



# ILLINOIS ACCESSIBILITY CODE

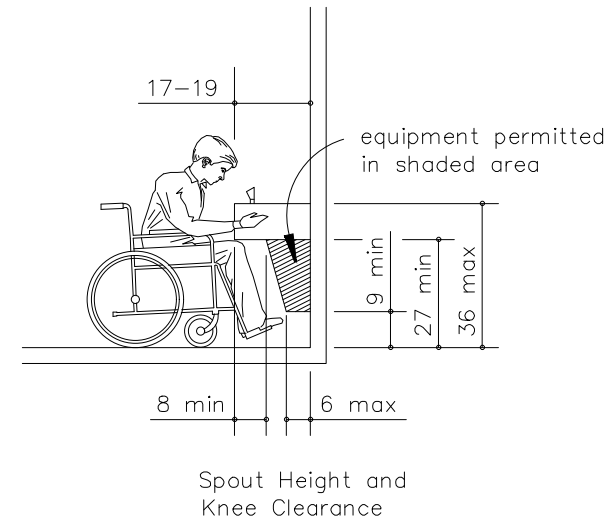
FOR MORE INFORMATION REFER TO THE ILLINOIS ACCESSIBILITY CODE STATE OF ILLINOIS DEVELOPMENT BOARD EFFECTIVE APRIL 24, 1997 CHAPTER 1 400.310 SUBCHAPTER B

INTERPRETATION OF THE ILLINOIS ACCESSIBILITY IS DETERMINED BY THE LOCAL CODE OFFICIAL.

## DRINKING FOUNTAINS

### DRINKING FOUNTAINS AND WATER COOLERS

- A) Spout Height. Spouts shall be no higher than 36 in. (915 mm), measured from the floor or ground surfaces to the spout outlet. (ADAAG 4.15.2)
- B) Spout Location. The spouts of drinking fountains and water coolers shall be at the front of the unit and shall direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit. The spout shall provide a flow of water at least 4 in. (100 mm) high so as to allow the insertion of a cup or glass under the flow of water. On an accessible drinking fountain with a round or oval bowl, the spout must be positioned so the flow of water is within 3 in. (75 mm) of the front edge of the fountain. (ADAAG 4.15.3)
- C) Controls. Controls shall comply with Section 400.310 (q)(4). Unit controls shall be front mounted or side mounted near the front edge. (ADAAG 4.15.4)

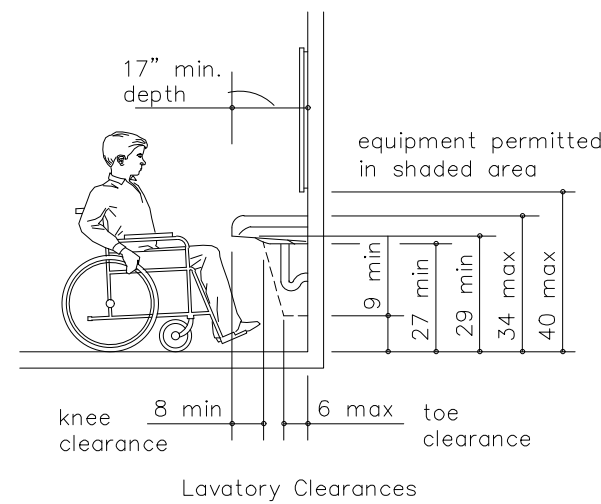


## LAVATORIES, SINKS & MIRRORS

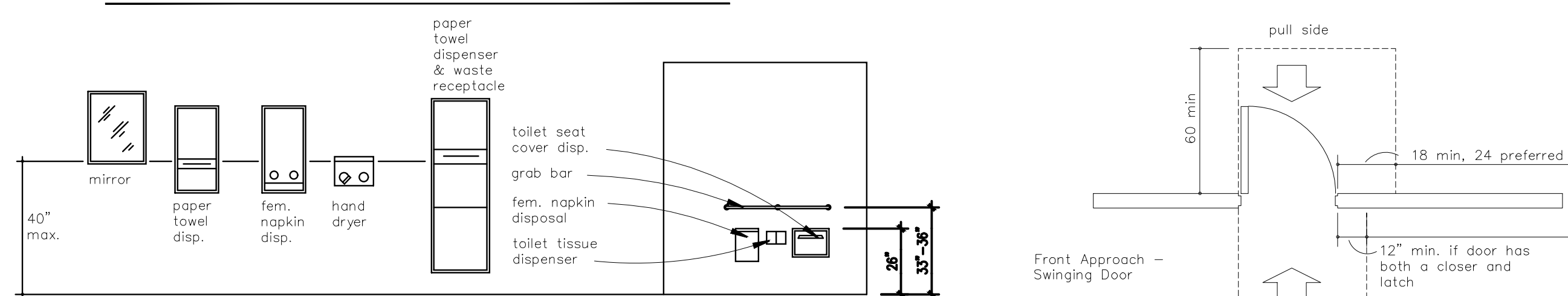
LAVATORIES AND MIRRORS. If lavatories and mirrors are provided, then at least one of each shall comply with the following requirements:

- A) General. The requirements of this subsection shall apply to lavatory fixtures, vanities, and built-in lavatories. (ADAAG 4.19)
- B) Height and Clearances. Lavatories shall be mounted with the rim or counter surface no higher than 34 in. (865 mm) above the finish floor. Provide a clearance of at least 29 in. (735 mm) above the finish floor to the bottom of the apron. (ADAAG 4.19.2)
- C) Clear Floor Space. A clear floor space 30 in by 48 in. (760 mm by 1220 mm) complying with Section 400.220 (d) shall be provided in front of a lavatory to allow forward approach. Such clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 in. (485 mm) underneath the lavatory. (ADAAG 4.19.3)
- D) Exposed Pipes and Surfaces. Hot water and drain pipes under lavatories shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories. (ADAAG 4.19.4)
- E) Faucets. Faucets shall comply with subsection (r)(4) of this Section. Lever-operated, push-type, and electronically controlled mechanisms are examples of acceptable designs. If self-closing valves are used the faucet shall remain open for at least 10 seconds. (ADAAG 4.19.5)
- F) Mirrors. Mirrors shall be mounted with the bottom edge of the reflecting surface no higher than 40 in. (1015 mm) above the finish floor. (ADAAG 4.19.6)

CONTROLS AND DISPENSERS. If controls, dispensers, receptacles, or other equipment are provided, then at least one of each shall be on an accessible route, and shall comply with subsection (r) of this Section. (ADAAG 4.22.7)



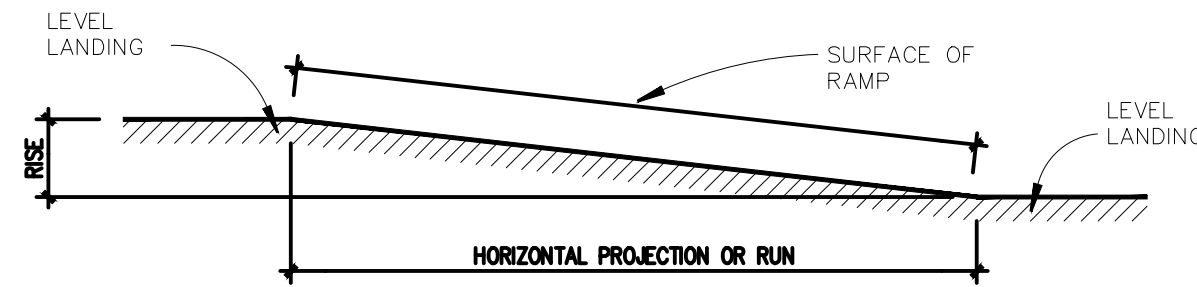
## RESTROOM FIXTURE MOUNTING HEIGHTS



NOTE: OPERATING MECHANISM MEETING HEIGHT OF ALL ACCESSORIES IN PUBLIC RESTROOMS SHALL NOT EXCEED 3'-4" A.F.F.

## RAMPS

- 1. General. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with the following requirements unless another means of accessible vertical access (e.g., accessible elevator or accessible platform lift) is provided. (ADAAG 4.8.1)
- 2. Slope and Rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in. Curb ramps and interior or exterior ramps to be constructed on existing sites or in existing buildings or facilities where space limitations prohibit the use of a 1:12 slope or less may have slopes and rises as follows: (ADAAG 4.8.2)
  - A) A slope between 1:10 and 1:12 is allowed for a maximum rise of 6 in.
  - B) A slope between 1:8 and 1:10 is allowed for a maximum rise of 3 in. A slope steeper than 1:8 is not allowed. (ADAAG 4.1.6(3)(a))
- 3. Clear Width. The minimum clear width of a ramp shall be 36 in. (915 mm). (ADAAG 4.8.3)
- 4. Landings. Ramps shall have level landings at bottom and top of each ramp run. Landings shall have the following features:
  - A) The landing shall be at least as wide as the ramp run leading to it.
  - B) The landing length shall be a minimum of 60 in. (1525 mm) clear.
  - C) If ramps change direction at landings, the minimum landing size shall be 60 in. by 60 in. (1525 mm by 1525 mm).
  - D) If a doorway is located at a landing, then the area in front of the doorway shall comply with subsection (j)(5) of this Section. (ADAAG 4.8.4)



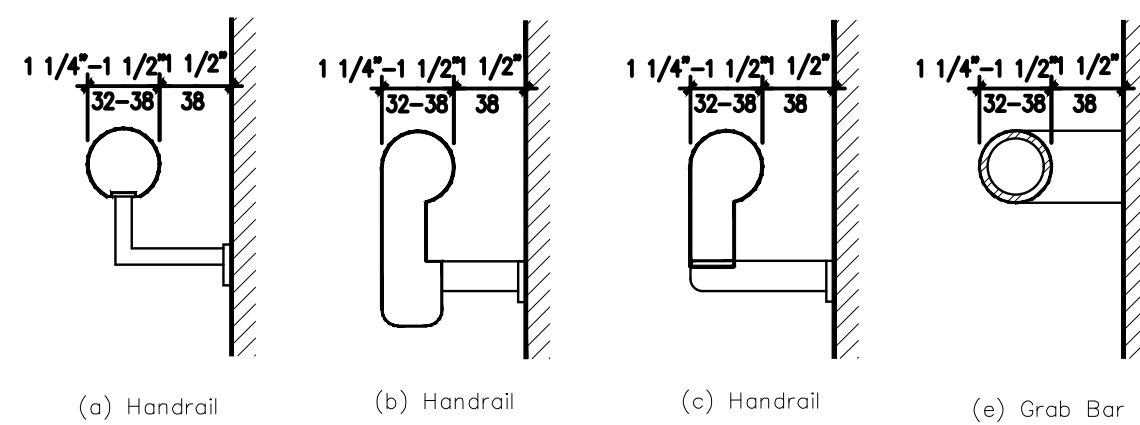
SLOPE	MAXIMUM RISE		MAXIMUM HORIZONTAL OR RUN	
	IN	MM	FT	M
1:12 TO < 1:16	30	760	30	9
1:16 TO < 1:20	30	760	40	12

### COMPONENTS OF A SINGLE RAMP RUN AND SAMPLE RAMP DIMENSIONS

## GRAB BARS

### Handrails, Grab Bars, and Tub and Shower Seats

- 1) General. All handrails, grab bars, and tub and shower seats required to be accessible shall comply with the requirements of this subsection (q). (ADAAG 4.26.1)
- 2) Size and Spacing of Grab Bars and Handrails. The diameter or width of the gripping surfaces of a handrail or grab bar shall be 1-1/4 in to 1-1/2 in (32 mm to 38 mm), or the shape shall provide an equivalent gripping surface. If handrails or grab bars are mounted adjacent to a wall, the space between the wall and the grab bar shall be 1-1/2 in. (38 mm). Handrails may be located in a recess if the recess is a maximum of 3 in. (75 mm) deep and extends at least 18 in. (455 mm) above the top of the rail. (ADAAG 4.26.2)
- 3) Structural Strength. The structural strength of grab bars, tub and shower seats, fasteners, and mounting devices shall meet the following specification:
  - A) Bending stress in a grab bar or seat induced by the maximum bending moment from the Application of 250 lbf (1112N) shall be less than the allowable stress for the material of the grab bar or seat
  - B) Shear stress induced in a grab bar or seat by the application of 250 lbf (1112N) shall be Less than the allowable shear stress for the material of the grab bar or seat. If the connection between the grab bar or seat and its mounting bracket or other support is considered to be fully restrained, then direct and torsional shear stresses shall be totaled for the combined shear stress, which shall not exceed the allowable shear stress.
  - C) Shear force induced in a fastener or mounting device from the application of 250 lbf (1112N) shall be less than the allowable lateral load of either the fastener or mounting device or the supporting structure, whichever is the smaller allowable load.
  - D) Tensile force induced in a fastener by a direct tension force of 250 lbf (1112N) plus the maximum moment from the application of 250 lbf (1112N) shall be less than the allowable withdrawal load between the fastener and the supporting structure.
  - E) Grab bars shall not rotate within their fittings. (ADAAG 4.26.3)
- 4) ELIMINATING HAZARDS. A handrail or grab bar and any wall or other surface adjacent to it shall be free of any sharp or abrasive elements. Edges shall have a minimum radius of 1/8 in. (3.2 mm). (ADAAG 4.26.4)



