RESPONSIBILITY SCHEDULE

	FURNISHED AND INSTALLED BY AT&T CORPORATE	FURNISHED BY A.L.L. INSTALLED BY A.L.L.	FURNISHED & INSTALLED BY GC# CONTRACTOR	FURNISHED AND INSTALLED BY AT&T	FURNISHED & INSTALLED BY AT&T'S CONTRACTOR	FURNISHED AND INSTALLED BY A.L.L.	FURNISHED & INSTALLED BY AT&T'S CONTRACTOR	INSTALLED BY AT&T'S CONTRACTOR	PATCHING - SC LANDLORD & OWNER	PROVIDED BY A.L.L. VENDOR	PROVIDED AND INSTALLED BY A.L.L. VENDOR	PURCHASED BY OWNER(S)	FACILITY AND REPAIR BY TENANT CONTRACTOR	ALL & BOC AS NEEDED BY TENANT CONTRACTORS	NOT APPLICABLE
GENERAL REQUIREMENTS															
DEMOLITION															●
ASBESTOS REMOVAL															●
PERMITS, FEES, INSURANCE						●									○
TEMPORARY UTILITIES						●									○
TRASH REMOVAL						●									○
CERTIFICATE OF OCCUPANCY						●									○
PROFESSIONAL CLEANING						●									○
STOREFRONT BARRICADE								●							●
STOREFRONT GLAZING AND FRAME								●							●
SECURITY GRILLE															●
CONCRETE / STEEL															
COMPACT FILL	●														○
CONCRETE SLAB	●														○
CONCRETE TOPPING	●														○
STRUCTURAL STEEL FRAMING	●														○
STRUCTURAL STEEL CONNECTIONS/ANCHOR	●														○
TEMPORARY SHORING & BRACING	●														●
MECHANICAL															
ROOF PENETRATIONS, CURBING, FLASHING						●									○
HVAC DUCTWORK						●									○
HVAC UNIT(S)						●									○
THERMOSTATS & CONTROL WIRE						●									○
SPRINKLER SYSTEM						●									○
PLUMBING															
TOILET RM. FIXTURES						●									○
ROUGH-IN						●									○
WATER FOUNTAIN						●									○
UTILITY SINK						●									○
FINAL CONNECTIONS & VENTS						●									○
ELECTRICAL															
METERS						●									○
PANELS & EQUIPMENT						●									○
LIGHT FIXTURES - SALES AREA							●								○
LIGHT FIXTURES - ALL OTHER ROOMS/AREAS						●									○
EXIT AND EMERGENCY LIGHTING						●									○
JUNCTION BOXES						●									○
TELEPHONE & CABLE						●									○
REGISTER P.O.S.				●		●									○
SECURITY SYSTEM						●		●							○
STEREO SYSTEM	●					●									○
FIRE ALARM SYSTEM						●									○
CARPENTRY															
DEMISING WALL (STUDS/DRYWALL)						●									○
INTERIOR PARTITIONS (STUDS/DRYWALL)						●									○
"SALES" AREA FIXTURES							●			●					○
BACK-OF-HOUSE FIXTURES						●									○
BREAK COUNTERS				●											○
STOREFRONT SILL								●							○
DOORS															
STOREFRONT ENTRANCE DOOR AND HARDWARE								●							○
REAR SERVICE DOOR AND HARDWARE								●							○
INTERIOR DOORS AND HARDWARE						●									○
TOILET ROOM DOOR AND HARDWARE						●									○
SIGNS															
INTERIOR SIGNAGE						●									○
STOREFRONT SIGNAGE				●											○
JUNCTION BOX @ SIGN LOCATIONS								●							○
SIGN PERMIT								●							○
WALL FINISHES															
PAINT						●									○
FRP PANELS						●									○
CEILING															
LAY-IN ACOUSTIC CEILINGS - SALES AREA							●			●					○
LAY-IN ACOUSTIC CEILINGS - BACK OF HOUSE						●									○
GYP. BD. SOFFITS						●									●
GYP. BD. CEILINGS						●									●
FLOORING															
LVT - SALES AREA							●			●					○
WOOD FLOORING						●									●
VINYL TILE FLOORING						●									○
CERAMIC TILE FLOORING						●									●
MALL TILE						●									●
TRANSITION STRIP						●									○
WALL BASE						●									○
MISCELLANEOUS EQUIPMENT															
QMI CABINET	●														○
FIRE EXTINGUISHERS	●														○
DESKS & CHAIRS						●									○
TOILET ROOM ACCESSORIES						●									○
TOILET ROOM EQUIPMENT						●									○
SHOPPERTRAK						●									○

GRAPHIC LEGEND

NEW PARTITION AND PARTITION TYPE DESIGNATION

ELEVATION DESIGNATION: ← ELEVATION NUMBER ← SHEET NUMBER

SECTION DESIGNATION: ← SECTION NUMBER ← SHEET NUMBER

DETAIL DESIGNATION: ← DETAIL NUMBER ← SHEET NUMBER

FINISH DESIGNATION

EQUIPMENT DESIGNATION

KEY NOTE

LEVEL DATUM & ELEVATION POINT

SALES AREA — ROOM NAME

000 — ROOM NUMBER

— DOOR DESIGNATION – REFER TO DOOR SCHEDULE ON A-6.2

N — TRUE NORTH

PROJECT NORTH

1 — "CLOUDED AREA REVISED"

CONTACTS

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CONTACT: NIKKI NORVELL

AT&T AUTHORIZED RETAILER (TENANT)
PORTABLE COMMUNICATIONS
PHONE: (202) 286-4444
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VENDORS
GRAINGER
PHONE: (404) 806-8288
EMAIL: ATT@GRAINGER.COM
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MIDWEST CUSTOM CASE
27 EAST 36TH PLACE
STEGER, IL. 60475
PHONE: (708) 672-2900
CONTACT: DANIEL CLADIS

AR M&E 2025
INTERIOR FIT-OUT FOR:
NORTHEAST CORNER OF STATE HIGHWAY 131 AT N. HIGHWAY 75
MELISSA, TX. 75454

AT&T

BUILDING CODE DATA & ANALYSIS

CODES

BUILDING CODE:	2021 INTERNATIONAL BUILDING CODE*
ELECTRICAL CODE:	2020 NATIONAL ELECTRIC CODE*
MECHANICAL CODE:	2021 INTERNATIONAL MECHANICAL CODE*
PLUMBING CODE:	2021 INTERNATIONAL PLUMBING CODE*
ACCESSIBILITY:	2010 ICC/ANSI 117.1/2017*
	2012 TEXAS ACCESSIBILITY STANDARDS

"*": WITH LOCAL AMENDMENTS

OCCUPANCY	GROSS SQUARE FOOTAGE	AREA ALLOCATED PER PERSON	NUMBER OF OCCUPANTS
SALES AREA	1,265 SQ. FT.	60 SQ. FT.	14 PERSONS
BACK OF HOUSE	374 SQ. FT.	150 SQ. FT.	3 PERSONS
TOTAL OCCUPANT LOAD:			17 PERSONS

EGRESS

REQUIRED	2 EXITS		
PROVIDED	2 EXITS		
SECTION 1005	EGRESS WIDTH PER OCCUPANT (INCHES)	NUMBER OF OCCUPANTS	TOTAL EGRESS WIDTH (INCHES)
REQUIRED	.2	17	3.4
PROVIDED			34
EXIT DOOR REMOTENESS			
OVERALL DIAGONAL DISTANCE			65'-0"
1/3 DIAGONAL DISTANCE (MIN. REQ'D.)			26'-6"
DISTANCE PROVIDED			79'-3"

EXIT TRAVEL DISTANCE

MAX. ALLOWABLE	250'-0"
MAX. PROVIDED	79'-3"

TABLE 403.1 — MERCANTILE — OCCUPANT LOAD: 17

	WATER CLOSETS	LAVATORIES	SERVICE SINK	WATER FOUNTAIN
REQUIRED	1 PER 500	1 PER 750	1	1
PROVIDED	1	1	1	1

STATISTICS	EXISTING SPACE	PROPOSED ALTERATION
IBC OCCUPANCY CLASSIFICATION	M	M
TYPE OF CONSTRUCTION (SHELL BLDG.)	III-B	III-B
FLOOR AREA OF RENOVATION	1,639 SQ. FT.	1,639 SQ. FT.
STORIES ABOVE GRADE (TENANT)	1	1
HIGH RISE (SHELL BLDG.)	N	N
COVERED MALL (SHELL BLDG.)	N	N
FULLY SPRINKLERED	Y	Y
STORIES ABOVE GRADE (SHELL BLDG.)	1	1

GENERAL NOTES

1. THE CONTRACTOR SHALL VISIT THE PROJECT SITE, INVESTIGATE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS PRIOR TO BIDDING THE PROJECT. ADDITIONAL COSTS WILL NOT BE AWARDED FOR EXISTING CONDITIONS WHICH ARE VISIBLE AND/OR CAN BE REASONABLY ANTICIPATED.
2. ALL CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
3. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK OF ALL UTILITY COMPANIES.
4. PROVIDE SHORING AND BRACING IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.

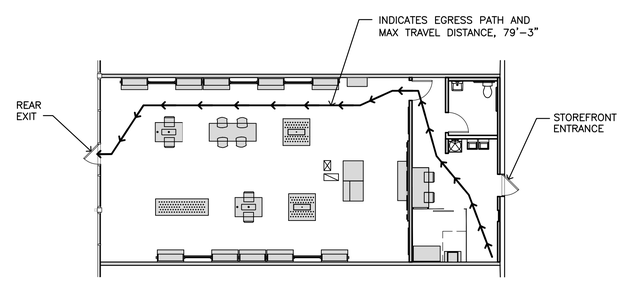
SHEET INDEX

CS COVER SHEET
TAS-1 TEXAS ACCESSIBILITY STANDARDS
TAS-2 TEXAS ACCESSIBILITY STANDARDS
TAS-3 TEXAS ACCESSIBILITY STANDARDS

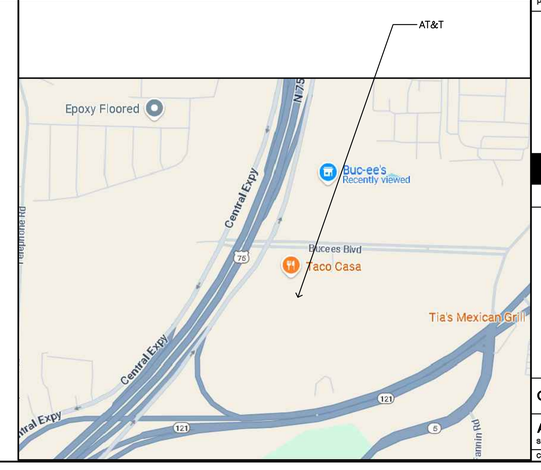
ARCHITECTURAL
A-1.1 FLOOR PLAN
A-1.2 FIXTURE PLAN
A-1.3 FINISH PLAN
A-1.4 ROOF PLAN & DETAILS
A-2.1 REFLECTED CEILING PLAN
A-6.1 ABBREVIATIONS, FINISH AND ROOM SCHEDULES
A-6.2 DOOR AND HARDWARE SCHEDULES
A-6.3 DETAILS
A-7.1 ARCHITECTURAL SPECIFICATIONS

ENGINEERING
M-1.1 MECHANICAL COVER SHEET
M-1.2 MECHANICAL SPECIFICATIONS (1of2)
M-1.3 MECHANICAL SPECIFICATIONS (2of2)
M-1.4 NATURAL GAS SPECIFICATIONS (2of2)
H1.1 HVAC PLAN
H2.1 HVAC DETAILS & SCHEDULES
H3.1 COMCHECK
H3.2 COMCHECK
P-1.1 PLUMBING COVER SHEET
P-1.2 PLUMBING SPECIFICATIONS (1of2)
P-1.3 PLUMBING SPECIFICATIONS (2of2)
P-2.1 PLUMBING PLAN
FP-0.1 FIRE PROTECTION COVER SHEET
FP-1.1 FIRE PROTECTION SPECIFICATIONS
FP-2.1 FIRE PROTECTION PLAN
E1.1 ELECTRICAL COVER SHEET
E1.2 ELECTRICAL SPECIFICATIONS - SHEET 1
E1.3 ELECTRICAL SPECIFICATIONS - SHEET 2
E2.1 POWER PLAN
E2.2 LIGHTING PLAN
E3.1 SINGLE LINE DIAGRAM & PANEL SCHEDULES
E3.2 COMCHECK

EGRESS PLAN



VICINITY MAP



revisions

project number 25017 — drawn by CG, RF

project north

REGISTERED ARCHITECT — RANDY J. FALK — STATE OF TEXAS

ARCHITECTS
530 Franklin Avenue
Santa Fe, NM 87501
215.391.6558

RANDY J. FALK & ASSOCIATES

AT&T

NORTHEAST CORNER OF STATE HWY 121 AT N. HWY 75
MELISSA, TX 75454

COVER SHEET — CS

AS NOTED (scale) — 05/12/25 (date)

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ACCESSIBILITY GUIDELINES (TAS)

301 General
301.1 Scope. The provisions of Chapter 3 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

302 Floor or Ground Surfaces
302.1 General. Floor and ground surfaces shall be stable, firm, and slip resistant and shall comply with 302.
EXCEPTIONS:
1. Within animal containment areas, floor and ground surfaces shall not be required to be stable, firm, and slip resistant.
2. Areas of sport activity shall not be required to comply with 302.

302.2 Carpet. Carpet or carpet tile shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height shall be 1/2 inch (13 mm) maximum. Exposed edges of carpet shall be fastened to floor surfaces and shall have trim on the entire length of the exposed edge. Carpet edge trim shall comply with 303.

302.3 Openings. Openings in floor or ground surfaces shall not allow passage of a sphere more than 1/2 inch (13 mm) diameter except as allowed in 407.4.3, 409.4.3, 410.4, 810.5.3 and 810.10. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

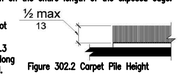

Figure 302.2 Carpet Pile Height

303 Changes in Level
303.1 General. Where changes in level are permitted in floor or ground surfaces, they shall comply with 303.
EXCEPTIONS:
1. Animal containment areas shall not be required to comply with 303.
2. Areas of sport activity shall not be required to comply with 303.

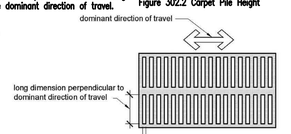

Figure 302.3 Elongated Openings in Floor or Ground Surfaces

303.2 Vertical. Changes in level of 1/4 inch (6.4 mm) high maximum shall be permitted to be vertical.

303.3 Beveled. Changes in level between 1/4 inch (6.4 mm) high minimum and 1/2 inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.

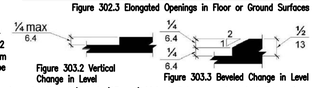

Figure 303.2 Vertical Change in Level
Figure 303.3 Beveled Change in Level

303.4 Ramps. Changes in level greater than 1/2 inch (13 mm) high shall be ramped, and shall comply with 405 or 406.

304 Turning Space
304.1 General. Turning space shall comply with 304.

304.2 Floor or Ground Surfaces. Floor or ground surfaces of a turning space shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

304.3 Size. Turning space shall comply with 304.3.1 or 304.3.2.

304.3.1 Circular Space. The turning space shall be a space of 60 inches (1525 mm) diameter minimum. The space shall be permitted to include knee and toe clearance complying with 306.

304.3.2 T-Shaped Space. The turning space shall be a T-shaped space within a 60 inch (1525 mm) square minimum with arms and base 36 inches (915 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with 306 only at the end of either the base or one arm.

304.4 Door Swing. Doors shall be permitted to swing into turning spaces.

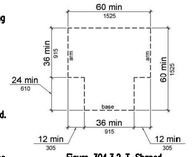

Figure 304.3.2 T-Shaped Turning Space

305 Clear Floor or Ground Space
305.1 General. Clear floor or ground space shall comply with 305.

305.2 Floor or Ground Surfaces. Floor or ground surfaces of a clear floor or ground space shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

305.3 Size. The clear floor or ground space shall be 30 inches (760 mm) minimum by 48 inches (1220 mm) minimum.

305.4 Knee and Toe Clearance. Unless otherwise specified, clear floor or ground space shall be permitted to include knee and toe clearance complying with 306.

305.5 Position. Unless otherwise specified, clear floor or ground space shall be positioned for either forward or parallel approach to an element.

305.6 Approach. One full unobstructed side of the clear floor or ground space shall adjoin an accessible route or adjoin another clear floor or ground space.

305.7 Maneuvering Clearance. Where a clear floor or ground space is located in an alcove or otherwise confined on all or part of three sides, additional maneuvering clearance shall be provided in accordance with 305.7.1 and 305.7.2.

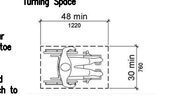

Figure 305.3 Clear Floor or Ground Space

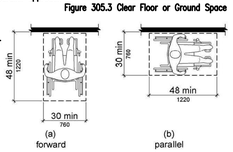

Figure 305.5 Position of Clear Floor or Ground Space

305.7.1 Forward Approach. Alcoves shall be 36 inches (915 mm)wide minimum where the depth exceeds 24 inches (610 mm).

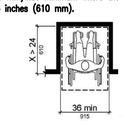

Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

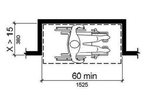

Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

305.7.2 Parallel Approach. Alcoves shall be 60 inches (1525 mm) wide minimum where the depth exceeds 15 inches (380 mm).

306 Knee and Toe Clearance
306.1 General. Where space beneath an element is included as part of clear floor or ground space or turning space, the space shall comply with 306. Additional space shall not be prohibited beneath an element but shall not be considered as part of the clear floor or ground space or turning space.

306.2 Toe Clearance.
306.2.1 General. Space under an element between the finish floor or ground and 9 inches (230 mm) above the finish floor or ground shall be considered toe clearance and shall comply with 306.2.

306.2.2 Maximum Depth. Toe clearance shall extend 25 inches (635 mm) maximum under an element.

306.2.3 Minimum Required Depth. Where toe clearance is required at an element as part of a clear floor space, the toe clearance shall extend 17 inches (430 mm) minimum under the element.

306.2.4 Additional Clearance. Space extending greater than 6 inches (150 mm) beyond the available knee clearance at 9 inches (230 mm) above the finish floor or ground shall not be considered toe clearance.

306.2.5 Width. Toe clearance shall be 30 inches (760 mm) wide minimum.

306.3 Knee Clearance.
306.3.1 General. Space under an element between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground shall be considered knee clearance and shall comply with 306.3.

306.3.2 Maximum Depth. Knee clearance shall extend 25 inches (635 mm) maximum under an element at 9 inches (230 mm) above the finish floor or ground.

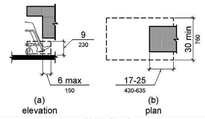

Figure 306.2 Toe Clearance

306.3.3 Minimum Required Depth. Where knee clearance is required under an element as part of a clear floor space, the knee clearance shall be 11 inches (280 mm) deep minimum at 9 inches (230 mm) above the finish floor or ground, and 8 inches (205 mm) deep minimum at 27 inches (685 mm) above the finish floor or ground.

306.3.4 Clearance Reduction. Between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground, the knee clearance shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for each 6 inches (150 mm) in height.

306.3.5 Width. Knee clearance shall be 30 inches (760 mm) wide minimum.

307 Protruding Objects
307.1 General. Protruding objects shall comply with 307.

307.2 Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finish floor or ground shall protrude 4 inches (100 mm) maximum horizontally into the circulation path.
EXCEPTION: Handrails shall be permitted to protrude 4 1/2 inches (115 mm) maximum.

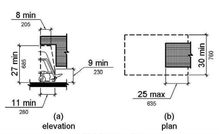

Figure 306.3 Knee Clearance

307.3 Post-Mounted Objects. Free-standing objects mounted on posts or pylons shall overhang circulation paths 12 inches (305 mm) maximum when located 27 inches (685 mm) minimum and 80 inches (2030 mm) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finish floor or ground.
EXCEPTION: The sloping portions of handrails serving stairs and ramps shall not be required to comply with 307.3.

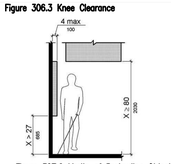

Figure 307.2 Limits of Protruding Objects

307.4 Vertical Clearance. Vertical clearance shall be 80 inches (2030 mm) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2030 mm) high. The leading edge of such guardrail or barrier shall be located 27 inches (685 mm) maximum above the finish floor or ground.
EXCEPTION: Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

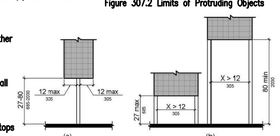

Figure 307.3 Post-Mounted Protruding Objects

307.5 Required Clear Width. Protruding objects shall not reduce the clear width required for accessible routes.

308 Reach Ranges
308.1 General. Reach ranges shall comply with 308.

308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

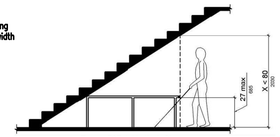

Figure 307.4 Vertical Clearance

Children's Reach Ranges

Forward or Side Reach	High (maximum)	Low (minimum)
Ages 3 and 4	36 in (915 mm)	20 in (510 mm)
Ages 5 through 8	40 in (1015 mm)	18 in (455 mm)
Ages 9 through 12	44 in (1120 mm)	16 in (405 mm)

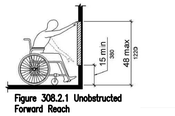

Figure 308.2.1 Unobstructed Forward Reach

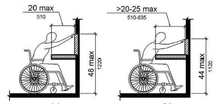

Figure 308.2.2 Obstructed High Forward Reach

308.2.2 Obstructed High Reach. Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm) maximum. Where the reach depth exceeds 20 inches (510 mm), the high forward reach shall be 44 inches (1120 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.

308.3 Side Reach.
308.3.1 Unobstructed. Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1220 mm) maximum and the low side reach shall be 15 inches (380 mm) minimum above the finish floor or ground.
EXCEPTIONS:
1. An obstruction shall be permitted between the clear floor or ground space and the element where the depth of the obstruction is 10 inches (255 mm) maximum.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

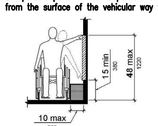

Figure 308.3.1 Unobstructed Side Reach

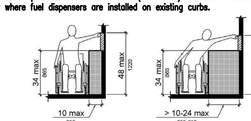

Figure 308.3.2 Obstructed High Side Reach

308.3.2 Obstructed High Reach. Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (865 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1220 mm) maximum for a reach depth of 10 inches (255 mm) maximum. Where the reach depth exceeds 10 inches (255 mm), the high side reach shall be 46 inches (1170 mm) maximum for a reach depth of 24 inches (610 mm) maximum.

308.3.2 EXCEPTIONS:
1. The top of washing machines and clothes dryers shall be permitted to be 36 inches (915 mm) maximum above the finish floor.
2. Operable parts of fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

309 Operable Parts
309.1 General. Operable parts shall comply with 309.

309.2 Clear Floor Space. A clear floor or ground space complying with 305 shall be provided.

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.
EXCEPTION: Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.

401 General
401.1 Scope. The provisions of Chapter 4 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

402 Accessible Routes
402.1 General. Accessible routes shall comply with 402.

402.2 Components. Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doorways, ramps, curb ramps excluding the flared sides, elevators, and platform lifts. All components of an accessible route shall comply with the applicable requirements of Chapter 4.

403 Walking Surfaces
403.1 General. Walking surfaces that are a part of an accessible route shall comply with 403.

403.2 Floor or Ground Surface. Floor or ground surfaces shall comply with 302.
403.3 Slope. The running slope of walking surfaces shall not be steeper than 1:20. The cross slope of walking surfaces shall not be steeper than 1:48.
403.4 Changes in Level. Changes in level shall comply with 303.

403.5 Clearances. Walking surfaces shall provide clearances complying with 403.5.
EXCEPTION: Within employee work areas, clearances on common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.

403.5.1 Clear Width. Except as provided in 403.5.2 and 403.5.3, the clear width of walking surfaces shall be 36 inches (915 mm) minimum.
EXCEPTION: The clear width shall be permitted to be reduced to 32 inches (815 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1220 mm) long minimum and 36 inches (915 mm) wide minimum.

403.5.2 Clear Width at Turn. Where the accessible route makes a 180 degree turn around an element which is less than 48 inches (1220 mm) wide, clear width shall be 42 inches (1065 mm) minimum approaching the turn, 48 inches (1220 mm) minimum at the turn and 42 inches (1065 mm) minimum leaving the turn.
EXCEPTION: Where the clear width at the turn is 60 inches (1525 mm) minimum compliance with 403.5.2 shall not be required.

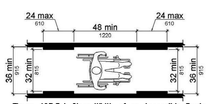

Figure 403.5.1 Clear Width of an Accessible Route

403.5.3 Passing Spaces. An accessible route with a clear width less than 60 inches (1525 mm) shall provide passing spaces at intervals of 200 feet (61 m) maximum. Passing spaces shall be either: a space 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum; or, an intersection of two walking surfaces providing a T-shaped space complying with 304.3.2 where the base and arms of the T-shaped space extend 48 inches (1220 mm) minimum beyond the intersection.

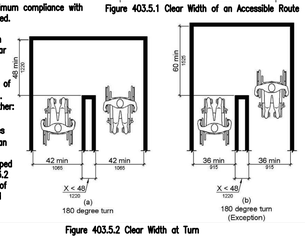

Figure 403.5.2 Clear Width at Turn

403.6 Handrails. Where handrails are provided along walking surfaces with running slopes not steeper than 1:20 they shall comply with 505.

404 Doors, Doorways, and Gates
404.1 General. Doors, doorways, and gates that are part of an accessible route shall comply with 404.
EXCEPTION: Doors, doorways, and gates designed to be operated only by security personnel shall not be required to comply with 404.2.7, 404.2.8, 404.2.9, 404.3.2 and 404.3.4 through 404.3.7.
404.2 Manual Doors, Doorways, and Manual Gates. Manual doors and doorways and manual gates intended for user passage shall comply with 404.2.

404.2.1 Revolving Doors, Gates, and Turnstiles. Revolving doors, revolving gates, and turnstiles shall not be part of an accessible route.

404.2.2 Double-Leaf Doors and Gates. At least one of the active leaves of doorways with two leaves shall comply with 404.2.3 and 404.2.4.

404.2.3 Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).
EXCEPTIONS: 1. In alterations, a projection of 5/8 inch (16 mm) maximum into the required clear width shall be permitted for the latch side stop.
2. Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

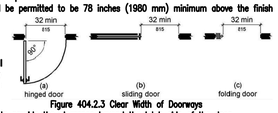

Figure 404.2.3 Clear Width of Doorways

EXCEPTION: Entry doors to hospital patient rooms shall not be required to provide the clearance beyond the latch side of the door.
404.2.4.1 Swinging Doors and Gates. Swinging doors and gates shall have maneuvering clearances complying with Table 404.2.4.1. (as illustrated on Figures 404.2.4.1)

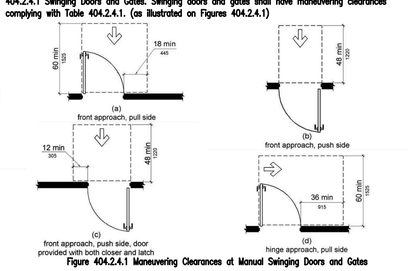

Figure 404.2.4.1 Maneuvering Clearances at Manual Swinging Doors and Gates

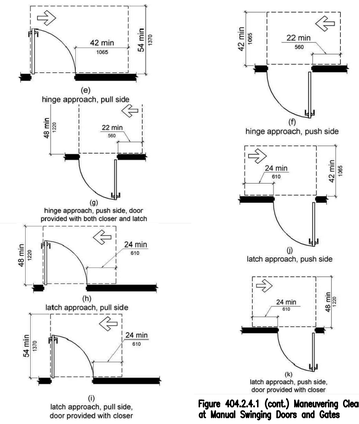

Figure 404.2.4.1 (cont.) Maneuvering Clearances at Manual Swinging Doors and Gates

404.2.4.2 Doorways without Doors or Gates, Sliding Doors, and Folding Doors. Doorways less than 36 inches (915 mm) wide without doors or gates, sliding doors, or folding doors shall have maneuvering clearances complying with Table 404.2.4.2. (as illustrated on Figure 404.2.4.2)

404.2.4.3 Recessed Doors and Gates. Maneuvering clearances for forward approach shall be provided when any obstruction within 18 inches (455 mm) of the latch side of a doorway projects more than 8 inches (205 mm) beyond the face of the door, measured perpendicular to the face of the door or gate.

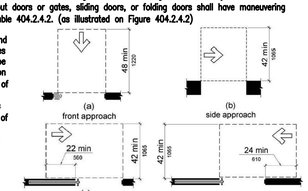

Figure 404.2.4.2 Maneuvering Clearances at Doorways without Doors, Sliding Doors, Gates, and Folding Doors

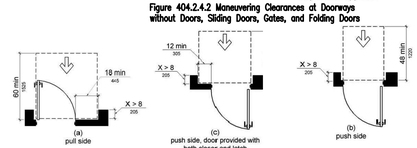

Figure 404.2.4.3 Maneuvering Clearances at Recessed Doors and Gates

404.2.4.4 Floor or Ground Surface. Floor or ground surface within required maneuvering clearances shall comply with 302. Changes in level are not permitted.
EXCEPTIONS:
1. Slopes not steeper than 1:48 shall be permitted.
2. Changes in level at thresholds complying with 404.2.5 shall be permitted.

404.2.5 Thresholds. Thresholds, if provided at doorways, shall be 1/2 inch (13 mm) high maximum. Raised thresholds and changes in level at doorways shall comply with 302 and 303.
EXCEPTION: Existing or altered thresholds 3/4 inch (19 mm) high maximum that have a beveled edge on each side with a slope not steeper than 1:2 shall not be required to comply with 404.2.5.

404.2.6 Doors in Series and Gates in Series. The distance between two hinged or pivoted doors in series and gates in series shall be 48 inches (1220 mm) minimum plus the width of doors or gates swinging into the space.

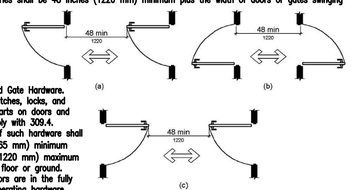

Figure 404.2.6 Doors in Series and Gates in Series

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 309.4. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
EXCEPTIONS:
1. Existing locks shall be permitted in any location at existing glazed doors without stiles, existing overhead rolling doors or grilles, and similar existing doors or grilles that are designed with locks that are activated only at the top or bottom rail.
2. Access gates in barrier walls and fences protecting pools, spas, and hot tubs shall be permitted to have operable parts of the release of latch on self-latching devices at 54 inches (1370 mm) maximum above the finish floor or ground provided the self-latching devices are not also self-locking devices and operated by means of a key, electronic opener, or integral combination lock.

404.2.8 Closing Speed. Door and gate closing speed shall comply with 404.2.8.

404.2.8.1 Door Closers and Gate Closers. Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

404.2.8.2 Spring Hinges. Door and gate spring hinges shall be adjusted so that from the open position of 70 degrees, the door or gate shall move to the closed position in 1.5 seconds minimum.

404.2.9 Door and Gate Opening Force. Fire doors shall have a minimum opening force allowable by the appropriate administrative authority. The force for pushing or pulling open a door or gate other than fire doors shall be as follows:
1. Interior hinged doors and gates: 5 pounds (22.2 N) maximum.
2. Sliding or folding doors: 5 pounds (22.2 N) maximum.
These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door or gate in a closed position.

404.2.10 Door and Gate Surfaces. Swinging door and gate surfaces within 10 inches (255 mm) of the finish floor or ground measured vertically shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within 1/16 inch (1.6 mm) of the same plane as the other. Cavities created by added kick plates shall be capped.
EXCEPTIONS:
1. Sliding doors shall not be required to comply with 404.2.10.
2. Tempered glass doors without stiles and having a bottom rail or shoe with the top leading edge tapered at 60 degrees minimum from the horizontal shall not be required to meet the 10 inch (255 mm) bottom smooth surface height requirement.
3. Doors and gates that do not extend to within 10 inches (255 mm) of the finish floor or ground shall not be required to comply with 404.2.10.
4. Existing doors and gates without smooth surfaces within 10 inches (255 mm) of the finish floor or ground shall not be required to provide smooth surfaces complying with 404.2.10 provided that if added kick plates are installed, cavities created by such kick plates are capped

404.2.11 Vision Lights. Doors, gates, and side lights adjacent to doors or gates, containing one or more glazing panels that permit viewing through the panels shall have the bottom of at least one glazed panel located 43 inches (1090 mm) maximum above the finish floor.
EXCEPTION: Vision lights with the lowest part more than 66 inches (1675 mm) from the finish floor or ground shall not be required to comply with 404.2.11.

404.3 Automatic and Power-Assisted Doors and Gates. Automatic doors and automatic gates shall comply with 404.3. Full-powered automatic doors shall comply with ANSI/BHMA A156.10 (incorporated by reference, see "Referenced Standards" in Chapter 1). Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).

404.3.1 Clear Width. Doorways shall provide a clear opening of 32 inches (815 mm) minimum in power-on and power-off mode. The minimum clear width for automatic door systems in a doorway shall be based on the clear opening provided by all leaves in the open position.

404.3.2 Maneuvering Clearance. Clearances at power-assisted doors and gates shall comply with 404.2.4. Clearances at automatic doors and gates without standby power and serving an accessible means of egress shall comply with 404.2.4.

EXCEPTION: Where automatic doors and gates remain open in the power-off condition, compliance with 404.2.4 shall not be required.

404.3.3 Thresholds. Thresholds and changes in level at doorways shall comply with 404.2.5.

404.3.4 Doors in Series and Gates in Series. Doors in series and gates in series shall comply with 404.2.6.

404.3.5 Controls. Manually operated controls shall comply with 309. The clear floor space adjacent to the control shall be located beyond the arc of the door swing.

404.3.6 Break Out Opening. Where doors and gates without standby power are a part of a means of egress, the clear break out opening at swinging or sliding doors and gates shall be 32 inches (815 mm) minimum when operated in emergency mode.
EXCEPTION: Where manual swinging doors and gates comply with 404.2 and serve the same means of egress compliance with 404.3.6 shall not be required.

404.3.7 Revolving Doors, Revolving Gates, and Turnstiles. Revolving doors, revolving gates, and turnstiles shall not be part of an accessible route.

405 Ramps
405.1 General. Ramps on accessible routes shall comply with 405.
EXCEPTION: In assembly areas, aisle ramps adjacent to seating and not serving elements required to be on an accessible route shall not be required to comply with 405.

405.2 Slope. Ramp runs shall have a running slope not steeper than 1:12.
EXCEPTION: In existing sites, buildings, and facilities, ramps shall be permitted to have running slopes steeper than 1:12 complying with Table 405.2 where such slopes are necessary due to space limitations.

Table 405.2 Maximum Ramp Slope and Rise for Existing Sites, Buildings, and Facilities	
Slope (A slope steeper than 1:8 is prohibited.)	Maximum Rise
Steeper than 1:10 but not steeper than 1:8	3 inches (75 mm)
Steeper than 1:12 but not steeper than 1:10	6 inches (150 mm)

405.3 Cross Slope. Cross slope of ramp runs shall not be steeper than 1:48.

405.4 Floor or Ground Surfaces. Floor or ground surfaces of ramp runs shall comply with 302. Changes in level other than the running slope and cross slope are not permitted on ramp runs.

405.5 Clear Width. The clear width of a ramp run and, where handrails are provided, the clear width between handrails shall be 36 inches (915 mm) minimum.
EXCEPTION: Within employee work areas, the required clear width of ramps that are a part of common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.

405.6 Rise. The rise for any ramp run shall be 30 inches (760 mm) maximum.

405.7 Landings. Ramps shall have landings at the top and the bottom of each ramp run. Landings shall comply with 405.7.

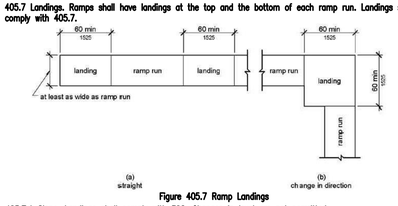

Figure 405.7 Ramp Landings

405.7.1 Slope. Landings shall comply with 302. Changes in level are not permitted.
EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

405.7.2 Width. The landing clear width shall be at least as wide as the widest ramp run leading to the landing.

405.7.3 Length. The landing clear length shall be 60 inches (1525 mm) long minimum.

405.7.4 Change in Direction. Ramps that change directi on between runs at landings shall have a clear landing 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum.

405.7.5 Doorways. Where doorways are located adjacent to a ramp landing, maneuvering clearances required by 404.2.4 and 404.3.2 shall be permitted to overlap the required landing area.

405.8 Handrails. Ramp runs with a rise greater than 6 inches (150 mm) shall have handrails complying with 505.
EXCEPTION: Within employee work areas, handrails shall not be required where ramps that are part of common use circulation paths are designed to permit the installation of handrails complying with 505. Ramps not subject to the exception to 405.5 shall be designed to maintain a 36 inch (915 mm) minimum clear width when handrails are installed.

405.9 Edge Protection. Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.
EXCEPTI01. Edge protection shall not be required on ramps that are not required to have handrails and have sides complying with 406.3.
2. Edge protection shall not be required on the sides of ramp landings serving an adjoining ramp run or stairway.
3. Edge protection shall not be required on the sides of ramp landings having a vertical drop-off of 1/2 inch (13 mm) maximum within 10 inches (255 mm) horizontally of the minimum landing area specified in 405.7.

405.9.1 Extended Floor or Ground Surface. The floor or ground surface of the ramp run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505.

405.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.

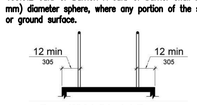

Figure 405.9.1 Extended Floor or Ground Surface Edge Protection

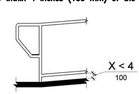

Figure 405.9.2 Curb or Barrier Edge Protection

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project north	

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STATE HWY 121 AT N. HWY 75
MELISSA, TX 75454

TEXAS ACCESSIBILITY STANDARDS

TAS-1

scale | 05/12/25 date

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ACCESSIBILITY GUIDELINES (TAS)

504 Stairways
504.1 General. Stairs shall comply with 504.

504.2 Treads and Risers. All steps on a flight of stairs shall have uniform riser heights and uniform tread depths. Risers shall be 4 inches (100 mm) high minimum and 7 inches (180 mm) high maximum. Treads shall be 11 inches (280 mm) deep minimum.

504.3 Open Risers. Open risers are not permitted.

504.4 Tread Surface. Stair treads shall comply with 302. Changes in level are not permitted.
EXCEPTION: Treads shall be permitted to have a slope not steeper than 1:48.

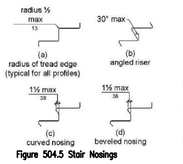

Figure 504.5 Stair Nosings

504.5 Nosings. The radius of curvature at the leading edge of the tread shall be 1/2 inch (13 mm) maximum. Nosings that project beyond risers shall have the underside of the leading edge curved or beveled. Risers shall be permitted to slope under the tread at an angle of 30 degrees maximum from vertical. The permitted projection of the nosing shall extend 1 1/2 inches (38 mm) maximum over the tread below.

504.6 Handrails. Stairs shall have handrails complying with 505.

504.7 Wet Conditions. Stair treads and landings subject to wet conditions shall be designed to prevent the accumulation of water.

505 Handrails
505.1 General. Handrails provided along walking surfaces complying with 403, required at ramps complying with 405, and required at stairs complying with 504 shall comply with 505.

505.2 Where Required. Handrails shall be provided on both sides of stairs and ramps.
EXCEPTION: In assembly areas, handrails shall not be required on both sides of aisle ramps where a handrail is provided at either side or within the aisle width.

505.3 Continuity. Handrails shall be continuous within the full length of each stair flight or ramp run. Inside handrails on switchback or dogleg stairs and ramps shall be continuous between flights or runs.
EXCEPTION: In assembly areas, handrails on ramps shall not be required to be continuous in aisles serving seating.

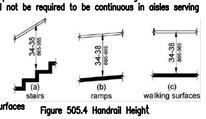

Figure 505.4 Handrail Height

505.4 Height. Top of gripping surfaces of handrails shall be 34 inches (865 mm) minimum and 38 inches (965 mm) maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above walking surfaces, stair nosings, and ramp surfaces.

505.5 Clearance. Clearance between handrail gripping surfaces and adjacent surfaces shall be 1 1/2 inches (38 mm) minimum.

Figure 505.5 Handrail Clearance

505.6 Gripping Surface. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. Where provided, horizontal projections shall occur 1 1/2 inches (38 mm) minimum below the bottom of the handrail gripping surface.
EXCEPTIONS:
1. Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.
2. The distance between horizontal projections and the bottom of the gripping surface shall be permitted to be reduced by 1/8 inch (3.2 mm) for each 1/2 inch (13 mm) of additional handrail perimeter dimension that exceeds 4 inches (100 mm).

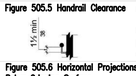

Figure 505.6 Horizontal Projections Below Gripping Surface

505.7 Cross Section. Handrail gripping surfaces shall have a cross section complying with 505.7.1 or 505.7.2.
505.7.1 Circular Cross Section. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.

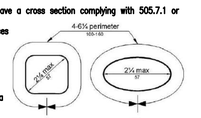

Figure 505.7.2 Handrail Non-Circular Cross Section

505.7.2 Non-Circular Cross Sections. Handrail gripping surfaces with a non-circular cross section shall have a perimeter dimension of 4 inches (100 mm) minimum and 6 1/4 inches (160 mm) maximum, and a cross-section dimension of 2 1/4 inches (57 mm) maximum.

505.8 Surfaces. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

505.9 Fittings. Handrails shall not rotate within their fittings.

505.10 Handrail Extensions. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with 505.10.
EXCEPTIONS:
1. Extensions shall not be required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.
2. In assembly areas, extensions shall not be required for ramp handrails in aisles serving seating where the handrails are discontinuous to provide access to seating and to permit crossovers within aisles.
3. In alterations, full extensions of handrails shall not be required where such extensions would be hazardous due to plan configuration.

505.10.1 Top and Bottom Extension at Ramps. Ramp handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run.

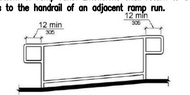

Figure 505.10.1 Top and Bottom Handrail Extension at Ramps

505.10.2 Top Extension at Stairs. At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

505.10.3 Bottom Extension at Stairs. At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing. Extension shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

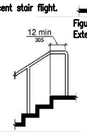

Figure 505.10.2 Top Handrail Extension at Stairs

Figure 505.10.3 Bottom Handrail Extension at Stairs

601 General
601.1 Scope. The provisions of Chapter 6 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

602 Drinking Fountains
602.1 General. Drinking fountains shall comply with 307 and 602.

602.2 Clear Floor Space. Units shall have a clear floor or ground space complying with 305 positioned for a forward approach and centered on the unit. Knee and toe clearance complying with 306 shall be provided.
EXCEPTION: A parallel approach complying with 305 shall be permitted at units for children's use where the spout is 30 inches (760 mm) maximum above the finish floor or ground and is 3 1/2 inches (90 mm) maximum from the front edge of the unit, including bumpers.

602.3 Operable Parts. Operable parts shall comply with 309.

602.4 Spout Height. Spout outlets shall be 36 inches (915 mm) maximum above the finish floor or ground.

602.5 Spout Location. The spout shall be located 15 inches (380 mm) minimum from the vertical support and 5 inches (125 mm) maximum from the front edge of the unit, including bumpers.

602.6 Water Flow. The spout shall provide a flow of water 4 inches (100 mm) high minimum and shall be located 5 inches (125 mm) maximum from the front of the unit. The angle of the water stream shall be measured horizontally relative to the front face of the unit. Where spouts are located less than 3 inches (75 mm) of the front of the unit, the angle of the water stream shall be 30 degrees maximum. Where spouts are located between 3 inches (75 mm) and 5 inches (125 mm) maximum from the front of the unit, the angle of the water stream shall be 15 degrees maximum

Figure 602.5 Drinking Fountain Spout Location

602.7 Drinking Fountains for Standing Persons. Spout outlets of drinking fountains for standing persons shall be 38 inches (965 mm) minimum and 43 inches (1090 mm) maximum above the finish floor or ground.

603 Toilet and Bathing Rooms
603.1 General. Toilet and bathing rooms shall comply with 603.

603.2 Clearances. Clearances shall comply with 603.2.

603.2.1 Turning Space. Turning space complying with 304 shall be provided within the room.

603.2.2 Overlap. Required clear floor spaces, clearance at fixtures, and turning space shall be permitted to overlap.

603.2.3 Door Swing. Doors shall not swing into the clear floor space or clearance required for any fixture. Doors shall be permitted to swing into the required turning space.
EXCEPTIONS:
1. Doors to a toilet room or bathing room for a single occupant accessed only through a private office and not for common use or public use shall be permitted to swing into the clear floor space or clearance provided the swing of the door can be reversed to comply with 603.2.3.
2. Where the toilet room or bathing room is for individual use and a clear floor space complying with 305.3 is provided within the room beyond the arc of the door swing, doors shall be permitted to swing into the clear floor space or clearance required for any fixture.

603.3 Mirrors. Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (890 mm) maximum above the finish floor or ground.

603.4 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604 Water Closets and Toilet Compartments

604.1 General. Water closets and toilet compartments shall comply with 604.2 through 604.8.
EXCEPTION: Water closets and toilet compartments for children's use shall be permitted to comply with 604.9.

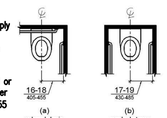

Figure 604.2 Water Closet Location

604.2 Location. The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

604.3 Clearance. Clearances around water closets and in toilet compartments shall comply with 604.3.

604.3.1 Size. Clearance around a water closet shall be 60 inches (1525 mm) minimum measured perpendicular from the side wall and 56 inches (1420 mm) minimum measured perpendicular from the rear wall.

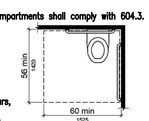

Figure 604.3.1 Size of Clearance at Water Closets

604.3.2 Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

604.4 Seats. The seat height of a water closet above the finish floor shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.
EXCEPTIONS:
1. A water closet in a toilet room for a single occupant accessed only through a private office and not for common use or public use shall not be required to comply with 604.4.

604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.
EXCEPTIONS:
1. Grab bars shall not be required to be installed in a toilet room for a single occupant accessed only through a private office and not for common use or public use provided that reinforcement has been installed in walls and located so as to permit the installation of grab bars complying with 604.5.

3. In detention or correction facilities, grab bars shall not be required to be installed in housing or holding cells that are specially designed without protrusions for purposes of suicide prevention.

604.5.1 Side Wall. The side wall grab bar shall be 42 inches (1065 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1370 mm) minimum from the rear wall.

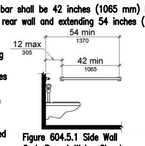

Figure 604.5.1 Side Wall Grab Bar at Water Closets

604.5.2 Rear Wall. The rear wall grab bar shall be 36 inches (915 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.
EXCEPTIONS:
1. The rear grab bar shall be permitted to be 24 inches (610 mm) long minimum, centered on the water closet, where wall space does not permit a length of 36 inches (915 mm) minimum due to the location of a recessed fixture adjacent to the water closet.
2. Where an administrative authority requires flush controls for flush valves to be located in a position that conflicts with the location of the rear grab bar, then the rear grab bar shall be permitted to be split or shifted to the open side of the toilet area.

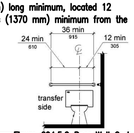

Figure 604.5.2 Rear Wall Grab Bar at Water Closets

604.6 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with 604.8.2.

604.7 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 15 inches (380 mm) minimum and 48 inches (1220 mm) maximum above the finish floor and shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

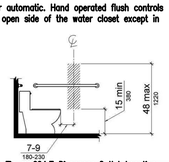

Figure 604.7 Dispenser Outlet Location

604.8 Toilet Compartments. Wheelchair accessible toilet compartments shall meet the requirements of 604.8.1 and 604.8.3. Compartments containing more than one plumbing fixture shall comply with 603. Ambulatory accessible compartments shall comply with 604.8.2 and 604.8.3.

604.8.1 Wheelchair Accessible Compartments. Wheelchair accessible compartments shall comply with 604.8.1.

604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. Wheelchair accessible compartments for children's use shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1500 mm) deep minimum for wall hung and floor mounted water closets measured perpendicular to the rear wall.

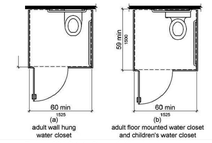

Figure 604.8.1.1 Size of Wheelchair Accessible Toilet Compartment

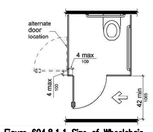

Figure 604.8.1.1 Size of Wheelchair Accessible Toilet Compartment

604.8.1.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404 except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. Doors shall be located in the front partition, the door opening shall be 4 inches (100 mm) maximum from the side wall or partition farthest from the water closet. Where located in the side wall or partition, the door opening shall be 4 inches (100 mm) maximum from the front partition. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

604.8.1.3 Approach. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

604.8.1.4 Toe Clearance. The front partition and at least one side partition shall provide a toe clearance of 9 inches (230 mm) minimum above the finish floor and 6 inches (150 mm) deep minimum beyond the compartment-side face of the partition, exclusive of partition support members. Compartments for children's use shall provide a toe clearance of 12 inches (305 mm) minimum above the finish floor.
EXCEPTION: Toe clearance at the front partition is not required in a compartment greater than 62 inches (1575 mm) deep with a wall-hung water closet or 65 inches (1650 mm) deep with a floor-mounted water closet. Toe clearance at the side partition is not required in a compartment greater than 66 inches (1675 mm) wide. Toe clearance at the front partition is not required in a compartment for children's use that is greater than 65 inches (1650 mm) deep.

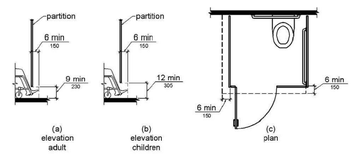

Figure 604.8.1.4 Wheelchair Accessible Toilet Compartment Toe Clearance

604.8.1.5 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided and shall be located on the wall closest to the water closet. In addition, a rear-wall grab bar complying with 604.5.2 shall be provided.

604.8.2 Ambulatory Accessible Compartments. Ambulatory accessible compartments shall comply with 604.8.2.

604.8.2.1 Size. Ambulatory accessible compartments shall have a depth of 60 inches (1525 mm) minimum and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.

604.8.2.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404, except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

604.8.2.3 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided on both sides of the compartment.

604.8.3 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604.9 Water Closets and Toilet Compartments for Children's Use. Water closets and toilet compartments for children's use shall comply with 604.9

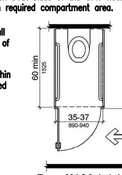

Figure 604.8.2 Ambulatory Accessible Toilet Compartment

Advisory Specifications for Water Closets Serving Children Ages 3 through 12			
	Ages 3 and 4	Ages 5 through 8	Ages 9 through 12
Water Closet Centerline	12 inches	12 to 15 inches	15 to 18 inches
Toilet Seat Height	11 to 12 inches	12 to 15 inches	15 to 17 inches
Grab Bar Height	18 to 20 inches	20 to 25 inches	25 to 27 inches
Dispenser Height	14 inches	14 to 17 inches	17 to 19 inches

604.9.1 Location. The water closet shall be located with a wall or partition to the rear and to one side. The centerline of the water closet shall be 12 inches (305 mm) minimum and 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

604.9.2 Clearance. Clearance around a water closet shall comply with 604.3.

604.9.3 Height. The height of water closets shall be 11 inches (280 mm) minimum and 17 inches (430 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

604.9.4 Grab Bars. Grab bars for water closets shall comply with 604.5.

604.9.5 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309.2 and 309.4 and shall be installed 36 inches (915 mm) maximum above the finish floor. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with 604.8.2.

604.9.6 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 14 inches (355 mm) minimum and 19 inches (485 mm) maximum above the finish floor. There shall be a clearance of 1 1/2 inches (38 mm) minimum below the grab bar. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

604.9.7 Toilet Compartments. Toilet compartments shall comply with 604.8.

605 Urinals

605.1 General. Urinals shall comply with 605.

605.2 Height and Depth. Urinals shall be the stall-type or the wall-hung type with the rim 17 inches (430 mm) maximum above the finish floor or ground. Urinals shall be 13 1/2 inches (345 mm) deep minimum measured from the outer face of the urinal rim to the back of the fixture.

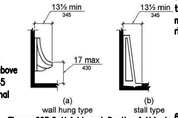

Figure 605.2 Height and Depth of Urinals

605.3 Clear Floor Space. A clear floor or ground space complying with 305 positioned for forward approach shall be provided.

605.4 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309.

606 Lavatories and Sinks
606.1 General. Lavatories and sinks shall comply with 606.

606.2 Clear Floor Space. A clear floor space complying with 305, positioned for a forward approach, and knee and toe clearance complying with 306 shall be provided.
EXCEPTIONS:
1. A parallel approach complying with 305 shall be permitted to a kitchen sink in a space where a cook top or conventional range is not provided and to wet bars.
2. A lavatory in a toilet room or bathing facility for a single occupant accessed only through a private office and not for common use or public use shall not be required to provide knee and toe clearance complying with 306.
3. Residential requirements not included.
4. A knee clearance of 24 inches (610 mm) minimum above the finish floor or ground shall be permitted at lavatories and sinks used primarily by children 6 through 12 years where the rim or counter surface is 31 inches (785 mm) maximum above the finish floor or ground.
5. A parallel approach complying with 305 shall be permitted to lavatories and sinks used primarily by children 5 years and younger.
6. The dip of the overflow shall not be considered in determining knee and toe clearances.
7. No more than one bowl of a multi-bowl sink shall be required to provide knee and toe clearance complying with 306.

606.3 Height. Lavatories and sinks shall be installed with the front of the higher of the rim or counter surface 34 inches (865 mm) maximum above the finish floor or ground.
EXCEPTIONS:
1. A lavatory in a toilet or bathing facility for a single occupant accessed only through a private office and not for common use or public use shall not be required to comply with 606.3.

606.4 Faucets. Controls for faucets shall comply with 309. Hand-operated metering faucets shall remain open for 10 seconds minimum.

606.5 Exposed Pipes and Surfaces. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.

701 General
701.1 Scope. The provisions of Chapter 7 shall apply where required by Chapter 2 or where referenced by a requirement in this document.
702 Fire Alarm Systems
702.1 General. Fire alarm systems shall have permanently installed audible and visible alarms complying with NFPA 72 (1999 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1), except that the maximum allowable sound level of audible notification appliances complying with section 4-3.2.1 of NFPA 72 (1999 edition) shall have a sound level no more than 110 dB at the minimum hearing distance from the audible appliance. In addition, alarms in guest rooms required to provide communication features shall comply with sections 4-3 and 4-4 of NFPA 72 (1999 edition) or sections 7.4 and 7.5 of NFPA 72 (2002 edition).
EXCEPTION: Fire alarm systems in medical care facilities shall be permitted to be provided in accordance with industry practice.

703 Signs
703.1 General. Signs shall comply with 703. Where both visual and tactile characters are required, either one sign with both visual and tactile characters, or two separate signs, one with visual, and one with tactile characters, shall be provided.

703.2 Raised Characters. Raised characters shall comply with 703.2 and shall be duplicated in braille complying with 703.3. Raised characters shall be installed in accordance with 703.4.

703.2.1 Depth. Raised characters shall be 1/32 inch (0.8 mm) minimum above their background.

703.2.2 Case. Characters shall be uppercase.

703.2.3 Style. Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.2.4 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

703.2.5 Character Height. Character height measured vertically from the baseline of the character shall be 5/8 inch (16 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I".
EXCEPTION: Where separate raised and visual characters with the same information are provided, raised character height shall be permitted to be 1/2 inch (13 mm) minimum.

Figure 703.2.5 Height of Raised Characters

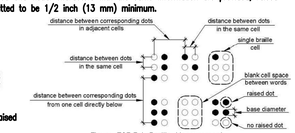

Figure 703.3.1 Braille Measurement

703.2.6 Stroke Thickness. Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character.

703.2.7 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Where characters have rectangular cross sections, spacing between individual raised characters shall be 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16 inch (1.6 mm) minimum and 4 times the raised character stroke width maximum at the base of the cross sections, and 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements 3/8 inch (9.5 mm) minimum.

703.2.8 Line Spacing. Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

703.3 Braille. Braille shall be contracted (Grade 2) and shall comply with 703.3 and 703.4.

703.3.1 Dimensions and Capitalization. Braille dots shall have a domed or rounded shape and shall comply with Table 703.3.1. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

Table 703.3.1 Braille Dimensions

Measurement Range	Minimum in Inches to Maximum in Inches
Dot base diameter	0.059 (1.5 mm) to 0.063 (1.6 mm)
Distance between two dots in the same cell	0.090 (2.3 mm) to 0.100 (2.5 mm) measured center to center
Distance between corresponding dots in adjacent cells	0.241 (6.1 mm) to 0.300 (7.6 mm)measured center to center
Dot height	0.025 (0.6 mm) to 0.037 (0.9 mm)
Distance between corresponding dotsfrom one cell directly below	0.395 (10 mm) to 0.400 (10.2 mm)measured center to center

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RANDY J. FALK & ASSOCIATES

AT&T

NORTHEAST CORNER OF STATE HWY 121 AT N. HWY 75
MELISSA, TX 75454

TEXAS ACCESSIBILITY STANDARDS

scale	05/12/25 date	TAS-2

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ACCESSIBILITY GUIDELINES (TAS)

703.3.2 Position. Braille shall be positioned below the corresponding text. If text is multi-lined, braille shall be placed below the entire text. Braille shall be separated 3/8 inch (9.5 mm) minimum from any other tactile characters and 3/8 inch (9.5 mm) minimum from raised borders and decorative elements.
EXCEPTION: Braille provided on elevator car controls shall be separated 3/16 inch (4.8 mm) minimum and shall be located either directly below or adjacent to the corresponding raised characters or symbols.

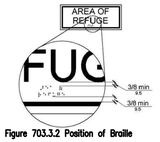

Figure 703.3.2 Position of Braille

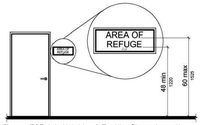

Figure 703.4.1 Height of Tactile Characters Above Finish Floor or Ground

703.4 Installation Height and Location. Signs with tactile characters shall comply with 703.4.

703.4.1 Height Above Finish Floor or Ground. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.
EXCEPTION: Tactile characters for elevator car controls shall not be required to comply with 703.4.1.

703.4.2 Location. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
EXCEPTION: Signs with tactile characters shall be permitted on the push side of doors with closers and without hold-open devices.

Figure 703.4.2 Location of Tactile Signs at Doors

703.5 Visual Characters. Visual characters shall comply with 703.5.
EXCEPTION: Where visual characters comply with 703.2 and are accompanied by braille complying with 703.3, they shall not be required to comply with 703.5.2 through 703.5.9.

703.5.1 Finish and Contrast. Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

703.5.2 Case. Characters shall be uppercase or lowercase or a combination of both.

703.5.3 Style. Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.5.4 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

703.5.5 Character Height. Minimum character height shall comply with Table 703.5.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter "I".

Table 703.5.5 Visual Character Height

Height to Finish Floor or Ground From Baseline of Character	Horizontal Viewing Distance	Minimum Character Height
40 inches (1015 mm) to less than or equal to 70 inches (1780 mm)	less than 72 inches (1830 mm)	5/8 inch (16 mm)
	72 inches (1830 mm) and greater	5/8 inch (16 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 72 inches (1830 mm)
Greater than 70 inches (1780 mm) to less than or equal to 120 inches (3050 mm)	less than 180 inches (4570 mm)	2 inch (51 mm)
	180 inches (4570 mm) and greater	2 inches (51 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 180 inches (4570 mm)
Greater than 120 inches (3050 mm)	less than 20 feet (6400 mm)	3 inch (75 mm)
	21 feet (6400 mm) and greater	3 inches (75 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6400 mm)

703.5.6 Height From Finish Floor or Ground. Visual characters shall be 40 inches (1015 mm) minimum above the finish floor or ground.
EXCEPTION: Visual characters indicating elevator car controls shall not be required to comply with 703.5.6.

703.5.7 Stroke Thickness. Stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 30 percent maximum of the height of the character.

703.5.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

703.5.9 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height.

703.6 Pictograms. Pictograms shall comply with 703.6.

703.6.1 Pictogram Field. Pictograms shall have a field height of 6 inches (150 mm) minimum. Characters and braille shall not be located in the pictogram field.

703.6.2 Finish and Contrast. Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.

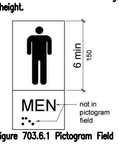

Figure 703.6.1 Pictogram Field

703.6.3 Text Descriptors. Pictograms shall have text descriptors located directly below the pictogram field. Text descriptors shall comply with 703.2, 703.3 and 703.4.

703.7 Symbols of Accessibility. Symbols of accessibility shall comply with 703.7.

703.7.1 Finish and Contrast. Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

703.7.2 Symbols.

703.7.2.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure 703.7.2.1.

703.7.2.2 International Symbol of TTY. The International Symbol of TTY shall comply with Figure 703.7.2.2.

703.7.2.3 Volume Control Telephones. Telephones with a volume control shall be identified by a pictogram of a telephone handset with radiating sound waves on a square field such as shown in Figure 703.7.2.3.

703.7.2.4 Assistive Listening Systems. Assistive listening systems shall be identified by the International Symbol of Access for Hearing Loss complying with Figure 703.7.2.4.

Figure 703.7.2.1 International Symbol of Accessibility

Figure 703.7.2.2 International Symbol of TTY

Figure 703.7.2.3 Volume Control Telephone

Figure 703.7.2.4 International Symbol of Access for Hearing Loss

NOT USED

901 General
901.1 Scope. The provisions of Chapter 9 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

902 Dining Surfaces and Work Surfaces
902.1 General. Dining surfaces and work surfaces shall comply with 902.2 and 902.3.
EXCEPTION: Dining surfaces and work surfaces for children's use shall be permitted to comply with 902.4.

