GENERAL	ARCHITECTURAL	CIVIL	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION	
T1.1 COVER SHEET T1.2 GENERAL NOTES & LEGENDS T1.3 ACCESSIBILITY GUIDELINES T1.4 ACCESSIBILITY DIAGRAMS	D1.1 DEMOLITION PLAN D1.2 REFLECTED CEILING DEMOLITION PLAN - PHASE ONE A1.1 OVERALL FIRST FLOOR PLAN - PHASE ONE A1.3 FLOOR PLAN NORTH - PHASE ONE A1.4 FLOOR PLAN SOUTH - PHASE ONE A2.1 RESTROOM DETAILS A5.1 BUILDING SECTIONS - PHASE ONE A2.1 RESTROOM DETAILS A5.1 DOOR SCHEDULE & WINDOW SCHEDULES & DETAILS A9.1 REFLECTED CEILING PLAN - PHASE ONE A1.3 SIGNAGE DETAILS A5.1 BUILDING SECTIONS - PHASE ONE A1.3 SIGNAGE DETAILS & SCHEDULE A1.3 SIGNAGE DETAILS & SCHEDULE	S1.1 SITE PLAN & DETAILS	MEPFP10 MEPFP APPREVIATIONS, NOTES, & SYMBOLS MEPFP20 FLOWER & MOMVEG BOOM MEPFP PART PLANS MEPFP23 LOCKER BOOMS 136 & 117 PART PLANS MEPFP25 DRV ROOM MEPFP PART PLANS MEPFP25 DRV ROOM MEPFP PART PLANS MEPFP26 DRV ROOM MEPFP PART PLANS MEPFP30 ELECTRICAL DETAILS, & CONTROL DIAGRAMS MEPFP40 FIRE PROTECTION SPECIFICATIONS MEPFP41 PLUMBING SPECIFICATIONS MEPFP43 ELECTRICAL SPECIFICATIONS MEPFP43 ELECTRICAL SPECIFICATIONS	
<u>OWNER REPRESENTATIVE</u> HIGHMARK 201 SUMMER STREET HOLLISTON, MA 01746	ARCHITECT SAM ANDRAS 2WR + PARTNERS 7430 E. CALEY AVE, SUITE 280	<u>CIVIL ENGINEER</u> MICHAEL NOVAK PATRIOT ENGINEERING 35 BEDFORD ST. STE 4	<u>MEP/FIRE PROTECTION ENGINEER</u> PATRICK CRILLY CES 128 CABNEGIE BOW STE 204	

HOLLISTON, MA 01746

7430 E. CALEY AVE, SUITE 280 CENTENNITAL, CO 80111 P: (720) 258-4780 E: SAM@2WRARCH.COM



201 SUMMER STREET / HOLLISTON, MA 01746

PERMIT SET

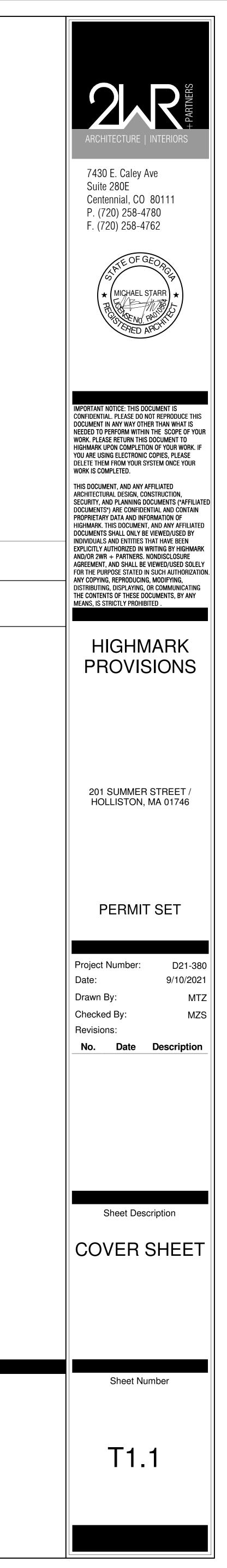
9/10/2021

2WR # D21-380

INDEX TO DRAWINGS

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U.N.O.

/EST

WNDW WF

WWF

	BREVIA
@	At
ABV	Above
ACT	Acoustic
ADJ	Adjacent
AFF	Above Fir
ALT	Alternate
ALUM	Aluminum
APPROX	Approxim
ARCH	Architect/
AVG	Average
BD	Board Building
BLDG BLKG	Blocking
B.O.	Bottom of
BOS	Bottom of
BOT	Bottom
BSMT	Basemen
CAB	Cabinet
CF	Cubic Fee
CG	Corner G
CIP	Cast In P
CJ	Control Jo Construct
CL	Center Li
CLG	Ceiling
CLR	Clear
CM	Construct
CMU	Cement N
COL	Column
CONC	Concrete
CONST	Construct
CONT	Continuou
COORD	Coordinat
CPT	Carpet
CT	Ceramic
CTR	Center
D	Deep or E
DBL	Double
DEMO	Demolish
DEPT DET	Departme
DIA	Diameter
DIAG	Diagonal
DIM DN	Dimensio
DWG	Drawing
EA	Each
EJ EL	Expansio
ELEC	Elevation
ELEV	Electric of
ELEV ENG EQ	Elevator Engineer
EQUIP	Equal Equipmer
EXIST EW EXT	Existing Equal Wid
FA	Exterior Fire Alarn
FDN FEC	Foundatio
FFE	Finished I
FIN	Finish
FLR	Floor
FT	Foot or Fe
FUR	Furred or
FURN	Furnished
GA	Gauge
GALV	Galvanize
GC	General (
GEN	General
GWB	Gypsum
GYP	Gypsum
HC	Hollow Co
H/C	Handicap
HDW	Hardware
HM	Hollow M
HOR HR	Horizonta
H	Height
HVAC	Heating, V
IN	Inch
INCL	Included/i
INFO	Informatio
INT	Interior
JC	Janitor's (
JST	Joist
JT	Joint
LAM	Laminate
LAV	Lavatory
LAV LBS LF	Pounds
LOC	Linear Fe Location
MACH	Machine
MAINT	Maintena
MAT	Material
MAX	Maximum
MECH	Mechanic
MFR	Manufact
MIN	Minimum
MISC	Miscellan
M.O.	Masonry
MTD	Mounted
MTL	Metal
N/A	Not Appli
N.I.C.	Not in Co
NOM	Nominal
NO.	Number
NTS	Not to Sc
O.C.	On Cente
OD	Outside D
OFCI	Owner Fu Contracto
OPP	Opposite
OZ	Ounce
PERF	Perforate
PERIM	Perimeter
PH	Partial He
PLAM	Plastic La
PLUM	Plumbing
PLWD	Plywood
PREFAB	Prefabrica
PSF	Pounds P
PSI	Pounds P
PT	Pressure
PTD	Painted
PVC	Poly Viny
QTY	Quantity
QT	Quarry Ti
R	Radius
RD	Roof Drai
REBAR	Reinforcir
REF	Refrigerat
REINF REQ'D	Reinforce
REV	Revision Room
R.O.	Rough Op
SC	Solid Core
SCHED	Schedule Section
SEC SF SHT	Square F
SIM	Sheet Similar Specificat
SPEC	Specificat
SS	Stainless
SQ STC STD	Square Sound Tra
STD	Standard
STOR	Storage
STRUCT	Structural
SV	Sheet Vin
SYS	System
T&G	Tongue a
TEL	Telephon
THRU	Through
THK	Thick
T.O.S.	Top of Ste
TLT	Toilet
TYP	Typical
	1.1

BREVIATIONS	Τ
At Above	
Acoustic Ceiling Tile Adjacent Above Finished Floor	
Alternate Aluminum	
Approximately Architect/Architectural Average	
Board Building	
Blocking Bottom of Bottom of Step	
Bottom Basement	
Cabinet Cubic Feet Corner Guard	
Cast In Place Control Joint	
Construction Joint Center Line Ceiling	
Clear Construction Manager	
Cement Masonry Unit Column Concrete	
Construction Continuous	
Coordinate Carpet Ceramic Tile	
Center Deep or Depth	
Double Demolish Department	
Detail Diameter Diagonal	
Diagonal Dimension Down	
Drawing Each Expansion Joint	
Elevation Electric or Electrical	
Elevator Engineer Equal	
Equipment Existing	
Equal Width Exterior Fire Alarm	
Fire Alarm Foundation Fire Extinguisher Cab	
Finished Floor Elevation Finish	
Floor Foot or Feet Furred or Furring	
Furnished Gauge	
Galvanize(d) General Contractor General	
Gypsum Wall Board Gypsum Hollow Core	
Handicap Accessible Hardware	
Hollow Metal Horizontal Hour	
Height Heating, Vent. & A/C	
Inch Included/ing	
Information Insulation Interior	
Janitor's Closet Joist Joint	
Laminate Lavatory	
Pounds Linear Feet Location	
Machine Maintenance	
Material Maximum Mechanical	
Manufacturer Minimum or Minute	
Miscellaneous Masonry Opening Mounted	
Metal Not Applicable	┢
Not in Contract Nominal Number	
Not to Scale On Center	
Outside Diameter Owner Furnished Contractor Installed	
Opposite Ounce	
Perforated Perimeter Partial Height	
Plastic Laminate Plumbing	
Plywood Prefabricated Pounds Per Square Foot	
Pounds Per Square Inch Pressure Treated	
Painted Poly Vinyl Chloride Quantity	
Quarry Tile Radius	
Roof Drain, Road Reinforcing Bar Refrigerator	
Reinforced Required	
Revision Room Rough Opening	
Solid Core Schedule	
Section Square Feet Sheet	
Similar Specification	
Stainless Steel Square Sound Transmission Class	
Standard Storage	
Structural Sheet Vinyl System	
Tongue and Groove Telephone Through	
Thick Top of Steel	
Toilet Typical	
Unless Noted Otherwise Utility	
Variable Vinyl Composite Tile	
Vertical Vestibule Verify in Field	
Volume Vinyl Wall Covering With	
With Out Water Closet	
Wood Window Wide Flange	
Weight Welded Wire Fabric	

	-DRAWING NUMBER
1 View Name	DRAWING TITLE
1/8" = 1'-0"	-DRAWING SCALE -SHEET NUMBER
	-SIM = SIMILAR TO VIEW
	OPP = MIRRORED VIEW ENLARGED DETAIL
SIM	
	INTERIOR ELEVATION
1.1 1	EXTERIOR ELEVATION
	-VIEW DIRECTION
1 SIM	SECTION
A101	
1)	COLUMN GRIDLINE
10'-3"	ELEVATION POINT
	-DRAWING NUMBER
/ A101	DRAWING REFERENCE
ŧ	-SHEET NUMBER
-&	CENTER LINE
	NORTH ARROW
DN >	SLOPE DOWN DIRECTION
Room name	-ROOM NAME
101 150 SF	ROOM LABEL
	-ROOM NUMBER
	-AREA -HEIGHT AFF
10'-0" A	CEILING LABEL
	-CEILING TYPE
	<u>RETED NOTE</u>
SA-1	TOILET ACCESSORY
	REVISION
W25	WALL TYPE
$\langle \mathbf{A} \rangle$	WINDOW TYPE
$\langle 1 \rangle$	HOLLOW METAL FRAME TYPE
(101A)	DOOR NUMBER
4:12 <₩₩	DRAINAGE SLOPE

ARCHITECTURAL SYMBOLS

∖A101/ 1

A101

(1) (A101)

A1.1

1

10'

1 / A101

DN

Room na

10'-0"

∖A101

WALL 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

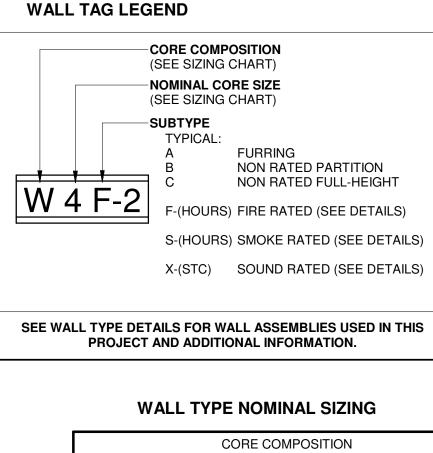
ARCHITECTURAL AND ENGINEERING DRAWINGS ARE C ARCHITECTURAL DRAWINGS SHALL BE PROVIDED WHE COORDINATED WITH CONSULTANTS' DRAWINGS. ANY ENGINEERING WORK SHALL BE IMMEDIATELY BROUGHT PROCEEDING WITH THE WORK. CONTRACTORS SHALL COORDINATE THE SCOPE OF TH PLANS AND SPECIFICATIONS SHALL NOT BE SEPARATE DUE TO SUB-CONTRACTOR NOT RELATING SCOPE OF V ALL WORK IS TO BE IN STRICT COMPLIANCE WITH ALL S USE AND TO GENERALLY ACCEPTED CONSTRUCTION T THE ARCHITECT WAIVES ANY AND ALL RESPONSIBILITY FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS A PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO C PROFESSIONAL'S GUIDANCE WITH RESPECT TO ANY EF AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED. SECTIONS AND DETAILS CONTAINED IN THE CONTRACT RESPONSIBLE FOR PROVIDING COMPONENTS AND/OR SIMILAR AREAS OF THE PROJECT IF THEY CAN BE REAS ASSEMBLY BASED ON OTHER SIMILAR SECTIONS AND D DOCUMENTS. NOT ALL COMPONENTS IN EACH DETAIL MAY BE SPECIF ARCHITECTURAL DETAIL. CONTRACTOR SHALL STILL B THEY CAN BE REASONABLY INFERRED TO BE A PART O DETAILS CONTAINED WITHIN THE CONTRACT DOCUME DO NOT SCALE ANY DRAWINGS TO DETERMINE DIMENS WRITTEN DIMENSIONS FOR NEW WORK. ALL DIMENSIONS ARE FROM FACE OF STUD OR FACE O 0. ALL DIMENSIONS AND CONDITIONS SHALL BE FIELD VEI THIS CONTRACT. ANY DISCREPANCIES BETWEEN FIELI IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE WORK . "SCALE" INDICATED ON THE ELEVATIONS MAY NOT BE F CONTRACTOR SHALL MAKE FIELD MEASUREMENTS AS QUANTITY OF WORK TO BE PERFORMED. . SUBCONTRACTORS SHALL INVESTIGATE ALL EXISTING WORK AND VERIFY REQ'D QUANTITIES OF MATERIALS P CONTRACTOR. NO CHANGE ORDERS WILL BE GRANTEI FROM FIELD INVESTIGATION AND IS CONSISTENT WITH DOCUMENTS 3. SUBCONTRACTORS SHALL VERIFY REQ'D QUANTITIES C PRIOR TO PURCHASING. NO CHANGE ORDERS WILL BE WORK REQ'D WHICH IS EVIDENT FROM FIELD CONDITIO OF THE CONTRACT DOCUMENTS. 4. ANY WORK INSTALLED IN CONFLICT WITH THE CONTRA CONTRACTOR AT HIS EXPENSE AND AT NO ADDITIONAL CONSULTANTS. CONTRACTOR RESPONSIBILITY THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PI CONTRACTOR AND SUBCONTRACTORS SHALL BE RESP PERMITS AND FEES REQUIRED, NOT NORMALLY COVER THE CONTRACTOR SHALL FILE ALL NECESSARY CERTIF OBTAIN ANY AND ALL BONDS REQUIRED BY ANY AGENC DESCRIBED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF AL RELATED SERVICE CONNECTIONS WITH THE RESPECTIV THE CONTRACTOR SHALL REMOVE FROM THE SITE AND CONSTRUCTION MATERIALS DUE TO CONSTRUCTION O WORK. THE CONTRACTOR SHALL LEAVE THE SITE IN A BEFORE COMMENCEMENT OF WORK ON THIS CONTRAC TRASH AND DEBRIS ARE NOT BLOWN OR SPREAD ON O THE CONTRACTOR SHALL RESTRICT ACCESS TO THE R TO THE ROOF IN ORDER TO COMPLETE THEIR WORK. PROTECTED AT ALL TIMES. THE CONTRACTOR SHALL LIMIT HIS WORK AND FORCES WORK AS DEFINED BY THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PROVIDE CRAFTSMAN-LIKE IN CONSTRUCTION SYSTEMS. PAINT ALL EXPOSED SCHEDULED PIPING, CONDUIT AND PAINTEL 0. THE CONTRACTOR SHALL REPAIR AT HIS EXPENSE DAM INCURRED DURING WORK ON THIS CONTRACT. . THE CONTRACTOR SHALL PROVIDE ADEQUATE WEATH CONTENTS DURING THE COURSE OF THE WORK. ALL C PROTECTED FROM ALL FORMS OF WEATHER OR WATE WALL TYPES