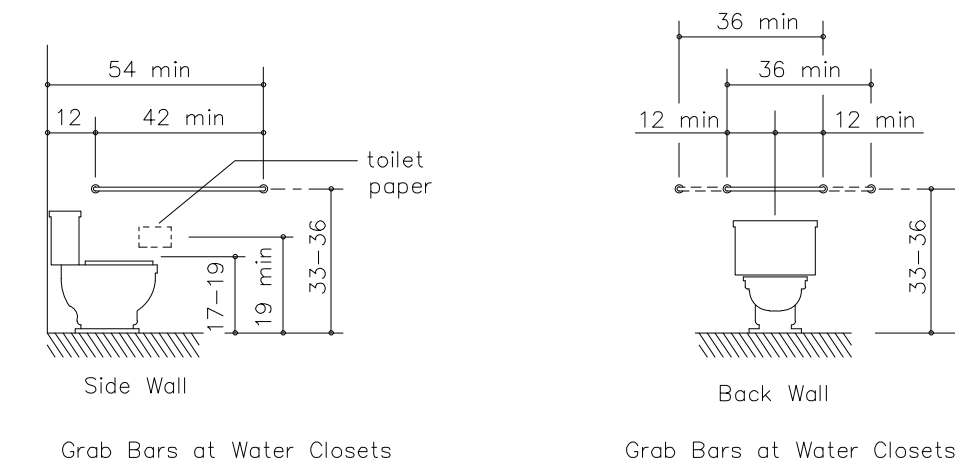
## WATER CLOSETS

### WATER CLOSETS

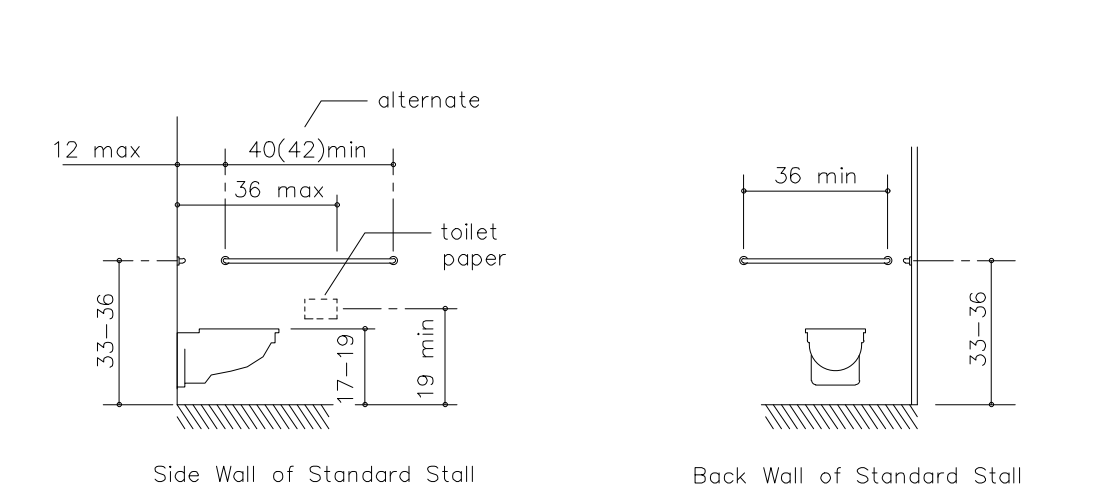
- 1) Grab Bars. Grab bars for water closets not located in stalls shall comply with subsection (q) of this Section. The grab bar behind the water closet shall be 36-in. (915 mm) minimum. (ADAAG 4.1.6.4) Grab bars at back of flush valve water closets may be provided in two sections if high flushometer riser pipe is required by applicable building or plumbing code.

### TOILET STALLS

Grab bars. Grab bars complying with the length and positioning shall be provided. Grab bars may be mounted with any desired method as long as they have a gripping surface at the locations shown and do not obstruct the required clear floor area. Grab bars shall comply with subsection (q) of this Section. (ADAAG 4.17.G) Grab bars at back of flush valve water closets may be provided in two sections if high flushometer riser pipe is required by applicable building or plumbing code.



## TOILET STALLS



## ALARMS

### ALARMS

- 1) General. Where emergency warning systems or alarms are provided or required by an applicable State or local building code, life safety code or fire protection regulation, such systems shall comply with the requirement below and shall be both audible and visual. Visual alarms shall be arranged so the flashing light beam can be seen at the required level of intensity from all common use areas. At a minimum, visual signal appliances shall be provided in buildings and facilities in each of the following areas: restrooms and any other general usage areas (e.g., meeting rooms), hallways, lobbies, and any other area for common use. (ADAAG 4.28.1)
- 2) Audible Alarms. If provided, audible emergency alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room or space by at least 15 dbA or exceeds any maximum sound level with a duration of 60 seconds by 5 dbA, whichever is louder. Sound levels for alarm signals shall not exceed 120 dbA. (ADAAG 4.28.2)
- 3) Visual Alarms. Visual alarm signal appliances shall be integrated into the building or facility alarm system. If single station audible alarms are provided then single station visual alarm signals shall be provided. Visual alarm signals shall comply with the requirements of U.S. Architectural and Transportation Barriers Compliance Board Bulletin #2: Visual Alarms.
- 4) Auxiliary Alarms. Units and sleeping accommodations shall have a visual alarm connected to building emergency alarm system or shall have a standard 110-volt electrical receptacle into which such an alarm can be connected and a means by which a signal from the building emergency alarm system can trigger such an auxiliary alarm. When visual alarms are in place the signal shall be visible in all areas of the unit or room. Instructions for use of the auxiliary alarm or receptacle shall be provided. (ADAAG 4.28.4)

## OPERATING MECHANISMS

### CONTROLS AND OPERATING MECHANISMS

- 1) General. Where controls and operating mechanisms are provided in accessible spaces, along accessible routes or as parts of accessible elements (for example, light switches and dispenser controls), operable parts and controls shall comply with the requirements of this subsection (r). (ADAAG 4.1.3(1.3))
  - 2) Clear Floor Space. Clear floor space complying with Section 400.220(d) that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles, and other operable equipment. (ADAAG 4.27.2)
  - 3) Height. The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in Section 400.220(e) and (f). Electrical and communications system receptacles on walls shall be mounted no less than 15 in. (380 mm) above the floor.
- EXCEPTION: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants. (ADAAG 4.27.4)
- Operation. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2N). (ADAAG 4.27.4)

## DETECTABLE WARNINGS

### DETECTABLE WARNINGS

Detectable warnings shall be provided as follows:

- 1) Detectable Warnings on Walking Surfaces. Detectable warning features on walking surfaces shall consist of exposed aggregate concrete, cushioned surfaces mad of rubber or plastic, raised strips, or grooves. Features shall contrast with that of the surrounding surface.
- 2) Tactile Warning on Doors to Hazardous Areas. Doors that lead to areas that might prove dangerous to a person who is visually impaired (for example, doors to loading platforms, boiler rooms, stages, etc.) shall be made identifiable to the touch by a textured surface on the door handle, knob, pull, or other operating hardware. This textured surface may be made by knurling or roughening or by a material applied to the contact surface. Such textured surfaces shall not be provided for emergency exit doors or any doors other than those to hazardous areas. See definition of "Hazardous Areas".
- 3) Detectable Warnings at Stairs. All stairs, except those in dwelling units, in enclosed stair towers, or set to the side of the path of travel shall have a detectable warning at the top of stair runs.
- 4) Detectable Warnings at Hazardous Vehicular Areas. If a walk crosses or adjoins a vehicular way, and the walking surfaces are not separated by curbs, railings, or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be defined by a continuous, detectable warning texture, which is 36 in. (915 mm) wide, complying with subsection (l)(1) of this Section. (ADAAG 4.29.5)
- 5) Detectable Warnings at Reflecting Pools. The edges of reflecting pools shall be protected by railings, walls, curbs, or detectable warnings complying with subsection (t)(1) of this Section. (ADAAG 4.29.6)
- 6) Standardization. Textured surfaces for detectable warnings shall be standard within a building, facility, site, or complex of buildings.

## SIGNAGE

### Signage

- 1) Signage for Particular Elements or Spaces. Elements and spaces of accessible facilities, which shall be identified by the international symbol of accessibility and which shall comply with subsection (u)(6)(A) of this Section are:
  - A) Parking spaces designated as reserved for individuals with disabilities (see Subsection (c)(7) of this Section);
  - B) Accessible passenger loading zones;
  - C) Accessible entrances when not all are accessible (inaccessible entrances shall have directional signage to indicate the route to the nearest accessible entrance);
  - D) Accessible toilet rooms, bathing facilities, and shower facilities when not all are accessible (inaccessible facilities shall have directional signage to indicate the route to the nearest accessible toilet room, bathing or shower facilities).
- 2) Signage. Accessible parking spaces shall be designated as reserved for environmentally limited persons by providing a R7-B (U.S. Department of Transportation standard) sign which contains the international symbol of accessibility. Such signs shall exhibit the words "\$100.00 Fine" (or higher amount if required by local ordinance). (See Illinois Vehicle Code [625 ILCS 5/11-301.1]). Signs shall be vertically mounted on a post or wall at front center of the parking space, no more than 5 feet horizontally from the front of the parking space and set a minimum of 4 feet from finished grade to the bottom of the sign. Such signs shall be located so they cannot be obscured by a vehicle parked in the space. (ADAAG 4.6.4)

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DATE  
06/17/05

REVISIONS	DATE	DESCRIPTION

PROJECT  
05170  
SHEET

A0.1

## ROOM FINISH SCHEDULE

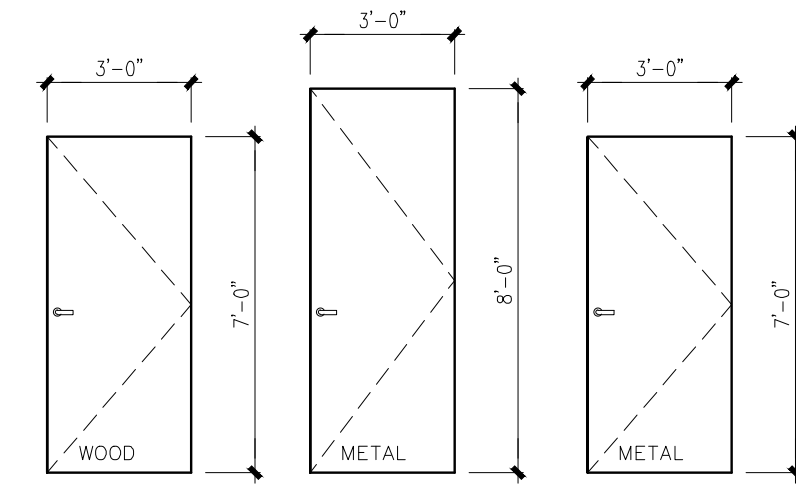
ROOM NO.	ROOM NAME	FLOOR BASE	FLOOR FINISH	WALL FINISH	DOOR FRAME FINISH	CEILING FINISH	CEILING HEIGHT	REMARKS
	RECEPTION AREA 101	4" VINYL	CARPET	DRYWALL - SATIN PAINT	N/A	ACOUSTICAL PANEL	EXISTING	
	CONFERENCE 102	4" VINYL	CARPET	DRYWALL - SATIN PAINT	N/A	ACOUSTICAL PANEL	EXISTING	
	OFFICE #1 103	4" VINYL	CARPET	DRYWALL - SATIN PAINT	N/A	ACOUSTICAL PANEL	EXISTING	
	STORAGE 104	4" VINYL	CARPET	DRYWALL - SATIN PAINT	N/A	ACOUSTICAL PANEL	EXISTING	VERIFY FLOOR & WALL FINISHES W/ OWNER
	OFFICE #2 105	4" VINYL	CARPET	DRYWALL - SATIN PAINT	N/A	ACOUSTICAL PANEL	EXISTING	
	WASHROOM 106	4" VINYL	TILE	DRYWALL - GLOSS PAINT	N/A	ACOUSTICAL PANEL	EXISTING	
	STORAGE 107	NONE	UNFINISHED	UNFINISHED	N/A	UNFINISHED	EXISTING	

## DOOR SCHEDULE

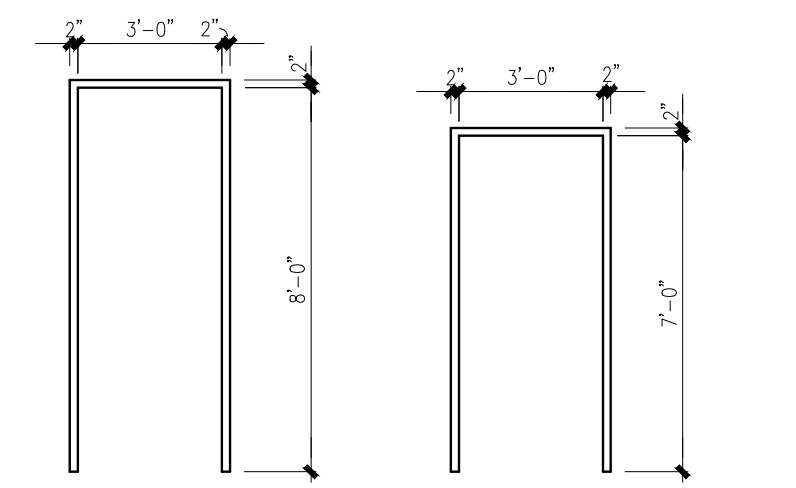
### GENERAL NOTES

- ALL EXIT DOORS SHALL BE OPERABLE FROM THE INSIDE BY A LEVER OR EXIT PADDLE WITHOUT USE OF KEY.
- ALL DOORS AND HARDWARE SHALL COMPLY WITH THE STATE OF ILLINOIS ACCESSIBILITY STANDARDS.
- PAINT ALL HOLLOW METAL DOORS AND FRAMES.
- VERIFY MASTER KEYING WITH OWNER.
- PROVIDE SOLID WOOD BLOCKING BETWEEN STUDS AT ALL WALL MOUNTED DOORS.
- ALL EXTERIOR CLOSURES 8# MAX. PULL.
- ALL INTERIOR CLOSURES 4# MAX. PULL.
- PROVIDE APPROPRIATE WEATHER-STRIPPING AND THRESHOLDS AT ALL EXTERIOR DOORS.