902.2 Clear Floor or Ground Space. A clear floor space complying with 305 positioned for a forward approach shall be provided. Knee and toe clearance complying with 306 shall be provided.

902.3 Height. The tops of dining surfaces and work surfaces shall be 28 inches (710 mm) minimum and 34 inches (865 mm) maximum above the finish floor or ground.
902.4 Dining Surfaces and Work Surfaces for Children's Use. Accessible dining surfaces and work surfaces for children's use shall comply with 902.4.
EXCEPTION: Dining surfaces and work surfaces that are used primarily by children 5 years and younger shall not be required to comply with 902.4 where a clear floor or ground space complying with 305 positioned for a parallel approach is provided.

902.4.1 Clear Floor or Ground Space. A clear floor space complying with 305 positioned for forward approach shall be provided. Knee and toe clearance complying with 306 shall be provided, except that knee clearance 24 inches (610 mm) minimum above the finish floor or ground shall be permitted.

902.4.2 Height. The tops of tables and counters shall be 26 inches (660 mm) minimum and 30 inches (760 mm) maximum above the finish floor or ground.

903 Benches
903.1 General. Benches shall comply with 903.

903.2 Clear Floor or Ground Space. Clear floor or ground space complying with 305 shall be provided and shall be positioned at the end of the bench seat and parallel to the short axis of the bench.

903.3 Size. Benches shall have seats that are 42 inches (1065 mm) long minimum and 20 inches (510 mm) deep minimum and 24 inches (610 mm) deep maximum.

903.4 Back Support. The bench shall provide for back support or shall be affixed to a wall. Back support shall be 42 inches (1065 mm) long minimum and shall extend from a point 2 inches (51 mm) maximum above the seat surface to a point 18 inches (455 mm) minimum above the seat surface. Back support shall be 2 1/2 inches (64 mm) maximum from the rear edge of the seat measured horizontally.

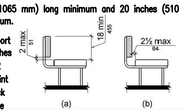

Figure 903.4 Bench Back Support

903.5 Height. The top of the bench seat surface shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum above the finish floor or ground.

903.6 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener, mounting device, or supporting structure.

903.7 Wet Locations. Where installed in wet locations, the surface of the seat shall be slip resistant and shall not accumulate water.

904 Check-Out Aisles and Sales and Service Counters
904.1 General. Check-out aisles and sales and service counters shall comply with the applicable requirements of 904.

904.2 Approach. All portions of counters required to comply with 904 shall be located adjacent to a walking surface complying with 403.

904.3 Check-Out Aisles. Check-out aisles shall comply with 904.3.

904.3.1 Aisle. Aisles shall comply with 403.

904.3.2 Counter. The counter surface height shall be 38 inches (965 mm) maximum above the finish floor or ground. The top of the counter edge protection shall be 2 inches (51 mm) maximum above the top of the counter surface on the aisle side of the check-out counter.

904.3.3 Check Writing Surfaces. Where provided, check writing surfaces shall comply with 902.3.

904.4 Sales and Service Counters. Sales counters and service counters shall comply with 904.4.1 or 904.4.2. The accessible portion of the counter top shall extend the same depth as the sales or service counter top.
EXCEPTION: In alterations, when the provision of a counter complying with 904.4 would result in a reduction of the number of existing counters at work stations or a reduction of the number of existing mail boxes, the counter shall be permitted to have a portion which is 24 inches (610 mm) long minimum complying with 904.4.1 provided that the required clear floor or ground space is centered on the accessible length of the counter.

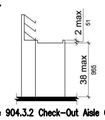

Figure 904.3.2 Check-Out Aisle Counters

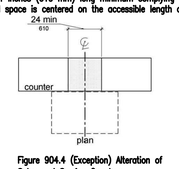

Figure 904.4 (Exception) Alteration of Sales and Service Counters

904.4.1 Parallel Approach. A portion of the counter surface that is 36 inches (915 mm) long minimum and 36 inches (915 mm) high maximum above the finish floor shall be provided. A clear floor or ground space complying with 305 shall be positioned for a parallel approach adjacent to the 36 inch (915 mm) minimum length of counter.
EXCEPTION: Where the provided counter surface is less than 36 inches (915 mm) long, the entire counter surface shall be 36 inches (915 mm) high maximum above the finish floor.

904.4.2 Forward Approach. A portion of the counter surface that is 30 inches (760 mm) long minimum and 36 inches (915 mm) high maximum shall be provided. Knee and toe space complying with 306 shall be provided under the counter. A clear floor or ground space complying with 305 shall be positioned for a forward approach to the counter.

904.5 Food Service Lines. Counters in food service lines shall comply with 904.5.
904.5.1 Self-Service Shelves and Dispensing Devices. Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall comply with 308.
904.5.2 Tray Slides. The tops of tray slides shall be 28 inches (710 mm) minimum and 34 inches (865 mm) maximum above the finish floor or ground.

904.6 Security Glazing. Where counters or teller windows have security glazing to separate personnel from the public, a method to facilitate voice communication shall be provided. Telephone handset devices, if provided, shall comply with 704.3.

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project number 25017

drawn by CG, RF

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TEXAS ACCESSIBILITY STANDARDS

TAS-3

scale

05/12/25
date

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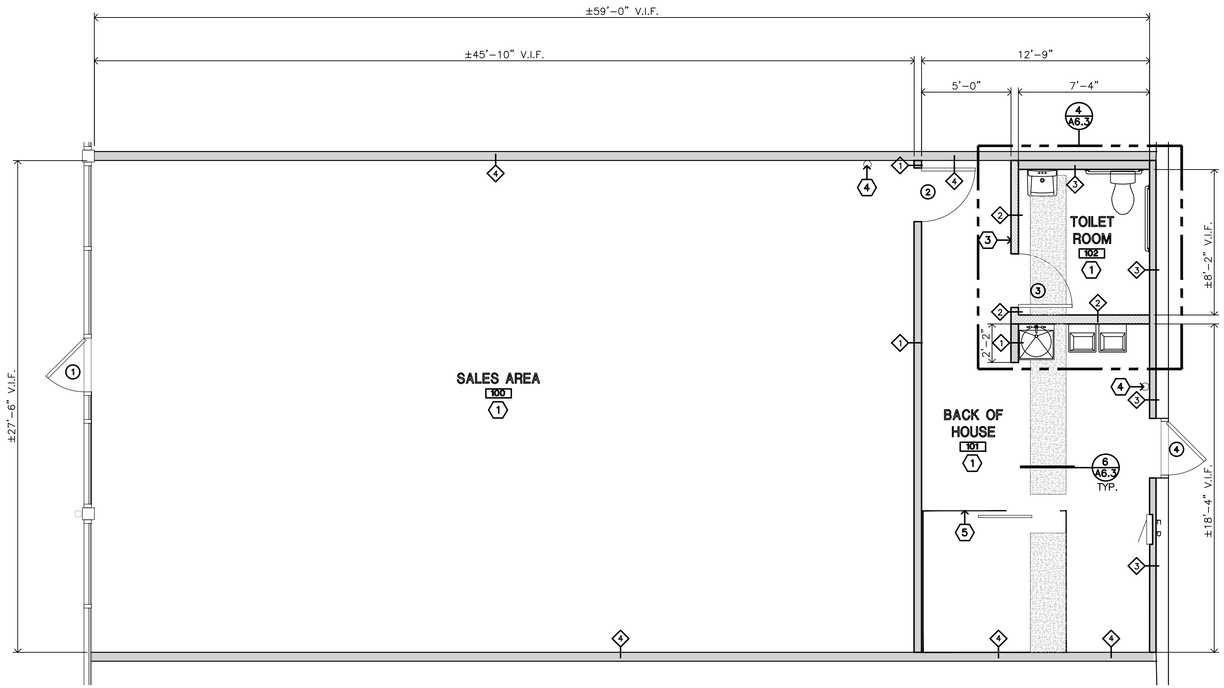


1 A-1.1 FLOOR PLAN
1/4" = 1'-0"

GENERAL NOTES

1. SHADED WALLS INDICATE NEW CONSTRUCTION.
2. GENERAL CONTRACTOR IS COMPLETELY RESPONSIBLE FOR VERIFYING ALL AS-IS CONDITIONS AT PROJECT SITE.
3. CONTRACTOR TO PROVIDE STUD SUPPORT AT DOOR FRAMES, BACKERS, AND ANY NECESSARY SHORING OF WALLS.
4. ALL MERCHANDISE FIXTURES THROUGHOUT TENANTS SALES AREA WILL BE SUPPLIED BY AT&T'S FIXTURE COMPANY AND INSTALLED BY TENANT, COORDINATION BY TENANT'S GENERAL CONTRACTOR, SEE A-1.2
5. NO CHANGE IN USE.
6. ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF LOCAL BUILDING CODES AND ALL OTHER APPLICABLE BUILDING CODES. GENERAL CONTRACTOR MUST ALSO SATISFY ALL LANDLORD REQUIREMENTS AND TENANT'S FINAL PUNCH LIST NEEDS.
7. CONTRACTOR TO VERIFY ALL CONDITIONS AND DIMENSIONS SHOWN ON THE PLAN AT THE JOB SITE PRIOR TO COMMENCING WORK, NOTIFY ARCHITECT OF MAJOR DISCREPANCIES
8. CONSTRUCTION CANNOT BE ALLOWED TO BEGIN UNTIL A PERMIT HAS BEEN SECURED.
9. ALL FINISH WOOD SHALL BE KILN DRIED, W/ MILL QUALITY FINISH AND ALL WOOD SHALL RECEIVE A FIRE RETARDANT COATING OR TREATMENT. NO WOOD OR OTHER COMBUSTIBLE MATERIAL SHALL BE USED ABOVE ANY CEILING.
10. ALL LUMBER TO BE GRADE MARKED PRIOR TO DELIVERY TO THE SITE.
11. G.C. TO INSTALL BLOCKING IN WALLS FOR ALL CASEWORK, SHELVING, COUNTERTOPS, WALL HUNG ACCESSORIES AND OWNER SUPPLIED EQUIPMENT.
12. SEE SHT. A-1.3 FOR ADDITIONAL FLOOR AND WALL FINISH INFORMATION
13. SEE FINISH SCHEDULE AND LEGEND SHEET, A-6.1, FOR ALL FINISH SPECIFICATIONS.
14. MAINTAIN FIRE RESISTIVE RATING FOR TENANT DEMISING WALLS
15. WHERE DEMOLITION OCCURS ADJACENT TO EXISTING, PATCH AND REPAIR ADJACENT

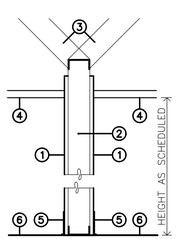
PARTITION LEGEND

EXISTING PARTITION TO REMAIN | NEW PARTITIONS | NEW ACOUSTICAL PARTITIONS

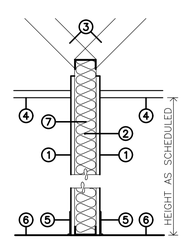
PARTITION TYPE NOTES

1. 1-LAYER 5/8", TYPE 'X' G.W.B.
2. 3-5/8" 20 GA. METAL STUDS @ 16" O.C., PROVIDE 6" METAL STUDS TO ACCOMMODATE PLUMBING AS NECESSARY.
3. 3 5/8" 20 GA. METAL STUD BRACES @ 8'-0" O.C. AND AT EACH SIDE OF OPENINGS, CONNECT TO STRUCTURE ABOVE
4. CEILING OR SOFFIT AS SCHEDULED
5. WALL BASE AS SCHEDULED
6. FLOOR FINISH AS SCHEDULED
7. ACOUSTICAL BATT INSULATION.
8. UNDERSIDE OF EXISTING ROOF STRUCTURE
9. 6" 20 GA. METAL STUDS @ 16" O.C.

PARTITION TYPES



1 PARTITION TYPE 1
1" = 1'-0"



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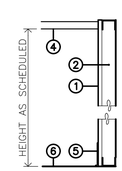

3 PARTITION TYPE 3
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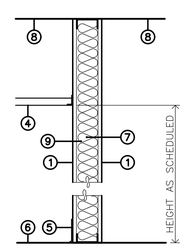

UL-U419 ONE-HOUR
4 PARTITION TYPE 4
1" = 1'-0"

KEY NOTES (1, 2, ETC.)

1. CONTRACTOR TO PATCH/REPAIR ALL EXISTING GWB. PROVIDE A SMOOTH & CLEAN SURFACE FOR NEW FINISHES, WHERE OCCURS. TYP. THROUGHOUT AREA.
2. PROVIDE ADA EXIT SIGN ADJACENT TO EXIT DOOR, V.I.F. SEE #2/A-6.2.
3. PROVIDE TOILET ROOM SIGN ADJACENT TO TOILET ROOM DOOR, V.I.F. SEE #1/A-6.2.
4. PROVIDE SURFACE MOUNTED 10 LB. FIRE EXTINGUISHER, LARSENS MFG. COMPANY #MP-10, MP SERIES, DRY CHEMICAL, COLOR: RED. PURCHASE FROM GRAINGER. MOUNT SO THAT HANDLE IS NO HIGHER THAN 48" A.F.F. MAINTAIN PER NFPA 10. CONFIRM EXACT LOCATION WITH INSPECTOR IN FIELD.
5. PROVIDE 8' X 8' CAGE

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RANDY J. FALK
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AT&T

NORTHEAST CORNER OF
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MELISSA, TX 75454

FLOOR PLAN

A-1.1

AS NOTED (scale) | 05/12/25 (date)

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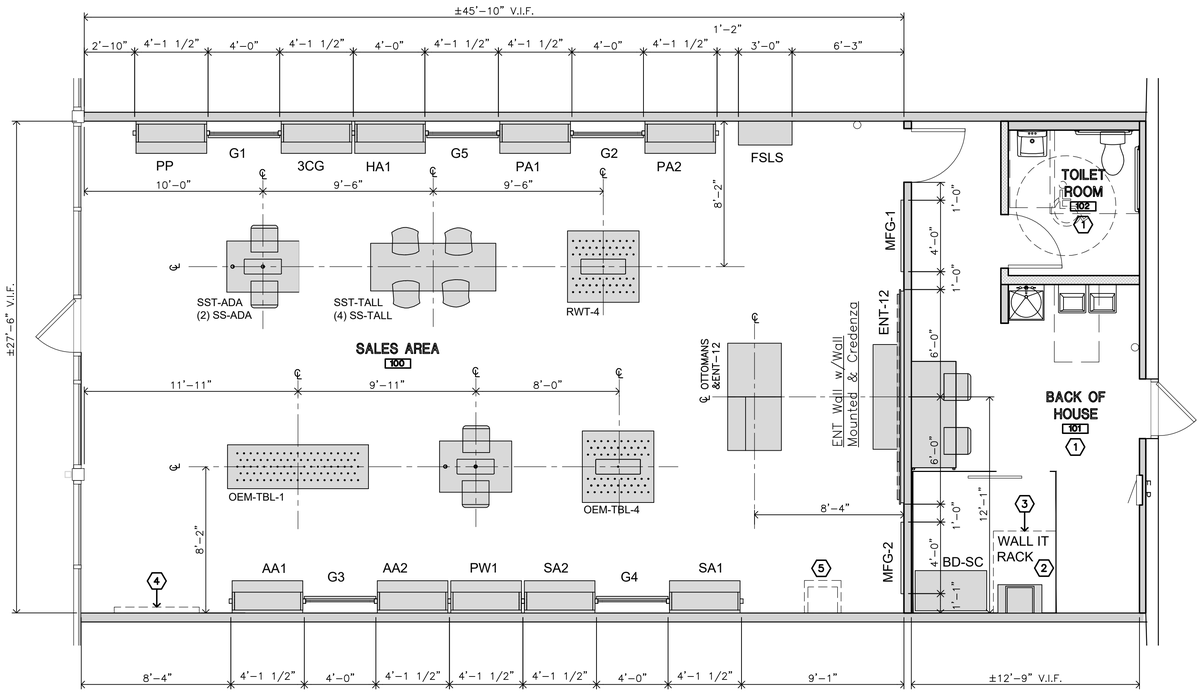

1 / A-1.2 FIXTURE PLAN
1/4" = 1'-0"

SALES FLOOR FURNITURE & EQUIPMENT

WALL FIXTURES (4' BAYS) 15 TOTAL		REMARKS
GRAPHIC	5	
OEM SHOP 1 (APPLE)	2	
OEM SHOP 2 (SAMSUNG)	2	
PREPAID	1	
PW	1	
3CG	1	
HA	1	
PERSONAL AUDIO	2	
ENTERTAINMENT WALL	12 FT.	
FLOOR FIXTURES		
DEVICE TABLES	1	
OEM DEVICE TABLES	2	
S&S TABLES	3	
ADA TABLES	2	
TALL TABLES	1	
ENTERTAINMENT SEATING	2	2 @ 36" X 36" ONE WITH BACK
FSLS	1	

GENERAL NOTES

1. GENERAL CONTRACTOR RESPONSIBLE FOR COORDINATING WITH AND INFORMING FIXTURE VENDOR OF ANY/ALL MODIFICATIONS REQUIRED TO SALES AREA FIXTURES
2. ALL FREESTANDING FIXTURES EXACT PLACEMENT TO BE DETERMINED IN FIELD
3. ALL SALES AREA MERCHANDISE FIXTURES AS SCHEDULED TO BE PROVIDED BY AT&T'S FIXTURE VENDOR AND INSTALLED BY AT&T'S FIXTURE VENDOR. CONTRACTOR TO COORDINATE WITH FIXTURE VENDOR; MIDWEST CUSTOM CASE 708-672-2907

KEY NOTES (1, 2, ETC.)

1. REVIEW ADDITIONAL BACK OF HOUSE REQUIREMENTS WITH AT&T AUTHORIZED RETAILER
2. PROVIDE NEW TELECO RACKS. CONFIRM EXACT LOCATION WITH AUTHORIZED RETAILER PRIOR TO INSTALLATION. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFO.
3. MDF AREA FLOOR CLEARANCES REQUIRED BY AT&T.
4. PROVIDE GLOBE GRAPHIC, VERTICAL LOCK UP.
5. FUTURE TECHNOLOGY.

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FIXTURE PLAN | A-1.2

AS NOTED (scale) | 05/12/25 (date)

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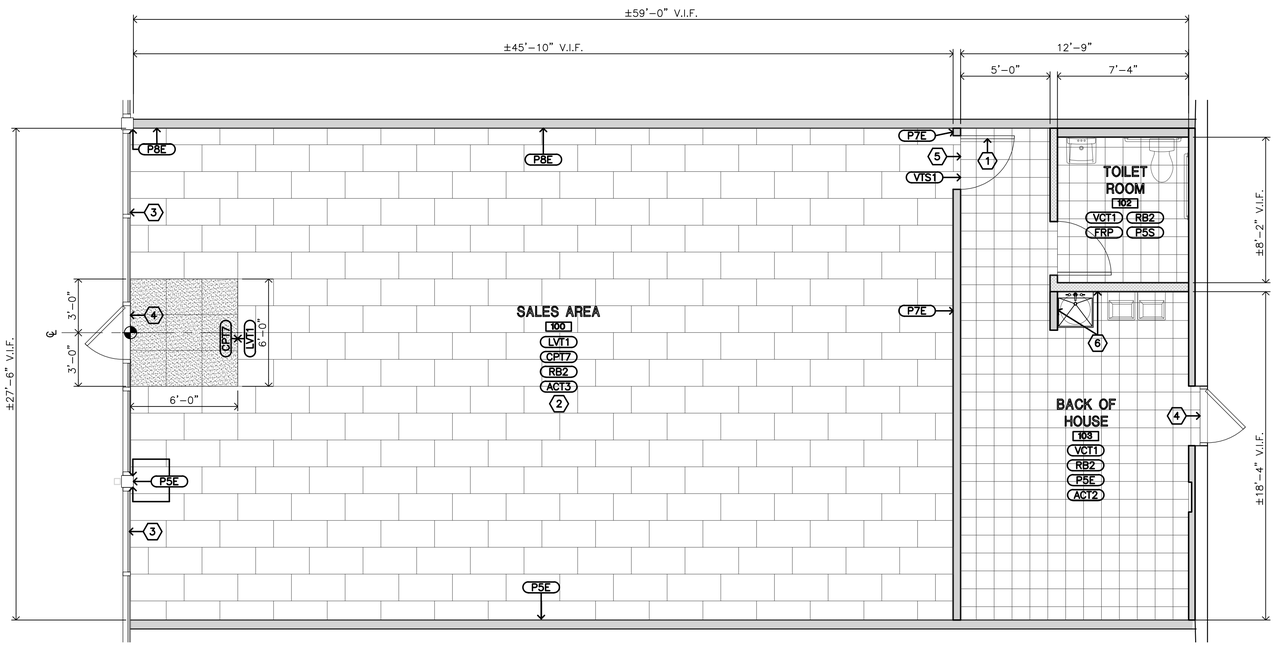

1 FINISH PLAN
A-1.3 1/4" = 1'-0"

FINISH NOTES(1, 2, ETC.)

1. PAINT SALES AREA SIDE OF DOOR & FRAME 'P7S'. PAINT BOH SIDE OF DOOR & FRAME 'P5S'.
2. PROVIDE 'RB2' THOUGHOUT SALES AREA.
3. PAINT G.W.B. ABOVE STOREFRONT 'P5E'.
4. EXTEND NEW FLOOR FINISH TO EXISTING THRESHOLD.
5. EXTEND NEW FLOOR FINISH TO BACK OF HOUSE SIDE OF PARTITION. PROVIDE TRANSITION STRIP IF REQUIRED.
6. PROVIDE 4'-0" HIGH FRP BEHIND MOP SINK AND DRINKING FOUNTAIN

GENERAL NOTES

1. SEE A-6.1 FOR FINISH LEGEND
2. ALL SALES AREA P&D DEVICE, DATA JACKS AND PLATE COLORS TO BE AS FOLLOWS:

TORONTO BLUE WALLS (P7E) – 'GRAY'
THUNDER CLOUD WALLS (P8E) – 'GRAY'
HORIZON WALLS (P5E) –'WHITE'

revisions

project number 25017

drawn by CG, RF

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MELISSA, TX 75454

FINISH PLAN

A-1.3

AS NOTED
scale

05/12/25
date

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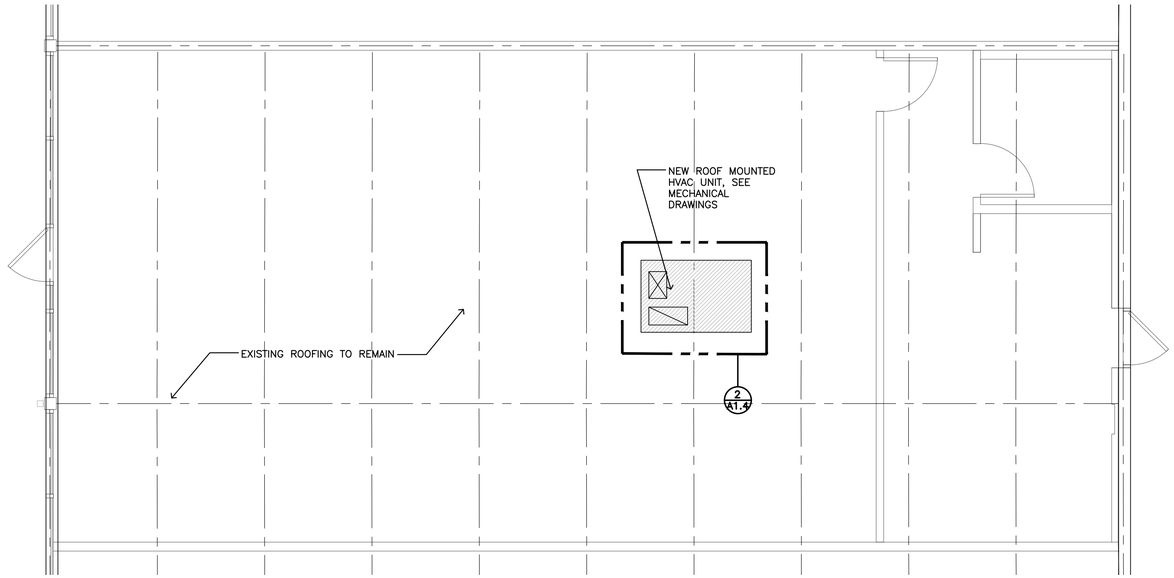


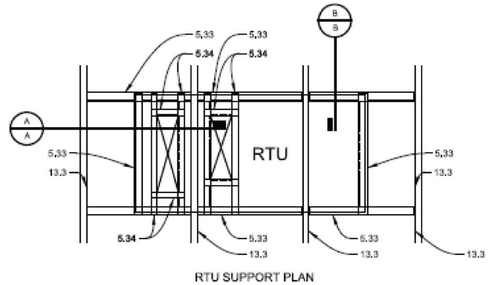
1 / A-1.4 ROOF PLAN
1/4" = 1'-0"

KEYNOTES:

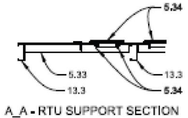
5.33 4"x4"x¼" ANGLE SUPPORT AT WEIGHT LOCATIONS FOR ROOF MOUNTED EQUIPMENT. ALL EQUIPMENT SHALL BE MOUNTED OVER A MINIMUM OF 2 JOISTS.

5.34 3"x3"x1/4" ANGLE FRAME AT EDGE OF ROOF DECK PENETRATIONS TO PROVIDE FIRM SUPPORT FOR ROOF DECK.

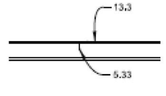
13.3 EXISTING ROOF PURLIN.



RTU SUPPORT PLAN



A_A - RTU SUPPORT SECTION



B_B - RTU SUPPORT SECTION

2 / A-1.4 RTU FRAMING
NTS

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ROOF PLAN & DETAILS

A-1.4

AS NOTED
scale

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date

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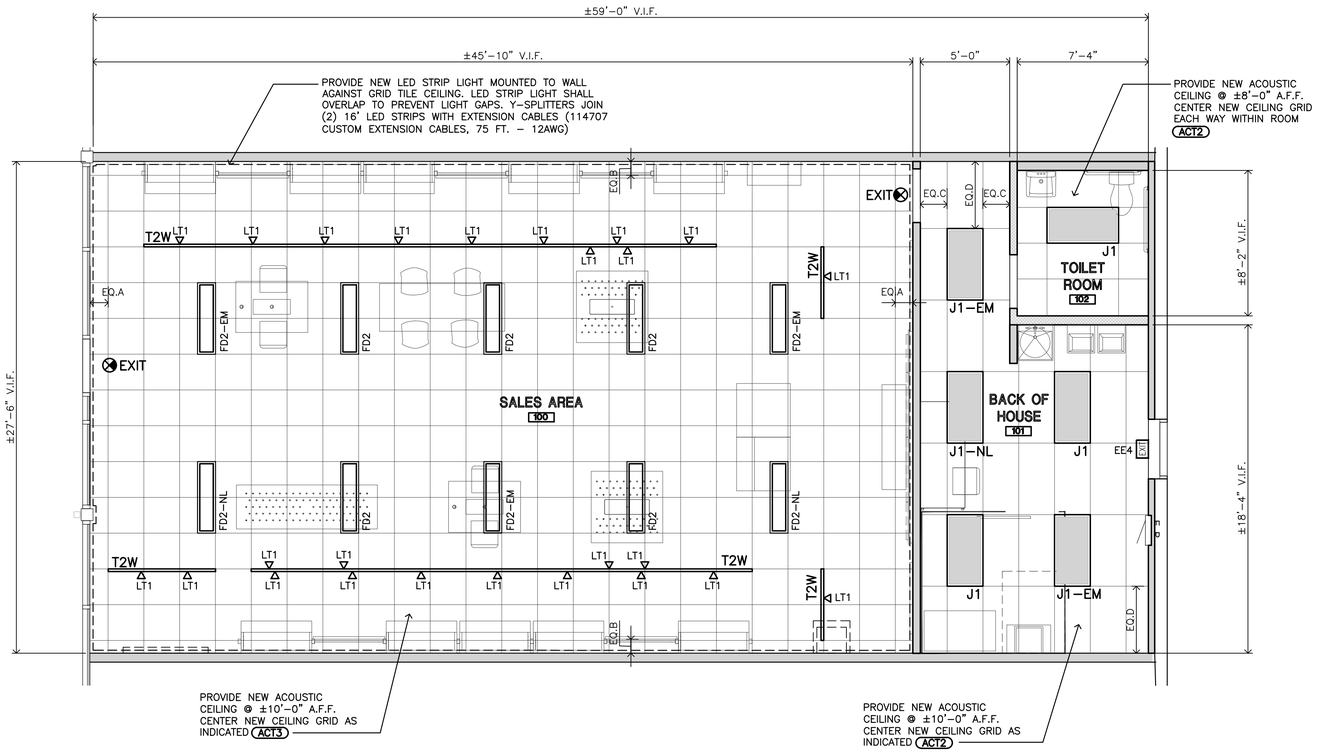

1 / A-2.1 REFLECTED CEILING PLAN
1/4" = 1'-0"

GENERAL NOTES

1. SEE A-1.3, AND A-6.1 FOR ADDITIONAL FINISH INFORMATION
2. SEE A-1.3 FOR ALL SALES AREA DEVICE COVER PLATE COLORS.
3. CONTROL ALL SALES AREA LIGHT FIXTURES VIA SWITCH BANK, EXCEPT WHERE NOTED OTHERWISE, SEE ELECTRICAL DRAWINGS
4. CONTRACTOR TO INSTALL NEW CEILING GRID IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS

LIGHT FIXTURE LEGEND

SYMBOL	QTY.	DESCRIPTION	MANUFACTURER	LOCATION	REMARKS
FD2	10	1X4 RECESSED LED DIRECT LIGHT	LITHONIA 420V74 EPANL 14 40L 40K WITH 1X4 PANLACG KIT	SALES AREA	1. LIGHTS WITH 'NL' DESIGNATION, WIRE THRU NIGHTLIGHT CIRCUIT 2. LIGHTS WITH 'EM' DESIGNATION PROVIDE W/ EMERGENCY BALLAST
	3	EM BATTERY	LITHONIA PS 1055CP FMC M10	SALES AREA	
T2W		LIGHT TRACK, WHITE FINISH	ACUITY/ JUNO 45DN	SALES AREA LIGHT TRACK	
LT1	25	TRACK MOUNTED LED ACCENT LIGHT, WHITE FINISH	JUNO 452L99 WITH 462F19 7 WATT LED LAMP	SALES AREA ACCENT LIGHT	1. AIM PER LAMP AIMING NOTES
		LED LIGHT STRIP WITH CHANNEL SYSTEM	114707 - LED CHANNEL SYSTEM, CS-108-2-5M, SET (8FT) 114706 - LIGHT STRIP LED, 5050,96/M-24V, 16FT SPLITTER 114642 - Y-SPLITTER, LOW-VOLTAGE	SALES AREA	1. ORDER THROUGH FIXTURE PARTNERS (NOT GRAINGER). DELIVERY TO COINCIDE WITH GRAINGER DELIVERY
J1	6	2X4 RECESSED LED FLAT PANELS	LITHONIA 420V82 EPANL 24 40L 40K	BACK-OF-HOUSE	1. LIGHTS WITH 'NL' DESIGNATION, WIRE THRU NIGHTLIGHT CIRCUIT 2. LIGHTS WITH 'EM' DESIGNATION PROVIDE W/ EMERGENCY BALLAST
	2	EM BATTERY	LITHONIA PS 1055CP FMC M10	BACK-OF-HOUSE	

SYMBOL	QTY.	DESCRIPTION	MANUFACTURER	LOCATION	REMARKS
EXIT	2	EDGE LIT EXIT SIGN, SINGLE FACE LETTERS	LITHONIA LIGHTING EDG 1 G EL	SALES AREA	
EXIT EE4	1	EMERGENCY EXIT SIGN FIXTURE	LITHONIA LQMSW3RELN	BACK-OF-HOUSE	

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MELISSA, TX 75454

REFLECTED CEILING PLAN

A-2.1

AS NOTED
scale

05/12/25
date

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ABBREVIATIONS

A	
A.F.F.	ABOVE FINISH FLOOR
AC	ACOUSTICAL
ACT	ACOUSTICAL TILE
A.C.	AIR CONDITIONING
ALT	ALTERNATE
ALUM	ALUMINUM
APP'D	APPROVED
ARCH	ARCHITECTURAL
ASSY	ASSEMBLY
B	
BSMT	BASEMENT
B.M.	BENCH MARK
BLK	BLOCK
BLKG	BLOCKING
BD	BOARD
BOT	BOTTOM
BRKT	BRACKET
BR	BRASS
C	
CAB	CABINET
CPT	CARPET
CLG	CEILING
C.H.	CEILING HEIGHT
C.L.	CENTER LINE
C.C.	CENTER TO CENTER
CT	CERAMIC TILE
CLR	CLEAR
CLOS	CLOSET
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
C.J.	CONTROL JOINT
CORR	CORRIDOR
D	
DEPT	DEPARTMENT
DTL.	DETAIL
DIA.	DIAMETER
DIM	DIMENSION
DO	DITTO
DR	DOOR
DN	DOWN
DWG	DRAWING
D.F.	DRINKING FOUNTAIN
E	
EA	EACH
ELEC.	ELECTRICAL
EL	ELEVATION
ELEV	ELEVATION
ENCL	ENCLOSURE
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F	
FT	FEET
F.V.	FIELD VERIFY
FIN	FINISH
F.E.	FIRE EXTINGUISHER
F.R.	FIRE RATED
F.P.	FIRE PROTECTION
FIXT	FIXTURE
FL	FLOOR
FLUOR	FLUORESCENT
F.S.	FULL SIZE
FURR	FURRING
G	
GALV.	GALVANIZED
GA	GAUGE
G.C.	GENERAL CONTRACTOR
GL	GLASS
GYP	GYPSUM
G.W.B.	GYPSUM WALL BOARD
H	
HR	HANDRAIL
HDW	HARDWARE
H.V.A.C.	HEATING VENTILATING & AIR CONDITIONING
H.C.	HOLLOW CORE
H.M.	HOLLOW METAL
HORIZ	HORIZONTAL
H.CLG	HUNG CEILING
I	
I.D.	INSIDE DIAMETER
INCAND	INCANDESCENT
INST	INSTALL
INSUL	INSULATION
INT	INTERIOR
J	
J.C.	JANITOR CLOSET
JT	JOINT
JST	JOIST
J.B.	JUNCTION BOX
K	
K.O.	KNOCK OUT
L	
LAB	LABORATORY
LAM	LAMINATE
LAV	LAVATORY
LT	LIGHT
LTG	LIGHTING
L.P.	LOW POINT
L.L.	LOWER LEVEL
LIN	LINEAR
M	
MDF	MAIN DISTRIBUTION FRAMEWORK
MFGR	MANUFACTURER
MAS	MASONRY
M.O.	MASONRY OPENING
MAT	MATERIAL
M.L.	MATCH LINE
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MTL.	METAL
MEZZ	MEZZANINE
MIN	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
MUL.	MULLION
N	
NICK	NICKEL
NOM	NOMINAL
N	NORTH
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
No.	NUMBER
O	
OFF	OFFICE
O.C.	ON CENTER
OPNG	OPENING
OPP	OPPOSITE
O.A.	OVER ALL
O.D.	OUTSIDE DIMENSION
P	
PT	PAINT
PTD	PAINTED
PR	PAIR
PNL	PANEL
PART	PARTITION
PGBD	PEGBOARD
PLAS	PLASTER
PL	PLASTIC LAMINATE
PLYWD	PLYWOOD
POL	POLISHED
PROP.L.	PROPERTY LINE
Q	
QT	QUARRY TILE
R	
RAD	RADIUS
REC	RECESSED
RECT	RECTANGLE
REF	REFERENCE
R.C.P.	REFL CEILING PLAN
REFL	REFLECTED
REM	REMOVE
REQ'D	REQUIRED
R.A.	RETURN AIR
REV	REVISION
R	RISER
RM	ROOM
R.O.	ROUGH OPENING
S	
SCHED	SCHEDULE
SECT	SECTION
SHT	SHEET
SHTRK	SHEET ROCK
SIM	SIMILAR
S.C.	SOLID CORE
SPKR	SPEAKER
SPECS	SPECIFICATIONS
SQ	SQUARE
STD	STANDARD
SS	STAINLESS STEEL
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE
SUSP	SUSPENDED
T	
TEL	TELEPHONE
TEMP	TEMPERED
TERR	TERRAZZO
TEXT	TEXTURED
T-STAT	THERMOSTAT
THK, TH	THICK/THICKNESS
T.F.F.	TOP OF FINISHED FLOOR
T.O.	TRIM OPENING
T.O.C.	TOP OF CONCRETE
T.O.S.	TOP OF STEEL
TYP	TYPICAL
U	
U.L.	UNDERWRITER'S LABORATORY
V	
VAL	VALANCE
VERT	VERTICAL
VEST	VESTIBULE
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
V.I.F.	VERIFY IN FIELD
VT	VINYL TILE
VWC	VINYL WALL COVERING
W	
W.C.	WATER CLOSET
WT	WEIGHT
W	WIDTH
W/	WITH
W/O	WITHOUT
WD	WOOD
W.P.	WORK POINT
Y	
YD	YARD

FINISH LEGEND

CODE	ITEM	PRODUCT	REMARKS	CLASS RATING
CPT5	CARPET	CARPET PROVIDED AND INSTALLED THROUGH G.C. BY SHAW. SHAW – MODEL: AT&T 800Y7/STEP FORWARD, COLOR: #31557 STERLING – 2'–0"x 2'–0" – CONTACT: MARK LAW, 770–241–1345 MARK.LAW@SHAWINC.COM	SALES AREA WALK–OFF MAT TO BE INSTALLED RECESSED FLUSH WITH ADJOINING FLOOR FINISH. SIZE AS INDICATED ON SHT A–1.3. INSTALL QUARTER TURNED.	MIN. C
CPT6	CARPET	CARPET PROVIDED AND INSTALLED THROUGH G.C. BY SHAW. SHAW – MODEL: AT&T 59575/INNOVATE TILE, COLOR: MERGE #75597 – 2'–0" x2'–0" – CONTACT: MARK LAW, 770–241–1345 MARK.LAW@SHAWINC.COM	INSTALL QUARTER TURNED.	
CPT7	CARPET	CARPET PROVIDED AND INSTALLED THROUGH G.C. MOHAWK – COLLECTION: TUFF STUFF II – STYLE: FIRST STEP II (GT315) – 2'–0"x 2'–0"	SALES AREA WALK–OFF MAT TO BE INSTALLED RECESSED FLUSH WITH ADJOINING FLOOR FINISH. SIZE AS INDICATED ON SHT A–1.3.	
RB2	RUBBER BASE	MOHAWK – 4" COVE WALL BASE – COLOR: CHARCOAL 958	BASE AT GYP. BD. WALLS	
LVT1	LUXURY VINYL TILE	TILE PROVIDED AND INSTALLED THROUGH G.C. MOHAWK – COLLECTION: HOT AND HEAVY II – STYLE: BOLDER 5.0 (C2108) COLOR: OBSIDIAN 969 – 18"x 36"	SALES AREA LVT	
LVT2	LUXURY VINYL TILE		BOH LVT	
VCT1	VINYL TILE	SHAW – IMPERIAL TEXTURE #51904 – COLOR: STERLING – 12" X 12" X 1/8" – CONTACT: MARK LAW, 770–241–1345 MARK.LAW@SHAWINC.COM		B
VTS1	VINYL TRANSITION STRIP	JOHNSONITE CE–40–A, COLOR: BLACK. MT–00–A RIGID ALUMINUM TRACK.		
ACT2	ACOUSTIC CLG. TILE	ARMSTRONG, SIZE: 2'x4' – #5NGKO – MODEL #1728 – COLOR: WHITE – GRID COLOR: FLAT WHITE – CONTACT W.W. GRAINGER, INC. 404–806–8288 ATT@GRAINGER.COM	BOH CEILING	A
	NOTE PROVIDE WHERE NEEDED: FLEXIBLE CEILING TRIM, KENBROOK COMPANY, ULTRA–FLEX ANGLE, 1 INCH, COLOR: WHITE			
ACT3	ACOUSTIC CLG. TILE	ARMSTRONG ACOUSTIC CEILING TILE, SIZE 2'x2' – 6YLP7/DUNE – MODEL #1772 – EDGE: ANGLED TEGULAR – COLOR: WHITE – GRID: DONN DX 15/16 – GRID COLOR: FLAT WHITE – CONTACT W.W. GRAINGER, INC. 404–806–8288 ATT@GRAINGER.COM	CLG SALES FLOOR, USE LOGIX UTILITY MODULE BRACKET TO FRAME ONE SIDE LIGHT FIXTURE OPENINGS	A
P5E	PAINT	BENJAMIN MOORE – "HORIZON" – #0C–53 – EGGSHELL FINISH – 877–623–8484 AT&T #113572	GYP. BD. WALLS	
P5S	PAINT	BENJAMIN MOORE – "HORIZON" – #0C–53 – SEMI–GLOSS FINISH – 877–623–8484 AT&T #113572	DOORS AND FRAMES	
P7E	PAINT	BENJAMIN MOORE – "TORONTO BLUE" – #2060–40 – EGGSHELL FINISH – 877–623–8484 AT&T #113572	GYP. BD. WALLS – ENTD WALL	
P7S	PAINT	BENJAMIN MOORE – "TORONTO BLUE" – #2060–40 – SEMI–GLOSS FINISH – 877–623–8484 AT&T #113572	DOOR AND FRAME – ENTD WALL	
P8E	PAINT	BENJAMIN MOORE – "THUNDERCLOUD GRAY" – #2124–40 – EGGSHELL FINISH – 877–623–8484 AT&T #113572	GYP. BD. WALLS – SALES AREA	
P8S	PAINT	BENJAMIN MOORE – "THUNDERCLOUD GRAY" – #2124–40 – SEMI–GLOSS FINISH – 877–623–8484 AT&T #113572	DOOR AND FRAME – SALES AREA	
CC–1	CORNER GUARD	RETAIL SPECIALTY, INC. 18GA STAINLESS STEEL, 430 GRADE #4 STAIN, 1"x1"x4'–0" – DAN HICKEY WWW.RSIHQ.COM	SALES FLOOR – ALL EXPOSED CORNERS	
PT1	STOREFRONT TILE AND WALL TILE	12" x 12" PORCELAIN TILE – NASCO TILE – EXTREME BLACK POLISHED – CONTACT: DIANA SCHNATTER 3732–602–9600 X 27 DIANA@NASCOSTONETILE.COM	USE GROUT 'G3'	
PT2	STOREFRONT FLOOR TILE	24" x 24" PORCELAIN FLOOR TILE – ASSOCIATED IMPORTS – NAME: FEEL, COLOR: LOUNGE, INSTALL: MONOLITHIC STOCK PRODUCT WITH GRAINGER	USE GROUT 'G2'	
G2	GROUT	LATICRETE (1/8" MAX) – COLOR: #24 NATURAL GREY, SANDED	USE WITH PORCELAIN TILE 'PT2'	
G3	GROUT	HYDROMENT (1/8" MAX) – COLOR: NATURAL, SANDED	USE WITH PORCELAIN TILE 'PT1'	
MCS1	METAL CORNER STRIP	SCHLUETER–SCHIENE: QUADEC Q–100–ACG & NECESSARY ACCESSORIES	PROVIDE ALL NECESSARY ACCESSORY PIECES AND INSTALL PER MANUFACTURER'S INSTRUCTIONS. CONFIRM EXACT SIZE IN FIELD	
MF1	MALL FLOORING	CONTACT MALL OPERATIONS MANAGER FOR FLOORING SPECFICATION(S)	FLOORING INSTALLATION PATTERN TO MATCH EXISTING, CONFIRM WITH MALL OPERATIONS MANGER PRIOR TO COMMENCING WORK	
MTS1	ALUM. TRANSITION STRIP	SCHLUTER–SCHIENE AE–100 – 3/8" HIGH, SATIN ANODIZED ALUMINUM	TRANSITION STRIP HEIGHT IN FIELD PRIOR TO ORDERING	
FRP	FRP PANEL	MARLITE – COLOR: WHITE – FINISH: TEXTURED – SIZE: 48" HEIGHT W/PVC ACCESSORIES	OR APPROVED EQUAL. MOP SINK, DRINKING FOUNTAINS AND TOILET ROOMS UP TO 4'–0" AFF.	

MAXIMUM FINISH FLAME SPREAD & SMOKE DEVELOPMENT SCHEDULE

REQUIRED- SPRINKLERED				REQUIRED- NONSPRINKLERED			
OCCUPANCY GROUP	EXIT CLOSURES /PASSAGEWAYS	CORRIDORS	ROOMS AND ENCLOSED SPACES	OCCUPANCY GROUP	EXIT CLOSURES /PASSAGEWAYS	CORRIDORS	ROOMS AND ENCLOSED SPACES
M	CLASS: B	CLASS: C	CLASS: C	M	CLASS: A	CLASS: B	CLASS: C

CLASS RATINGS

CLASS A: FLAME SPREAD 0–25; SMOKE–DEVELOPED 0–450

CLASS B: FLAME SPREAD 26–75; SMOKE–DEVELOPED 0–450

CLASS C: FLAME SPREAD 76–200; SMOKE–DEVELOPED 0–450

ROOM FINISH SCHEDULE

RM#	ROOM NAME	WALL	CLG	FLR	BASE	REMARKS
100	SALES AREA	SEE A–1.3	ACT3	CPT7/LVT1	RB2	SEE A–1.3 FOR ADDITIONAL INFORMATION
101	BACK OF HOUSE	P5E	ACT2	VCT1	RB2	4'–0" FRP BEHIND MOP SINK AND DRINKING FOUNTAIN
102	TOILET ROOM	P5S	ACT2	VCT1	RB2	4'–0" FRP ON ALL WALLS

GENERAL FINISH NOTES

1. FOR A.C.T. AND G.W.B. FINISHES, SEE REFLECTED CEILING PLANS, A–2.1
2. REFER TO A–2.1, REFLECTED CEILING PLAN, FOR LAY–IN CEILING HEIGHTS.
3. PROVIDE FLEX MOLD, COLOR: WHITE, AS NECESSARY.
4. FOR ALL WALLS WHERE NO FINISH OR BASE IS INDICATED, USE 'RB2'.
5. PAINT ALL DOORS AND FRAMES (ALUMINUM STOREFRONT NOT INCLUDED) 'P5S' UNLESS OTHERWISE NOTED.
6. NOTE DELETED.
7. CARPET TO BE PROVIDED AND INSTALLED BY CONTRACTOR, PURCHASE DIRECTLY FROM SHAW CARPETS.

revisions

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ABBREVIATIONS, FINISH LEGEND & SCHEDULE

A-6.1

AS NOTED
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date

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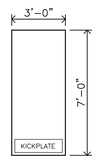
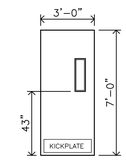
DOOR SCHEDULE

No.	LOCATION	SIZE	DOOR TYPE	DOOR THICK.	DOOR MAT'L.	DOOR FINISH	FRAME MAT'L	FRAME FINISH	HDWR. ITEM	REMARKS
1	STOREFRONT ENTRANCE	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	EXIST.	PROVIDE 'HW1' IF EXISTING IS NOT EQUAL, V.I.F. CONFIRM PRIOR TO ORDERING
2	SALES TO BOH	3'-0 X 7'-0"	B	1 3/4"	SCWD	SEE A-1.3	HM	SEE A-1.3	HW2	
3	TOILET ROOM	3'-0 X 7'-0"	A	1 3/4"	SCWD	P5S	HM	P5S	HW3	
4	REAR EXIT	EXIST.	EXIST.	EXIST.	EXIST.	P5S	EXIST.	P5S	EXIST.	PROVIDE 'HW6' IF EXISTING IS NOT EQUAL, V.I.F. CONFIRM PRIOR TO ORDERING

DOOR TYPES



A
SOLID CORE
WOOD DOOR



B
SOLID CORE WOOD DOOR
W/ 7" X 22" ONE-WAY
TEMPERED GLASS LITE

HARDWARE SETS

NOTE: #1 – UNLESS INDICATED OTHERWISE THE STANDARD FINISH FOR DOOR HARDWARE IS US26D
#2 – DOOR CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90°, THE TIME REQUIRED TO MOVE THE DOOR TO AN OPEN POSITION OF 12" SHALL BE 5 SECONDS MINIMUM
#3 – ALL HANDSETS INDICATED IN HARDWARE SET BELOW ARE LEVER TYPE

HW1
STOREFRONT ENTRY

1.5 PR	BUTTS	MFG	STANDARD
1	DEAD LOCK	A/R	MS1850S-1-1/8
1	EXIT INDICATOR	A/R	4089
1	CYLINDER	BES	1E6A4-C181-RP-626
1	THUMBTURN	BES	1E7A4-C181-626
	(LEVER TYPE THUMBTURN – ADA COMPLIANT)		
1	PUSH/PULL SET	QUA	Q-484
1	CLOSER	STA	D4550-S-689
1	DROP PLATE	STA	P45-180
1	THRESHOLD	NGP	425
1	SWEEP	NGP	102V
1	SEAL	MFG	STANDARD

HW2
PASSAGE WITH CLOSER

1 1/2 PR	BUTTS	STA	FBB179-4 1/2 x 4 1/2
1	PASSAGE	BES	93KON15D-S3-626
1	CLOSER	STA	D3550-SB
1	KICKPLATE	QUA	10" x 32" LDW-16GA
1	STOP	QUA	431ES
1	SILENCER	GJ	GJ64

HW3
PRIVACY WITH CLOSER

1 1/2 PR	BUTTS	STA	FBB179-4 1/2 x 4 1/2
1	PRIVACY	BES	94KOL15D-S3-626
1	CLOSER	STA	D3550-SB
1	KICKPLATE	QUA	10" x 32" LDW-16GA
1	STOP	QUA	431ES
1	SILENCER	GJ	GJ64

HW4 – NOT USED
PUSH BUTTON LOCK WITH CLOSER

HW5 – NOT USED
LOCK WITH CLOSER

HW6
REAR EXIT(INTERIOR) WITH LOCAL ALARM

1	ALARM LOCK	ARM	A101-002 (PANIC HARDWARE)
1	CYLINDER	BES	1E74
1	CLOSER	STA	D4550-SB
1	KICKPLATE	QUA	10" x 32" LDW-16GA
1	THRESHOLD	NGP	425
1	VIEWER	GRA	1HEW
1	ASTRAGAL	IVE	LG10 OR EQUAL

HW7 – NOT USED
CLOSET (PAIR) DUMMY

MANUFACTURERS LISTING

STA	STANLEY HARDWARE	A/R	ADAMS/RITE
QUA	QUALITY HARDWARE	PRE	PRECISION HARDWARE
BES	BEST ACCESS	ARM	ARM-A-DOR HARDWARE
LCN	LCN CLOSER	ADE	ADEMCO
NGP	NATIONAL GUARD PRODUCTS	GRA	GRAINGER
GJ	GLYNN-JOHNSON	TRI	TRILOGY-ALARM LOCK
IVE	H.B. IVES		

LOCK KEY / CORE ORDERING PROCEDURES

1. UPON PROJECT COMPLETION, GENERAL CONTRACTOR (GC) SHALL REPLACE EXISTING LOCK CORES. GENERAL CONTRACTOR SHALL PROVIDE THE APPROVED LOCK CORES
2. GC IS ABLE TO REQUEST ONLY THE NUMBER OF SPECIFIED CORES NEEDED AND (3) THREE MASTER KEYS. CONTROL KEY WILL BE SENT WITH MASTER KEYS TO (GC) TO INSTALL CORES
3. GENERAL CONTRACTOR TO VERIFY QUANTITY OF CORES OR PROVIDE DOOR SCHEDULE TO NATIONAL SUPPLIER
4. GENERAL CONTRACTOR TO ALLOW (2) WEEKS TO ORDER AND RECEIVE LOCK CORES FROM APPROVED AT&T SUPPLIER.
5. NATIONAL SUPPLIER WILL SHIP LOCK CORES/KEYS DIRECTLY TO GENERAL CONTRACTOR ADDRESS ONLY. INVOICING TO BE SENT TO (GC) FOR PAYMENT
6. DISTRICT SALES MANAGER AND THE AUTHORIZED RETAIL FACILITIES PERSONNEL MUST BOTH APPROVE ALL ADDITIONAL KEYS OR LOCK CORES.

AT&T APPROVED SUPPLIER:
STANLEY SECURITY SOLUTIONS
6150 EAST 75H STREET
INDIANAPOLIS, IN 46250
1-877-333-9294

CONTACT:
JENN CIESNIEWSKI – RED TEAM
JCIESNIEWSKI@STANLEYWORKS.COM
877-333-9294

ADA GUIDELINES

1 A-6.2 TYPICAL TOILET ROOM SIGNAGE
NO SCALE

ADA SIGNAGE GUIDELINES

1. SIGNS WHICH DESIGNATE PERMANENT ROOMS AND SPACES: REGULATIONS REQUIRE THAT SIGNAGE HAVE TACTILE (RAISED) LETTERING, BRAILLE AND PICTOGRAMS (WHERE APPLICABLE), MOUNTED IN A SPECIFIC LOCATION.
A. LETTERS AND NUMBERS SHALL BE RAISED A MINIMUM OF 1/32", UPPER CASE, SAN SERIF TYPE. RAISED CHARACTERS SHALL BE BETWEEN 5/8" – 2" WITH A MATTE FINISH.
B. BRAILLE TRANSLATIONS MUST READ AS GRADE II BRAILLE.
C. PICTOGRAMS OTHER THAN THE ACCESSIBLE SYMBOL ARE NOT REQUIRED. WHEN OTHER PICTOGRAMS ARE USED THEY SHOULD BE ACCOMPANIED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM. PICTOGRAMS MUST REST WITHIN A 6" VERTICAL FIELD.

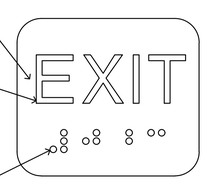
2. SIGNAGE LOCATION AND MEASUREMENTS: THE CENTER OF THE SIGN SHOULD MEASURE 60" FROM THE FLOOR, HOWEVER THE BASELINE OF RAISED COPY IS REQUIRED TO MEASURE A MINIMUM OF 48" AND A MAXIMUM 60" FROM THE FLOOR. WHERE A SIGN CONTAINING TACTILE CHARACTERS IS PROVIDED AT THE DOOR, THE SIGN SHALL BE LOCATED ALONG SIDE THE DOOR AT THE LATCH SIDE. WHERE THERE IS NO WALL SPACE AT THE LATCH SIDE OF A SINGLE DOOR OR TO THE RIGHT SIDE OF DOUBLE DOORS, SIGNS SHALL BE LOCATED ON THE NEAREST ADJACENT WALL. SIGNS SHOULD BE LOCATED SO THAT A CLEAR FLOOR SPACE OF 18" X 18", CENTERED ON THE SIGN, IS PROVIDED BEYOND THE ARC OF ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION.
SPECIAL NOTE: SIGNS SHALL BE PERMITTED ON THE PUSH SIDE OF DOORS WITH CLOSERS AND WITHOUT HOLD OPEN DEVICES.

BACKGROUND: NON-GLARE FINISH
TACTILE CHARACTERS CONTRAST WITH BACKGROUND

TACTILE (RAISED) CHARACTERS:
LINE SPACING – 135% – 170% MOUNTING HEIGHT – 48"-60"
SANS SERIF CHARACTERS UPPER CASE 1/32" MINIMUM THICKNESS
WIDTH – 55% – 110% OF HEIGHT STROKE – 10% – 15% OF HEIGHT

BRAILLE: GRADE II BRAILLE TRANSLATIONS LOCATED BELOW TACTILE CHARACTERS

NOTE: GC TO PROVIDE (1) SIGN PER TOILET ROOM, COORDINATE PER LOCATION



2 A-6.2 EXIT SIGNAGE
NO SCALE

revisions

project number 25017

drawn by CG, RF

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STATE HWY 121 AT N. HWY 75
MELISSA, TX 75454

DOOR & HARDWARE
SCHED. & ADA DETAILS

A-6.2

AS NOTED
scale

05/12/25
date

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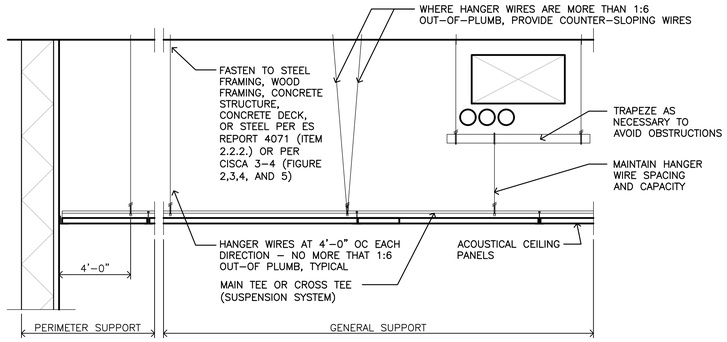
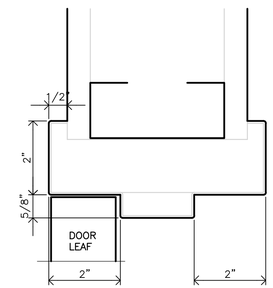
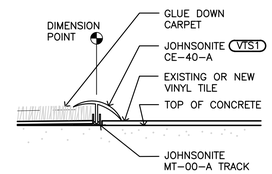


1 A-6.3 INSTALLATION OF SUSPENDED ACOUSTICAL CEILING SYSTEMS
1/4" = 1'-0"

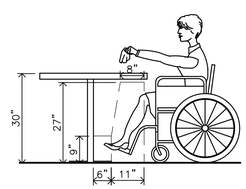
NOTE: COMPLY WITH ALL ADDITIONAL PROVISIONS OS ASTM C635 AND 636



2 A-6.3 HOLLOW METAL FRAME-DOOR JAMB (HEAD SIM)



3 A-6.3 CARPET TO VINYL TILE TRANSITION STRIP
N.T.S.



DASHED LINES INDICATE REQUIRED CLEAR AREA. CLEAR AREA REQUIRED AND PROVIDED AT TOILET ROOM LAVATORY, LT-D FIXTURE, AND MPOS-ADA FIXTURE

5 A-6.3 ADA KNEE AND TOE CLEARANCE DETAIL
1/2" = 1'-0"

KEYNOTES:

2.1 SELECT STRUCTURAL COMPACTED FILL AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

2.2 FLOWABLE FILL AS RECOMMENDED BY GEOTECHNICAL ENGINEER.

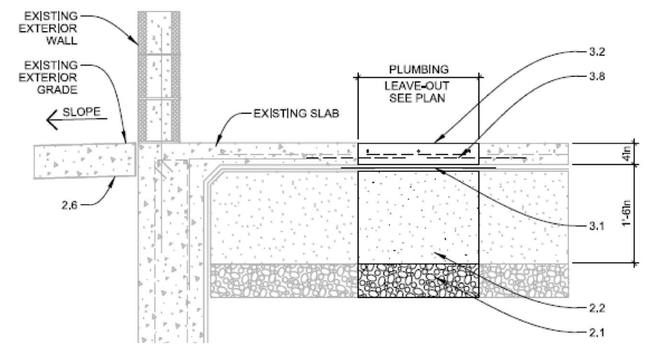
2.6 FLATWORK REFER TO ARCHITECTURAL/CIVIL.

3.1 10 MIL THICK PLASTIC VAPOR RETARDER, TYPE RECOMMENDED TO BE IN CONTACT WITH THE SOIL OR FILL UNDER A CONCRETE SLAB, LISTED IN ASTM 1745 CLASS A WITH A PERMEANCE LESS THAN 0.036 AS DETERMINED BY ASTM E96. POLYETHYLENE IS NOT ACCEPTABLE. INSTALL VAPOR RETARDER SOLIDLY WITHIN AND BELOW SLAB SURFACE WITH JOINTS LAPPED AT LEAST 6 INCHES AND TAPED CONTINUOUSLY WITH RECOMMENDED PRESSURE-SENSITIVE TAPE. EXTEND VAPOR RETARDER DOWN THE SIDES OF THE BEAM TRENCHES AND TERMINATE SO THAT IT DOES NOT EXTEND ACROSS THE TRENCH BOTTOM. CONTRACTOR AND ARCHITECT (NOT STRUCTURAL ENGINEER) SHALL VERIFY THAT VAPOR RETARDER SELECTED IS COMPATIBLE WITH PROPOSED FLOOR FINISHES.

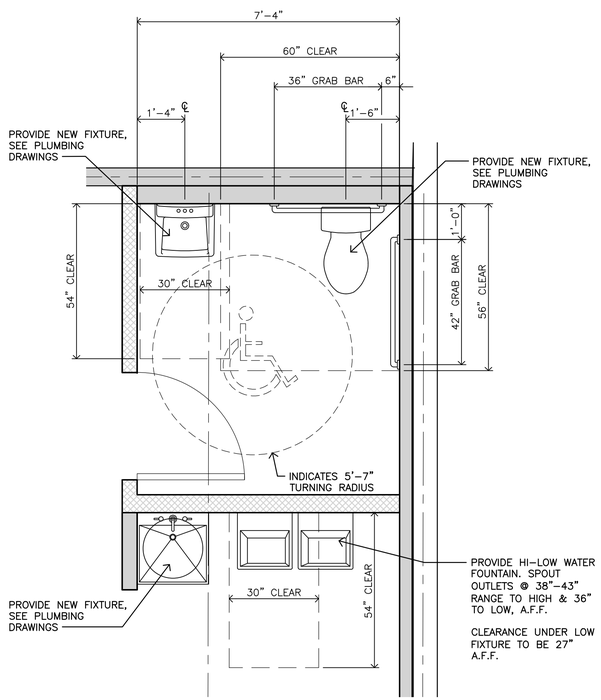
3.2 4" THICK SLAB AND EXTERIOR SIDEWALK SLAB REINFORCING SHALL BE:
#3 AT 18 INCHES ON CENTER EACH WAY CENTERED IN CONCRETE SLAB THICKNESS. START SLAB STEEL NOT MORE THAN 3 INCHES FROM THE PERIMETER EDGE OF SLAB. ADD 3- #3 DIAGONAL BARS X 4' LONGABOVE TYPICAL SLAB REINFORCING AT ALL SLAB INTERIOR CORNERS AND ALL AROUND METAL BULDING COLUMN. ADD #3 "Z" BARS AT 18 INCHES ON CENTER WHERE SLAB STEPS DOWN GREATER THAN 3 INCHES.