GENERAL NOTES

USE OF CONTRACT DOCUMENTS

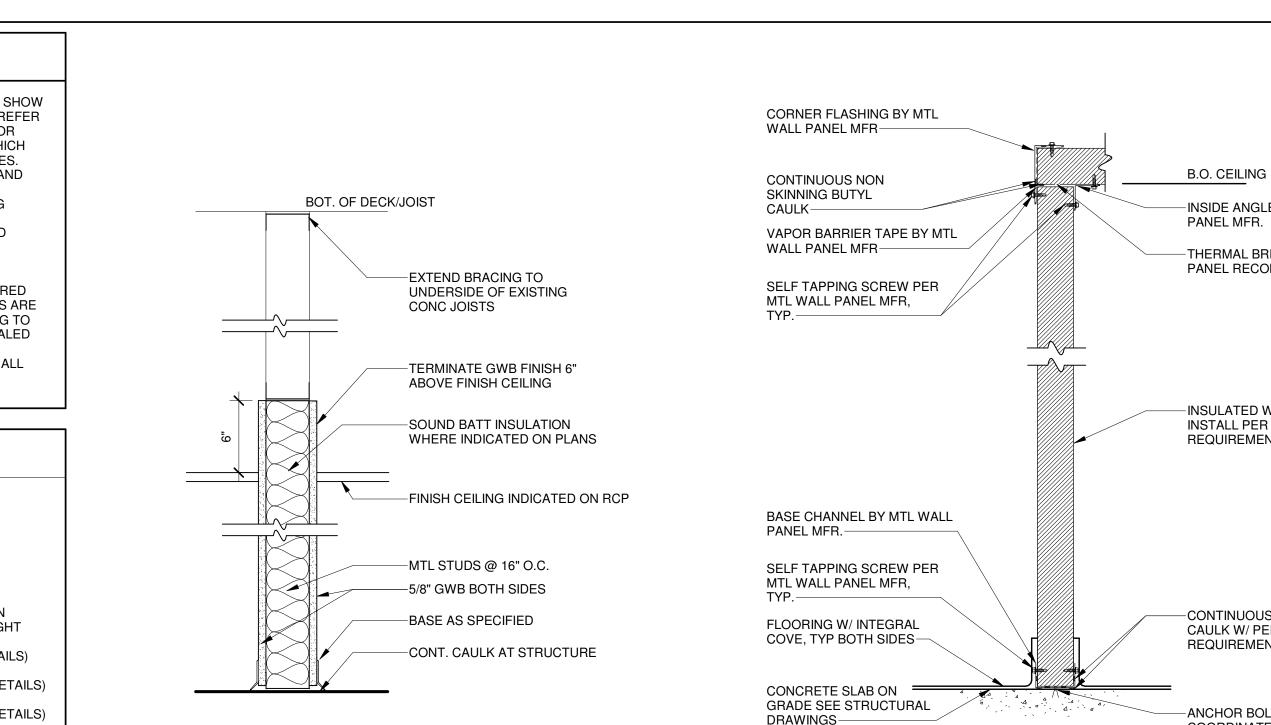
WALL TYPE GENERAL NOTES

- WALL TYPES ARE GENERIC IN NATURE AND DO NOT SHOW EVERY POSSIBLE CONFIGURATION OR CONDITION, REFER TO PLANS, ELEVATIONS, SECTIONS, AND DETAILS FOR SPECIFIC DESIGN INFORMATION AND ELEMENTS WHICH MAY ALTER INFORMATION CONTAINED IN WALL TYPES. NEW EXTERIOR WALLS ARE DETAILED IN BUILDING AND
- WALL SECTIONS. 3. SEE STRUCTURAL PLANS FOR ADDITIONAL FRAMING
- INFORMATION AND REINFORCING. . COORDINATE SEALING OF PENETRATIONS AT RATED
- WALLS WITH MEP DRAWINGS AND SPECIFICATIONS. REFER TO NOTED UL ASSEMBLY FOR ADDITIONAL
- CONSTRUCTION INFORMATION. 6. ALL FIRE WALLS, SMOKE WALLS, AND WALLS REQUIRED TO HAVE PROTECTED OPENINGS OR PENETRATIONS ARE
- TO BE PERMANENTLY STENCIL LABELED ACCORDING TO FIRE CODE REQUIREMENTS IN ACCESSIBLE CONCEALED FLOOR, CEILING OR ATTIC SPACES. REFER TO LIFE SAFETY PLANS FOR CONTINUITY OF ALL RATED PARTITIONS.



				CORE COM	IPOSITION	
		METAL STUD	WOOD STUD	CMU	BRICK	С
		М	W	U	В	
ZE	1	(HAT CHANNEL)	1x (FURRING STRIPS)	-	-	
- NOMINAL CORE SIZE	2	1 5/8"	2x2	-	-	
SOR	3	2 1/2"	2x3	-	-	
AL 0	4	3 5/8"	2x4	4"	1 WYTHE	
MIN	6	6"	2x6	6"	-	
N N N	8	8"	2x8	8"	2 WYTHE	
#	10	10"	2x10	10"	-	
	12	12"	2x12	12"	3 WYTHE	

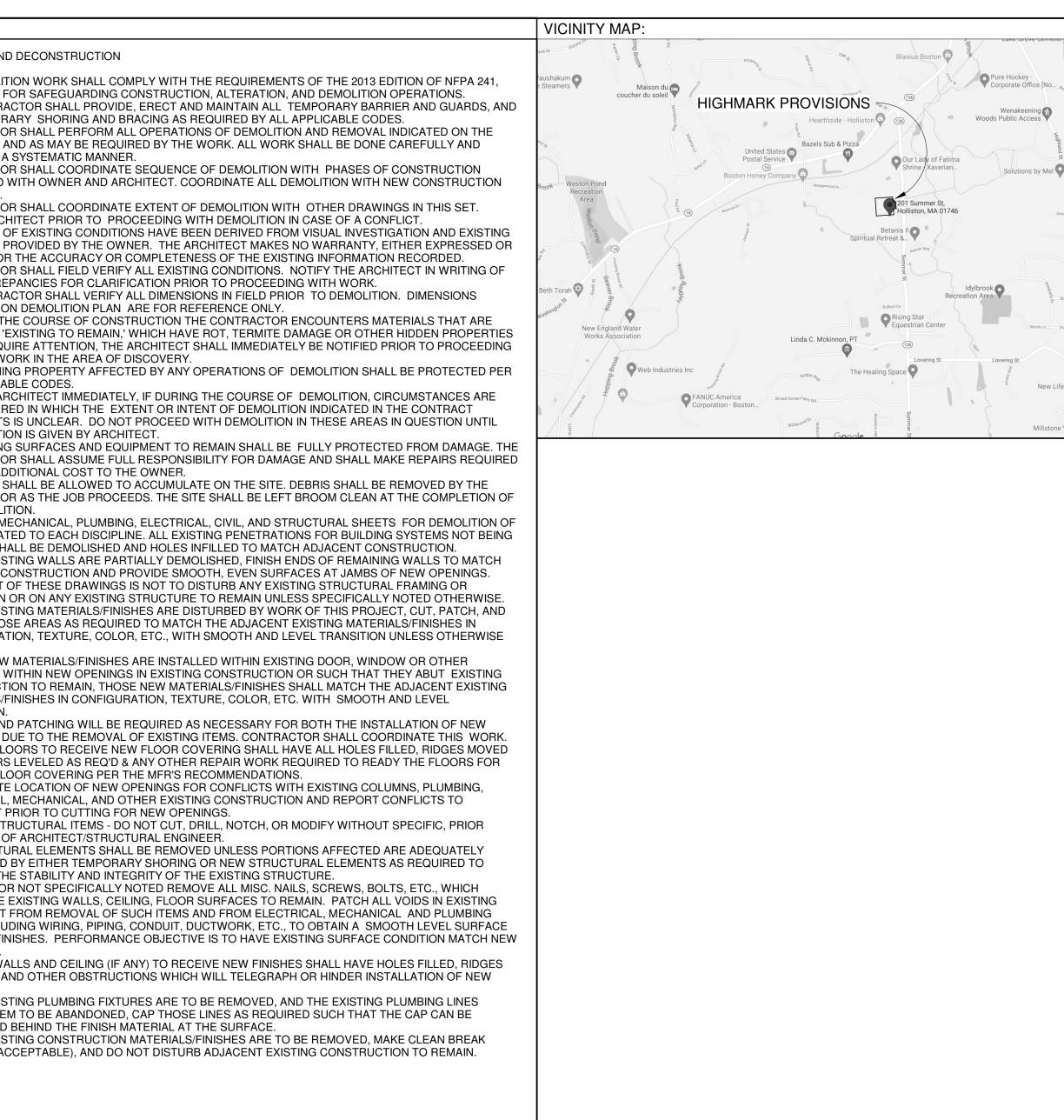
GENERAL NOTES		
E OF CONTRACT DOCUMENTS	FIRE RATED CONSTRUCTION	DEMOLITION ANI
DRAWINGS AND SPECIFICATIONS OF ALL DISCIPLINES INCLUDED HEREIN CONSTITUTE THE FULL SCOPE OF THIS PROJECT. THESE DOCUMENTS ARE INTERNOL TO SCIENTIAL THE FLUC DOCUMENT ACTUAL CUBLICATION OF THE ALTORNA. CONTRACTION TO COMPLETE THE WORK SHOWN NWS SPECIFIED. IT SHULL BE THE ALL TRADES. ARCHITECTURAL CONTS LITHING TO RAWINGS ARE COMPLIMENTARY. ITEMS INDICATED ON ARCHITECTURAL AND ENSINEERING DRAWINGS ARE COMPLIMENTARY. ITEMS INDICATED ON ARCHITECTURAL DRAWINGS ANALL BE PROVIDED WHETHER ON TOT THEY ARE INDICATED ON ARCHITECTURAL DRAWINGS ANALL BE PROVIDED WHETHER ON TOT THEY ARE INDICATED ON ARCHITECTURAL DRAWINGS ANALL BE PROVIDED WHETHER ON TOT THEY ARE INDICATED ON ARCHITECTURAL AND ENSINEERING DRAWINGS AND COMPLICTS BETWEEN ARCHITECTURAL AND COMPONINTED WITH CONSULTANTS: DRAWINGS, ANY COMPLICTS BETWEEN ARCHITECTURAL AND COMPANY THE WORK. CONTRACTORS SHALL COORDINATE THE SCOPE OF THEIR WORK WITH THE CONTRACT DOCUMENTS. PLANS AND SPECIFICATIONS SHALL NOT BE SEPARATED. NO CLAIMS FOR EXTRASS WILL BE CONSIDERED DUE TO SUB-CONTRACTOR NOT RELATING SCOPE OF THEIR WORK WITH THE CONTRACT DOCUMENTS. FLANS SHALL COORDINATE THE SCOPE OF THEIR WORK WITH THE CONTRACT OR COMPANY THE ARCHITECTURAVES ANY AND ALL RESPONSIBILITY YNN LIABELTY FOR PROBLEMS WHICH ARISE FROM AND ALL WORK ISTO DE IN STRUCT CONDULANCE WITH THE CONTRACT DOCUMENTS. ARE CONTRACTOR NOT RELATING SCOPE OF THEIR WORK WITH THE CONTRACT ON CONSISTENCES. SAECONTRACTOR WORK AND ALL RESPONSIBILITY AND LIABELTY FOR PROBLEMS WHICH ARISE FROM THE ALL WORK ISTO DE INSTRUCT CONDUCATED AND DE AND SCIENCE NOT PROBLEMS. WHICH ARISE FROM OTHERS FAULUE TO TO DETAN AND/OR FOR CONSISTENCES. SAECONTRACTOR SHALL MAN DE SECONTAND DA THE SECONT THE CONTRACT ON CONSISTENCES. SAECONTRACTOR SHALL MAN DE SECONTAND DA THE SECONT THE CONTRACT ON SAECONTRACTOR SHALL MAN DE SECONTAND OL CONSTRUCTION NOTED ON INCLESSION. 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ABOUR A DECORATIVE CELLING AND/OR IN CONCEAL ED SPACES WITH UTHOR SIGAS ON STANDARD FIRE PREVENTION CODE, 130-33, CHAPTER 5 OF THE FILES AND REGULATIONS OF THE FIRE SAFETY COMMENT. THE INDURY NATION SAFET IN ACODOROLOGY ALL DE NICLIONS OF THE FIRE SAFETY COMMENT OR IN DEVINING THE WALL OB BARDER IN ACODOROLOGY. THE CAULUS SHALL BE AS FEOURED TO ACHIEVE THE REQUIRED FIRE FATING FOR THAT SYSTEM. FROVIDE DACKER ROD AS NECESSARY FOR BACKU PHATENIAL. NOTE BOTH SIDES OF THATE SYSTEM. FROVIDE CAULUS SHALL BE AS FEOURED TO ACHIEVE THE REQUIRED FIRE FATING FOR THAT SYSTEM. FROVIDE DACKER ROD AS NECESSARY FOR BACKU PHATENIAL. NOTE BOTH SIDES OF RATED SYSTEMS SHALL BE CAULUED. BACKER ROD AS NECESSARY FOR BACKU PHATENIAL NOTE BOTH SIDES OF RATED SYSTEMS SHALL BE CAULUS DAS NECESSARY FOR BACKU PHATENIAL NOTES OF RATED SYSTEMS AND BACKING ROD AS NECESSARY FOR BACKU PHATENIAL NOTES OF RATED SYSTEMS. AND HAVE AD ACKING AND AND SHORE THE FIRE STANDARD SPECIFICS FOR FIRESTORS SHALL BE CAULUS DAS NOTED ON PLANS SHALL BE NONCOMBUSTERE MALL SAND FLOORS SHALL BE SALED UNTRACTOR SMOTTON THAN ANASONRY OR CONCRETE SHALL BE PRESSURE THEATED WITH AN APPROVED TO THE RECOVERENCE THE STANDARD SPECIFICS FOR FIRESTORS. AND HEAD HAVE ADVOIDS NOTTON TOTH MASONRY OR CONCRETE SHALL BE PRESSURE THEATED WITH AN APPROVED TO THE RECOVERENT ON THAT AND FLOORS AND HEAD HAVE ADVOIDS NOTTON THE MAS	 ALL DEMOLIT STANDARD F THE CONTRA ALL TEMPOR CONTRACTO DRAWINGS A NEATLY, IN A CONTRACTO AGREED TO DRAWINGS. CONTRACTO NOTIFY ARCI DRAWINGS C THE CONTRACTO ANY DISCRE THE CONTRACTO WITHOUT AD CONTACT AF ENCOUNTER DOCUMENTS CLARIFICATIO CONTRACTO WITHOUT AD CONTRACTO WITHOUT AD NO DEBRIS S CONTRACTO THE DEMOLI REFER TO M ITEMS RELAT RE-USED SH WHERE EXIS ADJACENT O REPAIR THO CONFIGURAT NOTED. WHERE EXIS REPAIR THO CONFIGURAT NOTED. WHERE EXIS REPAIR THO CONFIGURAT NOTED. 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INSULATE ONCRETE MTL PANEL С IM 2" 3" 4" 4" 10"

M#B MTL STUD WALL

NON-RATED ASSEMBLY



B.O. CEILING PANEL

-INSIDE ANGLE BY MTL WALL

-THERMAL BREAK PER MTL WALL PANEL RECOMMENDATIONS

-INSULATED WALL PANELS, INSTALL PER MFR.

REQUIREMENTS

-CONTINUOUS NON SKINNING BUTYL CAULK W/ PER MTL WALL PANEL MFR. REQUIREMENTS

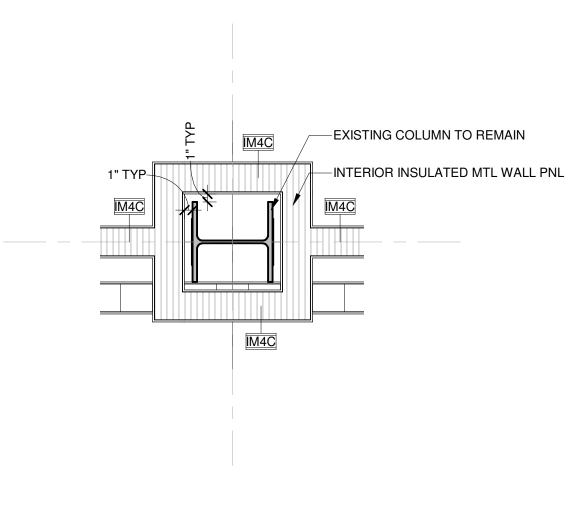
-ANCHOR BOLT, GC TO COORDINATE W/ MTL WALL

BASIS OF DESIGN: BLOOM ROOM PANEL

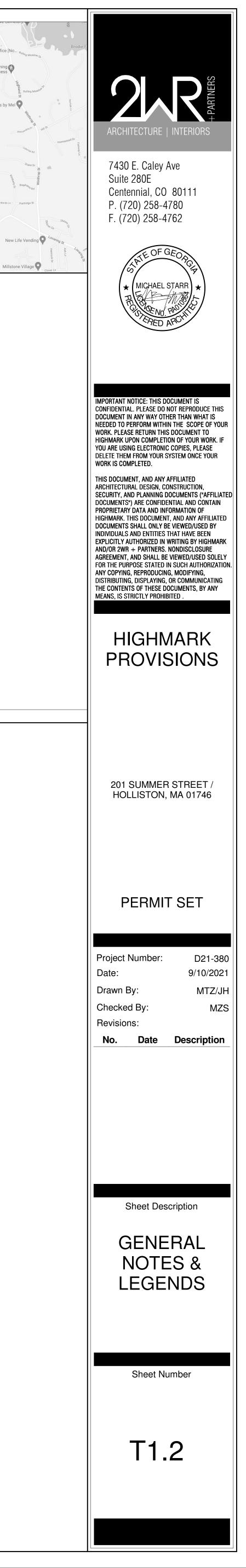
IM#C INSULATED METAL PANEL WALL

NON-RATED ASSEMBLY

PANEL MFR.



TYP IMP FURRING DETAIL T1.2 / SCALE: 1" = 1'-0"



GENERAL . ACCESSIBILITY NOTES AND DETAILS REPRESENT TYPICAL REQUIRMENTS 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 26.00: 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). A T-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 80 INCHES (27" AND 80" = 686MM AND 2032MM) ABOVE THE 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" = 686MM) 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 80 INCHES (27" AND 80"= 686MMAND 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 PURPOSE 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 20.12.2 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 A 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 STAIRWAY WHEN 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 4 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 RESTRICTIVE 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 ENCROACH ON ANY REQUIRED EXIT WIDTH. 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 1/4 INCH (1/4" = 6MM). CHANGES IN LEVEL BETWEEN 1/4 INCH AND 1/2 INCH (1/4" AND 1/2" = 6MM AND 13MM) 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.

RATINGS: IF GRATINGS ARE LOCATED IN WALKING SURFACES, THEY SHALL HAVE SPACES NO GREATER THAN 1/2 INCH (1/2" = 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.

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 ALABMS ARE PROVIDED. THEN SINGLE STATION VISUAL ALABM 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.