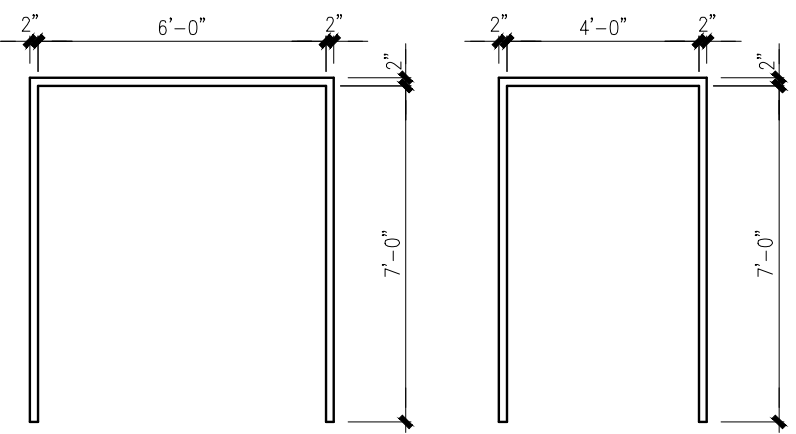
NO.	SIZE	DOOR MATERIAL	FRAME MATERIAL	REMARKS
1	3'-0" X 7'-0"	METAL	WOOD	AUTO CLOSER, NO AIR TRANSFER OPENINGS, "B" LABELED, 3/4 HOUR
2	3'-0" X 8'-0"	S.C. WOOD	WOOD	
3	3'-0" X 7'-0"	METAL	WOOD	
4	(2) - 2'-6" X 7'-0"	S.C. WOOD	WOOD	
5	(2) - 2'-0" X 7'-0"	S.C. WOOD	WOOD	
6	EXISTING TO REMAIN	-	-	



### DOOR STYLES



### FRAME STYLES

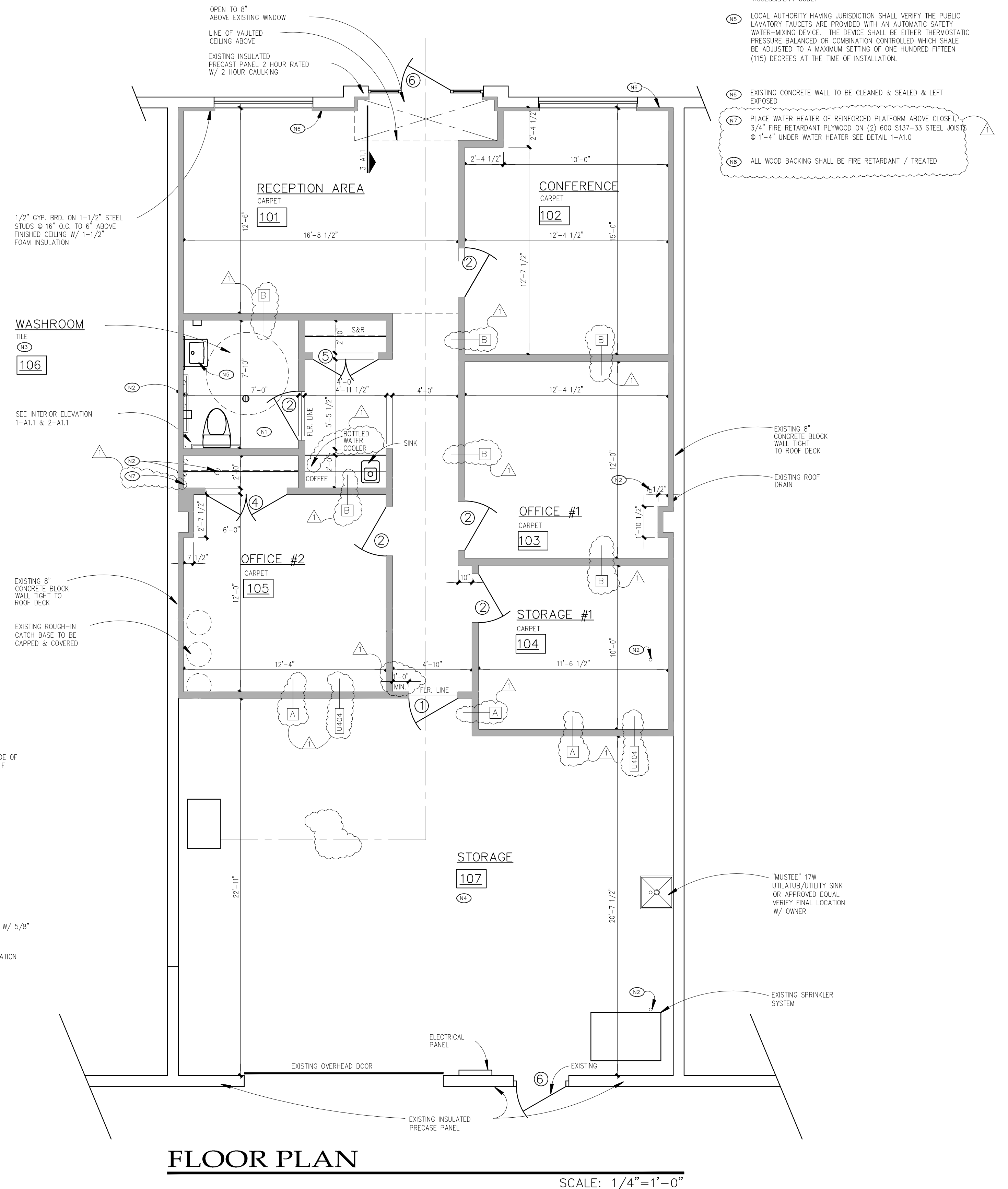
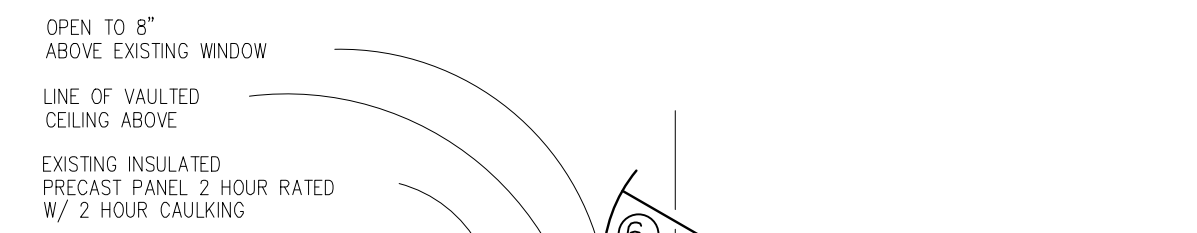


## GENERAL NOTES

- NOTE: DOOR HARDWARE SHALL BE CAPABLE OF OPERATION WITH THE USE OF ONE (1) HAND & SHALL NOT REQUIRE TIGHT PINCHING, TIGHT GRASPING OR TWISTING OF THE WRIST TO OPERATE. THUMBTURN DEADBOLTS ARE PROHIBITED; LEVER OR PADDLE DEADBOLT RELEASES ARE ACCEPTABLE. DOOR THRESHOLD SHALL NOT EXCEED ONE-HALF (1/2") IN HEIGHT. THRESHOLDS EXCEEDING ONE-QUARTER (1/4") IN HEIGHT SHALL HAVE A 1:2 SLOPE. DOOR CLOSERS SHALL MEET OPENING FORCE & SWEEP PERIOD REQUIREMENTS.
- EXISTING TENANT SEPARATION PARTITIONS (8" CMU) 1 HR RATED CONSTRUCTION TIGHT TO UNDERSIDE OF ROOF
- CERAMIC TILE TO BE INSTALLED OVER 3/8" CDX PLYWOOD UNDERLAYMENT. INSTALL UNDERLAYMENT AND TILE OVER ENTIRE FLOOR INCLUDING UNDER VANITY CABINETS.
- 30 GAL GAS WATER HEATER ON METAL PAN W/ EXPANSION TANK ON REINFORCED PLATFORM ABOVE RESTROOM
  - EXISTING P.V.C. PIPE TO BE CAPPED FLUSH W/ SLAB N.I.D.
  - RESTROOM SIGNAGE TO BE LOCATED 5'-0" A.F.F. MAX. PER THE "STATE OF ILLINOIS ACCESSIBILITY CODE" CURRENT ADDITION
  - PROVIDE "HI-LO" DRINKING FOUNTAIN OR WATER BUBBLER W/ CUP DISPENSER. ALL PROVISIONS SHALL COMPLY WITH THE ILLINOIS ACCESSIBILITY CODE.
  - LOCAL AUTHORITY HAVING JURISDICTION SHALL VERIFY THE PUBLIC LAVATORY FAUCETS ARE PROVIDED WITH AN AUTOMATIC SAFETY WATER-MIXING DEVICE. THE DEVICE SHALL BE EITHER THERMOSTATIC PRESSURE-BALANCED OR COMBINATION CONTROLLED WHICH SHALL BE ADJUSTED TO A MAXIMUM SETTING OF ONE HUNDRED FIFTEEN (115) DEGREES AT THE TIME OF INSTALLATION.

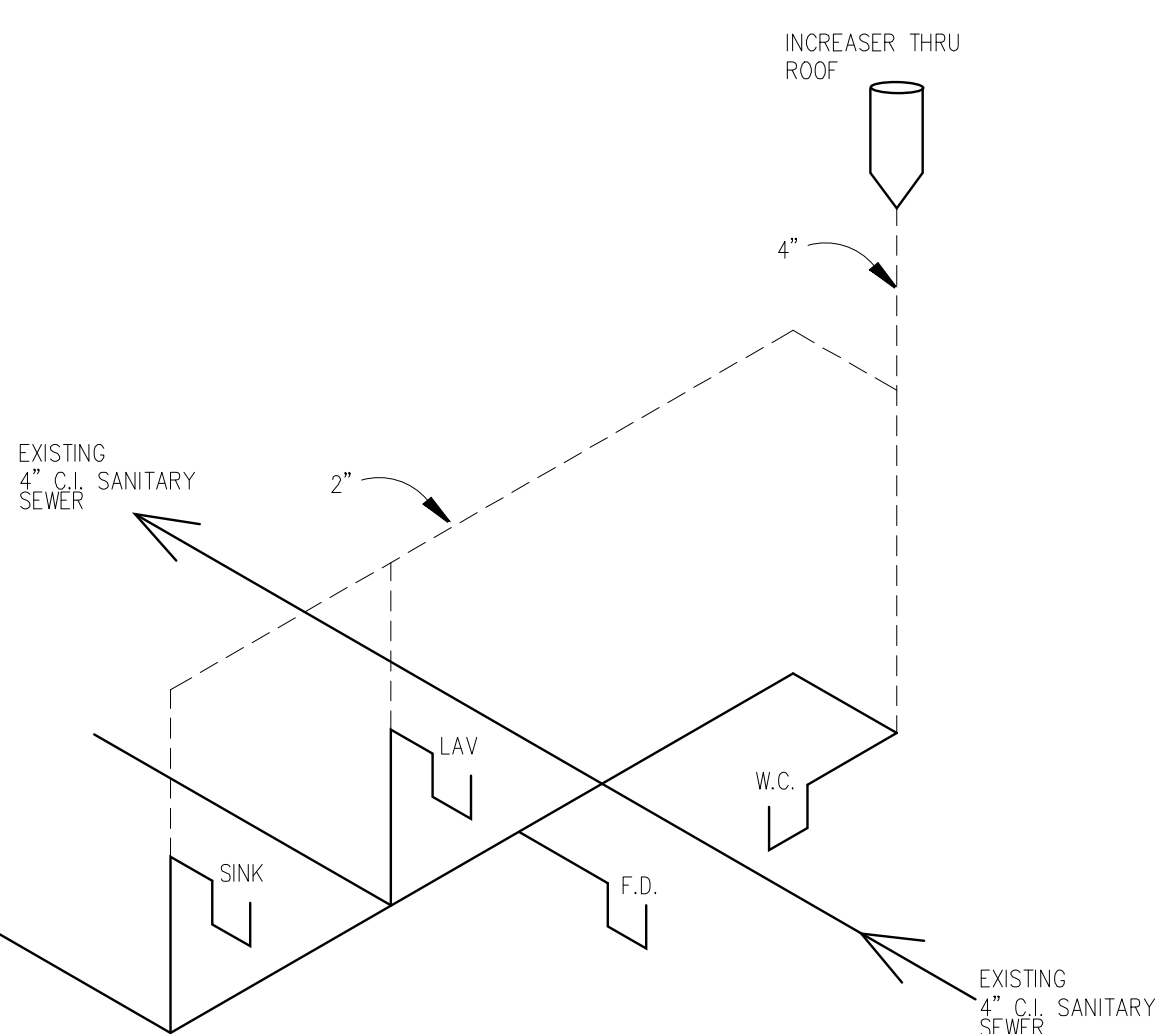
### WATER HEATER DETAIL

SCALE: 1/2"=1'-0"



