

HIGHMARK PROVISIONS

201 SUMMER STREET / HOLLISTON, MA 01746

PERMIT SET

9/10/2021

2WR # D21-380

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OWNER REPRESENTATIVE
HIGHMARK
201 SUMMER STREET
HOLLISTON, MA 01746

ARCHITECT
SAM ANDRAS
2WR + PARTNERS
7430 E. CALEY AVE, SUITE 280
CENTENNIAL, CO 80111
P: (720) 258-4780
E: SAM@2WRARCH.COM

CIVIL ENGINEER
MICHAEL NOVAK
PATRIOT ENGINEERING
35 BEDFORD ST, STE 4
LEXINGTON, MA 02420
P: (978) 726-2654

MEP/FIRE PROTECTION ENGINEER
PATRICK CRILLY
CES
128 CARNEGIE ROW STE 204
NORWOOD, MA 02062
P: (617) 261-7161
E: PCRILLY@CESENG.COM



430 E. Caley Ave
Suite 280E
Centennial, CO 80111
(720) 258-4780
(720) 258-4762



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ERMIT SET

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Sheet Description

COVER SHEET

Street Number

1.1

- GENERAL
1. ACCESSIBILITY NOTES AND DETAILS REPRESENT TYPICAL REQUIREMENTS PER 521 CMR. SCOPE AND DESIGN GUIDELINES AND SHALL BE APPLIED WHEREVER APPLICABLE, WHETHER OR NOT REFERENCED ON THE PLANS.
2. THESE GUIDELINES ARE NOT EXHAUSTIVE; ADDITIONAL REQUIREMENTS MAY APPLY AS NOTED IN THE DRAWINGS AND REFERENCED IN THE FULL SCOPE OF THE 521 CMR, AVAILABLE ONLINE AND IN PRINT.
3. REFER TO THE ACCESSIBILITY DIAGRAMS FOR ADDITIONAL INFORMATION.
4. REFER TO THE PROJECT DETAILS FOR LAYOUTS SPECIFIC TO THIS PROJECT THAT MEET OR EXCEED THESE GENERAL REQUIREMENTS.

ACCESSIBLE ROUTE: (SEE CMR SECTION 20.00 FOR MORE INFORMATION)

GENERAL: AN ACCESSIBLE ROUTE SHALL PROVIDE A CONTINUOUS UNOBSTRUCTED PATH CONNECTING ACCESSIBLE SPACES AND ELEMENTS INSIDE AND OUTSIDE A FACILITY. ACCESSIBLE ROUTES MAY INCLUDE BUT ARE NOT LIMITED TO WALKS, HALLS, CORRIDORS, AISLES, SKYWALKS, AND TUNNELS. ACCESSIBLE ROUTES MAY NOT INCLUDE STAIRS, STEPS, OR ESCALATORS, EVEN IF THE STAIRS AND STEPS ARE REQUIRED TO BE ACCESSIBLE UNDER 521 CMR.

LOCATION: WITHIN THE BOUNDARY OF THE SITE, AN ACCESSIBLE ROUTE(S) SHALL BE PROVIDED FROM ACCESSIBLE PARKING, ACCESSIBLE PASSENGER LOADING ZONES, AND PUBLIC STREETS OR SIDEWALKS TO THE ACCESSIBLE BUILDING ENTRANCE THEY SERVE. THE ACCESSIBLE ROUTE(S) SHALL COINCIDE WITH THE ROUTE FOR THE GENERAL PUBLIC. AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDINGS, FACILITIES, ELEMENTS AND SPACES THAT ARE ON THE SAME SITE.

WIDTH: AN ACCESSIBLE ROUTE SHALL HAVE A MINIMUM CLEAR WIDTH OF 36 INCHES (36" = 914 MM) EXCEPT AT DOORS AND AT OPENINGS LESS THAN 24 INCHES (24" = 610MM) DEEP WHERE IT SHALL COMPLY WITH 521 CMR 20.00: DOORS AND DOORWAYS.

PASSING SPACE: IF AN ACCESSIBLE ROUTE HAS LESS THAN 60 INCHES (60" = 1524MM) CLEAR WIDTH, THEN PASSING SPACES AT LEAST 60 INCHES BY 60 INCHES (60" X 60" = 1524MM BY 1524MM) SHALL BE LOCATED AT INTERVALS NOT TO EXCEED 200 FEET (200' = 61M). AT AN INTERSECTION OF TWO CORRIDORS OR WALKS IS AN ACCEPTABLE PASSING PLACE.

PROTRUDING OBJECTS: OBJECTS PROJECTING FROM WALLS (FOR EXAMPLE, TELEPHONES WITH THEIR LEADING EDGES BETWEEN 27 INCHES AND 90 INCHES (27" - 888MM) ABOVE THE FINISHED FLOOR, FINISHED FLOOR SHALL PROTRUDE NO MORE THAN FOUR INCHES (4" = 102MM) INTO WALKS, HALLS, CORRIDORS, PASSAGEWAYS, OR AISLES AND SHALL NOT HAVE SHARP OR ABRUPT EDGES. OBJECTS MOUNTED WITH THEIR LEADING EDGES AT OR BELOW 27 INCHES (27" = 688MM) ABOVE THE FINISHED FLOOR MAY PROTRUDE ANY DISTANCE AS LONG AS THEY DO NOT REDUCE THE ACCESSIBLE ROUTE BELOW 36 INCHES (36" = 914MM). FREE-STANDING OBJECTS MOUNTED ON POSTS OR PYLONS MAY HAVE A MAXIMUM OVERHANG OF 12 INCHES (12" = 305MM) MEASURED BETWEEN 27 INCHES AND 90 INCHES (27" AND 80" = 688MMAND 2032MM) ABOVE THE GROUND OR FINISHED FLOOR.

HEADROOM: WALKS, HALLS, CORRIDORS, PASSAGEWAYS, AISLES, OR OTHER CIRCULATION SPACES SHALL HAVE A MINIMUM OF 80 INCHES (80" = 2032MM) CLEAR HEADROOM. IF VERTICAL CLEARANCE OF AN AREA ADJOINING AN ACCESSIBLE ROUTE IS REDUCED TO LESS THAN 80 INCHES (80" = 2032MM), A BARRIER SHALL BE PROVIDED TO WARN BLIND OR VISUALLY-IMPAIRED PERSONS OF THE REDUCED HEADROOM.

EGRESS: ACCESSIBLE ROUTES SERVING ANY ACCESSIBLE SPACE OR ELEMENT SHALL ALSO SERVE AS A MEANS OF EGRESS FOR EMERGENCIES OR CONNECT TO AN ACCESSIBLE AREA OF RESCUE ASSISTANCE. ALL SPACES OR ELEMENTS REQUIRED TO BE ACCESSIBLE BY 521 CMR SHALL BE PROVIDED WITH NO LESS THAN ONE ACCESSIBLE MEANS OF EGRESS. WHERE MORE THAN ONE MEANS OF EGRESS IS REQUIRED UNDER 780 CMR (THE MASSACHUSETTS STATE BUILDING CODE) FROM ANY ACCESSIBLE SPACE OR ELEMENT, EACH SPACE OR ELEMENT SHALL BE SERVED BY NOT LESS THAN TWO ACCESSIBLE MEANS OF EGRESS. EXCEPTION: FOR THE PURPOSES OF 521 CMR 20.11, FIRE ESCAPES SHALL BE EXEMPT. THE EXIT DISCHARGE SHALL PROVIDE A CONTINUOUS PATH OF TRAVEL FROM AN EXIT TO A PUBLIC WAY BY MEANS OF A WALKWAY OR A RAMP. A WHERE PUBLIC WAYS ARE FURTHER THAN 100 FEET FROM AN EXIT, EXTERIOR AREAS OF RESCUE ASSISTANCE COMPLYING WITH 2012.2 MAY BE CONSTRUCTED ALONG THE EXIT DISCHARGE LOCATED NO CLOSER THAN 100 FEET FROM THE BUILDING. B. IN BUILDINGS WHERE THE GRADE AT THE LEVEL OF EXIT DISCHARGE PROHIBITS CONSTRUCTION OF EITHER A WALKWAY OR A RAMP, A PORTION OF AN EXTERIOR EXIT BALCONY LOCATED IMMEDIATELY ADJACENT TO AN EMERGENCY EXIT COMPLYING WITH 521 CMR 20.12.2 MAY BE CONSTRUCTED AS AN AREA OF RESCUE ASSISTANCE.

AREAS OF RESCUE ASSISTANCE: SHALL BE PROVIDED WHERE AN ACCESSIBLE MEANS OF EGRESS IS NOT PROVIDED AND SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS: EXCEPTION: AREAS OF RESCUE ASSISTANCE ARE NOT REQUIRED IN: A. EXISTING BUILDINGS UNDERGOING ALTERATIONS, REMODELING, RECONSTRUCTION B. BUILDINGS OR FACILITIES HAVING AN SUPERVISED AUTOMATIC SPRINKLER SYSTEMS C. TUNNELS: D. OPEN AIR PARKING GARAGES AND OPEN AIR TRANSIT STATIONS.

LOCATION AND CONSTRUCTION: AN AREA OF RESCUE ASSISTANCE SHALL BE ONE OF THE FOLLOWING: A. A PORTION OF A STAIRWAY LANDING WITHIN A MOKEPROOF ENCLOSURE (COMPLYING WITH APPLICABLE REQUIREMENTS OF 780 CMR (THE MASSACHUSETTS STATE BUILDING CODE). B. A PORTION OF AN EXTERIOR EXIT BALCONY LOCATED IMMEDIATELY ADJACENT TO AN EXIT STAIRS OR TO THE BALCONY COMPLIES WITH APPLICABLE REQUIREMENTS OF 780 CMR (THE MASSACHUSETTS STATE BUILDING CODE) FOR EXTERIOR EXIT BALCONIES. OPENINGS TO THE INTERIOR OF THE BUILDING LOCATED WITHIN 20 FEET (20' = 6M) OF THE AREA OF RESCUE ASSISTANCE SHALL BE PROTECTED WITH FIRE ASSEMBLIES HAVING A ¼ HOUR FIRE PROTECTION RATING. C. A PORTION OF A ONE-HOUR FIRE-RESISTIVE CORRIDOR COMPLYING WITH APPLICABLE REQUIREMENTS OF 780 CMR. THE STATE BUILDING CODE FOR FIRE-RESISTIVE CONSTRUCTION AND FOR OPENINGS (LOCATED IMMEDIATELY ADJACENT TO AN EXIT ENCLOSURE. D. A VESTIBULE LOCATED IMMEDIATELY ADJACENT TO AN EXIT ENCLOSURE AND CONSTRUCTED TO THE SAME FIRE-RESISTIVE STANDARDS CONTROLLING CORRIDORS AND OPENINGS. E. A PORTION OF A STAIRWAY LANDING WITHIN AN EXIT ENCLOSURE WHICH IS VENTED TO THE EXTERIOR AND IS SEPARATED FROM THE INTERIOR OF THE BUILDING WITH NOT LESS THAN ONE HOUR FIRE-RESISTIVE DOORS. F. WHEN APPROVED BY THE APPROPRIATE APPLICABLE BUILDING OFFICIAL, AN AREA OR A ROOM THAT IS SEPARATED FROM OTHER PORTIONS OF THE BUILDING BY A SMOKE BARRIER. SMOKE BARRIERS SHALL HAVE A FIRE-RESISTIVE RATING OF NOT LESS THAN ONE HOUR AND SHALL COMPLETELY ENCLOSE THE AREA OR ROOM. DOORS IN THE SMOKE BARRIER SHALL BE TIGHT-FITTING SMOKE- AND DRAFT-CONTROL ASSEMBLIES HAVING A FIRE-PROTECTION RATING OF NOT LESS THAN 20 MINUTES. AND SHALL BE SELF-CLOSING OR AUTOMATIC CLOSING. THE AREA OR ROOM SHALL BE PROVIDED WITH AN EXIT DIRECTLY TO AN EXIT ENCLOSURE, WHERE THE ROOM OR AREA EXITS INTO AN EXIT ENCLOSURE WHICH IS REQUIRED TO BE OF MORE THAN ONE HOUR FIRE-RESISTIVE CONSTRUCTION. THE ROOM OR AREA SHALL HAVE THE SAME FIRE-RESISTIVE CONSTRUCTION, INCLUDING THE SAME OPENING PROTECTION, AS REQUIRED FOR THE ADJACENT EXIT ENCLOSURE. G. AN ELEVATOR LOBBY WHERE ELEVATOR SHAFTS AND ADJACENT LOBBIES ARE PRESSURIZED AS REQUIRED FOR SMOKEPROOF ENCLOSURES BY 780 CMR: THE STATE BUILDING CODE OR 524 CMR: THE STATE BOARD OF ELEVATOR REGULATIONS, AND WHEN COMPLYING WITH REQUIREMENTS HEREIN FOR SIZE, COMMUNICATION, AND SIGNAGE. SUCH PRESSURIZATION SYSTEM SHALL BE ACTIVATED BY SMOKE DETECTORS ON EACH FLOOR LOCATED IN A MANNER APPROVED BY THE APPROPRIATE LOCAL AUTHORITY. PRESSURIZATION EQUIPMENT AND ITS DUCT WORK WITHIN THE BUILDING SHALL BE SEPARATED FROM OTHER PORTIONS OF THE BUILDING BY A MINIMUM TWO-HOUR FIRE-RESISTIVE CONSTRUCTION. H. A FLAT LEVEL AREA THAT IS STABLE, FIRM AND SLIP RESISTANT ADJACENT TO THE EXIT DISCHARGE IN LOCATIONS WHERE THE PUBLIC WAY IS FURTHER THAN 100 FEET FROM THE BUILDING.

SIZE: EACH AREA OF RESCUE ASSISTANCE SHALL PROVIDE AT LEAST TWO ACCESSIBLE SPACES, NOT LESS THAN 30 INCHES BY 48 INCHES (30" X 48" = 762MM BY 1219MM) EACH. A. THE AREA OF RESCUE ASSISTANCE SHALL NOT ENCRONCH ON ANY REQUIRED EXIT WITH: B. THE TOTAL NUMBER OF SUCH 30 INCH BY 48 INCH (30" X 48" = 762MM BY 1219MM) AREAS PER STORY SHALL BE NOT LESS THAN ONE FOR EVERY 200 PERSONS OF CALCULATED OCCUPANT LOAD SERVED BY THE AREA OF RESCUE ASSISTANCE.

STAIRWAY WIDTH: EACH STAIRWAY ADJACENT TO AN AREA OF RESCUE ASSISTANCE SHALL HAVE A MINIMUM CLEAR WIDTH OF 48 INCHES (48" = 1219MM) BETWEEN HANDRAILS.

TWO-WAY COMMUNICATION: A METHOD OF TWO-WAY COMMUNICATION, WITH BOTH VISIBLE AND AUDIBLE SIGNALS, SHALL BE PROVIDED BETWEEN EACH AREA OF RESCUE ASSISTANCE AND THE PRIMARY ENTRANCE TO THE BUILDING. THE FIRE DEPARTMENT OR APPROPRIATE BUILDING OFFICIAL MAY APPROVE A LOCATION OTHER THAN THE PRIMARY ENTRANCE TO THE BUILDING. ANY OPERABLE MECHANISM SHALL COMPLY WITH 521 CMR CONTROLS:

IDENTIFICATION: EACH AREA OF RESCUE ASSISTANCE SHALL BE IDENTIFIED BY A SIGN THAT STATES "AREA OF RESCUE ASSISTANCE" AND DISPLAYS THE INTERNATIONAL SYMBOL OF ACCESSIBILITY. THE SIGN SHALL BE ILLUMINATED WHEN EXIT SIGN ILLUMINATION IS REQUIRED. SIGNAGE SHALL ALSO BE INSTALLED AT ALL INACCESSIBLE EXITS AND WHERE OTHERWISE NECESSARY TO CLEARLY INDICATE THE DIRECTION TO AREAS OF RESCUE ASSISTANCE. IN EACH AREA OF RESCUE ASSISTANCE, INSTRUCTIONS ON THE USE OF THE AREA UNDER EMERGENCY CONDITIONS SHALL BE POSTED ADJOINING THE TWO-WAY COMMUNICATION SYSTEM.

WALKWAYS: (SEE CMR SECTION 22.00 FOR MORE INFORMATION)

WIDTH: WIDTH OF WALKWAYS SHALL BE NOT LESS THAN 48 INCHES (48" = 1219MM), EXCLUDING CURB STONES. AN UNOBSTRUCTED PATH OF TRAVEL SHALL BE PROVIDED WHICH IS AT LEAST 36 INCHES (36" = 914MM) CLEAR, EXCLUDING CURB STONES.

GRADE: WALKWAYS WITH A RUNNING SLOPE GREATER THAN ONE-IN-20 (1:20) (5%) ARE RAMPS AND SHALL COMPLY WITH 521 CMR

RAMPS: NOWHERE SHALL THE CROSS SLOPE OF WALKWAYS EXCEED ONE-IN-50 (1:50) (2%). EXCEPTION: SIDEWALKS ON STREETS AND WAYS SHALL BE CONSIDERED WALKWAYS, WITH THE EXCEPTION THAT IF THE SLOPE OF THE NATURAL TOPOGRAPHY EXCEEDS ONE-IN-20 (1:20) (5%) A RAMP IS NOT REQUIRED. NOWHERE SHALL THE SURFACE SLOPE OF ANY PLAZA AREA EXCEED ONE-IN-50 (1:50) (2%).

LEVEL CHANGES: WALKWAYS SHALL HAVE CONTINUOUS COMMON SURFACES, NOT INTERRUPTED BY STEPS OR CHANGES IN LEVEL GREATER THAN ¼ INCH (¼" = 6MM), CHANGES IN LEVEL BETWEEN ¼ INCH AND ½ INCH (¼" AND ½" = 6MM AND 12MM) SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1:2 (50%).

SURFACE: WALKWAY SURFACES SHALL BE STABLE, AND FIRM AND SHALL LIE GENERALLY IN A CONTINUOUS PLANE WITH A MINIMUM OF SURFACE WARPING.

DRAINAGE: GRADING AND DRAINAGE SHALL BE DESIGNED TO MINIMIZE POOLING OF WATER OR ACCUMULATION OF ICE OR FLOW OF WATER ACROSS WALKWAYS.

GRATINGS: IF GRATINGS ARE LOCATED IN WALKING SURFACES, THEY SHALL HAVE SPACES NO GREATER THAN ½ INCH (½" = 13MM) WIDE IN THE DIRECTION OF THE FLOW OF TRAVEL. IF GRATINGS HAVE ELONGATED OPENINGS, THEN THEY SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

INTERSECTIONS: WHEREVER A WALKWAY CROSSES OR JOINS STREETS, PUBLIC WAYS, DRIVEWAYS OR PARKING LOTS, IT SHALL COMPLY WITH THE FOLLOWING: 22.8.1 THE INTERSECTING SURFACES SHALL BLEND TO A COMMON LEVEL WITH A SLOPE NO GREATER THAN 1:20 (5%), OR A CURB CUT SHALL BE INSTALLED IN COMPLIANCE WITH 521 CMR 21.00: CURB CUTS.

ALARMS: (SEE CMR SECTION 40.00 FOR MORE INFORMATION)

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. IF AN AUDIBLE ALARM IN AN ADJACENT SPACE PROVIDES THE PROPER DECIBEL LEVEL WITHIN A ROOM, THEN ONLY THE VISUAL ALARM IS NEEDED. SOUND LEVELS FOR ALARM SIGNALS SHALL NOT EXCEED 120 DBA.

VISUAL ALARMS: AT A MINIMUM, VISUAL SIGNAL APPLIANCES, IF PROVIDED, SHALL BE PROVIDED IN BUILDINGS AND FACILITIES IN EACH OF THE FOLLOWING AREAS: RESTROOMS, MEETING ROOMS, HALLWAYS, LOBBIES, CLASSROOMS, AND ANY GENERAL USAGE AREAS OPEN TO THE PUBLIC. 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 HAVE PHOTOMETRIC FEATURES IN ACCORDANCE WITH NFPA SECTION 7.5, 2002. VISUAL ALARM SIGNALS SHALL BE LOCATED IN ACCORDANCE WITH NFPA SECTION 7.5, 2002.

521 CMR ACCESSIBILITY GUIDELINES

DOORS: (SEE CMR SECTION 26.00 FOR MORE INFORMATION)

GENERAL: ALL DOORS AND OPENINGS ALONG ACCESSIBLE ROUTES SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS. IN BUILDINGS CLASSIFIED IN THE ASSEMBLY USE AND EDUCATIONAL USE (SEE 780 CMR 302.0 WITH AN OCCUPANCY OF OVER 150 (SEE 521 CMR 14.1.1), ALL REQUIRED EGRESS DOORS WHICH LEAD DIRECTLY TO THE STREET OR TO GRADE, SHALL BE MADE ACCESSIBLE AT THE EXTERIOR AS WELL AS THE INTERIOR TO PROVIDE A SAFE PATH OF TRAVEL TO A PUBLIC WAY FOR PERSONS WHO ARE DISABLED. SUCH EGRESS DOORS SHALL BE PROVIDED WITH ILLUMINATED SIGNAGE IDENTIFYING ACCESSIBILITY BY THE USE OF THE INTERNATIONAL SYMBOL CONTAINED WITHIN THE "EXIT" SIGN (SEE 521 CMR 41.1.3)

REVOLVING DOORS: REVOLVING DOORS SHALL NOT BE THE ONLY MEANS OF PASSAGE AT AN ACCESSIBLE ENTRANCE OR ALONG AN ACCESSIBLE ROUTE UNLESS THE REVOLVING DOOR IS ALSO ACCESSIBLE. AN ACCESSIBLE DOOR SHALL BE PROVIDED ADJACENT TO A REVOLVING DOOR AND SHALL PERMIT THE SAME USE PATTERN. WHENEVER REVOLVING DOORS ARE PROVIDED, THE ADJACENT ACCESSIBLE DOOR SHALL BE UNLOCKED. THE ADJACENT ACCESSIBLE DOOR MUST HAVE HARDWARE THAT ALLOWS ENTRANCE INTO THE BUILDING AS WELL AS EGRESS.

DOUBLE-LEAF DOORWAYS: A DOORWAY HAVING TWO INDEPENDENTLY OPERATED DOOR LEAVES SHALL HAVE AT LEAST ONE LEAF THAT MEETS THE REQUIREMENTS OF 521 CMR 26.5. WIDTH AND 521 CMR 26.6. MANEUVERING CLEARANCE. THAT LEAF SHALL BE AN ACTIVE LEAF.

WIDTH: ALL DOORWAYS AND OPENINGS THAT ARE REQUIRED TO BE ACCESSIBLE SHALL HAVE A CLEAR OPENING OF NOT LESS THAN 32 INCHES (32" = 813MM). CLEAR OPENING IS MEASURED FROM THE FACE OF THE DOOR ON THE LATCH SIDE TO THE FACE OF THE DOOR WHEN THE DOOR IS OPEN 90 DEGREES. FOR DOOR TYPES SUCH AS BIFOLD, ACCORDION, AND POCKET, THE CLEAR OPENING IS MEASURED WHEN THE DOOR IS IN ITS MOST FULLY OPEN POSITION.

MANEUVERING CLEARANCE: A MINIMUM CLEAR FLOOR AREA SHALL BE PROVIDED ON BOTH SIDES OF ALL DOORS AND GATES. THE FLOOR OR GROUND AREA WITHIN THE REQUIRED CLEARANCES SHALL BE LEVEL DOORS LOCATED IN A RECESS OF MORE THAN SIX INCHES (6" = 152MM) DEEP SHALL HAVE CLEAR FLOOR SPACE AS REQUIRED IN 521 CMR 26.6.3 AND 521 CMR 26.6.4. SAID CLEAR FLOOR SPACE SHALL BE MEASURED WITHIN SIX INCHES OF THE DOOR. A MINIMUM CLEAR FLOOR AREA SHALL BE PROVIDED ON BOTH SIDES OF ALL DOORS AND GATES. SEE ACCESSIBILITY DIAGRAMS.

TWO DOORS IN SERIES: THE MINIMUM SPACE BETWEEN TWO HINGED OR PIVOTED DOORS IN SERIES SHALL BE 48 INCHES (48" = 1219MM) PLUS THE WIDTH OF ANY DOOR SWINGING INTO THE SPACE. DOORS IN SERIES SHALL SWING EITHER IN THE SAME DIRECTION OR AWAY FROM THE SPACE BETWEEN THE DOORS.

DOOR OPENING FORCE: DOORS: THESE FORCES APPLY ONLY TO OPENING THE DOOR, NOT TO THE EFFORT REQUIRED TO RETRACT LATCH BOLTS OR DISENGAUGE OTHER DEVICES THAT MAY HOLD THE DOOR IN A CLOSED POSITION. A. EXTERIOR HINGED DOORS: 15 LBS. B. INTERIOR HINGED DOORS: FIVE LBS. C. SLIDING OR FOLDING DOORS: FIVE LBS. FIRE DOORS SHALL HAVE THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY.

DOOR CLOSERS: IF A DOOR HAS A CLOSER, THEN THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT AN OPEN POSITION OF 90 DEGREES, THE DOOR WILL TAKE AT LEAST SIX SECONDS TO CLOSE.

THRESHOLDS: THRESHOLDS SHALL NOT EXCEED ½ INCH (½" = 13MM) IN HEIGHT AND SHALL BE BEVELED ON BOTH SIDES

WITH A SLOPE NO GREATER THAN ONE-IN-TWO (1:2) (50%). CHANGES IN FLOOR FINISH MATERIALS SHALL HAVE AN EDGE STRIP OR THRESHOLD THAT IS BEVELED AT A RATIO OF ONE-IN-TWO (1:2) (50%).

DOOR HARDWARE: TYPE: HANDLES, PULLS, LATCHES, LOCKS, AND OTHER OPERATING DEVICES ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO OPERATE WITH ONE HAND AND THAT DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING, OR TWISTING OF THE WRIST TO OPERATE. LEVER-OPERATED MECHANISMS, PUSH-TYPE MECHANISMS, AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGNS. WHEN SLIDING DOORS ARE FULLY OPEN, OPERATING HARDWARE SHALL BE EXPOSED AND USABLE FROM BOTH SIDES.

HEIGHT: HAND-OPERATED DOOR OPENING HARDWARE SHALL BE LOCATED 36 INCHES TO 48 INCHES (36" TO 48" = 914MM TO 1219MM) ABOVE THE FLOOR.

OPERATION: DOORS IN THE MEANS OF EGRESS SHALL BE OPERABLE WITH ONE HAND AND WITH A SINGLE EFFORT. DOORS IN THE PATHS OF INGRESS SHALL BE ABLE TO BE UNLOCKED AND OPENED WITH ONE HAND.

SPECIAL HARDWARE: DOORS OPENING INTO HAZARDOUS AREAS SHALL HAVE DOOR-OPENING HARDWARE WHICH IS KNURLED OR HAS A ROUGHENED SURFACE TO GIVE TACTILE WARNING TO PERSONS WITH VISUAL IMPAIRMENTS. HAZARDOUS AREAS SHALL INCLUDE BUT NOT BE LIMITED TO LOADING PLATFORMS, BOILER ROOMS, AND ELECTRICAL EQUIPMENT ROOMS.

STAIRS: (SEE CMR SECTION 27.00 FOR MORE INFORMATION)

STAIRS AND RISERS: ON ANY GIVEN FLIGHT OF STAIRS, ALL STEPS SHALL HAVE UNIFORM RISER HEIGHTS AND UNIFORM TREAD WIDTHS. OPEN RISERS ARE NOT PERMITTED.

NOISINGS: THE UNDERSIDES OF NOISINGS SHALL NOT BE ABRUPT. THE RADIUS OF CURVATURE AT THE ENDS OF STAIRS SHALL BE CONSIDERED WALKWAYS, WITH THE EXCEPTION THAT THE SLOPE OF THE NATURAL TOPOGRAPHY EXCEEDS ONE-IN-20 (1:20) (5%) A RAMP IS NOT REQUIRED. NOWHERE SHALL THE SURFACE SLOPE OF ANY PLAZA AREA EXCEED ONE-IN-50 (1:50) (2%).

LEVEL CHANGES: WALKWAYS SHALL HAVE CONTINUOUS COMMON SURFACES, NOT INTERRUPTED BY STEPS OR CHANGES IN LEVEL GREATER THAN ¼ INCH (¼" = 6MM), CHANGES IN LEVEL BETWEEN ¼ INCH AND ½ INCH (¼" AND ½" = 6MM AND 12MM) SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1:2 (50%).

SURFACE: WALKWAY SURFACES SHALL BE STABLE, AND FIRM AND SHALL LIE GENERALLY IN A CONTINUOUS PLANE WITH A MINIMUM OF SURFACE WARPING.

DRAINAGE: GRADING AND DRAINAGE SHALL BE DESIGNED TO MINIMIZE POOLING OF WATER OR ACCUMULATION OF ICE OR FLOW OF WATER ACROSS WALKWAYS.

GRATINGS: IF GRATINGS ARE LOCATED IN WALKING SURFACES, THEY SHALL HAVE SPACES NO GREATER THAN ½ INCH (½" = 13MM) WIDE IN THE DIRECTION OF THE FLOW OF TRAVEL. IF GRATINGS HAVE ELONGATED OPENINGS, THEN THEY SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

INTERSECTIONS: WHEREVER A WALKWAY CROSSES OR JOINS STREETS, PUBLIC WAYS, DRIVEWAYS OR PARKING LOTS, IT SHALL COMPLY WITH THE FOLLOWING: 22.8.1 THE INTERSECTING SURFACES SHALL BLEND TO A COMMON LEVEL WITH A SLOPE NO GREATER THAN 1:20 (5%), OR A CURB CUT SHALL BE INSTALLED IN COMPLIANCE WITH 521 CMR 21.00: CURB CUTS.

ENTRANCES AND EXITS: (SEE CMR SECTION 25.00 FOR MORE INFORMATION)

GENERAL: ALL PUBLIC ENTRANCE(S) OF A BUILDING OR TENANCY IN A BUILDING SHALL BE ACCESSIBLE. PUBLIC ENTRANCES ARE ANY ENTRANCES THAT ARE NOT SOLELY SERVICE ENTRANCES, LOADING ENTRANCES, OR ENTRANCES RESTRICTED TO EMPLOYEE USE ONLY.

APPROACH: THE APPROACH TO AN ACCESSIBLE ENTRANCE SHALL BE A PAVED WALK OR RAMP WITH A SLIP RESISTANT SURFACE, UNINTERRUPTED BY STEPS. ENTRANCE(S) SHALL HAVE A LEVEL SPACE ON THE INTERIOR AND EXTERIOR OF THE ENTRANCE DOORS.

VESTIBULES: BETWEEN ANY TWO HINGED OR PIVOTED DOORS, THERE SHALL BE A MINIMUM OF 48 INCHES (48" = 1219MM) PLUS THE WIDTH OF ANY DOOR SWINGING INTO THE SPACE.

MATS AND GRATES: DOOR MATS ½ INCH (½" = 13MM) THICK OR LESS SHALL BE SECURELY ACHORED AT ALL EDGES TO AVOID TRIPPING. DOOR MATS THICKER THAN ½ INCH (½" = 6MM) AND ½ INCH (½" = 13MM) THICK MUST BE SECURED WITH BEVELED EDGING THAT SLOPES NO MORE THAN 1:2 (50%). DOOR MATS THICKER THAN ½ INCH (½" = 13MM) SHALL BE RECESSED. GRATES SHALL HAVE OPENINGS NOT EXCEEDING ½ INCH (½" = 13MM) IN THE PATH OF TRAVEL.

PROTRUDING OBJECTS: OBJECTS THAT PROTRUDE INTO ENTRANCEWAYS, (SUSPENDED LIGHTS, SIGNS, FIXTURES, DOOR CLOSERS, ETC.) SHALL COMPLY WITH 521 CMR 20.6, PROTRUDING OBJECTS.

SIGNAGE: ANY ENTRANCE/EXIT OF A FACILITY NOT ACCESSIBLE BY PERSONS IN WHEELCHAIRS SHALL HAVE A SIGN CLEARLY INDICATING THE LOCATION OF THE ACCESSIBLE ENTRANCE/EXIT.

THRESHOLDS: THRESHOLDS SHALL NOT EXCEED ½ INCH (½" = 13MM) IN HEIGHT AND SHALL BE BEVELED ON BOTH SIDES

WITH A SLOPE NO GREATER THAN ONE-IN-TWO (1:2) (50%). CHANGES IN FLOOR FINISH MATERIALS SHALL HAVE AN EDGE STRIP OR THRESHOLD THAT IS BEVELED AT A RATIO OF ONE-IN-TWO (1:2) (50%).

DOOR HARDWARE: TYPE: HANDLES, PULLS, LATCHES, LOCKS, AND OTHER OPERATING DEVICES ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO OPERATE WITH ONE HAND AND THAT DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING, OR TWISTING OF THE WRIST TO OPERATE. LEVER-OPERATED MECHANISMS, PUSH-TYPE MECHANISMS, AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGNS. WHEN SLIDING DOORS ARE FULLY OPEN, OPERATING HARDWARE SHALL BE EXPOSED AND USABLE FROM BOTH SIDES.

HEIGHT: HAND-OPERATED DOOR OPENING HARDWARE SHALL BE LOCATED 36 INCHES TO 48 INCHES (36" TO 48" = 914MM TO 1219MM) ABOVE THE FLOOR.

OPERATION: DOORS IN THE MEANS OF EGRESS SHALL BE OPERABLE WITH ONE HAND AND WITH A SINGLE EFFORT. DOORS IN THE PATHS OF INGRESS SHALL BE ABLE TO BE UNLOCKED AND OPENED WITH ONE HAND.

SPECIAL HARDWARE: DOORS OPENING INTO HAZARDOUS AREAS SHALL HAVE DOOR-OPENING HARDWARE WHICH IS KNURLED OR HAS A ROUGHENED SURFACE TO GIVE TACTILE WARNING TO PERSONS WITH VISUAL IMPAIRMENTS. HAZARDOUS AREAS SHALL INCLUDE BUT NOT BE LIMITED TO LOADING PLATFORMS, BOILER ROOMS, AND ELECTRICAL EQUIPMENT ROOMS.

STAIRS AND RISERS: ON ANY GIVEN FLIGHT OF STAIRS, ALL STEPS SHALL HAVE UNIFORM RISER HEIGHTS AND UNIFORM TREAD WIDTHS. OPEN RISERS ARE NOT PERMITTED.

NOISINGS: THE UNDERSIDES OF NOISINGS SHALL NOT BE ABRUPT. THE RADIUS OF CURVATURE AT THE ENDS OF STAIRS SHALL BE CONSIDERED WALKWAYS, WITH THE EXCEPTION THAT THE SLOPE OF THE NATURAL TOPOGRAPHY EXCEEDS ONE-IN-20 (1:20) (5%) A RAMP IS NOT REQUIRED. NOWHERE SHALL THE SURFACE SLOPE OF ANY PLAZA AREA EXCEED ONE-IN-50 (1:50) (2%).

LEVEL CHANGES: WALKWAYS SHALL HAVE CONTINUOUS COMMON SURFACES, NOT INTERRUPTED BY STEPS OR CHANGES IN LEVEL GREATER THAN ¼ INCH (¼" = 6MM), CHANGES IN LEVEL BETWEEN ¼ INCH AND ½ INCH (¼" AND ½" = 6MM AND 12MM) SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1:2 (50%).

SURFACE: WALKWAY SURFACES SHALL BE STABLE, AND FIRM AND SHALL LIE GENERALLY IN A CONTINUOUS PLANE WITH A MINIMUM OF SURFACE WARPING.

DRAINAGE: GRADING AND DRAINAGE SHALL BE DESIGNED TO MINIMIZE POOLING OF WATER OR ACCUMULATION OF ICE OR FLOW OF WATER ACROSS WALKWAYS.

GRATINGS: IF GRATINGS ARE LOCATED IN WALKING SURFACES, THEN THEY SHALL HAVE SPACES NO GREATER THAN ½ INCH (½" = 13MM) WIDE IN ONE DIRECTION. IF GRATINGS HAVE ELONGATED OPENINGS, THEN THEY SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

INTERSECTIONS: WHEREVER A WALKWAY CROSSES OR JOINS STREETS, PUBLIC WAYS, DRIVEWAYS OR PARKING LOTS, IT SHALL COMPLY WITH THE FOLLOWING: 22.8.1 THE INTERSECTING SURFACES SHALL BLEND TO A COMMON LEVEL WITH A SLOPE NO GREATER THAN 1:20 (5%), OR A CURB CUT SHALL BE INSTALLED IN COMPLIANCE WITH 521 CMR 21.00: CURB CUTS.

ALARMS: (SEE CMR SECTION 40.00 FOR MORE INFORMATION)

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. IF AN AUDIBLE ALARM IN AN ADJACENT SPACE PROVIDES THE PROPER DECIBEL LEVEL WITHIN A ROOM, THEN ONLY THE VISUAL ALARM IS NEEDED. SOUND LEVELS FOR ALARM SIGNALS SHALL NOT EXCEED 120 DBA.

VISUAL ALARMS: AT A MINIMUM, VISUAL SIGNAL APPLIANCES, IF PROVIDED, SHALL BE PROVIDED IN BUILDINGS AND FACILITIES IN EACH OF THE FOLLOWING AREAS: RESTROOMS, MEETING ROOMS, HALLWAYS, LOBBIES, CLASSROOMS, AND ANY GENERAL USAGE AREAS OPEN TO THE PUBLIC. 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 HAVE PHOTOMETRIC FEATURES IN ACCORDANCE WITH NFPA SECTION 7.5, 2002. VISUAL ALARM SIGNALS SHALL BE LOCATED IN ACCORDANCE WITH NFPA SECTION 7.5, 2002.

PUBLIC TOILET ROOMS: (SEE CMR SECTION 30.00 FOR MORE INFORMATION)

GENERAL: IN EACH ADULT PUBLIC TOILET ROOM, AT LEAST ONE WATER CLOSET AND ONE SINK IN EACH LOCATION SHALL BE ACCESSIBLE TO PERSONS IN WHEELCHAIRS, OR A SEPARATE ACCESSIBLE UNISEX TOILET ROOM SHALL BE PROVIDED AT EACH LOCATION. ADULT WATER CLOSETS SHALL COMPLY WITH THE FOLLOWING PROVISIONS: 521 CMR 30.1 THROUGH 30.13. THE INSTALLATION OF UNISEX TOILET ROOM IN LIEU OF FULLY ACCESSIBLE MEN'S AND WOMEN'S ROOM IS PERMITTED BY 521 CMR.

LOCATION: ACCESSIBLE TOILET ROOMS SHALL BE ON AN ACCESSIBLE ROUTE. WHERE UNISEX TOILET ROOM(S) ARE PROVIDED, THEY SHALL BE IN THE SAME AREA AS OTHER TOILET ROOMS.

DOORS TO SINGLE USER TOILET ROOMS: DOORS TO SINGLE USER TOILET ROOMS MAY SWING INTO THE ROOM IF THE DOOR HAS A SELF-CLOSING DEVICE AND MANEUVERING SPACE IS PROVIDED IN ACCORDANCE WITH 521 CMR 26.6. THE DOOR MAY SWING INTO THE ROOM IF THERE IS A CLEAR FLOOR SPACE OF 60 INCHES (60" = 1524MM) DEEP AND 30 INCHES (30" = 762MM) BY 48 INCHES (48" = 1219MM) BEYOND THE SWING OF THE DOOR.

CLEAR FLOOR SPACE: AN UNOBSTRUCTED TURNING SPACE COMPLYING WITH 521 CMR 6.3. WHEELCHAIR TURNING SPACE SHALL BE PROVIDED WITHIN AN ACCESSIBLE TOILET ROOM. THE CLEAR FLOOR SPACE AT FIXTURES AND CONTROLS, THE ACCESSIBLE ROUTE, AND THE TURNING SPACE MAY OVERLAP.

STANDARD ACCESSIBLE TOILET STALL: STANDARD ACCESSIBLE TOILET STALLS SHALL BE AT LEAST 60 INCHES (60" = 1524MM) WIDE AND 72 INCHES (72" = 1829MM) DEEP. ARRANGEMENTS SHOWN FOR STANDARD ACCESSIBLE TOILET STALLS MAY BE REVERSED TO ALLOW EITHER A LEFT- OR RIGHT-HAND APPROACH. WATER CLOSETS IN ACCESSIBLE STALLS SHALL BE LOCATED ON THE 60 INCH (60" = 1524MM) WALL AND SHALL COMPLY WITH 521 CMR 30.7. WATER CLOSETS: A. ACCESSIBLE TOILET STALLS SHALL HAVE A DEVICE ON BOTH SIDES OF THE DOOR TO ASSIST IN CLOSING AND OPENING THE DOOR, AND A LOCK LOCATED APPROXIMATELY 36 INCHES (36" = 914MM) ABOVE THE FLOOR THAT DOES NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST TO OPERATE. C. A COAT HOOK SHALL BE PROVIDED AT A MAXIMUM HEIGHT OF 54 INCHES (54" = 1372MM) ABOVE THE FLOOR.

ALTERNATE ACCESSIBLE STALL: ALTERNATE ACCESSIBLE TOILET STALLS SHALL BE 36 INCHES (36" = 914MM) WIDE WITH AN OUTWARD SWINGING, SELF-CLOSING DOOR AND PARALLEL GRAB BARS. A. THE ALTERNATE TOILET STALL SHALL HAVE A DOOR THAT SWINGS OUT OR SLIDES AND HAS A 32 INCH (32" = 813MM) CLEAR OPENING. B. THE STALL DOOR SHALL HAVE AN AUTOMATIC SELF-CLOSING HINGE DEVICE. A PULL DEVICE ON BOTH SIDES OF THE DOOR TO ASSIST IN CLOSING AND OPENING THE DOOR, AND A LOCK LOCATED APPROXIMATELY 36 INCHES (36" = 914MM) ABOVE THE FLOOR THAT DOES NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST TO OPERATE. C. A COAT HOOK SHALL BE PROVIDED AT A MAXIMUM HEIGHT OF 54 INCHES (54" = 1372MM) ABOVE THE FLOOR.

WATER CLOSETS: FLOOR SPACE MAY BE ARRANGED TO ALLOW EITHER A LEFT-HANDED OR RIGHT-HANDED APPROACH TO THE WATER CLOSET.

LOCATION: THE CENTERLINE OF THE WATER CLOSET SHALL BE LOCATED 18 INCHES (18" = 457MM) FROM THE NEAREST SIDE WALL AND AT LEAST 42 INCHES (42" = 1067MM) FROM THE FARTHEST SIDE WALL OR THE CLOSEST EDGE OF AN ADJACENT FIXTURE. THERE SHALL BE AT LEAST 42 INCHES (42" = 1067MM) CLEARANCE BETWEEN THE FRONT EDGE OF THE WATER CLOSET AND THE NEAREST WALL OR FIXTURE.

HEIGHT: WATER CLOSETS SHALL BE 17 INCHES TO 19 INCHES (17" TO 19" = 432MM TO 483MM) HIGH, MEASURED TO THE TOP OF THE WATER CLOSET SEAT.

SEATS: WATER CLOSET SEATS SHALL NOT BE SPRING MOUNTED TO RETURN TO A LIFTED POSITION

FLUSH CONTROLS: FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC AND SHALL COMPLY WITH 521 CMR 39.5. OPERATION. CONTROLS FOR FLUSH VALVES SHALL BE MOUNTED ON THE WIDE SIDE OF WATER CLOSET NO MORE THAN 44 INCHES (44" = 1118MM) ABOVE THE FLOOR.

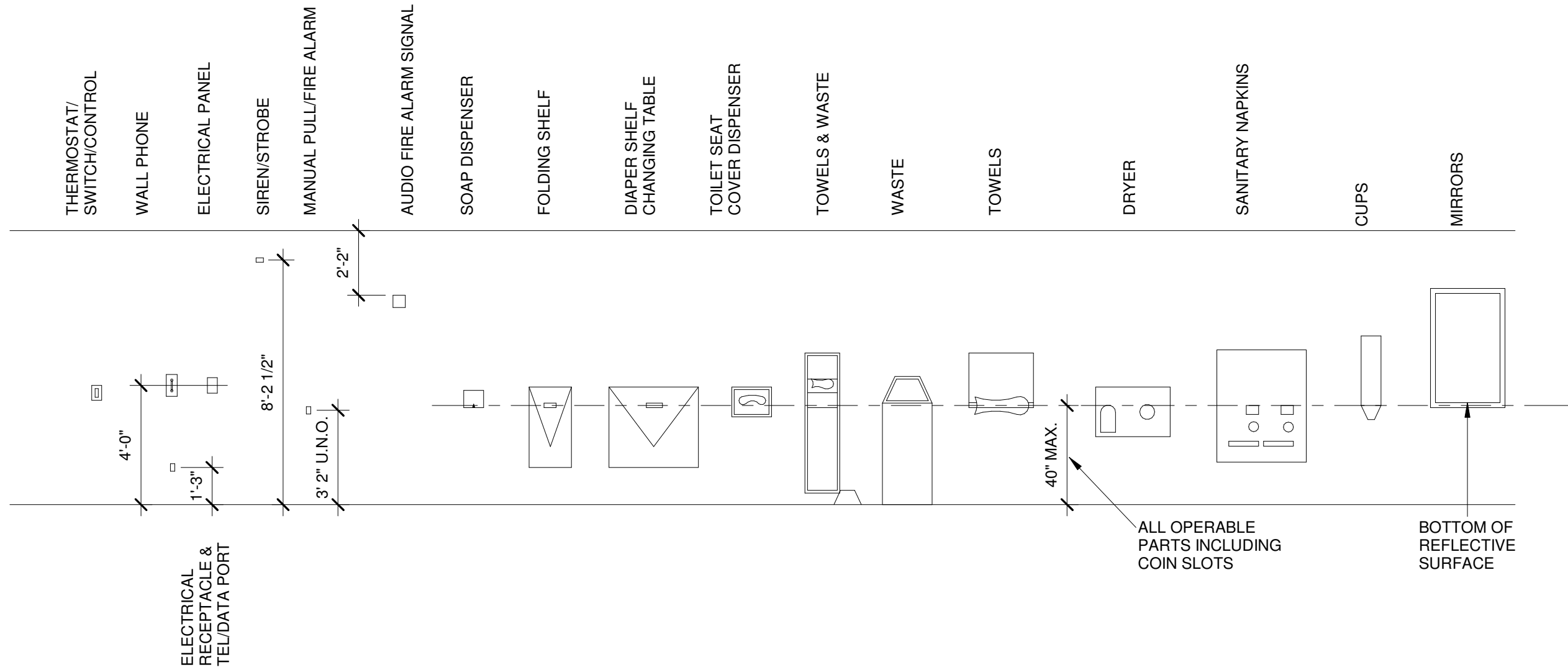
TOILET PAPER DISPENSERS: TOILET PAPER DISPENSERS SHALL BE LOCATED ON THE SIDE WALL CLOSEST TO THE WATER CLOSET. THE CENTERLINE OF THE ROLL SHALL BE SET AT A MINIMUM HEIGHT OF 24 INCHES (24" = 610MM) ABOVE THE FLOOR. DISPENSERS THAT CONTROL DELIVERY OR THAT DO NOT PERMIT CONTINUOUS PAPER FLOW ARE NOT ALLOWED.

GRAB BARS: FOR THE STANDARD ACCESSIBLE TOILET STALL THE WATER CLOSET SHALL HAVE TWO GRAB BARS 42 INCHES (42" = 1067MM) LONG, ONE ON THE WALL IN BACK OF THE WATER CLOSET AND ONE ON THE SIDE WALL CLOSEST TO THE WATER CLOSET. AT THE REAR GRAB BAR, THE WATER CLOSET ACCESSIBLE TOILET SHALL HAVE TWO PARALLEL GRAB BARS, 42 INCHES LONG (42" = 1067MM) INSTALLED ON THE SIDE WALLS AND LOCATED A MINIMUM OF SIX INCHES (6" = 76mm) FROM THE INTERIOR CORNER.

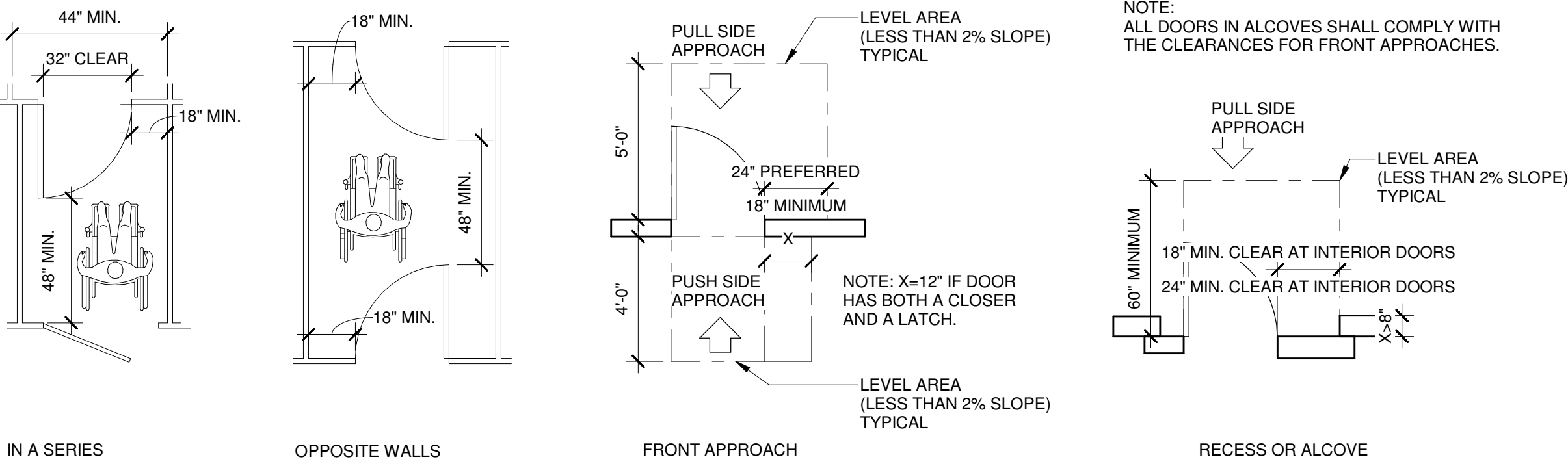
LOCATION: THE SIDE GRAB BAR SHALL BE LOCATED A MAXIMUM OF 12 INCHES (12" = 305MM) FROM THE INTERIOR CORNER. THE REAR GRAB BAR SHALL BE LOCATED A MAXIMUM OF SIX INCHES (6" = 152MM) FROM THE INTERIOR CORNER.

HEIGHT: GRAB BARS SHALL BE SET AT A HEIGHT OF 33 TO 38 INCHES (33" TO 38" = 838MM TO 914MM) ABOVE AND PARALLEL TO THE FLOOR, WHERE A TANK PREVENTS LOCATION OF THE REAR GRAB BAR, GRAB MAY BE INSTALLED THREE INCHES (3" = 76MM) ABOVE THE TANK, WHERE A FLUSHMETER PREVENTS THE LOCATION OF A 42 INCH (42" = 1067MM) REAR GRAB BAR, ONE GRAB BAR, 36 INCHES (36" = 914MM) SHALL BE INSTALLED TO THE SIDE OF THE FLUSHMETER, LOCATED THREE INCHES (3" = 76MM) FROM THE CLOSEST EDGE OF THE FLUSHMETER.

