WOODFOREST NATIONAL BANK
BRANCH AND COFFEE SHOP

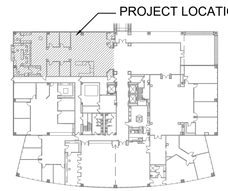
1330 LAKE ROBBINS DR., SUITE 100
THE WOODLANDS, TX 77380

ISSUED FOR BID AND PERMIT

VICINITY MAP



AREA OF WORK



TYPICAL MOUNTING HEIGHTS:

ELECTRICAL	
CONVENIENCE OUTLETS	15" (FL. TO BOTTOM OF BOX U.N.O. ON PLAN)
LIGHT SWITCHES	45" (FLOOR TO BOTTOM OF BOX)
FIRE ALARM PULL STATIONS	48" (FLOOR TO HORIZONTAL PULL)
TELEPHONE OUTLETS	15" (FLOOR TO BOTTOM OF BOX)
WALL TELEPHONE OUTLETS	45" (FLOOR TO BOTTOM OF BOX)
DATA CABLE OUTLETS	15" (FLOOR TO BOTTOM OF BOX)
SMOKE AND/OR HEAT DETECTORS	CEILING MOUNT
PLUMBING	
LAVATORIES	27" min. - 29" (FLOOR TO UNDERSIDE OF APRON)
HANDICAPPED-ACCESSIBLE (KNEE SPACE)	34" (FLOOR TO TOP OF APRON)
WATER CLOSET HANDICAPPED-ACCESSIBLE	18" (FLOOR TO TOP OF RIM)
FLUSH CONTROLS	44" (FLOOR TO CENTER LEVER)
ARCHITECTURAL	
GRAB BARS	36" (1 1/2" DIAMETER) (FLOOR TO TOP OF BAR)
PAPER TOWEL DISPENSER	40" (FLOOR TO TOWEL SLOT)
TOILET TISSUE HOLDER	19" (FLOOR TO CENTER ROLL)
	36" (MAXIMUM FOR REAR WALL)
SOAP DISPENSER	48" (FLOOR TO CENTER OF PUSH BOTTOM)
MIRRORS	40" (FLOOR TO BOTTOM OF MIRROR)

(FOR MORE INFORMATION ON MOUNTING HEIGHTS FOR ACCESSIBLE ELEMENTS AND AREAS,SEE SHEETS A-0.0 AND A-0.1.)

ABBREVIATIONS

ABBR	DEFINITION	ABBR	DEFINITION
AC	AIR CONDITIONER	INCL	INCLUDING
ACT	ACOUSTICAL CEILING TILE	INS	INSULATION
ADD	ADDITIONAL	INT	INTERIOR
ADJ	ADJACENT	JAN	JANITOR
AFF	ABOVE FINISH FLOOR	JC	JANITOR'S CLOSET
AFC	AT FINISH CEILING	JT	JOINT
ALUM	ALUMINUM	LP	LOW POINT
ARCH	ARCHITECTURAL	LAM	LAMINATED
BD	BOARD	LAV	LAVATORY
BFF	BELOW FINISH FLOOR	LTG	LIGHTING
BLDG.	BUILDING	MAX	MAXIMUM
BLKG	BLOCKING	MBM	METAL BUILDING MANUFACTURER
BM	BEAM	MECH	MECHANICAL
BO	BOTTOM OF	MEMB	MEMBRANE
BRG	BEARING	MFR	MANUFACTURER
CBD	CHALKBOARD	MIN	MINIMUM
CI	CAST IRON	MISC	MISCELLANEOUS
CIP	CAST-IN-PLACE	MO	MASONRY OPENING
CJ	CONTROL JOINT	MTL	METAL
CL	CENTERLINE	NIC	NOT IN CONTRACT
CLG	CEILING	NO	NUMBER
CLR	CLEAR	NTS	NOT TO SCALE
CLO	CLOSET	OC	ON CENTER
CMU	CONCRETE MASONRY UNIT	OHD	OVERHEAD DOOR
CONT	COLUMN	OPNG	OPENING
CONC	CONCRETE	OPP	OPPOSITE
CONT	CONTINUOUS	OPP.HD.	OPPOSITE HAND
CPT	CARPET	PART	PARTITION
CT	CERAMIC TILE	PC	PRECAST
DET	DETAIL	PEMB	PRE-ENGINEERED METAL BUILDING
DF	DRINKING FOUNTAIN	PLAM	PLASTIC LAMINATE
DIA	DIAMETER	PT	PRESSURE TREATED
DN	DOWN	PTD	PAINTED
DR	DOOR	PVC	POLYVINYL CHLORIDE
DWG	DRAWING	QT	QUARRY TILE
EA	EACH	QTY	QUANTITY
EJ	EXPANSION JOINT	R	RADIUS or RISER
ELEC	ELECTRICAL	RA	RETURN AIR
ELEV	ELEVATION or ELEVATOR	RD	ROOF DRAIN
EXT	EXTERIOR	REF	REFERENCE
EQ	EQUAL	REINF	REINFORCING or REINFORCED
EQUIP	EQUIPMENT	REQ	REQUIRED
EXIST	EXISTING	REV	REVISION
FD	FLOOR DRAIN	RM	ROOM
FDN	FOUNDATION	RO	ROUGH OPENING
FE	FIRE EXTINGUISHER	RTU	ROOF TOP UNIT
FEC	FIRE EXTINGUISHER CABINET	SECT	SECTION
FF	FINISH FLOOR	SIM	SIMILAR
FFE	FINISH FLOOR ELEVATION	SPEC	SPECIFICATION
FFT	FINISH FLOOR TRANSITION	SQ	SQUARE
FIN	FINISH	SSTL	STAINLESS STEEL
FIXT	FIXTURE	STD	STANDARD
FR	FIRE-RATED	STL	STEEL
FRP	FIBERGLASS REINFORCED PLASTIC	STRUC	STRUCTURAL
FRT	FIRE RETARDANT TREATED	SUSP	SUSPENDED
FT	FOOT	T	TREAD
FV	FIELD VERIFY	TBD	TO BE DETERMINED or TACKBOARD
GA	GAUGE	TD	TRENCH DRAIN
GALV	GALVANIZED	TO	TOP OF
GC	GENERAL CONTRACTOR	TOC	TOP OF CONCRETE
GL	GLASS	TOS	TOP OF STEEL
GYP BD	GYPSUM BOARD	TOW	TOP OF WALL
HC	HANDICAP ACCESSIBLE	THK	THICK
HDW	HARDWARE	TYP	TYPICAL
HGT	HEIGHT	UNO	UNLESS NOTED OTHERWISE
HM	HOLLOW METAL	VCT	VINYL COMPOSITION TILE
HORIZ	HORIZONTAL	VERT	VERTICAL
HP	HIGH POINT	WD	WOOD
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING	WDW	WINDOW
		WF	WIDE FLANGE
IN	INCH	WPR	WATERPROOFING

GENERAL

T-1.00 TITLE SHEET

ARCHITECTURAL

A-0.00 ACCESSIBILITY ROUTE COMPLIANCE
A-0.10 ACCESSIBILITY ELEMENT COMPLIANCE
D-1.00 FLOOR PLAN - DEMOLITION FIRST FLOOR
A-1.00 FLOOR PLAN - FIRST FLOOR
D-4.00 DEMOLITION REFLECTED CEILING PLAN
A-4.00 REFLECTED CEILING PLAN - FIRST FLOOR
A-10.00 INTERIOR ELEVATIONS
A-12.00 INTERIOR FINISH PLAN

MEP

MEP-1.01 MEP SPECIFICATIONS
MEP-2.01 MEP SPECIFICATIONS
MEP-3.01 MEP SPECIFICATIONS
M-0.01 MECHANICAL INFORMATION
M-1.01 MECHANICAL PLAN
E-0.01 ELECTRICAL INFORMATION
E-1.01 ELECTRICAL LIGHTING PLAN
E-2.01 ELECTRICAL POWER PLAN
E-3.01 ELECTRICAL SCHEDULES
E-4.01 ELECTRICAL SCHEDULES
P-0.01 PLUMBING INFORMATION
P-1.01 PLUMBING PLAN
P-2.01 PLUMBING RISERS
P-3.01 PLUMBING DETAILS

BUILDING CODE AND PROJECT INFORMATION

SCOPE OF WORK
INTERIOR RENOVATION OF EXISTING BANK BRANCH.

BUILDING CODE
2024 INTERNATIONAL BUILDING CODE (IBC)
2023 NATIONAL ELECTRICAL CODE (NEC)
2024 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
2024 INTERNATIONAL FIRE CODE (IFC)
2024 INTERNATIONAL MECHANICAL CODE (IMC)
2024 INTERNATIONAL PLUMBING CODE (IPC)
2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
2012 TEXAS ACCESSIBILITY STANDARDS

OCCUPANCY CLASSIFICATION, EGRESS & OCCUPANT LOADS

OCCUPANCY TYPE:	B-BUSINESS
CONSTRUCTION TYPE:	II B - EXISTING
OCCUPANCY	B - 1 PER 150 GROSS
SUITE SQ. FT.	3,562
TOTAL OCCUPANT LOAD	24
EXITS REQUIRED:	1
EXITS PROVIDED:	2
WIDTH OF EXITS REQUIRED:	12.2"
WIDTH OF EXITS PROVIDED:	262"
MAXIMUM ALLOWABLE TRAVEL DISTANCE:	300 FT.
MAXIMUM ACTUAL TRAVEL DISTANCE:	53 FT. 11 IN.

FIRE RESISTANCE

	(HRS.)
EXTERIOR BEARING WALLS	0
INTERIOR BEARING WALLS	0
STRUCTURAL FRAME	0
CORRIDORS	0
SHAFT ENCLOSURE	0
ROOFS/CEILINGS:	0
EXTERIOR DOORS AND WINDOWS	0
SMOKE BARRIER SEPERATIONS	0

FIRE EXTINGUISHERS	CLASS	MAX. SEP.
	2A	75 FT.

DRAWING SYMBOLS LEGEND

SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION	SYMBOLS	DESCRIPTION
	NORTH ARROW	P3	PARTITION TYPE	A B / 1 2	COLUMN GRID
01 FLOOR PLAN 1/4"=1'-0"	DRAWING NAME, NUMBER, AND SCALE	W00	WINDOW TYPE		CENTERLINE
A4.0	ENLARGED DETAIL REFERENCE	000	DOOR IDENTIFICATION		BREAK LINE
A5.0	EXTERIOR ELEVATION	OFFICE 325	ROOM NAME ROOM NUMBER		SPOT ELEVATION
A7.10 A7.10	BUILDING SECTION	02/A10.0	INTERIOR ELEVATION	2'-0" 2'-0"	DIMENSION LINES
A8.0	WALL SECTION		MATCH LINE		
A9.0	SECTION DETAIL	A	REVISION NUMBER & AFFECTED AREA		
FIRST FLOOR 0"	VERTICAL ELEVATION	FE	FIRE EXTINGUISHER		

GENERAL NOTES:

1. NOTIFY ARCHITECT OF ANY DISCREPANCIES AND/OR OMISSIONS.
2. ALL WORK SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL ORDINANCES.
3. ALL DIMENSIONS ARE TO FINISHED FACE OF PARTITIONS.
4. ALL DOORS ON AN ACCESSIBLE ROUTE SHALL HAVE A MIN. 18" CLEAR ON THE PULL SIDE, A MIN. 12" CLEAR ON THE PUSH SIDE WHEN DOOR IS EQUIPPED WITH BOTH A LATCH AND CLOSER.
5. ALL DOORS TO RECEIVE NEW AMERICAN DISABILITIES ACT COMPLIANT HARDWARE.
6. COMPLY WITH ALL 2012 TAS GUIDELINES

PROJECT TEAM

ARCHITECT/CONTRACTOR
SLI GROUP
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TEXAS 77084
713-465-4650

MEP ENGINEER
E|B|E CONSULTING ENGINEERS
12603 SOUTHWEST FRWY, SUITE 170
STAFFORD, TEXAS 77477
713-840-0177

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WOODFOREST NATIONAL BANK
1330 Lake Robbins Dr, Suite 100
Branch and Coffee Shop
The Woodlands, TX 77380

PROJECT NUMBER: 8995

ISSUED FOR CLIENT APPROVAL	DATE
ISSUED FOR BIDDING	10.01.26
ISSUED FOR PERMIT	10.01.26
ISSUED FOR CONSTRUCTION	

REVISIONS

MARK	DESCRIPTION	DATE

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PRINT DATE Oct 02, 2026 – 10:21am

REGISTERED ARCHITECT COMMONWEALTH OF MASSACHUSETTS 31280 STATE OF TEXAS 10/01/26

DRAWING TITLE
Title Sheet/Code Information

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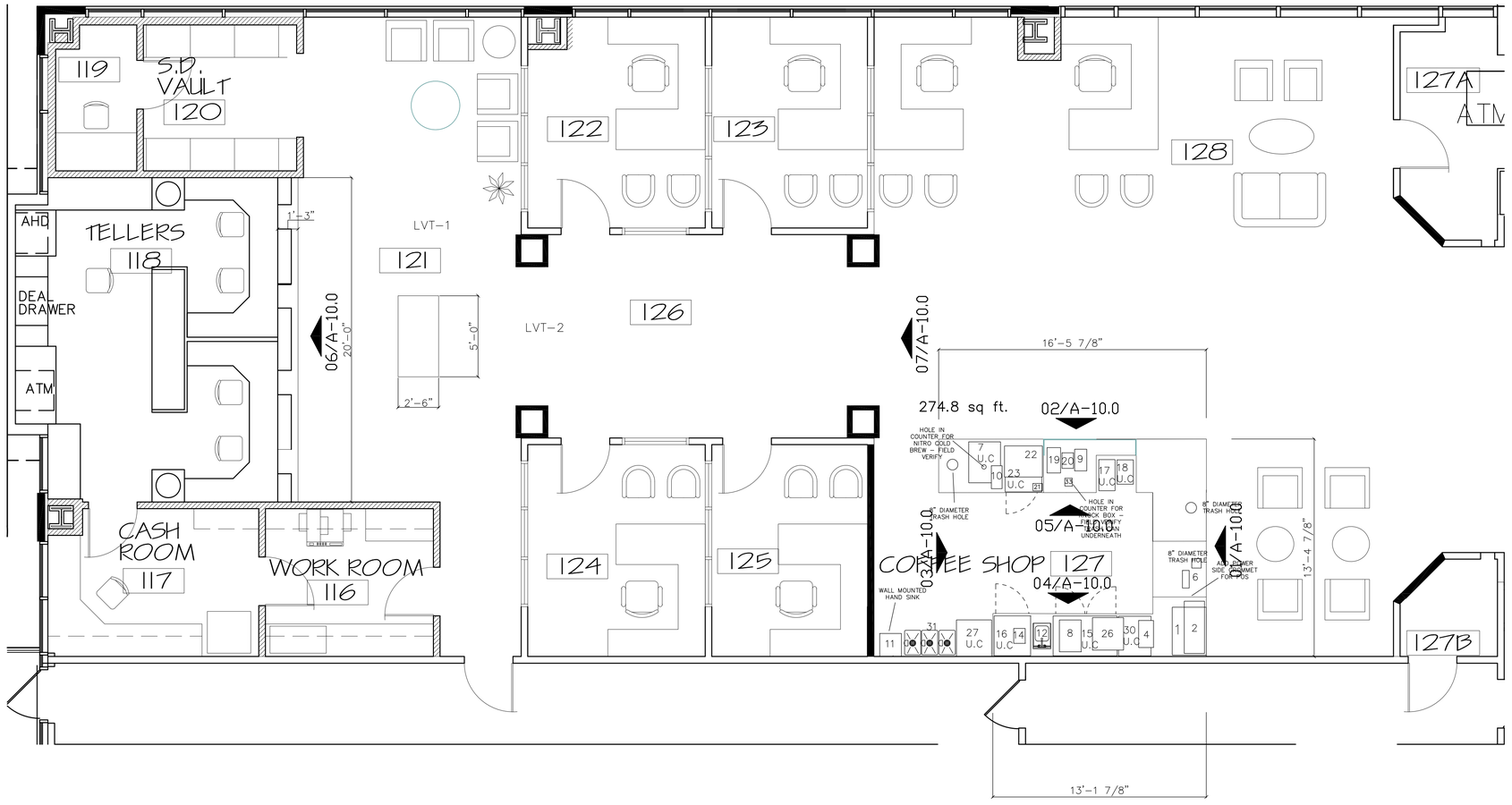
CHECKED BY	TB
APPROVED BY	TB
SHEET NO.	T-1.00



01 FLOOR PLAN
SCALE: 1/4"=1'-0"

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WOODLANDS, TEXAS

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REGISTERED ARCHITECT THOMAS LEE HUDSON 30268 STATE OF TEXAS

DRAWING TITLE: FLOOR PLAN

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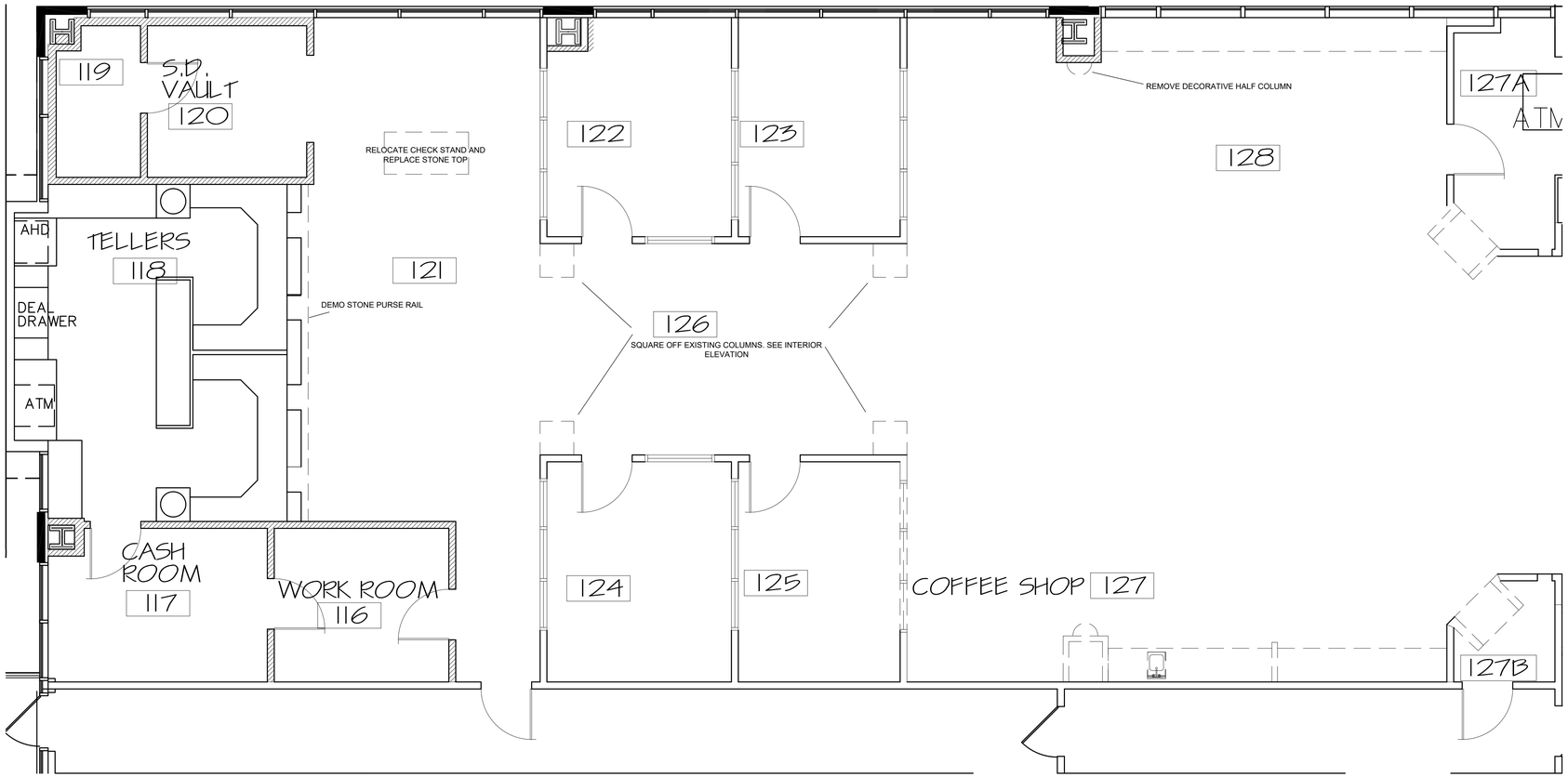

01 DEMO FLOOR PLAN
SCALE: 1/4"=1'-0"

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ISSUED FOR CONSTRUCTION	10.05.26

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REGISTERED ARCHITECT
BRIAN SCOTT HENRY
STATE OF TEXAS
29295

DRAWING TITLE DEMO PLAN

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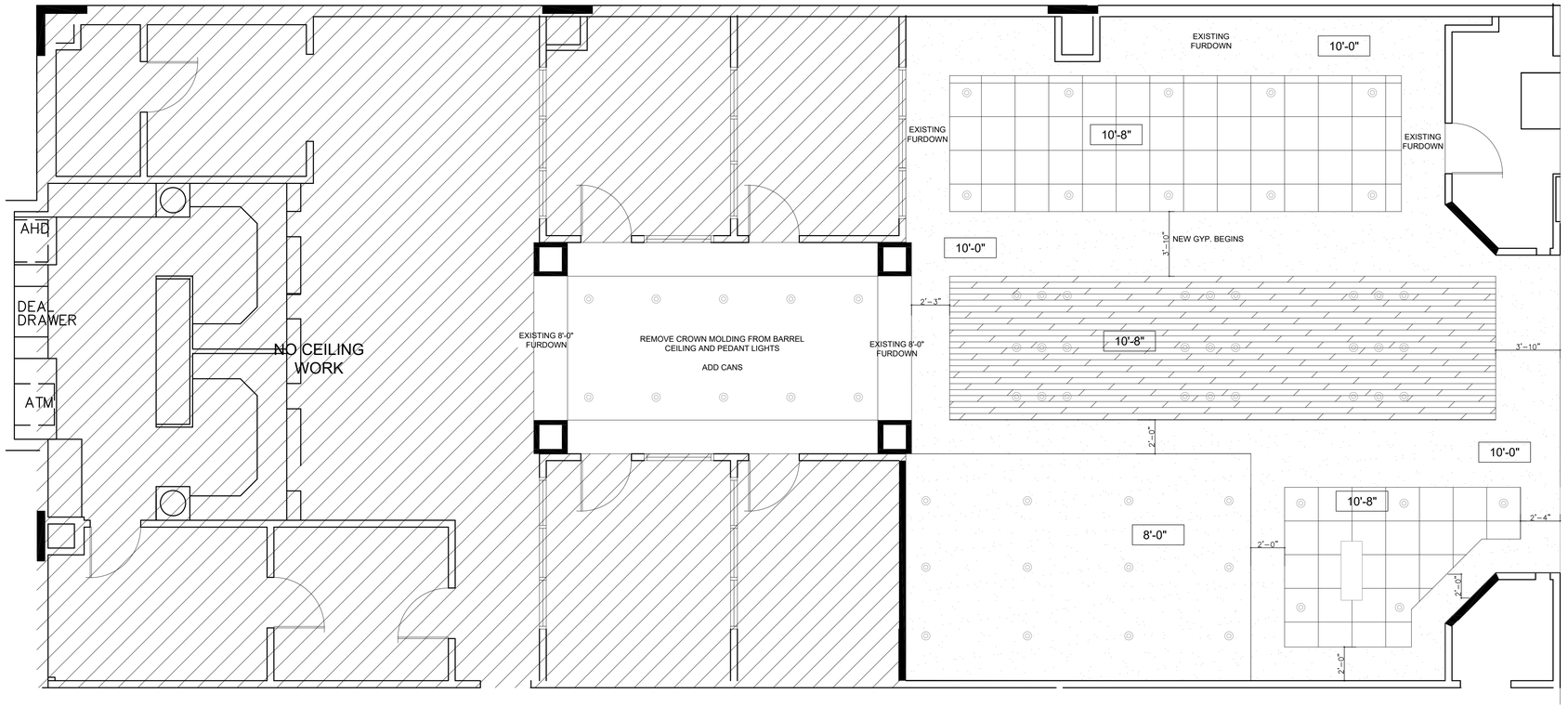
APPROVED BY	BH

SHEET NO. A-1.01



01 RCP
SCALE: 1/4"=1'-0"

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REGISTERED ARCHITECT BRANDI L. SKRIVANOS 31295 STATE OF TEXAS

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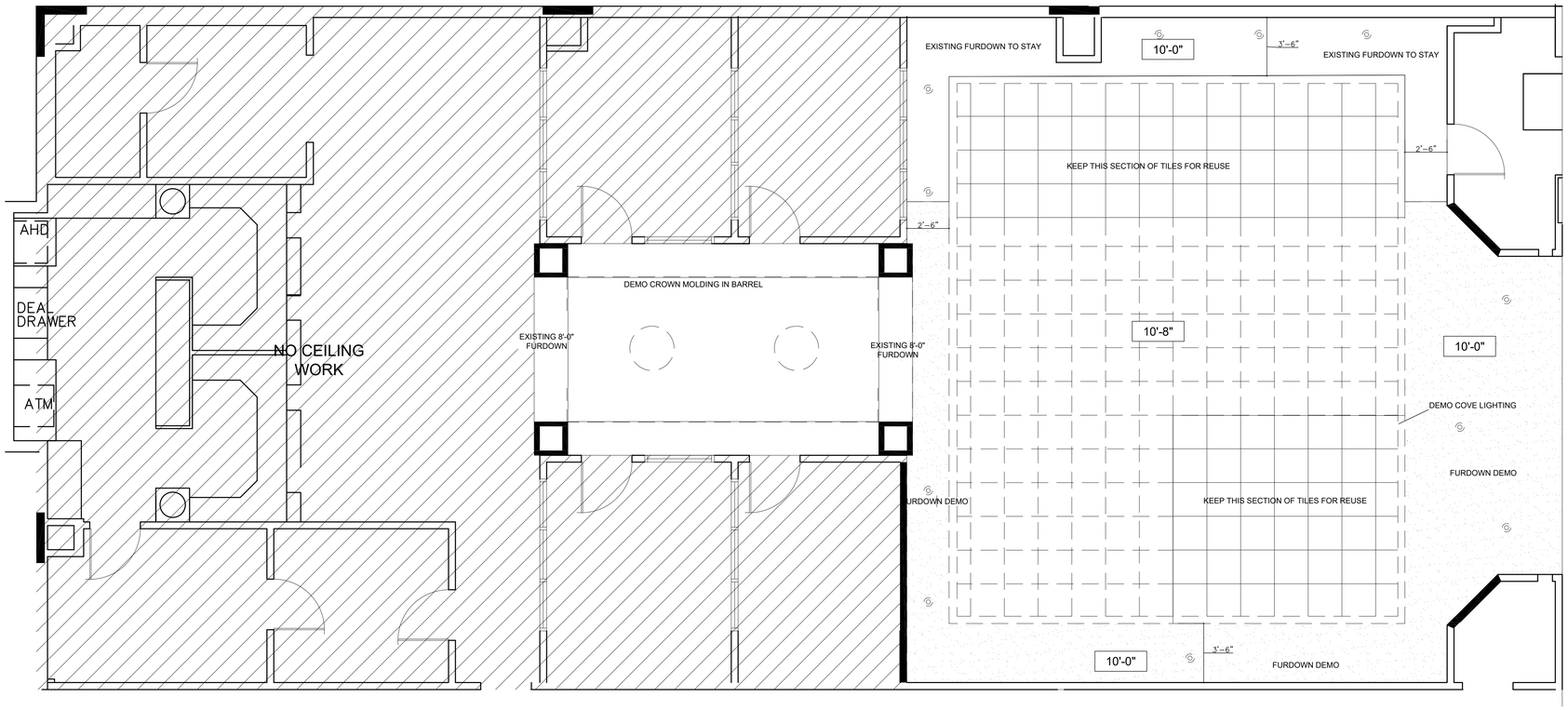

01 DEMO RCP
SCALE: 1/4"=1'-0"

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REGISTERED ARCHITECT
THOMAS BRAUN
#0388
STATE OF TEXAS

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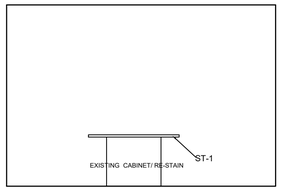
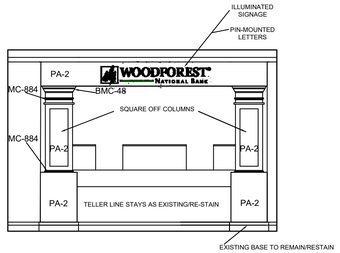
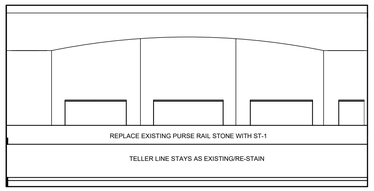
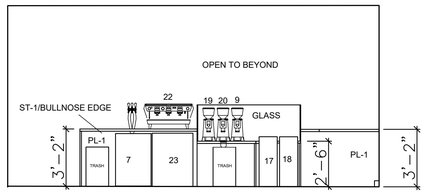
SHEET NO. A-4.01