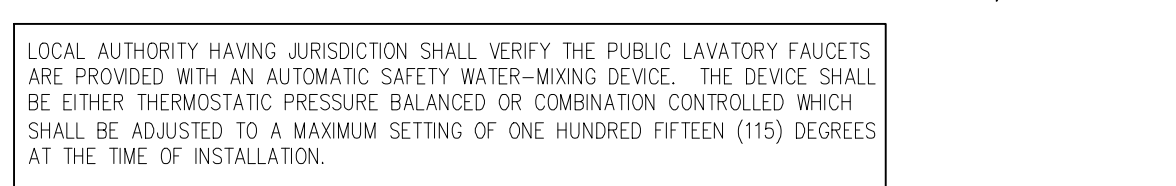
## WATER DIAGRAM

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

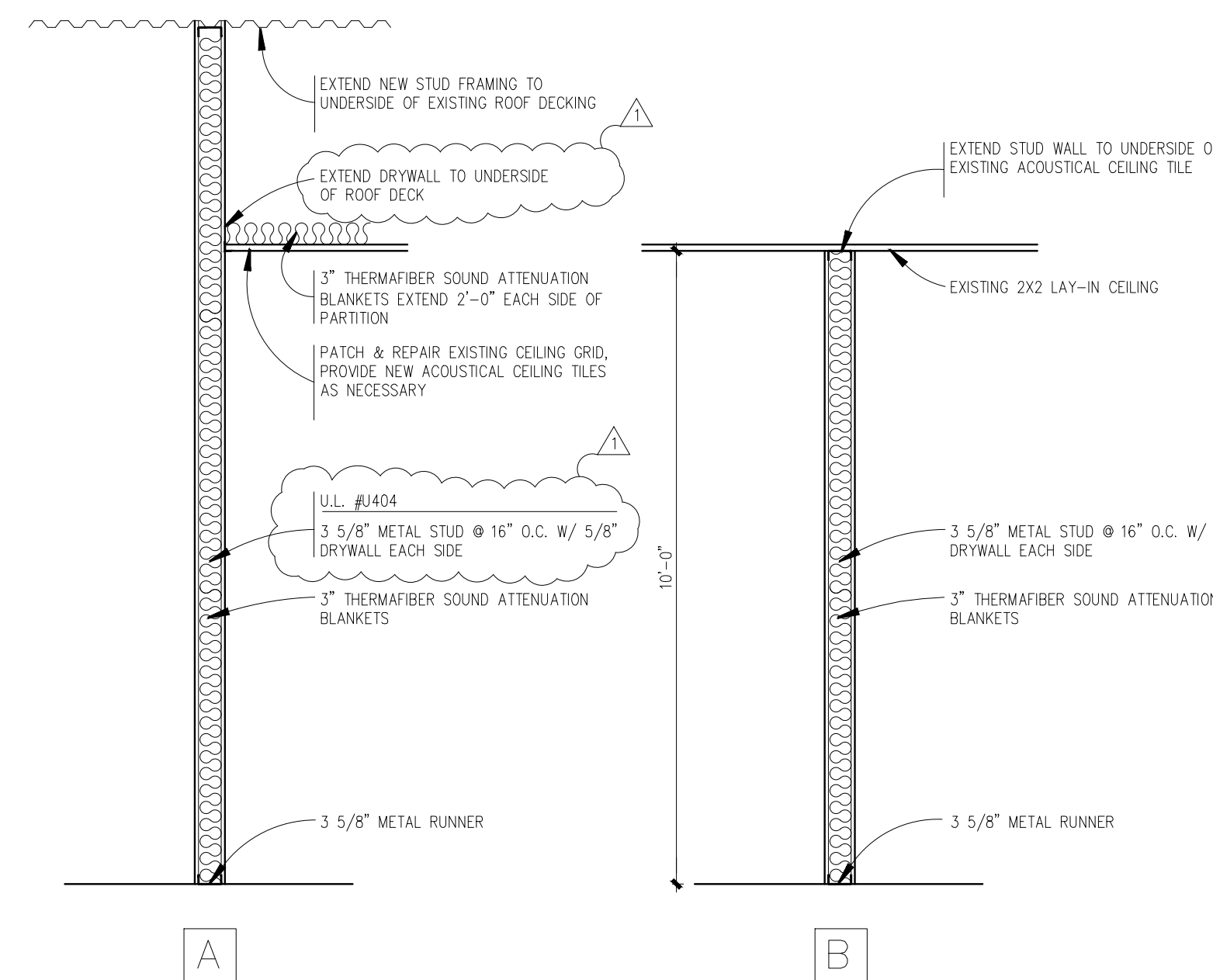


## WASTE DIAGRAM

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



LOCAL AUTHORITY HAVING JURISDICTION SHALL VERIFY THE PUBLIC LAVATORY FAUCETS ARE PROVIDED WITH AN AUTOMATIC SAFETY WATER-MIXING DEVICE. THE DEVICE SHALL BE EITHER THERMOSTATIC PRESSURE-BALANCED OR COMBINATION CONTROLLED WHICH SHALL BE ADJUSTED TO A MAXIMUM SETTING OF ONE HUNDRED FIFTEEN (115) DEGREES AT THE TIME OF INSTALLATION.



## PARTITION SECTION

SCALE: 1/2" = 1'-0"

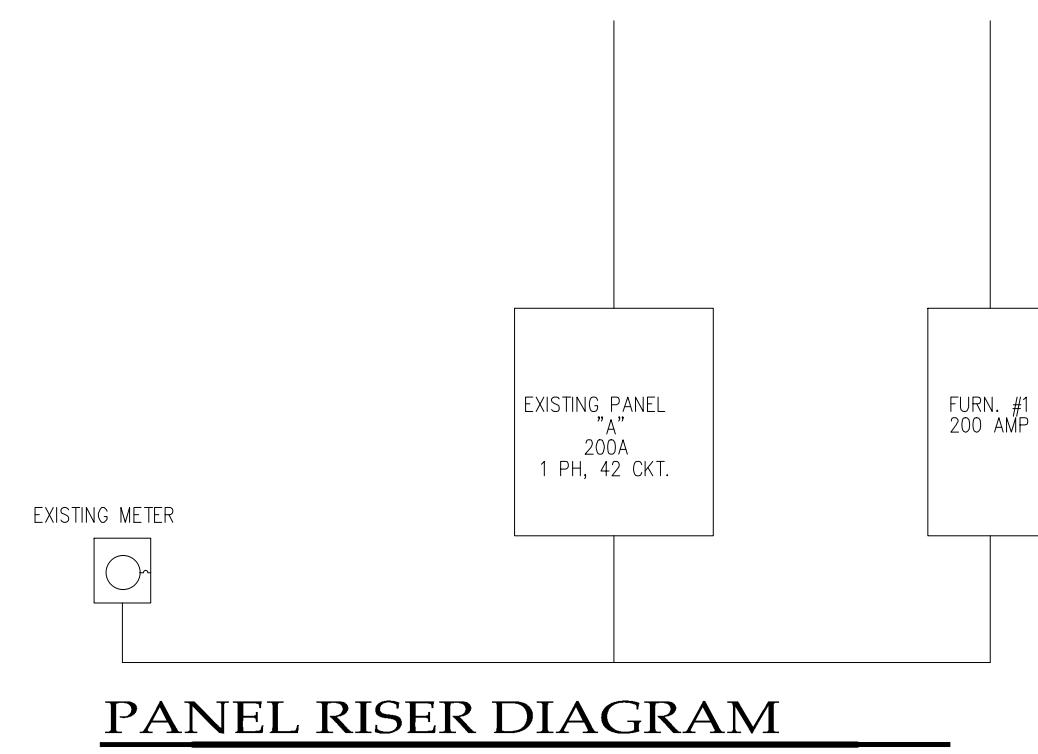
## FLOOR PLAN

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



PANEL A

120/240 VOLTS, 1 PHASE, 3 WIRE 200 AMPS SHORT CIRCUIT RATING 10,000				LOCATION: WAREHOUSE AREA MOUNTING: SURFACE, BOTT. FEED BUS (INCLUDING GROUND): COPPER 42 CIRCUIT PANEL									
CKT. NO.	TRIP AMPS	NO. POLES	DESCRIPTION	PHASE LOAD VA		CCT. NO.	TRIP AMPS	NO. POLES	DESCRIPTION	PHASE LOAD VA			
				A	B					A	B		
1	20	1	CONFERENCE OUTLET	800		2	20	1	OFFICE 1 OUTLETS	800			
3	20	1	RECEPTION OUTLET		1000	4	20	1	OFFICE 2 OUTLETS		800		
5	20	1	WAREHOUSE LIGHTING	540		6	20	1	WAREHOUSE LIGHTING	540			
7	20	1	OFFICE LIGHTING		520	8	20	1	OFFICE LIGHTING		560		
9	20	1	GENERAL OUTLETS	540		10	20	1	GENERAL OUTLETS	540			
11	20	1	O.H. DOOR MOTOR		1000	12	20	1	FIRE ALARM / EXIT LIGHTS		380		
13	20	1	RESTROOM	1176		14	20	1	RESTROOM LIGHTING	540			
15	20	1	EXTERIOR LIGHTS		400	16	20	1	RTU		2880		
17	20	1	SPACE			18	20	1	RTU				
BASED ON RTU INFO													
39	20	1	SPACE			40							
41	20	1	SPACE			42							
				TOTAL	3056	2920					TOTAL	3220	4620



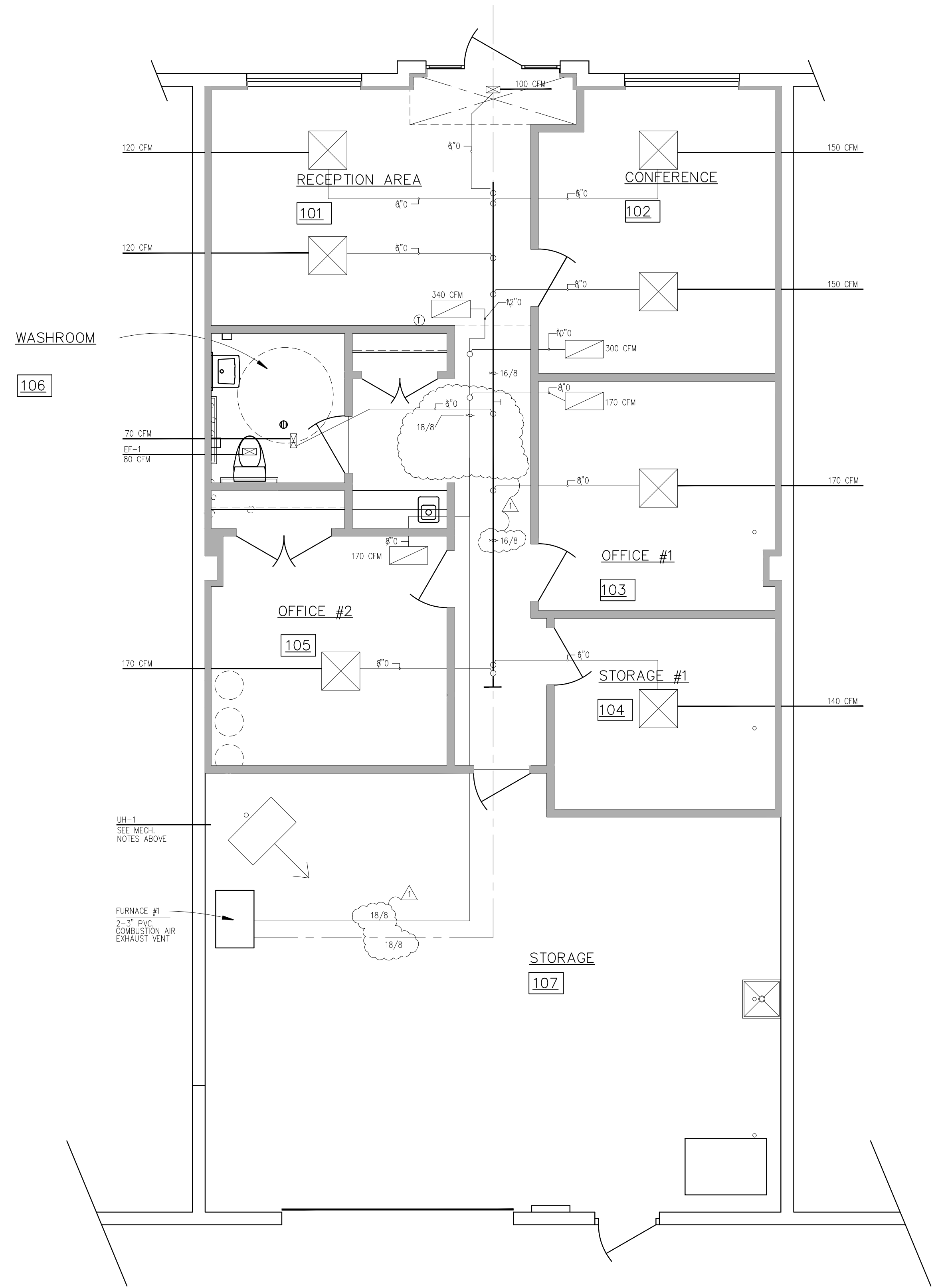
ROOM NO.	USE OF SPACE	FLOOR AREA SQ. FT.	ORDINANCE REQ.				PLAN REQ.				REMARKS	
			NATURAL LIGHT AND VENTILATION		MECHANICAL VENTILATION		NATURAL LIGHT AND VENTILATION		MECHANICAL VENTILATION			
			SQ. FT. GLASS AREA	SQ. FT. VENT AREA	C.F.M. AIR SUPPLY	C.F.M. AIR EXHAUST	SQ. FT. GLASS AREA	SQ. FT. VENT AREA	C.F.M. AIR SUPPLY	C.F.M. AIR EXHAUST	SUPPLY	EXHAUST
101	RECEPTION AREA	219			197	197			240	240		
102	CONFERENCE	179			179	179			300	300		
103	OFFICE #1	147			21	21			170	170		
104	STORAGE #1	115			17	17			140	140		
105	OFFICE #2	146			21	21			170	170		
106	WASHROOM	54			75	75			150	150		
107	STORAGE	660			100	100			100	100		