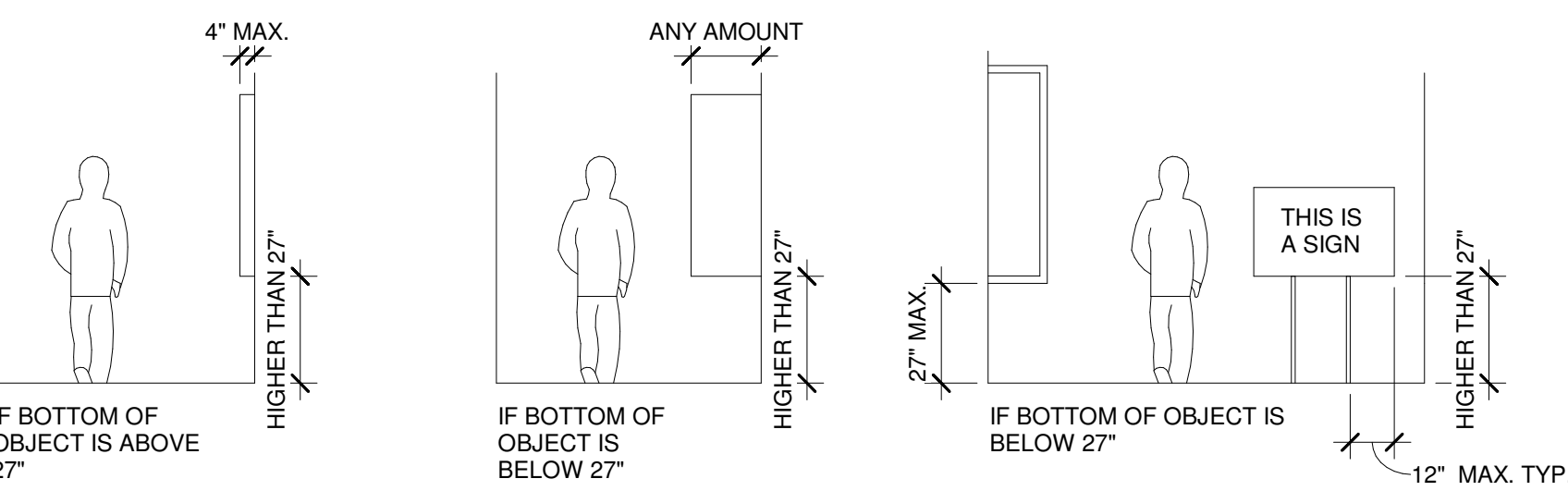
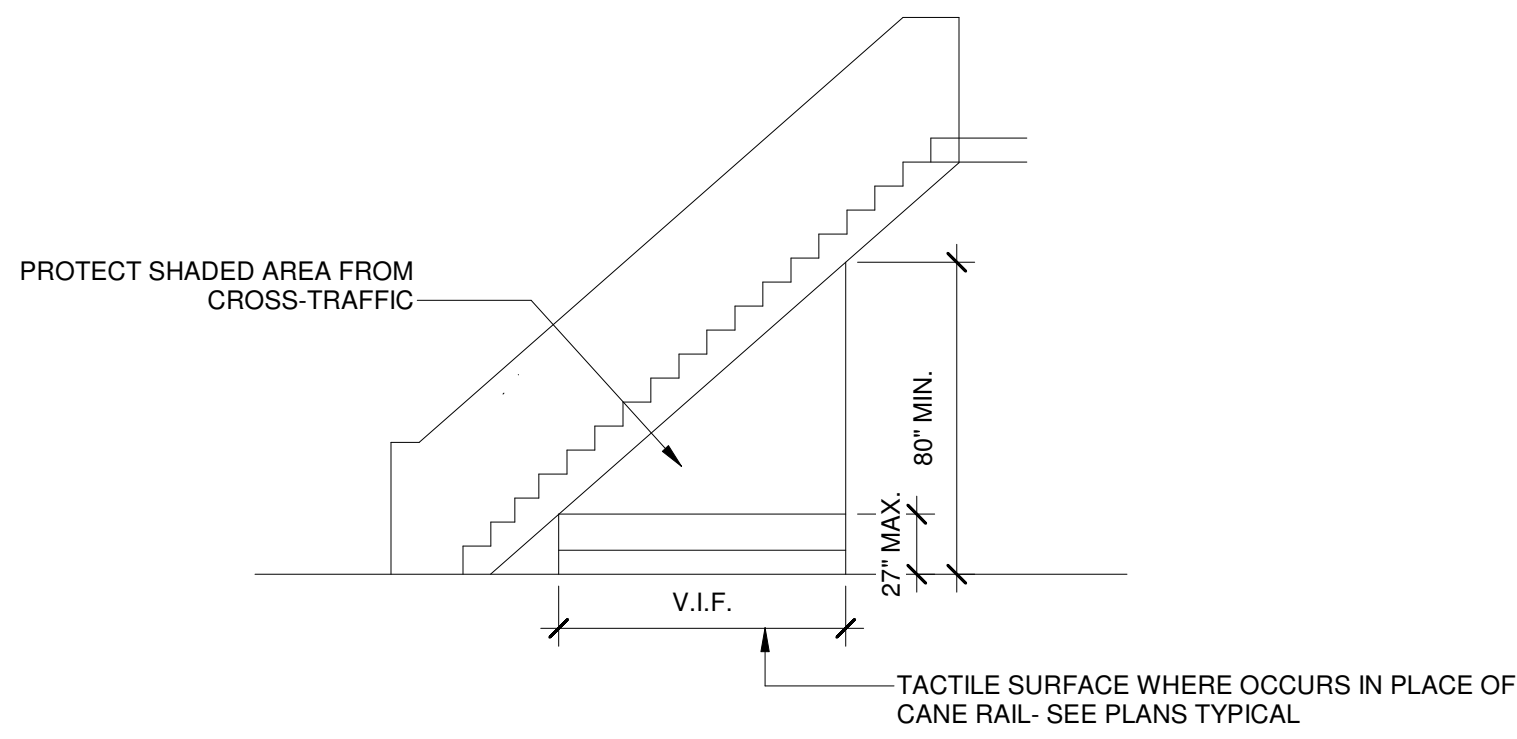
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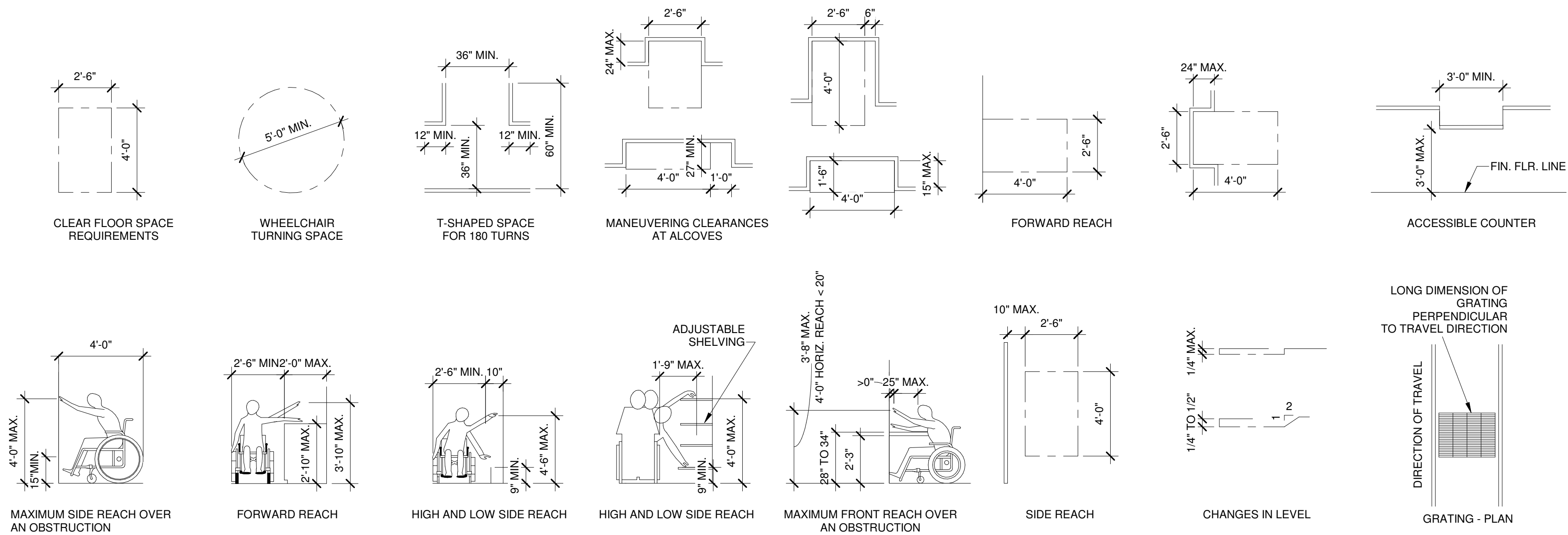
1 ADA - TYPICAL MOUNTING HEIGHTS
SCALE: 1/4" = 1'-0"



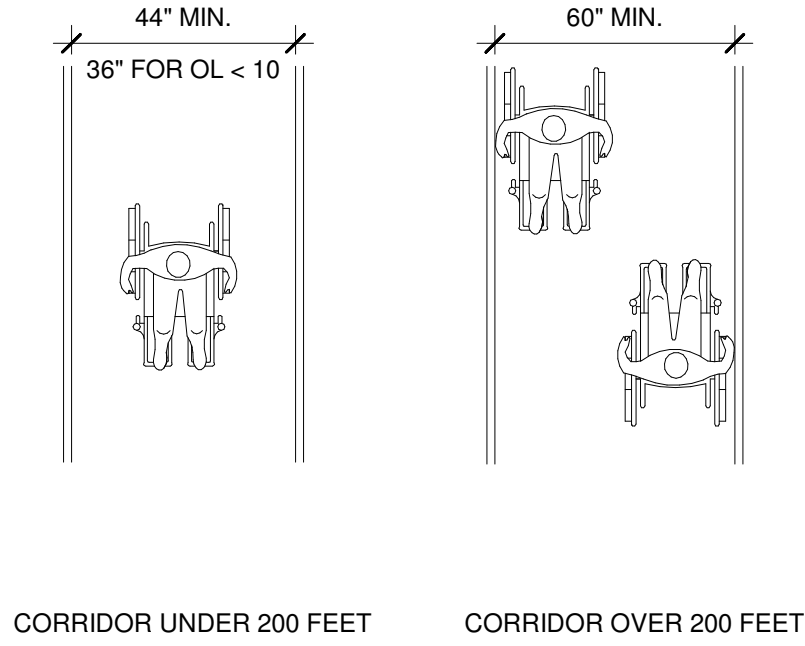
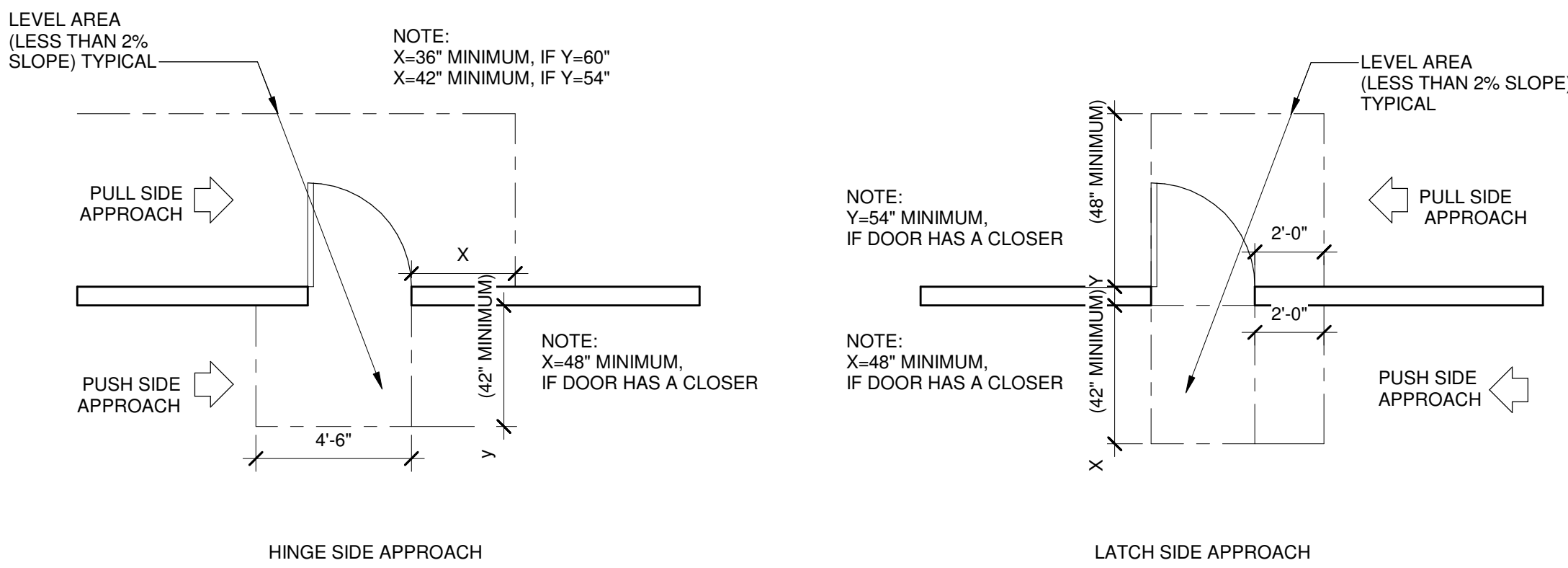
3 ADA - TYPICAL DOOR SWING CLEARANCES
SCALE: 1/4" = 1'-0"



5 ADA - TYPICAL PROTRUDING OBJECT DETAILS
SCALE: 1/4" = 1'-0"



2 ADA - TYPICAL CLEARANCES
SCALE: 1/4" = 1'-0"



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

2WRPARTNERS

ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

STATE OF GEORGIA

MICHAEL STARR

REGISTERED ARCHITECT

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Project Number: D21-380

Date: 9/10/2021

Drawn By: MTZ

Checked By: MZS

Revisions:

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Sheet Description

ACCESSIBILITY DIAGRAMS

Sheet Number

T1.4



1
D1.1
DEMOLITION PLAN
SCALE: 3/32" = 1'-0"

DEMO LEGEND

DEMOLISHED EXISTING TO REMAIN

GENERAL DEMOLITION NOTES

1. INFORMATION SHOWN IN THIS SHEET WAS DERIVED FROM ORIGINAL CONSTRUCTION DOCUMENTS. NO FIELD VERIFICATION WAS PERFORMED AND ARCHITECT MAKES NO WARRANTY EXPRESSED NOR IMPLIED REGARDING THE ACCURACY OF EXISTING CONDITIONS INDICATED. GC SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY ARCHITECT IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCIES.
2. ALL DEMOLITION WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS.
3. CONTRACTOR SHALL COORDINATE SEQUENCE OF DEMOLITION WITH PHASES OF CONSTRUCTION AGREED TO WITH OWNER AND ARCHITECT. COORDINATE ALL DEMOLITION WITH NEW CONSTRUCTION DRAWINGS.
4. THE CONTRACTOR SHALL FILE ALL NECESSARY CERTIFICATES OF INSURANCE, PAY ALL FEES, OBTAIN ALL PERMITS AND PROVIDE ANY AND ALL BONDS REQUIRED BY ANY AGENCY IN ORDER TO DO THE WORK HEREIN DESCRIBED.
5. NO STRUCTURAL ELEMENTS SHALL BE REMOVED UNLESS PORTIONS AFFECTED ARE ADEQUATELY SUPPORTED BY EITHER TEMPORARY SHORING OR NEW STRUCTURAL ELEMENTS AS REQUIRED TO PROTECT THE STABILITY AND INTEGRITY OF THE EXISTING STRUCTURE.
6. THE CONTRACTOR SHALL PROVIDE ADEQUATE WEATHER PROTECTION FOR THE BUILDING AND ITS CONTENTS DURING THE COURSE OF THE WORK. ALL OPENINGS IN ANY WALL OR ROOF SHALL BE PROTECTED FROM ALL FORMS OF WEATHER OR WATER.
7. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO DEMOLITION. DIMENSIONS INDICATED ON DEMOLITION PLAN ARE FOR REFERENCE ONLY.
8. CONTRACTOR SHALL COORDINATE EXTENT OF DEMOLITION WITH OTHER DRAWINGS IN THIS SET. NOTIFY ARCHITECT PRIOR TO PROCEEDING WITH DEMOLITION IN CASE OF A CONFLICT.
9. CONTRACTOR SHALL PERFORM ALL OPERATIONS OF DEMOLITION AND REMOVAL INDICATED ON THE DRAWINGS AND AS MAY BE REQUIRED BY THE WORK. ALL WORK SHALL BE DONE CAREFULLY AND NEATLY, IN A SYSTEMATIC MANNER.
10. DEMOLITION DRAWINGS AND NOTATIONS ARE GENERAL IN NATURE. PRIOR TO BIDDING THE WORK CONTRACTORS SHOULD PERFORM IN-FIELD VISUAL INSPECTION AND MAKE FIELD MEASUREMENTS TO ASCERTAIN THE EXTENT AND QUANTITY OF WORK TO BE PERFORMED.
11. THE CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN ALL TEMPORARY BARRIER AND GUARDS, AND ALL TEMPORARY SHORING AND BRACING AS REQUIRED BY ALL APPLICABLE CODES.
12. ALL ADJOINING PROPERTY AFFECTED BY ANY OPERATIONS OF DEMOLITION SHALL BE PROTECTED PER ALL APPLICABLE CODES.
13. CONTACT ARCHITECT IMMEDIATELY, IF DURING THE COURSE OF DEMOLITION, CIRCUMSTANCES ARE ENCOUNTERED IN WHICH THE EXTENT OR INTENT OF DEMOLITION INDICATED IN THE CONTRACT DOCUMENTS IS UNCLEAR. DO NOT PROCEED WITH DEMOLITION IN THESE AREAS IN QUESTION UNTIL CLARIFICATION IS GIVEN BY ARCHITECT.
14. ALL EXISTING SURFACES AND EQUIPMENT TO REMAIN SHALL BE FULLY PROTECTED FROM DAMAGE. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR DAMAGE AND SHALL MAKE REPAIRS REQUIRED WITHOUT ADDITIONAL COST TO THE OWNER.
15. NO DEBRIS SHALL BE ALLOWED TO ACCUMULATE ON THE SITE. DEBRIS SHALL BE REMOVED BY THE CONTRACTOR AS THE JOB PROCEEDS. THE SITE SHALL BE LEFT BROOM CLEAN AT THE COMPLETION OF THE DEMOLITION.
16. REFER TO MECHANICAL, PLUMBING, ELECTRICAL SHEETS FOR DEMOLITION OF ITEMS RELATED TO EACH DISCIPLINE. ALL EXISTING PENETRATIONS FOR BUILDING SYSTEMS NOT BEING RE-USED SHALL BE DEMOLISHED AND HOLES INFILLED TO MATCH ADJACENT CONSTRUCTION.
17. WHERE EXISTING WALLS ARE PARTIALLY DEMOLISHED, FINISH ENDS OF REMAINING WALLS TO MATCH ADJACENT CONSTRUCTION AND PROVIDE SMOOTH, EVEN SURFACES AT JAMBS OF NEW OPENINGS.
18. REMOVE ALL FLOOR FINISHES AND PREP FOR STAINED CONCRETE IN ALL AREAS WITHIN THE SCOPE OF PHASE ONE.

KEYED DEMOLITION NOTES 00

TAG	KEYNOTE
1	REMOVE AND DISPOSE OF WALL PARTITIONS AND ACCESSORIES.
2	REMOVE AND DISPOSE OF EXISTING MILLWORK.
3	REMOVE AND DISPOSE OF EXISTING DOOR AND ACCESSORIES.
4	REMOVE AND DISPOSE OF WALL FOR NEW OPENING, COORD. W/ NEW WORK.
5	REMOVE AND DISPOSE OF COAT ROD AND SHELF.
6	REMOVE AND SALVAGE LOCKERS FOR REUSE.

2WR

ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

STATE OF GEORGIA

MICHAEL STARR

REGISTERED ARCHITECT

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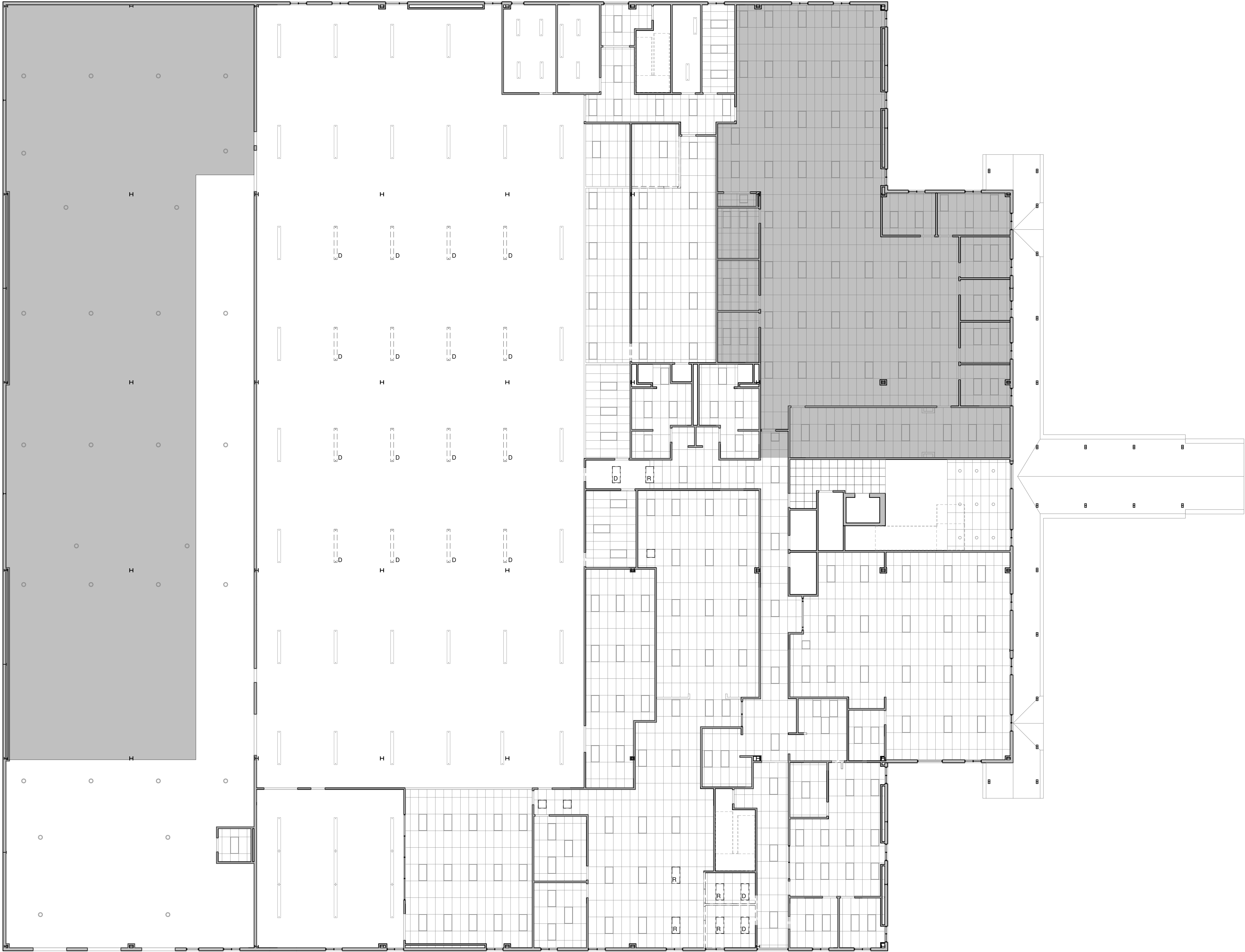
DEMOLITION PLAN

Sheet Number

D1.1

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1
D1.2
REFLECTED CEILING DEMOLITION PLAN -
PHASE ONE
SCALE: 3/32" = 1'-0"

GENERAL REFLECTED CEILING PLAN NOTES

A. INFORMATION SHOWN IN THIS SHEET WAS DERIVED FROM ORIGINAL CONSTRUCTION DOCUMENTS. NO FIELD VERIFICATION WAS PERFORMED AND ARCHITECT MAKES NO WARRANTY EXPRESSED NOR IMPLIED REGARDING THE ACCURACY OF EXISTING CONDITIONS INDICATED. GC SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY ARCHITECT IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCIES.

FIXTURE LEGEND

R = RELOCATED FIXTURE
D = DEMOLISHED FIXTURE

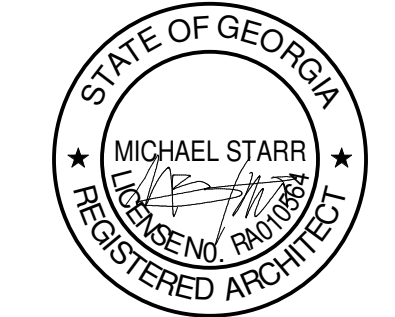
- 2' x 2' LIGHT FIXTURE
- 2' x 4' LIGHT FIXTURE
- LINEAR PENDANT
- SURFACE MOUNTED LED
- PENDANT

FINISH SYMBOLS LEGEND

- LAY-IN ACOUSTICAL CEILING
- GWB CEILING
- PAINTED EXPOSED STRUCTURE

2WR
ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762



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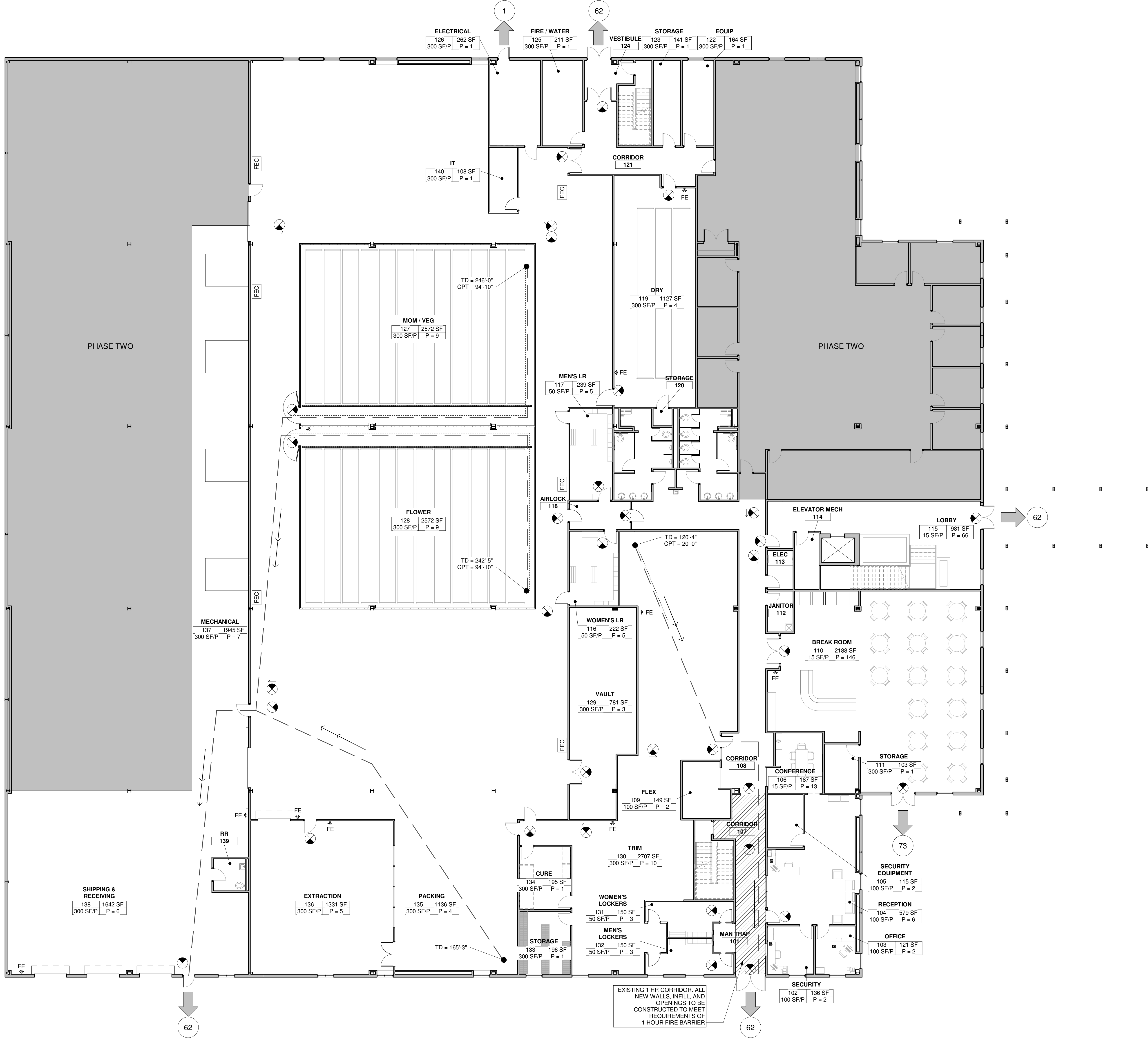
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Sheet Description

REFLECTED CEILING DEMOLITION PLAN - PHASE ONE

Sheet Number

D1.2



1 LIFE SAFETY PLAN - PHASE ONE
LS1.1 SCALE: 3/32" = 1'-0"

GENERAL CODE NOTES

1. OCCUPANT LOAD OF ALL ASSEMBLY SPACES IS CALCULATED PER TABLE 1004.1.2 (IBC).
2. ALL SPACES NOT PROVIDED WITH A SPATIAL USE TAG OR OCCUPANT LOAD ARE CONSIDERED INCIDENTAL USE AND ARE NOT CONSIDERED NORMALLY OCCUPIED SPACES.
3. ALL EXIT AND EXIT ACCESS DOORS PROVIDE 34" OF CLEAR EXIT WIDTH IF SINGLE LEAF AND 68" IF DOUBLE LEAF UNLESS OTHERWISE NOTED. AS SUCH, EGRESS CAPACITIES ARE 170 AND 340 OCCUPANTS RESPECTIVELY PER TABLE.

LIFE SAFETY SYMBOLS LEGEND

Room name 101	UNOCCUPIED SPACE TAG
ROOM NAME RM # AREA ## SF/P P = #	OCCUPIED SPACE TAG
OCCUPANT LOAD RATIO	OCCUPANT LOAD
→	EXIT PATH AND DIRECTION OF TRAVEL
→	EXIT DISCHARGE
54	NUMBER OF OCCUPANTS IN EXIT PATH
ILLUMINATED FACE DIRECTIONAL ARROW	EXIT LIGHT
FEC-#	FIRE EXTINGUISHER CABINET, SEE SPECS
FE	BRACKET MOUNTED FIRE EXTINGUISHER
PATH OF TRAVEL ORIGINATION	TRAVEL DISTANCE COMMON PATH OF TRAVEL
90'-4" TD 75'-10" CPT	
1 HR FIRE BARRIER	
EXIST. 1 HR CORRIDOR	

AREA INCREASE TABLE

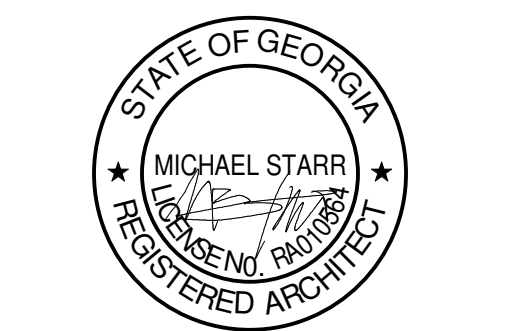
CONSTRUCTION TYPE	OCCUPANCY	ALLOWABLE BUILDING AREA (TABLE 503)	FRONTAGE INCREASE PER 506.2 2018 IBC
IIIB SPRINKLERED	F-1	34,000 SF PER FLOOR	If = (F/P - 0.25) W/30 If = (1 - 0.25) 1 If = .75
TOTAL EXISTING BUILDING AREA OF FIRST FLOOR:		51,545 SF	
NEW F-1 OCCUPANCY W/ ACCESSORY BUSINESS USE:		37,549 SF	
TOTAL ALLOWABLE AREA:		UNLIMITED PER 507.5	

CODES AND REGULATION DATA

ITEM	SUBJECT	IBC
1	RENOVATION OR ALTERATION:	RENOVATION
2	EQUIVALENCY CONCEPTS	NONE
3	OCCUPANCY CLASSIFICATION	F-1
4	BUILDING AREA	FIRST FLOOR 37,549 SF SECOND FLOOR NOT IN SCOPE TOTAL 37,549 SF
5	HIGH HAZARD AREA	NONE
6	NUMBER OF STORIES	2
7	HEIGHT OF BUILDING	26'-0"
8	MAX FLOOR AREA / FLOOR	UNLIMITED PER 507.5
9	OCCUPANT LOAD/MEANS OF EGRESS	322
10	NUMBER OF EXITS REQUIRED	2
11	DEAD END CORRIDORS	50'-0" MAXIMUM LENGTH
12	TRAVEL DISTANCE	250'-0"
13	COMMON PATH OF TRAVEL	100'-0"
14	FIRE RATING OF BUILDING	1 HOUR
15	FIRE RATING OF ELEVATOR SHAFTS	1 HOUR
16	FIRE RATING OF EXIT ACCESS CORRIDORS	1 HOUR
17	APPLICABLE CODES	MA, STATE BLDG CODE, 9TH ED MECH. CODE 2015 OF MA. 527 CMR 1.00-MA FIRE SAFETY CODE ENERGY CONSERVATION CODE 2015 OF MA. 521 CMR ADA STANDARDS IBC 2015 IMC 2015 NFPA 1 2015 IECC 2015 2006 ED. 2010
18	AREAS OF REFUGE	INTERNATIONAL FIRE CODE 2015 EDITION
19	PHASE 1 AREA	FIRST FLOOR TOTAL 51,545 SF FIRST FLOOR PHASE 1 37,549 SF SECOND FLOOR NOT IN SCOPE TOTAL PHASE 1 37,549 SF

NOTE: PER 1016.2 EGRESS THROUGH INTERVENING SPACES IS ALLOWED IN F OCCUPANCY IF EGRESS REQUIREMENTS ARE MET.

2WR PARTNERS
ARCHITECTURE | INTERIORS
7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762



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Drawn By: MTZ
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Revisions:

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Sheet Description

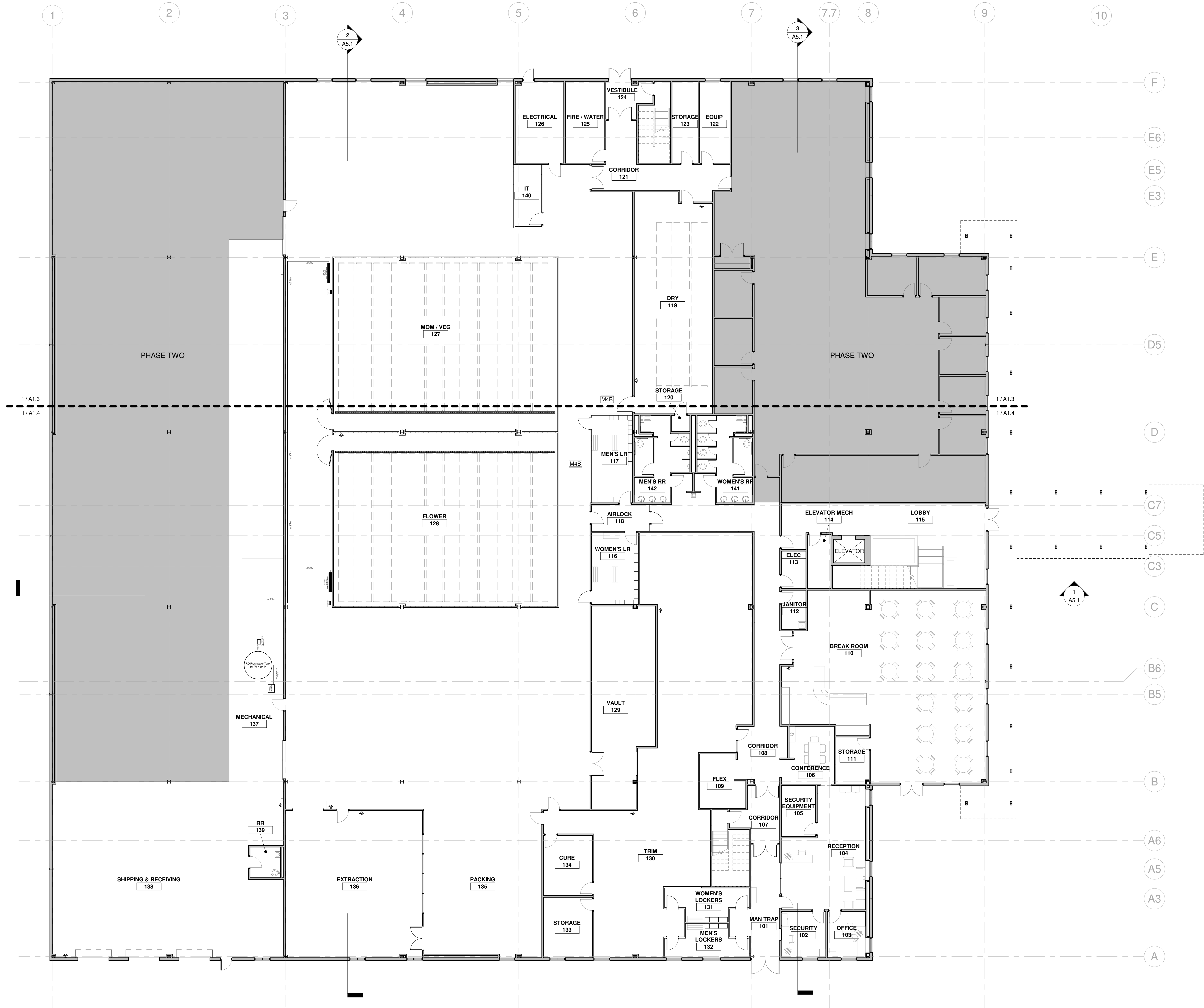
LIFE SAFETY PLAN - PHASE ONE

Sheet Number

LS1.1

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Sheet Description

OVERALL FIRST FLOOR PLAN - PHASE ONE

Sheet Number

A1.1

FLOOR PLAN LEGEND

NOTE:
1. SEE WALL TYPES FOR DETAILED DESIGNATIONS.
2. SEE LIFE SAFETY PLAN FOR FIRE SEPARATIONS.

EXISTING

NEW STUD PARTITION

NEW INSULATED METAL PANEL PARTITION

GENERAL CONSTRUCTION & FINISH NOTES

A. DIMENSIONS TO NEW CONSTRUCTION ARE MEASURED FROM FACE OF STUD, FACE OF MASONRY, OR FACE OF EXISTING CONSTRUCTION, TYP (UNO).

B. PROVIDE GWB CONTROL JOINT WHERE NEW AND EXISTING GWB WALLS ABUT.

C. REFER TO SHEET T1.2 FOR WALL TYPES AND SECTIONS.

D. REFER TO SHEET LS1.1 FOR LOCATIONS OF FIRE AND SMOKE WALLS AND COMPARTMENTATION DESIGNATIONS AND FOR CONSTRUCTION INFORMATION RELATED TO SMOKE WALLS.

E. REFER TO SHEET A9.1 FOR REFLECTED CEILING PLANS AND TYPICAL CEILING NOTES.

F. REFER TO SHEET A11.2 FOR FURNITURE, FIXTURES, AND EQUIPMENT. PROVIDE SOLID WALL BACKING AT ALL EQUIPMENT LOCATIONS.

G. APPLY STAIN TO CONCRETE FLOORS IN ALL AREAS WITHIN THE SCOPE OF PHASE ONE, SEE SPECIFICATIONS.

H. PAINT ALL NEW WALLS TO MATCH EXISTING FINISH AND COLOR OF ADJACENT WALLS.

I. PAINT ALL NEW HOLLOW METAL DOORS AND TRIM TO MATCH EXISTING. ALL NEW SOLID CORE WOOD DOOR FINISHES TO MATCH EXISTING.

KEYED CONSTRUCTION NOTES

TAG	KEYNOTE
1	TRENCH DRAIN, SEE PLUMBING DRAWINGS.
2	AIR HANDLING UNIT, SEE MECHANICAL DRAWINGS.
3	BENCHING BY OTHERS, SEE FF&E PLAN.
4	ALIGN

2WR

ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762



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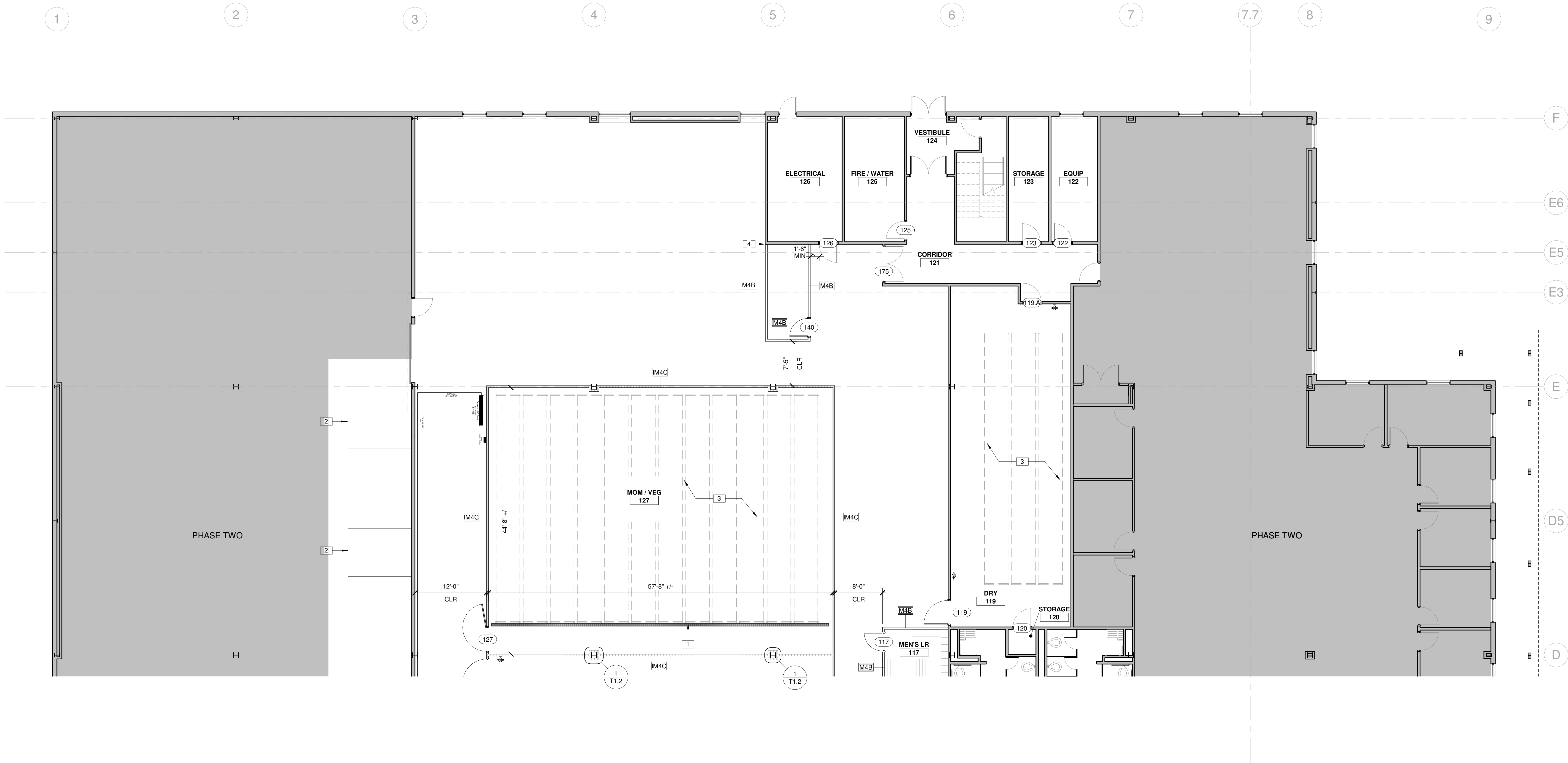
FLOOR PLAN NORTH - PHASE ONE

Sheet Number

A1.3

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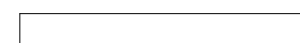



1 FLOOR PLAN NORTH - PHASE ONE
A1.3 SCALE: 1/8" = 1'-0"



FLOOR PLAN LEGEND

NOTE:
1. SEE WALL TYPES FOR DETAILED DESIGNATIONS.
2. SEE LIFE SAFETY PLAN FOR FIRE SEPARATIONS.

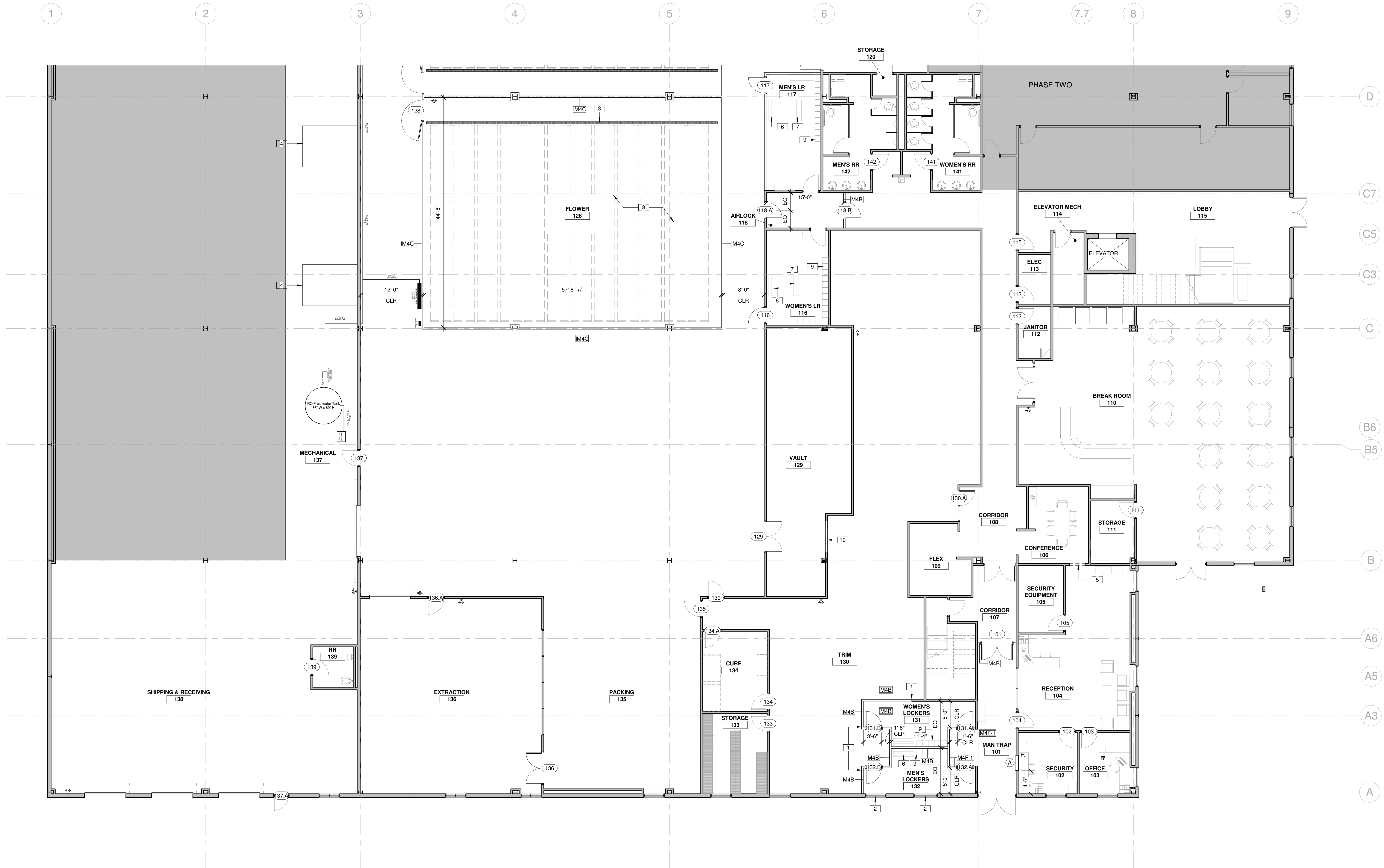
	EXISTING
	NEW STUD PARTITION
	NEW INSULATED METAL PANEL PARTITION

GENERAL CONSTRUCTION & FINISH NOTES

- A. DIMENSIONS TO NEW CONSTRUCTION ARE MEASURED FROM FACE OF STUD, FACE OF MASONRY, OR FACE OF EXISTING CONSTRUCTION, TYP (UNO).
- B. PROVIDE GWB CONTROL JOINT WHERE NEW AND EXISTING GWB WALLS ABUT.
- C. REFER TO SHEET T1.2 FOR WALL TYPES AND SECTIONS.
- D. REFER TO SHEET LS1.1 FOR LOCATIONS OF FIRE AND SMOKE WALLS AND COMPARTMENTATION DESIGNATIONS AND FOR CONSTRUCTION INFORMATION RELATED TO SMOKE WALLS.
- E. REFER TO SHEET A9.1 FOR REFLECTED CEILING PLANS AND TYPICAL CEILING NOTES.
- F. REFER TO SHEET A11.2 FOR FURNITURE, FIXTURES, AND EQUIPMENT. PROVIDE SOLID WALL BACKING AT ALL EQUIPMENT LOCATIONS.
- G. APPLY STAIN TO CONCRETE FLOORS IN ALL AREAS WITHIN THE SCOPE OF PHASE ONE, SEE SPECIFICATIONS.
- H. PAINT ALL NEW WALLS TO MATCH EXISTING FINISH AND COLOR OF ADJACENT WALLS.
- I. PAINT ALL NEW HOLLOW METAL DOORS AND TRIM TO MATCH EXISTING. ALL NEW SOLID CORE WOOD DOOR FINISHES TO MATCH EXISTING.

KEYED CONSTRUCTION NOTES ⁽⁰⁰⁾

TAG	KEYNOTE
1	ALIGN
2	PAINT INTERIOR SURFACE OF WINDOWS BLACK; PROVIDE MULTIPLE COATS AS NECESSARY TO OBTAIN OPAQUE CONDITION.
3	TRENCH DRAIN; SEE PLUMBING DRAWINGS.
4	AIR HANDLING UNIT; SEE MECHANICAL DRAWINGS.
5	NEW 3'-0" X 7'-0" OPENING. PAINT TO MATCH ADJACENT SURFACES.
6	ACCESSIBLE BENCH.
7	STANDARD HEIGHT BENCH.
8	BENCHING BY OTHERS; SEE FF&E PLAN.
9	REINSTALL SALVAGED LOCKERS.
10	REMOVE AND DISPOSE OF TRANSACTION WINDOW. INFILL INTERIOR WALL, TYP.