VISUAL ALARMS: AT A MINIMUM, VISUAL SIGNAL APPLIANCES, IF PROVIDED, SHALL BE PROVIDED IN

<u>CURB CUTS</u>: (SEE CMR SECTION 21.00 FOR MORE INFORMATION) FOLLOWING:

FOLLOWING LOCATIONS: CURB CUTS ARE REQUIRED AT EACH CORNER OF EACH INTERSECTION. WHOLLY CONTAINED WITH THE MARKED CROSSING. SEE FIG. 21A. THE CROSSWALK/PEDESTRIAN SAFE OBSERVATION OF CROSSWALKS OB APPROACHING TRAFFIC AT THE INTERSECTION BY A

PROVIDED AT THE BOTTOM OF THE CURB CUT AND LOCATED WITHIN THE MARKED CROSSWALK. RECIPROCAL CURB CUTS: WHEN CURB CUTS OR SIDEWALKS ARE BEING CONSTRUCTED OR RECONSTRUCTED ON ONE SIDE OF THE STREET, AND WHEN SUCH CURB CUTS OR SIDEWALKS ARE

LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED VEHICLES. SLOPE: THE LEAST POSSIBLE SLOPE SHOULD BE USED FOR ANY RAMP. THE MAXIMUM SLOPE SHALL BE

ALLOWED ON SLOPE REQUIREMENTS). TRANSITIONS: TRANSITIONS FROM CURB CUTS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH OR FREE OF CHANGES IN LEVEL GREATER THAN 1/2 INCH (1/2" = 13MM). MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB CUTS, OR ACCESSIBLE ROUTE SHALL NOT EXCEED ONE-IN-20 (1:20) (5%). DRAINAGE: GRADING AND DRAINAGE SHALL BE DESIGNED TO MINIMIZE POOLING OF WATER, CCUMULATION OF ICE, OR FLOW OF WATER ACROSS THE BASE OF THE CURB CUT.

WIDTH: THE MINIMUM WIDTH OF A CURB CUT SHALL BE 36 INCHES (36" = 914MM), EXCLUSIVE OF FLARED SIDES. LANDING WIDTH: WHERE A PERPENDICULAR CURB CUT IS PROVIDED, A LANDING THE WIDTH OF THE CURB CUT SHALL BE PROVIDED AT THE TOP OF THE CURB CUT. THE LANDING SHALL BE 48 INCHES (48"= 1219MM) IN LENGTH. THE SLOPE OF SAID LANDING SHALL NOT EXCEED ONE-IN-50 (1:50) (2%) IN ANY DIRECTION.

FLARED SIDES: SIDES OF CURB CUTS SHALL EXTEND AT LEAST 24 INCHES (24"= 610MM) AT THE CURB. THE MAXIMUM SLOPE OF THE FLARE IS ONE-IN-TEN (1:10) (10%). CURBING AT THE FLARED SIDES MUST BLEND WITH THE SLOPE OF THE FLARED SIDES. RETURNED SIDES: CURB CUTS WITH RETURNED SIDES ARE ONLY PERMITTED WHERE THEY ARE PROTECTED BY HANDRAILS PURSUANT TO 521 CMR 24.5, HANDRAILS OR WHERE PEDESTRIAN TRAVEL ACROSS THE RAMP IS OBSTRUCTED BY PERMANENTLY INSTALLED STREET HARDWARE OR LANDSCAPING.

VEHICULAR TRAFFIC LANES. 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 1/4 INCH (1/4" = 6MM). CHANGES IN LEVEL BETWEEN 1/4 INCH AND 1/2 INCH (1/4" AND 1/2" = 6MM AND 13MM) 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.

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 OF48 INCHES

(48" = 1219MM) PLUS THE WIDTH OF ANY DOOR SWINGING INTO THE SPACE. MATS AND GRATES: DOOR MATS 1/2 INCH (1/2"= 13MM) THICK OR LESS SHALL BE SECURELY ACHORED AT ALL EDGES TO AVOID TRIPPING. DOOR MATS BETWEEN 1/4 INCH (1/4" = 6MM) AND 1/2 INCH (1/2" = 13MM) THICK MUST BE SECURED WITH BEVELED EDGING THAT SLOPES NO MORE THAN 1:2 (50%). DOOR MATS THICKER THAN 1/2 INCH (1/2" = 13MM) SHALL BE RECESSED. GRATES SHALL HAVE OPENINGS NOT EXCEEDING 1/2 INCH (1/2" = 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.

GENERAL: WHENEVER SIDEWALKS, WALKWAYS, OR CURBS ON STREETS AND WAYS ARE CONSTRUCTED, RECONSTRUCTED, OR REPAIRED, CURB CUTS ARE REQUIRED. ALL CURB CUTS SHALL COMPLY WITH THE

LOCATION: CURB CUTS SHALL OCCUR WHEREVER AN ACCESSIBLE ROUTE CROSSES A CURB AND AT THE LOCATED WITHIN THE CROSSWALK AND/OR THE PEDESTRIAN PATH OF TRAVEL. CURB CUTS SHALL BE PERPENDICULAR TO THE CURB AT STREET CROSSINGS AND EACH SHALL HAVE A LEVEL LANDING AT THE TOP. AT MARKED CROSSINGS, THE BOTTOM OF THE RAMP RUN, EXCLUSIVE OF FLARED SIDES, SHALL BE PATH OF TRAVEL MUST ALSO BE PERPENDICULAR TO THE CURB. EXCEPTION: WHERE PEDESTRIAN RIGHT-OF-WAY ESTABLISHED WIDTH WILL NOT ACCOMMODATE A PERPENDICULAR CURB CUT AND LANDING, A PARALLEL PUBLIC SIDEWALK CURB CUT WITH A LEVEL LANDING AT ITS BOTTOM SHALL BE PROVIDED INSTEAD OF A PERPENDICULAR CURB CUT. APEX CURB CUTS: WHERE SITE CONSTRAINTS PREVENT THE INSTALLATION OF A PERPENDICULAR CURB CUT OR A PARALLEL CURB CUT WITH A LEVEL LANDING, AN APEX CUBB CUT IS ALLOWED, SITE CONSTRAINTS INCLUDE THE FOLLOWING: A, DRIVER OR PEDESTRIAN LINE OF SIGHT TO OR FROM THE FRONT OF THE LEVEL LANDING ON THE RAMP IS IMPAIRED, PREVENTING SIGNIFICANT IMMOVABLE OR UNALTERABLE STREETSCAPE FEATURE SUCH AS A BUILDING, STRUCTURE

HISTORIC ELEMENT, ETC. B. STOP LINE IS BEYOND THE ALLOWED LIMIT AS STATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. C. VAULTS CONTAINING ELECTRICAL, TELECOMMUNICATIONS, ETC. THAT ARE UNDER OR ON THE EXISTING SIDEWALK. D. LARGE RADIUS INTERSECTIONS WHICH ARE 30 FEET OR GREATER. WHEN APEX CURB CUTS ARE INSTALLED A 48 INCH (48" = 1219MM) LANDING SHALL ALSO BE

CONNECTED TO AN OPPOSITE SIDE OF THE STREET BY ONE OR MORE PEDESTRIAN PATHS OF TRAVEL, THEN AT LEAST ONE CURB CUT SHALL BE PROVIDED ON THE OPPOSITE SIDE OF THE STREET WHERE SUCH SIDE IS CONTROLLED BY THE SAME OWNER. **DRIVEWAYS**: CURB CUTS ARE REQUIRED AT DRIVEWAYS INTERSECTING SIDEWALKS WHEN THE DRIVEWAY HAS SIDE CURBS. RAISED ISLANDS: ANY RAISED ISLANDS IN CROSSINGS SHALL BE CUT THROUGH LEVEL WITH THE STREET OR HAVE CURB CUTS AT BOTH SIDES AND A LEVEL AREA AT LEAST 48 INCHES (48" = 1219MM) LONG BETWEEN THE CURB CUTS IN THE PART OF THE ISLAND INTERSECTED BY THE CROSSINGS. OBSTRUCTIONS: CURB CUTS SHALL BE

ONE-IN-12 (1:12) (8.3%). WHERE SIDEWALKS ARE TOO NARROW TO INSTALL A STRAIGHT-LINE CURB CUT AT A SLOPE OF ONE-IN-12 (1:12) (8.3%), THE SIDES OF THE CURB CUT SHALL NOT EXCEED ONE-IN-12 (1:12) (8.3%). THE MAXIMUM CROSS-SLOPE FOR ANY CURB CUT SHALL BE 1:50 (2%). (THERE IS NO TOLERANCE

BUILT-UP CURB CUTS: BUILT-UP CURB CUTS ARE ALLOWED ONLY WHERE THEY DO NOT PROJECT INTO

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

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 OUTSIDE AT 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 THE REVOLVING DOORS ARE UNLOCKED. 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 OF A DOOR IS MEASURED FROM THE FACE OF THE STOP 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 DISENGAGE 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 FROM AN OPEN POSITION OF 90 DEGREES, THE DOOR WILL TAKE AT LEAST SIX SECONDS TO CLOSE.

THRESHOLDS: THRESHOLDS SHALL NOT EXCEED ½ INCH (1/2" = 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)

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

NOSINGS: THE UNDERSIDES OF NOSINGS SHALL NOT BE ABRUPT. THE RADIUS OF CURVATURE AT THE LEADING EDGE OF THE TREAD SHALL BE NO GREATER THAN 1/2 INCH (1/2" = 13MM). RISERS SHALL BE SLOPED OR THE UNDERSIDE OF THE NOSING SHALL HAVE AN ANGLE NOT LESS THAN 60° FROM THE HORIZONTAL. NOSINGS SHALL PROJECT NO MORE THAN 1½ INCHES $(1\frac{1}{2}" = 38MM).$

HANDRAILS: LOCATION: STAIRWAYS SHALL HAVE CONTINUOUS HANDRAILS AT BOTH SIDES OF ALL STAIRS. THE INSIDE HANDRAIL ON SWITCHBACK OR DOGLEG STAIRS SHALL ALWAYS BE CONTINUOUS. HEIGHT: TOP OF HANDRAIL GRIPPING SURFACE SHALL BE MOUNTED BETWEEN 34 INCHES (34" = 864MM) AND 38 INCHES (38"= 965MM) ABOVE STAIR NOSINGS. HANDRAILS SHALL BE MEASURED VERTICALLY FROM THE TOP OF THE GRIPPING SURFACE OF THE HANDRAILS TO THE STAIR NOSING.

EXTENSIONS: WHERE HANDBAILS TERMINATE AT THE TOP AND BOTTOM OF A STAIR BUN. THEY SHALL HAVE EXTENSIONS THAT COMPLY WITH THE FOLLOWING: A. AT THE TOP, EXTEND AT LEAST 12 INCHES (12" = 305MM) BEYOND THE TOP RISER AND PARALLEL WITH THE FLOOR OR GROUND SURFACE. AT THE BOTTOM, EXTEND AT LEAST 12 INCHES (12" = 305MM) PLUS THE WIDTH OF ONE TREAD BEYOND THE BOTTOM RISER. THE HANDRAIL SHALL CONTINUE TO SLOPE FOR A DISTANCE OF THE WIDTH OF ONE TREAD FROM THE BOTTOM RISER; THE REMAINDER OF THE EXTENSION SHALL BE HORIZONTAL. HANDRAIL EXTENSIONS NEED NOT EXTEND IF IT WOULD CAUSE A SAFETY HAZARD OR IF SPACE DOES NOT PERMIT. EXTENSIONS SHALL COMPLY WITH 521 PROTRUDING OBJECTS.

HANDRAILS SHALL HAVE A CIRCULAR CROSS SECTION WITH AN OUTSIDE DIAMETER OF 11/4 INCHES (32MM) MINIMUM AND TWO INCHES (51MM) MAXIMUM. SHAPE: THE HANDGRIP PORTION OF THE HANDRAIL SHALL BE ROUND OR OVAL IN CROSS-SECTION. SURFACE: THE GRIPPING SURFACE SHALL BE CONTINUOUS SO THAT A HAND CAN MOVE FROM END TO END WITHOUT INTERRUPTION BY NEWEL POSTS OR OTHER OBSTRUCTIONS AND SHALL BE FREE OF ANY SHARP OR ABRASIVE ELEMENTS. CLEARANCE: WHEN A HANDRAIL IS MOUNTED ADJACENT TO A WALL, THE CLEAR SPACE BETWEEN THE HANDRAIL AND THE WALL SHALL BE 11/2 INCHES (11/2" = 38MM), HANDRAILS MAY BE LOCATED IN A WALL RECESS IF THE RECESS IS A MAXIMUM OF THREE INCHES (3" = 76MM) DEEP AND EXTENDS AT LEAST 18 INCHES (18" = 457MM) ABOVE THE TOP OF THE RAIL. **END CONDITION**: ENDS OF HANDRAILS SHALL BE EITHER ROUNDED OR RETURNED SMOOTHLY TO FLOOR, WALL, OR POST. EXTENSIONS ON HANDRAILS WHICH ARE NOT ATTACHED TO WALLS SHALL BE RETURNED SMOOTHLY TO THE FLOOR OR A POST. HANDRAILS SHALL NOT ROTATE WITHIN THEIR FITTINGS.

OUTDOOR CONDITIONS: OUTDOOR STAIRS AND THEIR APPROACHES SHALL BE DESIGNED SO THAT WATER WILL NOT ACCUMULATE ON WALKING SURFACES.

FLOOR SURFACES: (SEE CMR SECTION 29.00 FOR MORE INFORMATION)

GENERAL: GROUND AND FLOOR SURFACES INCLUDING FLOORS, WALKS, RAMPS, AND CURB CUTS SHALL BE STABLE, FIRM, SLIP RESISTANT, AND MAINTAINED WITH MATERIALS THAT ENSURE CONTINUED SLIP RESISTANCE.

LEVEL CHANGES: GROUND AND FLOOR SURFACES SHALL BE OF A COMMON LEVEL THROUGHOUT EXCEPT FOR THE FOLLOWING PERMITTED CHANGES IN LEVEL. CHANGES IN LEVEL UP TO AND INCLUDING ¹/₄ INCH (¹/₄" = 6MM) MAY BE VERTICAL AND WITHOUT EDGE TREATMENT. CHANGES IN LEVEL GREATER THAN¹/4 INCH (¹/₄"= 6MM) AND LESS THAN ¹/₂ INCH (¹/₂" = 13MM) SHALL BE BEVELED WITH A SLOPE NO GREATER THAN ONE-IN-TWO (1:2) (50%). CHANGES IN LEVEL GREATER THAN 1/2 INCH (1/2" = 13MM) ARE NOT ALLOWED UNLESS A RAMP, WALKWAY, OR MEANS OF VERTICAL ACCESS COMPLYING WITH 521 CMR IS PROVIDED.

CARPET: MATERIAL: CARPET MATERIAL SHALL BE HIGH DENSITY, NON-ABSORBENT, AND THE MAXIMUM PILE THICKNESS SHALL BE 1/2 INCH (1/2" = 13MM). INSTALLATION: CARPET SHALL BE ADHERED DIRECTLY TO THE FLOOR OR SHALL BE STRETCHED TAUTLY AND SECURELY FASTENED TO FLOOR SURFACES AT ALL EDGES. EXPOSED EDGES: EDGES OF CARPET EXPOSED TO TRAFFIC SHALL HAVE TRIM ALONG THE ENTIRE LENGTH OF THE EXPOSED EDGE. EDGES PERPENDICULAR TO THE PATH OF TRAVEL SHALL HAVE EDGING STRIPS NO HIGHER THAN D OF AN INCH (D" = 10MM) ABOVE THE FLOOR AND SHALL HAVE A BEVELED EDGE WITH A SLOPE NO GREATER THAN ONE-IN-TWO (1:2) (50%). PADDING: IF PADDING IS INSTALLED, IT SHALL NOT EXCEED 1/4 OF AN INCH (1/4"= 6MM) IN THICKNESS AND SHALL BE SECURED TAUT TO THE FLOOR.

GRATINGS: IF GRATINGS ARE LOCATED IN WALKING SURFACES. THEN THEY SHALL HAVE SPACES NO GREATER THAN 1/2 INCH (1/2" = 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.

FLOOR.

INTERIOR CORNER.

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 PROVISIONS OF521 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 30 INCHES BY 48 INCHES (30" = 762MM BY 48" = 19MM) 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 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. THERE SHALL BE 18 INCHES (18" = 457MM) OF CLEAR SPACE ON THE LATCH PULL SIDE OF THE DOOR. D. 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" = 1120MM) 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. FOR THE ALTERNATE ACCESSIBLE TOILET STALL THE WATER CLOSET SHALL HAVE TWO PARALLEL GRAB BARS, 42 INCHES LONG (42" = 1067M) 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 36 INCHES (33" TO 36"= 838MMTO 914MM) ABOVI AND PARALLEL TO THE FLOOR. WHERE A TANK PREVENTS LOCATION OF THE REAR GRAB BAR, A BAR MAY BE INSTALLED THREE INCHES (3" = 76MM) ABOVE THE TANK. WHERE A FLUSHOMETER 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 FLUSHOMETER, LOCATED THREE INCHES (3" = 76MM) FROM THE CLOSEST EDGE OF THE FLUSHOMETER.

THICKNESS: GRAB BARS SHALL BE BETWEEN 1¹/₄ INCHES AND 1¹/₂ INCHES (1¹/₄" TO 1¹/₂" = 32MM TO 38MM) IN OUTSIDE DIAMETER, HAVE A 11/2 INCH (11/2" = 38MM) CLEARANCE BETWEEN THE BAR AND THE WALL. MATERIAL: GRAB BARS SHALL ALSO BE NON-RUSTINGAND ACID-ETCHED OR ROUGHENED.

DISPENSERS OR OTHER DEVICES SHALL NOT BE MOUNTED ABOVE THE GRAB BARS.

SINK: CLEAR FLOORSPACE: A CLEAR FLOOR SPACE COMPLYING WITH 521 CMR 6.3, WHEELCHAIR TURNING SPACE SHALL BE PROVIDED IN FRONT OF A SINK TO ALLOW FORWARD APPROACH. THE CLEAR FLOOR SPACE SHALL BE ON AN ACCESSIBLE ROUTE AND SHALL EXTEND NO MORE THAN A MAXIMUM OF 19 INCHES (19" = 483MM) UNDERNEATH THE SINK.

HEIGHT: SINKS SHALL BE MOUNTED WITH THE RIM NO HIGHER THAN 34 INCHES (34" = 864MM) ABOVE THE FINISH FLOOR. SEE FIG. 30H. SINKS SHALL ALSO EXTEND A MINIMUM OF 17 INCHES (17" = 432MM) FROM THE WALL TO THE FRONT OF THE SINK OR COUNTER.