SLAB REINFORCING AT FREEZER SLAB, AND EQUIPMENT FOUNDATIONS, SHALL BE:
#4 AT 12 INCHES ON CENTER EACH WAY CENTERED IN CONCRETE SLAB THICKNESS. EXTEND SLAB REINFORCING TO TOP OUTSIDE PERIMETER BEAM BAR. START SLAB STEEL SPACING NOT MORE THAN 6 INCHES FROM TOP INSIDE BEAM BAR. ADD 3- #4 DIAGONAL BARS x4' LONG ABOVE TYPICAL SLAB REINFORCING AT ALL SLAB INTERIOR CORNERS. ADD #4 "Z" BARS AT 12 INCHES ON CENTER WHERE SLAB STEPS DOWN GREATER THAN 3 INCHES.

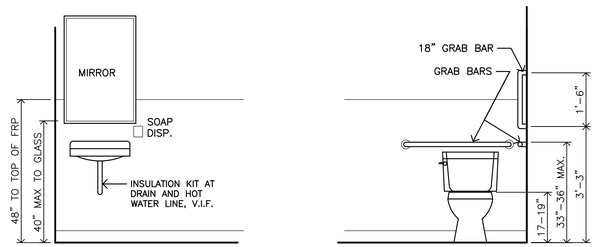
3.8 #3 x 30" LONG DOWELS AT 18" ON CENTER. BEFORE OCCUPYING RETAIL SPACE, REINFORCE LEAVE OUT WITH #3 AT 12" ON CENTER BOTH WAYS AND POUR 4" SLAB.



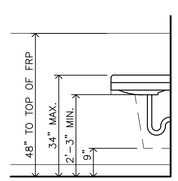
6 A-6.3 UTILITY TRENCH DETAIL
NTS



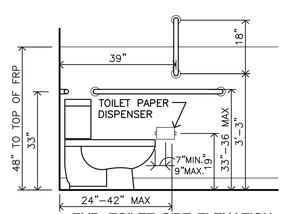
4 A-6.3 TOILET ROOM PLAN
1/2" = 1'-0"



TYP. FRONT ELEVATION OF PLUMBING FIXTURES



LAVATORY SIDE ELEVATION, TYP.



TYP. TOILET SIDE ELEVATION

TOILET ROOM GENERAL NOTES

1. SEE A-1.1 FOR NEW PARTITION INFORMATION
2. SEE A-1.3 FOR FINISHES
3. SEE A-2.1 FOR REFLECTED CEILING INFORMATION
4. PROVIDE ACCESSORIES AND EQUIPMENT WHERE INDICATED AND AS SPECIFIED IF NOT EXISTING, V.I.F.
5. SEE #5/A-6.3 FOR TOILET ROOM LAVATORY ADA KNEE AND TOE CLEARANCE DETAIL

TOILET ROOM EQUIP. IF NOT EXISTING

EQUIPMENT TYPE	SPECIFICATION
TOILET PAPER DISPENSER	BOBRICK #B-685, FINISH: STAINLESS STEEL, OR APPROVED EQUAL
COAT HOOK	BOBRICK #B-6707, FINISH: STAINLESS STEEL, OR APPROVED EQUAL. MOUNT ON BACK OF DOOR AT 60" A.F.F.
GRAB BARS	BOBRICK #B-5806 SERIES, FINISH: STAINLESS STEEL, OR APPROVED EQUAL – PROVIDE (1) 36", (1) 42", (1) 18"
SOAP DISPENSER	BOBRICK #B-156, OR APPROVED EQUAL
MIRROR	BOBRICK #B-165 24"WX36"H, FINISH: STAINLESS STEEL, OR APPROVED EQUAL
INSULATION KIT	TRUEBRO INC. #102W, COLOR: WHITE
PAPER TOWEL DISPENSER:	BOBRICK #B-262, FINISH: STAINLESS STEEL, OR APPROVED EQUAL

revisions

project number 25017 | drawn by CG, RF

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DETAILS

AS NOTED (scale) | 05/12/25 (date) | A-6.3

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GENERAL CONDITIONS

1. THE AMERICAN INSTITUTE OF ARCHITECT'S "GENERAL CONDITIONS OF CONTRACTS FOR CONSTRUCTION" AND SUPPLEMENTAL CONDITION REQUIREMENTS (CURRENT EDITIONS) SHALL RELATE TO THE WORK OF THE PROJECT AND IS HEREBY MADE A PART OF THESE CONTRACT DRAWINGS AS THOUGH FULLY CONTAINED.
2. DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE COMPLIMENTARY. SPECIFIC INFORMATION MAY BE FOUND IN EITHER OR BOTH.
3. THE CONTRACTOR SHALL LAY OUT WORK IN CONFORMITY WITH REQUIREMENTS OF CONSTRUCTION DOCUMENTS, AND WILL BE HELD RESPONSIBLE FOR PROPER ESTABLISHMENT AND MAINTENANCE OF ALL LINES AND DIMENSIONS BEFORE DOING ANY WORK, THE TENANT'S GENERAL CONTRACTOR(S) SHALL VERIFY ALL MEASUREMENTS AND CONDITIONS AT THE SITE AND NOTIFY THE DESIGNER OF ANY DISCREPANCIES. RESULTING ERRORS CAUSED BY THE FAILURE OF THE CONTRACTOR(S) TO EXERCISE SUCH PRECAUTION SHALL NOT BE CONSIDERED SUBSEQUENTLY AS A BASIS FOR ANY ADDITIONAL COMPENSATION.
4. IF ANY DISCREPANCIES, ERRORS, OR OMISSIONS ARE DISCOVERED IN THE CONTRACT DOCUMENTS, CONTACT THE STORE DESIGNER BEFORE PROCEEDING WITH RELATED WORK. OTHERWISE THE CORRECTION OF SUCH ITEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR(S). CONTRACTOR(S) SHALL VERIFY LANDLORD'S PLACEMENT OF WALL STUDS AND ADVISE LANDLORD AND OWNER OF DISCREPANCIES IMMEDIATELY. FAILURE TO NOTIFY LANDLORD OF DISCREPANCIES SHALL BE DEEMED AS ACCEPTANCE AND CONTRACTOR(S) SHALL BE RESPONSIBLE THEREAFTER.
4. CODES AND STANDARDS: ALL WORK, MATERIALS AND INSTALLATIONS SHALL BE IN STRICT ACCORDANCE WITH THE ORDINANCES, STATE AND LOCAL BUILDING CODES, LATEST EDITION. ALL PERMITS, INSPECTIONS AND LICENSES NECESSARY FOR PROPER EXECUTION OF THE WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR(S) INVOLVED.
6. THE CONTRACTOR(S) SHALL BE RESPONSIBLE FOR FULLY FAMILIARIZING HIMSELF WITH THE LANDLORD'S TENANT HANDBOOK AND DESIGN CRITERIA. ANY CONFLICTS BETWEEN "WORKING DRAWINGS" AND LANDLORD DIRECTION MUST BE BROUGHT TO THE ATTENTION OF THE STORE DESIGNER BEFORE WORK BEGINS.
7. ALTERATIONS:
   A. BARRICADE – THE GENERAL CONTRACTOR SHALL PROVIDE BARRICADE.
   B. TEMPORARY TRASH STORAGE AND REMOVAL – THE GENERAL CONTRACTOR(S) SHALL MAKE PROVISIONS AND COORDINATE WITH TENANT'S LANDLORD TO PROVIDE ARRANGEMENTS FOR THE STORAGE OR REMOVAL OF CONSTRUCTION OR DEMOLITION DEBRIS AND SHALL PAY ALL COSTS THAT ARISE FROM SUCH PROVISION.
8. THE CONTRACTOR(S) SHALL USE DIMENSIONS ONLY. DO NOT SCALE PLANS. ALL DIMENSIONS ARE TO FINISHED FACE UNLESS OTHERWISE NOTED.
9. ALL WOOD FRAMING, BLOCKING, ETC. TO BE FIRE RETARDANT.
10. NO WOOD OR COMBUSTIBLE MATERIAL OF ANY KIND SHALL BE USED ABOVE THE CEILING.
11. UPON COMPLETION OF WORK GENERAL CONTRACTOR IS TO OBTAIN CERTIFICATION OF COMPLETION AND APPROVAL FROM BUILDING DEPARTMENT AND/OR OTHER AUTHORITIES HAVING JURISDICTION, AND SUBMIT SAME TO TENANT AND LANDLORD.
12. PROTECTION OF WORK IN PLACE: WORK THAT IS SUBJECT TO INJURY BECAUSE OF OPERATIONS BEING CARRIED OUT ADJACENT TO OR ABOVE, SHALL BE COVERED, BOARDED UP, OR SUBSTANTIALLY ENCLOSED WITH ADEQUATE PROTECTION. ALL FORMS OF PROTECTION SHALL BE CONSTRUCTED IN SUCH A MANNER SUCH THAT, UPON COMPLETION, THE ENTIRE WORK SHALL BE DELIVERED TO THE TENANT AND OWNER IN PROPER WHOLE AND UNBLEMISHED CONDITION.
13. MATERIAL SUBSTITUTIONS: MANUFACTURER'S NAMES ARE LISTED HEREIN TO ESTABLISH A STANDARD. THE PRODUCTS OF OTHER MANUFACTURERS WILL BE ACCEPTABLE IF APPROVED BY THE TENANT'S STORE DESIGNER.
14. MATERIALS: ALL MANUFACTURED ARTICLES, MATERIALS, AND EQUIPMENT SHALL BE APPLIED AS RECOMMENDED BY THE MANUFACTURER. ALL LIKE MATERIALS USED SHALL BE NEW AND FREE FROM ANY DEFECTS. ALL LIKE MATERIALS USED SHALL BE OF THE SAME MANUFACTURER AND QUALITY UNLESS OTHERWISE SPECIFIED.
15. WORKMANSHIP: ALL WORK UNDER THIS CONTRACT SHALL BE PERFORMED BY COMPETENT WORKMEN AND EXECUTED IN A NEAT AND WORKMANLIKE MANNER. ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR ONE YEAR AFTER THE DATE OF ACCEPTANCE OF THE SPACE BY THE TENANT.
16. SHOP DRAWINGS AND CATALOG DATA ON ALL MAJOR ITEMS OF EQUIPMENT AND SYSTEMS, AND SUCH OTHER ILLUSTRATIVE MATERIALS AS MAY BE CONSIDERED NECESSARY BY THE CONTRACTOR WILL BE SUBMITTED IN ADEQUATE TIME TO PREVENT DELAY OR CHANGES DURING CONSTRUCTION. ONE (1) SET OF REPRODUCIBLES REQUIRED FOR EACH SUBMITTAL. ALL SUBMITTALS TO BE SENT TO: RICHARD M. COLE AND ASSOCIATES, 15 SOUTH 3RD STREET, PHILADELPHIA PA 19106.
17. ALL WELDING TO THE LANDLORD'S STRUCTURE MUST BE APPROVED IN WRITING BY THE LANDLORD'S REPRESENTATIVE.
18. DESIGN LOADS: LOADS AND CODE RESTRICTIONS FOR ALL DESIGN CONSIDERATIONS SHALL CONFORM TO ALL APPLICABLE ORDINANCES, STATE AND LOCAL BUILDING CODES, LATEST EDITION.
19. THE TENANT'S STORE DESIGNER HAS NOT BEEN RETAINED TO SUPERVISE CONSTRUCTION. THE GENERAL CONTRACTOR SHALL SUPERVISE, COORDINATE & SCHEDULE THE VARIOUS TRADES THROUGHOUT THE PROJECT.

DEMOLITION

1. THIS SECTION IS INCLUDED FOR GENERAL REFERENCE OF WORK TO BE REMOVED BY THE CONTRACTOR(S).
2. DEMOLITION INCLUDES THE REMOVAL OF EXISTING INTERIORS, IF REQUIRED, BUT NOT LIMITED TO INTERIOR PARTITIONS, CABINETS, SUSPENDED CEILINGS, ETC. AS REQUIRED AS SHOWN OR AS DIRECTED. CONTRACTOR SHALL CAP OFF ALL ABANDONED PLUMBING AND GAS UTILITIES – CAP OFF BELOW FINISHED CONCRETE FLOOR SURFACES AND CONCEALED ABOVE CEILINGS. ALL ABANDONED DUCTWORK, LIGHTS, DIFFUSERS, ETC. SHALL BE REMOVED.
3. THE CONTRACTOR(S) SHALL COOPERATE AND COORDINATE WITH THE LANDLORD, THE OWNERS OF THE ADJACENT BUILDINGS AND THE OWNER, IN SCHEDULING WORK IN ORDER TO CAUSE THE LEAST INCONVENIENCE TO PERSONNEL AND PROPERTY.
4. THE CONTRACTOR(S) SHALL ARRANGE WITH THE LANDLORD A CONVENIENT TIME TO PERFORM DEMOLITION WORK AND INSTALL TEMPORARY PROTECTED MEANS OF EGRESS FROM REQUIRED EXITS, INCLUDING TEMPORARY LIGHTING AND SAFETY DEVICES, ALL IN ACCORDANCE WITH GOVERNING STATE ORDINANCES AND LOCAL CODES AND LANDLORD REQUIREMENTS.
5. SEE NOTE 2 "CONCRETE"
6. NO EXPLOSIVES ARE ALLOWED FOR DEMOLITION WORK.
7. THE CONTRACTOR SHALL PROTECT ALL EXISTING BUILDING AREAS NOT SCHEDULED FOR DEMOLITION, AND SHALL BE RESPONSIBLE FOR THE COST OF THE REPAIRS OF ANY ACCIDENTAL DAMAGE HE INFLICTS UPON THE EXISTING BUILDING OR UTILITIES. IF THE CONTRACTOR BELIEVES THAT DAMAGE TO THE EXISTING BUILDING IS UNAVOIDABLE, HE MUST SUBMIT A WRITTEN NOTIFICATION OF THIS BEFORE THE DAMAGES OCCUR. IN THE ABSENCE OF SUCH NOTIFICATION THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR DAMAGE AND THE COST OF SATISFACTORILY REPAIRING OR REPLACING THE DAMAGED AREAS OF THE EXISTING BUILDING AND UTILITIES.

CONCRETE

CONCRETE WORK SHALL COMPLY WITH ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDINGS"; ACI 318 'BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE'; AND ACI 315 "ACI DETAILING MANUAL", AND CRSI "MANUAL OF STANDARD PRACTICE."

ANY CONTRACTORS REQUIRED TO TRENCH OR CHIP CONCRETE FLOOR SLABS FOR THEIR PORTION OF THE WORK, SHALL BE RESPONSIBLE FOR THE BACKFILLING AND PATCHING AS REQUIRED TO RETURN SLAB TO ITS ORIGINAL CONDITION.
THE CONTRACTOR SHALL REMOVE ALL EXISTING FLOORING WITHIN THE DEMISED PREMISES TO ACCOMMODATE THE NEW FLOORING PLAN. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR FLASH PATCHING, SCRAPING OR GRINDING THE EXISTING SLAB TO PROVIDE A SMOOTH SURFACE FREE FROM HOLES, BUMPS, OR CRACKS PRIOR TO THE APPLICATION OF ANY NEW FLOORING.

METALS

METAL STUDS AND LIGHT GAUGE METAL FRAMING SHALL BE GALVANIZED STEEL STUDS, SIZED AS INDICATED ON DRAWINGS OR AS REQUIRED, INCLUDING ALL ACCESSORIES SUCH AS BRIDGING, TRACK, ETC. GENERAL CONTRACTOR TO PROVIDE ALL MISCELLANEOUS BOLTS, CLIPS, ANCHORS, ANGLES, BRACKETS, SLEEVES, FASTENERS, AND OTHER METAL ITEMS AS REQUIRED.
STRUCTURAL METALS: THE DESIGN OF ALL MISCELLANEOUS METAL LINTELS, COLUMNS SUPPORTS AND FRAMING REQUIRED, INCLUDING ALL STOREFRONT WORK, SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR. SHOP DRAWINGS OF SUCH MISCELLANEOUS AND STRUCTURAL METAL WORK SHALL BE SUBMITTED TO TENANT FOR APPROVAL.

WOOD AND WOOD PRODUCTS

1. ALL ARCHITECTURAL WOODWORK SHALL BE MANUFACTURED IN ACCORDANCE WITH THE STANDARDS IN THE CURRENT EDITION OF THE ARCHITECTURAL WOODWORK INSTITUTE QUALITY STANDARDS MANUAL IN THE GRADE OR GRADES HEREINAFTER SPECIFIED OR SHOWN ON THE DRAWINGS.
2. IT IS NECESSARY TO SUBMIT (3) MATCHING SAMPLES OF COLORED LACQUER, SPECIAL PAINTS, AND SATIN FINISHES FOR APPROVAL BY TENANT OR STORE DESIGNER BEFORE WORK IS BEGUN.
3. PLYWOOD: PLYWOOD SHALL BE PAINT GRADE BIRCH IN CABINETRY IF PAINT FINISH IS TO BE APPLIED, A–D GRADE OTHERWISE. PLYWOOD IN THE STOCKROOM SHALL BE C–D GRADE. ALL EXPOSED EDGES SHALL HAVE A 1/4" THICK HARDWOOD EDGE BAND.
4. PARTICLE BOARD: ALL PARTICLE BOARD SHALL BE HIGH DENSITY INDUSTRIAL GRADE. ALL EXPOSED EDGES IN CABINETRY SHALL HAVE A 1/4" THICK HARDWOOD EDGE BAND.
5. PLASTIC LAMINATE: ALL PLASTIC LAMINATE SHALL BE 1/16" THICK UNLESS OTHERWISE NOTED. ALL PLYWOOD AND PARTICLE BOARD DOORS WHICH ARE TO HAVE A PLASTIC LAMINATE FACE SHALL HAVE A PLASTIC LAMINATE BALANCE SHEET ON BACK.

DOORS AND HARDWARE

1. HOLLOW AND SOLID CORE WOOD: DOORS SHALL BE MANUFACTURED IN ACCORDANCE WITH THE LATEST NATIONAL WOODWORK MANUFACTURER'S ASSOCIATION INDUSTRY STANDARD. WOOD DOORS SHALL BE PAINT GRADE BIRCH UNLESS NOTED OTHERWISE ON DOOR SCHEDULE.
2. HOLLOW METAL: DOORS SHALL CONSIST OF (2) FLUSH FACES OF 14 GAUGE STEEL, ONE PIECE, QUALITY ROLLED SHEET STEEL WITH ONE PIECE SOUND INSULATED CORE BONDED TO BOTH FACES. TOP AND BOTTOM CHANNELS TO BE 16 GAUGE STEEL; HINGE REINFORCEMENTS TO BE 10 GAUGE STEEL; FRAME DOORS THAT HAVE SPECIAL REQUIREMENTS, SEE DOOR SCHEDULE. ALL RATED DOORS TO BE "UL" OR FACTORY MUTUAL (FM) LISTED.
3. THE CONTRACTOR(S) SHALL INSTALL ALL DOORS, FRAMES, AND HARDWARE AND RELATED PARTS AND MATERIALS AS INDICATED ON DRAWINGS AND ON THE DOOR SCHEDULE. ALL DOORS, FRAMES AND HARDWARE SHALL BE FABRICATED AND ERECTED TRUE, PLUMB, AND SQUARE AS SPECIFIED, AS DETAILED AND AS PER MANUFACTURER'S RECOMMENDATIONS.

CEILINGS

1. PROVIDE FIRE RATED CEILING ASSEMBLY AS SHOWN ON DRAWINGS, OR WHERE REQUIRED BY CODE. CEILING TO BE INSTALLED IN STRICT ACCORDANCE WITH U.L. ASSEMBLY REQUIREMENTS. TOTAL ASSEMBLY TO BE 1 HR. FIRE RATED.
2. SUSPENSION GRID SYSTEM: AS SPECIFIED ON SHEET A–601
3. THE CONTRACTOR(S) SHALL FURNISH AND INSTALL CEILINGS WITH SUSPENSION SYSTEM AND RELATED ACCESSORIES AS SHOWN ON DRAWINGS AND AS SPECIFIED
4. SUSPENSION SYSTEM SHALL BE ADEQUATE TO SUPPORT LIGHT FIXTURES, CEILING GRILLES, DIFFUSERS, AND OTHER NORMAL ACCESSORIES. ALL SYSTEM COMPONENTS SHALL BE FROM A SINGLE MANUFACTURER.
5. INSTALL CEILING AND SUSPENSION SYSTEMS IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. FINISHED CEILING SHALL BE WATER LEVEL WITH JOINTS SNUG AND SQUARE, AND TILES IN PERFECT CONDITION. INSTALL SECURITY GRID CLIPS ON FIRST TWO TILES AROUND PERIMETER OF STORE. PROVIDE ALL ADDITIONAL PROTECTION AS REQUIRED INCLUDING GYPSUM BOARD "BOXES" FOR LIGHT FIXTURES AND FIRE DAMPERS ON HVAC GRILLES AND DIFFUSERS.
6. FURNISH TO TENANT NOT LESS THAN 2 UNOPENED BOXES OF EACH TILE USED.

FLOOR COVERING

1. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF ALL FLOOR COVERINGS AS INDICATED ON THE FINISH SCHEDULE AND AS NOTED ON THE DRAWINGS FOR LOCATION AND EXTENT.
2. CONTRACTOR TO FLASH PATCH OR SCRAPE AS REQUIRED TO PROVIDE A SMOOTH LEVEL FLOOR SURFACE FREE FROM HOLES, CRACKS OR BUMPS.
3. FILL ALL CRACKS, JOINTS, ETC. IN SUB–FLOOR WITH CRACK FILLER. APPROVED BY FLOORING MANUFACTURER. INSTALL ALL MATERIALS WITH WATERPROOF TYPE ADHESIVES AS RECOMMENDED BY FLOORING MANUFACTURER AND SURFACE INVOLVED.
4. CONTRACTOR TO "FLOAT–UP" SUB–FLOOR AS REQUIRED TO BRING CARPET OR COMPOSITION TILE FLUSH WITH ADJACENT FLOOR FINISHES.
5. PROVIDE DIRECT GLUE DOWN CARPET INSTALLATION USING MATERIAL AND METHODS RECOMMENDED BY CARPET MANUFACTURER.

GYPSUM BOARD

ALL GYPSUM BOARD SHALL BE "US GYPSUM" 5/8" THICK FIRE CODE SHEETROCK. (TYPE "X" PANELS OF STANDARD QUALITY) UNLESS OTHERWISE NOTED.
FASTENERS: FASTENERS SHALL BE DRYWALL SCREWS OF PROPER SIZE AND TYPE PER MANUFACTURER'S RECOMMENDATION.
ALL GYPSUM BOARD AT OUTSIDE CORNERS SHALL RECEIVE "USG" DUR–A–BEAD #103. USE "USG" 200B METAL TRIM WHERE ENDS ARE EXPOSED. ALL JOINTS SHALL HAVE "USG" PERF–A–TAPE JOINT SYSTEM. ALL SURFACES TO BE TAPED, SPACKLED, AND SANDED TO LEVEL 4 FINISH.
THE CONTRACTOR(S) SHALL FURNISH AND INSTALL ALL GYPSUM BOARD AND SYSTEMS COMPLETE WITH PARTITION FRAMING, CEILING SUSPENSION SYSTEMS AND RELATED ACCESSORIES, PARTS, MATERIALS, ETC. AS SHOWN ON DRAWINGS AND AS SPECIFIED. INSTALL ALL MATERIALS PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

PAINTING

1. THE CONTRACTOR IS RESPONSIBLE FOR VISITING AND INSPECTING THE TENANT SPACE PRIOR TO THE APPLICATION OF ANY PAINT OR FINISHING MATERIAL. IF ANY NEW OR EXISTING SURFACE TO BE FINISHED CANNOT BE PUT IN PROPER CONDITION BY CUSTOMARY CLEANING, SANDING, AND PUTTYING OPERATIONS, THE GENERAL CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OR ASSUME RESPONSIBILITY FOR, AND RECTIFY ANY UNSATISFACTORY RESULTING FINISH.
2. THE INTENT IS TO PROVIDE A SATISFACTORY FINISH TO ALL PARTS OF THE PROJECT, WHETHER NOTED HEREIN OR NOT, UNLESS SPECIFICALLY STATED OTHERWISE. COVER ALL SURFACES THOROUGHLY. IF THE NUMBER OF COATS SPECIFIED DOES NOT ACCOMPLISH THE INTENT, THEN APPLY ADDITIONAL COATS OF SPECIFIED MATERIAL TO GIVE SATISFACTORY COVERAGE. SEE FINISH SCHEDULE.
3. STAINLESS STEEL, ALUMINUM, CHROME PLATED SURFACES, AND ALL OTHER BRIGHT METAL FINISHES SHALL NOT BE PAINTED UNLESS OTHERWISE NOTED.
4. USE ONLY PAINT AND RELATED MATERIALS OF THE MANUFACTURER(S) SPECIFIED.
5. ALL PAINTED SURFACES SHALL BE PREPARED IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS (ESPECIALLY IN REGARD TO PRIMING EXISTING SURFACES).
6. PAINTED GYPSUM BOARD TO RECEIVE ONE COAT LATEX PRIMER AND TWO COATS OF SPECIFIED PAINT. TINT PRIMER TO APPROXIMATE SHADE OF SPECIFIED PAINT. TOUCH UP ALL SUCTION SPOTS OR HOT SPOTS AFTER APPLICATION OF FIRST COAT AND BEFORE APPLYING SECOND COAT TO PRODUCE AN EVEN RESULT IN THE FINISH COAT. DRY ALL COATS THOROUGHLY BEFORE APPLYING SUCCEEDING COATS. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR RE–COAT TIME. SEAL ALL DRYWALL SURFACES BEHIND MIRRORS.
7. WASH ALL METAL SURFACES WITH MINERAL SPIRITS TO REMOVE ALL DIRT AND GREASE BEFORE APPLYING FINISH. WHERE RUST AND/OR SCALE IS PRESENT, WIRE BRUSH OR SAND CLEAN BEFORE APPLYING FINISH.
8. PUTTY ALL NAIL HOLES, COUNTERSUNK SCREWS, BOLTS, CRACKS, ETC. BEFORE APPLYING FINISH.
9. SAND ALL WOOD SURFACES SMOOTH AND EVEN BEFORE APPLYING FINISH.
10. BEFORE STARTING FINISH WORK, REMOVE HARDWARE, ACCESSORIES, PLATES, LIGHTING FIXTURES, AND SIMILAR ITEMS, OR PROVIDE AMPLE PROTECTION FOR SUCH ITEMS.
11. WOOD DOORS: SEAL BOTTOMS, TOPS, AND EDGES. SAND ALL WOOD DOORS BEFORE FINISHING, AND BETWEEN COATS.
12. PAINT ALL RADIATOR COVERINGS, CONVECTORS, REGISTERS, LOUVERS, GRILLES, EXPOSED PIPING, ACCESS DOORS, VENTS, FIRE EXTINGUISHER CABINETS, EQUIPMENT MOUNTING BOARDS, ETC. PAINT TO MATCH ADJACENT WORK UNLESS OTHERWISE NOTED OR DIRECTED.
13. SAND ENAMELED FINISHES APPLIED TO WOOD OR METAL BETWEEN COATS WITH FINE SANDPAPER TO PROVIDE SMOOTH FINISH.
14. MAKE FINISH WORK UNIFORM AND SMOOTH. FREE OF RUNS, SAGS, DEFECTIVE BRUSHING AND CLOGGING. MAKE EDGES OF PAINT ADJOINING OTHER MATERIALS OR COLORS SHARP AND CLEAN WITHOUT OVERLAPPING.
15. FIELD PAINTING, EXCEPT TOUCHUP, WILL NOT BE REQUIRED ON ITEMS SPECIFIED TO BE COMPLETELY FINISHED AT FACTORY UNLESS SPECIFICALLY DESIGNATED. GENERAL CONTRACTOR SHALL LEAVE SUFFICIENT MATERIAL FOR TOUCHUP OF FINISHES.
16. THE CONTRACTOR SHALL LEAVE IN THE TENANT SPACE A MINIMUM OF (1) GALLON OF EACH WALL PAINT USED ON THE PROJECT.
17. THE CONTRACTOR SHALL REMOVE ALL PAINT RAGS, EMPTY CANS, AND WASTE FROM THE TENANT SPACE EACH DAY.
18. CLEANING AND TOUCHUP IN ADDITION TO THE CLEANING REQUIRED IN THE "AIA GENERAL CONDITIONS" THE CONTRACTOR SHALL UPON COMPLETION: (1) REMOVE ALL PAINT AND/OR PASTE WHERE IT HAS BEEN SPILLED, SPLASHED OR SPLATTERED (INCLUDING FIXTURES, GLASS, HARDWARE, CARPETING, ETC.). (2) TOUCHUP AND RESTORE THE FINISH OF ANY ITEM MARRED OR DAMAGED DURING FINISH OPERATIONS OR CLEAN–UP.

MILLWORK

1. THE FIXTURE CONTRACTOR SHALL FABRICATE, FINISH, AND DELIVER ALL FINISHED MILLWORK, CABINET WORK, LOOSE FIXTURES, PANELING, ETC. AS SHOWN ON DRAWINGS OR AS DIRECTED BY OWNER.
2. THE FIXTURE CONTRACTOR(S) SHALL BE RESPONSIBLE FOR:
   A. ALL INFORMATION CONTAINED ON THE ENCLOSED DRAWINGS, EXCEPT WHERE OTHERWISE NOTED.
   B. PREPARING DETAILED INSTRUCTIONS ON AREAS THAT REQUIRE BLOCKING OR REINFORCING FOR WORK HE PROVIDES.
   C. LAMPS, CORDS, CANOPIES, LENS, ETC. FOR ALL LIGHTING AND ELECTRICAL FIXTURES HE PROVIDES.

NEW UTILITY SETUP

1. GENERAL CONTRACTOR IS TO CONTACT LOCAL PROVIDER/LANDLORD TO SET UP UTILITIES (ELECTRIC, GAS, PROPANE, WATER, SEWER).
2. GENERAL CONTRACTOR IS TO CHANGE BILLING ADDRESS, CONTACT AT&T DEALER/AGENT FOR DETAILS.
3. GENERAL CONTRACTOR IS TO COMPLETE REQUIRED UTILITY APPLICATION FORMS AND PROCESS ANY REQUIRED DEPOSITS. NOTIFY AT&T DEALER/AGENT OF ANY FEES PRIOR TO PROCESSING APPLICATION.
4. GENERAL CONTRACTOR IS TO COMMUNICATE UTILITY INFORMATION TO AT&T DEALER/AGENT WITHIN 48 HOURS. (IE. PHYSICAL ADDRESS, CITY, STATE, ZIP CODE, ACCOUNT NUMBERS, METER NUMBERS, UTILITY VENDOR NAME, ETC.)

revisions

project number 25017 | drawn by CG, RF

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ARCHITECTURAL SPECIFICATIONS

A-7.1

AS NOTED scale | 05/12/25 date

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HVAC / PLUMBING SYMBOLS

- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- GCHWS — GLYCOL CHILLED WATER SUPPLY
- GCHWR — GLYCOL CHILLED WATER RETURN
- EHWS — EXTERIOR HOT WATER SUPPLY
- EHWR — EXTERIOR HOT WATER RETURN
- HWS — HOT WATER SUPPLY (HEATING)
- HWR — HOT WATER RETURN (HEATING)
- GHWS — GLYCOL HOT WATER SUPPLY (HEATING)
- GHWR — GLYCOL HOT WATER RETURN (HEATING)
- CD — CONDENSATE DRAIN
- RS — REFRIGERANT SUCTION
- RL — REFRIGERANT LIQUID
- G — NATURAL GAS
- DOMESTIC COLD WATER (CW)
- DOMESTIC HOT WATER (HW)
- DOMESTIC HOT WATER RECIRC. (HWR)
- SD — STORM DRAIN
- SANITARY SEWER
- SANITARY VENT
- IW — INDIRECT WASTE
- VA — VACUUM
- DIRECTION OF FLOW
- SLOPE – FALL PER FOOT
- GATE VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- BALL VALVE
- CHECK VALVE
- CIRCUIT SETTER
- ATC FLOW METER
- GAS COCK
- GAS PRESSURE REGULATOR
- AUTOMATIC CONTROL VALVE (3 WAY)
- AUTOMATIC CONTROL VALVE (2 WAY)
- PRESSURE REDUCING VALVE
- TEMPERATURE & PRESSURE RELIEF VALVE
- SAFETY RELIEF VALVE
- MANUAL AIR VENT
- AUTOMATIC AIR VENT
- STRAINER WITH BLOWDOWN VALVE, HOSE END, CAP AND CHAIN
- PIPE UP
- PIPE DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- UNION SCREWED/FLANGED
- A — PIPE ANCHOR
- G — PIPE GUIDE
- FM (GPM) — FLOW METER
- FLEXIBLE PIPE CONNECTOR
- FLOW SWITCH
- DOUBLE CHECK VALVE ASSEMBLY
- AD — AREA DRAIN
- RD — ROOF DRAIN
- FD — FLOOR DRAIN (SQUARE/ROUND)
- FCO — CLEANOUT
- DEMOLITION BREAK POINT
- NEW TO EXISTING CONNECTION

- SUPPLY DUCT AND/OR OUTSIDE AIR INTAKE (INTERNAL DIMENSIONS SHOWN)
- RETURN/EXHAUST RELIEF DUCT (INTERNAL DIMENSIONS SHOWN)
- SUPPLY AIR DIFFUSER (PATTERN AS INDICATED)
- RETURN/EXHAUST GRILLE
- 90° VANED ELBOW UP
- 90° VANED ELBOW DOWN
- INTERNALLY LINED DUCT(INTERNAL DIMENSIONS INDICATED)
- D — DROP IN DUCT IN DIRECTION OF AIRFLOW
- R — RISE IN DUCT IN DIRECTION OF AIRFLOW
- BRANCH DUCT TAKE–OFF
- VANED ELBOW
- IW, R — FULL THROAT RADIUS ELBOW R=1.5W
- FD — FIRE DAMPER WITH ACCESS DOOR
- VD — VOLUME DAMPER
- ATC — ATC DAMPER
- S.D. — SMOKE DETECTOR (DUCT MOUNTED)
- FSD — FIRE/SMOKE DAMPER WITH ACCESS DOOR
- (T) — THERMOSTAT/SENSOR
- (S) — TEMPERATURE SENSOR
- $ — SWITCH
- FLAG NOTE
- (E) — EXISTING TO REMAIN
- (N) — NEW
- (T) — TOTAL
- (R) — ABANDON & REMOVE
- (S) — SALVAGE
- (ER) — EXISTING TO BE RELOCATED

HVAC / PLUMBING ABBREVIATIONS

ABV.	ABOVE
AC	ABOVE CEILING
AD	AIR DEVICE
A/D	ACCESS DOOR
AF	AIRFOIL FAN
A.F.F.	ABOVE FINISHED FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL (WALL/CEILING)
ATC	AUTOMATIC TEMPERATURE CONTROL
AWT	AVERAGE WATER TEMPERATURE
B	BOILER
BF	BELOW FLOOR
BIF	BACKWARD INCLINED FAN
BLDG	BUILDING
B.O.S.	BOTTOM OF STEEL
BTU	BRITISH THERMAL UNITS
BTU/H	BRITISH THERMAL UNITS PER HOUR
CFM	CUBIC FEET PER MINUTE
C.I.	CAST IRON
CLG.	CEILING
CONT.	CONTINUED/CONTINUATION
CONT'R	CONTRACTOR
CW	DOMESTIC COLD WATER
dB	DECIBELS
DOM	DOMESTIC
DDC	DIRECT DIGITAL CONTROL
DEG C	DEGREE CELSIUS
DEG F	DEGREE FAHRENHEIT
DEPT	DEPARTMENT
D.F.	DEGREE FAHRENHEIT
DIS. SW.	DISCONNECT SWITCH
DIV	DIVISION
DN	DOWN
DX	DIRECT EXPANSION
DW	DOUBLE WALL
DWG	DRAWING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
E.C.	ELECTRICAL CONTRACTOR
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATING
EL	ELEVATION
ENT	ENTERING
ER	EXHAUST RISER
ETC	ET CETERA
EX	EXHAUST AIR
EXT	EXTERNAL
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE
F	FAN
F.A.I.	FRESH AIR INLET
FC	FLEXIBLE CONNECTION
FCF	FORWARD CURVED FAN
FCU	FAN COIL UNIT
FD	FIRE DAMPER OR FLOOR DRAIN
FLA	FULL LOAD AMPS
FP	FIRE PROTECTION
FPVAV	FAN POWERED VARIABLE AIR VOLUME BOX
FPM	FEET PER MINUTE
FT	FEET
FU	FIXTURE UNITS
G.	GAS
GA	GAUGE
G.C.	GENERAL CONTRACTOR
GAL	GALLON
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
H.C.	HVAC CONTRACTOR
HP	HORSEPOWER
HR	HOUR
HWR	DOMESTIC HOT WATER RECIRCULATED
HW	DOMESTIC HOT WATER
IN.	INCHES
INT	INTERNAL
INV.	INVERT
KW	KILOWATTS
LBS	POUNDS
LBS/H	POUNDS PER HOUR
LAT	LEAVING AIR TEMPERATURE
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSANDS OF BRITISH THERMAL UNITS PER HOUR
M.C.	MECHANICAL CONTRACTOR
MIN	MINIMUM
MOBDD	MOTOR–OPERATED BACK DRAFT DAMPER
MOD	MOTOR OPERATED DAMPER
NC	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
No.	NUMBER
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
O.C.	ON CENTER
OPER.	OPERATING
P.C.	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PF	PLENUM FAN
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RLA	RATED LOAD AMPS
RA	RETURN AIR
RECIR	RECIRCULATED
RH	RELATIVE HUMIDITY
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RWC	RAIN WATER CONDUCTOR
S.	SANITARY
SA	SUPPLY AIR
SD	STORM DRAIN
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
S.F.	SQUARE FEET
SR	SUPPLY RISER
TEMP	TEMPERATURE
T.O.S.	TOP OF STEEL
T–STAT	THERMOSTAT
TYP	TYPICAL
UH	UNIT HEATER
V.	VENT
VD	VOLUME DAMPER
V.I.F.	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
W.	WASTE
W/	WITH
WH	WALL HEATER
WG	WATER GAUGE
W/O	WITHOUT
#	POUNDS OR NUMBER
#/HR	POUNDS PER HOUR
°F	DEGREES FAHRENHEIT
°wb	DEGREES FAHRENHEIT WET BULB
°db	DEGREES FAHRENHEIT DRY BULB
ø	ELECTRICAL PHASE OR DIAMETER

DRAWING LIST

M1.1	MECHANICAL COVER SHEET
M1.2	MECHANICAL SPECIFICATIONS
M1.3	MECHANICAL SPECIFICATIONS
M1.4	NATURAL GAS SPECIFICATIONS
H1.1	HVAC PLAN
H2.1	HVAC DETAILS & SCHEDULES
H3.1	COMCHECK
H3.2	COMCHECK

NOTE:

NOT ALL SYMBOLS AND ABBREVIATIONS INDICATED APPEAR ON THESE DOCUMENTS.

APPLICABLE CODES:

2021 TEXAS IHB BUILDING CODE IBC AMENDED
2021 TEXAS IHB MECHANICAL CODE IMC 2021 AMENDED
LOCAL CODES HAVING JURISDICTION

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MECHANICAL COVER SHEET

M1.1

AS NOTED
scale

05/12/25
date

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SECTION 230500 GENERAL PROVISIONS

PART 1.00 – GENERAL

1.01 GENERAL REQUIREMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 –GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.
B. INCLUDE ALL LABOR, MATERIAL EQUIPMENT, TRANSPORTATION AND SERVICES TO FURNISH AND INSTALL COMPLETE MECHANICAL SYSTEMS AND ALTERATIONS AS SHOWN ON THE DRAWINGS AND HEREIN SPECIFIED. THE WORK INCLUDES, BUT IS NOT LIMITED TO:
   1. ALL PLUMBING WORK.
   2. ALL HEATING AND AIR CONDITIONING.
   3. INSULATION.
   4. TEMPERATURE CONTROLS.
   5. FIRE PROTECTION WORK.
   6. CONNECTION TO ALL UTILITIES.

1.02 DESCRIPTION OF WORK

A. EXTENT OF MECHANICAL WORK IS INDICATED ON DRAWINGS OR SPECIFIED IN DIVISION 23 SECTIONS OF THE SPECIFICATION. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SUPERVISION AND SERVICE NECESSARY FOR A COMPLETE MECHANICAL SYSTEMS.

1.03 QUALITY ASSURANCE

A. ALL WORK ACCOMPLISHED UNDER THESE SPECIFICATIONS SHALL BE IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATIONS OF THE LOCAL COUNTY & STATE, NATIONAL FIRE PROTECTION ASSOCIATION, ACCEPTED MECHANICAL CODE, PLUMBING CODE, BUILDING CODE, AUTHORITIES HAVING JURISDICTION & ALL REQUIREMENTS PERTAINING TO THE MALL TENANT DESIGN MANUAL.

1.04 SUBMITTALS

A. CONTRACTOR SHALL SUBMIT FOR REVIEW, SIX COPIES OF SHOP DRAWINGS, LITERATURE, AND EQUIPMENT LIST WITHIN 30 DAYS AFTER CONTRACT IS LET. FIRE PROTECTION DRAWINGS SHALL BE SUBMITTED PER SECTION 211313.
B. SUBMIT PRIOR TO FABRICATION OR DELIVERY.
C. SUBMIT COMPLETE, AT ONE TIME. PARTIAL SUBMITTALS WILL NOT BE CONSIDERED (EXCEPT AS NOTED ABOVE FOR CONTROLS, FIRE PROTECTION AND DUCTWORK).
D. CATALOG SHEETS SHALL BE COMPLETE AND THE ITEM OR MODEL TO BE USED SHALL BE CLEARLY MARKED.
E. LIST SUBSTITUTE ITEMS SEPARATELY AND SO IDENTIFIED.

PART 2.00 – PRODUCTS

2.01 MATERIALS

A. ALL MATERIALS SHALL BE NEW AND OF MANUFACTURERS SPECIFIED HEREIN & BEAR THE U.L., ETL OR CSA LABEL.
B. ALL EQUIPMENT SHALL BE REGULARLY CATALOGUED ITEMS OF THE MANUFACTURER AND IN USE FOR AT LEAST TWO YEARS AND SHALL BE SUPPLIED AS A COMPLETE UNIT IN ACCORDANCE WITH THE MANUFACTURER'S STANDARD SPECIFICATIONS AND ANY OPTIONAL ITEMS REQUIRED FOR PROPER INSTALLATION FOR THE EQUIPMENT UNLESS OTHERWISE NOTED. ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND BEST TRADE PRACTICES.

2.02 SUBSTITUTIONS

A. IN ALL CASES IN THIS SPECIFICATION WHERE AN ARTICLE IS FOLLOWED BY THE WORDS "OR APPROVED EQUAL", THE ARCHITECT IS THE SOLE JUDGE OF THE QUALITY OF THE PROPOSED SUBSTITUTION.
B. WHEN THE ARCHITECT/OWNER APPROVES A SUBSTITUTION, THE APPROVAL IS GIVEN WITH THE UNDERSTANDING THAT THE CONTRACTOR GUARANTEES THE ARTICLE OR MATERIAL SUBSTITUTED TO BE EQUAL TO OR BETTER IN EVERY RESPECT THAN THE ARTICLE OR MATERIAL SPECIFIED. THE CONTRACTOR SHALL ALSO ASSUME COMPLETE RESPONSIBILITY THAT THE ARTICLE OR MATERIAL WILL FIT THE JOB AS FAR AS SPACE, ACCESS AND SERVICING REQUIREMENTS.
C. WHERE SEVERAL MATERIALS ARE SPECIFIED BY NAME FOR ONE USE, SELECT FOR USE ANY OF THOSE SO SPECIFIED. NOTE THAT EQUIPMENT LAYOUT IS BASED ON EQUIPMENT LISTED IN EQUIPMENT SCHEDULES. ANY OTHER EQUIPMENT USED MUST FIT IN AVAILABLE SPACE WITH ALL ACCESS AND SERVICING REQUIREMENTS MAINTAINED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK THAT THIS EQUIPMENT WILL MEET THESE REQUIREMENTS.
D. WHENEVER ITEM OR CLASS OF MATERIAL IS SPECIFIED EXCLUSIVELY BY DETAIL SPECIFICATION, TRADE NAME, MANUFACTURER'S NAME OR BY CATALOG REFERENCE, USE ONLY SUCH ITEM, UNLESS WRITTEN APPROVAL IS GIVEN FOR SUBSTITUTION PRIOR TO BID.

PART 3.00 – EXECUTION

3.01 DRAWINGS

A. THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC. COMPLETE DETAILS OF THE BUILDING WHICH AFFECT THE MECHANICAL INSTALLATION MAY NOT BE SHOWN. FOR ADDITIONAL DETAILS, THE CONTRACTOR IS REFERRED TO THE ARCHITECTURAL, STRUCTURAL, & ELECTRICAL DRAWINGS.

3.02 CODES, ORDINANCES AND PERMITS

A. ALL WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES. ALL INSPECTION FEES AND PERMITS, COMPLIANCE WITH CODES AND ORDINANCES SHALL BE AT THE CONTRACTOR'S EXPENSE. INCLUDE ALL CONNECTION AND PERMIT FEES IN BID. WHEN APPLICABLE, CONTRACTOR SHALL CONTACT AUTHORITY HAVING JURISTDICTION FOR INSPECTION OF ALL SYSTEMS IN A TIMELY MANNER BEFORE OCCUPANCY OF THE BUILDING.

3.03 CLEAN UP AND HOUSEKEEPING

A. LEAVE ALL EQUIPMENT CLEAN AND READY FOR USE.
B. REMOVE ALL LABELS, PAINT, PLASTER, ETC., FROM FIXTURES, EQUIPMENT AND PIPING.

3.04 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. GENERAL

1. PROVIDE COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS AND CATALOG SHEETS FOR ALL EQUIPMENT.
2. PROVIDE FOUR COPIES OF EACH BOUND INTO BOOKLET FORM.
3. DELIVER BOOKLETS TO THE ARCHITECT BEFORE FINAL INSPECTION.

B. CONTENTS: EACH BOOKLET SHALL CONTAIN AT LEAST, BUT NOT LIMITED TO MAINTENANCE INSTRUCTIONS AND PARTS LIST AS FOLLOWS:

1. BASIC DESCRIPTION OF ALL SYSTEMS.
2. DESCRIPTION OF ROUTINE MAINTENANCE REQUIRED FOR EACH COMPONENT, INCLUDING OILING INSTRUCTIONS.
3. SUGGESTED FREQUENCY OF MAINTENANCE.
4. PARTS LIST OF ALL EQUIPMENT.
5. OPERATING INSTRUCTIONS AND WARRANTIES ON ALL EQUIPMENT.
6. CONTROLS: AS–BUILT WIRING DIAGRAMS
7. MECHANICAL AS–BUILT DRAWINGS.
8. TROUBLE–SHOOTING LIST.
9. NAME, ADDRESS, PHONE NUMBER OF ALL CONTRACTORS AND SUPPLIERS PARTICIPATING IN PROJECT.

3.05 RECORD DRAWINGS

A. PROVIDE THE ARCHITECT WITH RECORD DRAWINGS. RECORD DRAWINGS SHALL BE ELECTRONIC "PDF" FILES OR AS REQUESTED BY ARCHITECT & ONE REPRODUCIBLE. COPY AND SHALL SHOW THE MEASURED LOCATIONS OF ALL CONCERNED PORTIONS OF THE WORK AND SHALL SHOW ALL CHANGES THE CONTRACTOR HAS MADE.
B. DRAWINGS MUST SHOW ALL ADDENDUM ITEMS, CHANGE ORDERS AND DEVIATIONS FROM THE PLANS.

3.06 INTERFERENCE

A. THE CONTRACTOR'S ATTENTION IS CALLED TO THE RESTRICTED SPACE FOR INSTALLATION OF MECHANICAL SYSTEMS. OFFSETS, REROUTING AND COORDINATION WILL BE REQUIRED TO FIT ALL ELEMENTS IN AVAILABLE SPACE AND THE CONTRACTOR SHALL INCLUDE PROVISIONS FOR SUCH IN HIS BID.
B. DUCTWORK AND PIPING SHALL BE ROUTED TO CLEAR LIGHT FIXTURES. COORDINATE ROUTING OF DUCTWORK AND PIPING WITH EACH OTHER SO GRADE OF PIPING CAN BE ACCOMPLISHED, AND TO FIT IN AVAILABLE SPACE.
C. DUCTWORK SHALL BE INSTALLED AS REQUIRED TO CLEAR LIGHT FIXTURES AND TO FIT IN AVAILABLE SPACE. PROVIDE OFFSETS, V OR SLEEVES AS REQUIRED. MAINTAIN EQUIVALENT FREE AREA OF DUCTWORK.
D. DUCTWORK TAKES PRECEDENCE OVER PIPING FOR AVAILABLE SPACE AND ROUTING. COORDINATE INSTALLATION BASED ON THIS PRECEDENCE.
E. DUCTWORK AND/OR PIPING SHALL NOT BE RUN OVER ELECTRICAL PANELS.

3.07 WORKMANSHIP

A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH BEST TRADE PRACTICE. ANY SUBSTANDARD WORKMANSHIP SHALL BE REMOVED AND REPLACED AT NO EXTRA COST TO THE OWNER.

3.08 SEISMIC RESTRAINTS

A. PROVIDE SEISMIC RESTRAINTS ON ALL PIPING AND DUCTWORK IN ACCORDANCE WITH THE "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" AS PREPARED BY SMACNA AND THE PLUMBING PIPING INSTITUTE COUNCIL, AS REQUIRED BY LOCAL BUILDING CODE FOR SEISMIC RESTRAINTS.
B. PROVIDE SEISMIC RESTRAINTS, AS REQUIRED BY LOCAL BUILDING CODE FOR SEISMIC RESTRAINTS, ON ALL EQUIPMENT AND PROVIDE SLACK CABLE RESTRAINTS ON ALL SUSPENDED EQUIPMENT. COMPLETE RESTRAINT SYSTEM SHALL BE SELECTED, SHOP DRAWINGS SEALED BY AND CERTIFICATION PROVIDED BY A PROFESSIONAL STRUCTURAL ENGINEER.

SECTION 200513 ELECTRICAL PROVISIONS TO MECHANICAL WORK

PART 1.00 – GENERAL

1.01 DESCRIPTION

A. GENERAL REQUIREMENTS DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 STANDARDS

A. FOR ELECTRICAL EQUIPMENT AND PRODUCTS, EMPLOY WITH APPLICABLE NEMA STANDARDS, AND REFER TO NEMA STANDARDS FOR DEFINITIONS OF TERMINOLOGY HEREIN. COMPLY WITH NATIONAL ELECTRICAL CODE (NFPA 70) FOR WORKMANSHIP AND INSTALLATION REQUIREMENTS AND TO APPLICABLE SECTIONS OF DIVISION 26 OF THE SPECIFICATIONS.

PART 2.00 – PRODUCTS

2.01 MOTORS

A. MANUFACTURER
   1. EXCEPT WHERE ITEM OF MECHANICAL EQUIPMENT (WHICH OTHERWISE COMPLIES WITH REQUIREMENTS) MUST BE INTEGRALLY EQUIPPED WITH MOTOR PRODUCED BY ANOTHER MANUFACTURER, PROVIDE MOTORS FOR MECHANICAL EQUIPMENT.

B. MOTOR CHARACTERISTICS

   1. EXCEPT WHERE MORE STRINGENT REQUIREMENTS ARE INDICATED, AND EXCEPT WHERE REQUIRED ITEM OF MECHANICAL EQUIPMENT CANNOT BE OBTAINED WITH FULLY COMPLYING MOTOR, COMPLY WITH THE FOLLOWING REQUIREMENTS FOR MOTORS OF MECHANICAL WORK:
      a. TEMPERATURE RATING: RATED FOR 40 DEG. C ENVIRONMENT WITH MAXIMUM 50 DEG. C TEMPERATURE RISE FOR CONTINUOUS DUTY AT FULL LOAD (CLASS A INSULATION
      b. STARTING CAPABILITY: PROVIDE EACH MOTOR CAPABLE OF MAKING STARTS AS FREQUENTLY AS INDICATED BY AUTOMATIC CONTROL SYSTEM, AND NOT LESS THAN 5 STARTS/HOUR FORMANUALLY CONTROLLED MOTORS.
      c. PHASES AND CURRENT CHARACTERISTICS: PROVIDE SQUIRREL–CAGE INDUCTION POLYPHASE MOTORS FOR 1 HP AND LARGER, AND PROVIDE CAPACITOR–START SINGLE–PHASE MOTORS FOR 3/4 HP AND SMALLER, EXCEPT 1/6 HP AND SMALLER MAY, AT EQUIPMENT MANUFACTURER'S OPTION, BE SPLIT–PHASE TYPE. COORDINATE CURRENT CHARACTERISTICS WITH POWER SPECIFIED IN DIVISION–26 SECTIONS, AND WITH INDIVIDUAL EQUIPMENT REQUIREMENTS SPECIFIED IN OTHER DIVISION–23 REQUIREMENTS. FOR 2–SPEED MOTORS PROVIDE 2 SEPARATE WINDINGS ON POLYPHASE MOTORS. DO NOT PURCHASE MOTORS UNTIL POWER CHARACTERISTICS AVAILABLE AT LOCATIONS OF MOTORS HAVE BEEN CONFIRMED, AND UNTIL ROTATION DIRECTIONS HAVE BEEN CONFIRMED.
      d. SERVICE FACTOR: 1.15 FOR POLYPHASE MOTORS, AND 1.35 FOR SINGLE–PHASE MOTORS.

C. MOTOR CONSTRUCTION
   1. PROVIDE GENERAL PURPOSE, CONTINUOUS DUTY MOTORS, DESIGN "B", EXCEPT "C" WHERE REQUIRED FOR HIGH STARTING TORQUE.

      a. FRAMES: NEMA NO. 48.
      b. BEARINGS: BALL OR ROLLER BEARINGS WITH INNER AND OUTER SHAFT SEALS, PERMANENTLY SEALED. WHERE BELT DRIVES AND OTHER DRIVES PRODUCE LATERAL OR AXIAL THRUST IN MOTOR, PROVIDE BEARINGS DESIGNED TO RESIST THRUST LOADING. REFER TO INDIVIDUAL SECTIONS OF DIVISION–23 FOR FRACTIONAL–HP LIGHT–DUTY MOTORS WHERE SLEEVE–TYPE BEARINGS ARE PERMITTED.
      c. ENCLOSURE TYPE: EXCEPT AS OTHERWISE INDICATED PROVIDE OPEN DROP–PROOF MOTORS FOR INDOOR USE WHERE SATISFACTORILY HOUSED OR REMOTELY LOCATED DURING OPERATION, AND PROVIDE GUARDED DRIP–PROOF MOTORS WHERE EXPOSED TO CONTACT BY EMPLOYEES OR BUILDING OCCUPANTS. PROVIDE WEATHER–PROTECTED TYPE I FOR OUTDOOR USE. TYPE II WHERE NOT HOUSED. REFER TO INDIVIDUAL SECTIONS OF DIVISION–23 FOR OTHER ENCLOSURE REQUIREMENTS.
      d. OVERLOAD PROTECTION: PROVIDE BUILT–IN THERMAL OVERLOAD PROTECTION FOR 120V MOTORS.
      e. EFFICIENCY: MOTORS ARE TO BE "ENERGY EFFICIENT" HAVING MINIMUM EFFICIENCY AS SCHEDULED IN ACCORDANCE WITH IEEE STANDARD 112, TEST METHOD B. EFFICIENCY
      f. PROVIDE MOTORS WITH MINIMUM 85 % PROVIDE POWER FACTOR. WHERE LESS THAN 85 % PER ENERGY CODES CORRECT TO 85%

D. NAMEPLATE
   1. PROVIDE METAL NAMEPLATE ON EACH MOTOR, INDICATING FULL IDENTIFICATION OF MANUFACTURER, RATINGS, CHARACTERISTICS, CONSTRUCTION, SPECIAL FEATURES, AND SIMILAR INFORMATION.

2.02 STARTERS, ELECTRICAL DEVICES AND WIRING

A. MOTOR STARTER MANUFACTURER
   1. EXCEPT WHERE ITEM OF MECHANICAL EQUIPMENT MUST BE INTEGRALLY FURNISHED WITH MOTOR STARTER PRODUCED BY ANOTHER MANUFACTURER, PROVIDE MOTOR STARTERS FOR MECHANICAL EQUIPMENT MANUFACTURED BY ONE OF THE FOLLOWING: CUTLER–HAMMER, GE OR SQUARE D.

B. MOTOR STARTER CHARACTERISTICS
   1. COMPLY WITH NEMA STANDARDS AND NEC. PROVIDE TYPE I GENERAL PURPOSE ENCLOSURES WITH PAD LOCK EARS, AND WITH FRAMES AND SUPPORTS FOR MOUNTING ON WALL, FLOOR OR PANEL AS INDICATED. PROVIDE TYPE AND SIZE OF STARTER RECOMMENDED BY MOTOR MANUFACTURER AND EQUIPMENT MANUFACTURER FOR APPLICABLE PROTECTION AND START–UP CONDITION; REFER TO INDIVIDUAL EQUIPMENT SECTIONS FOR BASIC LOAD REQUIREMENTS.
      a. MANUAL SWITCHES: PROVIDE MANUAL SWITCH AND PILOT LIGHT FOR MOTORS 1/2 HP AND SMALLER, EXCEPT WHERE INTERLOCK OR AUTOMATIC OPERATION IS INDICATED.
         1) OVERLOAD PROTECTION: PROVIDE MELTING ALLOY TYPE THERMAL OVERLOAD RELAYS.
      b. MAGNETIC STARTERS: PROVIDE MAGNETIC STARTERS FOR 3 PHASE MOTORS AND FOR SMALLER MOTORS WHERE INTERLOCK OR AUTOMATIC OPERATION IS INDICATED. INCLUDE THE FOLLOWING:
         1) HAND–OFF–AUTO SWITCH AND PILOT LIGHTS, PROPERLY ARRANGED FOR SINGLE–SPEED OR MULTI–SPEED OPERATION AS INDICATED.
         2) TRIP–FREE THERMAL OVERLOAD RELAYS, EACH PHASE.
         3) INTERLOCKS, PNEUMATIC SWITCHES, AND SIMILAR DEVICES AS REQUIRED FOR COORDINATION WITH CONTROL REQUIREMENTS OF DIVISION–15 CONTROLS SECTIONS.
         4) BUILT–IN 120–VOLT CONTROL CIRCUIT TRANSFORMER, FUSED FROM LINE SIDE, WHERE SERVICE EXCEEDS 240 VOLTS. WHEN A TRANSFORMER ISN'T USED THE CONTROL COIL SHALL FUSED.
         5) EXTERNALLY OPERATED MANUAL RESET.
         6) UNDERVOLTAGE RELEASE OR PROTECTION FOR EACH PHASE.

PART 3.00 – EXECUTION

3.01 STARTERS
A. PROVIDE STARTERS AND WIRING DEVICES FOR MOTORS. INSTALLATION BY DIVISION 26000.

3.02 MOTORS
A. INSTALL MOTORS ON MOTOR MOUNTING SYSTEMS IN ACCORDANCE WITH MOTOR MANUFACTURER'S INSTRUCTIONS, SECURELY ANCHORED TO RESIST TORQUE, DRIVE THRUSTS, AND OTHER EXTERNAL FORCES INHERENT IN MECHANICAL WORK. SECURE SHEAVES AND OTHER DRIVE UNITS TO MOTOR SHAFTS WITH KEYS AND ALLEN SET SCREWS, EXCEPT MOTORS OF 1/3 HP AND LESS MAY BE SECURED INDICATED, SET MOTOR SHAFTS PARALLEL WITH MACHINE SHAFTS.

3.03 EQUIPMENT FABRICATION

A. FABRICATE MECHANICAL EQUIPMENT FOR SECURE MOUNTING OF MOTORS AND OTHER ELECTRICAL ITEMS INCLUDING IN WORK. PROVIDE EITHER PERMANENT ALIGNMENT OF MOTORS WITH EQUIPMENT, OR ADJUSTABLE MOUNTINGS AS APPLICABLE FOR BELT DRIVES, GEAR DRIVES, SPECIAL COUPLINGS AND SIMILAR INDIRECT COUPLING OF EQUIPMENT. PROVIDE SAFE, SECURE, DURABLE, AND REMOVABLE GUARDS FOR MOTOR DRIVES, ARRANGED FOR LUBRICATION AND SIMILAR RUNNING MAINTENANCE WITHOUT REMOVAL OF GUARDS.

END OF SECTION 200513

SECTION 200548 MECHANICAL IDENTIFICATION

PART 1.00 – GENERAL

1.01 GENERAL REQUIREMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 STANDARDS

A. ANSI COMPLIANCE COMPLY WITH ANSI A13.1 FOR LETTERING SIZE, COLORS, AND INSTALLED VIEWING ANGLES OF IDENTIFICATION DEVICES.

