440	NON HD FAN DIFF
NHD C	20/1	0.180	5	C	6	0.440	NON HD FAN DIFF
NON HD COMP REC	20/1	0.360	7	A	8	0.936	EF-1
ANTE HD COMP REC	20/1	0.540	9	B	10	0.936	
HVAC SENSORS	20/1	0.150	11	C	12	0.936	
STERILE HD	20/1	0.180	13	A	14	0.828	EF-2
SPARE	20/1	0.000	15	B	16	0.828	
HD C	20/1	0.180	17	C	18	0.828	
SPARE	20/1	0.000	19	A	20	5.604	60/3 RTU-1
LTG COMP/SANTE	20/1	0.522	21	B	22	5.604	
LTG PRIVATE TREAT	20/1	0.128	23	A	24	5.604	
ROOF REC	20/1	0.180	25	A	26	0.000	SPARE
SPARE	20/1	0.000	27	B	28	0.000	SPARE
SPARE	20/1	0.000	29	C	30	0.000	SPARE
SPARE	20/1	0.000	31	A	32	0.000	SPARE
SPARE	20/1	0.000	33	B	34	0.000	SPARE
SPARE	20/1	0.000	35	C	36	0.000	SPARE
SPARE	20/1	0.000	37	A	38	0.000	SPARE
SPARE	20/1	0.000	39	B	40	0.000	SPARE
SPARE	20/1	0.000	41	C	42	0.000	SPARE

Connected Load Panel Summary
Phase A: 8.7 KVA 72.9 AMPS
Phase B: 8.9 KVA 73.9 AMPS
Phase C: 8.4 KVA 70.4 AMPS
Total: 26.1 KVA

Breaker Options (If Used):
HT - Handle Tie
LO - Lock-On Device
GF - Grd Fault CKT Interrupter
EX - Existing to Remain
SH - Shunt Trip Breaker

Panel ID: TP4		Voltage: 208 / 120		Panel Type: SQ D NQOD			
Location: CORRIDOR		Phase: 3		Enclosure: NEMA 1			
Mounting: FLUSH		Wire: 4		Main Size: 225 Amps			
Main Type: M.L.O.							
PANEL IS EXISTING TO REMAIN							
BRANCH CIRCUIT DESCRIPTION	CKT BKR SIZE	CONN. LOAD (KVA)	CTK NO.	PHASE	CONN. LOAD (KVA)	CTK NO.	BRANCH CIRCUIT DESCRIPTION
LTG	20/1	0.631	1	A	2	1.800	TREATMENT RM REC
SPARE	20/1	0.000	3	B	4	1.800	TREATMENT RM REC
LTG	20/1	1.011	5	C	6	1.440	TREATMENT RM REC
LTG	20/1	0.885	7	A	8	1.440	TREATMENT RM REC
SPARE	20/1	0.000	9	B	10	1.440	TREATMENT RM REC
LTG	20/1	0.854	11	C	12	1.440	TREATMENT RM REC
LTG	20/1	1.006	13	A	14	1.080	TREATMENT RM REC
LTG	20/1	1.360	15	B	16	1.080	TREATMENT RM REC
CONVIENCE REC	20/1	0.540	17	C	18	0.360	RETAIL PHARMA
CONVIENCE REC	20/1	0.540	19	A	20	0.720	RETAIL PHARMA
LTG	20/1	0.000	21	B	22	0.540	ALCOVE
NURSE STATION REC	20/1	0.720	23	C	24	0.720	LOCKER
NURSE STATION REC	20/1	0.720	25	A	26	0.180	LOCKER COUNTER
NURSE STATION REC	20/1	0.720	27	B	28	0.180	LOCKER COUNTER
CONVIENCE REC	20/1	0.360	29	C	30	0.360	LAB REC
LAB REC	20/1	0.360	31	A	32	0.540	LAB REC
LAB REC	20/1	0.720	33	B	34	0.900	CLEAN/DIRTY REC
LAB REC	20/1	0.180	35	C	36	0.180	LAB REC
CONVIENCE REC	20/1	0.900	37	A	38	0.180	ANALYZER
CONVIENCE REC	20/1	0.540	39	B	40	0.000	SPARE
SPARE	20/1	0.000	41	C	42	0.000	SPARE

Connected Load Panel Summary
Phase A: 11.0 KVA 91.5 AMPS
Phase B: 9.3 KVA 77.3 AMPS
Phase C: 8.2 KVA 68.0 AMPS
Total: 28.4 KVA

Breaker Options (If Used):
HT - Handle Tie
LO - Lock-On Device
GF - Grd Fault CKT Interrupter
EX - Existing to Remain
SH - Shunt Trip Breaker

LINE TYPE LEGEND

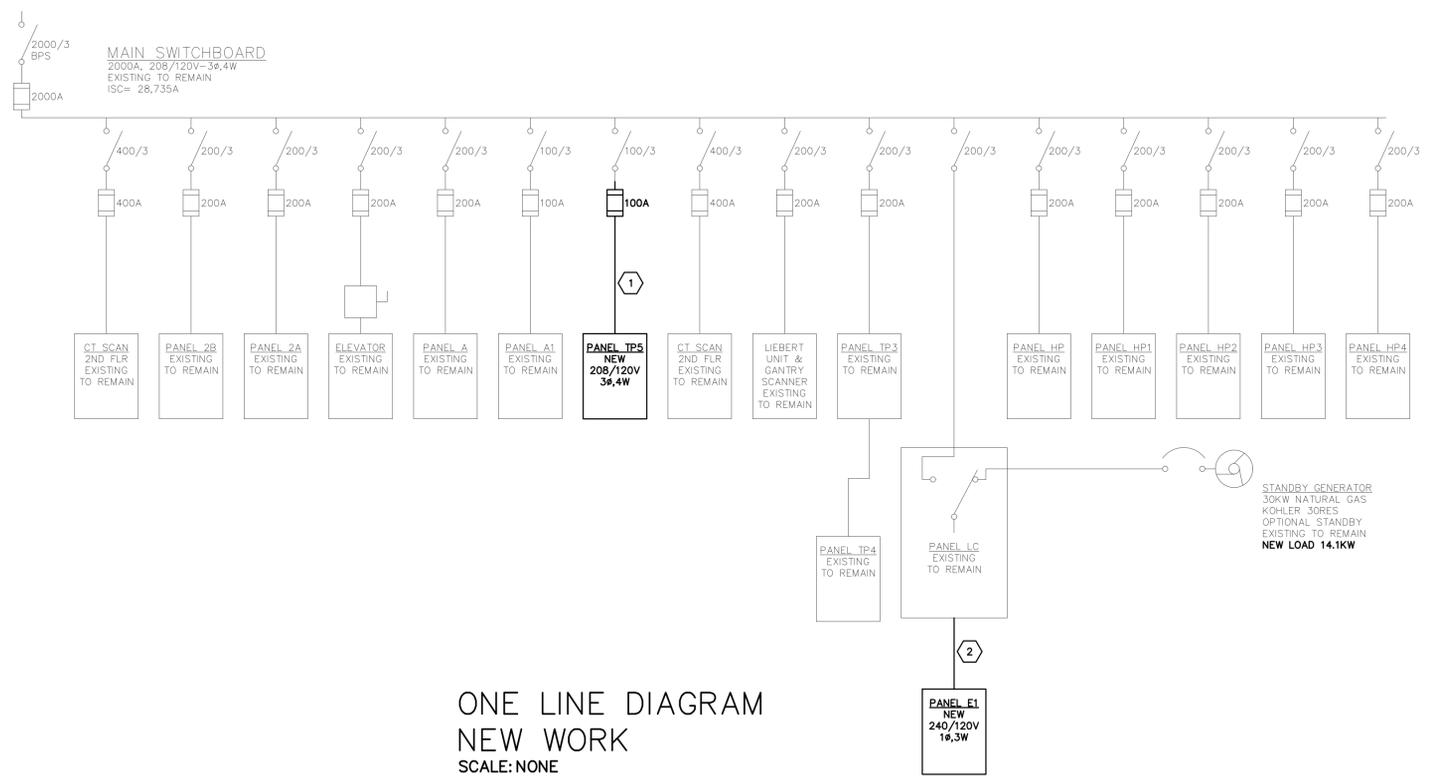
— LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO REMAIN.

--- LINETYPE INDICATES EXISTING ELECTRICAL EQUIPMENT/DEVICE TO BE REMOVED.

— LINETYPE INDICATES NEW ELECTRICAL EQUIPMENT/DEVICE TO BE FURNISHED AND INSTALLED.

CODED NOTES

- 4 - #3 + #8 GROUND IN 1-1/4" CONDUIT.
- 3 - #4 + #10 GROUND IN 1-1/4" CONDUIT.



ONE LINE DIAGRAM
NEW WORK
SCALE: NONE

Project Reference: #19004
CONSULTANTS:
COLUMBUS ONCOLOGY & HEMATOLOGY INFUSION LAB ADDITION
810 JASONWAY AVE.
COLUMBUS, OH 43214

Date: 01/24/2020
Project Status:
Planning
Programming
Schematic Design
Design Development
Construction Documents

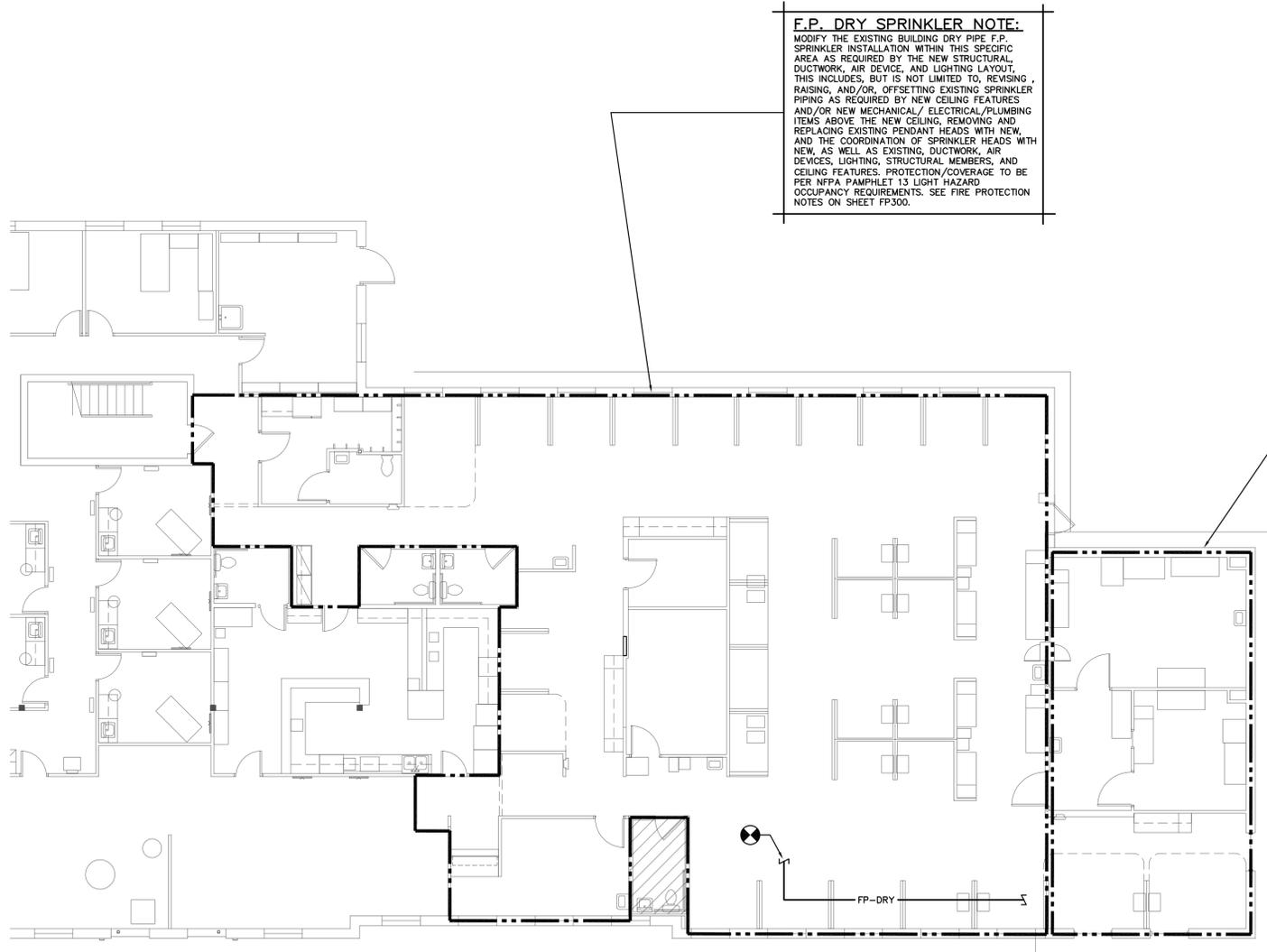
Sheet Reference:

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01/24/2020

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DESIGNED BY G. OWENS
DRAWN BY CSO
CHECKED BY DLP
JOB NUM. 19258




**FIRST FLOOR
 FIRE PROTECTION PLAN**
 SCALE: 1/8"=1'-0"

STATE OF OHIO
 ERIC M. BOOHER
 E-65106
 REGISTERED PROFESSIONAL ENGINEER


FP200-19258.DWG 01/24/2020
PRATER
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 6130 Wilcox Road (614) 766 4896
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 DESIGNED BY P.B.MELCHER DRAWN BY P.B.MELCHER CHECKED BY C.M.ANDERSON JOB NUM. 19258

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Consultants:

Project Reference: #19004
**COLUMBUS ONCOLOGY &
 HEMATOLOGY INFUSION
 LAB ADDITION**
 810 JASONWAY AVE.
 COLUMBUS, OH 43214

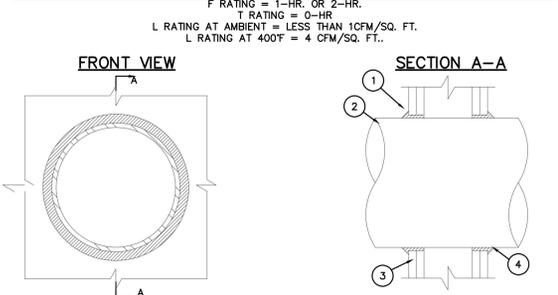
Date: 01/24/2020

Project Status:
 Planning
 Programming
 Schematic Design
 Design Development
 Construction Documents

Sheet Reference:

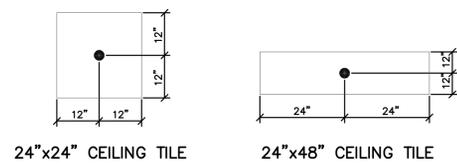
FP200

UL/CUL SYSTEM NO. WL1085
METAL PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY



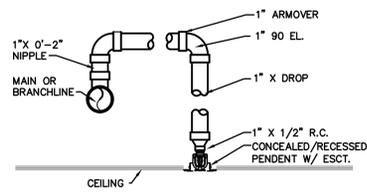
- GYPSUM WALL ASSEMBLY (UL/CUL CLASSIFIED U300 OR U400 SERIES) (1-HR OR 2-HR FIRE-RATING) (2-HR SHOWN).
- PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
 - MAXIMUM 12" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
 - MAXIMUM 12" NOMINAL DIAMETER CAST IRON PIPE.
 - MAXIMUM 6" NOMINAL DIAMETER COPPER PIPE.
 - MAXIMUM 6" NOMINAL DIAMETER GWT.
 - MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
- HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT FORCED INTO ANNULAR SPACE TO MAXIMUM EXTENT POSSIBLE.
- MINIMUM 1/2" BEAD HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT TO BE INSTALLED AROUND PIPE, LAPPING 1/4" BEYOND PERIPHERY OF OPENING.

NOTES:
 1. MAXIMUM DIAMETER OF OPENING = 13-1/4".
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".



24"x24" CEILING TILE 24"x48" CEILING TILE

- SPRINKLER HEAD LOCATION NOTES:**
- ALL LOCATIONS INDICATED ARE TO BE MAINTAINED WITHIN PLUS OR MINUS 1/2", AND ALIGNED WITH ADJACENT HEADS FOR A UNIFORM, EVEN APPEARANCE OF COMPLETED INSTALLATION. POSITIONS INDICATED APPLY TO FULL SIZE SMOOTH SURFACE TILES, AS WELL AS FULL SIZE SUB-GRIDDED (SCORED OR GRAPHICALLY DIVIDED) SURFACE TILES. THE APPEARANCE OF THE FINISHED CEILING TILE FACE AS INSTALLED OVERRIDES THE ACTUAL PHYSICAL DIMENSIONS OF THE TILE FOR PLACEMENTS INDICATED HEREIN. VERIFY CEILING TILE TYPES FROM ARCHITECTURAL DOCUMENTATION.
 - PENDANT SPRINKLER HEADS TO BE INSTALLED WITH DEFLECTORS AT SAME ELEVATION AS ADJACENT SPRINKLERS IN SAME AREA/ENCLOSURE, PLUS OR MINUS 1/4". RECESSED HEADS TO BE INSTALLED SO DEFLECTOR IS A MAXIMUM OF 1" BELOW THE ELEVATION OF THE CEILING PLANE. CONCEALED HEADS TO BE INSTALLED WITH COVERS FLUSH TO CEILING PLANE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - INSTALLATION OF ALL SPRINKLER HEADS TO BE COORDINATED WITH STRUCTURE AND WORK OF OTHER TRADES, VERIFIED IN ADVANCE BY THE FIRE PROTECTION CONTRACTOR.



ARMOVERT DETAIL
 NOT TO SCALE

SPRINKLER HEAD LOCATION DETAIL

FIRE PROTECTION EQUIPMENT

*ALL NEW HEADS TO BE INSTALLED AT SAME LOCATION AS EXISTING AT ALL LOCATIONS UNLESS REQUIRED TO BE OFFSET, MOVED, OR OTHERWISE RELOCATED TO ADJACENT EXISTING CEILING GRIDS.

- FIRE PROTECTION SPRINKLER HEADS**
- RECESSED PENDANT HEADS:** SIMILAR TO VIKING MODEL MICROFAST VK302 WITH 1/2" STD. ORIFICE, 1/2" NPT INLET, OUTLET SPRAY DEFLECTOR, 5.5 "K" FACTOR & ADJUSTABLE TWO-PIECE ESCUTCHEON. ESCUTCHEON & HEAD TO BE FURNISHED WITH MANUFACTURER APPLIED WHITE FINISH. HEAD TO BE LISTED "QUICK RESPONSE" TYPE. SIDEWALL HEADS (IF REQUIRED) TO BE SIMILAR, WITH HORIZONTAL DEFLECTOR. DRY PIPE BARREL HEADS TO BE SIMILAR, WITH 1" INLET, ADJUSTABLE DRY BARREL AND COMPRESSED CENTER STRUT ACTUATOR. DRY BARREL HEADS FOR USE IN AREAS SUBJECT TO FREEZING WITH ADJACENT CONDITIONED SPACE FOR INSTALLATION OF WET SUPPLY PIPING AND ASSOCIATED ITEMS.
 - UPRIGHT HEADS:** SIMILAR TO VIKING MODEL MICROFAST VK300 WITH 1/2" STANDARD ORIFICE, 1/2" NPT INLET, OUTLET SPRAY DEFLECTOR, 5.5 "K" FACTOR AND NATURAL BRONZE FINISH. SIDEWALL HEAD (IF REQUIRED) TO BE SIMILAR, WITH VERTICAL OR HORIZONTAL DEFLECTOR. DRY BARREL HEADS TO BE SIMILAR, WITH 1" INLET, ADJUSTABLE DRY BARREL AND CENTER STRUT ACTUATOR, AND STANDARD ORIFICE. HEADS TO BE LISTED "QUICK RESPONSE" TYPE. FOR USE IN AREAS WITHOUT CONCEALING "FINISH" STRUCTURE WITH EXPOSED SUPPLY PIPING.
 - IMAGING ROOM HEADS (TO BE USED IN ALL AREAS WITH MRI TYPE OR SIMILAR EQUIPMENT):** SIMILAR TO VIKING MODEL WK462 WITH 1/2" ORIFICE, 1/2" NPT INLET, OUTLET SPRAY DEFLECTOR, 5.6 "K" FACTOR, ADJUSTABLE ESCUTCHEON, COVERPLATE, AND ALL NON-FERROUS CONSTRUCTION. HEAD TO BE LISTED "QUICK RESPONSE" TYPE.
 - SPRINKLER HEAD TEMPERATURES:** ALL SPRINKLER HEADS TO BE INTERMEDIATE TEMPERATURE UNLESS NOTED OTHERWISE OR DIFFERENT DEGREE REQUIRED FOR CONDITIONS WITHIN BUILDING.

FIRE PROTECTION PIPING AND HANGERS

- DRY PIPE FIRE SUPPRESSION PIPING AND FITTINGS:
- PIPE SHALL BE ASTM A 795 LISTED/APPROVED SCHEDULE 40 BLACK STEEL GALVANIZED WITH ASME LISTED/APPROVED CLASS 125 CAST OR CLASS 150 MALLEABLE IRON SREWED GALVANIZED FITTINGS PER NFPA STANDARDS. THE CONTRACTOR HAS THE OPTION TO PROVIDE ASTM A 795 LISTED/APPROVED SCHEDULE 10 BLACK STEEL GALVANIZED PIPE FOR 2" TO 4" (INCLUSIVE) PIPE SIZE WITH LISTED/APPROVED ROLL GROOVED MECHANICAL COUPLING FITTINGS AS SPECIFIED HEREIN AND PER NFPA STANDARDS. THREADED FITTINGS OR CUT GROOVED COUPLINGS SHALL NOT BE PERMITTED WITH SCHEDULE 10 PIPE.
 - ALL SCHEDULE 10 PIPE SHALL USE LISTED/APPROVED GALVANIZED ROLL GROOVED FITTINGS WITH MALLEABLE IRON MECHANICAL COUPLINGS SIMILAR TO THAT MANUFACTURED BY VICTAULIC. THE CONTRACTOR MAY, AT HIS OPTION FOR SCHEDULE 40 PIPE 2" SIZE AND LARGER, USE LISTED/APPROVED GALVANIZED GROOVED FITTINGS AND MALLEABLE IRON MECHANICAL COUPLINGS SIMILAR TO THAT MANUFACTURED BY VICTAULIC.
 - COUPLINGS SHALL BE SIMILAR TO VICTAULIC RIGID STYLE 005/009N FIRELOCK WITH EDPM FLUSH SEALED GASKET & HOUSING FABRICATED IN TWO OR MORE PARTS OF MALLEABLE IRON CASTINGS. LISTED OUTLET COUPLINGS MAY BE USED SUBJECT TO APPROVAL BY ALL REVIEW & INSPECTION AUTHORITIES. FINAL ASSEMBLIES SHALL BE RATED FOR 175 PSIG WORKING PRESSURE.
 - ASSEMBLY AND INSTALLATION OF COUPLINGS TO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - PIPE GROOVING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. ROLL ROOVING ONLY PERMITTED FOR SCHEDULE 10 PIPE. ROLL OR CUT GROOVING MAY BE USED FOR SCHEDULE 40 PIPE, AT THE CONTRACTOR'S OPTION.
 - FOR MRI/IMAGING AREA (DETERMINED IN-FIELD BY THIS CONTRACTOR) ASTM LISTED/APPROVED TYPE L COPPER TUBE WITH ASTM B 813 SOLDERED FITTINGS SHALL BE PROVIDED.
 - HANGERS TO BE SIMILAR TO ANVIL FIG. 69 WITH GALVANIZED ADJUSTABLE NUT AND CARBON STEEL BAND. INSTALL IN ACCORDANCE WITH NFPA PAMPHLET NO. 13 REQUIREMENTS.