KNEE CLEARANCE: KNEE CLEARANCE SHALL BE PROVIDED UNDERNEATH THE SINK WHICH IS 27 INCHES (27" = 685MM) MINIMUM FROM THE FLOOR TO THE UNDERSIDE OF THE SINK AND EXTENDS EIGHT INCHES (8" = 205MM) MINIMUM MEASURED FROM THE FRONT EDGE UNDERNEATH THE SINK BACK TOWARDS THE WALL; IF A MINIMUM OF NINE INCHES (9" = 230MM) OF TOE CLEARANCE IS PROVIDED, A MAXIMUM OF SIX INCHES (6" = 150MM) OF THE 48 INCHES (48"= 1220MM) OF CLEAR FLOOR SPACE REQUIRED AT THE FIXTURE MAY EXTEND INTO THE TOE SPACE.

DEPTH: SINK DEPTH SHALL NOT EXCEED SIX INCHES 61/2 INCHES (61/2" = 165MM).

URINALS: WHERE ONE OR MORE URINALS IS PROVIDED, AT LEAST ONE URINAL SHALL BE ACCESSIBLE. HEIGHT: ACCESSIBLE URINALS SHALL BE STALL-TYPE OR WALL-HUNG WITH AN ELONGATED RIM AT A MAXIMUM OF 17 INCHES (17" = 432MM) ABOVE THE FINISH FLOOR.

CLEAR FLOOR SPACE: A CLEAR FLOOR SPACE SHALL BE PROVIDED IN FRONT OF AN ACCESSIBLE URINAL TO ALLOW FORWARD APPROACH. THIS CLEAR SPACE SHALL ADJOIN OR OVERLAP AN ACCESSIBLE ROUTE AND SHALL COMPLY WITH 521 CMR 6.3, WHEELCHAIR TURNING SPACE. URINAL SHIELDS THAT DO NOT EXTEND BEYOND THE FRONT EDGE OF THE URINAL RIM MAY BE PROVIDED WITH 29 INCHES (29" = 737MM) CLEARANCE BETWEEN THEM.

FLUSH CONTROLS: FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC, AND SHALL COMPLY WITH521 CMR 39.5. OPERATION AND SHALL BE MOUNTED NO MORE THAN 44 INCHES (44" = 1118MM) ABOVE THE FINISH

MIRROR: THE TOP OF ANY SHELF AND OR BOTTOM OF ANY MIRROR THAT IS PROVIDED ABOVE A SINK SHALL BE SET WITH THE BOTTOM EDGE OF THE REFLECTING SURFACE NO HIGHER THAN 40 INCHES (40" = 1016MM) ABOVE THE FINISH FLOOR.

DISPENSERS: TOWEL DISPENSERS, DRYING DEVICES, OR OTHER TYPES OF DEVICES AND DISPENSERS SHALL HAVE AT LEAST ONE OF EACH DEVICE MOUNTED WITHIN THE ZONE OF REACH. AT LEAST ONE OF EACH DEVICE SHALL BE LOCATED WITHIN REACH OF A PERSON USING THE ACCESSIBLE SINK AND SHALL COMPLY WITH 521 CMR 39.5. OPERATION

<u>CONTROLS</u>: (SEE CMR SECTION 39.00 FOR MORE INFORMATION)

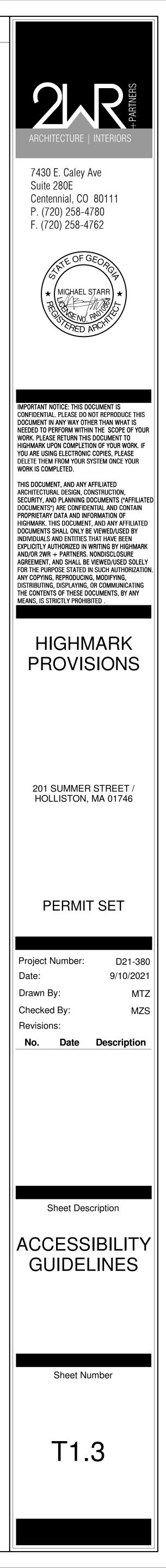
CLEAR FLOOR SPACE: CLEAR FLOOR SPACE THAT ALLOWS A FORWARD OR A PARALLEL APPROACH BY A PERSON USING A WHEELCHAIR SHALL BE PROVIDED AT CONTROLS, DISPENSERS, RECEPTACLES, AND OTHER OPERABLE EQUIPMENT.

HEIGHT: THE HIGHEST OPERABLE PART OF CONTROLS, DISPENSERS, RECEPTACLES, AND OTHER OPERABLE EQUIPMENT SHALL BE PLACED WITHIN AT LEAST ONE OF THE REACH RANGES SPECIFIED IN 521 CMR 6.5. FORWARD REACH AND 521 CMR 6.6. SIDE REACH, ELECTRICAL AND COMMUNICATIONS SYSTEM RECEPTACLES ON WALLS SHALL BE MOUNTED BETWEEN 15 INCHES (15" = 381MM) AND 48 INCHES (48" = 1219MM) ABOVE THE FLOOR, MEASURED AT THE CENTERLINE OF THE LOWEST RECEPTACLE. EXCEPTION: THESE REQUIREMENTS DO NOT APPLY WHERE THE USE OF SPECIAL EQUIPMENT DICTATES OTHERWISE OR WHERE ELECTRICAL AND COMMUNICATIONS SYSTEMS RECEPTACLES ARE NOT NORMALLY INTENDED FOR USE BY BUILDING OCCUPANTS.

LOCATION: ALL SUCH CONTROLS SHALL BE LOCATED AT LEAST 18 INCHES (18" = 457MM) FROM AN

OPERATION: CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN FIVE LBS.

SIGNAGE: (SEE SIGNAGE SHEET FOR MORE INFORMATION)





IN A SERIES

T1.4 SCALE: 1/4" = 1'-0"

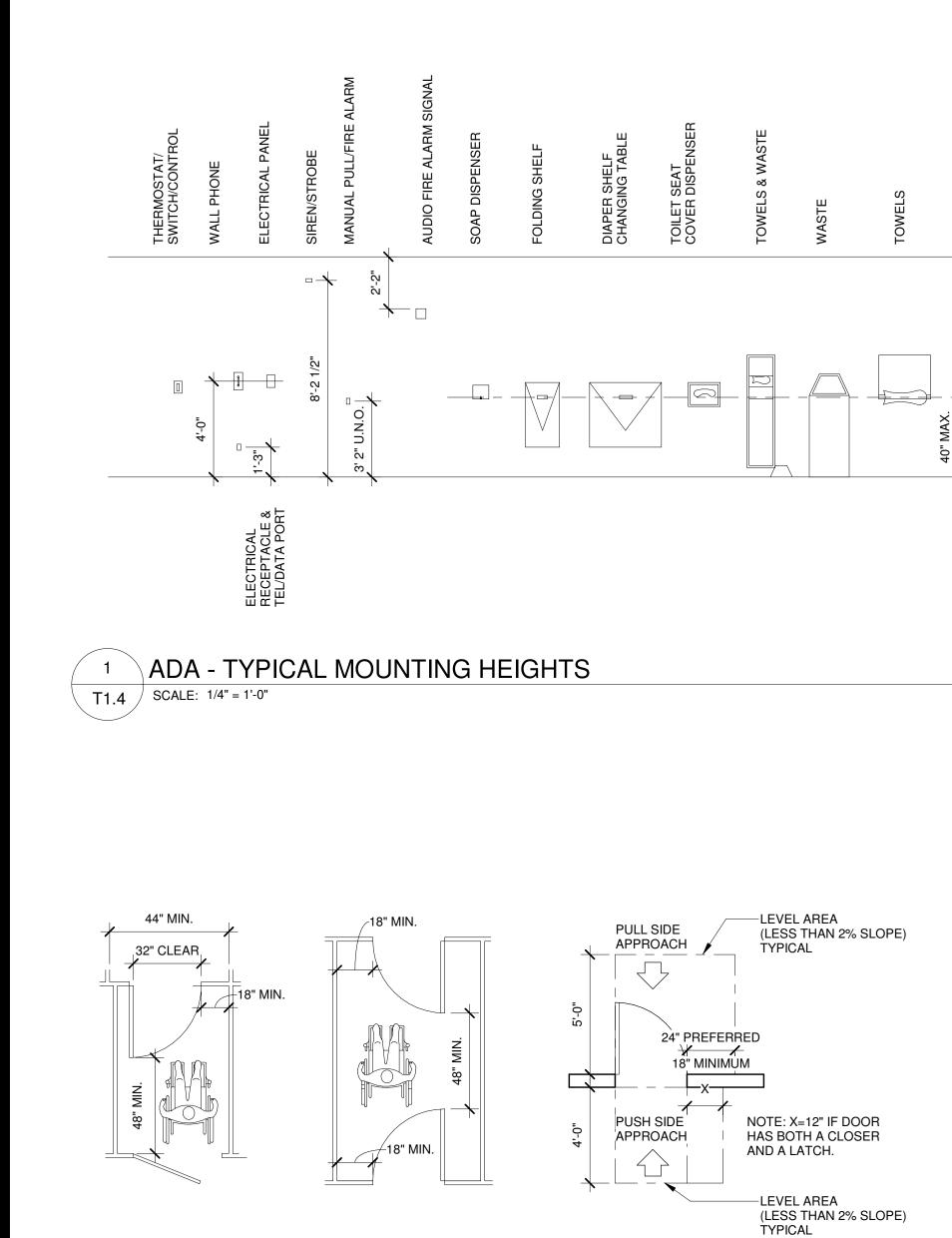
PROTECT SHADED AREA FROM CROSS-TRAFFIC-

4" MAX.

IF BOTTOM OF OBJECT IS ABOVE 27"

⁵ DETAILS T1.4 SCALE: 1/4" = 1'-0"

3



OPPOSITE WALLS

ADA - TYPICAL DOOR SWING CLEARANCES

FRONT APPROACH

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IF BOTTOM OF OBJECT IS BELOW 27"

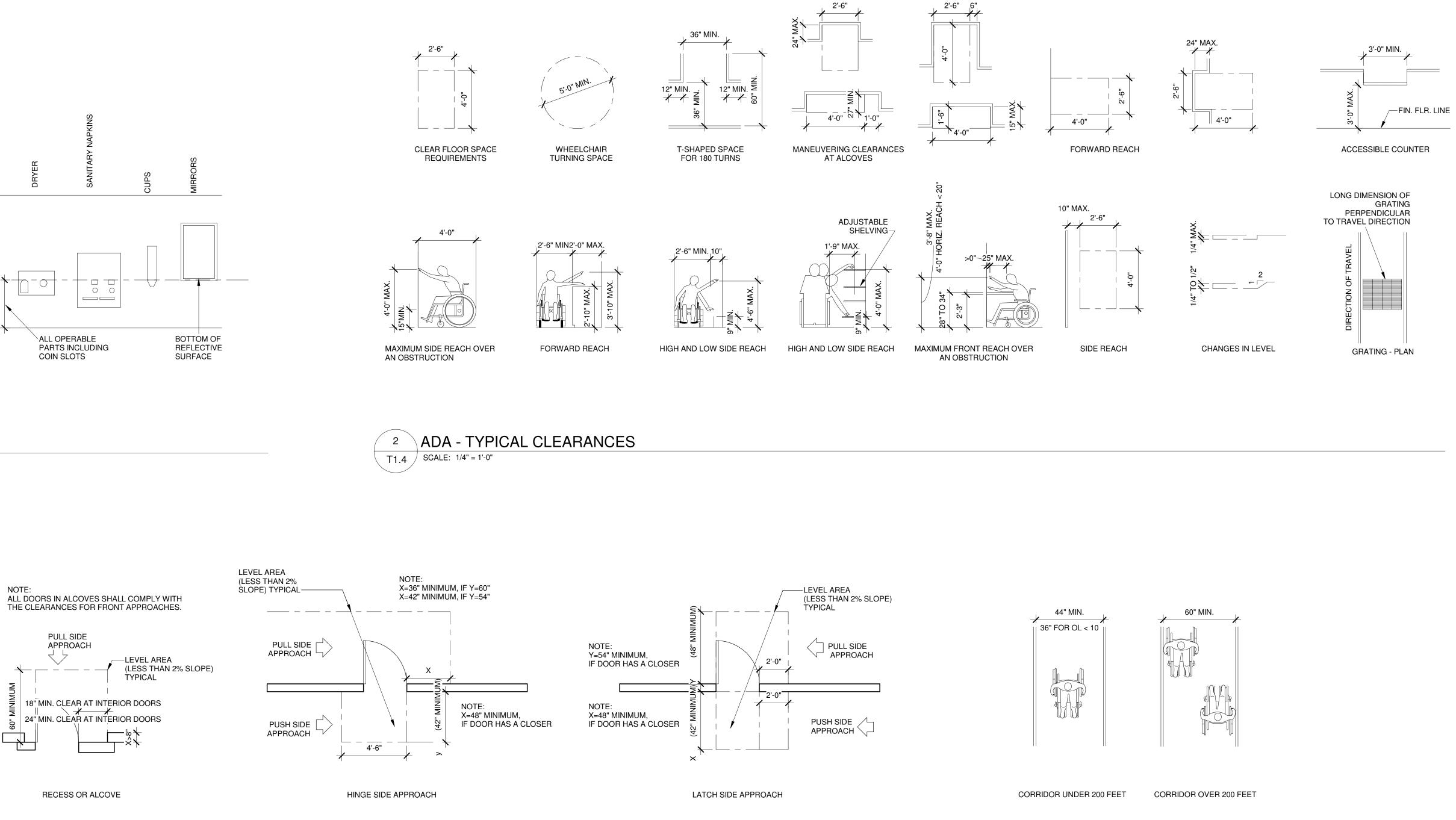
THIS IS A SIGN

V.I.F.

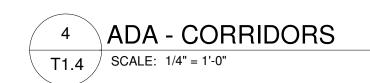
IF BOTTOM OF OBJECT IS BELOW 27"