PART 2.00 PRODUCTS

2.01 ENGRAVED PLASTIC–LAMINATE SIGNS

A. PROVIDE ENGRAVED STOCK MELAMINE PLASTIC LAMINATE, COMPLYING WITH FS L–P–387, ENGRAVED WITH ENGRAVER'S STANDARD LETTER STYLE OF SIZES AND WORDING, BLACK WITH WHITE CORE (LETTER COLOR) EXCEPT AS OTHERWISE INDICATED, PUNCHED FOR MECHANICAL FASTENING EXCEPT WHERE ADHESIVE MOUNTING IS NECESSARY BECAUSE OF SUBSTRATE. PROVIDE 1/16" THICKNESS FOR UNITS UP TO 20 SQ. IN. OR 8" LENGTH; 1/8" FOR LARGER UNITS. PROVIDE FASTENING PER SELF–TAPPING STAINLESS STEEL SCREWS, EXCEPT CONTACT–TYPE PERMANENT ADHESIVE WHERE SCREWS CANNOT OR SHOULD NOT PENETRATE SUBSTRATE. PROVIDE FOR ALL EQUIPMENT.

2.02 ELECTRICAL EQUIPMENT

A. ON ALL MECHANICAL EQUIPMENT THAT HAS POWER CONNECTORS, PROVIDE WITH PERMANENT MARKER, THE ELECTRICAL PANEL AND BREAKER NUMBER. MARK ON DISCONNECT.

PART 3.00 – EXECUTION

3.01 MECHANICAL EQUIPMENT IDENTIFICATION

A. MECHANICAL EQUIPMENT IDENTIFICATION INSTALL ENGRAVED PLASTIC LAMINATE SIGN ON OR NEAR EACH MAJOR ITEM OF MECHANICAL EQUIPMENT AND EACH OPERATING DEVICE. PROVIDE SIGNS FOR WATER HEATERS, FANS, HVAC UNITS AND OTHER OPERATIONAL DEVICES.

END OF SECTION 200548

SECTION 240000 COMMISSIONING:

PART 1.00 GENERAL

A. PROVIDE MECHANICAL SYSTEMS COMMISSIONING IN ACCORDANCE WITH LOCAL ENERGY CODE AND THE REQUIREMENTS OF THIS SPECIFICATION. ALL CONTROL SEQUENCES SHALL BE FUNCTIONALLY TESTED TO ENSURE THEY OPERATE IN ACCORDANCE WITH THE REQUIRED SEQUENCE.
B. HVAC UNITS: OPERATE SYSTEM IN COOLING MODE; RECORD OUTSIDE TEMPERATURE, MIXED AIR TEMPERATURE, SUPPLY AIR TEMPERATURE. WHERE ECONOMIZERS ARE SPECIFIED, DEMONSTRATE PROPER OPERATION OF CHANGEOVER FROM ECONOMIZER DAMPER OPERATION (FREE COOLING WITH OUTSIDE AIR) TO MECHANICAL COOLING (MINIMUM OUTSIDE AIR WITH COMPRESSOR COOLING). VERIFY THAT COOLING COIL SENSIBLE CAPACITY MATCHES THE TEMPERATURE DROP ON THE COOLING COIL VIA THE FORMULA COOLING CAPACITY (BTUH) = AIRFLOW (CFM) X (1.1) X DELTA T (MIXED AIR TEMP – SUPPLY AIR TEMP DEGREES F). OPERATE UNITS IN HEATING MODE: RECORD OUTSIDE AIR TEMPERATURE, MIXED AIR TEMPERATURE, SUPPLY AIR TEMPERATURE. VERIFY THAT HEATING COIL CAPACITY MATCHES THE TEMPERATURE RISE ON THE HEATING COIL VIA THE FORMULA HEATING CAPACITY (BTUH) = AIRFLOW (CFM) X (1.1) X DELTA T (MIXED AIR TEMP – SUPPLY AIR TEMP DEGREES F). VERIFY THE OPERATION OF ANY CONTROL VALVES WHERE PRESENT (CHILLED WATER OR HEATING WATER VALVES). VERIFY THAT EACH UNIT OPERATES WITH THE CORRECT THERMOSTAT/ SENSOR. UNIT FANS SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE AND CYCLE ON/OFF DURING UNOCCUPIED MODE. SETUP AND VERIFY HOURS ON OPERATION (TIME SCHEDULE) FOR OCCUPIED/UNOCCUPIED MODE AND HOLIDAY/WEEKEND SCHEDULING.
C. VERIFY SMOKE DETECTOR SHUTDOWN OF ANY FAN UNITS SCHEDULED FOR SMOKE DETECTOR SHUTDOWN.
D. VERIFY PROPER OPERATION OF ANY OTHER HVAC EQUIPMENT THAT IS INTERLOCKED WITH OTHER EQUIPMENT.
E. PROVIDE CHECK OUT OF ALL PLUMBING SYSTEMS FOR PROPER OPERATION, INCLUDING HOT AND COLD WATER AT ALL FAUCETS, WATER HEATERS SET FOR PROPER TEMPERATURE, OPERATION OF ALL VALVES, GREASE TRAPS, GAS VALVES, MIXING VALVES. RECORD DATA ON ALL DEVICES CHECKED AND THE STATUS OF THEIR OPERATION.

END OF SECTION 240000

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MECHANICAL SPECIFICATIONS

M1.2

AS NOTED
scale

05/12/25
date

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SECTION 233113 DUCTWORK

PART 1.00 – GENERAL

1.01 DESCRIPTION
A. GENERAL REQUIREMENTS DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND CONDITIONS AND DIVISION 1 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 WORK INCLUDED
A. INCLUDE ALL LABOR, MATERIALS, EQUIPMENT TRANSPORTATION AND SERVICES TO FURNISH AND INSTALL COMPLETE ALL DUCTWORK AND RELATED SYSTEMS SPECIFIED HEREIN AND INDICATED ON THE DRAWING.

PART 2.00 – PRODUCTS

2.01 SHEETMETAL WORK
A. FURNISH ALL DUCTWORK AS SHOWN ON PLANS. ALL DUCTWORK CONSTRUCTION SHALL COMPLY WITH SMACNA STANDARDS AND LOCAL MECHANICAL CODE STANDARDS, WHICHEVER IS MORE STRINGENT. DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOWING PRESSURE VELOCITY CLASSIFICATIONS FOUND IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS, FIRST EDITION (1985).
1. DUCTWORK BETWEEN VAV AIR HANDLING UNITS AND TERMINAL BOXES & AIR DEVICES: MAXIMUM +3" W.G., 2,500 F.P.M., VARIABLE AIR VOLUME.
2. DUCTWORK DOWNSTREAM OF TERMINAL BOXES: +2"W.G., 2,500 F.P.M., VARIABLE AIR VOLUME.
3. EXHAUST DUCTWORK (ALL EXHAUST FAN SYSTEMS WHERE DESIGN FAN STATIC IS LISTED AT 1.0" W.G. OR ABOVE): +2" TO –2"W.G., 2500 F.P.M., CONSTANT VOLUME.
4. RETURN, RELIEF OR EXHAUST DUCTWORK WHERE FAN DESIGN STATIC IS LISTED BELOW 1.0"W.G.: +1" TO –1" W.G., 2,500 F.P.M., CONSTANT VOLUME.
5. DUCTS: +0.5" TO –0.5" W.G., 2,000 F.P.M., CONSTANT VOLUME.

B. PRIOR TO ANY FABRICATING OF SHEET METAL WORK, THE CONTRACTOR SHALL CAREFULLY MEASURE (AT THE SITE) AVAILABLE SPACE FOR SHEET METAL WORK. HE SHALL PREPARE LARGE SCALE SHOP DRAWINGS OF SHEET METAL WORK SHOWING ALL OTHER ELEMENTS OF THE BUILDING INCLUDING PIPING, STRUCTURAL AND ELECTRICAL SO ALL ARE COORDINATED AND FIT AVAILABLE SPACE. THE SHOP DRAWINGS WILL NOT GO THROUGH A FORMAL SUBMITTAL PROCESS, BUT 2 COPIES SHALL BE GIVEN TO THE ARCHITECT AS EVIDENCE OF THEIR BEING COMPLETED.
C. LONGITUDINAL SEAMS IN DUCTS SHALL BE FLAT, DOUBLE LOCK TYPE. S AND DRIVE TYPE. SEALED WITH UL 181A OR UL 181B TAPES AND MASTICS.
D. TRANSVERSE SEAMS SHALL BE SEALED WITH UL 181A OR UL 181B TAPE OR MASTICS. TYPE AND SPACING AS FOLLOWS:

MAX. SIDE	TYPE	SPACING
UP TO 30"	DRIVE SLIP	7'–10"
31" TO 60"	1–1/2" POCKET SLIP	7'–10"
61" AND UP	1–1/2" POCKET SLIP	3'– 9"

CROSS BREAK PANELS 18" AND OVER IN WIDTH.
E. STANDING SEAMS ARE NOT ACCEPTABLE ON ANY DUCTWORK.
F. JOINT LOCKING: THE SLIPJOINT IN POCKET SLIP SEAMS SHALL BE SCREWED USING NOT LESS THAN ONE SCREW PER FACE AND MAXIMUM SPACING OF 2'–0".
G. DAMPERS PROVIDE DAMPERS AND QUADRANTS IN DUCTWORK AS NECESSARY FOR BALANCING. PROVIDE ONE DAMPER IN THE DUCT LEADING TO EACH SUPPLY OR RETURN/EXHAUST OPENINGS. DAMPERS SHALL BE LOCATED IN AN ACCESSIBLE LOCATION. DAMPERS SHALL BE FITTED WITH PARKER KALON DAMPER BEARINGS AND PARKER KALON NO. 195T QUADRANTS. DAMPERS SHALL BE OF 20 GA. G.I. SINGLE PLATE TYPE WITH EDGES HEMMED. FOR DAMPERS ABOVE "HARD" (GYPBOARD OR NON–ACCESSIBLE) CEILINGS, PROVIDE BOWDEN CABLE CONTROLLER WITH CONCEALED OPERATORS IN NEAREST RETURN GRILLE. SHOW LOCATION OF ALL REMOTE DAMPER OPERATORS & VOLUME DAMPERS ON RECORD DRAWINGS. INCLUDE DRAWING W/BALANCING REPORT. ADJUSTABLE SPLITTER DAMPERS TO BE YOUNG REGULATOR 890B.
H. ACCESS DOORS SHALL BE PROVIDED BY THIS CONTRACTOR IN FINISHED WALLS AND CEILINGS WHERE REQUIRED TO REACH MECHANICAL EQUIPMENT, MILCOR OR EQUAL.
I. INSULATED LOW PRESSURE FLEXIBLE DUCT SHALL BE A FACTORY FABRICATED ASSEMBLY CONSISTING OF A ZINC–COATED SPRING STEEL HELIX, NON–PERFORATED INNER LINER, WRAPPED WITH A NOMINAL 1" THICK BY 1 LB/CU. FT. DENSITY FIBERGLASS INSULATION. THE ASSEMBLY SHALL BE SHEATHED IN A VAPOR BARRIER JACKET, FACTORY SEALED AT BOTH ENDS OF EACH SECTION, THUS ASSURING THE VAPOR RESISTANCE OF EACH SECTION AS WELL AS THE COMPLETED INSTALLATION. THE COMPOSITE ASSEMBLY INCLUDING INSULATION AND VAPOR BARRIER SHALL MEET THE CLASS 1 REQUIREMENTS OF NFPA BULLETIN NO. 90–A AND BE LABELED BY UL WITH A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR UNDER. FLEXIBLE DUCTS SHALL BE INSTALLED IN A FULLY EXTENDED LENGTH REQUIRED TO MAKE THE CONNECTION. WHERE HORIZONTAL SUPPORT IS REQUIRED, FLEXIBLE DUCT SHALL BE SUSPENDED ON 36" CENTERS WITH A MINIMUM 1" WIDE FLAT BANDING MATERIAL. ALL JOINTS AND CONNECTIONS SHALL BE MADE WITH 1/2" WIDE POSITIVE LOCKING STEEL STRAPS. INSULATED LOW PRESSURE FLEXIBLE DUCT SHALL BE GREENFLEX TYPE SL–1 OR EQUAL. PROVIDE SPIN–IN FITTINGS FOR CONNECTION TO TRUCK DUCT. MAXIMUM LENGTH OF FLEX DUCT IS 5 FEET WITH ONE 90 DEGREE BEND.
J. OFFSETS
PROVIDE OFFSETS AND TRANSITIONS AS REQUIRED TO FIT DUCTWORK INTO AVAILABLE SPACE. MAINTAIN EQUIVALENT FREE AREA OF DUCTWORK, AND TRANSITION SHALL BE SMOOTH (LESS THAN 15 DEGREES).

2.02 DUCT LINING
A. JOHNS MANSVILLE 1" THICK 1.5 LB/CU.FT. DENSITY (WHERE CALLED OUT ON DRAWINGS AND OR WHERE SPECIFIED) LINACOUSTIC R–4 MIN. OR 1.5" THICK 1.5 LB/CU.FT. DENSITY LINACOUSTIC R–5 MIN. WHERE "SOUNDLINED" OR "LINED" DUCT IS CALLED OUT ON DRAWINGS OR SPECIFIED. SERVICE WITH GLUE AND CLIPS. SPACE CLIPS A MAXIMUM OF 18"O.C. LINE ALL RECTANGULAR DUCTS (INCLUDES OUTSIDE AIR, SUPPLY, RETURN, EXHAUST AND TRANSFER DUCTS). THE NET FREE AREA OF THE DUCT DIMENSIONS GIVEN ON THE DRAWINGS SHALL BE MAINTAINED. INCREASE METAL DUCT DIMENSIONS AS NECESSARY TO COMPENSATE FOR ADDITION OF THE LINER.
B. THE DUCT LINER SHALL BE APPLIED WITH 100 RESISTANT ADHESIVE. LINER SHALL BE ADDITIONALLY SECURED WITH % COVERAGE OF APPROVED FIRE MECHANICAL FASTENERS ON MAXIMUM 15" CENTERS. FASTENERS SHALL START WITHIN 2" OF THE LEADING EDGE OF EACH SECTION AND WITHIN 3" OF THE LEADING EDGE OF ALL CROSS JOINTS WITHIN THE DUCT SECTION. ALL EXPOSED EDGES AND THE LEADING EDGE OF ALL CROSS JOINTS OF THE LINER SHALL BE HEAVILY COATED WITH AN APPROVED FIRE RESISTANT ADHESIVE. THE DUCT LINER SHALL BE CUT TO ASSURE SNUG CLOSING CORNER JOINTS, THE BLACK SURFACE OF THE LINER SHALL FACE THE AIR STREAM, TRANSVERSE JOINTS SHALL BE NEATLY BUTTED, AND ANY DAMAGED AREAS SHALL BE HEAVILY COATED WITH AN APPROVED FIRE RESISTANT ADHESIVE.

2.03 BACKDRAFT DAMPERS
A. GENERAL PROVIDE DAMPERS AT ALL OUTSIDE AIR AND RELIEF DUCTS INTAKING OR EXHAUSTING TO ATMOSPHERE.
B. TYPE
1. BACKDRAFT DAMPERS ON FAN SYSTEMS SHALL BE GALVANIZED STEEL OR ALUMINUM MULTIBLADE TYPE. BLADES SHALL HAVE FELT STRIPS RIVETED OR CRIMPED IN PLACE. BLADES SHALL BE JOINED TOGETHER WITH CONNECTION BARS. EACH BLADE SHALL BE RIGIDLY ATTACHED TO A PIVOT ROD. THE ROD SHALL EXTEND INTO OIL–IMPREGNATED BRONZE BUSHINGS, OR ANTIFRICTION BEARINGS, LOCATED IN THE FRAMES. RUSKIN CBD2 OR EQUAL.
2. FABRIC BACKDRAFT DAMPERS ON RELIEF DUCTS SHALL BE CONSTRUCTED TO INDUSTRY STANDARDS.
C. MANUFACTURER SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. AMERICAN WARMING AND VENTILATING; A MESTEK ARCHITECTURAL GROUP COMPANY.
2. CESCO PRODUCTS; A DIVISION OF MESTEK, INC.
3. GREENHECK FAN CORPORATION.
4. LLOYD INDUSTRIES, INC.
5. NAILOR INDUSTRIES INC.
6. RUSKIN COMPANY.
7. UNITED ENERTECH VENT PRODUCTS CO., INC

2.04 LOUVERS
A. FURNISH WONDER METAL MODEL 'SDL–4" DRAINABLE FORMED GALVANIZED STEEL STORM–PROOF MULLION NON–MECHANICAL FIXED WALL LOUVERS, OR AIR LOUVERS INC., THE AIROLITE CO., CONSTRUCTION SPECIALTIES INC., RUSKIN, OR INDUSTRIAL LOUVERS INC. EQUIVALENT, OR APPROVED: SIZES AND CONFIGURATIONS AS SHOWN, COMPLETE WITH FLAT BAR ORNAMENTAL SHAPES WERE SHOWN; REFER TO EXTERIOR BUILDING ELEVATIONS AND LOUVER SCHEDULE, SECTION 22 OF PROJECT MANUAL VOLUME II. PROVIDE WITH BIRD SCREEN AND COLOR AS DESIGNATED BY ARCHITECT.
B. LOUVERS SHALL HAVE BEEN TESTED AND RATED TO HAVE MINIMUM 45% FREE OPENING BASED ON A 4X4 FOOT SIZE LOUVER.
C. FRAME AND BLADES TO BE 16 GAUGE GALVANIZED STEEL.
D. HEADS, SILLS AND JAMBS TO BE ONE PIECE STRUCTURAL MEMBERS AS DETAILED AND SECURELY ANCHOR TO WALL CONSTRUCTION AS APPROVED.
E. SLIDEABLE INTERLOCKED MULLIONS TO HAVE PROVISION TO EXPANSION AND CONTRACTION.
F. FURNISH COMPLETE WITH MANUFACTURER'S STANDARD BIRD SCREEN MOUNTED IN FOLDED "U" TYPE FRAME AND ATTACH TO INSIDE FACE OF LOUVER FRAME WITH STEEL SCREWS AT ACTIVE (OPEN) PORTIONS OF LOUVERS AND WITH 20 GAUGE GALVANIZED STEEL FACED INSULATED 'BLANK–OFF" PANELS AT INACTIVE LOUVER AREAS, COMPLETE WITH PERIMETER GASKETS AND FINISHED TO MATCH LOUVER. INSULATION CORE SHALL BE 1 INCH THICK EXTRUDED POLYSTRYENE HAVING A MINIMUM THERMAL RESISTANCE "R" VALUE OF 5.0.
G. ALL LOUVERS TO BE FREE OF SCRATCHES AND BLEMISHES AND SHALL BE FINISH PAINTED WITH BAKED–ON ENAMEL POWDER COATING.

2.05 FIRE DAMPERS
A. DYNAMIC FIRE DAMPERS SHALL BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH UL SAFETY STANDARD 555. EACH DAMPER SHALL HAVE A 1 1/2 HOUR RATING WITH 165 F FUSABLE¢ LINK AND BE LABLED PER UL 555 STANDARD.
B. DYNAMIC COMBINATION FIRE/SMOKE DAMPERS,RUSKIN FSD36, SHALL BE OF MIN. 16 GAUGE GALVANIZED STEEL WITH STAINLESS STEEL BEARINGS, JAMB SEALS UNDER 450 DEG. F RATED BLADE EDGE SEAL. DAMPERS SHALL BE 1 HR. RATED UNDER UL STANDARD 555 AND UL 555S. ALL DAMPERS USED UNDER THIS SPECIFICATION MUST BE UL TESTED & QUALIFIED IN THE COMPLETE RANGE OF SIZES USED. A SINGLE DAMPER TESTED WITHIN THIS RANGE IS NOT ACCEPTABLE. LEAKAGE RATING SHALL BE CLASS 11 INCLUDE A UL CLASSIFIED FIRE STAT. FIRESTAT SHALL ELECTRICALLY AND MECHANICALLY LOCK DAMPER CLOSED WHEN DUCT TEMPERATURE EXCEEDS 165°F. DAMPER MUST BE OPERABLE ABOVE 250° F. FIRESTAT SHALL BE EQUIPPED WITH TWO DAMPER POSITION INDICATORS FOR REMOTE INTERFACING WITH SMOKE DETECTORS & FIRE ALARM SYSTEM. ALSO PROVIDE INTEGRAL FLOW RATE DUCT SMOKE DETECTORS FOR NON–DUCTED FIRE SMOKE DETECTORS.
C. CEILING FIRE DAMPERS SHALL BE INSTALLED IN ALL CEILING REGISTERS AND GRILLES. IN THE RATED CEILING. FIRE DAMPERS CONSIST OF A RADIANT DAMPER IN THE DIFFUSER NECK AND THERMAL INSULATING BLANKET COVERING THE DIFFUSER PAN. THE ENTIRE SYSTEM SHALL BE UL RATED FOR FLOOR/CEILING AND ROOF/CEILING SYSTEM.

PART 3.00 – EXECUTION

3.01 SHEET METAL WORK
A. PARTITIONS FORMING PLENUMS OR CASINGS SHALL BE #18 GA., WITH GALVANIZED IRON ANGLES AND RIVETS FOR SEAM CONNECTION AND STIFFENING. ALL JOINTS AND STANDING SEAMS SHALL BE SEALED WITH APPROVED DUCT SEALANT.
B. CORK GASKETS SHALL BE INSTALLED BETWEEN ALL CONNECTIONS OF SHEET METAL TO COIL AND FILTER CASINGS.
C. SHEET METAL CONNECTIONS OF PLENUMS AND AIR CHAMBERS TO WALL AND FLOORS SHALL BE MADE WITH GALVANIZED ANGLES ANCHORED TO WALL OR FLOOR CONSTRUCTION WITH ANCHOR BOLTS WITH SHEET METAL BOLTED OR RIVETED TO ANGLES. MASTIC SEALER SHALL BE INSTALLED AT CONNECTION OF ANGLES TO SHEET METAL TO PROVIDE AIR–TIGHT JOINTS. PROVIDE ACCESS DOORS IN PLENUMS AND CHAMBERS WITH HANDLES OPERATED FROM BOTH SIDES, VENTLOCK NO. 205 OR APPROVED SUBSTITUTE.
D. HINGED ACCESS DOORS IN SHEET METAL DUCT FOR ACCESS TO DAMPERS SHALL BE #18 GA., FRAMED WITH STEEL ANGLE AND HEMMED EDGES
E. CONNECT ALL GRILLES TO DUCTWORK. PAINT THE INSIDE OF THE DUCT A DULL BLACK AT ALL GRILLES.
F. ALL AIR INLETS AND OUTLETS TO OUTSIDE SHALL HAVE BIRDSCREENS. BACKDRAFT DAMPER SHALL BE PROVIDED WHERE MOTORIZED DAMPER IS NOT INDICATED.
G. ALL DUCTS THROUGH ROOF SHALL BE FLASHED WATER–TIGHT. ALL DUCTS THRU WALLS AND FLOORS/ROOFS SHALL HAVE ANGLE ENCLOSURES.
H. CONNECTIONS OF ALL DUCTS TO ALL EQUIPMENT SHALL BE MADE WITH NEOPRENE.
I. ELBOWS SHALL HAVE AN INSIDE RADIUS EQUAL TO 1/2 THE DUCT WIDTH. RECTANGULAR ELBOWS SHALL HAVE DUCT TURNS, T&B OR APPROVED EQUAL. USE RECTANGULAR ELBOWS WHEREVER A ROUND ELBOW CANNOT BE USED AND WHERE SHOWN ON DRAWINGS. SQUARE INSIDE ELBOW AND ROUND OUTSIDE ELBOW ARE NOT PERMITTED. DO NOT INSTALL TURNING VANES IN GREASE EXHAUST DUCTWORK.
J. SUPPORTERS SHALL BE GALVANIZED STRAP OR ANGLE IRON HANGERS, ARRANGED TO PREVENT ANY BULGING, BENDING, OR SAGGING OF DUCTWORK. UNDER NO CONDITION SHALL HANGERS PIERCE THE DUCTS. VERTICAL DUCTS SHALL BE SUPPORTED AT EACH FLOOR WITH 18 GA. FORMED ANGLE.
K. SEAL ALL DUCT JOINTS WITH APPROVED DUCT SEALANT.
L. HANGERS
1. PROVIDE HANGERS ON ALL DUCTWORK.
2. HANGERS FOR CIRCULAR DUCTS AND TUBING: A #18 GAUGE GALVANIZED HEET STEEL STRAP SHALL BE WRAPPED AROUND THE DUCT AT EACH POINT OF SUPPORT. FOR CONCEALED WORK THIS STRAP SHALL BE BOLTED TO A STRAP HANGER OF SIMILAR GAUGE AND WIDTH; FOR EXPOSED WORK, BOLTED TO A STEEL ROD HANGER IN EACH CASE, ROD HANGER 1/4" SIZE FOR DUCTS UP TO 10" SIZE, 3/8" SIZE FOR LARGER DUCTS. WIDTH OF GALVANIZED STEEL STRAP WRAPPED AROUND THE DUCT SHALL NOT BE LESS THAN 1" IN ANY CASE; WHERE DUCTS ARE IN EXCESS OF 10" IN DIAMETER SHALL BE 2".
3. SPACING OF HANGERS SHALL NOT EXCEED 10'–0" ON CENTERS IN ANY CASE; WHERE DUCTS ARE INSULATED AND ARE IN EXCESS OF 10" IN SIZE, SPACING SHALL NOT EXCEED 8'–0".
M. A MAXIMUM OF 5 FEET LENGTH OF FLEX DUCT WITH ONE 90 BEND WILL BE ALLOWED AT CONNECTIONS TO DIFFUSERS, WHERE FLEX DUCT IS SHOWN ON DRAWINGS.
N. PROVIDE FIRE STOP AROUND DUCTWORK AT ALL DUCT PENETRATION OF RATED CONSTRUCTION. "FIRE STOP SEALANT" BY DOW CORNING.
O. BACKDRAFT DAMPERS ON RELIEF DUCTS SHALL BE METAL BLADE TYPE.
P. PROVIDE DUCT TRANSITIONS AS REQUIRED TO SOUND TRAPS AND ALL CONNECTIONS.
Q. PROVIDE DUCT LINING ON RECTANGULAR DUCTS WHERE INDICATED ON DRAWINGS
(OUTSIDE AIR, SUPPLY, RETURN, EXHAUST AND TRANSFER AIR DUCTS). THE NET FREE AREA OF THE DUCT DIMENSION GIVEN ON THE DRAWINGS SHALL BE MAINTAINED. INCREASE METAL DUCT DIMENSIONS AS NECESSARY TO COMPENSATE FOR ADDITION OF THE LINER.
R. ALL DUCTWORK, INCLUDING, BUT NOT LIMITED TO DUCTS, HANGERS, BRACKETS, FITTINGS AND JOINTS, SHALL BE INSTALLED IN A MANNER WHICH NEITHER REDUCES HEADROOM AND WALKWAY WIDTH NOR PROJECTS ANY SHARP EDGES INTO A CATWALK OR PASSAGE AREA. ANY DUCTWORK WHICH, IN THE OPINION OF THE ARCHITECT, PRESENTS A POSSIBLE HAZARD TO PEOPLE IN THE CATWALK AREA, SHALL BE CHANGED TO AN ACCEPTABLE AND SAFE MANNER. SUCH CHANGES MAY INCLUDE: MOVING THE EQUIPMENT, CHANGING ITS CONFIGURATION, AND/OR ADDING PROTECTIVE PADDING TO THE EQUIPMENT.
S. INTAKE BACKDRAFT DAMPERS SHALL BE INSTALLED AT THE ENVELOPE OF THE BUILDING.
T. INSTALL FIRE DAMPERS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

END OF SECTION 233113

SECTION 233713 OUTLETS AND INLETS

PART 1.00 – GENERAL

1.01 DESCRIPTION
A. GENERAL REQUIREMENTS
DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 COMPLIANCES
A. ADC COMPLIANCE
TEST AND RATE REGISTERS, GRILLES, AND DIFFUSERS IN ACCORDANCE WITH ADC EQUIPMENT TEST CODE 1062R4, PROVIDE CERTIFIED RATINGS SEAL ON EACH UNIT.
B. AMCA COMPLIANCE TEST AND RATE LOUVERS, DAMPERS, AND SHUTTERS IN ACCORDANCE WITH AMCA STANDARD 500, PROVIDE CERTIFIED RATINGS SEAL ON EACH UNIT.

1.03 SUBMITTALS
A. SUBMIT MANUFACTURER'S TECHNICAL PRODUCT DATA UNLESS AS SPECIFIED ON DRAWINGS, ASSEMBLY–TYPE SHOP DRAWINGS, AND MAINTENANCE DATA.

PART 2.00 – PRODUCTS

2.01 CEILING AIR DIFFUSERS
A. GENERAL
EXCEPT AS OTHERWISE INDICATED, PROVIDE MANUFACTURER'S STANDARD AIR DEVICES WITH FIRE DAMPERS; OF SIZE, SHAPE, CAPACITY AND TYPE INDICATED; CONSTRUCTED OF MATERIALS AND COMPONENTS INDICATED AND AS INDICATED ON DRAWINGS FOR COMPLETE INSTALLATION.
B. COMPATIBILITY:
1. PROVIDE DIFFUSERS WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT CEILING SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO CEILING MODULE WITH ACCURATE FIT AND ADEQUATE SUPPORT. REFER TO GENERAL CONSTRUCTION DRAWINGS AND SPECIFICATIONS FOR TYPES OF CEILING SYSTEMS WHICH WILL CONTAIN EACH TYPE OF CEILING AIR DIFFUSER.
2. PRVIDE REGISTERS AND GRILLES WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT WALL OR CEILING SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO CONSTRUCTION WITH ACCURATE FIT AND ADEQUATE SUPPORTS. REFER TO GENERAL CONSTRUCTION DRAWINGS AND SPECIFICATIONS FOR TYPES OF CONSTRUCTION WHICH WILL CONTAIN EACH TYPE OF WALL REGISTER AND GRILLE.

PART 3.00 – EXECUTION

3.01 INSTALLATION
A. GENERAL
INSTALL OUTLETS AND INLETS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO INSURE THAT PRODUCTS SERVE INTENDED FUNCTIONS.
B. COORDINATE WITH OTHER WORK, INCLUDING DUCTWORK AND DUCT ACCESSORIES, AS NECESSARY TO INTERFACE INSTALLATION OF OUTLETS AND INLETS WITH OTHER WORK.
C. LOCATE CEILING AIR DIFFUSERS, REGISTERS, AND GRILLES, AS INDICATED ON GENERAL CONSTRUCTION "REFLECTED CEILING PLANS" AND "INTERIOR ELEVATIONS". UNLESS OTHERWISE INDICATED, LOCATE UNITS IN CENTER OF ACOUSTICAL CEILING MODULES.

END OF SECTION 233713

SECTION 234100 FILTERS

PART 1.00 – GENERAL

1.01 GENERAL REQUIREMENTS
A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.

1.02 COMPLIANCE
A. NFPA COMPLIANCE: INSTALL AIR TREATMENT EQUIPMENT IN ACCORDANCE WITH NFPA 90A AND 90B.
B. UL COMPLIANCE: PROVIDE AIR FILTER UNITS WHICH HAVE BEEN LISTED AND LABELED BY UL.
C. ASHRAE COMPLIANCE: TEST AIR FILTER UNITS IN ACCORDANCE WITH ARI 850.

PART 2.00 – PRODUCTS
2.01 AIR FILTERS
A. EXTENDED SURFACE FILTERS
PROVIDE FACTORY–FABRICATED, DRY, EXTENDED SURFACE FILTERS;WHERE SHOWN, IN SIZES INDICATED. EQUIP WITH UL CLASS 1 FIBROUS MEDIA MATERIAL FORMED INTO 2" DEEP V–SHAPED PLEATS AND HELD BY SELF– SUPPORTING FRAMES. FARR 30/30 OR EQUAL.

2.02 FILTER FRAMES
A. PROVIDE METAL FILTER FRAMES.

3.01 INSTALLATION
A. INSTALL AIR FILTERS AND HOLDING DEVICES OF TYPES INDICATED, AND WHERE SHOWN; IN ACCORDANCE WITH AIR FILTER MANUFACTURER'S WRITTEN INSTRUCTIONS AND WITH RECOGNIZED INDUSTRY PRACTICES;TO ENSURE THAT FILTERS COMPLY WITH REQUIREMENTS AND SERVE INTENDED PURPOSES. COMPLY WITH APPLICABLE PORTIONS OF NFPA 70, 90A AND B, PERTAINING TO INSTALLATION OF AIR FILTERS. PROVIDE AS SCHEDULED ON THE DRAWINGS.
B. INSTALL FILTERS IN PROPER POSITION TO PREVENT PASSAGE OF UNFILTERED AIR.
C. PROVIDE CLEAN SET OF FILTERS FOR ALL PIECES OF EQUIPMENT:
1. IMMEDIATELY PRIOR TO AIR BALANCING.
2. WHEN FINAL PUNCHLIST IS DONE.
3. IN ADDITION, FURNISH ONE COMPLETE EXTRA SET OF FILTER TO OWNER WHEN FINAL PUNCHLIST IS DONE. THREE SETS OF FILTERS ARE REQUIRED (TWO INSTALLED, ONE TURNED OVER TO OWNER). LOCATE EXTRA SET IN MECHANICAL ROOMS WHERE FILTERS ARE LOCATED.

END OF SECTION 234100

SECTION 230593 BALANCING

PART 1.00 – GENERAL

1.01 DESCRIPTION
A. GENERAL REQUIREMENTS
DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND OTHER CONDITIONS AND DIVISION 1 – GENERAL REQUIREMENTS SECTIONS, APPLY TO THE WORK SPECIFIED IN THIS SECTION.
1.02 INDUSTRY STANDARDS
A. ALL TESTING, ADJUSTING AND BALANCING OF ALL WORK SHALL BE PERFORMED BY AN INDEPENDENT CONTRACTOR WHO IS CURRENTLY LICENSED ASSOCIATED AIR BALANCING COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) BALANCING CONTRACTOR. NO OTHER BALANCE REPORTS WILL BE REVIEWED OR ACCEPTED. ALL BALANCING WORK MUST BE COMPLETE AND DONE IN ACORDANCE WITH THE MOST RECENT STANDARDS OF THEIR SOCIETY. PAYMENT OF ALL COSTS FOR TESTING AND BALANCING SHALL BE BY THE GENERAL CONTRACTOR. ALL BALANCING WORK SHALL BE PERFORMED WITH ACCORDANCE WITH LOCAL CODES AND THIS SECTION.

1.03 SUBMITTALS
A. SUBMIT CERTIFIED TEST REPORTS SIGNED BY TEST AND BALANCE SUPERVISOR WHO PERFORMED TAB WORK. SUBMIT RECORD HVAC PLAN SHOWING ALL VOLUME DAMPER & REMOTE VOLUME DAMPER OPERATOR LOCATIONS & CONNECTION LINKAGE.
B. THE BALANCE REPORT SHALL BE ON THE AABC NATIONAL STANDARD REPORT FORMS OR THE NEBB CERTIFIED REPORT FORMS AS PUBLISHED IN THEIR MOST CURRENT EDITIONS AND SHALL INCLUDE AS A MINIMUM THE FOLLOWING INFORMATION.
1 AABC OR NEBB CERTIFICATION NUMBER AND SIGNATURE OF BALANCING CONTRACTOR.
2. COPY OF A CERTIFICATE OF CONFORMANCE WITH NATIONAL STANDARDS FOR THIS PROJECT.
3. INSTRUMENTATION LIST WITH LAST CALIBRATION DATES.
4. MAKE AND MODEL NUMBERS OF ALL HVAC EQUIPMENT.
5. AIR CFM AND STATIC PRESSURE READINGS (DISCHARGE AND SUCTION) AS MEASURED BY PITOT TUBE DUCT TRAVERSE AT THE UNIT.
6. MOTOR NAMEPLATE DATA WITH ACTUAL FIELD VOLTAGE AND AMPERAGE READINGS FOR EACH LEG.
7. MOTOR AND FAN R.P.M.'S, SHEAVE SIZES AND BELT SIZES.
8. OUTSIDE, RETURN, MIXED AND SUPPLY AIR TEMPERATURES AND VOLUMES SHALL BE MEASURED AT FULL COOLING WITH MINIMUM OUTSIDE AIR. RETURN/RELIEF/SMOKE EVACUATION AIRFLOW SHALL BE BALANCED AND MEASUREMENTS RECORDED BY PITOT DUCT TRAVERSE AT FULL ECONOMIZER AND POWER EXHAUST.
9. MAKE AND MODEL NUMBERS OF ALL AIR DISTRIBUTION EQUIPMENT.
10. FINAL BALANCED AIR VOLUMES AT ALL OUTLETS (INCLUDING RETURNS WHERE DUCTED).
11. INDEXED PLAN WITH DIFFUSER AND RETURN LOCATIONS. ALSO INDICATE IF DIFFUSER IS 3–WAY OR 2–WAY.
12. BALANCING DATA FOR CHILLED WATER SYSTEM, WHERE APPLICABLE.

C. FIVE COPIES OF THE BALANCE REPORT SHALL BE SUBMITTED TO HOLD EVERYRONE PROJECT MANAGER FOR APPROVAL. PROVIDE ONE COPY OF APPROVED REPORT TO LANDLORD UPON COMPLETION OF CONSTRUCTION FOR THE PREMISE AS A REQUIREMENT TO OPEN FOR BUSINESS.

1.04 JOB CONDITIONS
A. WORK WILL NOT PROCEED WITH TESTING, ADJUSTING AND BALANCING WORK UNTIL WORK HAS BEEN COMPLETED AND IS OPERABLE. ENSURE THAT THERE IS NO LATENT RESIDUAL WORK STILL TO BE COMPLETED. INFORM ARCHITECT IN WRITING WHEN PROJECT IS READY FOR ADJUSTING AND BALANCING.
B. REFER TO LANDLORD TENANT CRITERIA MANUAL FOR SYSTEM BALANCING REQUIRED AS PART OF TENANT WORK.

PART 2.00 –

PRODUCTS 2.01 GENERAL
A. CONTRACTOR SHALL PROVIDE ALL MOTORS, SHEAVES, BELTS, LADDERS, ETC. AS REQUIRED FOR BALANCER TO ACCOMPLISH WORK.
B. CONTRACTOR SHALL BE HIRED BY THE CONTRACTOR. CONTRACTOR SHALL BE AN INDEPENDENT CONTRACTOR, SEPARATE COMPANY FROM THE CONTRACTOR. COORDINATE WITH LANDLORD, LANDLORD MAY REQUIRE SPECIFIC CONTRACTOR FOR BALANCING.

PART 3.00 – EXECUTION

3.01 GENERAL
A. EXAMINE INSTALLED WORK AND CONDITIONS UNDER WHICH TESTING IS TO BE DONE TO ENSURE THAT WORK HAS BEEN COMPLETED, CLEANED AND IS OPERABLE. DO NOT PROCEED WITH TAB WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO TESTER.
B. TEST, ADJUST AND BALANCE AIR CONDITIONING SYSTEMS AND COMPONENTS, AS INDICATED, IN ACCORDANCE WITH PROCEDURES OUTLINED IN APPLICABLE STANDARDS. REFER TO LANDLORD TENANT CRITERIA MANUAL FOR SYSTEM BALANCING REQUIRED AS PART OF TENANT WORK.
C. PREPARE REPORT OF TEST RESULTS IN FORMAT RECOMMENDED BY APPLICABLE STANDARDS.
D. PATCH HOLES IN INSULATION, DUCTWORK AND HOUSING, WHICH HAVE BEEN CUT OR DRILLED IN MANNER RECOMMENDED BY THE ORIGINAL INSTALLER.
E. MARK EQUIPMENT SETTINGS, INCLUDING DAMPER CONTROL POSITIONS, VALVE INDICATORS, FAN SPEED CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS AT COMPLETION OF BALANCE WORK. PROVIDE MARKINGS WITH PAINT OR OTHER SUITABLE PERMANENT IDENTIFICATION MATERIALS.
F. INITIAL BALANCING SHALL INCLUDE BALANCING ALL AIR QUANTITIES TO WITHIN 10% OF THOSE LISTED ON THE DRAWINGS.
G. BALANCER SHALL THEN CHECK ALL BUILDING TEMPERATURES AND READ JUST AIR QUANTITIES TO EVEN OUT SPACE TEMPERATURES TO WITHIN 1 DEG. F WITHIN SPACES.
H. TESTING, ADJUSTING AND BALANCING REPORT MUST BE COMPLETE AND TURNED OVER EVERYTHING TO PROJECT MANAGER 1 WEEK PRIOR TO STORE TURNOVER.
I. THE CONTRACTOR SHALL BE PRESENT FOR AIR BALANCE TO VERIFY ACCESSIBILITY TO ALL DEVICES, VERIFY ALL OPERATING SEQUENCES AND INSTALL NEW FILTERS IN ALL UNITS JUST PRIOR TO THE AIR BALANCE. THE COMPLETE AIR BALANCE SHALL TAKE PLACE WITH OUTSIDE AIR DAMPERS IN MINIMUM POSITION, EXCEPT AS NOTED OTHERWISE. CONTRACTOR SHALL ALSO INSTALL A NEW SET OF FILTERS AFTER PROJECT IS COMPLETE.
J. BALANCE AIR TO WITHIN PLUS/MINUS 10% OF THAT INDICATED ON THE DRAWINGS. ANY REQUIRED CHANGES IN SHEAVES, BELTS, PULLE

231123 FACILITY NATURAL-GAS PIPING

A. SUBMITTALS
1. PRODUCT DATA: FOR EACH TYPE OF THE FOLLOWING:
   a. PIPING SPECIALTIES.
   b. VALVES. INCLUDE PRESSURE RATING, CAPACITY, SETTINGS, AND ELECTRICAL CONNECTION DATA OF SELECTED MODELS.
   c. PRESSURE REGULATORS. INDICATE PRESSURE RATINGS AND CAPACITIES.
2. SITE SURVEY: PLANS, DRAWN TO SCALE, ON WHICH NATURAL-GAS PIPING IS SHOWN AND COORDINATED WITH OTHER SERVICES AND UTILITIES.

B. PROJECT CONDITIONS
1. PERFORM SITE SURVEY, RESEARCH PUBLIC UTILITY RECORDS, AND VERIFY EXISTING UTILITY LOCATIONS. CONTACT UTILITY-LOCATING SERVICE FOR AREA WHERE PROJECT IS LOCATED.
2. INTERRUPTION OF EXISTING NATURAL-GAS SERVICE: DO NOT INTERRUPT NATURAL-GAS SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE PURGING AND STARTUP OF NATURAL-GAS SUPPLY ACCORDING TO REQUIREMENTS INDICATED:
   a. NOTIFY ARCHITECT OR OWNER NO FEWER THAN TWO DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF NATURAL-GAS SERVICE.
   b. DO NOT PROCEED WITH INTERRUPTION OF NATURAL-GAS SERVICE WITHOUT ARCHITECT'S OR OWNER'S WRITTEN PERMISSION.

C. PIPES, TUBES, AND FITTINGS
1. STEEL PIPE: ASTM A 53/A 53M, SCHEDULE 40, TYPE E OR S, GRADE B.
   a. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN.
   b. WROUGHT-STEEL WELDING FITTINGS: ASTM A 234/A 234M FOR BUTT WELDING AND SOCKET WELDING.
   c. UNIONS: ASME B16.39, CLASS 150, MALLEABLE IRON WITH BRASS-TO-IRON SEAT, GROUND JOINT, AND THREADED ENDS.
   d. PROTECTIVE COATING FOR EXPOSED PIPING, FACTORY – APPLIED, THREE – LAYER COATING OF EPOXY, ADHESIVE, AND PE.
      1) JOINT COVER KITS: EPOXY PAINT, ADHESIVE, AND HEAT – SHRINK PE SLEEVES

D. JOINING MATERIALS
1. JOINT COMPOUND AND TAPE: SUITABLE FOR NATURAL GAS.
2. WELDING FILLER METALS: COMPLY WITH AWS D10.12/D10.12M FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND CHEMICAL ANALYSIS OF STEEL PIPE BEING WELDED.

E. MANUAL GAS SHUTOFF VALVES
1. GENERAL REQUIREMENTS FOR METALLIC VALVES, NPS 2-1/2 (DN 65) AND SMALLER: COMPLY WITH ASME B16.33.
   a. CWP RATING: 125 PSIG (862 KPA).
   b. THREADED ENDS: COMPLY WITH ASME B1.20.1.

F. PRESSURE REGULATORS
1. GENERAL REQUIREMENTS:
   a. SINGLE STAGE AND SUITABLE FOR NATURAL GAS.
   b. STEEL JACKET AND CORROSION-RESISTANT COMPONENTS.
   c. ELEVATION COMPENSATOR.
   d. END CONNECTIONS: THREADED FOR REGULATORS NPS 2 (DN 50) AND SMALLER; FLANGED FOR REGULATORS NPS 2-1/2 (DN 65) AND LARGER.
2. SERVICE PRESSURE REGULATORS: COMPLY WITH ANSI Z21.80.
   a. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
      1) ACTARIS.
      2) AMERICAN METER COMPANY.
      3) FISHER CONTROL VALVES AND REGULATORS; DIVISION OF EMERSON PROCESS MANAGEMENT.
      4) INVENSYS.
      5) RICHARDS INDUSTRIES; JORDAN VALVE DIV.
   b. BODY AND DIAPHRAGM CASE: CAST IRON OR DIE-CAST ALUMINUM.
   c. SPRINGS: ZINC-PLATED STEEL; INTERCHANGEABLE.
   d. DIAPHRAGM PLATE: ZINC-PLATED STEEL.
   e. SEAT DISC: NITRILE RUBBER RESISTANT TO GAS IMPURITIES, ABRASION, AND DEFORMATION AT THE VALVE PORT.
   f. ORIFICE: ALUMINUM; INTERCHANGEABLE.
   g. SEAL PLUG: ULTRAVIOLET-STABILIZED, MINERAL-FILLED NYLON.
   h. SINGLE-PORT, SELF-CONTAINED REGULATOR WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET, AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR.
   i. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM, AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF.
   j. OVERPRESSURE PROTECTION DEVICE: FACTORY MOUNTED ON PRESSURE REGULATOR.
   k. ATMOSPHERIC VENT: FACTORY- OR FIELD-INSTALLED, STAINLESS-STEEL SCREEN IN OPENING IF NOT CONNECTED TO VENT PIPING.
3. LINE PRESSURE REGULATORS: COMPLY WITH ANSI Z21.80.
   a. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
      1) ACTARIS.
      2) AMERICAN METER COMPANY.
      3) ECLIPSE COMBUSTION, INC.
      4) FISHER CONTROL VALVES AND REGULATORS; DIVISION OF EMERSON PROCESS MANAGEMENT.
      5) INVENSYS.
      6) MAXITROL COMPANY.
      7) RICHARDS INDUSTRIES; JORDAN VALVE DIV.
   b. BODY AND DIAPHRAGM CASE: CAST IRON OR DIE-CAST ALUMINUM.
   c. SPRINGS: ZINC-PLATED STEEL; INTERCHANGEABLE.
   d. DIAPHRAGM PLATE: ZINC-PLATED STEEL.
   e. SEAT DISC: NITRILE RUBBER RESISTANT TO GAS IMPURITIES, ABRASION, AND DEFORMATION AT THE VALVE PORT.
   f. ORIFICE: ALUMINUM; INTERCHANGEABLE.
   g. SEAL PLUG: ULTRAVIOLET-STABILIZED, MINERAL-FILLED NYLON.
   h. SINGLE-PORT, SELF-CONTAINED REGULATOR WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET, AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR.
   i. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM, AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF.
   j. OVERPRESSURE PROTECTION DEVICE: FACTORY MOUNTED ON PRESSURE REGULATOR.
   k. ATMOSPHERIC VENT: FACTORY- OR FIELD-INSTALLED, STAINLESS-STEEL SCREEN IN OPENING IF NOT CONNECTED TO VENT PIPING.
4. APPLIANCE PRESSURE REGULATORS: COMPLY WITH ANSI Z21.18.
   a. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
      1) CANADIAN METER COMPANY INC.
      2) EATON CORPORATION; CONTROLS DIV.
      3) HARPER WYMAN CO.
      4) MAXITROL COMPANY.
      5) SCP, INC.
   b. BODY AND DIAPHRAGM CASE: DIE-CAST ALUMINUM.
   c. SPRINGS: ZINC-PLATED STEEL; INTERCHANGEABLE.
   d. DIAPHRAGM PLATE: ZINC-PLATED STEEL.
   e. SEAT DISC: NITRILE RUBBER.
   f. SEAL PLUG: ULTRAVIOLET-STABILIZED, MINERAL-FILLED NYLON.
   g. FACTORY-APPLIED FINISH: MINIMUM THREE-LAYER POLYESTER AND POLYURETHANE PAINT FINISH.
   h. REGULATOR MAY INCLUDE VENT LIMITING DEVICE, INSTEAD OF VENT CONNECTION, IF APPROVED BY AUTHORITIES HAVING JURISDICTION.

G. PIPE SUPPORTS
1. PRODUCT NAME: PILLOW BLOCK PIPESTAND MODEL 3-RAH-7 AND 3-RAH-12. NOTE: PILLOWBLOCK PIPESTAND MODEL NUMBERS CORRESPOND TO NOMINAL OR TYPICAL "TRADE" PIPE SIZES. PIPE THAT IS CALLED "THREE INCH" OR 3" PIPE HAS A 3" INSIDE DIAMETER AND A LARGER OUTSIDE DIAMETER. MODEL 3-RAH-7 AND 3-RAH-12 WILL HOLD UP TO ALL NOMINAL AND CUSTOMARY 3" AND SMALLER PIPE SIZES. THE MAXIMUM OUTSIDE DIAMETER OF THE PIPE OR CONDUIT THE MODEL 3-RAH-7 AND 3-RAH-12 WILL HOLD IS 3-3/4".
2. MANUFACTURER: MIRO INDUSTRIES, INC.
3. PRODUCT DESCRIPTION:
   a. "ROLLER-BEARING" PIPE SUPPORT USED TO SUPPORT ROOF MOUNTED GAS PIPES, ELECTRICAL CONDUIT, SOLAR PIPING AND OTHER MECHANICAL PIPING. UNIQUE DESIGN ABSORBS THERMAL EXPANSION AND CONTRACTION OF PIPES THUS PREVENTING DAMAGE TO THE ROOF MEMBRANE. PIPES REST ON A SELF-LUBRICATING ROLLER POLYCARBONATE RESIN ROD AND ROLLER. THE PIPE SUPPORT BASE IS MADE OF STURDY MIRON TPCTM OR POLYCARBONATE RESIN, AND ALL METAL PARTS ARE MADE OF STAINLESS STEEL. PIPESTAND WILL ACCOMMODATE UP TO 3" INSIDE DIAMETER PIPE OR UP TO 3-3/4" OUTSIDE DIAMETER PIPES.
4. PRODUCT PERFORMANCE: THE "U" SHAPED ROLLER SERVES TO KEEP THE PIPESTAND ROLLER SYSTEM DIRECTLY BENEATH THE PIPE WITHOUT BINDING AND ALLOWS FOR SOME LATERAL EXPANSION OF THE PIPING SYSTEM. THE BASE IS GENTLY ROUNDED TO PREVENT GOUGING THE ROOF MEMBRANE.
5. COMPATIBILITY: PILLOW BLOCK PIPESTANDS ARE RECOMMENDED FOR USE ON AND ARE COMPATIBLE WITH ALL CURRENT TYPES OF DECKING WITH ALL COMMONLY USED BUILT-UP AND SINGLE-PLY ROOFING MEMBRANES WHERE ROOF-MOUNTED PIPES OCCUR.
6. LOAD WEIGHT: MAXIMUM LOAD WEIGHT MAY NOT EXCEED 115 LBS. PER 3-RAH-7 AND 186 LBS. PER 3-RAH-12.
7. COMPOSITION AND MATERIALS: THE PIPESTAND CONSISTS OF TWO MAJOR COMPONENTS: (1) A ONE-PIECE ROOF DECK BASE, (2) A ROLLER AND ROLLER ROD MADE OUT OF POLYCARBONATE RESIN CONNECTED WITH 3/8" DIAMETER STAINLESS STEEL ALL THREAD DESIGNED FOR ADJUSTABLE HEIGHT. CARBON BLACK IS ADDED TO THE MIRON TPCTM OR POLYCARBONATE RESIN FOR UV RESISTANCE AND PROTECTION.
8. SIZE: PILLOW BLOCK PIPESTAND MODEL 3-RAH-7 HAS A DECK BASE THAT IS 7-1/2" BY 10". MODEL 3-RAH-12 HAS A DECK BASE OF 9" X 15-1/4", AND HAS A MAXIMUM CRADLE WIDTH OF 4". THE 3-RAH-7 CAN ADJUST IN HEIGHT FROM A LOW OF 3-1/2" TO A HIGH OF 7" FROM BOTTOM OF PIPE SUPPORT. THE 3-RAH-12 CAN ADJUST IN HEIGHT FROM A LOW OF 5-1/2" TO A HIGH OF 12".
9. INSTALLATION:
   a. CENTER THE PIPESTAND BENEATH THE PIPE SO THAT THE CRADLE ALLOWS THE PIPE TO BE SQUARELY OVER AND THROUGH THE ROLLER OF THE PIPESTAND.
   b. ADJUST THE PIPESTAND TO THE DESIRED HEIGHT AND TO EVEN LOAD WITH OTHER PIPESTANDS. MAKE CERTAIN THE STRUT OR ROLLER IS LEVEL.
   c. SET THE PIPE IN THE PIPESTAND WITHOUT DROPPING OR CAUSING UNDUE IMPACT. AN ADDITIONAL SHEET OF ROOFING MATERIAL, A MIRO SUPPORT PAD, OR A MIRO DECK PLATE SHOULD BE INSTALLED BENEATH THE PIPESTAND. FOR BUILTUP ROOFS, ALL LOOSE AGGREGATE FROM AN AREA 15" SQUARE SHOULD BE REMOVED FROM THE AREA DIRECTLY BENEATH THE PIPESTAND AND THEN FOLLOW THE INSTALLATION DIRECTIONS SET FORTH ABOVE. CARE SHOULD BE TAKEN TO INSTALL EACH PIPESTAND SO IT SUPPORTS A PROPORTIONAL AND EQUAL AMOUNT OF WEIGHT AT EACH PIPESTAND.
10. SPACING: MANUFACTURER'S RECOMMENDED SPACING IS NOT TO EXCEED 10 FOOT CENTERS DEPENDING UPON THE LOAD. DO NOT EXCEED SPECIFED LOAD WEIGHT AND MAKE CERTAIN EACH PIPESTAND IS ADJUSTED IN HEIGHT TO EVEN LOAD. SUPPORT SPACING IS NOT TO EXCEED THE MAXIMUM SPACING REQUIRED IN THE PIPE SPECIFICATIONS WHERE APPLICABLE.
11. AVAILABILITY: PILLOW BLOCK PIPESTANDS ARE MARKETED THROUGHOUT THE UNITED STATES THROUGH REPRESENTATIVES AND DISTRIBUTORS.
12. MAINTENANCE: NORMALLY MAINTENANCE IS NOT REQUIRED. SEMI-ANNUAL INSPECTION IS REQUIRED TO CHECK PIPESTAND POSITION AND SET PIPE ALIGNMENT, WEIGHT DISTRIBUTION AND IMPROPER INSTALLATION WHICH MAY CAUSE PIPESTAND DAMAGE OR FAILURE.

H. EXAMINATION
1. EXAMINE ROUGHING-IN FOR NATURAL-GAS PIPING SYSTEM TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS BEFORE EQUIPMENT INSTALLATION.
2. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

I. PREPARATION
1. CLOSE EQUIPMENT SHUTOFF VALVES BEFORE TURNING OFF NATURAL GAS TO PREMISES OR PIPING SECTION.
2. INSPECT NATURAL-GAS PIPING ACCORDING TO NFPA 54 AND THE INTERNATIONAL FUEL GAS CODE TO DETERMINE THAT NATURAL-GAS UTILIZATION DEVICES ARE TURNED OFF IN PIPING SECTION AFFECTED.

J. OUTDOOR PIPING INSTALLATION
1. COMPLY WITH NFPA 54 AND THE INTERNATIONAL FUEL GAS CODE FOR INSTALLATION AND PURGING OF NATURAL-GAS PIPING.
2. STEEL PIPING WITH PROTECTIVE COATING:
   a. APPLY JOINT COVER KITS TO PIPE AFTER JOINING TO COVER, SEAL, AND PROTECT JOINTS.
   b. REPAIR DAMAGE TO PE COATING ON PIPE AS RECOMMENDED IN WRITING BY PROTECTIVE COATING MANUFACTURER.
   c. REPLACE PIPE HAVING DAMAGED PE COATING WITH NEW PIPE.
3. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
4. SUPPORT PIPE WITH EQUIPMENT SUPPORTS FOR ROOF MATERIAL AND LANDLORD'S STANDARDS.

K. VALVE INSTALLATION
1. INSTALL MANUAL GAS SHUTOFF VALVE FOR EACH GAS APPLIANCE.
2. INSTALL REGULATORS AND OVERPRESSURE PROTECTION DEVICES WITH MAINTENANCE ACCESS SPACE ADEQUATE FOR SERVICING AND TESTING.

L. PIPING JOINT CONSTRUCTION
1. REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS.
2. REMOVE SCALE, SLAG, DIRT, AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPE AND FITTINGS BEFORE ASSEMBLY.
3. THREADED JOINTS:
   a. THREAD PIPE WITH TAPERED PIPE THREADS COMPLYING WITH ASME B1.20.1.
   b. CUT THREADS FULL AND CLEAN USING SHARP DIES.
   c. REAM THREADED PIPE ENDS TO REMOVE BURRS AND RESTORE FULL INSIDE DIAMETER OF PIPE.
   d. APPLY APPROPRIATE TAPE OR THREAD COMPOUND TO EXTERNAL PIPE THREADS UNLESS DRYSEAL THREADING IS SPECIFIED.
   e. DAMAGED THREADS: DO NOT USE PIPE OR PIPE FITTINGS WITH THREADS THAT ARE CORRODED OR DAMAGED. DO NOT USE PIPE SECTIONS THAT HAVE CRACKED OR OPEN WELDS.
4. WELDED JOINTS:
   a. CONSTRUCT JOINTS ACCORDING TO AWS D10.12/D10.12M, USING QUALIFIED PROCESSES AND WELDING OPERATORS.
   b. BEVEL PLAIN ENDS OF STEEL PIPE.
   c. PATCH FACTORY-APPLIED PROTECTIVE COATING AS RECOMMENDED BY MANUFACTURER AT FIELD WELDS AND WHERE DAMAGE TO COATING OCCURS DURING CONSTRUCTION.

M. CONNECTIONS
1. CONNECT TO UTILITY'S GAS MAIN ACCORDING TO UTILITY'S PROCEDURES AND REQUIREMENTS.
2. INSTALL NATURAL-GAS PIPING ELECTRICALLY CONTINUOUS, AND BONDED TO GAS APPLIANCE EQUIPMENT GROUNDING CONDUCTOR OF THE CIRCUIT POWERING THE APPLIANCE ACCORDING TO NFPA 70.
3. INSTALL PIPING ADJACENT TO APPLIANCES TO ALLOW SERVICE AND MAINTENANCE OF APPLIANCES.
4. CONNECT PIPING TO APPLIANCES USING MANUAL GAS SHUTOFF VALVES AND UNIONS. INSTALL VALVE WITHIN 72 INCHES (1800 MM) OF EACH GAS-FIRED APPLIANCE AND EQUIPMENT. INSTALL UNION BETWEEN VALVE AND APPLIANCES OR EQUIPMENT.
5. SEDIMENT TRAPS: INSTALL TEE FITTING WITH CAPPED NIPPLE IN BOTTOM TO FORM DRIP, AS CLOSE AS PRACTICAL TO INLET OF EACH APPLIANCE.

N. FIELD QUALITY CONTROL
1. PERFORM TESTS AND INSPECTIONS.
2. TESTS AND INSPECTIONS:
   a. TEST, INSPECT, AND PURGE NATURAL GAS ACCORDING TO NFPA 54 AND THE INTERNATIONAL FUEL GAS CODE AND AUTHORITIES HAVING JURISDICTION.
3. NATURAL-GAS PIPING WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.
4. PREPARE TEST AND INSPECTION REPORTS.