FIRE PROTECTION LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—D—	DRAIN LINE	---	ZONE LIMIT/BOUNDARY LINE
—F.P.—	FIRE PROTECTION LINE	---	SUB-ZONE LIMIT/BOUNDARY LINE
—C—	CAPPED LINE	⊥	TEE WITH NIPPLE & CAP
---	EXISTING WORK TO REMAIN	⊥	PLUGGED TEE
----	EXISTING WORK TO BE REMOVED	⊥	BALL VALVE
		⊙	CONNECT TO EXISTING

FIRE PROTECTION ABBREVIATIONS

AB.	ABOVE	FLR.	FLOOR
ARCH.	ARCHITECT	F.D.	FLOOR DRAIN
CLG.	CEILING	F.P.	FIRE PROTECTION
CONN.	CONNECT	GA.	GAGE
CONTR.	CONTRACTOR	PLBG.	PLUMBING
C.W.	COLD WATER	RM.	ROOM
CONT.	CONTINUATION	SHT.	SHEET
ELEC.	ELECTRICAL	TYP.	TYPICAL
EXIST.	EXISTING		

FIRE PROTECTION NOTES

- ALL FIRE PROTECTION CONTRACT WORK IS TO COMPLY WITH THE APPLICABLE NFPA STANDARDS REFERENCED IN THE BUILDING CODE (OBC) AS ADMINISTERED BY THE LOCAL REVIEW/INSPECTION/APPROVAL AUTHORITIES, THE INSURANCE UNDERWRITER'S GUARANTEE, THE LOCAL FIRE PREVENTION AUTHORITY (FIRE MARSHALL'S OFFICE/FIRE DEPARTMENT), AND ANY OTHER AUTHORITIES HAVING JURISDICTION, AS CONFIRMED AND VERIFIED IN ADVANCE BY THE LICENSED F.P. CONTRACTOR.
- UNLESS DIRECTED OTHERWISE, EXISTING FIRE PROTECTION ITEMS THAT ARE NOT IN PRIOR TO START OF WORK IN THIS CONTRACT THAT OBSTRUCT NEW WORK AND/OR ARE IN EXPOSED LOCATIONS WHERE NEW CONCEALING/FINISH STRUCTURE IS BEING PROVIDED UNDER SEPARATE CONTRACT SHALL BE REMOVED, INCLUDING ALL ASSOCIATED WORK, WHETHER INDICATED ON DRAWINGS OR NOT. PIPING (IF ANY) ASSOCIATED WITH THESE ITEMS TO BE REMOVED BACK TO NEAREST ACTIVE MAIN OUTSIDE OF THE EXPOSED LOCATION, OR TO WITHIN NEW CONCEALING STRUCTURE PROVIDED, AND CARPED AT THAT POINT.
- ALL EXISTING SPRINKLER HEAD LOCATIONS ARE TO BE FIELD VERIFIED BY THE FIRE PROTECTION CONTRACTOR IN ADVANCE.
- CUTTING/REMOVAL & REPAIR/REPLACEMENT OF EXIST. STRUCTURES, SURFACES AND/OR FINISHES REQ'D. FOR REMOVAL OF EXIST. AND/OR INSTALLATION OF NEW F.P. WORK IS BY THIS CONTR., UNLESS INDICATED OTHERWISE. REPAIR/REPLACEMENT TO BE TO ORIGINAL CONDITION, TO MATCH ADJACENT STRUCTURES, SURFACES AND FINISHES IN TYPE, KIND & FINISH.
- ANY NEW FIRE PROTECTION ITEMS/ELEMENTS REQUIRED ARE TO MATCH EXISTING ADJACENT ITEMS/ELEMENTS BY TYPE, KIND, AND FINISH AS VERIFIED BY THE FIRE PROTECTION CONTRACTOR IN FIELD, UNLESS INDICATED OTHERWISE.
- EXISTING SPRINKLER HEADS SHALL NOT BE REUSED, REPLACED, AND/OR RELOCATED.
- MODIFICATIONS TO THE EXISTING SPRINKLER SYSTEM SHALL BE ACCORDING TO NFPA PAMPHLET NO. 13, THE APPLICABLE BUILDING CODE AND THE INSURER'S GUIDELINES, RULES AND REGULATIONS (REQUIRED FOR APPROVAL). SPECIFIC AREAS DESIGNATED ON THE DRAWINGS SHALL BE IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
 - LIGHT HAZARD OCCUPANCY = 0.1 GPM PER SQUARE FOOT OF FLOOR AREA WHEN ALL SPRINKLERS WITHIN THE MOST REMOTE 1500 SQUARE FEET OF FLOOR AREA ARE OPERATING. MAXIMUM SPACING OF SPRINKLER HEADS SHALL BE 225 SQUARE FEET PER HEAD.
 - ORDINARY HAZARD GROUP 1 OCCUPANCY = .15 GPM PER SQUARE FOOT OF FLOOR AREA WHEN ALL SPRINKLERS WITHIN THE MOST REMOTE 1500 SQUARE FEET OF FLOOR AREA ARE OPERATING. MAXIMUM SPACING OF SPRINKLER HEADS SHALL BE 130 SQUARE FEET PER HEAD.
 - FOR DRY PIPE SYSTEMS, THE AREA OF SPRINKLER OPERATION SHALL BE INCREASED BY 30 PERCENT WITHOUT REVISING THE SPECIFIED DENSITY.
 - FOR PROTECTION UNDER OVERHEAD STRUCTURE PITCHED EXCEEDING 1 UNIT VERTICAL FOR 6 UNITS HORIZONTAL, THE AREA OF SPRINKLER OPERATION SHALL BE INCREASED BY 30 PERCENT WITHOUT REVISING THE SPECIFIED DENSITY.
 - ADD A TOTAL ALLOWANCE OF 250 GPM FOR SIMULTANEOUS USE OF INSIDE AND OUTSIDE HOSE STREAMS FOR ORDINARY HAZARD OCCUPANCY CALCULATIONS AT THE APPROPRIATE CONNECTION POINT(S).
 - DESIGN AREAS LISTED HEREIN MAY BE REDUCED IN ACCORDANCE WITH NFPA PAMPHLET NO. 13 ALLOWANCE FOR USE OF QUICK RESPONSE SPRINKLER HEADS, PROVIDED THE INSTALLATION COMPLIES WITH ALL SPECIFIED CONDITIONS.
- THE EXISTING BUILDING IS SPRINKLED PER NFPA PAMPHLET NO. 13; AND IN ACCORDANCE WITH THE BUILDING CODE. WORK IN THIS CONTRACT IS TO MAINTAIN THIS CONDITION FOR THE INDICATED TENANT FINISH PORTION OF THE STRUCTURE, AS WELL AS EXISTING ADJACENT AREAS.
- THE EXISTING BUILDING SPRINKLER ZONES ARE TO BE MAINTAINED BY NEW WORK.
- THE FIRE PROTECTION CONTRACTOR SHALL SIZE ALL FIRE PROTECTION SYSTEM PIPING, WITH THE EXCEPTION OF PIPING SIZES INDICATED ON THESE PLANS AT SPECIFIC LOCATIONS.
- FIRE PROTECTION CONTR. SHALL PROVIDE ALL ADDITIONAL PIPING, EQUIP. AND ACCESSORIES WHETHER SHOWN ON DWG'S. OR NOT, WHICH IS REQ'D TO PROVIDE COMPLETE, SPRINKLER & OTHER FIRE PROTECTION SYSTEMS FOR THE BUILDING.
- FIRE PROTECTION CONTR. TO LOCATE AND INSTALL ALL SPRINKLER HEADS IN LAY-IN CEILINGS PER DETAILS INCLUDED WITH THESE DRAWINGS.
- COORD. ALL SPRINKLER DROPS FOR HEAD LOCATIONS WITH EXISTING CLG. GRIDS, STRUCTURE, & WORK IN OTHER CONTRACTS IN SAME AREA.
- PROVIDE DRAIN VALVES AND AUXILIARY DRAINS PER NFPA REQUIREMENTS, AND AT LOW AND/OR TRAPPED PIPING POINTS WHEN SUCH ARE UNAVOIDABLE, TO ALLOW COMPLETE DRAIN DOWN OF PIPING SYSTEM. PIPING SHALL BE INSTALLED TO DRAIN AT THE MAIN RISER(S) WHENEVER POSSIBLE.
- UNLESS INDICATED OTHERWISE, ALL PENDANT SPRINKLERS ATTACHED TO DRY PIPE SUPPLY SYSTEMS SHALL BE LISTED DRY PIPE BARRELL TYPE, WITH ARM-OVER LENGTH OF BARRELL AS REQUIRED BY INSTALLATION CONDITIONS TO ALLOW COMPLETE DRAINAGE AND AVOID TRAPPING WATER IN ANY PORTION OF THE DRY PIPE SYSTEM.
- FIRE PROTECTION CONTR. TO PROVIDE ALL ADDITIONAL STEEL, HANGER MATERIALS, RODS AND CLAMPS AS REQ'D. FOR COORD. AND APPROVED INSTALLATION.
- FIRE PROTECTION PIPING IS NOT PERMITTED TO RUN ABOVE ANY ELECTRICAL SWITCHGEAR, MOTOR CONTROL CENTERS OR PANELS, INCLUDING ACCESS/CLEARANCE SPACE 42" IN FRONT OF THESE ITEMS, AND MIN. 30" WIDE, UNDER ANY CIRCUMSTANCES. NEW ITEM LOCATIONS TO BE VERIFIED FROM ELECTRICAL DRAWINGS, AND INSTALLATION COORDINATED WITH ELECTRICAL CONTRACTOR IN ADVANCE OF F.P. INSTALLATION.
 - LOCATION OF EXISTING ITEMS OF THESE TYPES TO BE DETERMINED AND CONFIRMED IN THE FIELD PRIOR TO START OF WORK.



SPRINKLER HEAD LOCATION DETAIL
 PROJECT NO. 19004
 DATE: 01/24/2020
 SHEET NO. 19004-01

Consultants:
 Project Reference: #19004
COLUMBUS ONCOLOGY & HEMATOLOGY INFUSION LAB ADDITION
 810 JASONWAY AVE.
 COLUMBUS, OH 43214

Project Status:
 Planning
 Programming
 Schematic Design
 Design Development
 Construction Documents

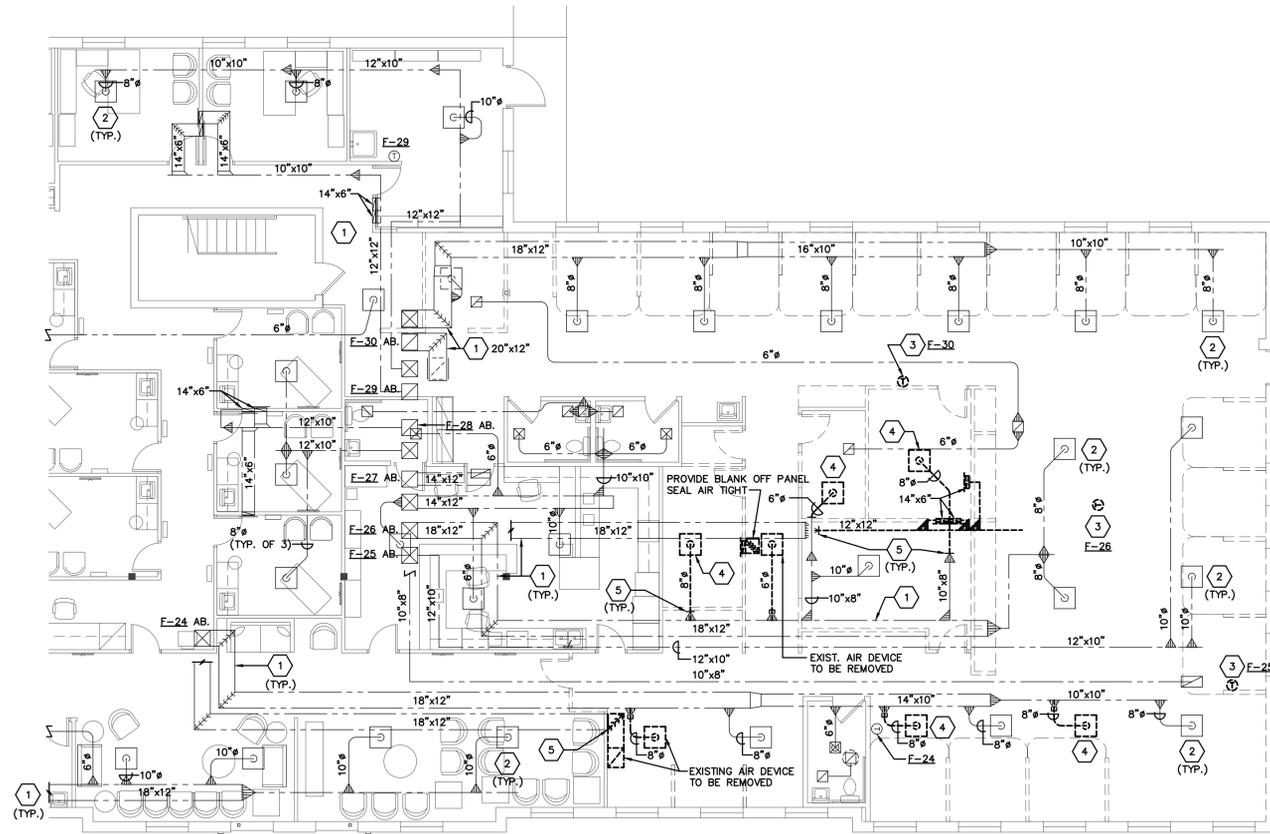


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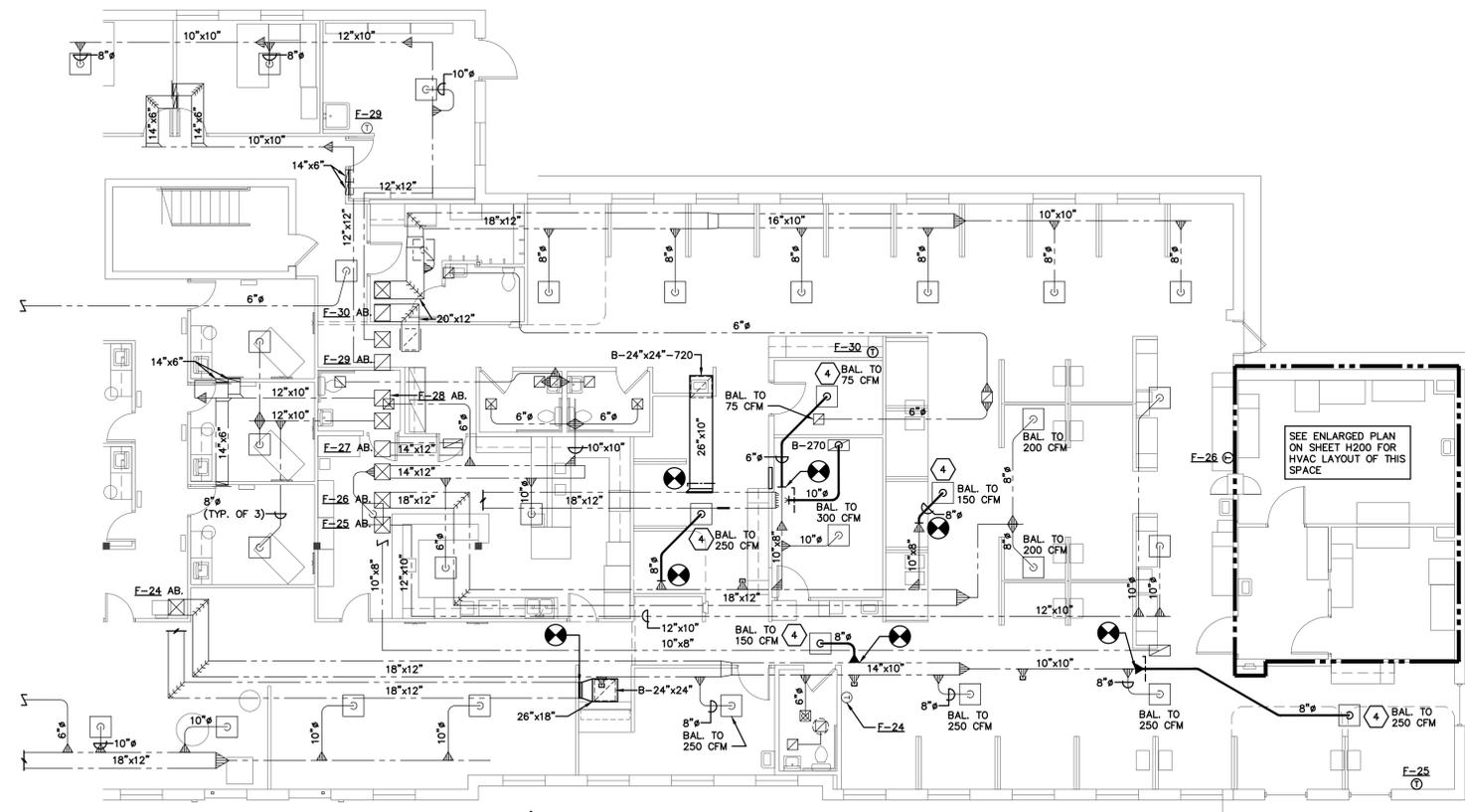
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Sheet Reference:
FP300



**FIRST FLOOR
HVAC DEMOLITION PLAN**
SCALE: 1/8"=1'-0"



**FIRST FLOOR
HVAC PLAN**
SCALE: 1/8"=1'-0"

CODED NOTES

1. EXISTING DUCTWORK TO REMAIN.
2. EXISTING AIR DEVICE TO REMAIN.
3. RELOCATE EXISTING THERMOSTAT.
4. RELOCATE EXISTING AIR DEVICE.
5. REMOVE DUCTWORK BACK TO INDICATED POINT.



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ROOFTOP UNIT SCHEDULE

NOTES:
1. UNIT PERFORMANCE AT 95° AMBIENT TEMPERATURE.

UNIT				EVAPORATOR FAN						COMPRESSOR				CONDENSER				COOLING COIL						HEAT NAT. GAS		ELECTRICAL				REMARKS													
UNIT NUMBER	LOCATION	MFR & MODEL NUMBER	DISCHARGE	UNIT WEIGHT POUNDS	APPLICATION EER	NOM. TONS	HP	BHP REQ'D	FLA	SUPPLY CFM	ESP	RPM	OUTSIDE AIR		HP	NO. OF COMP.	TOTAL POWER	NO. STAGES	HP	NO. OF FANS	SO. FT. COIL	CFM	FLA	TYPE	EDB	EWB	SENS. MBH	LATEX MBH	TOTAL MBH		SO. FT. COIL	FACE VEL.	MBTUH INPUT	MBTUH OUTPUT	STAGES OF CONTROL	TURNDOWN	VOLT	PHASE	CONTROL VOLTAGE	MINIMUM CIRCUIT AMPS	MAXIMUM OVERCURRENT PROTECTION		
													MIN %	CFM																													
RTU-1	ROOF	DAIKIN DPS012A	DOWNFLOW	2435	11.2	12	-	1.46	8.8	2,435	1.0	-	80	1980	6 (EA)	2	9.5 KW	-	-	2	-	-	4.0	DX	91	70.9	34.8	110.1	144.9	15.4	157.8	300	240	-	10:1	208	3	24	51.1	60	ALL REMARKS BELOW		

① UNIT TO BE PROVIDED WITH 24" INSULATION ROOF CURB. ② EXTEND CONDENSATION DRAIN PIPING FROM THE DRAIN PAN OF UNIT TO SPLASH BLOCK ON ROOF PROVIDED BY THIS CONTRACTOR. ③ FURNISH WITH HOT GAS REHEAT. (47.2 MBH) ④ MODULATING GAS TEMPERATURE CONTROL. ⑤ PROVIDE UNIT MOUNTED NON-FUSED LOCAL DISCONNECT. ⑥ FURNISH UNIT WITH 7-DAY PROGRAMMABLE THERMOSTAT. ⑦ PROVIDE WITH MERV 8 PRE-FILTERS. ⑧ PROVIDE WITH LOW AMBIENT CONTROL. ⑨ PROVIDE WITH INVERTER SCROLL AND FIXED SCROLL COMPRESSOR. ⑩ UNIT TO BE PROVIDED WITH LEAVING COIL/ENTERING FAN TEMPERATURE SENSOR, DUCT HIGH LIMIT SWITCH, RETURN AIR TEMPERATURE SENSOR, DISCHARGE AIR TEMP SENSOR (WIRED IN UNIT, MOUNTED IN SUPPLY AIR DUCT, OA TEMP SENSOR, RA ENTHALPHY SENSOR, OA ENTHALPHY SENSOR, DIRTY FILTER ON/OFF SWITCH, SUPPLY FAN PROVING, EBRTON AIRFLOW STATION)

FAN SCHEDULE

MANUFACTURER'S MODEL NUMBER BASED ON GREENHECK UNLESS OTHERWISE NOTED.
KEY: CENT.-CENTRIFUGAL; PROP.-PROPELLER; F.C.-FORWARD CURVED; B.J.-BACKWARD INCLINE; A.F.-AIR FOIL; A.T.L.-ACROSS THE LINE; VFD-VARIABLE FREQUENCY DRIVE

FAN NO.	LOCATION	FUNCTION	MFR. MODEL NUMBER	FAN TYPE	WHEEL TYPE & SIZE	CFM	TOTAL S.P. W.G.	R.P.M.	TIP SPEED F.P.M.	OUTLET VELOCITY F.P.M.	MAX. SOUND RATING (SONES)	MOTOR H.P.	BHP REQ'D	VOLT	PHASE	TYPE MOTOR STARTING	GRAVITY MOTOR OPERATED	DAMPER DRIVE	REMARKS
EF-1	ROOF	HOOD EXHAUST	FJI-10-BI-100	UTILITY SET	B.I. 10.5"	1600	1.5	2615	8986	3113	32.0	2	1.1	208	3	V.F.D.	●	●	① ②
EF-2	ROOF	GENERAL EXHAUST	FJI-12-BI-100	UTILITY SET	B.I. 12.25"	850	1.0	1770	4685	1216	12.4	1-1/2	0.22	208	3	V.F.D.	●	●	① ②

① MOUNTED ON FACTORY CURB WITH SPRING ISOLATION. ② PROVIDE WITH FACTORY VFD PACKAGE (NEMA 3R ENCLOSURE, INTEGRATED DISCONNECT WITH FUSED OVERLOAD PROTECTION)

MECHANICAL ABBREVIATIONS

AB.	ABOVE	INV. ELEV.	INVERT ELEVATION
A.D.	ACCESS DOOR	J.R.	JANITOR RECEPTOR
BLDG.	BUILDING	LAV.	LAVATORY
CLG.	CEILING	MAN. DPR.	MANUAL DAMPER
CONC.	CONCRETE	MECH.	MECHANICAL
C.O.	CLEANOUT	M. A.	MIXED AIR
CONN.	CONNECT	O.A.	OUTSIDE AIR
CONTR.	CONTRACTOR	PLBG.	PLUMBING
DTL.	DETAIL	REG.	REGISTER
DIFF.	DIFFUSER	REQD.	REQUIRED
DN.	DOWN	R.A.	RETURN AIR
ELEC.	ELECTRICAL	RM.	ROOM
EXH.	EXHAUST	S.A.	SUPPLY AIR
EXIST.	EXISTING	SHT.MTL.	SHEET METAL
E.W.C.	ELECTRIC WATER COOLER	S & R	SUPPLY & RETURN
FLEX.	FLEXIBLE	S.S.	SERVICE SINK
FLR.	FLOOR	TP.	TYPICAL
F.D.	FLOOR DRAIN	T.C.C.	TEMP. CONTROL CONTRACTOR
FURN.	FURNISH	UR.	URNAL
GR.	GRILLE	V.T.R.	VENT THRU ROOF
H.B.	HOSE BIBB	VB. ISOL.	VIBRATION ISOLATION
HTR.	HEATER	W/.	WITH
		W.C.	WATER CLOSET

AIR TERMINAL SCHEDULE

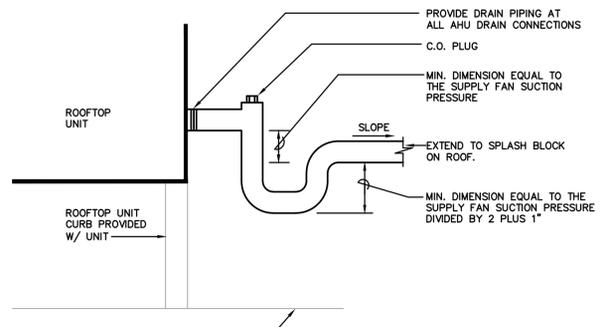
TYPE	DESCRIPTION
A	SUPPLY AIR DIFFUSER, 24"x24", PRICE MODEL 530A: DIFFUSERS SHALL HAVE ADJUSTABLE HORIZONTAL-TO-VERTICAL PATTERN WITH EQUALIZING GRID. COORDINATE FRAME TYPE WITH CEILING.
B	RETURN AIR GRILLE, LAY-IN, PRICE MODEL 530: 24"x12" UNLESS OTHERWISE NOTED.
C	PRICE INDUSTRIES RSR-FC-ECM FAN POWERED DIFFUSER WITH 99.99% HEPA FILTERS, 24"x48", LAY-IN WITH PLASTER RING FOR DRYWALL MOUNTING, 120 VOLT POWER, ROUND DUCT ADAPTER, FILTER, FAN AND CONTROLS SHALL BE SERVICEABLE FROM THE ROOM SIDE. FAN CONTROL SHALL BE REMOTE AND SHALL BE MOUNTED ABOVE ADJACENT ACCESSIBLE CEILING BY THE HVAC CONTRACTOR. PROVIDE UNIT WITH DOP TESTING PORT TO VERIFY/TEST HEPA INTEGRITY. PROVIDE STAINLESS STEEL MOUNTING PLATE FOR SPEED CONTROL. CONTRACTOR TO PROVIDE A FULL SET OF HEPA FILTERS FOR OWNERS ATTIC STOCK. QUANTITY OF ATTIC STOCK SHALL MATCH QUANTITY OF DIFFUSERS INSTALLED. EQUAL UNITS BY TITUS, ENVIRCO, CAMFIL/CLEAN ROOM INTERNATIONAL ARE ACCEPTABLE.
C	PRICE INDUSTRIES RSR-FC-ECM FAN POWERED DIFFUSER WITH 99.99% HEPA FILTERS, 24"x36", LAY-IN WITH PLASTER RING FOR DRYWALL MOUNTING, 120 VOLT POWER, ROUND DUCT ADAPTER, FILTER, FAN AND CONTROLS SHALL BE SERVICEABLE FROM THE ROOM SIDE. FAN CONTROL SHALL BE REMOTE AND SHALL BE MOUNTED ABOVE ADJACENT ACCESSIBLE CEILING BY THE HVAC CONTRACTOR. PROVIDE UNIT WITH DOP TESTING PORT TO VERIFY/TEST HEPA INTEGRITY. PROVIDE STAINLESS STEEL MOUNTING PLATE FOR SPEED CONTROL. CONTRACTOR TO PROVIDE A FULL SET OF HEPA FILTERS FOR OWNERS ATTIC STOCK. QUANTITY OF ATTIC STOCK SHALL MATCH QUANTITY OF DIFFUSERS INSTALLED. EQUAL UNITS BY TITUS, ENVIRCO, CAMFIL/CLEAN ROOM INTERNATIONAL ARE ACCEPTABLE.
E	RETURN AIR GRILLE, SURFACE MOUNTED, PRICE MODEL 530: 12"x24" UNLESS OTHERWISE NOTED. LONG BLADES TO BE VERTICAL TO PREVENT DUST COLLECTION.