ADA - TYPICAL PROTRUDING OBJECT

ANY AMOUNT

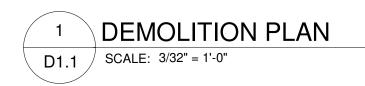




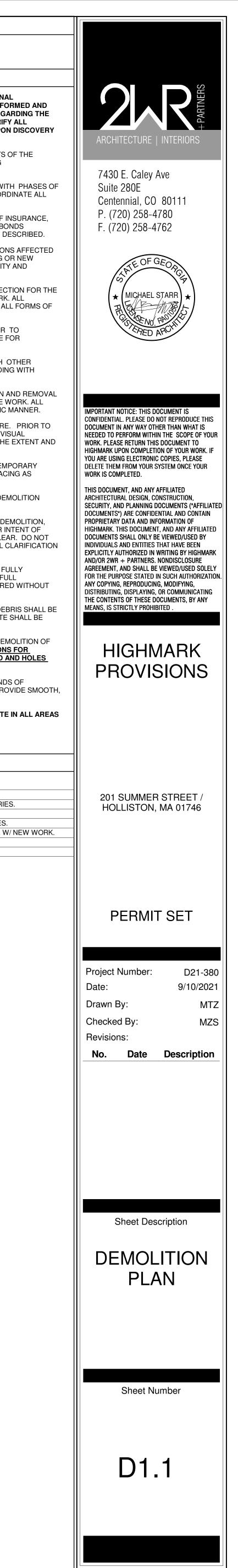


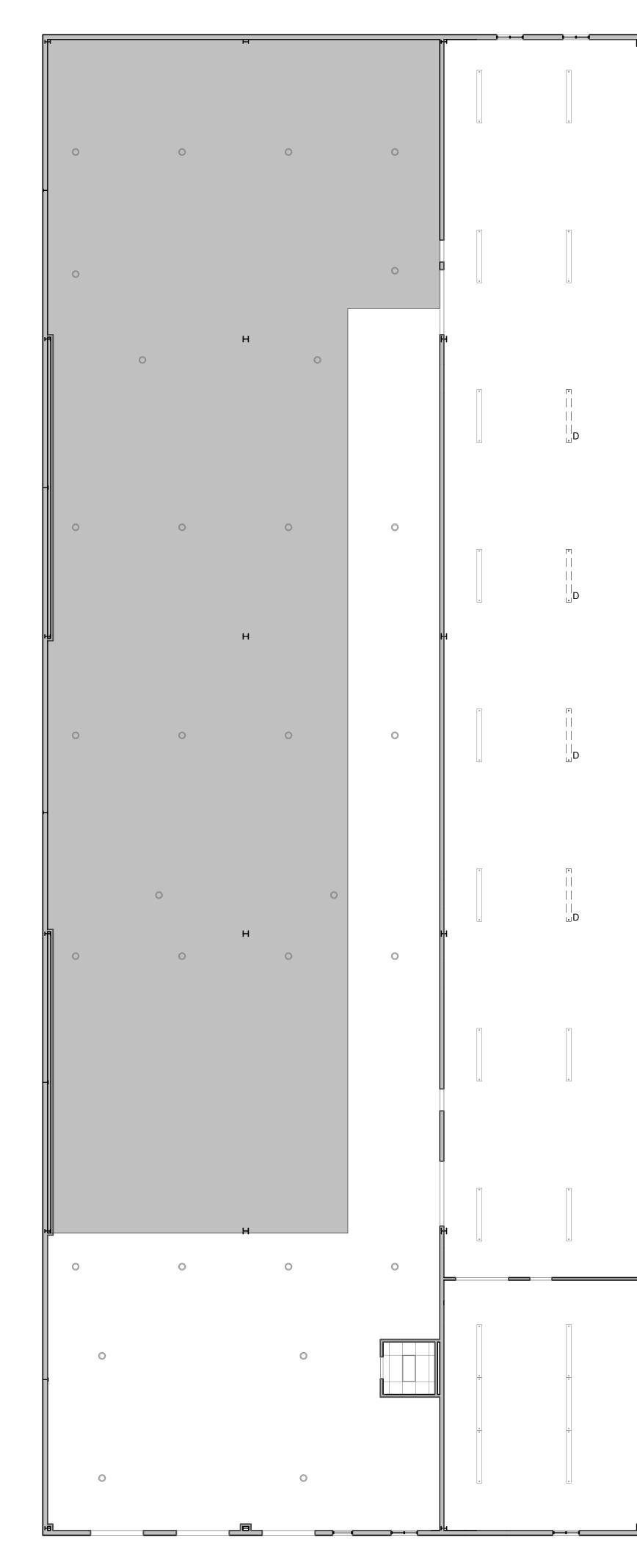






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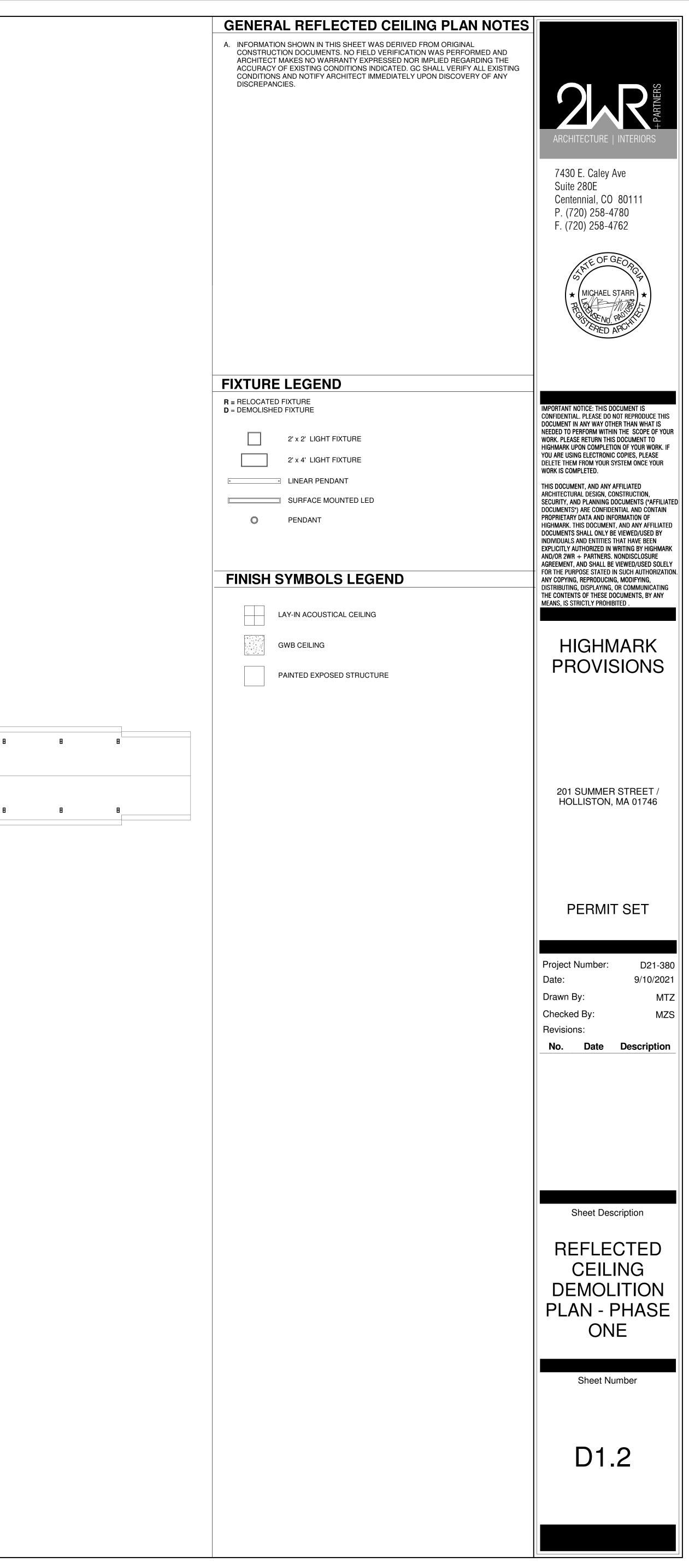


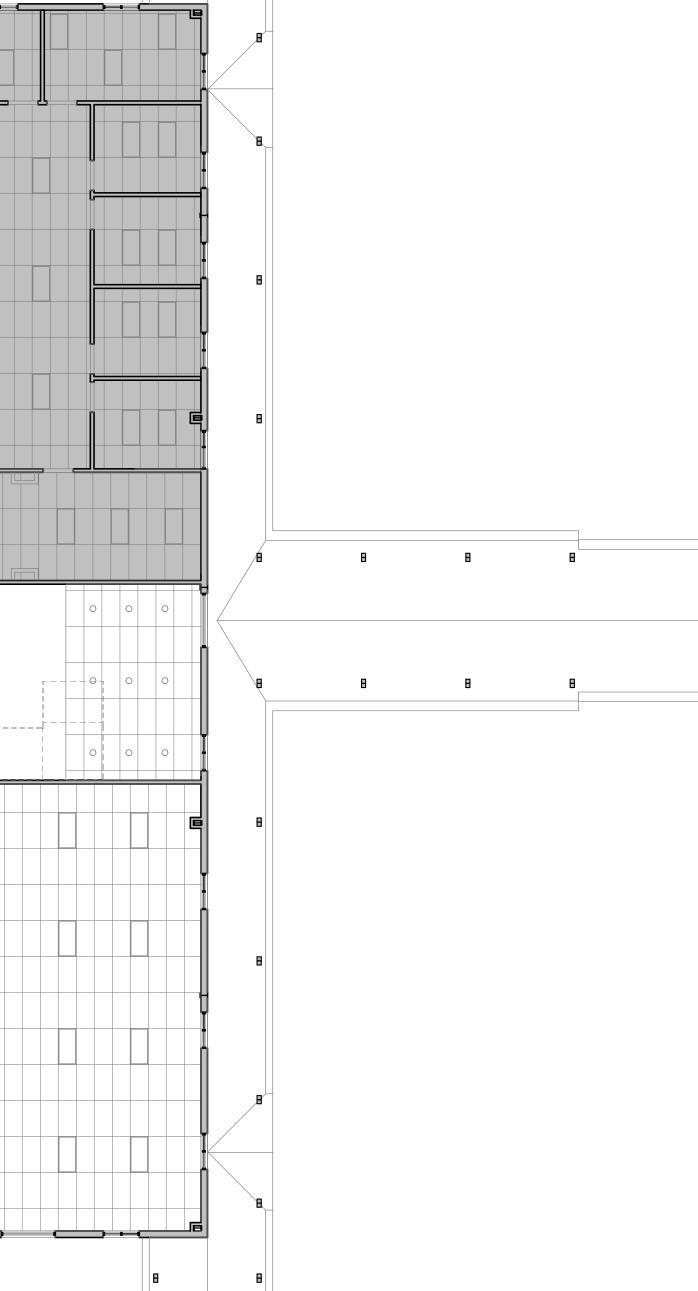


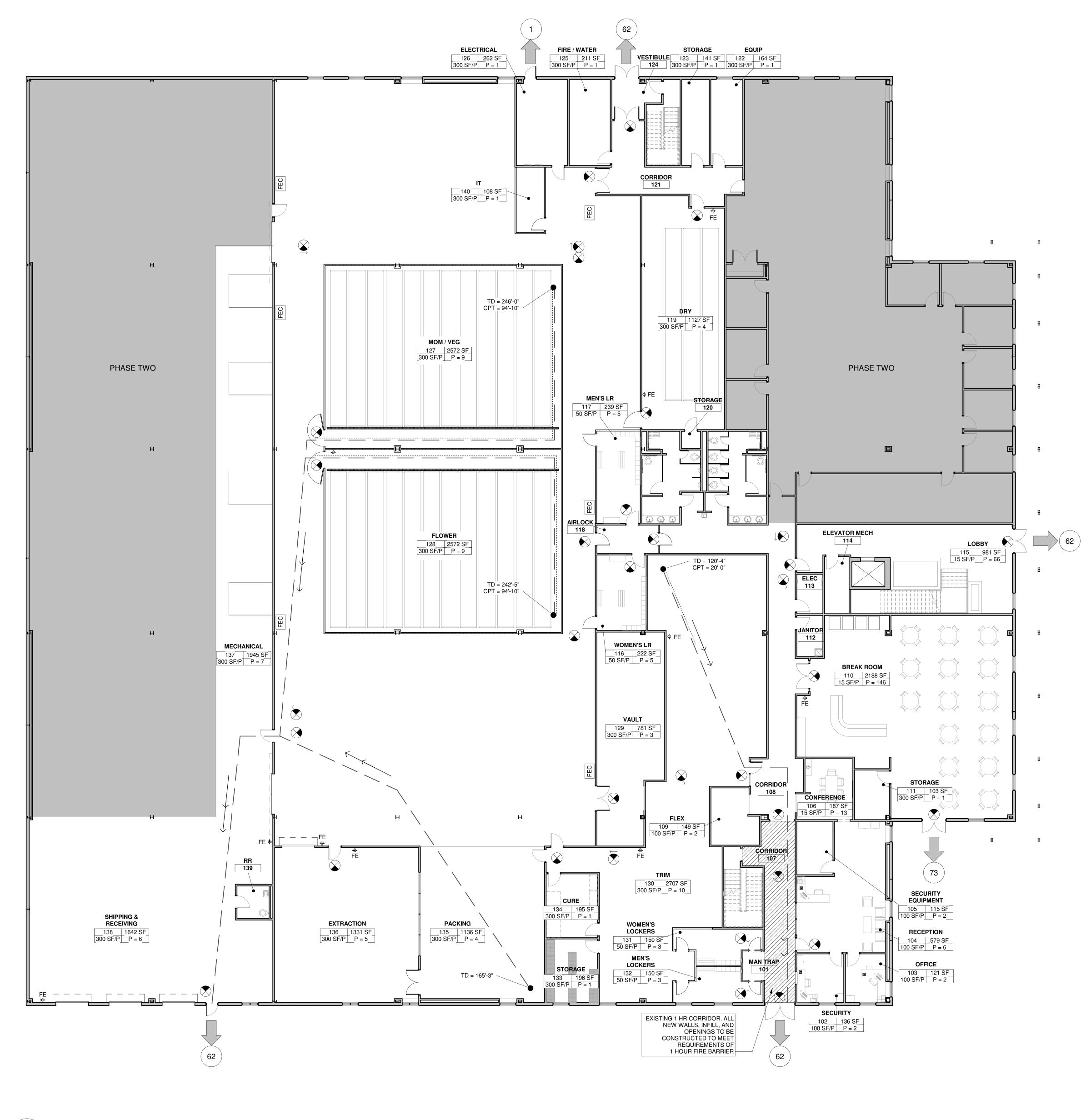
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 PHASE ONE

 D1.2
 SCALE: 3/32" = 1'-0"

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

GENERAL CODE NOTES

(IBC).

LIFE SAFETY SYMBOLS LEGEND NOCCUPIED SPACE TAG COCUPANT COCUP						ESPECTIVELY	11 TAE
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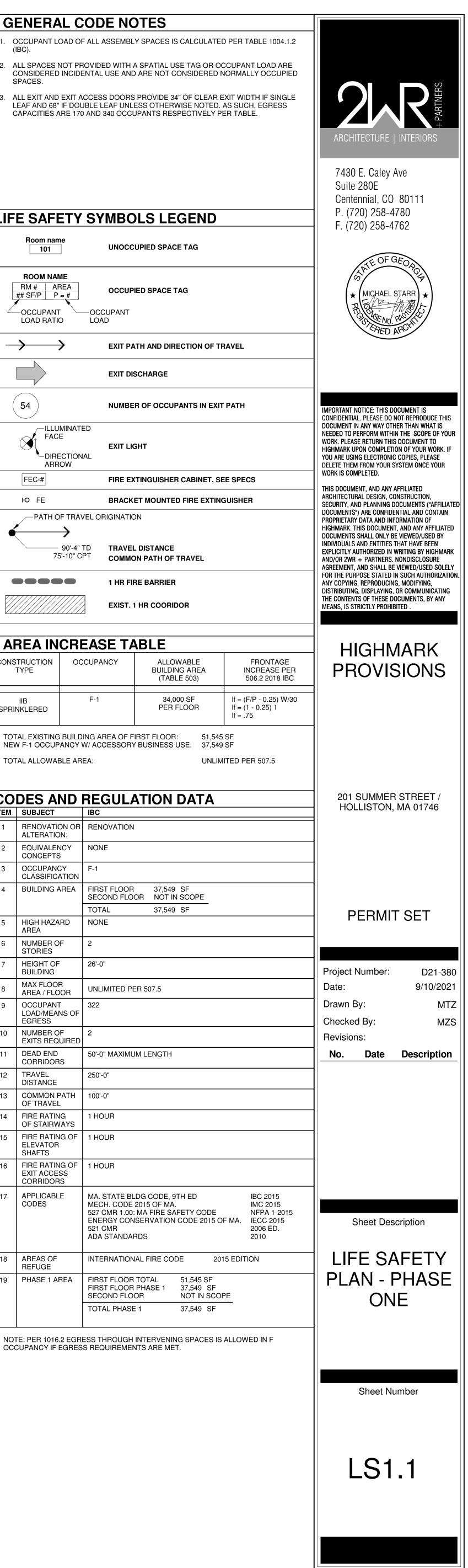
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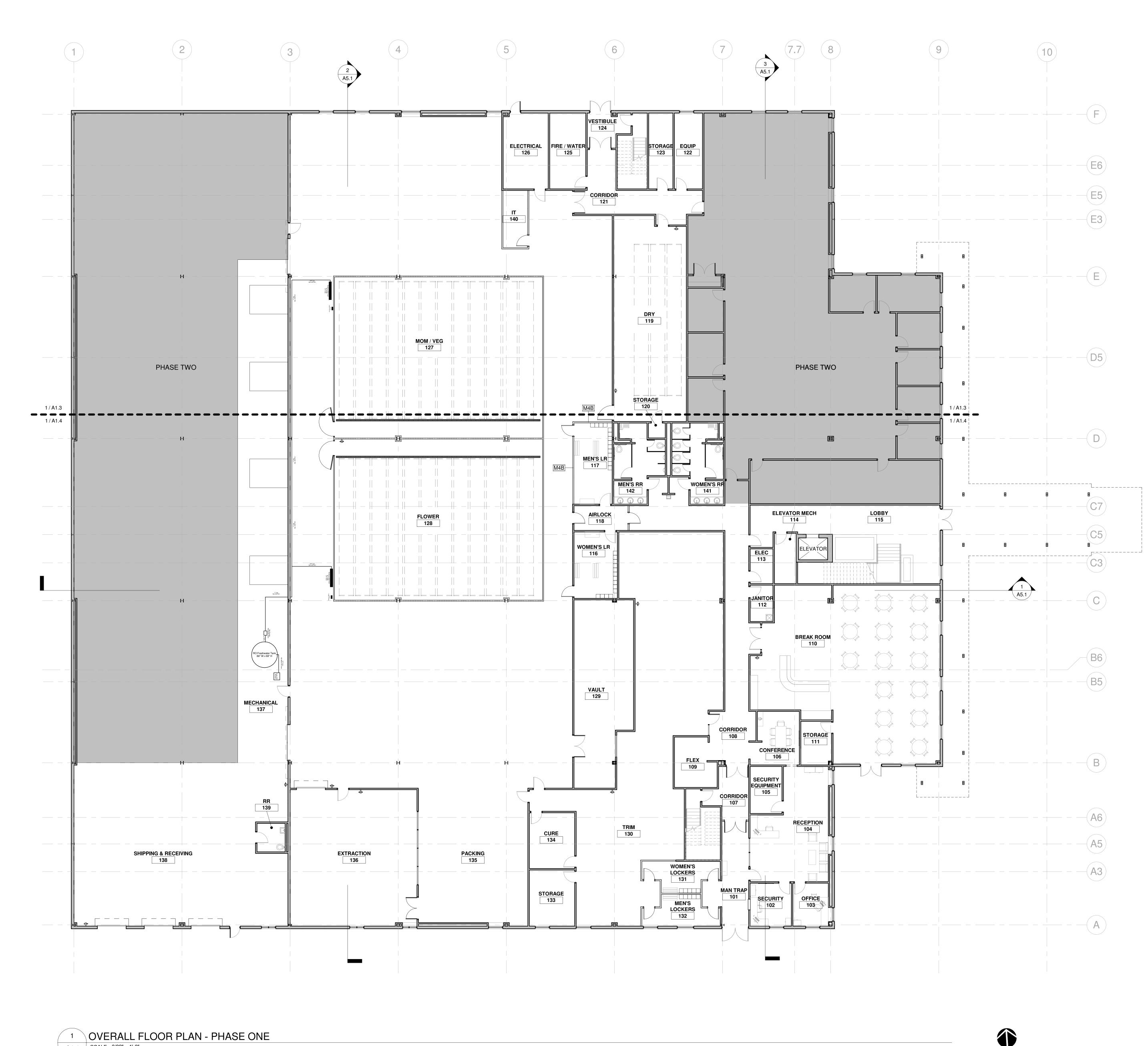
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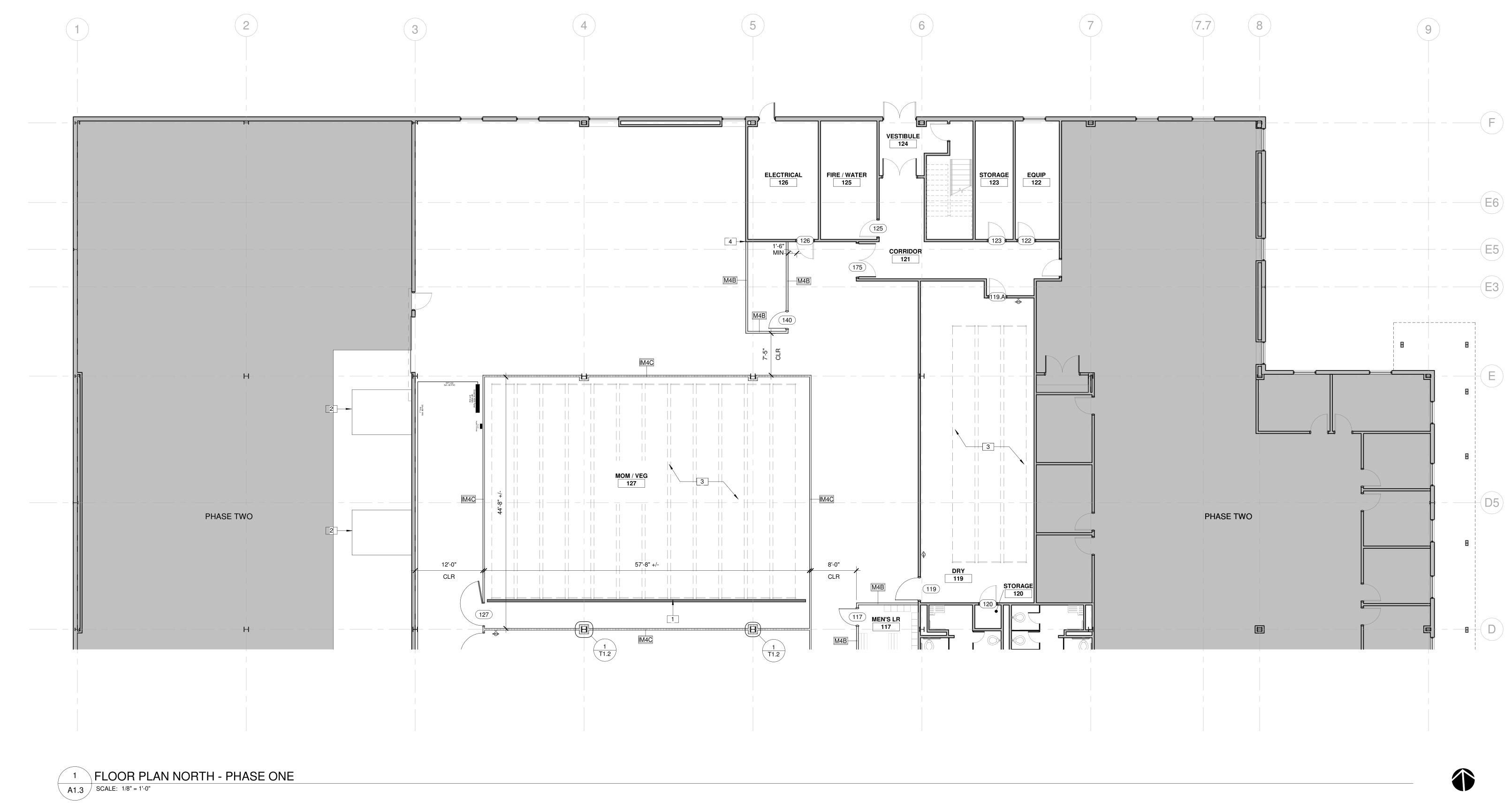
1 OVERALL FLOOR PLAN - PHASE ONE A1.1 SCALE: 3/32" = 1'-0"