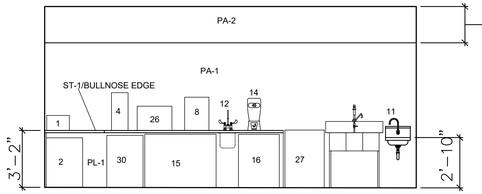
* RE-STAIN EXISTING CROWN MOLDING/BASE/TELLER LINE/CHECKSTAND
*BULLNOSE EDGE ON ALL STONE TOP EDGES FOR COFFEE BAR



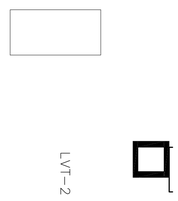


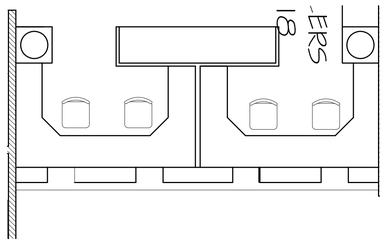


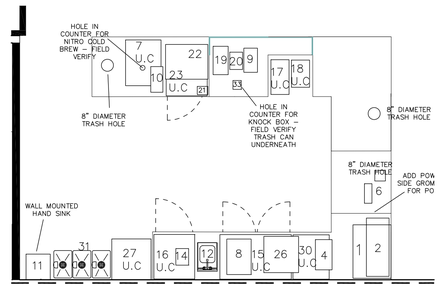


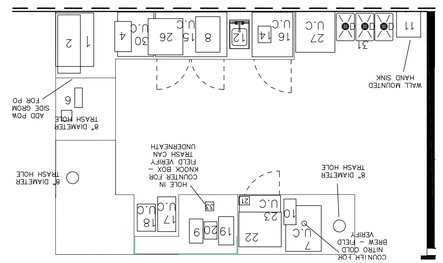












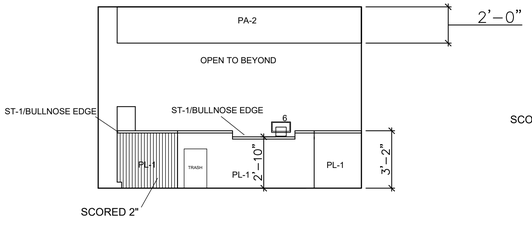
08 CHECKSTAND
SCALE: 1/4"=1'-0"

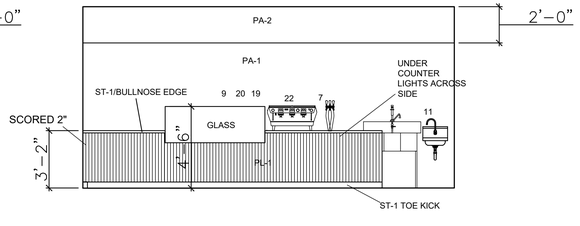
07 CORRIDOR 126- WEST
SCALE: 1/4"=1'-0"

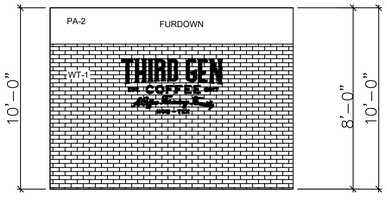
06 TELLER LINE 118 - WEST
SCALE: 1/4"=1'-0"

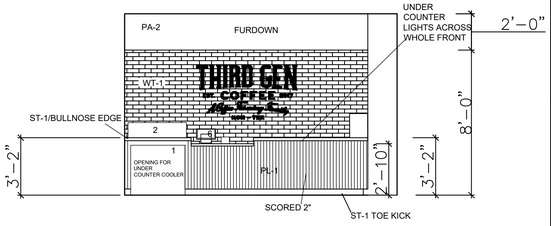
05 COFFEE BAR - NORTH
SCALE: 1/4"=1'-0"

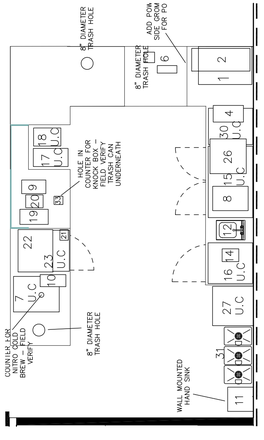
04 COFFEE BAR - SOUTH
SCALE: 1/4"=1'-0"

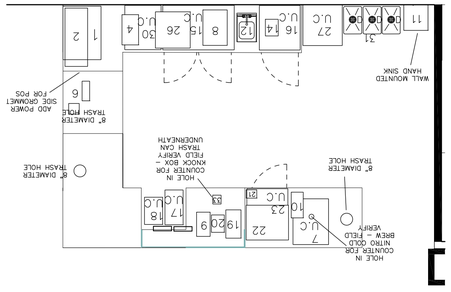


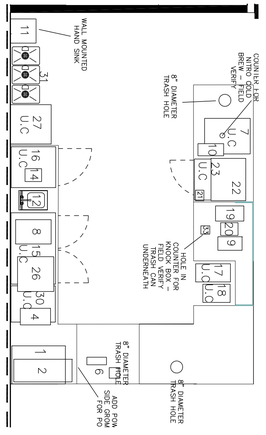


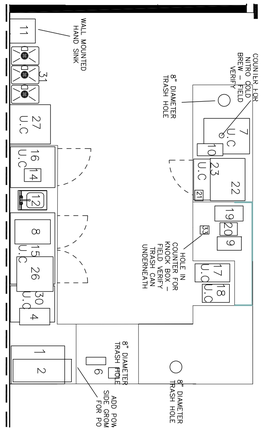












03 COFFEE BAR - EAST
SCALE: 1/4"=1'-0"

02 COFFEE BAR - SOUTH
SCALE: 1/4"=1'-0"

01 COFFEE BAR - WEST
SCALE: 1/4"=1'-0"

01 COFFEE BAR - WEST
SCALE: 1/4"=1'-0"

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INTERIOR ELEVATIONS

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SHEET NO.
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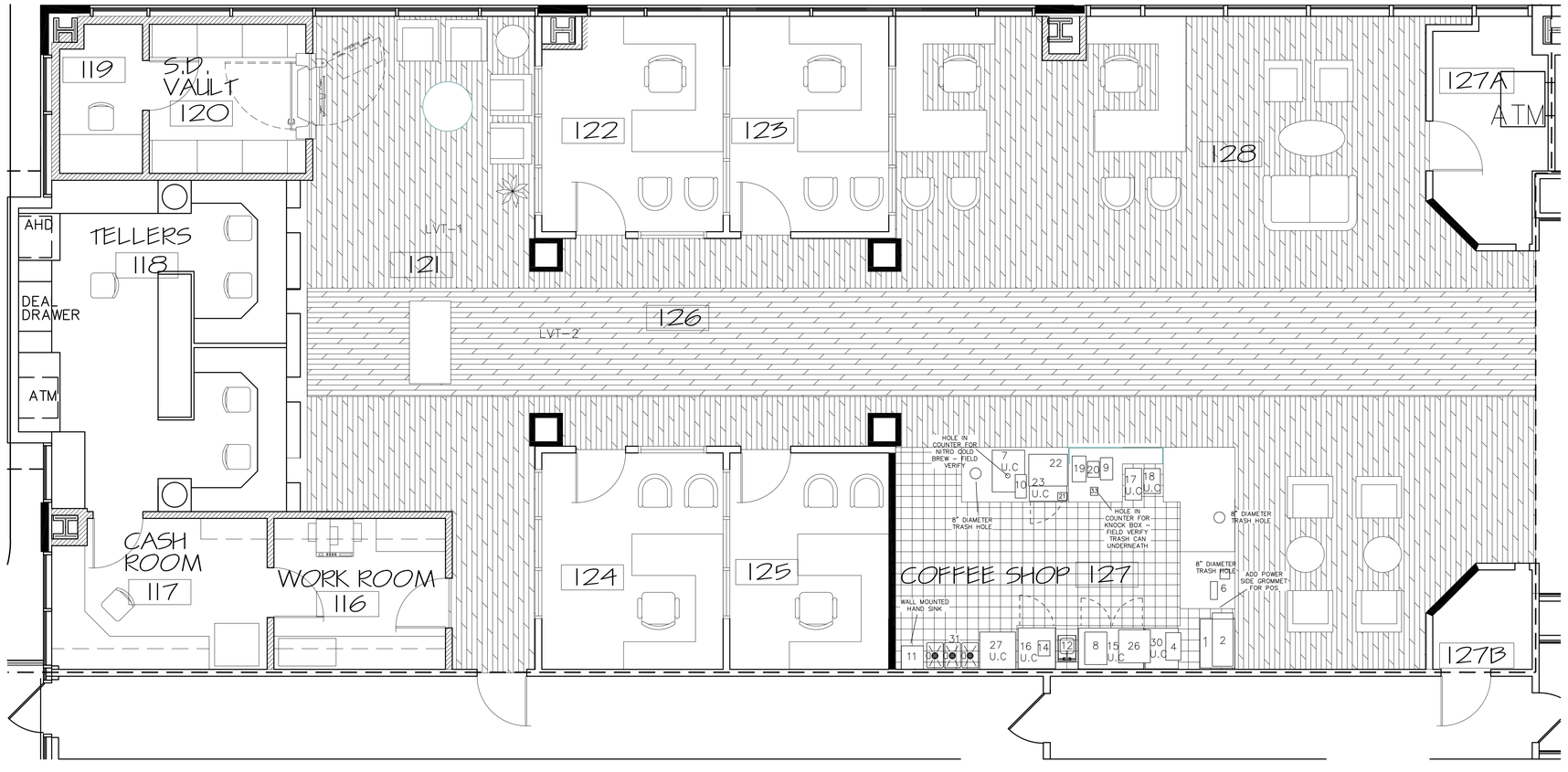
MATERIAL LEGEND						
FLOOR						
CODE	MFG	SERIES	COLOR	ITEM #	SIZE	NOTES
LVT-1	SHAW CONTRACT	UNCOMMON GROUND 4	CHOCOLATE CHRY	0187V-02573	4" WIDE	
LVT-2	SHAW CONTRACT	UNCOMMON GROUND 4	CEYLON	0187V-02760	4" WIDE	THIN STRIP DOWN CORRIDOR 126
PA-1	SHERWIN WILLIAMS	PRO MAR 400 ZERO VOC	ALABASTER	7008		WALL
PA-2	SHERWIN WILLIAMS	PRO MAR 400 ZERO VOC	HIGH REFLECTIVE WHITE	7757		CEILING
WT-1	MCNEAR BRICK & BLOCK	SANDMOLD SERIES	EMBARCADERO			THIN BRICK
CA-1	MOHAWK GROUP	PATHMAKERS, GENTLE GROUND	NECTAR	GT364-739	12" X 36"	BRICK ASHLAR
PL-1	WILSONART		HAMPTON WALNUT	7959-78		COFFEE BAR
WC-1	MONARCH PLANK	VINLAND	WALNUT SELECT		6" WIDE	WOOD CEILING
ST-1	CAESAR STONE		MOORELAND FOG	6046		BULLNOSE EDGE
FT-1	ARIZONA TILE	QUARRY METRO	PURITAN GRAY		8" X8"	COFFEE BAR FLOOR
GT-1	CUSTOM		NEW TAUPE	185	$\frac{1}{16}$"	FT-1 GROUT
GT-2	CUSTOM		WALNUT	541	$\frac{1}{16}$"	WT-1 GROUT

ROOM FINISH SCHEDULE									
NO.	ROOM	FLOOR	BASE	WALL ►	WALL ▲	WALL ◄	WALL ▼	CEILING	RE-STAIN
116	WORK ROOM	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING
117	CASH ROOM	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING
118	TELLERS	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING, TELLERLINE
119	SAFETY DEPOSIT	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING
120	VAULT	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	N/A
121	TELLER LOBBY	LVT-1/LVT-2	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING, WINDOW TRIM ON EXTERIOR OFFICE WINDOWS, CHECKSTAND, FORM HOLDER
122	OFFICE	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING, WINDOW TRIM, DOOR
123	OFFICE	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING, WINDOW TRIM, DOOR
124	OFFICE	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING, WINDOW TRIM, DOOR
125	OFFICE	CA-1	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING	BASE, CROWN MOLDING, WINDOW TRIM, DOOR
126	CORRIDOR	LVT-1/LVT-2	EXISTING	PA-1	PA-1	PA-1	PA-1	EXISTING/ WOOD PANEL	BASE, CROWN MOLDING, EXTERIOR OFFICE WINDOWS
127	COFFEE BAR	FT-1	EXISTING	PA-1	N/A	WT-1	PA-1	GYP./ACT	BASE
127A	STORAGE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	DOOR
127B	STORAGE	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	DOOR
128	LOBBY	LVT-1/LVT-2	EXISTING	PA-1	PA-1	PA-1	PA-1	ACT	BASE



01 FINISHED FLOOR PLAN
SCALE: 1/4"=1'-0"

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REGISTERED ARCHITECT TIMOTHY LEE BRADLEY 19289 STATE OF TEXAS

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FINISHED FLOOR PLAN

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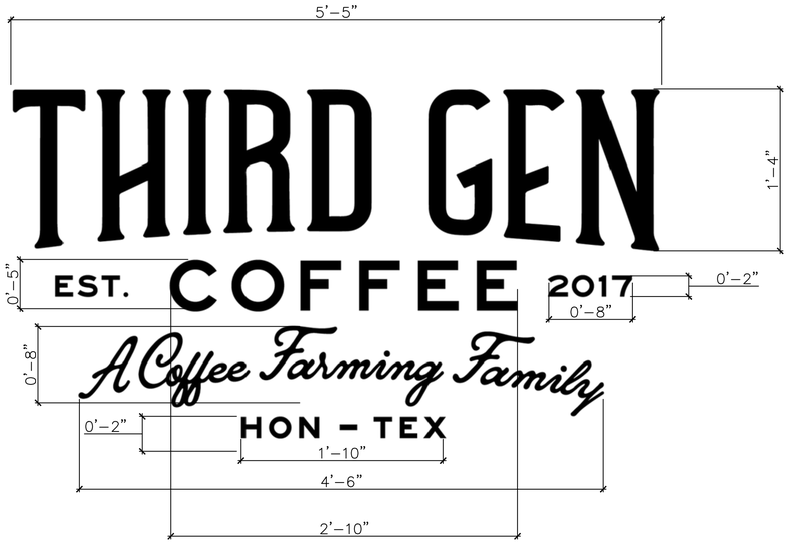
SHEET NO.
A-12.00

THIRD GEN SIGNAGE		
COLOR	FONT	NOTES
BLACK	?	PIN MOUNTED LETTERS



THIRD GEN SIGNAGE		
COLOR	FONT	NOTES
BLACK WITH GREEN STRIPE	?	PIN MOUNTED LETTERS / ILLUMINATED SIGN



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ISSUED FOR PERMIT	10.05.26
ISSUED FOR CONSTRUCTION	

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REGISTERED ARCHITECT
BRANDON L. HOLBROOK
STATE OF TEXAS
29288

DRAWING TITLE
INTERIOR SIGNAGE

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APPROVED BY	BH

SHEET NO.
A-14.00

GENERAL MEP NOTES

COORDINATION

EACH CONTRACTOR SHALL COORDINATE ITS CONSTRUCTION OPERATIONS WITH THOSE OF OTHER CONTRACTORS AND ENTITIES TO ENSURE EFFICIENT AND ORDERLY INSTALLATION OF EACH PART OF THE WORK. EACH CONTRACTOR SHALL COORDINATE ITS OPERATIONS WITH OPERATIONS, INCLUDED IN DIFFERENT SECTIONS, THAT DEPEND ON EACH OTHER FOR PROPER INSTALLATION, CONNECTION, AND OPERATION.

1. SCHEDULE CONSTRUCTION OPERATIONS IN SEQUENCE REQUIRED TO OBTAIN THE BEST RESULTS WHERE INSTALLATION OF ONE PART OF THE WORK DEPENDS ON INSTALLATION OF OTHER COMPONENTS, BEFORE OR AFTER ITS OWN INSTALLATION.
2. COORDINATE INSTALLATION OF DIFFERENT COMPONENTS WITH OTHER CONTRACTORS TO ENSURE MAXIMUM PERFORMANCE AND ACCESSIBILITY FOR REQUIRED MAINTENANCE, SERVICE, AND REPAIR.
3. MAKE ADEQUATE PROVISIONS TO ACCOMMODATE ITEMS SCHEDULED FOR LATER INSTALLATION.
4. VISIT THE SITE PRIOR TO SUBMITTING A BID TO VERIFY THE EXISTING CONDITIONS AND DESIGN CONSTRAINTS. FAILURE TO MEET THIS REQUIREMENT SHALL NOT BE JUSTIFICATION FOR FAULTY INSTALLATION OR ADDITIONAL COSTS.
5. SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR WORK, AND PAY ALL FEES FOR REQUIRED WORK.
6. COMPLY WITH ALL CURRENT LAWS, BUILDING CODES AND REGULATIONS FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE LOCAL AUTHORITY HAVING JURISDICTION, THE LATTER SHALL RULE. ANY CHANGES RESULTING SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR ARCHITECT/ENGINEER. THE CONTRACTOR SHALL REPORT ANY SUCH MODIFICATIONS TO THE ARCHITECT/ENGINEER AND SECURE HIS APPROVAL BEFORE PROCEEDING. SHOULD THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE CODES, THE CONTRACT DOCUMENTS SHALL GOVERN, PROVIDED THOSE REQUIREMENTS ARE NOT IN CONFLICT WITH THOSE CODES. ALL ITEMS OF EQUIPMENT AND ALL MATERIALS FOR WHICH APPROVAL STANDARDS HAVE BEEN ESTABLISHED BY UNDERWRITERS' LABORATORIES, INC. (UL), FACTORY MUTUAL (FM), AMERICAN STANDARD CODES, ASME, AGA, AMCA, ASA, ANSI, ASHRAE, AND ARI SHALL BE SO APPROVED AND SHALL BEAR APPROVAL LABELS.
7. PENETRATIONS OF WALLS AND FLOORS OF FIRE-RATED ASSEMBLIES SHALL COMPLY WITH ASTM, U.L., AND THE AUTHORITIES HAVING JURISDICTION.
8. IF THE DRAWINGS AND SPECIFICATIONS ARE IN CONFLICT THE GREATER AMOUNT OF WORK SHALL BE PRICED. BRING THE CONFLICT TO THE ATTENTION OF THE ENGINEER AND REQUEST DIRECTION.
9. DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW ALL FITTINGS, COMPONENTS AND OFFSETS, ETC. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, COMPONENTS, OFFSETS OR OTHER FEATURES REQUIRED FOR THE FULL OPERATIONAL CONDITION OF THIS PROJECT.
10. CONFIRM DIMENSIONS AND LOCATIONS IN THE FIELD, DRAWINGS ARE NOT TO BE SCALED AND ARE NOT INTENDED TO SHOW EXACT LOCATIONS BASED ON SCALING DIMENSIONS.
11. GUARANTEE LABOR AND MATERIALS OF ENTIRE INSTALLATION FOR ONE YEAR. WORK BELOW FLOOR OR OVER CORRIDORS SHALL BE PERFORMED AT THE OWNER'S CONVENIENCE AND MAY BE REQUIRED TO BE DONE DURING EVENINGS AND WEEKENDS. DEMOLITION DAMAGE TO EXISTING MATERIALS/EQUIPMENT WILL BE REPAIRED AT NO ADDITIONAL COST TO OWNER. RE-SUPPORT ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY WALLS BEING REMOVED.
12. ELECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT DRAWINGS

ACOUSTIC TREATMENT

A. IT IS THE INTENT OF THESE DRAWINGS TO SPECIFY AND FOR THE CONTRACTOR TO INSTALL SYSTEMS THAT ARE QUIET AND FREE OF VIBRATION. EQUIPMENT SHALL BE BALANCED AND VIBRATION ISOLATED TO MEET THE REQUIREMENTS SPECIFIED HEREIN FOR BOTH THE EQUIPMENT ITSELF AND CONDITIONS WITHIN OCCUPIED SPACES. THIS CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND INSTALLING EQUIPMENT THAT IS QUIET IN OPERATION AS COMPARED TO OTHER AVAILABLE EQUIPMENT OF ITS SIZE, CAPACITY, AND TYPE.

B. EQUIPMENT NOT MEETING THESE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR TO AN ACCEPTABLE LEVEL BUT WITHIN THE REQUIREMENTS OF THE SPECIFICATIONS AT NO COST TO THE OWNER, ARCHITECT OR ENGINEER.

C. AIR DISTRIBUTION EQUIPMENT SHALL BE SOUND TESTED AT THE DESIGN OPERATING CONDITIONS AND SHALL NOT EXCEED A MAXIMUM DISCHARGE NC RATING OF 25 OR A RADIATED NC RATING OF 30 AT RATED CFM.

D. UNLESS NOTED OTHERWISE HEREIN OR ON THE DRAWINGS, THE NOISE LEVEL IN ALL OCCUPIED SPACES SHALL NOT EXCEED THE "LOWEST VALUE IN THE RANGE" OF THE NOISE CRITERIA CURVES PUBLISHED IN THE CURRENT FUNDAMENTALS EDITION OF THE ASHRAE GUIDE AND DATA BOOK. THE NOISE CRITERIA CURVES SHALL BE BASED ON ANSI STANDARD S1.6-1967 OCTAVE BANDS AND A SOUND PRESSURE LEVEL IN DECIBELS REFERENCED TO 0.002 MICROBARS. SOUND LEVELS IN OCCUPIED SPACES MUST MEET THE DESIGN CRITERIA WITH ALL CONSTRUCTION IN PLACE.

E. SHOULD A QUESTION ARISE REGARDING THE ACCEPTABLE LEVEL OF NOISE OR VIBRATION IN A PARTICULAR SPACE OR PIECE OF EQUIPMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE SERVICES OF AN APPROVED ACOUSTICAL CONSULTANT TO DETERMINE ACTUAL NOISE/VIBRATION CONDITIONS.

SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. ELECTRONIC COPIES OF CAD DRAWINGS OF THE CONTRACT DRAWINGS WILL NOT BE PROVIDED BY THE ENGINEER FOR CONTRACTOR'S USE IN PREPARING SUBMITTALS OR AS-BUILT DRAWINGS.

B. COORDINATE PREPARATION AND PROCESSING OF SUBMITTALS WITH PERFORMANCE OF CONSTRUCTION ACTIVITIES. COORDINATE EACH SUBMITTAL WITH FABRICATION, PURCHASING, TESTING, DELIVERY, OTHER SUBMITTALS, AND RELATED ACTIVITIES THAT REQUIRE SEQUENTIAL ACTIVITY. SUBMIT ALL ITEMS REQUIRED FOR EACH SPECIFICATION SECTION CONCURRENTLY.

C. ALLOW TIME FOR SUBMITTAL REVIEW, INCLUDING TIME FOR RESUBMITTALS, AS FOLLOWS. TIME FOR REVIEW SHALL COMMENCE ON ENGINEER'S RECEIPT OF SUBMITTAL. NO EXTENSION OF THE CONTRACT TIME WILL BE AUTHORIZED BECAUSE OF FAILURE TO TRANSMIT SUBMITTALS ENOUGH IN ADVANCE OF THE WORK TO PERMIT PROCESSING, INCLUDING RESUBMITTALS.

1. INITIAL REVIEW: ALLOW 7 DAYS FOR INITIAL REVIEW OF EACH SUBMITTAL EXCLUSIVE OF TRAVEL TIME. ALLOW ADDITIONAL TIME IF COORDINATION WITH SUBSEQUENT SUBMITTALS IS REQUIRED.
2. RESUBMITTAL REVIEW: ALLOW 7 DAYS FOR REVIEW OF EACH RESUBMITTAL EXCLUSIVE OF TRAVEL TIME.

D. PLACE A PERMANENT LABEL OR TITLE BLOCK ON EACH PAPER COPY SUBMITTAL ITEM FOR IDENTIFICATION. INDICATE NAME OF FIRM OR ENTITY THAT PREPARED EACH SUBMITTAL ON LABEL OR TITLE BLOCK.

E. INCLUDE THE FOLLOWING INFORMATION FOR PROCESSING AND RECORDING ACTION TAKEN:

1. PROJECT NAME.
2. DATE.
3. NAME OF ARCHITECT.
4. NAME OF ENGINEER.
5. NAME OF CONTRACTOR.
6. NAME OF SUBCONTRACTOR.
7. NAME OF SUPPLIER.
8. NAME OF MANUFACTURER.

F. CONTRACTOR'S REVIEW:
REVIEW EACH SUBMITTAL AND CHECK FOR COORDINATION WITH OTHER WORK OF THE CONTRACT AND FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. NOTE CORRECTIONS AND FIELD DIMENSIONS. MARK WITH APPROVAL STAMP BEFORE SUBMITTING TO ARCHITECT/ENGINEER.
STAMP EACH SUBMITTAL WITH A UNIFORM, APPROVAL STAMP. PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.
PROVIDE A STATEMENT CERTIFYING THAT SUBMITTAL HAS BEEN REVIEWED, CHECKED, AND APPROVED FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS AT THE SITE.

IF THE GENERAL CONTRACTOR IS DEFERRING THE ABOVE REQUIREMENTS TO THE SUBCONTRACTOR, THEN THE SUBCONTRACTOR MUST ALSO REVIEW, STAMP AND CERTIFY THE SUBMITTAL.

G. ENGINEER'S ACTION:
ENGINEER WILL NOT REVIEW SUBMITTALS THAT DO NOT BEAR CONTRACTOR'S APPROVAL STAMP AND WILL RETURN THEM.
ENGINEER WILL REVIEW EACH SUBMITTAL, NOTE CORRECTIONS OR MODIFICATIONS REQUIRED, AND RETURN IT. ENGINEER WILL PROVIDE SUBMITTAL WITH AN ACTION SHEET TO INDICATE ACTION.

REQUESTS FOR INFORMATION (RFI)

IMMEDIATELY ON DISCOVERY OF THE NEED FOR ADDITIONAL INFORMATION OR INTERPRETATION OF THE CONTRACT DOCUMENTS, CONTRACTOR SHALL PREPARE AND SUBMIT AN RFI IN THE FORM SPECIFIED.

1. ENGINEER WILL RETURN RFIS SUBMITTED TO ENGINEER BY OTHER ENTITIES CONTROLLED BY CONTRACTOR WITH NO RESPONSE.
2. COORDINATE AND SUBMIT RFIS IN A PROMPT MANNER SO AS TO AVOID DELAYS IN CONTRACTOR'S WORK OR WORK OF SUBCONTRACTORS.
3. INCLUDE A PROPOSED SOLUTION AS WELL AS INCLUDE A DETAILED, LEGIBLE DESCRIPTION OF ITEM NEEDING INFORMATION OR INTERPRETATION. INCLUDE SKETCHES, DESCRIPTIONS, MEASUREMENTS, PHOTOS, PRODUCT DATA, SHOP DRAWINGS, COORDINATION DRAWINGS, AND OTHER INFORMATION NECESSARY TO FULLY DESCRIBE ITEMS NEEDING INTERPRETATION.

RECORD DRAWINGS

A. WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, A COMPLETE SET OF "AS BUILT" DRAWINGS PORTRAYING ACTUAL SITE CONDITIONS OF THE MECHANICAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION WORK. SUBMISSION SHALL CONSIST OF ONE SET OF PAPER SEPIAS AND ONE SET OF CAD FILES IN AUTOCAD 2007 FORMAT. ENGINEER AND ARCHITECT SEALS AND LOGOS SHALL BE REMOVED FROM THE DRAWINGS AND THEY SHALL BE STAMPED "AS-BUILT DRAWINGS".

B. WITHIN 90 DAYS OF COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, A COMPLETE SET OF "O&M MANUALS", EQUIPMENT DATA, HVAC AIR AND WATER BALANCING REPORT, AND LIGHTING CONTROL TESTING REPORT FOR COMPLIANCE WITH CURRENT ENERGY CODE. THE CONTRACTOR SHALL PROVIDE A WRITTEN CERTIFICATION THAT ALL NEW MATERIALS AND COMPONENTS DO NOT CONTAIN ASBESTOS OR PCBS.

REQUIRED SUBMITTALS

A. PROVIDE FOUR BOUND PRODUCT DATA SUBMITTALS FOR THE NEW EQUIPMENT LISTED BELOW TO THE ARCHITECT/ENGINEER. EACH CONTRACTOR RESPONSIBLE FOR THE WORK SHALL REVIEW AND CERTIFY THE SUBMITTAL DATA TO BE IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND THE PHYSICAL SPACE LIMITATIONS.

1. AIR HANDLING UNITS
2. FAN COIL UNITS
3. AIR DISTRIBUTION DEVICES
4. ELECTRICAL PANELS
5. ELECTRICAL TRANSFORMERS
6. LIGHTING FIXTURES
7. WIRING DEVICES
8. PLUMBING FIXTURES
9. AIR AND WATER BALANCE REPORTS
10. CIRCUIT DIRECTORY CARDS

MECHANICAL AND SERVICE WATER HEATING COMMISSIONING

A. ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.

B. SYSTEMS ADJUSTING AND BALANCING: HVAC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS. AIR AND WATER FLOW RATES SHALL BE MEASURED AND ADJUSTED TO DELIVER FINAL FLOW RATES WITHIN TOLERANCES PROVIDED IN THE PRODUCT SPECIFICATIONS. TEST AND BALANCE ACTIVITIES SHALL INCLUDE AIR SYSTEM AND HYDRONIC SYSTEM BALANCING. THE FOLLOWING SYSTEMS ARE EXEMPT:

1. MECHANICAL SYSTEMS AND SERVICE WATER HEATER SYSTEMS IN BUILDINGS WHERE THE TOTAL MECHANICAL EQUIPMENT CAPACITY IS LESS THAN 480,000 BTUH COOLING CAPACITY AND 600,000 BTUH COMBINED SERVICE WATER HEATING AND SPACE HEATING CAPACITY.
2. SYSTEMS THAT SERVE INDIVIDUAL DWELLING UNITS AND SLEEPING UNITS.