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revisions

project number 25017

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NATURAL GAS SPECIFICATIONS

M1.4

AS NOTED
scale

05/12/25
date

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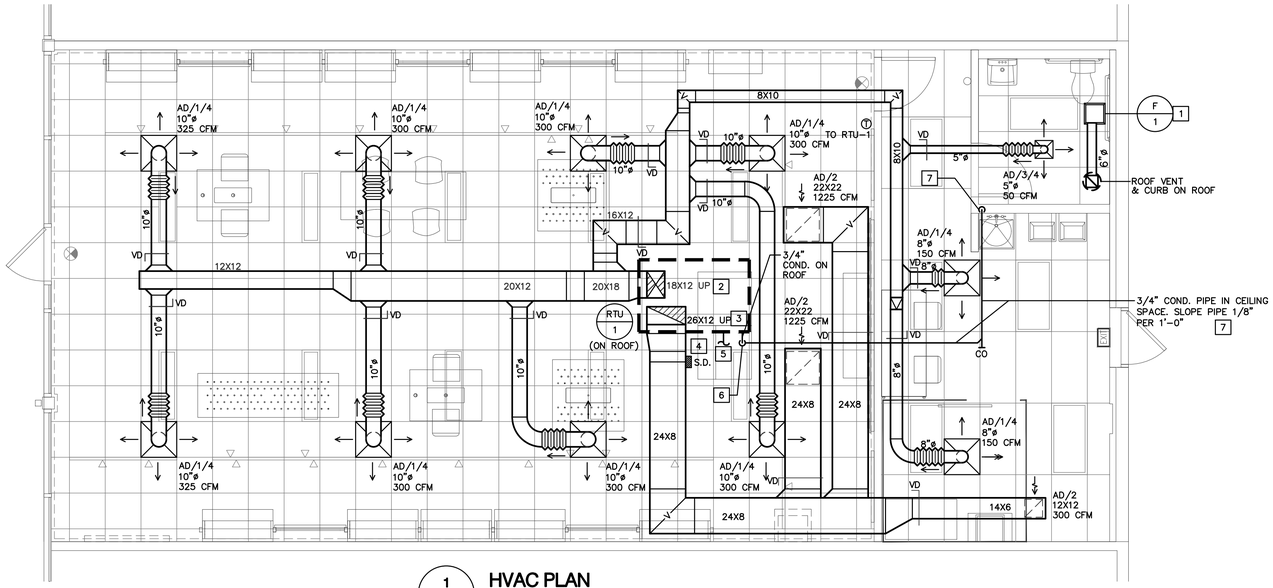
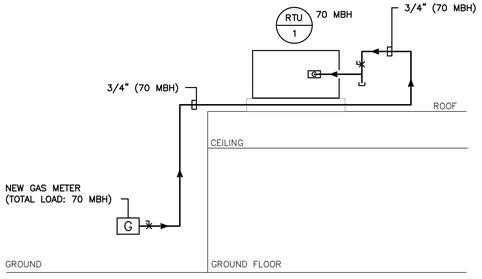


1 H1.1 **HVAC PLAN**

0 2 4 8



NOTES:
1. INSTALL UNIONS AT FINAL CONNECTIONS TO EACH PIECE OF EQUIPMENT. REFER TO GAS DRIP LEG DETAILS ON DWGS. 7/H2.1 FOR TYPICAL PIPING LAYOUT.

2 H1.1 **GAS RISER DIAGRAM**

KEY NOTES

1. DUCT UP TO ROOF CAP WITH CURB ON ROOF REFER TO DETAIL 6/H2.1 FOR ADDITIONAL INFORMATION. CONTRACTOR TO USE LANDLORD APPROVED ROOFING CONTRACTOR FOR ALL ROOF WORK.
2. SUPPLY AIR DUCT UP TO RTU-1. TRANSITION TO FULL SIZE OF UNIT OPENING IN RISE. CONNECT SUPPLY AIR DUCT TO ROOFTOP UNIT USING FLEXIBLE CONNECTION.
3. RETURN AIR DUCT UP TO RTU-1. TRANSITION TO FULL SIZE OF UNIT OPENING IN RISE. CONNECT RETURN AIR DUCT TO ROOFTOP UNIT USING FLEXIBLE CONNECTION.
4. DUCT MOUNTED SMOKE DETECTOR FURNISHED BY ELECTRICAL CONTRACTOR INSTALLED BY MECHANICAL CONTRACTOR WIRED TO BUILDING ALARM SYSTEM BY ELECTRICAL CONTRACTOR.
5. EXTEND 3/4" GAS PIPING ON ROOF AND DOWN TO MEDIUM PRESSURE STUB UP APPROXIMATELY 80'-0". COORDINATE LOCATION WITH UTILITY PROVIDER. COORDINATE WITH UTILITY PROVIDER TO SET APPROPRIATE REGULATOR AND METER.
6. 3/4" CONDENSATE PIPE UP TO RTU-1. REFER TO 8/H2.1 FOR ADDITIONAL INFORMATION. COORDINATE PIPE PENETRATION WITH LANDLORD'S ROOFING CONTRACTOR.
7. CONDENSATE PIPE. PROVIDE CLEAN OUT AT EACH CHANGE IN DIRECTION.
8. 3/4" CONDENSATE PIPE DOWN TO HUB DRAIN. COORDINATE LOCATION OF HUB DRAIN WITH THE PLUMBING CONTRACTOR. PLUMBING CONTRACTOR TO PROVIDE AND INSTALL HUB DRAIN.

DEMOLITION NOTES

A. DISCONNECT, DEMOLISH, AND REMOVE HVAC SYSTEMS, EQUIPMENT, DUCTWORK, PIPING MADE OBSOLETE BY THIS PROJECT AND COMPONENTS INDICATED TO BE REMOVED.

1. IF PIPE, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVCEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.

GENERAL NOTES

1. ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS.
2. PRIOR TO INSTALLATION, CONTRACTOR SHALL TEST AND VERIFY PROPER OPERATION OF ALL EXISTING MECHANICAL EQUIPMENT TO BE REUSED.
3. PROVIDE ALL LABOR AND MATERIALS NECESSARY TO ENSURE PROPER OPERATION OF EXISTING MECHANICAL EQUIPMENT TO BE REUSED.

SEQUENCE OF OPERATIONS

1. ROOFTOP GAS HEAT/ELECTRIC COOLING UNIT
   - A. PACKAGE ROOFTOP UNIT SHALL BE INDEXED TO THE OCCUPIED/UNOCCUPIED MODE THROUGH THE PROGRAMMABLE THERMOSTAT. SCHEDULE PER OWNERS' DIRECTIONS.
   - B. OCCUPIED MODE: OUTSIDE AIR DAMPER SHALL OPEN TO PRESET POSITION AND SUPPLY AIR FAN SHALL BE ENERGIZED AND RUN CONTINUOUSLY.
   - C. UNOCCUPIED MODE: OUTSIDE AIR DAMPER SHALL BE CLOSED, SUPPLY FAN SHALL CYCLE ON CALL FOR HEATING OR COOLING.
   - D. PROGRAMMABLE THERMOSTAT SHALL MODULATE THE GAS FURNACES, REFRIGERATION AND ECONOMIZER SYSTEM THROUGH THE UNIT CONTROLS TO MAINTAIN THE FOLLOWING:

	OCCUPIED	UNOCCUPIED
HEATING	70 DEG.F	55 DEG.F
COOLING	75 DEG.F	85 DEG.F

   - E. SMOKE DETECTOR : DE-ENERGIZE UNIT ON SMOKE DETECTOR ACTIVATION.
2. TOILET EXHAUST FAN
   - A. TOILET EXHAUST SHALL BE INTERCONNECTED TO THE TOILET LIGHT SWITCH.

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HVAC PLAN

AS NOTED (scale) | 05/12/25 (date) | H1.1

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GAS FIRED ROOFTOP UNIT SCHEDULE

RTU

No.	Evaporator Fan Data			Cooling Data (Outdoor: 95°db)						Fan Data			Gas Heating Data					Electrical Characteristics								Manufacturer & Model No.	Remarks
	Total CFM	MIN OA CFM	MAX EXT SP "WG	EAT		Total MBH	Sensible MBH	KW	EER	Total CFM	MAX EXT SP" WG	HP	Input MBH	Output MBH	AFUE	Gas Pressure		Compressor		Condenser Fan(s)		Evaporator Fan(s)		Volts	Phase		
				Db	Wb											Min.	Max.	QTY	RLA	QTY	HP	QTY	HP				
1	2,800	385	1.0	80.0	67.0	70,368	59,806	–	12.5	2,800	1.29	2.3	70.0/56.7	52.5/42.5	81%	5.0	10.0	1	7.0	1	3/4	1	2.3	460	3	DAIKIN DHG0724W070CSBDXNXAXXX	–

MECHANICAL INSULATION SCHEDULE

System	Application	Temperature Range	Location	Insulation Type	Thickness/R-Value	Lined or Wrapped	Jacket Type	Vapor Barrier	Finish
AIR DISTRIBUTION	SUPPLY AIR	50°F – 120°F	INDOOR	FIBERGLASS	R=8	WRAPPED	NONE	YES	FOIL
AIR DISTRIBUTION	RETURN	60°F – 90°F	INDOOR	FIBERGLASS	R=8	WRAPPED	NONE	YES	FOIL

NOTES: 1. EXCLUDES FACTORY INSULATED EQUIPMENT.

FAN SCHEDULE

F

No.	CFM	Available SP " WG	Electrical Data			Accessories						Manufacturer & Model No.	Remarks
			HP	Volts	Phase	Damper	Dis Sw	Screen	Curb	Function	Control		
1	75	.5	86 WATTS	120	1	BDD	YES	–	–	EXHAUST	INTERLOCK W/ LIGHT SWITCH	COOK GC–148	WITH ROOIF CURB AND CAP

VENTILATION SCHEDULE

Room	Description	Area (SQFT) (Az)	Area Outdoor Air Rate per IMC Table 403.3 (Ra)	Area Outdoor Air (RaAz)	Occupant Load Rate per IMC Table 403.3 (People/1000 SQFT)	Occupancy C x F/1000 (Pz)	Occupant Outdoor Air Rate per IMC Table 403.3 (Rp)	Occupant Outdoor Air (RpPz)	Breathing Zone Outdoor Air (Vbz = RpPz + RaAz)	Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Air (Voz = Vbz / Ez)	Supply Air Design (Vpz)	Outdoor Air Fraction (Zp = Voz / Vpz)
SALES AREA	SALES	1,263	0.12	151	15	18	7.5	135	286	0.8	357	300	0.07
WORK/BREAK AREA	BREAK AREA	283	0.06	16	5	1	5	5	21	0.8	26	2450	0.09
TOILET ROOM	TOILET ROOM	59	–	–	–	–	–	–	–	0.8	–	50	–

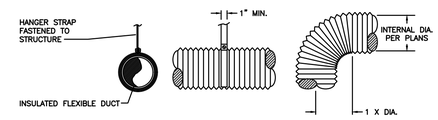
1. TOTAL OUTSIDE AIR BASED ON SUM OF SALES AREA OUTSIDE AIR AND TOILET EXHAUST MAKE–UP AIR.

AIR DEVICE SCHEDULE

AD/Type/Pattern

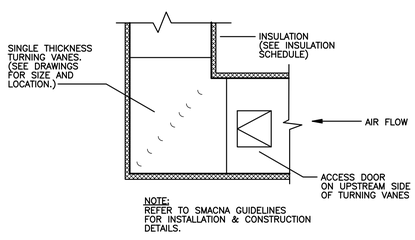
No.	Function	Damper	Description	Finish	Manufacturer & Model No.	Remarks
1	SUPPLY	–	SQUARE PLAQUE DIFFUSER	WHITE	TITUS TMS	–
2	RETURN	–	PERFORATED CEILING DIFFUSER	WHITE	TITUS PAR	–
3	TOILET ROOM SUPPLY	–	SQUARE PLAQUE DIFFUSER	WHITE	TITUS TMS–AA	–

NOTES:
1. STYLE AND TYPE TO BE COORDINATED WITH ARCHITECT.
2. SEE ARCHITECTURAL DRAWINGS FOR PAINT SPEC. IN SALES AREA.
3. PROVIDE DIRECTIONAL BLOW CLIP FOR SUPPLY DIFFUSERS.

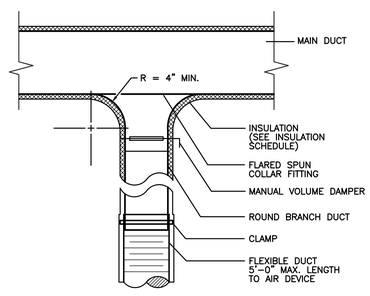


NOTES:
1. STRAP HANGERS SHALL BE SPACED NO MORE THAN 3'–0" APART.
2. MAXIMUM PERMISSIBLE SAG OF FLEXIBLE DUCT SHALL BE 1/2" PER FOOT OF SPACING BETWEEN HANGERS.
3. INSTALLATION OF ALL FLEXIBLE DUCT SHALL BE IN ACCORDANCE WITH SMACNA & ASHRAE STANDARDS.

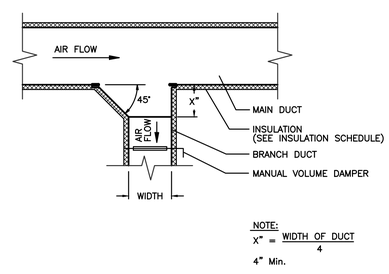
1 / H2.1 FLEXIBLE DUCT DETAILS
SCALE: NONE



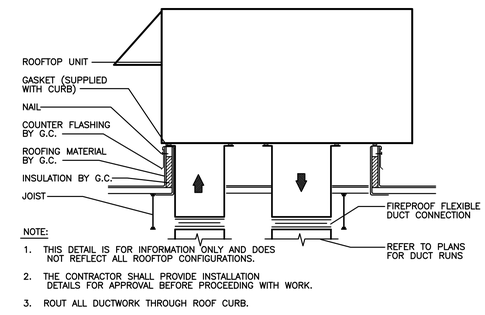
2 / H2.1 VANED ELBOW DETAIL
SCALE: NONE



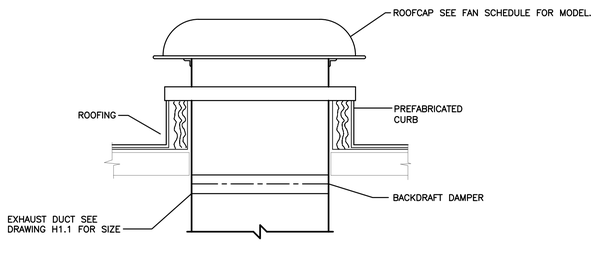
3 / H2.1 ROUND BRANCH TAKE-OFF DETAIL
SCALE: NONE



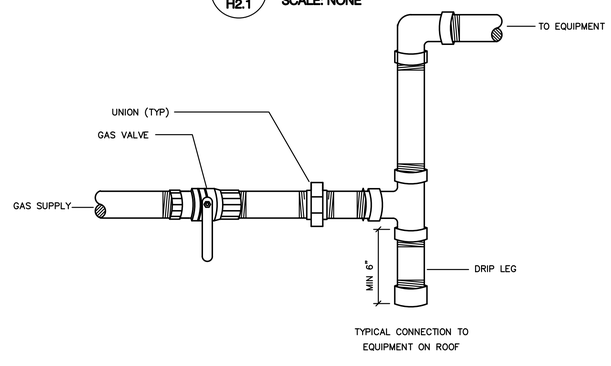
4 / H2.1 RECTANGULAR BRANCH DUCT TAKE-OFF DETAIL
SCALE: NONE



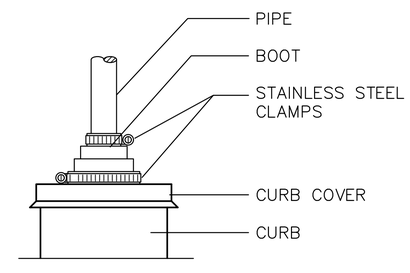
5 / H2.1 NEW ROOFTOP UNIT CURB DETAIL
SCALE: NONE



6 / H2.1 TOILET EXHAUST ROOFCAP DETAIL
SCALE: NONE



7 / H2.1 GAS DRIP LEG DETAIL (TO EQUIPMENT ON ROOF)
SCALE: NONE



8 / H2.1 PIPE CURB AND PENATRATION DETAIL
SCALE: NONE

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HVAC DETAILS & SCHEDULES

H2.1

AS NOTED scale | 05/12/25 date

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COM*check* Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: AT&T Melissa TX.
Location: Melissa, Texas
Climate Zone: 3a
Project Type: Alteration

Construction Site:
SEQ US 75 & Bucees Blvd.
Melissa, Texas 75454

Owner/Agent:

Designer/Contractor:
Urban Engineers
SEQ US 75 & Bucees Blvd.
Melissa, Texas 75454
(214)499-9270
Urbanengineers.com

Mechanical Systems List

Quantity System Type & Description

1 HVAC System (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 70 kBtu/h
Proposed Efficiency = 80.00% Et, Required Efficiency: 80.00 % Et or 78% AFUE
Cooling: 1 each - Single Package DX Unit, Capacity = 70 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 12.50 EER, Required Efficiency = 11.00 EER
Proposed Part Load Efficiency = 0.00 IEER, Required Part Load Efficiency = 12.60 IEER
Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
FAN 1 Supply, Constant Volume, 2800 CFM, 2.3 motor nameplate hp, 80.0 fan efficiency grade, 80.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title _____ Signature _____ Date _____

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 100.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.2.4.5, C403.2.4.6 [FO9][3]	Snow/ice melting system sensors for future connection to controls. Freeze protection systems have automatic controls installed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8][3]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.13 [ME71][2]	Unenclosed spaces that are heated use only radiant heat.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.4.7 [ME113][2]	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.6.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.6.2 [ME115][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.7 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.2.7(1) and C403.2.7(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.8 [ME116][3]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.9 [ME60][2]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.9 [ME10][2]	Ducts and plenums sealed based on static pressure and location.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.9.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3 [ME62][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.2 [ME16][1]	Economizer operation will not increase heating energy use during normal operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.4.6 [ME110][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME123][3]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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05/12/25 date
H3.1

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Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8][3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.2 [FI27][3]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.2 [FI38][3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.3 [FI20][3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2 [FI39][3]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.1, C403.2.4.2.2 [FI40][3]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.1 [FI31][1]	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.2 [FI10][1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.3 [FI32][1]	Economizers have been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.1 [FI7][3]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.3 [FI43][1]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.4 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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PLUMBING SYMBOLS

- DOMESTIC COLD WATER (CW)
- DOMESTIC HOT WATER (HW)
- DOMESTIC HOT WATER RECIRC. (HWR)
- SD — STORM DRAIN
- SANITARY SEWER
- SANITARY VENT
- DIRECTION OF FLOW
- SLOPE – FALL PER FOOT
- GATE VALVE
- BALL VALVE
- CHECK VALVE
- CIRCUIT SETTER
- PRESSURE REDUCING VALVE
- TEMPERATURE & PRESSURE RELIEF VALVE
- PIPE UP
- PIPE DOWN
- CONCENTRIC REDUCER
- UNION SCREWED/FLANGED
- FD FD — FLOOR DRAIN (SQUARE/ROUND)
- CO FCO — CLEANOUT
- DEMOLITION BREAK POINT
- NEW TO EXISTING CONNECTION

- DEMOLITION NOTE
- KEY NOTE
- (E) EXISTING TO REMAIN
- (N) NEW
- (T) TOTAL
- (R) ABANDON & REMOVE
- (S) SALVAGE
- (ER) EXISTING TO BE RELOCATED
- (RE) REMOVE EXISTING

PLUMBING ABBREVIATIONS

ABV.	ABOVE
AC	ABOVE CEILING
A.F.F.	ABOVE FINISHED FLOOR
AWT	AVERAGE WATER TEMPERATURE
B	BOILER
BF	BELOW FLOOR
BLDG	BUILDING
B.O.S.	BOTTOM OF STEEL
C.I.	CAST IRON
CLG.	CEILING
CONT.	CONTINUED/CONTINUATION
CONT'R	CONTRACTOR
CW	DOMESTIC COLD WATER
dB	DECIBELS
DOM	DOMESTIC
DEPT	DEPARTMENT
DIS. SW.	DISCONNECT SWITCH
DIV	DIVISION
DN	DOWN
DWG	DRAWING
EA	EACH
EL	ELEVATION
ENT	ENTERING
ETC	ET CETERA
EXT	EXTERNAL
EWT	ENTERING WATER TEMPERATURE
FD	FLOOR DRAIN
FLA	FULL LOAD AMPS
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FT	FEET
G.	GAS
GA	GAUGE
G.C.	GENERAL CONTRACTOR
GAL	GALLON
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
H.C.	HVAC CONTRACTOR
HP	HORSEPOWER
HR	HOUR
HWR	DOMESTIC HOT WATER RECIRCULATED
HW	DOMESTIC HOT WATER
IN.	INCHES
INT	INTERNAL
INV.	INVERT
KW	KILOWATTS
LBS	POUNDS
LBS/H	POUNDS PER HOUR
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
M.C.	MECHANICAL CONTRACTOR
MIN	MINIMUM
NC	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
No.	NUMBER
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O.C.	ON CENTER
OPER.	OPERATING
P.C.	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RECIR	RECIRCULATED
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RWC	RAIN WATER CONDUCTOR
S.	SANITARY
SPEC	SPECIFICATIONS
S.F.	SQUARE FEET
TEMP	TEMPERATURE
T.O.S.	TOP OF STEEL
TYP	TYPICAL
V.	VENT
V.I.F.	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
W.	WASTE
W/	WITH
WG	WATER GAUGE
W/O	WITHOUT
#	POUNDS OR NUMBER
#/HR	POUNDS PER HOUR
°F	DEGREES FAHRENHEIT
ø	ELECTRICAL PHASE OR DIAMETER

DRAWING LIST

P1.1	PLUMBING COVER SHEET
P1.2	PLUMBING SPECIFICATIONS
P1.3	PLUMBING SPECIFICATIONS
P2.1	PLUMBING PLAN

APPLICABLE CODES:

BUILDING CODES: 2018 INTERNATIONAL BUILDING CODE

PLUMBING: 2018 INTERNATIONAL PLUMBING CODE

NOTE:

NOT ALL SYMBOLS AND ABBREVIATIONS INDICATED APPEAR ON THESE DOCUMENTS.

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220500 COMMON WORK RESULTS FOR PLUMBING

A. GENERAL REQUIREMENTS
1. INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, TRANSPORTATION AND SERVICES TO FURNISH AND INSTALL COMPLETE PLUMBING SYSTEMS AND ALTERATIONS AS SHOWN ON THE DRAWINGS AND HEREIN SPECIFIED.
2. ALL WORK SHALL BE IN ACCORDANCE WITH ALL LOCAL AND STATE CODES, ALL APPLICABLE BUILDING, MECHANICAL AND PLUMBING CODES, AND ALL AUTHORITIES HAVING JURISDICTION.
3. ALL WORK SHALL BE IN ACCORDANCE WITH ALL LANDLORD REQUIREMENTS.
4. ALL CONNECTION, INSPECTION AND PERMIT FEES SHALL BE AT THE CONTRACTOR'S EXPENSE.
5. CONTRACTOR SHALL CONTACT AUTHORITIES HAVING JURISDICTION FOR INSPECTION OF ALL SYSTEMS IN A TIMELY MANNER BEFORE OCCUPANCY OF THE BUILDING.

B. SUBMITTALS
1. CONTRACTOR SHALL SUBMIT FOR REVIEW SIX COPIES OF SHOP DRAWINGS, LITERATURE, AND EQUIPMENT LISTS PRIOR TO FABRICATION OR DELIVERY.
2. CATALOG SHEETS SHALL BE COMPLETE, AND THE ITEM OR MODEL TO BE USED SHALL BE CLEARLY MARKED.
3. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE PRODUCT INDICATED ON DRAWINGS OR A COMPARABLE PRODUCT. ARCHITECT AND/OR ENGINEER APPROVAL IS REQUIRED FOR ALL COMPARABLE PRODUCTS SUBMITTED.

C. PLUMBING DEMOLITION
1. DISCONNECT, DEMOLISH, AND REMOVE PLUMBING SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVED.
   a. PIPING TO BE REMOVED: REMOVE PORTION OF PIPING INDICATED TO BE REMOVED, AND CAP OR PLUG REMAINING PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
   b. PIPING TO BE ABANDONED IN PLACE: DRAIN PIPING, AND CAP OR PLUG PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
   c. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT.
   d. EQUIPMENT TO BE REMOVED AND REINSTALLED: DISCONNECT AND CAP SERVICES, AND REMOVE, CLEAN, AND STORE EQUIPMENT; WHEN APPROPRIATE, REINSTALL, RECONNECT, AND MAKE EQUIPMENT OPERATIONAL.
   e. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES, AND REMOVE EQUIPMENT AND DELIVER TO OWNER.
2. IF PIPE, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS, AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.

D. PIPING SYSTEMS – COMMON REQUIREMENTS
1. 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.
2. INSTALL PIPING IN CONCEALED LOCATIONS, UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.
3. INSTALL PIPING ABOVE ACCESSIBLE CEILINGS TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL.
4. INSTALL PIPING TO PERMIT VALVE SERVICING.
5. INSTALL PIPING AT INDICATED SLOPES.
6. INSTALL PIPING TO ALLOW APPLICATION OF INSULATION.
7. INSTALL ESCUTCHEONS FOR PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.
8. FIRE–BARRIER PENETRATIONS: MAINTAIN INDICATED FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT PIPE PENETRATIONS. SEAL PIPE PENETRATIONS WITH FIRESTOP MATERIALS
9. VERIFY FINAL EQUIPMENT LOCATIONS FOR ROUGHING–IN.

E. PIPING JOINT CONSTRUCTION
1. REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS. BEVEL PLAIN ENDS OF STEEL PIPE.
2. REMOVE SCALE, SLAG, DIRT, AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPE AND FITTINGS BEFORE ASSEMBLY.
3. SOLDERED JOINTS: APPLY ASTM B 813, WATER–FLUSHABLE FLUX, UNLESS OTHERWISE INDICATED, TO TUBE END. CONSTRUCT JOINTS ACCORDING TO ASTM B 828 OR CDA'S "COPPER TUBE HANDBOOK," USING LEAD–FREE SOLDER ALLOY COMPLYING WITH ASTM B 32.
4. THREADED JOINTS: THREAD PIPE WITH TAPERED PIPE THREADS ACCORDING TO ASME B1.20.1. CUT THREADS FULL AND CLEAN USING SHARP DIES. REAM THREADED PIPE ENDS TO REMOVE BURRS AND RESTORE FULL ID. JOIN PIPE FITTINGS AND VALVES AS FOLLOWS:
   a. APPLY APPROPRIATE TAPE OR THREAD COMPOUND TO EXTERNAL PIPE THREADS UNLESS DRY SEAL THREADING IS SPECIFIED.
   b. DAMAGED THREADS: DO NOT USE PIPE OR PIPE FITTINGS WITH THREADS THAT ARE CORRODED OR DAMAGED. DO NOT USE PIPE SECTIONS THAT HAVE CRACKED OR OPEN WELDS.

F. EQUIPMENT INSTALLATION – COMMON REQUIREMENTS
1. INSTALL EQUIPMENT TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS ARE NOT INDICATED.
2. INSTALL EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS IN EXPOSED INTERIOR SPACES, UNLESS OTHERWISE INDICATED.
3. INSTALL PLUMBING EQUIPMENT TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE TO OTHER INSTALLATIONS. EXTEND GREASE FITTINGS TO ACCESSIBLE LOCATIONS.

220513 COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT

A. SUMMARY
1. SECTION INCLUDES GENERAL REQUIREMENTS FOR SINGLE–PHASE AND POLYPHASE, GENERAL–PURPOSE, HORIZONTAL, SMALL AND MEDIUM, SQUIRREL–CAGE INDUCTION MOTORS FOR USE ON AC POWER SYSTEMS UP TO 600 V AND INSTALLED AT EQUIPMENT MANUFACTURER'S FACTORY OR SHIPPED SEPARATELY BY EQUIPMENT MANUFACTURER FOR FIELD INSTALLATION.

B. COORDINATION
1. COORDINATE FEATURES OF MOTORS, INSTALLED UNITS, AND ACCESSORY DEVICES TO BE COMPATIBLE WITH THE FOLLOWING:
   a. MOTOR CONTROLLERS.
   b. TORQUE, SPEED, AND HORSEPOWER REQUIREMENTS OF THE LOAD.
   c. RATINGS AND CHARACTERISTICS OF SUPPLY CIRCUIT AND REQUIRED CONTROL SEQUENCE.
   d. AMBIENT AND ENVIRONMENTAL CONDITIONS OF INSTALLATION LOCATION.

C. GENERAL MOTOR REQUIREMENTS
1. COMPLY WITH NEMA MG 1 UNLESS OTHERWISE INDICATED.

D. MOTOR CHARACTERISTICS
1. DUTY: CONTINUOUS DUTY AT AMBIENT TEMPERATURE OF 40 DEG C AND AT ALTITUDE OF 3300 FEET (1000 M) ABOVE SEA LEVEL.
2. CAPACITY AND TORQUE CHARACTERISTICS: SUFFICIENT TO START, ACCELERATE, AND OPERATE CONNECTED LOADS AT DESIGNATED SPEEDS, AT INSTALLED ALTITUDE AND ENVIRONMENT, WITH INDICATED OPERATING SEQUENCE, AND WITHOUT EXCEEDING NAMEPLATE RATINGS OR CONSIDERING SERVICE FACTOR.

220516 EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

A. PERFORMANCE REQUIREMENTS
1. COMPATIBILITY: PRODUCTS SHALL BE SUITABLE FOR PIPING SYSTEM FLUIDS, MATERIALS, WORKING PRESSURES, AND TEMPERATURES.
2. CAPABILITY: PRODUCTS SHALL ABSORB 200 PERCENT OF MAXIMUM AXIAL MOVEMENT BETWEEN ANCHORS.

B. EXPANSION JOINTS
1. METAL–BELLOWS EXPANSION JOINTS: ASTM F 1120, CIRCULAR–CORRUGATED–BELLOWS TYPE WITH EXTERNAL TIE RODS.
   a. METAL–BELLOWS EXPANSION JOINTS FOR COPPER PIPING: SINGLE– OR MULTIPLE–PLY PHOSPHOR–BRONZE BELLOWS, COPPER PIPE END CONNECTIONS, AND BRASS SHROUDS.
   b. METAL–BELLOWS EXPANSION JOINTS FOR STEEL PIPING: SINGLE– OR MULTIPLE–PLY STAINLESS–STEEL BELLOWS, STEEL PIPE END CONNECTIONS, AND CARBON–STEEL SHROUD.
   c. MINIMUM PRESSURE RATING: 175 PSIG (1200 KPA), UNLESS OTHERWISE INDICATED.
   d. CONFIGURATION: SINGLE OR DOUBLE–BELLOWS TYPE WITH BASE, UNLESS OTHERWISE INDICATED.
   e. END CONNECTIONS: FLANGED OR WELD.
2. RUBBER EXPANSION JOINTS: ASTM F 1123, FABRIC–REINFORCED RUBBER WITH EXTERNAL CONTROL RODS AND COMPLYING WITH FSA'S "TECHNICAL HANDBOOK: NON–METALLIC EXPANSION JOINTS AND FLEXIBLE PIPE CONNECTORS."
   a. ARCH TYPE: SINGLE OR MULTIPLE ARCHES.
   b. SPHERICAL TYPE: SINGLE OR MULTIPLE SPHERES.
   c. MATERIAL: BUTYL RUBBER.
   d. END CONNECTIONS: FULL–FACED, INTEGRAL, STEEL FLANGES WITH STEEL RETAINING RINGS.
3. FLEXIBLE–HOSE EXPANSION JOINTS: MANUFACTURED ASSEMBLY WITH TWO FLEXIBLE–METAL–HOSE LEGS JOINED BY LONG–RADIUS, 180–DEGREE RETURN BEND OR CENTER SECTION OF FLEXIBLE HOSE; WITH INLET AND OUTLET ELBOW FITTINGS, CORRUGATED–METAL INNER HOSES, AND BRAIDED OUTER SHEATHS.
   a. FLEXIBLE–HOSE EXPANSION JOINTS FOR COPPER PIPING: COPPER–ALLOY FITTINGS WITH SOLDER– JOINT END CONNECTIONS.
   b. FLEXIBLE–HOSE EXPANSION JOINTS FOR STEEL PIPING: CARBON–STEEL FITTINGS WITH THREADED END CONNECTIONS FOR NPS 2 (DN 50) AND SMALLER AND FLANGED END CONNECTIONS FOR NPS 2–1/2 (DN 65) AND LARGER.

C. ALIGNMENT GUIDES
1. DESCRIPTION: STEEL, FACTORY FABRICATED, WITH BOLTED TWO–SECTION OUTER CYLINDER AND BASE FOR ALIGNMENT OF PIPING AND TWO–SECTION GUIDING SPIDER FOR BOLTING TO PIPE.

D. EXPANSION–JOINT INSTALLATION
1. INSTALL MANUFACTURED, NONMETALLIC EXPANSION JOINTS ACCORDING TO FSA'S "TECHNICAL HANDBOOK: NON–METALLIC EXPANSION JOINTS AND FLEXIBLE PIPE CONNECTORS."
2. INSTALL EXPANSION JOINTS OF SIZES MATCHING SIZE OF PIPING IN WHICH THEY ARE INSTALLED.
3. INSTALL ALIGNMENT GUIDES TO ALLOW EXPANSION AND TO AVOID END–LOADING AND TORSIONAL STRESS.

E. PIPE BEND AND LOOP INSTALLATION
1. INSTALL PIPE BENDS AND LOOPS COLD–SPRUNG IN TENSION OR COMPRESSION AS REQUIRED TO PARTLY ABSORB TENSION OR COMPRESSION PRODUCED DURING ANTICIPATED CHANGE IN TEMPERATURE.
2. ATTACH PIPE BENDS AND LOOPS TO ANCHORS.

F. ALIGNMENT–GUIDE INSTALLATION
1. INSTALL GUIDES ON PIPING ADJOINING PIPE EXPANSION FITTINGS AND LOOPS.
2. ATTACH GUIDES TO PIPE AND SECURE TO BUILDING STRUCTURE.

G. ANCHOR INSTALLATION
1. INSTALL ANCHORS AT LOCATIONS TO PREVENT STRESSES FROM EXCEEDING THOSE PERMITTED BY ASME B31.9 AND TO PREVENT TRANSFER OF LOADING AND STRESSES TO CONNECTED EQUIPMENT.
2. INSTALL PIPE ANCHORS ACCORDING TO EXPANSION–JOINT MANUFACTURER'S WRITTEN INSTRUCTIONS IF EXPANSION JOINTS ARE INDICATED.

220519 METERS AND GAGES FOR PLUMBING PIPING

A. METAL–CASE, LIQUID–IN–GLASS THERMOMETERS
1. CASE: DIE–CAST ALUMINUM, 9 INCHES (229 MM) LONG.
2. TUBE: RED OR BLUE READING, MERCURY FILLED, WITH MAGNIFYING LENS.
3. TUBE BACKGROUND: SATIN–FACED, NONREFLECTIVE ALUMINUM WITH PERMANENTLY ETCHED SCALE MARKINGS.
4. WINDOW: GLASS.
5. CONNECTOR: ADJUSTABLE TYPE, 180 DEGREES IN VERTICAL PLANE, 360 DEGREES IN HORIZONTAL PLANE, WITH LOCKING DEVICE.

B. PRESSURE GAGES
1. DIRECT–MOUNTING, DIAL–TYPE PRESSURE GAGES: INDICATING–DIAL TYPE COMPLYING WITH ASME B40.100.
   a. CASE: DRY TYPE, DRAWN STEEL OR CAST ALUMINUM, 4–1/2–INCH (114–MM) DIAMETER.
   b. MOVEMENT: MECHANICAL WITH LINK TO PRESSURE ELEMENT AND CONNECTION TO POINTER.
   c. DIAL: SATIN–FACED, NONREFLECTIVE ALUMINUM WITH PERMANENTLY ETCHED SCALE MARKINGS.
   d. POINTER: DARK METAL.
   e. WINDOW: GLASS.
   f. RING: METAL.

C. THERMOMETER APPLICATIONS
1. INSTALL LIQUID–IN–GLASS THERMOMETERS IN THE OUTLET OF EACH DOMESTIC, HOT–WATER STORAGE TANK.
2. PROVIDE THE FOLLOWING TEMPERATURE RANGES FOR THERMOMETERS:
   a. DOMESTIC HOT WATER: 30 TO 240 DEG F, WITH 2–DEGREE SCALE DIVISIONS (MINUS 1 TO PLUS 115 DEG C, WITH 1–DEGREE SCALE DIVISIONS).

D. INSTALLATIONS
1. INSTALL DIRECT–MOUNTING THERMOMETERS AND ADJUST VERTICAL AND TILTED POSITIONS.
2. INSTALL DIRECT–MOUNTING PRESSURE GAGES IN PIPING TEES WITH PRESSURE GAGE LOCATED ON PIPE AT MOST READABLE POSITION.
3. INSTALL NEEDLE–VALVE AND SNUBBER FITTING IN PIPING FOR EACH PRESSURE GAGE.
4. INSTALL THERMOMETERS AND GAGES ADJACENT TO MACHINES AND EQUIPMENT TO ALLOW SERVICE AND MAINTENANCE FOR THERMOMETERS, GAGES, MACHINES, AND EQUIPMENT.
5. ADJUST FACES OF THERMOMETERS AND GAGES TO PROPER ANGLE FOR BEST VISIBILITY.

220523 GENERAL–DUTY VALVES FOR PLUMBING PIPING

A. QUALITY ASSURANCE
1. SOURCE LIMITATIONS FOR VALVES: OBTAIN EACH TYPE OF VALVE FROM SINGLE SOURCE FROM SINGLE MANUFACTURER.
2. NSF COMPLIANCE: NSF 61 FOR VALVE MATERIALS FOR POTABLE–WATER SERVICE.

B. GENERAL REQUIREMENTS FOR VALVES
1. REFER TO VALVE SCHEDULE ARTICLES FOR APPLICATIONS OF VALVES.
2. VALVE PRESSURE AND TEMPERATURE RATINGS: NOT LESS THAN INDICATED AND AS REQUIRED FOR SYSTEM PRESSURES AND TEMPERATURES.
3. VALVE SIZES: SAME AS UPSTREAM PIPING UNLESS OTHERWISE INDICATED.
4. VALVE BYPASS AND DRAIN CONNECTIONS: MSS SP–45.

C. BRONZE ANGLE VALVES
1. CLASS 125, BRONZE ANGLE VALVES WITH NONMETALLIC DISC:

D. BRASS BALL VALVES
1. TWO–PIECE, FULL–PORT, BRASS BALL VALVES WITH BRASS TRIM:

E. BRONZE BALL VALVES
1. TWO–PIECE, FULL–PORT, BRONZE BALL VALVES WITH BRONZE TRIM:

F. BRONZE SWING CHECK VALVES
1. CLASS 125, BRONZE SWING CHECK VALVES WITH BRONZE DISC:

G. BRONZE GATE VALVES
1. CLASS 125, NRS BRONZE GATE VALVES:

H. VALVE INSTALLATION
1. INSTALL VALVES WITH UNIONS OR FLANGES AT EACH PIECE OF EQUIPMENT ARRANGED TO ALLOW SERVICE, MAINTENANCE, AND EQUIPMENT REMOVAL WITHOUT SYSTEM SHUTDOWN.
2. LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY.
3. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE CENTER OF PIPE.
4. INSTALL VALVES IN POSITION TO ALLOW FULL STEM MOVEMENT.
5. INSTALL CHECK VALVES FOR PROPER DIRECTION OF FLOW AND AS FOLLOWS:

I. GENERAL REQUIREMENTS FOR VALVE APPLICATIONS
1. IF VALVE APPLICATIONS ARE NOT INDICATED, USE THE FOLLOWING:
   a. SHUTOFF SERVICE: BALL OR GATE VALVES.
   b. THROTTLING SERVICE: BALL VALVES.
   c. PUMP–DISCHARGE: CHECK VALVES

220529 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

A. STEEL PIPE HANGERS AND SUPPORTS
1. DESCRIPTION: MSS SP–58, TYPES 1 THROUGH 58, FACTORY–FABRICATED COMPONENTS. REFER TO PART 3 "HANGER AND SUPPORT APPLICATIONS" ARTICLE FOR WHERE TO USE SPECIFIC HANGER AND SUPPORT TYPES.

B. TRAPEZE PIPE HANGERS
1. DESCRIPTION: MSS SP–69, TYPE 59, SHOP– OR FIELD–FABRICATED PIPE–SUPPORT ASSEMBLY MADE FROM STRUCTURAL–STEEL SHAPES WITH MSS SP–58 HANGER RODS, NUTS, SADDLES, AND U–BOLTS.

C. METAL FRAMING SYSTEMS
1. DESCRIPTION: MFMA–3, SHOP– OR FIELD–FABRICATED PIPE–SUPPORT ASSEMBLY MADE OF STEEL CHANNELS AND OTHER COMPONENTS.

D. THERMAL–HANGER SHIELD INSERTS
1. DESCRIPTION: 100–PSIG– (690–KPA–) MINIMUM, COMPRESSIVE–STRENGTH INSULATION INSERT ENCASED IN SHEET METAL SHIELD.
2. INSULATION–INSERT MATERIAL FOR COLD PIPING: WATER–REPELLENT TREATED, ASTM C 533, TYPE I CALCIUM SILICATE OR ASTM C 552, TYPE II CELLULAR GLASS WITH VAPOR BARRIER.
3. INSULATION–INSERT MATERIAL FOR HOT PIPING: WATER–REPELLENT TREATED, ASTM C 533, TYPE I CALCIUM SILICATE OR ASTM C 552, TYPE II CELLULAR GLASS.
4. FOR TRAPEZE OR CLAMPED SYSTEMS: INSERT AND SHIELD SHALL COVER ENTIRE CIRCUMFERENCE OF PIPE.
5. FOR CLEVIS OR BAND HANGERS: INSERT AND SHIELD SHALL COVER LOWER 180 DEGREES OF PIPE.

E. FASTENER SYSTEMS
1. POWDER–ACTUATED FASTENERS: THREADED–STEEL STUD, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH PULL–OUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.
2. MECHANICAL–EXPANSION ANCHORS: INSERT–WEDGE–TYPE ZINC–COATED STEEL, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH PULL–OUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.

F. MISCELLANEOUS MATERIALS
1. STRUCTURAL STEEL: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.

G. HANGER AND SUPPORT APPLICATIONS
1. SPECIFIC HANGER AND SUPPORT REQUIREMENTS ARE SPECIFIED IN SECTIONS SPECIFYING PIPING SYSTEMS AND EQUIPMENT.
2. COMPLY WITH MSS SP–69 FOR PIPE HANGER SELECTIONS AND APPLICATIONS THAT ARE NOT SPECIFIED IN PIPING SYSTEM SECTIONS.
3. USE HANGERS AND SUPPORTS WITH GALVANIZED, METALLIC COATINGS FOR PIPING AND EQUIPMENT THAT WILL NOT HAVE FIELD–APPLIED FINISH.
4. USE NONMETALLIC COATINGS ON ATTACHMENTS FOR ELECTROLYTIC PROTECTION WHERE ATTACHMENTS ARE IN DIRECT CONTACT WITH COPPER TUBING.
5. USE PADDED HANGERS FOR PIPING THAT IS SUBJECT TO SCRATCHING.
6. HORIZONTAL–PIPING HANGERS AND SUPPORTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SECTIONS, INSTALL THE FOLLOWING TYPES:
   a. ADJUSTABLE, STEEL CLEVIS HANGERS (MSS TYPE 1): FOR SUSPENSION OF NONINSULATED OR INSULATED STATIONARY PIPES, NPS 1/2 TO NPS 30 (DN 15 TO DN 750).
   b. YOKE–TYPE PIPE CLAMPS (MSS TYPE 2): FOR SUSPENSION OF 120 TO 450 DEG F (49 TO 232 DEG C) PIPES, NPS 4 TO NPS 16 (DN 100 TO DN 400), REQUIRING UP TO 4 INCHES (100 MM) OF INSULATION.
   c. CARBON– OR ALLOY–STEEL, DOUBLE–BOLT PIPE CLAMPS (MSS TYPE 3): FOR SUSPENSION OF PIPES, NPS 3/4 TO NPS 24 (DN 20 TO DN 600), REQUIRING CLAMP FLEXIBILITY AND UP TO 4 INCHES (100 MM) OF INSULATION.
   d. STEEL PIPE CLAMPS (MSS TYPE 4): FOR SUSPENSION OF COLD AND HOT PIPES, NPS 1/2 TO NPS 24 (DN 15 TO DN 600), IF LITTLE OR NO INSULATION IS REQUIRED.
   e. PIPE HANGERS (MSS TYPE 5): FOR SUSPENSION OF PIPES, NPS 1/2 TO NPS 4 (DN 15 TO DN 100), TO ALLOW OFF–CENTER CLOSURE FOR HANGER INSTALLATION BEFORE PIPE ERECTION.
   f. ADJUSTABLE, SWIVEL, SPLIT– OR SOLID–RING HANGERS (MSS TYPE 6): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 3/4 TO NPS 8 (DN 20 TO DN 200).
   g. ADJUSTABLE, STEEL BAND HANGERS (MSS TYPE 7): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8 (DN 15 TO DN 200).
   h. ADJUSTABLE BAND HANGERS (MSS TYPE 9): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8 (DN 15 TO DN 200).
   i. ADJUSTABLE, SWIVEL–RING BAND HANGERS (MSS TYPE 10): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 2 (DN 15 TO DN 50).
   j. SPLIT PIPE–RING WITH OR WITHOUT TURNBUCKLE–ADJUSTMENT HANGERS (MSS TYPE 11): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 3/8 TO NPS 8 (DN 10 TO DN 200).
   k. EXTENSION HINGED OR 2–BOLT SPLIT PIPE CLAMPS (MSS TYPE 12): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 3/8 TO NPS 3 (DN 10 TO DN 80).
   l. CLIPS (MSS TYPE 26): FOR SUPPORT OF INSULATED PIPES NOT SUBJECT TO EXPANSION OR CONTRACTION.
7. VERTICAL–PIPING CLAMPS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SECTIONS, INSTALL THE FOLLOWING TYPES:
   a. EXTENSION PIPE OR RISER CLAMPS (MSS TYPE 8): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20 (DN 20 TO DN 500).
8. HANGER–ROD ATTACHMENTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SECTIONS, INSTALL THE FOLLOWING TYPES:
   a. STEEL TURNBUCKLES (MSS TYPE 13): FOR ADJUSTMENT UP TO 6 INCHES (150 MM) FOR HEAVY LOADS.
   b. STEEL CLEVISES (MSS TYPE 14): FOR 120 TO 450 DEG F (49 TO 232 DEG C) PIPING INSTALLATIONS.
   c. SWIVEL TURNBUCKLES (MSS TYPE 15): FOR USE WITH MSS TYPE 11, SPLIT PIPE RINGS.
   d. MALLEABLE–IRON SOCKETS (MSS TYPE 16): FOR ATTACHING HANGER RODS TO VARIOUS TYPES OF BUILDING ATTACHMENTS.
   e. STEEL WELDLESS EYE NUTS (MSS TYPE 17): FOR 120 TO 450 DEG F (49 TO 232 DEG C) PIPING INSTALLATIONS.
9. BUILDING ATTACHMENTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SECTIONS, INSTALL THE FOLLOWING TYPES:
   a. STEEL OR MALLEABLE CONCRETE INSERTS (MSS TYPE 18): FOR UPPER ATTACHMENT TO SUSPEND PIPE HANGERS FROM CONCRETE CEILING.
   b. TOP–BEAM C–CLAMPS (MSS TYPE 19): FOR USE UNDER ROOF INSTALLATIONS WITH BAR–JOIST CONSTRUCTION TO ATTACH TO TOP FLANGE OF STRUCTURAL SHAPE.
   c. SIDE–BEAM OR CHANNEL CLAMPS (MSS TYPE 20): FOR ATTACHING TO BOTTOM FLANGE OF BEAMS, CHANNELS, OR ANGLES.
   d. CENTER–BEAM CLAMPS (MSS TYPE 21): FOR ATTACHING TO CENTER OF BOTTOM FLANGE OF BEAMS.
   e. WELDED BEAM ATTACHMENTS (MSS TYPE 22): FOR ATTACHING TO BOTTOM OF BEAMS IF LOADS ARE CONSIDERABLE AND ROD SIZES ARE LARGE.
   f. C–CLAMPS (MSS TYPE 23): FOR STRUCTURAL SHAPES.
   g. TOP–BEAM CLAMPS (MSS TYPE 25): FOR TOP OF BEAMS IF HANGER ROD IS REQUIRED TANGENT TO FLANGE EDGE.
   h. SIDE–BEAM CLAMPS (MSS TYPE 27): FOR BOTTOM OF STEEL I–BEAMS.
   i. STEEL–BEAM CLAMPS WITH EYE NUTS (MSS TYPE 28): FOR ATTACHING TO BOTTOM OF STEEL I–BEAMS FOR HEAVY LOADS.
   j. LINKED–STEEL CLAMPS WITH EYE NUTS (MSS TYPE 29): FOR ATTACHING TO BOTTOM OF STEEL I–BEAMS FOR HEAVY LOADS, WITH LINK EXTENSIONS.
   k. MALLEABLE BEAM CLAMPS WITH EXTENSION PIECES (MSS TYPE 30): FOR ATTACHING TO STRUCTURAL STEEL.
   l. WELDED–STEEL BRACKETS: FOR SUPPORT OF PIPES FROM BELOW, OR FOR SUSPENDING FROM ABOVE BY USING CLIP AND ROD. USE ONE OF THE FOLLOWING FOR INDICATED LOADS:
      1) LIGHT (MSS TYPE 31): 750 LB (340 KG).
      2) MEDIUM (MSS TYPE 32): 1500 LB (680 KG).
      3) HEAVY (MSS TYPE 33): 3000 LB (1360 KG).
   m. SIDE–BEAM BRACKETS (MSS TYPE 34): FOR SIDES OF STEEL OR WOODEN BEAMS.
   n. PLATE LUGS (MSS TYPE 57): FOR ATTACHING TO STEEL BEAMS IF FLEXIBILITY AT BEAM IS REQUIRED.
   o. HORIZONTAL TRAVELERS (MSS TYPE 58): FOR SUPPORTING PIPING SYSTEMS SUBJECT TO LINEAR HORIZONTAL MOVEMENT WHERE HEADROOM IS LIMITED.
10. SADDLES AND SHIELDS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SECTIONS, INSTALL THE FOLLOWING TYPES:
   a. STEEL PIPE–COVERING PROTECTION SADDLES (MSS TYPE 39): TO FILL INTERIOR VOIDS WITH INSULATION THAT MATCHES ADJOINING INSULATION.
   b. PROTECTION SHIELDS (MSS TYPE 40): OF LENGTH RECOMMENDED IN WRITING BY MANUFACTURER TO PREVENT CRUSHING INSULATION.
   c. THERMAL–HANGER SHIELD INSERTS: FOR SUPPORTING INSULATED PIPE.
11. COMPLY WITH MSS SP–69 FOR TRAPEZE PIPE HANGER SELECTIONS AND APPLICATIONS THAT ARE NOT SPECIFIED IN PIPING SYSTEM SECTIONS.
12. COMPLY WITH MFMA–102 FOR METAL FRAMING SYSTEM SELECTIONS AND APPLICATIONS THAT ARE NOT SPECIFIED IN PIPING SYSTEM SECTIONS.
13. USE POWDER–ACTUATED FASTENERS OR MECHANICAL–EXPANSION ANCHORS INSTEAD OF BUILDING ATTACHMENTS WHERE REQUIRED IN CONCRETE CONSTRUCTION.
14. USE PIPE POSITIONING SYSTEMS IN PIPE SPACES BEHIND PLUMBING FIXTURES TO SUPPORT SUPPLY AND WASTE PIPING FOR PLUMBING FIXTURES.

H. HANGER AND SUPPORT INSTALLATION
1. STEEL PIPE HANGER INSTALLATION: COMPLY WITH MSS SP–69 AND MSS SP–89. INSTALL HANGERS, SUPPORTS, CLAMPS, AND ATTACHMENTS AS REQUIRED TO PROPERLY SUPPORT PIPING FROM BUILDING STRUCTURE.
2. TRAPEZE PIPE HANGER INSTALLATION: COMPLY WITH MSS SP–69 AND MSS SP–89. ARRANGE FOR GROUPING OF PARALLEL RUNS OF HORIZONTAL PIPING AND SUPPORT TOGETHER ON FIELD–FABRICATED TRAPEZE PIPE HANGERS.
3. METAL FRAMING SYSTEM INSTALLATION: ARRANGE FOR GROUPING OF PARALLEL RUNS OF PIPING AND SUPPORT TOGETHER ON FIELD–ASSEMBLED METAL FRAMING SYSTEMS.
4. THERMAL–HANGER SHIELD INSTALLATION: INSTALL IN PIPE HANGER OR SHIELD FOR INSULATED PIPING.
5. INSTALL HANGERS AND SUPPORTS COMPLETE WITH NECESSARY INSERTS, BOLTS, RODS, NUTS, WASHERS, AND OTHER ACCESSORIES.
6. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE SLABS OR ATTACH TO STRUCTURAL STEEL. INSTALL ADDITIONAL ATTACHMENTS AT CONCENTRATED LOADS, INCLUDING VALVES, FLANGES, AND STRAINERS, NPS 2–1/2 (DN 65) AND LARGER AND AT CHANGES IN DIRECTION OF PIPING. INSTALL CONCRETE INSERTS BEFORE CONCRETE IS PLACED; FASTEN INSERTS TO FORMS AND INSTALL REINFORCING BARS THROUGH OPENINGS AT TOP OF INSERTS.
7. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADS AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
8. PIPE SLOPES: INSTALL HANGERS AND SUPPORTS TO PROVIDE INDICATED PIPE SLOPES AND SO MAXIMUM PIPE DEFLECTIONS ALLOWED BY ASME B31.9 (FOR BUILDING SERVICES PIPING) ARE NOT EXCEEDED.
9. INSULATED PIPING: COMPLY WITH THE FOLLOWING:
   a. ATTACH CLAMPS AND SPACERS TO PIPING.
   b. INSTALL MSS SP–58, TYPE 39, PROTECTION SADDLES IF INSULATION WITHOUT VAPOR BARRIER IS INDICATED. FILL INTERIOR VOIDS WITH INSULATION THAT MATCHES ADJOINING INSULATION.
   c. INSTALL MSS SP–58, TYPE 40, PROTECTIVE SHIELDS ON COLD PIPING WITH VAPOR BARRIER. SHIELDS SHALL SPAN AN ARC OF 180 DEGREES.
   d. THERMAL–HANGER SHIELDS: INSTALL WITH INSULATION SAME THICKNESS AS PIPING INSULATION.

220553 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

A. COORDINATION
1. COORDINATE INSTALLATION OF IDENTIFYING DEVICES WITH COMPLETION OF COVERING AND PAINTING OF SURFACES WHERE DEVICES ARE TO BE APPLIED.
2. COORDINATE INSTALLATION OF IDENTIFYING DEVICES WITH LOCATIONS OF ACCESS PANELS AND DOORS.

B. EQUIPMENT LABELS
1. EQUIPMENT NAMEPLATES: METAL, WITH DATA ENGRAVED OR STAMPED, FOR PERMANENT ATTACHMENT ON EQUIPMENT.
   a. DATA:
      1) MANUFACTURER, PRODUCT NAME, MODEL NUMBER, AND SERIAL NUMBER.
      2) CAPACITY, OPERATING AND POWER CHARACTERISTICS, AND ESSENTIAL DATA.
      3) LABELS OF TESTED COMPLIANCES.
   b. LOCATION:

221316 PLUMBING PIPING

A. SUBMITTALS
1. PRODUCT DATA: FOR PIPE, TUBE, FITTINGS, AND COUPLINGS.

B. PROJECT CONDITIONS
1. INTERRUPTION OF EXISTING WATER SERVICE: DO NOT INTERRUPT WATER SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY WATER SERVICE ACCORDING TO REQUIREMENTS INDICATED:
   a. NOTIFY ARCHITECT OR OWNER NO FEWER THAN TWO DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF WATER SERVICE.
   b. DO NOT PROCEED WITH INTERRUPTION OF WATER SERVICE WITHOUT ARCHITECT'S OR OWNER'S WRITTEN PERMISSION.

C. PIPING MATERIALS
1. REFER TO DRAWINGS FOR PIPING MATERIALS.

D. PIPING APPLICATIONS
1. REFER TO DRAWINGS FOR PIPING APPLICATIONS.

E. VALVE INSTALLATION
1. GENERAL-DUTY VALVES: COMPLY WITH REQUIREMENTS IN DIVISION 22 SECTION "GENERAL-DUTY VALVES FOR PLUMBING PIPING" FOR VALVE INSTALLATIONS.
2. 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 OR GATE VALVES FOR PIPING NPS 2 (DN 50) AND SMALLER. USE BUTTERFLY OR GATE VALVES FOR PIPING NPS 2-1/2 (DN 65) AND LARGER.
3. INSTALL DRAIN VALVES FOR EQUIPMENT AT BASE OF EACH WATER RISER, AT LOW POINTS IN HORIZONTAL PIPING, AND WHERE REQUIRED TO DRAIN WATER PIPING. DRAIN VALVES ARE SPECIFIED IN DIVISION 22 SECTION "PLUMBING PIPING SPECIALTIES."
   a. HOSE-END DRAIN VALVES: AT LOW POINTS IN WATER MAINS, RISERS, AND BRANCHES.
   b. STOP-AND-WASTE DRAIN VALVES: INSTEAD OF HOSE-END DRAIN VALVES WHERE INDICATED.

F. JOINT CONSTRUCTION
1. JOIN HUB-AND-SPIGOT, CAST-IRON SOIL PIPING WITH GASKET JOINTS ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" FOR COMPRESSION JOINTS.
2. JOIN HUB-AND-SPIGOT, CAST-IRON SOIL PIPING WITH CALKED JOINTS ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" FOR LEAD AND OAKUM CALKED JOINTS.
3. JOIN HUBLESS CAST-IRON SOIL PIPING ACCORDING TO CISPI 310 AND CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" FOR HUBLESS-COUPLING JOINTS.
4. SOLDERED JOINTS: USE ASTM B 813, WATER-FLUSHABLE, LEAD-FREE FLUX; ASTM B 32, LEAD-FREE-ALLOY SOLDER; AND ASTM B 828 PROCEDURE, UNLESS OTHERWISE INDICATED.

G. HANGER AND SUPPORT INSTALLATION
1. PIPE HANGERS AND SUPPORTS ARE SPECIFIED IN DIVISION 22 SECTION "HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT." INSTALL THE FOLLOWING:
   a. VERTICAL PIPING: MSS TYPE 8 OR TYPE 42, CLAMPS.
   b. INSTALL INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS ACCORDING TO THE FOLLOWING:
      1) 100 FEET (30 M) AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS HANGERS.
      2) LONGER THAN 100 FEET (30 M): MSS TYPE 43, ADJUSTABLE ROLLER HANGERS.
      3) LONGER THAN 100 FEET (30 M), IF INDICATED: MSS TYPE 49, SPRING CUSHION ROLLS.
   c. MULTIPLE, STRAIGHT, HORIZONTAL PIPING RUNS 100 FEET (30 M) OR LONGER: MSS TYPE 44, PIPE ROLLS. SUPPORT PIPE ROLLS ON TRAPEZE.
   d. BASE OF VERTICAL PIPING: MSS TYPE 52, SPRING HANGERS.
2. INSTALL SUPPORTS ACCORDING TO DIVISION 22 SECTION "HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT."
3. SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR.
4. ROD DIAMETER MAY BE REDUCED 1 SIZE FOR DOUBLE-ROD HANGERS, WITH 3/8-INCH (10-MM) MINIMUM RODS.
5. INSTALL HANGERS FOR CAST-IRON SOIL PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
   a. NPS 1-1/2 AND NPS 2 (DN 40 AND DN 50): 60 INCHES (1500 MM) WITH 3/8-INCH (10-MM) ROD.
   b. NPS 3 (DN 80): 60 INCHES (1500 MM) WITH 1/2-INCH (13-MM) ROD.
   c. NPS 4 AND NPS 5 (DN 100 AND DN 125): 60 INCHES (1500 MM) WITH 5/8-INCH (16-MM) ROD.
   d. NPS 6 (DN 150): 60 INCHES (1500 MM) WITH 3/4-INCH (19-MM) ROD.
   e. NPS 8 TO NPS 12 (DN 200 TO DN 300): 60 INCHES (1500 MM) WITH 7/8-INCH (22-MM) ROD.
6. INSTALL SUPPORTS FOR VERTICAL CAST-IRON SOIL PIPING EVERY 15 FEET (4.5 M).
7. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS:
   a. NPS 3/4 (DN 20) AND SMALLER: 60 INCHES (1500 MM) WITH 3/8-INCH (10-MM) ROD.
   b. NPS 1 AND NPS 1-1/4 (DN 25 AND DN 32): 72 INCHES (1800 MM) WITH 3/8-INCH (10-MM) ROD.
   c. NPS 1-1/2 AND NPS 2 (DN 40 AND DN 50): 96 INCHES (2400 MM) WITH 3/8-INCH (10-MM) ROD.
   d. NPS 2-1/2 (DN 65): 108 INCHES (2700 MM) WITH 1/2-INCH (13-MM) ROD.
   e. NPS 3 TO NPS 5 (DN 80 TO DN 125): 10 FEET (3 M) WITH 1/2-INCH (13-MM) ROD.
   f. NPS 6 (DN 150): 10 FEET (3 M) WITH 5/8-INCH (16-MM) ROD.
   g. NPS 8 (DN 200): 10 FEET (3 M) WITH 3/4-INCH (19-MM) ROD.
8. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET (3 M).
9. SUPPORT PIPING AND TUBING NOT LISTED ABOVE ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

H. CONNECTIONS
1. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.
2. INSTALL PIPING ADJACENT TO EQUIPMENT AND MACHINES TO ALLOW SERVICE AND MAINTENANCE.
3. CONNECT DOMESTIC WATER PIPING TO WATER-SERVICE PIPING WITH SHUTOFF VALVE; EXTEND AND CONNECT TO THE FOLLOWING:
   a. WATER HEATERS: COLD-WATER INLET AND HOT-WATER OUTLET PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN SIZES OF WATER HEATER CONNECTIONS.
   b. PLUMBING FIXTURES: COLD- AND HOT-WATER SUPPLY PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE. COMPLY WITH REQUIREMENTS IN DIVISION 22 PLUMBING FIXTURE SECTIONS FOR CONNECTION SIZES.
   c. EQUIPMENT: COLD- AND HOT-WATER SUPPLY PIPING AS INDICATED, BUT NOT SMALLER THAN EQUIPMENT CONNECTIONS. PROVIDE SHUTOFF VALVE AND UNION FOR EACH CONNECTION. USE FLANGES INSTEAD OF UNIONS FOR NPS 2-1/2 (DN 65) AND LARGER.