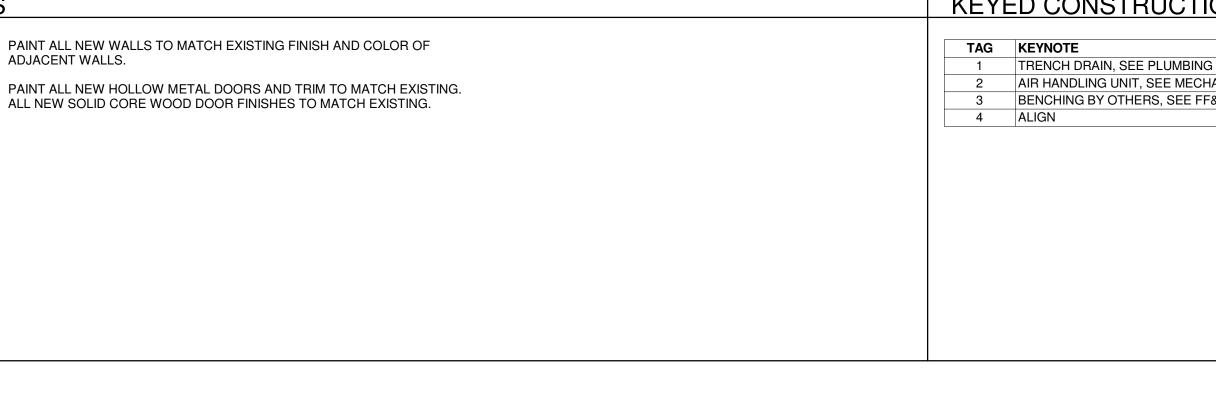


FLOOR PLAN LEGEND	GENERAL CONSTRUCTION & FINISH NOTES
NOTE: 1. SEE WALL TYPES FOR DETAILED DESIGNATIONS. 2. SEE LIFE SAFETY PLAN FOR FIRE SEPARATIONS.	A. DIMENSIONS TO NEW CONSTRUCTION ARE MEASURED FROM FACE OF STUD, FACE OF MASONRY, OR FACE OF EXISTING CONSTRUCTION, TYP (UNO).
EXISTING	I. B. PROVIDE GWB CONTROL JOINT WHERE NEW AND EXISTING GWB WALLS ABUT.
NEW STUD PARTITION	C. REFER TO SHEET T1.2 FOR WALL TYPES AND SECTIONS.
NEW INSULATED METAL PANEL PARTITION	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.



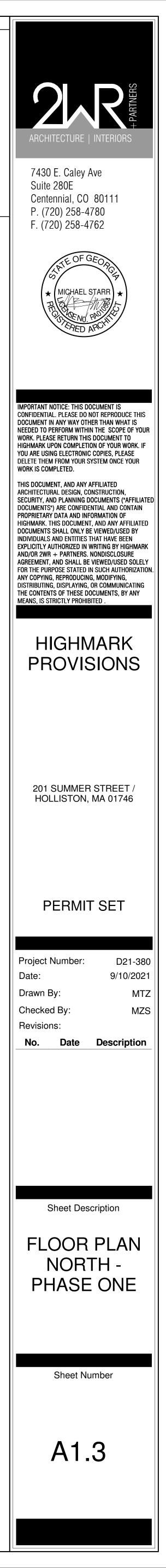


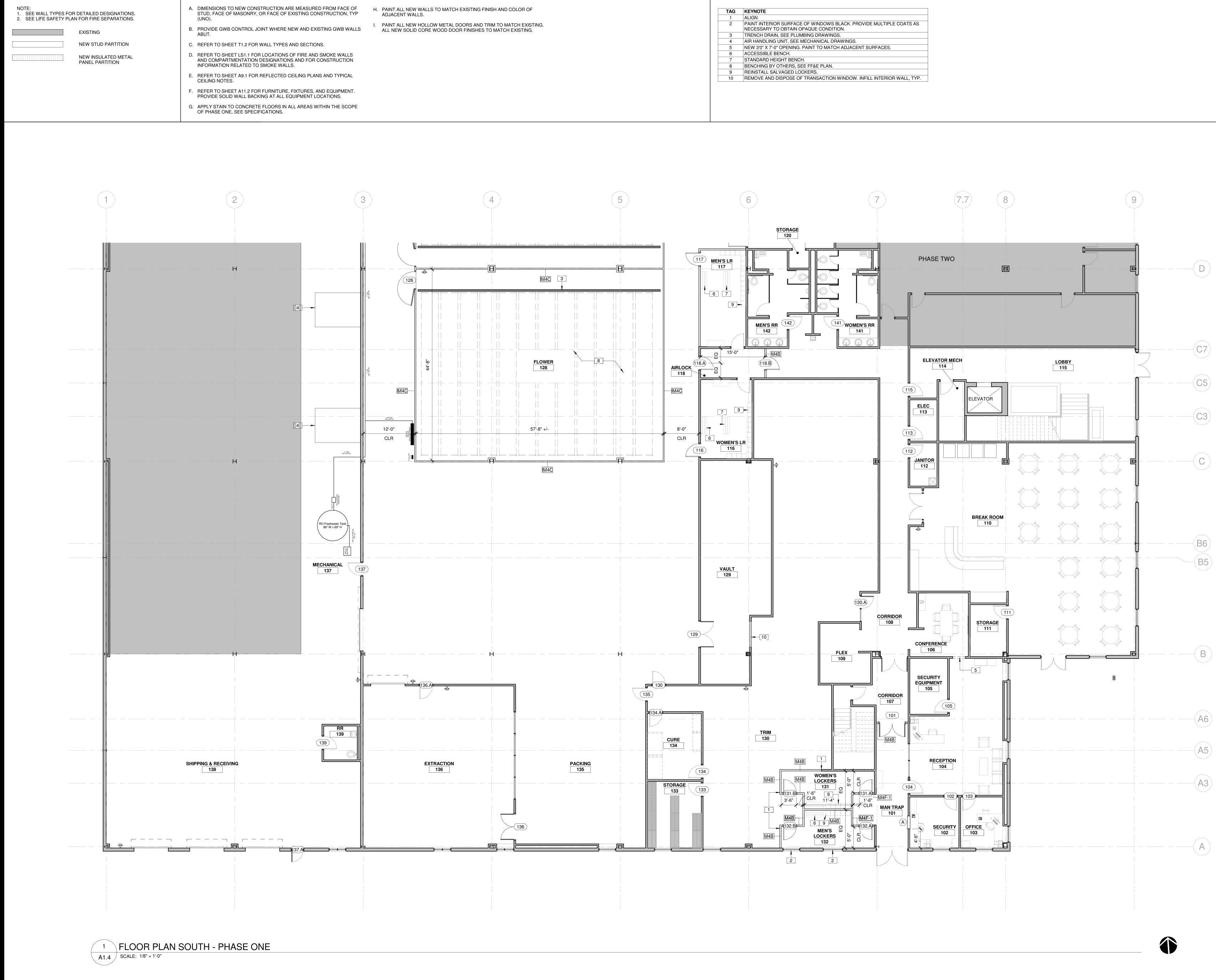




KEYED CONSTRUCTION NOTES 🔟

G DRAWINGS.	
HANICAL DRAWINGS.	
F&E PLAN.	



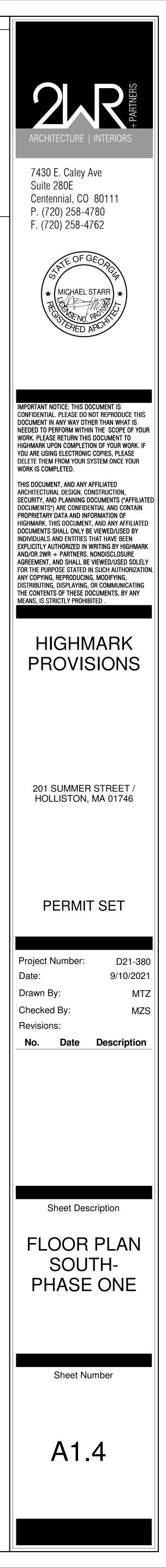


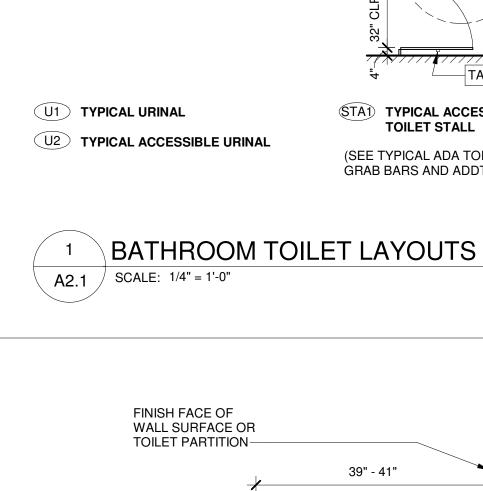
FLOOR PLAN LEGEND



GENERAL CONSTRUCTION & FINISH NOTES

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





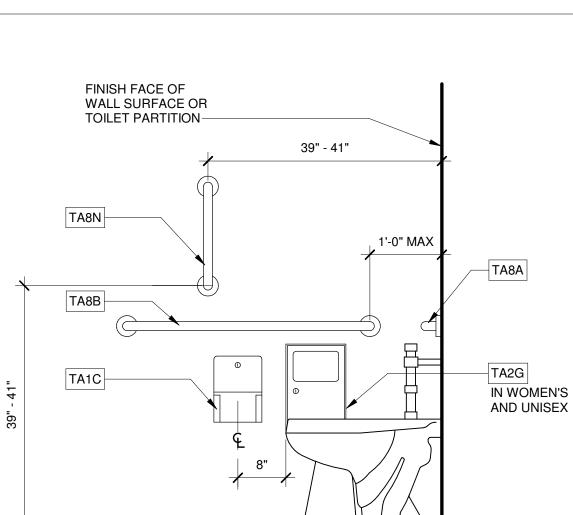
EQ EQ

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@(U2)

-30x48 CLEAR SPACE

CENTER ON DRAIN



5'-0" CLR MIN

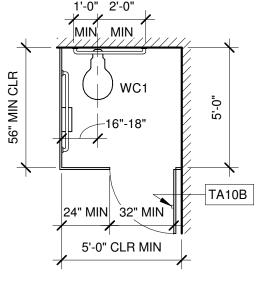
WC1

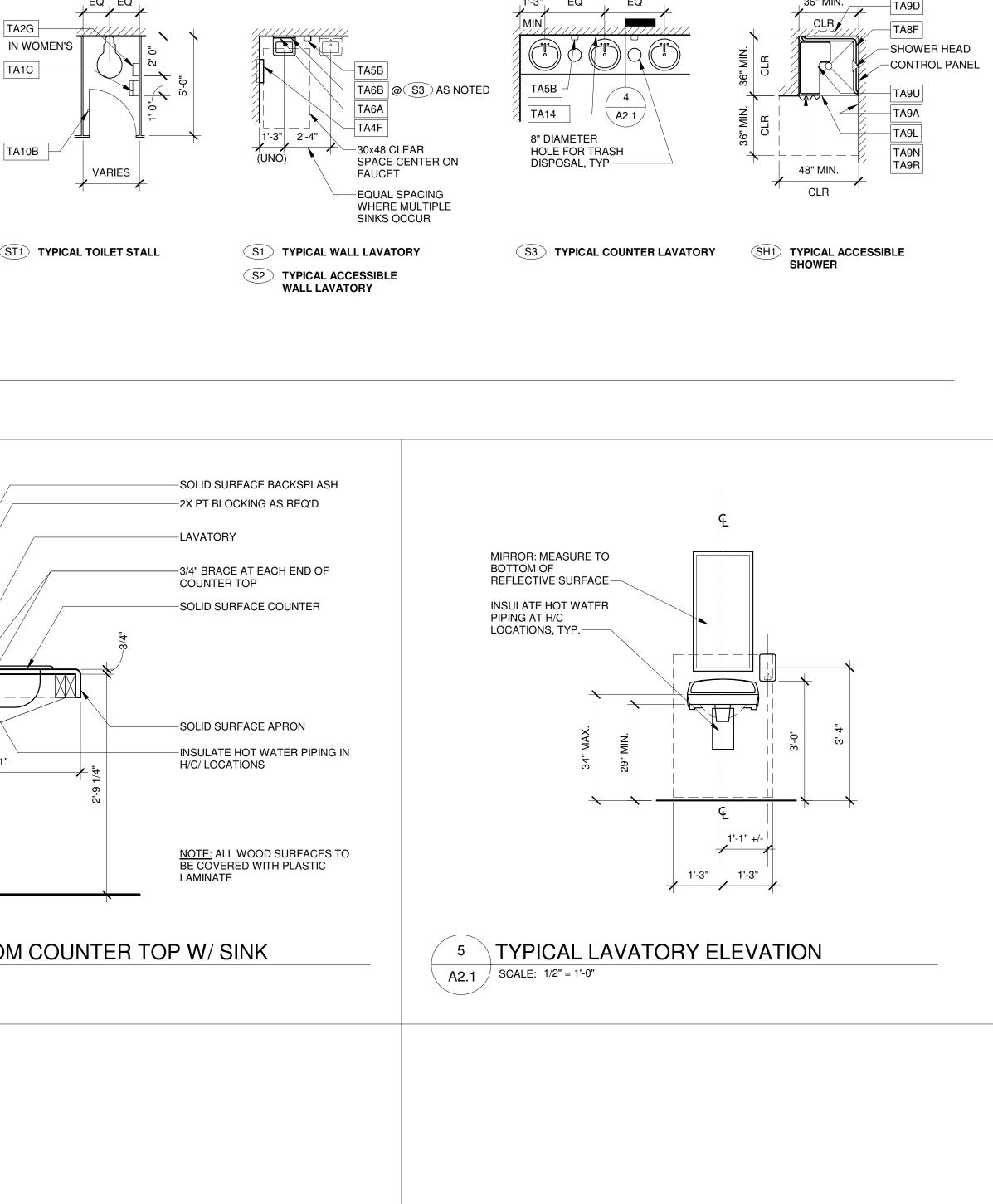
(STA1) TYPICAL ACCESSIBLE TOILET STALL

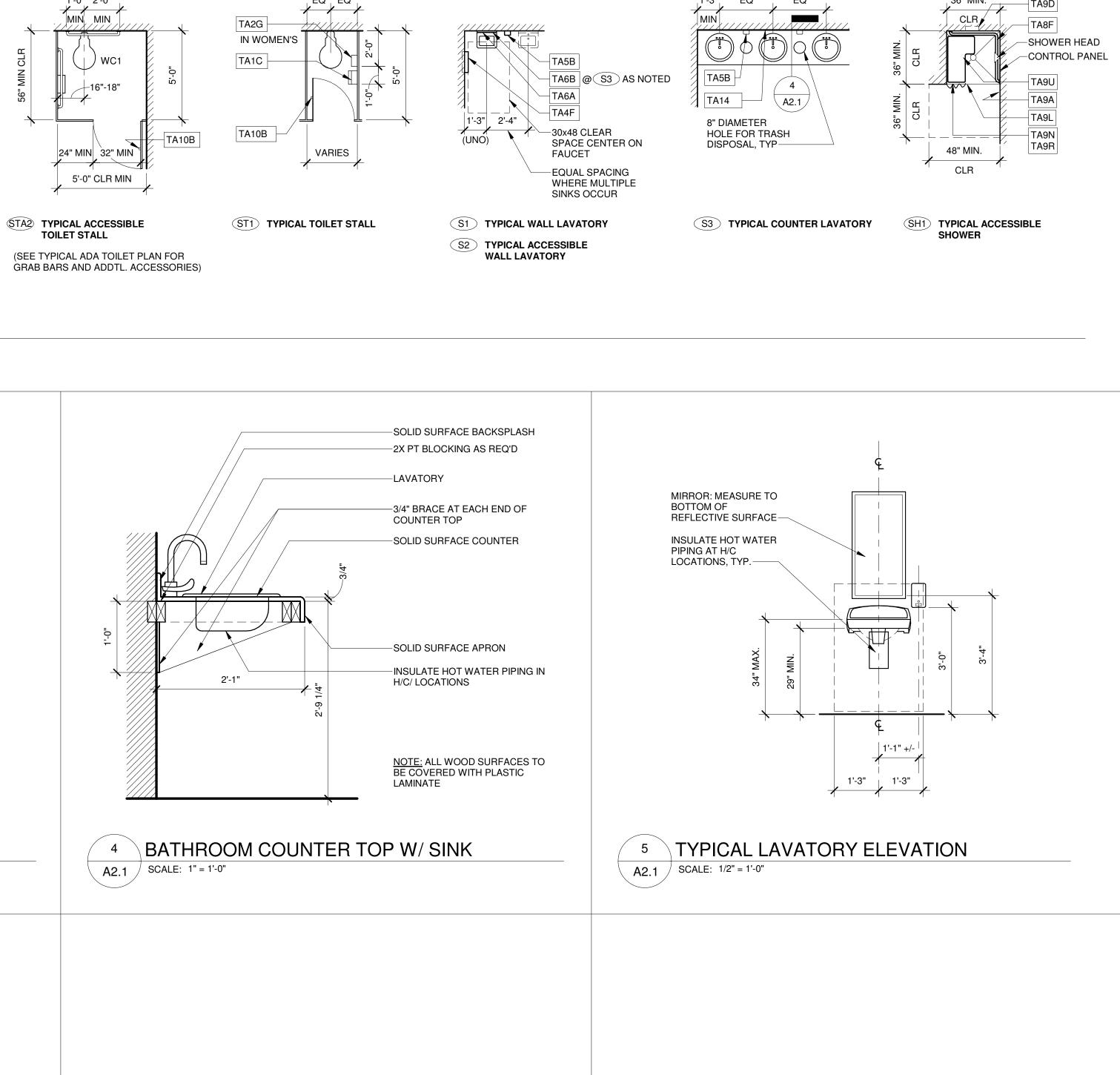
(SEE TYPICAL ADA TOILET PLAN FOR

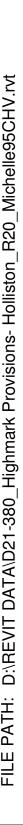
GRAB BARS AND ADDTL. ACCESSORIES)