C. AIR SYSTEMS BALANCING: EACH SUPPLY AIR OUTLET AND ZONE TERMINAL DEVICE SHALL BE EQUIPPED WITH MEANS FOR AIR BALANCING. DISCHARGE DAMPERS USED FOR AIR SYSTEM BALANCING ARE PROHIBITED ON CONSTANT VOLUME FANS AND VARIABLE VOLUME FANS WITH MOTORS 10HP AND LARGER. AIR SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES THEN, FOR FANS WITH SYSTEM POWER OF GREATER THAT 1 HP, FAN SPEED SHALL BE ADJUSTED TO ACHIEVE FLOW CONDITIONS. EXCEPTIONS: FANS WITH MOTORS OF 1 HP OR LESS ARE NOTE REQUIRED TO BE PROVIDED WITH A MEANS FOR AIR BALANCING.

D. HYDRONIC SYSTEM BALANCING: INDIVIDUAL HYDRONIC HEATING AND COOLING COILS SHALL BE EQUIPPED WITH A MEANS FOR BALANCING AND MEASURING FLOW. HYDRONIC SYSTEMS SHALL BE PROPORTIONATELY BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN THE PUMP IMPELLER SHALL BE TRIMMED OR PUMP SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS. EACH HYDRONIC SYSTEM SHALL HAVE EITHER THE CAPABILITY TO MEASURE PRESSURE ACROSS THE PUMP, OR TEST PORTS AT EACH SIDE OF EACH PUMP. THE FOLLOWING EQUIPMENT IS NOT REQUIRED TO BE EQUIPPED WITH A MEANS FOR BALANCING OR MEASURING FLOW:

1. PUMPS WITH PUMP MOTORS OF 5 HP (3.7 KW) OR LESS.
2. WHERE THROTTLING RESULTS IN NO GREATER THAN 5 PERCENT OF THE NAMEPLATE HORSEPOWER DRAW ABOVE THAT REQUIRED IF THE IMPELLER WERE TRIMMED.

E. FUNCTIONAL PERFORMANCE TESTING. FUNCTIONAL PERFORMANCE TESTING SHALL BE CONDUCTED.

1. EQUIPMENT. EQUIPMENT FUNCTIONAL PERFORMANCE TESTING SHALL DEMONSTRATE THE INSTALLATION AND OPERATION OF COMPONENTS, SYSTEMS, AND SYSTEM-TO-SYSTEM INTERFACING RELATIONSHIPS IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS SUCH THAT OPERATION, FUNCTION, AND MAINTENANCE SERVICEABILITY FOR EACH OF THE COMMISSIONED SYSTEMS IS CONFIRMED. TESTING SHALL INCLUDE ALL MODES AND SEQUENCE OF OPERATION, INCLUDING UNDER FULL-LOAD, PART-LOAD AND THE FOLLOWING EMERGENCY CONDITIONS:
   1.1. ALL MODES AS DESCRIBED IN THE SEQUENCE OF OPERATION.
   1.2. REDUNDANT OR AUTOMATIC BACK-UP MODE.
   1.3. PERFORMANCE OF ALARMS.
   1.4. MODE OF OPERATION UPON A LOSS OF POWER AND RESTORATION OF POWER.

EXCEPTION: UNITARY OR PACKAGED HVAC EQUIPMENT THAT DO NOT REQUIRE SUPPLY AIR ECONOMIZERS.

F. CONTROLS. HVAC AND SERVICE WATER-HEATING CONTROL SYSTEMS SHALL BE TESTED TO DOCUMENT THAT CONTROL DEVICES, COMPONENTS, EQUIPMENT AND SYSTEMS ARE CALIBRATED AND ADJUSTED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS. SEQUENCES OF OPERATION SHALL BE FUNCTIONALLY TESTED TO DOCUMENT THEY OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.

G. ECONOMIZERS. AIR ECONOMIZERS SHALL UNDERGO A FUNCTIONAL TEST TO DETERMINE THAT THEY OPERATE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

LIGHTING SYSTEM FUNCTIONAL TESTING

A. ALL REQUIREMENTS SHALL BE PERFORMED PER THE CURRENTLY ADOPTED ENERGY CONSERVATION CODE IN THE AUTHORITY HAVING JURISDICTION. THE FOLLOWING IS NOT A COMPLETE LISTING.

B. OCCUPANT SENSOR CONTROLS. WHERE OCCUPANT SENSOR CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:

1. CERTIFY THAT THE OCCUPANT SENSOR HAS BEEN LOCATED AND AIMED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
2. FOR PROJECTS WITH SEVEN OR FEWER OCCUPANT SENSORS, EACH SENSOR SHALL BE TESTED.
3. FOR PROJECTS WITH MORE THAN SEVEN OCCUPANT SENSORS, TESTING SHALL BE DONE FOR EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY. WHERE MULTIPLES OF EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY ARE PROVIDED, NOT LESS THAN 10 PERCENT, BUT IN NO CASE LESS THAN ONE, OF EACH COMBINATION SHALL BE TESTED UNLESS THE CODE OFFICIAL OR DESIGN PROFESSIONAL REQUIRES A HIGHER PERCENTAGE TO BE TESTED. WHERE 30 PERCENT OR MORE OF THE TESTED CONTROLS FAIL, ALL REMAINING IDENTICAL COMBINATIONS SHALL BE TESTED. FOR OCCUPANT SENSOR CONTROLS TO BE TESTED, VERIFY THE FOLLOWING:
   3.1. WHERE OCCUPANT SENSOR CONTROLS INCLUDE STATUS INDICATORS, VERIFY CORRECT OPERATION.
   3.2. THE CONTROLLED LIGHTS TURN OFF OR DOWN TO THE PERMITTED LEVEL WITHIN THE REQUIRED TIME.
   3.3. FOR AUTO-ON OCCUPANT SENSOR CONTROLS, THE LIGHTS TURN ON TO THE PERMITTED LEVEL WHEN AN OCCUPANT ENTERS THE SPACE.
   3.4. FOR MANUAL-ON OCCUPANT SENSOR CONTROLS, THE LIGHTS TURN ON ONLY WHEN MANUALLY ACTIVATED.
   3.5. THE LIGHTS ARE NOT INCORRECTLY TURNED ON BY MOVEMENT IN ADJACENT AREAS OR BY HVAC OPERATION.

C. TIME-SWITCH CONTROLS. WHERE TIME-SWITCH CONTROLS ARE PROVIDED, THE FOLLOWING PROCEDURES SHALL BE PERFORMED:

1. CONFIRM THAT THE TIME-SWITCH CONTROL IS PROGRAMMED WITH ACCURATE WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES.
2. PROVIDE DOCUMENTATION TO THE OWNER OF TIMESWITCH CONTROLS PROGRAMMING INCLUDING WEEKDAY, WEEKEND, HOLIDAY SCHEDULES, AND SET-UP AND PREFERENCE PROGRAM SETTINGS.
3. VERIFY THE CORRECT TIME AND DATE IN THE TIME SWITCH.
4. VERIFY THAT ANY BATTERY BACK-UP IS INSTALLED AND ENERGIZED.
5. VERIFY THAT THE OVERRIDE TIME LIMIT IS SET TO NOT MORE THAN 2 HOURS.
6. SIMULATE OCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
   6.1. ALL LIGHTS CAN BE TURNED ON AND OFF BY THEIR RESPECTIVE AREA CONTROL SWITCH.
   6.2. THE SWITCH ONLY OPERATES LIGHTING IN THE ENCLOSED SPACE IN WHICH THE SWITCH IS LOCATED.
7. SIMULATE UNOCCUPIED CONDITION. VERIFY AND DOCUMENT THE FOLLOWING:
   7.1. NONEXEMPT LIGHTING TURNS OFF.
   7.2. MANUAL OVERRIDE SWITCH ALLOWS ONLY THE LIGHTS IN THE ENCLOSED SPACE WHERE THE OVERRIDE SWITCH IS LOCATED TO TURN ON OR REMAIN ON UNTIL THE NEXT SCHEDULED SHUTOFF OCCURS.
8. ADDITIONAL TESTING AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL.

D. DAYLIGHT RESPONSIVE CONTROLS. WHERE DAYLIGHT RESPONSIVE CONTROLS ARE PROVIDED, THE FOLLOWING SHALL BE VERIFIED:

1. CONTROL DEVICES HAVE BEEN PROPERLY LOCATED, FIELD CALIBRATED AND SET FOR ACCURATE SETPOINTS AND THRESHOLD LIGHT LEVELS.
2. DAYLIGHT CONTROLLED LIGHTING LOADS ADJUST TO LIGHT LEVEL SET POINTS IN RESPONSE TO AVAILABLE DAYLIGHT.
3. THE LOCATIONS OF CALIBRATION ADJUSTMENT EQUIPMENT ARE READILY ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL.

MECHANICAL SPECIFICATIONS

SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" BASED ON REQUIRED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.

B. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE."

C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE."

D. ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE."

E. FLEXIBLE DUCT FABRIC CONNECTIONS SHALL BE INSTALLED ON THE INLET AND OUTLET CONNECTIONS TO ALL POWERED AIR MOVING EQUIPMENT WHICH IS NOT CONNECTED WITH FLEXIBLE DUCT. A MINIMUM OF 1" OF SLACK SHALL BE ALLOWED IN ALL FLEXIBLE CONNECTIONS TO INSURE VIBRATION ISOLATION. FLEXIBLE FABRIC SHALL BE A MINIMUM OF 3 INCHES WIDE WITH "GRIP-LOC" SEAM TO 24 GAUGE GALVANIZED METAL SIDE CONNECTORS A MINIMUM OF 3 INCHES WIDE EACH. FLEXIBLE CONNECTION ARE TO FABRICATED WITH ELGEN "ZIPPERLOCK" #DLN-4 NEOPRENE COATED 30 OZ. FIBERGLASS WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS, OR DURO DYNE EXCELON "METAL-FAB" VINYL COATED 22 OZ. NYLON WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS OR "APPROVED EQUAL".

M. INSTALL MANUAL SPLITTER DAMPERS IN BRANCH TAKE-OFFS WHERE SHOWN. SPLITTER DAMPERS SHALL BE MINIMUM 16 GAUGE GALVANIZED SHEET METAL AND SHALL BE 3/4 OF THE WIDTH OF THE SMALLEST TAKE-OFF BUT NO LESS THAN 6" LONG. DAMPERS SHALL HAVE 1/8" OF CLEARANCE TO THE DUCT IN WHICH THEY ARE INSTALLED. SPLITTER DAMPERS SHALL BE CONTROLLED BY ONE OR MORE CONTROL RODS IN ACCORDANCE WITH FIG. 2-5 OF THE SMACNA MANUAL. WHERE SPLITTERS ARE IN CONCEALED INACCESSIBLE LOCATIONS, SUBMIT PROPOSED CONTROL ROD DETAILS FOR APPROVAL.

N. DUCTWORK WHICH IS EXPOSED TO WEATHER SHALL HAVE SOLDERED JOINTS AND SEAMS AND SHALL BE PAINTED WITH A SUITABLE EPOXY COATING.

HVAC FILTRATION AND AIR QUALITY

A. UNO, EACH NEW EQUIPMENT SHALL BE PROVIDED WITH A PRE-FILTER WITH A MINIMUM FILTRATION OF MERV-11. FILTER EFFICIENCY SHALL BE RATED IN ACCORDANCE WITH ASHRAE 52-76. AIRFLOW SHALL NOT BE GREATER THAN 500 FPM.

B. UNO, EACH NEW EQUIPMENT SHALL BE PROVIDED WITH A BI-POLAR IONIZATION DEVICE(S) THAT MUST MEET UL-2998 STANDARD CERTIFICATION (ENVIRONMENTAL CLAIM VALIDATION PROCEDURE (ECVP) FOR ZERO OZONE EMISSIONS FOR AIR CLEANERS). THE DEVICE(S) SHALL BE MOUNTED IN THE DOWN STREAM SUPPLY DUCTWORK OR INSIDE THE EQUIPMENT. UNO, THE POWER TO THE DEVICE(S) SHALL BE COMING FROM THE EQUIPMENT'S POWER SOURCE AND INTERLOCKED WITH THE EQUIPMENT'S OPERATION. THE NUMBER OF THE DEVICES SHALL BE SELECTED AND DESIGNED PER THE MANUFACTURER GUIDELINES TO MEET THE DESIGN AIR FLOW CAPACITY REQUIREMENT AND AREA OF COIL FACE COVERAGE.

SHEET METAL DUCTWORK

A. GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.

B. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.

C. SUPPLY AND RETURN DUCTWORK SHALL BE EXTERNALLY INSULATED WITH EXTERNAL BLANKET INSULATION. DUCTWORK SHALL BE INTERNALLY LINED ONLY WHERE SPECIFICALLY INDICATED.

D. DUCTWORK SHALL BE SEALED AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND AS REQUIRED TO LIMIT LEAKAGE. LEAKAGE IN EXCESS OF 5% SHALL NOT BE ACCEPTABLE.

E. DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.

F. THE INTERIOR SURFACE OF ALL DUCTWORK SHALL BE SMOOTH WITH NO SHEETMETAL OR OTHER PARTS PROJECTING INTO THE AIR STREAM. ALL SEAMS AND JOINTS SHALL BE EXTERNAL. THE INSIDE OF ALL DUCTWORK SHALL BE THOROUGHLY CLEANED AND ALL FANS OPERATED TO REMOVE ANY DEBRIS PRIOR TO CONNECTION OF AIR DISTRIBUTION DEVICES.

G. ALL DUCTWORK DIMENSIONS ON THE DRAWINGS ARE CLEAR INSIDE

H. INSTALL ALL DUCTWORK TIGHT TO STRUCTURE UNLESS OTHERWISE NOTED. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO THE CONSTRUCTION OR INSTALLATION OF DUCTWORK.

I. ALL TRANSVERSE JOINTS SHALL BE SEALED WITH A WATER BASE ADHESIVE SEALER DESIGNED FOR USE IN MEDIUM VELOCITY DUCT SYSTEMS. SEALER SHALL BE EFFECTIVE AGAINST BOTH NEGATIVE AND POSITIVE PRESSURE LOSSES. SEALER SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS. APPLY UN-THINNED WITH BRUSH, TROWEL OR CAULKING GUN AS PER THE MANUFACTURER'S RECOMMENDATIONS AND ALLOW TO DRY FOR A MINIMUM OF 48 HOURS BEFORE AIR IS APPLIED TO THE SYSTEM. SEALER SHALL BE "IRON GRIP WATER BASE DUCT SEALANT #601" AS MANUFACTURED BY HARDCAST, INC., UNI-GRIP AS MANUFACTURED BY UNITED MOGUL, OR AN APPROVED EQUAL.

J. ALL ROUND TAKE-OFFS SHALL BE MADE WITH A DAMPER EXTRACTOR SPIN-IN COLLAR. SPIN-INS SHALL BE INSTALLED WITH THEIR DAMPER AXIS PARALLEL TO AIR FLOW.

K. ALL DUCTWORK SUPPORTS SHALL BE PER TABLE 5-1 OF THE SMACNA MANUAL WITH ALL SUPPORTS DIRECTLY ANCHORED TO THE BUILDING STRUCTURE. SUPPORTS SHALL BE ON MAXIMUM 8'- 0" CENTERS WITH ADDITIONAL SUPPORTS AS REQUIRED TO PREVENT SAGGING.

L. FLEXIBLE DUCT FABRIC CONNECTIONS SHALL BE INSTALLED ON THE INLET AND OUTLET CONNECTIONS TO ALL POWERED AIR MOVING EQUIPMENT WHICH IS NOT CONNECTED WITH FLEXIBLE DUCT. A MINIMUM OF 1" OF SLACK SHALL BE ALLOWED IN ALL FLEXIBLE CONNECTIONS TO INSURE VIBRATION ISOLATION. FLEXIBLE FABRIC SHALL BE A MINIMUM OF 3 INCHES WIDE WITH "GRIP-LOC" SEAM TO 24 GAUGE GALVANIZED METAL SIDE CONNECTORS A MINIMUM OF 3 INCHES WIDE EACH. FLEXIBLE CONNECTION ARE TO FABRICATED WITH ELGEN "ZIPPERLOCK" #DLN-4 NEOPRENE COATED 30 OZ. FIBERGLASS WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS, OR DURO DYNE EXCELON "METAL-FAB" VINYL COATED 22 OZ. NYLON WITH 24 GAUGE GALVANIZED IRON SIDE CONNECTORS OR "APPROVED EQUAL".

M. INSTALL MANUAL SPLITTER DAMPERS IN BRANCH TAKE-OFFS WHERE SHOWN. SPLITTER DAMPERS SHALL

PLUMBING SPECIFICATIONS

DOMESTIC WATER PIPING - COPPER TUBE AND FITTINGS

A. HARD COPPER TUBE: ASTM B 88, TYPE L (ASTM B 88M, TYPE B) WATER TUBE, DRAWN TEMPER.
   1. CAST-COPPER SOLDER-JOINT FITTINGS: ASME B16.18, PRESSURE FITTINGS.
   2. WROUGHT-COPPER SOLDER-JOINT FITTINGS: ASME B16.22, WROUGHT-COPPER PRESSURE FITTINGS.
   3. BRONZE FLANGES: ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
   4. COPPER UNIONS: MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.

B. SOFT COPPER TUBE: ASTM B 88, TYPE K (ASTM B 88M, TYPE A) AND ASTM B 88, TYPE L (ASTM B 88M, TYPE B) WATER TUBE, ANNEALED TEMPER.
   COPPER SOLDER-JOINT FITTINGS: ASME B16.22, WROUGHT-COPPER PRESSURE FITTINGS.
   COPPER PRESSURE-SEAL-JOINT FITTINGS:
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. NIBCO INC.
   2. VIEGA; PLUMBING AND HEATING SYSTEMS.
   NPS 2 (DN 50) AND SMALLER: WROUGHT-COPPER FITTING WITH EPDM-RUBBER O-RING SEAL IN EACH END.
   NPS 3 AND NPS 4 (DN 80 AND DN 100): CAST-BRONZE OR WROUGHT-COPPER FITTING WITH EPDM-RUBBER O-RING SEAL IN EACH END.

C. DIELECTRIC FITTINGS
   GENERAL REQUIREMENTS: ASSEMBLY OF COPPER ALLOY AND FERROUS MATERIALS WITH SEPARATING NONCONDUCTIVE INSULATING MATERIAL. INCLUDE END CONNECTIONS COMPATIBLE WITH PIPES TO BE JOINED.

D. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DOMESTIC WATER PIPING. INDICATED LOCATIONS AND ARRANGEMENTS ARE USED TO SIZE PIPE AND CALCULATE FRICTION LOSS, EXPANSION, AND OTHER DESIGN CONSIDERATIONS. INSTALL PIPING AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.

E. INSTALL COPPER TUBING UNDER BUILDING SLAB ACCORDING TO CDA'S "COPPER TUBE HANDBOOK."

F. INSTALL SHUTOFF VALVE IMMEDIATELY UPSTREAM OF EACH DIELECTRIC FITTING.

G. INSTALL DOMESTIC WATER PIPING LEVEL WITH 0.125 PERCENT SLOPE DOWNWARD TOWARD DRAIN AND PLUMB.

H. INSTALL PIPING CONCEALED FROM VIEW AND PROTECTED FROM PHYSICAL CONTACT BY BUILDING OCCUPANTS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.

I. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.

J. INSTALL PIPING ABOVE ACCESSIBLE CEILINGS TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL, AND COORDINATE WITH OTHER SERVICES OCCUPYING THAT SPACE.

K. INSTALL PIPING ADJACENT TO EQUIPMENT AND SPECIALTIES TO ALLOW SERVICE AND MAINTENANCE.

L. INSTALL PIPING TO PERMIT VALVE SERVICING.

M. INSTALL NIPPLES, UNIONS, SPECIAL FITTINGS, AND VALVES WITH PRESSURE RATINGS THE SAME AS OR HIGHER THAN SYSTEM PRESSURE RATING USED IN APPLICATIONS BELOW UNLESS OTHERWISE INDICATED.

N. INSTALL PIPING FREE OF SAGS AND BENDS.

O. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.

P. INSTALL UNIONS IN COPPER TUBING AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT, MACHINE, AND SPECIALTY.

Q. INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.

R. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.

S. INSTALL SHUTOFF VALVE CLOSE TO WATER MAIN ON EACH BRANCH AND RISER SERVING PLUMBING FIXTURES OR EQUIPMENT, ON EACH WATER SUPPLY TO EQUIPMENT, AND ON EACH WATER SUPPLY TO PLUMBING FIXTURES THAT DO NOT HAVE SUPPLY STOPS. USE BALL VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE GATE VALVES FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.

T. HANGER AND SUPPORT INSTALLATION: SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR.

U. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH (10 MM).

V. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
   1. NPS 3/4 (DN 20) AND SMALLER: 60 INCHES (1500 MM) WITH 3/8-INCH (10-MM) ROD.
   2. NPS 1 AND NPS 1-1/4 (DN 25 AND DN 32): 72 INCHES (1800 MM) WITH 3/8-INCH (10-MM) ROD.
   3. NPS 1-1/2 AND NPS 2 (DN 40 AND DN 50): 96 INCHES (2400 MM) WITH 3/8-INCH (10-MM) ROD.
   4. NPS 2-1/2 (DN 65): 108 INCHES (2700 MM) WITH 1/2-INCH (13-MM) ROD.
   5. NPS 3 TO NPS 5 (DN 80 TO DN 125): 10 FEET (3 M) WITH 1/2-INCH (13-MM) ROD.
   6. NPS 6 (DN 150): 10 FEET (3 M) WITH 5/8-INCH (16-MM) ROD.
   7. NPS 8 (DN 200): 10 FEET (3 M) WITH 3/4-INCH (19-MM) ROD.

W. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET (3 M).

X. FIELD QUALITY CONTROL PERFORM TESTS AND INSPECTIONS.
   PIPING INSPECTIONS:
   1. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT HAS BEEN INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.
   2. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST ONE DAY BEFORE INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION:
   3. ROUGHING-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND BEFORE SETTING FIXTURES.
   4. FINAL INSPECTION: ARRANGE FINAL INSPECTION FOR AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
   5. REINSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TESTS OR INSPECTIONS, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR REINSPECTION.
   6. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
   Y. PIPING TESTS:
   1. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF WATER.
   2. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT A SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
   3. LEAVE NEW, ALTERED, EXTENDED, OR REPLACED DOMESTIC WATER PIPING UNCOVERED AND UNCONCEALED UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
   4. CAP AND SUBJECT PIPING TO STATIC WATER PRESSURE OF 50 PSIG (345 KPA) ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.
   5. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED.
   6. PREPARE REPORTS FOR TESTS AND FOR CORRECTIVE ACTION REQUIRED.

Z. DOMESTIC WATER PIPING WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.

AA. PREPARE TEST AND INSPECTION REPORTS.

AB. CLEAN AND DISINFECT POTABLE AND NON-POTABLE DOMESTIC WATER PIPING AS FOLLOWS:

AC. PURGE NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED BEFORE USING.

AD. USE PURGING AND DISINFECTING PROCEDURES PRESCRIBED BY AUTHORITIES HAVING JURISDICTION; IF METHODS ARE NOT PRESCRIBED, USE PROCEDURES DESCRIBED IN EITHER AWWA C651 OR AWWA C652 OR FOLLOW PROCEDURES DESCRIBED BELOW:
   1. FLUSH PIPING SYSTEM WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT OUTLETS.
   2. FLUSH SYSTEM WITH CLEAN, POTABLE WATER UNTIL NO CHLORINE IS IN WATER COMING FROM SYSTEM AFTER THE STANDING TIME.
   3. SUBMIT WATER SAMPLES IN STERILE BOTTLES TO AUTHORITIES HAVING JURISDICTION. REPEAT PROCEDURES IF BIOLOGICAL EXAMINATION SHOWS CONTAMINATION.

AE. UNDER-BUILDING-SLAB, DOMESTIC WATER PIPING, NPS 2 (DN 50) AND SMALLER, SHALL BE THE FOLLOWING:
   1. SOFT COPPER TUBE, ASTM B 88, TYPE L (ASTM B 88M, TYPE B); WROUGHT-COPPER SOLDER-JOINT FITTINGS; AND BRAZED JOINTS.

AF. ABOVEGROUND DOMESTIC WATER PIPING, NPS 2 (DN 50) AND SMALLER, SHALL BE THE FOLLOWING:
   1. HARD COPPER TUBE, ASTM B 88, TYPE L (ASTM B 88M, TYPE B); WROUGHT-COPPER SOLDER-JOINT FITTINGS; AND SOLDERED JOINTS.
   2. COOPER PRESS FITTINGS: AT THE CONTRACTOR'S OPTION ON THE DOMESTIC HOT AND COLD WATER PIPING, COOLING COIL CONDENSATE DRAINS IN COPPER LINES 1/2" DIAMETER UP THROUGH 2-1/2" DIAMETER MECHANICAL PRESS (PRO-PRESS) JOINTS AND FITTINGS INCLUDING THE SMART CONNECTION FEATURE OPTION TO ENSURE THAT UNPRESSED FITTING WILL EASILY AND RELIABLY DETECTED DURING PRESSURE TESTING AS MANUFACTURER BY VIEGA, NIBCO AND APOLLO PRESS WILL BE ACCEPTABLE PROVIDED THE FITTING MANUFACTURER'S RECOMMENDED CRIMPING TOOL WITH PROPERLY SIZED REPLACEABLE JAWS ARE UTILIZED RIGID TOOL COMPANY. INSTALLATION WILL BE IN ACCORDANCE WITH MANUFACTURER'S APPROVED PUBLISHED GUIDELINES.

AG. ABOVEGROUND DOMESTIC WATER PIPING, NPS 2-1/2 TO NPS 4 (DN 65 TO DN 100), SHALL BE OF THE FOLLOWING:
   1. HARD COPPER TUBE, ASTM B 88, TYPE L (ASTM B 88M, TYPE B); CAST-COPPER SOLDER-JOINT FITTINGS; AND SOLDERED JOINTS.
   2. GALVANIZED-STEEL PIPE; GROOVED-JOINT, GALVANIZED-STEEL-PIPE APPURTENANCES; AND GROOVED JOINTS.

AH. DRAWINGS INDICATE VALVE TYPES TO BE USED. WHERE SPECIFIC VALVE TYPES ARE NOT INDICATED, THE FOLLOWING REQUIREMENTS APPLY:
   1. SHUTOFF DUTY: USE BALL VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE GATE VALVES WITH FLANGED ENDS FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
   2. THROTTLING DUTY: USE BALL VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE BALL VALVES WITH FLANGED ENDS FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
   3. HOT-WATER CIRCULATION PIPING, BALANCING DUTY: CALIBRATED BALANCING VALVES.
   4. DRAIN DUTY: HOSE-END DRAIN VALVES.

AI. USE CHECK VALVES TO MAINTAIN CORRECT DIRECTION OF DOMESTIC WATER FLOW TO AND FROM EQUIPMENT.

AJ. IRON GROOVED-END VALVES MAY BE USED WITH GROOVED-END PIPING.

AK. WATER HAMMER ARRESTERS
   1. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      A. AMTROL, INC.
      B. JOSAM COMPANY.
      C. MIFAB, INC.
      D. PPP INC.
      E. SIOUX CHIEF MANUFACTURING COMPANY, INC.
      F. SMITH, JAY R. MFG. CO.; DIVISION OF SMITH INDUSTRIES, INC.
      G. TYLER PIPE; WADE DIV.
      H. WATTS DRAINAGE PRODUCTS INC.
   2. STANDARD: ASSE 101 OR PDI-WH201.
   3. TYPE: COPPER SIZE WITH PISTON.
   4. SIZE: ASSE 1010, SIZES AA AND A THROUGH F OR PDI-WH 201, SIZES A THROUGH F.

   INSTALL WATER HAMMER ARRESTERS IN WATER PIPING ACCORDING TO PDI-WH 201.

   INSTALL AIR VENTS AT HIGH PINTS OF WATER PIPING. INSTALL DRAIN PIPING AND DISCHARGE ONTO FLOOR DRAIN.

SANITARY WASTE AND STORM PIPING

A. HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS
   PIPE AND FITTINGS: ASTM A 74, SERVICE CLASS(ES).
   GASKETS: ASTM C 564, RUBBER.

B. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS
   PIPE AND FITTINGS: ASTM A 888 OR CISPI 301.
   SOVENT STACK FITTINGS: ASME B16.45 OR ASSE 1043, HUBLESS, CAST-IRON AERATOR AND DEAERATOR DRAINAGE FITTINGS.
   CISPI, HUBLESS-PIPING COUPLINGS:
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. ANACO-HUBSKY, SD-4000.
   2. MIFAB, INC.
   3. MISSION RUBBER COMPANY; A DIVISION OF MCP INDUSTRIES, INC.
   4. CLAMP-ALL CORP.
   5. STANDARDS: ASTM C 1277 AND CISPI 310.
   6. DESCRIPTION: STAINLESS-STEEL CORRUGATED SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL, CENTER PIPE STOP.

C. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF PIPING SYSTEMS. INDICATED LOCATIONS AND ARRANGEMENTS WERE USED TO SIZE PIPE AND CALCULATE FRICTION LOSS, EXPANSION, PUMP SIZING, AND OTHER DESIGN CONSIDERATIONS. INSTALL PIPING AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.

D. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.

E. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.

F. INSTALL PIPING ABOVE ACCESSIBLE CEILINGS TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL.

G. INSTALL PIPING TO PERMIT VALVE SERVICING.

H. INSTALL PIPING AT INDICATED SLOPES.

I. INSTALL PIPING FREE OF SAGS AND BENDS.

J. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.

K. INSTALL PIPING TO ALLOW APPLICATION OF INSULATION.

L. MAKE CHANGES IN DIRECTION FOR SOIL AND WASTE DRAINAGE AND VENT PIPING USING APPROPRIATE BRANCHES, BENDS, AND LONG-SWEEP BENDS. SANITARY TEES AND SHORT-SWEEP 1/4 BENDS MAY BE USED ON VERTICAL STACKS IF CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. USE LONG-TURN, DOUBLE Y-BRANCH AND 1/8-BEND FITTINGS IF TWO FIXTURES ARE INSTALLED BACK TO BACK OR SIDE BY SIDE WITH COMMON DRAIN PIPE. STRAIGHT TEES, ELBOWS, AND CROSSES MAY BE USED ON VENT LINES. DO NOT CHANGE DIRECTION OF FLOW MORE THAN 90 DEGREES. USE PROPER SIZE OF STANDARD INCREASERS AND REDUCERS IF PIPES OF DIFFERENT SIZES ARE CONNECTED. REDUCING SIZE OF DRAINAGE PIPING IN DIRECTION OF FLOW IS PROHIBITED.

M. LAY BURIED BUILDING DRAINAGE PIPING BEGINNING AT LOW POINT OF EACH SYSTEM. INSTALL TRUE TO GRADES AND ALIGNMENT INDICATED, WITH UNBROKEN CONTINUITY OF INVERT. PLACE HUB ENDS OF PIPING UPSTREAM. INSTALL REQUIRED GASKETS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS FOR USE OF LUBRICANTS, CEMENTS, AND OTHER INSTALLATION REQUIREMENTS. MAINTAIN SWAB IN PIPING AND PULL PAST EACH JOINT AS COMPLETED.

N. INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING MINIMUM SLOPES UNLESS OTHERWISE INDICATED:
   1. BUILDING SANITARY DRAIN: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 (DN 80) AND SMALLER; 1 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 4 (DN 100) AND LARGER.
   2. HORIZONTAL SANITARY DRAINAGE PIPING: 1 PERCENT DOWNWARD IN DIRECTION OF FLOW.
   3. VENT PIPING: 1 PERCENT DOWN TOWARD VERTICAL FIXTURE VENT OR TOWARD VENT STACK.

O. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK," CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS."
   1. INSTALL ENCASEMENT ON UNDERGROUND PIPING ACCORDING TO ASTM A 674 OR AWWA C105/A 21.5.

P. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT IS INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.

Q. INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.

R. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.

S. HANGER AND SUPPORT INSTALLATION
   COMPLY WITH REQUIREMENTS FOR PIPE HANGER AND SUPPORT DEVICES AND INSTALLATION.
   1. INSTALL CARBON-STEEL PIPE HANGERS FOR HORIZONTAL PIPING IN NONCORROSIVE ENVIRONMENTS.
   2. INSTALL STAINLESS-STEEL PIPE HANGERS FOR HORIZONTAL PIPING IN CORROSIVE ENVIRONMENTS.
   3. INSTALL CARBON-STEEL PIPE SUPPORT CLAMPS FOR VERTICAL PIPING IN NONCORROSIVE ENVIRONMENTS.
   4. INSTALL STAINLESS-STEEL PIPE SUPPORT CLAMPS FOR VERTICAL PIPING IN CORROSIVE ENVIRONMENTS.
   5. VERTICAL PIPING: MSS TYPE 8 OR TYPE 42, CLAMPS.
   6. INSTALL INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS:
   7. 100 FEET (30 M) AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS HANGERS.
   8. LONGER THAN 100 FEET (30 M): MSS TYPE 43, ADJUSTABLE ROLLER HANGERS.
   9. LONGER THAN 100 FEET (30 M) IF INDICATED: MSS TYPE 49, SPRING CUSHION ROLLS.
   10. MULTIPLE, STRAIGHT, HORIZONTAL PIPING RUNS 100 FEET (30 M) OR LONGER: MSS TYPE 44, PIPE ROLLS. SUPPORT PIPE ROLLS ON TRAPEZE.
   11. BASE OF VERTICAL PIPING: MSS TYPE 52, SPRING HANGERS.

T. SUPPORT HORIZONTAL PIPING AND TUBING WITHIN 12 INCHES (300 MM) OF EACH FITTING, VALVE, AND COUPLING.

U. SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR.

V. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, WITH 3/8-INCH (10-MM) MINIMUM RODS.

W. INSTALL HANGERS FOR CAST-IRON SOIL PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
   1. NPS 1-1/2 AND NPS 2 (DN 40 AND DN 50): 60 INCHES (1500 MM) WITH 3/8-INCH (10-MM) ROD.
   2. NPS 3 (DN 80): 60 INCHES (1500 MM) WITH 1/2-INCH (13-MM) ROD.
   3. NPS 4 AND NPS 5 (DN 100 AND DN 125): 60 INCHES (1500 MM) WITH 5/8-INCH (16-MM) ROD.
   4. NPS 6 AND NPS 8 (DN 150 AND DN 200): 60 INCHES (1500 MM) WITH 3/4-INCH (19-MM) ROD.
   5. INSTALL SUPPORTS FOR VERTICAL CAST-IRON SOIL PIPING EVERY 15 FEET (4.5 M).

X. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST 24 HOURS BEFORE INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION.
   ROUGHING-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND BEFORE SETTING FIXTURES.
   FINAL INSPECTION: ARRANGE FOR FINAL INSPECTION BY AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.

Y. REINSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TEST OR INSPECTIONS, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR REINSPECTION.

Z. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.

AA. TEST SANITARY DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
   1. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
   2. LEAVE UNCOVERED AND UNCONCEALED NEW, ALTERED, EXTENDED, OR REPLACED DRAINAGE AND VENT PIPING UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED.
   3. ROUGHING-IN PLUMBING TEST PROCEDURE: TEST DRAINAGE AND VENT PIPING EXCEPT OUTSIDE LEADERS ON COMPLETION OF ROUGHING-IN. CLOSE OPENINGS IN PIPING SYSTEM AND FILL WITH WATER TO POINT OF OVERFLOW, BUT NOT LESS THAN 10-FOOT HEAD OF WATER (30 KPA). FROM 15 MINUTES BEFORE INSPECTION STARTS TO COMPLETION OF INSPECTION, WATER LEVEL MUST NOT DROP. INSPECT JOINTS FOR LEAKS.
   4. FINISHED PLUMBING TEST PROCEDURE: AFTER PLUMBING FIXTURES HAVE BEEN SET AND TRAPS FILLED WITH WATER, TEST COMPONENTS AND PROVE THEY ARE GASTIGHT AND WATERTIGHT. PLUG VENT-STACK OPENINGS ON ROOF AND BUILDING DRAINS WHERE THEY LEAVE BUILDING. INTRODUCE AIR INTO PIPING SYSTEM EQUAL TO PRESSURE OF 1-INCH WG (250 PA). USE U-TUBE OR MANOMETER INSERTED IN TRAP OF WATER CLOSET TO MEASURE THIS PRESSURE. AIR PRESSURE MUST REMAIN CONSTANT WITHOUT INTRODUCING ADDITIONAL AIR THROUGHOUT PERIOD OF INSPECTION. INSPECT PLUMBING FIXTURE CONNECTIONS FOR GAS AND WATER LEAKS.
   5. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE OBTAINED.

AB. CAP AND SUBJECT PIPING TO STATIC-WATER PRESSURE OF 50 PSIG (345 KPA) ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED.

AC. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE OBTAINED.

AD. PREPARE REPORTS FOR TESTS AND REQUIRED CORRECTIVE ACTION.

AF. ABOVEGROUND, SOIL AND WASTE PIPING 6" AND SMALLER SHALL BE ANY OF THE FOLLOWING:
   1. SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS; AND GASKETED JOINTS.
   2. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS HEAVY-DUTY HUBLESS-PIPING COUPLINGS; AND COUPLED JOINTS.

AG. ABOVEGROUND, SOIL AND WASTE PIPING 8" AND LARGER SHALL BE ANY OF THE FOLLOWING:
   1. SERVICE WEIGHT(SV) HUB AND SPIGOT CAST IRON SOIL PIPE FITTINGS

AH. ABOVEGROUND, VENT PIPING 6" AND SMALLER SHALL BE ANY OF THE FOLLOWING:
   1. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS; CISPI HUBLESS-PIPING COUPLINGS; AND COUPLED JOINTS.

AI. ABOVEGROUND, VENT PIPING 8" AND LARGER SHALL BE ANY OF THE FOLLOWING:
   1. SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS; AND GASKETED JOINTS.

AJ. UNDERGROUND, SOIL, WASTE, AND VENT PIPING 15" AND SMALLER SHALL BE ANY OF THE FOLLOWING:
   1. SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS; AND GASKETED JOINTS
   2. SOLID WALL PVC PIPE; PVC SOCKET FITTINGS, AND SOLVENT-CEMENTED JOINTS

CLEANOUTS

A. EXPOSED METAL CLEANOUTS:
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. JOSAM COMPANY; JOSAM DIV.
   2. MIFAB, INC.
   3. SMITH, JAY R. MFG. CO.; DIVISION OF SMITH INDUSTRIES, INC.
   4. TYLER PIPE; WADE DIV.
   5. ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
   STANDARD: ASME A112.36.2M FOR CAST IRON FOR CLEANOUT TEST TEE.
   SIZE: SAME AS CONNECTED DRAINAGE PIPING
   BODY MATERIAL: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH AS REQUIRED TO MATCH CONNECTED PIPING.
   CLOSURE: COUNTERSUNK PLUG.
   CLOSURE PLUG SIZE: SAME AS OR NOT MORE THAN ONE SIZE SMALLER THAN CLEANOUT SIZE.
   CLOSURE: STAINLESS-STEEL PLUG WITH SEAL.

B. METAL FLOOR CLEANOUTS:
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. JOSAM COMPANY; JOSAM DIV.
   2. SMITH, JAY R. MFG. CO.; DIVISION OF SMITH INDUSTRIES, INC.
   3. TYLER PIPE; WADE DIV.
   4. A. MIFAB, INC.
   STANDARD: ASME A112.36.2M FOR THREADED, ADJUSTABLE HOUSING CLEANOUT.
   SIZE: SAME AS CONNECTED BRANCH.
   TYPE: ADJUSTABLE HOUSING THREADED, ADJUSTABLE HOUSING.
   BODY OR FERRULE: CAST IRON.
   CLAMPING DEVICE: NOT REQUIRED.
   OUTLET CONNECTION: THREADED.
   CLOSURE: BRASS PLUG WITH STRAIGHT THREADS AND GASKET.
   ADJUSTABLE HOUSING MATERIAL: CAST IRON WITH SET-SCREWS OR OTHER DEVICE.
   FRAME AND COVER MATERIAL AND FINISH: ROUGH BRONZE.
   FRAME AND COVER SHAPE: ROUND.
   TOP LOADING CLASSIFICATION: LIGHT DUTY.
   RISER: ASTM A 74, SERVICE CLASS, CAST-IRON DRAINAGE PIPE FITTING AND RISER TO CLEANOUT.
   STANDARD: ASME A112.3.1.
   SIZE: SAME AS CONNECTED BRANCH.
   HOUSING: STAINLESS STEEL
   CLOSURE: STAINLESS STEEL WITH SEAL.
   RISER: STAINLESS-STEEL DRAINAGE PIPE FITTING TO CLEANOUT.

C. CAST-IRON WALL CLEANOUTS:
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. JOSAM COMPANY; JOSAM DIV.
   2. MIFAB, INC.
   3. SMITH, JAY R. MFG. CO.; DIVISION OF SMITH INDUSTRIES, INC.
   4. TYLER PIPE; WADE DIV.
   5. ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
   STANDARD: ASME A112.36.2M. INCLUDE WALL ACCESS.
   SIZE: SAME AS CONNECTED DRAINAGE PIPING.
   BODY: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH AS REQUIRED TO MATCH CONNECTED PIPING.
   CLOSURE: COUNTERSUNK OR RAISED-HEAD, BRASS PLUG.
   CLOSURE PLUG SIZE: SAME AS OR NOT MORE THAN ONE SIZE SMALLER THAN CLEANOUT SIZE.
   WALL ACCESS: ROUND, STAINLESS-STEEL COVER PLATE WITH SCREW.
   WALL ACCESS: ROUND, STAINLESS-STEEL WALL-INSTALLATION FRAME AND COVER.

D. INSTALL CLEANOUTS IN ABOVEGROUND PIPING AND BUILDING DRAIN PIPING ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE INDICATED:
   1. SIZE: SAME AS DRAINAGE PIPING UP TO NPS 4 (DN 100). USE NPS 4 (DN 100) FOR LARGER DRAINAGE PIPING UNLESS LARGER CLEANOUT IS INDICATED.
   2. LOCATE AT EACH CHANGE IN DIRECTION OF PIPING GREATER THAN 45 DEGREES.
   3. LOCATE AT MINIMUM INTERVALS OF 50 FEET (15 M) FOR PIPING NPS 4 (DN 100) AND SMALLER AND 100 FEET (30 M) FOR LARGER PIPING.
   4. LOCATE AT BASE OF EACH VERTICAL SOIL AND WASTE STACK.

E. FOR FLOOR CLEANOUTS FOR PIPING BELOW FLOORS, INSTALL CLEANOUT DECK PLATES WITH TOP FLUSH WITH FINISHED FLOOR.

F. FOR CLEANOUTS LOCATED IN CONCEALED PIPING, INSTALL CLEANOUT WALL ACCESS COVERS, OF SIZE INDICATED, WITH FRAME AND COVER FLUSH WITH FINISHED WALL.

G. INSTALL FLOOR DRAINS AT LOW POINTS OF SURFACE AREAS TO BE DRAINED. SET GRATES OF DRAINS FLU

ELECTRICAL SPECIFICATIONS

ELECTRICAL CONDUCTORS

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   ALCAN PRODUCTS CORPORATION; ALCAN CABLE DIVISION.
   AMERICAN INSULATED WIRE CORP.; A LEVITON COMPANY.
   GENERAL CABLE CORPORATION
   SENATOR WIRE & CABLE COMPANY.
   SOUTHWIRE COMPANY.
   COPPER CONDUCTORS: COMPLY WITH NEMA WC 70.
   CONDUCTOR INSULATION: COMPLY WITH NEMA WC 70 FOR TYPES THW, THW–THWN, XHHW, UF, USE, AND SO.
   MULTICONDUCTOR CABLE: COMPLY WITH NEMA WC 70 FOR ARMORED CABLE, TYPE AC, METAL–CLAD CABLE, TYPE MC ,TYPE SO, AND TYPE USE WITH GROUND WIRE.

B. CONDUCTOR MATERIAL APPLICATIONS:
   COPPER: SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER.

C. CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
   1. SERVICE ENTRANCE: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY, TYPE SE OR USE MULTICONDUCTOR CABLE.
   2. EXPOSED FEEDERS: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY.
   3. FEEDERS CONCEALED IN CEILINGS, WALLS, PARTITIONS, AND CRAWLSPACES: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY.
   4. FEEDERS CONCEALED IN CONCRETE, BELOW SLABS–ON–GRADE, AND UNDERGROUND: YPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY.
   5. FEEDERS INSTALLED BELOW RAISED FLOORING: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY.
   6. EXPOSED BRANCH CIRCUITS, INCLUDING IN CRAWLSPACES: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY, METAL–CLAD CABLE, TYPE MC.
   7. BRANCH CIRCUITS CONCEALED IN CEILINGS, WALLS, AND PARTITIONS: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY, ARMORED CABLE, TYPE AC, METAL–CLAD CABLE, TYPE MC.
   8. BRANCH CIRCUITS CONCEALED IN CONCRETE, BELOW SLABS–ON–GRADE, AND UNDERGROUND: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY.
   9. BRANCH CIRCUITS INSTALLED BELOW RAISED FLOORING: TYPE THW–THWN, SINGLE CONDUCTORS IN RACEWAY OR ARMORED CABLE, TYPE AC, METAL–CLAD CABLE, TYPE MC.
   10. BRANCH CIRCUITS INSTALLED IN PATIENT CARE AREAS: TYPE HCF–MCAP OR AC–HCF WITH ASSEMBLY CERTIFIED AS AN EQUIPMENT GROUNDING CONDUCTOR AND A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO ALL RECEPTACLES, METALLIC BOXES CONTAINING RECEPTACLES, AND ALL METALLIC EQUIPMENT CASINGS.

GROUNDING

A. INSULATED CONDUCTORS: COPPER WIRE OR CABLE INSULATED FOR 600 V UNLESS OTHERWISE REQUIRED BY APPLICABLE CODE OR AUTHORITIES HAVING JURISDICTION.

B. BARE COPPER CONDUCTORS:
   1. SOLID CONDUCTORS: ASTM B 3.
   2. STRANDED CONDUCTORS: ASTM B 8.
   3. BONDING CABLE: 28 KCMIL, 14 STRANDS OF NO. 17 AWG CONDUCTOR, 1/4 INCH (6 MM) IN DIAMETER.
   4. BONDING CONDUCTOR: NO. 4 OR NO. 6 AWG, STRANDED CONDUCTOR.
   5. BONDING JUMPER: COPPER–TIN–PLATED CONDUCTORS TERMINATED WITH COPPER FERRULES; 1–5/8 INCHES (41 MM) WIDE AND 1/16 INCH (1.6 MM) THICK.

C. GROUNDING BUS: PREDRILLED RECTANGULAR BARS OF ANNEALED COPPER, 1/4 BY 4 INCHES (6.3 BY 100 MM) IN CROSS SECTION, WITH 9/32–INCH (7.14–MM) HOLES SPACED 1–1/8 INCHES (28 MM) APART. STAND–OFF INSULATORS FOR MOUNTING SHALL COMPLY WITH UL 891 FOR USE IN SWITCHBOARDS, 600 V. LEXAN, IMPULSE TESTED AT 5000 V.

D. CONNECTORS:LISTED AND LABELED BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION FOR APPLICATIONS IN WHICH USED AND FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS CONNECTED.

E. BOLTED CONNECTORS FOR CONDUCTORS AND PIPES: COPPER OR COPPER ALLOY, PRESSURE TYPE WITH AT LEAST TWO BOLTS.
   PIPE CONNECTORS: CLAMP TYPE, SIZED FOR PIPE.

F. WELDED CONNECTORS: EXOTHERMIC–WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS.

G. BUS–BAR CONNECTORS: MECHANICAL TYPE, CAST SILICON BRONZE, SOLDERLESS COMPRESSION–TYPE WIRE TERMINALS, AND LONG–BARREL, TWO–BOLT CONNECTION TO GROUND BUS BAR.

H. CONDUCTORS: INSTALL SOLID CONDUCTOR FOR NO. 8 AWG AND SMALLER, AND STRANDED CONDUCTORS FOR NO. 6 AWG AND LARGER UNLESS OTHERWISE INDICATED.

I. ISOLATED GROUNDING CONDUCTORS: GREEN–COLORED INSULATION WITH CONTINUOUS YELLOW STRIPE. ON FEEDERS WITH ISOLATED GROUND, IDENTIFY GROUNDING CONDUCTOR WHERE VISIBLE TO NORMAL INSPECTION, WITH ALTERNATING BANDS OF GREEN AND YELLOW TAPE, WITH AT LEAST THREE BANDS OF GREEN AND TWO BANDS OF YELLOW.

J. CONDUCTOR TERMINATIONS AND CONNECTIONS:
   PIPE AND EQUIPMENT GROUNDING CONDUCTOR TERMINATIONS: BOLTED CONNECTORS.
   UNDERGROUND CONNECTIONS: WELDED CONNECTORS EXCEPT AT TEST WELLS AND AS OTHERWISE INDICATED. CONNECTIONS TO GROUND RODS AT TEST WELLS: BOLTED CONNECTORS. CONNECTIONS TO STRUCTURAL STEEL: WELDED CONNECTORS.

K. EQUIPMENT GROUNDING:
   INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS TO COMPLY WITH THE NEC AND AS INDICATED ON THE DRAWINGS.

ELECTRICAL HANGERS AND SUPPORTS

A. COMPLY WITH NECA 1 AND NECA 101 FOR APPLICATION OF HANGERS AND SUPPORTS FOR ELECTRICAL EQUIPMENT AND SYSTEMS EXCEPT IF REQUIREMENTS IN THIS SECTION ARE STRICTER. MAXIMUM SUPPORT SPACING AND MINIMUM HANGER ROD SIZE FOR RACEWAY. SPACE SUPPORTS FOR EMT, IMC, AND RMC AS SCHEDULED IN NECA 1, WHERE ITS TABLE 1 LISTS MAXIMUM SPACINGS LESS THAN STATED IN NFPA 70. MINIMUM ROD SIZE SHALL BE 1/4 INCH (6 MM) IN DIAMETER. MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE–TYPE SUPPORTS FABRICATED WITH STEEL SLOTTED OR OTHER SUPPORT SYSTEM, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 25 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO–BOLT CONDUIT CLAMPS. SPRING–STEEL CLAMPS DESIGNED FOR SUPPORTING SINGLE CONDUITS WITHOUT BOLTS MAY BE USED FOR 1–1/2–INCH (38–MM) AND SMALLER RACEWAYS SERVING BRANCH CIRCUITS AND COMMUNICATION SYSTEMS ABOVE SUSPENDED CEILINGS AND FOR FASTENING RACEWAYS TO TRAPEZE SUPPORTS.

B. SUPPORT INSTALLATION: COMPLY WITH NECA 1 AND NECA 101 FOR INSTALLATION REQUIREMENTS EXCEPT AS SPECIFIED IN THIS ARTICLE.

C. RACEWAY SUPPORT METHODS: IN ADDITION TO METHODS DESCRIBED IN NECA 1, EMT, IMC, AND RMC MAY BE SUPPORTED BY OPENINGS THROUGH STRUCTURE MEMBERS, AS PERMITTED BY NFPA 70.

D. STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LB (90 KG).

E. MOUNTING AND ANCHORAGE OF SURFACE–MOUNTED EQUIPMENT AND COMPONENTS: ANCHOR AND FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTS TO BUILDING STRUCTURAL ELEMENTS BY THE FOLLOWING METHODS UNLESS OTHERWISE INDICATED BY CODE:
   1. TO WOOD: FASTEN WITH LAG SCREWS OR THROUGH BOLTS.
   2. TO NEW CONCRETE: BOLT TO CONCRETE INSERTS.
   3. TO MASONRY: APPROVED TOGGLE–TYPE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION ANCHOR FASTENERS ON SOLID MASONRY UNITS.
   4. TO EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS.
   5. INSTEAD OF EXPANSION ANCHORS, POWDER–ACTUATED DRIVEN THREADED STUDS PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED IN EXISTING STANDARD–WEIGHT CONCRETE 4 INCHES (100 MM) THICK OR GREATER. DO NOT USE FOR ANCHORAGE TO LIGHTWEIGHT–AGGREGATE CONCRETE OR FOR SLABS LESS THAN 4 INCHES (100 MM) THICK.
   6. TO STEEL: WELDED THREADED STUDS COMPLYING WITH AWS D1.1/D1.1M, WITH LOCK WASHERS AND NUTS OR BEAM CLAMPS (MSS TYPE 19, 21, 23, 25, OR 27) COMPLYING WITH MSS SP–69.
   7. TO LIGHT STEEL: SHEET METAL SCREWS.
   8. DRILL HOLES FOR EXPANSION ANCHORS IN CONCRETE AT LOCATIONS AND TO DEPTHS THAT AVOID REINFORCING BARS.

ELECTRICAL CONDUIT

A. METAL CONDUIT AND TUBING
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. AFC CABLE SYSTEMS, INC.
   2. ALFLEX INC.
   3. ALLIED TUBE & CONDUIT; A TYCO INTERNATIONAL LTD. CO.
   4. ANAMET ELECTRICAL, INC.; ANACONDA METAL HOSE.
   5. ELECTRI–FLEX CO.
   6. MAVERICK TUBE CORPORATION.
   7. O–Z GEDNEY; A UNIT OF GENERAL SIGNAL.
   8. WHEATLAND TUBE COMPANY.

B. RIGID STEEL CONDUIT: ANSI C80.1.

C. ALUMINUM RIGID CONDUIT: ANSI C80.5.

D. IMC: ANSI C80.6.

E. PVC–COATED STEEL CONDUIT: PVC–COATED RIGID STEEL CONDUIT.

F. COMPLY WITH NEMA RN 1.

G. COATING THICKNESS: 0.040 INCH (1 MM), MINIMUM.

H. EMT: ANSI C80.3.

I. FMC: ZINC–COATED STEEL.

J. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.

K. FITTINGS FOR CONDUIT (INCLUDING ALL TYPES AND FLEXIBLE AND LIQUIDTIGHT), EMT, AND CABLE: NEMA FB 1; LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
   1. FITTINGS FOR EMT: STEEL SET–SCREW OR COMPRESSION TYPE. DIE–CAST IS NOT ACCEPTABLE.
   2. COATING FOR FITTINGS FOR PVC–COATED CONDUIT: MINIMUM THICKNESS, 0.040 INCH (1 MM), WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.

L. JOINT COMPOUND FOR RIGID STEEL CONDUIT OR IMC: LISTED FOR USE IN CABLE CONNECTOR ASSEMBLIES, AND COMPOUNDED FOR USE TO LUBRICATE AND PROTECT THREADED RACEWAY JOINTS FROM CORROSION AND ENHANCE THEIR CONDUCTIVITY.

M. SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP–ON COVERS. MANUFACTURER'S STANDARD ENAMEL FINISH IN COLOR SELECTED BY ARCHITECT.
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. THOMAS & BETTS CORPORATION.
   2. WALKER SYSTEMS, INC.; WIREMOLD COMPANY (THE).
   3. WIREMOLD COMPANY (THE); ELECTRICAL SALES DIVISION.

N. BOXES, ENCLOSURES, AND CABINETS:
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   1. COOPER CROUSE–HINDS; DIV. OF COOPER INDUSTRIES, INC.
   2. EGS/APPLETON ELECTRIC.
   3. HOFFMAN.
   4. HUBBELL INCORPORATED; KILLARK ELECTRIC MANUFACTURING CO. DIVISION.
   5. O–Z/GEDNEY; A UNIT OF GENERAL SIGNAL.
   6. RACO; A HUBBELL COMPANY.
   7. ROBROY INDUSTRIES, INC.; ENCLOSURE DIVISION.
   8. THOMAS & BETTS CORPORATION.
   9. WALKER SYSTEMS, INC.; WIREMOLD COMPANY (THE).

O. SHEET METAL OUTLET AND DEVICE BOXES: NEMA OS 1.

P. CAST–METAL OUTLET AND DEVICE BOXES: NEMA FB 1, FERROUS ALLOY, TYPE FD, WITH GASKETED COVER.

Q. METAL FLOOR BOXES: CAST METAL, FULLY ADJUSTABLE, RECTANGULAR.

R. SMALL SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1.

S. CAST–METAL ACCESS, PULL, AND JUNCTION BOXES: NEMA FB 1, GALVANIZED, CAST IRON WITH GASKETED COVER.

T. HINGED–COVER ENCLOSURES: NEMA 250, TYPE 1, WITH CONTINUOUS–HINGE COVER WITH FLUSH LATCH, UNLESS OTHERWISE INDICATED.
   1. METAL ENCLOSURES: STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.
      A. IN STANDARD PARTITIONS, WHERE 1/2" AND 3/4" CONDUITS ARE EMPLOYED: 4" SQUARE BY 2–1/8" DEEP BOXES WITH 1–GANG OR 2–GANG PLASTER COVERS SHALL BE USED, NO. 4SS–SPL.
      B. IN THIN PARTITIONS MEASURING 3–1/2" OR LESS; 4" SQUARE BY 1–1/2" DEEP BOXES WITH 1–GANG OR 2–GANG PLASTER COVERS SHALL BE USED, NO. 4S–SPL.
      C. IN STANDARD PARTITIONS, WHERE CONDUITS OF A SIZE GREATER THAN 3/4" ARE EMPLOYED: 4" SQUARE BY 2–1/8" DEEP BOXES WITH 1–GANG OR 2–GANG PLASTER COVERS SHALL BE USED, NO. 4SD SERIES. THE OUTLET BOXES SHALL BE LOCATED WHEREBY NO TWO (2) OUTLET BOXES ARE INSTALLED CLOSER THAN 24" ON CENTER, AND SECURELY ATTACHED TO THE PARTITION STUDS, WITH AT LEAST ONE (1) PARTITION STUD SEPARATING THE OUTLET BOXES. IT IS NOT ACCEPTABLE TO SECURE OUTLET BOXES ONLY TO DRYWALL PARTITION.

U. CABINETS:
   1. NEMA 250, TYPE 1, GALVANIZED–STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.
   2. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE.
   3. KEY LATCH TO MATCH PANELBOARDS.
   4. METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE.
   5. ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.