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ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
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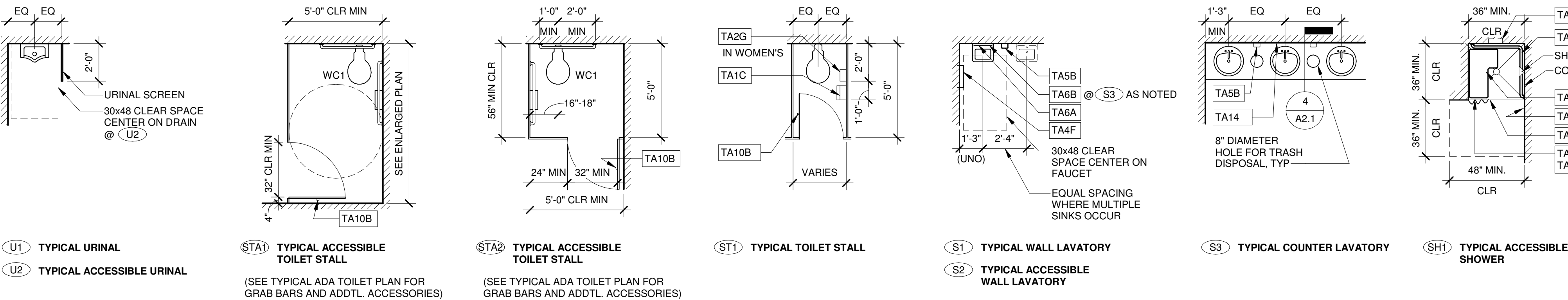
FLOOR PLAN
SOUTH-
PHASE ONE

Sheet Number

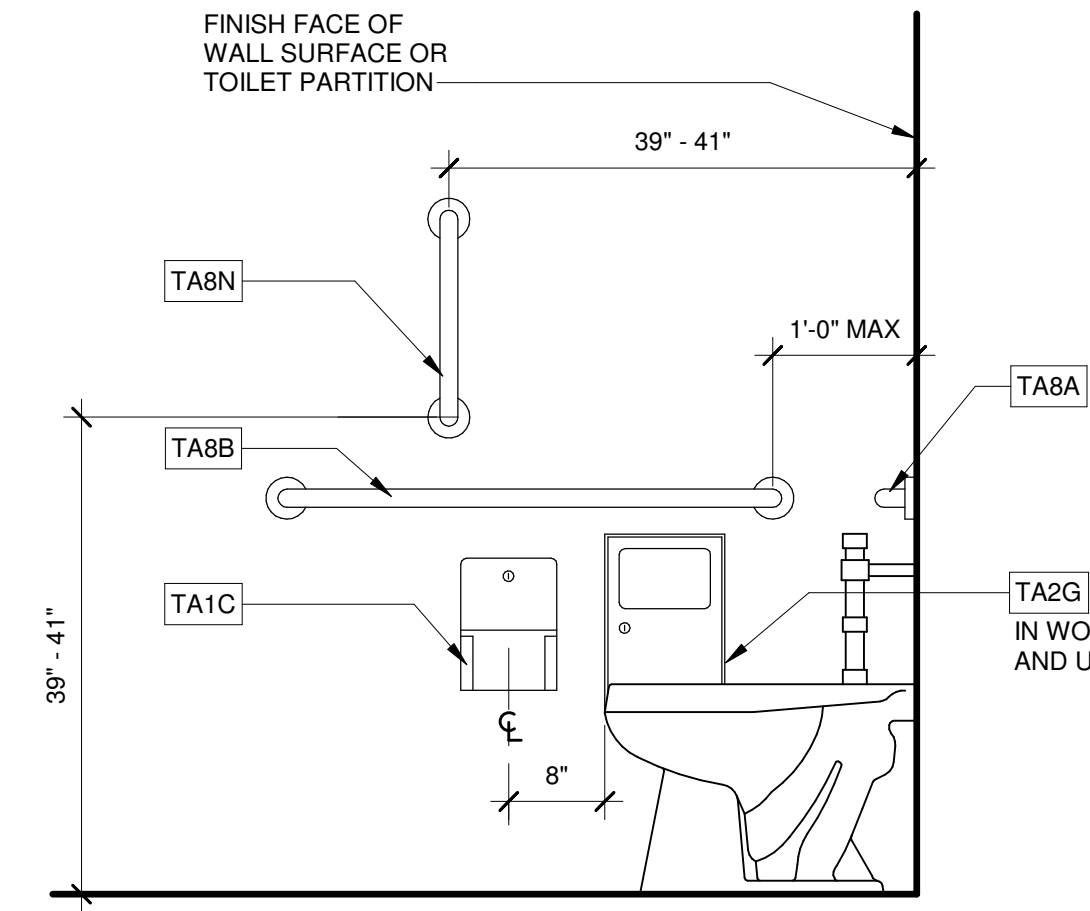
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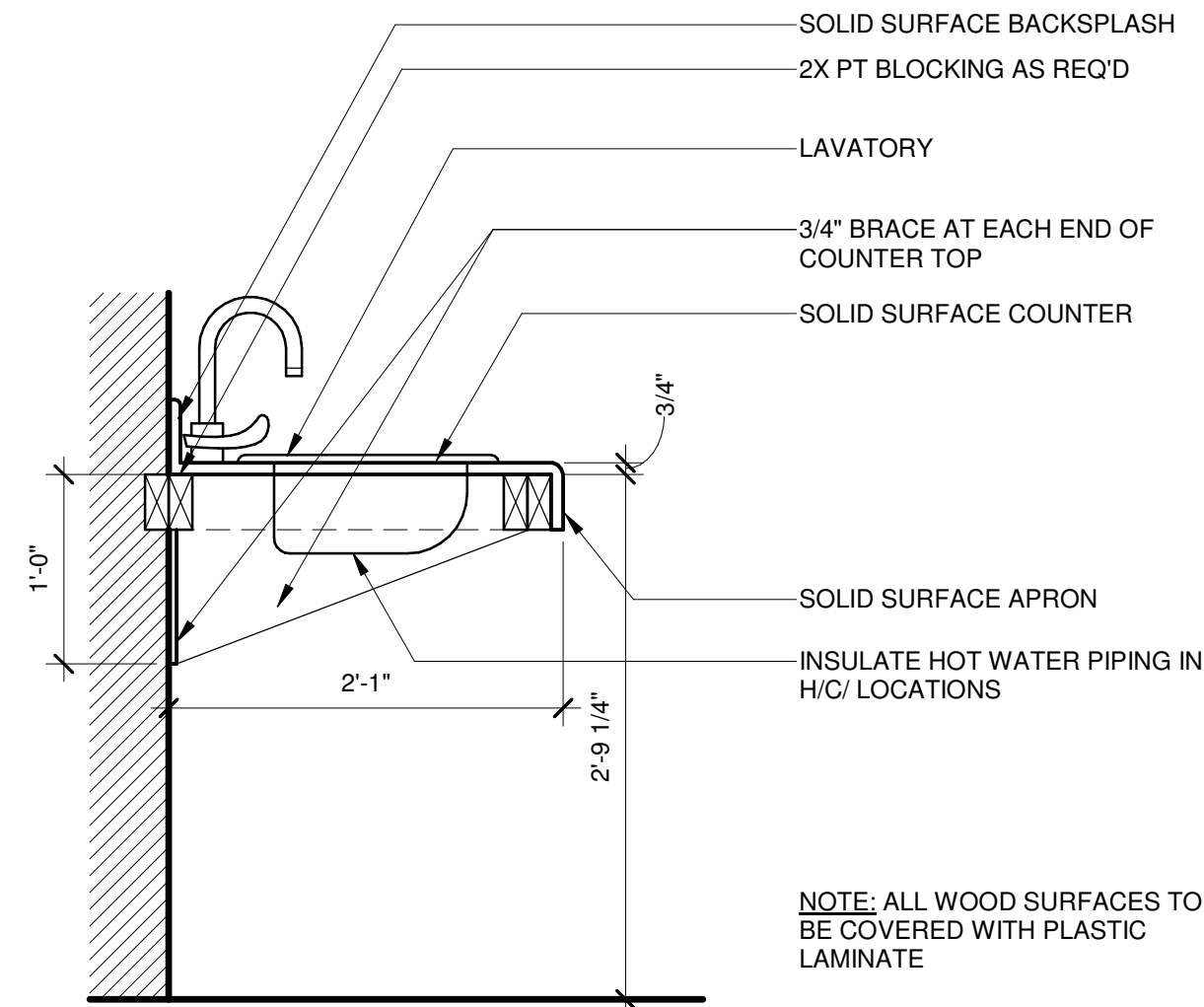
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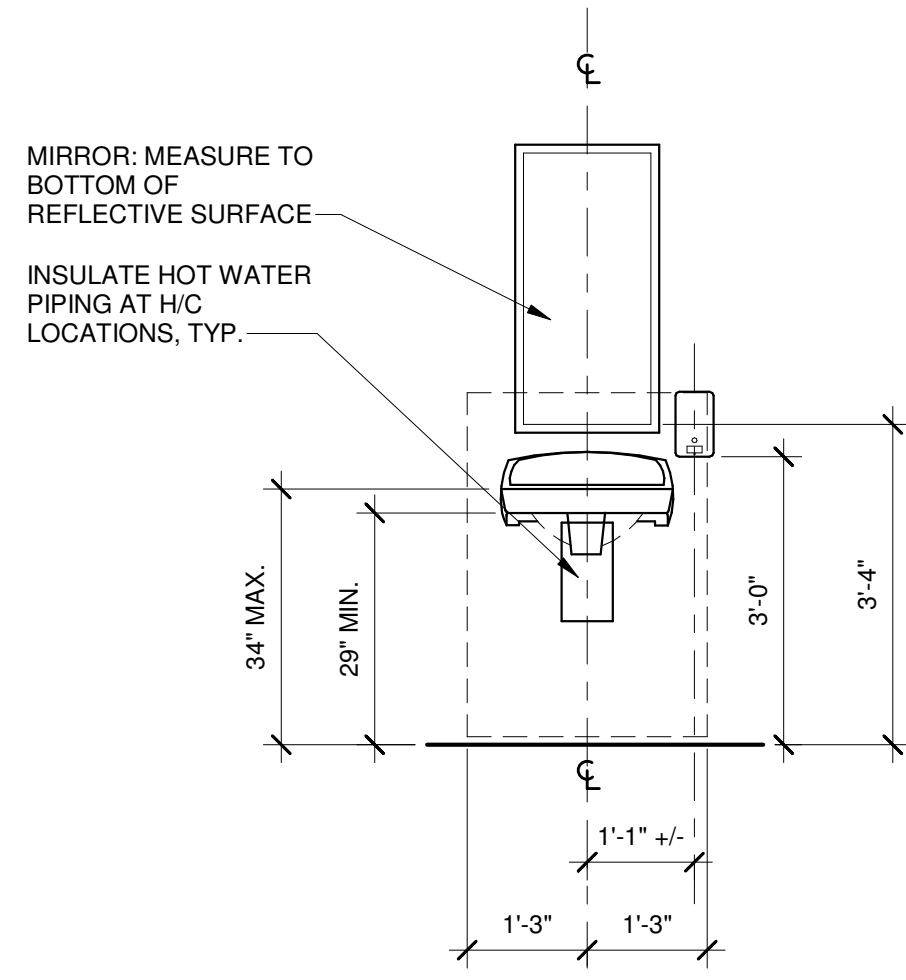
1 BATHROOM TOILET LAYOUTS
A2.1 SCALE: 1/4" = 1'-0"



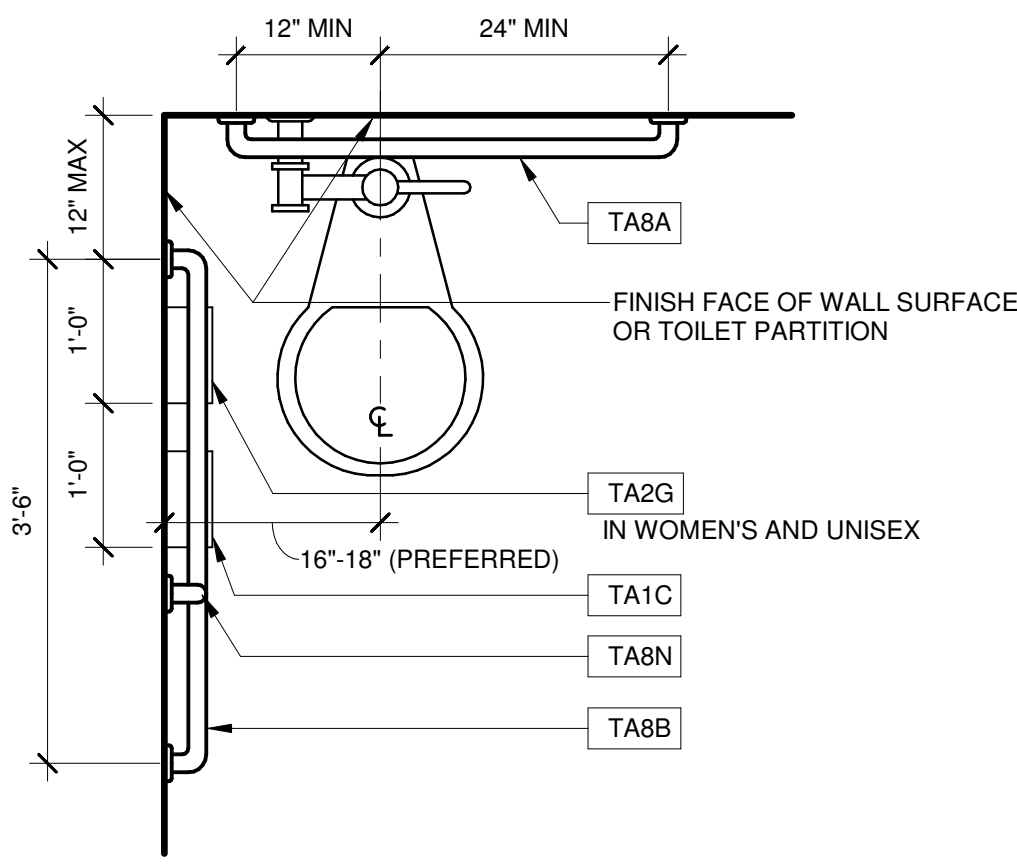
3 ADA TOILET ELEVATION TYP.
A2.1 SCALE: 3/4" = 1'-0"



4 BATHROOM COUNTER TOP W/ SINK
A2.1 SCALE: 1" = 1'-0"



5 TYPICAL LAVATORY ELEVATION
A2.1 SCALE: 1/2" = 1'-0"



2 TYPICAL ADA TOILET PLAN
A2.1 SCALE: 3/4" = 1'-0"

GENERAL NOTES

- COORDINATE WALL FINISHES (TILE, ETC) WITH ALL WALL MOUNTED ACCESSORIES PRIOR TO FINISH INSTALLATION. WHERE ACCESSORIES ARE MOUNTED OVER A FINISH TRANSITION WITH A VARIATION IN THICKNESS, ADJUST ACCORDING TO THE FOLLOWING:
OPTION 1 - OMIT FINISH BEHIND ACCESSORY. INSTALL FINISH FLUSH TO EDGES OF ACCESSORY AND PROVIDE WORKMANLIKE EDGES AND TRANSITIONS.
OPTION 2 - PROVIDE PLYWOOD SHIM BEHIND ACCESSORY TO FLUSH WITH FINISH MATERIAL. SIZE TO BE 1/2" INSET ON ALL SIDES OF ACCESSORY AND PAINT TO MATCH WALL COLOR.
- VERIFY ALL TOILET ACCESSORIES WITH OWNER PRIOR TO ORDER AND INSTALLATION. ITEMS MAY NEED TO BE COORDINATED WITH CAMPUS OR CUSTODIAL SERVICE STANDARDS THAT ARE CURRENT AT THE DATE OF INSTALL.
- SHOULD ANY DISCREPANCY BE FOUND BETWEEN ITEMS NOTED IN THE CONTRACT DOCUMENTS AND THE APPLICABLE CODES, THE CONTRACTOR SHALL BRING ITEMS TO THE ATTENTION OF THE ARCHITECT PRIOR TO ORDERING, FABRICATING OR INSTALLING.
- IF A CONFLICT BETWEEN ANY TOILET ACCESSORIES OCCURS, NOTIFY ARCHITECT FOR DIRECTION PRIOR TO INSTALLATION.
- INSULATE ALL EXPOSED HOT WATER PIPING AT HANDICAP LOCATIONS.
- MIRRORS SHALL BE CENTERED OVER SINKS, TYP.
- PROVIDE DEAD WOOD BLOCKING BEHIND ALL WALL MOUNTED SHELF LOCATIONS, ACCESSORIES, AND GRAB BAR CONNECTIONS.
- ALL DOORS TO HANDICAP ACCESSIBLE TOILET STALLS OR ROOMS SHALL BE OUTWARD SWINGING AND SELF CLOSING, UNO.
- ARRANGE ALL BATHROOM ACCESSORIES TO PROVIDE GOOD WORKING CLEARANCES FOR ACCESS TO LOCKS AND FULLY OPEN REFILL POSITIONS.

RE: TOILET ELEVATIONS

- TYPICAL ELEVATIONS SHOW LOCATION AND MOUNTING HEIGHTS OF TOILET FIXTURES AND ACCESSORIES.
- DIMENSIONS LOCATING TOILET ACCESSORIES, INCLUDING TOILET PARTITIONS AND URINAL SCREENS, ARE TYPICAL, UNO.
- WHERE SPECIFIED, TILE SHALL BE CENTERED ON WALL, UNO.

RE: TOILET PLANS

- ENLARGED TOILET PLANS SHOW LOCATION OF TOILET FIXTURES, ACCESSORIES, AND NOTES. DETAILS INDICATE ACCESSORIES WHICH ARE TO BE PROVIDED AT EACH FIXTURE / STALL. SEE 1/8" FLOOR PLANS FOR ALL INFORMATION REGARDING WALL TYPES, CONSTRUCTION NOTES AND ROOM FINISHES. DIMENSIONS LOCATING TOILET ACCESSORIES AND SCREENS ARE TYPICAL, UNO.
- SET ALL FLOOR DRAINS IN NEW SLABS AT -0'-1" AND SLOPE FLOOR TO DRAIN. COORD WITH STRUCTURAL AND PLUMBING.
- ALL DIMENSIONS SHOWN ON THIS SHEET ARE TO FINISH FACE, UNO.

TOILET ACCESSORY SCHEDULE

ITEMS REPRESENT BASIS OF DESIGN ONLY. VERIFY WITH OWNER ON ALL ITEMS TO BE PROVIDED AND COORDINATE WITH ANY ADDITIONAL OWNER FURNISHED ITEMS.

MARK	ITEM DESCRIPTION	HANDICAP ACCESSIBLE MOUNTING HEIGHTS
TA1A	RECESSED MULTI-ROLL TOILET TISSUE DISPENSER (B-4388)	19" TO CENTER
TA1C	SURFACE MTD. TOILET TISSUE DISPENSER (B-4288)	19" TO CENTER
TA2E	RECESSED SANITARY NAPKIN DISPOSAL (B-353)	28" TO TOP OF UNIT
TA2G	SINGLE SURFACE MOUNTED SANITARY NAPKIN RECEPTACLE (B-254)	28" TO TOP OF UNIT
TA4C	RECESSED PAPER TOWEL DISPENSER (B-359)	40" TO PAPER
TA4F	SURFACE MOUNTED PAPER TOWEL DISPENSER (B-262)	40" TO PAPER
TA5B	SURFACE MOUNTED SOAP DISPENSER (B-4112)	36" TO BOTTOM OF UNIT
TA6A	FIXED MIRROR - 18" x 36" (B-290)	40" TO BOTTOM OF UNIT
TA6B	TILT H/C MIRROR - 18" x 36" (B-293)	40" TO BOTTOM OF UNIT
TA6A	36" GRAB BAR (B-6806)	33" TO CENTER
TA8B	42" GRAB BAR (B-6806)	33" TO CENTER
TA8F	CORNER GRAB BAR (B-6861)	33" TO CENTER
TA8N	18" GRAB BAR (B-6806)	39" TO CENTER
TA9B	SURFACE MOUNTED ROB HOOK (B-76717)	55" AFF
TA9F	HEAVY DUTY STAINLESS STEEL TOWEL BAR (B-205)	
TA9J	RECESSED VANDAL RESISTANT SOAP DISH	43" TO TOP OF UNIT
TA9M	SHOWER CURTAIN ROD	
TA9N	VINYL SHOWER CURTAIN (204-2)	
TA9R	STAINLESS STEEL SHOWER CURTAIN HOOK (204-1)	
TA9S	FOLDING SHOWER SEAT	18 1/2" TO TOP OF SEAT
TA10B	COAT HOOK / WALL BUMPER (B-212)	55" AFF
TA11A	STAINLESS STEEL MOP AND BROOM HOLDER (B-223)	
TA11B	MOP AND BROOM HOLDER (B-224X36)	60" AFF
TA14	40" HIGH MIRROR FULL WIDTH OF COUNTER	35" TO BOTTOM
TA15	12"W x 36"H LOCKERS (TWO TIER)	



7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
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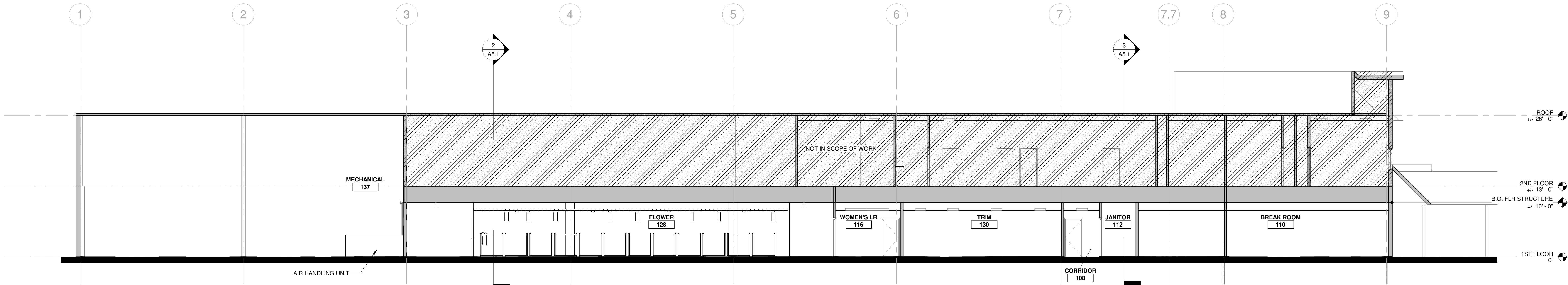
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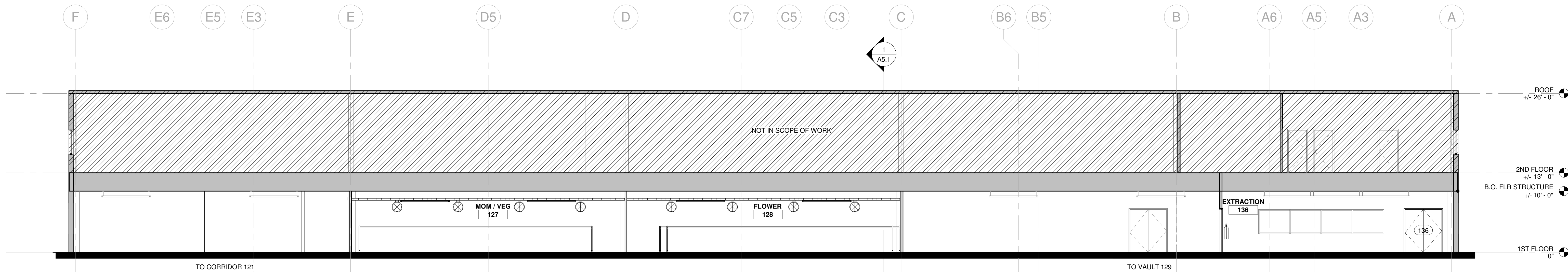
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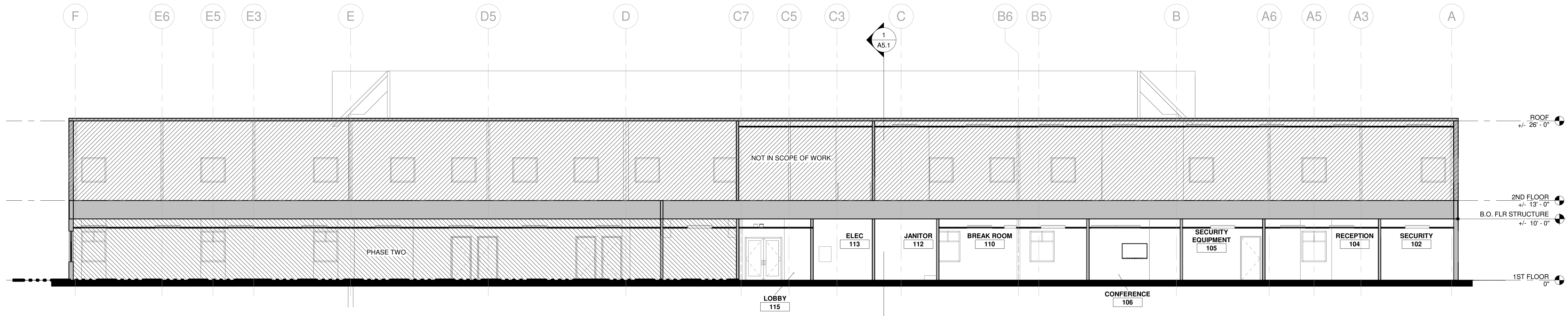
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1
A5.1
EAST-WEST BUILDING SECTION - PHASE ONE
SCALE: 1/8" = 1'-0"



2
A5.1
NORTH-SOUTH BUILDING SECTION I - PHASE ONE
SCALE: 1/8" = 1'-0"



3
A5.1
NORTH-SOUTH BUILDING SECTION II - PHASE ONE
SCALE: 1/8" = 1'-0"

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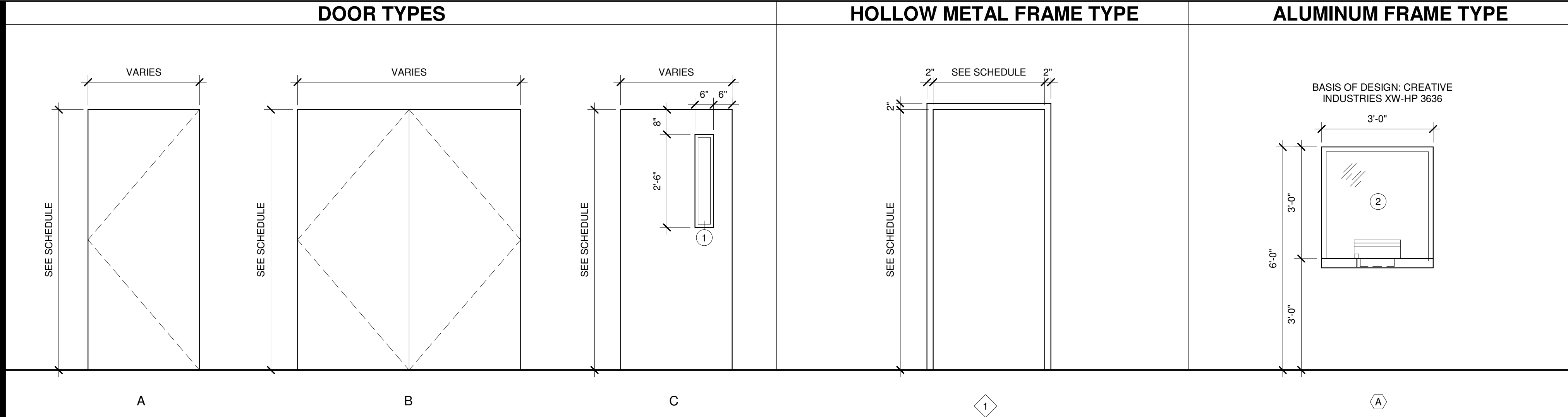
BUILDING SECTIONS - PHASE ONE

Sheet Number

A5.1

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DOOR AND FRAME SCHEDULE												
DOOR NO.	DOOR TYPE	DOOR			DETAIL		FIRE RATING (MINUTES)	DETAIL		REMARKS		
		MAT'L	WIDTH	HEIGHT	THK	FRAME TYPE		MAT'L	HAED		JAMB	
EXISTING												
115	EXIST	EXIST	3'-0"	7'-0"	1 3/4"	EXIST	EXIST	EXIST	EXIST	EXIST	B	
PHASE ONE												
101	B	HM	6'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1	C	
116	A	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1		
117	A	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1		
118	A	C	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1	C
118.B	C	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1	C	
119	A	FG	4'-0"	7'-0"	1 3/4"	1	FG	-	2/A8.2	2/A8.2	A, B	
127	A	FG	4'-0"	7'-0"	1 3/4"	1	FG	-	2/A8.2	2/A8.2	A, B	
128	A	FG	4'-0"	7'-0"	1 3/4"	1	FG	-	2/A8.2	2/A8.2	A, B	
131.A	A	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	3/4 HR	1/A8.1	1/A8.1	B	
131.B	A	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1		
132.A	A	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	3/4 HR	1/A8.1	1/A8.1	B	
132.B	A	SCWD	3'-0"	7'-0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1		
140	A	HM	3'-0"	7'-0"	1 3/4"	1	H	-	1/A8.1	1/A8.1	B	

- GENERAL DOOR NOTES**
- EXISTING DOORS TO REMAIN AS IS ARE NOT LISTED IN THE SCHEDULE.
 - ALL EXISTING FRAMES TO REMAIN SHALL BE FILLED, PATCHED AND REPAIRED TO LIKE NEW CONDITION.
 - ALL THRESHOLDS SHALL CONFORM TO HANDICAP ACCESS REQUIREMENTS.
 - PROVIDE UNDERCUTS PER MECHANICAL DRAWINGS.
 - PRIOR TO SUBMITTING DOOR AND FRAME SHOP DRAWINGS, CONTRACTOR SHALL VERIFY DIMENSIONS, CONDITIONS, AND HARDWARE AT EACH EXISTING DOOR OR FRAME TO REMAIN AND UTILIZE THIS INFORMATION TO PREPARE SHOP DRAWINGS.

- REMARKS**
- A. PROVIDE SOUND GASKETING.
- B. PREP FOR INSTALLATION OF CARD READER/DOOR CONTACT
- C. PANIC HARDWARE

- GLAZING LEGEND**
- 1 1/4" CLEAR, TEMPERED
- 2 1 1/16" PILKINGTON PYROSTOP BR UL 752 LEVEL 1, 60 MINUTE FIRE-RATED, CLEAR

- GENERAL WINDOW NOTES**
- TEMPERED GLAZING SHALL BE PROVIDED IN ALL LOCATIONS WHERE WINDOWS OR GLAZING ARE LOCATED WITHIN 4'-0" OF INTERIOR OR EXTERIOR DOORS AND BELOW DOOR HEAD HEIGHT.
 - SEE WINDOW ELEVATIONS FOR GLAZING TYPES.
 - SECTIONS THROUGH WINDOW MEMBERS ARE SHOWN SCHEMATICALLY - ACTUAL CONFIGURATIONS MAY VARY PER APPROVED MFRS.
 - ROUGH OPENINGS ARE SHOWN ON WINDOW ELEVATIONS. ACTUAL WINDOW UNITS SHOULD BE CONSTRUCTED TO MEET TOLERANCES NECESSARY FOR PROPER HORIZONTAL AND VERTICAL ALIGNMENT OF SYSTEMS AND CONFORMANCE WITH DETAILS AND SPECIFICATIONS OF THE CONSTRUCTION DOCUMENTS.
 - FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATIONS.
 - WINDOW MFR SHALL BE RESPONSIBLE FOR PROVIDING ANY ADDITIONAL MULLION REINFORCEMENT NECESSARY TO MEET ALL SPECIFIED LOADING CRITERIA.
 - ALL NEW FIRE PROTECTION-RATED GLAZING SHALL BE PERMANENTLY MARKED IN ACCORDANCE WITH NFPA 101: 8.3.3.12

- HARDWARE GENERAL NOTES**
- SEE SPECIFICATION FOR HARDWARE SETS.
 - OPERABLE PARTS OF DOOR HARDWARE SHALL BE 34 INCHES MIN AND 44 INCHES MAX FROM FINISH FLOOR OR GROUND, EXCLUDING OVERHEAD DOORS AND EXISTING DOORS WHERE LOCKS ARE ACTIVATED ONLY AT THE TOP OR BOTTOM RAILS.
 - ALL SPECIAL LOCKING ARRANGEMENTS WITH ELECTRONICALLY LOCKED DOORS IN THE MEANS OF EGRESS SHALL RELEASE LOCK IN THE EVENT OF A POWER FAILURE, SPRINKLER ACTIVATION OR ALARM ACTIVATION. DOORS SHALL COMPLY WITH IBC SEC 1010.1.9.8, SEC. 1010.1.9.9 & 1010.1.9.10.

2W PARTNERS

ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

STATE OF GEORGIA
MICHAEL STARR
REGISTERED ARCHITECT

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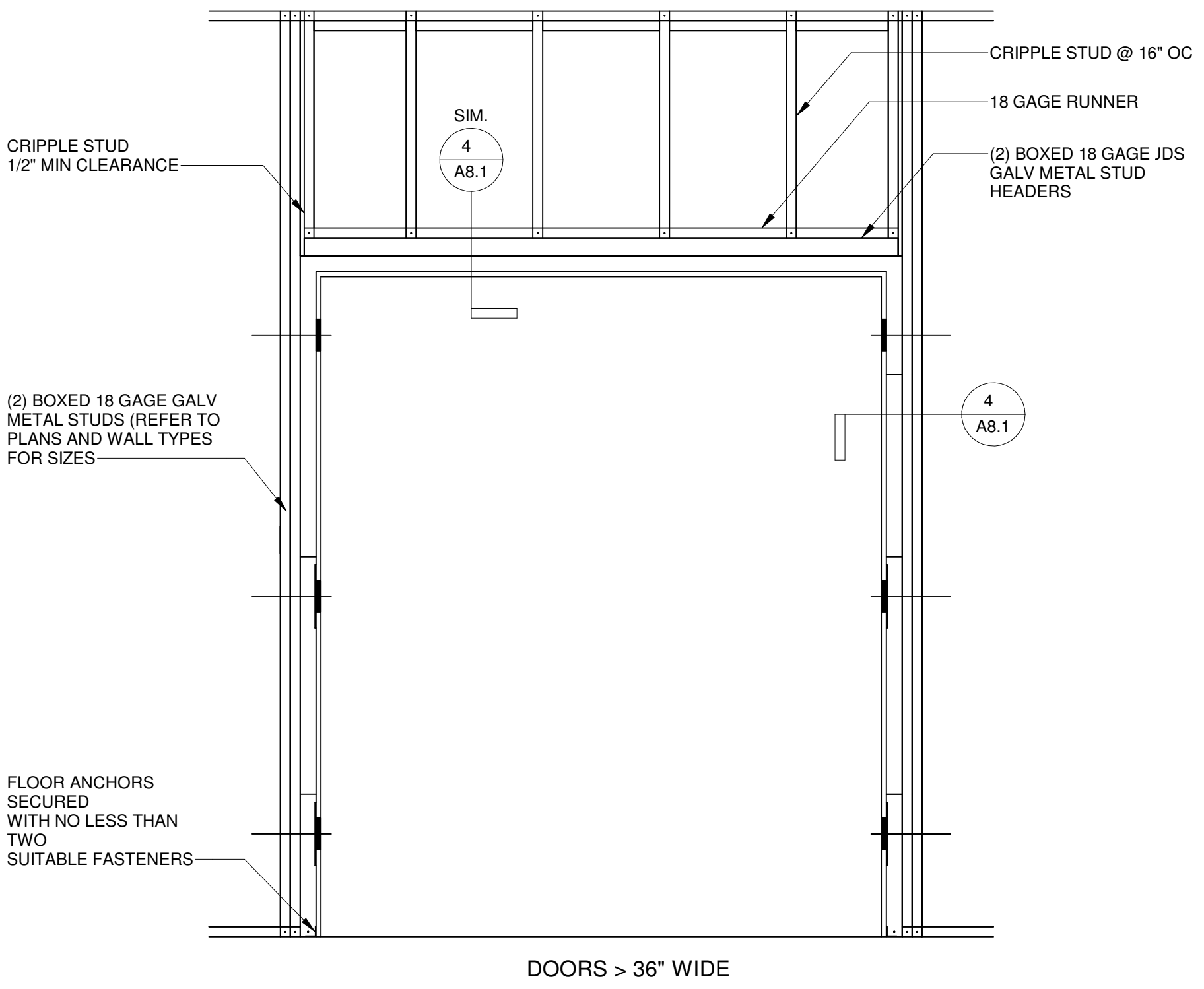
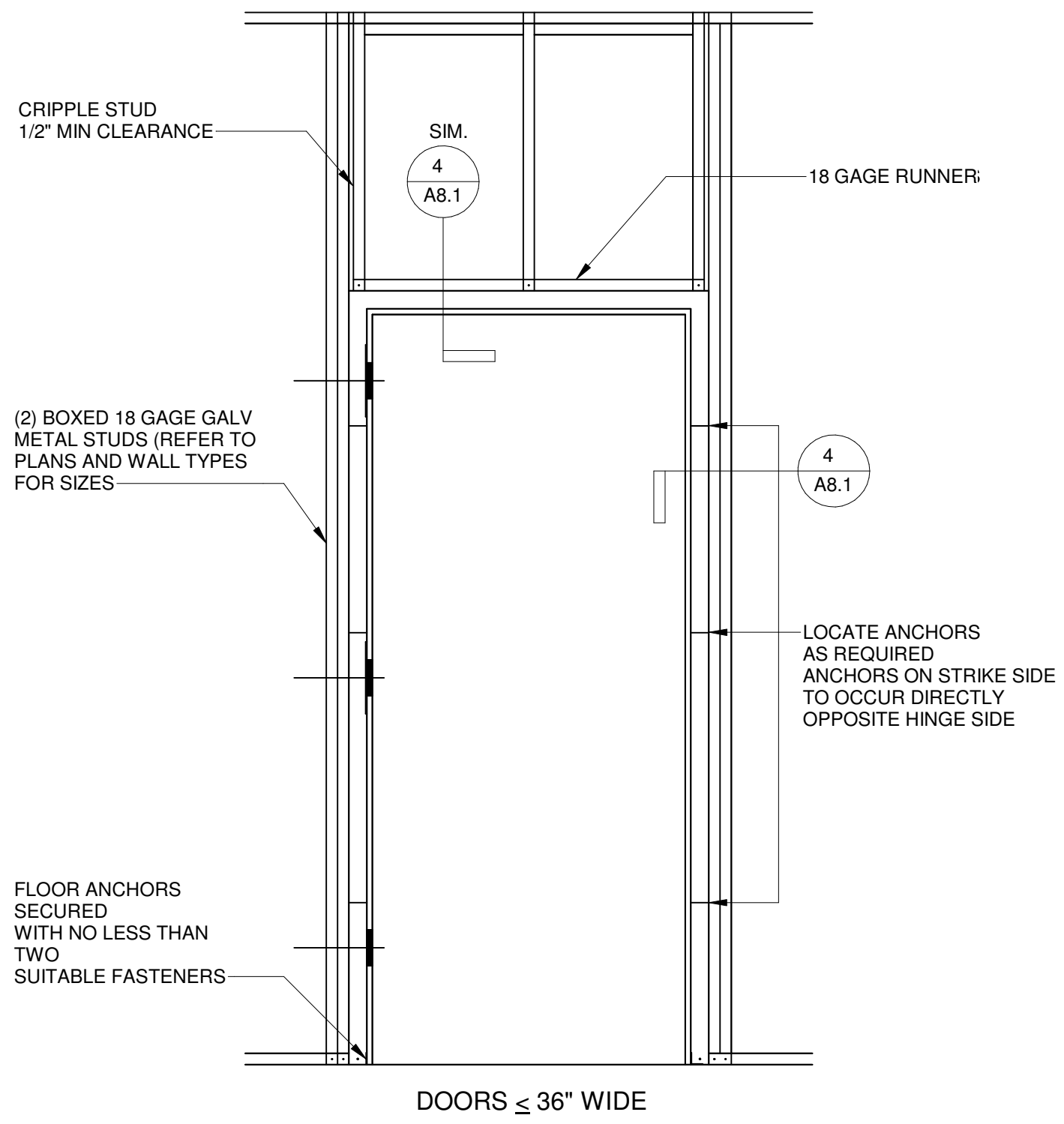
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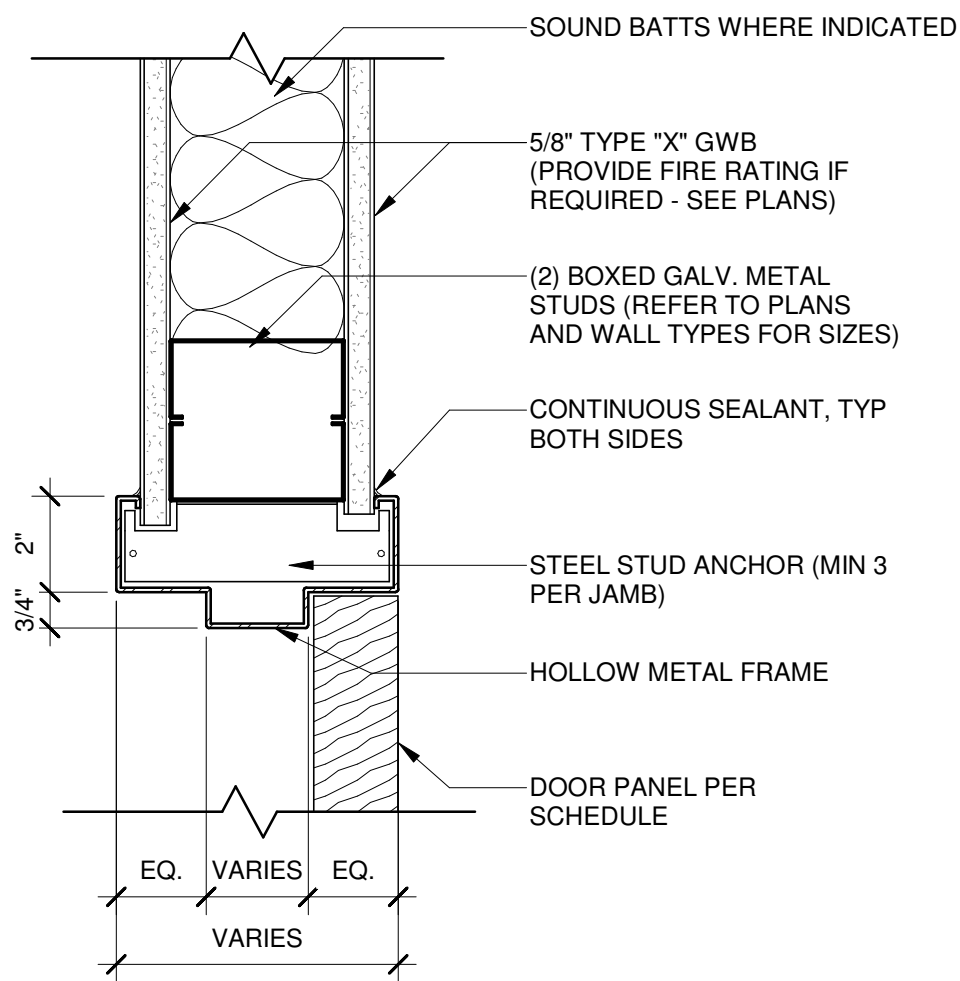
DOOR SCHEDULE & WINDOW SCHEDULES & DETAILS

Sheet Number

A8.1



1 DOOR FRAME DETAILS
SCALE: 3/4" = 1'-0"



2 HM DOOR JAMB DETAIL (HEAD SIM.)
SCALE: 3" = 1'-0"

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- GENERAL REFLECTED CEILING PLAN NOTES**
- A. DUE TO TIGHT HEIGHT CLEARANCES ABOVE CEILINGS AND EXPOSED SYSTEMS, ALL INSTALLATION BY SUBS TO BE COORDINATED WITH OTHER TRADES PRIOR TO BEGINNING WORK.
 - B. REFER TO ENGINEERING AND CULTIVATION DRAWINGS FOR LIGHTING IN FLOWER ROOMS.
 - C. ENGINEERING DRAWINGS TAKE PRECEDENCE FOR PARTICULAR FIXTURE TYPES. ARCHITECTURAL REFLECTED CEILING PLANS ARE FOR COORDINATION OF AESTHETIC ARRANGEMENTS.
 - D. ENGINEERING DRAWINGS TAKE PRECEDENCE FOR SIZES OF DUCTWORK. ARCHITECTURAL REFLECTED CEILING PLANS ARE FOR COORDINATION OF AESTHETIC ARRANGEMENTS.
 - E. CEILING HEIGHTS INDICATED ARE FROM TOP OF FINISH FLOOR TO UNDERSIDE OF FINISHED CEILING.
 - F. NEW GYP CEILINGS TO BE PAINTED: SHERWIN WILLIAMS EXTRA WHITE 7006 FLAT FINISH .
 - G. ALL EXPOSED ELECTRICAL CONDUIT TO BE PAINTED TO MATCH ADJACENT SURFACES.
 - H. REFER TO SPECS FOR GWB TYPE DESIGNATIONS.
 - I. CENTER FIXTURE WHEN NO DIMENSIONS ARE PROVIDED.
 - J. EXISTING CEILINGS AND LIGHT FIXTURES TO REMAIN UNLESS OTHERWISE NOTED.

FIXTURE LEGEND

- N = NEW FIXTURE
R = RELOCATED FIXTURE
- 2' x 2' LIGHT FIXTURE
 - 2' x 4' LIGHT FIXTURE
 - LINEAR PENDANT
 - SURFACE MOUNTED LED
 - PENDANT
 - CEILING FAN, SEE FF&E PLAN

FINISH SYMBOLS LEGEND

- LAY-IN ACOUSTICAL CEILING
- GWB CEILING
- PAINTED EXPOSED STRUCTURE
- INSULATED METAL PANEL CEILING

KEYED REFLECTED CEILING PLAN NOTES

00 KEYNOTE TAG

TAG	KEYNOTE
1	PATCH AND REPAIR CEILING TILES AS REQUIRED.
2	CULTIVATION LIGHTING IN THIS ROOM. SEE CULTIVATION DRAWINGS.

CEILING SCHEDULE

CEILING HEIGHT 10'-0" ACT-1 CLG TYPE

TAG	MANUFACTURER	DESCRIPTION
ACT-1	MATCH EXIST.	2X4 ACOUSTICAL CEILING TILE. MATCH EXISTING. VERIFY CEILING HEIGHT IN FIELD.
GYP	-	GYP CEILING, SEE SPECIFICATIONS.
IMP	-	INSULATED METAL PANEL CEILING, SEE SPECIFICATIONS.



7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762



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Sheet Description

REFLECTED CEILING PLAN - PHASE ONE

Sheet Number

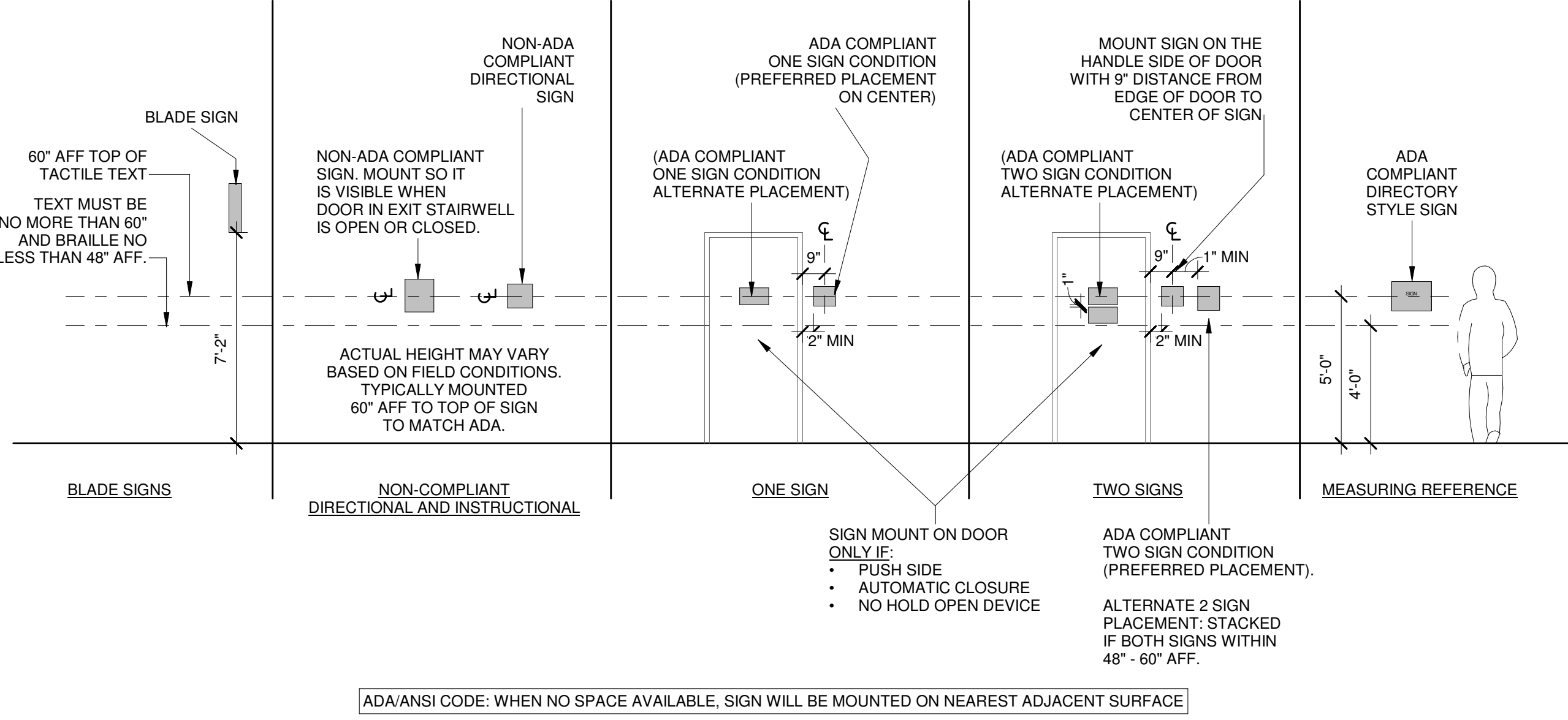
A9.1



SIGNAGE MUST COMPLY WITH 521 CMR. REFER TO 521 CMR 41.00 FOR MORE INFORMATION.

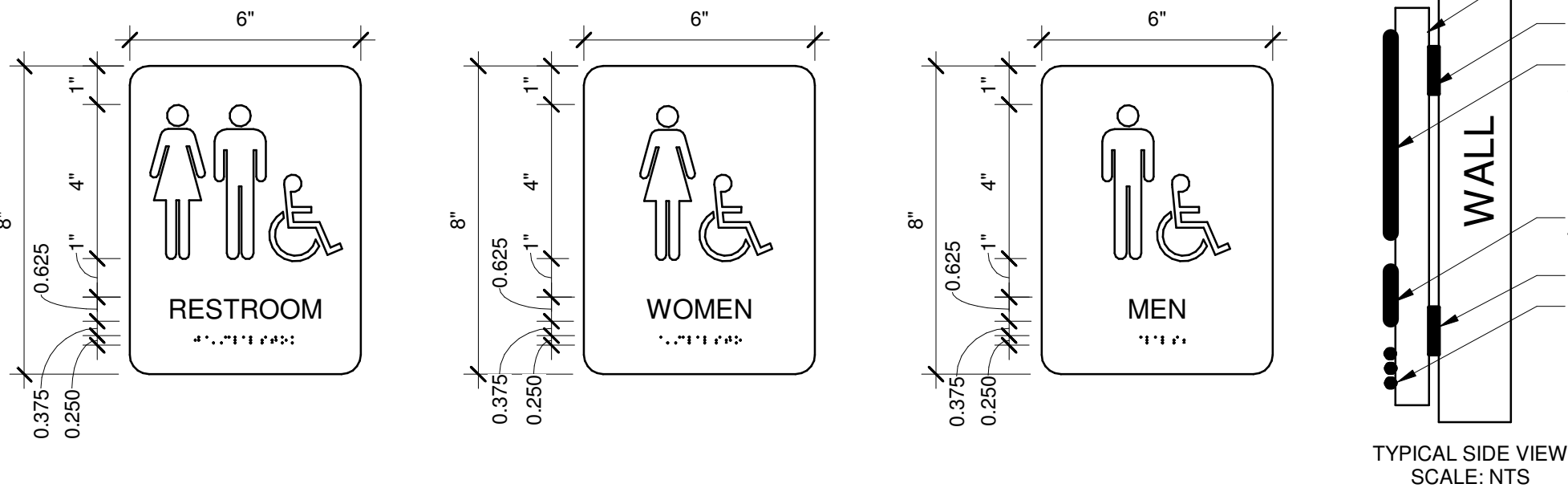
WALL MOUNTED ROOM IDENTIFICATION SIGN.
1/25" THICK ACRYLIC TACTILE SIGNS WITH UV CURED INTEGRAL RAISED COPY AND BRAILLE AND NON-TACTILE BORDER.