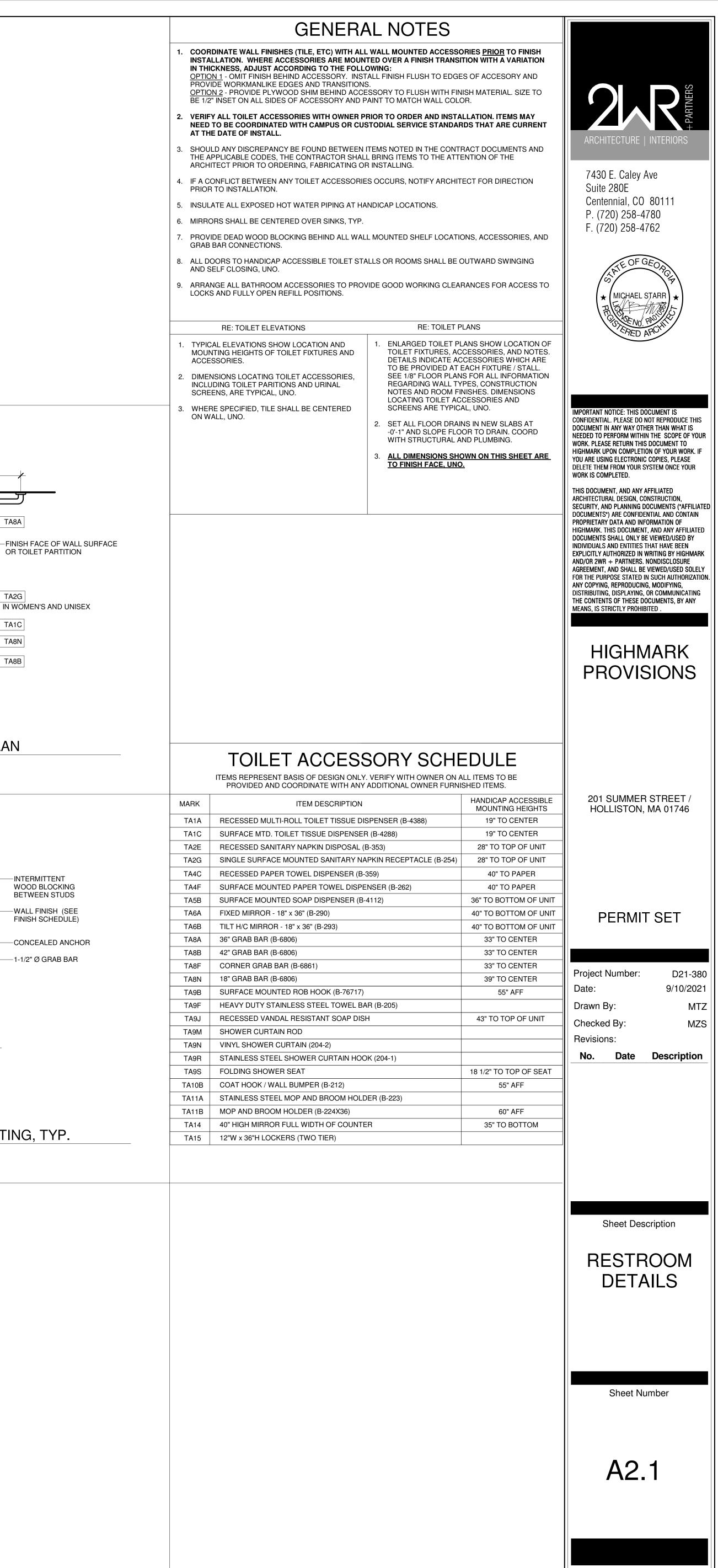


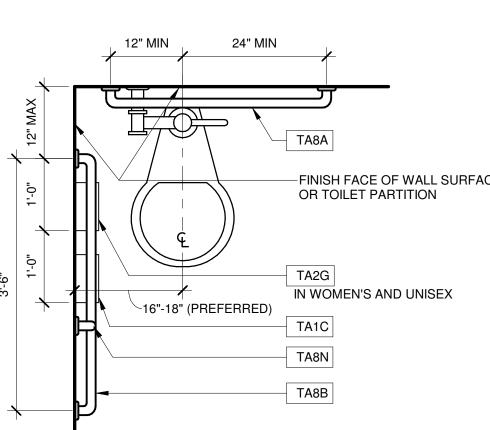




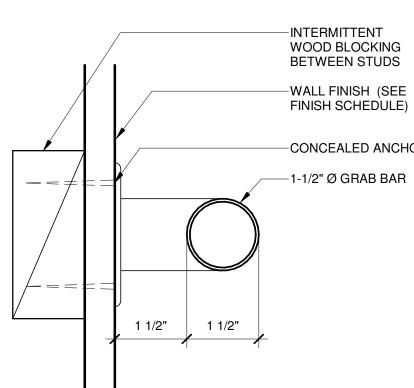




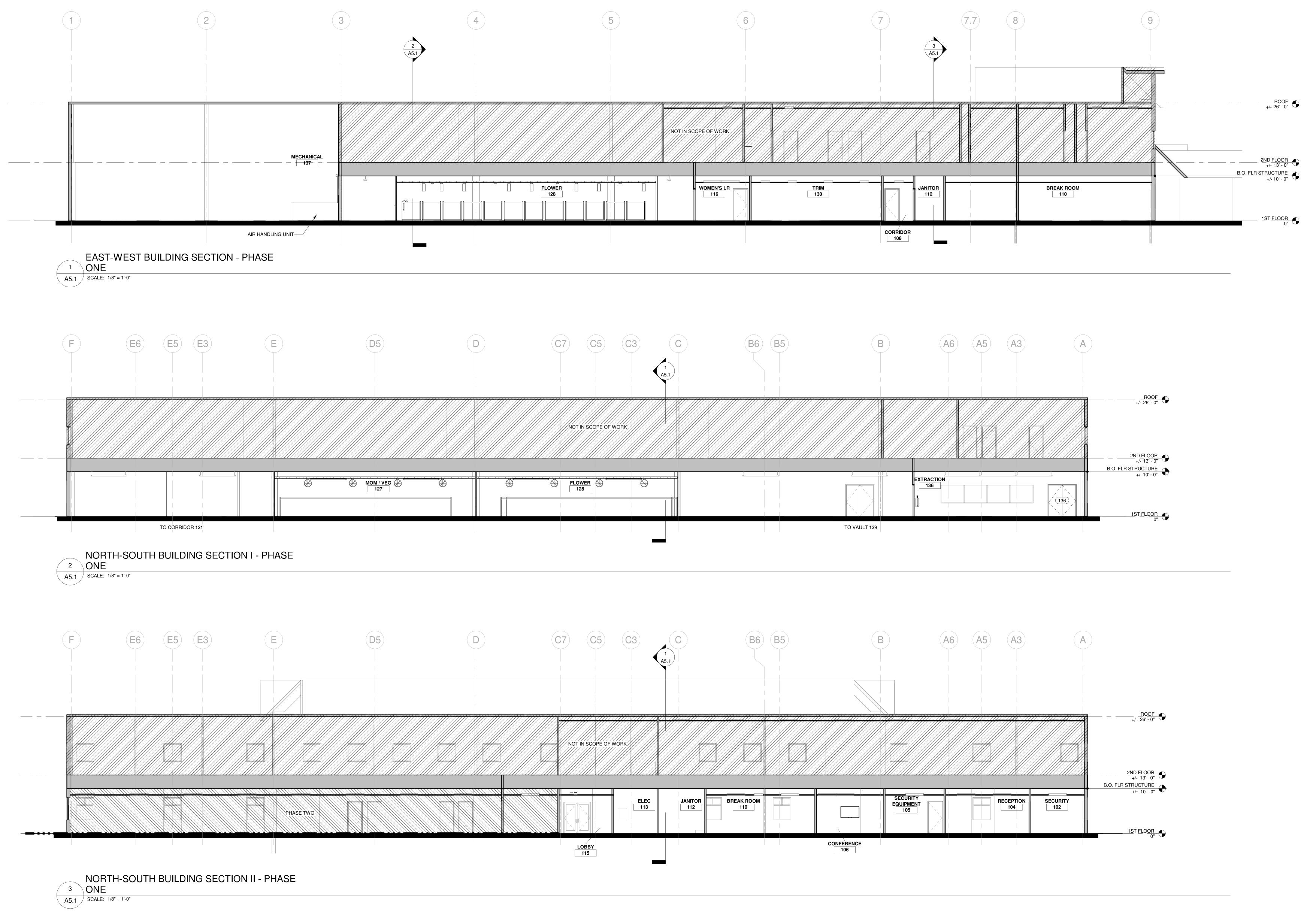




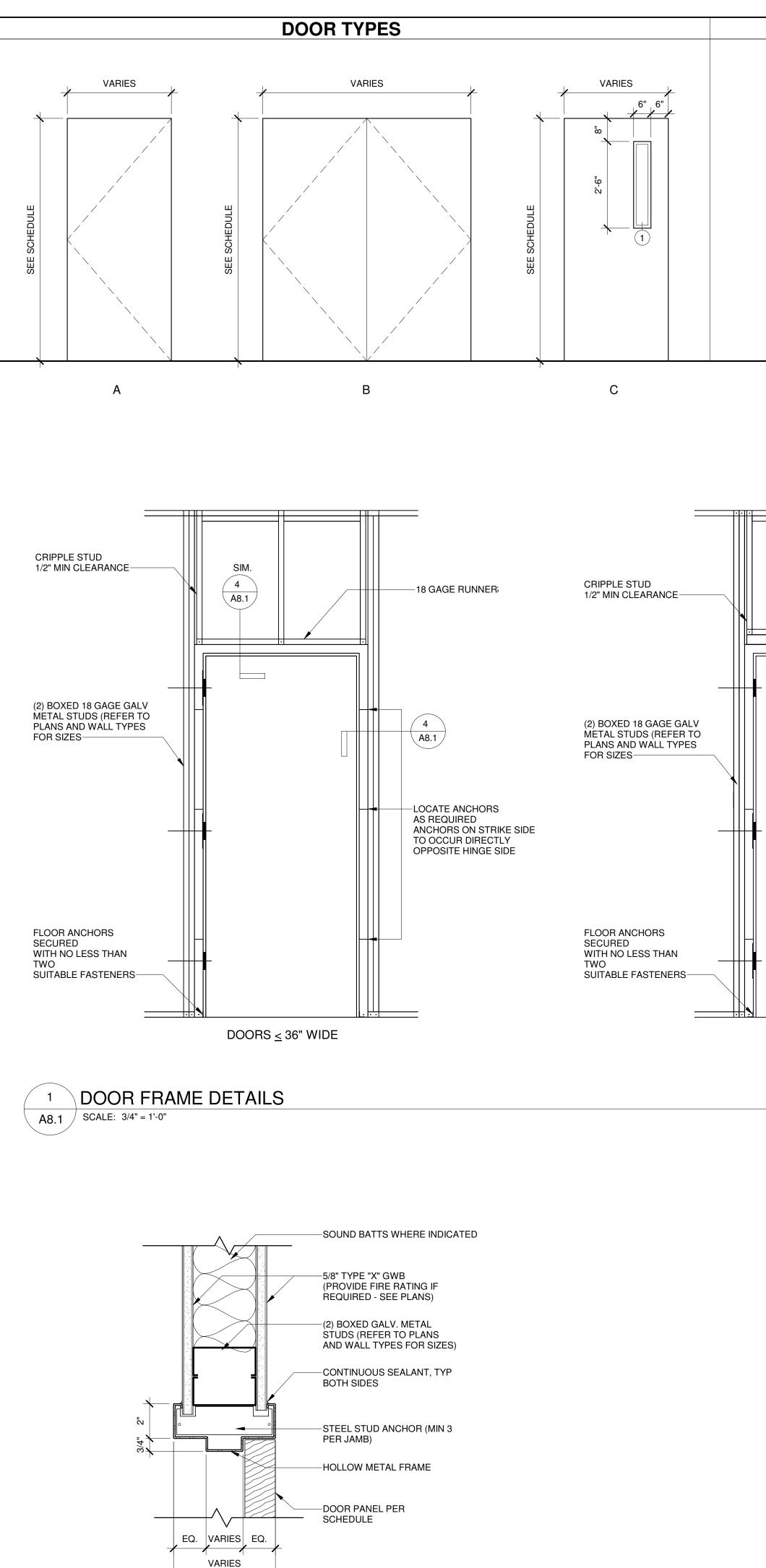
² TYPICAL ADA TOILET PLAN A2.1 SCALE: 3/4" = 1'-0"



6 2006 - GRAB BAR MOUNTING, TYP. A2.1 SCALE: 6" = 1'-0"







2 HM DOOR JAMB DETAIL (HEAD SIM.) A8.1 SCALE: 3" = 1'-0"

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HOLLOW METAL FRAME TYPE ALUMINUM FRAME TYPE DOO DOOR DOOR NO. TYPE MAT'L WI SEE SCHEDULE BASIS OF DESIGN: CREATIVE EXISTING INDUSTRIES XW-HP 3636 EXIST EXIST ~ T 115 3'-0" PHASE ONE HM SCWD SCWD SCWD 118.A SCWD 118.B FG 119 FG FG 128 _____ 131.A SCWD 131.B SCWD 132.A SCWD SCWD 132.B A HM 140 A $\langle \mathbf{A} \rangle$ -CRIPPLE STUD @ 16" OC -18 GAGE RUNNER SIM -(2) BOXED 18 GAGE JDS A8.1 GALV METAL STUD HEADERS (4 A8.1

DOORS > 36" WIDE

	DOOR AND FRAME SCHEDULE									
OR			DE	DETAIL		DE	TAIL			
VIDTH	HEIGHT	THK	FRAME TYPE	MAT'L	RATING (MINUTES)	HEAD	JAMB	REMARKS		
							=			
3' - 0"	7' - 0"	1 3/4"	EXIST	EXIST	EXIST	EXIST	EXIST	В		
6' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1	С		
3' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1			
3' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1			
3' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1	С		
3' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1	С		
4' - 0"	7' - 0"	1 3/4"	1	FG	-	2/A8.2	2/A8.2	A, B		
4' - 0"	7' - 0"	1 3/4"	1	FG	-	2/A8.2	2/A8.2	A, B		
4' - 0"	7' - 0"	1 3/4"	1	FG	-	2/A8.2	2/A8.2	A, B		
3' - 0"	7' - 0"	1 3/4"	1	HM	3/4 HR	1/A8.1	1/A8.1	В		
3' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1			
3' - 0"	7' - 0"	1 3/4"	1	HM	3/4 HR	1/A8.1	1/A8.1	В		
3' - 0"	7' - 0"	1 3/4"	1	HM	-	1/A8.1	1/A8.1			
3' - 0"	7' - 0"	1 3/4"	1	Н	-	1/A8.1	1/A8.1	В		

GENERAL DOOR NOTES

- 1. EXISTING DOORS TO REMAIN AS IS ARE NOT LISTED IN THE SCHEDULE.
- 2. 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