MECHANICAL LEGEND

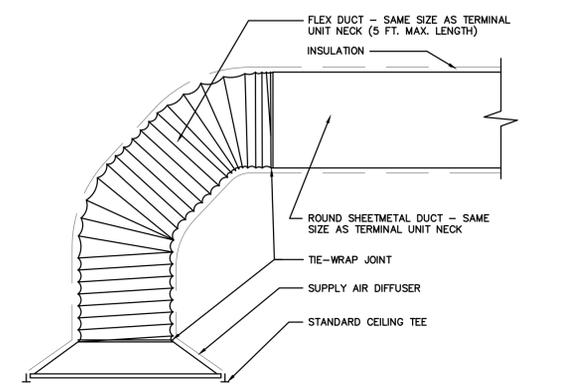
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—CWR—	DOMESTIC COLD WATER LINE	—U—	PIPE UNION
—CWR—	CHILLED WATER RETURN	—Y—	Y-TYPE STRAINER
—CWS—	CHILLED WATER SUPPLY	—V—	COMB. BALANCE & STOP VALVE
—D—	DRAIN LINE	—G—	GATE VALVE (SCREWED BODY)
—HWS—	HEATING WATER SUPPLY	—B—	BALL VALVE
—HWR—	HEATING WATER RETURN	—Z—	CHECK VALVE
—HW—	DOMESTIC HOT WATER LINE	—G—	GAS COCK OR BALANCE VALVE
—G—	NATURAL GAS LINE	—F—	FLOOR OR AREA DRAIN
—SAN—	SANITARY LINE	—T—	THERMOSTAT
—SUCT—	SUCTION LINE	—C—	CONNECT TO EXISTING
—V—	VENT LINE	—S—	THRU FLOOR AS SHOWN
—P—	PENDANT TYPE SPRINKLER HEAD	—SH—	JANITOR OR SHOWER TRIM
—U—	UPRIGHT TYPE SPRINKLER HEAD	—S—	SUPPLY DUCT UP
—G—	P-TRAP (PLAN VIEW)	—D—	SUPPLY DUCT DOWN
—H—	HOSE BIBB	—U—	R.A., O.A., OR EXH. DUCT UP
—X—	EXISTING WORK TO REMAIN	—D—	R.A., O.A., OR EXH. DUCT DOWN
—X—	EXISTING WORK TO BE REMOVED	—R—	ROUND DUCT
—HCR—	HOT/CHILLED WATER RETURN	—E—	ELBOW WITH TURNING VANES
—HCS—	HOT/CHILLED WATER SUPPLY	—M—	MAN. DAMPER
—F—	PIPE FLANGES	—S—	SPIN-IN FITTING WITH BALANCE DAMPER
—B—	45° BOOT BRANCH TAKEOFF		

HVAC NOTES

- PIPING AND DUCT LAYOUT IS ONLY SCHEMATIC, EXACT LOCATION OF PIPES AND DUCTS TO BE COORD. ON JOB W/BLDG. STRUCTURE, AND WORK OF OTHER CONTRS.
- COORD. EXACT LOCATION OF DUCT RISERS IN PIPE SPACES W/PLBG. STACKS BY PLBG. CONTR.
- CAULK SPACE BETWEEN SLEEVES, DUCTS AND PIPES WHERE DUCTS AND PIPES PASS THROUGH WALL OF R.A. SHAFTS. CAULKING TO BE AIRTIGHT.
- ALL DUCTS AND PIPES AB. CLG. UNLESS OTHERWISE NOTED.
- OFFSET DUCTS INTO JOIST SPACE FOR CLEARANCE WHERE SPACE AB. CLG. IS NOT SUFFICIENT FOR DUCTS TO CROSS OTHER DUCTS OR WORK OF OTHER CONTRS.
- NOTIFY GEN. CONTR. OF SIZE AND LOCATION OF ALL RECESSES AND OPNGS. REQ'D FOR HTG. WORK.
- INSTALL BALANCING DPRS. AS SHOWN AND AS REQ'D FOR PROPER BALANCING AIR HANDLING SYSTEMS.
- PROVIDE AIRTIGHT A.D. IN DUCTS ADJACENT TO ALL AUTOMATIC DPRS. AND TEMP. CONTROL DEVICES.
REFER TO ARCH. REFLECTED CLG. PLAN FOR EXACT LOCATION OF DIFFUSERS, GRILLES, ETC.
- THERMOSTATS SHALL BE MOUNTED AT 54" A.F.F. UNLESS OTHERWISE NOTED. COORDINATE EXACT LOCATIONS WITH ARCHITECTURAL DRAWINGS.



ROOFTOP UNIT CONDENSATE DRAIN TRAP PIPING
SCALE: NO SCALE



SUPPLY AIR DIFFUSER DETAIL
SCALE: N.T.S.



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Project Reference: #19004
Date: 01/24/2020

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810 JASONWAY AVE.
COLUMBUS, OH 43214

Project Status:
Planning
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Design Development
Construction Documents

Sheet Reference:



HVAC SPECIFICATIONS

MECHANICAL SPECIFICATIONS

I. GENERAL CONDITIONS

A. GENERAL

- EXCEPT AS SPECIFIED TO THE CONTRARY, THIS CONTRACT SHALL INCLUDE FURNISHING, INSTALLING, CONNECTING AND OPERATION OF ALL EQUIPMENT WHICH IS PART OF MECHANICAL SYSTEMS.
- GENERAL AND SPECIAL CONDITIONS OF AIA (AMERICAN INSTITUTE OF ARCHITECTS) AND OWNER'S GENERAL REQUIREMENTS SHALL APPLY UNLESS NOTED OTHERWISE.
- THE REQUIREMENTS SET FORTH UNDER "GENERAL CONDITIONS", "MODIFICATIONS TO GENERAL CONDITIONS", AND "SPECIAL CONDITIONS" ARE A PART OF THIS CONTRACT.
- THIS CONTRACT SHALL INCLUDE A VISIT TO THE JOB SITE AND TAKE INTO CONSIDERATION MECHANICAL, ELECTRICAL AND GENERAL TRADE WORK TO BE PLACED AND WORK TO BE PUT INTO PLACE PRIOR TO BIDDING. REROUTING OF DUCTWORK, PIPING AND EQUIPMENT, AS REQUIRED TO MISS THIS WORK SHALL BE ACCOMPLISHED AT NO ADDITIONAL COST TO THE OWNER.
- ALL MOTORS FOR SUCH EQUIPMENT (IF AND WHERE SPECIFIED ON DRAWINGS) SHALL BE FURNISHED AND INSTALLED AS PART OF THIS CONTRACT. CONTROLS FOR SUCH MOTORS SHALL BE FURNISHED UNDER THIS CONTRACT AND INSTALLATION OF CONTROLS AND ALL ELECTRICAL WIRING, NOT SHOWN ON ELECTRICAL DRAWINGS, SHALL BE PERFORMED UNDER THIS CONTRACT.

B. SUBSTITUTIONS AND MISCELLANEOUS EQUIPMENT

- WHICHEVER OF THIS WORK WILL CONTEMPLATE THE USE OF EQUIPMENT AND MATERIALS EXACTLY AS SPECIFIED HEREIN, THERE IS ONE OR MORE NAMES OF MANUFACTURERS ARE MENTIONED ANY ONE MAY BE UTILIZED.
- ALTERNATE EQUIPMENT MAY BE BID AS A SUBSTITUTION TO THAT SPECIFIED WITH THE APPROPRIATE DEDUCT NOTED. HOWEVER, THE EQUIPMENT SUBSTITUTED SHALL MEET ALL SPECIFICATIONS IN DESIGN AND BE SUBJECT TO OWNER AND/OR ENGINEER APPROVAL. ANY ADDITIONAL COST INCURRED DUE TO SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
- MISCELLANEOUS ITEMS NECESSARY TO COMPLETE THE PIPING SYSTEMS, SUCH AS FITTINGS, HANGERS, ETC., SHALL BE OF ANY RECOGNIZED MANUFACTURER PROVIDED THESE ITEMS MEET MINIMUM STANDARDS AS SET BY THE ENGINEER.

C. ORDINANCES, PERMITS CERTIFICATES AND OWNER REQUIREMENTS

- ALL WORK UNDER THIS CONTRACT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE OWNER'S REQUIREMENTS, ALL LAWS, ORDINANCES AND ALL REGULATIONS OF THE STATE, COUNTY, AND MUNICIPALITY WHICH IN ANY WAY AFFECTS THIS WORK. THE ARCHITECT WILL OBTAIN THE GENERAL BUILDING, MECHANICAL, ELECTRICAL AND PLUMBING PERMITS. ANY OTHER PERMITS AND CERTIFICATES OF INSPECTION REQUIRED FOR THE PROJECT WILL BE OBTAINED BY THE CONTRACTOR PERFORMING THE WORK. FEES WILL BE INCLUDED IN THE BID PRICE. ALL WORK SHALL ALSO BE INSTALLED IN ACCORDANCE WITH REGULATIONS OF THE FIRE UNDERWRITERS ASSOCIATION AND LOCAL UTILITIES. CONTRACTOR SHALL ALSO SECURE ANY PERMITS OR PAY ANY FEES TO THE LOCAL UTILITY COMPANIES FOR THE WORK REQUIRED.

D. DRAWINGS

- MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE APPROXIMATE LOCATION OF OUTLETS, EQUIPMENT AND PIPING.
- THE EXACT LOCATION OF OUTLETS, EQUIPMENT AND PIPING MAY BE CHANGED FROM TIME TO TIME TO ACCOMMODATE UNDER THIS CONTRACT ALL LOCATIONS SHALL BE VERIFIED SHALL BE VERIFIED WITH ALL TRADES AND THAT THEY ARE ACCORDING TO THE LATEST INFORMATION AVAILABLE. SHOULD THIS NOT BE DONE THE WORK WILL BE CHANGED AT NO ADDITIONAL EXPENSE TO THE OWNER.
- THE OWNER RESERVES THE RIGHT TO MAKE MINOR CHANGES IN LOCATIONS OF EQUIPMENT OR PIPING ARRANGEMENTS UP TO THE TIME OF ROUGH-IN WITHOUT ADDITIONAL COSTS.
- THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIALS OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED EVEN THOUGH NOT SPECIFIED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK AND WHICH IS USUALLY INCLUDED IN WORK OF A SIMILAR CHARACTER SHALL BE FURNISHED UNDER THIS CONTRACT.
- AS PART OF THIS WORK THE CONTRACTOR SHALL SUBMIT ONE (1) BLUE LINE SET AND ONE SET OF SEPIAS OF AS BUILT DRAWINGS INDICATING THE EXACT LOCATION OF ALL WORK INSTALLED. ACCEPTANCE SHALL NOT OCCUR UNTIL RECEIPT OF THESE DRAWINGS IS OBTAINED BY THE OWNER.

E. SHOP DRAWINGS

- AS PART OF THE WORK INCLUDED UNDER EACH MECHANICAL SECTION, WITHOUT CAUSING ANY DELAY IN WORK, SHOP DRAWINGS OF ALL EQUIPMENT AND MATERIAL SHALL BE SUBMITTED FOR ENGINEER'S REVIEW.
- SUBMITTALS SHALL INCLUDE WIRING DIAGRAMS, PERFORMANCE CURVES AND DATA SPECIFIC TO THIS PROJECT AND BEAR CONTRACTOR'S APPROVAL STAMP CERTIFYING THAT HE HAS VERIFIED CONFORMANCE TO THE CONTRACTUAL DOCUMENTS.
- IN THE ENGINEER'S REVIEW OF SHOP DRAWINGS, REVIEW IS FOR CONFORMANCE WITH THE GENERAL DESIGN CONCEPT AND ARRANGEMENT ONLY. COMMENTS, CORRECTIONS OR MARKINGS DO NOT CONSTITUTE WAIVER OF THE CONTRACT DOCUMENTS REQUIREMENTS. DIMENSIONS, QUANTITIES AND COORDINATION ARE THE RESPONSIBILITY OF THE CONTRACTOR.

F. CLEANING UP

- UNLESS OTHERWISE NOTED, ALL EXCESS MATERIALS AND DEBRIS CAUSED BY THIS WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE SITE. ALL FIXTURES AND EQUIPMENT INSTALLED SHALL BE THOROUGHLY CLEANED WEEKLY. ALL MOTORS AND EQUIPMENT SHALL BE COVERED OR OTHERWISE PROTECTED FROM CONSTRUCTION DUST AND DEBRIS. NO EQUIPMENT OTHER THAN THOSE DESIGNED TO ARE TO BE EXPOSED TO INCLEMENT WEATHER.
- CUTTING AND PATCHING
1. CUTTING FOR OPENINGS, WHEN NECESSARY, SHALL BE DONE BY THIS CONTRACTOR WITH SUCH TOOLS AND METHODS AS TO PREVENT UNNECESSARY DAMAGE TO SURROUNDING AREAS OR EQUIPMENT.
- FILL SPACE IN ALL AREAS PACKING WHERE REQUIRED TO MAINTAIN FIRE RATING. OPENINGS SHALL BE TEMPORARILY FIRE STOPPED UNTIL PERMANENT FIRE STOPPING IS DONE. THIS INCLUDES HOLES LEFT DUE TO REMOVAL OF PIPING.
- PATCHING SHALL MATCH EXISTING SURFACES IN KIND AND FINISH, AND SHALL BE DONE BY THE GENERAL CONTRACTOR.
- NO STRUCTURAL MEMBER WILL BE CUT INTO WITHOUT THE EXPRESSED PERMISSION OF THE OWNER'S REPRESENTATIVE.

H. FIRESTOPPING

- EACH CONTRACTOR SHALL BE RESPONSIBLE FOR FIRESTOPPING AROUND ALL OPENINGS FOR PIPES, DUCTS, CONDUITS ETC., INSTALLED BY HIM AT ALL FIRE WALLS. FIRESTOPPING SHALL BE PERFORMED BY AN INSTALLER WHO HAS BEEN TRAINED BY THE MANUFACTURER, OR MANUFACTURER'S REPRESENTATIVE, IN THE INSTALLATION PROCEDURES BASED ON PUBLISHED UL TESTED FIRE STOP SYSTEMS.
- FIRESTOPPING SHALL MEET THE REQUIREMENTS OF ASTM E-814 OR UL 1479 FIRE TESTS BY A RECOGNIZED TESTING AGENCY. FIRESTOPPING SHALL ALSO CONFORM TO THE FOLLOWING GOVERNING CODES: OHIO BUILDING CODE, NFPA 101-NATIONAL FIRE SAFETY CODE & NFPA 70 - NATIONAL ELECTRIC CODE.
- PENETRATION
a. CLEAN PENETRATION HOLES OF DIRT, LOOSE MATERIALS AND FOREIGN MATTER WHICH MAY AFFECT BOND OR INSTALLATION.
b. REMOVE COATINGS SUCH AS PAINT, CURING COMPOUNDS, WATER REPELLENT & SEALERS AS REQUIRED.
- INSTALL BACKING MATERIALS TO PREVENT LIQUID MATERIAL LEAKAGE.
- APPLICATION
a. PREPARE AND APPLY PENETRATION SEALING SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.
b. EMPLOY INSTALLATION TECHNIQUES WHICH WILL ENSURE THAT FIRESTOPPING IS DEPOSITED TO FILL AND SEAL HOLES AND OPENINGS.
c. TOOL EXPOSED SURFACES OF APPLIED SEALANT TO SMOOTH FINISH.
- PROTECT MATERIALS FROM DAMAGE ON SURFACES SUBJECTED TO TRAFFIC.
- PROVIDE INTUMESCENT SEALANTS AND COLLARS AT OPENINGS INVOLVING PLASTIC OR INSULATED PIPE SIMILAR TO THE METACALK SERIES 880 AND 950.
- FIRESTOPPING BY DOW CORNING, 3M, HILTI OR METACALK MAY FURNISHED AT THE CONTRACTOR'S OPTION.

J. GUARANTEE

- ALL LABOR AND MATERIALS FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER WHICH WILL COMMENCE UPON THE FINAL INSPECTION BY THE ENGINEER. DURING THIS TIME, ALL LEAKS, CORRECTION OF ALL THE FAILURES TO SUCH MATERIAL, AND THE CORRECTION OF ALL DISCREPANCIES WITH DRAWING CODE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
- RECORD DRAWINGS
1. THE CONTRACTOR SHALL KEEP AN ACCURATE RECORD OF ALL DEVIATIONS FROM CONTRACT DRAWINGS AND SPECIFICATIONS. HE SHALL NEATLY AND CORRECTLY ENTER IN COLORED PENCIL ANY DEVIATIONS ON DRAWINGS. AT COMPLETION OF THE PROJECT DELIVER DRAWINGS TO OWNER'S REPRESENTATIVE.

K. RECORD DRAWINGS

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L. HVAC INSULATION

- INSULATION THICKNESSES ARE BASED ON INSULATION HAVING THERMAL RESISTANCE IN THE RANGE OF 4.0 HR F R2/2 BTU TO 4.6 HR F R2/2 BTU PER INCH OF THICKNESS ON A FLAT SURFACE AT A MEAN TEMPERATURE OF 75°F. INSULATION THICKNESS SHALL BE INCREASED FOR MATERIALS HAVING R VALUES LESS THAN 4.0 OR MAY BE REDUCED FOR MATERIALS HAVING R VALUES GREATER THAN 4.6 TO GIVE EQUIVALENT "R" VALUES.
ALL INSULATING MATERIALS, INCLUDING JACKETS, GEMENTS, ADHESIVES, VAPOR BARRIERS, ETC., SHALL BE U.L. LISTED WITH A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50.
MOLDED PLASTIC FITTING COVERS SHALL BE U.L. APPROVED WITH A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50.
PIPE INSULATION SHALL BE SCHUELLER "MICRO-LOK" GLASS FIBER INSULATION RATED FOR RIGID RATED FACTORY APPLIED AS A PURPOSE, SELF-SEALING VAPOR BARRIER JACKET. BUTT STRIPS SHALL BE MINIMUM 3" WIDE OF SAME MATERIAL AS JACKET.
DUCT INSULATION SHALL BE SCHUELLER RIGID TYPE AS NOTED WITH FSK GLASS FIBER REINFORCED FOIL FACED FLAME RESISTANT KRAFT PAPER VAPOR BARRIER FACING.
ALL COVER ABOVE SHALL BE BY SCHUELLER. EQUIVALENT TYPE THICKNESS AND CONDUCTIVITY INSULATION BY OWENS CORNING, KNAUF, OR CERTAINTED MEETING ALL REQUIREMENTS MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

M. COVER ALL DUCTWORK AS FOLLOWS:

- ALL ROUND DUCTWORK IN THE CEILING SPACE SHALL BE INSULATED W/ 1 1/2" THICK, 1 LB. DENSITY BLANKET FLEXIBLE DUCT INSULATION.
- ALL RECTANGULAR LOW PRESSURE DUCTWORK IS TO BE SHALL BE INSULATED W/ 1 3/4" THICK, 1 LB. DENSITY BLANKET FLEXIBLE DUCT INSULATION.
- ADHERE INSULATION TO DUCT SURFACE WITH FOSTER NO. 85-20 ADHESIVE APPLIED IN 6" WIDE STRIPS ON 12" CENTERS. BUTT ALL EDGES OF INSULATION AND SEAL ALL JOINTS WITH A FOIL-SKRIM-KRAFT TAPE OR FLANGE ADHERED OVER THE JOINT. SECURE INSULATION WITH FLARE DOOR STAPLES UNTIL THE ADHESIVE SETS.
- SEAL ALL BREAKS AND JOINTS IN VAPOR BARRIER WITH 2-1/2" WIDE PRESSURE SENSITIVE TAPE TO MATCH VAPOR BARRIER FACING. ADHERE WITH FOSTER 85-20 ADHESIVE WHERE NECESSARY.
- LOW PRESSURE DUCTWORK AND ACCESSORIES
1. DUCTWORK AND ACCESSORIES SHALL BE FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH THE 2" W.G. TABLE IN THE LATEST EDITION OF SMACNA EXCEPT AS HEREIN NOTED AND/OR AS DETAILED ON THE DRAWINGS.
a. FIBERGLASS DUCT BOARD SHALL NOT BE UTILIZED. DUCTWORK, PLENUM, ETC. SHALL BE CONSTRUCTED OF SHEET METAL.
b. VANED ELBOWS ARE TO UTILIZE DOUBLE THICKNESS VANES TO PREVENT ELBOW HEAL RADIALIZED THE SAME AS THE TURNING VANE. ELBOW CHECKS ARE TO BE MINIMUM OF 3". VANED ELBOWS ARE NOT TO BE UTILIZED IN DUCTWORK WHERE VELOCITY EXCEEDS 2000 FPM.
c. RADIUS ELBOWS, 1/3 RADIUS OR FULL RADIUS ARE TO BE UTILIZED EXCEPT WITHIN 20' OF AN AIR OUTLET. 1/3 RADIUS ELBOWS SHALL HAVE A TURNING VANE ONE GAGE HEAVIER THAN DUCT CONSTRUCTION.

- ALL DUCTWORK DIMENSIONS INDICATED ON PLANS ARE CLEAR INSIDE DIMENSIONS, WHERE DUCTS ARE LINED. DUCTWORK IS TO BE INCREASED TO MAINTAIN THAT FREE AREA.
- FLEXIBLE CONNECTIONS TO ALL EQUIPMENT SHALL BE MADE WITH 3" WIDE DOUBLE NEOPRENE COATED FLAME RETARDANT FIBER GLASS FLEXIBLE CONNECTIONS. FLEXIBLE CONNECTIONS HAVE MINIMUM OF 24" GAUGE, 3" WIDE SHEET METAL COLLARS PERMANENTLY ATTACHED TO EACH SIDE.
- MITERED OFFSETS GREATER THAN 30" IN EITHER DIRECTION SHALL NOT BE PERMITTED.
- CHANGES IN DUCT SIZES SHALL BE MADE BY UNIFORM TAPER SECTION WITH A MAXIMUM INCLUDED ANGLE OF DIVERGENCE OF 15°.
- SPLITTER DAMPERS SHALL NOT BE PERMITTED UNLESS SPECIFICALLY NOTED ON THE DRAWING.

- VOLUME DAMPERS SHALL BE SINGLE BLADE UP TO 6" IN WIDTH AND MULTIBLADE FOR LARGER SIZES. VOLUME DAMPERS SHALL HAVE BALL BEARINGS AND SHALL INCORPORATE TURNING TYPE INDICATING ADJUSTMENT.
- FLEXIBLE DUCTS TO BE THERMAFLEX M-CO INSULATED FLEXIBLE DUCTWORK RATED AT 10" POSITIVE STATIC PRESSURE MINIMUM. MAXIMUM LENGTH OF FLEXIBLE DUCT TO BE 5'-0" FLEXMASTER TYPE 3M INSULATED FLEXIBLE DUCT MEETING ALL SPECIFIED REQUIREMENTS MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
- ALL DUCT JOINTS IN DUCT SYSTEMS SHALL BE MADE TIGHT. DUCT SEALER SHALL BE USED TO SEAL JOINTS.

E. GRILLES, REGISTERS AND DIFFUSERS

- REFER TO DRAWINGS FOR BASIS OF DESIGN.
- AIR DEVICES BY ANEMOSTAT, KRUEGER OR PRICE, MEETING ALL SPECIFIED REQUIREMENTS MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
- ALL LINEAR DIFFUSER PLENUM BOXES ARE TO BE SUPPORTED FROM THE STRUCTURE ABOVE.