V. RACEWAY APPLICATION:
   OUTDOORS: APPLY RACEWAY PRODUCTS AS SPECIFIED BELOW, UNLESS OTHERWISE INDICATED:
   1. EXPOSED CONDUIT: RIGID STEEL CONDUIT.
   2. CONCEALED CONDUIT, ABOVEGROUND: RIGID STEEL CONDUIT, EMT, RNC.
   3. UNDERGROUND CONDUIT: RNC, TYPE EPC–40–PVC, DIRECT BURIED.
   4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR–DRIVEN EQUIPMENT): LFMC.
   5. BOXES AND ENCLOSURES, ABOVEGROUND: NEMA 250, TYPE 3R.

W. COMPLY WITH THE FOLLOWING INDOOR APPLICATIONS, UNLESS OTHERWISE INDICATED:
   1. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
   2. EXPOSED, NOT SUBJECT TO SEVERE PHYSICAL DAMAGE: EMT.
   3. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: RIGID STEEL CONDUIT. INCLUDES RACEWAYS IN THE FOLLOWING LOCATIONS: LOADING DOCK, CORRIDORS USED FOR TRAFFIC OF MECHANIZED CARTS, FORKLIFTS, AND PALLET–HANDLING UNITS, MECHANICAL ROOMS.
   4. CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT.
   5. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR–DRIVEN EQUIPMENT): FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
   6. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
   7. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE IN SPACES USED FOR ENVIRONMENTAL AIR: PLENUM–TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
   8. RACEWAYS FOR OPTICAL FIBER OR COMMUNICATIONS CABLE RISERS IN VERTICAL SHAFTS: RISER–TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
   9. RACEWAYS FOR CONCEALED GENERAL PURPOSE DISTRIBUTION OF OPTICAL FIBER OR COMMUNICATIONS CABLE: GENERAL–USE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, RISER–TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, PLENUM–TYPE, OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY, EMT.
   10. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT USE NEMA 250, TYPE 4X, STAINLESS STEEL IN DAMP OR WET LOCATIONS.

X. MINIMUM RACEWAY SIZE: 1/2–INCH (16–MM) TRADE SIZE.

Y. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.
   1. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS, UNLESS OTHERWISE INDICATED.
   2. PVC EXTERNALLY COATED, RIGID STEEL CONDUITS: USE ONLY FITTINGS LISTED FOR USE WITH THAT MATERIAL. PATCH AND SEAL ALL JOINTS, NICKS, AND SCRAPES IN PVC COATING AFTER INSTALLING CONDUITS AND FITTINGS. USE SEALANT RECOMMENDED BY FITTING MANUFACTURER.

Z. INSTALLATION
   COMPLY WITH NECA 1 FOR INSTALLATION REQUIREMENTS APPLICABLE TO PRODUCTS SPECIFIED EXCEPT WHERE REQUIREMENTS ON DRAWINGS OR IN THIS ARTICLE ARE STRICTER.

AA. KEEP RACEWAYS AT LEAST 6 INCHES (150 MM) AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT–WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.

AB. COMPLETE RACEWAY INSTALLATION BEFORE STARTING CONDUCTOR INSTALLATION.

AC. SUPPORT RACEWAYS AS SPECIFIED IN "HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS."

AD. ARRANGE STUB–UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE THE FINISHED SLAB.

AE. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90–DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR COMMUNICATIONS CONDUITS, FOR WHICH FEWER BENDS ARE ALLOWED.

AF. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.

AG. RACEWAYS EMBEDDED IN SLABS:
   1. RUN CONDUIT LARGER THAN 1–INCH (27–MM) TRADE SIZE, PARALLEL OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT.
   2. ARRANGE RACEWAYS TO CROSS BUILDING EXPANSION JOINTS AT RIGHT ANGLES WITH EXPANSION FITTINGS.
   3. CHANGE FROM ENT TO RNC, TYPE EPC–40–PVC, RIGID STEEL CONDUIT, OR IMC BEFORE RISING ABOVE THE FLOOR.

AH. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS.

AI. RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION: USE INSULATING BUSHINGS TO PROTECT CONDUCTORS, INCLUDING CONDUCTORS SMALLER THAN NO. 4 AWG.

AJ. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200–LB (90–KG) TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES (300 MM) OF SLACK AT EACH END OF PULL WIRE.

AK. RACEWAYS FOR OPTICAL FIBER AND COMMUNICATIONS CABLE: INSTALL RACEWAYS, METALLIC AND NONMETALLIC, RIGID AND FLEXIBLE, AS FOLLOWS:
   1. 3/4–INCH (19–MM) TRADE SIZE AND SMALLER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 50 FEET (15 M).
   2. 1–INCH (25–MM) TRADE SIZE AND LARGER: INSTALL RACEWAYS IN MAXIMUM LENGTHS OF 75 FEET (23 M).
   3. INSTALL WITH A MAXIMUM OF TWO 90–DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF RACEWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS.

AL. INSTALL RACEWAY SEALING FITTINGS AT SUITABLE, APPROVED, AND ACCESSIBLE LOCATIONS AND FILL THEM WITH LISTED SEALING COMPOUND. FOR CONCEALED RACEWAYS, INSTALL EACH FITTING IN A FLUSH STEEL BOX WITH A BLANK COVER PLATE HAVING A FINISH SIMILAR TO THAT OF ADJACENT PLATES OR SURFACES. INSTALL RACEWAY SEALING FITTINGS AT THE FOLLOWING POINTS:
   1. WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS, SUCH AS BOUNDARIES OF REFRIGERATED SPACES.
   2. WHERE OTHERWISE REQUIRED BY NFPA 70.

AP. FLEXIBLE CONDUIT CONNECTIONS: USE MAXIMUM OF 48 INCHES (1219 MM) OF FLEXIBLE CONDUIT FOR RECESSED AND SEMIRECESSED LIGHTING FIXTURES, EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR TRANSFORMERS AND MOTORS.
   1. USE LFMC IN DAMP OR WET LOCATIONS.

AQ. RECESSED BOXES IN MASONRY WALLS: SAW–CUT OPENING FOR BOX IN CENTER OF CELL OF MASONRY BLOCK, AND INSTALL BOX FLUSH WITH SURFACE OF WALL.

AR. SET METAL FLOOR BOXES LEVEL AND FLUSH WITH FINISHED FLOOR SURFACE.

AS. FIRESTOPPING
   APPLY FIRESTOPPING TO ELECTRICAL PENETRATIONS OF FIRE–RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL FIRE–RESISTANCE RATING OF ASSEMBLY. PROVIDE SLEEVES FOR FLOOR PENETRATIONS EXTENDING 2" ABOVE FLOOR EXCEPT IN FINISHED AREAS WHERE COORDINATED WITH ARCHITECT.

TRANSFORMERS

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   ACME ELECTRIC CORPORATION; POWER DISTRIBUTION PRODUCTS DIVISION.
   EATON ELECTRICAL INC.; CUTLER–HAMMER PRODUCTS.
   GENERAL ELECTRIC COMPANY.
   SIEMENS ENERGY & AUTOMATION, INC.
   SOLA/HEVI–DUTY.
   SQUARE D; SCHNEIDER ELECTRIC.

B. GENERAL TRANSFORMER REQUIREMENTS
   DESCRIPTION: FACTORY–ASSEMBLED AND –TESTED, AIR–COOLED UNITS FOR 60–HZ SERVICE. GRAIN–ORIENTED, NON–AGING SILICON STEEL.
   CONTINUOUS WINDINGS WITHOUT SPLICES EXCEPT FOR TAPS.
   INTERNAL COIL CONNECTIONS: BRAZED OR PRESSURE TYPE.
   COIL MATERIAL: COPPER.

C. COMPLY WITH NEMA ST 20, AND LIST AND LABEL AS COMPLYING WITH UL 1561. ONE LEG PER PHASE.

D. ENCLOSURE: VENTILATED, NEMA 250, TYPE 2. CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND, SEALING OUT MOISTURE AND AIR.

E. ENCLOSURE: VENTILATED, NEMA 250, TYPE 3R. CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND, SEALING OUT MOISTURE AND AIR.

F. TRANSFORMER ENCLOSURE FINISH: COMPLY WITH NEMA 250. FINISH COLOR: GRAY.

G. TAPS FOR TRANSFORMERS SMALLER THAN 7.5 KVA: ONE 5 PERCENT TAP ABOVE NORMAL FULL CAPACITY.

H. TAPS FOR TRANSFORMERS 7.5 TO 24 KVA: ONE 5 PERCENT TAP ABOVE AND ONE 5 PERCENT TAP BELOW NORMAL FULL CAPACITY.

I. TAPS FOR TRANSFORMERS 25 KVA AND LARGER: TWO 2.5 PERCENT TAPS ABOVE AND TWO 2.5 PERCENT TAPS BELOW NORMAL FULL CAPACITY.

J. INSULATION CLASS: 220 DEG C, UL–COMPONENT–RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 115 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE.

K. ENERGY EFFICIENCY FOR TRANSFORMERS RATED 15 KVA AND LARGER: COMPLYING WITH DOE–2016 10 CFR PART 431.

L. K–FACTOR RATING: TRANSFORMERS INDICATED TO BE K–FACTOR RATED SHALL COMPLY WITH UL 1561 REQUIREMENTS FOR NONSINUSOIDAL LOAD CURRENT–HANDLING CAPABILITY TO THE DEGREE DEFINED BY DESIGNATED K–FACTOR. ENSURE THAT NOT OVERHEAT WHEN CARRYING FULL–LOAD CURRENT WITH HARMONIC DISTORTION CORRESPONDING TO DESIGNATED K–FACTOR. INDICATE VALUE OF K–FACTOR ON TRANSFORMER NAMEPLATE.

M. ELECTROSTATIC SHIELDING: EACH WINDING SHALL HAVE AN INDEPENDENT, SINGLE, FULL–WIDTH COPPER ELECTROSTATIC SHIELD ARRANGED TO MINIMIZE INTERWINDING CAPACITANCE. ARRANGE COIL LEADS AND TERMINAL STRIPS TO MINIMIZE CAPACITIVE COUPLING BETWEEN INPUT AND OUTPUT TERMINALS. INCLUDE SPECIAL TERMINAL FOR GROUNDING THE SHIELD. SHIELD EFFECTIVENESS: CAPACITANCE BETWEEN PRIMARY AND SECONDARY WINDINGS: NOT TO EXCEED 33 PICOFARADS OVER A FREQUENCY RANGE OF 20 HZ TO 1 MHZ. COMMON–MODE NOISE ATTENUATION: MINIMUM OF MINUS 120 DBA AT 0.5 TO 1.5 KHZ, MINIMUM OF MINUS 65 DBA AT 1.5 TO 100 KHZ. NORMAL–MODE NOISE ATTENUATION: MINIMUM OF MINUS 52 DBA AT 1.5 TO 10 KHZ.

N. FUNGUS PROOFING: PERMANENT FUNGICIDAL TREATMENT FOR COIL AND CORE.

O. LUG RATING: ALL LUG CONNECTIONS SHALL BE RATED FOR CONNECTION OF 75 DEG C INSULATION CONDUCTORS.

PANELBOARDS

A. ENCLOSURES: FLUSH– AND SURFACE–MOUNTED CABINETS. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION. INDOOR DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R. WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4X STAINLESS STEEL.

B. FRONT: SECURED TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE–MOUNTED FRONTS, MATCH BOX DIMENSIONS; FOR FLUSH–MOUNTED FRONTS, OVERLAP BOX.

C. HINGED FRONT COVER: ENTIRE FRONT TRIM HINGED TO BOX AND WITH STANDARD DOOR WITHIN HINGED TRIM COVER.

D. FINISHES:
   PANELS AND TRIM: GALVANIZED STEEL, FACTORY FINISHED IMMEDIATELY AFTER CLEANING AND PRETREATING WITH MANUFACTURER'S STANDARD TWO–COAT, BAKED–ON FINISH CONSISTING OF PRIME COAT AND THERMOSETTING TOPCOAT.

E. BACK BOXES: GALVANIZED STEEL.

F. FUNGUS PROOFING: PERMANENT FUNGICIDAL TREATMENT FOR OVERCURRENT PROTECTIVE DEVICES AND OTHER COMPONENTS.

G. DIRECTORY CARD: INSIDE PANELBOARD DOOR, MOUNTED IN TRANSPARENT CARD HOLDER.

H. INCOMING MAINS LOCATION: TOP AND BOTTOM.

I. PHASE, NEUTRAL AND GROUND BUSES:
   MATERIAL: TIN–PLATED ALUMINUM OR HARD–DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
   EQUIPMENT GROUND BUS: ADEQUATE FOR FEEDER AND BRANCH–CIRCUIT EQUIPMENT GROUNDING CONDUCTORS; BONDED TO BOX.

J. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND SIZES.
   MATERIAL: TIN–PLATED ALUMINUM OR HARD–DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
   MAIN AND NEUTRAL LUGS: COMPRESSION TYPE. GROUND LUGS AND BUS–CONFIGURED TERMINATORS: COMPRESSION TYPE. FEED–THROUGH LUGS: COMPRESSION TYPE, SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT OPPOSITE END OF BUS FROM INCOMING LUGS OR MAIN DEVICE. RATED FOR CONNECTION OF 75 DEG C INSULATED CONDUCTORS.

K. PANELBOARD SHORT–CIRCUIT CURRENT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT–CIRCUIT CURRENT AVAILABLE AT TERMINALS.

L. LIGHTING AND APPLIANCE BRANCH–CIRCUIT PANELBOARDS
   MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
   EATON ELECTRICAL INC.; CUTLER–HAMMER BUSINESS UNIT.
   GENERAL ELECTRIC COMPANY; GE CONSUMER & INDUSTRIAL
   SIEMENS ENERGY & AUTOMATION, INC.
   SQUARE D; A BRAND OF SCHNEIDER ELECTRIC.
   PANELBOARDS: NEMA PB 1, LIGHTING AND APPLIANCE BRANCH–CIRCUIT TYPE.
   MAINS: CIRCUIT BREAKER OR LUGS ONLY.
   BRANCH OVERCURRENT PROTECTIVE DEVICES: BOLT–ON CIRCUIT BREAKERS, REPLACEABLE WITHOUT DISTURBING ADJACENT UNITS.
   DOORS: CONCEALED HINGES; SECURED WITH FLUSH LATCH WITH TUMBLER LOCK; KEYED ALIKE.

LIGHTING FIXTURES

A. G

MECHANICAL GENERAL NOTES:

1. ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
2. NO PIPING, EQUIPMENT, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE LANDLORD AND/OR ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED. IF ANY AREAS NOT WITHIN THE SCOPE OF WORK ARE AFFECTED BY ANY SHUTDOWN, REMOVAL OR DISCONNECTION, SUFFICIENT ADVANCE NOTICE MUST BE GIVEN TO THE LANDLORD INDICATING WHICH AREAS WILL BE AFFECTED, WHEN THE PROPOSED SHUTDOWN WILL OCCUR, AND FOR HOW LONG A PERIOD OF TIME.
3. ALL ITEMS REMOVED SHALL BECOME PROPERTY OF THE LANDLORD AND SHALL BE DISPOSED OF AS PER THE LANDLORD'S INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE BY OWNERS SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
4. THIS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE LANDLORD AND/OR ENGINEER FOR EXPEDITING AND THE RESOLUTION.
5. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
6. USE OF THE LANDLORD'S ELEVATORS AND BUILDING CORRIDORS FOR HANDLING OF THE LANDLORD'S AND REMOVED EQUIPMENT AND MATERIALS SHALL BE AT THE DIRECTION OF THE LANDLORD AND SHALL BE COORDINATED WITH HIS OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT AND ENVIRONMENTAL CONDITIONS.
8. EXISTING MATERIALS THAT ARE REMOVED SHALL NOT BE REUSED IN NEW SYSTEMS, EXCEPT WHERE INDICATED AS BEING RELOCATED.
9. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
10. WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
11. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH THE LANDLORD AND ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF ALL WORK.
12. SUBMISSION OF PROPOSAL DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
13. ALL WORK SHALL CONFORM TO ALL STATE AND LOCAL CODES, RULES AND REGULATIONS AND ORDINANCES.
14. CONTRACTOR SHALL SECURE AND PAY ALL FEES AND PERMITS PERTAINING TO THE CONTRACT.
15. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SAFETY AND FIRE PROTECTION, CONTRACTOR'S LIABILITY INSURANCE, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING AND PROTECTION OF MATERIALS.
18. CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT AND TRANSFER TO POINT OF INSTALLATION, OWNER FURNISHED ITEMS.
19. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THIS SERVICE.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AS IT RELATES TO HIS WORK.
21. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S RULES AND REGULATIONS' TO COMPLY WITH BUILDING STANDARDS.
22. FLEXIBLE DUCTWORK LENGTHS SHALL NOT EXCEED 5'-0". USE INSULATED RIGID ROUND DUCTWORK WHERE REQUIRED. ALL NEW FLEXIBLE DUCTWORK CONNECTIONS TO AIR DEVICES SHOWN ON THE DRAWING SHALL BE SIZED ACCORDING TO THE NECK SIZE SCHEDULE.
23. THE ENTIRE AIR SUPPLY SYSTEM SHALL BE RE-BALANCED TO THE AIR QUANTITIES INDICATED ON THIS DRAWING BY AN INDEPENDENT AIR BALANCE CONTRACTOR. THE AIR BALANCE CONTRACTOR SHALL SUBMIT NEBB CERTIFIED AIR BALANCE REPORTS FOR ENGINEERING REVIEW AND TO BUILDING MANAGEMENT. PROVIDE AHU DRIVE ADJUSTMENTS AS REQUIRED.
24. REFER TO DRAWING MEP FOR SPECIFICATIONS THAT APPLY TO THIS SHEET.
25. CONTRACTOR SHALL VERIFY THAT SUFFICIENT RETURN AIR OPENINGS ARE PROVIDED IN EXISTING WALLS ABOVE CEILING. AIR IS RETURNED TO THE CEILING PLENUM AND THEN TO THE AIR HANDLING UNITS THROUGH RETURN AIR GRILLES, ARCHITECTURAL CEILING OPENING AND LIGHT FIXTURES.
26. EXISTING TAPS TO SUPPLY DUCTWORK SHALL BE USED WHERE POSSIBLE. ANY UNUSED TAPS TO EXISTING SUPPLY DUCTWORK SHALL BE CAPPED, SEALED AIRTGHT, AND INSULATED.
27. EXISTING MAIN TRUNK SUPPLY DUCTWORK SHALL REMAIN. CONTRACTOR SHALL VERIFY EXISTING LOCATION AND LIGHTING FIXTURE CLEARANCES AND INCLUDE IN THEIR COST THE RELOCATION OR REMOVAL OF EXISTING EQUIPMENT REQUIRED TO COMPLY WITH THIS DRAWING.
28. CONTRACTOR SHALL PROVIDE TO BUILDING OWNER THE AS-BUILT RECORD DRAWINGS AND THE OPERATING AND MAINTENANCE MANUALS WITHIN 90 DAYS OF SYSTEMS ACCEPTANCE. RECORD DRAWINGS SHALL INCLUDE PERFORMANCE DATA FOR EQUIPMENT, DUCT AND PIPE DISTRIBUTION SYSTEMS, AND AIR AND WATER FLOW RATES. O&M MANUALS SHALL INCLUDE EQUIPMENT AND ASSOCIATED OPTIONS REQUIRING SERVICE, REQUIRED MAINTENANCE ACTIVITIES, CONTACT INFO OF SERVICE AGENCIES, HVAC CONTROLS CALIBRATION INFORMATION AND SET-POINTS, AND DESCRIPTION OF EQUIPMENTS' INTENDED OPERATIONS.
29. FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.

AIR DEVICE SCHEDULE

MARK	MANUF. + MODEL	TYPE	REMARKS
⊠	TITUS PCS OR EQUAL	CEILING SUPPLY	24x24 PERFORATED FACE. FACE SHALL BE ALUMINUM WITH A STEEL BACK PAN. PROVIDE AIR PATTERN CONTROLS. FACE AND FRAME SHALL HAVE AN OFF-WHITE ENAMEL FINISH. COORDINATE CEILING MOUNTING TYPE WITH ARCHITECTURAL CEILING TYPE. PROVIDE REMOTE DAMPER OPERATORS IN AREAS WITH INACCESSIBLE CEILINGS.
⊘	TITUS PAR OR EQUAL	CEILING RETURN	24x24 PERFORATED FACE. FACE SHALL BE ALUMINUM WITH A STEEL BACK PAN. FACE AND FRAME SHALL HAVE AN OFF- WHITE ENAMEL FINISH. COORDINATE CEILING MOUNTING TYPE WITH ARCHITECTURAL CEILING TYPE.
▭	TITUS FTI-20	CEILING SUPPLY	48" LONG SUPPLY DIFFUSER WITH AN EXTRUDED ALUMINUM, ADJUSTABLE AIR OUTLET DESIGNED TO DIRECT SUPPLY AIR HORIZONTALLY ACROSS THE CEILING OR DOWN THE WALL. COORDINATE MOUNTING WITH CEILING TYPE.

DIFFUSER NECK SIZE SCHEDULE

CFM RANGE	SQUARE NECK SIZE	ROUND NECK SIZE
0 – 120	6 X 6	6"ø
125 – 220	8 X 8	8"ø
225 – 330	10 X 10	10"ø
335 – 450	12 X 12	12"ø
455 – 530	15 X 15	14"ø
540 – 700	16 X 16	16"ø

OUTSIDE AIR ANALYSIS

OUTSIDE AIR SHALL BE PROVIDED IN ACCORDANCE WITH THE MECHANICAL CODES:

(Rp x Pz) + (Ra x Az) = Vbz

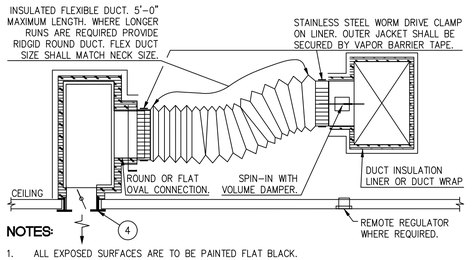
OFFICE SPACE: (5 CFM/PER x 7 PPL) + (0.06 CFM/SQFT x 1540 SQFT) = 128 CFM

TOTAL = 128 CFM

OVERALL: Vbz / Ez = Voz
128 CFM / 1 = 128 CFM

TOTAL OUTSIDE AIR REQUIRED = 130 CFM

TOTAL OUTSIDE AIR PROVIDED = 130 CFM



NOTES:

1. ALL EXPOSED SURFACES ARE TO BE PAINTED FLAT BLACK.
2. SUPPORT FLEXIBLE DUCT FROM STRUCTURE AS SPECIFIED. DUCT SHALL NOT KINK, SAG OR REST ON LIGHT FIXTURES, CEILING SUPPORT TEES OR TILE.
3. FOR UNCONDITIONED CEILING PLENUMS, INSULATE BACK OF SLOT DIFFUSER WITH 1" DUCT WRAP AND SEAL WITH VAPOR BARRIER TAPE.
4. CEILING "TEE" OR DRYWALL TRIM PIECE BY OTHERS. PROVIDE BLACK BLANK-OFF FOR INACTIVE SECTION. PROVIDE BLACK LIGHT SHIELD ON ACTIVE RETURN SECTIONS.
5. SLOT DIFFUSER DEVICE SHOWN MAY NOT BE ACTUAL DEVICE SCHEDULED. REFER TO AIR DEVICE SCHEDULE FOR EXACT DEVICE.
6. METALLIC FLEXIBLE DUCT SHALL BE USED WHERE FLEXIBLE DUCT CONNECTIONS ARE SHOWN ON THE DRAWING TO ALL DISTRIBUTION DEVICES INSTALLED IN INACCESSIBLE LOCATIONS, SUCH AS ABOVE GYPSUM BOARD OR PLASTER CEILING. (RE. TO ARCH. DWGS. FOR CEILING TYPE.)

SLOT DIFFUSER 01
SCALE: NONE

LEGEND OF MECHANICAL SYMBOLS

SYMBOL	DESCRIPTION
	SUPPLY DUCT VIEW INTO DUCT
	SUPPLY DUCT VIEW HEEL OF ELBOW
	RETURN OR EXHAUST DUCT VIEW INTO DUCT
	RETURN OR EXHAUST DUCT VIEW HEEL OF ELBOW
	SQUARE TO ROUND TRANSITION
	SQUARE ELBOW WITH TURNING VANES.
	RADIUS ELBOW WITHOUT TURNING VANES.
	SUPPLY SIDEWALL REGISTER
	RETURN OR EXHAUST SIDEWALL REGISTER
	ROUND S.A. DIFFUSER
	EXISTING FLEX DUCT
	NEW FLEX DUCT
	EXISTING DUCTWORK
	NEW DUCTWORK
	DUCTWORK TO BE REMOVED
	SQUARE CEILING DIFFUSER
	RETURN AIR GRILLE
	RETURN OR EXHAUST AIR REGISTER W/ SQUARE NECK
	PLENUM SLOT DIFFUSER
MD	MANUAL DAMPER
	FIRE DAMPER WITH ACCESS DOOR
D	DRAIN LINE
	PIPE RISING
	PIPE TURNING DOWN
S	EXHAUST FAN SPEED CONTROL
T	THERMOSTAT
(E)	EXISTING TO REMAIN
(R)	RELOCATED
R.A.	RETURN AIR
S.A.	SUPPLY AIR
C.F.M.	CUBIC FEET PER MINUTE
AHU	AIR HANDLER UNIT

NOTES:

1. ALL SYMBOLS MAY NOT BE USED ON THIS DRAWINGS.

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	ISSUE FOR FINAL REVIEW	09/30/2026

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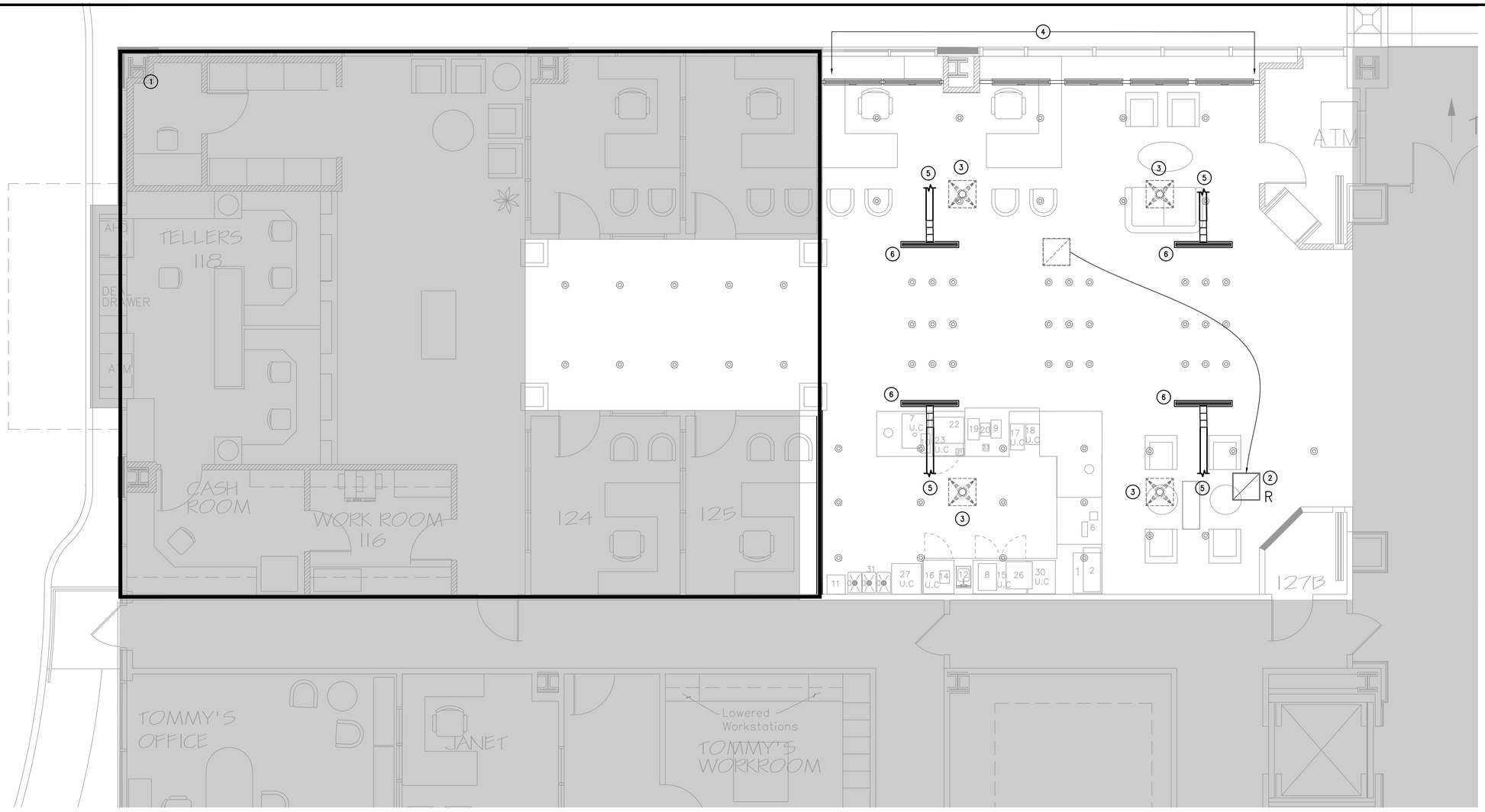
DRAWING TITLE
MECHANICAL INFORMATION

SHEET NO.
M0.01

E/B/E Mechanical Electrical Plumbing CONSULTING ENGINEERS
12603 Southwest Frwy, Ste 170, Stafford, Tx 77477
Tel: (713) 840-0177 / Firm Reg. No: 5638



01 MECHANICAL PLAN
SCALE: 1/8"=1'-0"

MECHANICAL KEYED NOTES:

1. EXISTING MECHANICAL IN THIS AREA TO REMAIN.
2. RELOCATE EXISTING 24" X 24" RETURN AIR GRILLE TO LOCATION INDICATED. CLEAN TO APPEAR IN LIKE NEW CONDITION. REPAIR OR REPLACE IF DAMAGED. TYPICAL.
3. DEMOLISH EXISTING 24" X 24" SUPPLY AIR DEVICE. TYPICAL.
4. EXISTING EXTERIOR SUPPLY OR RETURN PLENUM SLOT DIFFUSER TO REMAIN.
5. PROVIDE 8" TO EXISTING LOCATION OF DEMOLISHED SQUARE DIFFUSER.
6. PROVIDE NEW LINEAR SUPPLY PLENUM SLOT DIFFUSER AT LOCATION INDICATED. COORDINATE WITH ARCHITECT FOR FINAL LOCATION AND DETAIL. BALANCE TO EXISTING CFM. SEE SCHEDULE AND DETAIL. TYPICAL.