- BRAILLE:** GRADE 2
- CHARACTER SIZE:** RAISED CHARACTERS TO BE BETWEEN 6 OF AN INCH (E" = 16MM) AND TWO INCHES (2" = 51MM) HIGH; RAISED 1/32" - .6MM
- CHARACTER PROPORTION:** WIDTH-TO-HEIGHT RATIO TO BE BETWEEN 3:5 AND 1:1, AND A STROKE WIDTH-TO-HEIGHT
- FONT:** UPPERCASE, SANS SERIF OR SIMPLE SERIF
- CHARACTERS AND BACKGROUND COLOR:** EGGSHELL, MATTE, OR OTHER NON-GLARE FINISH. CHARACTERS AND SYMBOLS TO CONTRAST WITH THE BACKGROUND COLOR



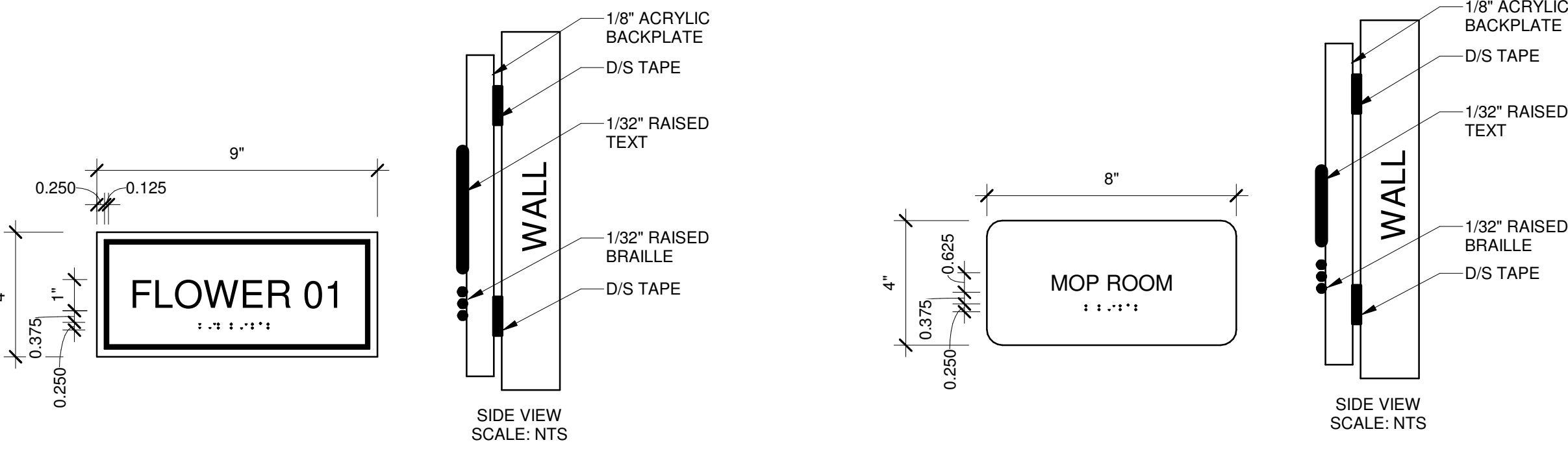
7 SIGNAGE PLACEMENT

A10.3 SCALE: 1/4" = 1'-0"



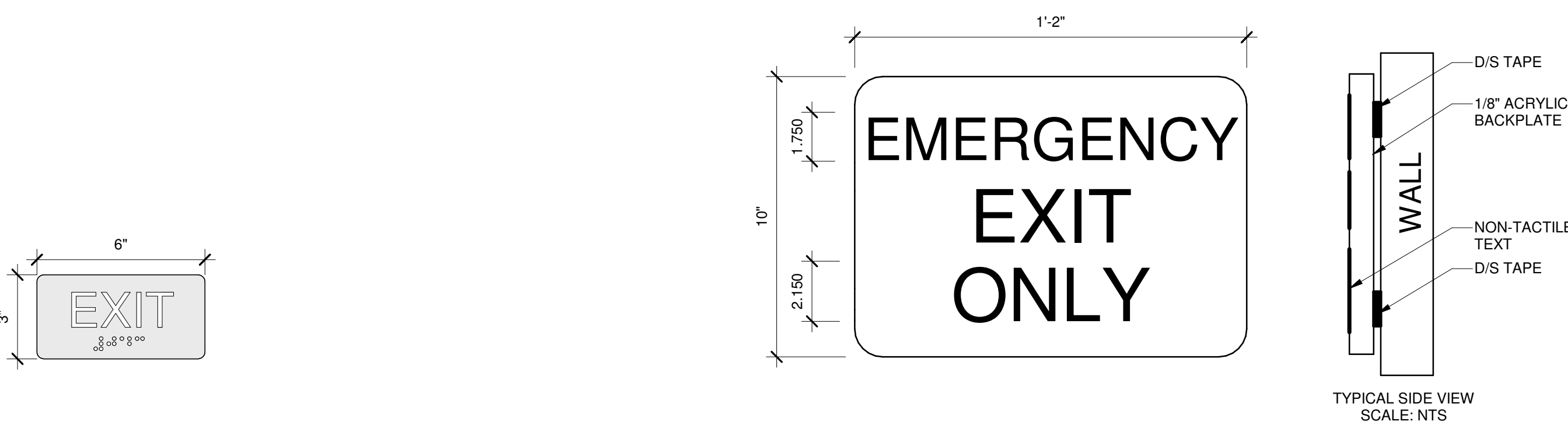
1 SIGN TYPE "A" DETAIL

A10.3 SCALE: 3" = 1'-0"



2 SIGN TYPE "B" DETAIL

A10.3 SCALE: 3" = 1'-0"



4 SIGN TYPE "D" DETAIL

A10.3 SCALE: 3" = 1'-0"

6 SIGN TYPE "E" DETAIL

A10.3 SCALE: 3" = 1'-0"

SIGNAGE SCHEDULE					
EXISTING/NEW	DOOR #	ROOM #	TEXT	SIGN TYPE	COMMENTS
EXISTING	102	104	SECURITY	B	
EXISTING	103	104	OFFICE	B	
EXISTING	104	101	OFFICE	B	
EXISTING	105	105	SECURITY EQUIPMENT	B	
EXISTING	110	110	BREAK ROOM	B	
EXISTING	111	111	STORAGE	B	
EXISTING	112	108	JANITOR	C	
EXISTING	113	113	PACKING	B	
PHASE ONE	116	116	WOMEN'S LOCKER ROOM	B	
EXISTING	116.A	118	WOMEN'S LOCKER ROOM	B	
PHASE ONE	117	117	MEN'S LOCKER ROOM	B	
EXISTING	117.A	117	MEN'S LOCKER ROOM	B	
PHASE ONE	119	119	DRY	B	
EXISTING	119.A	119	DRY	B	
EXISTING	120	120	STORAGE	B	
EXISTING	122	121	IT	A	
EXISTING	123	121	EQUIPMENT	B	
EXISTING	124	124	EXIT	D	
EXISTING	125	121	POTTING	B	
EXISTING	126	126	ELECTRICAL	B	
PHASE ONE	127	127	FLOWER	B	
PHASE ONE	128	128	FLOWER	B	
EXISTING	129	129	VAULT	B	
EXISTING	130	130	TRIM	B	
EXISTING	130.A	130	TRIM	B	
PHASE ONE	131.A	131	WOMEN'S LOCKER ROOM	B	
PHASE ONE	131.B	131	WOMEN'S LOCKER ROOM	B	
PHASE ONE	132.A	132	MEN'S LOCKER ROOM	B	
PHASE ONE	132.B	132	MEN'S LOCKER ROOM	B	
EXISTING	133	133	STORAGE	B	
EXISTING	134	134	CURE	B	
EXISTING	134.A	134	CURE	B	
EXISTING	135	135	PACKING	B	
PHASE ONE	136	136	EXTRACTION	B	
EXISTING	136.A	136	EXTRACTION	B	
EXISTING	137		FERTIGATION / SHIPPING & RECEIVING	B	
EXISTING	137.A		EXIT	E	DOOR-MOUNT
EXISTING	139	139	RESTROOM	A	
PHASE ONE	140	140	POTTING	B	
EXISTING	141	141	WOMEN'S RESTROOM	A	
EXISTING	142	142	MEN'S RESTROOM	A	

GENERAL SIGNAGE NOTES

SIGNAGE: (SEE 521 CMR SECTION 41.00 FOR MORE INFORMATION)

GENERAL: THE FOLLOWING TYPES OF SIGNAGE SHALL BE PROVIDED: SIGNS THAT DESIGNATE PERMANENT ROOMS AND SPACES SHALL COMPLY WITH 521 CMR 41.2, 41.5 AND 41.6. THESE INCLUDE TOILET ROOM SIGNS, ROOM NUMBERS, STAIR SIGNS, ETC. EXCEPTION: BUILDING DIRECTORIES, MENUS, AND ALL OTHER SIGNS THAT ARE TEMPORARY ARE NOT REQUIRED TO COMPLY. OTHER SIGNS THAT PROVIDE DIRECTION TO, OR INFORMATION ABOUT, FUNCTIONAL SPACES OF THE BUILDING SHALL COMPLY WITH 521 CMR 41.3, 41.4, AND 41.6. ELEMENTS AND SPACES OF ACCESSIBLE FACILITIES WHICH SHALL BE IDENTIFIED BY THE INTERNATIONAL SYMBOL OF ACCESSIBILITY AND WHICH SHALL COMPLY WITH 521 CMR 41.7. SYMBOLS OF ACCESSIBILITY ARE: A. PARKING SPACES DESIGNATED AS RESERVED FOR INDIVIDUALS WITH DISABILITIES; 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 AND BATHING FACILITIES WHEN NOT ALL ARE ACCESSIBLE. E. EMERGENCY EGRESS SIGNS, WHICH ARE REQUIRED TO BE ILLUMINATED.

MOUNTING LOCATION AND HEIGHT: WHERE PERMANENT IDENTIFICATION IS PROVIDED FOR ROOMS AND SPACES, SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR. WHERE THERE IS NO WALL SPACE TO THE LATCH SIDE OF THE DOOR, INCLUDING AT DOUBLE LEAF DOORS, SIGNS SHALL BE PLACED ON THE NEAREST ADJACENT WALL. MOUNTING LOCATION SHALL ALLOW A PERSON TO APPROACH WITHIN THREE INCHES (3" = 76MM) OF SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR. **MOUNTING HEIGHT** SHALL BE 60 INCHES (60" = 1524MM) ABOVE THE FINISH FLOOR TO THE CENTERLINE OF THE SIGNS.

CHARACTER PROPORTION: LETTERS AND NUMBERS ON SIGNS SHALL HAVE A WIDTH-TO-HEIGHT RATIO BETWEEN 3:5 AND 1:1, AND A STROKE WIDTH-TO-HEIGHT RATIO BETWEEN 1:5 AND 1:10.

CHARACTER HEIGHT: CHARACTERS AND NUMBERS ON SIGNS SHALL BE SIZED ACCORDING TO THE VIEWING DISTANCE FROM WHICH THEY ARE TO BE READ. THE MINIMUM HEIGHT OF SUSPENDED OR OVERHEAD CHARACTERS IS THREE INCHES (3" = 76MM) AND IS MEASURED USING AN UPPER CASE X. LOWER CASE CHARACTERS ARE PERMITTED.

RAISED AND BRAILLED CHARACTERS AND PICTORIAL SYMBOL SIGNS: LETTERS AND NUMERALS SHALL BE RAISED ONE THIRTY-SECOND OF AN INCH (1/32" = 0.8MM). UPPER CASE, SANS SERIF OR SIMPLE SERIF TYPE. LETTERS AND/OR NUMERALS SHALL BE ACCOMPANIED WITH GRADE 2 BRAILLE. RAISED CHARACTERS SHALL BE AT LEAST 6 OF AN INCH (E" = 16MM) HIGH, BUT NO HIGHER THAN TWO INCHES (2" = 51MM). PICTOGRAMS SHALL BE ACCOMPANIED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM. THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE SIX INCHES (6" = 152MM) MINIMUM HEIGHT.

FINISH AND CONTRAST: THE CHARACTERS AND BACKGROUND OF SIGNS SHALL BE EGGSHELL, MATTE, OR OTHER NON-GLARE FINISH. CHARACTERS AND SYMBOLS SHALL CONTRAST WITH THEIR BACKGROUND: EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.

SYMBOLS OF ACCESSIBILITY: FACILITIES AND ELEMENTS REQUIRED TO BE IDENTIFIED AS ACCESSIBLE BY 521 CMR 41.1.3 SHALL USE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY. THE SYMBOL SHALL BE DISPLAYED AS SHOWN IN FIG. 41A.

VOLUME CONTROL TELEPHONES: TELEPHONES REQUIRED TO HAVE A VOLUME CONTROL UNDER 521 CMR 37.5, SHALL BE IDENTIFIED BY A SIGN CONTAINING A DEPICTION OF A TELEPHONE HANDSET WITH RADIATING SOUND WAVES.

TEXT TELEPHONES (TTY): TEXT TELEPHONES (TTY) REQUIRED BY 521 CMR 37.8. TEXT TELEPHONES SHALL BE IDENTIFIED BY THE INTERNATIONAL TTY SYMBOL (SEE FIG. 41C). IN ADDITION, IF A FACILITY HAS A PUBLIC TEXT TELEPHONE (TTY), DIRECTIONAL SIGNAGE INDICATING THE LOCATION OF THE NEAREST TEXT TELEPHONE (TTY) SHALL BE PLACED ADJACENT TO ALL BANKS OF TELEPHONES THAT DO NOT CONTAIN A TEXT TELEPHONE (TTY). SUCH DIRECTIONAL SIGNAGE SHALL INCLUDE THE INTERNATIONAL TTY SYMBOL. IF A FACILITY HAS NO BANKS OF TELEPHONES BUT A PUBLIC TEXT TELEPHONE (TTY) IS AVAILABLE, THE DIRECTIONAL SIGNAGE SHALL BE PROVIDED AT THE ENTRANCE (E.G., IN A BUILDING DIRECTORY).

ASSISTIVE LISTENING SYSTEMS: IN ASSEMBLY AREAS WHERE PERMANENTLY INSTALLED ASSISTIVE LISTENING SYSTEMS ARE REQUIRED BY 521 CMR 14.5, ASSISTIVE LISTENING DEVICES THE AVAILABILITY OF SUCH SYSTEMS SHALL BE IDENTIFIED WITH SIGNAGE THAT INCLUDES THE INTERNATIONAL SYMBOL OF ACCESS FOR HEARING LOSS.



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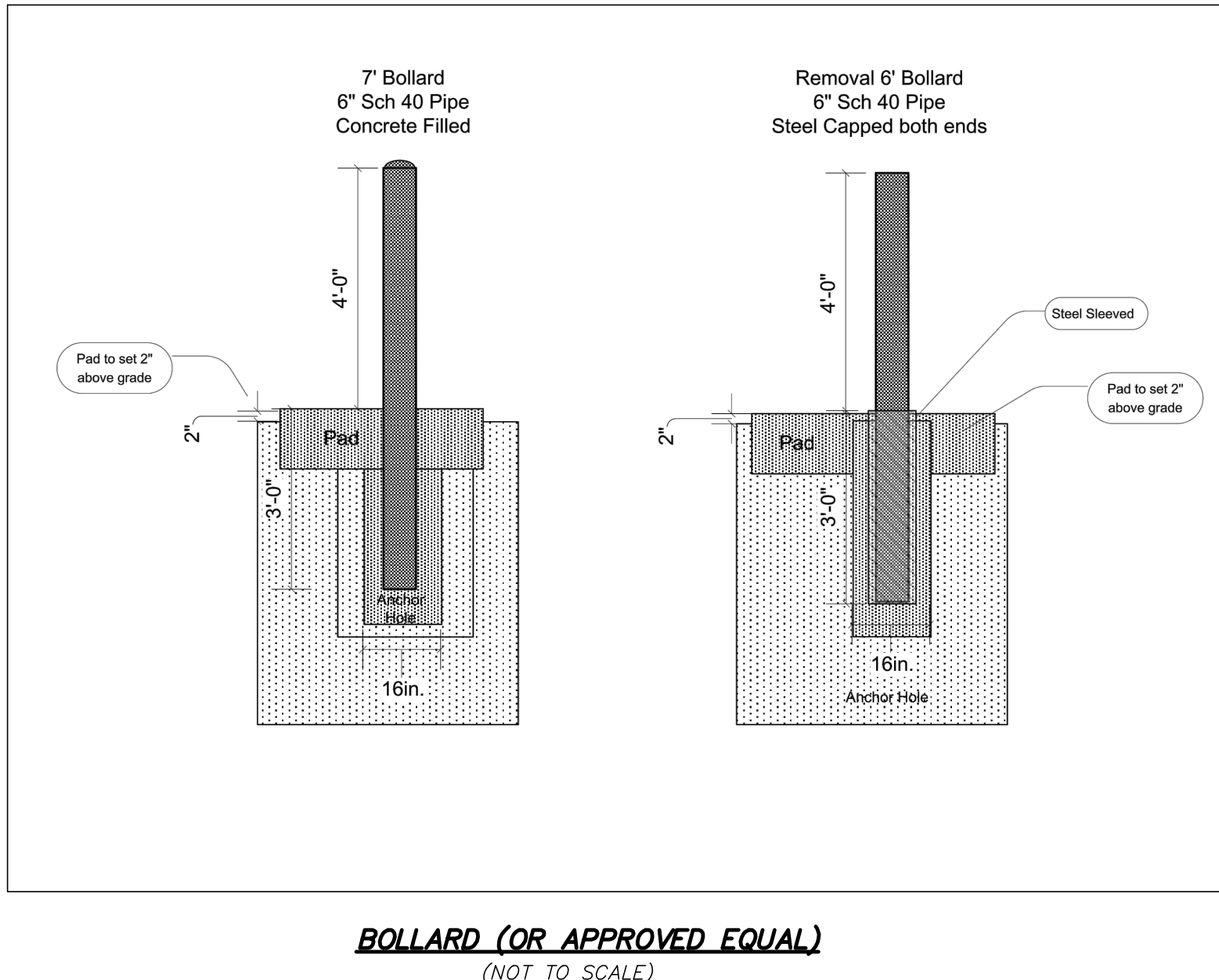
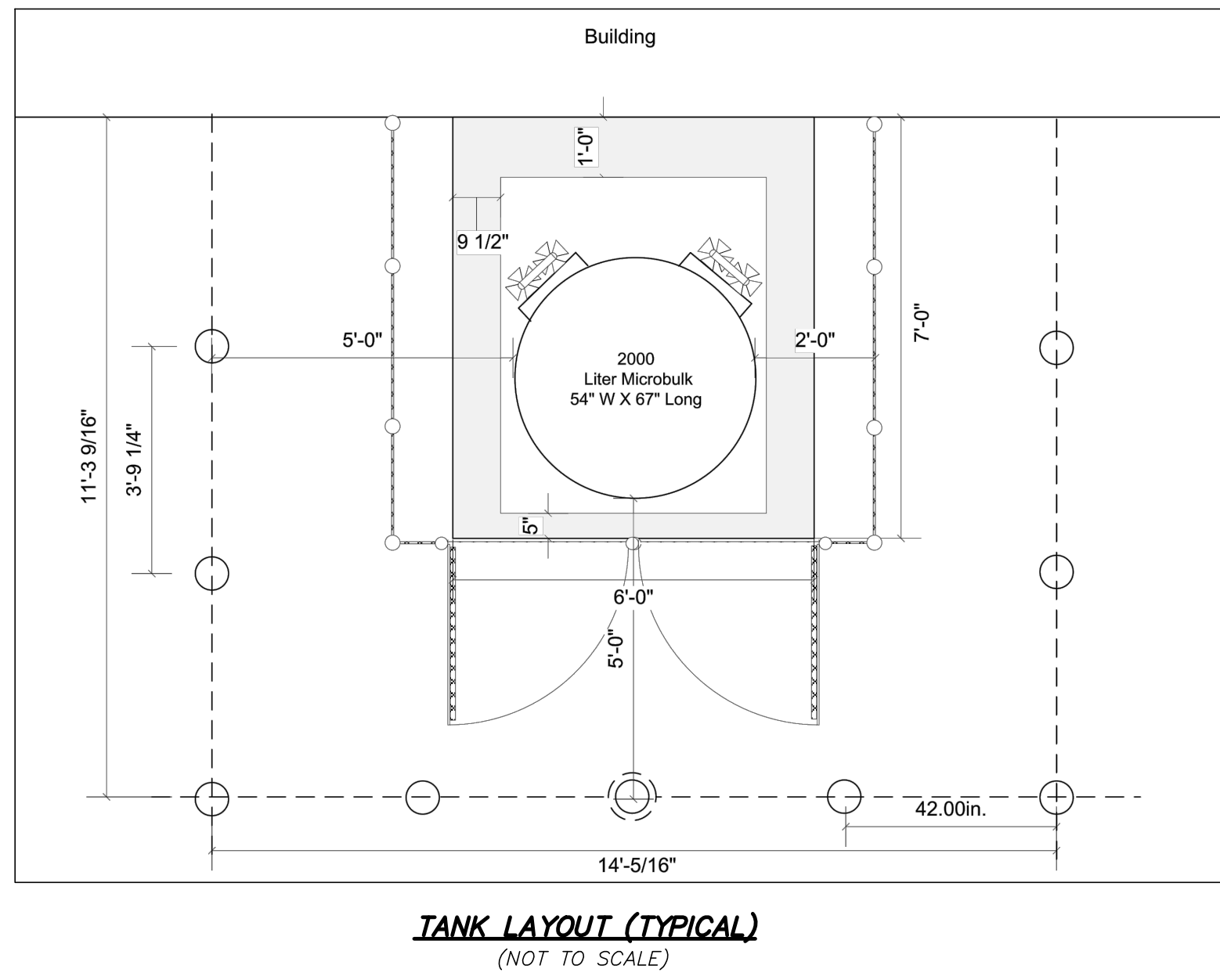
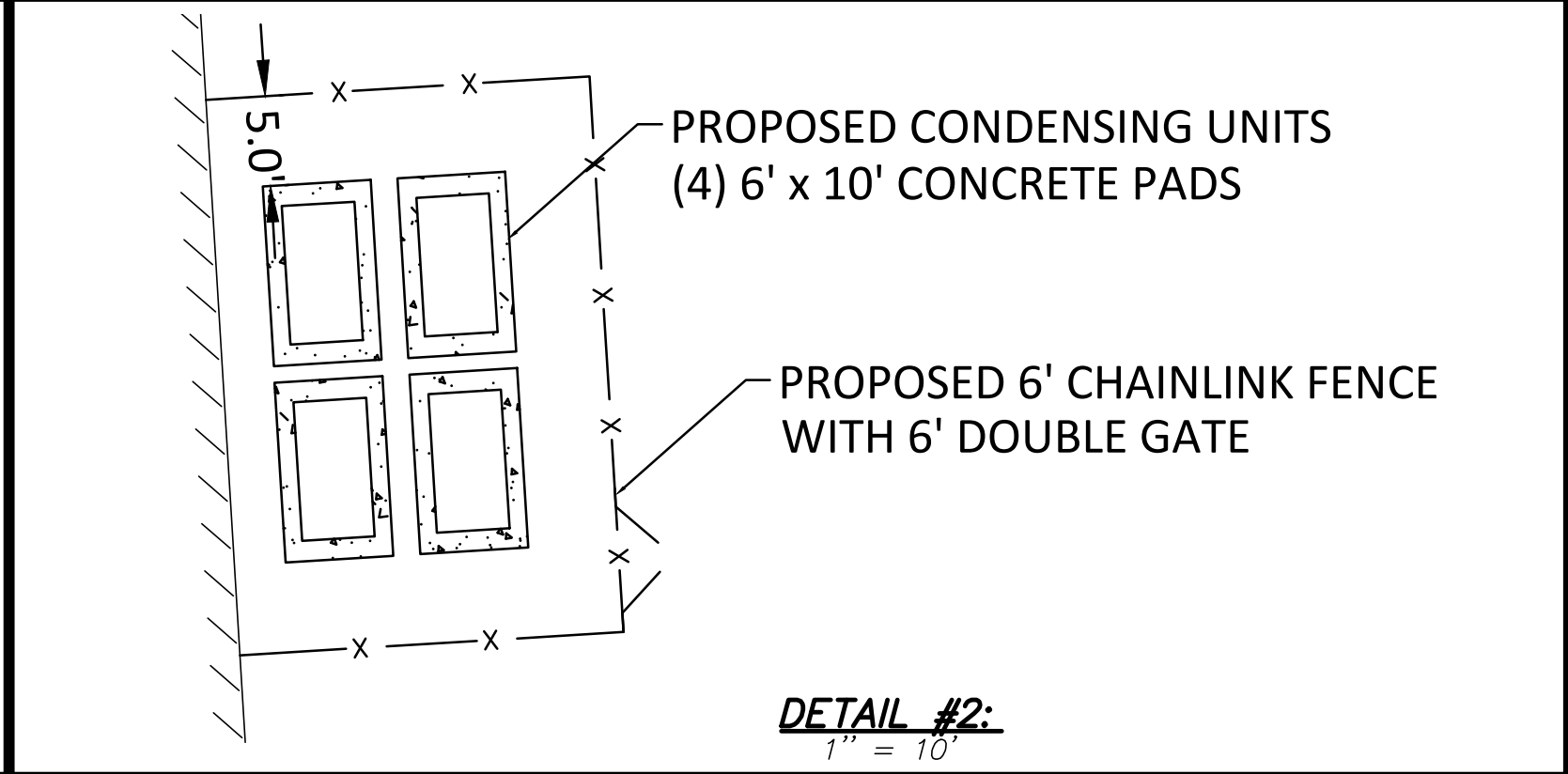
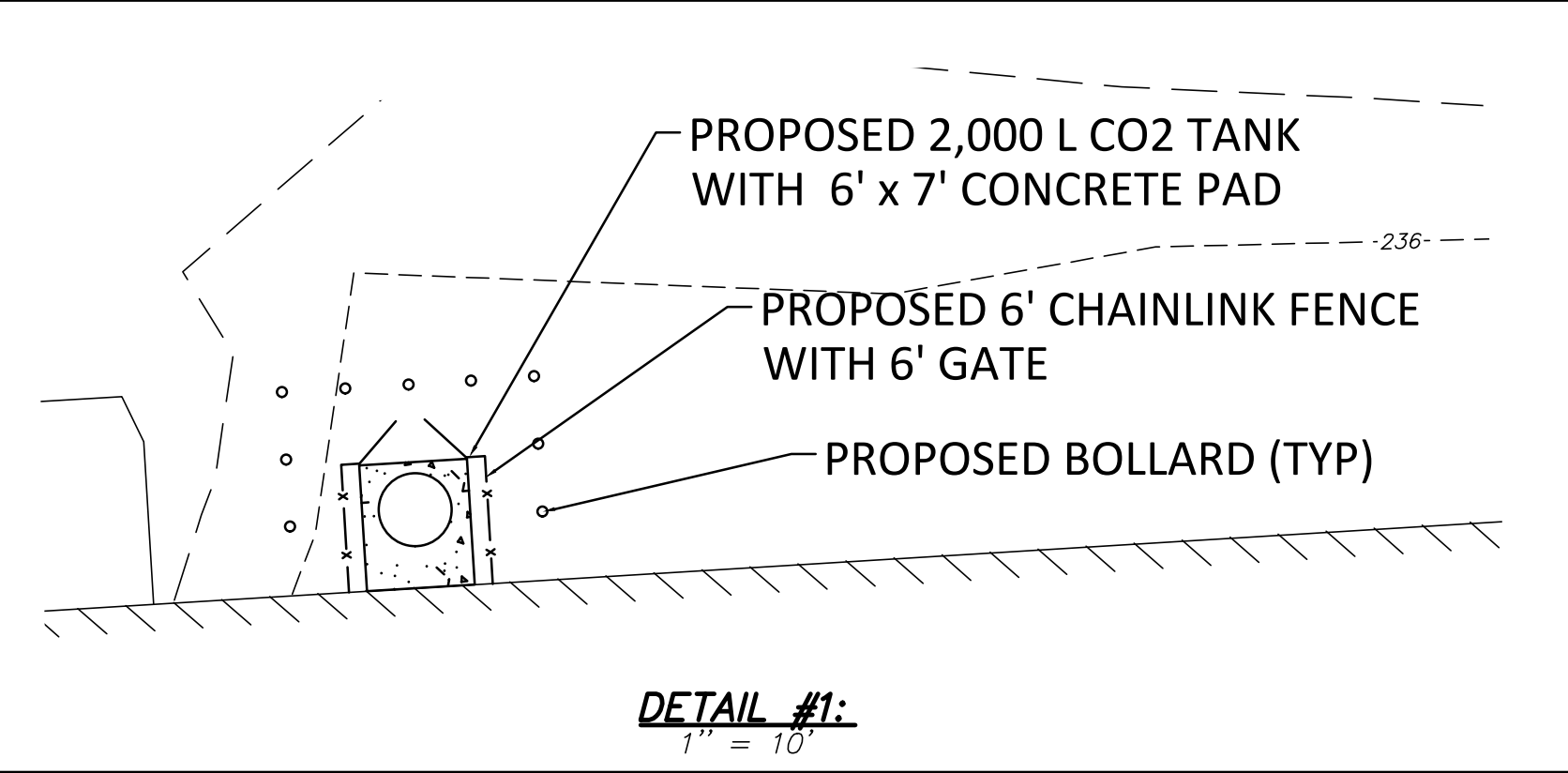
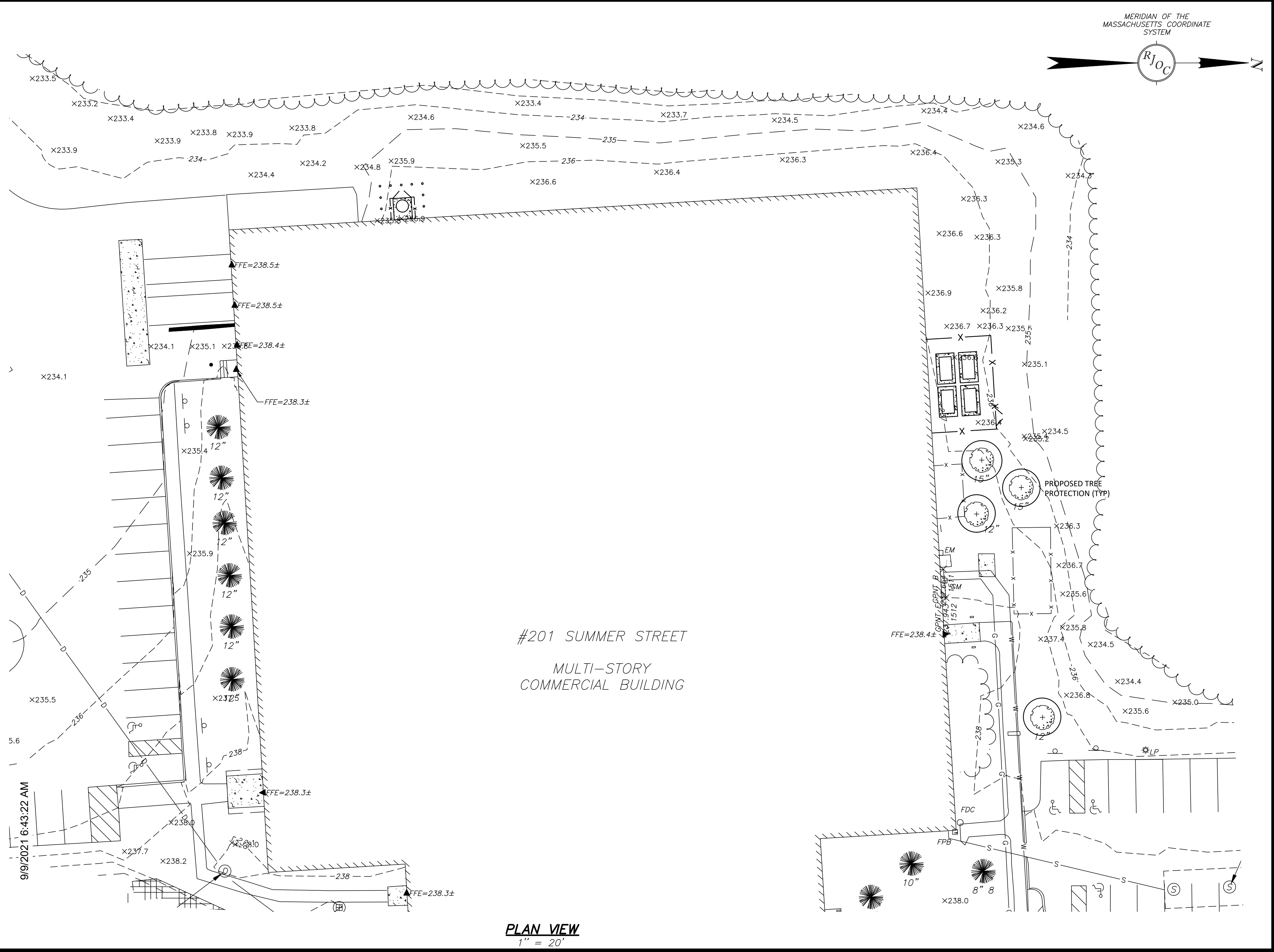
SIGNAGE DETAILS & SCHEDULE

Sheet Number

A10.3

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Concrete Specifications:
4500 PSI at 28 days, # 4 rebar on 10" centers each way.
Set form work around perimeter, exposed surface shall be beveled.
Pad depth 10" unless otherwise stated.

Bollards Specifications: Bollards 6" sch 40 steel pipe x 7' concrete filled. Bollard to be painted OSHA yellow.

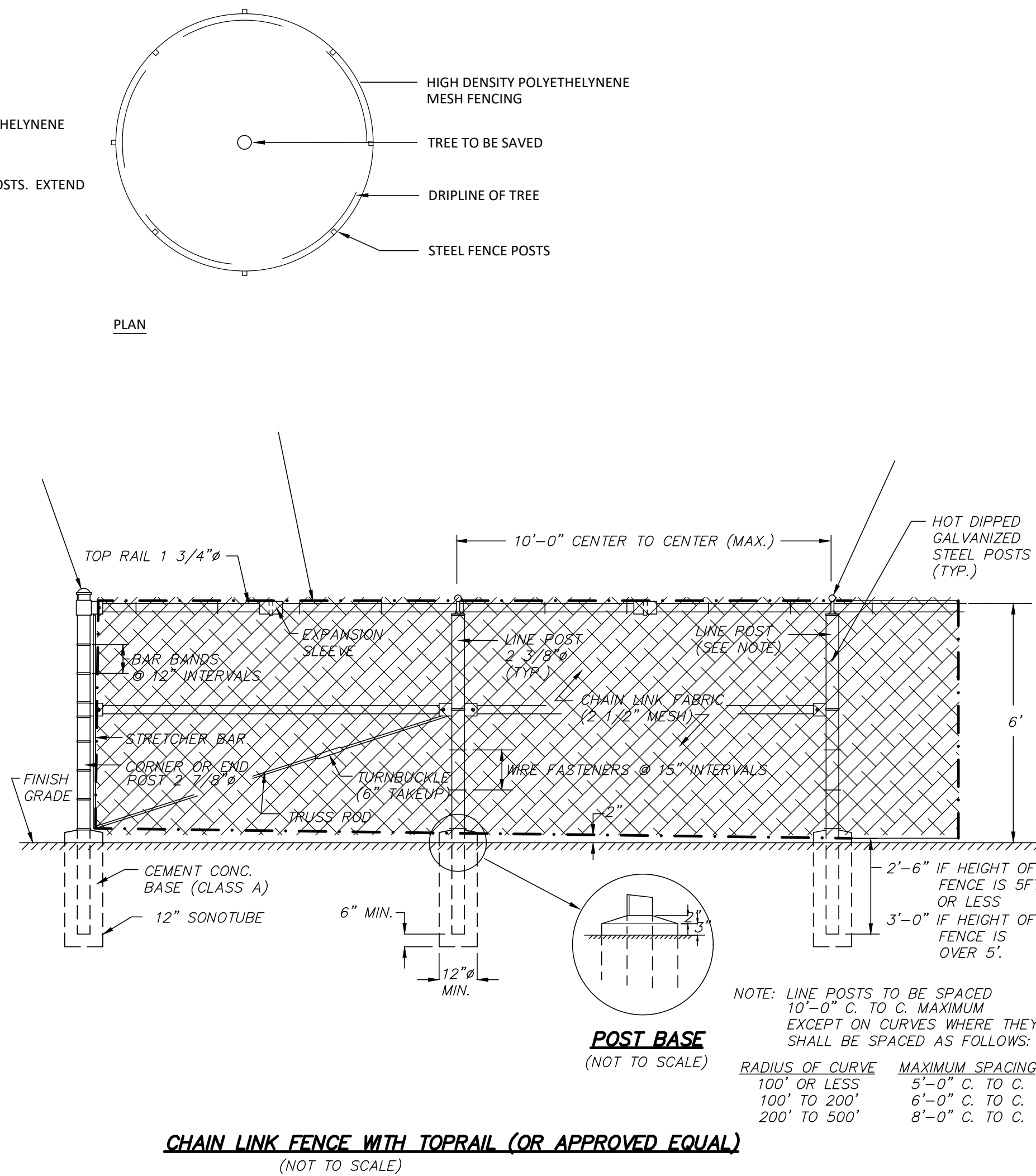
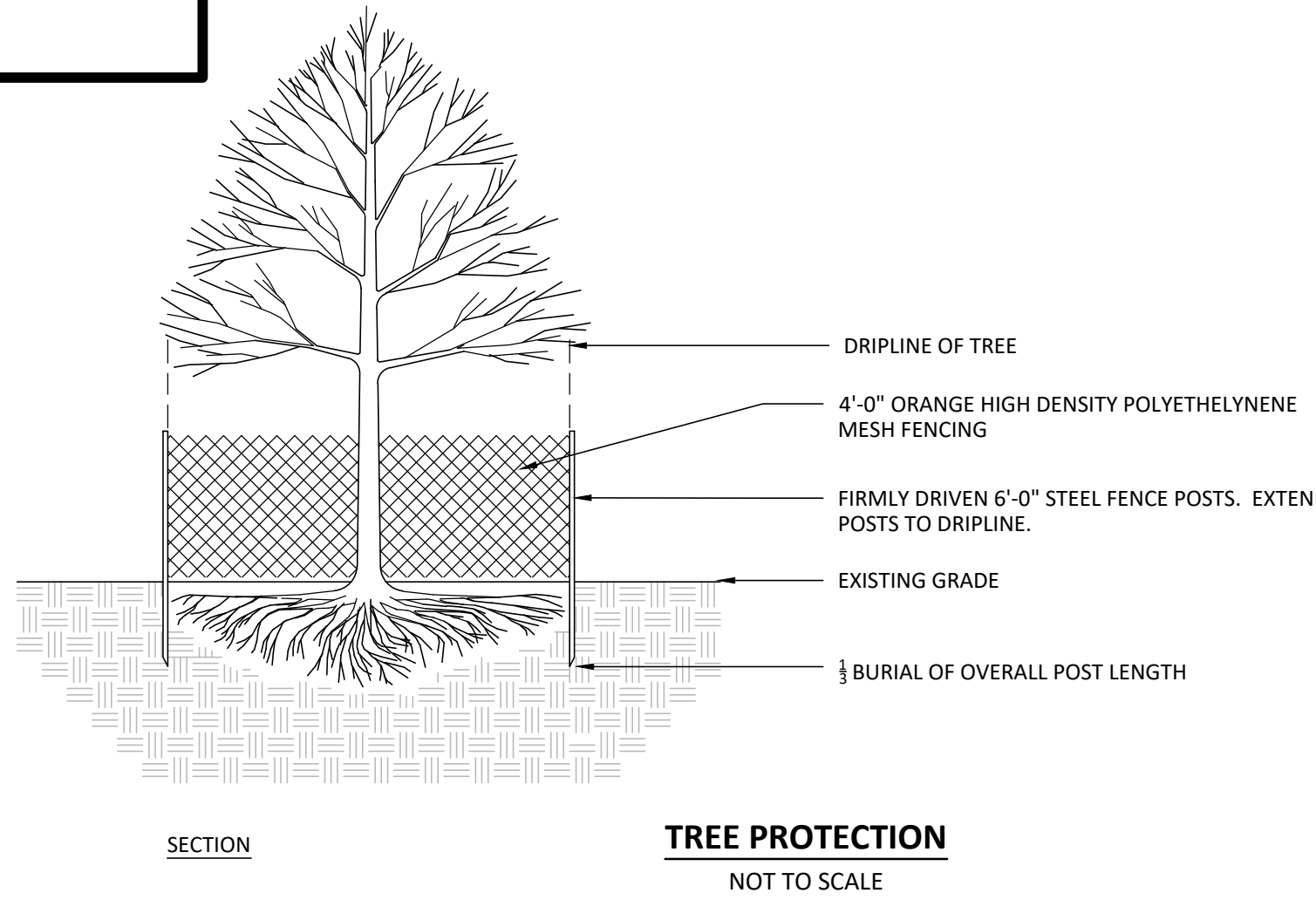
General Piping Specification:
All piping to be cleaned and capped ACR copper. All joints on liquid lines will be silver brazed under a nitrogen purge. Gases line joints under 200 psig working pressure may be silver brazed or installed with Viega compression fitting. Piping to be pressure tested at 1-1/2 times system working pressure. Piping to be identified with product and flow directional arrows.
Oxygen spill pad required for oxygen installations.

Chain Link Fence Specifications:
Gate Link Fence 6" high 9 gauge, open links no slats allowed. If tank is accessible by the general public.

Above Specifications meet Praxair Minimum Standards.
All specification should be confirmed by a Licensed Professional Engineer to meet local state and city requirements.

All permits are the responsibility of the customer unless financial agreements have been made to cover the permit cost. If final permitted plans differ from these concept plans Praxair must be notified before work is started.
Any change from concept plans may affect cost of installation.

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PATRIOT Engineering
45 BEDFORD STREET, SUITE 4
LEXINGTON, MASSACHUSETTS 02460
T: (978) 729-8854
www.patriot-eng.com

MICHAEL J. NOVAK
CIVIL
No. 50696
MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER

Sheet Description



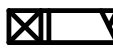

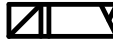




SITE PLAN & DETAILS




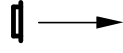
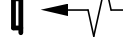
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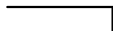
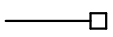
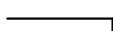
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

AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFB	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ASJ	AUTHORITY HAVING JURISDICTION
AP	ACCESS PANEL
BAS	BUILDING AUTOMATION SYSTEM
BTU	BRITISH THERMAL UNIT
BTU/H	BTU / HOUR
BOP	BOTTOM OF PIPE
CD	CONDENSATE DRAIN
CFH	CUBIC FEET PER HOUR
CI	CAST IRON
CO	CLEANOUT
CW	COLD WATER
DM	DAMETER
DN	DOWN
DSN	DOWN SPOUT NOZZLE
DW	DIRECT WASTE
ELEC	ELECTRICAL
EXP	EXPANSION TANK
F	DEGREES FAHRENHEIT
FCD	FLOOR CLEANOUT
FE	FINISHED FLOOR ELEVATION
FGCD	FINISHED GRADE CLEANOUT
FLA	FULL LOAD AMPS
FLO	FLOOR DRAIN
FS	FLOOR SINK
FT	FEET
FT WG	FEET HEAD
G	GAS
GALL	GALLONS
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSV	GAS SOLENOID VALVE
HB	HOSE BIB
HW	HOT WATER
HD	HEAD
HP	HORSEPOWER
HZ	HERTZ
HWR	HOT WATER RECIRCULATION
INT	INTERCEPTOR
INV ELEV	INVERT ELEVATION
KW	KILOWATT
KV	KILOVOLT
LAV	LAVATORY
MAX	MAXIMUM
MECH	MECHANICAL
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPCACITY
MIN	MINIMUM
NIC	NOT IN CONTRACT
NG	NATURAL GAS
NTS	NOT TO SCALE
PCD	PUMPED CONDENSATE DRAIN
PLBG	PLUMBING
PPS	POUNDS PER SQUARE INCH GAUGE
QTY	QUANTITY
RSB	REDUCED PRESSURE BACKFLOW PREVENTER
RTU	ROOFTOP UNIT
SAN	SANITARY
SOFT / SF	SQUARE FEET
TEMP	TEMPERATURE
TW	TEMPERED WATER
TV	TYPICAL
V	VENT
VS	VENT STACK
VTR	VENT THRU ROOF
W	WASTE
WS	WASTE STACK
WAST	WASTE WATER

PLUMBING VALVE AND SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	COLD WATER
	HOT WATER (110°F)
	SANITARY DRAIN/WASTE ABOVE FLOOR
	SANITARY DRAIN/WASTE BELOW FLOOR
	VENT
	CO2 PIPING
	PIPE RISE
	PIPE DROP
	PIPE TEE TOWARDS (UP IN PLAN)
	PIPE TEE AWAY (DOWN IN PLAN)
	PIPE DROP AND RUN
	DIRECTION OF FLOW
	PIPE TRAP
	DIRT LEG
	CLEANOUT
	UNION OR ORANGE FLANGE
	BLIND FLANGE
	END CAP
	REDUCER (ECCENTRIC)
	REDUCER (CONCENTRIC)

DUCTWORK LEGEND	
SYMBOL	DESCRIPTION
	RECTANGULAR DUCTWORK
	ROUND DUCTWORK
	SUPPLY DUCTWORK TOWARDS (UP IN PLAN)
	RECTANGULAR SUPPLY DUCTWORK AWAY (DOWN IN PLAN)
	RECTANGULAR RETURN DUCTWORK TOWARDS (UP IN PLAN)
	RECTANGULAR RETURN DUCTWORK AWAY (DOWN IN PLAN)
	RECTANGULAR EXHAUST DUCTWORK TOWARDS (UP IN PLAN)
	RECTANGULAR EXHAUST DUCTWORK AWAY (DOWN IN PLAN)
	CAPPED DUCT

AIR DEVICE LEGEND	
SYMBOL	DESCRIPTION
	SUPPLY DIFFUSER
	RETURN GRILLE OR REGISTER
	EXHAUST GRILLE OR REGISTER
	SIDEWALL SUPPLY GRILLE
	SIDEWALL RETURN OR EXHAUST GRILLE OR REGISTER
XX-# (###)	AIR DEVICE TAG (TAG NO. (AIRFLOW))

DAMPER LEGEND	
SYMBOL	DESCRIPTION
	MANUAL VOLUME DAMPER
 MD	MOTORIZED CONTROL DAMPER W/ACCESS DOOR
 BD	BACKDRAFT DAMPER

CONTROLS LEGEND	
PLAN SYMBOL	DESCRIPTION
	CARBON DIOXIDE SENSOR
	HUMIDITY SENSOR
	THERMOSTAT

A large, dark, textured rectangular area, possibly a placeholder for a photograph or a solid dark block. It occupies the central portion of the page, below the header and above the footer. The texture is grainy and uneven, suggesting a scan of a physical surface or a digital noise effect.