F. MANUAL BALANCE DAMPERS

- BASED ON RUSKIN MD-35/0B OPPOSED BLADE WITH MOLDED SYNTHETIC BEARINGS, 6" WIDE 16 GAUGE GALVANIZED STEEL BLADES, EXTENDED SHAFT AND LINKAGE.
a. BALANCING DAMPERS FOR ROUND DUCTS SHALL BE RUSKIN MDRS-25 SINGLE BLADE, 20 GAUGE GALVANIZED STEEL.
b. ALL DAMPERS SHALL BE EQUIPPED WITH LOCKING QUADRANTS.
- AT THE CONTRACTOR'S OPTION, MANUAL BALANCING DAMPERS SHALL BE MANUFACTURED BY THE CONTRACTOR PER SMACNA STANDARDS. DAMPERS SHALL HAVE LOCKING QUADRANTS ON BOTH SIDES OF THE DUCT.
- DAMPERS BY AIR BALANCE, GREENHECK OR VENT PRODUCING SAME TYPE AND MEETING ALL SPECIFIED REQUIREMENTS, MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

G. RTU SPECIFICATIONS

- MANUFACTURERS
A. BASIS OF DESIGN: DAKIN APPLIED
B. ALTERNATES: VALENT, AON
- GENERAL DESCRIPTION
A. FURNISH AS SHOWN ON PLANS, DAKIN APPLIED REBEL SINGLE ZONE HEATING AND COOLING UNIT(S) MODEL DPS. UNIT PERFORMANCE AND ELECTRICAL CHARACTERISTICS SHALL BE PER THE JOB SCHEDULE.
B. CONFIGURATION: FABRICATE AS DETAILED ON PRINTS AND DRAWINGS:
1. RETURN PLenum / ECONOMIZER SECTION
2. FILTER SECTION
3. COOLING COIL SECTION
4. SUPPLY FAN SECTION
5. GAS HEATING SECTION
6. CONDENSING UNIT SECTION
C. THE COMPLETE UNIT SHALL BE DETAIL LISTED.
D. THE UNIT SHALL BE ASHRAE 90.1-2016 COMPLIANT AND LABELED.
E. EACH UNIT SHALL BE SPECIFICALLY DESIGNED FOR OUTDOOR APPLICATION AND INCLUDE A WEATHERPROOF CABINET. EACH UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND SHIPPED IN ONE PIECE. PACKAGED UNIT SHALL BE SHIPPED FULLY CHARGED WITH R-410 REFRIGERANT AND OIL.
F. THE UNIT SHALL UNDERGO A COMPLETE FACTORY RUN TEST PRIOR TO SHIPMENT. THE FACTORY TEST SHALL INCLUDE A REFRIGERANT CIRCUIT RUN TEST, A UNIT CONTROL SYSTEM OPERATIONS CHECKOUT, A UNIT REFRIGERANT LEAK TEST AND A FINAL UNIT INSPECTION. ALL UNITS SHALL HAVE TAGS AND LABELS TO INDICATE CAUTION AREAS AND AID UNIT SERVICE. UNIT NAMEPLATES SHALL BE FIXED TO THE MAIN CONTROL PANEL. ELECTRICAL WIRING DIAGRAMS SHALL BE ATTACHED TO THE CONTROL PANELS. INSTALLATION, OPERATING AND MAINTENANCE BUILDS SHALL BE SUPPLIED WITH EACH UNIT.
H. PERFORMANCE: ALL SCHEDULED AMPS, KW, AND HP ARE MAXIMUM ACCEPTED VALUES THAT ALLOW SCHEDULED CAPACITY TO BE MET.
I. WARRANTY: THE MANUFACTURER SHALL PROVIDE 12-MONTH PARTS ONLY WARRANTY. DEFECTIVE PARTS SHALL BE REPAIRED OR REPLACED DURING THE WARRANTY PERIOD AT NO CHARGE. THE WARRANTY PERIOD SHALL COMMENCE AT STARTUP OR SIX MONTHS AFTER SHIPMENT, WHICHEVER OCCURS FIRST.

CABINET, CASING, AND FRAME

- PANEL CONSTRUCTION SHALL BE DOUBLE-WALL CONSTRUCTION FOR ALL PANELS. ALL FLOOR PANELS SHALL HAVE A SOLID GALVANIZED STEEL INNER LINER ON THE AIR STREAM SIDE OF THE UNIT TO PROTECT INSULATION DURING SERVICE AND MAINTENANCE. INSULATION SHALL BE A MINIMUM OF 1" THICK WITH AN R-VALUE OF 7.0, AND SHALL BE 2" PART INJECTED FOAM. PANEL DESIGN SHALL INCLUDE NO EXPOSED INSULATION EDGES. UNIT CABINET SHALL BE DESIGNED TO OPERATE AT TOTAL STATIC PRESSURES UP TO 5.0 INCHES WATER GAGE.
B. EXTERIOR SURFACES SHALL BE CONSTRUCTED OF PRE-PAINTED GALVANIZED STEEL FOR AESTHETICS AND LONG TERM DURABILITY. PAINT FINISH TO INCLUDE A BASE PRIMER WITH A HIGH QUALITY POLYESTER RESIN TOPCOAT OF A NEUTRAL, BROWN COLOR. FINISHED PANEL SURFACES TO WITHSTAND A MINIMUM 1000-HOUR SALT SPRAY TEST IN ACCORDANCE WITH ASTM B117 STANDARD FOR CORROSION RESISTANCE.
C. SERVICE DOORS SHALL BE PROVIDED ON THE FAN SECTION, FILTER SECTION, CONTROL PANEL SECTION, AND HEATING VESTIBULE IN ORDER TO PROVIDE USER ACCESS TO UNIT COMPONENTS. ALL SERVICE ACCESS DOORS SHALL BE MOUNTED ON MULTIPLE STAINLESS STEEL HINGES AND SHALL BE SECURED BY A LATCH SYSTEM. REMOVABLE SERVICE PANELS SECURED BY MULTIPLE MECHANICAL FASTENERS ARE NOT ACCEPTABLE.
D. THE UNIT BASE SHALL OVERLAP THE ROOF CURB FOR POSITIVE WATER RUNOFF AND SHALL SEAT ON THE ROOF CURB GASKET TO PROVIDE A POSITIVE, WEATHERTIGHT SEAL. LIFTING BRACKETS SHALL BE PROVIDED ON THE UNIT BASE TO ACCEPT CHAIN OR CHAIN HOOKS FOR RIGGING THE EQUIPMENT.

OUTDOOR/RETURN AIR SECTION

- UNIT SHALL BE PROVIDED WITH AN OUTDOOR AIR ECONOMIZER SECTION. THE ECONOMIZER SECTION SHALL INCLUDE OUTDOOR RETURN AND EXHAUST AIR DAMPERS. THE ECONOMIZER OPERATION SHALL BE FULLY INTEGRAL TO THE MECHANICAL COOLING AND ALLOW UP TO 100% OF MECHANICAL COOLING IF NEEDED TO MAINTAIN THE COOLING DISCHARGE AIR TEMPERATURE. THE OUTDOOR AIR HOOD SHALL BE FACTORY INSTALLED AND CONSTRUCTED FROM GALVANIZED STEEL FINISHED WITH THE SAME DURABLE PAINT FINISH AS THE MAIN UNIT. THE HOOD SHALL INCLUDE MOISTURE ELIMINATOR FILTERS AND RETURN AIR DAMPERS. THE HOOD SHALL BE MOUNTED TO THE OUTSIDE AND RETURN AIR DAMPERS SHALL BE SIZED TO HANDLE 100% OF THE SUPPLY AIR VOLUME. THE DAMPERS SHALL BE PARALLEL BLADE DESIGN. DAMPER BLADES SHALL BE GASKETED WITH SEAL TO PROVIDE AN AIR LEAKAGE RATE OF 1.5 CFM SQUARE FOOT OF DAMPER AREA AT 10" DIFFERENTIAL PRESSURE IN ACCORDS WITH TESTING DEFINED IN AMCA 500. A BARIERING EXHAUST DAMPER SHALL BE PROVIDED TO EXHAUST AIR OUT OF THE BACK OF THE UNIT. A BRID SCREEN SHALL BE PROVIDED TO PREVENT INFILTRATION OF RAIN AND FOREIGN MATERIALS. EXHAUST DAMPER BLADES SHALL BE LINED WITH VINYL GASKETING ON CONTACT EDGES. CONTRALS OF THE DAMPERS SHALL BE BY A FACTORY INSTALLED DIRECT COUPLED ACTUATOR. DAMPER ACTUATOR SHALL BE OF THE MODULATING, SPRING RETURN TYPE. EXHAUST DAMPER SHALL BE PROVIDED WITH SENSORS TO DETERMINE IF OUTDOOR AIR IS SUITABLE FOR FRESH COOLING. IF OUTDOOR AIR IS SUITABLE FOR FRESH COOLING, THE OUTDOOR AIR DAMPERS SHALL MOOVE IN RESPONSE TO THE UNIT'S TEMPERATURE CONTROL SYSTEM.
B. PROVIDE FACTORY INSTALLED AND TESTED, OUTDOOR AIR MONITOR THAT CONTROLS OUTDOOR AIR +/- 15% ACCURACY DOWN TO 40 CFM PER TON.

EXHAUST FAN

- EXHAUST FAN SHALL BE A SINGLE WIDTH, SINGLE INLET (SWS) AIRFLOW CENTRIFUGAL FAN. THE FAN WHEEL SHALL BE CLASS II CONSTRUCTION WITH ALUMINUM FAN BLADES THAT ARE CONTINUOUSLY WELDED TO THE MOTOR SHAFT. BELTS AND SHEAVES ARE NOT TO BE A DIRECT DRIVE FAN MOUNTED TO THE MOTOR SHAFT. BELTS AND SHEAVES ARE NOT ACCEPTABLE DUE TO THE ADDITIONAL MAINTENANCE.
B. THE FAN MOTOR SHALL BE A TOTALLY ENCLOSED EC MOTOR THAT IS SPEED CONTROLLED BY THE ROOFTOP UNIT CONTROLLER. THE MOTOR SHALL INCLUDE THERMAL OVERLOAD PROTECTION AND PROTECT THE MOTOR IN THE CASE OF EXCESSIVE MOTOR TEMPERATURES. THE MOTOR SHALL HAVE PHASE FAILURE PROTECTION AND PREVENT THE MOTOR FROM OPERATION IN THE EVENT OF A LOSS OF PHASE. MOTORS SHALL BE PREMIUM EFFICIENCY.
C. THE UNIT DDC CONTROLLER SHALL PROVIDE BUILDING STATIC PRESSURE CONTROL. THE UNIT CONTROLLER SHALL PROVIDE PROPORTIONAL CONTROL OF THE EXHAUST FANS FROM 25% TO 100% OF THE SUPPLY AIR FAN DESIGNED AIRFLOW TO MAINTAIN THE ADJUSTABLE BUILDING STATIC PRESSURE SETPOINT. THE FIELD SHALL MOUNT THE REQUIRED SENSING TUBING FROM THE BUILDING TO THE FACTORY MOUNTED BUILDING STATIC PRESSURE SENSOR.

FILTERS

- UNIT SHALL BE PROVIDED WITH A DRAW-TROUGH FILTER SECTION. THE FILTER RACK SHALL BE DESIGNED TO ACCEPT A 2" PREFILTER AND A 4" FINAL FILTER. THE UNIT DESIGN SHALL HAVE A HINGED ACCESS DOOR FOR THE FILTER SECTION. THE MANUFACTURER SHALL SHIP THE ROOFTOP UNIT WITH 2" MERV 8 CONSTRUCTION FILTERS. THE CONTRACTOR SHALL FURNISH AND INSTALL, AT BUILDING OCCUPANCY, THE FINAL SET OF FILTERS PER THE CONTRACT DOCUMENTS.

COOLING COIL

- THE INDOOR COIL SECTION SHALL BE INSTALLED IN A DRAW THROUGH CONFIGURATION. UPSTREAM OF THE SUPPLY FAN. THE COIL SECTION SHALL BE COMPLETE WITH A FACTORY PIPED COOLING COIL AND AN ASHRAE 62.1 COMPLIANT DOUBLE SLOPED DRAIN PAN. THE DIRECT EXPANSION (DX) COOLING COILS SHALL BE FABRICATED OF SEAMLESS HIGH EFFICIENCY COPPER TUBE THAT IS MECHANICALLY EXPANDED INTO HIGH EFFICIENCY ALUMINUM FLATE FINNS. COILS SHALL BE A MULTI-ROW, STAGGERED TUBE DESIGN WITH A MINIMUM OF 3 ROWS. ALL COOLING COILS SHALL HAVE AN INTEGRATED COIL GROUTING THAT APPLIES THE FULL COIL FACE ACTIVE AT ALL LOAD CONDITIONS. ALL COILS SHALL BE FACTORY LEAK TESTED WITH HIGH PRESSURE AIR UNDER WATER.
C. THE COOLING COIL SHALL HAVE AN ELECTRONIC CONTROLLED EXPANSION VALVE. THE UNIT CONTROLLER SHALL CONTROL THE EXPANSION VALVE TO MAINTAIN LIQUID SUBCOOLING AND THE SUPERHEAT OF THE REFRIGERANT SYSTEM.
D. THE REFRIGERANT SUCTION LINES SHALL BE FULLY INSULATED FROM THE EXPANSION VALVE TO THE COMPRESSORS.
E. THE DRAIN PAN SHALL BE STAINLESS STEEL AND POSITIVELY SLOPED. THE SLOPE OF THE DRAIN PAN SHALL BE IN TWO DIRECTIONS AND COMPLY WITH ASHRAE STANDARD 62.1. THE DRAIN PAN SHALL HAVE A MINIMUM SLOPE OF 1/8" PER FOOT TO PROVIDE POSITIVE DRAINING. THE DRAIN PAN SHALL EXTEND BEYOND THE LEAVING SIDE OF THE COIL. THE DRAIN PAN SHALL HAVE A THREADED DRAIN CONNECTION EXTENDING THROUGH THE UNIT BASE.

HOT GAS REHEAT

- UNIT SHALL BE EQUIPPED WITH A FULLY MODULATING HOT GAS REHEAT COIL WITH HOT GAS COMING FROM THE UNIT CONDENSER.
B. HOT GAS REHEAT COIL SHALL BE A MICRO CHANNEL DESIGN. THE ALUMINUM TUBE SHALL BE ON MICRO CHANNELS AND SHALL BE MECHANICALLY EXPANDED INTO HIGH EFFICIENCY ALUMINUM FLATE FINNS. THE CAPACITY OF THE REHEAT COIL SHALL ALLOW FOR A 20F TEMPERATURE RISE AT ALL OPERATING CONDITIONS.
C. THE MODULATING HOT GAS REHEAT SYSTEMS SHALL ALLOW FOR INDEPENDENT CONTROL OF THE COOLING COIL LEAVING AIR TEMPERATURE AND THE REHEAT COIL LEAVING AIR TEMPERATURE. THE COOLING COIL LEAVING AIR TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE THROUGH THE UNIT CONTROLLER. DURING THE DEHUMIDIFICATION CYCLE THE UNIT SHALL BE CAPABLE OF 100% OF THE COOLING CAPACITY. THE HOT GAS REHEAT COIL SHALL PROVIDE DISCHARGE TEMPERATURE CONTROL WITHIN +/- 2F.
D. EACH COIL SHALL BE FACTORY LEAK TESTED WITH HIGH-PRESSURE AIR UNDER WATER.

SUPPLY FAN

- SUPPLY FAN SHALL BE A SINGLE WIDTH, SINGLE INLET (SWS) AIRFLOW CENTRIFUGAL FAN. THE FAN WHEEL SHALL BE CLASS II CONSTRUCTION WITH ALUMINUM FAN BLADES THAT ARE CONTINUOUSLY WELDED TO THE HUB PLATE AND END RM. THE SUPPLY FAN SHALL BE A DIRECT DRIVE FAN MOUNTED TO THE MOTOR SHAFT. BELTS AND SHEAVES ARE NOT ACCEPTABLE DUE TO THE ADDITIONAL MAINTENANCE.
B. ALL FAN ASSEMBLIES SHALL BE STATICALLY AND DYNAMICALLY BALANCED AT THE FACTORY, INCLUDING A FINAL BALANCE PRIOR TO SHIPMENT.
C. SUPPLY FAN AND MOTOR ASSEMBLY COMBINATIONS LARGER THAN 8 HP OR 22 SHALL BE INTERNALLY ISOLATED ON 1 REMOVABLE SHIPPING TIE DOWNS.
D. THE FAN MOTOR SHALL BE A TOTALLY ENCLOSED EC MOTOR THAT IS SPEED CONTROLLED BY THE ROOFTOP UNIT CONTROLLER. THE MOTOR SHALL INCLUDE THERMAL OVERLOAD PROTECTION AND PROTECT THE MOTOR IN THE CASE OF EXCESSIVE MOTOR TEMPERATURES. THE MOTOR SHALL HAVE PHASE FAILURE PROTECTION AND PREVENT THE MOTOR FROM OPERATION IN THE EVENT OF A LOSS OF PHASE. MOTORS SHALL BE PREMIUM EFFICIENCY.
E. THE SUPPLY FAN SHALL BE CAPABLE OF AIRFLOW MODULATION FROM 50% TO 100% OF THE SCHEDULED DISCHARGE AIRFLOW. THE FAN SHALL NOT OPERATE IN A STATE OF SURGE AT ANY POINT WITHIN THE MODULATION RANGE.

VARIABLE AIR VOLUME CONTROL

- THE UNIT CONTROLLER SHALL PROPORTIONAL CONTROL THE ECM MOTORS ON THE SUPPLY FAN BASED ON SPACE TEMPERATURE. THE UNIT CONTROLLER SHALL INCREASE/DECREASE THE SPEED OF THE SUPPLY FAN IN ORDER TO MAINTAIN THE SPACE TEMPERATURE WITHIN ITS SETPOINT AND DEADBAND. THE UNIT CONTROLLER SHALL PROVIDE DISCHARGE AIR TEMPERATURE CONTROL WITH THE COMPRESSOR MODULATION.

HEATING SECTION

- THE ROOFTOP UNIT SHALL INCLUDE A NATURAL GAS HEATING SECTION. THE GAS FURNACE DESIGN SHALL BE ONE NATURAL GAS FIRED HEATING MOULDE FACTORY INSTALLED DOWNSTREAM FROM THE SUPPLY FAN PORT OF THE HEAT SECTION. THE HEATING MOULDE SHALL BE A TUBULAR DESIGN WITH IN-SHOT GAS BURNERS.
B. THE MOULDE SHALL BE COMPLETE WITH FURNACE CONTROLLER AND CONTROL VALVE CAPABLE OF 1" FLOW. MECHANICAL PARTS SHALL BE PROVIDED TO THE CONTRACTOR.
C. THE HEAT EXCHANGER TUBES SHALL BE CONSTRUCTED OF STAINLESS STEEL.
D. THE MOULDE SHALL HAVE AN INPUT TO THE UNIT CONTROLLER AND THE VALUES BE DISPLAYED IN THE HEAT EXCHANGER TUBES FOR THE REMOVAL OF THE FLUE GASES.
E. EACH BURNER MOULDE SHALL HAVE TWO FLAME ROLL-OUT SAFETY PROTECTION SWITCHES AND TWO EXHAUSTER UNIT SWITCHES. THE GAS VALVE OFF UPON DETECTION OF IMPROPER BURNER MANIFOLD OPERATION. THE INDUCED DRAFT FAN SHALL HAVE AN AIRFLOW SAFETY SWITCH THAT MONITORS THE HEATING MOULDE FROM TURNING ON IN THE EVENT OF NO AIRFLOW IN THE FLUE CHAMBER.
F. THE FACTORY-INSTALLED DDC UNIT CONTROL SYSTEM SHALL CONTROL THE GAS HEAT MOULDE. FIELD INSTALLED HEATING MOULDES SHALL REQUIRE A FIELD ETL CERTIFICATION. THE MANUFACTURER'S ROOFTOP UNIT ETL CERTIFICATION SHALL COVER THE COMPLETE UNIT INCLUDING THE GAS HEATING MOULDES.

CONDENSING SECTION

- OUTDOOR COILS SHALL HAVE SEAMLESS COPPER TUBES, MECHANICALLY BONDED INTO ALUMINUM PLATE-TYPE FINNS. THE FINNS SHALL HAVE FULL DRAW COLLARS TO COMPLETELY COVER THE TUBES. A SUB-COOLING COIL SHALL BE AN INTEGRAL PART OF THE MAIN CONDENSING COIL. THE CONDENSING COIL SHALL BE FACTORY LEAK TESTED WITH HIGH-PRESSURE AIR UNDER WATER.
B. FAN MOTORS SHALL BE A TYPE MOTOR FOR PROPORTIONAL CONTROL. THE UNIT CONTROLLER SHALL PROPORTIONALLY CONTROL THE SPEED OF THE CONDENSER FAN MOTORS TO MAINTAIN THE HEAD PRESSURE OF THE REFRIGERANT CIRCUIT FROM AMBIENT CONDITION OF 15-20F. MECHANICAL PARTS SHALL BE PROVIDED TO THE CONTRACTOR.
C. THERMAL OVERLOAD PROTECTION AND PROTECT THE MOTOR IN THE CASE OF EXCESSIVE MOTOR TEMPERATURES. THE MOTOR SHALL HAVE PHASE FAILURE PROTECTION AND PREVENT THE MOTOR FROM OPERATION IN THE EVENT OF A LOSS OF PHASE.
D. THE CONDENSER FAN SHALL BE LOW NOISE BLADE DESIGN. FAN BLADE DESIGN SHALL BE A DYNAMIC PROFILE. LOW TIP SPEED. FAN BLADE SHALL BE OF A COMPOSITE MATERIAL.
E. THE UNIT SHALL HAVE SCROLL COMPRESSORS. ONE OF THE COMPRESSORS SHALL BE AN INVERTER COMPRESSOR THAT MOVES BACK TO THE COMPRESSOR INSTEAD OF THROUGH THE DISCHARGE LINE. DIGITAL SCROLL COMPRESSORS ARE NOT ACCEPTABLE.
F. THERMAL OVERLOAD PROTECTION AND PROTECT THE MOTOR IN THE CASE OF EXCESSIVE MOTOR TEMPERATURES. THE MOTOR SHALL HAVE PHASE FAILURE PROTECTION AND PREVENT THE MOTOR FROM OPERATION IN THE EVENT OF A LOSS OF PHASE.
G. THE CONDENSER FAN SHALL HAVE A BYPASS VALVE BETWEEN THE SUCTION AND DISCHARGE VALVE SHALL BE INPUT TO THE UNIT CONTROLLER AND THE VALUES BE DISPLAYED AT THE UNIT CONTROLLER.
H. THE CONDENSER FAN SHALL HAVE A BYPASS VALVE BETWEEN THE SUCTION AND DISCHARGE VALVE SHALL BE INPUT TO THE UNIT CONTROLLER AND THE VALUES BE DISPLAYED AT THE UNIT CONTROLLER.
I. PERFORMANCE: ALL SCHEDULED AMPS, KW, AND HP ARE MAXIMUM ACCEPTED VALUES THAT ALLOW SCHEDULED CAPACITY TO BE MET.
J. WARRANTY: THE MANUFACTURER SHALL PROVIDE 12-MONTH PARTS ONLY WARRANTY. DEFECTIVE PARTS SHALL BE REPAIRED OR REPLACED DURING THE WARRANTY PERIOD AT NO CHARGE. THE WARRANTY PERIOD SHALL COMMENCE AT STARTUP OR SIX MONTHS AFTER SHIPMENT, WHICHEVER OCCURS FIRST.

ELECTRICAL

- UNIT WIRING SHALL COMPLY WITH NEC REQUIREMENTS AND WITH ALL APPLICABLE UL STANDARDS. ALL ELECTRICAL COMPONENTS SHALL BE UL RECOGNIZED WHERE APPLICABLE. ALL WIRING AND ELECTRICAL COMPONENTS PROVIDED WITH THE UNIT SHALL BE NUMBERED AND COLOR-CODED AND IDENTIFIED TO THE ELECTRICAL DIAGRAM PROVIDED FOR EASY IDENTIFICATION. THE UNIT SHALL BE PROVIDED WITH A FACTORY WIRED WEATHERPROOF CONTROL PANEL. THE PANEL SHALL HAVE A SINGLE POINT POWER TERMINAL BLOCK FOR MAIN POWER AND A SECOND TERMINAL BOARD FOR LOW VOLTAGE CONTROL WIRING. BRANCH SHORT CIRCUIT PROTECTION, 115-VOLT CIRCUIT BREAK TRANSFORMER AND FUSE SYSTEM SWITCHES, SHALL BE PROVIDED FOR THE UNIT. THE UNIT SHALL BE PROVIDED WITH THE UNIT, EACH COMPRESSOR AND CONDENSER FAN MOTOR SHALL BE PROVIDED WITH CONTACTORS AND INHERENT THERMAL OVERLOAD PROTECTION. SUPPLY FAN MOTORS SHALL HAVE THERMAL OVERLOAD PROTECTION. THERMAL OVERLOAD PROTECTION KNOCKOUTS SHALL BE PROVIDED IN THE BOTTOM OF THE MAIN CONTROL PANELS FOR FIELD WIRING ENTRANCE.
B. SINGLE NON-FUSIBLE DISCONNECT SWITCH SHALL BE PROVIDED FOR DISCONNECTING ELECTRICAL POWER AT THE UNIT. DISCONNECT SWITCHES SHALL BE MOUNTED INTERNALLY TO THE CONTROL PANEL AND OPERATED BY AN EXTERNALLY MOUNTED HANDLE.