I. ESCUTCHEON INSTALLATION
1. INSTALL ESCUTCHEONS FOR PENETRATIONS OF WALLS, CEILINGS, AND FLOORS.

J. FIELD QUALITY CONTROL
1. 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.
   a. ROUGHING-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND BEFORE SETTING FIXTURES.
   b. FINAL INSPECTION: ARRANGE FOR FINAL INSPECTION BY AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS.
2. REINSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TEST OR INSPECTION, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR REINSPECTION.
3. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.
4. PIPING TESTS:
   a. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF WATER.
   b. 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.
   c. 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.
   d. 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.
   e. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED.
   f. PREPARE REPORTS FOR TESTS AND FOR CORRECTIVE ACTION REQUIRED.
5. DOMESTIC WATER PIPING WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND INSPECTIONS.
6. TEST DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
   a. 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.
   b. 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.
   c. 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.
   d. FINISHED PLUMBING TEST PROCEDURE: AFTER PLUMBING FIXTURES HAVE BEEN SET AND TRAPS FILLED WITH WATER, TEST CONNECTIONS 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.
   e. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE OBTAINED.
   f. PREPARE REPORTS FOR TESTS AND REQUIRED CORRECTIVE ACTION.

K. ADJUSTING
1. PERFORM THE FOLLOWING ADJUSTMENTS BEFORE OPERATION:
   a. CLOSE DRAIN VALVES, HYDRANTS, AND HOSE BIBBS.
   b. OPEN SHUTOFF VALVES TO FULLY OPEN POSITION.
   c. OPEN THROTTLING VALVES TO PROPER SETTING.

CHECK PLUMBING SPECIALTIES AND VERIFY PROPER SETTINGS, ADJUSTMENTS, AND OPERATION.

L. CLEANING
1. PORTIONS OF DISINFECTING REQUIREMENTS IN THIS ARTICLE ARE TAKEN FROM MODEL PLUMBING CODES; REVISE IF REQUIREMENTS VARY BY AUTHORITIES HAVING JURISDICTION.
2. CLEAN AND DISINFECT POTABLE DOMESTIC WATER PIPING AS FOLLOWS:
   a. PURGE NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED BEFORE USING.
   b. 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:
   c. FLUSH PIPING SYSTEM WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT OUTLETS.
   d. FILL AND ISOLATE SYSTEM ACCORDING TO EITHER OF THE FOLLOWING:
      - FILL SYSTEM OR PART THEREOF WITH WATER/CHLORINE SOLUTION WITH AT LEAST 50 PPM (50 MG/L) OF CHLORINE. ISOLATE WITH VALVES AND ALLOW TO STAND FOR 24 HOURS.
      - FILL SYSTEM OR PART THEREOF WITH WATER/CHLORINE SOLUTION WITH AT LEAST 200 PPM (200 MG/L) OF CHLORINE. ISOLATE AND ALLOW TO STAND FOR THREE HOURS.
   e. FLUSH SYSTEM WITH CLEAN, POTABLE WATER UNTIL NO CHLORINE IS IN WATER COMING FROM SYSTEM AFTER THE STANDING TIME.
   f. REPEAT PROCEDURES IF BIOLOGICAL EXAMINATION SHOWS CONTAMINATION.
   g. SUBMIT WATER SAMPLES IN STERILE BOTTLES TO AUTHORITIES HAVING JURISDICTION.

221317 PLUMBING SPECIALTIES

A. SUBMITTALS
1. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.

B. QUALITY ASSURANCE
1. NSF COMPLIANCE:
   a. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; SECTIONS 1 THROUGH 9."
2. UNLESS OTHERWISE INDICATED IN OTHER SECTION 2 ARTICLES, PROVIDE PRODUCTS INDICATED ON DRAWINGS OR COMPARABLE PRODUCTS COMPLIANT WITH REQUIREMENTS OF THE PRODUCTS SPECIFIED.

C. DRAIN VALVES
1. BALL-VALVE-TYPE, HOSE-END DRAIN VALVES:
   a. STANDARD: MSS SP-110 FOR STANDARD-PORT, TWO-PIECE BALL VALVES.
   b. SIZE: NPS 3/4 (DN 20).
   c. OUTLET: THREADED, SHORT NIPPLE WITH GARDEN-HOSE THREAD COMPLYING WITH ASME B1.20.7 AND CAP WITH BRASS CHAIN.
2. STOP-AND-WASTE DRAIN VALVES:
   a. STANDARD: MSS SP-110 FOR BALL VALVES OR MSS SP-80 FOR GATE VALVES.
   b. SIZE: NPS 3/4 (DN 20).
   c. DRAIN: NPS 1/8 (DN 6) SIDE OUTLET WITH CAP.

D. WATER HAMMER ARRESTERS
1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   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.
   i. ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
2. STANDARD: ASSE 1010 OR PDI-WH 201.
3. TYPE: METAL BELLOWS.
4. SIZE: ASSE 1010, SIZES AA AND A THROUGH F OR PDI-WH 201, SIZES A THROUGH F.

E. CLEANOUTS
1. EXPOSED METAL CLEANOUTS:
   a. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
      1) JOSAM COMPANY; JOSAM DIV.
      2) MIFAB, INC.
      3) SMITH, JAY R. MFG. CO.; DIVISION OF SMITH INDUSTRIES, INC.
      4) TYLER PIPE; WADE DIV.
      5) WATTS DRAINAGE PRODUCTS INC.
      6) ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
   b. STANDARD: ASME A112.36.2M FOR CAST IRON, ASTM A74 OR CISPI 301 FOR CLEANOUT TEST TEE.
   c. SIZE: SAME AS CONNECTED DRAINAGE PIPING
   d. BODY MATERIAL: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE OR T-BRANCH HUBLESS, CAST-IRON SOIL PIPE TEST TEE AS REQUIRED TO MATCH CONNECTED PIPING.
   e. CLOSURE: COUNTERSUNK OR RAISED-HEAD, BRASS PLUG.
   f. CLOSURE PLUG SIZE: SAME AS OR NOT MORE THAN ONE SIZE SMALLER THAN CLEANOUT SIZE.
2. FLOOR CLEANOUTS:
   a. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      1) JOSAM COMPANY.
      2) OATEY.
      3) SIOUX CHIEF MANUFACTURING COMPANY, INC.
      4) SMITH, JAY R. MFG. CO.
      5) TYLER PIPE.
      6) WATTS WATER TECHNOLOGIES, INC.
      7) ZURN PLUMBING PRODUCTS GROUP; LIGHT COMMERCIAL PRODUCTS OPERATION.
      8) ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
   b. STANDARD: ASME A112.36.2M.
   c. SIZE: SAME AS CONNECTED BRANCH.
   d. TYPE: CAST-IRON SOIL PIPE WITH CAST-IRON FERRULE.
   e. BODY OR FERRULE MATERIAL: CAST IRON.
   f. CLOSURE: BRASS PLUG WITH STRAIGHT THREADS AND GASKET.
   g. ADJUSTABLE HOUSING MATERIAL: CAST IRON.
   h. RISER: ASTM A 74, SERVICE CLASS, CAST-IRON DRAINAGE PIPE FITTING AND RISER TO CLEANOUT.
3. WALL CLEANOUTS:
   a. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
      1) JOSAM COMPANY.
      2) MIFAB, INC.
      3) SMITH, JAY R. MFG. CO.
      4) TYLER PIPE.
      5) WATTS WATER TECHNOLOGIES, INC.
      6) ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
   b. STANDARD: ASME A112.36.2M FOR CAST IRON, ASTM A74 OR CISPI 301 FOR CLEANOUT TEST TEE. INCLUDE WALL ACCESS.
   c. SIZE: SAME AS CONNECTED DRAINAGE PIPING.
   d. BODY: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH OR HUBLESS, CAST-IRON SOIL PIPE TEST TEE AS REQUIRED TO MATCH CONNECTED PIPING.
   e. CLOSURE: COUNTERSUNK OR RAISED-HEAD, DRILLED-AND-THREADED BRASS PLUG.
   f. CLOSURE PLUG SIZE: SAME AS OR NOT MORE THAN ONE SIZE SMALLER THAN CLEANOUT SIZE.
   g. WALL ACCESS: ROUND, FLAT, CHROME-PLATED BRASS OR STAINLESS-STEEL COVER PLATE WITH SCREW.

F. ROOF FLASHING ASSEMBLIES
1. ROOF FLASHING ASSEMBLIES:
   a. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
      1) ACORN ENGINEERING COMPANY; ELMDOR/STONEMAN DIV.
      2) THALER METAL INDUSTRIES LTD.
2. DESCRIPTION: MANUFACTURED ASSEMBLY MADE OF 6.0-LB/SQ. FT. (30-KG/SQ. M), 0.0938-INCH- (2.4-MM-) THICK, LEAD FLASHING COLLAR AND SKIRT EXTENDING AT LEAST 8 INCHES (200 MM) FROM PIPE, WITH GALVANIZED-STEEL BOOT REINFORCEMENT AND COUNTERFLASHING FITTING.

G. MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES
1. AIR-GAP FITTINGS:
   a. STANDARD: ASME A112.1.2, FOR FITTING DESIGNED TO ENSURE FIXED, POSITIVE AIR GAP BETWEEN INSTALLED INLET AND OUTLET PIPING.
   b. BODY: BRONZE OR CAST IRON.
   c. INLET: OPENING IN TOP OF BODY.
   d. OUTLET: LARGER THAN INLET.
   e. SIZE: SAME AS CONNECTED WASTE PIPING AND WITH INLET LARGE ENOUGH FOR ASSOCIATED INDIRECT WASTE PIPING.
2. EXPANSION JOINTS:
   a. STANDARD: ASME A112.21.2M.
   b. BODY: CAST IRON WITH BRONZE SLEEVE, PACKING, AND GLAND.
   c. END CONNECTIONS: MATCHING CONNECTED PIPING.
   d. SIZE: SAME AS CONNECTED SOIL, WASTE, OR VENT PIPING.

H. INSTALLATION
1. INSTALL TEMPERATURE-ACTUATED WATER MIXING VALVES WITH CHECK STOPS OR SHUTOFF VALVES ON INLETS AND WITH SHUTOFF VALVE ON OUTLET.
2. INSTALL WATER HAMMER ARRESTERS IN WATER PIPING ACCORDING TO PDI-WH 201.
3. INSTALL SUPPLY-TYPE, TRAP-SEAL PRIMER VALVES WITH OUTLET PIPING PITCHED DOWN TOWARD DRAIN TRAP A MINIMUM OF 1 PERCENT, AND CONNECT TO FLOOR-DRAIN BODY, TRAP, OR INLET FITTING. ADJUST VALVE FOR PROPER FLOW.
4. INSTALL CLEANOUTS IN ABOVEGROUND PIPING AND BUILDING DRAIN PIPING ACCORDING TO THE FOLLOWING INSTRUCTIONS UNLESS OTHERWISE INDICATED:
   a. USE CLEANOUTS THE SAME SIZE AS DRAINAGE PIPING UP TO NPS 4 (DN 100). USE NPS 4 (DN 100) FOR LARGER DRAINAGE PIPING UNLESS LARGER CLEANOUT IS INDICATED.
   b. LOCATE CLEANOUTS AT EACH CHANGE IN DIRECTION OF PIPING GREATER THAN 45 DEGREES.
   c. LOCATE CLEANOUTS AT MINIMUM INTERVALS OF 50 FEET (15 M) FOR PIPING NPS 4 (DN 100) AND SMALLER AND 100 FEET (30 M) FOR LARGER PIPING.
   d. LOCATE CLEANOUTS AT BASE OF EACH VERTICAL SOIL AND WASTE STACK.
12. FOR FLOOR CLEANOUTS FOR PIPING BELOW FLOORS, INSTALL CLEANOUT DECK PLATES WITH TOP FLUSH WITH FINISHED FLOOR.
13. FOR CLEANOUTS LOCATED IN CONCEALED PIPING, INSTALL CLEANOUT WALL ACCESS COVERS, OF TYPES INDICATED, WITH FRAME AND COVER FLUSH WITH FINISHED WALL.
14. INSTALL TEST TEES IN VERTICAL CONDUCTORS AND NEAR FLOOR.
15. INSTALL WALL CLEANOUTS IN VERTICAL CONDUCTORS. INSTALL ACCESS DOOR IN WALL IF INDICATED.
16. INSTALL FLOOR DRAINS AT LOW POINTS OF SURFACE AREAS TO BE DRAINED. SET GRATES OF DRAINS FLUSH WITH FINISHED FLOOR, UNLESS OTHERWISE INDICATED.
17. INSTALL ROOF FLASHING ASSEMBLIES ON SANITARY STACK VENTS AND VENT STACKS THAT EXTEND THROUGH ROOF.
18. INSTALL AIR-GAP FITTINGS ON DRAINING-TYPE BACKFLOW PREVENTERS AND ON INDIRECT-WASTE PIPING DISCHARGE INTO SANITARY DRAINAGE SYSTEM.
19. INSTALL EXPANSION JOINTS ON VERTICAL STACKS AND CONDUCTORS. POSITION EXPANSION JOINTS FOR EASY ACCESS AND MAINTENANCE.
20. INSTALL ESCUTCHEONS AT WALL, FLOOR, AND CEILING PENETRATIONS IN EXPOSED FINISHED LOCATIONS AND WITHIN CABINETS AND MILLWORK. USE DEEP-PATTERN ESCUTCHEONS IF REQUIRED TO CONCEAL PROTRUDING PIPE FITTINGS.

I. ADJUSTING
1. SET FIELD-ADJUSTABLE TEMPERATURE SET POINTS OF TEMPERATURE-ACTUATED WATER MIXING VALVES.

224100 PLUMBING FIXTURES

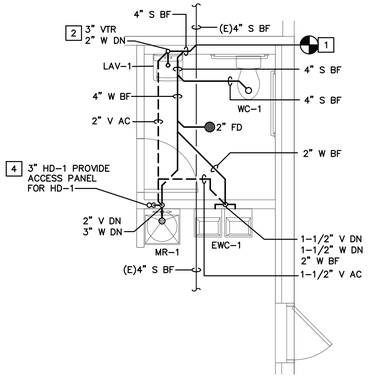
A. SUBMITTALS
1. PRODUCT DATA: FOR EACH TYPE OF PLUMBING FIXTURE INDICATED. INCLUDE SELECTED FIXTURE AND TRIM, FITTINGS, ACCESSORIES, APPLIANCES, APPURTENANCES, EQUIPMENT, AND SUPPORTS. INDICATE MATERIALS AND FINISHES, DIMENSIONS, CONSTRUCTION DETAILS, AND FLOW-CONTROL RATES.

B. QUALITY ASSURANCE
1. SOURCE LIMITATIONS: OBTAIN PLUMBING FIXTURES, FAUCETS, AND OTHER COMPONENTS OF EACH CATEGORY THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER.
   a. EXCEPTION: IF FIXTURES, FAUCETS, OR OTHER COMPONENTS ARE NOT AVAILABLE FROM A SINGLE MANUFACTURER, OBTAIN SIMILAR PRODUCTS FROM OTHER MANUFACTURERS SPECIFIED FOR THAT CATEGORY.
2. REGULATORY REQUIREMENTS: COMPLY WITH REQUIREMENTS IN ICC A117.1, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES", PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT", AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT" FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
3. REGULATORY REQUIREMENTS: COMPLY WITH REQUIREMENTS IN PUBLIC LAW 102-486, "ENERGY POLICY ACT," ABOUT WATER FLOW AND CONSUMPTION RATES FOR PLUMBING FIXTURES.
4. NSF STANDARD: COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS---HEALTH EFFECTS," FOR FIXTURE MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER.
5. PROVIDE PRODUCTS INDICATED ON DRAWINGS OR COMPARABLE PRODUCTS COMPLIANT WITH REQUIREMENTS OF THE PRODUCTS SPECIFIED.

C. PROTECTIVE SHIELDING GUARDS
1. PROTECTIVE SHIELDING PIPE COVERS:
   a. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
      1) ENGINEERED BRASS CO.
      2) INSUL-TECT PRODUCTS CO.; A SUBSIDIARY OF MVG MOLDED PRODUCTS.
      3) MCGUIRE MANUFACTURING CO., INC.
      4) PLUMBEREX SPECIALTY PRODUCTS INC.
      5) TCI PRODUCTS.
      6) TRUEBRO, INC.
      7) ZURN PLUMBING PRODUCTS GROUP; TUBULAR BRASS PLUMBING PRODUCTS OPERATION.
   b. DESCRIPTION: MANUFACTURED PLASTIC WRAPS FOR COVERING PLUMBING FIXTURE HOT- AND COLD-WATER SUPPLIES AND TRAP AND DRAIN PIPING. COMPLY WITH AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS.

D. FIXTURE SUPPORTS
1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   a. JOSAM COMPANY.
   b. MIFAB MANUFACTURING INC.
   c. SMITH, JAY R. MFG. CO.
   d. TYLER PIPE; WADE DIV.
   e. WATTS DRAINAGE PRODUCTS INC.; A DIV. OF WATTS INDUSTRIES, INC.
   f. ZURN PLUMBING PRODUCTS GROUP; SPECIFICATION DRAINAGE OPERATION.
2. LAVATORY SUPPORTS:
   a. DESCRIPTION: TYPE II, LAVATORY CARRIER WITH CONCEALED ARMS AND TIE ROD FOR WALL-MOUNTING, LAVATORY-TYPE FIXTURE. INCLUDE STEEL UPRIGHTS WITH FEET.
   b. ACCESSIBLE-FIXTURE SUPPORT: INCLUDE RECTANGULAR STEEL UPRIGHTS.
3. WATER COOLER SUPPORTS:
   a. DESCRIPTION: ASME A112.6.1M, WATER COOLER CARRIERS. INCLUDE VERTICAL, STEEL UPRIGHTS WITH FEET AND TIE RODS AND BEARING PLATES WITH MOUNTING STUDS MATCHING FIXTURE TO BE SUPPORTED.
      1) TYPE I: HANGER-TYPE CARRIER WITH TWO VERTICAL UPRIGHTS.
      2) TYPE II: BILEVEL, HANGER-TYPE CARRIER WITH THREE VERTICAL UPRIGHTS.

E. INSTALLATION
1. ASSEMBLE PLUMBING FIXTURES, TRIM, FITTINGS, AND OTHER COMPONENTS ACCORDING TO MANUFACTURERS' WRITTEN INSTRUCTIONS.
2. INSTALL OFF-FLOOR SUPPORTS, AFFIXED TO BUILDING SUBSTRATE, FOR WALL-MOUNTING FIXTURES.
   a. USE CARRIER SUPPORTS WITH WASTE FITTING AND SEAL FOR BACK-OUTLET FIXTURES.
   b. USE CARRIER SUPPORTS WITHOUT WASTE FITTING FOR FIXTURES WITH TUBULAR WASTE PIPING.
   c. USE CHAIR-TYPE CARRIER SUPPORTS WITH RECTANGULAR STEEL UPRIGHTS FOR ACCESSIBLE FIXTURES.
3. INSTALL FLOOR-MOUNTING FIXTURES ON CLOSET FLANGES OR OTHER ATTACHMENTS TO PIPING OR BUILDING SUBSTRATE.
4. INSTALL WALL-MOUNTING FIXTURES WITH TUBULAR WASTE PIPING ATTACHED TO SUPPORTS.
5. INSTALL COUNTER-MOUNTING FIXTURES IN AND ATTACHED TO CASEWORK.
6. INSTALL FIXTURES LEVEL AND PLUMB ACCORDING TO ROUGHING-IN DRAWINGS.
7. INSTALL WATER-SUPPLY PIPING WITH STOP ON EACH SUPPLY TO EACH FIXTURE TO BE CONNECTED TO WATER DISTRIBUTION PIPING. ATTACH SUPPLIES TO SUPPORTS OR SUBSTRATE WITHIN PIPE SPACES BEHIND FIXTURES. INSTALL STOPS IN LOCATIONS WHERE THEY CAN BE EASILY REACHED FOR OPERATION.
   a. EXCEPTION: USE BALL, GATE, OR GLOBE VALVES IF SUPPLY STOPS ARE NOT SPECIFIED WITH FIXTURE.
10. INSTALL TRAP AND TUBULAR WASTE PIPING ON DRAIN OUTLET OF EACH FIXTURE TO BE DIRECTLY CONNECTED TO SANITARY DRAINAGE SYSTEM.
11. INSTALL TUBULAR WASTE PIPING ON DRAIN OUTLET OF EACH FIXTURE TO BE INDIRECTLY CONNECTED TO DRAINAGE SYSTEM.
12. INSTALL TANKS FOR ACCESSIBLE, TANK-TYPE WATER CLOSETS WITH LEVER HANDLE MOUNTED ON WIDE SIDE OF COMPARTMENT.
13. INSTALL



1 P2.1 **PARTIAL PLAN - SANITARY**

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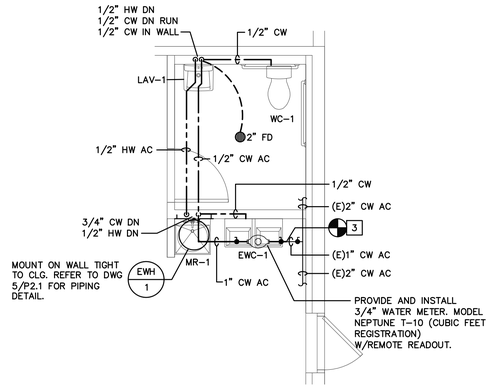

2 P2.1 **PARTIAL PLAN - DOMESTIC WATER**

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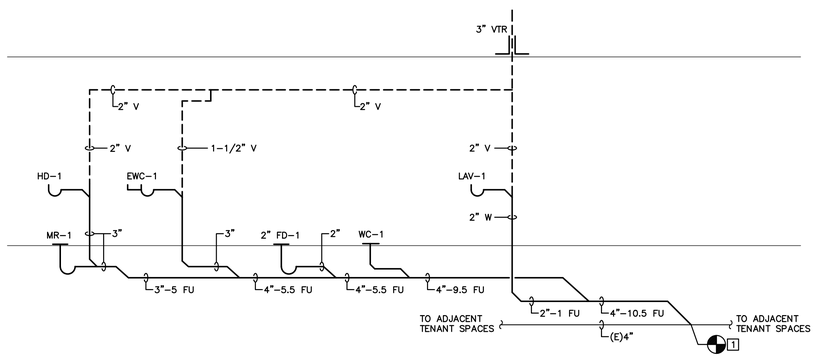
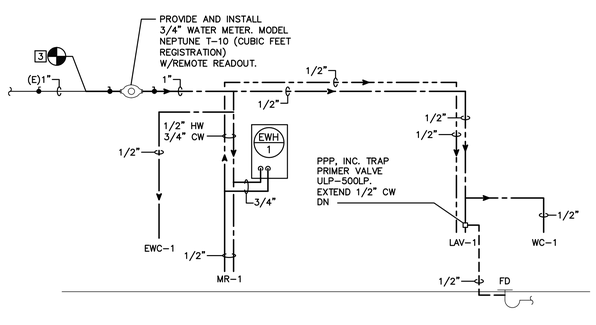


3 P2.1 **SANITARY RISER DIAGRAM**

SCALE: N.T.S.



4 P2.1 **DOMESTIC WATER RISER DIAGRAM**

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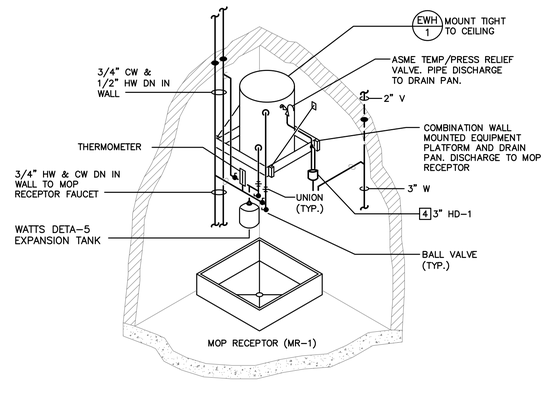


5 P2.1 **WATER HEATER PIPING DIAGRAM**

SCALE: N.T.S.

PLUMBING PIPE AND FITTING SCHEDULE

System	Diameter inches	Material	Pipe Designation	Schedule	Fitting		Joint	Remarks
					Material	Pressure		
SANITARY & WASTE	1-1/4"-1/2"	COPPER	ASTM B88	DWV	DWV	DRAINAGE	SOLDER	
VENT	2" & LARGER	CAST IRON	ASTM A74	STD. WEIGHT	CAST IRON	DRAINAGE	NOTE 1	NOTE 1
DOMESTIC WATER	ALL	COPPER	ASTM B88	TYPE L	WROT COPPER	125#	SOLDER	ABOVE GRADE
	1/2"-3/4"	COPPER	ASTM B88	TYPE K	WROT COPPER	125#	SOLDER	BELOW GRADE

NOTE 1: IN ACCORDANCE WITH CODES AND AUTHORITIES HAVING JURISDICTION.

PLUMBING INSULATION SCHEDULE

Item	Manufacturer	Type	Jacket	Thickness	Remarks
DOMESTIC HW & CW PIPING	OWENS-CORNING # 25 ASJ/SSC	MINERAL FIBER	ALL PURPOSE	1"	NOTE 1

NOTE 1: ALL CW FITTINGS, VALVES & SPECIALTIES SHALL BE INSULATED SAME AS PIPING.

PLUMBING FIXTURE SCHEDULE

Symbol	Model Number	Faucet/Valve	Trim/Seat	Remarks
WC-1	2467.016	–	BEMIS 1955SSFR	
LAV-1	0355.012	SYMMONS S-20-G	TRUEBRO LAV-1 GUARD2	WATTS LFUSG-B M3 TEMPERING VALVE
MR-1	FIAT MSB2424	FIAT 830-AA		WITH FIAT E-77-A, MSG2424, 889-CC & 832-AA
EWC-1	ELKAY LZSTLG8WSSK	–		WITH BOTTLE FILLER

NOTE 1: FIXTURES BASED ON AMERICAN STANDARD UNLESS OTHERWISE NOTED.

NOTE 2: REFER TO ARCHITECTURAL PLANS FOR LOCATION OF FIXTURES TO BE DESIGNATED BARRIER FREE.

NOTE 3: REFER TO ARCHITECTURAL PLANS FOR FIXTURE MOUNTING HEIGHTS

ELECTRIC WATER HEATER SCHEDULE — EWH

No.	Gallon	Recovery @ 90°F	KW	Volts	Phase	Manufacturer & Model No.	Remarks
1	19	7 GPH	1.5	120	1	BRADFORD WHITE LE120U3-1	SET TEMPERATURE @ 120°F MAX. PROVIDE HOLDRITE QUICK STAND #30-SWHP-WM WALL MOUNTED EQUIPMENT PLATFORM.

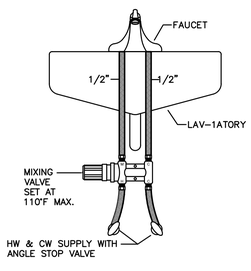
FLOOR DRAINS — FD

Type	Function	Manufacturer & Model No.	Remarks
FD-1	FLOOR DRAIN	JAY R. SMITH 2005-P050	W/1/2" PRIMER TAP
HD-1	HUB DRAIN	JAY R. SMITH 9654	TYPE 304 STAINLESS STEEL. W/SURE SEAL TRAP SEAL PROTECTOR SS4009V

PLUMBING FIXTURE RUNOUT SCHEDULE

Fixture	Symbol	Waste	Cold Water	Hot Water	Remarks
WATER CLOSET	WC-1	4"	1/2"	–	
LAVATORY	LAV-1	1-1/4"	1/2"	1/2"	NOTE 1
MOP RECEPTOR	MR-1	3"	1/2"	1/2"	
WATER COOLER	EWC-1	1-1/4"	1/2"	–	NOTE 1
FLOOR DRAIN	FD-1	2"	–	–	
HUB DRAIN	HD-1	3"	–	–	

NOTE 1: 2" FOR DRAINS BELOW GRADE.



6 P2.1 **MIXING VALVE UNDER LAVATORY**

SCALE: N.T.S.

KEY NOTES

1. CONNECT NEW 4" S. TO EXISTING 4" SANITARY LINE. VERIFY EXACT LOCATION AND CONNECTION POINT IN FIELD.
2. NEW 3" V. THROUGH ROOF. VERIFY EXACT LOCATION IN FIELD.
3. CONNECT NEW 3/4" CW TO EXISTING COLD WATER LINE. VERIFY EXACT LOCATION AND CONNECTION POINT IN FIELD. PROVIDE WATER METER AND BACKFLOW PREVENTER AS REQUIRED.
4. 3" HUB DRAIN (HD-1) SHALL BE TRAPPED AND INSTALLED 36" ABOVE THE MOP RECEPTOR. T&P RELIEF VALVE AND WATER HEATER DRAIN PAN SHALL INDEPENDENTLY DRAIN TO THE HUB DRAIN WITH AIR GAP.

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PLUMBING PLAN — P2.1

AS NOTED (scale) | 05/12/25 (date)

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FIRE PROTECTION SYMBOLS

- SPRINKLER BRANCH PIPE
- DS — DRY PIPE SPRINKLER SYSTEM
- DR — DRAIN RISER
- F — FIRE MAIN, DISTRIBUTION PIPING
- PS — PREACTION SPRINKLER SYSTEM
- WSP — WET STANDPIPE SYSTEM
- SP — WET SPRINKLER SYSTEM
- DIRECTION OF FLOW
- PIPING TO BE DEMOLISHED
- PIPE DROP
- PIPE RISE
- SYSTEM CONTROL VALVE
- CHECK VALVE
- DOUBLE CHECK BACKFLOW PREVENTER
- WATER FLOW SWITCH
- DRAIN AND TEST VALVES/FITTINGS
- STORZ CONNECTION
- 2-1/2" X 2-1/2" FIRE DEPARTMENT CONNECTION
- 2-1/2" X 2-1/2" X 2-1/2" FIRE DEPARTMENT CONNECTION
- ANGLE VALVE / FIRE HOSE VALVE (SIZE AS INDICATED)
- DRY STANDPIPE RISER
- WET STANDPIPE RISER
- DRAIN RISER
- RECESSED CABINET (FEC), (FHC). (FHCC), (FHEC), OR (FHVC)
- SEMI-RECESSED CABINET (FEC), (FHC), (FHCC), (FHEC), OR (FHVC) SURFACE
- MOUNTED CABINET (FEC), (FHC), (FHCC), (FHEC), OR (FHVC)
- PRESSURE GAUGE
- CHECK VALVE WITH BALL DRIP
- RPZ BACKFLOW PREVENTER
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- PRESSURE DETECTOR
- ALARM CHECK VALVE
- DRY PIPE VALVE
- DELUGE VALVE
- PREACTION VALVE
- KEY OPERATED VALVE
- INDICATING BUTTERFLY VALVE
- INDICATING GATE VALVE
- WAFER CHECK VALVE
- FLUSH MOUNTED (FDC) OR (WH)
- SURFACE MOUNTED (FDC) OR (WH)
- SIDEWALK MOUNTED FIRE DEPARTMENT CONNECTION OR TEST HEADER
- SURFACE MOUNTED ROOF HYDRANT ROOF TEST HEADER
- ROOF MOUNTED HYDRANT
- OUTSIDE SCREW & YOKE VALVE
- BALL DRIP VALVE
- YARD HYDRANT
- PIV — POST INDICATOR VALVE
- WPIV — WALL POST INDICATOR VALVE
- PRESSURE RECORDER
- SPRINKLER VALVE (PLAN)
- WET PIPE SPRINKLER VALVE (ELEVATION)
- DRY PIPE SPRINKLER VALVE (ELEVATION)
- DELUGE SPRINKLER VALVE (ELEVATION)
- PREACTION SPRINKLER DELUGE VALVE (ELEVATION)
- PREACTION CONTROL PANEL
- WATER MOTOR GONG
- ELECTRIC ALARM BELL
- NAS — NO AUTOMATIC SPRINKLERS
- CLEAN AGENT STORAGE CONTAINER
- PIPE HANGER
- PUMP

FIRE PROTECTION DRAWING LIST

FP-0.1 FIRE PROTECTION COVER SHEET
FP-1.1 FIRE PROTECTION SPECIFICATIONS
FP-2.1 FIRE PROTECTION FLOOR PLANS

NOTE:

NOT ALL SYMBOLS AND ABBREVIATIONS INDICATED APPEAR ON THESE DOCUMENTS.

APPLICABLE CODES:

2018 INTERNATIONAL BUILDING CODE
NFPA-13, INSTALLATION OF SPRINKLER SYSTEMS, 2015 EDITION

FIRE PROTECTION COORDINATION NOTES

1. FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR FULL COORDINATION OF SPRINKLER DRAWINGS WITH ALL OTHER CONTRACTORS AND TRADES (ARCHITECTURAL, STRUCTURAL, SHEET METAL, HVAC, MECHANICAL, PLUMBING, FIRE ALARM, SPECIAL SYSTEMS, INTERIOR DESIGN, AND ELECTRICAL) FOR INTERFERENCE BEFORE COMMENCING THE INSTALLATION.
2. SHOP DRAWINGS SHALL SHOW ELEVATIONS, CEILING HEIGHT, LIGHTS, DIFFUSERS, HYDRAULIC NODES, PIPE DIMENSIONS AND SIZES. THE COORDINATED DRAWINGS SHALL BE FULLY SIGNED OFF BY EACH TRADE BEFORE THE INSTALLATION.
3. CONTRACTOR SHALL SUBMIT COORDINATED SHOP DRAWINGS TO ARCHITECT FOR REVIEW. DRAWINGS WILL NOT BE REVIEWED IF IT IS NOT COORDINATED AND SIGNED OFF BY EACH TRADE.

FIRE PROTECTION GENERAL NOTES

1. THE FIRE PROTECTION SYSTEM SHALL BE DESIGNED AND INSTALLED AS PER APPLICABLE NFPA CODES, LOCAL CODES, ALL AUTHORITIES HAVING JURISDICTION AND INFORMATION PROVIDED ON THESE DOCUMENTS. THE COMPLETE SYSTEM WITH BRANCH PIPE, RISERS, MAINS, SPRINKLERS AND ALL NECESSARY EQUIPMENT SHALL BE APPROVED BY ALL AUTHORITIES HAVING JURISDICTION & OWNER'S INSURANCE COMPANY.
2. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES FOR INTERFERENCE BEFORE COMMENCING THE INSTALLATION. ALL EXPOSED PIPES SHALL BE AS HIGH AS POSSIBLE TO THE CEILING OR IF RUN ALONG THE WALL, SHALL BE KEPT HIGH AND TIGHT TO THE WALL TO AVOID ANY PERSONAL INJURY. FINAL PIPE LOCATION MUST BE APPROVED BY ARCHITECT.
3. PROVIDE SLEEVES FOR PIPE PENETRATION THRU WALLS AND/OR SLABS. ALL SPACING BETWEEN PIPING AND PENETRATION AT FLOOR SLABS AND WALLS SHALL BE PACKED WITH UL/FM LISTED MATERIAL EQUAL TO RATINGS OF FLOORS AND WALLS. ALL PENETRATION FIRE STOP SYSTEMS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND COMPLY WITH ALL REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.
4. PIPING AS SHOWN IS DIAGRAMMATIC AND THE PIPE LOCATION SHOWN MAY NOT BE FINAL DUE TO COORDINATION WITH OTHER TRADES. FINAL PIPE LOCATION SHALL BE DETERMINED IN THE FIELD AND THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ALL REQUIRED CHANGES AT NO EXTRA COST. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND COORDINATE WITH ARCHITECT FOR EXACT LOCATION OF PIPE, SPRINKLERS AND FIRE EQUIPMENT.
5. ALL DRAINS SHALL BE DISCHARGED TO OUTSIDE THE BUILDING OR TO FLOOR DRAINS. PROVIDE DRAINS AT ALL LOW POINTS AS PER NFPA 13-2013. ALL DRAINS SHALL BE DISCHARGED TO AN APPROVED LOCATION.
6. CUTTING, PATCHING AND REPAIR WORK IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
7. CONTRACTOR TO COORDINATE SPRINKLER LOCATION WITH LIGHTS, DUCTS AND OTHER OBSTRUCTIONS AS PER NFPA 13-2013 AND PROVIDE ADDITIONAL SPRINKLERS AS REQUIRED. PROVIDE SPRINKLERS UNDER DUCT AS PER NFPA 13-2013.
8. GUARDS AND SHIELDS ON SPRINKLERS SHALL BE PROVIDED AS PER NFPA 13-2013. PROVIDE SPRINKLERS UNDER DUCT WHERE REQUIRED AS PER NFPA 13-2013.
9. SPRINKLERS INDICATED ARE FOR GENERAL ARRANGEMENT ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE APPLICABLE CODE REQUIREMENTS FOR THE NUMBER OF SPRINKLERS AND SIZING OF FIRE PROTECTION SYSTEM. CONTRACTOR, AT HIS OPTION, MAY PROVIDE A TREE, GRID OR LOOP SYSTEM, PROVIDED THE REQUIREMENTS OF THE DESIGN CRITERIA ARE MET.
10. SPRINKLERS SHALL BE LOCATED IN CENTER OF TILE OF 2'X2' OR 2'X4' CEILING TILE.
11. PROVIDE STANDARD METAL SIGNS AND IDENTIFICATION IN ACCORDANCE WITH NFPA 13-2013 AND AHJ'S.

FIRE PROTECTION ABBREVIATIONS

ACV	ALARM CHECK VALVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ASSY	ASSEMBLY
BFG	BELOW FINISHED GRADE
BFP	BACKFLOW PREVENTER
BV	BUTTERFLY VALVE
CFM	CUBIC FEET PER MINUTE
CA	CLEAN AGENT
CL	CENTER LINE
CLG	CEILING
COMP	COMPRESSOR
CO2	CARBON DIOXIDE
CV	CHECK VALVE
DL	DRY CHEMICAL
DIPS	DOUBLE INTERLOCKED PREACTION SYSTEM
DN	DOWN
DR	DRAIN RISER
DSP	DRY STANDPIPE
DS	DRY SPRINKLER SYSTEM
(E)	EXISTING
ESFR	EARLY SUPPRESSION FAST RESPONSE
(ER)	EXISTING TO BE RELOCATED
(F)	FUTURE
°F	DEGREES FAHRENHEIT
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FDV	FIRE DEPARTMENT VALVE
FDVC	FIRE DEPARTMENT VALVE CABINET
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FFD	FUNNEL FLOOR DRAIN
FH	FIRE HYDRANT
FP	FIRE PUMP
FPC	FIRE PUMP CONTROLLER
FS	FLOW SWITCH
GPM	GALLONS PER MINUTE
GV	GATE VALVE
HD	HEAT DETECTOR
HC	HOSE CABINET
HP	HORSE POWER
IW	INDIRECT WASTE
JP	JOCKEY PUMP
JPC	JOCKEY PUMP CONTROLLER
MAX	MAXIMUM
MS	MOP SINK
MIN.	MINIMUM
MIO. MTD	MOUNTED
(N)	NEW
NAS	NO AUTOMATIC SPRINKLERS
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NRS	NON-RISING STEM VALVE
NTS	NOT TO SCALE
OC	ON CENTER
OS&Y	OUTSIDE SCREW & YOKE VALVE
PC	PLUMBING CONTRACTOR
PIV	POST INDICATOR VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PR	PREACTION SPRINKLER SYSTEM
PS	PULL STATION
QR	QUICK RESPONSE
(R)	EXISTING TO BE REMOVED
RA	ROOF ACCESS
RPM	REVOLUTIONS PER MINUTE
SIPS	SINGLE INTERLOCKED PREACTION SYSTEM
SD	SMOKE DETECTOR
SF	SQUARE FEET FOOT
SP	STAND PIPE
SPKR	SPRINKLER
TH	TEST HEADER
TS	TAMPER SWITCH
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
WB	WATERFLOW BELL
WCV	WAFER CHECK VALVE
WF	WATER FLOW DETECTOR/SWITCH
WH	WALL HYDRANT
WM	WATER MIST
WSP	WATER STANDPIPE
WS	WET SPRINKLER SYSTEM
WT	WATER TANK
ZV	SPRINKLER ZONE VALVE

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FIRE PROTECTION COVER SHEEET

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SECTION 211000 FIRE PROTECTION SYSTEM

PART 1 – GENERAL 1.01 DESCRIPTION

1.01 DESCRIPTION

A. GENERAL INFORMATION:
   1. THE OTHER CONTRACT DOCUMENTS COMPLEMENT THE REQUIREMENTS OF THIS SECTION.
   2. REQUIREMENTS OF DIVISION 0 AND DIVISION 1 APPLY TO THE WORK OF THIS SECTION.

1.02 WORK INCLUDED

A. INSIDE AND OUTSIDE PIPING, INCLUDING SPRINKLER HEADS, VALVES, HANGERS AND SUPPORTS, SLEEVES, AND ACCESSORIES.

B. THE DRAWINGS SHOW THE LOCATION OF SOME OF THE COMPONENTS. THE CONTRACTOR SHALL PROVIDE A COMPLETE DESIGN AND INSTALLATION TO PROVIDE SPRINKLER PROTECTION FOR THE AREAS SHOWN CONFORMING TO ALL NFPA 13 REQUIREMENTS AND LOCAL JURISDICTION REQUIREMENTS.
   1. PROVIDE SPRINKLER PROTECTION FOR THE SPACE, INCLUDING COMBUSTIBLE VOID SPACES & CEILING SPACES, AND IN ACCORDANCE WITH NFPA 13 AND LOCAL JURISDICTION REQUIREMENTS.

1.03 QUALITY ASSURANCE

A. THIS SHALL BE A DESIGN BUILD FIRE SUPPRESSION SYSTEMS FOR THIS PROJECT.

B. THIS INSTALLATION SHALL BE PROVIDED BY CERTIFIED SPRINKLER CONTRACTOR TO PROVIDE A DESIGN BUILD FIRE SUPPRESSION SYSTEM. DESIGN BUILD CONTRACTOR SHALL PROVIDE ALL NECESSARY DRAWINGS AND CALCULATIONS TO THE AUTHORITIES HAVING JURISDICTION (AHJ) AND THE OWNER'S INSURANCE CO. AND ENGINEER. ARCHITECT SHALL REVIEW FOR APPEARANCE ONLY. CONTRACTOR SHALL PROVIDE CONSTRUCTION MANAGER A COMPLETE SET OF RECORD DOCUMENTS, SHOP DRAWINGS AND MAINTENANCE MANUALS FOR THE OWNERS RECORDS.

C. THE SPRINKLER DRAWINGS INDICATE GENERAL SPRINKLER LOCATIONS, BUT THE DESIGN BUILD CONTRACTOR SHALL VERIFY TOTAL SPRINKLERS REQUIRED BASED ON THEIR CALCULATION AND LOCAL CODE.

D. THE GENERAL CONTRACTOR AND THE SPRINKLER SUB-CONTRACTOR SHALL MEET WITH THE LOCAL BUILDING DEPARTMENT AND FIRE DEPARTMENT TO REVIEW PROCEDURES FOR HANDLING SUBMITTALS, INSPECTION, TESTING, AND FOR GENERAL COORDINATION.

E. PROVIDE ARCHITECT WITH A LETTER OF APPROVAL FROM THE FIRE MARSHAL AFTER INSTALLATION IS COMPLETE.

F. THE EXISTING SPRINKLER SYSTEM SHALL BE MODIFIED BY THE CONTRACTOR THROUGHOUT THE SPACE. WARRANTY THE SUITABILITY OF HEAD LOCATION OR BRANCH PIPE SIZING IN THE PREMISES IS NOT WARRANTY FOR AT&T USE. THE CONTRACTOR SHALL MODIFY THE EXISTING SPRINKLER SYSTEM THROUGHOUT THE ENTIRE PREMISES AS REQUIRED TO ACHIEVE THE PROPER SPRINKLER COVERAGE REQUIRED BY THIS CRITERIA AND CODE.

G. THE GENERAL CONTRACTOR SHALL BE REQUIRED TO CONTRACT WITH THE LANDLORD'S DESIGNATED SPRINKLER CONTRACTOR ONLY FOR ALL FIRE PROTECTION WORK WHERE REQUIRED BY LEASED SPACE CRITERIA

1.04 REFERENCE STANDARDS

A. NFPA STANDARD NO. 13, CURRENT EDITION: SPRINKLER SYSTEMS.

B. UNDERWRITERS LABORATORIES APPROVED FIRE PROTECTION EQUIPMENT LIST.

1.05 SUBMITTALS

A. SUBMIT PRELIMINARY LAYOUT SHOWING ONLY HEAD LOCATIONS FOR REVIEW BY ARCHITECT/ENGINEER. FURNISH ADDITIONAL HEADS WHICH MAY BE REQUIRED FOR COORDINATED CEILING PATTERN WITHOUT ADDED COST, EVEN THOUGH NUMBER OF HEADS MAY EXCEED MINIMUM CODE REQUIREMENTS.

B. SUBMIT SHOP DRAWINGS STAMPED BY A LICENSED INDIVIDUAL (MINIMUM OF NICET LEVEL III OR REGISTERED FIRE PROTECTION ENGINEER) OF THE ENTIRE SPRINKLER SYSTEM, FOR REVIEW BY ARCHITECT FOR HEAD LOCATIONS. AFTER ARCHITECTS COMMENTS HAVE BEEN ADDRESSED SUBMIT SHOP DRAWINGS TO BUILDING DEPARTMENT/FIRE MARSHAL FOR APPROVAL. COMPLETION OF SHOP DRAWINGS SHALL BE DONE SO THAT FIRE MARSHAL CAN REVIEW FIRE ALARM SHOP DRAWINGS WITH FIRE SPRINKLER SHOP DRAWINGS. COORDINATE AS REQUIRED WITH FIRE ALARM SUB-CONTRACTOR.

C. OBTAIN AND SUBMIT FROM EACH AUTHORITY HAVING JURISDICTION WRITTEN CERTIFICATION THAT THE PERMANENT INSTALLATION HAS BEEN INSPECTED BY THE AUTHORITY AND THAT IT COMPLIES WITH ALL DETAILS OF THE AUTHORITY'S PUBLISHED REGULATIONS AND REQUIREMENTS.

D. SUBMIT FOUR COPIES OF NFPA RECOMMENDED PRACTICE NO. 13A: CARE AND MAINTENANCE OF SPRINKLER SYSTEMS.

1.06 ADDITIONS OR DELETIONS

A. NO CHANGE ORDERS WILL BE ISSUED FOR ADDITIONS OR DELETIONS OF SPRINKLERS EXCEPT AS SUCH ADDITIONS OR DELETIONS STEM FROM CHANGES IN BUILDING CONSTRUCTION MADE SUBSEQUENT TO APPROVAL OF SPRINKLER SYSTEM SHOP DRAWINGS.

1.07 SYSTEM DESIGN

A. GENERAL: DESIGN AND INSTALL SYSTEMS SO THAT NO PARTS INTERFERE WITH DOORS, WINDOWS, HEATING, PLUMBING, AIR-CONDITIONING SYSTEMS, OR ELECTRICAL EQUIPMENT. COMPLY WITH REQUIREMENTS OF NFPA NO. 13. SPRINKLER SUB-CONTRACTOR IS REQUIRED TO FULLY COORDINATE SPRINKLER WORK WITH ALL OTHER TRADES. PIPING SHALL NOT RUN OVER TOP OF ELECTRICAL PANELS OR SWITCH GEAR.

B. HYDRAULIC CALCULATIONS: PREPARE IN ACCORDANCE WITH CHAPTER 7 OF NFPA NO. 13.

   1. SPRINKLER SYSTEM DESIGN SHALL BE BASED ON ORDINARY HAZARD GROUP II OCCUPANCY CLASSIFICATION OR THE CODE REQUIREMENT IF SUCH A CODE IS MORE STRINGENT. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY CALCULATED WITH FLOW AND PRESSURE REQUIREMENTS SHOWN. DESIGN SHALL BE BASED ON THE COVERAGE NOTED BELOW, SUBJECT TO APPROVAL OF DESIGN BY LANDLORD'S FIRE INSURANCE UNDERWRITER AND LOCAL CODES. CALCULATED SPRINKLER SYSTEM SHALL BE DESIGNED FOR NO MORE THAN NINETY PERCENT (90%) OF THE WATER SUPPLY CURVE.

C. SYSTEM LAYOUT:
   1. SPACE, LOCATE, AND POSITION SPRINKLER HEADS ACCORDING TO NFPA NO. 13 AND AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY LOCAL FIRE DEPARTMENT AND BUILDING DEPARTMENT.

   2. PIPE SIZES AND CONFIGURATIONS SHALL BE ON THE BASIS OF HYDRAULIC CALCULATIONS.

   3. PROVIDE RISERS, FLOW SWITCHES, INSIDE SHUT-OFF VALVES, TAMPER SWITCHES, POST INDICATOR VALVES, BACK FLOW PREVENTERS AND VAULTS, ETC., AS REQUIRED.

   4. PROVIDE ALL TAMPER SWITCHES, VALVES, ETC. REQUIRED. THE SYSTEM SHALL HAVE CONTROL STATION SUPERVISION.

D. EXISTING SYSTEM INTERFACE:

   1. WHERE INTERFACING WITH EXISTING SYSTEMS, THE COMPLETE (EXISTING & NEW) MUST BE IN CONFORMANCE WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION .

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. MANUFACTURER OF EQUIPMENT SPECIFIED IN THIS SECTION SHALL BE REGULARLY ENGAGED IN THE MANUFACTURE OF COMPONENTS SPECIFIED AND SHALL PUBLISH CATALOGS LISTING ALL PERTINENT SPECIFICATIONS OF ITEMS MANUFACTURED.

B. MANUFACTURERS NAME AND MODEL IDENTIFICATION USED THROUGHOUT THIS SECTION IS TO ESTABLISH GENERAL CONFIGURATION, FUNCTION, SIZE, PERFORMANCE AND QUALITY.

C. ALL EQUIPMENT, MATERIAL, AND COMPONENTS SHALL BE U.L. LISTED OR APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

D. SUBSTITUTIONS: ITEMS OF SAME FUNCTION AND PERFORMANCE ARE ACCEPTABLE IN CONFORMANCE WITH SECTION "SUBSTITUTION"

2.02 SPRINKLER HEADS

A. OPERATING TEMPERATURE: PER NFPA 13. SELECT TO COMPENSATE FOR THE MAXIMUM TEMPERATURES WHICH OCCUR IN A PARTICULAR AREA DURING EITHER WINTER OR SUMMER CONDITIONS FROM SUCH SOURCES AS UNIT HEATERS AND SUNLIGHT.

B. EXTENDED COVERAGE SPRINKLERS MAY BE USED SUBJECT TO AUTHORITY HAVING JURISDICTION.

2.03 ESCUTCHEONS

A. PROVIDE SELF-ADJUSTING TYPE, SPRING-LOADED, OR FRICTION FIT ON EACH PENDANT SPRINKLER HEAD FITTING AGAINST CEILING.

2.04 SPARE HEADS AND SPRINKLER WRENCHES

A. PROVIDE SPARE HEADS AND ONE SET OF WRENCHES. THE NUMBER OF SPARE HEADS FURNISHED SHALL BE NOT LESS THAN 1 PERCENT OF THE NUMBER OF EACH TYPE OF HEAD INSTALLED IN THE SYSTEM. HEADS AND WRENCHES MOUNTED IN A SHEET METAL CABINET MARKED "AUTOMATIC SPRINKLERS – RESERVE SUPPLY".

PART 3 – EXECUTION

3.01 INSTALLATION

A. RUN PIPING CONCEALED ABOVE FURRED CEILINGS TO MINIMIZE OBSTRUCTIONS. EXPOSE ONLY HEADS. ONLY SPRINKLER PIPING SPECIFICALLY CALLED OUT ON DRAWINGS AS BEING EXPOSED SHALL BE BELOW CEILING CONSTRUCTION. RUN PIPING THROUGH HOLES IN BEAMS WHERE SO NOTED ON DRAWINGS.

B. PROVIDE 1-INCH DIAMETER NIPPLE AND 1 X 1/2-INCH REDUCING FITTING OR EACH UPRIGHT HEAD.

C. INSTALL TEST PIPES PER NFPA AND THE LOCAL INSPECTION AUTHORITY, WITH DISCHARGE PIPE TO A SUITABLE DRAIN. NAMEPLATE LEGEND TO READ "WATER SUPPLY TEST VALVE".

D. REFER TO COORDINATION REQUIREMENTS IN PARAGRAPH 1.07.

E. THE INSTALLER OF THE FIRE PROTECTION (SPRINKLERS) SHALL BE FAMILIAR WITH THE ARCHITECTURAL CONSTRUCTION OF THE BUILDING. THE INSTALLER SHALL REVIEW ALL CONTRACT DOCUMENTS. SPRINKLER PIPING SHALL NOT:

   1. REDUCE HEADROOM TO LESS THAN 7'-0".

   2. PROJECT INTO ANY CATWALK, PASSAGEWAY, LADDER RUN, ACCESS OR EGRESS.

   3. INTERFERE WITH ELECTRICAL EQUIPMENT OR ACCESS TO MECHANICAL UNITS (INCLUDING FILTERS). SPRINKLER PIPING WHICH, IN THE OPINION OF THE ARCHITECT, DOES NOT COMPLY WITH ANY OF THE ABOVE SHALL BE RELOCATED IN A MANNER WHICH IS ACCEPTABLE TO THE ARCHITECT. SUCH RELOCATION MAY BE DIRECTED DURING SHOP DRAWING REVIEW AND/OR DURING CONSTRUCTION. iF DOUBT SHOULD EXIST AS TO THE COMPLIANCE OF THE ABOVE, THE CONTRACTOR OR INSTALLER SHALL REVIEW THE SITUATION WITH THE ARCHITECT PRIOR TO ROUGH-IN.

F. NO FIRE PROTECTION WORK SHALL BE DONE WITHOUT APPROVED SHOP DRAWINGS.

G. BUILDING ATTACHMENTS: CONCRETE INSERTS, POWDER-ACTUATED FASTENERS, OR STRUCTURAL-STEEL FASTENERS APPROPRIATE FOR CONSTRUCTION MATERIALS TO WHICH HANGERS ARE BEING ATTACHED.
   1. WHERE PRACTICAL, INSTALL CONCRETE INSERTS BEFORE PLACING CONCRETE.
   2. INSTALL POWDER-ACTUATED CONCRETE FASTENERS AFTER CONCRETE IS PLACED AND COMPLETELY CURED.
   3. USE POWDER-ACTUATED CONCRETE FASTENERS FOR STANDARD-WEIGHT AGGREGATE CONCRETES OR FOR SLABS MORE THAN 4 INCHES THICK.
   4. DO NOT USE POWDER-ACTUATED CONCRETE FASTENERS FOR LIGHTWEIGHT-AGGREGATE CONCRETES OR FOR SLABS LESS THAN 4 INCHES THICK.
   5. IF REQUIRED, REPAIR DAMAGED CONCRETE TO THE ORIGINAL STRENGTH FROM HANGING OPERATION.

3.02 IDENTIFICATION

A. STANDARD SIGNS AS ADOPTED BY THE AUTOMATIC SPRINKLER INDUSTRY. SUBMIT SHOP DRAWINGS AND SPECIFICATIONS OF SIGNS.
   1. FOR COMBINATION TEST AND DRAIN: LEGEND TO READ "WATER SUPPLY TEST AND DRAIN VALVE".

3.03 TESTING

A. UPON COMPLETION OF THE FIRE SPRINKLER SYSTEM INSTALLATION, TEST AND RETEST THE COMPLETE INSTALLATION AND MAKE ALL CORRECTIONS AS NECESSARY TO SECURE ACCEPTANCE BY THE LOCAL FIRE MARSHAL. FURNISH ALL TEST EQUIPMENT AND PERSONNEL REQUIRED.

3.04 ACCEPTANCE

A. PRIOR TO THE OPENING DATE, INSTRUCT THE OWNERS AND THEIR SELECTED PERSONNEL IN THE OPERATION OF THE SPRINKLER SYSTEM. TAKE SPECIAL CARE TO ENSURE THAT THE OWNER WILL:
   1. IMMEDIATELY RECOGNIZE WHETHER THE MAIN VALVE IS IN OPEN OR CLOSED POSITION.
   2. KNOW HOW TO DRAIN THE SYSTEM.
   3. KNOW HOW TO TEST THE ALARM VALVE.
   4. BE FAMILIAR WITH THE EXISTENCE AND CONTENTS OF THE MATERIAL INCLUDED IN THE OPERATING AND MAINTENANCE MANUAL DESCRIBED HEREIN.

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FIRE PROTECTION SPECIFICATIONS

FP1.1

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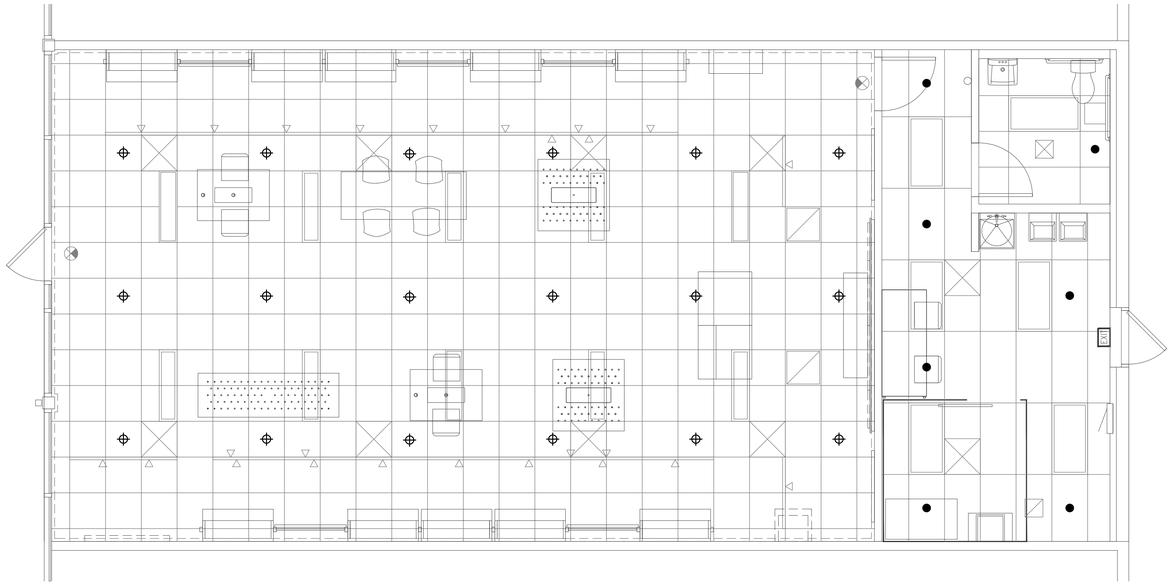

1 FP2.1 **FIRE PROTECTION PLAN**

0 2 4 8

SPRINKLER HEAD SCHEDULE							
Sym.	Area / Ceiling Type	Head Type	Head Finish	Escutcheon Finish	Cap Finish	Manufacturer	Model #
⌖	WHITE SALES FLOOR CEILING (ACT-1)	FLUSH TYPE CONCEALED (165 °F)	PLAIN	BRUSHED CHROME	BRUSHED CHROME (#13504FC/B)	VIKING	HORIZON MIRAGE #VK 462
●	WHITE BACK-OF-HOUSE (ACT-2)	SEMI - RECESSED (165 °F)	PLAIN	WHITE POLYESTER	N/A	VIKING	MICROFAST #VK 302

DESIGN CRITERIA

1. THE FIRE PROTECTION SYSTEM SHALL BE HYDRAULICALLY CALCULATED AS PER NFPA-13 (EDITION BY LOCAL AUTHORITY), ALL AUTHORITIES HAVING JURISDICTION, & LANDLORD'S INSURANCE CO.
2. HAZARD OCCUPANCY: ORDINARY HAZARD GROUP II
   MINIMUM DENSITY - 0.20 GPM PER SQUARE FOOT.
   OVER THE MOST REMOTE 1,500 SQUARE FOOT OR DESIGN DENSITY AS REQUIRED BY LANDLORD'S CRITERIA.
3. ALL PIPE SHALL BE BLACK STEEL SCH 40 PIPE AS PER NFPA-13.
   MAXIMUM VELOCITY IN PIPE SHALL BE 20 FT./SEC.
4. THE CONTRACTOR SHALL SUBMIT THE APPROPRIATE SHOP DRAWING TO THE REVIEWING AGENCY FOR APPROVAL & OBTAINING PERMIT. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE PREPARED BY THIS CONTRACTOR AND SHALL BE SUBMITTED TO ALL AUTHORITIES HAVING JURISDICTION, LANDLORD'S INSURANCE COMPANY. SHOP DRAWINGS SHALL BE SUBMITTED FOR ENGINEER'S REVIEW PRIOR TO FABRICATION OF ALL MATERIAL OR STARTING ANY WORK. SHOP DRAWING SHALL COMPLY WITH NFPA-13, SECTION "PLANS, AND CALCULATIONS." SHOW ELEVATIONS FOR SYSTEM.
5. THE SPRINKLER CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND PROVIDE NECESSARY "SEALS" (NICET OR PROFESSIONAL ENGINEER) ON SHOP DRAWINGS.