ELECTRICAL ABBREVIATIONS		7. ALL PLUMBING CLEAR OR
AV/AMP	AMPERE	8. PROVIDE
AFCI	ALTERNATING CURRENT	
ACU	ARC FAULT CIRCUIT INTERRUPTER	FIRESTOPPING
ACU	AIR CONDITIONING UNIT	1. PROVIDE
AFB	ABOVE FINISHED FLOOR	FIRE WALL
AHU	AIR HANDLING UNIT	CONTAINING
AIC	AMPS INTERRUPTING CURRENT	ARCHITECT'S
AL	ALUMINUM	SPECIFICATIONS
ATS	AUTOMATIC TRANSFER SWITCH	
AWG	AMERICAN WIRE GAUGE	
BSMT	BASEMENT	
C	CONDUIT	
CA/TV	CABLE TELEVISION	
CB	CIRCUIT BREAKER	
CKT	CIRCUIT	
COMP	COMPRESSOR	
CT	CONDENSATE PUMP	
CU	CURRENT TRANSFORMER	
CJ	COPPER UNIT OR COPPERING	
CJH	CABINET UNIT HEATER	
D	DRYER	
DEC.	DEGREE	
DA	DIAMETER	
DW	DOWN	
DWG	DRAWING	
ETR	EXISTING TO REMAIN	
EF	EXHAUST FAN	
ELEC	ELECTRICAL	
ELV	ELEVATOR	
EM	EMERGENCY	
EMT	ELECTRIC METALLIC TUBING	
EP	EMERGENCY PANEL	
EWH	ELECTRIC UNIT HEATER	
EWIC	ELECTRIC WATER COOLER	
F	ELECTRIC WATER HEATER	
FA	FAHRENHEIT	
FACP	FIRE ALARM	
FC	FIRE ALARM CONTROL PANEL	
FCU	FOOT CANDLE	
G	FAN COIL UNIT	
GFI	GROUND	
GCJ	GROUND FAULT CIRCUIT INTERRUPTER	
H	HORSE POWER	
HPS	HIGH PRESSURE SODIUM	
HP	HOUR	
HR	HERTZ	
HZ	ISOLATED GROUND	
IN	INCHES	
JB	JUNCTION BOX	
KW	THOUSAND CIRCULAR MILS	
KV	KILOVOLT AMPERE	
KVA	KELVIN	
MAX	MAXIMUM	
MAU	MAKE-UP AIR UNIT	
MCB	MAIN CIRCUIT BREAKER	
MCC	MOTOR CONTROL CENTER	
MCCB	MOLDED CASE CIRCUIT BREAKER	
MCB	METAL HALIDE OR MANHOLE	
MR	MINIMUM	
MLO	MAIN LUGS ONLY	
NA	NOT APPLICABLE	
NE	NEW DEVICE INSTALLED IN SAME LOCATION AS EXISTING	
NR	REMOVED DEVICE	
NEC	NATIONAL ELECTRIC CODE	
NC	NOT IN CONTRACT	
NL	NEW LOCATION OF RELOCATED DEVICE	
NT	NEW TO REPLACE EXISTING	
NTS	NOT TO SCALE	
PE	POLE	
PE	PRIMARY ELECTRIC SERVICE	
PF	POWER FACTOR	
PH	PHASE	
PNL	PANEL	
PVC	POLYVINYL CHLORIDE CONDUIT	
REF	EXISTING TO BE REMOVED	
REF	REFRIGERATOR	
RCS	RIGID GALVANIZED STEEL CONDUIT	
RL	EXISTING TO BE RELOCATED	
RM	ROOM	
RR	EXISTING TO BE REMOVED AND REPLACED WITH NEW (EXISTING BACKBOXES, CONDUIT AND WIRING TO REMAIN)	
RR	EXISTING TO BE RELOCATED IN SAME LOCATION ON NEW SURFACE	
RTU	ROOFTOP UNIT	
SE	SECONDARY ELECTRICAL SERVICE	
SPEC	SPECIFICATION	
SWBD	SWITCHBOARD	
SPD	SPRING DISCONNECT	
TELE	TELECOMMUNICATIONS/TELEPHONE	
TV	TELEVISION	
T/XT	TRANSFORMER	
TYP	TYPICAL	
UH	UNIT HEATER	
UON	UNLESS OTHERWISE NOTED	
V	VOLTS	SIZE
VAC	VOLTS ALTERNATING CURRENT	
VF	VERIFY IN FIELD	
W	WATT OR WIRE	T
WF	WASHER	
WG	WIRE GUARD	
WP	WEATHERPROOF	

SPRINKLER SYMBOL LEGEND						
SYMBOL				DESCRIPTION		
				CONCEALED PENDANT SPRINKLER		

DRY TYPE TRANSFORMER						
COPPER CONDUCTORS						
SIZE	KVA	PRIMARY AMPS	SECONDARY AMPS	480 VOLT OVERCURRENT	208 VOLT (NOTE 4) OVERCURRENT	480 VOLT FEEDER
T4	45	54	125	90A, 3P	150A, 3P	3#3 & 1#8G - 1 1/4"

TRANSFORMER NOTES:

- BOND NEUTRAL TRANSFORMER SECONDARY TO THE TRANSFORMER GROUND BAR AND CAUSE NEAREST AVAILABLE EFFECTIVELY GROUNDED WATER PIPE, STRUCTURAL STEEL AND 250KGS FOR THE SEPARATELY DERIVED SYSTEM GROUNDING ELECTRODE.
- ALL CONDUCTOR SIZES ARE FOR COPPER CONDUCTORS (N.E.C. TABLE 310.15(B)(16)).
- SECONDARY OVERCURRENT PROTECTION SHALL BE LOCATED WITHIN (10) FEET OF THE T (MAIN BREAKER), AN INDIVIDUALLY MOUNTED CIRCUIT BREAKER, OR A FUSIBLE DISCONNECT.
- GROUNDING ELECTRODE CONDUCTOR TO BE RUN FROM GROUND BAR IN TRANSFORMER SYSTEM.
- SYSTEM BONDING JUMPER SUPPLY SIDE BONDING JUMPER TO BE INSTALLED BETWEEN THE GROUND BAR IN THE FIRST SUPPLY SIDE DISCONNECTING MEANS (PANELBOARD, ENCLOSURE) TRANSFORMER GROUND BAR. INSTALL MULTIPLE SUPPLY SIDE BONDING JUMPERS OF THE

SPRINKLER PIPE SIZE SCHEDULE		
NO. OF SPRINKLER HEADS	PIPE SIZE	
1-2	1"	
3-4	1 1/4"	
4-5	1 1/2"	
6-10	2"	

NOTE:
PIPE SIZES SHOWN ARE BASED ON PIPING LAYOUTS WITH ONLY ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATION BASED ON THE CONTRACTORS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN THE CONTRACT PRICE

208/120 VOLT FEEDER	SSB/ (NOTE 5)	SSB/ (NOTE 6)
480/120 - 2VC	18R - 3VC	18R

[illegible]

GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRD	GRILLE, REGISTER, DIFFUSER
HD	HEAD
HP	HORSEPOWER
HSF	HEATING SEASON PERFORMANCE FACTOR
HZ	HERTZ
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
I	INCHES
IN WG	INCHES WATER GAUGE
K	INTEGRATED PART LOAD VALUE
KW	KILOWATTS
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MECH	MECHANICAL
MBH	THOUSANDS OF BTU / HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
NC	NOT IN CONTRACT
NIS	NOT TO SCALE
OAT	OUTSIDE AIR TEMPERATURE
OD	OUTER DIAMETER
OED	OPEN ENDED DUCT
P	PUMP
PH	PHASE
PLUG	PLUMBING
PRV	PRESSURE REDUCING VALVE
PSIG	POUNDS PER SQUARE INCH GAUGE
QTY	QUANTITY
RA	RETURN AIR
RM	REVOLUTIONS PER MINUTE
RPM	SUPPLY AIR
SA	STATIC PRESSURE
SP	STATIC PRESSURE DROP
SS	STAINLESS STEEL
SST	SATURATED SUCTION PRESSURE
SQFT / SF	SQUARE FEET
TEMP	TEMPERATURE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TON	TYPICAL
W	UNLESS OTHERWISE INDICED
W	WITH
WO	WITHOUT
WB	WET BULB
WG	WATER COLUMN
WG	WATER GAUGE
WMS	WIRE MESH SCREEN
WD	WATER WIRE DROP

[illegible]

ELECTRICAL POWER NOTES	
1.	RECEPTACLES LOCATED WITHIN 6' FROM WATER SOURCES SHALL BE GFCI TYPE.
2.	ELECTRICAL CONTRACTOR SHALL PROVIDE (1) 2" CONDUIT SLEEVE INTO EACH ROOM COMMUNICATIONS DEVICE(S). LOCATE ABOVE CEILING WHERE POSSIBLE.
3.	15A AND 20A, 120V AND 250V NON-LOCKING TYPE RECEPTACLES MOUNTED BELOW 5'-6"

	WMS WPD	WIRE MESH SCREEN WATER PRESSURE DROP
OWN WITH SHALL BE	EQUIPMENT A	

CP	CONDENSATE PUMP
CU	CONDENSING UNIT
CB	ELECTRIC BASEBOARD
EUH	ELECTRIC UNIT HEATER
EWH	ELECTRIC WALL HEATER
ERV	ENERGY RECOVERY VENTILATOR
EG	EXHAUST GRILLE
F	FAN
H	HUMIDIFIER
LB	LINEAR BAR GRILLE
P	PUMP
SD	SUPPLY DIFFUSER
SG	SUPPLY GRILLE


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REVISIONS	

MEPFP0.0

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COMMONWEALTH OF MASSACHUSETTS
SCOTT A. SULLIVAN
ELECTRICAL
NO. 47661
REGISTERED
PROFESSIONAL ENGINEER

PERMIT SET

Project Number: 2021377.00
Date: 9/10/2021
Drawn By: PTC
Checked By: NHF
Revisions:

No.	Date	Description
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Sheet Description	
<div>MEPFP</div> <div>ABBREVIATIONS</div> <div>NOTES AND</div> <div>SYMBOLS</div>	
Sheet Number	

MEPFP0.0

- FLOWER 128, MOM/VEG 127 SCOPE NOTES

1. FP - NEW SPRINKLERS. SEE PART PLAN
P - NEW WASTE PUMPS. SEE PART PLAN
M - NEW HVAC SYSTEMS. SEE PART PLAN
E - ALL NEW ELECTRICAL SYSTEMS. SEE PART PLAN
- LOCKER ROOMS 131 & 132 SCOPE NOTES

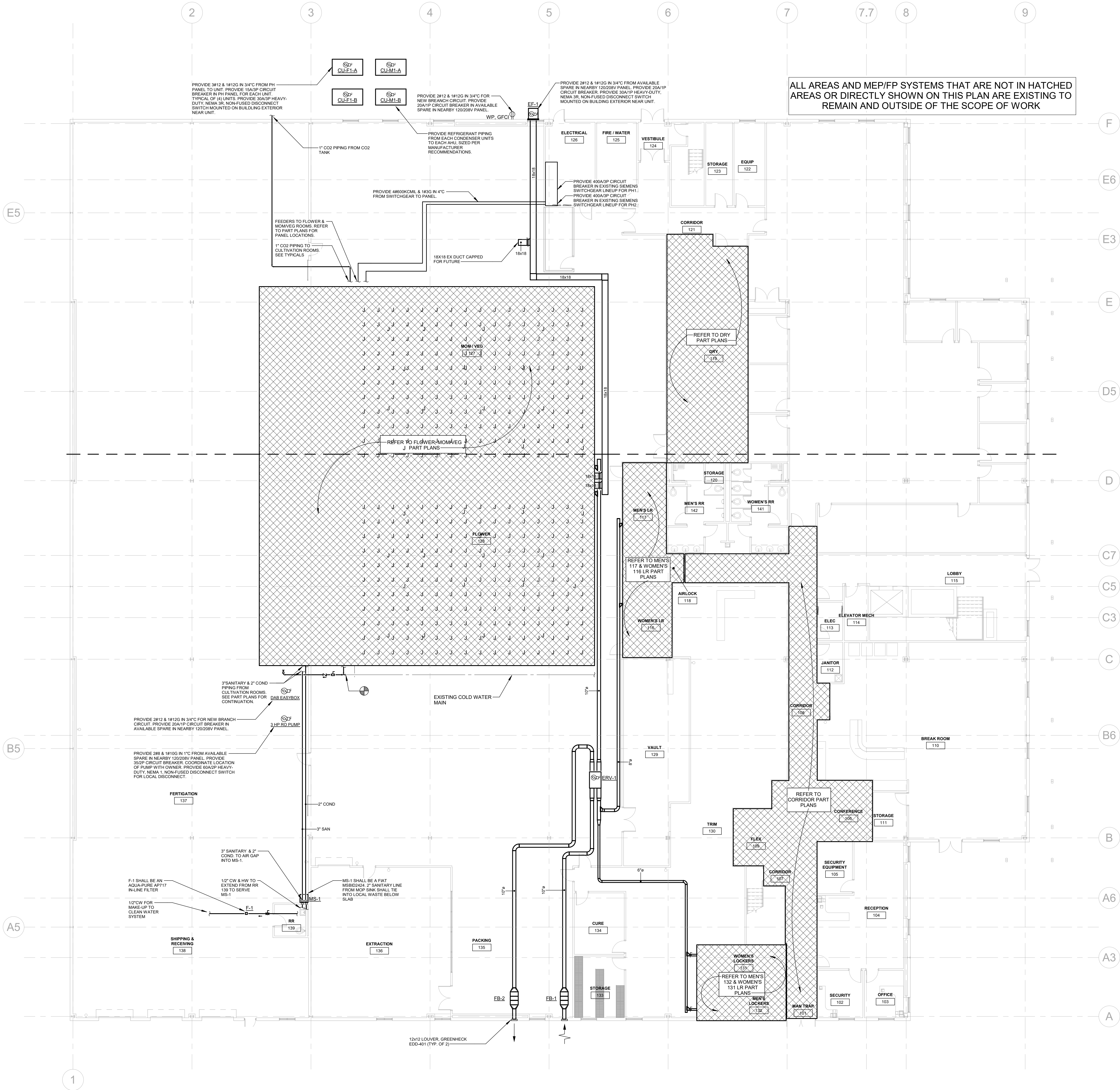
1. FP - NEW SPRINKLER HEADS
P - ETR SYSTEMS
M - NEW EXHAUST
E - NEW ELECTRICAL AND FIRE ALARM DEVICES. SEE PART PLAN
- LOCKER ROOMS 116 & 117 SCOPE NOTES

1. FP - NEW SPRINKLER HEAD IN AIRLOCK. ETR SYSTEMS IN LOCKER ROOMS. SEE PART PLAN
P - ETR SYSTEMS
M - NEW MECHANICAL EXHAUST. SEE PART PLAN
E - REMOVAL OF EXISTING POWER. SEE PART PLAN
- CORRIDOR SCOPE NOTES

1. FP - ETR SYSTEMS
P - ETR SYSTEMS
M - ETR SYSTEMS
E - NEW RECEPTACLES AND FIRE ALARM DEVICES. SEE PART PLAN
- DRY ROOM 119 SCOPE NOTES

1. FP - ETR SYSTEMS
P - ETR SYSTEMS
M - NEW DEHUMIDIFICATION. SEE PART PLAN
E - POWER FOR NEW DEHUMIDIFICATION SYSTEM. SEE PART PLAN

ALL AREAS AND MEP/FP SYSTEMS THAT ARE NOT IN HATCHED AREAS OR DIRECTLY SHOWN ON THIS PLAN ARE EXISTING TO REMAIN AND OUTSIDE OF THE SCOPE OF WORK



1 MEPFP OVERALL PLAN
3/32" = 1'-0"

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

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MEPFP OVERALL PLAN

Sheet Number

MEPFP1.0

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FIRE PROTECTION KEY NOTES

F1

PROVIDE NEW SPRINKLER HEADS FOR GROW ROOMS. PROVIDE NEW BRANCH PIPING FROM 3" EXISTING WET SPRINKLER MAIN SHOWN ON PLAN. REFER TO SPRINKLER PIPE SIZE SCHEDULE FOR BRANCH PIPE SIZING.

PLUMBING KEY NOTES

P1

1/2" CW LINE TO AHU HUMIDIFIER SERVING CULTIVATION ROOM

P2

1/2" CO2 TO SUPPLY DUCTWORK. PROVIDE SHUTOFF VALVE AND SOLENOID VALVE. COORDINATE FINAL LOCATION AND TERMINATION POINT OF CO2 PIPING WITH OWNER (TYP OF BOTH CULTIVATION ROOMS)

P3

SP-1 & SP-2 SHALL BE LIBERTY PUMP P682XLE52. PROVIDE WITH PRO680XL BASIN & PDC-230 DUPLEX CONTROL PACKAGE. WASTE SHALL BE DIRECTED OFF OF THE CULTIVATION TABLE TO A FLEXIBLE HOSE THAT IS DIRECTLY CONNECT TO THE SUMP INLET.

P4

1" CW. SEE OVERALL PLAN FOR CONTINUATION.

P5

3" SANITARY. SEE OVERALL PLAN FOR CONTINUATION.

MECHANICAL KEY NOTES

M1

LOCATION OF EXISTING HVAC UNIT TO REMAIN. REMOVE AND CAP EXISTING DUCT TAP LOCATED IN PROPOSED MOM/VEG ROOM 127.

M2

LOCATION OF EXISTING HVAC UNIT TO REMAIN. RECONFIGURE EXISTING DUCTWORK IN ORDER FOR GRILLES TO BE LOCATED OUTSIDE OF PROPOSED FLOWER & MOM/VEG ROOMS.

M3

PROVIDE 24"x24" TRANSFER GRILLE. TITUS 350RL, WITH MOTORIZED DAMPER. DAMPER SHALL BE NORMALLY CLOSED AND SHALL OPEN UPON ACTIVATION OF EF-1.

ELECTRICAL KEY NOTES

E1

PROVIDE SURFACE-MOUNT WORK LIGHT FIXTURE, BASIS OF DESIGN GROWLITE GLE-GL, GREEN LED, 1-10V DIMMING.

E2

PROVIDE NEW FIRE ALARM NOTIFICATION APPLIANCE COMPATIBLE WITH EXISTING FIRELITE ES-200X SYSTEM. INCLUDE MODIFICATION OF EXISTING CIRCUITS, PROVISIONS FOR ADDITIONAL CIRCUITS, UPDATED BATTERY CALCULATION, AND REPROGRAMMING OF SYSTEM TO ACCOMMODATE ADDITIONAL DEVICES.

E3

PROVIDE 277/480V, 3P, 4W, 225 MCB, 42-CIRCUIT, NEMA 1 PANELBOARD FOR MOM/VEG ROOM LABELED "PH1".

E4

PROVIDE 45 KVA, 480V PRIMARY, 120/208V SECONDARY NEMA TRANSFORMER HUNG FROM CEILING STRUCTURE. COORDINATE MOUNTING WITH STRUCTURAL ENGINEER. REFER TO TRANSFORMER SCHEDULE.

E5

PROVIDE 120/208V, 3P, 4W, 150A MCB, 42-CIRCUIT, NEMA 1 PANELBOARD FOR MOM/VEG AND FLOWER LABELED "PL1".

E6

PROVIDE 277/480V, 3P, 4W, 225A MCB, 42-CIRCUIT, NEMA 1 PANELBOARD FOR FLOWER ROOM LABELED "PH2".

E7

PROVIDE LIGHTING CONTROL RELAY PANEL FOR CULTIVATION LIGHTING. REFER TO LIGHTING CONTROL RELAY DETAIL. BASIS OF DESIGN, HUBBELL NX SERIES.

E8

PROVIDE 2#12 & 1#12G IN 3/4"C TO 20A/1P CIRCUIT BREAKER IN PH PANEL.

E9

PROVIDE JUNCTION BOX FOR GROW LIGHT FIXTURES ON CEILING. COORDINATE RECEPTACLE TYPE AND LOCATION WITH OWNER AND VENDOR. PROVIDE GFI PROTECTION TO CIRCUIT IN COMPLIANCE WITH NEC.

E10

PROVIDE 2#12 & 1#12G IN 3/4"C TO 20A/1P CIRCUIT BREAKER IN PH PANEL VIA LIGHTING CONTROL PANEL.

E11

PROVIDE JUNCTION BOX FOR CIRCULATION FAN ON CEILING. COORDINATE LOCATION WITH ARCHITECTURAL PLANS.

E12

PROVIDE 2#12 & 1#12G IN 3/4"C BETWEEN CIRCULATION FANS TO 20A/1P CIRCUIT. PROVIDE 30A-2P NEMA 1 HEAVY-DUTY NON-FUSED DISCONNECT SWITCH OUTSIDE ROOM FOR EACH CIRCUIT.

E13

PROVIDE 2#12 & 1#12G IN 3/4"C FOR NEW BRANCH CIRCUIT. PROVIDE 20A/1P CIRCUIT BREAKER IN PANEL PL1.

E14

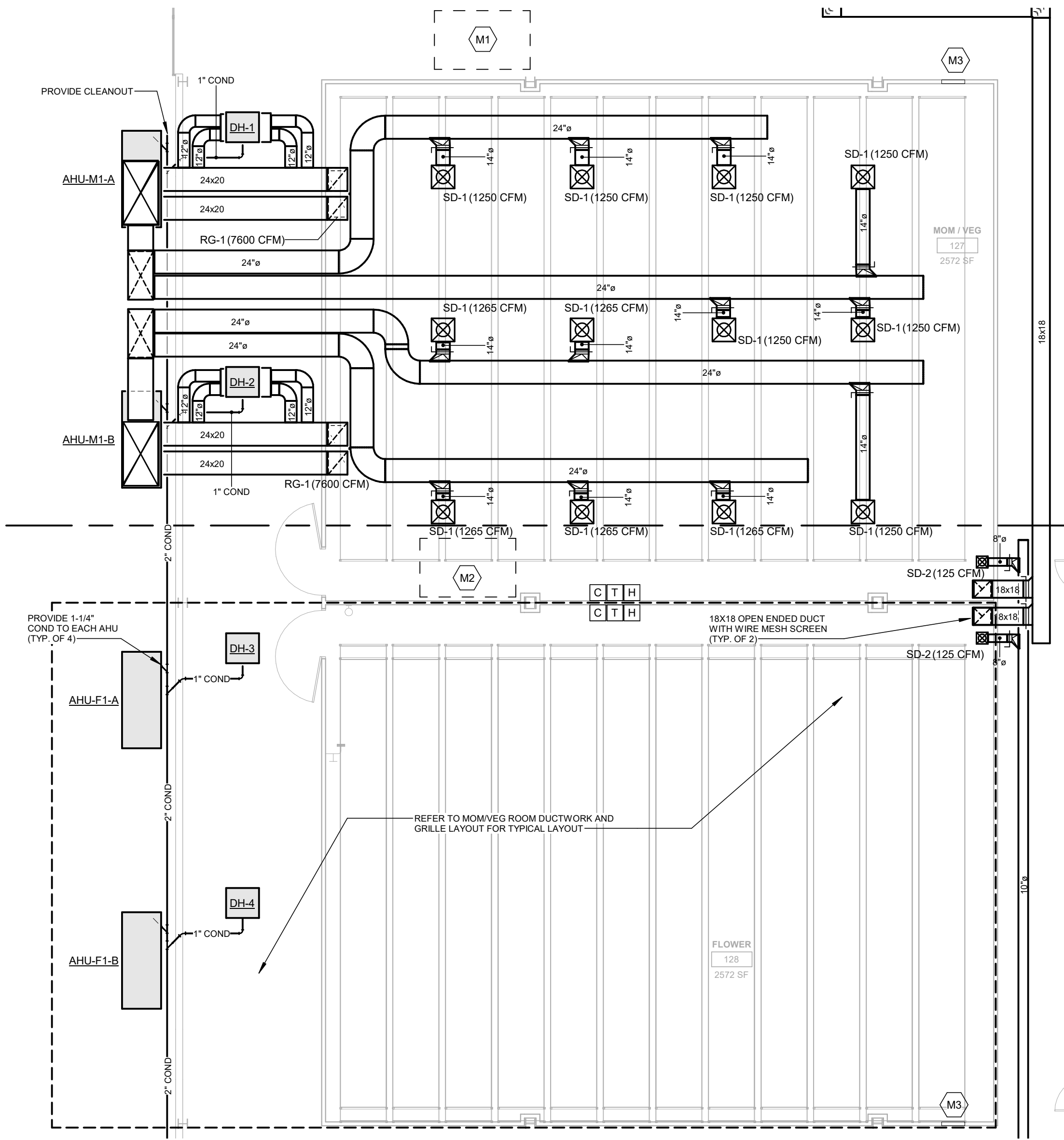
PROVIDE 3#4 & 1#8G IN 1-1/4"C FROM PH PANEL TO UNIT. PROVIDE 80A/3P CIRCUIT BREAKER IN PH PANEL FOR EACH UNIT. PROVIDE 100A/3P HEAVY-DUTY, NEMA 1, NON-FUSED DISCONNECT SWITCH ON CORRIDOR WALL.

E15

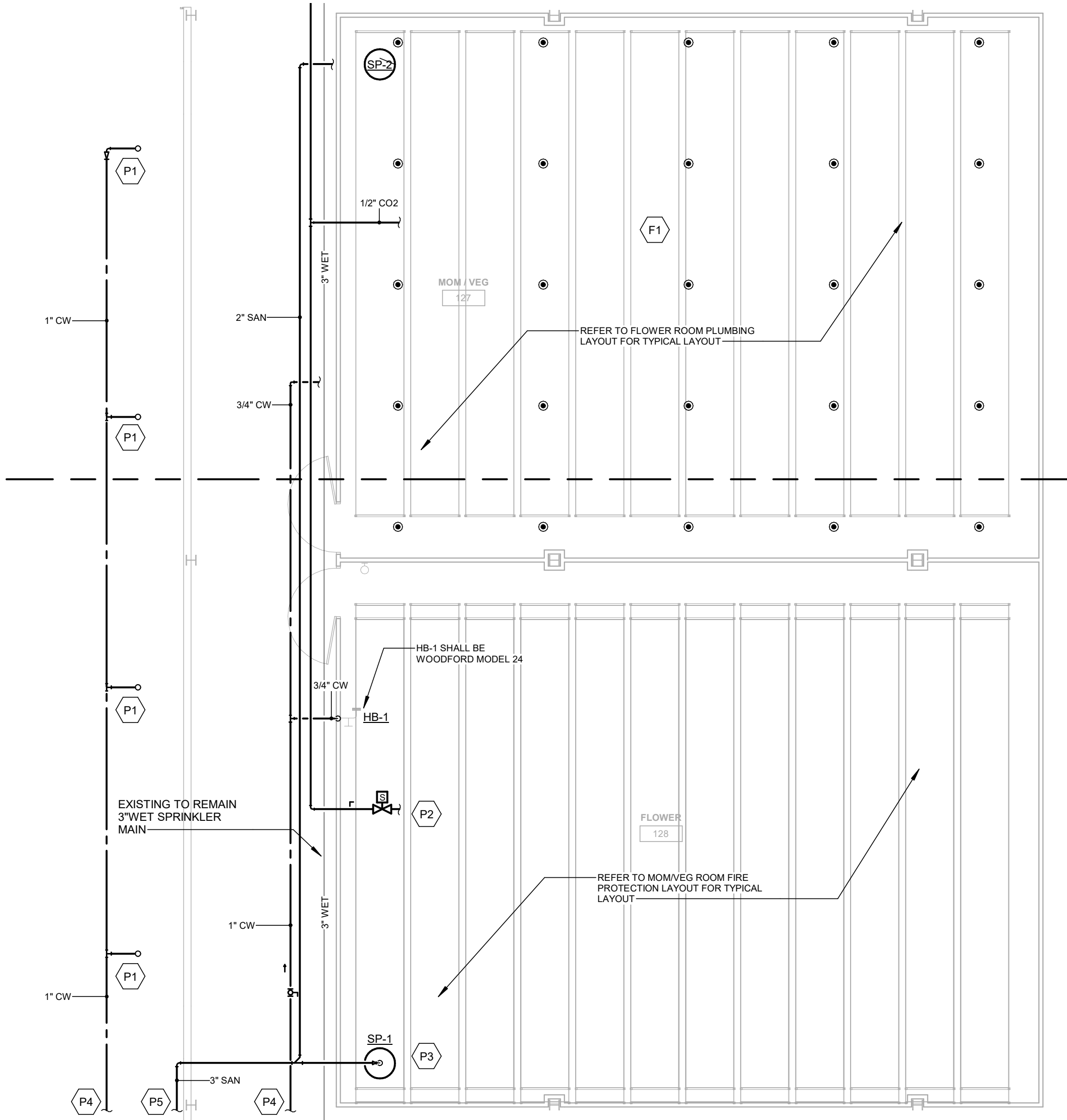
PROVIDE 3#10 & 1#10G IN 3/4"C FROM PH PANEL TO UNIT. PROVIDE 30A/2P CIRCUIT BREAKER IN PH PANEL FOR EACH UNIT. PROVIDE 30A/2P HEAVY-DUTY, NEMA 1, NON-FUSED DISCONNECT SWITCH ON CORRIDOR WALL AND L7-30.

E16

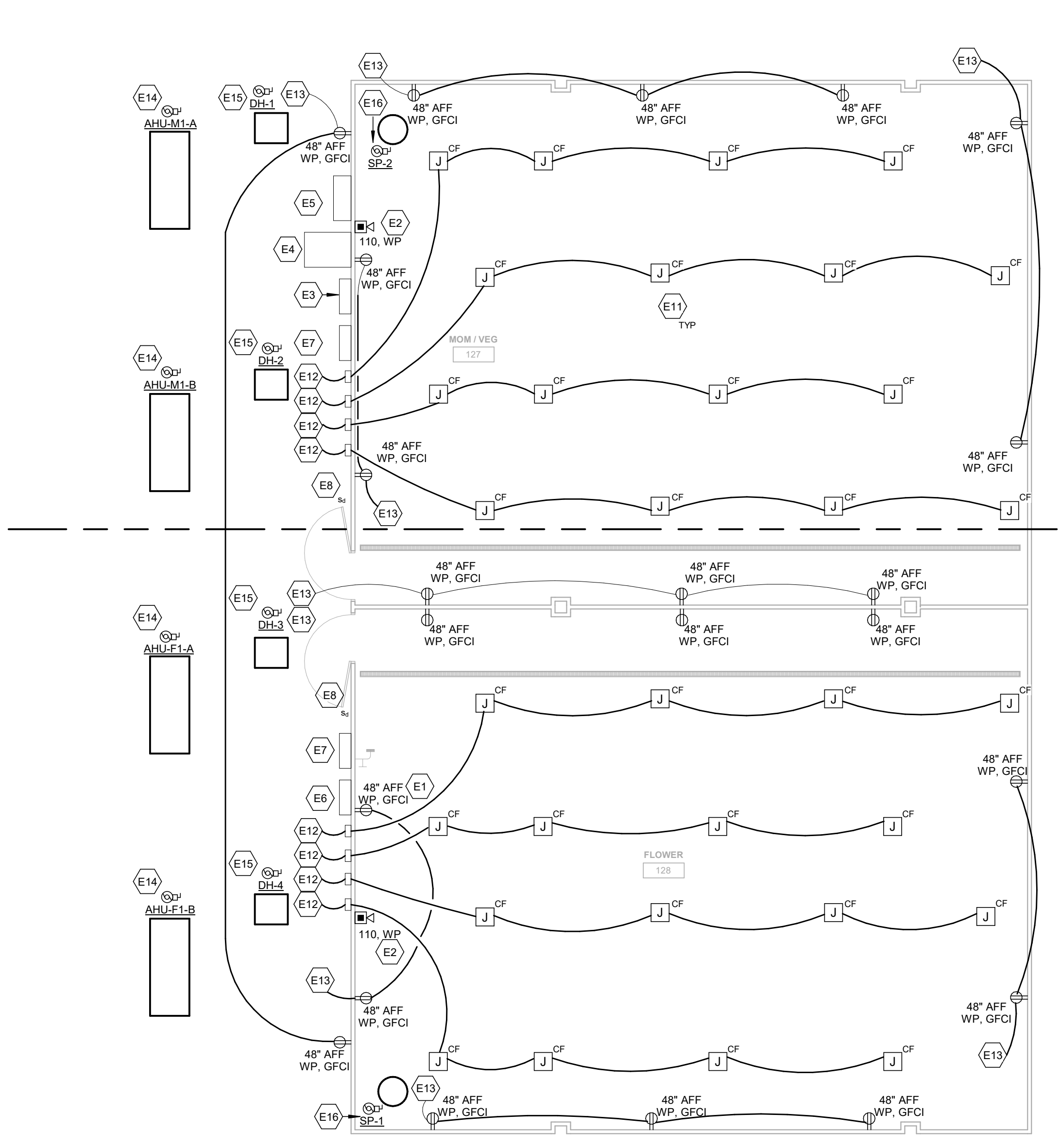
PROVIDE 3#12 & 1#12G IN 3/4"C FROM PL1 PANEL TO UNIT. PROVIDE 20A/2P CIRCUIT BREAKER IN PL1 PANEL FOR EACH UNIT. PROVIDE MOTOR RATED TOGGLE SWITCH.



1 FLOWER & MOM/VEG ROOM MECHANICAL DUCTWORK PART PLAN
1/8" = 1'-0"



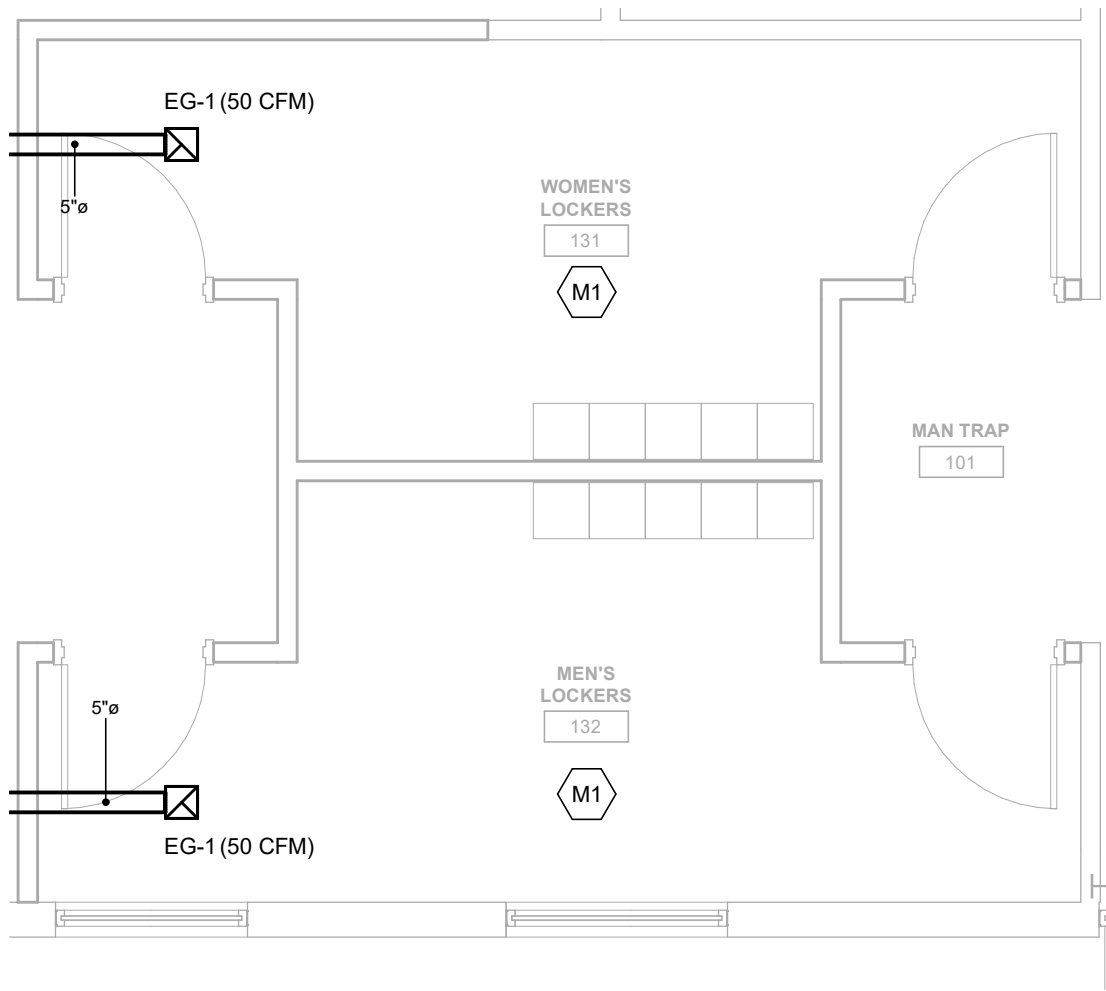
2 FLOWER & MOM/VEG ROOM FIRE PROTECTION & PLUMBING PART PLAN
1/8" = 1'-0"



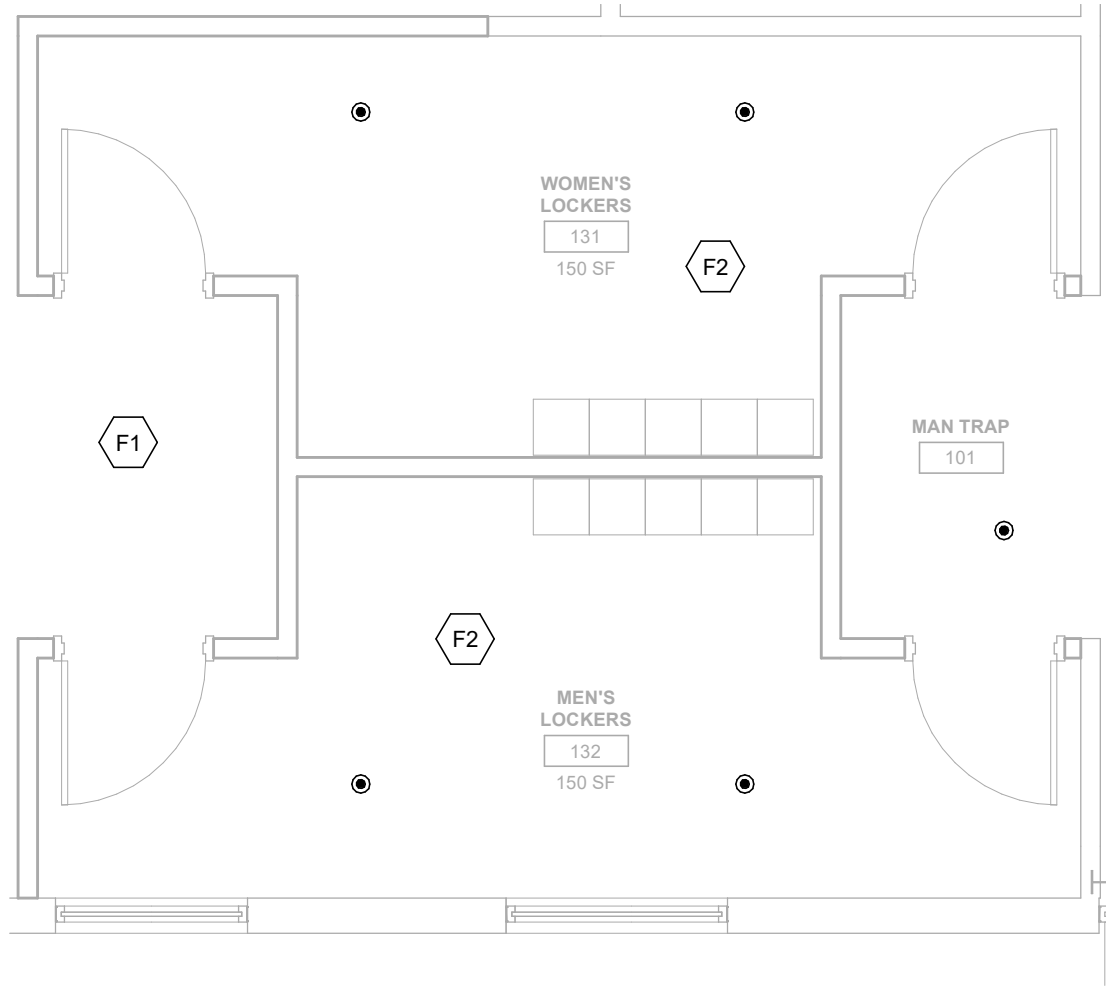
FIRE PROTECTION KEY NOTES	
F1	SPRINKLERS IN ENTRANCE TO TRIM ROOM ARE EXISTING TO REMAIN.
F2	PROVIDE NEW SPRINKLER FROM EXISTING BRANCH PIPE FOR NEW CEILING.

MECHANICAL KEY NOTES	
M1	HEATING AND COOLING SYSTEMS ARE EXISTING TO REMAIN.

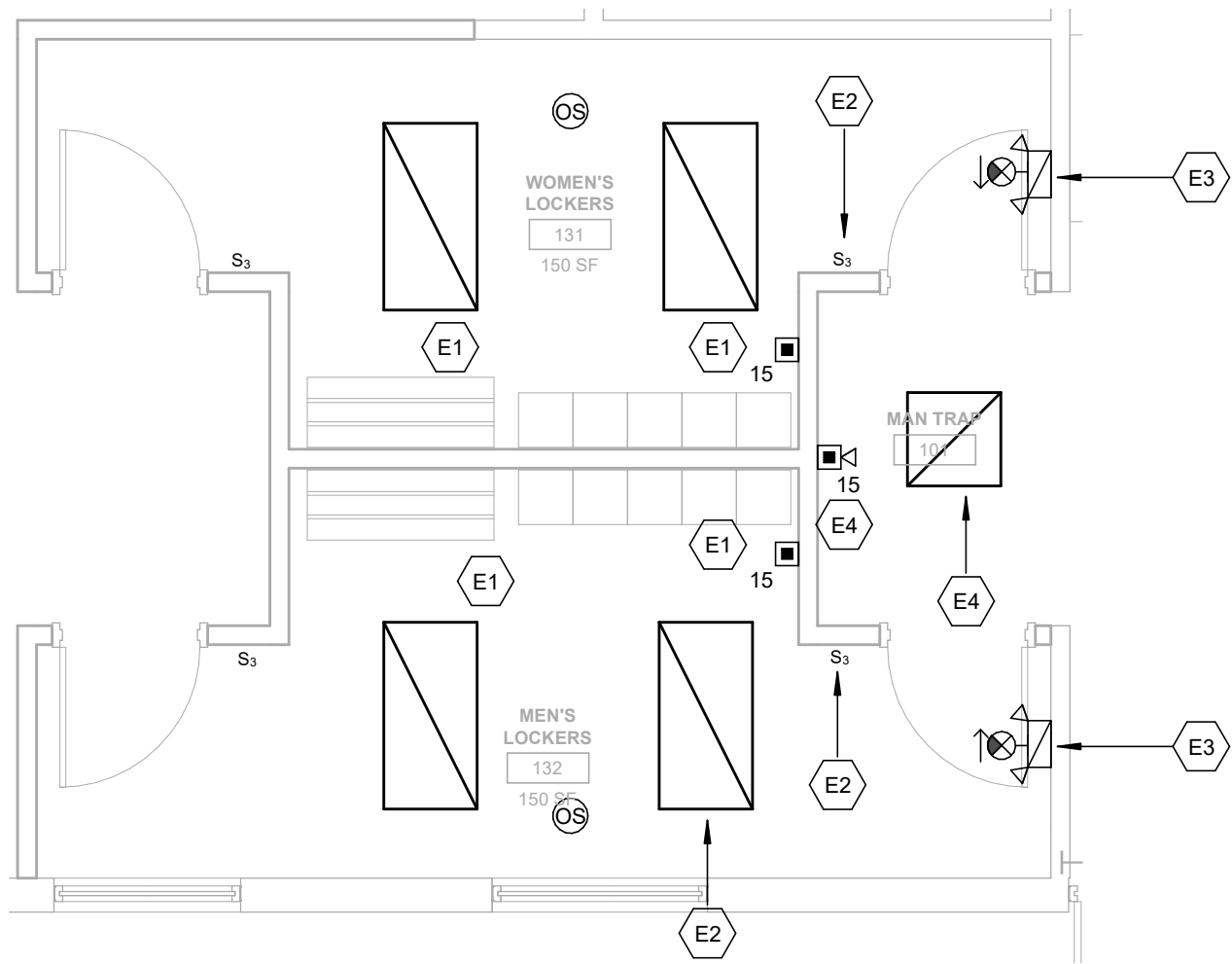
ELECTRICAL KEY NOTES	
E1	REUSE EXISTING LIGHT FIXTURES; ADJUST LOCATION AS NECESSARY FOR CEILING GRID. PROVIDE NEW WIRING BETWEEN SWITCHES AND FIXTURES.
E2	EXTEND 20A/1P WIRING TO EXISTING UNSWITCHED LIGHTING CIRCUIT.
E3	PROVIDE THERMOPLASTIC EMERGENCY EXIT SIGN WITH EGRESS LIGHTING, BASIS OF DESIGN LITHONIA LHOM LED, LETTERING AS INDICATED.
E4	PROVIDE FIXTURE, BASIS OF DESIGN COLUMBIA LCAT 2X2 SERIES, LCAT22-35MLG-R-EDU, 3500LM, 5000K, 80+CRI, DLC LISTED, REMOVABLE LENS, EXTEND EXISTING CORRIDOR LIGHTING CIRCUIT TO NEW FIXTURE (TYPICAL OF POWER AND CONTROL)
E5	PROVIDE NEW FIRE ALARM NOTIFICATION APPLIANCE COMPATIBLE WITH EXISTING FIRELITE ES-200X SYSTEM. INCLUDE MODIFICATION OF EXISTING CIRCUITS, PROVISIONS FOR ADDITIONAL CIRCUITS, UPDATED BATTERY CALCULATION, AND REPROGRAMMING OF SYSTEM TO ACCOMMODATE ADDITIONAL DEVICES.



2 LOCKER ROOMS 131 & 132 MECHANICAL DUCTWORK PART PLAN
1/4" = 1'-0"



1 LOCKER ROOMS 131 & 132 FIRE PROTECTION PART PLAN
1/4" = 1'-0"

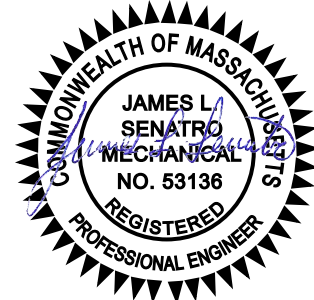


3 LOCKER ROOMS 131 & 132 ELECTRICAL PART PLAN
1/4" = 1'-0"

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Checked By: NHF
Revisions:

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Sheet Description

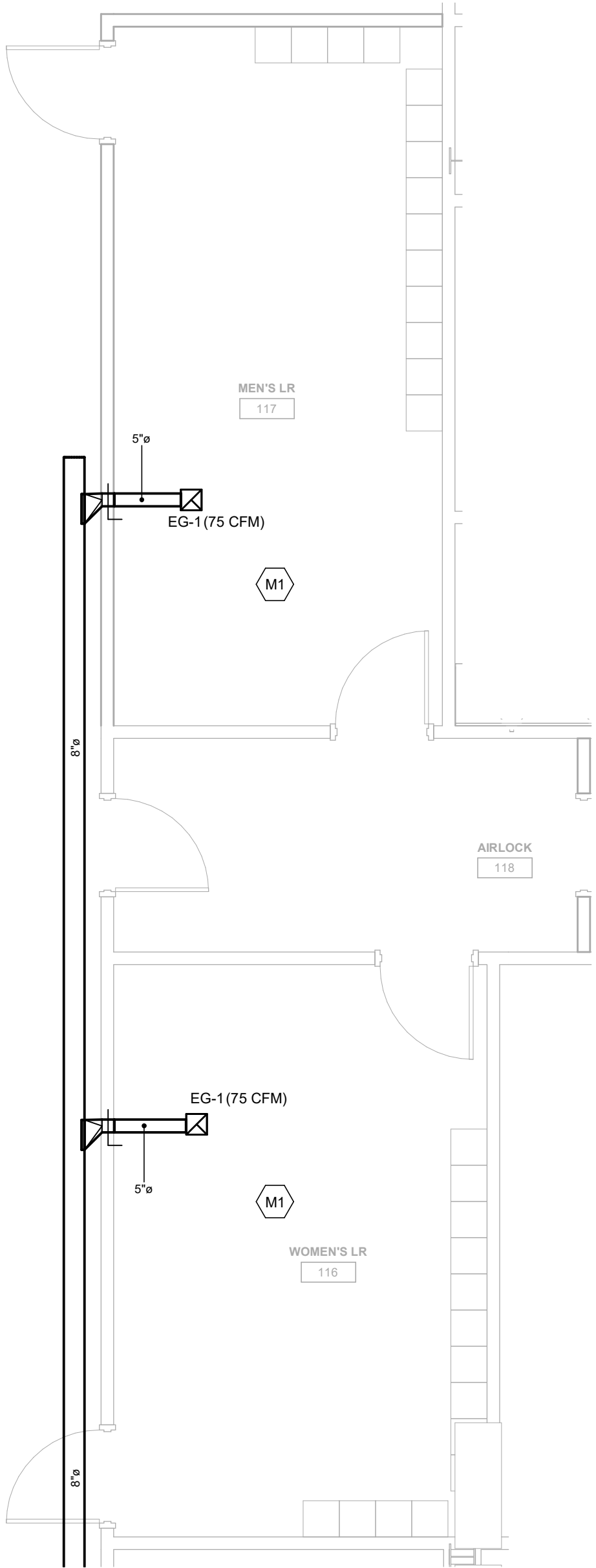
LOCKER ROOMS 131 & 132 MEPFP PART PLANS

Sheet Number

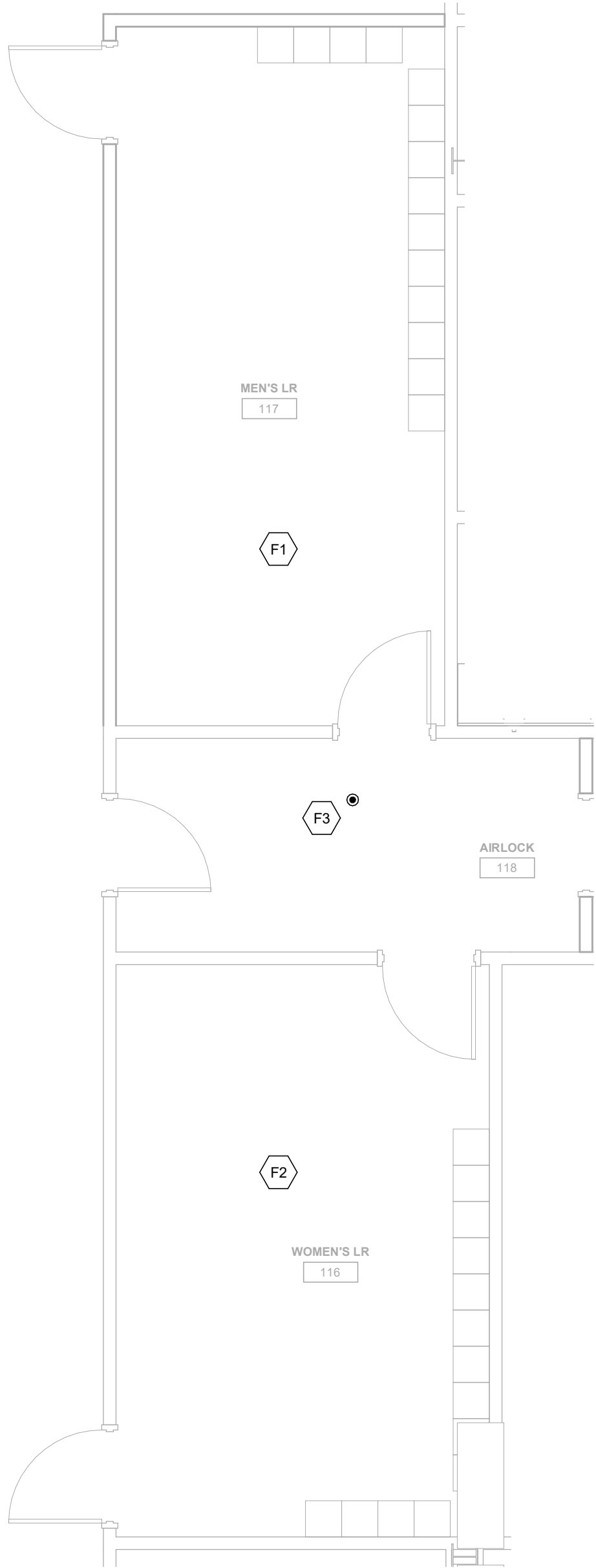
FIRE PROTECTION KEY NOTES	
F1	EXISTING SPRINKLERS IN MEN'S LR 117 ARE EXISTING TO REMAIN.
F2	EXISTING SPRINKLERS IN WOMEN'S LR 116 ARE EXISTING TO REMAIN.
F3	PROVIDE NEW SPRINKLER FROM EXISTING BRANCH PIPE FOR NEW CEILING.