CONTROLS

- PROVIDE A COMPLETE INTEGRATED MICROPROCESSOR BASED DIGITAL CONTROL (DDC) SYSTEM TO CONTROL ALL UNIT FUNCTIONS INCLUDING TEMPERATURE CONTROL, SCHEDULING, MONITORING, UNIT SAFETY PROTECTION, INCLUDING COMPRESSOR MINIMUM RUN AND MINIMUM OFF TIMES, AND DIAGNOSTICS. THIS SYSTEM SHALL CONSIST OF ALL REQUIRED TEMPERATURE SENSORS, PRESSURE SENSORS, CONTROLLER AND KEYPAD/DISPLAY OPERATOR INTERFACE. ALL MCBs AND SENSORS SHALL BE FACTORY MOUNTED, WIRED AND TESTED.
B. THE STAND-ALONE DDC CONTROLLERS SHALL NOT BE DEPENDENT ON COMMUNICATIONS WITH ANY ON-SITE OR REMOTE PC OR MASTER CONTROL PANEL. FOR PROPER UNIT OPERATION, THE MICROPROCESSOR SHALL BE FACTORY INSTALLED AND OPERATE STAN ALONE. THE UNIT SHALL INCLUDE EITHER DIRECT CONNECT OR NETWORK COMMUNICATIONS. THE MICROPROCESSOR SHALL BE PROTECTED FROM VOLTAGE FLUCTUATIONS AS WELL AS ANY EXTENDED POWER SHADOWING. ALL FACTORY AND USER SET SCHEDULES AND CONTROL POINTS SHALL BE MAINTAINED IN NONVOLATILE MEMORY. NO SETTINGS SHALL BE LOST, EVEN DURING EXTENDED POWER SHADOWING.
C. THE DDC CONTROL SYSTEM SHALL PERMIT STARTING AND STOPPING OF THE UNIT LOCALLY OR REMOTELY. THE SYSTEM SHALL BE CAPABLE OF STOPPING A REMOTE ALARM INDICATION. THE UNIT CONTROL SYSTEM SHALL PROVIDE FOR OUTSIDE AIR DAMPER ACTUATION, EMERGENCY SHUTDOWN, REMOTE HEAT ENABLE/DISABLE, REMOTE COOL ENABLE/DISABLE, HEAT MODULATION, COOL INDICATION, AND FAN OPERATIONS. THE UNIT SHALL HAVE ALL DIGITAL INPUTS AND OUTPUTS SHALL BE PROTECTED AGAINST DAMAGE FROM TRANSIENTS OR INDUCTIVE VOLTAGES. ALL FIELD WIRING SHALL BE TERMINATED AT A SEPARATE, CLEARLY MARKED TERMINAL STRIP.
D. THE DDC CONTROLLER SHALL HAVE A BUILT-IN TIME SCHEDULE. THE SCHEDULE SHALL BE PROVIDED BY THE USER. THE SCHEDULE SHALL BE PASWORD PROTECTED AGAINST UNAUTHORIZED CHANGES. FOR EASE OF SERVICE, THE DISPLAY FORMAT SHALL BE ENGLISH LANGUAGE READOUT. CODED FORMATS WITH LOOK-UP TABLES WILL NOT BE ACCEPTED. THE USER INTERACTION WITH THE UNIT SHALL BE PROVIDED BY THE FOLLOWING INFORMATION AS A MINIMUM:
1. RETURN AIR TEMPERATURE.
2. DISCHARGE AIR TEMPERATURE.
3. OUTDOOR AIR TEMPERATURE.
4. SPACE AIR TEMPERATURE.
5. OUTDOOR ENTHALPY, HIGH/LOW.
6. COMPRESSOR SUCTION TEMPERATURE AND PRESSURE.
7. COMPRESSOR HEAD PRESSURE AND TEMPERATURE.
8. EXPANSION VALVE POSITION.
9. CONDENSER FAN SPEED.
10. INVERTER COMPRESSOR SPEED.
11. DIRTY FILTER INDICATION.
12. AIRFLOW VERIFICATION.

- COOLING STATUS. TEMPERATURE (CHANGEOVER).
- CONTROL TEMPERATURE (CHANGEOVER).
- WAV BOX OUTPUT STATUS.
- COOLING STATUS/CAPACITY.
- UNIT STATUS.
- ALL TIME SCHEDULES.
- ACTIVE ALARMS WITH TIME AND DATE.
- PREVIOUS ALARMS WITH TIME AND DATE.
- DISPLAY ALARMS WITH TIME AND DATE.
- SUPPLY FAN AND EXHAUST FAN SPEED.
- SYSTEM OPERATING HOURS.

- THE USER INTERACTION WITH THE KEYPAD SHALL PROVIDE THE FOLLOWING:
1. CONTROLS MODE
a. OFF MANUAL
b. AUTO
c. HEAT/COOL
d. COOL ONLY
e. HEAT ONLY
f. FAN ONLY
2. OCCUPANCY MODE
a. AUTO
b. OCCUPIED
c. UNOCCUPIED
4. TEMANT OVERRIDE
3. UNIT OPERATION CHANGEOVER CONTROL
a. RETURN AIR TEMPERATURE
b. SPACE TEMPERATURE
c. NETWORK SIGNAL
4. COOLING AND HEATING CHANGE-OVER TEMPERATURE WITH DEADBAND
5. COOLING DISCHARGE AIR TEMPERATURE (DAT)
6. SUPPLY RESET OPTIONS
a. RETURN AIR TEMPERATURE
b. OUTDOOR AIR TEMPERATURE
c. SPACE TEMPERATURE
d. AIRFLOW (VAV)
e. NETWORK SIGNAL
f. EXTERNAL (0-20 VDC)
7. TEMPERATURE ALARM LIMITS
a. HIGH SUPPLY AIR TEMPERATURE
b. LOW SUPPLY AIR TEMPERATURE
c. HIGH RETURN AIR TEMPERATURE
8. LOCKOUT CONTROL FOR COMPRESSORS.
9. COMPRESSOR INTERSTAGE TIMERS
10. NIGHT SETBACK AND SETUP SPACE TEMPERATURE.
11. BUILDING STATIC PRESSURE.
12. ECONOMIZER CHANGEOVER
a. ENTHALPY
b. DRYBULB TEMPERATURE
13. CURRENT TIME AND DATE
14. TENANT OVERRIDE TIME
15. OCCUPIED/UNOCCUPIED TIME SCHEDULE
16. ON-DEMAND SCHEDULE
17. HOLIDAY DATES AND DURATION
18. ADJUSTABLE SET POINTS
19. SERVICE MODE
a. TIMERS NORMAL (ALL TIME DELAYS NORMAL)
b. TIMERS FAST (ALL TIME DELAYS 20 NIGHT)

- IF THE UNIT IS TO BE PROGRAMMED WITH A NIGHT SETBACK OR SETUP FUNCTION, AN OPTIONAL SPACE SENSOR SHALL BE PROVIDED. SPACE SENSOR TO SUPPORT FIELD SELECTABLE FEATURES. SENSOR OPTIONS SHALL INCLUDE:
1. ZONE SENSOR WITH TENANT OVERRIDE SWITCH
2. ZONE SENSOR WITH TENANT OVERRIDE SWITCH PLUS HEATING AND COOLING SET POINT ADJUSTMENT. (SPACE CONTROL SYSTEMS ONLY)
1. TO INCREASE THE EFFICIENCY OF THE COOLING SYSTEM THE DDC CONTROLLER SHALL INCLUDE A DISCHARGE AIR TEMPERATURE RESET PROGRAM FOR PART LOAD OPERATING CONDITIONS. DISCHARGE AIR TEMPERATURE SHALL BE CONTROLLED BETWEEN A MINIMUM AND A MAXIMUM DISCHARGE AIR TEMPERATURE (DAT) BASED ON ONE OF THE FOLLOWING INPUTS:
1. AIRFLOW
2. OUTSIDE AIR TEMPERATURE
3. SPACE TEMPERATURE
4. RETURN AIR TEMPERATURE
5. EXTERNAL SIGNAL OF 0-20 MA
6. NETWORK SIGNAL

- POWER WIRING EXTERNAL TO THE UNIT BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING EXTERNAL TO UNIT NOT SHOWN ON ELECTRICAL DRAWINGS TO BE BY THE HVAC CONTRACTOR.
EXTEND CONDENSATION DRAIN PIPING FROM THE DRAIN PAN OF EACH UNIT TO A SPLASH BLOCK OR ROOF OR GRADE PROVIDED BY THIS CONTRACTOR.
PROVIDE FLEXIBLE CONNECTIONS FOR ALL DUCTS AT UNITS OR PLENUM ROOF CURBS.
UNIT TO BE MOUNTED ON STRUCTURAL STEEL.

- FURNISH AND INSTALL UTILITY SET EXHAUST FANS AND APPURTENANCES WITH SIZES AND CAPACITIES AS SHOWN ON THE DRAWINGS.
2. UTILITY SET FANS BASED ON GREENHECK FJI SERIES WITH DYNAMICALLY BALANCED BACKWARD INCLINED CENTRIFUGAL WHEEL, DIRECT DRIVE TYPE MOTOR, IN EMBOSSED GALVANIZED STEEL CASING. FANS SHALL HAVE A FACTORY INSTALLED DISCONNECT.
3. FAN RATINGS SHALL BE AMCA CERTIFIED AND FAN SHALL BEAR AMCA SEALS AND SHALL BE U.L. LISTED.
4. MOTOR SHALL BE 208/60/3 W/ BUILT IN THERMAL OVERLOAD PROTECTION. THE MOTOR SHALL BE MOUNTED ON VIBRATION ISOLATORS.

- EXHAUST FANS WITH A FACTORY MOUNTED VARIABLE SPEED DRIVE FOR BALANCING THE FAN SYSTEM AIRFLOW.
6. INLINE EXHAUST FANS BY COOK, OR TWIN CITY OF THE SAME TYPE, SIZE AND MEETING CAPACITY REQUIREMENTS, MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
7. PROVIDE FLEXIBLE CONNECTIONS AT INLET AND DISCHARGE DUCTS.
8. MOUNT

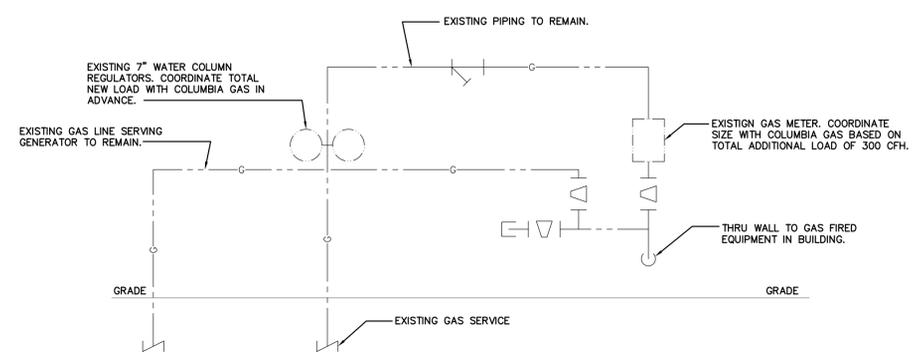
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CODED NOTES

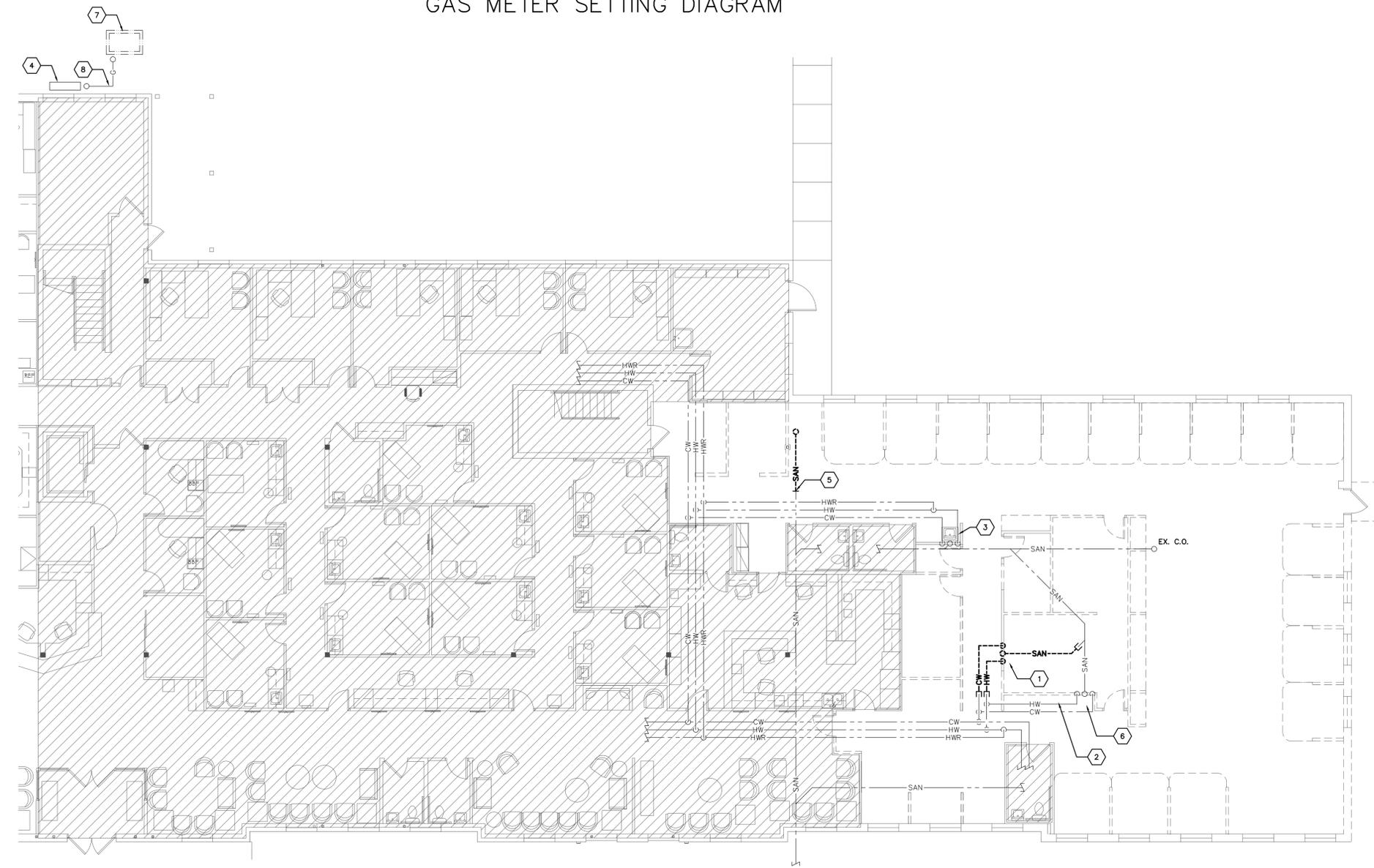
- EXISTING SINK TO BE REMOVED. REMOVE CW, HW, VENT, AND SANITARY BACK TO WITHIN 24" OF THE NEAREST ACTIVE MAIN AND CAP.
- EXISTING WATER DISPENSER TO BE REMOVED. REMOVE CW BACK TO NEAREST ACTIVE MAIN AND CAP.
- EXISTING SINK TO BE REMOVED. EXISTING ROUGH-IN TO REMAIN FOR CONNECTION TO NEW SINK UNDER NEW WORK.
- EXISTING GAS METER AND REGULATOR TO BE MODIFIED AS REQUIRED BY COLUMBIA GAS TO ALLOW FOR ADDITIONAL LOAD OF 1300 CFH. COORDINATE WITH COLUMBIA GAS IN ADVANCE.
- REMOVE BELOW GRADE SANITARY BACK TO THIS APPROXIMATE LOCATION. SEE NEW WORK PLANS FOR NEW EXTENSION.
- EXISTING SINK TO BE REMOVED. REMOVE CW, HW, AND VENT BACK TO ABOVE CEILING AND SANITARY BACK TO BELOW SLAB FOR EXTENSION TO NEW SINK AT THIS APPROXIMATE LOCATION UNDER NEW WORK.
- EXISTING NATURAL GAS FIRED GENERATOR TO REMAIN.
- EXISTING GAS PIPING TO EXISTING GENERATOR TO REMAIN.

DEMOLITION NOTES

- EXISTING PIPING REMAINING IN SERVICE IS AS INDICATED ON THE PLBG. PLAN DRAWINGS.
- REFER TO ARCHITECTURAL DOCUMENTATION FOR ADDITIONAL SCOPE/INFORMATION REGARDING DEMOLITION WORK, INCLUDING IDENTIFICATION OF AREAS AND ITEMS INVOLVED, AND ITEMS OF BOTH A SPECIFIC AND GENERAL NATURE.
- UNLESS INDICATED OTHERWISE, ALL SUPPLY AND DRAIN PIPING ASSOCIATED WITH ITEMS BEING REMOVED IS TO BE REMOVED BACK TO THE NEAREST ACTIVE MAIN/BRANCH MAIN THAT WILL REMAIN IN SERVICE AFTER COMPLETION OF PROJECT, AND CAPPED OR PLUGGED (AS APPLICABLE) AT THIS POINT. CAP/PLUG TO OCCUR ON DOWNSTREAM SIDE OF ISOL. VALVE AT MAIN/BRANCH MAIN TIE-IN POINT, IF SUCH VALVE IS PROVIDED. THIS INCLUDES PIPING BELOW FLOOR AND/OR ON FLOOR ABOVE ASSOCIATED WITH ITEMS WITHIN THE REMODELED AREAS.
- REMOVE/RELOCATE ANY INCIDENTAL EXISTING PLUMBING ITEMS (INCLUDING PIPING IN THE REMODELED AREAS AS REQUIRED TO REMAIN CONCEALED AND OPERATIONAL AFTER PROJECT COMPLETION, WHERE STRUCTURE IS BEING REMOVED, ADDED AND/OR MODIFIED.
- CUTTING/REMOVAL AND REPAIR/REPLACEMENT OF EXISTING STRUCTURES AND/OR SURFACES REQUIRED FOR REMOVAL OF EXISTING AND/OR INSTALLATION OF NEW WORK IS BY THIS CONTRACTOR, UNLESS INDICATED OTHERWISE. REPAIR/REPLACEMENT TO BE TO ORIGINAL CONDITION, TO MATCH ADJACENT STRUCTURES AND SURFACES IN TYPE AND KIND. THIS INCLUDES CEILINGS, PARTITIONS, FLOORS, SOFFITS, ETC., BOTH WITHIN AND OUTSIDE THE REVISED/REMODELED AREAS THAT ARE AFFECTED BY WORK REQUIRED FOR COMPLETION OF THIS PROJECT. NOT APPLICABLE IF EXISTING STRUCTURES AND/OR SURFACES ARE BEING REVISED/REMOVED/REPLACED UNDER SEPARATE CONTRACT.



GAS METER SETTING DIAGRAM



FIRST FLOOR PLUMBING DEMOLITION PLAN
 SCALE: 1/8"=1'-0"



P100-19258.DWG 01/24/2020

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DESIGNED BY P.B.MELCHER	DRAWN BY P.B.MELCHER	CHECKED BY C.J.ANDERSON	JOB NUM. 19258
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Consultants:

Project Reference: #19004
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Date: 01/24/2020

Project Status:
 Planning
 Programming
 Schematic Design
 Design Development
 Construction Documents

Sheet Reference:

P100

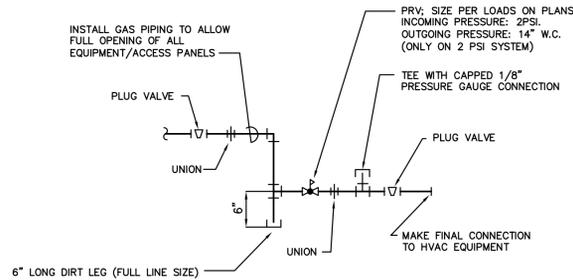
PLUMBING LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—CW—	DOMESTIC COLD WATER LINE	OC—	P-TRAP (PLAN VIEW)
—F—	FIRE PROTECTION LINE	—C—	CAPPED LINE
—G—	GAS LINE (NATURAL)	—E—	EXISTING WORK TO REMAIN
—HW—	HOT WATER LINE (DOMESTIC)	—D—	EXISTING WORK TO BE REMOVED
—HWR—	HOT WATER RETURN (DOMESTIC)	—B—	PIPE BRANCH TOP CONNECTION
—SAN—	SANITARY LINE	—A—	PIPE BRANCH BOTTOM CONNECTION
—TP—	TRAP PRIMER LINE	—P—	PETE'S PLUG
—V—	VENT LINE	—S—	COMB. BALANCE & STOP VALVE
—C—	CHECK VALVE	—B—	BALL VALVE
—V—	GAS COCK OR BALANCE VALVE	—S—	SOLENOID VALVE
—F—	FLOOR OR AREA DRAIN	—C—	CONNECT TO EXISTING THRU FLOOR AS SHOWN
—T—	THERMOMETER		

PLUMBING ABBREVIATIONS			
ABV.	DESCRIPTION	GEN.	GENERAL
A.F.F.	ABOVE FINISHED FLOOR	H.B.	HOSE BIBB
APPROX.	APPROXIMATELY	HTR.	HEATER
BTM.	BOTTOM	HTG.	HEATING
BLDG.	BUILDING	INV. ELEV.	INVERT ELEVATION
B.T.	BATH TUB	INT.	INTERIOR
C.B.	CATCH BASIN	LAV.	LAVATORY
C.D.	CANOPY DRAIN	M. H.	MANHOLE
CHEM.	CHEMICAL	MFR.	MANUFACTURER
C.I.	CAST IRON	MECH.	MECHANICAL
CLG.	CEILING	PLBG.	PLUMBING
CONC.	CONCRETE	PRESS.	PRESSURE
C.O.	CLEAN OUT	REQD.	REQUIRED
CONN.	CONNECT	RM.	ROOM
CONTR.	CONTRACTOR	S.D.	SHOWER DRAIN
D.TL.	DETAIL	SH.	SHOWER
DIA.	DIAMETER	S.I.	SURFACE INLET
D.F.	DRINKING FOUNTAIN	THERM.	THERMOMETER
DN.	DOWN	TYP.	TYPICAL
E.W.H.	ELECTRIC WATER HEATER	VTR.	VENT THRU ROOF
ELEC.	ELECTRICAL	W.	WASTE
E.W.C.	ELECTRIC WATER COOLER	W/	WITH
EXIST.	EXISTING	WC.	WATER CLOSET
EXT.	EXTERIOR		
FT. HD.	FEET OF HEAD		
FLR.	FLOOR		
F.D.	FLOOR DRAIN		
FURN.	FURNISH		
F.V.	FLUSH VALVE		

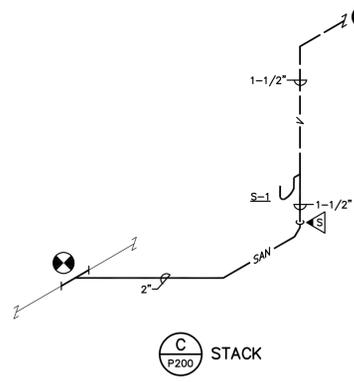
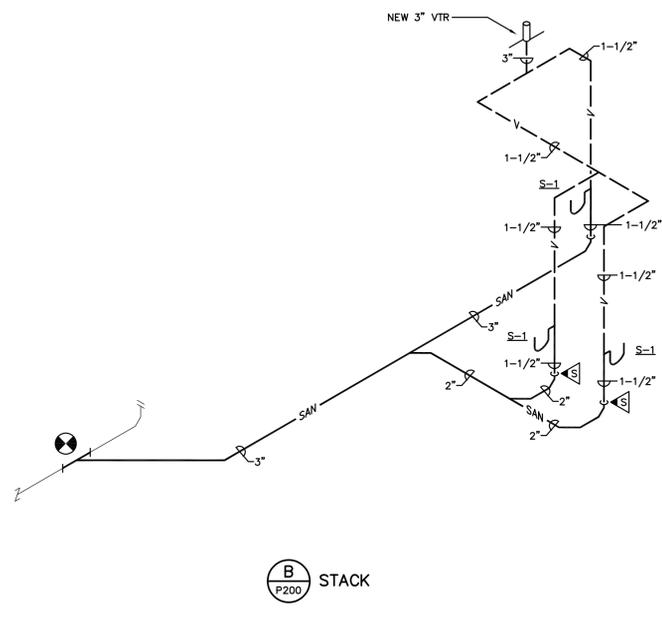
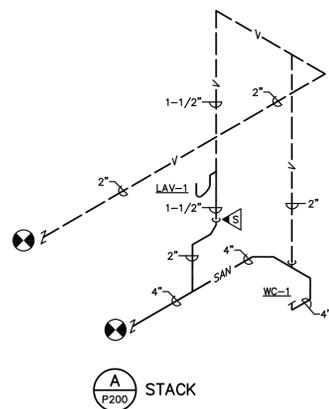
DRAIN & CLEANOUT SCHEDULE		
DES.	LOCATION	DESCRIPTION
CO	CONCEALING WALL	USE CLEANOUT TEE AND PROVIDE CLEANOUT AND ACCESS COVER SIMILAR TO ZURN ZANB-1468 WITH ROUND POLISHED STAINLESS STEEL ACCESS COVER, SECURING SCREW, AND BRONZE TAPER THREADED PLUG. FOR CLEANOUTS LOCATED WITHIN RATED STRUCTURES PROVIDE A FIRE RATED 8" SQUARE FLUSH MOUNTED STEEL ACCESS DOOR SIMILAR TO AN ACUDOR NO. FB-5060 WITH FLUSH KEY LATCH AND PRIMER COAT FINISH.
CO	FLOOR IN FINISH AREAS	ZURN MODEL NO.ZN-1400 CAST IRON BODY ADJUSTABLE CLEANOUT WITH ANCHOR FLANGE, POLISHED NICKEL BRONZE ROUND SCORATED FRAME AND TOP, AND BOTTOM GASKET CONNECTION OUTLET. CLEANOUTS IN STRUCTURES ABOVE GRADE TO BE FURNISHED WITH CLAMPING COLLAR.
CO	EXPOSED OR WITHIN ACCESSIBLE STRUCTURE	ZURN MODEL ZB-1470 WITH COUNTER-SUNK TAPERED THROD BRONZE PLUG.