GENERAL NOTES

1. THE EXISTING SPRINKLER SYSTEM SHALL BE MODIFIED TO FIT THE LAYOUT OF THE NEW TENANT SPACE.
2. THE FIRE PROTECTION SYSTEM SHALL BE DESIGNED AND INSTALLED AS PER APPLICABLE NFPA CODES, LOCAL CODES, ALL AUTHORITIES HAVING JURISDICTION AND INFORMATION PROVIDED ON DOCUMENTS. THE COMPLETE SYSTEM WITH BRANCH PIPE, RISERS, MAINS, SPRINKLERS AND ALL NECESSARY EQUIPMENT SHALL BE APPROVED BY ALL AUTHORITIES HAVING JURISDICTION, AND THE LANDLORD'S INSURANCE COMPANY.
3. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES (EXISTING & NEW) FOR INTERFERENCE BEFORE COMMENCING THE INSTALLATION. ALL EXPOSED PIPES SHALL BE AS HIGH AS POSSIBLE CLOSE TO THE CEILING OR IF RUN ALONG THE WALL, SHALL BE KEPT HIGH AND TIGHT TO THE WALL TO AVOID ANY PERSONAL INJURY. FINAL PIPE LOCATION MUST BE APPROVED BY ENGINEER/ARCHITECT.
4. PROVIDE SLEEVES FOR PIPE PENETRATION THRU WALLS. ALL SPACING BETWEEN PIPING AND PENETRATION AT WALLS SHALL BE PACKED WITH UL/FM LISTED MATERIAL EQUAL TO RATINGS OF WALLS.
5. ALL DRAINS SHALL BE DISCHARGED TO OUTSIDE THE BUILDING. PROVIDE DRAIN AT ALL LOW POINTS AS PER NFPA-13.
6. PROVIDE STANDARD METAL SIGNS AND IDENTIFICATION IN ACCORDANCE WITH NFPA. 13 AND AUTHORITIES HAVING JURISDICTION.
7. SPRINKLER PIPING SHALL BE CONCEALED. CUTTING, PATCHING AND REPAIR WORK IS THE RESPONSIBILITY OF GENERAL CONTRACTOR. SPRINKLER CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR FOR THIS WORK.
8. FIRE PROTECTION CONTRACTOR SHALL BE APPROVED BY THE LANDLORD.
9. SPRINKLER HEADS SHALL BE CENTERED IN ACOUSTIC TILE AND INSTALLED ABOVE OR BELOW ANY OBSTRUCTIONS THAT INTERFERE WITH PROPER FIRE SUPPRESSION.

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FIRE PROTECTION PLAN

AS NOTED scale | **05/12/25** date | **FP2.1**

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POWER DEVICE SYMBOLS

- SINGLE RECEPTACLE, NEMA 5–20R
- IG — DUPLEX RECEPTACLE, NEMA 5–20R
  - IG ISOLATED GROUND
  - SP TVSS SURGE SUPPRESSOR
- FLOOR BOX WITH DUPLEX RECEPTACLE, NEMA 5–20R
- CEILING MOUNTED DUPLEX RECEPTACLE, NEMA 5–20R
- QUADRUPLEX RECEPTACLE, NEMA 5–20R
- FLOOR BOX WITH QUADRUPLEX RECEPTACLE, NEMA 5–20R
- CEILING MOUNTED QUADRUPLEX RECEPTACLE, NEMA 5–20R
- DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTER
- DUPLEX RECEPTACLE ON EMERGENCY POWER, NEMA 5–20R
- QUADRUPLEX RECEPTACLE ON EMERGENCY POWER, NEMA 5–20R
- 5–20R — NON–LOCKING SPECIAL PURPOSE RECEPTACLE
  - NEMA CONFIGURATION AS INDICATED
- L5–20R — LOCKING SPECIAL PURPOSE RECEPTACLE
  - NEMA CONFIGURATION AS INDICATED
- WALL MOUNTED JUNCTION BOX
- JUNCTION BOX
- PB — PULL BOX
- GS — PUSHBUTTON
  - GS GENERATOR SHUTDOWN
  - ES EMERGENCY STOP
  - PB GENERAL PUSHBUTTON
  - AD ADA ACCESS

POWER EQUIPMENT SYMBOLS

- 5 — MOTOR
  - SIZE AS INDICATED IN HORSEPOWER
- 30A — UNFUSED SAFETY DISCONNECT SWITCH
  - SIZE AS INDICATED IN AMPS
- 30A — FUSED SAFETY DISCONNECT SWITCH
  - SIZE AS INDICATED IN AMPS
- 30A — CIRCUIT BREAKER
  - SIZE AS INDICATED IN AMPS
- 1 — MOTOR STARTER
  - NEMA SIZE AS INDICATED
- 30A — COMBINATION MOTOR STARTER AND CIRCUIT BREAKER
  - SIZE AS INDICATED IN AMPS
- 30A — COMBINATION MOTOR STARTER AND FUSED DISCONNECT SWITCH
  - SIZE AS INDICATED IN AMPS
- ELECTRICAL PANEL – SURFACE MOUNTED
- ELECTRICAL PANEL – FLUSH MOUNTED
- DISTRIBUTION PANEL
- T — TRANSFORMER
- M — ELECTRICAL METER

GROUNDING SYMBOLS

- G — GROUNDING CABLE (EXPOSED)
- GROUNDING CABLE (BURIED OR CONCEALED)
- GB — GROUNDING BUS BAR
- GROUND CONNECTION POINT

CONDUIT AND WIRING SYMBOLS

- LP–7 — BRANCH CIRCUIT CONDUIT & WIRE, HOMERUN TO PANELBOARD
  - PANELBOARD AND CIRCUIT NUMBER INDICATED
- OR — CONDUIT & WIRE OR ITEM RUN AT OR ABOVE ELEVATION SHOWN
- OR — EQUIPMENT ON SAME CIRCUIT BUT SEPARATELY CONTROLLED
- OR — CONDUIT & WIRE OR ITEM RUN BELOW ELEVATION SHOWN, BEHIND OBSTRUCTION, IN SLAB, OR BELOW GRADE
- CONDUIT BENDS TOWARD OBSERVER (UP)
- CONDUIT BENDS AWAY FROM OBSERVER (DOWN)
- CONDUIT STUBBED OUT AND CAPPED FOR FUTURE USE

COMMUNICATIONS SYSTEM SYMBOLS

- TELE/DATA (DOUBLE GANG JUNCTION BOX, W/SINGLE GANG PLASTER RING AND EMPTY 1"C RACEWAY W/PULLSTRING
  - INDICATES FLOOR
  - INDICATES CEILING
  - QUANTITY OF JACKS, ONE IF QUANTITY IS NOT SHOWN
- TELEPHONE (DOUBLE GANG JUNCTION BOX, W/SINGLE GANG PLASTER RING AND EMPTY 1"C RACEWAY W/PULLSTRING
  - INDICATES FLOOR
  - INDICATES CEILING
  - QUANTITY OF JACKS, ONE IF QUANTITY IS NOT SHOWN
- DATA OUTLET (DOUBLE GANG JUNCTION BOX, W/SINGLE GANG PLASTER RING AND EMPTY 1"C RACEWAY W/PULLSTRING
  - INDICATES FLOOR
  - INDICATES CEILING
  - QUANTITY OF JACKS, ONE IF QUANTITY IS NOT SHOWN
- C — F–81 COAXIAL OUTLET (DOUBLE GANG JUNCTION BOX, W/SINGLE GANG PLASTER RING AND EMPTY 1"C RACEWAY W/PULLSTRING, SEE SPECIFICATIONS)
- S, V — SPEAKER
  - V VOICE PAGING ONLY
  - M MUSIC ONLY
  - VM VOICE PAGING AND MUSIC
  - PA PUBLIC ADDRESS

LIGHTING SYMBOLS

- F1 — LIGHT FIXTURE
  - FIXTURE TYPE
- RECESSED OR SURFACE MOUNTED FLUORESCENT FIXTURE
- RECESSED OR SURFACE MOUNTED FLUORESCENT FIXTURE WITH EMERGENCY BALLAST
- INDUSTRIAL, UNDERCOUNTER, STRIP, OR CASEWORK FLUORESCENT FIXTURE
- INDUSTRIAL OR STRIP FLUORESCENT FIXTURE WITH EMERGENCY BALLAST
- INCANDESCENT OR FLUORESCENT DOWNLIGHT FIXTURE
- INCANDESCENT OR FLUORESCENT DOWNLIGHT FIXTURE WITH EMERGENCY BALLAST
- DIRECTIONAL INCANDESCENT OR FLUORESCENT DOWNLIGHT FIXTURE
- INCANDESCENT OR FLUORESCENT WALL OR SURFACE MOUNTED FIXTURE
- INCAND. OR FLUOR. WALL OR SURFACE MOUNTED FIXTURE WITH EMERGENCY BALLAST
- EXIT FIXTURE – CEILING MOUNTED – ARROWS AS INDICATED
- EXIT FIXTURE – WALL OR SURFACE MOUNTED – ARROWS AS INDICATED
- EMERGENCY BATTERY UNIT WITH ADJUSTABLE HEAD(S)
- EMERGENCY BATTERY UNIT FOR REMOTE EMERGENCY FIXTURES
- REMOTE EMERGENCY FIXTURE SINGLE HEAD
- REMOTE EMERGENCY FIXTURES DUAL HEAD
- TRACK SYSTEM WITH INCANDESCENT DOWNLIGHT OR FLOOD LIGHTING
- PC — PHOTOCELL
- S MS — WALL SWITCH
  - SUBSCRIPT:
  - 2 DOUBLE POLE SINGLE THROW SWITCH
  - 3 THREE WAY SWITCH
  - 4 FOUR WAY SWITCH
  - D SINGLE POLE DIMMING SWITCH
  - M MANUAL SWITCH (MOTOR RATED) WITH LOCKOUT DEVICE, WITHOUT OVERLOADS
  - CO SINGLE POLE, CENTER OFF MOMENTARY CONTACT SWITCH
  - TC TIME CONTROL SWITCH
  - MS MOTION SENSOR, AUTOMATIC ON/MANUAL ON, WALL SWITCH
- CORNER MOUNTED MOTION SENSOR
- CEILING MOUNTED MOTION SENSOR
- TC — TIME CLOCK

FIRE ALARM SYSTEM SYMBOLS

- FACP — FIRE ALARM CONTROL PANEL
- FAAP — FIRE ALARM ANNUNCIATOR PANEL
- F — FIRE ALARM MANUAL PULL STATION
- F — FIRE ALARM WALL MOUNTED HORN/STROBE
- F — FIRE ALARM HORN
- F — FIRE ALARM STROBE
- F — FIRE ALARM BELL
- S F — FIRE EVACUATION SPEAKER
- S F — COMBINATION FIRE EVACUATION SPEAKER WITH FIRE ALARM STROBE
- I — FIRE ALARM ADDRESSABLE RELAY
  - I INTERFACE
  - C CONTROL
  - M MONITOR
  - S SIGNAL
- D D — AUTOMATIC DETECTOR
  - D DUCT MOUNTED, SMOKE IONIZATION
  - F THERMAL, FIXED TEMPERATURE
  - PE SMOKE REFRACTION, PHOTO ELECTRIC
  - R THERMAL, RATE OF RISE
  - S AREA SMOKE, IONIZATION
- I — ISOLATION MODULE, TYP.
- C FS — ALARM INITIATING CONTACT
  - FS FLOW SWITCH "ALARM"
  - TR ALARM CHECK VALVE "TROUBLE"
  - TS TAMPER SWITCH "TROUBLE"
  - PS PRESSURE SWITCH

SINGLE LINE DIAGRAM SYMBOLS

- LOAD BREAK SWITCH
- CIRCUIT BREAKER
- DRAWOUT CIRCUIT BREAKER
- DISTRIBUTION TRANSFORMER
- ELECTRICAL METER
- ELECTRICAL METER MAINS
- VOLTAGE TRANSFORMER
- CURRENT TRANSFORMER
- FUSE
- DELTA
- WYE
- ELECTRICAL PANEL

ABBREVIATIONS

AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AMP/A	AMPERE
AT	AMP TRIP
BKR	BREAKER
C/COND	CONDUIT
CB, C/B	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CT	CURRENT TRANSFORMER
CU	COPPER
DEMO	DEMOLITION
DISC	DISCONNECT
DWG	DRAWING
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRICAL
EM	EMERGENCY
EUH	ELECTRIC UNIT HEATER
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFSC	GROUND FAULT SENSING RELAY
G/GND	GROUND
INCAND	INCANDESCENT
IMC	INTERMEDIATED METAL CONDUIT
kVA	KILOVOLT AMPERE
kW	KILOWATT
kWH	KILOWATT HOUR
LTG	LIGHTING
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
P	POLE
PC	PLUMBING CONTRACTOR
PF	POWER FACTOR
PH	PHASE
PL	PILOT LIGHT
PNL	PANEL
PRI	PRIMARY
RECEPT	RECEPTACLE(S)
SIG	SIGNAL
SPEC	SPECIFICATION
ST	SHUNT TRIP
STD	STANDARD
SW	SWITCH
SWGR	SWITCHGEAR
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
V	VOLT
W	WATT
WP	WATERPROOF
XFR	TRANSFER
ø	PHASE

GENERAL NOTES

1. THIS IS A STANDARD SYMBOL LIST. ALL DEVICE SYMBOLS AND ABBREVIATIONS MAY NOT NECESSARILY APPEAR ON THE FLOOR PLANS OR DETAIL SHEET. ONLY THOSE SYMBOLS INDICATED ON THE FLOOR PLANS ARE USED FOR THIS PROJECT. ALL OTHERS ARE TO BE CONSIDERED NOT USED AND SHOULD BE DISREGARDED.
2. REFER TO ELECTRICAL SPECIFICATIONS SECTION 260000.
3. ABBREVATIONS NOT SHOWN ARE DERIVED FROM ASME Y1.1 1989 ABBREVIATIONS FOR USE ON DRAWINGS AND IN TEXT.
4. DIMENSIONS MARKED ± ARE TO BE VERIFIED IN THE FIELD. THOSE MARKED N.T.S. ARE SHOWN NOT TO SCALE, ALL OTHERS ASSUMED TO BE CORRECT AND SHOULD BE CHECKED WITH OTHER TRADE DRAWINGS AND VERIFIED BY THE CONTRACTOR.
5. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND WITH THE LATEST REVISIONS OF THE NATIONAL ELECTRICAL CODE, WITH THE LOCAL CODES WHICH HAVE PRECEDENCE.
6. RUNS ARE SHOWN DIAGRAMMATICALLY ON THE DRAWINGS. EXACT LOCATIONS AND OUTING IS TO BE DETERMINED IN THE FIELD. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL WORK WITH ALL OTHER TRADES.
7. MINIMUM CONDUIT SIZE SHALL BE 3/4" ABOVE GRADE AND 1" BELOW GRADE UNLESS OTHERWISE NOTED.
8. ALL CONDUIT SHALL BE GALVANIZED STEEL ABOVE GRADE AND PVC BELOW GRADE.
9. ALL MOUNTING HARDWARE (PIPE STRAPS, V–BOLTS, ETC.) MUST BE HOT DIPPED GALVANIZED.
10. CONDUIT SHALL BE RUN NEAT AND IN A WORKMAN LIKE MANNER, AT 90 DEGREE ANGLES WERE POSSIBLE.
11. CONDUIT RUNS SHALL BE KEPT AT LEAST 12" FROM STEAM OR OTHER HOT LINES. WHERE CROSSINGS ARE UNAVOIDABLE, CONDUIT SHALL BE KEPT AT LEAST 6" FROM COVERING OF SUCH LINES.
12. ALL LIGHTING FIXTURE ELEVATIONS ARE TAKEN FROM FINISHED FLOOR ELEVATION, PLATFORM ELEVATION OR GRADE TO BOTTOM OF GLOBE.
13. FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE BY FLEXIBLE CONDUIT.
14. INSTRUMENT SIGNAL AND CONTROL WIRES SHALL NOT BE SPLICED.
15. ALL ELECTRICAL WIRES AND CABLES FOR POWER, CONTROL AND INSTRUMENTATION SHALL BE TAGGED AT BOTH ENDS.
16. MULTIPLE "HOME RUN" CIRCUITS MAY BE COMBINED BY THE CONTRACTOR INTO A SINGLE CONDUIT/CABLE USING THE FOLLOWING GUIDELINES:
    - A. NO MORE THAN (6) SINGLE PHASE OR (3) THREE PHASE CIRCUITS MAY BE COMBINED.
    - B. CONDUCTOR AMPACITY SHALL BE ADJUSTED PER N.E.C. TABLE 310.15(B)(3)(a). CONDUCTOR SIZES SHALL BE ADJUSTED AS REQUIRED.
    - C. CONDUITS SIZES MUST BE ADJUSTED TO MAINTAIN A MAXIMUM OF 40% FILL.
    - D. ONLY CIRCUITS ORIGINATING AT A COMMON PANEL, MCC, ETC. MAY BE COMBINED.
    - E. LOW LEVEL SIGNAL CIRCUITS SHALL NOT BE COMBINED WITH ALTERNATING CURRENT CIRCUITS.
17. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY RACEWAY SUPPORTS. SUPPORTS SHALL BE FABRICATED FROM GALVANIZED STEEL STRUCTURAL SHAPES OR UNISTRUT.
18. NEUTRAL AND GROUND CONDUCTORS SHALL BE OF THE SAME AWG AS CURRENT CARRYING CONDUCTORS. (UNLESS OTHERWISE NOTED).
19. GROUNDING AND BONDING OF ELECTRICAL EQUIPMENT AND PIPING SHALL BE IN ACCORDANCE WITH NEC SECTION 250.
20. WIRE AND CABLE
    - A. FEEDER CABLES AND BRANCH CIRCUIT WIRING AT INTERIOR, DRY LOCATIONS, UP TO 500MCM SHALL BE TYPE THWN/THNN THERMOPLASTIC 600 VOLT INSULATED COPPER CONDUCTOR. MINIMUM SIZE IS #12 AWG (#14 MAY BE USED FOR CONTROL CIRCUITS ONLY). ALL UNDERGROUND SERVICE CABLES SHALL HAVE THW – THERMOPLASTIC, 600 VOLT INSULATION COPPER CONDUCTOR.
21. RACEWAYS
    - A. CONDUCTORS SHALL BE INSTALLED IN RGS WHERE SUBJECT TO PHYSICAL DAMAGE, EMT MAY BE USED IN OTHER LOCATIONS AS ALLOWED BY CODE.
22. BRANCH WIRING
    - A. PROVIDE ALL CIRCUITING OF GENERAL, HVAC AND LIGHTING CIRCUITS TO THE PANELS
    - B. ACTUAL CIRCUIT NUMBERS MAY BE ALTERED DURING CONSTRUCTION. HOWEVER, THE DESIGN INTENT MUST BE MAINTAINED. THE EC WILL ACCURATELY REFLECT ALL CIRCUIT NUMBERS ON THE AS–BUILT DRAWINGS.
    - C. BASE BUILDING LIGHTING AND GENERAL CONVENIENCE RECEPTACLE CIRCUITS SHALL BE NETWORKED WITH (3) SINGLE PHASE CONDUCTORS SHARING (1) NEUTRAL CONDUCTOR (4#12 AWG.). ONLY AT 3–PHASE PANELS.
    - D. ALL 120 VOLT, 20 AMP BRANCH WIRING EXCEEDING 120 FEET SHALL BE INCREASED TO #10 AWG.
    - E. TANDEM WIRING OF GFI RECEPTACLES SHALL BE PERMITTED IF INSTALLED PER CODE.

DRAWING LIST

E1.1	ELECTRICAL COVER SHEET
E1.2	ELECTRICAL SPECIFICATIONS – SHEET 1 OF 2
E1.3	ELECTRICAL SPECIFICATIONS – SHEET 2 OF 2
E2.1	POWER PLAN
E2.2	LIGHTING PLAN
E3.1	SINGLE LINE DIAGRAM AND PANEL SCHEDULES
E3.2	COMCHECK

DEMOLITION NOTES

1. CONTRACTOR SHALL SURVEY AND VERIFY EXISTING CONDITIONS PRIOR TO BIDDING AND COMMENCEMENT OF THE WORK.
2. COORDINATE ALL ELECTRICAL DEMOLITION WORK WITH THAT OF OTHER DISCIPLINES AS SHOWN ON ARCHITECTURAL, PLUMBING/FIRE PROTECTION AND MECHANICAL DRAWINGS.
3. THE WORK HEREIN CONSISTS OF PROVIDING EQUIPMENT, MATERIALS, LABOR AND SERVICES, AND PERFORMING OPERATIONS REQUIRED TO DEMOLISH EXISTING ELECTRICAL SYSTEMS SERVING SPACES TO BE RENOVATED. REMOVALS SHOWN ON THE DRAWINGS GIVE GENERAL INDICATION ONLY, AND MAY NOT INDICATE FULL EXTENT OF REMOVALS WHICH ARE REQUIRED TO COMPLETE THE WORK.
4. INCLUDED HEREAFTER, EVEN THOUGH NOT SPECIFICALLY DETAILED OR DESCRIBED, IS THE PROVIDING OF EQUIPMENT, LABOR AND SERVICES TO ENABLE CONTINUED FUNCTIONING OF SERVICES PASSING THROUGH, OR ORIGINATING IN, THIS PROJECT AREA, BUT SERVING AREAS OUTSIDE THE PROJECT AREA WHICH ARE TO REMAIN IN OPERATION.
5. E.C. SHALL BE RESPONSIBLE FOR PROVIDING ALL ELECTRICAL DEMOLITION OF THE EXISTING AREAS AS REQUIRED AND AS DIRECTED BY THE ARCHITECT.
6. E.C. MUST COMPLETELY REMOVE ALL EXISTING DEVICES, WIRING, DEMOLITION. INACTIVE CONDUIT SHALL BE REMOVED AS MUCH AS PRACTICAL AND CAPPED.
7. CONTRACTOR SHALL PROVIDE FOR DEMOLITION AND REROUTE OF EXISTING CONDITIONS THAT MAY IMPEDE CONSTRUCTION OF NEW WORK.
8. WHERE EXISTING ELECTRICAL WORK MUST BE REMOVED, DEVICES AND WIRE SHALL BE COMPLETELY REMOVED BACK TO POINT OF ORIGIN IN ELECTRICAL PANEL.
9. DEMOLITION WORK SHALL BE SUBJECT TO DIRECTION AND APPROVAL OF THE OWNER OR THE OWNER'S REPRESENTATIVE, AND SHALL NOT INTERFERE WITH ACTIVITIES IN OTHER BUILDING AREAS. REMOVED MATERIALS, UNLESS OTHERWISE SPECIFICALLY DESIGNATED, SHALL BE PROMPTLY REMOVED. SHUTDOWNS OR SERVICE INTERRUPTIONS REQUIRED SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER BEFORE THEY ARE IMPLEMENTED. SUFFICIENT ADVANCE NOTICE MUST BE PROVIDED TO THE OWNER.
10. CONTRACTOR SHALL FOLLOW PHASED DEMOLITION AS OUTLINED BY OWNERS REPRESENTATIVE. WHERE DEMOLITION OF ONE PHASE INTERFERES WITH ELECTRICAL SERVICES TO DEVICES AND/OR EQUIPMENT IN ANOTHER PHASE, E.C. SHALL PROVIDE TEMPORARY SERVICES, AS REQUIRED, TO THE AFFECTED EQUIPMENT. ALL TEMPORARY SERVICES SHALL BE APPROVED BY THE OWNER.
11. FIELD VERIFY CIRCUITING TO REMAIN. FOR CIRCUITS FEEDING AREAS BOTH INSIDE AND OUTSIDE CONTRACT AREA, DETERMINE BREAK POINT TO MAINTAIN POWER TO AREA OUTSIDE CONTRACT AREA WHILE DEMOLITION IS COMPLETED.
12. ANY BRANCH CIRCUIT PASSING THROUGH OR TERMINATING WITHIN THE RENOVATED AREA REQUIRING POWER AFTER DEMOLITION SHALL BE POWERED FROM EXISTING OR NEW PANELS, AS DIRECTED BY OWNERS REPRESENTATIVE AT NO ADDITIONAL COST.
13. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.

STANDARD MOUNTING HEIGHTS

9" BELOW FINISHED CEILING	WALL–MOUNTED CLOCKS, PROGRAM BELLS, (OR AS SHOWN ON ARCHITECTURAL DETAILS).
6" ABOVE FIRE HOUSE CABINET	BLUE SIGNAL LIGHT
10'–0"	BATTERY LIGHTING UNITS AND REMOTE WALL MOUNTED LIGHTHEADS (OR 1'–0" BELOW FINISHED CEILING OF TOP OF UNIT)
8'–6"	PENDANT–HUNG INDUSTRIAL AND STRIP LIGHTING FIXTURES
CENTERED ABOVE DOOR OR WINDOW	WARNING AND SIGNALING FIXTURES/SIGNS
6'–8" – TO BOTTOM OF DEVICE	OR 6" BELOW FINISHED CEILING WHICHEVER IS LOWER. FIRE ALARM SIGNAL DEVICES AND ILLUMINATED FIRE SIGNALS.
6'–6"	TOP OF FLUSH AND SURFACE MOUNTED ELECTRICAL LIGHTING OR POWER PANELBOARDS AND TELEPHONE CABINETS.
6'–3"	TOP OF BACK–MOUNTED WALL EXIT FIXTURES (NOT MOUNTED ABOVE DOORS).
6'–0"	TOP OF HIGHEST ELECTRICAL SAFETY DISCONNECT SWITCHES, MAGNETIC STARTERS, CONTACTORS.
4'–0"	WALL MOUNTED ELECTRICAL DEVICE LIGHTING SWITCHES, MANUAL MOTOR STARTERS, THERMOSTATS, WALL–MOUNTED WIREMOLD AND G.F.I. RECEPTACLES IN TOILET ROOMS OR FOR SEPERATE SINKS NOT IN CASEWORK (MAXIMUM SIDE REACH HEIGHT ADA).
3'–6"	FIRE ALARM PULL STATIONS, ADA COMPLIANT DEVICE ROUGH IN.
2'–0"	ELECTRICAL RECEPTACLES WITHIN MECHANICAL SPACES, ELECTRICAL AND ELEVATOR ROOMS.
18"	ELECTRICAL RECEPTACLES, TELEPHONE JACKS, COAXIAL JACKS, AND DATA JACKS FOR DESKS, WALL–MOUNTED WIREMOLD NOT LOCATED ABOVE CASEWORK. (15" MINIMUM TO BOTTOM OF BOX)
00"	FINISHED FLOOR

MOUNTING HEIGHT NOTES

1. DEVICES SHALL BE MOUNTED AT STANDARD MOUNTING HEIGHTS INDICATED ABOVE, UNLESS NOTED OTHERWISE ON PLAN.
2. MOUNTING HEIGHTS TO CENTER OF OUTLETS UNLESS OTHERWISE NOTED. IN MASONRY CONSTRUCTION THE ABOVE MOUNTING HEIGHTS SHALL BE USED FOR REFERENCE TO NEAREST BLOCK OR BRICK COURSING.
3. THE ABOVE MOUNTING HEIGHTS SHALL BE ADHERED TO UNLESS SPECIFICALLY NOTED OR DETAILED OTHERWISE ON THE DRAWING OR SPECIFICATIONS.
4. INDICATION (+) NEXT TO A DEVICE INDICATES THAT DEVICE IS MOUNTED ABOVE A COUNTER OR CASEWORK. COORDINATE WITH ARCHITECTURAL DETAILS AND CASEWORK CONTRACTOR.
5. 3'–6" FOR ADA COMPLIANT DEVICES VERIFY EXACT HEIGHT WITH ARCHITECT PRIOR TO ROUGH IN.

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ELECTRICAL COVER SHEET

AS NOTED — scale | 05/12/25 — date | E1.1

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260501 GENERAL ELECTRICAL

A. GENERAL REQUIREMENTS

1. FURNISH ALL LABOR, MATERIALS, APPARATUS, TOOLS, EQUIPMENT, TRANSPORTATION.

2. TEMPORARY CONSTRUCTION AND SPECIAL OR OCCASIONAL SERVICES AS REQUIRED TO MAKE A COMPLETE WORKING ELECTRICAL INSTALLATION, AS SHOWN ON THE DRAWINGS OR DESCRIBED IN THESE SPECIFICATIONS.

3. WORK INCLUDED:
   a. FURNISH, INSTALL, AND ASSEMBLE LIGHTING FIXTURES AND LAMPS.
   b. GROUNDING.
   c. INSTALLATION OF DUCT SMOKE DETECTORS.
   d. PROVIDE PANELBOARDS AND OVERCURRENT DEVICES.
   e. BRANCH CIRCUIT WIRING.
   f. EXIT SIGNS AND EMERGENCY LIGHTING SYSTEM.
   g. INSTALLATION OF CONVENIENCE OUTLETS.
   h. INSTALLATION OF TELEPHONE AND DATA OUTLETS AND RACEWAYS.
   i. FURNISHING, SUPPORT, AND INSTALLATION OF NEW TRANSFORMER.
   j. ROUGH-IN WIRING FOR DISPLAY CASE LIGHTING.
   k. DEMOLITION AND REMOVALS.
   l. LIGHTING CONTROLS AND TIME SWITCHES. CONNECTIONS OF, AND POWER WIRING TO, HVAC EQUIPMENT.
   m. CONDUIT FOR DATA, TELEPHONE, AND ALARM SYSTEMS.

4. RELATED WORK NOT INCLUDED IN CONTRACT:
   a. INSTALLATION OF PRIMARY AND SECONDARY UTILITY CABLES.
   b. INSTALLATION OF TELEPHONE INSTRUMENTS AND EQUIPMENT.
   c. INSTALLATION OF DATA CABLE OR COMPUTER EQUIPMENT.
   d. INSTALLATION OF SECURITY ALARM EQUIPMENT.

B. CODES AND STANDARDS

1. COMPLY WITH ALL CODES ENFORCED BY THE STATE AND LOCAL JURISDICTIONS.

2. EQUIPMENT AND MATERIALS SPECIFIED UNDER THIS DIVISION SHALL CONFORM TO THE FOLLOWING STANDARDS WHERE APPLICABLE.
   a. UL – UNDERWRITERS' LABORATORIES
   b. ASTM – AMERICAN SOCIETY FOR TESTING MATERIALS
   c. CBM – CERTIFIED BALLAST MANUFACTURERS
   d. ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
   e. NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

C. DRAWINGS:

1. LAYOUT: GENERAL LAYOUT SHOWN ON THE DRAWINGS SHALL BE FOLLOWED EXCEPT WHERE OTHER WORK MAY CONFLICT WITH THE DRAWINGS.

2. ACCURACY:
   b. DRAWINGS FOR THE WORK UNDER THIS SECTION ARE DIAGRAMMATIC AND COMPLETE DETAILS OF THE BUILDING WHICH AFFECT THE ELECTRICAL INSTALLATION ARE NOT SHOWN. COORDINATE WITH DRAWINGS OF ALL OTHER TRADES.
   c. CONTRACTOR SHALL VERIFY LINES, LEVELS, AND DIMENSIONS SHOWN ON THE DRAWINGS AND SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE SETTING OUT OF WORK AND FOR ITS STRICT CONFORMANCE WITH EXISTING CONDITIONS AT THE SITE.

D. SUBSTITUTIONS
1. SUBSTITUTIONS OF SPECIFIED DEVICES AND EQUIPMENT SHALL NOT BE ALLOWED.

E. SUBMITTALS:

1. SUBMITTALS SHALL CONSIST OF DETAILED SHOP DRAWINGS, SPECIFICATIONS, CATALOG "CUTS", AND DATA SHEETS CONTAINING PHYSICAL AND DIMENSIONED INFORMATION, PERFORMANCE DATA, ELECTRICAL CHARACTERISTICS, MATERIALS USED IN FABRICATION, MATERIAL FINISH, AND THOSE OPTIONAL ACCESSORIES WHICH ARE INCLUDED AND THOSE WHICH ARE EXCLUDED.

2. EACH SUBMITTAL SHALL BE THOROUGHLY REVIEWED BY THE CONTRACTOR. THE COVER LETTER ACCOMPANYING SUBMITTAL LETTER SHALL LIST IN FULL THE ITEMS AND DATA SUBMITTED AND SHALL CONTAIN A STATEMENT ACKNOWLEDGING THAT THE CONTRACTOR HAS PERFORMED A DETAILED REVIEW OF THE SUBMITTAL DOCUMENTS PRIOR TO SUBMISSION. FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL CONSTITUTE GROUNDS FOR RETURN OF DATA FOR RESUBMISSION WITHOUT REVIEW.

3. CONTRACTOR AGREES THAT SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS, THAT THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT, THAT HE DEMONSTRATES HIS UNDERSTANDING BY INDICATING WHICH EQUIPMENT AND MATERIAL HE INTENDS TO FURNISH AND INSTALL AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS HE INTENDS TO USE.

F. PRODUCT DELIVERY, STORAGE, AND HANDLING: EQUIPMENT AND MATERIALS SHALL BE PROPERLY STORED AND ADEQUATELY PROTECTED AND CAREFULLY HANDLED TO PREVENT DAMAGE BEFORE AND DURING INSTALLATION. EQUIPMENT AND MATERIALS SHALL BE HANDLED, STORED, AND PROTECTED IN ACCORDANCE WITH THE MANUFACTURERS'S RECOMMENDATIONS AND AS APPROVED BY THE OWNER'S REPRESENTATIVE. ELECTRICAL CONDUIT SHALL BE STORED TO PROVIDE PROTECTION FROM THE WEATHER AND ACCIDENTAL DAMAGE. PLASTIC CONDUIT SHALL BE STORED ON EVEN SUPPORTS AND IN LOCATIONS NOT SUBJECT TO DIRECT SUN RAYS OR EXCESSIVE HEAT. CABLES SHALL BE SEALED, STORED, AND HANDLED CAREFULLY TO AVOID DAMAGE TO THE OUTER COVERING OR INSULATION AND DAMAGE FROM MOISTURE AND WEATHER. DAMAGED OR DEFECTIVE ITEMS, IN THE OPINION OF THE OWNER'S REPRESENTATIVE, SHALL BE REPLACED WITH NEW ITEMS AT THE EXPENSE OF THE CONTRACTOR.

G. PERMITS AND FEES: PROVIDE, PROCURE, AND PAY FOR ALL PERMITS, LICENSES, AND FEES REQUIRED TO CARRY ON AND COMPLETE THE WORK.

H. TESTS:

1. TESTS SHALL BE CONDUCTED DURING THE CONSTRUCTION PERIOD AND AT COMPLETION TO DETERMINE CONFORMITY WITH APPLICABLE CODES AND WITH THESE SPECIFICATIONS. TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE ARCHITECT AND SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   a. INSULATION RESISTANCE: PERFORM 500-VOLT D.C. TESTS FOR ONE MINUTE ON ALL FEEDER CONDUCTORS, INCLUDING THE NEUTRAL, AND MAKE A TYPED RECORD OF ALL READINGS TO BE INCLUDED IN THE MAINTENANCE INSTRUCTIONS. REPAIR OR REPLACE CIRCUITS SHOWING LESS THAN 40MΩ RESISTANCE TO GROUND. MAKE TESTS USING BIDDLE INSULATION RESISTANCE MEGGER, OR EQUAL.
   b. GROUND RESISTANCE: TEST GROUND RESISTANCE PER IEEE STANDARD NO. 81.
   c. CIRCUITS CONTINUITY: TEST ALL FEEDER AND BRANCH FOR CONTINUITY. TEST ALL NEUTRALS FOR IMPROPER GROUNDS.
   d. EQUIPMENT OPERATIONS: TEST LIGHTING CIRCUITS FOR CORRECT OPERATION THROUGH THEIR CONTROL DEVICES. TEST ELECTRIC BASEBOARD HEATERS FOR CORRECT OPERATIONS THROUGH THEIR CONTROL RELAYS/THERMOSTATS.
   e. LIGHTING CONTROL CIRCUITS: PERFORM OPERATION TESTS FOR ALL LIGHTING CIRCUITS.
   f. PRODUCT FAILURE: ANY PRODUCTS WHICH FAIL DURING THE TESTS OR ARE RULED UNSATISFACTORY BY THE OWNER'S REPRESENTATIVE SHALL BE REPLACED, REPAIRED, OR CORRECTED AS PRESCRIBED BY THE OWNER'S REPRESENTATIVE AT THE EXPENSE OF THE CONTRACTOR. TESTS SHALL BE PERFORMED AFTER REPAIRS, REPLACEMENTS, OR CORRECTIONS UNTIL SATISFACTORY PERFORMANCE IS DEMONSTRATED.
   g. PHYSICAL INSPECTION OF ELECTRICAL EQUIPMENT AND CABLES: INSPECTION SHALL BE MADE OF ALL EQUIPMENT TO ENSURE PROPER ASSEMBLY AND CONSTRUCTION.

I. INSTRUCTIONS AND MANUALS

1. AT THE TIME OF COMPLETION, AN ADEQUATE PERIOD SHALL BE ALLOTTED BY THE CONTRACTOR FOR INSTRUCTION OF BUILDING OPERATING AND MAINTENANCE PERSONNEL IN THE USE OF ALL SYSTEMS. ALL PERSONNEL SHALL BE INSTRUCTED AT ONE TIME, THE CONTRACTOR MAKING ALL NECESSARY ARRANGEMENTS WITH MANUFACTURER'S REPRESENTATIVES. THE EQUIPMENT MANUFACTURER SHALL PROVIDE PRODUCT LITERATURE AND APPLICATION GUIDES FOR THE USERS' REFERENCE.

2. COSTS, IF ANY, FOR THE ABOVE SERVICE SHALL BE PAID BY THE CONTRACTOR.

J. PROJECT RECORD DOCUMENTS (AS-BUILT)

1. PROVIDE PROJECT RECORD DRAWINGS AND SPECIFICATIONS AS REQUIRED BY OTHER SECTIONS OF SPECIFICATIONS AND AS REQUIRED HEREIN. SUCH DRAWINGS SHALL FULLY REPRESENT INSTALLED CONDITIONS INCLUDING ACTUAL LOCATION OF OUTLETS, CORRECT CONDUIT AND WIRE SIZING AS WELL AS ROUTING, REVISED FIXTURE SCHEDULING LISTING THE MANUFACTURER AND PRODUCTS ACTUALLY INSTALLED.

2. ALL CHANGES TO DRAWINGS SHALL BE MADE BY QUALIFIED DRAFTSPERSONS TO MATCH EXISTING LINE WORK AND LETTERING AS CLOSELY AS POSSIBLE.

K. WORKMANSHIP

1. PREPARATION, HANDLING, AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND TECHNICAL DATA PARTICULAR TO THE PRODUCT SPECIFIED AND/OR APPROVED EXCEPT AS OTHERWISE SPECIFIED. COORDINATE WORK AND COOPERATE WITH OTHERS IN FURNISHING AND PLACING THIS WORK. WORK TO APPROVED SHOP DRAWINGS FOR WORK BY OTHERS AND TO FIELD MEASUREMENTS AS NECESSARY TO PROPERLY FIT THE WORK.

2. CONFORM TO THE NATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION STANDARD OF INSTALLATION FOR GENERAL INSTALLATION PRACTICE.

L. SCHEDULE OF WORK: ARRANGE WORK TO CONFORM TO THE SCHEDULE WHICH HAS BEEN ESTABLISHED FOR THE PROGRESS OF THE WORK. ADVISE REGARDING SHIPPING SCHEDULE OF MAJOR EQUIPMENT.

M. SUPERVISION: CONTRACTOR SHALL PERSONALLY, OR THROUGH AN AUTHORIZED AND COMPETENT REPRESENTATIVE, CONSTANTLY SUPERVISE THE WORK FROM BEGINNING TO COMPLETION AND, WITHIN REASON, KEEP THE SAME WORKMEN AND FOREMAN ON THE PROJECT THROUGHOUT THE PROJECT DURATION.

N. PROTECTION: KEEP CONDUITS, JUNCTION BOXES, OUTLET BOXES, AND OTHER OPENINGS CLOSED TO PREVENT ENTRY OF FOREIGN MATTER. COVER FIXTURES, EQUIPMENT, AND APPARATUS AND PROTECT AGAINST DIRT, PAINT, WATER, CHEMICAL, OR MECHANICAL DAMAGE, BEFORE AND DURING CONSTRUCTION PERIOD. RESTORE TO ORIGINAL CONDITION ANY FIXTURE, APPARATUS, OR EQUIPMENT DAMAGED PRIOR TO FINAL ACCEPTANCE. PROTECT BRIGHT FINISHED SURFACES AND SIMILAR ITEMS UNTIL IN SERVICE. NO RUST OR DAMAGE WILL BE PERMITTED.

O. SPECIAL TOOLS: ALL SPECIAL TOOLS FOR PROPER OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED UNDER THIS SECTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE.

P. CUTTING AND PATCHING

1. INSTALL ALL REQUIRED SLEEVES, FORMS, AND INSETS BEFORE WALLS OR PARTITION ARE BUILT. CUTTING AND PATCHING OF WALLS, PARTITIONS, CEILINGS, AND FLOOR NECESSARY FOR RECEPTION OF WORK, CAUSED BY FAILURE TO PROVIDE OR PROPERLY LOCATED SLEEVES, FORMS, AND INSETS, INCORRECT LOCATION OF WORK OR FAILURE TO COOPERATE WITH OTHER TRADES, SHALL BE DONE AT EXPENSE OF TRADE RESPONSIBLE.

2. NO CUTTING OF FINISHED OR STRUCTURAL WORK MAY BE DONE WITHOUT ACCEPTANCE. WHEN NECESSARY TO HAVE FINISHED MATERIAL OR STUCTURAL WORK CUT, FURNISH NECESSARY DRAWINGS TO TRADE WHOSE MATERIALS ARE OUT TO BE CUT.

Q. CLEARANCES: PROVIDE WORKING CLEARANCE IN FRONT OF, IN BACK OF, AND TO SIDES FOR ALL ELECTRICAL EQUIPMENT AS REQUIRED BY NATIONAL ELECTRICAL CODE ARTICLE 110.

R. DEMOLITION: DEMOLITION AND REMOVAL OF EXISTING ELECTRICAL SERVICES TO THE EXISTING TENANT SPACE TO BE BY THE CONTRACTOR.

S. ACCESS PANEL

1. ELEC. CONTRACTOR SHALL PROVIDE ALL ACCESS PANELS REQUIRED FOR CODE REQUIRED ACCESS TO ELECTRICAL DEVICES AND JUNCTION BOXES.

2. ACCESS PANELS SHALL NOT BE ALLOWED IN SALES AREA CEILING OR WALLS. DEVICES AND EQUIPMENT THAT NORMALLY WOULD BE CONCEALED FROM VIEW SHALL BE LOCATED AT NORMALLY ACCESSIBLE AREAS SUCH AS ABOVE CEILING, NEAR HVAC DIFFUSERS OR IN BACK ROOMS IN ACCESSIBLE CEILING AREAS.

SECTION 260502 BASIC MATERIALS AND METHODS

A. DESCRIPTION

1. WORK SPECIFIED IN THIS SECTION ENCOMPASSES PRODUCTS, ASSEMBLIES, AND BASIC INSTALLATION METHODS REQUIRED FOR ELECTRICAL PROJECT SYSTEMS SPECIFIED UNDER THIS DIVISION AND INCLUDES, BUT IS NOT LIMITED TO:
   a. CONDUIT, RACEWAYS, AND FITTINGS
   b. WIRE AND CABLES
   c. WIRE CONNECTIONS AND DEVICES
   d. OUTLET BOXES
   e. PULL AND JUNCTION BOXES
   f. SWITCHES AND RECEPTACLES
   g. DEVICE PLATES
   h. OVERCURRENT PROTECTIVE DEVICES
   i. TELEPHONE TERMINAL BACKBOARD
   j. DOOR BUZZER AND PUSHBUTTON SYSTEM
   j. BACKGROUND SOUND SYSTEM EQUIPMENT INSTALLATION AND WIRING
   l. EMPTY RACEWAY PROVISIONS FOR BURGLAR ALARM AND SECURITY SYSTEM DETECTION UNITS AND SWITCHES
   m. PANELBOARDS AND ASSOCIATED EQUIPMENT

2. WORK NOT INCLUDED:
   a. BACKGROUND SOUND SYSTEM EQUIPMENT FURNISHED BY OTHERS.
   b. BURGLAR ALARM AND SECURITY SYSTEM EQUIPMENT AND WIRING.

B. SUBMITTALS

1. SUBMIT THE FOLLOWING ITEMS:
   a. SWITCHES, RECEPTACLES AND DEVICE PLATES
   b. CONDUCTORS AND CABLES
   c. OVERCURRENT PROTECTIVE DEVICES
   d. RACEWAYS
   e. DOOR BUZZERS AND PUSHBUTTONS
   f. PANELBOARDS AND TRANSFORMER

C. CONDUIT AND FITTINGS

1. RIGID STEEL CONDUIT
   a. CONDUIT, RIGID STEEL: FULL WEIGHT, THREADED, HOT-DIP GALVANIZED, INSIDE ENAMELED, CONFORMING TO ANSI C80.1.
   b. THREE-PIECE COUPLINGS: ELECTROPLATED, CAST MALLEABLE IRON. EFCOR 165 SERIES, O.Z./GEDNEY 4-50 SERIES, OR EQUAL.
   c. THREADLESS COUPLINGS: ELECTROPLATED, CAST MALLEABLE IRON, WITH INTEGRAL CONDUIT STOP. EFCOR 1760.
   d. THREADLESS CONNECTORS: ELECTROPLATED, CAST MALLEABLE IRON, ON THREADED MALE HUB PLASTIC INSULATED THROAT RATED 90°C MINIMUM.
   e. EFCOR 1750B SERIES, O.Z./GEDNEY 31-050 1T SERIES, OR EQUAL. INSULATED BUSHINGS: THREADED POLYPROPYLENE OR THERMOSETTING PHENOLIC RATED 150°C MINIMUM.
   f. INSULATED GROUNDING BUSHINGS: THREADED CAST MALLEABLE IRON BODY WITH INSULATED THROAT AND STEEL, "LAY-IN" GROUND LUG WITH COMPRESSION SCREW. O.Z./GEDNEY BLG SERIES, THOMAS & BETTS 3870 SERIES, OR EQUAL.
   g. INSULATED METALLIC BUSHINGS: THREADED CAST MALLEABLE IRON BODY WITH PLASTIC INSULATED THROAT RATED 105°C. O.Z./GEDNEY TYPE B, THOMAS & BETTS 1222 SERIES, OR EQUAL.

2. ELECTRICAL METALLIC TUBING (EMT)
   a. CONDUIT: SHALL BE FORMED OF COLD ROLLED STRIP STEEL, ELECTRICAL RESISTANCE WELDED CONTINUOUSLY ALONG THE LONGITUDINAL SEAM AND HOT-DIP GALVANIZED AFTER FABRICATION. CONDUIT SHALL CONFORM TO ANSI C80.3 SPECIFICATIONS AND SHALL MEET U.L. REQUIREMENTS.
   b. COUPLINGS: ELECTROPLATED, CAST MALLEABLE IRON, GLAND COMPRESSION TYPE, U.L. LISTED RAIN AND CONCRETE TIGHT THROUGH 1-1/4" TRADE SIZE, O.Z./GEDNEY 6050W SERIES, EFCOR 760 SERIES, OR EQUAL. SET SCREW TYPE COUPLINGS MAY BE USED IN DRY LOCATIONS, O.Z./GEDNEY 5050 SERIES, OR EQUAL.
   c. CONNECTORS: GLAND COMPRESSION TYPE WITH CAST MALLEABLE IRON BODY WITH MALE HUB AND INSULATED PLASTIC THROAT 150°C. TEMPERATURE RATED. O.Z./GEDNEY 4050 SERIES, OR EQUAL.

3. FLEXIBLE METALLIC CONDUIT
   a. CONDUIT: SHALL BE FABRICATED IN CONTINUOUS LENGTHS FROM GALVANIZED STEEL STRIP, SPIRALLY WOUND, AND FORMED TO PROVIDE AN INTERLOCKING DESIGN. 6' MAX. LENGTH FLEXIBLE CONDUIT IS NOT PERMITTED IN WALLS.
   b. FITTINGS: CONNECTORS SHALL BE MADE OF THE SCREW CLAMP WITH CAST MALLEABLE IRON BODIES AND THREADED MALE HUBS WITH INSULATED THROATS.
   c. FLEXIBLE CONDUIT SHALL ONLY BE ALLOWED IN THE LENGTHS AND FOR APPLICATIONS AS ALLOWED BY THE JURISDICTION. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING INSTALLATION THAT IS NOT IN COMPLIANCE WITH THE JURISDICTIONAL REQUIREMENTS.

4. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT
   a. CONDUIT: ANACONDA TYPE U.A., COLEMAN TYPE UXT1, OR EQUAL.
   b. FITTINGS: CONNECTOR BODY AND GLAND NUT SHALL BE OF CADMIUM PLATED CAST MALLEABLE IRON, WITH INSULATED THROAT, MAX. 24", T & B 5331 SERIES, O.Z./GEDNEY 4Q-38-1T SERIES, OR EQUAL.

5. MC CABLING
   a. METAL CLAD CABLE SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH UL 1569. THE CABLE SHALL BEAR THE UL LABEL AND MANUFACTURER'S "E" NUMBER.
   b. ACCEPTABLE SIZES FOR MC CABLE: 12/2 THROUGH 12/9; 10/2 THROUGH 10/9 AND SHALL CONTAIN COPPER CONDUCTORS ONLY, NO ALUMINUM ALLOWED.
   c. MANUFACTURER – AFC, OR EQUAL.
   d. CONDUCTORS: COPPER; SOLID OR STRANDED.
   e. INSULATION: THERMOPLASTIC (THHN) OR EQUIVALENT; VOLTAGE RATING 600V; TEMPERATURE RATING 90°C.
   f. ARMOR: ALUMINUM; CORRUGATED OR SMOOTH TUBE.
   g. CABLE SHALL UL LISTED, RATED FOR USE IN CABLE TRAY, AND FOR USE IN ENVIRONMENTAL AIR PLENUMS.
   h. CONNECTORS: FURNISH ONLY UL LISTED MC CONNECTORS MANUFACTURED FOR MC CABLE. CONNECTORS SHALL BE STEEL; DIE CAST NOT ALLOWED.

D. MC CABLING SUPPORTS: CADDY, OR APPROVED EQUAL. ALL SUPPORTS SHALL BE U.L. LISTED FOR THE APPLICATION, AND SHALL COMPLY WITH THE NEC. TIE-WRAPS AND STAPLES ARE NOT ACCEPTABLE.
   1. SNAP-IN SUPPORTS TO FRAMING STUD, CADDY #MAC2
   2. STRAP TO FRAMING STUD, CADDY #FXC20
   3. DROP-WIRE SUPPORTS, CADDY #PCS1
   4. CABLE SNAP CLIP FOR ATTACHMENT TO STRUCTURE, CADDY #SC
   5. CABLE SUPPORT FOR ATTACHMENT TO FRAMING STUD, CADDY #CJ6
   6. SUPPORT AND ANTI-RATTLE CLIP FOR MC THROUGH STUDS, CADDY #781

E. MINIMUM ACCEPTABLE CONDUIT SIZE SHALL BE 3/4".

F. MC CABLING SHALL ONLY BE ALLOWED FOR APPLICATIONS AS ALLOWED BY THE JURISDICTION AND THE LANDLORD. PRIOR TO INSTALLATION, CONTRACTOR SHALL CONFIRM WITH BOTH AGENCIES, THAT MC IS PERMITTED. FOR INSTALLATIONS THAT HAVE NOT BEEN APPROVED BY BOTH AGENCIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE MC AND REPLACEMENT WITH EMT, AT THE EXPENSE OF THE CONTRACTOR.

G. MC CABLING SHALL NOT BE ALLOWED TO RUN INTO THE PANELBOARDS. TRANSITION TO EMT BY MEANS OF A WIREWAY ABOVE PANELBOARDS, AND RUN BRANCH CIRCUITS IN EMT FROM WIREWAY TO PANELBOARDS – NO EXCEPTIONS.

H. CONTRACTOR'S BID SHALL REFLECT COSTS FOR UTILIZING MC CABLING AND/OR EMT INSTALLATION AS PERMITTED BY THE JURISDICTION AND LANDLORD.

I. MC CABLE SHALL NOT BE PERMITTED IN AREAS OPEN TO PUBLIC VIEW.

J. WIRE AND CABLE

1. ACCEPTABLE MANUFACTURERS: SOUTHWIRE, GENERAL CABLE, OR EQUAL.

2. CONDUCTOR MATERIAL: ALL WIRE AND CABLE SHALL BE INSULATED COPPER CONDUCTORS FOR ALL WIRE SIZES. ALUMINUM WIRE AND CABLE SHALL NOT BE USED.

3. INSULATION: INSULATION SHALL BE THWN-THHN FOR WIRE SIZES THROUGH SIZE 1/0 AWG. FOR LARGER WIRE SIZES INSULATION SHALL BE THWN, XHHW, THW, OR AS REQUIRED TO SUIT APPLICATION.

4. FIXTURE WIRE: TYPE AF.

5. MINIMUM CONDUCTOR SIZE:
   a. POWER AND LIGHTING BRANCH CIRCUITS: #12 AWG
   b. SIGNAL AND CONTROL CIRCUITS UNDER 100 VOLTS: #14 AWG
   c. ANY 120V/20A CIRCUITS OVER 120 L.F. MUST BE: #10 AWG

6. COLOR CODE ALL CONDUCTORS IN ACCORD WITH NEC AS FOLLOWS:

	120/208V	277/480V
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	GRAY

K. OUTLET BOXES AND COVERS

1. STANDARD OUTLET BOXES: GALVANIZED, ONE-PIECE, DRAWN STEEL. KNOCK-OUT TYPE OF SIZE AND CONFIGURATION BEST SUITED TO THE APPLICATION INDICATED ON THE PLANS. MINIMUM BOX SIZE, 4" SQUARE BY 1-1/2" DEEP.

2. SWITCH BOXES: 2" X 3" LONG, GALVANIZED STEEL SWITCH BOXES SHALL BE USED ONLY FOR THE INSTALLATION OF SINGLE SWITCHES, INSTALL MULTIPLE SWITCHES IN STANDARD GANG BOXES WITH RAISED DEVICE COVERS SUITABLE FOR THE APPLICATION INDICATED.

L. SWITCHES AND RECEPTACLES

1. COLOR OF DEVICES SHALL BE WHITE UNLESS OTHERWISE NOTED. ORANGE FOR DEDICATED I.G. RECEPTACLES. BLACK AT SALES AREAS WHERE LOCATED ABOVE 12'-0" A.F.F.

2. ALL GENERAL PURPOSE 20 AMPERE, 125-250 VOLT RECEPTACLES AND 120-277 VOLT SWITCHES SHALL CONFORM TO NEMA WD 1 AND APPLICABLE U.L. TESTS.

3. RECEPTACLES:
   a. GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE: NEMA TYPE 5-20R LEVITON #6898-HG, OR EQUAL.
   b. DUPLEX RECEPTACLES: NEMA TYPE 5-20R, HEAVY DUTY SPECIFICATION GRADE, SIDE WIRED ONLY, LEVITON 5243, OR EQUAL.
   c. CASH REGISTER RECEPTACLES: NEMA TYPE 5-20R, HEAVY DUTY SPECIFICATION GRADE, SIDE WIRED ONLY, HUBBELL #IG-5362, PROVIDED WITH GREEN INSULATED GROUND WIRE, AND WITH ENGRAVED COVER PLATE "FOR CASH REGISTERS ONLY".

4. SWITCHES: TWENTY AMPERE, 120-277 VOLTS, FAST MAKE-SLOW BREAK, QUIET TYPE SWITCH WITH SILVER CADMIUM ALLOY CONTACTS, BINDING HEAD TERMINAL SCREWS, SIDE WIRED ONLY. ALL SWITCHES SHALL BE WHITE IN COLOR.
   a. SINGLE POLE, SINGLE THROW, LEVITON #1221, OR EQUAL.
   b. THREE-WAY, LEVITON #1223, OR EQUAL.

M. DEVICE PLATES

1. FLUSH DEVICE PLATES: PLATES SHALL BE SMOOTH PLASTIC, COLOR TO MATCH DEVICE, LEVITON #8600 SERIES, OR EQUAL.

2. SURFACE MOUNTED DEVICES, INDOOR: GALVANIZED METAL TO FIT BOX.

3. OUTDOOR, WEATHERPROOF: DIE CAST ALUMINUM CONSTRUCTION, CORROSION RESISTANT, HEAVY DUTY, HINGED COVER FLAP, AND GASKET, LEVITON #6196, HORIZONTAL MOUNTING.

N. DISCONNECT SWITCHES

1. SWITCH INTERIOR: DEAD-FRONT CONSTRUCTION WITH HINGED ARC SUPPRESSOR AND SWITCH BLADES WHICH ARE FULLY VISIBLE IN THE "OFF" POSITION AND WITH DOOR OPEN.

2. SWITCH MECHANISM: QUICK-MAKE AND QUICK-BREAK OPERATING HANDLE AND MECHANISM WITH DUAL COVER INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF THE SWITCH DOOR IN THE "ON" POSITION OR CLOSING THE SWITCH MECHANISM WHILE THE DOOR IS OPEN.

3. RATINGS: SWITCHES SHALL BE HORSEPOWER RATED FOR THE OPERATING VOLTAGE AND WITH FUSED OR NON-FUSED ARRANGEMENTS AS SHOWN ON THE DRAWINGS.

4. ENCLOSURES: NEMA 1, CODE GAUGE SHEET STEEL WITH HINGED COVER, OR NEMA 3R AS SHOWN ON DRAWINGS, AND AS REQUIRED BY APPLICATION.

O. TRANSFORMERS

1. TRANSFORMERS SHALL BE INDOOR TYPE, SELF-COOLED, 480V, THREE-PHASE, DUAL WINDING, FULLY ENCLOSED, VENTILATED, GENERAL PURPOSE DRY TYPE, 480 VOLT PRIMARY, 120/208 VOLT SECONDARY, 60 HERTZ, EQUIPPED WITH TWO 2-1/2% FULL CAPACITY TAPS ABOVE AND BELOW RATED VOLTAGE AND SHALL BE OF THE KVA RATING SHOWN ON THE DRAWINGS.

2. TRANSFORMERS SHALL HAVE COPPER OR ALUMINUM WINDINGS CLASS 'H' INSULATION GROUP, WITH TEMPERATURE RISE, WHEN OPERATED CONTINUOUSLY AT FULL LOAD AND RATED FREQUENCY, NOT EXCEEDING 150°C. RISE OVER 40°C. AMBIENT, UNLESS MENTIONED OTHERWISE ON THE SINGLE LINE DIAGRAM.

3. TRANSFORMER SHALL HAVE A MINIMUM OF 10% OVERLOAD CAPACITY AT RATED VOLTAGE AND SHALL HAVE A 10kV BIL RATING.

4. SOUND LEVEL AT ANY LOAD SHALL NOT EXCEED 45dB WHEN TESTED IN A ROOM WITH AMBIENT SOUND LEVEL NOT EXCEEDING 24dB. EXCESSIVELY NOISY TRANSFORMERS SHALL BE REPLACED WITH NEW AT THE EXPENSE OF THE CONTRACTOR.

5. TRANSFORMER IMPEDANCE SHALL NOT BE LESS THAN 4% NOR GREATER THAN 5%. TRANSFORMERS SHALL CONFORM TO NEMA TRI-1974, NEC 450-21, AND ALL APPLICABLE STATE AND LOCAL CODES.

6. TRANSFORMER SHALL NOT CONTAIN ANY PCB'S (POLYCHLORINATED BIPHENYLS).

7. TRANSFORMER SIZE SHALL FIT SPACE ALLOCATED PER DRAWINGS.

8. MANUFACTURER SHALL BE GE, SIEMENS, EATON, OR SQUARE D.

9. ELECTRICAL CONTRACTOR SHALL PROVIDE TRANSFORMER AS INDICATED ON THE PLANS.

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ELECTRICAL SPECIFICATIONS
SHEET 1 OF 2

E1.2

AS NOTED
scale

05/12/25
date

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ELECTRICAL SPECIFICATIONS (CONTINUED)

P. PANELBOARDS

1. RATINGS: SEE PANEL SCHEDULES.
2. FINISH: ALL PAINTED STEEL WORK SHALL BE TREATED WITH A PRIMER COAT AND FINISH COAT OF THE MANUFACTURER'S STANDARD GRAY COLOR OR ANSI 61.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL PANELBOARDS AS INDICATED ON THE PLANS.
4. PANELBOARDS SHALL BE KEYED ALIKE, AND ARRANGED TO FIT IN THE SPACE INDICATED ON THE PLANS.
5. BUSSING
   a. BUSSING SHALL BE RECTANGULAR CROSS SECTION FULL LENGTH TIN PLATED.
   b. EACH PANELBOARD SHALL BE EQUIPPED WITH A GROUND BUS SECURED TO THE INTERIOR OF THE ENCLOSURE. THE BUS SHALL BE EQUAL TO THE PANELBOARD NEUTRAL BUS AND SHALL HAVE A SEPERATE LUG FOR EACH GROUND CONDUCTOR. NOT MORE THAN ONE CONDUCTOR SHALL BE INSTALLED PER LUG.
   c. EACH ISOLATED GROUND PANELBOARD SHALL BE EQUIPPED WITH AN ISOLATED GROUND BUS SECURED TO THE INTERIOR OF PANELBOARD WITH A SEPARATE ISOLATED GROUND WIRE (SIZED PER THE NEC) RUN BACK TO THE GROUNDING ELECTRODE.
6. MANUFACTURER SHALL BE GENERAL ELECTRIC, SIEMENS, SQUARE D, OR EQUAL.
7. PRIOR TO ORDERING, THE ELECTRICAL CONTRACTOR SHALL CONFIRM WITH THE SERVING UTILITY AND THE LANDLORD, THE AVAILABLE FAULT CURRENT LEVEL AT THE TENANT DISCONNECT. TENANT PANELBOARDS SHALL BE ORDERED WITH AN AIC RATING GREATER THAN THE AVAILABLE FAULT CURRENT LEVEL. IF CONTRACTOR DOES NOT CONFIRM FAULT CURRENT LEVEL, EQUIPMENT FULLY RATED AT 65K AIC MINIMUM SHALL BE REQUIRED.