MECHANICAL KEY NOTES	
M1	EXISTING HEATING AND COOLING SYSTEMS ARE EXISTING TO REMAIN

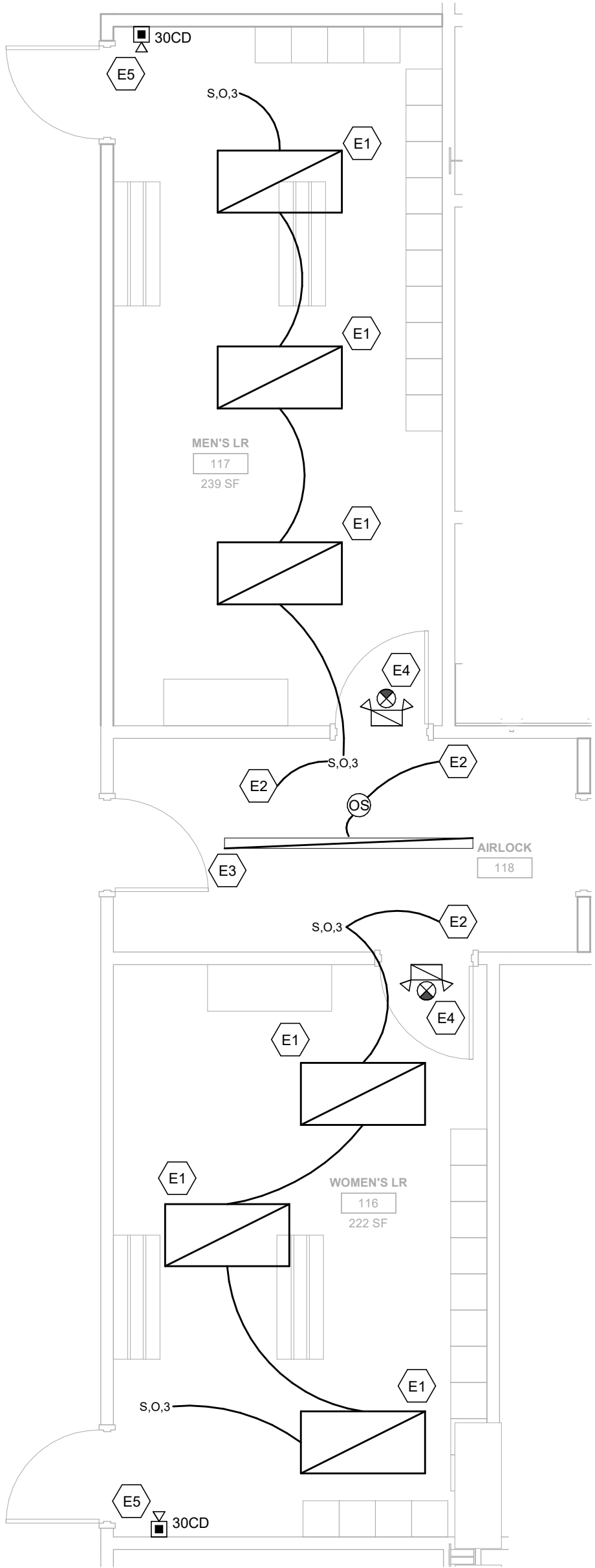
ELECTRICAL KEY NOTES	
E1	REUSE EXISTING LIGHT FIXTURES; ADJUST LOCATION AS NECESSARY FOR CEILING GRID. PROVIDE WIRING BETWEEN SWITCHES AND FIXTURES
E2	EXTEND 20A/1P WIRING TO EXISTING UNSWICHED LIGHTING CIRCUIT
E3	PROVIDE FIXTURE, BASIS OF DESIGN COLUMBIA LCL SERIES, LCL8-35-HL-ED-U, 3500K, 80+CRI, DLC LISTED, ACRYLIC DIFFUSER
E4	PROVIDE THERMOPLASTIC EMERGENCY EXIT SIGN WITH EGRESS LIGHTING, BASIS OF DESIGN LITHONIA LHQM LED, LETTERING AS INDICATED
E5	PROVIDE NEW FIRE ALARM NOTIFICATION APPLIANCE COMPATIBLE WITH EXISTING FIRELITE ES-200X SYSTEM. INCLUDE MODIFICATION OF EXISTING CIRCUITS, PROVISIONS FOR ADDITIONAL CIRCUITS, UPDATE BATTERY CALCULATION, AND REPROGRAMMING OF SYSTEM TO ACCOMMODATE ADDITIONAL DEVICES



1 LOCKER ROOMS 116 & 117 MECHANICAL DUCTWORK PART PLAN
1/4" = 1'-0"



2 LOCKER ROOMS 116 & 117 FIRE PROTECTION PART PLAN
1/4" = 1'-0"

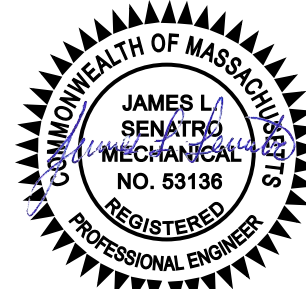


3 LOCKER ROOMS 116 & 117 ELECTRICAL PART PLAN
1/4" = 1'-0"

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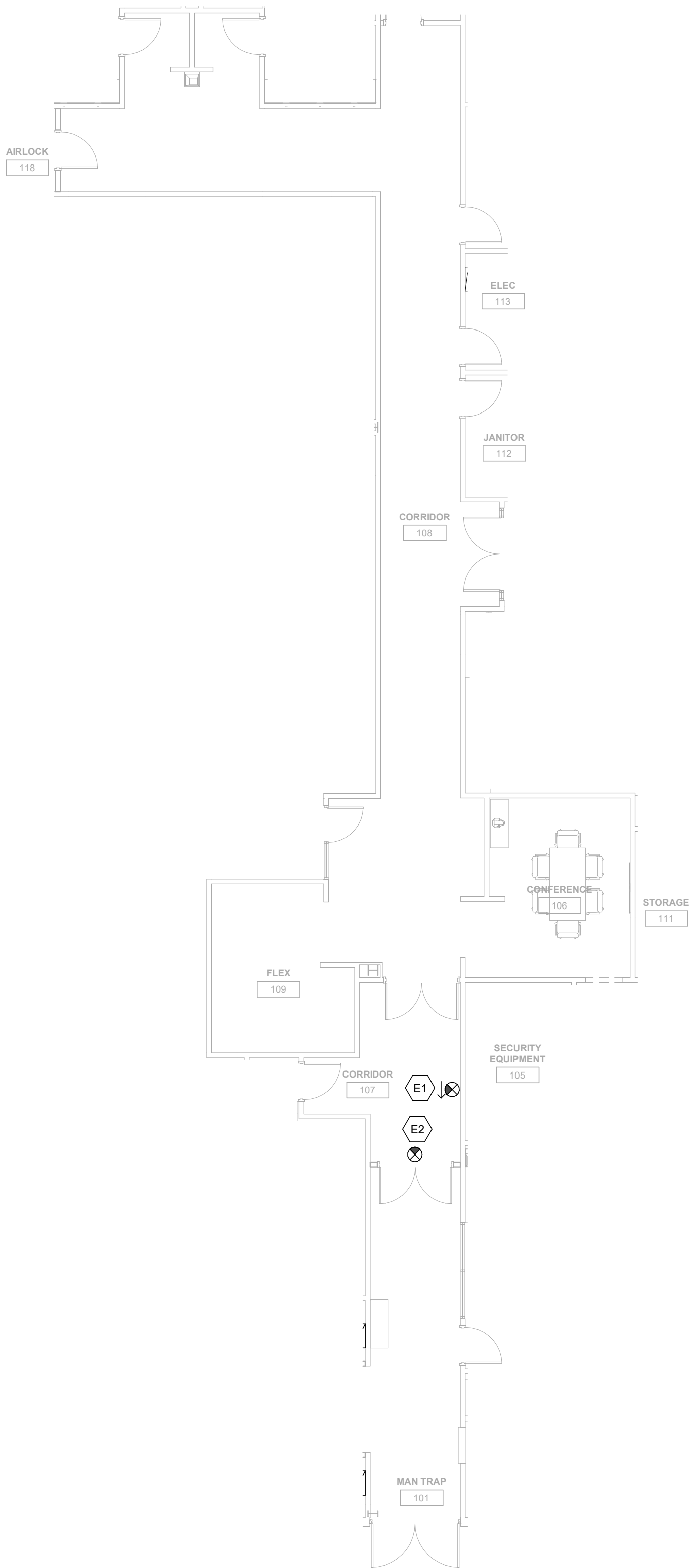
Sheet Description

LOCKER
ROOMS 116 &
117 PART
PLANS

Sheet Number

MEPFP2.3

ELECTRICAL KEY NOTES	
E1	EXISTING EXIT SIGN LOCATION
E2	RELOCATE EXISTING EXIT SIGN AS INDICATED. REMOVE OR BLANK OUT EXISTING DIRECTIONAL ARROW. EXTEND EXISTING BRANCH CIRCUIT WIRING AS NECESSARY.



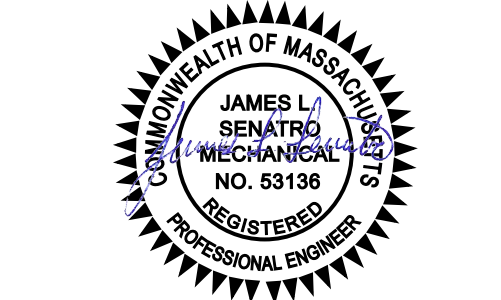
1 CORRIDOR ELECTRICAL PART PLAN
1/8" = 1'-0"

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

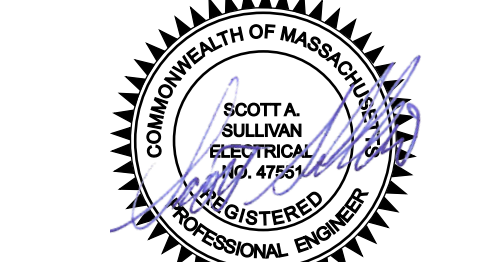
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Sheet Description

CORRIDOR MEFP PART PLANS

Sheet Number

MEPFP2.4

MECHANICAL KEY NOTES

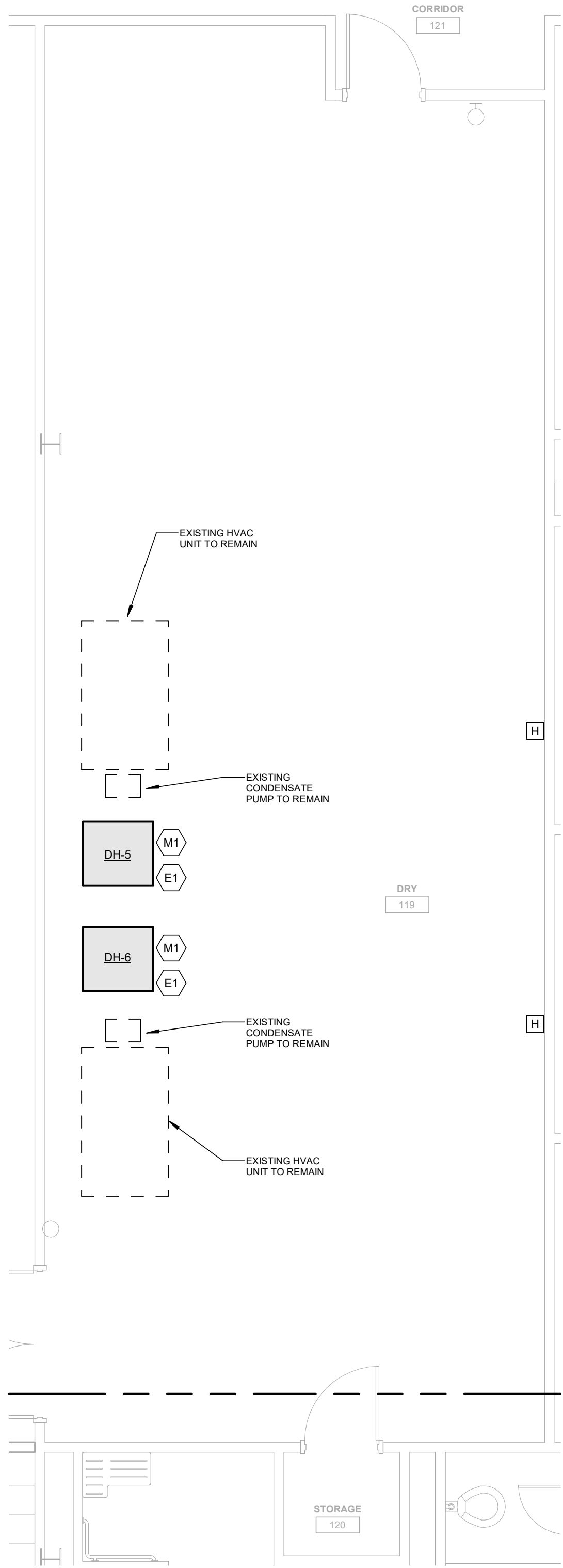
M1

PROVIDE 1" CONDENSATE PIPE FROM DH-5 TO EXISTING CONDENSATE PUMP CURRENTLY SERVING THE EXISTING HVAC UNIT.

ELECTRICAL KEY NOTES

E1

PROVIDE 3#10 & 1#10G IN 3/4" FC FROM PH PANEL TO UNIT. PROVIDE 30A/2P CIRCUIT BREAKER IN PH PANEL FOR EACH UNIT. PROVIDE 30A/2P HEAVY-DUTY, NEMA 1, NON-FUSED DISCONNECT SWITCH ON CORRIDOR WALL AND L7-30 RECEPTACLE FOR EACH UNIT.



1 DRY ROOM MECHANICAL/ELECTRICAL DUCTWORK PART PLAN
1/4" = 1'-0"

2WR

ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

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JAMES L. BENATRO
MECHANICAL
NO. 53158
REGISTERED PROFESSIONAL ENGINEER

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SCOTT A. RULLMAN
ELECTRICAL
NO. 47957
REGISTERED PROFESSIONAL ENGINEER

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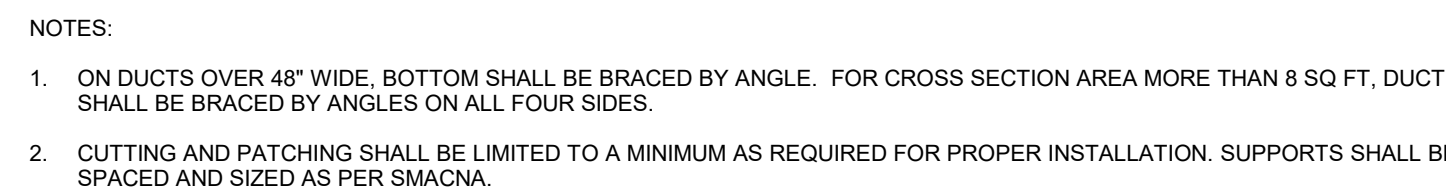
No.	Date	Description
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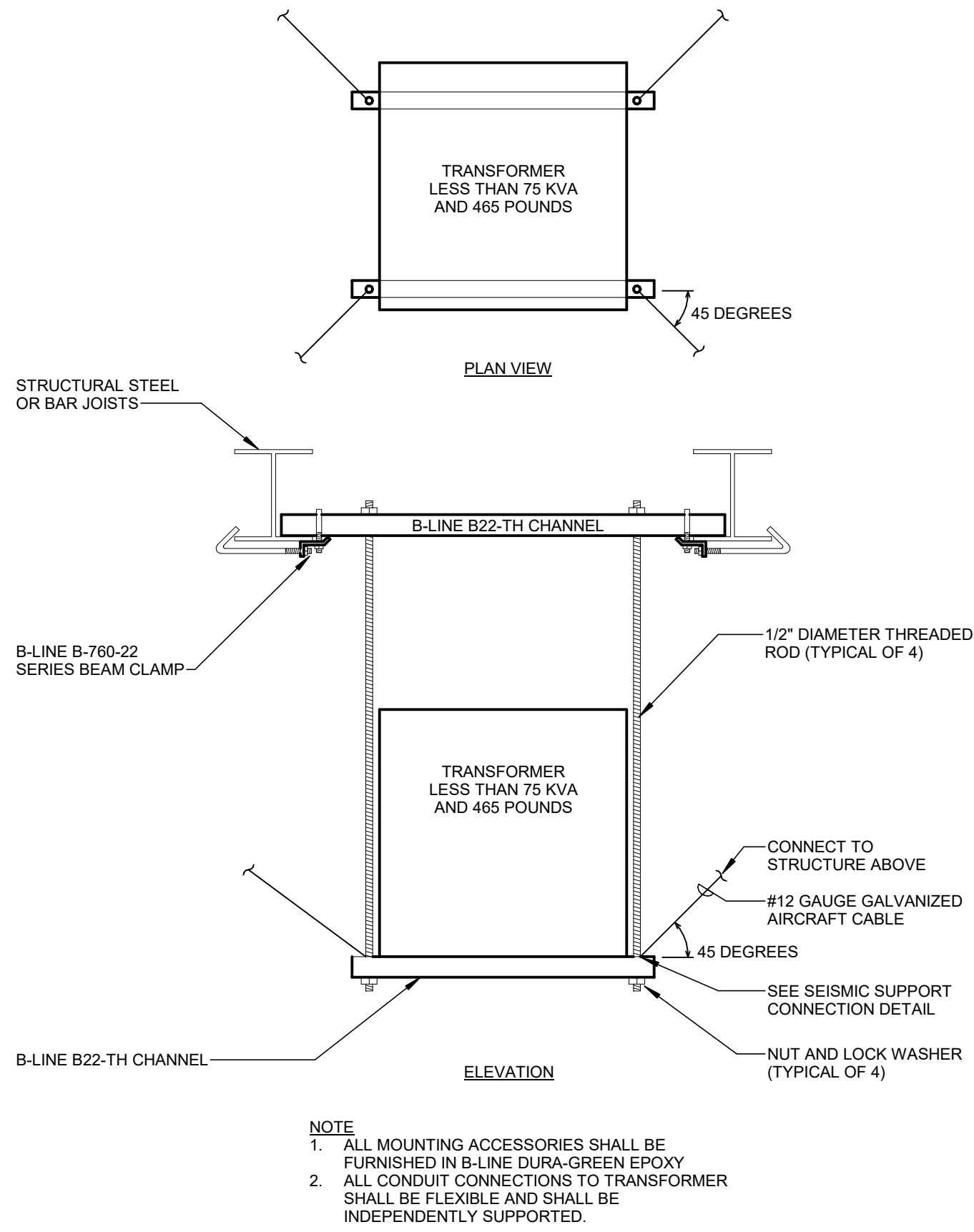
DRY ROOM
MEPFP PART
PLANS

Sheet Number

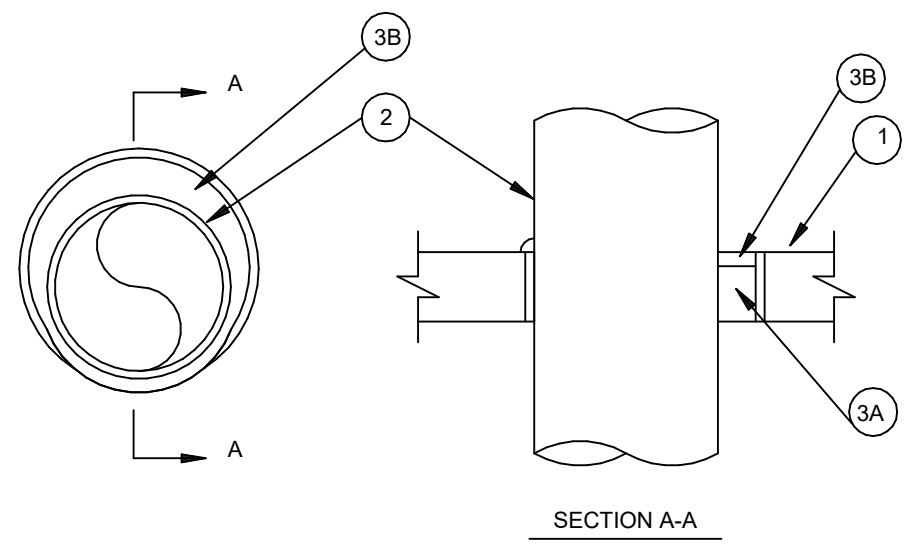
MEPFP2.5



1. CONCEALED SPRINKLER
DEPTH REQUIREMENT:
2-1/4" MINIMUM TO 2-3/4"
MAXIMUM.



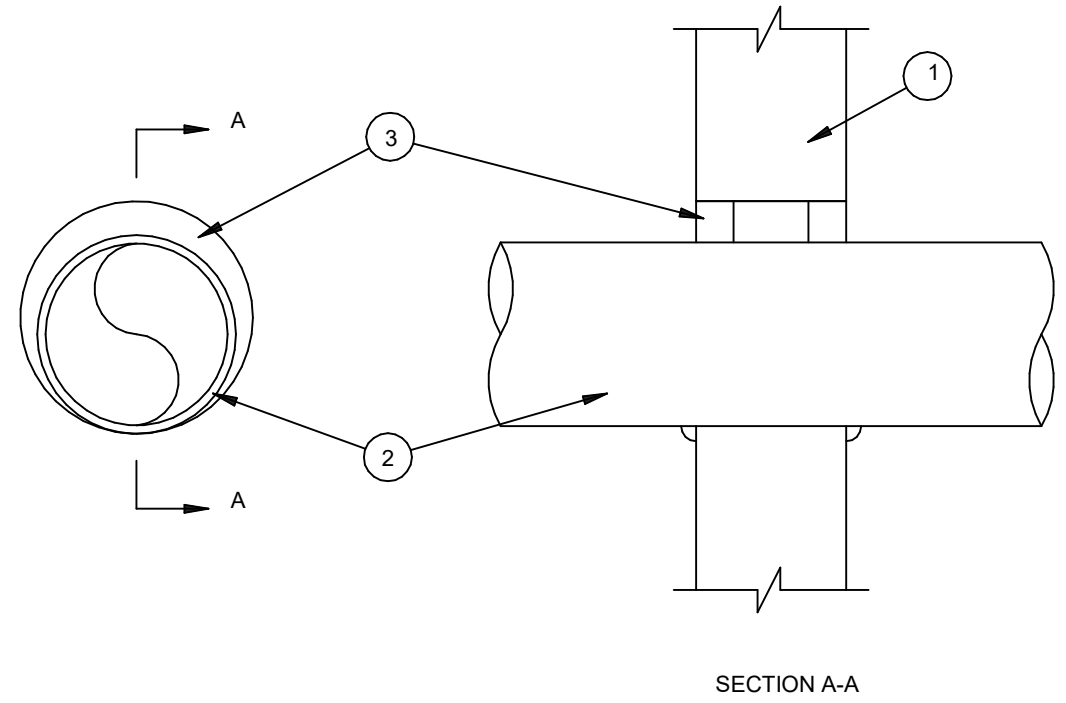
6 SUSPENDED TRANSFORMER SEISMIC SUPPORT DETAIL NTS



1. FLOOR ASSEMBLY — MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. MAX DIAMETER OF OPENING IS 31-7/8 IN.
2. THROUGH PENETRANTS — ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED CONCENTRICALLY WITHIN THE FIRESTOP DEVICE. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR ASSEMBLY.
3. FIRESTOP SYSTEM — THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
 - A. PACKING MATERIAL — MIN 2 IN. THICKNESS OF MIN 4 PCF MINERAL WOOL BATT INSULATION TIGHTLY PACKED INTO THE OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
 - B. FILL, VOID OR CAVITY MATERIALS* - SEALANT MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR. AT POINT CONTACT, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/SLEEVE/PIPE INTERFACE ON TOP SURFACES OF FLOOR.

SEALANT: HILTI FS-ONE OR APPROVED EQUAL.
*BEARING THE UL CLASSIFICATION MARK

7 UL LISTED CONDUIT SLEEVE FIRESTOPPING SPECIFICATIONS NTS

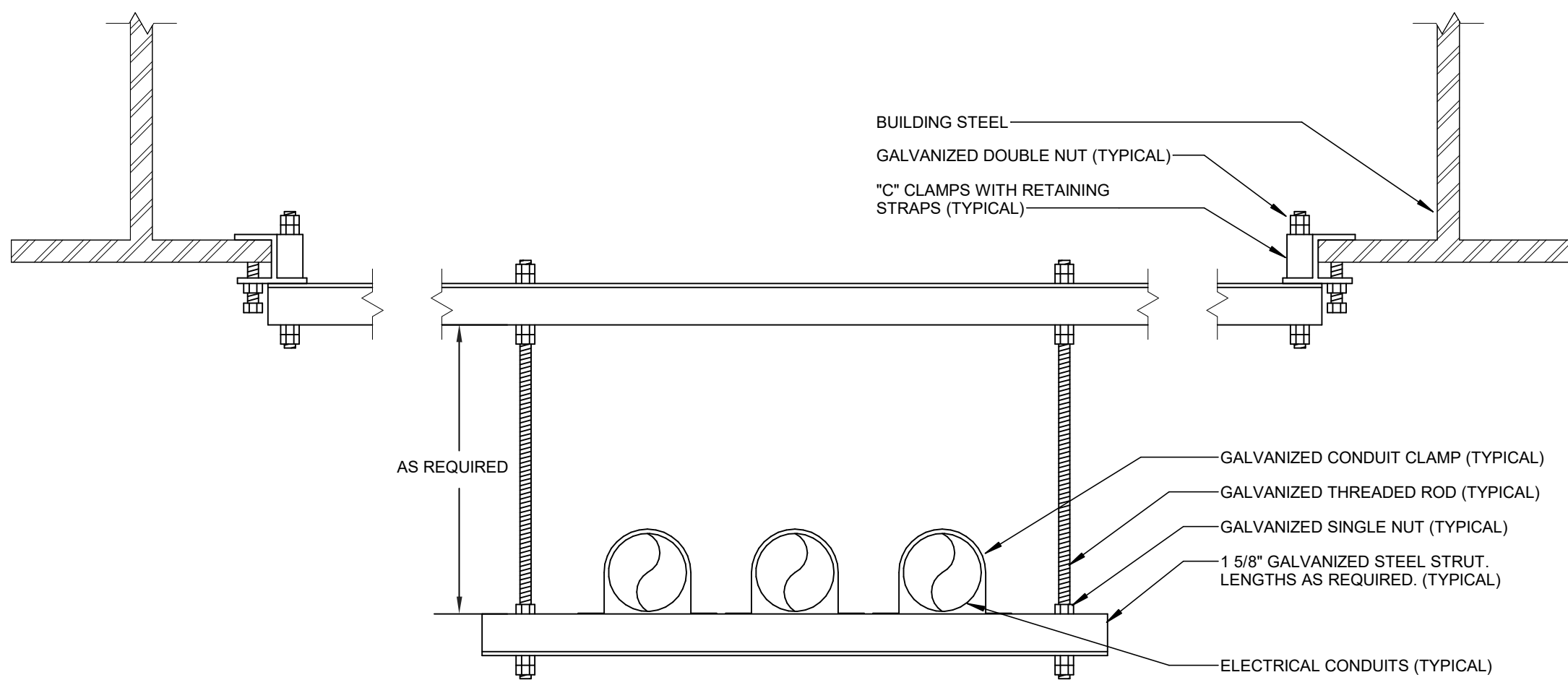


1. WALL ASSEMBLY - MIN 3-3/4 IN. AND 5 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS.
2. THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM PERPENDICULAR. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY.
3. FILL, VOID OR CAVITY MATERIAL* - MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE-WALL INTERFACE ON BOTH SURFACES OF WALL.

SEALANT: FS-ONE SEALANT
*BEARING THE UL CLASSIFICATION MARK

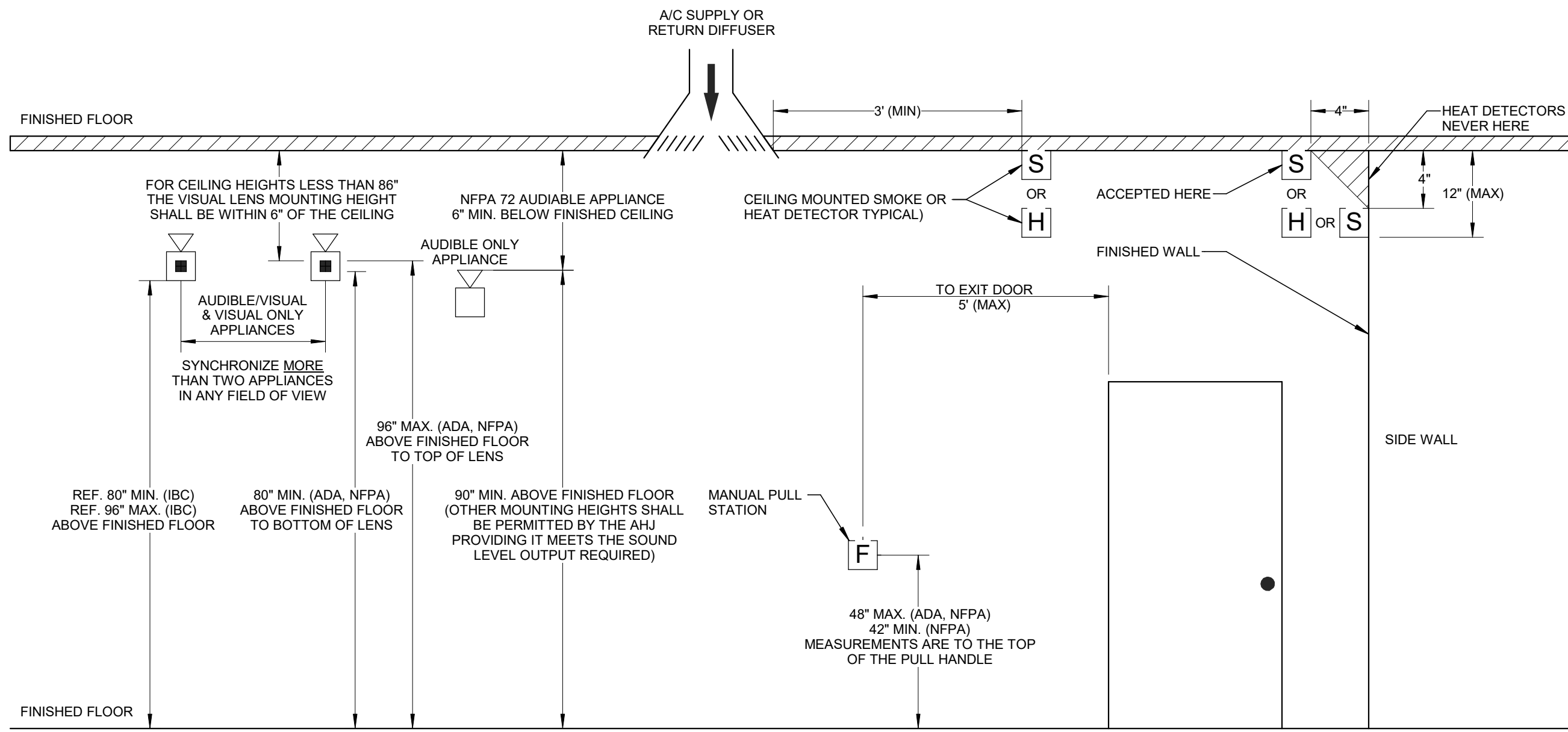
4. PROVIDE A BEAD OF NON-SHRINK, WP SILICON SEALANT AROUND EXTERIOR WALL PENETRATIONS.

2 HUBBELL NX RELAY PANEL DETAIL NTS



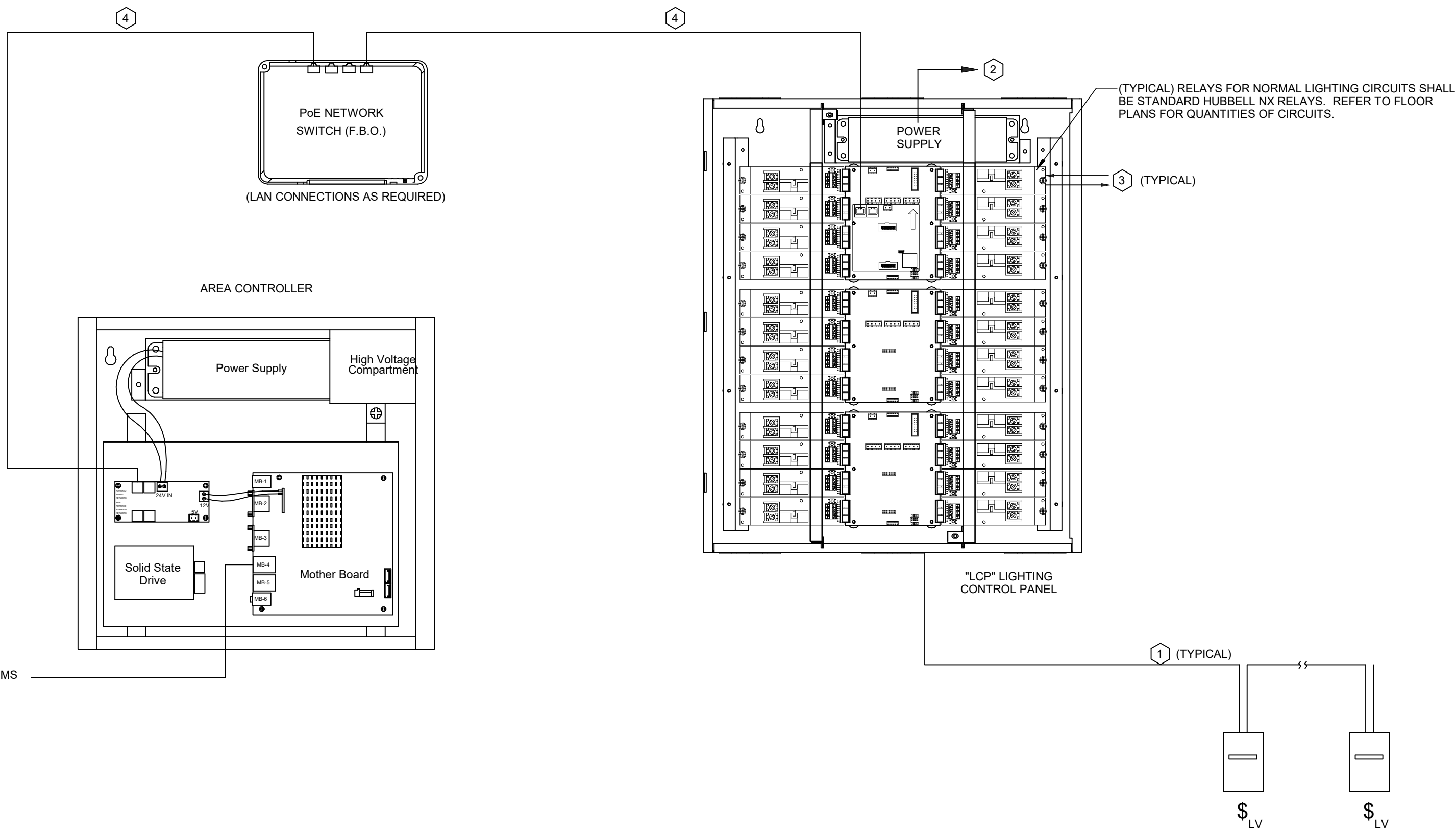
- NOTES:
1. PROVIDE ALL REQUIRED HARDWARE INCLUDING BUT NOT LIMITED TO THREADED ROD, WASHERS, BOLTS, BEAM CLAMPS, STRAPS, AND CHANNEL SPRING NUTS.
 2. QUANTITIES AND SIZE OF CONDUITS VARY.

3 TYPICAL CONDUIT HANGING DETAIL 1/8" = 1'-0"



NOTE:
REFER TO THE PROPER DEVICE INSTALLATION INSTRUCTIONS FOR BACKBOX MOUNTING HEIGHT.

1 FIRE ALARM DEVICE MOUNTING HEIGHT REFERENCE DETAIL N.T.S.



WIRING LEGEND:

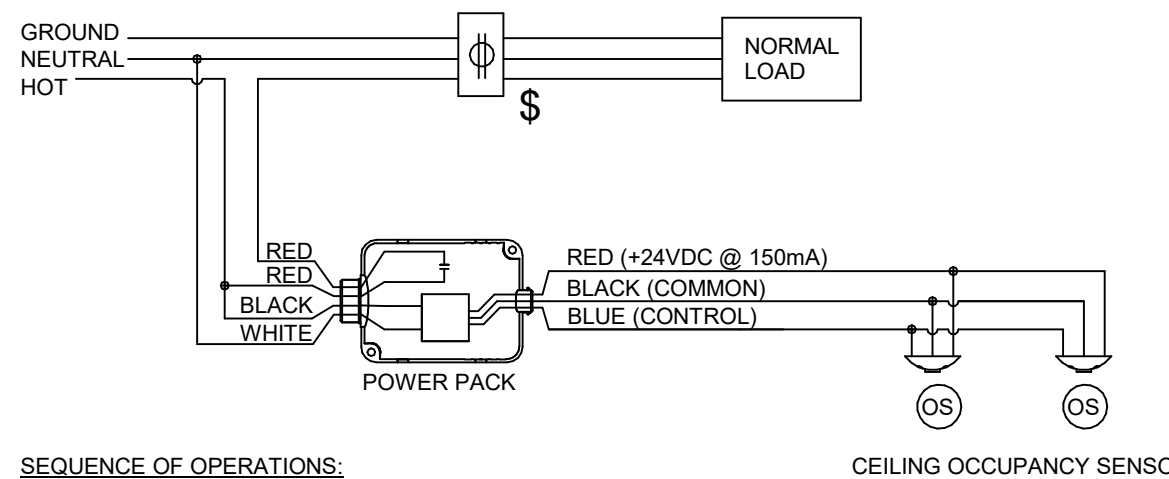
- 1 18/2 DATALINE CABLE
- 2 2#12 + #12 GND. TO NORMAL POWER FEED INDICATED ON FLOOR PLANS.
- 3 LINE 2#12 + #12G FROM NORMAL POWER FEED INDICATED ON FLOOR PLANS
- 4 CAT5E CABLE

GENERAL NOTES:

1. BASIS OF DESIGN IS HUBBELL NX.
2. PROVIDE FACTORY ENGRAVING ON ALL WALL SWITCHES AND ROOM CONTROLLER BUTTONS AS INDICATED IN DETAIL.
3. PROVIDE FACTORY COMMISSIONING OF ALL SENSORS, PHOTOCELLS AND CONTROLS.
4. REFER TO FLOOR PLANS FOR EXACT LIGHTING FIXTURES ON EACH ZONE, AND QUANTITY AND LOCATION OF ALL DEVICES.
5. PROVIDE OPTIONAL ADD-IN VOLTAGE BARRIERS FOR SEPARATING NORMAL AND EMERGENCY CIRCUITS AND/OR CIRCUITS OF DIFFERENT VOLTAGES.
6. FINISHES AND COLORS SHALL BE SELECTED BY ARCHITECT.
7. REFER TO LIGHTING CONTROL SPECIFICATION FOR ADDITIONAL INFORMATION.

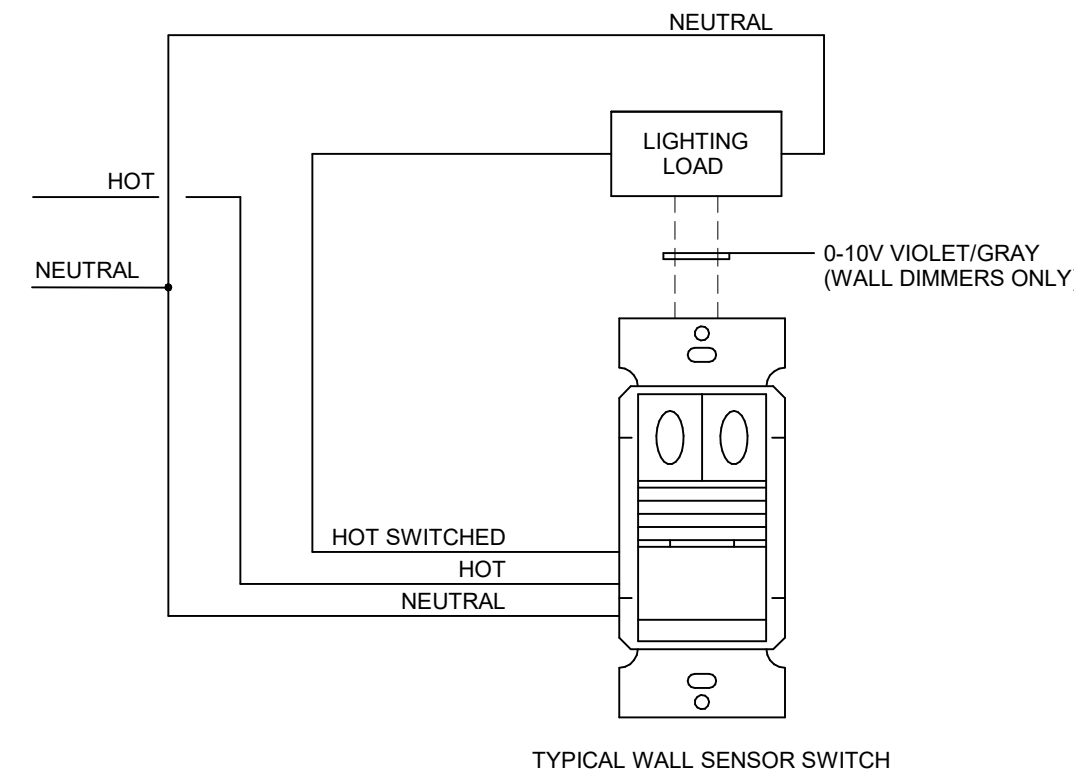
SEQUENCE OF OPERATIONS:

1. ALL RELAYS TO BE CONTROLLED VIA TIME-SCHEDULE FROM BUILDING MANAGEMENT SYSTEM (BMS).
2. LOW VOLTAGE OVERRIDE SWITCHES AS SHOWN ON FLOOR PLANS.
3. HOURS OF OPERATION FOR TIME-SCHEDULE TO BE DECIDED BY OWNER PRIOR TO LIGHTING CONTROL STARTUP. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE TIME SCHEDULING.



- SEQUENCE OF OPERATIONS:
1. AUTO-ON WHEN OCCUPANCY IS DETECTED BY CEILING SENSOR(S). REFER TO FLOOR PLANS FOR QUANTITY AND LOCATIONS.
 2. AUTO-OFF AFTER 20 MINUTES OF UNOCCUPIED SPACE.
 3. REFER TO LIGHTING CONTROL SPECIFICATION FOR ADDITIONAL INFORMATION.

4 TYPICAL STANDALONE OCCUPANCY SENSOR DETAIL NTS



NOTES:

1. REFER TO MANUFACTURERS WIRING DIAGRAM FOR EXACT WIRING DETAIL.
2. WIRE IN SERIES WITH THREE-WAY SWITCH, WHERE INDICATED ON PLANS.
3. PROVIDE 0-10V WIRING FROM WALL DIMMERS, WHERE INDICATED ON PLANS.
4. LIGHTING SHALL TIME OUT AFTER 20 MINUTES.
5. REFER TO LIGHTING CONTROL SPECIFICATION FOR ADDITIONAL INFORMATION.

TYPICAL SPECIFICATIONS:

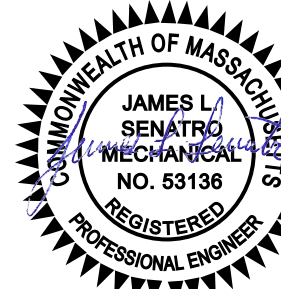
1. "OS" OCCUPANCY SENSOR SWITCH. (SET TO AUTO-ON, AUTO-OFF MODE)
2. "OSD" OCCUPANCY SENSOR 0-10V DIMMER. (SET TO AUTO-ON, AUTO-OFF MODE)
3. "VS" VACANCY SENSOR SWITCH. (SET TO MANUAL-ON, AUTO-OFF MODE)
4. "VSD" VACANCY SENSOR 0-10V DIMMER. (SET TO MANUAL-ON, AUTO-OFF MODE)

5 TYPICAL LINE VOLTAGE SENSOR SWITCH DETAIL NTS

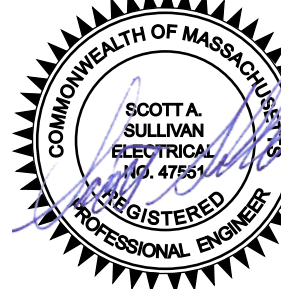
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Revisions:

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Sheet Description

ELECTRICAL DETAILS

Sheet Number

21.00.00 - GENERAL	A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.	
	B. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS UNLESS NOTED OTHERWISE. REVIEW THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING DRAWINGS FOR NOTES, DIMENSIONS, ETC., AND COORDINATE WITH OTHER TRADES INVOLVED.	
C. DESCRIPTION	1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING.	
	2. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.	
D. DEFINITIONS	1. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS"	
	2. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WELDING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS"	
E. DRAWINGS	1. DRAWINGS ARE DIAGRAMMATIC. THE FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS. THOUGH SOME OFFSETS & TRANSITIONS MAY BE SHOWN IN PRINTING A SHEET METAL TO HELP INDICATE THE PHYSICAL RELATIONSHIP BETWEEN THEM, IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL PIPING & TRANSITION SHEET METAL OFFSETS & TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY COORDINATE THE WORK AND PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.	
	F. CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE FOLLOWING: 1. NFPA 13 - INSTALLATION OF SPRINKLER SYSTEMS. 2. NFPA 13R - STANDARD FOR INSTALLATION OF SPRINKLER SYSTEMS IN RESIDENTIAL OCCUPANCIES UP TO AND INCLUDING FOUR STORIES IN HEIGHT. 3. NFPA STANDARD 14 - STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS. 4. NFPA 24 - INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES. 5. STATE BUILDING AND FIRE CODES. 6. LOCAL AUTHORITIES HAVING JURISDICTION.	
G. PERMITS AND FEES:	1. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK. FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION, OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.	
	H. EXISTING SYSTEMS AND EQUIPMENT 1. EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER. 2. CONNECT WORK TO VARIOUS EXISTING SYSTEMS AS INDICATED ON THE DRAWINGS. WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEM CONDITIONS. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED AS WELL AS WITH EXISTING SYSTEMS, THE STRUCTURE, AND OTHER OBSTRUCTIONS.	
I. SURVEY AND MEASUREMENTS	1. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, SHALL BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS.	
	2. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.	
J. SUBMITTALS AND SHOP DRAWINGS	1. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALL OWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE. 4. CONTRACTORS SHALL VERIFY, LAYOUT AND BE RESPONSIBLE FOR ALL MEASUREMENTS OF ALL EXISTING CONDITIONS BEFORE COMMENCING WORK AND SHALL NOTIFY ARCHITECT AND/OR ENGINEER IF A CONDITION EXISTS THAT PREVENTS THE CONTRACTOR FROM ACCOMPLISHING THE INTENT OF THE DRAWINGS.	
	K. AS-BUILT DRAWINGS 1. MAINTAIN ONE SET OF PRINTS ON THE SITE AND NOTE ALL CHANGES OR DEVIATIONS FROM THE ORIGINAL DESIGN THEREON. AT THE COMPLETION OF PROJECT, INCORPORATE ALL CHANGES INTO RECORD AS-BUILT DRAWINGS IN ELECTRONIC FORMAT AND SUBMIT FOR APPROVAL.	
L. OPERATION AND MAINTENANCE	1. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNERS REPRESENTATIVE IN THE OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.	
	2. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL, HEAVY-DUTY, SPRING VINYL COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.	
M. CLEANING	1. EQUIPMENT: AFTER COMPLETION OF PROJECT, CLEAN THE EXTERIOR SURFACE OF EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE.	
	2. WORK AREA: AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS, TEMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION.	
N. GUARANTEE	1. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNERS SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.	

21.05.00 - COMMON WORK RESULTS FOR FIRE SUPPRESSION SYSTEMS	A. WORKMANSHIP AND QUALIFICATIONS: MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH NFPA AND HOSE SYSTEMS, AND NFPA 24 FOR SERVICE MAINS.	
	B. GROOVED JOINT COUPLINGS, FITTINGS, VALVES, AND SPECIALTIES SHALL BE THE PRODUCTS OF A SINGLE MANUFACTURER. GROOVING TOOLS SHALL BE OF THE SAME MANUFACTURER AS THE GROOVED COMPONENTS.	
C. VALVES: SHALL BEAR UL AND/OR FM LABEL OR MARKING. PROVIDE MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY. ITEMS OF SIMILAR CLASS SHALL BE THE PRODUCTS OF THE SAME MANUFACTURER. MANUFACTURERS: KENNEDY VALVE MFG. CO., VICTAULIC, STEPHEN NECK, J. WATTS, HANNOON, MILWAUKEE.	D. PIPE & FITTINGS (ABOVE GRADE) 1. STEEL PIPING: ASTM A53, SCHEDULE 40 SEAMLESS CARBON STEEL. SCHEDULE 10 PIPE SHALL BE ALLOWED FOR PIPE SIZES LARGER THAN 1-1/4" DIAMETER WHEN ROLL GROOVED MECHANICAL COUPLINGS ARE USED. 2. CAST IRON FITTINGS: ANSI/ASME B16.1, FLANGES AND FLANGED FITTINGS, ANSI/ASME B16.4, SCREWED FITTINGS. 3. MALLEABLE IRON FITTINGS: ANSI/ASME B16.3, SCREWED CLASS 300 TYPE. THREADS SHALL CONFORM TO ANSI/ASTM A47. 4. GROOVED MECHANICAL FITTINGS: ANSI A21.10/AWWA C-110 DUCTILE IRON, ASTM A536 GRADE 65-45-12 DUCTILE IRON, ASTM A234 GRADE WPB, OR FACTORY FABRICATED FROM CARBON STEEL PIPE CONFORMING TO ASTM A53, WITH GROOVES OR SHOULDERS DESIGNED TO ACCEPT GROOVED END COUPLINGS. FITTINGS SHALL BE OF THE SAME MANUFACTURER AS THE ADJOINING COUPLINGS. 5. GROOVED MECHANICAL COUPLINGS: ASTM A536 GRADE 65-45-12, DUCTILE IRON HOUSING, ELASTOMER GASKET WITH NUTS AND BOLTS TO SECURE ROLL, GROOVED END COUPLINGS. 6. RIGID TYPE COUPLINGS: HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN RIB PADS TO PROVIDE RIGIDITY AND SYSTEM SUPPORT AND HANGING IN ACCORDANCE WITH NFPA-13. a. 1-1/4" THROUGH 4" FACTORY ASSEMBLED FOR INSTALLATION W/OUT FIELD DISASSEMBLY, VICTAULIC STYLE 009 EZ. b. 5" THROUGH 8" VICTAULIC FIRELOCK STYLE 005. c. 10" AND LARGER: VICTAULIC STYLE 007.	
	7. FLEXIBLE TYPE COUPLINGS: USE IN LOCATIONS WHERE VIBRATION ATTENUATION AND STRESS RELIEF ARE REQUIRED, AND FOR SEISMIC CONSIDERATIONS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. VICTAULIC STYLE 75.	
E. GASKETS	1. WET SYSTEMS: C-SHAPE OR EZ STYLE 009.	
	F. JOINTS 1. GROOVED MECHANICAL COUPLINGS: ASTM A536 GRADE 65-45-12, DUCTILE IRON HOUSING, FLUSH/SEALED, OR QUICK/CV ELASTOMER GASKET WITH NUTS AND BOLTS TO SECURE ROLL, GROOVED END COUPLINGS. HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN RIB PADS TO PROVIDE RIGIDITY, AND MANUFACTURED TO CONNECT COPPER TUBING AND FITTINGS WITHOUT FLARING. VICTAULIC STYLE 606 OR STYLE 607 QUICK/CV STAB-ON COUPLINGS. 2. ASTM B32, SOLDER, GRADE 95TA OR ANSIAWAS A5.8 BCUF SILVER BRAZE. 3. CAST IRON: AWWA C151 PIPING WITH AWWA C110 STANDARD THICKNESS FITTINGS AND AWWA C111 RUBBER GASKET JOINTS OR MECHANICAL GROOVED COUPLINGS WITH DUCTILE IRON HOUSING CLAMPS, 2" ENGAGE AND LOCK, 3" SHARP COMPOSITION SEALING GASKET, STEEL BOLTS, NUTS, AND WASHERS, GALVANIZED OR GALVANIZED PIPE.	
G. GATE VALVES	1. UP TO AND INCLUDING 2": BRONZE BODY AND TRIM, 175 LB. COLD WATER NON-SHOCK WORKING PRESSURE, RISING STEM, HAND WHEEL, SOLID WEDGE OR DISC, THREADED ENDS. 2. OVER 2": IRON BODY, BRONZE TRIM, 175 LB. COLD WATER NON-SHOCK WORKING PRESSURE, RISING STEM PRE-GROOVED FOR MOUNTING TAMPER SWITCH, HAND WHEEL, OUTSIDE SCREW AND YOKL, SOLID TAPER BRONZE OR CAST IRON WEDGE, GROOVED OR FLANGED ENDS. 3. OVER 4": IRON BODY, BRONZE TRIM, 175 POUND COLD WATER, NON-SHOCK WORKING PRESSURE. VALVE SHALL HAVE SOLID TAPER WEDGE, OUTSIDE SCREW AND YOKL, RISING STEM, FLANGED BONNET WITH BODY AND BONNET CONFORMING TO ASTM A106 CLASS B, REPLACEABLE BRONZE WEDGE FACING RINGS, GROOVED OR FLANGED ENDS, AND A PACKING ASSEMBLY CONSISTING OF A CAST IRON GLAND FLANGE, BRASS GLAND, PACKING, BONNET AND BRONZE BONNET BUSHING. VALVE SHALL BE CAPABLE OF BEING REPACKED UNDER PRESSURE, WITH VALVE WEDGE OPEN.	
	H. GLOBE VALVES 1. UP TO AND INCLUDING 2 INCHES (50 MM): CLASS 125, BRONZE BODY, BRONZE TRIM, RISING STEM AND HAND WHEEL, INSIDE SCREW, RENEWABLE RUBBER DISC, THREADED ENDS, WITH BACK SEATING CAPACITY, PACKABLE UNDER PRESSURE. 2. OVER 2 INCHES (50 MM): IRON BODY, BRONZE TRIM, RISING STEM, HAND WHEEL, OS&Y, PLUG-TYPE DISC, FLANGED ENDS, RENEWABLE SEAT AND DISC.	
I. ANGLE VALVES	1. UP TO AND INCLUDING 2": CLASS 125, BRONZE BODY, BRONZE TRIM, RISING STEM AND HAND WHEEL, INSIDE SCREW, RENEWABLE RUBBER DISC, THREADED ENDS, WITH BACK SEATING CAPACITY, PACKABLE UNDER PRESSURE. 2. OVER 2": IRON BODY, BRONZE TRIM, RISING STEM, HAND WHEEL, OS&Y, PLUG-TYPE DISC, FLANGED ENDS, RENEWABLE SEAT AND DISC.	
	J. BALL VALVES 1. UP TO AND INCLUDING 2": BRONZE TWO PIECE BODY, STANDARD PORT, CHROME PLATED BRASS BALL, 316 STAINLESS STEEL STEM, TEFLON SEATS BRASS STEM NUT, DIE-CAST BRASS GEAR BOX WITH SUPERVISORY SWITCHES, THREADED OR GROOVED ENDS. 2. OVER 2": MANUFACTURERS: CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLON SEAT AND STUFFING BOX SEALS, LEVER HANDLE.	
K. BUTTERFLY VALVES	1. DUCTILE IRON BODY, DUCTILE IRON DISC WITH EPDM DISC COATING AND INTEGRALLY CAST STEM, GROOVED ENDS. 2. CAST BRONZE BODY, DUCTILE IRON DISC WITH EPDM DISC COATING AND INTEGRALLY CAST STEM, COPPER-TUBING DIMENSIONED GROOVED ENDS. 3. CAST IRON WITH RESILIENT REPLACEABLE EPDM SEAT, WAFER OR LUG ENDS, EXTENDED NECK WITH 316 STAINLESS STEEL STEM, MSS-SP-47, 200 PSI. 4. DISC: EPDM COATED DUCTILE IRON OR ALUMINUM BRONZE. 5. OPERATOR: NOTCHED PLATE LEVER HANDLE, HANDWHEEL OR GEAR DRIVE, AND WEATHERPROOF ACTUATOR WITH SUPERVISORY SWITCHES.	
	L. CHECK VALVES 1. UP TO AND INCLUDING 2": CLASS 125, BRONZE SWING DISC, SCREWED ENDS. 2. HORIZONTAL SWING OVER 2": 300 PSI CWP, DUCTILE IRON BODY AND COUPLED CAP CONFORMING TO ASTM A536, GRADE 65-45-12, HORIZONTAL SWING, WITH STAINLESS STEEL DISC, ELASTOMER SEAT, AND GROOVED ENDS. 3. CLASS 175, CAST IRON BODY AND BOLTED CAP CONFORMING TO ASTM A126, CLASS B, HORIZONTAL SWING, WITH A BRONZE DISC OR CAST IRON DISC WITH BRONZE DISC RING, AND FLANGED ENDS VALVE SHALL BE CAPABLE OF BEING RETITLED WHILE THE VALVE REMAINS IN LINE. 4. SPRING ACTUATED OVER 2": 300 PSI CWP, DUCTILE IRON BODY CONFORMING TO ASTM A536, GRADE 65-45-12, VERTICAL OR HORIZONTAL CHECK, WITH STAINLESS STEEL SPRING AND SHAFT. 5. 2-1/2" AND 3": ALUMINUM BRONZE DISC WITH DISC MOUNTED ELASTOMER SEAL AND PPS (POLYPHENYLENE SULFIDE) COATED SEAT. 6. 4" AND LARGER: ELASTOMER COATED DUCTILE IRON DISC WITH WELDED-IN NICKEL SEAT.	
M. DRAIN VALVES: COMPRESSION STOP: BRONZE WITH HOSE THREAD NIPLLE AND CAP.	N. BALL VALVE: BRASS WITH CAP AND CHAIN, 3/4" HOSE THREAD	
	O. BACKFLOW PREVENTERS 1. REDUCED PRESSURE BACKFLOW PREVENTERS: ANSI/ASME 1013, AWWA C511, BRONZE BODY, TWO INDEPENDENTLY OPERATING SPRING LOADED CHECK VALVES, DIAPHRAGM TYPE DIFFERENTIAL PRESSURE RELIEF VALVE LOCATED BETWEEN CHECK VALVES, TWO GATE VALVES, STRAINER, TEST COCKS AND AIR GAP FITTING. 2. REDUCED PRESSURE DETECTOR CHECK VALVE ASSEMBLIES: ANSI/ASME 1047, AWWA C511, BRONZE BODY, TWO INDEPENDENTLY OPERATING SPRING LOADED CHECK VALVES, DIAPHRAGM TYPE DIFFERENTIAL PRESSURE RELIEF VALVE LOCATED BETWEEN CHECK VALVES, METERED BYPASS, TWO GATE VALVES, STRAINER, TEST COCKS AND AIR GAP FITTING. 3. DOUBLE CHECK VALVE ASSEMBLY: ANSI/ASME 1015, AWWA C510, BRONZE BODY, TWO INDEPENDENTLY OPERATING SPRING LOADED CHECK VALVES, TWO GATE VALVES, STRAINER, AND TEST COCKS. 4. DOUBLE CHECK DETECTOR CHECK VALVE ASSEMBLIES: ANSI/ASME 1048, AWWA C510, BRONZE BODY, TWO INDEPENDENTLY OPERATING SPRING LOADED CHECK VALVES, METERED BYPASS, TWO GATE VALVES, STRAINER, TEST COCKS.	
P. UNIONS & DIELECTRIC CONNECTIONS	1. UNIONS FOR PIPE 2" AND UNDER: a. FERROUS PIPING: 150 PSIG (1034 KPA) MALLEABLE IRON, THREADED. b. COPPER PIPE: BRONZE, SOLDERED JOINTS. 2. DIELECTRIC CONNECTIONS: WATERWAY FITTING WITH WATER IMPERVIOUS ISOLATION BARRIER, VICTAULIC STYLE 47 OR APPROVED EQUAL.	
	Q. PIPE HANGERS AND SUPPORTS 1. CONFORM TO NFPA 13 AND NFPA 14. 2. HANGERS, MALLEABLE IRON, CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING, CARBON STEEL, ADJUSTABLE, CLEVIS. 3. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS. 4. WALL SUPPORT FOR PIPE SIZES 2 TO 3": CAST IRON HOOK. 5. WALL SUPPORT FOR PIPE SIZES 4" AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP. 6. VERTICAL SUPPORT: STEEL RISER CLAMP ANGLE RING. 7. FLOOR SUPPORT: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPLLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.	