PLUMBING FIXTURE SCHEDULE			
PLUMBING FIXTURE NOTES:			
1. UNLESS INDICATED OTHERWISE, THE ARCHITECT SHALL SELECT THE FIXTURE COLOR/FINISH FROM THE MANUFACTURER'S FULL RANGE OF STANDARD OPTIONS.			
2. UNLESS INDICATED OTHERWISE, ALL EXPOSED METALLIC COMPONENTS TO BE FURNISHED WITH POLISHED CHROME FINISH, INCLUDING FAUCETS, TRAPS, STOPS, PIPING, ETC.			
3. UNLESS INDICATED OTHERWISE, ALL EXPOSED PIPING SHALL BE FURNISHED WITH POLISHED CHROME FINISH BRASS ESCUTCHEONS AT ALL WALL/CABINET PENETRATIONS AND FIXTURE CONNECTIONS.			
FIXTURE	MANUFACTURER	REMARKS	PIPE SIZE
S-1	ELKAY/ SLOAN/ MCGUIRE//	FIXTURE: AMERICAN STD. WALL HUNG; LUCERNE NO. 0356.015 CONTROLS: SPEAKMAN MODEL SEF-CA-BO-TW COMBINATION HI-ARC GOOSENECK TYPE FAUCET WITH INTEGRAL EYEWASH, 4" WRIST BLADE HANDLES 0.5 GPM LAMINAR FLOW OUTLET, ONE-STEP OPERATION PULL HANDLES EYEWASH (2) AERATED EYEWASH SPRAY OUTLETS, FLIP-TOP DUST CAPS, AND SE-370 EMERGENCY MIXING VALVE. MIXING VALVE TO BE ADJUSTED AS REQUIRED TO PROVIDE A MAXIMUM OF 70° TEMPERED WATER TO EYE-WASH SPRAY OUTLETS. INSTALLATION TO COMPLY WITH ANSI Z358.1. DRAIN: AMERICAN STANDARD GRID STRAINER COMPATIBLE WITH FIXTURE. TRAP: MCGUIRE MODEL 8912 1 1/2"x1 1/2" 17 GA. P-TRAP, CHROME PLATED STOP(S): MCGUIRE MODEL 2165 1/2" SINK SUPPLIES WITH WHEEL HANDLE BRASS ANGLE STOPS AND CHROME PLATED COPPER FLEX TUBE RISERS.	1/2" 1/2"
WC-1 (HANDICAP ACCESSIBLE)	AMERICAN STANDARD/MCGUIRE//BEMIS	FIXTURE: AMERICAN STD. FLR. MTD. TANK TYPE; CADET NO. 2998.012 (1.6 GPF). FURN. W/ FLR. FLANGE, CLOSET ELBOW & WAX RING STOP(S): MCGUIRE MODEL 2165LK 1/2" CLOSET SUPPLY W/ LOOSE KEY BRASS ANGLE STOP & COPPER FLEX RISER. ALL CHROME PLATED SEAT: BEMIS MODEL NO. 1655/SSC (SELF-SUSTAINING CHECK HINGE) FIXTURE ASSEMBLY TO COMPLY WITH HANDICAP ACCESS REQUIREMENTS.	1/2" ---
LAV-1 (HANDICAP ACCESSIBLE)	AMERICAN STANDARD/MCGUIRE//ZURN/LEONARD	FIXTURE: AMERICAN STD. WALL HUNG; LUCERNE NO. 0355.012 CONTROLS: AMERICAN STD. SINGLE HANDLE MIXER; RELIANT PLUS NO. 7385.003 WITH GRID DRAIN INCLUDED. 0.5 GPM LAMINAR FLOW OUTLET. TW MIXER; SIMILAR TO LEONARD MODEL NO. 170 THERMOSTATIC MIXING VALVE WITH INTEGRAL INLET CHECK STOPS, LOCKING TEMPERATURE ADJUSTMENT, AND ASSE 1070 CERTIFIED. ADJUST VALVE AS REQUIRED TO PROVIDE A MAXIMUM OF 110° TEMPERED WATER TO SINK. TRAP: MCGUIRE MODEL 8902 1 1/4"x1 1/2" 17 GA. P-TRAP, CHROME PLATED STOP(S): MCGUIRE MODEL 2165LK 1/2" LAVATORY SUPPLIES W/ LOOSE KEY BRASS ANGLE STOPS & COPPER FLEX TUBE RISERS. ALL CHROME PLATED CARRIER: ZURN SERIES 1231 COVER: MCGUIRE PRO-WRAP SERIES FOR EXPOSED SUPPLY AND DRAIN FIXTURE ASSEMBLY TO COMPLY WITH HANDICAP ACCESS REQUIREMENTS.	1/2" 1/2"

- ### PLUMBING NOTES
- NOTE THAT EXISTING CONDITIONS SHOWN ON PLANS ARE FROM PREVIOUS ENGINEERING DOCUMENTATION AND FIELD OBSERVATION. ACTUAL CONDITIONS MAY VARY, AND MUST BE FIELD VERIFIED BY THIS CONTRACTOR (WHETHER SHOWN OR NOT). THIS CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS AS NECESSITATED BY ACTUAL CONDITIONS, REQUIRED TO COMPLETE INSTALLATION OF NEW ELEMENTS. IF EXISTING CONDITIONS PROHIBIT INSTALLATION OF NEW ELEMENTS, NOTIFY THE CONSTRUCTION MANAGER/OWNER'S REPRESENTATIVE FOR REDIRECTION AS REQUIRED.
 - REFER TO ARCHITECTURAL DOCUMENTATION FOR ADDITIONAL SCOPE/INFORMATION REGARDING DEMOLITION/REMODELING WORK, INCLUDING IDENTIFICATION OF AREAS AND ITEMS/ELEMENTS INVOLVED, AS WELL AS INFORMATION OF BOTH A GENERAL AND SPECIFIC NATURE.
 - UNLESS DIRECTED OTHERWISE, WHEN EXISTING PLUMBING ITEMS/ELEMENTS THAT ARE IN USE/SERVICE/OPERATION PRIOR TO START OF THIS PROJECT DO NOT OBSTRUCT NEW WORK, THE ITEM/ELEMENT SHALL REMAIN IN USE/SERVICE/OPERATION DURING THE EXECUTION OF NEW WORK AND AFTER PROJECT COMPLETION. EXISTING PLUMBING ITEMS/ELEMENTS THAT OBSTRUCT NEW WORK, AND/OR ARE IN EXPOSED LOCATIONS IN REVISED/REMODELED AREAS WHERE NEW CONCEALING/FINISH STRUCTURE IS PROVIDED UNDER SEPARATE CONTRACT, SHALL BE REVISED/RELOCATED AS REQUIRED TO CLEAR NEW WORK, AND/OR BE IN A CONCEALED LOCATION.
 - UNLESS DIRECTED OTHERWISE, WHERE CONCEALING/FINISH STRUCTURE IS PROVIDED UNDER SEPARATE CONTRACT, ALL WORK IN THE PLUMBING CONTRACT NOT SPECIFICALLY INTENDED OR IDENTIFIED FOR EXPOSED/VISIBLE INSTALLATION SHALL BE INSTALLED WITHIN THE CONCEALING STRUCTURE.
 - CUTTING/REMOVAL AND REPAIR/REPLACEMENT OF EXISTING STRUCTURES AND/OR SURFACES REQUIRED BY WORK IN THE PLUMBING CONTRACT IS BY THE PLUMBING CONTRACTOR, UNLESS INDICATED OTHERWISE. REPAIR/REPLACEMENT TO BE TO ORIGINAL CONDITION, AND TO MATCH ADJACENT SURFACES IN TYPE, KIND AND FINISH. THIS INCLUDES CEILINGS, PARTITIONS, FLOORS, SOFFITS, ETC., BOTH WITHIN AND OUTSIDE THE REVISED/REMODELED AREAS THAT ARE AFFECTED BY WORK IN THE PLUMBING CONTRACT. THIS CONDITION DOES NOT APPLY IF EXISTING STRUCTURES AND/OR SURFACES ARE BEING REVISED/REMOVED/REPLACED UNDER SEPARATE CONTRACT.
 - ALL PIPING SHOWN IS ABOVE CEILING IN AREAS WITH DROPPED CEILINGS, OR AT BOTTOM OF OVERHEAD SUPPORT STRUCTURE IN EXPOSED STRUCTURE AREAS, UNLESS INDICATED OTHERWISE.
 - THE PLUMBING CONTRACTOR IS TO SECURE AND VERIFY ALL MEASUREMENTS AND CONDITIONS AT THE PROJECT IN ADVANCE OF WORK (INCLUDING FABRICATION).
 - THE PLUMBING CONTRACTOR IS TO PROVIDE ALL ADDITIONAL STEEL, HANGERS, RODS, CLAMPS, ETC., AS REQUIRED FOR PROPER INSTALLATION, SUPPORT, AND COORDINATION WITH WORK PROVIDED UNDER SEPARATE CONTRACT. UNLESS INDICATED OTHERWISE IN PROJECT SPECIFICATIONS OR BY THE PIPE MATERIAL MANUFACTURER, SUPPORT PIPING AS FOLLOWS:
 - CAST IRON PIPING (NOT IN EARTH); 5FT. CENTERS
 - STEEL PIPING; 10 FT. CENTERS
 - COPPER PIPING; 8FT. CENTERS
 - PLASTIC PIPING; 4FT. CENTERS
 - THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR FIRESTOPPING AT ALL PLUMBING RELATED PENETRATIONS OF FIRE, SMOKE AND OTHER RATED STRUCTURES, INCLUDING FLOORS, WALLS, PARTITIONS, ETC. REFER TO ARCHITECTURAL DOCUMENTATION FOR LOCATIONS OF ALL RATED STRUCTURES, AND SPECIFIC INFORMATION AND REQUIREMENTS PERTAINING TO SAME.
 - LAYOUT AND INSTALLATION OF PLUMBING CONTRACT PIPING, EQUIPMENT, ITEMS AND ELEMENTS INDICATED ON PLAN IS SCHEMATIC IN NATURE. EXACT LOCATION, ROUTING AND INSTALLATION TO BE COORDINATED WITH BUILDING STRUCTURE AND ALL OTHER WORK PROVIDED UNDER SEPARATE CONTRACT.
 - COORDINATE EXACT LOCATION AND INSTALLATION OF ALL PLUMBING UTILITIES REQUIRED AND PROVIDED FOR WORK UNDER SEPARATE CONTRACT WITH APPROPRIATE CONTRACTOR(S) IN ADVANCE OF WORK. THIS INCLUDES SUPPLY AND DRAIN ELEMENTS, FOR DIRECT (PIPED) AND/OR INDIRECT (FLOOR/HUB DRAIN, AIR GAP, ETC.) CONNECTION/SERVICE.
 - RUN ALL WATER LINES LEVEL.
 - ROUGH IN ALL PIPING (SUPPLY, RETURN, WASTE, DRAIN, ETC.) FOR FIXTURES/EQUIPMENT INSTALLATION THRU OR ON FACE OF WALL (AS APPLICABLE), AND TERMINATE WITH SHORT PIPE NIPPLE AND CAP. ROUGH INS AT EXTERIOR WALLS (IF ANY) TO BE ON "WARM" SIDE OF INSULATION ASSEMBLY, AS REQUIRED FOR NON-FREEZE INSTALLATION.
 - ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF HILLIARD/ STATE OF OHIO BUILDING CODE, INCLUDING APPLICABLE PLUMBING, MECHANICAL AND HANDICAP ACCESSIBILITY PROVISIONS.
 - PROVIDE CLEANOUTS AS FOLLOWS:
 - AT THE BASE OF ALL SANITARY STACKS.
 - IN ALL AND SANITARY PIPING AT INTERVALS NOT TO EXCEED 100 LF. IN LENGTH
 - AT EACH CHANGE OF DIRECTION BY SANITARY PIPING BELOW GRADE OR AT THE LOWEST POINT OF THE HORIZONTAL DRAINAGE SYSTEM GREATER THAN 45 DEGREES, UNLESS ANOTHER CLEANOUT IS WITHIN 40 FT. DEVELOPED LENGTH.
 - AT CONNECTING POINTS TO EXISTING SANITARY AND VENT PIPING (TEST TYPE CLEANOUTS).
 - UNLESS INDICATED OTHERWISE, ALL FIXTURES AND EQUIPMENT PROVIDED WITH PLUMBING SUPPLY PIPING TO BE FURNISHED WITH APPROVED/LISTED STOPS IN ACCESSIBLE LOCATIONS.
 - SEE ARCHITECTURAL DRAWINGS FOR DETAILS OF CASEWORK, EQUIPMENT AND OTHER ITEMS/ELEMENTS PROVIDED UNDER SEPARATE CONTRACT, INCLUDING EXACT LOCATIONS AND UTILITY CONNECTION REQUIREMENTS. COORDINATE PLUMBING UTILITY WORK AS REQUIRED IN ADVANCE, INCLUDING PLACEMENT OF FITTINGS, ACCESSORIES, APPURTENANCES, DRAINS, ETC.
 - VERIFY THE EXACT LOCATION AND INSTALLATION REQUIREMENTS FOR ALL DRAINS WITH THE ARCHITECTURAL AND STRUCTURAL DOCUMENTATION FOR PROPER PLACEMENT IN RESPECT TO SLOPES AND STRUCTURE AT EACH DRAIN. COORDINATE INSTALLATION WITH THE APPROPRIATE CONTRACTOR. FINAL INSTALLATION AND LOCATION SUBJECT TO APPROVAL.
 - PLUMBING PIPING IS NOT PERMITTED TO RUN ABOVE ANY ELECTRICAL SWITCHGEAR, MOTOR CONTROL CENTERS OR PANELS (INCLUDING ACCESS/CLEARANCE SPACE 42" IN FRONT OF THESE ITEMS, AND A MIN. 30" WIDE), UNDER ANY CIRCUMSTANCES.
 - LOCATION OF NEW ITEMS OF THESE TYPES TO BE DETERMINED AND CONFIRMED FROM INDICATION BY THE PROJECT ELECTRICAL DOCUMENTATION, AND ACTUAL INSTALLATION CONFIRMED WITH THE ELECTRICAL CONTRACTOR PRIOR TO START OF WORK.
 - LOCATION OF EXISTING ITEMS OF THESE TYPES TO BE DETERMINED AND CONFIRMED IN THE FIELD PRIOR TO START OF WORK.



GAS CONNECTION DETAIL



P300-19258.DWG 01/24/2020

PRATER
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DESIGNED BY P.B.MELCHER	DRAWN BY P.B.MELCHER	CHECKED BY C.M.ANDERSON	JOB NUM. 19258
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781 Northwest Lakeshore Blvd.
Columbus, Ohio 43212

Consultants:

Project Reference: #19004

Date:

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Project Status:
Planning
Programming
Schematic Design
Design/Development
Construction Documents

Sheet Reference:

P300

PLUMBING SPECIFICATIONS

GENERAL

- EXCEPT AS SPECIFIED TO THE CONTRARY, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, TESTING, CONTECTING AND OPERATION OF ALL EQUIPMENT WHICH IS PART OF MECHANICAL SYSTEMS.
- GENERAL AND SPECIAL CONDITIONS OF AIA (AMERICAN INSTITUTE OF ARCHITECTS) AND OWNER'S GENERAL REQUIREMENTS SHALL APPLY UNLESS NOTED OTHERWISE.
- THIS CONTRACT SHALL INCLUDE A VISIT TO THE JOB SITE AND TAKE INTO CONSIDERATION MECHANICAL, ELECTRICAL AND GENERAL TRADE TRADES AND ALL REGULATIONS OF THE STATE, COUNTY AND MUNICIPALITY WHICH IN ANY WAY AFFECTS THIS WORK. THE ARCHITECT WILL OBTAIN THE GENERAL BUILDING PERMITS, THE PLUMBING AND ANY OTHER PERMITS AND CERTIFICATES OF INSPECTION REQUIRED FOR THE PROJECT WILL BE OBTAINED BY THE PLUMBING CONTRACTOR PERFORMING THE WORK. FEES WILL BE INCLUDED IN THE BID PRICE. ALL WORK SHALL ALSO BE ACCOMPLISHED AT NO ADDITIONAL COST TO THE OWNER.

ORDINANCES, PERMIT CERTIFICATES AND OWNER REQUIREMENTS.

- ALL WORK UNDER THIS CONTRACT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE OWNER'S REQUIREMENTS, ALL LAWS, ORDINANCES AND ALL REGULATIONS OF THE STATE, COUNTY AND MUNICIPALITY WHICH IN ANY WAY AFFECTS THIS WORK. THE ARCHITECT WILL OBTAIN THE GENERAL BUILDING PERMITS, THE PLUMBING AND ANY OTHER PERMITS AND CERTIFICATES OF INSPECTION REQUIRED FOR THE PROJECT WILL BE OBTAINED BY THE PLUMBING CONTRACTOR PERFORMING THE WORK. FEES WILL BE INCLUDED IN THE BID PRICE. ALL WORK SHALL ALSO BE ACCOMPLISHED AT NO ADDITIONAL COST TO THE OWNER.
- THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR SATISFACTORILY ADDRESSING ALL REVIEW AND INSPECTION AUTHORITIES REQUIREMENTS AND DIRECTIVES IN REGARD TO METHODS OF INSTALLATION NECESSARY FOR FINAL APPROVAL.

PERMITS AND FEES

- UNLESS DIRECTED OTHERWISE BY THE GENERAL CONDITIONS PORTION OF PROJECT DOCUMENTATION, THE PLUMBING CONTRACTOR SHALL APPLY FOR AND PAY ANY REVIEW INSPECTION, PERMIT, LICENSE, TESTING AND/OR OTHER SERVICE FEES REQUIRED BY ALL REVIEW/INSPECTION/APPROVAL AUTHORITIES IN CONNECTION WITH THE WORK UNDER THIS CONTRACT.

PLUMBING UTILITY CONNECTIONS

- PROVIDE PLUMBING SUPPLY, WASTE, DRAIN, VENT, AND ANY OTHER PIPED UTILITIES INCLUDED FOR THE PROJECT AS REQUIRED, AS LISTED HEREIN, AND/OR AS SHOWN ON THE PLUMBING DRAWINGS FOR ITEMS FURNISHED AND/OR INSTALLED UNDER SEPARATE CONTRACT REQUIREMENTS. THESE ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING.
 - HVAC EQUIPMENT; FINAL CONNECTION (WHERE APPLICABLE) BY THE HVAC CONTRACTOR.
 - EQUIPMENT FINAL CONNECTION (WHERE APPLICABLE) AS INDICATED BY PLAN NOTES.
 - OWNER PROVIDED ITEMS; FINAL CONNECTION (WHERE APPLICABLE) BY THE PLUMBING CONTRACTOR.
- ROUGH-IN PLUMBING SUPPLY, WASTE, DRAIN, VENT, AND ANY OTHER PIPED UTILITIES INCLUDED FOR THE PROJECT AS REQUIRED, AS LISTED HEREIN, AND/OR AS SHOWN ON THE PLUMBING DRAWINGS FOR ALL FUTURE ITEMS REQUIRING SAME.
 - WHERE ITEMS/ELEMENTS ARE INDICATED HEREIN TO BE LISTED/APPROVED, THE INTENT OF THE SPECIFICATION IS THAT SAID ITEM/ELEMENT SHALL BE LISTED BY ALL APPLICABLE MATERIAL/CONSTRUCTION STANDARDS, AND SUBJECT TO FINAL APPROVAL (INCLUDING METHODS OF INSTALLATION) BY ALL REVIEW/INSPECTION/APPROVAL AUTHORITIES.
 - UNLESS INDICATED OTHERWISE, ALL PLUMBING CONTRACT ITEMS/ELEMENTS (PIPE, FITTINGS, VALVES, SPECIALTIES, FIXTURES, EQUIPMENT, ETC.) MATERIALS, CONSTRUCTION, PERFORMANCE, TESTING AND METHODS OF INSTALLATION TO BE AS LISTED/APPROVED BY ALL APPLICABLE MATERIAL/CONSTRUCTION/INSTALLATION STANDARDS FOR SAME, AND BE IN ACCORDANCE WITH THE REQUIREMENTS OF ALL REVIEW/INSPECTION/ APPROVAL AUTHORITIES. THIS INCLUDES, BUT IS NOT LIMITED TO, THE STANDARDS AND AUTHORITIES REFERENCED IN THIS SPECIFICATION. IN THE ABSENCE OF SUCH STANDARDS AND/OR REQUIREMENTS, THE ITEM/ELEMENT/MANUFACTURER'S RECOMMENDATIONS, AS CONFIRMED BY THE PLUMBING CONTRACTOR IN ADVANCE, SHALL BE FOLLOWED.
 - UNLESS INDICATED OTHERWISE, ALL PLUMBING PIPING SHALL BE IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN REGARD TO MATERIALS, CONSTRUCTION, DIMENSIONS/TOLERANCES, TYPE OF SERVICE/TRANSMISSION MEDIUM (WATER, AIR, GAS, ETC.) AND METHODS OF INSTALLATION (AS APPLICABLE), AND SHALL BE SO LISTED. FINAL APPROVAL FOR USE IS SUBJECT TO THE REQUIREMENTS OF THE REVIEW AND INSPECTION AUTHORITIES:
 - STEEL PIPE, STEEL MALLEABLE AND CAST IRON FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME STANDARDS. IN ADDITION, WHERE UTILIZED FOR POTABLE WATER SERVICE, ALL ELEMENTS SHALL BE PER APPLICABLE NSF AND ASTM A53 (FOR CARBON STEEL STANDARDS).
 - PLASTIC PIPE, FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME/NSF STANDARDS.
 - CAST IRON PIPE, FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME/CSPI STANDARDS.
 - COPPER/COPPER ALLOY/BRASS PIPE/TUBE, FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME STANDARDS. IN ADDITION, WHERE UTILIZED FOR POTABLE WATER SERVICE, ALL ELEMENTS SHALL BE PER APPLICABLE NSF STANDARDS.
- ALL PLUMBING CONTRACT ITEMS/ELEMENTS SHALL HAVE THE MANUFACTURER'S MARK OF NAME AND THE QUALITY OF THE PRODUCT OR IDENTIFICATION OF SAME CAST, EMBOSSED, STAMPED OR INDELIBLY MARKED ON EACH ITEM/ELEMENT IN ACCORDANCE WITH THE STANDARDS UNDER WHICH THEY ARE ACCEPTED AND APPROVED PER APPLICABLE CODE(S).

CLEANING UP

- UNLESS OTHERWISE NOTED, ALL EXCESS MATERIALS AND DEBRIS CAUSED BY THIS WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND PROMPTLY BE REMOVED FROM THE SITE. ALL FIXTURES AND EQUIPMENT INSTALLED SHALL BE THOROUGHLY CLEANED WEEKLY. ALL MOTORS AND EQUIPMENT SHALL BE COVERED OR OTHERWISE PROTECTED FROM CONSTRUCTION DUST AND DEBRIS. NO EQUIPMENT OTHER THAN THOSE DESIGNED TO ARE TO BE EXPOSED TO INCLEMENT WEATHER. TOUCH UP ALL SCRATCHES AND REPAIR ANY DENTS IN EQUIPMENT.
- THE PLUMBING CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS SHOWING ALL OF HIS WORK WITH OTHER TRADES. THIS CONTRACTOR SHALL AGREE WITH OTHER TRADES ON SCALE OF DRAWINGS PRIOR TO ANY WORK.

CUTTING AND PATCHING

- CUTTING FOR OPENINGS, WHEN NECESSARY, SHALL BE DONE BY THIS CONTRACTOR WITH SUCH TOOLS AND METHODS AS TO PREVENT UNNECESSARY DAMAGE TO SURROUNDING AREAS OR EQUIPMENT.
- FILL SPACE IN ALL AREAS PACKING WHERE REQUIRED TO MAINTAIN FIRE RATING, OPENINGS SHALL BE TEMPORARILY FIRE STOPPED UNTIL PERMANENT FIRE STOPPING IS DONE. THIS INCLUDES HOLES LEFT DUE TO REMOVAL OF PIPING.
- PATCHING SHALL MATCH EXISTING SURFACES IN KIND AND FINISH, AND SHALL BE DONE BY THE GENERAL CONTRACTOR.
- NO STRUCTURAL MEMBER WILL BE CUT INTO WITHOUT THE EXPRESSED PERMISSION THE OWNER'S REPRESENTATIVE.