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DRAWING TITLE
MECHANICAL PLAN

SHEET NO.
M1.01

E|B|E CONSULTING ENGINEERS Mechanical Electrical Plumbing
12603 Southwest Frwy, Ste 170, Stafford, Tx 77477
Tel: (713) 840-0177 / Firm Reg. No: 5638

NORTH

ELECTRICAL POWER GENERAL NOTES:

1. MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
2. REFER TO ARCHITECT FOR EXACT HEIGHT AND LOCATION OF ALL FLOOR AND WALL OUTLETS.
3. ALL DATA/TELEPHONE OUTLETS SHALL BE PROVIDED WITH PULL STRINGS.
4. CONTRACTOR SHALL LOCATE ALL ELECTRICAL & TELEPHONE OUTLETS WITHIN THE LIMITS OF THE TENANT FURNITURE PLAN PROVIDED BY THE ARCHITECT. CONTRACTOR SHALL MARK INTENDED LOCATION OF ALL OUTLETS PRIOR TO INSTALLATION, THEN SHALL NOTIFY TENANT FOR APPROVAL BEFORE PROCEEDING.
5. CONTRACTOR SHALL PROVIDE NEW CIRCUIT DIRECTORY CARD AT PANELS. CIRCUITS SHALL BE LABELED TO CORRESPOND TO THE CIRCUITS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CONNECT CIRCUITS AS REQUIRED TO COMPLY WITH THIS DRAWING.
6. CONDUCTORS SHALL BE #12 AWG SOLID COPPER (THWN) IN 1/2" CONDUIT UNLESS OTHERWISE INDICATED.
7. ALL OUTLETS TO BE MOUNTED VERTICALLY UNLESS OTHERWISE INDICATED.
8. CONTRACTOR SHALL PROVIDE ONE PULL STRING FOR EACH VOICE OR DATA OUTLET SHOWN. WHEN VOICE AND DATA OUTLETS ARE SHOWN ADJACENT, CONTRACTOR SHALL PROVIDE ONE PULL STRING (WITH ONE WALL PENETRATION) FOR THE PAIR, UNLESS NOTED OTHERWISE. VOICE AND DATA LINES SHALL BE PULLED BY OTHERS.
9. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
10. GANG TOGETHER, ALL NEW ELECTRICAL, TELEPHONE AND COMPUTER OUTLETS SHOWN ADJACENT TO EACH OTHER.
11. VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.
12. COORDINATE THE INSTALLATION OF ELECTRICAL MATERIALS AND EQUIPMENT ABOVE CEILINGS WITH SUSPENSION SYSTEM, MECHANICAL EQUIPMENT AND SYSTEMS, AND STRUCTURAL COMPONENTS. COORDINATE ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS.
13. VERIFY MECHANICAL EQUIPMENT SWITCH AND CONNECTION REQUIREMENTS, ITEM BY ITEM, WITH THE MECHANICAL CONTRACTOR, BEFORE WIRING EQUIPMENT. RESOLVE ALL DISCREPANCIES WITHOUT FURTHER COST TO OWNER.
14. FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.

ELECTRICAL LIGHTING GENERAL NOTES:

1. MEP SPECIFICATIONS SHALL APPLY TO ALL WORK SHOWN ON THIS DRAWING UNLESS OTHERWISE NOTED.
2. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLAN FOR THE EXACT LOCATION OF ALL LIGHTING FIXTURES.
3. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL JUNCTION BOXES IN THE JUNCTION BOX GRID AND AVAILABILITY OF ALL CIRCUITS INDICATED TO BE USED.
4. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING EQUIPMENT PRIOR TO CONSTRUCTION. PROVIDE CIRCUIT TRACING AS REQUIRED TO DETERMINE CIRCUIT AVAILABILITY. PROVIDE A WRITTEN REPORT TO ENGINEER AND BUILDING MANAGEMENT SHOWING LIGHTING LOCATIONS AND CIRCUIT NUMBER USED.
5. ALL UNUSED WIRING IS TO BE REMOVED BACK TO SOURCE UNLESS NOTED OTHERWISE.
6. CONNECT NEW FIRE ALARM DEVICES TO THE BASE BUILDING FIRE ALARM SYSTEM AS REQUIRED. EXISTING DEVICES ARE INDICATED BY THE LETTER "E" ADJACENT TO THE DEVICE SYMBOL. THE BASE BUILDING FIRE ALARM SYSTEM SEQUENCES OF OPERATION SHALL COMPLY WITH THE CITY OF HOUSTON BUILDING CODE. ALARM INITIATION BY SMOKE DETECTOR, HEAT DETECTOR, PULL STATIONS, OR BY OTHER ALARM INITIATING DEVICES SHALL CAUSE AUDIBLE AND VISIBLE ALARM SIGNALS TO OCCUR ON THE FLOOR OF INCIDENCE, THE FLOOR ABOVE AND THE FLOOR BELOW. ELEVATORS SHALL RETURN TO THEIR DESIGNATED FLOORS AND ELECTRICALLY LOCKED EGRESS DOORS SHALL RELEASE, AND ALL OTHER EVENTS REQUIRED TO COMPLY WITH THE CITY OF HOUSTON BUILDING CODE SHALL OCCUR. PROVIDE ADDITIONAL ZONING AS NEEDED TO COMPLETE THE FIRE ALARM INSTALLATION AND TO MEET REQUIRED SEQUENCES OF OPERATION.
7. EGRESS AND EXIT LIGHT FIXTURES SHALL BE CONNECTED TO UNSWITCHED HOT CONDUCTOR WITH 2#10,1/2"C.
8. ALL LIGHTS SHALL BE CLEANED AND RESTORED TO GOOD WORKING CONDITION. PROVIDE NEW FIXTURES TO MATCH EXISTING AS REQUIRED. RELAMP ALL FIXTURES WITH NEW LAMPS AS REQUIRED.
9. INSTALL NEW ACRYLIC LENSES AS NEEDED IN LIGHT FIXTURES TO REPLACE DAMAGED LENSES.
10. ALL LIGHTING FIXTURES, LAMPS AND EXIT SIGNS SHALL MATCH BASE BUILDING STANDARD UNLESS OTHERWISE NOTED.
11. ALL FIRE ALARM DEVICES SHALL MATCH EXISTING.
12. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
13. LIGHTING FIXTURES SHALL BE PROTECTED TO COMPLY WITH THE EXISTING BUILDING FLOOR/CEILING FIRE RATED ASSEMBLY.
14. FOR RETURN AIR PLENUMS, ALL MATERIALS LOCATED WITHIN A RETURN AIR PLENUM SHALL BE RATED AND APPROVED FOR INSTALLATION IN A RETURN AIR PLENUM.

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER + SERIES NUMBER	MOUNTING	LAMPS NO/TYPE	VOLTS	REMARKS
o	WILLIAMS 4DR-TL-L20/835-DIM-UNV-OW-OF-CS-N-F1	RECESSED	20W LED	277	4" RECESSED LED DOWNLIGHT.
oK	WILLIAMS 4DR-TL-L20/835-DIM-UNV-OW-OF-CS-WET/CC-N-F1	RECESSED	20W LED	277	4" RECESSED LED DOWNLIGHT. WET LOCATION RATED
	WILLIAMS LT-24-L52/835-AF-DIM-UNV	SURFACE	37W	277	LED 2X4 FIXTURE
G	FEISS PRODUCT No. SF3400RB	SURFACE	75W LED	277	LED PENDANT LIGHT #LENNON-5-LIGHT OIL RUBBED BRONZE SEMI-FLUSH MOUNT
E	EXIT SIGN	SURFACE	4.5W LED	277	LED EXIT SIGN. EXISTING.
	EXIT SIGN MATCH BUILDING STANDARD	SURFACE	4.5W LED	277	LED EXIT SIGN. NEW TO MATCH EXISTING.

THIS FIXTURE SCHEDULE IS INTENDED TO PROVIDE GENERAL LIGHTING FIXTURE QUALITY AND PERFORMANCE REQUIREMENTS ONLY. CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN THE EXACT MODEL/CATALOG NUMBER OF THE LIGHTING FIXTURES LISTED ABOVE. ANY DIFFERENCES BETWEEN THIS LIGHTING FIXTURE SCHEDULE AND ARCHITECTURAL DRAWINGS OR MANUFACTURERS PRODUCT LISTINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER. FLUORESCENT LIGHTS THAT ARE SHOWN WITH DIMMER CONTROL SHALL BE PROVIDED WITH AN ELECTRONIC DIMMING BALLAST. FLUORESCENT LIGHTS NOT SHOWN DIMMED SHALL HAVE A NON-DIMMING ELECTRONIC BALLAST. ALL LAMPS SHALL MATCH BUILDING STANDARD.

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING. ARROW INDICATES HOMERUN TO PANEL. CONDUCTOR DESIGNATIONS ARE AS FOLLOWS: LONG HATCH INDICATES NEUTRAL, SHORT HATCH INDICATES PHASE, "T" INDICATES INSULATED OR ISOLATED GROUND, "J" INDICATES SWITCHLEG, AND NO HATCHES INDICATES TWO CONDUCTORS.
	PARTIAL HOME RUN. SAME AS ABOVE.
	CONDUIT RUN CONCEALED IN FLOOR SLAB, BELOW FLOOR SLAB OR BELOW GRADE. WIRING SAME AS ABOVE.
	HATCHED LINES INDICATES FIXTURE CONNECTED TO BUILDING EMERGENCY SYSTEM.
A	2'x4' FLUORESCENT FIXTURE. LETTER INDICATES FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE FOR SPECIFICATIONS.
A	2'x2' FLUORESCENT FIXTURE. LETTER INDICATES FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE FOR SPECIFICATIONS.
A	UNDERCABINET FIXTURE. LETTER INDICATES FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE FOR SPECIFICATIONS.
A	DOWNLIGHT FIXTURE. LETTER INDICATES FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE FOR SPECIFICATIONS.
A	WALL WASHER FIXTURE. LETTER INDICATES FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE FOR SPECIFICATIONS.
	EXIT LIGHT. PROVIDE ARROWS AS INDICATED ON DRAWINGS.
	DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V., 3 WIRE, GROUNDED TYPE.
	QUADRUPLEX RECEPTACLE OUTLET GANGED WITH A COMMON WALL PLATE; (2)-20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
GFI	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER; 20 AMP, 125V., 3 WIRE GROUNDED TYPE.
S D	FLUSH MOUNTED FLOOR OUTLET W/ RECEPTACLE (S) AND OR DATA AND, OR TELEPHONE.
	COMBINATION TELEPHONE / DATA OUTLET.
	TELEPHONE OUTLET.
	DATA OUTLET
TTB	TELEPHONE TERMINAL BOARD, 4'x8'x3/4" PLYWOOD.
$	SINGLE POLE, SINGLE-THROW SWITCH; 20 AMP, 120/277V.
3 $	3-WAY SWITCH: 20 AMP, 120/277V.
OS $ OS	OCCUPANCY SENSOR SWITCH. LUTRON MS-B102, U.N.O. WITH DIMMING WHERE NOTED ON PLANS.
VS $ VS	VACANCY SENSOR SWITCH. LUTRON MS-B102, U.N.O. WITH DIMMING WHERE NOTED ON PLANS.
	DIMMER SWITCH. LUTRON MAESTRO SERIES.
	JUNCTION BOX MOUNTED ABOVE ACCESSIBLE CEILING.
	JUNCTION BOX
	DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, & FUSE SIZE. (IF REQUIRED)
	MOTOR STARTER / DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, FUSE SIZE (IF REQUIRED), AND SIZE.
	TRANSFORMER - REFER TO DRAWINGS FOR VOLTAGE AND AMPERAGE.
	SURFACE PANELBOARD W/ NEC CLEARANCES; 120/208 VOLT.
	SURFACE PANELBOARD W/ NEC CLEARANCES; 277/480 VOLT.

NOTES:
1. ALL SYMBOLS MAY NOT BE USED ON THIS DRAWINGS.
2. REFER TO SPECIFICATIONS FOR MOUNTING HEIGHTS

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DRAWING TITLE
ELECTRICAL INFORMATION

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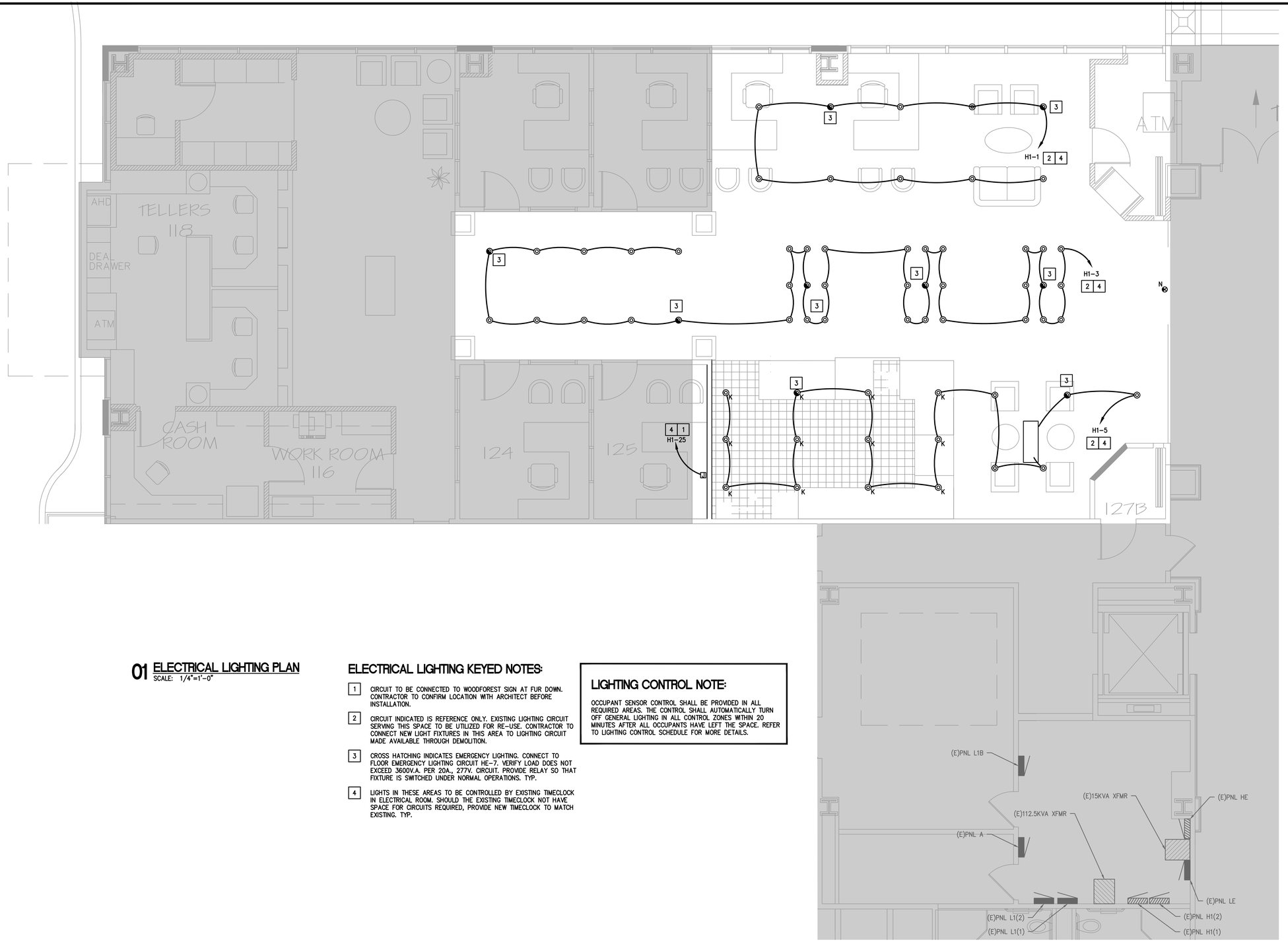

01 ELECTRICAL LIGHTING PLAN
SCALE: 1/4"=1'-0"

ELECTRICAL LIGHTING KEYED NOTES:

1. CIRCUIT TO BE CONNECTED TO WOODFOREST SIGN AT FUR DOWN. CONTRACTOR TO CONFIRM LOCATION WITH ARCHITECT BEFORE INSTALLATION.
2. CIRCUIT INDICATED IS REFERENCE ONLY. EXISTING LIGHTING CIRCUIT SERVING THIS SPACE TO BE UTILIZED FOR RE-USE. CONTRACTOR TO CONNECT NEW LIGHT FIXTURES IN THIS AREA TO LIGHTING CIRCUIT MADE AVAILABLE THROUGH DEMOLITION.
3. CROSS HATCHING INDICATES EMERGENCY LIGHTING. CONNECT TO FLOOR EMERGENCY LIGHTING CIRCUIT HE-7. VERIFY LOAD DOES NOT EXCEED 3600V.A. PER 20A., 277V. CIRCUIT. PROVIDE RELAY SO THAT FIXTURE IS SWITCHED UNDER NORMAL OPERATIONS. TYP.
4. LIGHTS IN THESE AREAS TO BE CONTROLLED BY EXISTING TIMECLOCK IN ELECTRICAL ROOM. SHOULD THE EXISTING TIMECLOCK NOT HAVE SPACE FOR CIRCUITS REQUIRED, PROVIDE NEW TIMECLOCK TO MATCH EXISTING. TYP.

LIGHTING CONTROL NOTE:

OCCUPANT SENSOR CONTROL SHALL BE PROVIDED IN ALL REQUIRED AREAS. THE CONTROL SHALL AUTOMATICALLY TURN OFF GENERAL LIGHTING IN ALL CONTROL ZONES WITHIN 20 MINUTES AFTER ALL OCCUPANTS HAVE LEFT THE SPACE. REFER TO LIGHTING CONTROL SCHEDULE FOR MORE DETAILS.

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MARK	DESCRIPTION	DATE
	ISSUE FOR FINAL REVIEW	09/30/2026

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PRINT DATE
09/30/2025

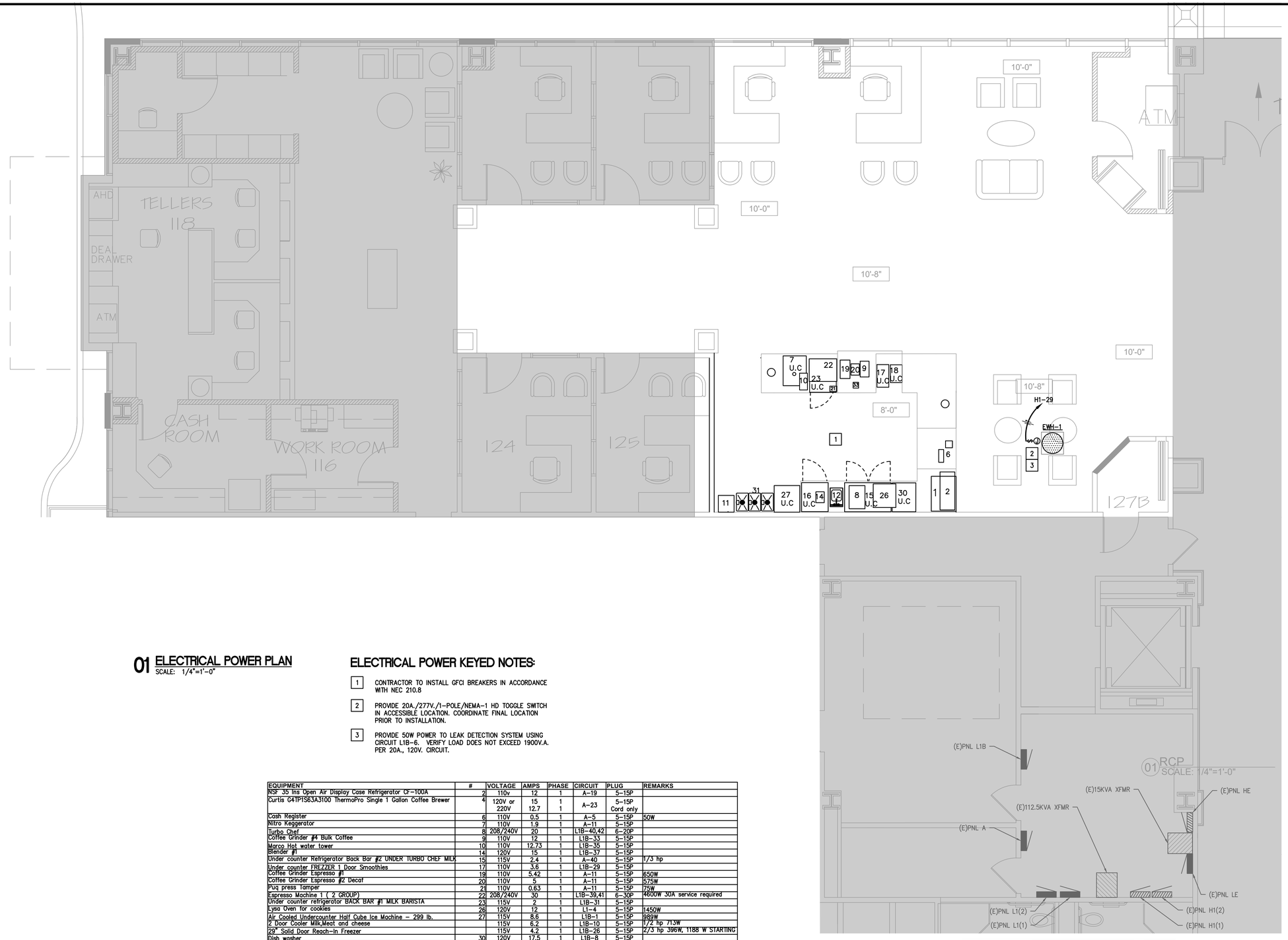
NOT FOR CONSTRUCTION

DRAWING TITLE
ELECTRICAL LIGHTING PLAN

SHEET NO.
E1.01

E|B|E CONSULTING ENGINEERS Mechanical Electrical Plumbing
12603 Southwest Frwy, Ste 170, Stafford, Tx 77477
Tel: (713) 840-0177 / Firm Reg. No: 5638

NORTH



01 ELECTRICAL POWER PLAN
SCALE: 1/4"=1'-0"

ELECTRICAL POWER KEYED NOTES:

1. CONTRACTOR TO INSTALL GFCI BREAKERS IN ACCORDANCE WITH NEC 210.8
2. PROVIDE 20A./277V./1-POLE/NEMA-1 HD TOGGLE SWITCH IN ACCESSIBLE LOCATION. COORDINATE FINAL LOCATION PRIOR TO INSTALLATION.
3. PROVIDE 50W POWER TO LEAK DETECTION SYSTEM USING CIRCUIT L1B-6. VERIFY LOAD DOES NOT EXCEED 1900V.A. PER 20A., 120V. CIRCUIT.

EQUIPMENT	#	VOLTAGE	AMPS	PHASE	CIRCUIT	PLUG	REMARKS
NSF 35 Ins Open Air Display Case Refrigerator CF-10DA	2	110v	12	1	A-19	5-15P	
Curtis G4TPTS63A3100 ThermoPro Single 1 Gallon Coffee Brewer	4	120V or 220V	15 12.7	1 1	A-23	5-15P Cord only	
Cash Register	6	110V	0.5	1	A-5	5-15P	50W
Nitro Keggerator	7	110V	1.9	1	A-11	5-15P	
Turbo Chef	8	208/240V	20	1	L1B-40,42	6-20P	
Coffee Grinder #4 Bulk Coffee	9	110V	12	1	L1B-33	5-15P	
Marco Hot water tower	10	110V	12.73	1	L1B-35	5-15P	
Blender #1	14	120V	15	1	L1B-37	5-15P	
Under counter Refrigerator Back Bar #2 UNDER TURBO CHEF MILK	15	115V	2.4	1	A-40	5-15P	1/3 hp
Under counter FREZZER 1 Door Smoothies	17	110V	3.6	1	L1B-29	5-15P	
Coffee Grinder Espresso #1	19	110V	5.42	1	A-11	5-15P	650W
Coffee Grinder Espresso #2 Decaf	20	110V	5	1	A-11	5-15P	575W
Puq press Tamper	21	110V	0.63	1	A-11	5-15P	75W
Espresso Machine 1 (2 GROUP)	22	208/240V	30	1	L1B-39,41	6-30P	4600W 30A service required
Under counter refrigerator BACK BAR #1 MILK BARISTA	23	115V	2	1	L1B-31	5-15P	
Lysa Oven for cookies	26	120V	12	1	L1-4	5-15P	1450W
Air Cooled Undercounter Half Cube Ice Machine - 299 lb.	27	115V	8.6	1	L1B-1	5-15P	989W
2 Door Cooler Milk,Meat and cheese		115V	6.2	1	L1B-10	5-15P	1/2 hp 713W
29" Solid Door Reach-In Freezer		115V	4.2	1	L1B-26	5-15P	2/3 hp 396W, 1188 W STARTING
Dish washer	30	120V	17.5	1	L1B-8	5-15P	

01 RCP
SCALE: 1/4"=1'-0"

RECEPTACLE CONTROL NOTE:

RECEPTACLE CONTROL SHALL BE PROVIDED IN ALL REQUIRED AREA. THE OCCUPANT SENSOR CONTROL SHALL AUTOMATICALLY TURN OFF RECEPTACLES WITHIN 20 MINUTES OF ALL OCCUPANTS LEAVING THE SPACE. REFER TO RECEPTACLE CONTROL SCHEDULE FOR MORE DETAILS.

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WOODFOREST TOWN CENTER
WOODLANDS, TEXAS

E/B/E PROJECT NUMBER : 2018.00

	DATE
ISSUED FOR CLIENT APPROVAL	
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	ISSUE FOR FINAL REVIEW	09/30/2026

The information, ideas, designs, details, layouts, techniques, features, arrangements, plans, sequences, dimensions, allowances, tolerances, conceptions, specifications, intentions, technology or embodiments, as illustrated, arranged, displayed, noted, recorded, indicated, represented, disclosed, evidenced, detailed or otherwise reduced to tangible form hereon, either expressly, inherently or by implication, are the confidential and proprietary information of SLI Design, Inc., and shall not be used for any purpose other than the specific project or undertaking identified on the drawing title block or legend for which they are and have been prepared by SLI Design, Inc. Any other reproduction, disclosure or use of any portion of the confidential and proprietary information of SLI Design, Inc., shall be a breach of the obligation of confidence created by the acceptance of this drawing from SLI Design, Inc. for a specific project or Contract. Any copying, duplicating, reproducing, utilization, alteration, modification, revision or change to this drawing, is expressly prohibited unless done with the prior written consent or approval of SLI Design, Inc., and shall not be undertaken without receipt of such prior written approval. This drawing is loaned by SLI Design, Inc., for the limited purpose of complying with a specific Contract. The drawing remains the property of SLI Design, Inc., and shall be returned upon request or completion of the contract, unless specifically authorized by Contract, under which it was loaned.