21.10.10 - FIRE-SUPPRESSION SPRINKLER SYSTEMS	A. SYSTEM DESCRIPTION (EXISTING BUILDING) 1. PROVIDE A WET PIPE SYSTEM HYDRAULICALLY DESIGNED IN ACCORDANCE WITH NFPA 13 AND ALL REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION, TO PROVIDE COVERAGE FOR SPACES INDICATED ON THE DRAWINGS. 2. PROVIDE ALTERATIONS AND RENOVATIONS TO THE EXISTING SPRINKLER SYSTEM. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS INCLUDING BUT NOT LIMITED TO: LOCATION OF THE EXISTING SPRINKLER HEADS, LOCATIONS AND SIZES OF EXISTING SPRINKLER PIPING, AVAILABLE STATIC PRESSURE, RESIDUAL PRESSURE, AND FLOW AT THE BASE OF THE RISER. MODIFY EXISTING SPRINKLER PIPING AS REQUIRED TO MEET THE LAYOUT OF NEW SPRINKLER HEADS, INCLUDING MODIFICATIONS TO EXISTING PIPING. 3. HYDRAULIC DATA AND WATER SUPPLY INFORMATION PROVIDED ON THE PLANS FOR REFERENCE ONLY. CONTRACTOR SHALL PERFORM A WATER FLOW TEST. RESULTS OF THE CONTRACTORS WATER FLOW TEST SHALL BE USED FOR PREPARING HYDRAULIC CALCULATIONS. 4. INTERFACE SYSTEM WITH BUILDING FIRE ALARM SYSTEM. 5. THE SPRINKLER LOCATIONS AND PIPING ARRANGEMENTS INDICATED ON THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC. 6. SPRINKLER LOCATIONS INDICATED ARE FOR STANDARD COVERAGE SPRINKLERS. MAXIMUM 225 SQUARE FEET PER SPRINKLER FOR LIGHT HAZARD AND 130 SQUARE FEET PER SPRINKLER FOR ORDINARY HAZARD. EXTENDED COVERAGE SPRINKLERS SHALL NOT BE INSTALLED IN ANY LOCATIONS UNLESS SPECIFICALLY INDICATED. B. SUBMITTALS 1. SUBMIT FIRE PROTECTIONS SHOP DRAWINGS DRAWN TO A MINIMUM SCALE OF 1/4"=1'-0". DRAWINGS SHALL INCLUDE DETAILED PIPE LAYOUT, PIPE MATERIALS USED, JOINING METHODS, HANGERS AND SUPPORTS, FLOOR AND WALL PENETRATION SEALS, CONTROLS, AND COMPONENTS AND ACCESSORIES. 2. SUBMIT HYDRAULIC CALCULATIONS PREPARED IN ACCORDANCE WITH NFPA 13. 3. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED. 4. PRODUCT DATA: SUBMIT DATA ON SPRINKLERS, VALVES, AND SPECIALTIES. 5. AFTER REVIEW BY THE OWNER'S REPRESENTATIVE, SUBMIT SPRINKLER LAYOUT SHOP DRAWINGS, PRODUCT DATA, AND HYDRAULIC CALCULATIONS TO THE AUTHORITY HAVING JURISDICTION, FIRE MARSHAL, AND OWNERS INSURANCE UNDERWRITER FOR APPROVAL. SUBMIT PROOF OF APPROVAL FROM SUCH AUTHORITIES/ORGANIZATIONS.	
	C. SPRINKLERS 1. MANUFACTURERS: VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP. WHERE REQUIRED. 2. SPRINKLERS SHALL BE ADJUSTABLE, GLASS BULB, AUTOMATIC SPRINKLERS WITH 1/2" ORIFICE AND 5.0 K-FACTOR UNLESS OTHERWISE INDICATED. TYPE OF SPRINKLER HEAD SHALL BE AS INDICATED ON THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING: 3. SPRINKLER BODIES SHALL BE DIE CAST BRASS, WITH HEX SHAPED WRENCH BOSS INTEGRALLY CAST INTO THE SPRINKLER BODY TO REDUCE THE RISK OF DAMAGE DURING INSTALLATION. 4. UNLESS OTHERWISE INDICATED, ORDINARY TEMPERATURE RATED SPRINKLER HEADS SHALL BE PROVIDED. 5. WHERE SPRINKLERS WILL BE INSTALLED IN CLOSE PROXIMITY TO HEAT SOURCES AND SPECIAL LOCATIONS, AS IDENTIFIED IN NFPA 13, TEMPERATURE RATINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13. 6. WHERE PLANS CALL FOR EXTENDED COVERAGE SPRINKLER HEADS, COORDINATE COVERAGE REQUIREMENTS WITH REQUIRED PRESSURE AND K-FACTOR. 7. SPARE SPRINKLERS: FURNISH SPARE AUTOMATIC SPRINKLERS IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 FOR STOCK OF EXTRA SPRINKLERS. THE SPRINKLERS SHALL BE REPRESENTATIVE OF, AND IN PROPORTION TO, THE NUMBER OF EACH TYPE AND TEMPERATURE RATING OF THE SPRINKLERS INSTALLED. PROVIDE TWO SPECIAL SPRINKLER WRENCHES, OR MINIMUM ONE WRENCH FOR EACH CONTAINER OR SPRINKLER BOX, WHICHEVER IS GREATER. 8. IN AREAS WHERE SPRINKLERS ARE SUBJECT TO PHYSICAL DAMAGE, PROVIDE SPRINKLER GUARD ASSEMBLY OVER HEAD, FINISH TO MATCH SPRINKLER FINISH. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SPRINKLERS IN ELEVATOR SHAFTS, UNDER LOWER RAKES OF STAIRWAYS, IN ELECTRICAL ROOMS, BOILER ROOMS AND OTHER MECHANICAL ROOMS, 7'-0" OR LESS ABOVE FINISHED FLOORS, AND IN GYMNASIUM/FITNESS CENTER AREAS.	
E. PIPING SPECIALTIES	1. MANUFACTURERS: POTTER-ROEMER, VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP. SUBSTITUTIONS: ALLOWED. 2. ELECTRIC ALARM: ELECTRICALLY OPERATED RED EMERALD GONGS WITH PRESSURE ALARM SWITCH, 120 VOLT WITH WEATHERPROOF BACK BOX. 3. VALVE TAMPER SUPERVISORY SWITCH: TWO FORM C CONTACTS; RATED 10 AMP AT 120 VOLT, UL LISTED AND FM APPROVED. UP TO 2" - POTTER MODEL PVS-1. OVER 2" SWITCH SHALL BE POTTER MODEL OSYS0-2. 4. PRESSURE SWITCH: 1/2" MALE PRESSURE CONNECTION TO ALARM VALVE RISER AND ACTUATED BY ANY FLOW OF WATER IN EXCESS OF ONE SPRINKLER. MAXIMUM PRESSURE RATING 175 PSI, WEATHER-PROOF WITH TAMPER RESISTANT SCREWS, RATED 10 AMPS AT 120 VOLT. 5. PRESSURE GAGE: RATED FOR 300 PSI USE, 3-1/2" DIAMETER.	
	F. GENERAL INSTALLATION REQUIREMENTS FOR SPRINKLER SYSTEMS 1. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. 2. INSTALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA 13, NFPA 13R, NFPA 13R, AND NFPA 24 FOR SERVICE MAINS. 3. MINIMIZE SHUT-DOWNS OF EXISTING WATER SUPPLIES. WORK SHALL BE COMPLETE BEFORE MAKING THE FINAL CONNECTIONS TO EXISTING WATER SUPPLIES. NOTIFY THE OWNERS REPRESENTATIVE BEFORE AFFECTING THE OPERATION OF ANY EXISTING FIRE PROTECTION EQUIPMENT. 4. SPRINKLERS LOCATED IN FULL SIZE CEILING TILES SHALL BE CENTERED IN THE TILE. PROVIDE PIPING OFFSETS AS REQUIRED. 5. SPRINKLER BULB PROTECTOR SHALL REMAIN IN PLACE UNTIL THE SPRINKLER IS COMPLETELY INSTALLED. REMOVE THE BULB PROTECTOR BY HAND AFTER INSTALLATION AND BEFORE THE SYSTEM IS PLACED IN SERVICE. 6. COORDINATE FLOW SWITCHES, TAMPER SWITCHES, AND ALL OTHER SPRINKLER DEVICES WITH THE FIRE ALARM SYSTEM. 7. PROVIDE AND APPLY SIGNS TO CONTROL, DRAIN, TEST AND ALARM VALVES TO IDENTIFY THEIR PURPOSE AND FUNCTION.	

R. GENERAL INSTALLATION REQUIREMENTS FOR PIPE AND FITTINGS	1. INSTALL PIPING IN ACCORDANCE WITH NFPA 13 FOR SPRINKLER SYSTEMS, NFPA 14 FOR STANDPIPE AND HOSE SYSTEMS, AND NFPA 24 FOR SERVICE MAINS. 2. PLACE PIPING IN CONCEALED SPACES ABOVE FINISHED CEILINGS UNLESS NOTED OTHERWISE. 3. ROUTE PIPING IN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. 4. INSTALL PIPING TO CONSERVE BUILDING SPACE, TO NOT INTERFERE WITH USE OF SPACE AND OTHER WORK. 5. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS. 6. INSTALL PIPE SLEEVE AT PIPING PENETRATIONS THROUGH FOOTINGS, PARTITIONS, WALLS, AND FLOORS. SEAL PIPE AND SLEEVE PENETRATIONS TO MAINTAIN FIRE RESISTANCE EQUIVALENT TO FIRE SEPARATION. 7. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT. USE VICTAULIC STYLE 7 FOR 75 COUPLINGS IN ACCORDANCE WITH VICTAULIC INSTRUCTIONS FOR EXPANSION AND CONTRACTION OF PIPE. 8. GROOVED JOINT COUPLINGS AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. GROOVED ENDS SHALL BE CLEAN AND FREE FROM IDENTATIONS, PROJECTIONS, AND ROLL MARKS IN THE AREA FROM PIPE END TO GROOVE. GASKETS SHALL BE VERIFIED AS SUITABLE FOR THE INTENDED SERVICE PRIOR TO INSTALLATION. GASKETS SHALL BE MOLDED AND PRODUCED BY THE COUPLING MANUFACTURER. THE GROOVED COUPLING MANUFACTURER'S FACTORY TRAINED REPRESENTATIVE SHALL PROVIDE ON-SITE TRAINING FOR CONTRACTOR'S FIELD PERSONNEL, IN THE USE OF GROOVING TOOLS, APPLICATION OF GROOVE, AND INSTALLATION OF GROOVED JOINT PRODUCTS. THE MANUFACTURER'S REPRESENTATIVE SHALL PERIODICALLY VISIT THE JOBSITE AND REVIEW INSTALLATION. CONTRACTOR SHALL REMOVE AND REPLACE ANY JOINTS DEEMED IMPROPERLY INSTALLED. 9. PITCH PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS. USE ECCENTRIC REDUCERS TO MAINTAIN TOP OF PIPE LEVEL. 10. PREPARE PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING, WHERE PIPE SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH, CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDING. 11. DO NOT PENETRATE BUILDING STRUCTURAL MEMBERS UNLESS INDICATED. 12. WHERE MORE THAN ONE PIPING SYSTEM MATERIAL IS SPECIFIED, INSTALL COMPATIBLE SYSTEM COMPONENTS AND JOINTS. INSTALL FLANGES, UNION, AND COUPLINGS AT LOCATIONS REQUIRING SERVICING.	
	S. GENERAL INSTALLATION REQUIREMENTS FOR VALVES 1. INSTALL DRAIN VALVES AT MAIN SHUT-OFF VALVES, LOW POINTS OF PIPING AND APPARATUS. 2. VALVES SHALL BE ACCESSIBLE FOR OPERATION AND SERVICING. PROVIDE ACCESS PANELS WHERE REQUIRED. 3. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED. REMOVE PROTECTIVE COATINGS AFTER INSTALLATION. 4. INSTALL GATE OR BUTTERFLY VALVES FOR SHUT-OFF OR ISOLATING SERVICE. 5. INSTALL BURIED SHUT OFF VALVES IN VALVE BOX. T. GENERAL INSTALLATION REQUIREMENTS FOR PIPE HANGERS AND SUPPORTS 1. INSTALL IN ACCORDANCE WITH NFPA 13 AND NFPA 14. 2. INSTALL HANGERS TO WITH MINIMUM 1/2" SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK. 3. PLACE HANGERS WITHIN 12" OF EACH HORIZONTAL ELBOW. 4. USE HANGERS WITH 1-1/2" MINIMUM VERTICAL ADJUSTMENT. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE. 5. SUPPORT VERTICAL PIPING AT EVERY FLOOR. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING. 6. WHERE INSTALLING SEVERAL PIPES IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS. 7. INSTALL COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING. 8. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED. U. TESTING: PRESSURE TEST THE ABOVE GROUND PIPING IN ACCORDANCE TO NFPA 13. TESTING SHALL BE COMPLETED PRIOR TO PERMANENT SEALING OF WALLS AND PARTITIONS. PRESSURE TEST BELOW GRADE PIPING IN ACCORDANCE WITH NFPA 24.	

21.13.10 - FIRE-SUPPRESSION SPRINKLER SYSTEMS	A. SYSTEM DESCRIPTION (EXISTING BUILDING) 1. PROVIDE A WET PIPE SYSTEM HYDRAULICALLY DESIGNED IN ACCORDANCE WITH NFPA 13 AND ALL REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION, TO PROVIDE COVERAGE FOR SPACES INDICATED ON THE DRAWINGS. 2. PROVIDE ALTERATIONS AND RENOVATIONS TO THE EXISTING SPRINKLER SYSTEM. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS INCLUDING BUT NOT LIMITED TO: LOCATION OF THE EXISTING SPRINKLER HEADS, LOCATIONS AND SIZES OF EXISTING SPRINKLER PIPING, AVAILABLE STATIC PRESSURE, RESIDUAL PRESSURE, AND FLOW AT THE BASE OF THE RISER. MODIFY EXISTING SPRINKLER PIPING AS REQUIRED TO MEET THE LAYOUT OF NEW SPRINKLER HEADS, INCLUDING MODIFICATIONS TO EXISTING PIPING. 3. HYDRAULIC DATA AND WATER SUPPLY INFORMATION PROVIDED ON THE PLANS FOR REFERENCE ONLY. CONTRACTOR SHALL PERFORM A WATER FLOW TEST. RESULTS OF THE CONTRACTORS WATER FLOW TEST SHALL BE USED FOR PREPARING HYDRAULIC CALCULATIONS. 4. INTERFACE SYSTEM WITH BUILDING FIRE ALARM SYSTEM. 5. THE SPRINKLER LOCATIONS AND PIPING ARRANGEMENTS INDICATED ON THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC. 6. SPRINKLER LOCATIONS INDICATED ARE FOR STANDARD COVERAGE SPRINKLERS. MAXIMUM 225 SQUARE FEET PER SPRINKLER FOR LIGHT HAZARD AND 130 SQUARE FEET PER SPRINKLER FOR ORDINARY HAZARD. EXTENDED COVERAGE SPRINKLERS SHALL NOT BE INSTALLED IN ANY LOCATIONS UNLESS SPECIFICALLY INDICATED. B. SUBMITTALS 1. SUBMIT FIRE PROTECTIONS SHOP DRAWINGS DRAWN TO A MINIMUM SCALE OF 1/4"=1'-0". DRAWINGS SHALL INCLUDE DETAILED PIPE LAYOUT, PIPE MATERIALS USED, JOINING METHODS, HANGERS AND SUPPORTS, FLOOR AND WALL PENETRATION SEALS, CONTROLS, AND COMPONENTS AND ACCESSORIES. 2. SUBMIT HYDRAULIC CALCULATIONS PREPARED IN ACCORDANCE WITH NFPA 13. 3. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED. 4. PRODUCT DATA: SUBMIT DATA ON SPRINKLERS, VALVES, AND SPECIALTIES. 5. AFTER REVIEW BY THE OWNER'S REPRESENTATIVE, SUBMIT SPRINKLER LAYOUT SHOP DRAWINGS, PRODUCT DATA, AND HYDRAULIC CALCULATIONS TO THE AUTHORITY HAVING JURISDICTION, FIRE MARSHAL, AND OWNERS INSURANCE UNDERWRITER FOR APPROVAL. SUBMIT PROOF OF APPROVAL FROM SUCH AUTHORITIES/ORGANIZATIONS.	
	C. SPRINKLERS 1. MANUFACTURERS: VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP. WHERE REQUIRED. 2. SPRINKLERS SHALL BE ADJUSTABLE, GLASS BULB, AUTOMATIC SPRINKLERS WITH 1/2" ORIFICE AND 5.0 K-FACTOR UNLESS OTHERWISE INDICATED. TYPE OF SPRINKLER HEAD SHALL BE AS INDICATED ON THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING: 3. SPRINKLER BODIES SHALL BE DIE CAST BRASS, WITH HEX SHAPED WRENCH BOSS INTEGRALLY CAST INTO THE SPRINKLER BODY TO REDUCE THE RISK OF DAMAGE DURING INSTALLATION. 4. UNLESS OTHERWISE INDICATED, ORDINARY TEMPERATURE RATED SPRINKLER HEADS SHALL BE PROVIDED. 5. WHERE SPRINKLERS WILL BE INSTALLED IN CLOSE PROXIMITY TO HEAT SOURCES AND SPECIAL LOCATIONS, AS IDENTIFIED IN NFPA 13, TEMPERATURE RATINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13. 6. WHERE PLANS CALL FOR EXTENDED COVERAGE SPRINKLER HEADS, COORDINATE COVERAGE REQUIREMENTS WITH REQUIRED PRESSURE AND K-FACTOR. 7. SPARE SPRINKLERS: FURNISH SPARE AUTOMATIC SPRINKLERS IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 FOR STOCK OF EXTRA SPRINKLERS. THE SPRINKLERS SHALL BE REPRESENTATIVE OF, AND IN PROPORTION TO, THE NUMBER OF EACH TYPE AND TEMPERATURE RATING OF THE SPRINKLERS INSTALLED. PROVIDE TWO SPECIAL SPRINKLER WRENCHES, OR MINIMUM ONE WRENCH FOR EACH CONTAINER OR SPRINKLER BOX, WHICHEVER IS GREATER. 8. IN AREAS WHERE SPRINKLERS ARE SUBJECT TO PHYSICAL DAMAGE, PROVIDE SPRINKLER GUARD ASSEMBLY OVER HEAD, FINISH TO MATCH SPRINKLER FINISH. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SPRINKLERS IN ELEVATOR SHAFTS, UNDER LOWER RAKES OF STAIRWAYS, IN ELECTRICAL ROOMS, BOILER ROOMS AND OTHER MECHANICAL ROOMS, 7'-0" OR LESS ABOVE FINISHED FLOORS, AND IN GYMNASIUM/FITNESS CENTER AREAS.	
E. PIPING SPECIALTIES	1. MANUFACTURERS: POTTER-ROEMER, VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP. SUBSTITUTIONS: ALLOWED. 2. ELECTRIC ALARM: ELECTRICALLY OPERATED RED EMERALD GONGS WITH PRESSURE ALARM SWITCH, 120 VOLT WITH WEATHERPROOF BACK BOX. 3. VALVE TAMPER SUPERVISORY SWITCH: TWO FORM C CONTACTS; RATED 10 AMP AT 120 VOLT, UL LISTED AND FM APPROVED. UP TO 2" - POTTER MODEL PVS-1. OVER 2" SWITCH SHALL BE POTTER MODEL OSYS0-2. 4. PRESSURE SWITCH: 1/2" MALE PRESSURE CONNECTION TO ALARM VALVE RISER AND ACTUATED BY ANY FLOW OF WATER IN EXCESS OF ONE SPRINKLER. MAXIMUM PRESSURE RATING 175 PSI, WEATHER-PROOF WITH TAMPER RESISTANT SCREWS, RATED 10 AMPS AT 120 VOLT. 5. PRESSURE GAGE: RATED FOR 300 PSI USE, 3-1/2" DIAMETER.	
	F. GENERAL INSTALLATION REQUIREMENTS FOR SPRINKLER SYSTEMS 1. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. 2. INSTALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH NFPA 13, NFPA 13R, NFPA 13R, AND NFPA 24 FOR SERVICE MAINS. 3. MINIMIZE SHUT-DOWNS OF EXISTING WATER SUPPLIES. WORK SHALL BE COMPLETE BEFORE MAKING THE FINAL CONNECTIONS TO EXISTING WATER SUPPLIES. NOTIFY THE OWNERS REPRESENTATIVE BEFORE AFFECTING THE OPERATION OF ANY EXISTING FIRE PROTECTION EQUIPMENT. 4. SPRINKLERS LOCATED IN FULL SIZE CEILING TILES SHALL BE CENTERED IN THE TILE. PROVIDE PIPING OFFSETS AS REQUIRED. 5. SPRINKLER BULB PROTECTOR SHALL REMAIN IN PLACE UNTIL THE SPRINKLER IS COMPLETELY INSTALLED. REMOVE THE BULB PROTECTOR BY HAND AFTER INSTALLATION AND BEFORE THE SYSTEM IS PLACED IN SERVICE. 6. COORDINATE FLOW SWITCHES, TAMPER SWITCHES, AND ALL OTHER SPRINKLER DEVICES WITH THE FIRE ALARM SYSTEM. 7. PROVIDE AND APPLY SIGNS TO CONTROL, DRAIN, TEST AND ALARM VALVES TO IDENTIFY THEIR PURPOSE AND FUNCTION.	

SPRINKLER SCHEDULE:	
1. QUICK-RESPONSE CONCEALED: BRASS FINISH WITH FACTORY PAINTED WHITE COVER PLATE, VICTAULIC MODEL V3002.	

2W

ARCHITECTURE | INTERIORS

7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

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HIGHMARK PROVISIONS

PERMIT SET

22.00.00 - GENERAL

- A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.
- B. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING DRAWINGS UNLESS NOTED OTHERWISE. REVIEW THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING DRAWINGS FOR NOTES, DIMENSIONS, ETC., AND COORDINATE WITH OTHER TRADES INVOLVED.
- C. THIS SECTION APPLIES TO ALL DIVISION 22 SPECIFICATION SECTIONS WHERE THERE ARE DIFFERENCES OR DISCREPANCIES BETWEEN THIS SPECIFICATION SECTION AND OTHER DIVISION 22 SPECIFICATION SECTIONS. THE MORE STRINGENT REQUIREMENT(S) SHALL APPLY.

D. DESCRIPTION

1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING.
2. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF: CONSISTS OF FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND INDICATED, TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.
- E. DEFINITIONS: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT
1. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS" INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
2. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."
3. PROVIDE: THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
4. REMOVE: THE TERM "REMOVE" MEANS TO DISCONNECT FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."
5. SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND/OR METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT."

F. DRAWINGS

1. DRAWINGS ARE DIAGRAMMATIC. THE FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS, THOUGH SOME OFFSETS & TRANSITIONS MAY BE SHOWN IN PIPING TO HELP INDICATE THE PHYSICAL RELATIONSHIP BETWEEN THEM. IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL PIPING OFFSETS & TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY COORDINATE THE WORK AND PROTECT ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO CONSULT WITH THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.

G. CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE FOLLOWING:

1. INTERNATIONAL BUILDING CODE
2. 248 CMR 10.00: UNIFORM STATE PLUMBING CODE
3. INTERNATIONAL MECHANICAL CODE
4. NATIONAL ELECTRIC CODE (NFPA 70)
5. THE LIFE SAFETY CODE (NFPA 101)

H. PERMITS AND FEES:

1. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL GOVERNMENT AND PRIVATE FEES AND CHARGES AND ALL NECESSARY LABOR AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK. FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENT'S HAVING JURISDICTION. OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HISHER WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

I. EXISTING SYSTEMS AND EQUIPMENT

1. EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER.
2. CONNECT WORK TO VARIOUS EXISTING SYSTEMS AS INDICATED ON THE DRAWINGS. WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEM CONDITIONS. WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED AS WELL AS WITH EXISTING SYSTEMS, THE STRUCTURE, AND OTHER OBSTRUCTIONS.

J. SURVEY AND MEASUREMENTS

1. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, SHALL BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS.
2. DO NOT SCALE DRAWINGS: SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.
3. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS. ORDER EQUIPMENT BROKEN DOWN AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ALTERATIONS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.
4. CONTRACTORS SHALL VERIFY, LAYOUT AND BE RESPONSIBLE FOR ALL MEASUREMENTS OF ALL EXISTING CONDITIONS BEFORE COMMENCING WORK AND SHALL NOTIFY ARCHITECT AND/OR ENGINEER IF A CONDITION EXISTS THAT PREVENTS THE CONTRACTOR FROM ACCOMPLISHING THE INTENT OF THE DRAWINGS.

K. SUBMITTALS AND SHOP DRAWINGS

1. SUBMIT FOR REVIEW, ELECTRONIC SHOP DRAWINGS IN SEARCHABLE PDF FORMAT FOR THE FOLLOWING.
- a. SUBMITTAL DATA FOR ALL MATERIAL AND EQUIPMENT. CLEARLY IDENTIFY DEVIATIONS OF THE SUBMITTED WITH THE DESIGN.
- b. SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"=1'-0". HIGHLIGHT, ENCLOSE, OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS OF SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS.
2. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
3. DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SUBMITTALS.
4. SCHEDULE AT LEAST TEN WORKING DAYS EXCLUSIVE OF TRANSMITTAL TIME, FOR SUBMITTAL REVIEW.
- L. AS-BUILT DRAWINGS
- A. MAINTAIN ONE SET OF PRINTS ON THE SITE AND NOTE ALL CHANGES OR DEVIATIONS FROM THE ORIGINAL DESIGN THEREON. AT THE COMPLETION OF THE PROJECT, INCORPORATE ALL CHANGES INTO RECORD AS-BUILT DRAWINGS IN ELECTRONIC FORMAT AND SUBMIT FOR APPROVAL.
2. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPIKE OF EACH BINDER.
3. MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.

M. OPERATION AND MAINTENANCE

1. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNER'S REPRESENTATIVE IN THE OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.
2. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPIKE OF EACH BINDER.
3. MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.

N. CLEANING

1. EQUIPMENT: AFTER COMPLETION OF PROJECT, CLEAN THE EXTERIOR SURFACE OF EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE.
2. WORK AREA: AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS, TEMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION.
3. DOMESTIC WATER PIPING: PRIOR TO STARTING WORK, VERIFY SYSTEM IS COMPLETE, FLUSHED AND CLEANED. ENSURE ACIDITY (PH) OF WATER TO BE TREATED IS BETWEEN 7.4 AND 7.8 BY ADJING ALKALI (CAUSTIC SODA OR SODA ASH) OR ACID (HYDROCHLORIC). INJECT DISINFECTANT, FREE CHLORINE IN LIQUID, POWDER, TABLET OR GAS FORM, THROUGHOUT SYSTEM TO OBTAIN 60 TO 80 mg/L RESIDUAL. BLEED FROM OUTLETS TO ENSURE DISTRIBUTION AND TEST FOR DISINFECTANT RESIDUAL AT MINIMUM 15 PERCENT OF OUTLETS. MAINTAIN RESIDUAL AT 60 TO 80 mg/L FOR 24 HOURS. IF FINAL DISINFECTANT RESIDUAL TESTS LESS THAN 25 mg/L, REPEAT TREATMENT. FLUSH DISINFECTANT FROM SYSTEM UNTIL RESIDUAL EQUAL TO THAT OF INCOMING WATER OF 1.0 mg/L. TAKE SAMPLES NO SOONER THAN 24 HOURS AFTER FLUSHING. FROM 10 PERCENT OF OUTLETS AND FROM WATER ENTRY, AND ANALYZE IN ACCORDANCE WITH AWWA C651.

O. GUARANTEE

1. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD. PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.

P. MEANS AND METHODS ALL TRADES

1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.
2. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNER'S PROPERTY. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.
3. MATERIALS AND EQUIPMENT SHALL BE AS LISTED WHERE STANDARD HAS BEEN ESTABLISHED.
4. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS. PATCH AND PAINT SURFACES DISTURBED BY WORK UNDER THIS CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.
5. SCAFFOLDING, RIGGING, HOISTING: THE CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES ANY EQUIPMENT AND APPARATUS FURNISHED UNDER THIS DIVISION. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.
6. EXCAVATION AND BACKFILLING: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE SIZES, DEPTHS, FILL AND BEDDING REQUIREMENTS AND ANY OTHER EXCAVATION WORK REQUIRED UNDER THESE SPECIFICATIONS.

7. WATERPROOFING: WHERE ANY WORK PIERCES WATERPROOFING, INCLUDING WATERPROOF CONCRETE, ROOFS, EXTERIOR WALL AND FLOORS IN WET AREAS, THE METHOD OF INSTALLATION SHALL BE REVIEWED BY THE ENGINEER BEFORE WORK IS DONE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WEATHERTIGHT."
8. PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION, PLUMBING, MECHANICAL AND ELECTRICAL PENETRATIONS THROUGH FIRE RATED PARTITIONS. PROVIDE ASBESTOS FREE FIRESTOPPING SYSTEM CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME AND GASES. SYSTEM SHALL BE UL LISTED AND COMPLY WITH ASTM E 814. REFER TO ARCHITECTURAL DRAWINGS FOR RATINGS OF ASSEMBLIES.
9. PROVIDE ACCESS PANELS IN WALLS, FLOORS AND GYPSUM WALL BOARD CEILINGS TO ALLOW ACCESS TO VALVES AND OTHER APPARATUS AND EQUIPMENT REQUIRING PERIODIC SERVICE AND INSPECTION. NOT ALL ACCESS PANELS ARE INDICATED ON THE PLANS. REVIEW ARCHITECTURAL AND PLUMBING PLANS TO DETERMINE THE LOCATION AND QUANTITY OF ACCESS PANELS REQUIRED. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.

22.05.00 - COMMON WORK RESULTS FOR PLUMBING

A. IDENTIFICATION FOR PIPING AND EQUIPMENT:

1. MANUFACTURERS: CRAFTMARK IDENTIFICATION SYSTEMS, SAFETY SIGN CO., SETON IDENTIFICATION PRODUCTS, NORTHTOWN, KOLBI, SUBSTITUTIONS: DIVISION 01 - GENERAL REQUIREMENTS AND 22 04 00 - GENERAL REQUIREMENTS.
2. PLASTIC NAMEPLATES: LAMINATED THREE-LAYER PLASTIC WITH ENGRAVED BLACK LETTERS ON LIGHT BACKGROUND COLOR.
3. TAGS
- a. PLASTIC TAGS: LAMINATED THREE-LAYER PLASTIC WITH ENGRAVED BLACK LETTERS ON LIGHT BACKGROUND COLOR, MINIMUM 1 1/2 INCHES DIAMETER.
- b. METAL TAGS: ALUMINUM WITH STAMPED LETTERS; TAG SIZE MINIMUM 1-1/2 INCHES DIAMETER WITH FINISHED EDGES.
- c. INFORMATION TAGS: CLEAR PLASTIC WITH PRINTED "DANGER," "CAUTION," OR "WARNING" AND MESSAGE; SIZE 3-1/4 X 5-5/8 INCHES WITH GROMMET AND SELF-LOCKING NYLON TIES.
- d. TAG CHART: TYPEWRITTEN LETTER SIZE LIST OF APPLIED TAGS AND LOCATION IN ANODED ALUMINUM FRAME.
4. PIPE MARKERS
- a. COLOR AND LETTERING TO CONFORM TO ASME A13.1.
- b. PLASTIC PIPE MARKERS: FACTORY FABRICATED, FLEXIBLE, SEMI-RIGID PLASTIC; PREFORMED TO FIT AROUND PIPE OR PIPE COVERING. LARGER SIZES MAY HAVE MAXIMUM SHEET SIZE WITH SPRINGS FASTENER. MINIMUM INFORMATION INDICATING MANUFACTURER, MASON INDUSTRIES, KINETICS OR AMBER BOOTH. TYPES OF ISOLATORS, REQUIRED DEFLECTIONS, AND INSTALLATION PRACTICES SHALL BE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE VIBRATION ISOLATION MANUFACTURER.
5. CEILING TAGS
- a. DESCRIPTION: STEEL WITH 3/4 INCH DIAMETER COLOR-CODED HEAD.
- b. COLOR CODE AS FOLLOWS: PLUMBING VALVES: GREEN.
6. LABELS
- a. DESCRIPTION: POLYESTER FOR ABOVE GRADE AND LAMINATED MYLAR FOR BELOW GRADE; SIZE 1.5 X 0.75 INCHES, ADHESIVE BACKED WITH PRINTED IDENTIFICATION.

B. SLEEVES

1. MANUFACTURERS: FLEXICRAFT INDUSTRIES: PIPE WALL SLEEVE, METRIFLEX; PIPE WALL SLEEVE, COI PIPELINE; PIPE WALL SLEEVE, OPT - EXPLICITLY AUTHORIZED IN WRITING BY HIGHMARK AND/OR ZWR + PARTNERS. NID-B80XDOCUMENT, NAME=ASTM E814 ASTM E814-13A IN ACCORDANCE WITH DIVISION 07 THERMAL AND MOISTURE PROTECTION TO PREVENT THE SPREAD OF FIRE, SMOKE, AND GASES.
2. VERTICAL PIPING:
- a. SLEEVE LENGTH: 1 INCH ABOVE FINISHED FLOOR.
- b. PROVIDE SEALANT FOR WATERTIGHT JOINT.
- c. BLOCKED OUT FLOOR OPENINGS: PROVIDE 1-1/2 INCH ANGLE SET IN SILICON ADHESIVE AROUND OPENINGS.
- d. DRILLED PENETRATIONS: PROVIDE 1-1/2 INCH ANGLE RING OR SQUARE SET IN SILICONE ADHESIVE AROUND PENETRATION.
3. SHEET METAL: PIPE PASSING THROUGH INTERIOR WALLS, PARTITIONS, AND FLOORS, UNLESS STEEL OR BRASS SLEEVES ARE SPECIFIED BELOW.
4. PIPE PASSING THROUGH BELOW GRADE OR EXTERIOR WALLS:
- a. ANCHORED SLEEVE - ZINC COATED OR CAST IRON PIPE.
- b. PROVIDE WATERTIGHT SPACE WITH LINK RUBBER OR MODULAR SEAL BETWEEN SLEEVE AND PIPE ON BOTH PIPE ENDS.
5. CLEARANCES:
- a. PROVIDE ALLOWANCE FOR INSULATED PIPING.
- b. WALL, FLOOR, FLOOR, PARTITIONS, AND BEAM FLANGES: 1 INCH GREATER THAN EXTERNAL PIPE DIAMETER.
- c. ALL RATED OPENINGS: CAULKED TIGHT WITH FIRE STOPPING MATERIAL CONFORMING TO HYPERLINK "HTTP://GLOBAL.HS.COM/DOC/DETAIL.CFM?RID=B80XDOCUMENT, NAME=ASTM E814 ASTM E814-13A IN ACCORDANCE WITH DIVISION 07 THERMAL AND MOISTURE PROTECTION TO PREVENT THE SPREAD OF FIRE, SMOKE, AND GASES.
6. SLEEVES FOR PIPES THROUGH NON-FIRE RATED FLOORS: 18 GAGE THICK GALVANIZED STEEL.
7. SLEEVES FOR PIPES THROUGH NON-FIRE RATED WALLS, AND POTENTIALLY WET FLOORS: STEEL PIPE OR 18 GAGE THICK GALVANIZED STEEL.
8. SEALANT: REFER TO DIVISION 07 THERMAL AND MOISTURE PROTECTION.
9. MECHANICAL SLEEVE SEALS
- a. PRODUCT DESCRIPTION: MODULAR MECHANICAL TYPE, CONSISTING OF INTERLOCKING SYNTHETIC NITRILE RUBBER LINKS SHAPED TO CONTINUOUSLY FILL ANNULAR SPACE BETWEEN OBJECT AND SLEEVE, CONNECTED WITH BOLTS AND PRESSURE PLATES CAUSING RUBBER SEALING ELEMENTS TO EXPAND WHEN TIGHTENED, PROVIDING WATERTIGHT SEAL AND ELECTRICAL INSULATION.
- b. PROVIDE NSF 61 CERTIFIED ASSEMBLY WHEN USED IN POTABLE WATER STORAGE TANK APPLICATIONS.

C. FORMED STEEL CHANNEL

1. MANUFACTURERS: B-LINE SYSTEMS, UNISTRUT CORP., ANVIL INTERNATIONAL, SUBSTITUTIONS: DIVISION 01 - GENERAL REQUIREMENTS AND 22 04 00 - GENERAL REQUIREMENTS.
2. PRODUCT DESCRIPTION: GALVANIZED 12 GAGE THICK STEEL, WITH HOLES 1-1/2 INCHES ON CENTER.

D. GENERAL INSTALLATION REQUIREMENTS FOR PLUMBING

1. CONNECTIONS BETWEEN COPPER & STEEL PIPING SHALL BE MADE WITH DIELECTRIC WATERWAYS, WITH BRONZE BODY VALVES, OR WITH BRASS ADAPTER FITTINGS.
2. INSTALL AND TEST GAS PIPING IN ACCORDANCE WITH THE FUEL GAS CODE AND NFPA 54.
3. PREPARATION
- a. REAM PIPE AND TUBE ENDS. REMOVE BURRS, BEVEL OR GROOVE PLAIN END FERROUS PIPE.
- b. REMOVE SCALE AND DIRT ON INSIDE AND OUTSIDE BEFORE ASSEMBLY.
- c. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES OR UNIONS.
- d. KEEP OPEN ENDS OF PIPE FREE FROM SCALE AND DIRT. PROTECT OPEN ENDS WITH TEMPORARY PLUGS OR CAPS.
- e. AFTER COMPLETION, FILL, CLEAN, AND TREAT SYSTEM.
- E. INSTALLATION REQUIREMENTS FOR PLUMBING PIPING
1. INSTALL PIPING IN ACCORDANCE WITH ALL APPLICABLE PLUMBING CODES, ASME B31.1, AND ASME B31.9 AS APPLICABLE.
2. ROUTE PIPING PARALLEL TO BUILDING STRUCTURE AND MAINTAIN GRADIENT.
3. INSTALL PIPING TO CONSERVE BUILDING SPACE, AND NOT INTERFERE WITH USE OF SPACE.
4. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
5. SLEEVE PIPE PASSING THROUGH PARTITIONS, WALLS AND FLOORS.
6. INSTALL FIRESTOPPING AT PENETRATIONS OF RATED ASSEMBLIES. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND RATINGS OF RATED ASSEMBLIES.
7. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
8. PROVIDE ACCESS WHERE VALVES AND FITTINGS ARE NOT EXPOSED.
9. SLOPE DOMESTIC WATER PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS, USE ECCENTRIC REDUCERS TO MAINTAIN TOP OF PIPE ALIGNED.
10. WHERE PIPE SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDS.
11. PREPARE UNFINISHED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES, READY FOR FINISH PAINTING.
12. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.

F. TESTING

1. TEST PIPING IN ACCORDANCE WITH ALL APPLICABLE PLUMBING CODES, ASME B31.1 AND ASME B31.9 AS APPLICABLE.

22.05.29 - HANGERS AND SUPPORTS

- A. PROVIDE PIPE STANDS, SUPPORTS, HANGERS AND OTHER SUPPORTING APPLIANCES AS NECESSARY TO SUPPORT WORK REQUIRED BY CONTRACT DOCUMENTS. SPACING OF HANGERS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE BUILDING AND MECHANICAL CODES. STRUCTURAL STEEL SUPPORTS, HANGERS, ETC., SHALL BE ANGLE IRON, STEEL CHANNEL OR STEEL ROD USED WITH APPROVED CLAMPS, INSERTS, ETC., ALL SUPPORTS, HANGERS, BRACKETS, ETC., SHALL BE AS APPROVED BY THE ENGINEER.
- B. ALL HANGERS SHALL BE GALVANIZED.
- C. ATTACH HANGERS AND SUPPORTS DIRECTLY ONTO THE STRUCTURE BY FIRST REMOVING EXISTING FIRE PROOFING AND AFTER SECURING THE ATTACHMENT, REPAIRING THE FIRE PROOFING TO ITS ORIGINAL CONDITION, CONTINUOUSLY OVER THE ATTACHMENT.
- D. FOR EXPANSION BOLTS/SHIELDS USE RED HEAD, HLTI OR WELT SELF DRILLING OR STEEL SHIELD, LOAD RATED. DO NOT USE DRILLED ANCHORS IN POST TENSION SLABS WITHOUT APPROVAL OF OWNER. DO NOT CUT REINFORCING STEEL WITH DRILLED INSERTS.
- E. INSTALLATION REQUIREMENTS FOR HANGERS AND SUPPORTS
1. INSTALL IN ACCORDANCE WITH ASME B31.9, ASTM F708 AND MSS SP 89.
2. SUPPORT HORIZONTAL PIPING AS SCHEDULED.
3. INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
4. PLACE HANGERS WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
5. USE HANGERS WITH 1-1/2 INCH MINIMUM VERTICAL ADJUSTMENT. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
6. SUPPORT VERTICAL PIPING AT EVERY FLOOR. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
7. WHERE INSTALLING SEVERAL PIPES IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE PIPES HANGERS OR TRAP/TEE HANGERS.
8. PROVIDE COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.
9. PRIME COAT EXPOSED STEEL, HANGERS AND SUPPORTS, HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
10. PROVIDE CLEARANCE IN HANGERS AND FROM STRUCTURE AND OTHER EQUIPMENT FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.

22.05.48 - VIBRATION AND SEISMIC CONTROLS

1. PROVIDE VIBRATION ISOLATION FOR EACH PIECE OF ROTATING OR RECIPROCATING EQUIPMENT SHOWN ON THE DRAWINGS. ALL ISOLATION COMPONENTS SHALL BE SUPPLIED BY A SINGLE MANUFACTURER: MASON INDUSTRIES, KINETICS OR AMBER BOOTH. TYPES OF ISOLATORS, REQUIRED DEFLECTIONS, AND INSTALLATION PRACTICES SHALL BE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE VIBRATION ISOLATION MANUFACTURER.
- B. PROVIDE SEISMIC RESTRAINTS AS REQUIRED BY CODE.

22.07.00 - PLUMBING INSULATION

A. GENERAL REQUIREMENTS

1. INSULATION SHALL BE CERTAIN-TEED, KNAUF, MANVILLE, OR OWENS CORNING. MATERIALS SHALL MEET REQUIREMENTS OF ADHESIVE AND SEALANT COUNCIL STANDARDS AND SMACNA. INSTALL INSULATION, MASTICS, ADHESIVES, COATINGS, COVERS, WEATHER PROTECTION AND OTHER WORK IN STRICT ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50 SMOKE DEVELOPED.
2. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH SAME MATERIAL AND TO SAME THICKNESS AS ADJOINING PIPE INSULATION, WITH PRESENT SECTIONS.
3. FOR STRAINERS AND OTHER VALVES OR FITTINGS WHICH NEED MAINTENANCE, PROVIDE PREFORMED REMOVABLE ISOLATION SECTION.
4. INCREASE PIPE INSULATION AS REQUIRED FOR PIPING WITH HEAT TRACING PER MANUFACTURERS' REQUIREMENTS.
- A. PRODUCTS AND APPLICATIONS
1. INSULATION SHALL BE FIBROUS GLASS PIPE INSULATION WITH FACTORY-APPLIED ASJ WITH K FACTOR OF AT LEAST 0.23 AT 75F MEAN TEMPERATURE.
2. PROVIDE INSULATION FOR THE FOLLOWING SYSTEMS:
- a. DOMESTIC HOT WATER PIPE INSULATION: MINIMUM 1 INCH THICKNESS. PROVIDE 1-1/2 INCH THICKNESS FOR DOMESTIC HOT WATER PIPES 1-1/2 INCH DIAMETER AND LARGER.
- b. DOMESTIC COLD WATER: MINIMUM 1/2 INCH THICKNESS. PROVIDE 1 INCH THICKNESS FOR COLD WATER PIPES 1-1/2 INCH DIAMETER AND GREATER.
- c. SANITARY PIPING HORIZONTAL ABOVE GROUND WITHIN BUILDING: MINIMUM 1 INCH THICKNESS.
- d. SANITARY PIPING VERTICAL ABOVE GROUND WITHIN BUILDING: MINIMUM 1 INCH THICKNESS.