GUARANTEE

- ALL LABOR AND MATERIALS FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER WHICH WILL COMMENCE UPON THE FINAL INSPECTION BY THE ENGINEER. DURING THIS TIME, ALL LEAKS, CORROSION OF ALL THE FAILURES TO SUCH MATERIAL AND THE CORRECTION OF ALL DISCREPANCIES WITH THE UMBING CODE, THE CONTRACT DRAWINGS, AND THE PROJECT SPECIFICATIONS SHALL BE DONE UNDER THIS CONTRACT AT NO ADDITIONAL EXPENSE TO THE OWNER.

PLUMBING REFERENCES

- APPLICABLE CONSTRUCTION CODES, STANDARDS AND GUIDELINES FOR ALL PLUMBING CONTRACT ELEMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - STATE OF OHIO, OHIO BUILDING CODE, OBC, INCLUDING THE STATE OF OHIO PLUMBING CODE.
 - LOCAL BOARD OF HEALTH.
 - STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY (E.P.A.).
 - NFPA PAMPHLET NO. 70, NATIONAL ELECTRIC CODE.
 - CITY OF COLUMBUS SEWER UTILITY AUTHORITY.
 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) STANDARDS FOR MATERIALS AND CONSTRUCTION.
 - AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS FOR PERFORMANCE AND TESTING.
 - AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARDS FOR MATERIALS, CONSTRUCTION AND TESTING.
 - NATIONAL SANITATION FOUNDATION (NSF) STANDARDS FOR MATERIALS AND CONSTRUCTION.
 - CAST IRON SOIL PIPE INSTITUTE (CSP) STANDARDS FOR MATERIAL AND CONSTRUCTION.
 - UNDERWRITER'S LABORATORIES (UL) STANDARDS FOR MATERIALS AND CONSTRUCTION.
 - THE MANUFACTURER'S INSTALLATION GUIDELINES/RECOMMENDATIONS FOR INDIVIDUAL ITEMS, ELEMENTS AND/OR SYSTEM INDICATED HEREIN.
- INSTALL AN IN-LINE PRESSURE TYPE VACUUM BREAKER AS SPECIFIED HEREIN IN THE INDIVIDUAL/DEDICATED SUPPLY PIPING FOR ALL VALVES, FITTINGS, TRIM OR OTHER ELEMENTS WITH SERRATED ENDS OR OTHER OUTLETS CAPABLE OF HOSE CONNECTION THAT DO NOT INCLUDE AN INTEGRAL LISTED/APPROVED BACKFLOW PREVENTION DEVICE.
10. BALANCE RECIRCULATING BRANCH LINE FLOW AS REQUIRED FOR PROPER OPERATION OF FLASHING VAPOR BARRIER, COMBINATION BALANCE/SHUT OFF VALVES, CHECK VALVES, THERMOMETERS, AND PETE'S PLUGS FOR EACH BRANCH RECIRCULATING LINE.

SCOPE OF WORK

- THIS CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, INCIDENTALS, DETAILS, ETC. NECESSARY TO PROVIDE A COMPLETE OPERATIONAL AND SYSTEM INCLUDING, BUT NOT LIMITED TO ALL ITEMS AND ELEMENTS DESCRIBED IN THE PLUMBING SPECIFICATION AND SHOWN ON THE PLUMBING DRAWINGS, AND AS REQUIRED FOR COORDINATION AND/OR INTERFACE WITH WORK UNDER SEPARATE CONTRACT AS INDICATED BY COMPLETE CONSTRUCTION DOCUMENTATION PACKAGE.
- THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR SATISFACTORILY ADDRESSING ALL REVIEW AND INSPECTION AUTHORITIES REQUIREMENTS AND DIRECTIVES IN REGARD TO METHODS OF INSTALLATION NECESSARY FOR FINAL APPROVAL.

PERMITS AND FEES

- UNLESS DIRECTED OTHERWISE BY THE GENERAL CONDITIONS PORTION OF PROJECT DOCUMENTATION, THE PLUMBING CONTRACTOR SHALL APPLY FOR AND PAY ANY REVIEW INSPECTION, PERMIT, LICENSE, TESTING AND/OR OTHER SERVICE FEES REQUIRED BY ALL REVIEW/INSPECTION/APPROVAL AUTHORITIES IN CONNECTION WITH THE WORK UNDER THIS CONTRACT.

PLUMBING UTILITY CONNECTIONS

- PROVIDE PLUMBING SUPPLY, WASTE, DRAIN, VENT, AND ANY OTHER PIPED UTILITIES INCLUDED FOR THE PROJECT AS REQUIRED, AS LISTED HEREIN, AND/OR AS SHOWN ON THE PLUMBING DRAWINGS FOR ITEMS FURNISHED AND/OR INSTALLED UNDER SEPARATE CONTRACT REQUIREMENTS. THESE ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING.
 - HVAC EQUIPMENT; FINAL CONNECTION (WHERE APPLICABLE) BY THE HVAC CONTRACTOR.
 - EQUIPMENT FINAL CONNECTION (WHERE APPLICABLE) AS INDICATED BY PLAN NOTES.
 - OWNER PROVIDED ITEMS; FINAL CONNECTION (WHERE APPLICABLE) BY THE PLUMBING CONTRACTOR.
- ROUGH-IN PLUMBING SUPPLY, WASTE, DRAIN, VENT, AND ANY OTHER PIPED UTILITIES INCLUDED FOR THE PROJECT AS REQUIRED, AS LISTED HEREIN, AND/OR AS SHOWN ON THE PLUMBING DRAWINGS FOR ALL FUTURE ITEMS REQUIRING SAME.
 - WHERE ITEMS/ELEMENTS ARE INDICATED HEREIN TO BE LISTED/APPROVED, THE INTENT OF THE SPECIFICATION IS THAT SAID ITEM/ELEMENT SHALL BE LISTED BY ALL APPLICABLE MATERIAL/CONSTRUCTION STANDARDS, AND SUBJECT TO FINAL APPROVAL (INCLUDING METHODS OF INSTALLATION) BY ALL REVIEW/INSPECTION/APPROVAL AUTHORITIES.
 - UNLESS INDICATED OTHERWISE, ALL PLUMBING CONTRACT ITEMS/ELEMENTS (PIPE, FITTINGS, VALVES, SPECIALTIES, FIXTURES, EQUIPMENT, ETC.) MATERIALS, CONSTRUCTION, PERFORMANCE, TESTING AND METHODS OF INSTALLATION TO BE AS LISTED/APPROVED BY ALL APPLICABLE MATERIAL/CONSTRUCTION/INSTALLATION STANDARDS FOR SAME, AND BE IN ACCORDANCE WITH THE REQUIREMENTS OF ALL REVIEW/INSPECTION/ APPROVAL AUTHORITIES. THIS INCLUDES, BUT IS NOT LIMITED TO, THE STANDARDS AND AUTHORITIES REFERENCED IN THIS SPECIFICATION. IN THE ABSENCE OF SUCH STANDARDS AND/OR REQUIREMENTS, THE ITEM/ELEMENT/MANUFACTURER'S RECOMMENDATIONS, AS CONFIRMED BY THE PLUMBING CONTRACTOR IN ADVANCE, SHALL BE FOLLOWED.
 - UNLESS INDICATED OTHERWISE, ALL PLUMBING PIPING SHALL BE IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN REGARD TO MATERIALS, CONSTRUCTION, DIMENSIONS/TOLERANCES, TYPE OF SERVICE/TRANSMISSION MEDIUM (WATER, AIR, GAS, ETC.) AND METHODS OF INSTALLATION (AS APPLICABLE), AND SHALL BE SO LISTED. FINAL APPROVAL FOR USE IS SUBJECT TO THE REQUIREMENTS OF THE REVIEW AND INSPECTION AUTHORITIES:
 - STEEL PIPE, STEEL MALLEABLE AND CAST IRON FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME STANDARDS. IN ADDITION, WHERE UTILIZED FOR POTABLE WATER SERVICE, ALL ELEMENTS SHALL BE PER APPLICABLE NSF AND ASTM A53 (FOR CARBON STEEL STANDARDS).
 - PLASTIC PIPE, FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME/NSF STANDARDS.
 - CAST IRON PIPE, FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME/CSPI STANDARDS.
 - COPPER/COPPER ALLOY/BRASS PIPE/TUBE, FITTINGS AND JOINING METHODS; PER APPLICABLE ASTM/ANSI/ASME STANDARDS. IN ADDITION, WHERE UTILIZED FOR POTABLE WATER SERVICE, ALL ELEMENTS SHALL BE PER APPLICABLE NSF STANDARDS.
- ALL PLUMBING CONTRACT ITEMS/ELEMENTS SHALL HAVE THE MANUFACTURER'S MARK OF NAME AND THE QUALITY OF THE PRODUCT OR IDENTIFICATION OF SAME CAST, EMBOSSED, STAMPED OR INDELIBLY MARKED ON EACH ITEM/ELEMENT IN ACCORDANCE WITH THE STANDARDS UNDER WHICH THEY ARE ACCEPTED AND APPROVED PER APPLICABLE CODE(S).

GENERAL PIPING REQUIREMENTS

- WHERE STANDARDS, CODES OR GUIDELINES ARE REFERENCED HEREIN AND THROUGHOUT THE PLUMBING CONTRACT DOCUMENTATION, INCLUDING PLANS AND SPECIFICATIONS, THE LATEST VERSION/EDITION SHALL BE APPLIED, UNLESS THE BUILDING CODE REFERENCE IS ANOTHER VERSION/EDITION, WHICH SHALL TAKE PRECEDENCE.
- REFER TO PROJECT DOCUMENTATION FURNISHED WITH THE COMPLETE CONSTRUCTION PACKAGE IN ADVANCE OF WORK FOR OVERALL COORDINATION AND VERIFICATION OF REQUIREMENTS AT WORK OF OTHER TRADES RELATING TO, INTERFACING WITH, AND/OR IMPACTING WORK OF THE PLUMBING CONTRACT. THIS INCLUDES EXACT LOCATIONS, QUANTITIES, PHYSICAL SIZES, ROUGH-IN DETAILS, PIPE ROUTING, CONNECTION SIZES, ETC., FOR ITEMS INCLUDING BOTH IN THE PLUMBING CONTRACT AND UNDER SEPARATE CONTRACT. COORDINATE INSTALLATION AND INTERFACE REQUIREMENTS WITH THE APPROPRIATE CONTRACTOR(S) IN ADVANCE OF WORK.
- INCLUDE ANY MINOR DETAILS, ITEMS AND/OR ELEMENTS ESSENTIAL TO NECESSARY APPROVALS AND SUCCESSFUL OPERATION IN ADDITION TO THE ITEMS LISTED/REQUIRED HEREIN AND SHOWN ON THE DRAWINGS.
- SEE GENERAL "PLUMBING NOTES" ON DRAWINGS FOR ADDITIONAL CONDITIONS AND REQUIREMENTS RELATIVE TO THE PLUMBING CONTRACT.
- PLUMBING ITEMS AND ELEMENTS SHALL BE INSTALLED WITH DUE REGARD TO PRESERVATION OF THE STRENGTH OF STRUCTURAL MEMBERS AND PREVENTION OF DAMAGE TO WALLS, SURFACES AND OTHER STRUCTURES THROUGH INSTALLATION, BEARING SUPPORT OF SUBSEQUENT USAGE OF PLUMBING ITEMS AND ELEMENTS. NO FRAMING OR OTHER SUPPORT STRUCTURE SHALL BE CUT, NOTCHED OR BORED IN EXCESS OF LIMITATIONS SPECIFIED IN THE BUILDING CODE, OR BY THE MANUFACTURER OF THE FRAMING OR OTHER SUPPORT STRUCTURE, AS CONFIRMED IN ADVANCE OF WORK BY THE PLUMBING CONTRACTOR.
- ALL PIPING THAT SUPPLIES A FLUSH VALVE, SOLENOID VALVE (OTHER THAN SLOW-CLOSING TYPE) FOOT PEDAL OPERATOR, SPRING RETURN OPERATOR OR OTHER QUICK CLOSING TYPE DEVICE SHALL HAVE A SHOCK ABSORBER INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. UNLESS INDICATED OTHERWISE, WHERE MULTIPLE FIXTURES OR EQUIPMENT IN ADJACENT LOCATIONS (SUCH AS WITHIN A CHASE OR OTHER ENCLOSURE) ARE SUPPLIED BY COMMON PIPING MANIFOLD, A PROPERLY SIZED AND INSTALLED SHOCK ABSORBER MUST BE UTILIZED.
- UNLESS OTHERWISE SHOWN ON THE DRAWINGS, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING WATER PIPING IN CHASES, ETC. TO INDIVIDUAL FIXTURES. WHERE PIPING SERVES FLUSH VALVES, COLD WATER PIPE SHALL BE RUN FULL SIZE TO END OF PIPE CHASE RUN AND A LISTED SHOCK ABSORBER INSTALLED.
- RUN ALL WATER PIPING LEVEL AND CONCEAL WHENEVER POSSIBLE, PIPING TO BE INSTALLED TO ALLOW COMPLETE DRAIN DOWN OF SYSTEM BACK TO THE MAIN RISER(S), AT BASE OF SYSTEM WHENEVER POSSIBLE. PROVIDE 3/4" DRAINS AT BASE OF RISER(S), AND ANY OTHER TRAPPED OR LOW POINTS WHEN SUCH ARE UNAVOIDABLE DUE TO PROJECT CONDITIONS. 3/4" DRAINS TO CONSIST OF BALL VALVE WITH OUTLET CONNECTION VACUUM BREAKER AS SPECIFIED HEREIN.
- VALVES 2-1/2" SIZE AND SMALLER MAY BE TWO-PIECE BRONZE BODY BALL VALVE, SREWED CONNECTIONS, UNION CONNECTION BODY, TEFLON SEATS, CONVENTIONAL BALL VALVE, OR ADJUSTABLE PACKING GLAND, CHROME PLATED BRONZE BALL AND LEVER HANDLE LABELED FOR THE SERVICE CONTROLLED. DESIGN FOR 150 S.W.P. AND 400 WOG. EQUAL TO APPLD 70-300 SERIES.
- VALVES BY CRANE, HEMLOCK, NIBCO OR JENKINS MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

11. COORDINATE INSTALLATION WITH STRUCTURE, AND WORK OF OTHER TRADES AT AND ADJACENT TO DOMESTIC WATER SERVICE PIPING INSTALLATION.

PLUMBING INSULATION

- PROVIDE LISTED INSULATION COVER FOR ALL ITEMS/ELEMENTS AS SPECIFIED HEREIN, AS SHOWN ON DRAWINGS, AND FOR ANY OTHER ITEMS/ELEMENTS REQUIRING SAME.
- INSULATE PIPING AND ASSOCIATED ACCESSORIES AND APPURTENANCES INCLUDING IN THE FOLLOWING SYSTEMS:
 - DOMESTIC HOT AND COLD WATER.
 - BUILDING SOIL WASTE AND VENT SYSTEM.
- PROVIDE A PRE-MANUFACTURED INSULATION COVERS ON ALL EXPOSED LAVATORY WASTE PIPING AND LAVATORY SUPPLY PIPING. PRODUCT TO BE SIMILAR TO HANDWRAP, PRO-WRAP, AND TRUBRO MANUFACTURES. PRODUCTS
 - ALL INSULATING MATERIALS, INCLUDING JACKETS, CEMENTS, ADHESIVES, VAPOR BARRIERS, ETC., SHALL BE U.L. LISTED, WITH A FLAME SPREAD RATING NOT TO EXCEED 25, AND A SMOKE DEVELOPMENT RATING NOT TO EXCEED 50. ALL EXTERIOR FINISHES SHALL BE SIMILAR TO HANDWRAP, PRO-WRAP, AND TRUBRO MANUFACTURES.
 - MOLDED PLASTIC FITTING COVERS SHALL BE U.L. LISTED WITH A FLAME SPREAD RATING NOT TO EXCEED 25, AND A SMOKE DEVELOPMENT RATING NOT TO EXCEED 50.
 - INSULATED THICKNESS' ARE BASED ON INSULATION HAVING THERMAL RESISTANCE IN THE RANGE OF 4.0 HR. F. FT²/BTU TO 4.8 HR. F. FT²/BTU PER INCH OF THICKNESS ON A FLAT SURFACE AT A MEAN TEMPERATURE OF 75 DEGREES F. MINIMUM INSULATION THICKNESS SHALL BE INCREASED FOR MATERIALS HAVING R VALUES LESS THAN 4.8 TO GIVE EQUIVALENT "R" VALUES.
 - PIPE COVERS SHALL BE SIMILAR TO JOHNS MANVILLE "MICRO-LOK" GLASS FIBER INSULATION, RATED FOR 850 DEGREES F. WITH A FACTORY APPLIED AP-T ALL-PURPOSE SELF-SEALING VAPOR BARRIER JACKET. BUTT STRIPS SHALL BE MINIMUM 3" WIDE, AND OF SAME MATERIAL AS JACKET, EQUAL MATERIALS, INCLUDING THICKNESS AND CONDUCTIVITY RATINGS/LISTINGS, AS MANUFACTURED BY OWENS CORNING, KNAUF OR MANSION MAY BE FURNISHED, AT THE CONTRACTOR'S OPTION, WHERE INSULATION THICKNESS IS REQUIRED FOR COVER HEREIN. IT IS NOMINAL THICKNESS REQUIRED THICKNESS.
 - ALL CEMENTS, ADHESIVES, FINISHES, AND ASSOCIATED MATERIALS SHALL BE SIMILAR TO THAT PROVIDED BY FOSTER. EQUAL MATERIALS AS PROVIDED BY CHILDERS OR VMASCO MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
 - LONGITUDINAL LAP JOINTS AND BUTT STRIPS FOR GLASS FIBER PIPING INSULATION SHALL BE SECURED WITH STAPLES ON THREE (3) INCH CENTERS, AND SEALED WITH AN APPROVED VAPOR BARRIER ADHESIVE WHERE APPLICABLE. STAPLES ARE NOT REQUIRED WHEN INSULATION UTILIZED IS A "DOUBLE" ADHESIVE SELF-SEALING SYSTEM.
- COVER COLD WATER AND HOT WATER AS FOLLOWS:
 - COVER HOT WATER AND HOT WATER RETURN PIPING WITH 1" THICKNESS GLASS FIBER PIPE INSULATION.
 - COVER COLD WATER WITH 1/2" THICKNESS GLASS FIBER PIPE INSULATION.
- ALL APPURTENANCES AND ACCESSORIES SUCH AS VALVES, FLANGES, UNIONS, ETC. INSTALLED IN REFERENCED PIPING (WITH THE EXCEPTION OF BACKFLOW PREVENTION ASSEMBLIES LISTED AT THE END OF THIS PARAGRAPH) SHALL BE WRAPPED WITH FULL THICKNESS INSULATION AND COVERED WITH A LISTED MOLDED PLASTIC FITTING COVER, OR AN OPEN MESH GLASS CLOTH SHALL BE FIRE RESISTANT MESH. BACKFLOW PREVENTION ASSEMBLIES WHICH REQUIRE PERIODIC INSPECTION/TEST/MANINTENANCE SHALL NOT BE PROVIDED WITH INSULATION COVER. UNLESS THESE ASSEMBLIES ARE IN WATER SENSITIVE LOCATIONS, SUCH AS ABOVE LA-Y-IN CEILINGS, IF LISTED BACKFLOW PREVENTION ASSEMBLIES ARE IN WATER SENSITIVE LOCATIONS, THEY SHALL BE COVERED COMPLETELY. THIS SPECIFICATION THAT ALLOWS REMOVAL AND REPLACEMENT AS NECESSARY FOR REQUIRED ACCESS.
- USE 12" LONG SECTIONS OF CALCIUM SILICATE RIGID INSULATION, WITH JACKET SAME AS ADJACENT PIPE COVERING FOR TRANSFER OF SUPPLY TO PIPING AT EACH HANGER, WITHOUT STRESS TO THE PIPE COVERING ASSEMBLY. AT THE CONTRACTOR'S OPTION, AN APPROVED WOOD OR HIGH-DENSITY (20 LB./CU. FT.) FIBERGLASS BLOCK MAY BE SUBSTITUTED FOR THE RIGID INSULATION SECTION. VAPOR BARRIER TO BE MAINTAINED THROUGHOUT.
- ALL APPLICATIONS SHALL BE MADE ON CLEAN, DRY SURFACES WITH ALL JOINTS BUTTED FIRMLY TOGETHER.
- INSULATION MUST RUN CONTINUOUS THROUGH HANGERS, SLEEVES AND WALL FOR ALL COLD WATER, HOT WATER, HOT WATER RETURN, VACUUM PUMP EXHAUST AND AIR COMPRESSOR INTAKE PIPING.
- ON ALL PIPING 1-1/4" DIAMETER AND LARGER WITH INSULATION COVER SPECIFIED TO RUN CONTINUOUS THROUGH HANGER ASSEMBLIES, PROVIDE A LISTED/APPROVED SHEET METAL PROTECTIVE INSULATION SHIELD AT EACH HANGER.
- INSULATION SHALL NOT BE APPLIED UNTIL GENERAL CONSTRUCTION HAS PROGRESSED SUFFICIENTLY TO MINIMIZE POTENTIAL FOR PHYSICAL OR MOISTURE DAMAGE TO THE COVER ASSEMBLY. ALL DAMAGED COVER SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- INSTALL PROTECTIVE SLEEVE ON ALL INSULATED, EXPOSED PIPES PENETRATING THE FLOOR STRUCTURE.
- HANGER RODS MUST BE PERPENDICULAR BEFORE INSULATION IS INSTALLED.
- PROVIDE PRE-MANUFACTURED PIPE INSULATION ON ALL LAVATORY WASTE AND SUPPLY PIPING. SIMILAR PRODUCTS TO PRO-WRAP, HANDI-WRAP, AND TRU-BRO.

DOMESTIC WATER PIPING SYSTEMS

- PROVIDE A COMPLETE DOMESTIC WATER SUPPLY PIPING SYSTEM AS SHOWN ON THE DRAWINGS, AND AS NECESSARY TO SERVE ALL ITEMS REQUIRING SAME.
- THE DOMESTIC WATER PIPING SYSTEM SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
 - COLD WATER SUPPLY AND HOT WATER SUPPLY.
 - TRAP PRIMER SUPPLY.
 - DOMESTIC WATER MAKE-UP SUPPLY TO ELEMENTS PROVIDED UNDER SEPARATE CONTRACT, SUCH AS HVAC EQUIPMENT/SYSTEMS, KITCHEN EQUIPMENT, ETC.
- PRODUCTS
 - ABOVE GROUND PIPING UP TO AND INCLUDING 4" SIZE TO BE TYPE L, ASTM B-75, ASTM B88, ASTM B251, ASTM B447, HARD DRAWN COPPER TUBE WITH WROT COPPER FITTINGS AND SOCKET SOLDER JOINTS AND CONNECTIONS. TEST DRILL HOLE ELEMENT PROVIDED UNDER, UNLESS INDICATED OTHERWISE.
 - PIPE FITTINGS SHALL BE APPROVED FOR INSTALLATION WITH THE PIPING MATERIAL INSTALLED AND SHALL CONFORM TO THE RESPECTIVE PIPE STANDARDS OR ONE OF THE STANDARDS LISTED IN THE PLUMBING CODE.
 - PLASTIC PIPING, WHICH CONFORMS TO ASTM D 2737 SHALL BE FURNISHED FOR THE ENTIRE LENGTH OF UNDERGROUND INSTALLATION. PLASTIC PIPING SHALL BE USED FOR UNDERGROUND INSTALLATION ONLY. JOINTS TO BE KEPT TO MINIMUM QUANTITY POSSIBLE.
 - TRAP PRIMER SUPPLY PIPING BELOW SLAB TO BE TYPE K SOFT COPPER TUBING IN A SINGLE LENGTH WITH LINE JOINTS OR JOINTS, AND MINIMUM NUMBER OF FITTINGS UNLESS INDICATED OTHERWISE. FITTINGS IF REQUIRED TO BE WROT COPPER WITH SOCKET SOLDER BRAZED CONNECTIONS. COMPLETE INSTALLATION TO BE RATED FOR 175 PSIG WORKING PRESSURE. WHEN DRAIN BODY PRIMER CONNECTIONS OCCUR WITHIN THE SLAB/FLOOR STRUCTURE, PROVIDE AN OFFSET IMMEDIATELY ADJACENT TO THE DRAIN LOCATION TO ALLOW INSTALLATION OF SUPPLY PIPING ENTIRELY BELOW THE SLAB/FLOOR STRUCTURE, INCLUDING THE CONDUIT SLEEVE REQUIRED FOR TRAP PRIMER SUPPLY PIPING UNDER SLAB ON GRADE.
 - PROVIDE A COMPATIBLE FASTENING ASSEMBLY WITH INTERNAL SECONDARY DRAINAGE FLANGE AND WEEPHOLE FOR ALL ITEMS SPECIFIED HEREIN BEING INSTALLED IN STRUCTURES HAVING A WATER PROOF MEMBRANE. FLASHING VAPOR BARRIER, COMBINATION BALANCE/SHUT OFF SEPARATE CONTRACT. INSTALLATION CONDITIONS TO BE VERIFIED FROM ARCHITECTURAL DOCUMENTATION AND COORDINATED WITH THE APPROPRIATE CONTRACTOR.