**GENERAL NOTES**

- DUCTWORK PER SMCA STANDARD
- SUPPLY DUCT TO BE 1/2" LINED
- THERMOSTAT

**MECHANICAL EQUIPMENT**

- EXISTING UH-1 100,000 RTUH  
REZND  
25% FRESH AIR INTAKE
- FURNACE ONE (1) AMERICAN STANDARD MODEL #AUD080C 80% EFFICIENT FURNACE, 120V
- CONDENSER UNIT ONE (1) AMERICAN STANDARD MODEL #ZATA1030 2 1/2 TON CONDENSER ON ROOF WITH MATCHING A-COIL, 208-230 VOLT SINGLE PHASE
- EXHAUST ONE (1) BROAN HD80 BATHROOM EXHAUST FAN AND VENTING

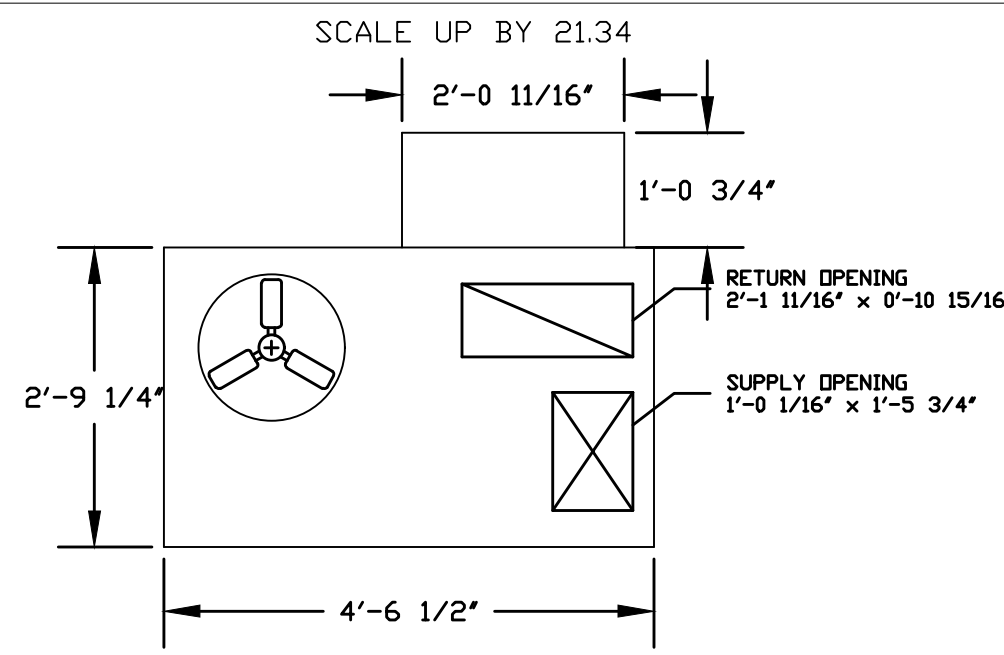


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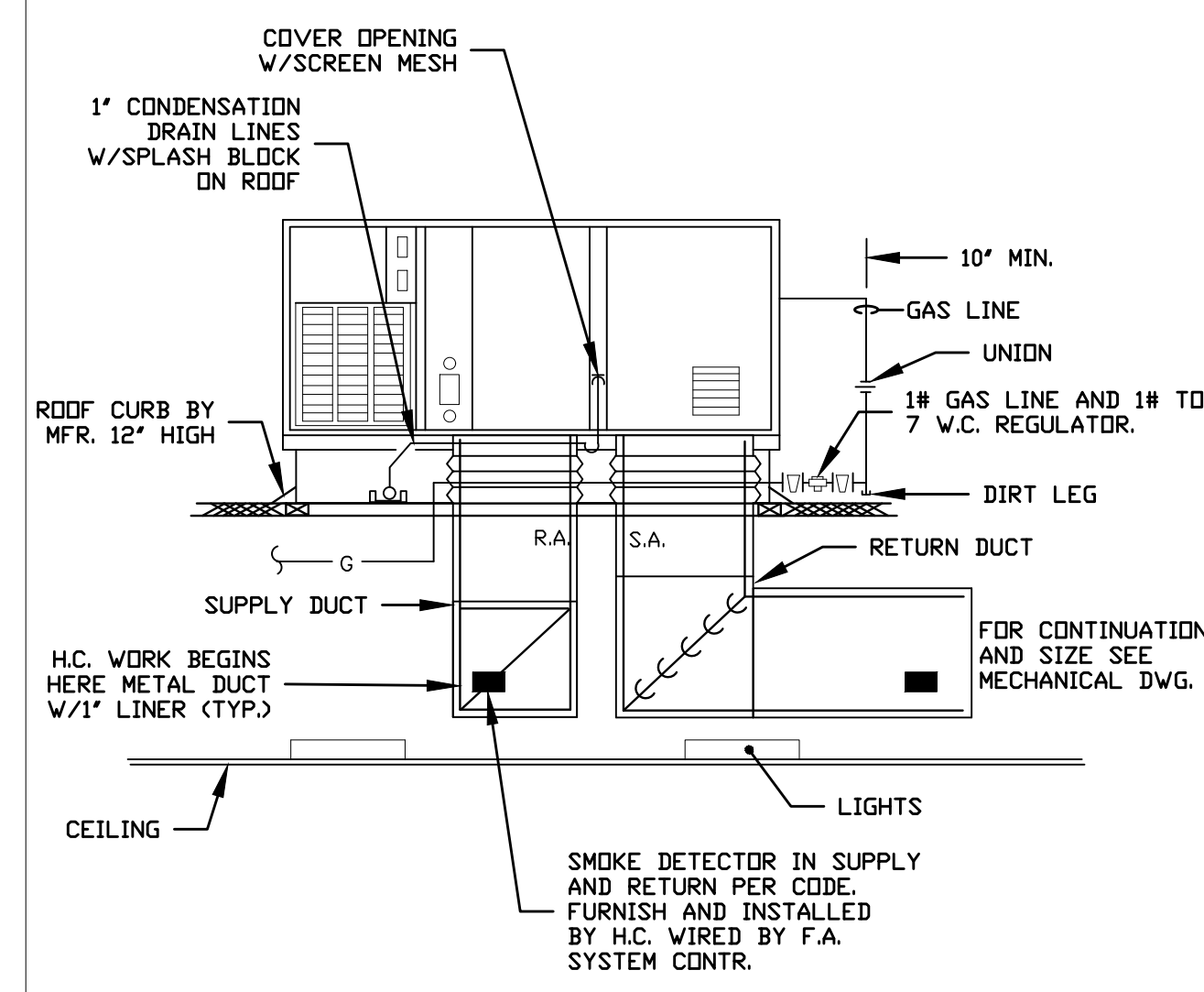
DATE	06/17/05
REVISIONS	
Δ	ISSUES PERMIT REVISIONS

PROJECT	05170
SHEET	M1.0



MODEL NO.	UNIT WT. (lb)	CURB WT. (lb)	ECONOMIZER WT. (lb)
AL/AL 460		115	50
AL/CU 463			
CU/CU 468			
AL/AL 470		115	50
AL/CU 476			
CU/CU 482			
AL/AL 490		115	50
AL/CU 497			
CU/CU 505			
AL/AL 565		115	50
AL/CU 576			
CU/CU 587			

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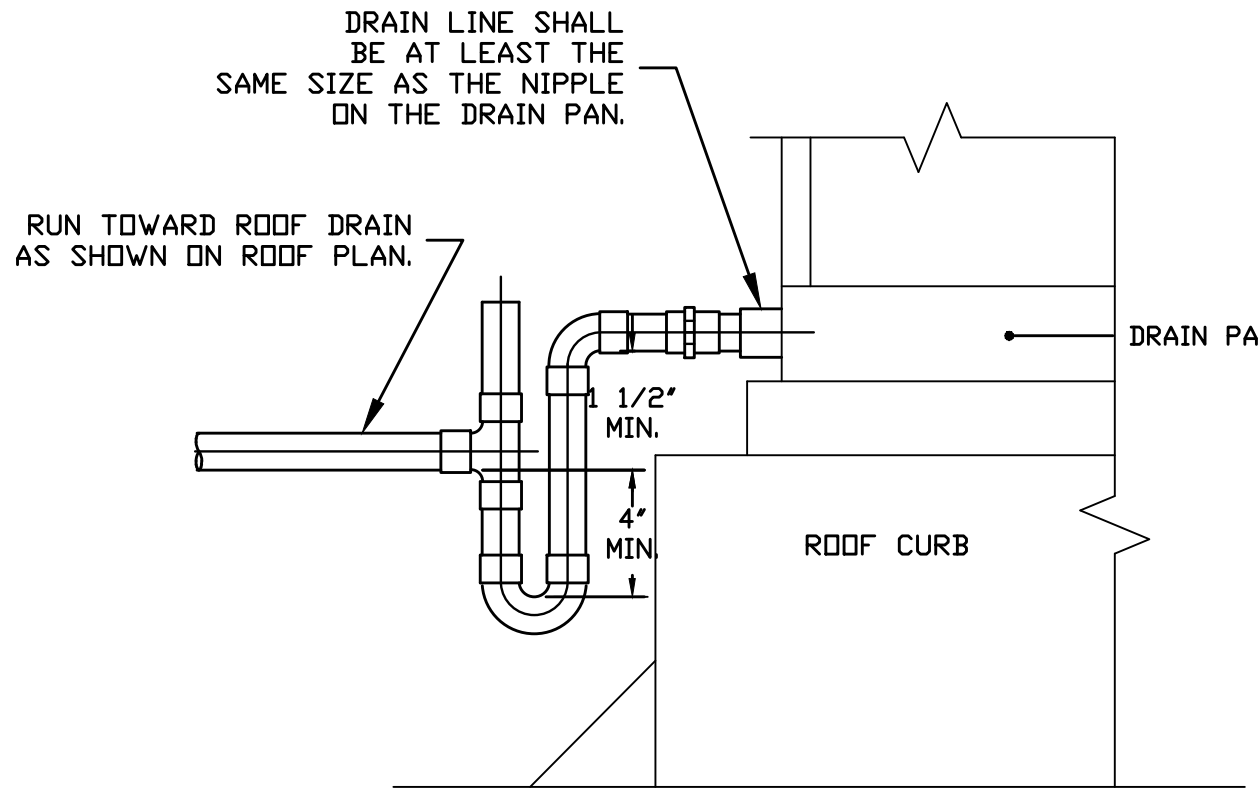