PRINT DATE
09/30/2025

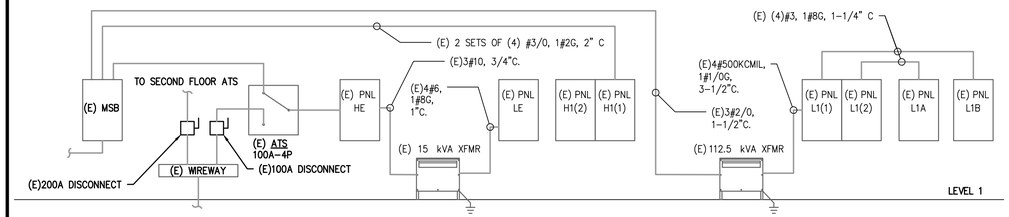
NOT FOR CONSTRUCTION

DRAWING TITLE
ELECTRICAL POWER PLAN

SHEET NO.
E2.01

E/B/E Mechanical Electrical Plumbing
CONSULTING ENGINEERS
12603 Southwest Frwy, Ste 170, Stafford, Tx 77477
Tel: (713) 840-0177 / Firm Reg. No: 5638

NORTH



01 PARTIAL ELECTRICAL DISTRIBUTION DIAGRAM

SCALE: NO SCALE

VOLTAGE DROP CALCULATION:

VOLTAGE DROP CALCULATIONS HAVE BEEN PERFORMED. NO CIRCUIT HAS A VOLTAGE DROP HIGHER THAN 3%

ELECTRICAL LOAD ANALYSIS

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00

SERVICE VOLTAGE: 277/480V, 3 PHASE, 4 WIRE, WYE

SERVICE RATING: 400 AMPS

GROSS AREA: 3,703 SQUARE FEET

LOAD DESCRIPTION	CODE LOAD (kVA)	CONNECTED LOAD (kVA)	DEMAND FACTORS (%)	DESIGN LOAD (kVA)	REMARKS
LIGHTS (1.3 VA/FT2):	4.8	1.6	125%	6.0	NEC 220.42, 43, 44, 45
SIGN LIGHTS:		0.5	125%	0.6	NEC 220.14.F
SITE LIGHTS:		0.0	125%	0.0	NEC 220.42, 43, 44, 45
RECEPTACLES:	3.7	0.0	10kVA+50%	3.7	NEC 220.14.H, I, J, K, 220.47
EQUIPMENT:		24.1	100%	24.1	NEC 220.14.A
WATER HEATERS:		0.0	100%	0.0	NEC 220.14.A
HVAC:		0.0	100%	0.0	NEC 220.14.C, 220.50
ELECTRIC HEAT:		0.0	100%	0.0	NEC 220.51
LARGEST MOTOR:		0.0	125%	0.0	NEC 430.22
		TOTAL DESIGN LOAD:		34	kVA
		@ 480V, 3 PHASE:		41	AMPS

NOTE: ALL LOADS AND DEMAND FACTORS ARE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NEC ARTICLE 220

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00
PANEL: L1B — EXISTING PANEL
VOLTAGE: 120/208V, 3PH, 4W — BUS: 100 AMP — MAINS: M.L.O. — ACCESSORIES: — NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
6	989	UC ICE MACHINE	*	20/1	1	A	2	20/1	RECEP.	*	900	1
2	900	PC	*	20/1	3	B	4	20/1	RECEP.	*	540	1
2	900	PC	*	20/1	5	C	6	20/1	RECEP.	*	950	1
2	900	PC	*	20/1	7	A	8	20/1	DISHWASHER	*	2100	6
2	900	PC	*	20/1	9	B	10	20/1	COOLER	*	713	6
2	900	PC	*	20/1	11	C	12	20/1	EXISTING	*	540	1
2	900	PC	*	20/1	13	A	14	20/1	COFFEE MACHINE	*	800	6
1	900	RECEP.	*	20/1	15	B	16	20/1	COPY MACHINE	*	800	2
1	540	RECEP.	*	20/1	17	C	18	20/1	EXISTING	*	540	1
1	900	RECEP.	*	20/1	19	A	20	20/1	ATM	*	1000	2
2	540	NEW DIRECTORY	*	20/1	21	B	22	20/1	EXISTING	*	540	1
2	1000	ATM	*	40/1	23	C	24	20/1	POWER BANK	*	800	2
2	2000	ATM	*	20/1	25	A	26	20/1	FREEZER	*	1188	6
1	540	CORRIDOR REC	*	20/1	27	B	28	20/1	COFFEE MACHINE	*	800	6
6	800	FREEZER	*	20/1	29	C	30	20/1	COFFEE MACHINE	*	800	6
6	240	UNDER COUNTER FRIDGE	****	20/1	31	A	32	20/2	EXISTING	*	800	2
6	1440	COFFEE GRINDER	****	20/1	33	B	34	---	---	*	800	2
6	1528	HOT WATER TOWER	****	20/1	35	C	36	20/2	IDF ROOM RACK	*	800	2
6	1800	BLENDER	****	20/1	37	A	38	---	---	*	800	2
6	2300	ESPRESSO MACHINE	****	30/2	39	B	40	20/2	TURBO CHEF	****	2000	6
6	2300	--	****	--	41	C	42	--	--	****	2000	6

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE			PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
0	1800	11026	0	0	A			A	12.8	LIGHTS @ 125%	12.8	107
0	2520	8654	0	0	B			B	11.2	EQUIP. @ 100%	11.2	93
0	2570	9228	0	0	C			C	11.8	LG. MOTOR @125%	11.8	98
0	6890	28908	0	0	TOTAL			TOTAL	35.8	RECEPS @ 10kW+50%	35.8	99

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

ELECTRICAL DISTRIBUTION DIAGRAM NOTES:

1. CONDUCTOR SIZES SHOWN ARE FOR COPPER CONDUCTORS WITH THWN INSULATION IN EMT (4" C., OR LESS) OR RIGID CONDUIT (> 4" C.) PROVIDE GROUNDING CONDUCTORS FOR ALL CONDUIT. GROUNDING CONDUCTORS ARE NEEDED FOR ALL PVC CONDUIT.
2. SHORT CIRCUIT CURRENT VALUES ARE GIVEN IN RMS SYMETRICAL AMPERES. PREFIX 'FCA' INDICATES MAXIMUM AVAILABLE FAULT CURRENT. PREFIX 'FCLT' INDICATES APPARENT LET-THRU CURRENT FROM UPSTREAM CURRENT LIMITING DEVICE.
3. ELECTRICAL SYSTEM SHALL BE FULLY RATED. SERIES RATED EQUIPMENT IS NOT ACCEPTABLE.
4. PROVIDE FULL LENGTH, FULL SIZE INSULATED GROUND AND NEUTRAL BUS IN ALL PANELBOARDS.
5. REFER TO ELECTRICAL UTILITY SPECIFICATIONS FOR ALL WORK AT SERVICE POINT OF ATTACHMENT.
6. CONTRACTOR TO VERIFY FAULT CURRENT AVAILABLE AT UTILITY TRANSFORMER SECONDARY WITH ELECTRICAL UTILITY FOR THE FINAL SELECTION OF EQUIPMENT AIC RATINGS.
7. SPARES AND SPACES ARE INDICATED ON PANELBOARD SCHEDULES.
8. FLEXIBLE METAL CONDUIT SHALL NOT BE USED IN WET LOCATIONS OR WET AREAS.
9. ALL FEEDER AND BRANCH CIRCUIT WIRING METHODS SHALL INCLUDE AN EQUIPMENT-GROUNDING CONDUCTOR PER NEC.
10. ALL CONDUIT BELOW GRADE OR IN CONCRETE SLABS SHALL BE PVC. MAXIMUM CONDUIT SIZE FOR CONDUIT IN CONCRETE SLABS IS 3/4".
11. A PERMANENTLY AFFIXED LABEL SHALL BE APPLIED WITH THE AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2 X 3 IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION. COH ELECTRICAL CODE 504.1.1.

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00
PANEL: H1(1) — EXISTING PANEL
VOLTAGE: 277/480V, 3PH, 4W — BUS: 400 AMP — MAINS: M.L.O. — ACCESSORIES: — NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
0	1500	LIGHTING GRID	*	20/1	1	A	2	20/1	LIGHTING GRID	*	1000	0
0	1500	LIGHTING GRID	*	20/1	3	B	4	20/1	LIGHTING GRID	*	1000	0
0	1500	LIGHTING GRID	*	20/1	5	C	6	20/1	LIGHTING GRID	*	1000	0
0	1000	LIGHTING GRID	*	20/1	7	A	8	20/1	LIGHTING GRID	*	1000	0
0	1000	LIGHTING GRID	*	20/1	9	B	10	20/1	LIGHTING GRID	*	1000	0
0	1000	LIGHTING GRID	*	20/1	11	C	12	20/1	LIGHTING GRID	*	1000	0
0	1000	LIGHTING GRID	*	20/1	13	A	14	20/1	CORE LIGHTING	*	1000	0
0	1000	LIGHTING GRID	*	20/1	15	B	16	20/1	CORE LIGHTING	*	1000	0
		SPARE	**	20/1	17	C	18	20/1	LOBBY LIGHTING	*	1000	0
4	3000	H20 HEAT	*	20/1	19	A	20	20/1	SOFFIT LIGHTING	*	1000	0
0	1000	EXISTING	*	20/1	21	B	22	20/1	EXISTING	*	1000	0
4	3000	H20 HEAT KIT	*	20/1	23	C	24	20/1	POLE LIGHTING	*	1000	0
1	500	SIGN LIGHT	*	20/1	25	A	26	20/1	SPARE	**		
		SPARE	**	20/1	27	B	28	20/1	SPARE	**		
4	6000	WATER HEATER	****	30/1	29	C	30		SPACE	***		
		SPACE	***		31	A	32	35/3	VAV	*		3
		SPACE	***		33	B	34	---	---	*		3
4	6000	WATER HEATER	*	30/1	35	C	36	---	---	*		3
3	8000	AHU-7	*	70/3	37	A	38	45/3	VAV	*		3
3	8000	---	*	---	39	B	40	---	---	*		3
3	8000	---	*	---	41	C	42	---	---	*		3

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE			PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
7500	500	0	8000	3000	A			A	19.0	LIGHTS @ 125%	20.9	75
8500	0	0	8000	0	B			B	16.5	EQUIP. @ 100%	18.6	67
6500	0	0	8000	15000	C			C	29.5	LG. MOTOR @125%	31.1	112
22500	500	0	24000	18000	TOTAL			TOTAL	65.0	RECEPS @ 10kW+50%	70.6	85

SUB-FEED PANELS:

PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP
PANEL H1(2)	90.0	SUB FEED @ 100%	90.0	108
		GRAND TOTAL	160.6	193

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00
PANEL: L1(1) — EXISTING PANEL
VOLTAGE: 120/208V, 3PH, 4W — BUS: 400 AMP — MAINS: M.L.O. — ACCESSORIES: — NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
2	800	ODC PNL	*	20/1	1	A	2	20/1	EXISTING	*	540	1
2	800	TTB	*	20/1	3	B	4	20/1	OVEN	*	1440	2
1	900	EXTERIOR REC	*	20/1	5	C	6	20/1	TIMECLOCK	*	1000	2
1	540	EXTERIOR REC	*	20/1	7	A	8	20/1	CORE REC	*	900	1
2	800	BUILDING DIRECTORY	*	20/1	9	B	10	20/1	EDF-1	*	50	2
1	900	CORE REC	*	20/1	11	C	12	20/1	CORE REC	*	900	1
1	540	EXISTING	*	20/1	13	A	14	20/1	EXHAUST	*	50	2
1	900	EXISTING	*	20/1	15	B	16	20/1	LTS	*	1000	0
1	540	EXISTING	*	20/1	17	C	18	20/1	LTS	*	1000	0
1	900	EXISTING	*	20/1	19	A	20	20/1	LTS	*	1000	0
1	540	EXISTING	*	20/1	21	B	22	20/1	LTS	*	1000	0
1	900	RECEP.	*	20/1	23	C	24	20/1	LTS	*	1000	0
1	540	RECEP.	*	20/1	25	A	26	20/1	LTS	*	1000	0
1	900	RECEP.	*	20/1	27	B	28	20/1	LTS	*	1000	0
1	540	RECEP.	*	20/1	29	C	30	20/1	LTS	*	1000	0
1	900	EXISTING	*	20/1	31	A	32	20/1	LTS	*	1000	0
7	11174	L1-B	*	100/3	33	B	34	20/1	LTS	*	1000	0
7	11798	--	*	--	35	C	36	20/1	LTS	*	1000	0
7	12826	--	*	--	37	A	38	20/1	LTS	*	1000	0
1	900	RECEP.	*	20/1	39	B	40	20/1	LTS	*	1000	0
1	540	RECEP.	*	20/1	41	C	42	20/1	LTS	*	1000	0

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE			PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
4000	4860	850	0	0	A			A	22.5	LIGHTS @ 125%	9.9	83
5000	3240	3090	0	0	B			B	22.5	EQUIP. @ 100%	12.6	105
5000	5220	1000	0	0	C			C	23.0	LG. MOTOR @125%	11.5	96
14000	13320	4940	0	0	TOTAL			TOTAL	68.1	RECEPS @ 10kW+50%	34.1	95

SUB-FEED PANELS:

PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP
PANEL L1(2)	50.8	SUB FEED @ 100%	50.8	141
PANEL L1B	35.8		35.8	99
		GRAND TOTAL	120.7	335

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00
PANEL: L1(2) — EXISTING PANEL
VOLTAGE: 120/208V, 3PH, 4W — BUS: 225 AMP — MAINS: M.L.O. — ACCESSORIES: — NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
1	900	RECEP.	*	20/1	43	A	44	20/1	LTS	*	1000	0
1	540	EXISTING	*	20/1	45	B	46	20/1	RECEP.	*	900	1
1	900	RECEP.	*	20/1	47	C	48	20/1	RECEP.	*	540	1
1	540	RECEP.	*	20/1	49	A	50	20/1	RECEP.	*	900	1
1	900	RECEP.	*	20/1	51	B	52	20/1	RECEP.	*	540	1
1	540	EXISTING	*	30/1	53	C	54	20/1	RECEP.	*	900	1
0	1000	LTS	*	20/1	55	A	56	20/1	RECEP.	*	540	1
1	900	RECEP.	*	20/1	57	B	58	20/1	RECEP.	*	900	1
1	540	RECEP.	*	20/1	59	C	60	20/1	RECEP.	*	540	1
1	900	RECEP.	*	20/1	61	A	62	20/1	RECEP.	*	900	1
1	540	RECEP.	*	20/1	63	B	64	20/1	RECEP.	*	540	1
1	900	RECEP.	*	20/1	65	C	66	20/1	RECEP.	*	900	1
1	540	RECEP.	*	20/1	67	A	68	30/2	OVEN	*	2000	4
1	900	RECEP.	*	20/1	69	B	70	---	---	*	2000	4
1	540	RECEP.	*	20/1	71	C	72	20/1	RECEP.	*	900	1
1	900	RECEP.	*	20/1	73	A	74	20/1	RECEP.	*	540	1
1	540	RECEP.	*	20/1	75	B	76	20/1	RECEP.	*	900	1
1	900	RECEP.	*	20/1	77	C	78	20/1	RECEP.	*	540	1
1	540	RECEP.	*	20/1	79	A	80	100/3	PANEL LA	*	9516	7
1	900	RECEP.	*	20/1	81	B	82	---	---	*	9980	7
1	540	RECEP.	*	20/1	83	C	84	---	---	*	10864	7

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE			PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
2000	7200	0	0	2000	A			A	20.7	LIGHTS @ 125%	9.8	81
0	9000	0	0	2000	B			B	21.0	EQUIP. @ 100%	8.2	68
0	9180	0	0	0	C			C	20.0	LG. MOTOR @125%	6.3	52
2000	25380	0	0	4000	TOTAL			TOTAL	61.7	RECEPS @ 10kW+50%	24.2	67

SUB-FEED PANELS:

PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP
PANEL A	26.6	SUB FEED @ 100%	26.6	74
		GRAND TOTAL	50.8	141

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00
PANEL: H1(2) — EXISTING PANEL
VOLTAGE: 277/480V, 3PH, 4W — BUS: 400 AMP — MAINS: M.L.O. — ACCESSORIES: — NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
	4000	EXISTING CORE T1, TII	*	35/3	43	A	44	45/3	EXISTING CORE T7, T8	*	5500	
	4000	VAVS T1, TII	*	--	45	B	46	--	VAVS T7, T8	*	5500	
	4000	VAVS T1, TII	*	--	47	C	48	--	VAVS T7, T8	*	5500	
	3000	EXISTING CORE T2, T3	*	25/3	49	A	50	45/3	EXISTING CORE T6	*	5500	
	3000	VAVS T2, T3	*	--	51	B	52	--	VAVS T6	*	5500	
	3000	VAVS T2, T3	*	--	53	C	54	--	VAVS T6	*	5500	
	6000	CORP STEAM BATH	*	50/3	55	A	56		SPACE	***		
	6000	--	*	--	57	B	58		SPACE	***		
	6000	--	*	--	59	C	60		SPACE	***		
		SPACE	***		61	A	62		SPACE	***		
		SPACE	***		63	B	64		SPACE	***		
		SPACE	***		65	C	66		SPACE	***		
		SPACE	***		67	A	68		SPACE	***		
		SPACE	***		69	B	70		SPACE	***		
		SPACE	***		71	C	72		SPACE	***		
		SPACE	***		73	A	74		SPACE	***		
		SPACE	***		75	B	76		SPACE	***		
		SPACE	***		77	C	78		SPACE	***		
		SPACE	***		79	A	80		SPACE	***		
		SPACE	***		81	B	82		SPACE	***		
		SPACE	***		83	C	84		SPACE	***		

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE			PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
24000	0	0	0	0	A			A	24.0	LIGHTS @ 125%	30.0	108
24000	0	0	0	0	B			B	24.0	EQUIP. @ 100%	30.0	108
24000	0	0	0	0	C			C	24.0	LG. MOTOR @125%	30.0	108
72000	0	0	0	0	TOTAL			TOTAL	72.0	RECEPS @ 10kW+50%	90.0	108

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00
PANEL: A — EXISTING PANEL
VOLTAGE: 120/208V, 3PH, 4W — BUS: 100 AMP — MAINS: M.L.O. — ACCESSORIES: — NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
1	560	RECEP.	*	20/1	1	A	2	20/1	RECEP.	*	900	1
6	800	DISHWASHER	*	20/1	3	B	4	20/1	RECEP.	*	560	1
2	50	CASH REGISTER	*	20/1	5	C	6	20/1	PC	*	600	2
6	1440	REFRIGERATOR	*	20/1	7	A	8	20/1	PC	*	600	2
6	800	WINE COOLER FRIDGE	*	20/1	9	B	10	20/1	RECEP.	*	900	1
6	1529	KEGGERATOR + COFFEE GRINDERS	*	20/1	11	C	12	20/1	RECEP.	*	560	1
2	560	AV EQUIPMENT	*	20/1	13	A	14	20/1	RECEP.	*	900	1
2	560	AV EQUIPMENT	*	20/1	15	B	16	20/1	RECEP.	*	560	1
6	800	ICE MAKER	*	20/1	17	C	18	20/1	RECEP.	*	900	1
6	800	REFRIGERATOR	*	20/1	19	A	20	20/1	RECEP.	*	560	1
6	800	COFFEE MAKER	*	20/1	21	B	22	20/1	RECEP.	*	900	1
1	1800	COFFEE MAKER	*	20/1	23	C	24	20/1	W.F.BK	*	560	2
1	560	RECEP.	*	20/1	25	A	26	20/1	RECEP.	*	900	1
1	900	RECEP.	*	20/1	27	B	28	20/1	RECEP.	*	560	1
1	560	RECEP.	*	20/1	29	C	30	20/1	EXPRESSO MACHINE	*	800	2
1	900	RECEP.	*	20/1	31	A	32	20/1	RECEP.	*	560	1
1	560	RECEP.	*	20/1	33	B	34	30/1	AT&T	*	1500	2
1	900	RECEP.	*	20/1	35	C	36	20/1	AV EQUIPMENT	*	560	2
1	560	RECEP.	*	20/1	37	A	38	20/1	L1 37	*	500	2
1	900	RECEP.	*	20/1	39	B	40	20/1	UNDER COUNTER FRIDGE	****	800	6
1	560	RECEP.	*	20/1	41	C	42	30/1	AT&T	*	1500	2

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE			PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
0	6400	3116	0	0	A			A	9.5	LIGHTS @ 125%	8.0	66
0	5840	4140	0	0	B			B	10.0	EQUIP. @ 100%	8.7	73
0	5280	5584	0	0	C			C	10.9	LG. MOTOR @125%	9.9	82
0	17520	12840	0	0	TOTAL			TOTAL	30.4	RECEPS @ 10kW+50%	26.6	74

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

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WOODFOREST TOWN CENTER
WOODLANDS, TEXAS

E/B/E PROJECT NUMBER : 26181.00

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PRINT DATE

09/30/2025

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12603 Southwest Frwy, Ste 170, Stafford, Tx 77477
Tel: (713) 840-0177 / Firm Reg. No: 5638

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00

PANEL: **MSB** EXISTING PANEL
VOLTAGE: 277/480V, 3PH, 4W BUS: 4000 AMP MAINS: M.L.O. ACCESSORIES: NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
		SPACE	***		1	A	2		SPACE	***		
		SPACE	***		3	B	4		SPACE	***		
		SPACE	***		5	C	6		SPACE	***		
2	8967	ATS	*	100/3	7	A	8		SPACE	***		
2	7732	--	*	--	9	B	10		SPACE	***		
2	6978	--	*	--	11	C	12		SPACE	***		
7	40522	XFMR 1	*	175/3	13	A	14		SPACE	***		
7	40694	--	*	--	15	B	16		SPACE	***		
7	39471	--	*	--	17	C	18		SPACE	***		
7	50875	PNL H1	*	400/3	19	A	20		SPACE	***		
7	48625	--	*	--	21	B	22		SPACE	***		
7	61125	--	*	--	23	C	24		SPACE	***		

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE		PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
0	0	8967	0	0	A		A	100.4	LIGHTS @ 125%	9.0	32
0	0	7732	0	0	B		B	97.1	EQUIP. @ 100%	7.7	28
0	0	6978	0	0	C		C	107.6	LG. MOTOR @125%	7.0	25
0	0	23676	0	0	TOTAL		TOTAL	305.0	RECEPS @ 10kW+50%	23.7	28

SUB-FEED PANELS:

PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP
PANEL H1	160.6	SUB FEED @ 100%	160.6	193
PANEL L1	120.7		120.7	145
		GRAND TOTAL	305.0	367

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00

PANEL: **HE** EXISTING PANEL
VOLTAGE: 277/480V, 3PH, 4W BUS: 100 AMP MAINS: M.L.O. ACCESSORIES: NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
0	1500	STAIRWELL B	*	20/1	1	A	2	20/1	EXIT SIGNAGE	*	1500	0
0	1500	STAIRWELL A	*	20/1	3	B	4	20/1	SPARE	**		
0	1500	LEVEL 1 CORRIDOR LIGHTING	*	20/1	5	C	6	20/1	SPARE	**		
0	1500	LEVEL 1 EGRESS LIGHTING	*	20/1	7	A	8	30/3	XFMR XLE	*	4420	7
0	1000	LEVEL 2 CORRIDOR LIGHTING	*	20/1	9	B	10	--	--	*	5020	7
0	1000	LEVEL 2 EGRESS LIGHTING	*	20/1	11	C	12	--	--	*	3860	7
0	1000	LEVEL 3 CORRIDOR LIGHTING	*	20/1	13	A	14		SPACE	***		
0	1000	LEVEL 3 EGRESS LIGHTING	*	20/1	15	B	16		SPACE	***		
0	1000	LEVEL 4 CORRIDOR LIGHTING	*	20/1	17	C	18		SPACE	***		
0	1000	LEVEL 4 CORRIDOR LIGHTING	*	20/1	19	A	20		SPACE	***		
0	1000	LEVEL 5 CORRIDOR LIGHTING	*	20/1	21	B	22		SPACE	***		
0	1000	LEVEL 5 CORRIDOR LIGHTING	*	20/1	23	C	24		SPACE	***		
0	1000	LEVEL 6 CORRIDOR LIGHTING	*	20/1	25	A	26		SPACE	***		
0	1000	LEVEL 6 CORRIDOR LIGHTING	*	20/1	27	B	28		SPACE	***		
0	1000	EXISTING	*	20/1	29	C	30		SPACE	***		

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE		PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
7500	0	0	0	0	A		A	11.9	LIGHTS @ 125%	9.4	34
5500	0	0	0	0	B		B	10.5	EQUIP. @ 100%	6.9	25
5500	0	0	0	0	C		C	9.4	LG. MOTOR @125%	6.9	25
18500	0	0	0	0	TOTAL		TOTAL	31.8	RECEPS @ 10kW+50%	23.1	28

SUB-FEED PANELS:

	PANEL NAME	S.F. KVA	LOAD FACTORS	DES. KVA	DES. AMP
3324	PANEL LE	13.3	SUB FEED @ 100%	13.3	16
			GRAND TOTAL	36.4	44

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

PROJECT NAME: WOODFOREST TOWN CENTER
PROJECT NUMBER: 26181.00

PANEL: **LE** EXISTING PANEL
VOLTAGE: 120/208V, 3PH, 4W BUS: 60 AMP MAINS: M.L.O. ACCESSORIES: NEMA: 1
CODES: 0=LIGHTS 1=RECEP 2=EQUIP 3=A/C 4=HTG 5=125% LGST MTR 6=KITCHEN 7=PREVIOUSLY CALCULATED

CODE	LOAD	CIRCUIT DESCRIPTION		BKR	CKT	PH	CKT	BKR	CIRCUIT DESCRIPTION		LOAD	CODE
1	900	EXISTING	*	20/1	1	A	2	20/1	EXISTING	*	560	1
1	560	EXISTING	*	20/1	3	B	4	20/1	EXISTING	*	900	1
1	900	EXISTING	*	20/1	5	C	6	20/1	EXISTING	*	560	1
1	560	EXISTING	*	20/1	7	A	8	20/1	EXISTING	*	900	1
2	1500	EXISTING	*	30/2	9	B	10	20/1	EXISTING	*	560	1
2	1500	EXISTING	*	--	11	C	12	20/1	EXISTING	*	900	1
		SPACE	***		13	A	14	30/2	EXISTING	*	1500	2
		SPACE	***		15	B	16	--	EXISTING	*	1500	2
		SPACE	***		17	C	18		SPACE	***		
		SPACE	***		19	A	20		SPACE	***		
		SPACE	***		21	B	22		SPACE	***		
		SPACE	***		23	C	24		SPACE	***		
		SPACE	***		25	A	26		SPACE	***		
		SPACE	***		27	B	28		SPACE	***		
		SPACE	***		29	C	30		SPACE	***		

LIGHTS	RECEP.	EQUIP.	MOTORS	EL. HEAT	PHASE		PHASE	CONN.KVA	LOAD FACTORS	DES. KVA	DES. AMP
0	2920	1500	0	0	A		A	4.4	LIGHTS @ 125%	4.4	37
0	2020	3000	0	0	B		B	5.0	EQUIP. @ 100%	5.0	42
0	2360	1500	0	0	C		C	3.9	LG. MOTOR @125%	3.9	32
0	7300	6000	0	0	TOTAL		TOTAL	13.3	RECEPS @ 10kW+50%	13.3	37

* EXISTING CIRCUIT BREAKER - ESTIMATED LOAD
** EXISTING SPARE CIRCUIT BREAKER
*** EXISTING BREAKER SPACE
**** REPLACE EXISTING BREAKER AS SHOWN

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WOODFOREST TOWN CENTER
WOODLANDS, TEXAS

E/B/E PROJECT NUMBER: 26181.00

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E|B|E CONSULTING ENGINEERS Mechanical Electrical Plumbing
12603 Southwest Frwy, Ste 170, Stafford, Tx 77477
Tel: (713) 840-0177 / Firm Reg. No: 5638

DEMOLITION NOTES:

1. CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS IN THE DEMOLITION AREA PRIOR TO SUBMITTING A BID. THE CONTRACTOR SHALL INCLUDE IN HIS BID THE COST OF REPLACEMENT, REPAIR, RELOCATION OR REMOVAL OF EXISTING ELEMENTS AS REQUIRED TO COMPLETE INSTALLATION OF ALL SYSTEMS AS SPECIFIED AND AS SHOWN ON THESE DRAWINGS.
2. THE CONTRACTOR BY SUBMITTING HIS BID PROPOSAL AGREES TO ACCEPT ALL EXISTING SITE CONDITIONS NOT SPECIFICALLY EXPECTED. DISPOSE OF ITEMS REMOVED FROM THE DEMOLITION AREA. REUSE OF ANY EXISTING ITEM ON THIS PROJECT INCLUDING THOSE INDICATED ON THE DRAWINGS TO BE RELOCATED SHALL BE APPROVED BY THE ENGINEER AND SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS. WHERE THESE DRAWINGS CONFLICT WITH EXISTING FIELD CONDITIONS. A RECORD OF THE FIELD CONDITIONS SHALL BE MADE AVAILABLE TO THE OWNER, ENGINEER, AND ARCHITECT.
3. RELOCATE AND RECONNECT ACTIVE PORTIONS OF THE PLUMBING SYSTEM AS INDICATED ON THE DRAWINGS AND AS REQUIRED TO MAINTAIN A COMPLETE AND OPERATING SYSTEM THAT IS FUNCTIONALLY EQUIVALENT TO THE PRE-EXISTING SYSTEM PRIOR TO DEMOLITION.
4. GENERAL CONTRACTOR IS RESPONSIBLE FOR KEEPING AND CAPPING OFF ANY PIPING WITHIN WALLS NOT BEING DEMOLISHED.
5. PLUMBING CONTRACTOR SHALL REMOVE ALL EXISTING SANITARY SEWER LINES UNUSED IN CEILING SPACE. CONTRACTOR TO CAP TO POINT OF USE.
6. ALL UNUSED WATER, WASTE, AND VENT LINES SHALL BE COMPLETELY REMOVED BACK TO POINT OF USE. CAP AND PLUG WASTE, VENT AND WATER LINES BACK TO POINT OF USE ABOVE CEILING.
7. THE PLUMBING DEMOLITION WORK SHALL INCLUDE THE DISCONNECT, REMOVAL AND DISPOSAL OF THE FOLLOWING PIPING AND ASSOCIATED VALVES, FITTINGS, ACCESSORIES AND SUPPORTS: DOMESTIC COLD WATER, HOT WATER, SANITARY VENT AND SANITARY WASTE.
8. EXISTING PIPING AND EQUIPMENT LOCATIONS ARE SCHEMATICS. CONTRACTOR TO FIELD VERIFY SIZE, LOCATION AND ELEVATION OF EXISTING PIPING PRIOR TO START OF WORK.
9. EXISTING PIPING, FIXTURES AND EQUIPMENT THAT ARE NOT TO BE REUSED SHALL BE REMOVED AND SHALL REMAIN PROPERTY OF THE OWNER IF THEY WISH TO RETAIN OWNERSHIP OF REMOVED EQUIPMENT. IF NOT, EQUIPMENT SHALL BECOME PROPERTY OF THE GENERAL CONTRACTOR AND REMOVED FROM THE SITE AS SOON AS POSSIBLE AND DISPOSED OF ACCORDANCE TO APPLICABLE LAWS AND REGULATIONS.
10. WHERE EXISTING PIPING AND EQUIPMENT THAT ARE TO BE UTILIZED IN THE COMPLETED PROGRAM CONFLICT WITH NEW CONSTRUCTION AND THE REQUIRED DEMOLITION, THEY SHALL BE RELOCATED AND RECONNECTED TO MAINTAIN THE DESIRED SERVICE.
11. ALL WORK MUST BE COORDINATED AND SCHEDULED WITH THE OWNER AND OCCUPANTS OF THIS BUILDING SO AS TO PROVIDE THE LEAST AMOUNT OF DISRUPTION OF BUILDING ACTIVITIES AS POSSIBLE.