EXECUTION

- ALL DOMESTIC WATER PIPING SHALL BE CLEAN, FLUSHED AND TESTED FOR LEAKS AND LOCAL HEALTH DEPARTMENT REQUIREMENTS.
- ALL DOMESTIC WATER PIPING SHALL BE CERTIFIED SAFE FOR HUMAN CONSUMPTION BY A CERTIFIED PROFESSIONAL BY THE STATE OF OHIO (BACTERIAL CERTIFICATION NUMBER) EMPLOYED BY A TESTING LABORATORY THAT STATES THE SYSTEM MEETS THE DEPARTMENT OF HEALTH REQUIREMENTS AND IS APPROVED FOR HUMAN CONSUMPTION.
- SOLDER AND FLUX MATERIAL SHALL BE CERTIFIED "LEAD FREE" AND LISTED FOR USE WITH POTABLE WATER SYSTEMS.
- RUN ALL WATER PIPING LEVEL AND CONCEAL WHENEVER POSSIBLE. PIPING TO BE INSTALLED TO ALLOW COMPLETE DRAIN DOWN OF SYSTEM BACK TO MAIN RISER AT BASE OF SYSTEM WHENEVER POSSIBLE. PROVIDE 3/4" DRAINS AT BASE OF RISER, AND ANY OTHER TRAPPED OR LOW POINTS WHEN SUCH ARE UNAVOIDABLE DUE TO PROJECT CONDITIONS. 3/4" DRAINS TO CONSIST OF BALL VALVE WITH OUTLET CONNECTION VACUUM BREAKER.
- HORIZONTAL SUPPLY PIPING BELOW SLABS ON GRADE TO BE INSTALLED ENTIRELY BELOW THE SLAB STRUCTURE, INCLUDING CONDUIT SLEEVE WHEN PROVIDED. UNDER SLAB PIPING AND/OR CONDUIT SHALL NOT BE EMBEDDED OR SUPPORT SLAB STRUCTURES.
- COORDINATE INSTALLATION WITH STRUCTURE, SITE CONDITIONS AND WORK OF OTHER TRADES AT AND ADJACENT TO DOMESTIC WATER SERVICE PIPING INSTALLATIONS.
- MAINTAIN NECESSARY CLEARANCE FROM STRUCTURAL SUPPORT ELEMENTS AS REQUIRED FOR INSTALLATION OF DOMESTIC WATER SERVICE PIPING OUTSIDE OF SUPPORT/BEARING ZONES.
- WITH ALL OUTLETS CLOSED, FILL SYSTEM TO WORKING PRESSURE AND CLOSE VALVE AT SUPPLY MAIN.
- A CLEANING SOLUTION CONTAINING NOT LESS THAN 150 PARTS PER MILLION OF CHLORINE SHALL BE INTRODUCED INTO THE SYSTEM.
- EACH OUTLET, HOT AND COLD, SHALL BE TESTED DURING FILL TO PROVE THE PRESENCE OF CHLORINE AT THAT OUTLET AND VALVES AND FAUCETS SHALL BE OPENED AND CLOSED SEVERAL TIMES DURING THE DISINFECTING TIME PERIOD.
- WATER PIPING SYSTEMS SHALL REMAIN FILLED FOR A PERIOD OF 24 HOURS AND EACH OUTLET SHALL BE AGAIN TESTED AND SHALL PRODUCE NOT LESS THAN 100 PARTS PER MILLION OF CHLORINE AT THE END OF THE RETENTION PERIOD.
- ALL OUTLETS SHALL BE OPENED WIDE AND THE MAIN SUPPLY VALVES OPENED. FLUSHING SYSTEM WITH WATER UNTIL THE CHLORINE CONTENT IS NOT GREATER THAN 0.2 PARTS PER MILLION OR UNTIL APPROVED BY THE HEALTH DEPARTMENT FLUSH BRASS VALVE.
- AFTER FINAL FLUSHING ALL AERATORS ON PLUMBING BRASS SHALL BE REMOVED, CLEANED AND REINSTALLED.
- STERILIZATION TEST MAY BE PERFORMED AT THE SAME TIME THE PRESSURE TEST IS PLACED ON THE SYSTEM.

PIPE ANCHORS, HANGERS AND SUPPORTS

- ALL PIPING SHALL BE SEPARATELY HUNG AND SUPPORTED FROM APPROVED STRUCTURAL MEMBERS OR CONCRETE OVERHEAD STRUCTURE ONLY. NO PIPE SHALL BE HUNG FROM ROOF DECK, PIPE DUCTS, OR OTHER COMPONENTS OF THE BUILDING STRUCTURE.
- PROVIDE LISTED/APPROVED ADJUSTABLE HANGERS, INSERTS, BRACKETS, CLAMPS, SUPPLEMENTAL STEEL AND OTHER DEVICES REQUIRED FOR PROPER SUPPORT OF ALL PIPE LINES.
- HANGERS SHALL BE DESIGNED TO ALLOW FOR EXPANSION AND CONTRACTION AND TO ALLOW INSULATION (WHERE APPLICABLE) TO RUN CONTINUOUSLY THROUGH HANGERS.
- WIRE OR STRAP HANGERS ARE NOT PERMITTED. ADJUST HANGERS SO AS TO DISTRIBUTE WEIGHT LOAD EQUALLY ON ATTACHMENTS.
- USE OF TRAPEZOID HANGERS DO NOT PERMIT THE ELIMINATION OF THE PIPING INSULATION TO NOT BE CONTINUOUS THRU THE HANGER.
- PIPING TO BE SUPPORTED ACCORDING TO THE FOLLOWING SCHEDULE. SUPPORT AT INTERVALS NOT TO EXCEED SPACING LISTED OR ELSEWHERE SUPPLY AND DRAIN PIPING BELOW GRADE. PRE-FABRICATED CLOSE CELL VINYL INSULATION/COVER ASSEMBLIES WITH SEAMLESS PVC JACKET FOR ALL SUPPLY (FULL RANGE OF HOT, COLD AND TEMPERED) AND DRAIN PIPING. ASSEMBLY TO BE SIMILAR TO MCGUIRE PRO-WRAP SERIES. OFFSET DRAINS (IF USED) TO BE PROVIDED WITH COVER ASSEMBLIES SPECIFICALLY DESIGNED FOR SAME. ASSEMBLIES TO BE LISTED BY MANUFACTURER AS HANDICAP ACCESS COMPLIANT.

(1) Steel Pipe		(2) Copper Pipe	
Pipe Size	Rod Spacing	Pipe Size	Rod Spacing
Thru 1"	3/8" 7'0"	Thru 3/4"	3/8" 6'0"
1-1/4"	3/8" 9'0"	1"	3/8" 7'0"
1-1/2"	3/8" 9'0"	1-1/4"	3/8" 9'0"
2"	3/8" 10'0"	2"	3/8" 9'0"

FLUSHING AND STERILIZATION

- FLUSH OUT ALL DOMESTIC WATER PIPING SYSTEMS TO REMOVE ALL DIRT AND GREASE FROM PIPING AND EQUIPMENT. PIPING TO BE INSTALLED INTO OPERATION, CLEAN STRAINERS AFTER EACH FLUSHING UNTIL THE STRAINER REMAINS CLEAN.
- AFTER DOMESTIC WATER LINES ARE ALL INSTALLED, STERILIZE LINES AS INDICATED BY ANNA-651. STERILIZATION SHALL BE DONE UNDER IMMEDIATE-ON-THE-JOB SUPERVISION OF A WATER TESTING LABORATORY REGULARLY ENGAGED IN THE SERVICE AND SHALL BE DONE PER THEIR INSTRUCTIONS. ALL FEES FOR TESTING AND TEST EQUIPMENT SHALL BE PAID BY THIS CONTRACTOR.
- FURNISH A CERTIFICATE OF STERILIZATION AND APPROVAL FOR HUMAN CONSUMPTION FROM THE TESTING LABORATORY. LOCATION OF THE STATE OF OHIO REGULARLY IN THE EMPLOY OF THE TESTING LABORATORY. CERTIFICATION SHALL BE FURNISHED TO THE ARCHITECT/ENGINEER PRIOR TO ANY PAYMENT IS MADE.
- STERILIZATION: CHLORINATING MATERIAL ETHER LIQUID CHLORINE MEETING AWWA STANDARD B301, SODIUM OR CALCIUM HYPOCHLORITE MEETING AWWA STANDARD B300.

DRAINS, CLEANOUTS, AND DRAINAGE SPECIALTIES

- FURNISH AND INSTALL DRAINS, CLEANOUTS AND DRAINAGE SPECIALTIES AS INDICATED ON THE DRAWINGS, AND ELSEWHERE. PROVIDE FOR COMPLETE DRAINAGE, ACCESS AND SPECIAL FUNCTION/OPERATION AT ALL ITEMS/ELEMENTS AND AREAS REQUIRING SAME AND FOR PROPER INTEGRATION WITH THE BUILDING DRAINAGE SYSTEM.
- UNLESS INDICATED OTHERWISE, ALL ITEMS/ELEMENTS AND THEIR COMPONENT PARTS DESCRIBED HEREIN TO BE OF METALLIC CONSTRUCTION WHEN SUCH IS AVAILABLE FOR THE SPECIFIED ITEM/ELEMENT. USE OF PLASTIC, COMPOSITE, OR OTHER NON-METALLIC COMPONENTS AND/OR MATERIALS BY LISTED ALTERNATE ITEMS/ELEMENTS IS PROHIBITED.
- PRODUCTS
 - FURNISH AND INSTALL A P-TRAP FOR EACH SANITARY DRAIN INLET TERMINAL (FLOOR DRAIN, HUB, KITCHEN SINK, ETC.) OF THE SAME MATERIAL AND CONNECTION TYPE AS THE PIPING SYSTEM CONNECTED TO, UNLESS INDICATED OTHERWISE.
 - THIS CONTRACTOR MAY, AT HIS OPTION, USE ABS PLASTIC PLUGS IN LIEU OF BRONZE PLUGS WHERE SPECIFIED, EXCEPT ABS PLUGS SHALL NOT BE PERMITTED IN RETURN AIR PLENUMS OR AT EXPOSED LOCATIONS. LOCATION OF THE RETURN AIR PLENUM TO BE CONFIRMED WITH THE HVAC CONTRACTOR.
 - EQUAL DRAINS, DRAINAGE SPECIALTIES AND CLEANOUTS AS MANUFACTURED BY ZURN, JOSAM, WADE, WATTS OR J.R. SMITH MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.

EXECUTION

- WHEN TRAP PRIMER SUPPLY IS INDICATED ON PLANS FOR DRAIN TUBING IN A SINGLE LENGTH WITH LINE JOINTS OR JOINTS, AND FITTING ON EITHER THE DRAIN ASSEMBLY OR THE P-TRAP INLET ABOVE THE WATER SEAL, IN ACCORDANCE WITH INSPECTION/APPROVAL AUTHORITIES, PROVIDE A DIELECTRIC UNION AT TRAP PRIMER SUPPLY CONNECTION POINTS. WHEN DRAIN BODY PRIMER CONNECTIONS OCCUR WITHIN THE SLAB/FLOOR STRUCTURE, PROVIDE AN OFFSET IMMEDIATELY ADJACENT TO THE DRAIN LOCATION TO ALLOW INSTALLATION OF SUPPLY PIPING ENTIRELY BELOW THE SLAB/FLOOR STRUCTURE, INCLUDING THE CONDUIT SLEEVE REQUIRED FOR TRAP PRIMER SUPPLY PIPING UNDER SLAB ON GRADE.
- PROVIDE A COMPATIBLE FASTENING ASSEMBLY WITH INTERNAL SECONDARY DRAINAGE FLANGE AND WEEPHOLE FOR ALL ITEMS SPECIFIED HEREIN BEING INSTALLED IN STRUCTURES HAVING A WATER PROOF MEMBRANE. FLASHING VAPOR BARRIER, COMBINATION BALANCE/SHUT OFF SEPARATE CONTRACT. INSTALLATION CONDITIONS TO BE VERIFIED FROM ARCHITECTURAL DOCUMENTATION AND COORDINATED WITH THE APPROPRIATE CONTRACTOR.

COUNTER FLASHING (WHEN REQUIRED) FOR ITEMS SPECIFIED HEREIN IS TO BE COMPATIBLE WITH WATERPROOF MEMBRANE, VAPOR BARRIER, FLASHING, OR SIMILAR ELEMENTS PROVIDED UNDER SEPARATE CONTRACT AT THE INTERFACE POINT. COUNTER FLASHING TO BE PROVIDED AND SET IN PLACE BY THE TESTING LABORATORY. WATERPROOFING TO BE MADE WATER TIGHT BY THE CONTRACTOR INSTALLING THE MEMBRANE, VAPOR BARRIER, FLASHING OR SIMILAR ELEMENTS PROVIDED UNDER SEPARATE CONTRACT. INSTALLATION TO BE VERIFIED FROM ARCHITECTURAL DOCUMENTATION AND COORDINATED WITH THE APPROPRIATE CONTRACTOR.

- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING ALL DRAINS, CLEANOUTS AND OTHER ITEMS SO NOTED INSTALLED FLUSH AND LEVEL WITH FINISH WALL, FLOOR OR OTHER STRUCTURE AS APPLIES. COORDINATE INSTALLATION WITH CONTRACTOR'S PROVIDING ASSOCIATED STRUCTURE, INCLUDING REQUIRED ELEVATIONS AND DIMENSIONAL LOCATIONS. ITEMS NOT PROPERLY INSTALLED SHALL BE REMOVED AND REPLACED TO THE SATISFACTION OF THE OWNERS' ON-SITE REPRESENTATIVE.
- ALL ITEMS AND ACCESSORIES SPECIFIED HEREIN ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE INSPECTION/APPROVAL AUTHORITIES.
- COORDINATE LOCATION OF ALL DRAINS AS REQUIRED FOR PROPER OPERATION WHEN ASSOCIATED WITH SLOPED FLOORS, DECKS OR OTHER STRUCTURES PROVIDED UNDER SEPARATE CONTRACT.
- VERIFY EXACT LOCATIONS OF DRAINS FURNISHED FOR ITEMS UNDER SEPARATE CONTRACT WITH THE EQUIPMENT AS ACTUALLY PROVIDED AND INSTALLED BY THE APPROPRIATE CONTRACTOR. COORDINATE INSTALLATION IN ADVANCE OF WORK.
- WITH THE EXCEPTION OF CLEANOUTS, ALL ITEMS SPECIFIED ARE TO HAVE CONNECTION SIZE SAME AS CONNECTED PIPING SIZE SHOWN ON THE DRAWINGS, UNLESS DIRECTED OTHERWISE.
- COORDINATE LOCATIONS OF ITEMS SPECIFIED HEREIN, AND INSTALLED IN OR AT STRUCTURE PROVIDED UNDER SEPARATE CONTRACT RELATIVE TO FOUNDATIONS, BEAMS AND OTHER STRUCTURE ELEMENTS TO AVOID CONFLICTS. MAKE MINOR ADJUSTMENTS AS REQUIRED FOR PROPER INSTALLATION, CLEARANCE AND ACCESSIBILITY. REFER TO ARCHITECTURAL STRUCTURE DOCUMENTATION IN ADVANCE OF WORK AND COORDINATE INSTALLATION WITH THE APPROPRIATE CONTRACTOR.
- ALL ITEMS/ELEMENTS SPECIFIED THAT AE TO BE INTEGRATED INTO ABOVE GRADE STRUCTURES SHALL BE FURNISHED WITH AN ANCHOR FLANGE. WHEN SUCH IS AVAILABLE, SECONDARY DRAINAGE FLANGE AT DRAIN ASSEMBLIES MAY ALSO SERVE AS AN ANCHORING FLANGE, SUBJECT TO APPROVAL.
- PLUMBING FIXTURES
 - FURNISH AND INSTALL ALL PLUMBING FIXTURES AND ASSOCIATED ACCESSORIES AS SPECIFIED HEREIN AT LOCATIONS INDICATED ON THE DRAWINGS. FIXTURES TO BE PROVIDED FREE OF DEFECTS AND SET IN A NEAT, FINISHED AND UNIFORM MANNER.
 - WHERE FIXTURES ARE INDICATED TO BE HANDICAP ACCESSIBLE, INSTALL AS DIRECTED HEREIN IN COMPLIANCE WITH THE CODES AND GUIDELINES REFERENCED.
- PRODUCTS
 - PLUMBING FIXTURES, TRIM, FITTINGS, ACCESSORIES, APPURTENANCES, ETC. NOT INCLUDED HEREIN ARE AS SPECIFIED ON PLAN.
 - CHINA PLUMBING FIXTURES AND ACCESSORIES AS MANUFACTURED BY AMERICAN STANDARD, KOHLER, ELJER OR CRANE COMPANY MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
 - EQUAL MANUAL OPERATION FAUCETS AND ACCESSORIES AS MANUFACTURED BY AMERICAN STANDARD, KOHLER, CRANE, ELJER, CHICAGO FAUCET, SPEAKMAN, ZURN OR T&S BRASS MAY BE FURNISHED AT THE CONTRACTOR'S OPTION.
 - UNLESS INDICATED OTHERWISE, ALL EXPOSED METALLIC PARTS, PIPING, TRIM, FITTINGS, ACCESSORIES, APPURTENANCES, ETC. ASSOCIATED WITH PLUMBING FIXTURES SHALL BE POLISHED TO A FINISH WITH AVAILABLE. PROVIDE POLISHED CHROME PLATED BRASS SCUTCHEONS ON PIPING AT ALL EXPOSED STRUCTURE PENETRATIONS (WALLS, FLOORS, CEILINGS, CASEWORK, ETC.) AND AT ALL FIXTURE CONNECTIONS.
 - AT ALL HANDICAP ACCESS LAVATORIES AND/OR SINKS WITH EXPOSED SUPPLY AND DRAIN PIPING BELOW GRADE, PROVIDE PRE-FABRICATED CLOSE CELL VINYL INSULATION/COVER ASSEMBLIES WITH SEAMLESS PVC JACKET FOR ALL SUPPLY (FULL RANGE OF HOT, COLD AND TEMPERED) AND DRAIN PIPING. ASSEMBLY TO BE SIMILAR TO MCGUIRE PRO-WRAP SERIES. OFFSET DRAINS (IF USED) TO BE PROVIDED WITH COVER ASSEMBLIES SPECIFICALLY DESIGNED FOR SAME. ASSEMBLIES TO BE LISTED BY MANUFACTURER AS HANDICAP ACCESS COMPLIANT.

EXECUTION

- PROVIDE INDIVIDUAL ACCESSIBLE STOP VALVES ON ALL FIXTURES AND EQUIPMENT SUPPLY PIPING.
- INSTALL ALL FIXTURES ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- INSTALL VANDAL RESISTANT 5 GPM FLOW RESTRICTIONS ON ALL LAVATORY FAUCETS IN WATER AREAS, SIMILAR TO CHICAGO FAUCET MODEL NUMBER E-2805.
- ALL EXPOSED PORTIONS OF SUPPLY AND DRAIN PIPING, INCLUDING FITTINGS, ACCESSORIES AND APPURTENANCES, BELOW HANDICAP ACCESS LAVATORIES AND SINKS (WITH THE EXCEPTION OF WALL SCUTCHEONS) TO BE PROVIDED WITH COVER TO BE PROVIDED WITH COVER ASSEMBLIES SPECIFICALLY DESIGNED FOR SAME. ASSEMBLIES TO BE LISTED BY MANUFACTURER AS HANDICAP ACCESS COMPLIANT.
- AT ALL COUNTERTOP OR OTHER CASEWORK CONDITIONS, VERIFY EXACT LOCATION AND INSTALLATION OF ALL ITEMS WITH ARCHITECTURAL DOCUMENTATION BEFORE ANY WORK IS PERFORMED. COORDINATE INSTALLATION WITH THE GENERAL CONTRACTOR. WHERE PLUMBING FIXTURES ARE INSTALLED IN CASEWORK AND INDICATED TO BE "HANDICAP ACCESSIBLE" COORDINATE INSTALLATION WITH GENERAL CONTRACTOR TO PROVIDE CLEARANCES AND MOUNTING HEIGHTS AS REQUIRED.
- ALL HANDICAP ACCESS FIXTURE CONTROLS, INCLUDING FAUCETS AND FLUSH VALVES, TO BE PROVIDED WITH OPERATORS REQUIRING 5 POUND PRESSURE OR LESS FOR OPERATION.
- WHEN SINKS ARE INDICATED ON THE DRAWINGS TO BE PROVIDED WITH DISPOSERS OR GARBAGE GRINDERS, DELETE SINK DRAIN ASSEMBLY AND PROVIDE DISPOSER AND GARBAGE GRINDER INSTALLATION.
- JOINTS FORMED WHERE FIXTURES COME INTO CONTACT WITH WALLS OF FLOORS SHALL BE SEALED WATER TIGHT WITH AND APPROVED SEALING COMPOUND, COORDINATE INSTALLATION AND COLOR WITH THE GENERAL CONTRACTOR.

BUILDING SOIL, WASTE AND VENT SYSTEM

- APPLICATIONS FOR SANITARY AND VENT SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
 - SANITARY AND VENT PIPING FROM DESIGNATED POINTS WITH ALL CONNECTIONS.
 - DRAINAGE AND VENT PIPING FOR ALL OTHER MISCELLANEOUS SYSTEMS OR EQUIPMENT AS INDICATED ON DOCUMENTS AND AS REQUIRED.
 - DIRECT AND INDIRECT DRAINAGE AND VENT PIPING FOR ALL OTHER MISCELLANEOUS SYSTEMS OR EQUIPMENT AS INDICATED ON DOCUMENTS AND AS REQUIRED.
 - THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SANITARY PIPING FINAL CONNECTIONS AND ALL INDIRECT PIPING FROM EQUIPMENT TO DRAIN TO COMPLETE THE SANITARY WASTE AND VENT PIPING SYSTEM. TEST TO COMPLETE THE INDIRECT DRAINAGE PIPING SYSTEM TO OPERATE ALL EQUIPMENT AND FIXTURES PROPERLY.
 - FURNISH A COMPLETE SYSTEM OF INTERIOR SOIL WASTE DRAINAGE (INCLUDES SANITARY AND VENT PIPING) FROM BUILDING FIXTURES, EQUIPMENT, AND ANY OTHER ELEMENTS REQUIRING THE SAME.
- PIPING TO BE AS FOLLOWS:
 - BELOW SLAB ONLY: STANDARD WEIGHT CAST IRON DWV PIPE AND DWV FITTINGS WITH NEOPRENE GASKET HUB AND SPIGOT.
 - ABOVE FLOOR ONLY: STANDARD WEIGHT CAST IRON DWV PIPE AND DWV FITTINGS WITH NO-HUB MECHANICAL COUPLING JOINTS AND CONNECTIONS.
 - BELOW FLOOR ONLY: STANDARD WEIGHT COPPER DWV PIPE AND DWV FITTINGS WITH SOCKET SOLDER JOINTS AND CONNECTIONS.
 - BELOW SLAB ONLY: SCHEDULE 40 TYPE 1, GRADE 1 PVC DWV PIPE AND FITTINGS WITH SOCKET SOLVENT SOLDER JOINTS AND CONNECTIONS. CAST IRON TO BE USED FOR A MINIMUM OF 10 FEET DOWNSTREAM OF THE TILTING KETTLE, DISHWASHER, AND BRAZING PAN.
 - ABOVE FLOOR ONLY: ALL EXPOSED HAND SINK DRAINS AND DIRECT WASTE LINES SHALL BE CHROME PLATED BRASS PIPING.

- ABOVE FLOOR ONLY: ALL EXPOSED INDIRECT DRAINS SHALL BE COPPER DWV PIPING.
- PLASTIC PIPING SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS, WITH PARTICULAR ATTENTION TO REQUIREMENTS FOR JOINING METHODS, SUPPORT, AND ALLOWANCES FOR EXPANSION AND CONTRACTION. PLASTIC PIPING SHALL NOT BE INSTALLED IN ANY RETURN AIR PLENUM OR CHASE THAT IS USED FOR RETURN AIR. PLASTIC PIPING SHALL NOT BE USED FOR INDIRECT DRAIN LINES.

EXECUTION

- FURNISH AND INSTALL A CLEANOUT AT THE BASE OF EACH STACK AND ELSEWHERE AS REQUIRED BY THE PLUMBING CODE.
- ALL CAST IRON SOIL PIPE SHALL BE BITUMASTIC COATED INSIDE AND OUTSIDE. ALL CAST IRON PIPING (INCLUDING JOINTS AND CONNECTIONS) SHALL BE INSTALLED IN ACCORDANCE WITH STANDARDS AS SET FORTH BY THE CAST IRON SOIL PIPE INSTITUTE (CSP).
- AT THE CONTRACTOR'S OPTION, HUBLESS