Q. PROTECTIVE DEVICES

1. CIRCUIT BREAKERS: MOLDED CASE, BOLT-ON, THERMAL MAGNETIC TYPE, 40°C. AMBIENT TEMPERATURE COMPENSATED, FIXED MOUNTING, WITH QUICK-MAKE AND QUICK-BREAK SWITCHING MECHANISM MECHANICALLY TRIP-FREE FROM THE OPERATING HANDLE.
2. RATINGS: REFER TO DRAWINGS AND PANEL SCHEDULES FOR TRIP FRAME AND POLES REQUIRED. EQUIPMENT SHALL BE FULLY RATED BASED ON AVAILABLE FAULT CURRENT LEVEL.
3. MANUAL MOTOR STARTERS: FRACTIONAL H.P., 1 PHASE MOTORS SHALL BE PROTECTED BY THERMAL O.L. RELAY INTEGRAL WITH THE DISCONNECT: "MOTOR-MINDER", OR EQUAL.

R. ELECTRICAL SUPPORTING DEVICES

1. CONDUIT STRAPS: HOT-DIP GALVANIZED, CAST MALLEABLE IRON, ONE HOLE TYPE STRAP WITH CAST CLAMP-BACKS AND SPACERS AS REQUIRED. O.Z./GEDNEY #14-50G STRAP AND #141G SPACER, REFCOR #231 STRAP AND #131 SPACER, OR EQUAL.
2. CONSTRUCTION CHANNEL: 1-1/2" X 1-1/2" 12 GAUGE GALVANIZED STEEL CHANNEL WITH 17/32" DIAMETER BOLT HOLES, 1-1/2" ON CENTER, IN BASE OF THE CHANNEL. KINDORF 905 SERIES, UNISTRUT P-1000-HS, OR EQUAL.
3. FASTENERS (GENERAL): WOOD SCREWS FOR FASTENING TO WOOD. MACHINE SCREWS FOR FASTENING TO STEEL. TOGGLE BOLTS FOR FASTENING TO HOLLOW CONCRETE BLOCK, GYPSUM BOARD OR PLASTER WALL. EXPANSION ANCHORS FOR ATTACHMENTS TO PRE-POURED CONCRETE.

S. IDENTIFYING DEVICES

1. PANELBOARD DIRECTORIES: SHALL BE TYPEWRITTEN, ARRANGED IN NUMERICAL ORDER AND SHALL SHOW THE NUMBER OF THE CIRCUIT IS INDICATED. THE ROOM NUMBERS USED SHALL BE VERIFIED WITH THE OWNER AND SHALL NOT NECESSARILY BE THOSE USED IN THE DRAWINGS. MOUNT DIRECTORIES IN A 6" X 8" METAL FRAME UNDER PLEXIGLASS INSIDE EACH PANELBOARD.
2. WIRE & TERMINAL MARKERS: SELF-ADHERING, PRE-PRINTED VINYL WITH ELF-LAMINATING WRAP GROUND STRIP BRADY B191 SERIES, THOMAS & BETTS WSI SERIES, OR EQUAL.

T. PLYWOOD BACKBOARDS

1. WHERE INDICATED FOR TELEPHONE OR COMMUNICATION SYSTEM TERMINALS, OR FOR MOTOR CONTROL OR OTHER EQUIPMENT ASSEMBLES, PROVIDE BACKBOARDS OF SIZE INDICATED.
   a. USE DOUGLAS FIR PLYWOOD, EXTERIOR GRADE WITH "B" FACE, PRIME AND FINISHED PAINTED.
   b. UNLESS OTHERWISE INDICATED, PROVIDE 3/4" THICK PLYWOOD.
   c. ALL PLYWOOD SHALL BE FIRE RESISTANT.

U. GROUNDING

1. ENCLOSURES OF EQUIPMENT, RACEWAYS, AND FIXTURES SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED. PROVIDE CODE-SIZED, (UNLESS OTHERWISE INDICATED) COPPER, INSULATED GREEN EQUIPMENT GROUND WITH ALL BRANCH AND FEEDER CIRCUIT RUNS. EQUIPMENT GROUND SHALL ORIGINATE AT PANELBOARD GROUND BUS AND SHALL BE BONDED TO ALL SWITCH AND RECEPTACLE BOXES AND ELECTRICAL EQUIPMENT ENCLOSURES.
2. BUILDING SERVICES SHALL BE GROUNDED TO BUILDING STEEL AND TO COLD METALLIC WATER PIPING.
3. ISOLATED GROUND CONDUCTORS SHALL TERMINATE ON ISOLATED GROUND BUS AND RECEPTACLE ISOLATED GROUND LUGS ONLY.

V. DOOR BUZZER AND PUSHBUTTON SYSTEM

1. PROVIDE A COMPLETE AND OPERATING DOOR BUZZER SYSTEM WITH ALL NECESSARY ACCESSORIES, TRANSFORMER, AND WIRING.
2. BUZZERS SHALL BE EDWARDS #1064-G5, MOUNTED 8'-0" A.F.F. IN STOCK AND MEZZANINE AREAS, AND 2'-0" A.F.F. UNDER CASH WRAP COUNTER.
3. PUSHBUTTON SHALL BE EDWARDS #1786-B, MOUNT AT 4'-0" A.F.F.
4. TRANSFORMER RATED 20VA, 24VAC SHALL BE EDWARDS #592, MOUNT AT 8'-0" A.F.F.

W. LIGHTING CONTROL SYSTEM

1. PROVIDE A COMPLETE AND OPERATING LIGHTING CONTROL SYSTEM WITH ALL NECESSARY ACCESSORIES, RELAYS, WIRING, CONTACTORS, PHOTOELECTRIC DEVICE, AND PROGRAMMING.
2. PROVIDE ALL PROGRAMMING AS REQUIRED TO ACCOMMODATE THE OWNER'S SCHEDULING. PROVIDE TRAINING TO THE OWNER, FOR OPERATING THE TIMECLOCK.

X. CONDUIT AND RACEWAY APPLICATIONS

1. RIGID STEEL CONDUIT: FOR ALL EXPOSED AND U/G CONDUIT EXPOSED TO MECHANICAL DAMAGE. MINIMUM SIZE IS 3/4".
2. ELECTRICAL METALLIC TUBING (EMT): INTERIOR POWER AND LIGHTING BRANCH CIRCUITS WHERE RUN CONCEALED ABOVE SUSPENDED CEILING, IN STUD WALLS, FURRED SPACES, AND WHERE NOT EXPOSED TO MECHANICAL DAMAGE, OR 6'-0" A.F.F.
3. FLEXIBLE METALLIC CONDUIT: IN DRY LOCATIONS CONNECTION TO TRANSFORMERS, (6' MAX.), VIBRATING EQUIPMENT (24" MAX.), AND TO RECESSED LIGHTING FIXTURES.
4. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT: IN DAMP AND WET LOCATIONS FOR CONNECTION TO ALL PUMP MOTORS, SOLENOID VALVES, HVAC EQUIPMENT, AND SIMILAR DEVICES SHALL BE MADE USING LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT. PROVIDE SEPARATE GROUND WIRE INDEPENDENT OF CONDUIT, RUN INSIDE CONDUIT AND BONDED AT BOTH ENDS TO ENCLOSURES. MAXIMUM LENGTH OF 24".

Y. CONDUIT INSTALLATION

1. CONDUIT SYSTEM SHALL BE CONCEALED UNLESS EXPOSED WORK IS CLEARLY CALLED FOR ON THE DRAWINGS.
2. CONDUITS SHALL BE TIGHTLY COVERED AND WELL PROTECTED DURING CONSTRUCTION USING METALLIC BUSHINGS AND BUSHING "PENNIES" TO SEAL OPEN ENDS.
3. IN ALL EMPTY CONDUITS OR DUCTS, INSTALL A 200-POUND TENSILE STRENGTH POLYETHYLENE PULLING ROPE.
4. CONDUIT SYSTEMS SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT. INSTALL CODE SIZE, INSULATED, COPPER, GREEN GROUNDING CONDUCTOR IN ALL CONDUIT RUNS PULLED WITH PHASE AND NETURAL CONDUCTORS.
5. LAYOUT
   a. LOCATIONS OF CONDUIT RUNS SHALL BE PLANNED IN ADVANCE OF THE INSTALLATION AND COORDINATED WITH THE DUCTWORK, PLUMBING, CEILING, AND WALL CONSTRUCTION IN THE SAME AREAS AND SHALL NOT UNNECESSARILY CROSS OTHER CONDUITS OR PIPE, NOR PREVENT REMOVAL OF CEILING OR TILES OR PANELS, NOR BLOCK ACCESS TO MECHANICAL OR ELECTRICAL EQUIPMENT.
   b. WHERE PRACTICAL, INSTALL CONDUITS IN GROUPS, IN PARALLEL, FOR VERTICAL AND HORIZONTAL RUNS AND AT ELEVATIONS THAT AVOID UNNECESSARY OFFSETS.
   c. EXPOSED CONDUIT SHALL BE RUN PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINES OF COLUMNS AND BEAMS.
   d. CONDUITS SHALL NOT BE PLACED CLOSER THAN 12" FROM A PARALLEL HOT WATER OR STEAM LINE OR 3" FROM SUCH LINES CROSSING PERPENDICULAR TO THE RUNS.
   e. AT FLUSH FLOOR RECEPTACLE LOCATIONS, ASSOCIATED CONDUIT (1/2"ø REQUIRED) SHALL BE RUN WITHIN WOOD FLOORING PLYWOOD UNDERLAYMENT. COORDINATE LAYOUT WITH FLOORING CONTRACTOR PRIOR TO UNDERLAYMENT INSTALL TO ACCOMMODATE CONDUIT CUT-OUTS IN PLYWOOD. CONDUIT LAYOUT SHALL NOT BE PARALLEL WITH WOOD FLOOR PLANKS SCHEDULED FOR INSTALL ON TOP OF UNDERLAYMENT. MAINTAIN MINIMUM 30° ANGLE FROM PARALLEL.
6. SUPPORTS
   a. ALL RACEWAY SYSTEMS SHALL BE SECURED TO THE BUILDING STRUCTURES USING SPECIFIED FASTENERS, CLAMPS, AND HANGERS SPACED ACCORDING TO CODE REQUIREMENTS.
   b. SUPPORT SINGLE RUNS OF CONDUIT USING ONE HOLE PIPE STRAPS. WHERE RUN HORIZONTALLY ON WALLS IN DAMP OR WET LOCATION, INSTALL "CLAMP-BACKS" TO SPACE CONDUIT OFF THE SURFACE.
   c. MULTIPLE CONDUIT RUNS SHALL BE SUPPORTED USING "TRAPEZE" HANGERS FABRICATED FROM SPECIFIED CONSTRUCTION CHANNEL, MOUNTED TO 3/8 INCH DIAMETER, THREADED STEEL RODS SECURED TO BUILDING STRUCTURES. FASTEN CONDUIT TO CONSTRUCTION CHANNEL WITH STANDARD ONE HOLE PIPE CLAMPS, OR THE EQUIVALENT.
7. TERMINATION AND JOINTS
   a. RACEWAYS SHALL BE JOINED USING SPECIFIED COUPLING OR TRANSITION COUPLINGS WHERE DISSIMILAR RACEWAY SYSTEMS ARE JOINED.
   b. CONDUITS SHALL BE SECURELY FASTENED TO CABINETS, BOXES, AND GUTTERS USING TWO LOCKNUTS AND AN INSULATING BUSHING OR SPECIFIED INSULATED CONNECTORS. INSTALL GROUNDING BUSHINGS OR BONDING JUMPERS ON ALL CONDUITS TERMINATING AT CONCENTRIC KNOCKOUTS.
   c. CONDUIT TERMINATIONS EXPOSED AT WEATHERPROOF ENCLOSURES AND CAST OUTLET BOXES SHALL BE MADE WATERTIGHT USING SPECIFIED CONNECTORS AND HUBS.
   d. INSTALL EXPANSION COUPLINGS WHERE ANY CONDUIT CROSSES A BUILDING SEPARATION OR EXPANSION JOINT.
8. PENETRATIONS
   a. ALL FLOOR PENETRATIONS SHALL BE SEALED WATER-TIGHT. MAINTAIN FIRE RATING AS REQUIRED.
   b. FIRE-SAFE ALL RATED WALL PENETRATIONS USING 3M LISTED FIRE-SAFING SEALANTS AND ASSEMBLIES.

Z. CABLE AND WIRE INSTALLATION

1. CONDUCTORS SHALL NOT BE INSTALLED IN CONDUIT UNTIL ALL WORK OF ANY NATURE THAT MAY CAUSE DAMAGE IS COMPLETED. CARE SHALL BE TAKEN IN PULLING CONDUCTORS THAT INSULATION IS NOT DAMAGED. U.L. APPROVED NON-PETROLEUM BASE AND INSULATING TYPE PULLING COMPOUND SHALL BE USED AS NEEDED.
2. ALL CABLES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND WARRANTY.
3. SPLICING AND TERMINATING
   a. ALL ASPECTS OF SPLICING AND TERMINATING SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURER'S PUBLISHED PROCEDURES.
   b. MAKE UP ALL SPLICES IN OUTLET BOXES WITH CONNECTORS AS SPECIFIED HEREIN WITH SEPARATE TAILS OF CORRECT COLOR TO BE MADE UP TO SPLICE. PROVIDE AT LEAST 6" OF TAILS PACKED IN BOX AFTER SPLICE IS MADE UP.
   c. ALL WIRE AND CABLE IN PANELS, TERMINAL CABINETS, AND EQUIPMENT ENCLOSURES SHALL BE BUNDLED AND CLAMPED.
4. MC CABLE INSTALLATION
   a. INSTALL CABLE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND IN STRICT ACCORDANCE WITH NEC.
   b. USE SOLID CONDUCTOR FOR BRANCH CIRCUITS 12 AWG AND SMALLER.
   c. BEND CABLE PER NEC.
   d. GROUNDING: ALL CABLE SHALL CONTAIN A GREEN WIRE GROUND. THE JACKET SHALL NOT SERVE AS THE ONLY GROUNDING MEANS.
   e. SUSPENSION:
      a.a. CABLE SHALL BE STRAPPED TIGHT TO UNDERSIDE OF DECKING WHERE PRACTICAL.
      a.b. CABLE SHALL HAVE INDEPENDENT SUSPENSION AND SHALL NOT BE TIED TO CEILING GRID SUSPENSION SYSTEM, PLUMBING PIPING, OR SPRINKLER PIPING.
      a.c. CABLE SHALL BE GROUPED SEPARATELY FROM LOW VOLTAGE CABLE SYSTEMS.
      a.d. SUPPORT CABLE EVERY 6', MAXIMUM.
      a.e. CABLE SHALL BE STRAPPED EVERY 6'-0', AT EACH TURN, AND WITHIN 12" OF ALL JUNCTION BOXES USING CABLE STRAPS, NOT TIES.
      a.f. BUNDLING: INSTALL NO MORE THAN 4 CABLES TOGETHER IN A SINGLE BUNDLE.
   b. ROUTING:
      a.a. BENDING RADIUS SHALL BE APPROXIMATELY 12 TIMES THE EXTERNAL DIAMETER OF THE METAL SHEATH.
      a.b. ROUTING OF THE CABLE SHALL FOLLOW THE ORTHOGONAL GRID OF THE BUILDING STRUCTURAL ELEMENTS OF THE BUILDING, SUCH AS BEAMS AND PURLINS.
      a.c. CABLE IN CEILINGS SHALL RUN AS TIGHT TO STRUCTURE AS POSSIBLE, AND IN NO CASE (WITH THE EXCEPTION OF DROPS) LESS THAN 12" ABOVE ACCESSIBLE CEILINGS.
      a.d. MC CABLE SHALL NOT BE USED IN FINAL HOMERUN CONNECTION TO THE BRANCH CIRCUIT PANEL.
      a.e. ISOLATED GROUND CIRCUITS AND NORMAL GROUND CIRCUITS SHALL BE RUN IN SEPARATE CABLES.
      a.f. CABLE SHALL BE INSTALLED USING BUSHINGS OR BUSHED FITTINGS.

AA. INSTALLATION OF BOXES AND WIRING SERVICES

1. ALL OUTLETS SHALL BE FINISHED FLUSH WITH WALL FINISHES AND CEILING, EXCEPT WHERE EXPOSED WORK IS CALLED FOR. THERE SHALL BE NO GAP BETWEEN BOX AND WALL OR CEILING MATERIAL. ANY OPENING BETWEEN BOX AND WALL OR CEILING SHALL BE CAULKED AIRTIGHT.
2. INSTALL RAISED DEVICE COVERS ON ALL OUTLET BOXES AS REQUIRED TO FINISH FLUSH WITH SURFACE. COVERS SHALL BE OF A DEPTH TO SUIT THE WALL OR CEILING FINISH.
3. LEAVE NO UNUSED OPENINGS IN ANY BOX. INSTALL CLOSE-UP PLUGS AS REQUIRED TO SEAL OPENINGS.
4. EXPOSED OUTLET BOXES AND BOXES IN DAMP AND WET LOCATIONS SHALL BE CAST METAL WITH GASKETED CAST METAL COVER PLATES.
5. BOXES LAYOUT
   a. OUTLET BOXES SHALL BE INSTALLED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN. MAKE ADJUSTMENTS TO LOCATIONS AS REQUIRED BY STRUCTURAL CONDITIONS AND TO SUIT COORDINATION REQUIREMENTS OF OTHER TRADES.
   b. OUTLET BOXES IN STUD WALL AND PARTITIONS SHALL NOT BE MOUNTED BACK-TO-BACK, NOR SHALL THROUGH-WALL BOXES BE PERMITTED.
   c. WHERE INSTALLATION IS WITHIN OR BEHIND CASEWORK, COORDINATE EXACT LOCATION WITH CASEWORK CONTRACTOR PRIOR TO ROUGH-IN TO ENSURE ACCESSIBILITY.
6. SUPPORTS
   a. BOXES INSTALLED IN STUD WALLS SHALL BE EQUIPPED WITH BRACKETS DESIGNED FOR ATTACHING DIRECTLY TO THE STUDS OR SHALL BE MOUNTED ON HEAVY GAUGE GALVANIZED STEEL BOX SUPPORTS.
   b. FIXTURE OUTLET BOXES INSTALLED IN SUSPENDED CEILINGS OF GYPSUM BOARD OR LATH AND PLASTER CONSTRUCTION SHALL BE MOUNTED TO 16 GAUGE METAL CHANNEL BARS ATTACHED TO MAIN CEILING RUNNERS.
   c. FIXTURE OUTLET BOXES INSTALLED IN SUSPENDED CEILINGS SYSTEMS SUPPORTING ACOUSTICAL TILES OR PANELS SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURES ABOVE WHEREVER PENDANT-MOUNTED FIXTURES ARE INSTALLED FROM THE BOX.

AB. TRANSFORMER INSTALLATION

1. TRANSFORMER SHALL BE FLOOR MOUNTED AS SHOWN ON THE DRAWINGS. FURNISH AND INSTALL ALL MOUNTING HARDWARE TO SAFELY CARRY THE WEIGHT OF THE TRANSFORMER. MAINTAIN ADEQUATE SPACING FOR VENTILATION AS RECOMMENDED BY THE MANUFACTURER AND REQUIRED BY CODE.
2. PROVIDE KORFUND TYPE VIBRATION ISOLATION PADS FOR EACH TRANSFORMER.
3. CONNECTIONS TO TRANSFORMER SHALL BE MADE WITH FLEXIBLE METALLIC CONDUIT. INSTALL GROUND CONDUCTORS IN EACH CONDUIT AND PROVIDE GROUNDING BUSHINGS AS REQUIRED.
4. PROVIDE HEAT INSULATING BARRIER BELOW TRANSFORMER WHERE INSTALLED ON COMBUSTIBLE SURFACE.

SECTION 265100 LIGHTING FIXTURES

A. WORK INCLUDED

1. INSTALLATION AND CONNECTION OF ALL FIXTURES, LAMPS, BALLASTS, LIGHTING CONTROL DEVICES, RELAYS, RELATED COMPONENTS, AND ACCESSORY WIRING AS SHOWN ON THE PLANS, FIXTURE SCHEDULE, OR AS SPECIFIED HEREIN.
2. CONTRACTOR SHALL FURNISH LIGHTING FIXTURES AND LAMPS.
3. FINAL AIMING AND ADJUSTMENT OF RECESSED ADJUSTABLE FIXTURES AND TRACK MOUNTED FIXTURES SHALL BE BY THE ELECTRICAL CONTRACTOR, AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

B. COORDINATION: REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION OF LIGHTING FIXTURES.

C. SUBMITTALS: SUBMIT IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION 260501: TIME SWITCHES, CONTROL DEVICES, RELAYS, CABINETS, AND WIRING DIAGRAMS.

D. LAMPS

1. INCANDESCENT LAMPS: GENERAL PURPOSE A BASE LAMPS SHALL BE INSIDE FROSTED, RATED 120 VAC, OR AS NOTED ON FIXTURE SCHEDULE. REFLECTOR STYLE LAMPS, R AND PAR, AS NOTED ON FIXTURE SCHEDULE. MR16 LAMPS SHALL BE G.E. PRECISE CONSTANT COLOR TYPE.
2. FLUORESCENT LAMPS
   a. 24", 36" AND 48" LONG LAMPS SHALL BE T-8 ENERGY SAVING DELUXE WARM-WHITE.
   b. COMPACT TWIN-TUBE AND DOUBLE TWIN-TUBE, 9, 13, AND 18 WATTS NOMINAL, 735 K SPX35.
3. LAMPS SHALL BE MANUFACTURED AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE ONLY.

E. BALLASTS

1. FLUORESCENT LAMP BALLASTS
   a. BALLASTS FOR ALL SINGLE TUBE FLUORESCENT LAMPS SHALL BE U.L. APPROVED, CBM CERTIFIED OR ETL TESTED, CLASS P, SOUND RATED A, "FULL-OUTPUT" ENERGY-SAVING, ELECTRONIC BALLASTS FOR OCTRON LAMPS AS MANUFACTURED BY MAGNETEK.
   b. BALLASTS FOR COMPACT FLUORESCENT LAMPS SHALL HAVE HIGH POWER FACTOR.
   c. BALLASTS SHALL BE APPROVED FOR USE WITH ENERGY SAVING LAMPS BY THE LAMP MANUFACTURER.

F. REFRACTORS, REFLECTORS, AND LOUVERS

1. ALL GLASSWARE, PLASTER, AND METAL SHALL BE UNIFORM, FREE FROM DEFECTS, AND PHOTOMETRICALLY TESTED FOR DISTRIBUTION BY AN INDEPENDENT TESTING LABORATORY.
2. PLASTIC DIFFUSERS SHALL BE OF VIRGIN ACRYLIC PLASTIC.
3. POLISHED REFLECTORS USED WITH TRIPHOSPHOR COMPACT LAMPS SHALL HAVE ANTI-IRIDESCENT OPTICAL COATING.
4. INSTALLATION
   a. CONTRACTOR SHALL BE RESPONSIBLE FOR HANDLING AND STORAGE. FIXTURES SHALL BE INSTALLED LEVEL, PLUMB, AND SQUARE WITH CEILINGS AND WALLS UNLESS OTHERWISE INDICATED.
   b. INSTALL EACH FIXTURE IN A MANNER RECOMMENDED BY THE FIXTURE MANUFACTURER AND APPROVED BY THE OWNER'S REPRESENTATIVE. UNDER THIS SECTION OF THE WORK, FURNISH AND INSTALL ALL ADDITIONAL CEILING BRACING, HANGER SUPPORTS AND OTHER STRUCTURAL REINFORCEMENTS TO THE BUILDING REQUIRE TO PROPERLY AND SAFELY SUSPEND FIXTURES, ALL AS APPROVED BY THE OWNER'S REPRESENTATIVE.
   c. FIXTURES IN AREAS OF EXPOSED DUCT AND PIPE WORK SHALL BE SUSPENDED TO AVOID CONFLICT WITH SAME.
   d. PENDANT FIXTURES SHALL BE PROVIDED WITH BALL ALIGNERS AND SWAY ADAPTERS. FIXTURE CHAIN SHALL NOT BE USED FOR SUPPORTING FIXTURES.
   e. BALLASTS: BALLASTS JUDGED BY THE OWNER'S REPRESENTATIVE TO BE NOISY, AND FAILED OR MALFUNCTIONING BALLASTS SHALL BE REPLACED AT OWNER'S EXPENSE.
5. FIXTURE SUPPORT - SUSPENDED CEILINGS
   a. PROVIDE FOUR WIRE SUPPORTS FOR EACH SUSPENDED FIXTURE, SECURED TO THE BUILDING STRUCTURE INDEPENDENT OF THE CEILING SUPPORTING SYSTEM.

SECTION 283000: FIRE ALARM SYSTEM BIDDER DESIGN

A. PROVIDE A COMPLETE BIDDER DESIGN FIRE ALARM SYSTEM FOR THE TENANT SPACE TO INCLUDE, BUT SHALL NOT BE LIMITED TO:
1. COMPLETE SYSTEM DESIGN. THIS SHALL INCLUDE COORDINATION OF LANDLORD AND JURISDICTIONAL REQUIREMENTS.
2. DEVELOP PERMIT SUBMITTAL DOCUMENTATION, INCLUDING SHOP DRAWINGS, AND BATTERY CALCULATIONS.
3. ALL WORK, ITEMS, ARTICLES, MATERIALS, EQUIPMENT, WIRING, AND RACEWAY FOR A COMPLETE AND OPERATIONAL SYSTEM.
4. SYSTEM TESTING, DEMONSTRATION, AND TRAINING.
5. WARRANTY.
6. ALL DOCUMENTATION REQUIRED BY NFPA.

B. SUBMITTALS - BIDDER DESIGN CONTRACTOR SHALL PROVIDE ALL SUBMITTALS AS FOLLOWS:

1. SHOP DRAWINGS AND PRODUCT DATA SHALL BE SUBMITTED TO ARCHITECT FOR APPROVAL OF DEVICE LOCATIONS AND FINISH.
2. SUBMIT ALL DOCUMENTATION TO LANDLORD AND LOCAL JURISDICTION AS REQUIRED FOR APPROVAL AND TO OBTAIN PERMITS. THIS SHALL INCLUDE, BUT IS NOT LIMITED TO, SHOP DRAWINGS, BATTERY CALCULATIONS, LISTING INFORMATION, AND PRODUCT DATA.

C. CODES AND STANDARDS

1. TENANT SYSTEM SHALL BE IN ACCORDANCE WITH ALL JURISDICTIONAL CODES AND SHALL BE IN COMPLIANCE WITH THE LANDLORD'S STANDARDS AND REQUIREMENTS.

D. APPROVED CONTRACTOR AND INSTALLER

1. ALL WORK RELATED TO THE TENANT FIRE ALARM SYSTEM INSTALLATION SHALL BE PERFORMED BY A LANDLORD APPROVED CONTRACTOR.
2. ALL WORK REQUIRED TO BE PERFORMED BY THE LANDLORD OR THE LANDLORD'S CONTRACTOR SHALL BE AT THE EXPENSE OF THE TENANT FIRE ALARM CONTRACTOR.

E. DEVICE COORDINATION

1. FIRE ALARM SYSTEM DEVICES, NOTES, AND RELATED INFORMATION SHOWN ON THE ELECTRICAL PLANS ILLUSTRATES THE INTENT OF DEVICE LOCATIONS AND INSTALLATION REQUIREMENTS AND SHALL NOT CONSTITUTE A COMPLETE FIRE ALARM SYSTEM DESIGN. BIDDER DESIGN CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE EXACT SYSTEM REQUIREMENTS WITH LANDLORD AND JURISDICTION.
2. FIRE ALARM SYSTEM INSTALLER SHALL COORDINATE WITH ARCHITECTURAL AND ALL OTHER TRADES FOR PROPER PLACEMENT OF DEVICES TO ELIMINATE CONFLICTS WITH OTHER SYSTEMS.

F. DEVICES AND EQUIPMENT

1. ALL WIRING, DEVICES, AND EQUIPMENT SHALL BE NEW AND COMPATIBLE WITH LANDLORD'S SYSTEM.
2. ALL DEVICES AND EQUIPMENT SHALL BE U.L. LISTED, FM APPROVED, AND LABELED FOR FIRE ALARM SYSTEM USE.
3. AUDIBLE/VISUAL DEVICES, IF REQUIRED, SHALL BE WHITE IN COLOR AND CEILING MOUNTED, UNLESS NOT ALLOWED BY LANDLORD OR JURISDICTION. IF CEILING MOUNTED DEVICES ARE NOT ALLOWED BY JURISDICTION OR LANDLORD, PROVIDE THE REQUIRED WALL MOUNTED DEVICES.
4. PULL STATIONS, IF REQUIRED, SHALL BE FLUSH.
5. FOR INSTALLATIONS REQUIRING COMMUNICATOR OR DIALER, PROVIDE REQUIRED PRIMARY AND SECONDARY TELEPHONE LINES TO CONTROL PANEL AND PROVIDE 120 VAC DEDICATED BRANCH CIRCUIT AS REQUIRED FOR POWER.

G. INSTALLATION

1. INSTALLATION SHALL BE IN COMPLIANCE WITH LANDLORD AND JURIDICTIONAL REQUIREMENTS.
2. INSTALLATION SHALL BE IN ACCORDANCE WITH REQUIREMENTS OUTLINED IN TENANT DESIGN CRITERIA MANUAL.
3. WIRING
   a. AT AREAS THAT ARE WITHIN PUBLIC VIEW, ALL FIRE ALARM CABLING SHALL BE RUN IN EMT.
   b. AT NON-PUBLIC AREAS, CABLING MAY BE RUN EXPOSED ABOVE 10'-0" A.F.F. UNLESS LANDLORD/JURSDICTION REQUIRES METALLIC RACEWAY. IF SO, PROVIDE REQUIRED RACEWAY. FOR CABLING BELOW 10'-0" A.F.F., RUN CONCEALED IN WALL OR IN RACEWAY.

H. CEILING MOUNTED DEVICES

1. AT AREAS WITH GWB OR ACT CEILING, PROVIDE REQUIRED BACKBOX AND FLUSH MOUNT DEVICE IN CEILING.
2. AT AREAS OPEN TO STRUCTURE, PROVIDE APPROPRIATE BACKBOX ATTACHED TO STRUCTURE WITH SURFACE MOUNT DEVICE. FOR AUDIBLE/VISUAL DEVICE SUPPORT FROM STRUCTURE WITH 3/8" THREADED ROD WITH DEVICE AT THE REQUIRED ELEVATION.

I. COORDINATION

1. PRIOR TO INSTALLATION, INSTALLER SHALL REVIEW WITH THE LOCAL JURISDICTION AND THE LANDLORD, THE FIRE ALARM SYSTEM DEVICE LOCATIONS. INSTALLATION SHALL NOT OCCUR UNTIL APPROVAL OF LAYOUT IS OBTAINED BY BOTH AGENCIES AND COORDINATED WITH ARCHITECT.
2. IF CEILING MOUNTED AUDIBLE/VISUAL DEVICES ARE NOT ALLOWED BY THE LOCAL JURSIDICTION, NOTIFY ARCHITECT.

J. FIRE ALARM SYSTEM BIDDER DESIGN CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL RACEWAY REQUIRED FOR THE FIRE ALARM SYSTEM INSTALLATION.

K. TESTING AND CLOSEOUT

1. PROVIDE A COMPLETE SYSTEM TEST AS REQUIRED BY NFPA 72, AND THE LANDLORD.
2. TEST ALL CONDUCTORS AS REQUIRED IN NFPA 72, CHAPTER 7.
3. CONTRACTOR SHALL COMPLETE THE INSPECTION AND TESTING FORM IN NFPA 72, FIGURE 10.6.2.3.
4. SUBMIT ALL TESTING AND INSPECTION REPORTS, SHOP DRAWINGS, AND AS-BUILT DRAWINGS TO OWNER AND AUTHORITY HAVING JURISDICTION AS REQUIRED BY NFPA 72.

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ELECTRICAL SPECIFICATIONS
SHEET 2 OF 2

E1.3

AS NOTED
scale

05/12/25
date

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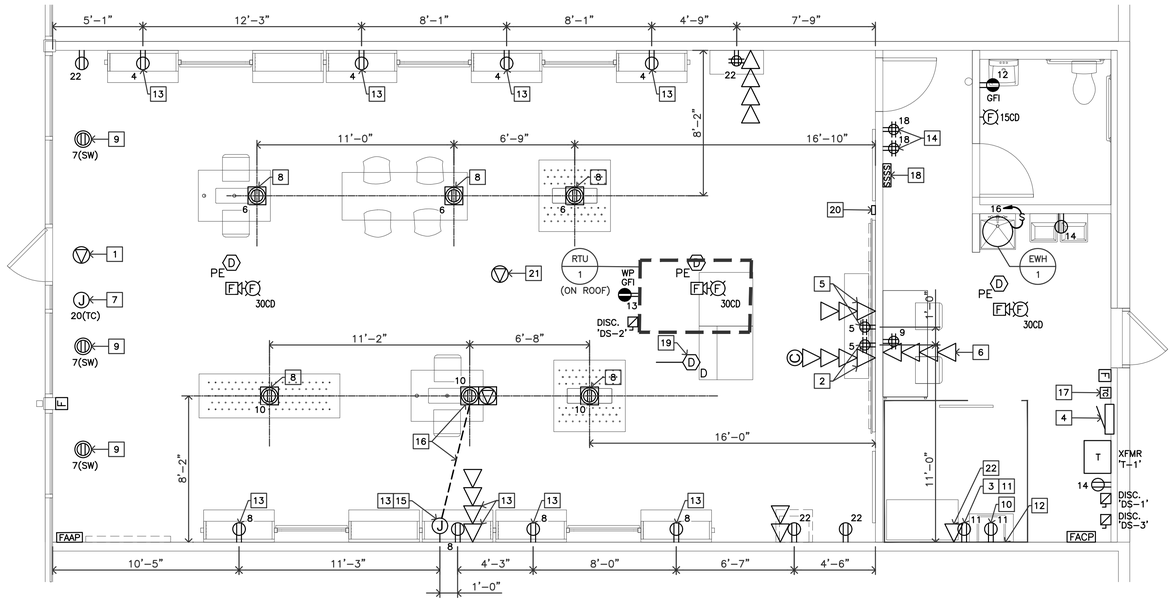
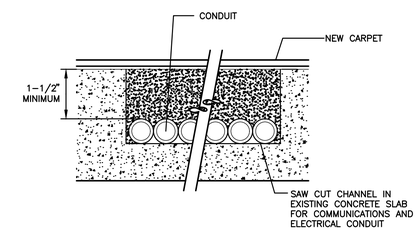


1 E2.1 **POWER PLAN**

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

0 2 4 8



2 E2.1 **TRENCH DETAIL**

SCALE: N.T.S.

GENERAL NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHES OF ELECTRICAL DEVICES.
2. REFER TO DRAWING E1.1 FOR STANDARD DEVICE MOUNTING HEIGHTS. DEVICES SHALL BE MOUNTED AT STANDARD MOUNTING HEIGHTS, UNLESS NOTED OTHERWISE ON PLAN.
3. THE NUMBER ADJACENT TO THE DEVICE INDICATES THE CIRCUIT. ALL DEVICES ON THIS PLAN ARE CIRCUITED TO PANEL 'PA' UNLESS NOTED OTHERWISE.
4. PROVIDE AND MOUNT RECEPTACLES AND TELE/DATA OUTLETS AT 18" AFF UNLESS NOTED OTHERWISE.
5. "+" SYMBOL INDICATES DEVICE MOUNTING HEIGHT AT 42" AFF.
6. DATA OUTLETS SHALL BE CATEGORY 6 (PLUS/ENHANCED) 8P8C RATED FOR 600MHZ.
7. INSTALL FLOOR BOXES AND COVERS PER MANUFACTURER'S RECOMMENDATIONS.
8. DATA CABLING SHALL BE CATEGORY 6 (PLUS/ENHANCED) RATED FOR 600MHZ.

KEY NOTES

1. PROVIDE DATA ABOVE ACOUSTIC CEILING FOR SHOPPERTRACK EQUIPMENT, IF NOT EXISTING. CONTRACTOR TO CONFIRM WITH AT&T CONSTRUCTION MANAGER IF AN ADDITIONAL DATA DEVICE FOR SHOPPERTRAK IS REQUIRED, LOCATE PER AUTHORIZED RETAILER'S DIRECTION.
2. MOUNT DEVICES AT 2'-0" A.F.F.
3. PROVIDE DUPLEX RECEPTACLE IN BACK OF HOUSE FOR Wi-Fi EQUIPMENT, LOCATE PER AUTHORIZED RETAILER'S DIRECTION.
4. PROVIDE ELECTRICAL PANEL 'PA'. REFER TO E3.1 FOR MORE INFORMATION.
5. MOUNT DEVICES AT 5'-6" A.F.F.
6. PROVIDE 2-GANG MUD RING 18" AFF WITH PULL STRING FOR ROUTING OF CCTV CABLING.
7. PROVIDE JUNCTION BOX FOR SIGNAGE, IF NOT EXISTING. SIGN SUPPLIED AND INSTALLED BY AT&T SIGN VENDOR. CONTROL SIGN VIA TIME CLOCK LOCATED NEXT TO ELECTRICAL PANEL.
8. PROVIDE LEGRAND RATCHET-PRO FLOOR BOX #RPNFB WITH #RP7CTCBK COVER AND ASSOCIATED ADAPTERS. PROVIDE (1) DUPLEX RECEPTACLE. COORDINATE EXACT LOCATION IN FIELD WITH AUTHORIZED RETAILER OR AUTHORIZED RETAILER'S GC PRIOR TO INSTALLATION.
9. PROVIDE RECEPTACLE IN CEILING. CONTROL VIA SWITCH "d" IN SWITCH BANK. REFER TO SWITCH BANK DETAIL 4/E2.2.
10. MOUNT DEVICES AT 11'-6" A.F.F.
11. PROVIDE TELECO TERMINATION POINT WITHIN BACK OF HOUSE, VERIFY LOCATION WITH DEALER, DRAWINGS, AND SPECIFICATIONS BY OTHERS.
12. PROVIDE DATA BACKBOARD/RACK, CONFIRM LOCATION WITH AUTHORIZED RETAILER.
13. MOUNT DEVICE AT 15" A.F.F.
14. PROVIDE (2) QUADPLEX RECEPTACLES FOR LED STRIP LIGHTING. CONNECT FROM QUAD BOX TO TIME CLOCK AND ELECTRICAL PANEL. REFER TO BOH ELEVATION DETAIL 3/E2.1 AND LED STRIP LIGHT DETAIL 4/E2.1 FOR MORE INFORMATION. COORDINATE EXACT LOCATION WITH AT&T CONSTRUCTION MANAGER.
15. TERIMINATE 2" DATA CONDUIT IN 4-GANG JUNCTION BOX. PROVIDE PULL STRING IN THIS CONDUIT. REFER TO TRENCH DETAIL 2/E2.1, EXACT ROUTING SHALL BE DETERMINED IN FIELD.
16. PROVIDE LEGRAND RACHET-PRO FLOOR BOX #RPNFB WITH #RPAV3TCBK COVER AND '2HUB' FLOOR BOX ACCESSORY. PROVIDE (1) DUPLEX RECEPTACLE. PROVIDE 2" PVC CONDUIT WITH PULL WIRE FOR USB/HDMI CABLES. CONNECT TO FLOOR BOX '2HUB' ACCESSORY. PROVIDE 1 1/4" PVC CONDUIT WITH PULL WIRE FOR DATA OUTLETS AS REQUIRED.
17. PROVIDE POWER & DATA FOR TIME CLOCK, INTERMATIC MODEL NUMBER 'ET1125C', VERIFY MOUNTING HEIGHT WITH AUTHORIZED RETAILER.
18. SWITCH BANK, REFER TO DETAIL 4/E2.2. INSTALL 20-AMP RATED SINGLE POLE SWITCHES, UNLESS NOTED OTHERWISE.
19. ACTIVATION OF DUCT DETECTOR SHALL SHUTDOWN HVAC UNIT, AND SEND ALARM INITIATION SIGNAL TO FIRE ALARM SYSTEM. DETECTOR FURNISHED BY ELECTRICAL CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR. POWER AND CONTROL WIRING BY ELECTRICAL CONTRACTOR. PROVIDE SYSTEM SENSOR 'D4120' DUCT SMOKE DETECTOR OR APPROVED EQUAL. REFER TO MECHANICAL PLAN H1.1 FOR EXACT LOCATION.
20. PROVIDE HORN/STROBE SIGNALING ACCESSORY FOR DUCT DETECTOR, SYSTEM SENSOR MODEL NUMBER 'RTS2-AOS' OR APPROVED EQUAL. CONTROL WIRING BY ELECTRICAL CONTRACTOR. MOUNT 48" AFF.
21. PROVIDE POE (POWER OVER ETHERNET) CONNECTION TO A SINGLE ACCESS POINT, CENTRALLY LOCATED WITHIN STORE, IF NOT EXISTING. POE TO EXTEND TO WIFI EQUIPMENT LOCATION IN BACK OF HOUSE, MARK LOCATION ON CEILING.
22. PROVIDE DATA FOR MUSIC EQUIPMENT. CONFIRM LOCATION WITH AUTHORIZED RETAILER IN FIELD..

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revisions

project number 25017 | drawn by SJI

project north

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RANDY J. FALK & ASSOCIATES

AT&T

NORTHEAST CORNER OF STATE HWY 121 AT N. HWY 75 MELISSA, TX 75454

POWER PLAN

AS NOTED (scale) | 05/12/25 (date) | E2.1

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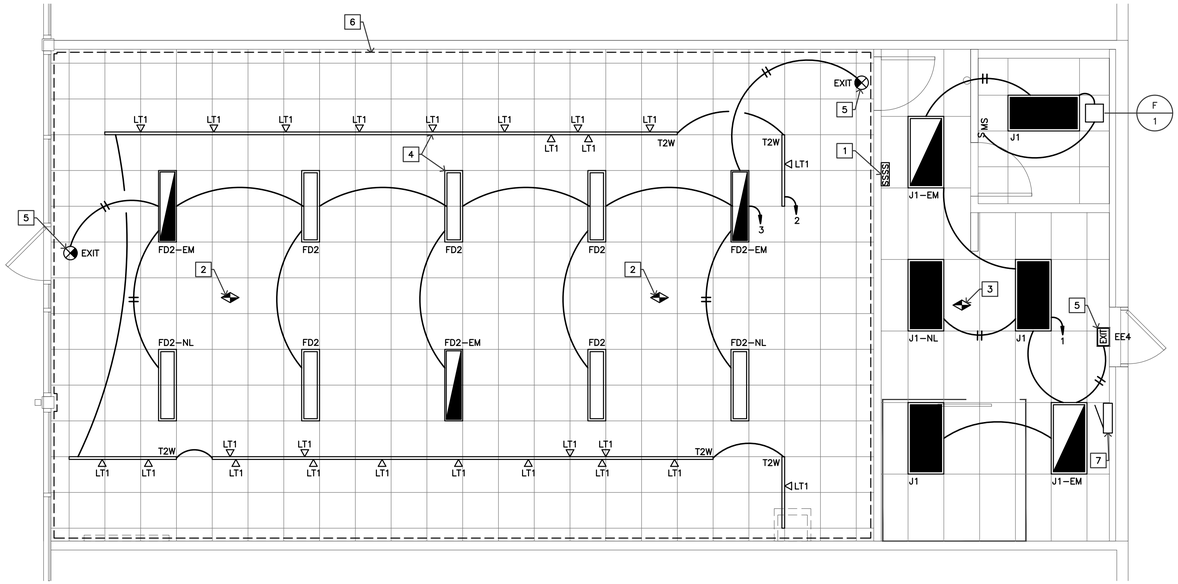
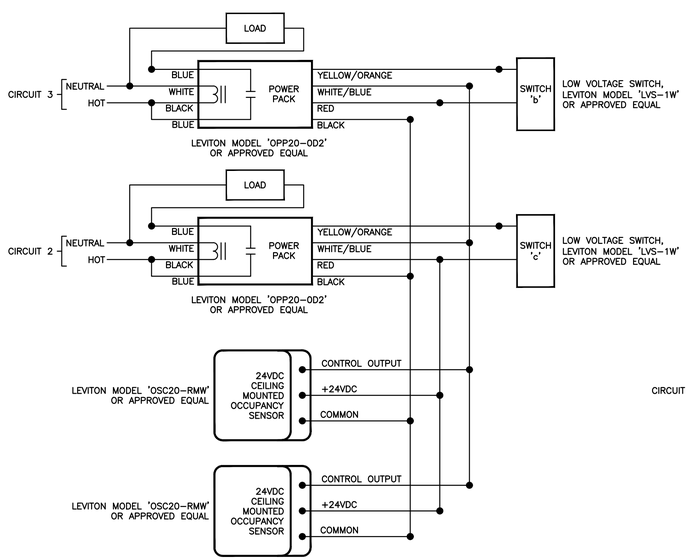


1 / E2.2 LIGHTING PLAN

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

0 2 4 8

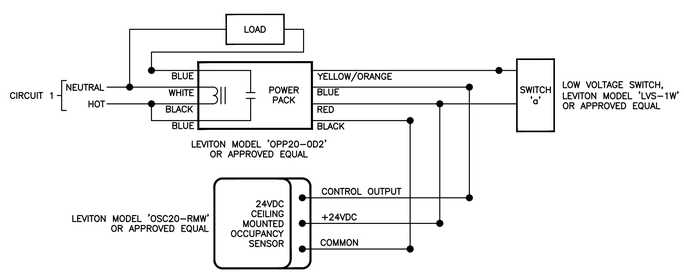


SEQUENCE OF OPERATION:

LIGHTS SHALL TURN ON MANUALLY VIA WALL SWITCH AND OCCUPANCY SENSOR SHALL TURN LIGHTS OFF 30 MINUTES AFTER LAST DETECTION OF OCCUPANCY.

2 / E2.2 SALES OCCUPANCY SENSOR WIRING DIAGRAM

SCALE: NO SCALE

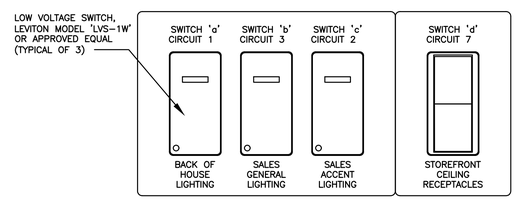


SEQUENCE OF OPERATION:

LIGHTS SHALL TURN ON AUTOMATICALLY VIA MOTION SENSOR AND MOTION SENSOR SHALL TURN LIGHTS OFF 30 MINUTES AFTER LAST DETECTION OF OCCUPANCY.

3 / E2.2 BACK OF HOUSE OCCUPANCY SENSOR WIRING DIAGRAM

SCALE: NO SCALE



NOTE:

EXACT SWITCH BANK LAYOUT SHALL BE DETERMINED IN FIELD.

4 / E2.2 SWITCH BANK DETAIL

SCALE: N.T.S.

GENERAL NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR LIGHTING FIXTURE SCHEDULE.
2. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS.
3. LIGHTING FIXTURES DESIGNATED WITH THE LETTERS 'NL' ARE NIGHT LIGHTS.
4. LIGHTING FIXTURES DESIGNATED WITH THE LETTERS 'EM' ARE EMERGENCY LIGHTS, PROVIDE EMERGENCY BALLAST.
5. THE NUMBER ADJACENT TO THE DEVICE INDICATES THE CIRCUIT. ALL DEVICES ON THIS PLAN ARE CIRCUITED TO PANEL 'PA' UNLESS NOTED OTHERWISE.
6. WIRING DIAGRAMS ARE SHOWN FOR REFERENCE ONLY, INSTALL DEVICES PER MANUFACTURER'S RECOMMENDATIONS.

KEY NOTES

1. SWITCH BANK, REFER TO DETAIL 4/E2.2. INSTALL 20–AMP RATED SINGLE POLE SWITCHES, UNLESS NOTED OTHERWISE.
2. PROVIDE CEILING MOUNTED OCCUPANCY SENSOR, LEVITON MODEL NUMBER 'OSC20–RMW' OR APPROVED EQUAL. REFER TO SALES OCCUPANCY SENSOR WIRING DIAGRAM DETAIL 2/E2.2.
3. PROVIDE CEILING MOUNTED OCCUPANCY SENSOR, LEVITON MODEL NUMBER 'OSC10–RMW' OR APPROVED EQUAL. REFER TO BACK OF HOUSE OCCUPANCY SENSOR WIRING DIAGRAM DETAIL 3/E2.2.
4. REFER TO SWITCH BANK DETAIL 4/E2.2 AND SALES AREA OCCUPANCY SENSOR WIRING DIAGRAM 2/E2.2 FOR SWITCHING.
5. PROVIDE UNSWITCHED CONDUCTOR.
6. LED STRIP LIGHT, REFER TO BOH ELEVATION DETAIL 3/E2.1 AND LED STRIP LIGHT DETAIL 4/E2.1 FOR MORE INFORMATION.
7. PROPOSED ELECTRICAL PANEL 'PA'. REFER TO E3.1 FOR MORE INFORMATION.

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MELISSA, TX 75454

LIGHTING PLAN

AS NOTED (scale) | 05/12/25 (date) | E2.2

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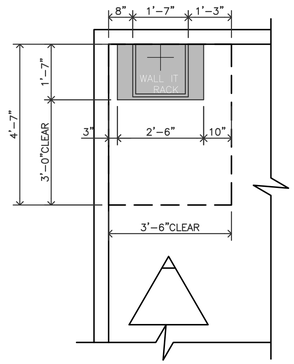
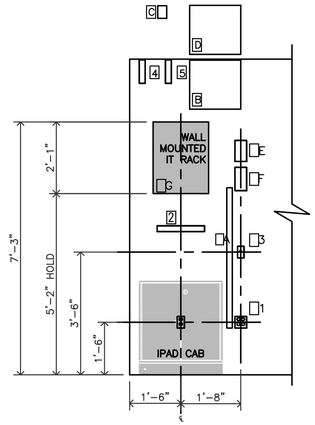


1 E3.1 **AUDIO/VIDEO RACK DETAIL**
SCALE: N.T.S.



2 E3.1 **AUDIO/VIDEO ELEVATION DETAIL**
SCALE: N.T.S.

RACK – KEYED ELECTRICAL NOTES

1. EC TO PROVIDE QUADPLEX OUTLET 18" AFF AND 38" OFF ADJACENT WALL.
2. EC SHALL PROVIDE 24"X1" BUSBAR. GC SHALL ROUTE A #6 GROUND FROM BUSBAR FOR CONNECTION TO ELECTRICAL SYSTEM GROUND.
3. EC SHALL PROVIDE FLUSH DEVICE BOX AT TYCO CABLING WITH CONDUIT/BUSHING AND PULL STING STUBBED ABOVE FINISHED CEILING. PROVIDE BLANK COVER PLATE WITH 1/2" HOLE DRILLED IN THE CENTER.
4. GC SHALL PROVIDE AND EXTEND 3" CONDUIT WITH PULL STRING AND BUSHING FROM MDF RACK AREA TO EXISTING PHONE SERVICES. FIELD VERIFY EXACT LOCATION AND ROUTING IN FIELD. COORDINATE INSTALLATION WITH AT&T CONSTRUCTION MANAGER.
5. GC SHALL EXTEND EXISTING 2" CONDUIT WITH PULL STRING AND BUSHING FROM MDF RACK AREA TO EXISTING WEATHER HEAD PROVIDED BY LL FOR SATELLITE. FIELD VERIFY EXACT LOCATIONS AND ROUTING IN FIELD. COORDINATE INSTALLATION WITH AT&T CONSTRUCTION MANAGER. COORDINATE WITH LL ROOFER IF NOT EXISTING.

PROVIDED BY VENDOR

A. 4' POWER STRIP.
B. DUMMY SECURITY PANEL MOUNTED.
C. RJ31X EXTENSION OF ALARM LINE, JUST ABOVE CEILING WEHRE LOW-VOLTAGE CABLING PENETRATION OCCURS. LABEL JACK WITH ONLY THE POTS LINE ASSOCIATED WITH IT.
D. SECURITY PANEL MOUNTED ABOVE CEILING.
E. TI SMART JACK/ETHERNET BROADBAND CONNECTION.
F. LEC NETWORK INTERFACE BLOCK, RJ21X OR 66 BLOCK.
G. WALL MOUNTED EQUIPMENT RACK.

AT&T - MELISSA, TX

(N) PANEL 'PA'

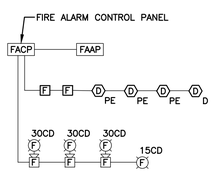
NOTES:
(E) DENOTES EXISTING CIRCUIT BREAKER
(L) DENOTES LOCKED ON CIRCUIT BREAKER
(SW) DENOTES SWITCHED RECEPTACLE CIRCUIT
(TC) DENOTES CIRCUIT CONTROLLED BY TIME CLOCK

CONTRACTOR SHALL VERIFY EXISTING LOADS TO REMAIN AND ADJUST CIRCUIT NUMBERS AS NECESSARY.

VOLTAGE: 208Y/120V
PHASE: 3
WIRE: 4
BUS: 100A
MAINS: 100A MCB
AIC RATING: 22KAIC
ENCLOSURE: NEMA 1
MOUNTING: SURFACE

CONN. AMPS	DESCRIPTION	BRANCH CIRCUIT	BKR	CKT	PH	CKT	BKR	BRANCH CIRCUIT	DESCRIPTION	CONN. AMPS
2.73	BACK OF HOUSE LTG & F-1	2#12 + 1#12GND, 3/4"C	20	1	A	2	20	2#12 + 1#12GND, 3/4"C	SALES AREA ACCENT LTG	2.08
3.17	SALES AREA GENERAL LTG	2#12 + 1#12GND, 3/4"C	20	3	B	4	20	2#12 + 1#12GND, 3/4"C	MERCH UNITS RECEPTS. - NORTH	6.00
6.00	SALES AREA CASE RECEPT	2#12 + 1#12GND, 3/4"C	20	5	C	6	20	2#12 + 1#12GND, 3/4"C	SALES AREA FLOORBOX RECEPT. - NORTH	4.50
4.50	(SW) STOREFRONT CEILING RECEPT.	2#12 + 1#12GND, 3/4"C	20	7	A	8	20	2#12 + 1#12GND, 3/4"C	MERCH UNITS RECEPTS. - SOUTH	6.00
3.00	BACK OF HOUSE CCTV	2#12 + 1#12GND, 3/4"C	20	9	B	10	20	2#12 + 1#12GND, 3/4"C	SALES AREA FLOORBOX RECEPT. SOUTH	4.50
3.00	BACK OF HOUSE WIFI/DATA/VIDEO RECEPTS	2#12 + 1#12GND, 3/4"C	20	11	C	12	20	2#12 + 1#12GND, 3/4"C	BATHROOM GFI RECEPT.	1.50
1.50	ROOFTOP GFI RECEPT. (ON ROOF)	2#12 + 1#12GND, 3/4"C	20	13	A	14	20	2#12 + 1#12GND, 3/4"C	BACK OF HOUSE GENERAL RECEPT.	3.00
0.00	SPARE		20	15	B	16	20	2#12 + 1#12GND, 3/4"C	EWH-1	12.50
0.00	SPARE		20	17	C	18	20	2#12 + 1#12GND, 3/4"C	(TC) LED STRIP LTG QUAD RECEPT.	6.00
0.00	SPARE		20	19	A	20	20	2#12 + 1#12GND, 3/4"C	(TC) STOREFRONT SIGNAGE	1.50
0.00	SPARE		20	21	B	22	20	2#12 + 1#12GND, 3/4"C	SALES AREA GENERAL RECEPT.	7.50
0.00	SPARE		20	23	C	24	20		SPARE	0.00
0.00	SPACE			25	A	26			SPACE	0.00
0.00	SPACE			27	B	28			SPACE	0.00
0.00	SPACE			29	C	30			SPACE	0.00
		PHASE A CONNECTED AMPS	21.32			21.32		**PHASE A DEMAND AMPS**		
		PHASE B CONNECTED AMPS	36.67			36.67		**PHASE B DEMAND AMPS**		
		PHASE C CONNECTED AMPS	21.00			21.00		**PHASE C DEMAND AMPS**		
		TOTAL CONNECTED AMPS	26.31			26.31		**TOTAL DEMAND AMPS**		
		TOTAL CONNECTED KVA	9.48			9.48		**TOTAL DEMAND KVA**		

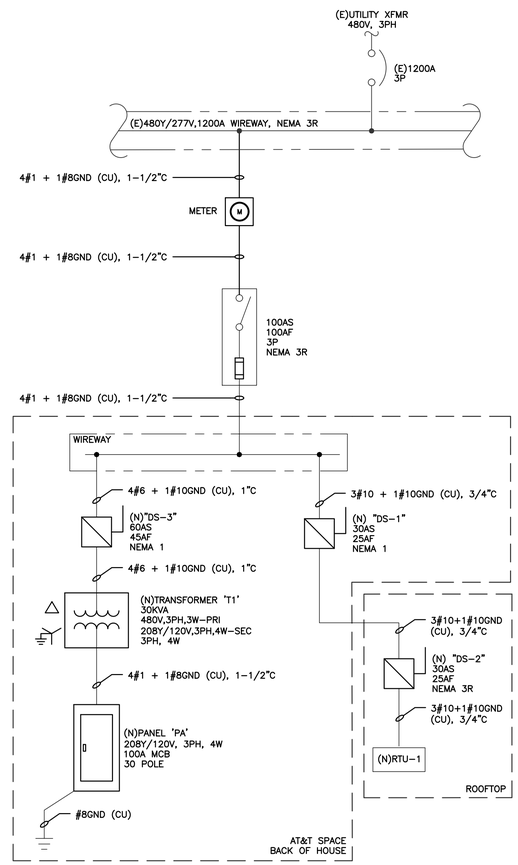
FIRE ALARM RISER DIAGRAM



GENERAL NOTES:

1. ALL WIRING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
2. MINIMUM SIZE CONDUIT SHALL BE 3/4".
3. FOR EXACT LOCATION AND NUMBER OF DEVICES, REFER TO DRAWING E2.1.
4. ALL FIRE ALARM DEVICES PROVIDED SHALL BE COMPATIBLE WITH EXISTING SYSTEM.
5. (E) DENOTES EXISTING DEVICE

SINGLE LINE DIAGRAM



GENERAL NOTES:

1. CONTRACTOR TO ENSURE THE ELECTRIC SERVICE IS PROPERLY BONDED AND GROUNDED PER NEC ARTICLES 230 AND 250.
2. CONTRACTOR SHALL COORDINATE MINIMUM AIC RATING WITH ELECTRIC UTILITY AND EXISTING EQUIPMENT.
3. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING EQUIPMENT RATINGS AND WIRE AMPACITIES, REPORT ANY DISCREPANCIES TO ENGINEER OF RECORD.
4. CONTRACTOR TO ENSURE COMPLIANCE WITH WIRE TAP REQUIREMENTS PER NEC 240.

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AT&T

NORTHEAST CORNER OF STATE HWY 121 AT N. HWY 75 MELISSA, TX 75454

SINGLE LINE DIAGRAM AND PANEL SCHEDULES

E3.1

AS NOTED scale | **05/12/25** date

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COM*check* Software Version COMcheckWeb

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: ATandT MELISSA,TX
Project Type: Alteration

Construction Site:
NORTHEAST CORNER OF STATE HWY 121 AT N. HWY 75
MELISSA, Texas 75454

Owner/Agent:
Pennsylvania

Designer/Contractor:
URBAN ENGINEERS, INC
909 Lake Carolyn Parkway, Suite 370
Irving, Texas 75039
2144999270

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-Retail:Sales Area	1630	1.59	2592
Allowance: Decorative Appearance / Fix. ID: LED	1240 (a)	1.00	250 (b)
Allowance: Vehicles, sporting goods, small electronics highlighting / Fix. ID: LT1	1240 (a)	0.60	744 (b)
		Supplemental Allowed Watts (null) =	500
		Total Allowed Watts =	4086

(a) Area claimed may exceed total floor area when Retail Merchandise Highlighting allowance(s) are specified.
(b) Allowance is (B x C) or the actual wattage of the fixtures given in Proposed Power section, whichever is less.
(c) Supplemental watts must be associated with retail merchandise highlighting fixtures.

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Retail: Sales Area (1630 sq.ft.)				
LED: LED STRIP: Other:	1	1	250	250
LED: J1: BOH GENERAL LTG: LED Panel 38W:	1	6	38	228
LED: FD2: SALES AREA GENERAL LTG: LED Panel 38W:	1	10	38	380
Track Lighting: LT1: SALE AREA ACCENT LTG: Wattage based on 74 feet of track	0	0	2220	2220
			Total Proposed Watts =	3078

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title Signature Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 100.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.1 [EL15][1]	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.2.1 [EL18][1]	Occupancy sensors installed in required spaces.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.2.1, C405.2.2, 3 [EL23][2]	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.2.2. 1 [EL22][2]	Automatic controls to shut off all building lighting installed in all buildings.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Lighting controlled by occupancy sensors.
C405.2.3 [EL16][2]	Daylight zones provided with individual controls that control the lights independent of general area lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.2.3, C405.2.3. 1, C405.2.3. 2 [EL20][1]	Primary sidelighted areas are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.2.3, C405.2.3. 1, C405.2.3. 3 [EL21][1]	Enclosed spaces with daylight area under skylights and rooftop monitors are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.2.4 [EL4][1]	Separate lighting control devices for specific uses installed per approved lighting plans.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.2.4 [EL8][1]	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.3 [EL6][1]	Exit signs do not exceed 5 watts per face.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5. 2 [FI17][3]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.4.1 [FI18][1]	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Interior Lighting fixture schedule for values.*
C408.2.5. 1 [FI16][3]	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.3 [FI33][1]	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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revisions

project number 25017 drawn by SJI

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COMCHECK

AS NOTED scale 05/12/25 date E3.2

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