GENERAL NOTES:

1. ALL CONTRACT DOCUMENTS (SPECIFICATIONS AND DRAWINGS), I.E., ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL ARE COMPLEMENTARY AND MUST BE USED IN COMBINATION TO OBTAIN COMPLETE CONSTRUCTION INFORMATION.
2. ALL CONFLICTS, WHICH MAY PREVENT THE COMPLETION OF WORK AS INTENDED, SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION. THE CONTRACTOR SHALL NOT PROCEED WITH ANY RELATED WORK UNTIL ALL CONFLICTS ARE RESOLVED AND THE CLARIFYING INFORMATION IS ISSUED TO THE CONTRACTOR BY THE ARCHITECT.
3. IT IS THE INTENTION OF THESE DRAWINGS TO CALL FOR FINISHED WORK, I.E., FULLY ADJUSTED, TESTED, AND READY FOR OPERATION. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN, "FURNISH AND INSTALL COMPLETE AND READY FOR USE."
4. THE PLUMBING DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EVERY COMPONENT AND/OR ACCESSORY REQUIRED FOR A COMPLETE INSTALLATION. THE CONTRACTOR SHALL INCLUDE SUCH ITEMS AS ARE REQUIRED TO ENSURE THAT THE ENTIRE SYSTEM IS FUNCTIONING IN COMPLIANCE WITH APPLICABLE CODES, ACCEPTED INDUSTRY STANDARDS, AND MANUFACTURER'S INSTALLATION REQUIREMENTS/RECOMMENDATIONS UPON COMPLETION OF THE WORK.
5. ALL CUTTING, DRILLING AND PATCHING OF WALLS, FLOORS, AND/OR STRUCTURAL MEMBERS FOR THE INSTALLATION OF THE PLUMBING AND FIRE PROTECTION SYSTEMS SHALL BE PROVIDED. STRUCTURAL COMPONENTS SHALL NOT BE CUT, DRILLED OR MODIFIED IN A WAY WITHOUT THE STRUCTURAL ENGINEER'S REVIEW AND PRIOR WRITTEN APPROVAL.
6. PROVIDE NFPA APPROVED FIRE STOPPING WHERE PIPES PENETRATE FIRE RATED FLOORS AND WALLS.

PLUMBING NOTES:

1. MEP SPECIFICATIONS SHALL APPLY TO ALL WORK ON THIS DRAWING UNLESS OTHERWISE NOTED.
2. ALL CONNECTIONS BETWEEN PIPES OF DISSIMILAR MATERIALS SHALL BE MADE WITH DIELECTRIC UNIONS. PROVIDE ACCESS PANELS WHERE REQUIRED.
3. CONTRACTOR SHALL NOTIFY OWNER OF ANY REQUIRED SHUT DOWNS AND COORDINATE THESE WITH OWNER. DOWNTIME SHALL BE HELD TO A MINIMUM.
4. CONTRACTOR SHALL COORDINATE ALL WORK CLOSELY WITH EXISTING AND NEW MECHANICAL AND ELECTRICAL ITEMS.
5. ALL PROPOSED CORE DRILL LOCATIONS THROUGH (E) FLOOR SLAB ARE TO BE COORDINATED WITH AND APPROVED BY THE OWNER PRIOR TO CORING.
6. CONTRACTOR SHALL REFER TO BUILDING MANAGEMENT'S "RULES AND REGULATIONS" TO COMPLY WITH BUILDING STANDARDS.
7. COORDINATE PLUMBING FIXTURE SIZES WITH MILLWORK PRIOR TO INSTALLATION. COORDINATE ROUGH-IN ELEVATIONS WITH MOUNTING HEIGHTS.
8. DEMOLISH ANY ABANDONED PVC PIPING IN CEILING SPACE. REPLACE ANY EXISTING PVC PIPING STILL IN SERVICE WITH APPROVED MATERIALS. PROVIDE A SEPARATE LINE ITEM PRICE.
9. NEW DOMESTIC WATER SHUT-OFF VALVES TO BE NIBCO MODEL NO. T-585-66-LF. FURNISH WITH EXTENDED STEM FOR VALVES IN INSULATED LINES.
10. REFER TO ARCHITECTURAL DRAWING FOR EXACT LOCATION OF ALL WALLS AND CHASES.
11. REFER TO RISER DIAGRAMS FOR PIPE SIZES NOT SHOWN ON THE DRAWINGS.
12. PER COMMERCIAL ENERGY CODE, ALL HOT WATER PIPING SHALL BE INSULATED: 12. 1-1/4" AND BELOW 1 1/2" REQUIRED, 1-1/2" AND ABOVE 2" REQUIRED PER TABLE 6.8.3. REFER TO SPECS. FOR ADDITIONAL INFORMATION.

FIRE PROTECTION NOTES:

1. PROVIDE A COMPLETE FULLY AUTOMATIC WET PIPE SYSTEM HYDRAULICALLY CALCULATED IN ACCORDANCE WITH THE STATE FIRE MARSHAL AND THE LATEST EDITION N.F.P.A. 13, 14, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION.
2. ALL FIRE PROTECTION EQUIPMENT, I.E. PIPING, VALVES, FITTINGS AND ACCESSORIES, ETC. SHALL BE RATED FOR A MAXIMUM WORKING PRESSURE OF 250 PSI.
3. PROVIDE PRESSURE REDUCING VALVES AT ALL SPRINKLER SYSTEM AND FIRE DEPARTMENT HOSE CONNECTIONS WHERE PRESSURES EXCEED 175 PSIG IN ACCORDANCE WITH CODE REQUIREMENTS. CONTRACTOR SHALL FIELD PRESSURE TEST SYSTEM AND DETERMINE WHERE PRESSURE REDUCING VALVES ARE REQUIRED.
4. USE PIPING AND FITTINGS FOR FIRE SUPPRESSION SYSTEMS WHICH ARE APPROVED FOR USE BY UNDERWRITERS' LABORATORIES AND FACTORY MUTUAL SYSTEM ANDS OF THE FOLLOWING TYPES; AND IN ACCORDANCE WITH NFPA, LOCAL CODES ALL AUTHORITIES HAVING JURISDICTION.

   a) BLACK STEEL PIPING: MANUFACTURED TO SATISFY ASTM STANDARDS A53 OR A135.
5. ALL SPRINKLER PIPING SHALL BE INSTALLED SO THAT ALL PORTIONS OF THE SYSTEM CAN BE DRAINED BACK THROUGH THE DRAIN VALVE WHERE REQUIRED. PROVIDE DRAIN VALVES FOR ALL TRAPPED PORTIONS OF THE SYSTEM.
6. ALL FIRE EQUIPMENT THREADS SHALL CONFORM TO LOCAL FIRE DEPARTMENT STANDARDS.
7. ALL CONTROL VALVES – CHECK VALVES AND FLOW ALARM SWITCHES LOCATED ABOVE FINISHED CEILING SHALL BE ACCESSIBLE AND HAVE A NOTIFICATION MARKING TAG AS REQUIRED FOR INSPECTION VERIFICATION.
8. CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL PLUMBING/SPRINKLER PIPING TO MAINTAIN PROPER CLEARANCES OVER AREA.

PLUMBING FIXTURE AND CONNECTION SCHEDULE

SYMBOL	DESCRIPTION	SIZE OF CONNECTION TRAP	SS	SV	CW	HW	REMARKS	WATER CONSERVATION
SK-1	SINK	1 1/4"	2"	2"	1/2"	1/2"	REGENCY No. 60DI1101410K SINGLE COMPARTMENT STAINLESS STEEL DROP-IN SINK, 16 GAUGE SELF-RIMMING (13" x 19" x 18" DEEP). PROVIDE TMV-1, RIGID/SWING GOOSENECK SPOUT WITH E3-2 AERATOR, CHICAGO No. 1017, ANGLE SUPPLIES WITH STOP, 1/2" CHROME-PLATED BRASS NIPPLES TO WALL, McGUIRE No. 151-A CRUMB CUP STRAINER, No. 8912 (1-1/2") ADJUSTABLE SEMI-CAST CHROME-PLATED BRASS P-TRAP WITH TUBING WASTE TO WALL AND CHROME-PLATED CAST WALL FLANGE WITH SET SCREW SUPPLIES, AND P-TRAP SHALL BE INSULATED WITH TRAP WRAP BY PLUMBEREX SPECIALTY PRODUCTS,INC OR APPROVED EQUAL.	
HS-1	HAND SINK	1 1/4"	2"	2"	1/2"	1/2"	WALL MOUNTED HAND SINK. SEE ARCHITECTURAL PLANS FOR EXACT SPEC	
SK-2	3 COMPARTMENT SINK	1-1/2"	2"	2"	1/2"	1/2"	STAND ALONE 3 COMPARTMENT SINK. SEE ARCHITECTURAL PLANS FOR EXACT SPEC	
WF-1	WATER FILTER	–	–	–	3/4"	–	AQUA PURE MODEL NO 7900CLOKITM OR 7900CLOCARTM	
FD-1	FLOOR DRAIN	3"	3"	2"	1/2"		J.R. SMITH FIGURE No. 2005Y-A06NB-P OR APPROVED EQUAL PAINTED CAST IRON FLOOR DRAIN AND SEEPAGE FLANGE, SIZE AS NOTED ON DRAWINGS, CLAMPING UNIT, QUAD CLOSE TRAP SEAL, AND 6" ROUNDE ADJUSTABLE POLISHED NICKEL BRONZE STRAINER TYPE TOP AND DEEP SEAL TRAP.	
TMV-1	THERMOSTATIC MIXING VALVE	–	–	–	1/2"	–	SYMMONS NO #B210CK THERMOSTATIC MIXING VALVE CONSTRUCTION SHALL BE ROUGH BRASS AND BRONZE WITH BRASS AND STAINLESS STEEL FLOW CONTROL COMPONENTS, WITH INTEGRAL CHECKS AND VALVES. 360 DEGREES HANDLE ADJUSTMENT FOR TEMPERATURE SELECTION. @ 110 F. MAX	
ATP-1	AUTOMATIC TRAP PRIMER	–	–	–	1/2"	–	PRECISION PRODUCTS "PRIME-RITE" TRAP PRIMER MODEL # PRO1-500.	
TS-1	TIME SWITCH	–	–	–	3/4"	–	TORK ELECTROMECHANICAL 24 HOUR TIME SWITCH POWERED BY A SELF STARTING SYNCHRONOUS MOTOR. INSTALL ON WALL ADJACENT TO CIRCULATING PUMP. COORDINATE WITH ELECTRICAL AND PROVIDE FOR 120/1/60 HZ POWER REQUIREMENT.	
BFP-1	BACKFLOW PREVENTER	–	–	–	3/8"	–	WATTS No. LF7. 1/4" BACKFLOW PREVENTER WITH BRONZE. LEAD FREE.	
FD-1	FLOOR DRAIN	3"	2"	2"	1/2"	–	J.R. SMITH FIGURE No. 2005Y B06NB-P OR APPROVED EQUAL PAINTED CAST IRON FLOOR DRAIN AND SEEPAGE FLANGE, SIZE AS NOTED ON DRAWINGS, CLAMPING UNIT, TRAP PRIMER TAP, AND 6"x6" SQUARE ADJUSTABLE POLISHED NICKEL BRONZE STRAINER TYPE TOP AND DEEP SEAL TRAP.	
FS-1	FLOOR SINK	3"	2"	2"	1/2"	–	J.R. SMITH FIGURE No. 3101C-12 OR APPROVED EQUAL 8"x8" PAINTED CAST IRON FLOOR DRAIN WITH SEDIMENT BUCKET, 1/2" GRATE, SIZE AS NOTED ON PLANS, CLAMPING UNIT, TRAP PRIMER TAP AND DEEP SEAL TRAP.	

WATER HEATER SCHEDULE

MARK	SERVICE	STORAGE IN GALLONS	RECOVERY AT 100° RISE	ELECTRICAL	ELEMENT WATTS	MAKE AND MODEL
EWH-1	ELECTRIC WATER HEATER	20	12 GPH	277/1ø/60Hz	6KW	A.O. SMITH MODEL NO. DEL-20. PROVIDE WITH WATERCOP LEAKSTOP+ LEAK DETECTION SYSTEM.

PUMP SCHEDULE

MARK	LOCATION	SERVICE	GPM	HEAD FT.	MIN. EFF.	HP	VOLTS/Ø	RPM	MAKE AND MODEL
HWCP-1	LEVEL 1	DOMESTIC HOT WATER	9	7	--	1/15	120/1ø	1750	BELL & GOSSET SERIES 100, 1-1/4" FLANGED ALL BRONZE, INLINE TYPE

PLUMBING LEGEND

SYMBOL	DESCRIPTION
	SANITARY SEWER PIPING
	VENT PIPING
	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	DOMESTIC HOT WATER RETURN
	EXISTING SANITARY SEWER PIPING
	EXISTING VENT PIPING
	EXISTING DOMESTIC COLD WATER
	EXISTING HOT WATER
	EXISTING HOT WATER RETURN
	NEW CONNECTION TO EXISTING
AFF	ABOVE FINISHED FLOOR
BF	BELOW FLOOR
	GATE VALVE
	CHECK VALVE
	PRESSURE RELIEF VALVE
	UNION
	PRESSURE GAUGE
	THERMOMETER
D	CONDENSATE DRAIN LINE
(E)	EXISTING
(D)	ITEMS TO BE REMOVED
	ELBOW UP
	ELBOW RISE OR DN. THROUGH SLAB
	FLOOR CLEANOUT
	CLEANOUT
	FLOOR DRAIN

DISREGARD LEGEND ITEMS NOT INDICATED ON DRAWINGS

PIPING MATERIAL SCHEDULE

PIPING FUNCTION	PIPING MATERIAL
SANITARY WASTE BELOW GRADE	SCHEDULE 40 PVC
SANITARY WASTE ABOVE GROUND	NO-HUB CAST IRON
SANITARY VENT	NO-HUB CAST IRON
DOMESTIC HOT & COLD WATER	COPPER, TYPE "L" HARD DRAWN
FIRE SPRINKLER ABOVE GROUND	BLACK STEEL SCHEDULE 40

NOTE:
NO HUB COUPLING SHALL HAVE A SHIELD CONSTRUCTED OF 304 CORRUGATED STAINLESS STEEL WITH A MINIMUM THICKNESS OF .016. COUPLING SIZE 1-1/2" – 4" SHALL HAVE FOUR (4) BANDS: APPROVED MANUFACTURES HUSKY SD 4000 AND MISSION. NO TWO BANDS ARE ACCEPT

LEGEND OF PLUMBING SYMBOLS

DISREGARD LEGEND ITEMS NOT INDICATED ON DRAWINGS

FIXTURES

SYMBOLS	DESCRIPTION	SIZE OF CONNECTION SANITARY	TRAP	VENT	C.W.	H.W.	I.W.
W C	WATER CLOSET (FLUSH VALVE)	4"	–	2"	1"	–	–
U	URINAL	2"	–	2"	3/4"	–	–
L	LAVATORY	2"	1-1/4"	1-1/4"	1/2"	1/2"	–
BT	BATH TUB	2"	1-1/2"	1-1/2"	1/2"	1/2"	–
MS	MOP SINK	–	2"	2"	1/2"	1/2"	–
SK-"X"	SINK (BY ARCHITECT)	–	1-1/2"	2"	1/2"	1/2"	–
SH	SHOWER	–	2"	2"	1/2"	1/2"	–
EDF	ELECTRIC DRINKING FOUNTAIN	–	1-1/4"	1-1/4"	1/2"	–	–
DF	DRINKING FOUNTAIN	–	1-1/4"	1-1/4"	1/2"	–	1/2"

SHOCK ARRESTOR SCHEDULE

SYMBOL	DESCRIPTION	P.D.I. FIXTURE UNIT RATING	TYPE NO. PPP
SA-A	SHOCK ARRESTOR	1-11	SC-500
SA-B	SHOCK ARRESTOR	12-32	SC-750
SA-C	SHOCK ARRESTOR	33-60	SC-1000
SA-D	SHOCK ARRESTOR	61-113	SC-1250

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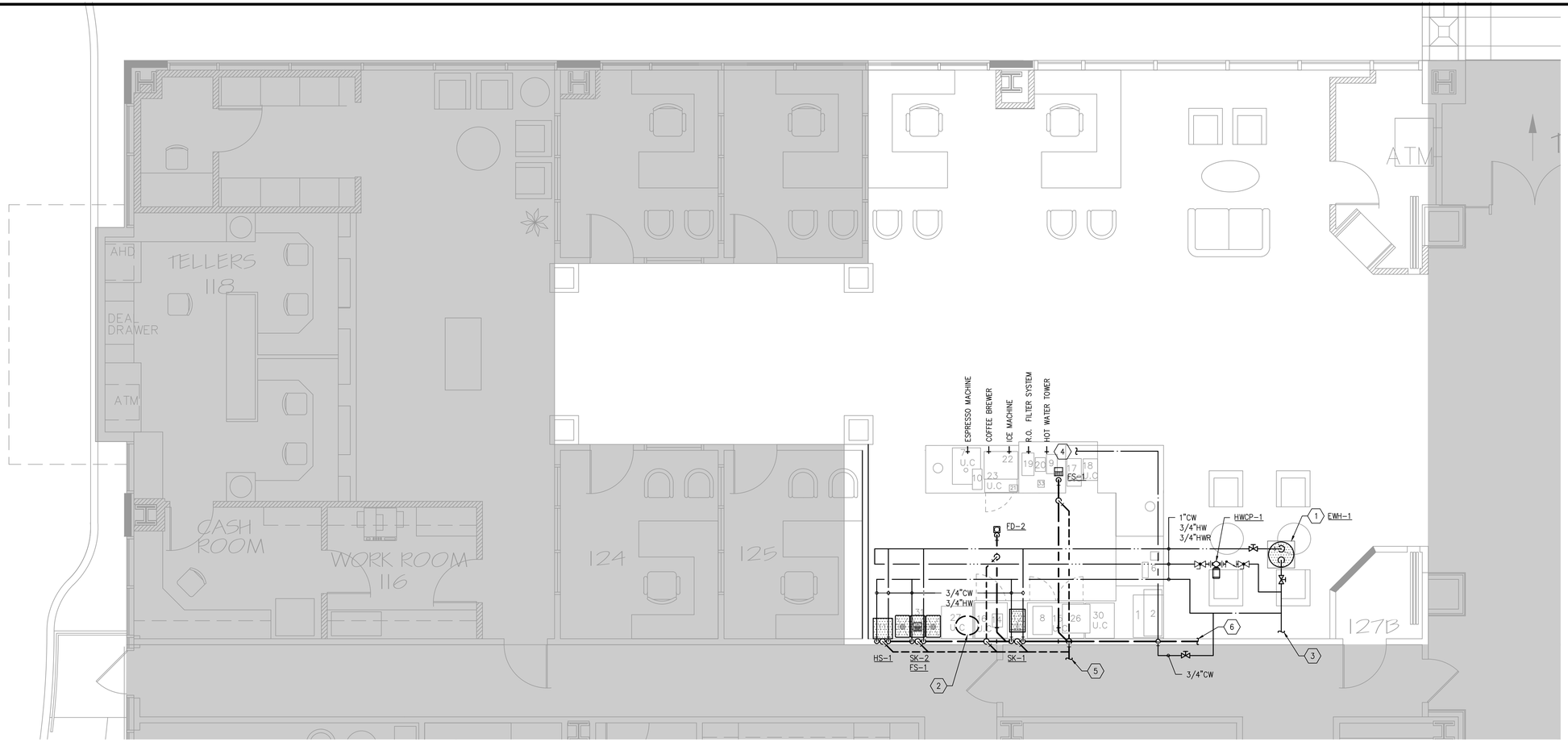

01 PLUMBING PLAN
SCALE: 1/4"=1'-0"

BACKFLOW PREVENTION ASSEMBLY REQUIREMENTS

TYPE OF EQUIPMENT OR SYSTEM	METHOD OF CROSS CONNECTION CONTROL	MANUFACTURER AND MODEL NUMBER	REMARKS
COFFEE BREWER	DOUBLE CHECK VALVE	WATTS LF7	WITH QUARTER TURN VALVES AND BRONZE STRAINER. NOTE A AND B.
ICE MACHINE	DOUBLE CHECK VALVE	WATTS LF7	WITH QUARTER TURN VALVES AND BRONZE STRAINER. NOTE A AND B.
R.O. FILTER SYSTEM	DOUBLE CHECK VALVE	WATTS LF7	WITH QUARTER TURN VALVES AND BRONZE STRAINER. NOTE A.
ESPRESSO MACHINE	DOUBLE CHECK VALVE	WATTS LF7	WITH QUARTER TURN VALVES AND BRONZE STRAINER. NOTE A AND B.
HOT WATER TOWER	DOUBLE CHECK VALVE	WATTS LF7	WITH QUARTER TURN VALVES AND BRONZE STRAINER. NOTE A AND B.
HOT WATER DISPENSER	DOUBLE CHECK VALVE	WATTS LF7	WITH QUARTER TURN VALVES AND BRONZE STRAINER. NOTE A AND B.

COMMENTS:

1. CONTRACTOR SHALL PROVIDE INDIVIDUAL BACKFLOW PREVENTERS FOR EACH PIECE OF EQUIPMENT.
2. EACH BACKFLOW PREVENTER MUST HAVE TESTING PORTS.
3. CONTRACTOR SHALL TEST BACKFLOW PREVENTER AND PROVIDE COPY OF TEST TO HEALTH DEPARTMENT.
4. SPLIT OR TEE WATER LINE BEFORE BACKFLOW PREVENTER IF USING LINE RO PROVIDE WATER TO OTHER FIXTURES OR EQUIPMENT.

NOTES:

A. NO COPPER OR BRASS FITTINGS DOWNSTREAM OF BACKFLOW PREVENTER.
B. WATER FILTRATION BEFORE BACKFLOW PREVENTER.

PLUMBING KEYED NOTES:

1. NEW WATER HEATER SUSPENDED ABOVE ACCESSIBLE CEILING. COORDINATE WITH MEP IN THE AREA. REFER TO DETAILS.
2. EXISTING SINK TO BE REMOVED. CUT AND CAP WASTE AND WATER CONNECTIONS BACK TO POINT OF USE AS REQUIRED.
3. CONNECT NEW 1" COLD WATER TO EXISTING WATER ABOVE CEILING. VERIFY SIZE AND LOCATION PRIOR TO START OF WORK.
4. ROUTE COMMON 3/4" COLD WATER LINE FOR PLUMBING EQUIPMENT WITHIN COFFEE BAR.
5. CONNECT NEW 2" VENT TO EXISTING VENT RISER ABOVE CEILING. PROVIDE CAPPED TEE FOR FUTURE. VERIFY SIZE AND LOCATION PRIOR TO START OF WORK.
6. CONNECT NEW 3" WASTE TO EXISTING WASTE STACK. VERIFY SIZE AND LOCATION PRIOR TO START OF WORK.

EXISTING PLUMBING PIPING LOCATIONS SHOWN ON THIS DRAWING ARE APPROXIMATE. FIELD VERIFICATION IS REQUIRED. LOCATIONS SHOWN ARE BASED UPON LIMITED SITE SURVEY INFORMATION. COORDINATE FOR EXACT LOCATIONS OF NEW PLUMBING EQUIPMENT FOR COFFEE BAR WITH ARCHITECT.

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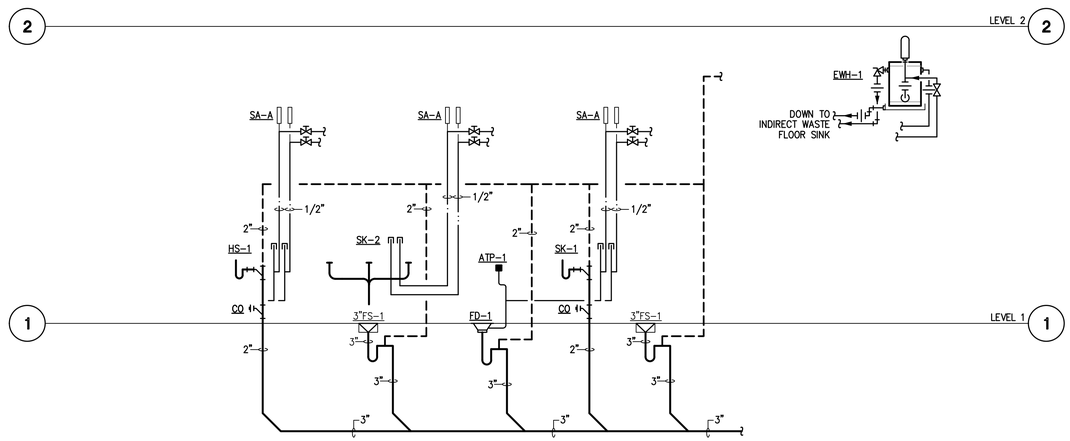

01 PLUMBING RISER DIAGRAM

SCALE: NONE

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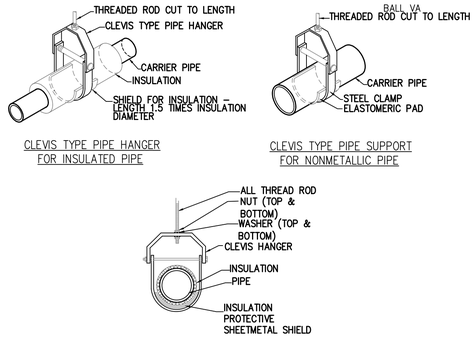


CLEVIS TYPE PIPE HANGER FOR INSULATED PIPE

CLEVIS TYPE PIPE SUPPORT FOR NONMETALLIC PIPE

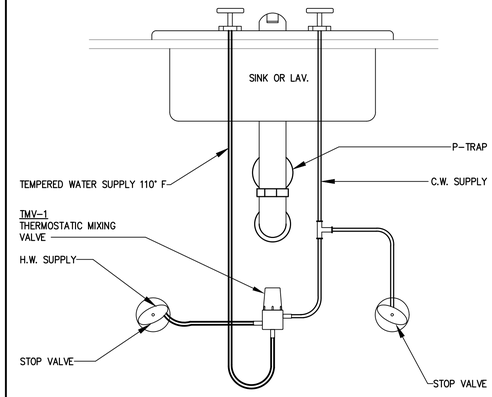
TYPICAL CLEVIS HANGER DETAIL

NOTES:

1. REFER TO MANUFACTURERS SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. 16 GA. GALVANIZED SHEET STEEL SADDLE AT LEAST 12" LONG. (INSULATED LINES ONLY)
3. INSULATION WHERE SPECIFIED.

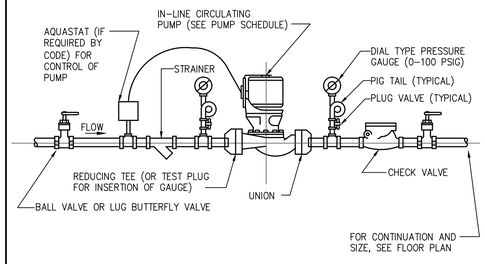
CLEVIS PIPE HANGER SUPPORT DETAIL 01

SCALE: NONE



THERMOSTATIC MIXING VALVE TMV-1 02

SCALE: NONE



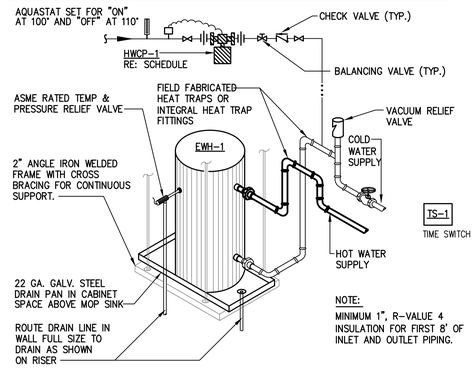
TS-1

TIME SWITCH OPERATION:

1. TIME SWITCH TO OPERATE DURING NORMAL OPERATIONS UNDER A PRESET SCHEDULE.
2. TIME SWITCH TO TURN ON AND OFF PUMP MOTORS ACCORDING TO THE SET SCHEDULE

IN-LINE CIRCULATING PUMP 03

SCALE: NONE



NOTE: CONTRACTOR TO COORDINATE WITH STRUCTURAL ENGINEER FOR PROPER INSTALLATION OF ANCHORS.

CONTRACTOR TO COORDINATE WITH BUILDING MANAGEMENT TO CONNECT THE FLOOD STOPPER TO THE BAS SYSTEM.

ELECTRICAL WATER HEATER DETAIL 04

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