2 | TYPICAL ROOF TOP UNIT

- A. STATEMENT OF INTENT
- IT IS THE INTENT OF THESE DOCUMENTS THAT THE CONTRACTOR PROVIDE ALL LABOR, MATERIAL, EQUIPMENT AND TOOLS NECESSARY FOR THE INSTALLATION OF ALL WORK SHOWN ON THE PLANS AND/OR DESCRIBED HEREIN. INCLUDING ALL APPURTENANCES REQUIRED TO SET RESPECTIVE SYSTEMS IN OPERATION. THE TERM "FURNISH AND INSTALL" WILL NOT BE USED, BUT IS INTENDED UNLESS SPECIFIC NOTATION IS MADE TO THE CONTRARY.
  - ALL ITEMS OF WORK AND ALL SYSTEMS ARE TO BE COMPLETE IN ALL DETAILS, READY FOR SATISFACTORY OPERATION. PROVIDE ALL NECESSARY DEVICES AND RELATED APPARATUS FOR COMPLETE SYSTEMS EVEN THOUGH SUCH ITEMS MAY NOT BE SPECIFICALLY MENTIONED.
- B. CODES: REGULATIONS
- IF THE CONTRACTOR OBSERVES THAT ANY OF THE CONTRACT DOCUMENTS ARE AT VARIANCE WITH THE LAWS, ORDINANCES, RULES AND REGULATIONS OF ANY PUBLIC AUTHORITY BEARING ON THE PERFORMANCE OF THE WORK HE SHALL PROMPTLY NOTIFY THE ARCHITECT IN WRITING AND ANY NECESSARY CHANGES SHALL BE ADJUSTED BY APPROPRIATE MODIFICATIONS. IF THE CONTRACTOR PERFORMS ANY WORK KNOWING IT TO BE CONTRARY TO SUCH NOTICE TO THE ARCHITECT, HE SHALL ASSUME FULL RESPONSIBILITY THEREFOR AND SHALL BEAR ALL COSTS ATTRIBUTABLE THERETO.
  - COMPLY WITH ALL APPLICABLE REGULATIONS OF UTILITY COMPANIES SERVING THE PROJECT.
  - COMPLY WITHIN ALL APPLICABLE RECOMMENDATIONS OF THE NATIONAL FIRE PROTECTION ASSOCIATION, NATIONAL ELECTRIC CODE, AMERICAN SOCIETY OF MECHANICAL ENGINEERS, FACTORY INSURANCE ASSOCIATION AND FACTORY MUTUAL INSURANCE COMPANIES.
  - WHERE APPLICABLE, MATERIAL OR EQUIPMENT SHALL BEAR THE STAMP OR SEAL OF UL, ASME, AGA AND NEMA.
  - COMPLIANCE WITH OWNER'S AND ARCHITECT'S REQUIREMENTS.
- C. DRAWINGS AND EXISTING CONDITIONS
- THE DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL EQUIPMENT. FOLLOW THE MECHANICAL PLANS AS CLOSELY AS POSSIBLE FOR THE INSTALLATION OF PIPING AND EQUIPMENT. DUE TO THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO SHOW ALL OFFSETS, AND DETAIL EVERY POINT AT WHICH EXIGENCIES OF CONSTRUCTION MAY REQUIRE SPECIAL ATTENTION.
  - SHOULD CONDITIONS NECESSITATE ANY REARRANGEMENTS, OR IF PIPING CAN BE RUN TO BETTER ADVANTAGE, PREPARE AND SUBMIT DRAWINGS SHOWING THE CHANGES BEFORE PROCEEDING WITH THE WORK. IF SUCH CHANGES ARE APPROVED, THEY SHALL BECOME A PART OF THE CONTRACT AFTER THEIR APPROVAL.
  - ANY ADDITIONAL FITTINGS, VALVES, DUCTS, CONDUITS OR SPECIALTIES REQUIRED OR OTHER APPURTENANCES NECESSARY, DUE TO THE FIELD CONDITIONS OR CODE REQUIREMENTS, SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR, AT NO EXTRA COST TO THE OWNER.
  - THE CONTRACTOR SHALL VISIT AND INSPECT THE EXISTING BUILDING AND TENANT SPACE AND THOROUGHLY FAMILIARIZE HIMSELF WITH ACTUAL JOB CONDITIONS BEFORE BEGINNING WORK AND PRIOR TO BID.
  - VERIFY EXISTING CONDITIONS AND LOCATIONS IN FIELD PRIOR TO BEGINNING WORK. CONTRACTOR SHALL MAKE A DETAILED EXAMINATION OF ALL LOCATIONS WHERE NEW WORK IS TO BE INSTALLED AND EXAMINE EXISTING STRUCTURAL SUPPORTING BEAMS, JOISTS, ETC.
  - WHILE THE SIZE AND LOCATION OF NEW WORK AND EQUIPMENT IN THE EXISTING BUILDING HAS BEEN INDICATED ON THE DRAWINGS AS ACCURATELY AS POSSIBLE, CONTRACTOR SHALL ADJUST HIS WORK AS REQUIRED TO AVOID EXISTING BEAMS AND JOISTS NOT SHOWN IN PLANS. CONTRACTOR SHALL ADAPT HIS WORK TO MEET ALL ACTUAL CONDITIONS IN THE EXISTING TENANT SPACE.
- D. CUTTING AND PATCHING
- CUTTING OF EXISTING WORK: CUTTING TO BE BY TRADE INSTALLING THE WORK
  - NO CUTTING OF STRUCTURAL WORK OR FIREPROOF WITHOUT ARCHITECT'S WRITTEN CONSENT.
  - PATCHING UNLESS NOTED OTHERWISE TO BE BY EACH TRADE. SEE GENERAL CONDITIONS REGARDING CUTTING AND PATCHING AT CORRECTIVE WORK.
- E. CLEANING: REMOVAL OF RUBBISH
- RUBBISH: EACH TRADE TO PROMPTLY REMOVE ALL DEBRIS, SURPLUS AND DISCARDED MATERIAL FROM THE PREMISES. IN FINISHING STAGES COOPERATE WITH OTHER CONTRACTORS IN THIS, AND SHARE IN PROPRATE BASIS BEFORE COMPLETION OF THE WORK, REPLACE ALL FILTERS.
- F. TESTING, BALANCING AND ADJUSTING
- CERTIFICATES OF APPROVAL AND/OR ACCEPTANCE OF TESTS BY REGULATING AGENCIES HAVING JURISDICTION SHALL BE PROVIDED BEFORE FINAL ACCEPTANCE. IN GIVEN SUCH CERTIFICATES OR APPROVAL SHALL BE IN THE HANDS OF THE OWNER BEFORE THE ARCHITECT SHALL ARRANGE FINAL INSPECTION.
  - THE ARCHITECT MAY ELECT BEFORE THE DATE OF FINAL ACCEPTANCE OF THE WORK TO HAVE THE CAPACITY AND EFFICIENCY TESTS CONDUCTED BY A QUALIFIED TESTING ORGANIZATION. RESULTS INDICATING THAT ITEMS OF THE WORK DO NOT MEET THE REQUIREMENTS OF THE DRAWINGS AND THE SPECIFICATION SHALL MAKE THE CONTRACTOR RESPONSIBLE FOR THE COST OF ADDITIONAL WORK NECESSARY TO MEET THE SPECIFICATION. THE ARCHITECT SHALL DEDUCT SUCH COSTS FROM THE FINAL PAYMENT TO THE CONTRACTOR INVOLVED.
  - ALL TESTING, BALANCING AND OPERATION OF THE NEW AND EXISTING SYSTEMS SHALL BE PERFORMED BY COMPETENT AND EXPERIENCED PERSONNEL WHO HAVE FORMERLY DONE SIMILAR WORK AND WHOSE QUALIFICATIONS AND PERFORMANCE SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. FAN SHALL BE SET TO DESIGN REQUIREMENTS BY REPLACING SHEAVES IF NECESSARY WITHIN MINIMUM DAMPENING.
  - THE CONTRACTOR SHALL SUBMIT WRITTEN AIR BALANCING REPORTS TO THE ARCHITECT FOR APPROVAL, CONTAINING THE FOLLOWING INFORMATION:
    - QUANTITY OF AIR IN CFM AT EACH AIR OUTLET OR INLET.
    - TOTAL QUANTITY OF SUPPLY, RETURN AND OUTSIDE AIR IN CFM FOR EACH UNIT.
    - R.P.M. OF FAN AND MOTOR.
    - AMPERE INPUT OF EACH MOTOR.
    - PRESSURE IN INCHES WATER GAUGE AT INLET AND DISCHARGE OF FAN OR BLOWER.
  - GUARANTEE
    - THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK INSTALLED UNDER THIS CONTRACT. HE SHALL MAKE GOOD, REPAIR OR REPLACE AT HIS OWN COST AND EXPENSE, AS MAY BE NECESSARY, ANY DEFECTIVE WORK OR MATERIAL WHICH MAY SHOW ITSELF WITHIN ONE YEAR AFTER DATE OF THE FINAL ACCEPTANCE CERTIFICATE, IF IN THE OPINION OF THE ARCHITECT SAID DEFECT IS DUE TO IMPERFECTION IN MATERIAL OR WORKMANSHIP.
    - ALL MATERIAL, WORKMANSHIP AND EQUIPMENT SHALL BE GUARANTEED FOR ONE YEAR AFTER SYSTEM ACCEPTANCE. PROVIDE TYPEWRITTEN OPERATING INSTRUCTIONS AND EQUIPMENT WARRANTIES. AS A PART OF THIS CONTRACT, THE CONTRACTOR SHALL PROVIDE A ONE YEAR SERVICE AND MAINTENANCE AGREEMENT. THIS CONTRACTOR SHALL NOTIFY THE STORE MANAGER 48 HOURS PRIOR TO THE SYSTEM TURNOVER AND INSTRUCT THE MANAGER IN THE SYSTEM OPERATION.