22.10.00 - PLUMBING PIPING

A. DOMESTIC WATER PIPING - ABOVE GRADE

1. SOLDERED OR BRAZED: ASTM B88, TYPE L HARD DRAWN COPPER TUBING, WITH ASME B16.18 CAST BRASS OR ASME B16.22 WROUGHT COPPER FITTINGS. JOINTS SHALL BE SOLDER TYPE WITH ASTM B32 95-1 TIN/ANTIMONY OR TIN AND SILVER SOLDER, OR BRACKETS, ETC., SHALL BE AS APPROVED BY THE ENGINEER. MECHANICALLY EXTRACTED COLLARS TEES ARE NOT ALLOWED.
2. GROOVED: ASTM B88, TYPE L WITH ROLLED GROOVED ENDS, WITH ASME B16.18 CAST PIPING ALLOY, ASME B16.22 WROUGHT COPPER FITTINGS OR ASME B16.22 CAST BRONZE CASTINGS, GROOVED END FITTINGS, AND ASTM F1476 GROOVED MECHANICAL COUPLINGS JOINTS WITH ENAMEL COATED ASTM A395 DUCTILE IRON AND ASTM A536 DUCTILE IRON HUBSINGS WITH CLAMPS, COMPATIBLE WITH COPPER TUBING SIZES. TO ENGAGE AND LOCK DESIGNED TO PERMIT SOME ANGULAR DEFLECTION, CONTRACTION, AND EXPANSION. ELASTOMER COMPOSITION GASKETS WITH AN OPERATING TEMPERATURE RANGE FROM -40°F TO 230°F, AND GALVANIZED OR STAINLESS STEEL BOLTS, NUTS, AND WASHERS. TEES SHALL BE FITTINGS; CLAMP TYPE TEES ARE NOT ALLOWED. MANUFACTURERS: ANVIL, GRUOLV, TYCOGRINNEL, VICTAULIC. FITTINGS AND JOINTS SHALL BE BY THE SAME MANUFACTURER.
3. PRESS CONNECTIONS: COPPER AND COPPER ALLOY PRESS CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE TUBING SHALL BE FULLY INSERTED INTO THE FITTING AND THE TUBING MARKED AT THE SHOULDER OF THE FITTING. THE FITTING ALIGNMENT SHALL BE CHECKED AGAINST THE MARK ON THE TUBING TO ASSURE THE TUBING IS FULLY ENGAGED (INSERTED) IN THE FITTING. THE JOINTS SHALL BE PRESSED USING THE TOOL(S) APPROVED BY THE MANUFACTURER.
- B. DRAIN, WASTE, AND VENT PIPING (SANITARY AND STORM)
1. BELOW GRADE: HUB & SPIGOT: ASTM A74 CAST IRON PIPE, WITH ASTM A74 CAST IRON FITTINGS AND ASTM C584 RUBBER GASKET JOINT DEVICES OR LEAD AND CAULK.
2. HUBLESS (NO-HUB): CISPI 301 HUBLESS SERVICE WEIGHT CAST IRON PIPE WITH CISPI 310 NEOPRENE GASKET AND STAINLESS STEEL CLAMP AND SHIELD JOINT ASSEMBLIES.
3. COPPER: ASTM B306 TUBE OR ASTM B42 PIPE, WITH ASME B16.23, CAST BRONZE, OR ASME B16.29 WROUGHT COPPER ALLOY GRADE FITTINGS, AND ALLOY GRADE 88S TITANIUM SOLDER.
4. PVC PIPE: ASTM D1785 SCHEDULE 40, OR ASTM D2241 SDR 26 WITH NOT LESS THAN 150 PSI PRESSURE RATING. FITTINGS ARE PER ASTM D2466, PVC. JOINTS SHALL BE SOLVENT WELDED, WITH ASTM D2584 SOLVENT CEMENT. PVC IS NOT ALLOWED IN ALL JURISDICTIONS AND OCCUPANCIES. REFER TO AUTHORITY HAVING JURISDICTION GUIDELINES FOR PVC. EDIT AS REQUIRED).

C. BRONZE BALL VALVES

1. MANUFACTURERS: APOLLO, CRANE, JENKINS, NIBCO, STOCKHAM.
2. GENERAL: BRONZE BODY, TWO PIECE, FULL PORT, 150 PSIG SWP, 60 PSIG WOG (UP TO 2"), 400 PSIG WOG (2-1/2" TO 4"), MSS SP-110, NSF 61 OR NSF/ANSI 372 CERTIFIED.
3. FEATURES: VINYL COATED LEVER HANDLE, CHROME PLATED SOLID BRASS BALL, BLOW-OUT PROOF STEM, ADJUSTABLE PACKING GLAND, PTFE SEATS AND SEALS.
4. EXTENDED LEVER HANDLE: PROVIDE AS NECESSARY TO ALLOW FOR UNCOMPRESSED INSULATION INSTALLATION; LEVER SHALL BE OPERABLE WITHOUT DISTURBING THE INSULATION.

D. STEEL BODY BALL VALVES

1. MANUFACTURERS: APOLLO, CRANE, JENKINS, NIBCO, STOCKHAM.
2. GENERAL: STEEL BODY, TWO PIECE, FULL PORT, 125 PSIG SWP, MSS SP-72.
3. FEATURES: VINYL COATED LEVER HANDLE, STAINLESS STEEL BALL AND STEM, PTFE SEATS AND SEALS, NSF 61 OR NSF/ANSI 372 CERTIFIED.
4. EXTENDED LEVER HANDLE: PROVIDE AS NECESSARY TO ALLOW FOR UNCOMPRESSED INSULATION INSTALLATION; LEVER SHALL BE OPERABLE WITHOUT DISTURBING THE INSULATION.

E. CHECK VALVES - HORIZONTAL SWING

1. MANUFACTURERS: APOLLO, CRANE, JENKINS, NIBCO, STOCKHAM.
2. GENERAL: ASTM B-61 BRONZE OR BRASS Y-PATTERN BODY, CLASS 125, 200 PSIG CWP, MSS SP-80, NSF 61 OR NSF/ANSI 372 CERTIFIED.
3. FEATURES: LOW LEAD BRASS SCREWED CAP, LOW LEAD BRASS DISC, LOW LEAD STEM, LOW LEAD BRASS HINGE, STAINLESS STEEL, OR LOW LEAD BRASS HINGE PIN.
- F. CHECK VALVES - SPRING LOADED
1. MANUFACTURERS: FLOMATIC, MILWAUKEE, NIBCO.
2. GENERAL: GLOBE STYLE IRON BODY, 200 PSIG CWP, ASME B16.1, 2" AND SMALLER, MSS SP 80, CLASS 250, BRONZE BODY, BRASS SPRING LEAD CHECK, SILENT CLOSING DISC, INTEGRAL SEAT, SOLDERED OR THREADED ENDS, 2-1/2" AND LARGER, MSS SP 125, CLASS 125, LEAD FREE, WATER STYLE, CAST IRON BODY, BRONZE SEAT, CENTER GUIDED BRONZE DISC, STAINLESS STEEL SPRING AND SCREWS, FLANGED ENDS.
3. FEATURES: NSF 61 OR NSF/ANSI 372 CERTIFIED.

G. THERMOSTATIC MIXING VALVES

1. MANUFACTURERS: LAWLOR, LEONARD, POWERS, WATTS.
2. GENERAL: THERMOSTATIC CONTROLLER WITH SWIVEL ACTION CHECK STOPS, REMOVABLE CARTRIDGE WITH STRAINER, STAINLESS STEEL PISTON AND LIQUID FILLED MOTOR WITH BELLWOWS MOUNTED OUT OF WATER, ROUGH BRASS FINISH, LEAD FREE BRONZE OR BRASS VALVE BODY.

H. MISCELLANEOUS FITTINGS

1. DIELECTRIC WATERWAYS
- a. MANUFACTURERS: TYCOGRINNEL, CLEARFLOW, PRECISION PLUMBING PRODUCTS (PPP) CLEARFLOW, VICTAULIC STYLE 647.
- b. GALVANIZED ASTM A53 STEEL, ASTM A395 DUCTILE IRON, OR ASTM A536 DUCTILE IRON SLEEVE WITH INERT NON-CORROSIVE THERMOPLASTIC LINING, NSF 61 OR NSF/ANSI 372 CERTIFIED.
2. FLANGES
- a. COPPER PIPING: CLASS 150, SLIP-ON BRONZE FLANGES.
- b. STEEL PIPING: CLASS 150, SLIP-ON FORGED STEEL FLANGES.
- c. GASKETS: 1/16" THICK PREFORMED NEOPRENE GASKETS.
3. UNIONS
- a. COPPER PIPING: CLASS 150, BRONZE UNIONS WITH SOLDERED OR BRAZED JOINTS.
- b. STEEL PIPING: CLASS 150, MALLEABLE IRON, THREADED.
- c. DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL, THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER ARE REQUIRED WHERE TWO DISSIMILAR METAL PRODUCTS ARE CONNECTED WITHIN A SYSTEM.

I. VALVES AND FITTINGS FOR GAS PIPING

1. UNIONS - FOR PIPE 2 INCHES AND SMALLER:
- a. FERROUS PIPING: CLASS 150, MALLEABLE IRON, THREADED.
2. DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.
3. FLANGES - FOR PIPE 2-1/2 INCHES AND LARGER:
- a. FERROUS PIPING: CLASS 150, FORGED STEEL, SLIP-ON FLANGES.
- b. COPPER PIPING: CLASS 150, SLIP-ON BRONZE FLANGES.
- c. GASKETS: 1/16 INCH THICK PREFORMED NEOPRENE GASKETS.
4. BALL VALVES
- a. MANUFACTURERS: APOLLO, CRANE, HAMMOND, JENKINS, MILWAUKEE, NIBCO, STOCKHAM, WATTS.
- b. 1/4 INCH TO 1 INCH, MSS SP 110, CLASS 125, TWO PIECE, THREADED ENDS, BRONZE BODY, CHROME PLATED BRONZE BALL, REINFORCED TEFLO SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, CONVENTIONAL PORT.
- c. 1-1/4 INCH TO 3 INCH, MSS SP 110, CLASS 125, TWO PIECE, THREADED ENDS, BRONZE BODY, CHROME PLATED BRONZE BALL, REINFORCED TEFLO SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, CONVENTIONAL PORT.

22.30.00 - PLUMBING EQUIPMENT

- A. FLOOR SINKS: MANUFACTURED BY JAY R. SMITH, FIAT, MIFAB, WADE, WATTS, ZURN.
- B. CLEANOUTS: MANUFACTURED BY JAY R. SMITH, JOSAM, MIFAB, WADE, WATTS, ZURN.
- C. HOSE BIBBS: MANUFACTURED BY CHICAGO FAUCETS, JAY R. SMITH, JOSAM, MIFAB, ROYAL, WADE, WATTS, WOODFORD, ZURN.
- D. WATER HAMMER ARRESTORS: MANUFACTURED BY JAY R. SMITH, JOSAM, MIFAB, PRECISION PLUMBING PRODUCTS (PPP), WADE, WATTS, WOODFORD, ZURN.
- E. TRAP PRIMERS: MANUFACTURED BY JAY R. SMITH, JOSAM, MIFAB, PRECISION PLUMBING PRODUCTS (PPP), WADE, WATTS, WOODFORD, ZURN.
- F. SUMP PUMPS: MANUFACTURED BY LIBERTY, ZOELLER, GOULDS.
- G. WATER FILTER: MANUFACTURED BY AQUA-PURE, PENTAIR, 3M.
- H. GENERAL
- a. VERIFY WALLS AND FLOOR FINISHES ARE PREPARED AND READY FOR INSTALLATION OF FIXTURES.
- b. COORDINATE CUTTING AND FORMING OF ROOF AND FLOOR CONSTRUCTION TO RECEIVE DRAINS.
- c. INSTALL COMPONENTS LEVEL AND PLUMB.
- d. EXTEND CLEANOUTS TO FINISHED FLOOR OR WALL SURFACE. LUBRICATE THREADED CLEANOUT PLUGS WITH MATURE OF GRAPHITE AND UNLINED OIL. ENSURE CLEARANCE AT CLEANOUT FOR RODDING OF DRAINAGE SYSTEM.
- e. INSTALL WATER HAMMER ARRESTORS WITH ISOLATION VALVE IN ACCESSIBLE LOCATIONS.



7430 E. Caley Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

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23.00.00 - GENERAL

A. THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS UNLESS NOTED OTHERWISE. REVIEW THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING DRAWINGS FOR NOTES, DIMENSIONS, ETC. AND COORDINATE WITH OTHER TRADES INVOLVED. THE WORK REQUIREMENTS DESCRIBED WITHIN DIVISION 20 SPECIFICATION SECTION "COMMON MECHANICAL/ELECTRICAL REQUIREMENTS" FORM COMPLEMENTARY REQUIREMENTS TO THE SCOPE OF WORK CONTAINED WITHIN DIVISION 23.

B. DESCRIPTION

1. SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS AND WITHOUT LIMITING GENERALITY THEREOF CONSISTS OF: FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.

C. DEFINITIONS: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT

1. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS"

2. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS"

3. PROVIDE: THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.

4. REMOVE: THE TERM "REMOVE" MEANS TO DISCONNECT FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."

5. SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND/OR METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT."

D. DRAWINGS

1. DRAWINGS ARE DIAGRAMMATIC. THE FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS. THOUGH SOME OFFSETS & TRANSITIONS MAY BE SHOWN IN PIPING & SHEET METAL TO HELP INDICATE THE PHYSICAL RELATIONSHIP BETWEEN THEM, IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL PIPING & SHEET METAL OFFSETS & TRANSITIONS REQUIRED. THE CONTRACTOR SHALL FULLY CONSIDER THE LOCATION AND QUANTITY OF ACCESS PANELS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS & A COMMITMENT TO POSITIONING OCCURS. IT IS THE CONTRACTOR'S TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.

E. CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE FOLLOWING:

1. SHEET METAL, SMACNA STANDARDS
2. INTERNATIONAL MECHANICAL CODE
3. INTERNATIONAL ENERGY CONSERVATION CODE
4. INTERNATIONAL BUILDING SYSTEM CODES
5. ALL OTHER APPLICABLE STATE AND LOCAL CODES AND ORDINANCES. OWNER STANDARDS AND BASE BUILDING SPECIFICATIONS AND STANDARDS.

F. PERMITS AND FEES:

1. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK, FILE ALL NECESSARY DRAWING SYSTEMS. ALL WORK SHALL BE COMPLETED WITH NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION. OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR HIS WORK, AND DELIVER A COPY TO THE OWNER AND ENGINEER BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK.

G. EXISTING SYSTEMS AND EQUIPMENT

1. EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER.

2. CONNECT WORK TO VARIOUS EXISTING SYSTEMS AS INDICATED ON THE DRAWINGS. WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEMS. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED AS WELL AS WITH EXISTING SYSTEMS, THE STRUCTURE, AND OTHER OBSTRUCTIONS.

3. PROVIDE THE FOLLOWING SERVICES ON ALL EXISTING HVAC EQUIPMENT INDICATED TO REMAIN:

- a. CLEAN CONDENSATE PAN AND TRAP
- b. CALIBRATE CONTROLS
- c. FILTER CHANGES
- d. VERIFY FAN ROTATION AND OPERATION
- e. BALANCING
- f. VERIFY PITCH OF CONDENSATE DRAIN PIPES AND DRAIN PAN
- g. VERIFY EQUIPMENT CONTROL OPERATION
- h. LUBRICATION OF FANS, MOTORS, ETC.
- i. CLEAN HEATING/COOLING COILS

H. SURVEY AND MEASUREMENTS

1. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, SHALL BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED DESIGNERS AND INSTALLATION PRACTICES SHALL BE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE VIBRATION ISOLATION MANUFACTURER.

2. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GVERN ALL DIMENSIONS.

3. PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE EQUIPMENT DESCRIBED WITHIN THE OPERATIONS AND/OR MATERIALS. MAKE CHANGES INTO RECORD AS-BUILT DRAWINGS IN ELECTRONIC FORMAT AND SUBMIT FOR APPROVAL.

4. CONTRACTORS SHALL VERIFY LAYOUT AND BE RESPONSIBLE FOR ALL MEASUREMENTS OF ALL EXISTING CONDITIONS BEFORE COMMENCING WORK AND SHALL NOTIFY ARCHITECT AND/OR ENGINEER IF A CONDITION EXISTS THAT PREVENTS THE CONTRACTOR FROM ACCOMPLISHING THE INTENT OF THE DRAWINGS.

I. SUBMITTALS AND SHOP DRAWINGS

1. SUBMIT FOR REVIEW, ELECTRONIC SHOP DRAWINGS IN SEARCHABLE PDF FORMAT FOR THE FOLLOWING:

- a. SUBMITTAL DATA FOR ALL MATERIAL AND EQUIPMENT. CLEARLY IDENTIFY DEVIATIONS OF THE SUBMITTED PRODUCTS FROM THE DESIGN.
- b. DUCTWORK SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"=1'-0". HIGHLIGHT, ENCLOSE, OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS AS THE BASIS OF SHOP DRAWINGS. STANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS.

c. CONTROLS SHOP DRAWINGS: INCLUDE EQUIPMENT AND SYSTEM CONTROL SCHEMATICS, SEQUENCES OF OPERATIONS, LOGIC DIAGRAMS AND SYSTEM COMPONENTS.

2. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.

3. DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SUBMITTALS.

4. SCHEDULE AT LEAST TEN WORKING DAYS EXCLUSIVE OF TRANSMITTAL TIME, FOR SUBMITTAL REVIEW.

J. AS-BUILT DRAWINGS

A. MAINTAIN ONE SET OF PRINTS ON THE SITE AND NOTE ALL CHANGES OR DEVIATIONS FROM THE ORIGINAL DESIGN. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL CHANGES INTO RECORD AS-BUILT DRAWINGS IN ELECTRONIC FORMAT AND SUBMIT FOR APPROVAL.

K. OPERATION AND MAINTENANCE

1. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE OWNER OR THE OWNER'S REPRESENTATIVE IN THE OPERATION, ADJUSTING AND MAINTENANCE OF ALL EQUIPMENT FURNISHED. THE CONTRACTOR SHALL GIVE AT LEAST SEVEN (7) DAYS NOTICE TO THE OWNER AND THE ENGINEER IN ADVANCE OF THIS PERIOD.

2. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A COMPLETE OPERATION AND MAINTENANCE MANUAL, BOUND IN BOOKLET FORM. ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.

3. OPERATION AND MAINTENANCE MANUAL SHALL INCLUDE THE FOLLOWING:

- a. MANUFACTURERS PRINTED OPERATING AND MAINTENANCE PROCEDURES.
- b. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING.
- c. COPIES OF WARRANTIES.
- d. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
- e. BALANCE REPORTS.
- f. INCLUDE IN THE MANUAL, A TABULATED EQUIPMENT SCHEDULE FOR ALL EQUIPMENT. SCHEDULE SHALL INCLUDE PERTINENT DATA SUCH AS: MAKE, MODEL NUMBER, SERIAL NUMBER, VOLTAGE, NORMAL OPERATING CURRENT, BELT SIZE, FILTER QUANTITIES AND SIZES, BEARING NUMBER, ETC. SCHEDULE SHALL INCLUDE MAINTENANCE TO BE DONE AND FREQUENCY.

4. MAINTENANCE AND INSTRUCTION MANUALS SHALL BE SUBMITTED TO THE OWNER AT THE SAME TIME AS THE SEVEN (7) DAY NOTICE IS GIVEN PRIOR TO THE INSTRUCTION PERIOD.

L. CLEANING

1. ALL WORK AREAS SHALL BE LEFT AS CLEAN AS NEW. CLEAN INTERNALS OF ALL DUCTWORK AND AIR HANDLING UNITS AND REPLACE FILTERS AFTERWARDS.

2. DUCTWORK: DUCTS SHALL BE THOROUGHLY CLEANED SO THAT NO DIRT OR DUST SHALL BE DISCHARGED FROM DIFFUSERS, REGISTERS, OR GRILLES, WHEN SYSTEM IS OPERATED.

3. PIPING: AFTER CONDENSATE PIPING HAS BEEN PRESSURE TESTED AND APPROVED FOR TIGHTNESS, CLEAN AND FLUSH PIPING.

4. EQUIPMENT: AFTER COMPLETION OF PROJECT, CLEAN THE EXTERIOR SURFACE OF EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE.

5. WORK AREA: AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS, TEMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION.

M. GUARANTEE

1. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD. PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.

N. MEANS AND METHODS ALL TRADES

1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

2. DO NOT BURN WASTE MATERIALS. DO NOT BURY DEBRIS OR EXCESS MATERIALS ON THE OWNERS' PREMISES. DO NOT DISCHARGE VOLATILE, HARMFUL OR DANGEROUS MATERIALS INTO DRAINAGE SYSTEMS. REMOVE AND DISPOSE OF ALL WASTE MATERIALS, PACKAGING MATERIAL, SKIDS ETC. FROM THE SITE AND DISPOSE OF IN A LAWFUL MANNER IN ACCORDANCE WITH MUNICIPAL, STATE AND FEDERAL REGULATIONS.

3. MATERIALS AND EQUIPMENT SHALL BE UL LISTED WHERE STANDARD HAS BEEN ESTABLISHED.

4. CAREFULLY INSPECT ALL BUILDING ELEMENTS PRIOR TO CUTTING OR DRILLING INTO WALL, FLOORS OR CEILINGS. PATCH AND PAINT SURFACES DISTURBED BY WORK UNDER THIS CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.

5. SCAFFOLDING, RIGGING, HOISTING: THE CONTRACTOR SHALL FURNISH ALL SCAFFOLDING, RIGGING, HOISTING AND SERVICES NECESSARY FOR ERECTION AND DELIVERY INTO THE PREMISES ANY EQUIPMENT AND APPARATUS FURNISHED UNDER THIS DIVISION. REMOVE SAME FROM PREMISES WHEN NO LONGER REQUIRED.

6. EXCAVATION AND BACKFILLING: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE SIZES, DEPTHS, FILL AND BEDDING REQUIREMENTS AND ANY OTHER EXCAVATION WORK REQUIRED UNDER THESE SPECIFICATIONS.

7. WATERPROOFING: WHERE ANY WORK PERCEES WATERPROOFING, INCLUDING WATERPROOF CONCRETE, ROOFS, EXTERIOR WALL, AND FLOORS, WET AREAS, THE METHOD OF INSTALLATION SHALL BE REVIEWED BY THE ENGINEER BEFORE WORK IS DONE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WATERTIGHT.

8. PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION, PLUMBING, MECHANICAL AND ELECTRICAL PENETRATIONS THROUGH FIRE RATED PARTITIONS. PROVIDE ASBESTOS FREE FIRE STOPPING SYSTEM CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME AND GASES. SYSTEM SHALL BE UL LISTED AND COMPLY WITH ASTM E 814.

9. PROVIDE ACCESS PANELS IN WALLS, FLOORS AND GYPSUM WALL BOARD CEILINGS TO FACTORY APPLIED FSR JACKET. PROVIDE MINIMUM OF R-12 (AS INSTALLED) INSULATION REQUIRING PERIODIC SERVICE AND INSPECTION. NOT ALL ACCESS PANELS ARE INDICATED ON THE PLANS. REVIEW ARCHITECTURAL AND MECHANICAL PLANS TO DETERMINE THE LOCATION AND QUANTITY OF ACCESS PANELS REQUIRED. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.

23.04.17 - SLEEVES AND PENETRATIONS

A. GENERAL REQUIREMENTS

1. LAY OUT PENETRATION AND SLEEVE OPENINGS IN ADVANCE. COORDINATE WORK CAREFULLY WITH ARCHITECTURAL AND STRUCTURAL WORK. PROVIDE CORE DRILLING OF EXISTING CONSTRUCTION WHERE REQUIRED. SUBMIT PROPOSED LOCATIONS FOR REVIEW PRIOR TO CORE DRILLING.

2. MAINTAIN FIRE RATING OF WALLS, PARTITIONS, CEILINGS, AND FLOORS AT PENETRATIONS. SEAL PENETRATIONS WITH APPROVED FIRESTOP MATERIALS.

3. SLEEVES FOR INSULATED PIPE AND DUCT IN NON-FIRE RATED CONSTRUCTION SHALL ACCOMMODATE CONTINUOUS INSULATION WITHOUT COMPRESSION.

B. PIPE SLEEVES:

1. PROVIDE HOT-DIPPED GALVANIZED SCHEDULE 40 STEEL PIPE SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS AND CONCRETE FLOOR AND ROOF SLABS.

2. PROVIDE 26 GAUGE GALVANIZED STEEL SLEEVES THROUGH PARTITIONS AND NON-FIRE RATED CONSTRUCTION.

3. PROVIDE MECHANICAL SLEEVE SLEEVES CONSISTING OF INTERLOCKING MODULES AT EXTERIOR PIPE PENETRATIONS.

4. PROVIDE ADJUSTABLE ESCUTCHEONS ON EXPOSED PIPING THAT PASSES THROUGH FINISHED FLOORS, WALLS AND CEILINGS. ESCUTCHEONS SHALL BE CHROME-PLATED CAST BRASS, SIZED TO COVER SLEEVE OPENING AND TO ACCOMMODATE PIPE AND INSULATION, UP EQUIPMENT.

23.05.29 - HANGERS AND SUPPORTS

A. PROVIDE PIPE STANDS, SUPPORTS, HANGERS AND OTHER SUPPORTING APPLIANCES AS NECESSARY TO SUPPORT WORK REQUIRED BY CONTRACT DOCUMENTS. SPACING OF HANGERS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE BUILDING AND MECHANICAL CODES. STRUCTURAL STEEL, SUPPORTS, HANGERS, ETC. SHALL BE ANGLE IRON, STEEL CHANNEL OR STEEL ROD USED WITH APPROVED CLAMPS, INSERTS, ETC. ALL SUPPORTS, HANGERS, BRACKETS, ETC. SHALL BE AS APPROVED BY THE ENGINEER.

B. ALL HANGERS SHALL BE GALVANIZED.

C. ATTACH HANGERS AND SUPPORTS DIRECTLY ONTO THE STRUCTURE BY FIRST REMOVING EXISTING FIRE PROOFING, AND AFTER SECURING THE ATTACHMENT, REPAIRING THE FIRE PROOFING TO ITS ORIGINAL CONDITION, CONTINUOUSLY OVER THE ATTACHMENT.

D. SUPPORT ALL GALVANIZED DUCTWORK WITH GALVANIZED HANGERS AND MOUNTS AS REQUIRED BY SMACNA (6 FT SPACING). DO NOT SUPPORT RISERS FROM SLEEVES IN SLABS.

23.05.48 - VIBRATION AND SEISMIC CONTROLS FOR HVAC

A. PROVIDE VIBRATION ISOLATION FOR EACH PIECE OF ROTATING OR RECIPROCATING HVAC EQUIPMENT SHOWN ON THE DRAWINGS. VIBRATION ISOLATION COMPONENTS SHALL BE A SINGLE MANUFACTURER - MASON INDUSTRIES, KINETICS OR AMBER BOOTH. TYPES OF ISOLATORS, REQUIRED DETAILINGS AND INSTALLATION PRACTICES SHALL BE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE VIBRATION ISOLATION MANUFACTURER.

23.05.53 - PIPE AND DUCT IDENTIFICATION

A. DUCTWORK AND PIPING SHALL BE LABELED WITH PREPRINTED SELF-ADHESIVE, PREMIUM GRADE VINYL, COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION.

B. VALVES SHALL BE TAGGED WITH STAMPED OR ENGRAVED BRASS VALVE TAGS. INSTALL TAGS ON VALVES AND CONTROL DEVICES IN PIPING SYSTEMS, EXCEPT CHECK VALVES. VALVES WITHIN FACTORY-FABRICATED EQUIPMENT UNITS, SHUT-OFF VALVES, FAUCETS, CONVENIENCE AND LAWN-WATERING HOSE CONNECTIONS, AND HVAC TERMINAL DEVICES AND SIMILAR ROUTING/RAIN CONNECTIONS OF END-USE FIXTURES AND UNITS. LIST TAGGED VALVES IN A VALVE SCHEDULE.

C. MACHINERY SUCH AS CURS, FANS, ETC. SHALL BE LABELED WITH PLASTIC LABELS WITH ENGRAVED EQUIPMENT NUMBER CORRESPONDING TO DRAWING SCHEDULE NUMBERS.

23.05.93 - TESTING, ADJUSTING AND BALANCING

A. PROVIDE QUALIFIED PERSONNEL, EQUIPMENT, APPARATUS AND SERVICES FOR START-UP, TESTING AND BALANCING OF MECHANICAL SYSTEMS, TO PERFORMANCE DATA SHOWN IN SCHEDULES, AS SPECIFIED, AND AS REQUIRED BY CODES, STANDARDS, REGULATIONS AND AUTHORITIES HAVING JURISDICTION INCLUDING CITY INSPECTORS, OWNERS AND ARCHITECT.

B. PROVIDE THE SERVICES OF AN INDEPENDENT TESTING, ADJUSTING, AND BALANCING (TAB) AGENCY TO PROVIDE TAB SERVICES FOR THE MECHANICAL SYSTEMS. THE TAB AGENCY SHALL BE CERTIFIED BY NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) OR THE ASSOCIATED AIR BALANCE COUNCIL (AABC) IN THOSE TESTING AND BALANCING DISCIPLINES REQUIRED FOR THIS PROJECT. THE TAB AGENCY SHALL PROVIDE AT LEAST ONE PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE SERVICES ARE TO BE PERFORMED AND CERTIFIED BY NEBB OR AABC AS A TEST AND BALANCE ENGINEER.

C. PRIOR TO TESTING, ADJUSTING, AND BALANCING, THE MECHANICAL CONTRACTOR SHALL VERIFY THAT THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING AS SPECIFIED. APPROVED SHOP DRAWINGS, AS BUILT DRAWINGS, AND ALL OTHER DATA REQUIRED FOR EACH SYSTEM AND/OR COMPONENT TO BE TESTED SHALL BE MADE AVAILABLE AT THE JOB SITE DURING THE ENTIRE TAB EFFORT. THE OWNER SHALL BE NOTIFIED IN WRITING OF ALL EQUIPMENT COMPONENTS, OR BALANCING DEVICES, THAT ARE DAMAGED, INCORRECTLY INSTALLED, OR MISSING, AS WELL AS ANY DESIGN DEFICIENCIES THAT WILL PREVENT PROPER TESTING, ADJUSTING, AND BALANCING. TESTING, ADJUSTING, AND BALANCING SHALL NOT COMMENCE UNTIL APPROVED BY THE OWNER.

D. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM IDENTIFIED, IN ACCORDANCE WITH THE DETAILED PROCEDURES OUTLINED IN EITHER NEBB "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR AABC "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE." THE TAB AGENCY SHALL TEST, ADJUST, AND BALANCE THE FOLLOWING MECHANICAL SYSTEMS:

1. ALL AIR HANDLING EQUIPMENT
2. ALL PUMPING SYSTEMS
3. ALL SUPPLY AIR SYSTEMS
4. ALL RETURN AIR SYSTEMS
5. VERIFY OPERATION OF ALL TEMPERATURE CONTROL SYSTEMS
6. TEST SYSTEMS FOR PROPER SOUND AND VIBRATION LEVELS

A. SUBMIT TESTING, ADJUSTING, AND BALANCING REPORTS BEARING THE SEAL AND SIGNATURE OF THE TAB PROFESSIONAL ENGINEER. PREPARE A REPORT OF RECOMMENDATIONS FOR CORRECTING UNSATISFACTORY MECHANICAL PERFORMANCES WHEN A SYSTEM CANNOT BE SUCCESSFULLY BALANCED.

B. START UP ALL SYSTEMS, PRESSURE TEST DUCTWORK AND PIPING, AND BALANCE SYSTEMS INCLUDING, BUT NOT LIMITED TO, ALL NEW AND EXISTING REGISTERS, GRILLES, DIFFUSERS, TERMINAL UNITS, FANS, ETC. WITHIN THE AREA OF WORK TO PERFORMANCE DATA SHOWN ON PLANS, SCHEDULES, AND AS SPECIFIED.

C. DO NOT COVER OR CONCEAL WORK BEFORE TESTING AND INSPECTION AND OBTAINING APPROVAL.

D. LEAKS, DAMAGE AND DEFECTS DISCOVERED OR RESULTING FROM STARTUP, TESTING, AND BALANCING SHALL BE REPAIRED OR REPLACED TO LIKE-NEW CONDITION WITH ACCEPTABLE MATERIALS. TEST SHALL BE CONTINUED UNTIL SYSTEM OPERATES WITHOUT ADJUSTMENT OR REPAIR.

E. REPORT ON REPORTING FORMS, SUBMITTED TO ARCHITECT FOR APPROVAL IN ADVANCE.

F. SUBMIT PROCEDURES, RECORDING FORMS, AND TEST EQUIPMENT FOR REVIEW PRIOR TO BALANCING, AS DESCRIBED IN SPECIFICATIONS. SUBMIT ELECTRONIC COPY OF TESTING AND BALANCING REPORTS TO ARCHITECT FOR APPROVAL.

G. FURNISH ALL TEST MEDIUMS AND DISPOSE OF ALL TEST MEDIUMS AT AN APPROVED OFF-SITE LOCATION AFTER TESTING IS COMPLETE.

H. NOTE REQUIREMENT ABOVE FOR CFM AND STATIC PRESSURE READINGS PRIOR TO DEMOLITION.

I. THE BALANCING CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL DIRECTIONAL ADJUSTMENT OF ALL LINEAR DIFFUSERS AS INDICATED ON PLANS. IF NO DIRECTIONAL FLOW IS INDICATED INTERIOR LINEAR DIFFUSERS SHALL BE DIRECTED HORIZONTALLY AND PERIMETER LINEAR DIFFUSERS SHALL BE DIRECTED VERTICALLY. IF PERIMETER LINEAR DIFFUSERS HAVE MULTIPLE SLOTS THE PERIMETER SLOT DIRECTED VERTICALLY, AND THE INTERIOR SLOT DIRECTED HORIZONTALLY TOWARDS THE INTERIOR SPACE.

23.07.13 - HVAC INSULATION

A. GENERAL REQUIREMENTS

1. INSULATION SHALL BE CERTAIN-TYPE, KNAUF, MANVILLE, OR OWENS CORNING. MATERIALS SHALL MEET REQUIREMENTS OF ADHESIVE AND SEALANT COUNCIL STANDARDS AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. WEATHER-PROTECTION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50 SMOKE DEVELOPED.

2. INSULATION AND VAPOR BARRIER SHALL BE CONTINUOUS AROUND ENTIRE PERIMETER OF DUCTS. DUCTS SUPPORTED BY METAL STRAPS SHALL HAVE INSULATION ENCOMPASSING STRAPS, WHERE STRAPS PENETRATE AT TOP OF DUCT TIGHTLY SEAL AROUND STRAP WITH INSULATING TAPE. DUCTS SUPPORTED BY TRAPEZOID TYPE HANGERS UNDER DUCTS SHALL HAVE 1 LB. DENSITY RIGID INSULATION PROVIDED BETWEEN DUCT AND HANGER.

3. INSULATION SHALL HAVE SAME THICKNESS AND VAPOR BARRIER AS SPECIFIED FOR SPECIFIC DUCT TYPE. RIGID INSULATION SECTION SHALL BE FULL WIDTH OF DUCT AND MINIMUM 1/2" LONG. TAPE AND SEAL ALL SEAMS WHERE RIGID INSULATION MEETS OTHER INSULATION.

4. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH SAME MATERIAL AND TO SAME THICKNESS AS ADJOINING PIPE INSULATION, WITH PRESENT SECTIONS.

5. FOR STRAINERS AND OTHER VALVES OR FITTINGS WHICH NEED MAINTENANCE, PROVIDE PREFORMED REMOVABLE INSULATION SECTION.

B. PRODUCTS AND APPLICATIONS

1. INDOOR DUCT INSULATION SHALL BE MINERAL FIBER BLANKET DUCT INSULATION WITH FACTORY APPLIED FSR JACKET. PROVIDE MINIMUM OF R-6 (AS INSTALLED) INSULATION FOR THE FOLLOWING:

- a. SUPPLY AND FRESH AIR DUCTS WHEN LOCATED WITHIN CONCEALED SPACES INSIDE THE BUILDING ENVELOPE.
- b. RETURN AIR DUCTWORK IN UNCONDITIONED SPACES (WHERE SPACE TEMPERATURE IS MORE THAN 10 DEGREES F DIFFERENCE FROM DUCT TEMPERATURE).

2. OUTDOOR DUCT INSULATION SHALL BE RIGID MINERAL FIBER BOARD DUCT INSULATION WITH FACTORY APPLIED FSR JACKET. PROVIDE MINIMUM OF R-12 (AS INSTALLED) INSULATION. SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTS WHEN LOCATED OUTSIDE THE BUILDING ENVELOPE.

3. REFRIGERANT LINE AND CONDENSATE DRAIN LINE INSULATION SHALL BE 1 INCH THICK FLEXIBLE ELASTOMERIC, ACCEPTABLE MANUFACTURERS: ARMACELL OR K-FLEX.

4. CONDENSATE DRAIN LINE INSULATION SHALL BE 1 INCH THICK FLEXIBLE ELASTOMERIC, ACCEPTABLE MANUFACTURERS: ARMACELL OR K-FLEX.

5. EQUIPMENT INSULATION SHALL BE MINERAL FIBER BOARD INSULATION WITH FACTORY APPLIED ASJ. PROVIDE 2 INCH THICK FOR HEATING SYSTEM HEAT EXCHANGERS, 1 INCH THICK FOR OTHER EQUIPMENT. INSULATION SHALL BE FORMED OR FABRICATED TO FIT EQUIPMENT.

C. OUTDOOR JACKET

6. PROVIDE OUTDOOR PIPING WITH WATERPROOF 0.016" THICK ALUMINUM JACKET WITH 2" TRANSVERSE AND LONGITUDINAL LAP JOINTS ORIENTED TO SHED WATER.

23.09.00 - INSTRUMENTATION AND CONTROLS

A. PROVIDE COMPLETE SYSTEM OF AUTOMATIC TEMPERATURE CONTROLS (ATC). CONTROL SYSTEM SHALL BE CAPABLE OF PERFORMING ALL SEQUENCES OF OPERATION SHOWN ON THE DRAWINGS OR DESCRIBED IN THESE SPECIFICATIONS. INDIVIDUAL CONTROL COMPONENTS MAY NOT BE SHOWN ON CONTRACT DOCUMENTS, BUT THE CONTRACTOR SHALL SUPPLY ALL COMPONENTS, AND CONTROL WIRING NECESSARY FOR A COMPLETE OPERABLE SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SYSTEM COMPONENTS, WHETHER THE ELECTRICAL OR OTHER WORK IS SUBCONTRACTED OR NOT.

B. INSTALL THERMOSTATS AT APPOINTED HEIGHTS ABOVE FINISHED FLOOR IN ACCORDANCE WITH "ADA" REQUIREMENTS, OR AS DIRECTED OTHERWISE BY ARCHITECT.

C. ALL SAFETY SWITCHES AND CUT OUTS SHALL BE FIELD CALIBRATED AND SET PRIOR TO START-UP.

D. ALL CONTROL WIRING SHALL COMPLY WITH THE REQUIREMENTS OF THE ELECTRICAL SPECIFICATIONS.

E. WIRING BETWEEN FIRE ALARM SYSTEM AND TEMPERATURE CONTROL SYSTEM, EXCEPT FOR DUCT MOUNTED SMOKE DETECTORS, SHALL BE BY MECHANICAL CONTRACTOR.

F. HEATING/COOLING THERMOSTATS SHALL HAVE AN ADJUSTABLE DEADBAND.

G. LOCAL CONTROLLERS, RELAYS, SWITCHES, AND OTHER CONTROL COMPONENTS SHALL BE MOUNTED ON ENCLOSED CONTROL PANELS WITH HINGE-LOCK DOOR MOUNTED NEXT TO SYSTEM CONTROLLED. TEMPERATURE SETTINGS, ADJUSTMENTS AND CALIBRATIONS SHALL BE MADE AT SYSTEM CONTROL PANEL. PANEL SHALL HAVE CANOPY LIGHT AND ON-OFF SWITCH.

23.21.00 - PIPING AND PUMPS

A. GENERAL REQUIREMENTS

1. PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS INDICATED IN SCHEDULE OF PIPE AND FITTING MATERIALS. PROVIDE DIELECTRIC FITTINGS TO CONNECT DIFFERENT PIPING MATERIALS.

B. SCHEDULE OF PIPE AND FITTING MATERIALS

1. CONDENSATE DRAIN (INCLUDING PUMPED CONDENSATE): 125 PS WORKING PRESSURE, TYPE 1 COPPER WITH SOLDERED COPPER JOINTS.

2. REFRIGERANT PIPING: TYPE ACR COPPER

C. VALVES AND STRAINERS

1. VALVES SHALL HAVE NAME OF MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST OR STAMPED ON BODIES. VALVES OF SIMILAR TYPE SHALL BE BY A SINGLE MANUFACTURER. VALVES SHALL BE AS MANUFACTURED BY APOLLO, CRANE, HAMMOND, JENKINS, STOCKHOLM OR MILWAUKEE.

D. COMBINATION BALANCING AND SHUT-OFF VALVES

1. PROVIDE CALIBRATED COMBINATION BALANCING SHUT-OFF VALVES AS INDICATED ON THE PLANS. ACCEPTABLE MANUFACTURERS SHALL BE ARMSTRONG, BELL AND GOSSET, FLOWSET, OR TAGO.

E. AUTOMATIC FLOW CONTROL VALVES

1. PROVIDE AUTOMATIC PRESSURE COMPENSATING FLOW CONTROL VALVES BY GRISWOLD, FID OR TAG AS INDICATED ON THE PLANS. VALVES SHALL BE FACTORY SET AND SHALL AUTOMATICALLY LIMIT THE RATE OF FLOW TO WITHIN 5 PERCENT OF THE SPECIFIED CAPACITY.

23.31.00 - HVAC DUCTS

A. GENERAL REQUIREMENTS

1. FOR GALVANIZED DUCTWORK, SEAL AIR DUCT JOINTS AND JOINTS BETWEEN FITTINGS AND DUCTS WITH HARDEST SEALANT OR APPROVED EQUAL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

2. DUCTWORK SHALL BE FREE FROM VIBRATION UNDER ALL CONDITIONS OF OPERATION.

3. DIFFUSER & REGISTER LOCATIONS SHALL BE COORDINATED WITH ARCHITECTURAL REFLECTED CEILING PLANS.

4. DIFFUSER SIZES SHOWN ARE NECK SIZES; REGISTER AND GRILLE SIZES ARE NOMINAL.

5. ALL DUCTS PENETRATING RATED FIRE WALLS SHALL BE PROVIDED WITH FIRE DAMPERS AND ACCESS DOORS.

6. DUCTWORK SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.

7. PATCH AND SEAL ALL EXISTING OPENINGS IN DUCTWORK NOT UTILIZED FOR NEW LAYOUT.

8. WHEN SECTION OF DUCTWORK IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED DUCT SHALL PREVAIL. SIZE OF DUCT RUN-OUTS TO DIFFUSER SHALL EQUAL DIFFUSER NECK SIZE.

9. DUCT BRANCH CONNECTIONS AND TAKE OFF'S SHALL BE MADE WITH 45° CONNECTION, BELLMOUTH OR CONICAL ONLY. SPIN IN COLLARS AND STRAIGHT TAPS SHALL NOT BE USED.

10. ELBOWS AND BENDS FOR RECTANGULAR DUCTS SHALL HAVE CENTER LINE RADIUS OF 1.5 TIMES DUCT WIDTH WHEREVER POSSIBLE. WHERE CENTERLINE RADIUS IS LESS THAN 1.5 TIMES DUCT WIDTH ELBOWS SHALL BE RADIUS THROAT WITH RADIUS HEEL AND FULL-LENGTH SPLITTER VANES.

11. NO PIPE, CONDUIT, HANGER, ARCHITECTURAL ELEMENT NOR STRUCTURAL MEMBER SHALL PASS THROUGH DUCT WITHOUT ARCHITECTS AND/OR ENGINEER'S WRITTEN APPROVAL.

B. SHEETMETAL DUCTWORK

1. SHEET METAL DUCTS SHALL BE CONSTRUCTED OF HOT DIPPED G90 GALVANIZED SHEET METAL UNLESS OTHERWISE SPECIFIED. MATERIAL CONSTRUCTION AND INSTALLATION SHALL MEET REQUIREMENTS OF MOST RECENT EDITIONS OF SMACNA STANDARDS (EXCEPT FOR MORE STRINGENT REQUIREMENTS SPECIFIED OR SHOWN ON DRAWINGS). ALL MEDIUM PRESSURE DUCTWORK BETWEEN MAIN SYSTEM FAN AND AIR TERMINAL DEVICE SHALL BE MINIMUM 4" WIDG PRESSURE CLASS, SEAL CLASS A, LEAKAGE CLASS B. ALL LOW-PRESSURE DUCTWORK BETWEEN TERMINAL DEVICE AND AIR OUTLETS SHALL BE MINIMUM 2" WIDG PRESSURE CLASS. SEAL CLASS B, LEAKAGE CLASS 12.

C. FLEXIBLE DUCTWORK

1. FLEXIBLE DUCTWORK, CONNECTING TO UNINSULATED OR UNLINED DUCT, SHALL BE VINYL-COATED FIBERGLASS CLOTH 0.0057" MINIMUM THICKNESS, 25 STRANDS PER INCH MINIMUM THREAD COUNT WITH CORROSION-RESISTANT HELICAL WIRE REINFORCEMENT. FLEX DUCT SHALL BE UL RATED FOR 12" W.C. POSITIVE PRESSURE, 2" W.C. NEGATIVE PRESSURE WITH A MAXIMUM DEFLECTION OF 40% PER IN

2AR

ARCHITECTURE | INTERIORS

47 PARTNERS

7430 E. Cailey Ave
Suite 280E
Centennial, CO 80111
P. (720) 258-4780
F. (720) 258-4762

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HIGHMARK
PROVISIONS

SEAL OF THE CITY OF DENVER
JAMES BENNETT
MECHANICAL
NO. 5319
PROFESSIONAL ENGINEER

SEAL OF THE CITY OF DENVER
KOTTA RALLAN
ELECTRICAL
NO. 4755
PROFESSIONAL ENGINEER

201 SUMMER STREET /
HOLLISTON, MA 01746

PERMIT SET

Project Number: 2021377.00
Date: 9/10/2021
Drawn By: CEC
Checked By: NHF
Revisions:

No.	Date	Description
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Sheet Description

ELECTRICAL
SPECIFICATIONS

MEPFP4.3

Sheet Number

26.00.00 - GENERAL CONDITIONS FOR ELECTRICAL

A. DESCRIPTION

1. THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. THE EXISTING BUILDING IS CURRENTLY OCCUPIED AND THE PROJECT WILL PROCEED IN A MANNER WHICH WILL WITHIN POKET BOOKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SCOPE OF WORK CONSISTS OF INSTALLATION OF MATERIALS TO BE FURNISHED UNDER THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO: MATERIALS, LABOR, EQUIPMENT, FURNISHING LABOR, MATERIALS, EQUIPMENT, HOISTING, PLANT, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES, AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN.

B. DEFINITIONS

1. FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

2. INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING: ACTING, UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SERVICING NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL WORK AS SHOWN ON THE DRAWINGS AND AS DESCRIBED HEREIN.

3. PROVIDE: THE TERM "PROVIDE" MEANS TO "FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

4. REMOVE: THE TERM "REMOVE" MEANS TO DISCONNECT/FROM ITS PRESENT POSITION, REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER."

5. SUBSTITUTIONS: ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT.

C. EQUIPMENT EQUIVALENTS AND SUBSTITUTIONS

1. CERTAIN MANUFACTURERS OF MATERIAL, APPARATUS OR APPLIANCES ARE INDICATED IN THE DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT. THESE ITEMS HAVE BEEN USED AS THE BASIS OF DESIGN, AND AS A CONVENIENCE IN FIXING THE MINIMUM STANDARD OF WORKMANSHIP, FINISH AND DESIGN THAT IS REQUIRED. IF THE CONTRACTORS USES AN "APPROVED EQUAL" ALTERNATIVE TO THE BASIS OF DESIGN, AND IF THE FEATURES OF THAT ALTERNATIVE HAVE AN IMPACT ON OTHER COMPONENTS OF THE PROJECT, THE CONTRACTOR SHALL INCLUDE THE NECESSARY ADJUSTMENTS IN THOSE COMPONENTS, WHETHER FOR ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, FIRE PROTECTION, OR ANY OTHER ELEMENTS, PLUS ANY TO ADJUSTMENTS FOR DIFFERENCE IN PERFORMANCE.

2. EQUIPMENT MATERIAL OR DEVICES SUBMITTED FOR REVIEW AS AN "EQUIVALENT" SHALL MEET THE FOLLOWING REQUIREMENTS:

a. THE EQUIVALENT SHALL HAVE THE SAME CONSTRUCTION FEATURES SUCH AS, BUT NOT LIMITED TO:

a. MATERIAL, THICKNESS, GAUGE, WEIGHT, DENSITY, ETC.

b. FINISH, UNDOERCOATING, CORROSION PROTECTION

c. FINISH UNDERCOATING, CORROSION PROTECTION

B. THE EQUIVALENT SHALL BE OF THE SAME OR BETTER OPERATING EFFICIENCY.

C. THE EQUIVALENT SHALL BE LOCALLY REPRESENTED BY THE MANUFACTURER FOR SERVICE, PARTS AND TECHNICAL INFORMATION.

D. THE EQUIVALENT SHALL BEAR THE SAME LABELS OF PERFORMANCE CERTIFICATION AS IS APPLICABLE TO THE SPECIFIED ITEM, SUCH AS UL OR NEMA LABELS OR DLC QUALIFICATIONS.

D. DRAWINGS

1. PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS. THE CONTRACTOR IS TO NOTE THAT THE DRAWINGS ARE DIAGRAMMATIC ONLY AND THAT FINAL PLACEMENT OF EQUIPMENT OR DEVICES IN THE FIELD MAY NOT DIRECTLY CORRESPOND TO THAT WHICH IS SHOWN ON THE DRAWINGS. IF A CONFLICT IN POSITIONING OCCURS THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY TO ASCERTAIN WHAT THE INTENT WAS BY THE DESIGN PROFESSIONAL.

2. WHERE VARIANCES OCCUR BETWEEN THE DRAWINGS AND SPECIFICATIONS OR WITHIN THE DRAWINGS, THE ITEM OR DIMENSION OF THE DRAWING SHALL BE THE BASIS OF DESIGN, AND AS A CONVENIENCE IN FIXING THE MINIMUM STANDARD OF WORKMANSHIP, FINISH AND DESIGN THAT IS REQUIRED. IF THE CONTRACTORS USES AN "APPROVED EQUAL" ALTERNATIVE TO THE BASIS OF DESIGN, AND IF THE FEATURES OF THAT ALTERNATIVE HAVE AN IMPACT ON OTHER COMPONENTS OF THE PROJECT, THE CONTRACTOR SHALL INCLUDE THE NECESSARY ADJUSTMENTS IN THOSE COMPONENTS, WHETHER FOR ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, FIRE PROTECTION, OR ANY OTHER ELEMENTS, PLUS ANY TO ADJUSTMENTS FOR DIFFERENCE IN PERFORMANCE.

3. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK TO BE PERFORMED. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK REQUIRED BY THE CONTRACTOR TO CORRECT CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL REMEDIATION WORK REQUIRED.

4. DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.

5. PRIOR TO ORDERING ANY ITEMS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO INSTALL THE COMPONENTS, ORDER EQUIPMENT AND MATERIALS AS NECESSARY TO ALLOW FOR PROPER RIGGING THROUGH THE PROJECT AREA. PROVIDE ALL NECESSARY ADJUSTMENTS TO THE STRUCTURE OF THE BUILDING AS NECESSARY TO RIG THE EQUIPMENT IN PLACE.

6. ARRANGE INSTALLATION TO PROVIDE ACCESS TO EQUIPMENT FOR EASY MAINTENANCE AND REPAIR.

F. CODES AND STANDARDS: ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST RECENTLY ADOPTED EDITIONS OF THE FOLLOWING CODES AND STANDARDS, INCLUDING ALL JURISDICTIONAL REVISIONS:

1. STATE BUILDING CODE INCLUDING ALL SUPPLEMENTS.

2. STATE FIRE SAFETY CODE INCLUDING ALL SUPPLEMENTS.

3. STATE FIRE PREVENTION CODE INCLUDING ALL SUPPLEMENTS.

4. THE INTERNATIONAL FIRE ALARM AND SIGNALING CODE.

5. THE INTERNATIONAL EXISTING BUILDING CODE.

6. THE INTERNATIONAL MECHANICAL CODE.

7. THE INTERNATIONAL PLUMBING CODE.

8. THE INTERNATIONAL ENERGY CONSERVATION CODE.

9. NFPA 70: NATIONAL ELECTRICAL CODE WITH STATE AMENDMENTS

10. NFPA 72: NATIONAL FIRE ALARM AND SIGNALING CODE

11. NFPA 73: STANDARD FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION

12. NFPA 75: STANDARD FOR FIRE PROTECTION OF RECORDS

13. NFPA 78: STANDARD FOR FIRE PROTECTION OF RECORDS

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