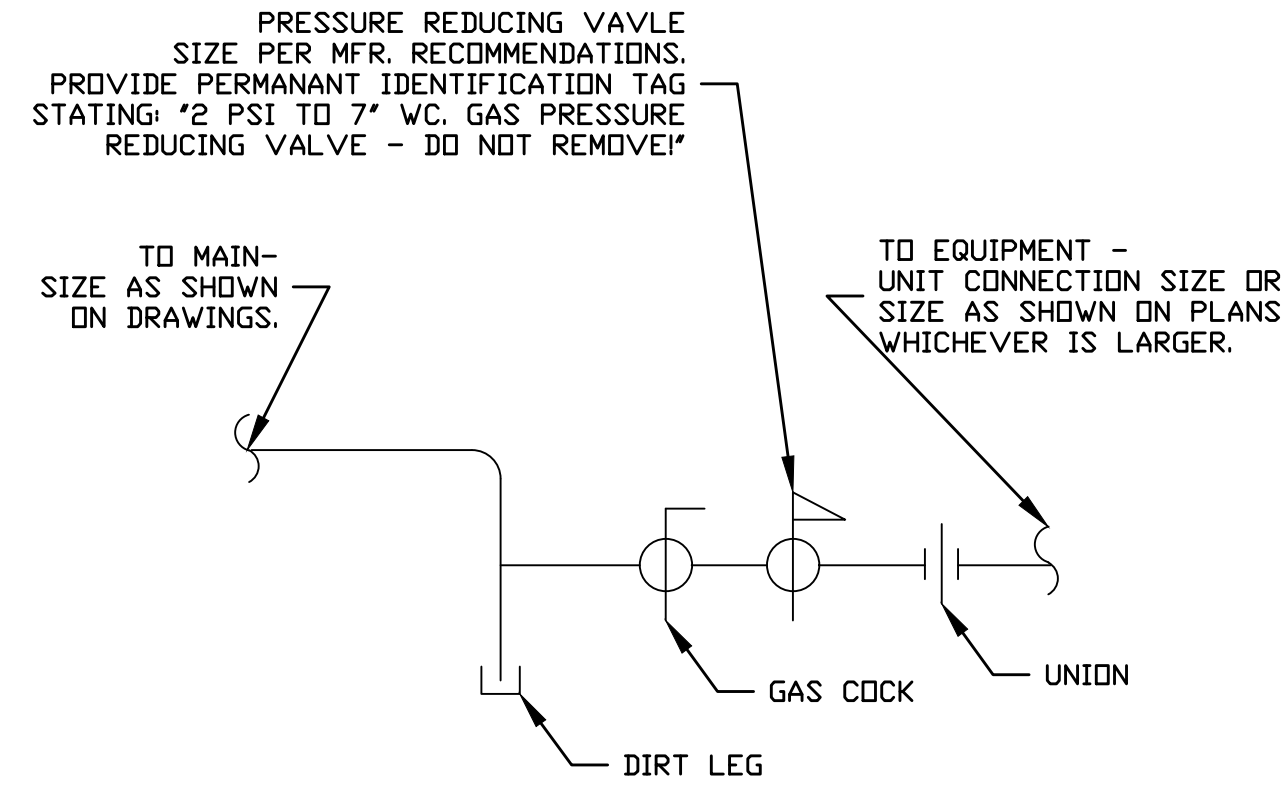
- H. INSURANCE
- THE CONTRACTOR SHALL PURCHASE AND MAINTAIN SUCH INSURANCE AS WILL PROTECT HIM FROM CLAIMS INCLUDING WORKMAN'S COMPENSATION AND PUBLIC LIABILITY WHICH MAY ARISE OUT OF OR RESULT FROM THE CONTRACTOR'S OPERATIONS UNDER THE CONTRACT. WORKMAN'S COMPENSATION SHALL BE BY HIMSELF OR BY ANY SUBCONTRACTOR OR BY ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY OF THEM, OR BY ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE.
- I. COORDINATION AND INSTALLATION
- THE ENTIRE INSTALLATION SHALL BE PERFORMED IN A FIRST-CLASS WORKMANLIKE MANNER. THE COMPLETE SYSTEM SHALL BE FULLY OPERATIONAL AND ACCEPTANCE BY OWNER SHALL BE A CONDITION OF THE CONTRACT.
  - ALL WORK SHALL BE COORDINATED WITH OTHER TRADES IN ORDER TO AVOID INTERFERENCES, PRESERVE HEADROOM, AVOID OMISSIONS AND VERIFY EQUIPMENT LOCATIONS.
  - DUCTWORK AND PIPING SHALL BE CONCEALED WHERE POSSIBLE, RUN IN STRAIGHT LINES PARALLEL AND/OR PERPENDICULAR TO THE BUILDING CONSTRUCTION, AS HIGH AS POSSIBLE.
  - ALL OUTSIDE AIR INTAKES SHALL BE INSTALLED A MINIMUM OF 10'-0" FROM ALL EXHAUST AS PER LOCAL CODES (VERIFY IN FIELD)
- J. DEMOLITION
- THIS CONTRACTOR SHALL VISIT THE JOB SITE AND DETERMINE THE EXTENT OF WORK REQUIRED TO REMOVE ALL EXISTING HVAC SYSTEMS AND EQUIPMENT.
  - ALL DEMOLITION WORK SHALL BE CONSIDERED A PART OF THE BASE BID.
  - THIS CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS WITH THE GENERAL CONTRACTOR PRIOR TO BID.
- K. DUCTWORK
- ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES, ASHRAE STANDARDS AND SMACNA STANDARDS
  - ALL FLEXIBLE DUCTWORK SHALL BE WIRE MOLD WG U/L TYPE 181 AS APPROVED BY LOCAL CODES.
  - ALL OUTSIDE AIR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL AND WRAPPED WITH 1-1/2" THICK FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, IN ACCORDANCE WITH LOCAL CODES.
  - ALL DUCTWORK INSULATING MATERIALS SHALL HAVE A MAXIMUM FLAME SPREAD RATING OF 25, SMOKE DEVELOPED RATING SHALL NOT EXCEED 50. ALL VALUES SHALL BE IN ACCORDANCE WITH ASTM TEST E84 "SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS."
  - FURNISH AND INSTALL ALL STARTING COLLARS, MANUAL DAMPERS, SPLITTERS AND DEFLECTORS SHOWN ON THE DRAWINGS OR WHEREVER REQUIRED FOR THE PROPER AIR FLOW AND BALANCING OF THE ENTIRE AIR SYSTEM. ALL SQUARE (90) ELBOWS SHALL BE PROVIDED WITH TURNING VANES.
- L. ELECTRICAL MOTORS
- THIS CONTRACTOR SHALL FURNISH MOTORS, MOTOR STARTERS AND CONTROLS FOR ALL MECHANICAL EQUIPMENT PROVIDED HEREIN, INCLUDING SETTING OF ALL LOOSE MOTORS FURNISHED, MOUNTING OF STARTERS AND ALL POWER WIRING WILL BE BY ELECTRICAL TRADES. PROVIDE MANUAL STARTERS FOR ALL SINGLE PHASE MOTORS AND MAGNETIC STARTERS FOR ALL THREE PHASE MOTORS, ALL U/L LABELS, NEMA RATED.
- M. PIPING AND FITTINGS
- ALL PIPE SHALL BE NEW, CUT SQUARE, REAMED AND FREE OF BURRS. PRIOR TO INSTALLATION IT SHALL BE THOROUGHLY CLEANED AND THREADS SHALL BE TAPERED. PIPE SHALL BE CUT ACCURATELY TO MEASUREMENTS ESTABLISHED AT THE BUILDING AND WORKED INTO PLACE WITHOUT SPRINGING OR FORGING. OPEN ENDS SHALL BE CLOSED DURING CONSTRUCTION TO PREVENT DIRT OR BUILDING MATERIALS FROM ENTERING. CHANGES IN DIRECTION SHALL BE MADE WITH FITTINGS AND CHANGES IN SIZES WITH ECCENTRIC REDUCING FITTINGS. ALL FITTINGS SHALL BE CATALOGED AND MANUFACTURED BY AN APPROVED MANUFACTURER.
  - VALVES AND UNIONS OR FLANGES SHALL BE PROVIDED TO ISOLATE EACH PIECE OF EQUIPMENT, BRANCH CIRCUIT OR SECTION OF PIPING. SWING JOINTS SHALL BE PROVIDED AT RUN OUTS TO EQUIPMENT AS WELL AS SUFFICIENT EXPANSION OF LOOPS OR SWING CONNECTIONS AT OTHER POINTS TO ALLOW FOR SERVICE, MAINTENANCE REPAIR OR REPLACEMENT OF EQUIPMENT WITHOUT CUTTING OR SPRINGING PIPING.
  - ALL PIPING AND FITTINGS SHALL CONFORM TO ALL ASTM AND ASA STANDARDS.
  - ALL CONDENSING WATER PIPING AND CONDENSATE DRAIN PIPING SHALL BE INSULATED AS REQUIRED TO MATCH EXISTING.
- N. TEMPERATURE CONTROL
- THIS CONTRACTOR SHALL FURNISH AND INSTALL A FULLY OPERATIONAL TEMPERATURE CONTROL SYSTEM IN ACCORDANCE WITH OWNER'S AND LOCAL CODE REQUIREMENTS.
  - THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY COMPONENTS INCLUDING RETURN AIR AND OUTSIDE AIR DAMPERS, DAMPER OPERATOR, INTERLOCK WIRING, CONTROL WIRING, THERMOSTATS WITH LOCKING COVER, CONTROL VALVES, ETC., AS REQUIRED TO MATCH THE EXISTING SYSTEM.
- O. HANGERS AND SUPPORTS
- DESCRIPTION
- PROVIDE HANGERS FOR ALL PIPING NOT INDICATED BELOW GRADE. USE HANGERS CAPABLE OF ADJUSTMENT.
- PART 2 - PRODUCTS
- 2.01 HANGERS AND SUPPORTS
- HANGERS FOR BLACK OR GALVANIZED STEEL PIPE SHALL BE GRINNELL, MODEL NO. 65 OR APPROVED EQUAL.
  - HANGERS FOR CAST IRON PIPE SHALL BE GRINNELL, MODEL NO. 260 OR APPROVED EQUAL.
  - HANGERS FOR COPPER TUBING SHALL BE GRINNELL, MODEL NO. 97 C OR APPROVED EQUAL.
  - TRAPZEE HANGERS OF A TYPE APPROVED BY THE OWNER'S REPRESENTATIVE MAY BE USED WHERE PIPES ARE DESIGNED TO RUN PARALLEL AT THE SAME ELEVATION.
  - PROVIDE ISOLATION HANGER WITH PROTECTIVE SHIELD, GRINNELL MODEL NO. 300 103 OR APPROVED EQUAL, FOR ALL INSULATED PIPING, AT HANGER POINTS, PROVIDE 8 INCH LONG SECTION OF 1/2" INCH THICK ALUMINUM SILICATE PIPE INSULATION WITH FACTORY LONGITUDINAL LAP. SEAL BUTT JOINTS WITH INSULATING CEMENT.
  - STRAP HANGERS: NOT PERMITTED.
  - INSERTS: IN CONCRETE, GRINNELL MODEL NO. 285 OR APPROVED EQUAL, HAVING ADJUSTMENT FROM 3/4 INCH THROUGH 1-1/4 INCH. IN METAL DECKS READHEAD SDI OR APPROVED EQUAL.
  - SIDE BEAM CLAMPS: PROVIDE WHEN SUPPORTING FROM STRUCTURAL STEEL MEMBERS, GRINNELL MODEL 225 OR APPROVED EQUAL.
  - OTHER SUPPORTS: OBTAIN OWNER'S REPRESENTATIVE APPROVAL FOR OTHER METHODS OF SUPPORT.
- PART 3 - EXECUTION
- 3.01 SPACING OF HANGERS
- PROVIDE HANGER AT EACH CHANGE OF DIRECTION.
  - SPACE HANGERS AND SUPPORTS TO PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES WITH SPACING NO GREATER AND NO SMALLER THAN SHOWN ON THE FOLLOWING TABLE. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.
- C. FERROUS PIPING AND COPPER TUBING:
- | DIAMETER OF PIPE    | MAXIMUM SPACING | ROD SIZE |
|---------------------|-----------------|----------|
| 1/2" THROUGH 1-1/2" | 6 FT.           | 3/8"     |
| 2" THROUGH 3"       | 10 FT.          | 1/2"     |
| 4" THROUGH 6"       | 12 FT.          | 5/8"     |
| 8" AND LARGER       | 16 FT.          | 3/4"     |
- D. CAST IRON PIPING:
- | DIAMETER OF PIPE | MAXIMUM SPACING          | ROD SIZE |
|------------------|--------------------------|----------|
| 2" AND 3"        | EACH JOINT               | 3/8"     |
| 4" AND 5"        | EACH JOINT               | 1/2"     |
| 6" AND 8"        | EACH JOINT               | 3/4"     |
| 10" THROUGH 15"  | EACH JOINT (TWO HANGERS) | 3/4"     |

- Q. GAS PIPING
- PART 1 - GENERAL
- PART 2 - PRODUCTS
- 2.01 PIPING
- SHALL COMPLY WITH THE REQUIREMENTS OF NFPA NO. 54 AND THE LOCAL GAS COMPANY.
  - PIPE SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE FITTINGS
- PART 3 - EXECUTION
- 3.01 INSTALLATION
- PIPING SHALL COMPLY WITH THE REQUIREMENTS OF NFPA NO. 54 AND THE LOCAL GAS COMPANY.
  - INSTALL GAS SHUTOFF AND GAS MANIFOLDS AS INDICATED OR REQUIRED.



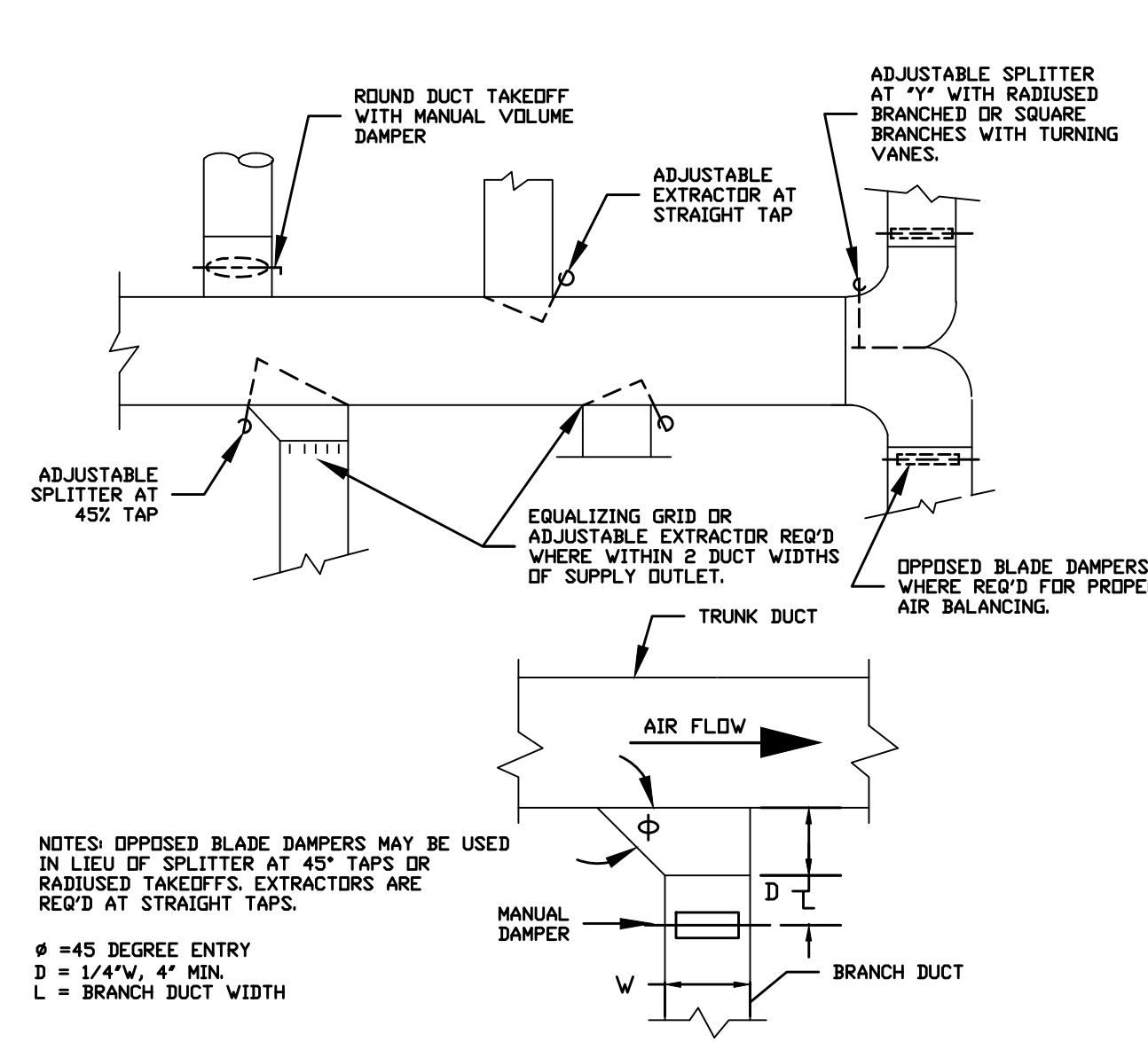
NOTE: INSTALLATION OF CONDENSATE PIPING SHALL NOT INTERFERE WITH THE OPENING OF THE ROOF TOP UNIT ACCESS PANEL.

3 | ROOF TOP CONDENSATE TRAP

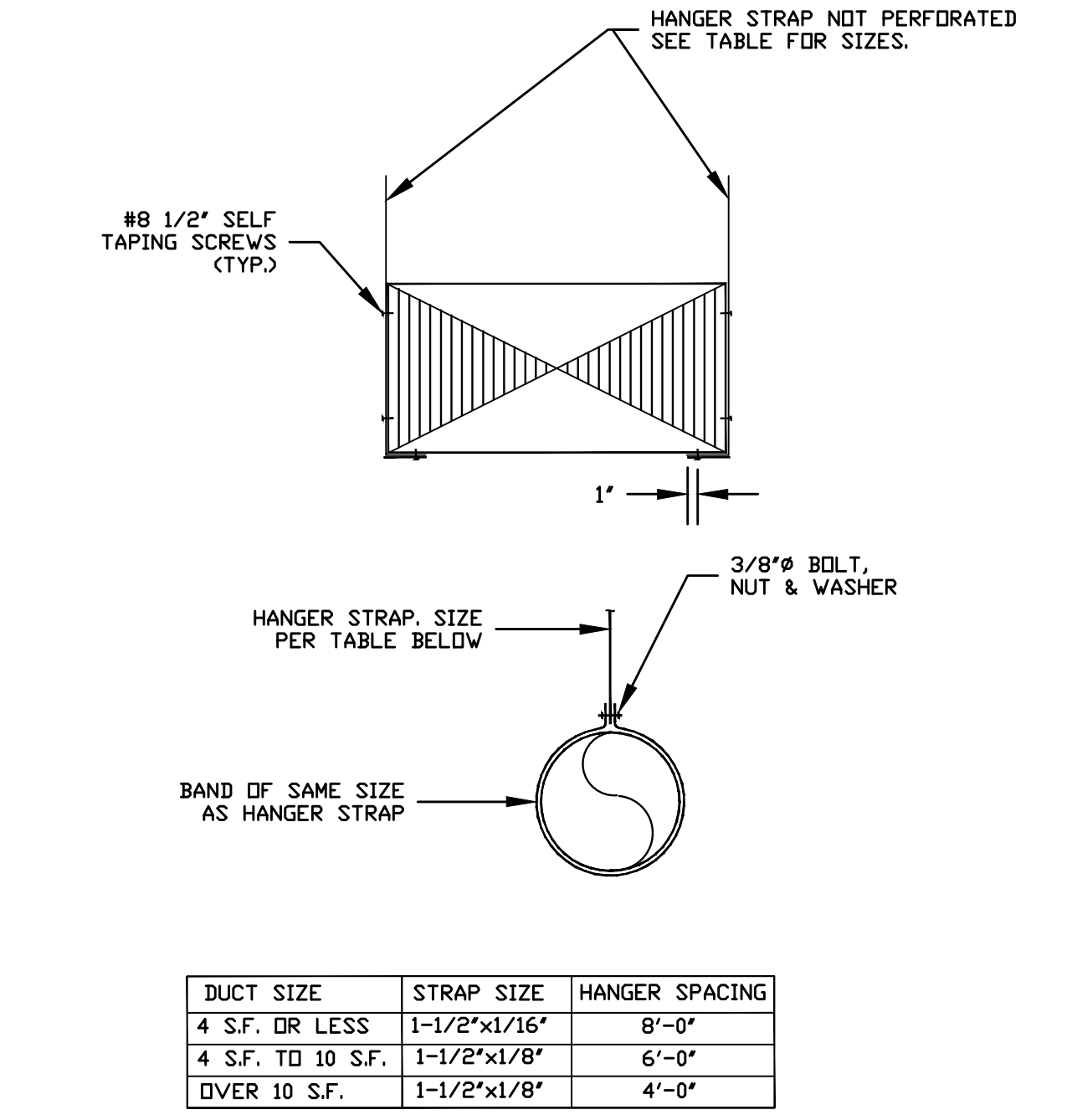


NOTE: WHERE INSTALLED INDOORS, EXTEND FULL SIZE VENT TO OUTDOORS. ALL VENTS SHALL TERMINATE W/ DISCHARGE OPENING FACING DOWN.

4 | TYPICAL GAS PRESSURE REDUCING STATION



5 | TYPICAL DUCT BRANCH CONNECTION DETAILS



6 | DUCT SUPPORTS

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- CUTTING OF EXISTING WORK: CUTTING TO BE BY TRADE INSTALLING THE WORK
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  - GUARANTEE
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  - ALL WORK SHALL BE COORDINATED WITH OTHER TRADES IN ORDER TO AVOID INTERFERENCES, PRESERVE HEADROOM, AVOID OMISSIONS AND VERIFY EQUIPMENT LOCATIONS.
  - DUCTWORK AND PIPING SHALL BE CONCEALED WHERE POSSIBLE, RUN IN STRAIGHT LINES PARALLEL AND/OR PERPENDICULAR TO THE BUILDING CONSTRUCTION, AS HIGH AS POSSIBLE.
  - ALL OUTSIDE AIR INTAKES SHALL BE INSTALLED A MINIMUM OF 10'-0" FROM ALL EXHAUST AS PER LOCAL CODES (VERIFY IN FIELD)
- J. DEMOLITION
- THIS CONTRACTOR SHALL VISIT THE JOB SITE AND DETERMINE THE EXTENT OF WORK REQUIRED TO REMOVE ALL EXISTING HVAC SYSTEMS AND EQUIPMENT.
  - ALL DEMOLITION WORK SHALL BE CONSIDERED A PART OF THE BASE BID.
  - THIS CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS WITH THE GENERAL CONTRACTOR PRIOR TO BID.
- K. DUCTWORK
- ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES, ASHRAE STANDARDS AND SMACNA STANDARDS
  - ALL FLEXIBLE DUCTWORK SHALL BE WIRE MOLD WG U/L TYPE 181 AS APPROVED BY LOCAL CODES.
  - ALL OUTSIDE AIR DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET METAL AND WRAPPED WITH 1-1/2" THICK FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, IN ACCORDANCE WITH LOCAL CODES.
  - ALL DUCTWORK INSULATING MATERIALS SHALL HAVE A MAXIMUM FLAME SPREAD RATING OF 25, SMOKE DEVELOPED RATING SHALL NOT EXCEED 50. ALL VALUES SHALL BE IN ACCORDANCE WITH ASTM TEST E84 "SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS."
  - FURNISH AND INSTALL ALL STARTING COLLARS, MANUAL DAMPERS, SPLITTERS AND DEFLECTORS SHOWN ON THE DRAWINGS OR WHEREVER REQUIRED FOR THE PROPER AIR FLOW AND BALANCING OF THE ENTIRE AIR SYSTEM. ALL SQUARE (90) ELBOWS SHALL BE PROVIDED WITH TURNING VANES.
- L. ELECTRICAL MOTORS
- THIS CONTRACTOR SHALL FURNISH MOTORS, MOTOR STARTERS AND CONTROLS FOR ALL MECHANICAL EQUIPMENT PROVIDED HEREIN, INCLUDING SETTING OF ALL LOOSE MOTORS FURNISHED, MOUNTING OF STARTERS AND ALL POWER WIRING WILL BE BY ELECTRICAL TRADES. PROVIDE MANUAL STARTERS FOR ALL SINGLE PHASE MOTORS AND MAGNETIC STARTERS FOR ALL THREE PHASE MOTORS, ALL U/L LABELS, NEMA RATED.
- M. PIPING AND FITTINGS
- ALL PIPE SHALL BE NEW, CUT SQUARE, REAMED AND FREE OF BURRS. PRIOR TO INSTALLATION IT SHALL BE THOROUGHLY CLEANED AND THREADS SHALL BE TAPERED. PIPE SHALL BE CUT ACCURATELY TO MEASUREMENTS ESTABLISHED AT THE BUILDING AND WORKED INTO PLACE WITHOUT SPRINGING OR FORGING. OPEN ENDS SHALL BE CLOSED DURING CONSTRUCTION TO PREVENT DIRT OR BUILDING MATERIALS FROM ENTERING. CHANGES IN DIRECTION SHALL BE MADE WITH FITTINGS AND CHANGES IN SIZES WITH ECCENTRIC REDUCING FITTINGS. ALL FITTINGS SHALL BE CATALOGED AND MANUFACTURED BY AN APPROVED MANUFACTURER.
  - VALVES AND UNIONS OR FLANGES SHALL BE PROVIDED TO ISOLATE EACH PIECE OF EQUIPMENT, BRANCH CIRCUIT OR SECTION OF PIPING. SWING JOINTS SHALL BE PROVIDED AT RUN OUTS TO EQUIPMENT AS WELL AS SUFFICIENT EXPANSION OF LOOPS OR SWING CONNECTIONS AT OTHER POINTS TO ALLOW FOR SERVICE, MAINTENANCE REPAIR OR REPLACEMENT OF EQUIPMENT WITHOUT CUTTING OR SPRINGING PIPING.
  - ALL PIPING AND FITTINGS SHALL CONFORM TO ALL ASTM AND ASA STANDARDS.
  - ALL CONDENSING WATER PIPING AND CONDENSATE DRAIN PIPING SHALL BE INSULATED AS REQUIRED TO MATCH EXISTING.
- N. TEMPERATURE CONTROL
- THIS CONTRACTOR SHALL FURNISH AND INSTALL A FULLY OPERATIONAL TEMPERATURE CONTROL SYSTEM IN ACCORDANCE WITH OWNER'S AND LOCAL CODE REQUIREMENTS.
  - THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY COMPONENTS INCLUDING RETURN AIR AND OUTSIDE AIR DAMPERS, DAMPER OPERATOR, INTERLOCK WIRING, CONTROL WIRING, THERMOSTATS WITH LOCKING COVER, CONTROL VALVES, ETC., AS REQUIRED TO MATCH THE EXISTING SYSTEM.
- O. HANGERS AND SUPPORTS
- DESCRIPTION
- PROVIDE HANGERS FOR ALL PIPING NOT INDICATED BELOW GRADE. USE HANGERS CAPABLE OF ADJUSTMENT.
- PART 2 - PRODUCTS
- 2.01 HANGERS AND SUPPORTS
- HANGERS FOR BLACK OR GALVANIZED STEEL PIPE SHALL BE GRINNELL, MODEL NO. 65 OR APPROVED EQUAL.
  - HANGERS FOR CAST IRON PIPE SHALL BE GRINNELL, MODEL NO. 260 OR APPROVED EQUAL.
  - HANGERS FOR COPPER TUBING SHALL BE GRINNELL, MODEL NO. 97 C OR APPROVED EQUAL.
  - TRAPZEE HANGERS OF A TYPE APPROVED BY THE OWNER'S REPRESENTATIVE MAY BE USED WHERE PIPES ARE DESIGNED TO RUN PARALLEL AT THE SAME ELEVATION.
  - PROVIDE ISOLATION HANGER WITH PROTECTIVE SHIELD, GRINNELL MODEL NO. 300 103 OR APPROVED EQUAL, FOR ALL INSULATED PIPING, AT HANGER POINTS, PROVIDE 8 INCH LONG SECTION OF 1/2" INCH THICK ALUMINUM SILICATE PIPE INSULATION WITH FACTORY LONGITUDINAL LAP. SEAL BUTT JOINTS WITH INSULATING CEMENT.
  - STRAP HANGERS: NOT PERMITTED.
  - INSERTS: IN CONCRETE, GRINNELL MODEL NO. 285 OR APPROVED EQUAL, HAVING ADJUSTMENT FROM 3/4 INCH THROUGH 1-1/4 INCH. IN METAL DECKS READHEAD SDI OR APPROVED EQUAL.
  - SIDE BEAM CLAMPS: PROVIDE WHEN SUPPORTING FROM STRUCTURAL STEEL MEMBERS, GRINNELL MODEL 225 OR APPROVED EQUAL.
  - OTHER SUPPORTS: OBTAIN OWNER'S REPRESENTATIVE APPROVAL FOR OTHER METHODS OF SUPPORT.
- PART 3 - EXECUTION
- 3.01 SPACING OF HANGERS
- PROVIDE HANGER AT EACH CHANGE OF DIRECTION.
  - SPACE HANGERS AND SUPPORTS TO PREVENT SAGGING AND REDUCE STRAIN ON VALVES AND SPECIALTIES WITH SPACING NO GREATER AND NO SMALLER THAN SHOWN ON THE FOLLOWING TABLE. HANGERS SHALL ALLOW FOR EXPANSION AND CONTRACTION.
- C. FERROUS PIPING AND COPPER TUBING:
- | DIAMETER OF PIPE    | MAXIMUM SPACING | ROD SIZE |
|---------------------|-----------------|----------|
| 1/2" THROUGH 1-1/2" | 6 FT.           | 3/8"     |
| 2" THROUGH 3"       | 10 FT.          | 1/2"     |
| 4" THROUGH 6"       | 12 FT.          | 5/8"     |
| 8" AND LARGER       | 16 FT.          | 3/4"     |
- D. CAST IRON PIPING:
- | DIAMETER OF PIPE | MAXIMUM SPACING          | ROD SIZE |
|------------------|--------------------------|----------|
| 2" AND 3"        | EACH JOINT               | 3/8"     |
| 4" AND 5"        | EACH JOINT               | 1/2"     |
| 6" AND 8"        | EACH JOINT               | 3/4"     |
| 10" THROUGH 15"  | EACH JOINT (TWO HANGERS) | 3/4"     |