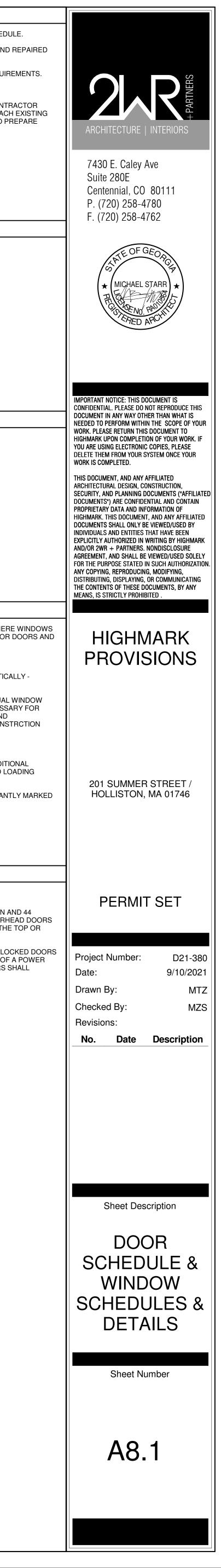
(2) 1 1/16" PILKINGTON PYROSTOP BR UL 752 LEVEL 1, 60 MINUTE FIRE-RATED, CLEAR

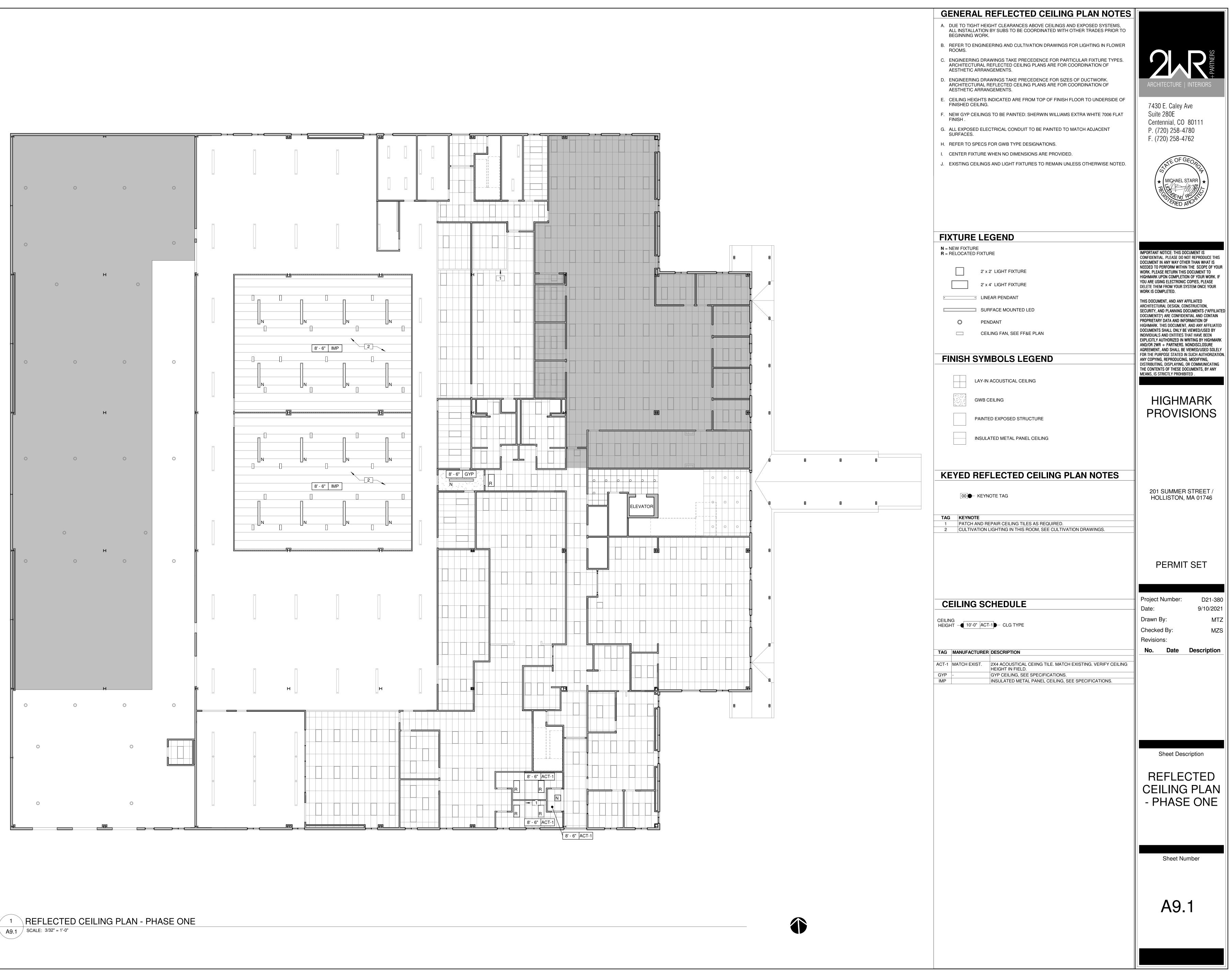
GENERAL WINDOW NOTES

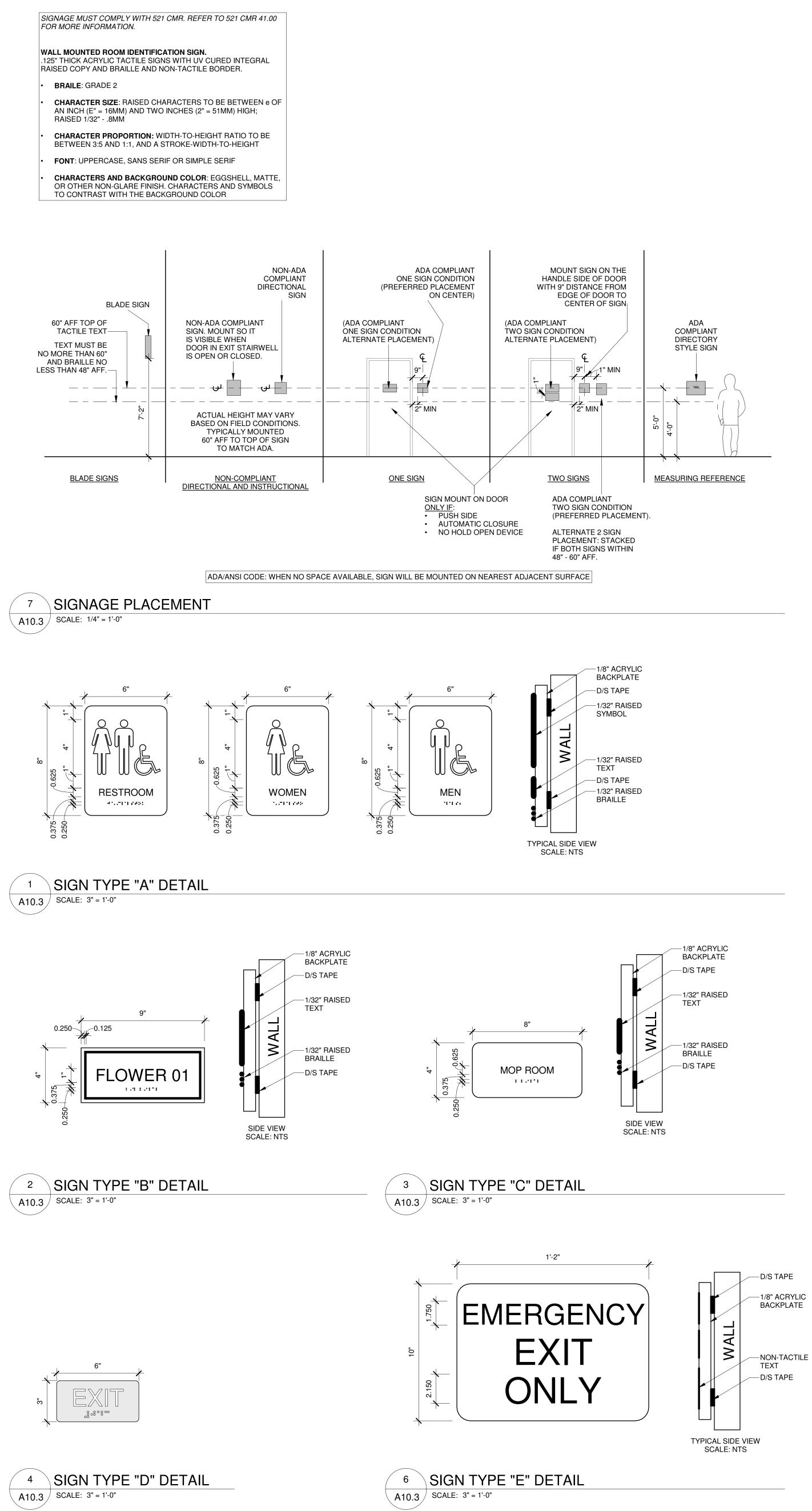
- TEMPERED GLAZING SHALL BE PROVIDED IN ALL LOCATIONS WHERE WINDOWS OR GLAZING ARE LOCATED WITHIN 4'-0" OF INTERIOR OR EXTERIOR DOORS AND BELOW DOOR HEAD HEIGHT.
- 2. SEE WINDOW ELEVATIONS FOR GLAZING TYPES.
- 3. SECTIONS THROUGH WINDOW MEMBERS ARE SHOWN SCHEMATICALLY -ACTUAL CONFIGURATIONS MAY VARY PER APPROVED MFR'S.
- 4. ROUGH OPENINGS ARE SHOWN ON WINDOW ELEVATIONS. ACTUAL WINDOW UNITS SHOULD BE CONSTRUCTED TO MEET TOLERANCES NECESSARY FOR PROPER HORIZONTAL AND VERICAL ALIGNMENT OF SYSTEMS AND CONFORMANCE WITH DETAILS AND SPECIFICATIONS OF THE CONSTRCTION 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.
- 7. ALL NEW FIRE PROTECTION-RATED GLAZING SHALL BE PERMENANTLY MARKED IN ACCORDANCE WITH NFPA 101: 8.3.3.12

HARDWARE GENERAL NOTES

- 1. SEE SPECIFICATION FOR HARDWARE SETS.
- 2. 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.
- 2. 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.







SIGNAGE SCHEDULE

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

GENERAL SIGNAGE NOTES

REQUIRED TO BE ILLUMINATED.

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 WITH521 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

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) OFSIGNAGE 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 SIGN.

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 E 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.

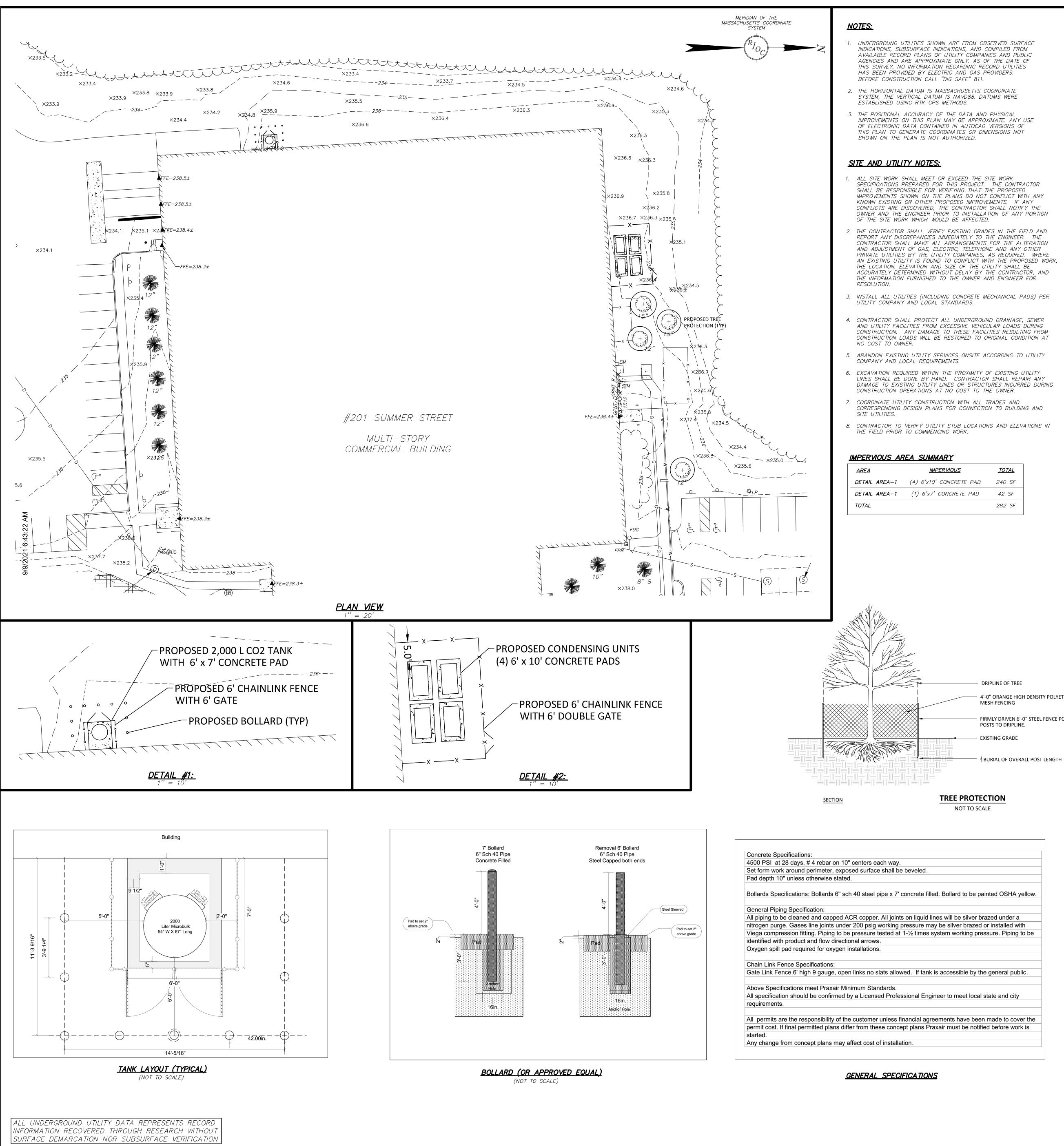
VOLUME CONTROL TELEPHONES: TELEPHONES REQUIRED TO HAVE A VOLUME CONTROL UNDER 521 CMR 37.5, SHALL BE IDENTIFIED BY A SIGN CONTAINING A DEPICTION OF A TELEPHONE HANDSET WITH RADIATING SOUND WAVES.

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

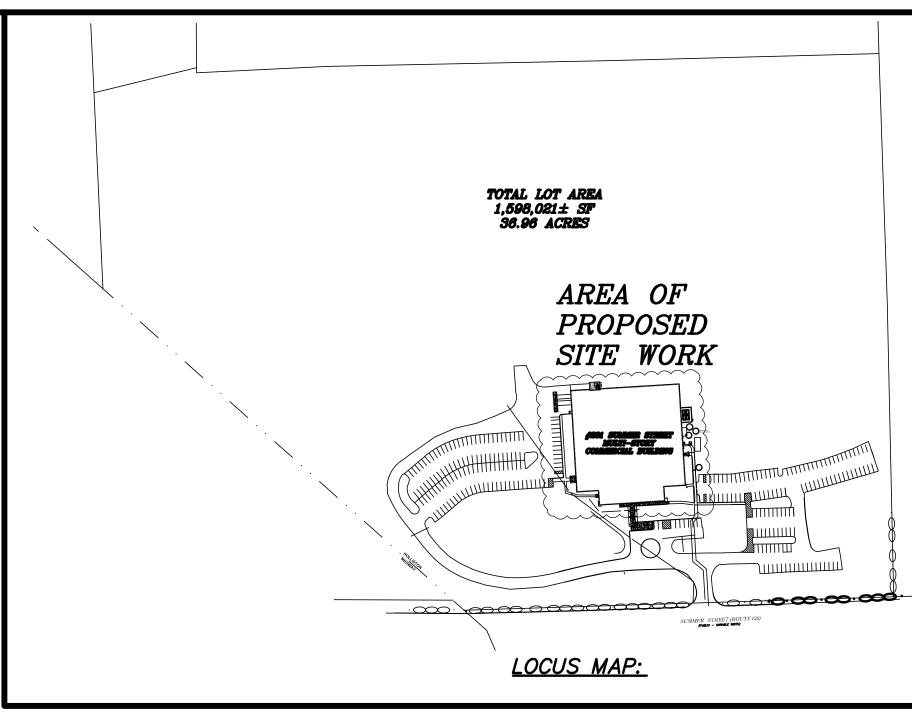
INCLUDE THE INTERNATIONAL TTY SYMBOL. IF A FACILITY HAS NO BANKS OF TELEPHONES BUT A PUBLIC TEXT TELEPHONE (TTY) IS AVAILABLE, THE DIRECTIONAL SIGNAGE SHALL BE PROVIDED AT THE ENTRANCE (E.G., IN A BUILDING DIRECTORY). ASSISTIVE LISTENING SYSTEMS: IN ASSEMBLY AREAS WHERE PERMANENTLY

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.





<u>IMPER VIOUS</u>	<u>TOTAL</u>
'x10' CONCRETE PAD	240 SF
S'x7' CONCRETE PAD	42 SF
	282 SF



LEGEND

PLAN

(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)

	(NUT ALL FEATURES CONTAINED IN	N THIS LEGEND APPEAR ON THE PLA	AN)	
		BOUNDARY LINE	ഹ	UTILITY POLE
		ABUTTING PROPERTY LINE	*	LIGHT POLE
		EASEMENT LINE		ELECTRIC HAND HOLE
		SEWER SERVICE		CABLE MANHOLE
	— D ———— D ————	DRAIN SERVICE	S	SEWER MANHOLE
		WATER SERVICE	\bigcirc	DRAIN MANHOLE
	- G G	GAS LINE		CATCH BASIN
	— F F	ELECTRIC LINE		WATER VALVE
		TELEPHONE LINE	\checkmark	FIRE HYDRANT
	- ohw ohw	OVERHEAD WIRES	0	SPRINKLER CONNECTIO
. 	<u> </u>	GUARDRAIL	0	POST INDICATOR VALVE
——— X	x x x	CHAIN LINK FENCE	•	BOLLARD
		STOCKADE FENCE	Π	GAS METER
		INDEX CONTOUR	\bowtie	GAS VALVE
		INTERMEDIATE CONTOUR		ROOF DRAIN
	IRRIGATION CONTROL VALVE		0	AREA DRAIN
×114.7	SPOT GRADE			
			CC	CONCRETE CURB
			VGC	VERTICAL GRANITE CUR
(+ ;)	DECIDUOUS TREE		BCB	BITUMINOUS CONCRETE
كتريب بها			НС	HANDICAP
	CONIFEROUS TREE		HPDE	HIGH DENSITY POLYETH
			CONC.	CONCRETE
(REC)	FROM RECORD PLANS		LSA	LANDSCAPE AREA
4	CONCRETE WALK / PATIO		▼	DOOR
	RETAINING WALL		d	SIGN
			,	

· 4 . RETAINING WALL 000000000

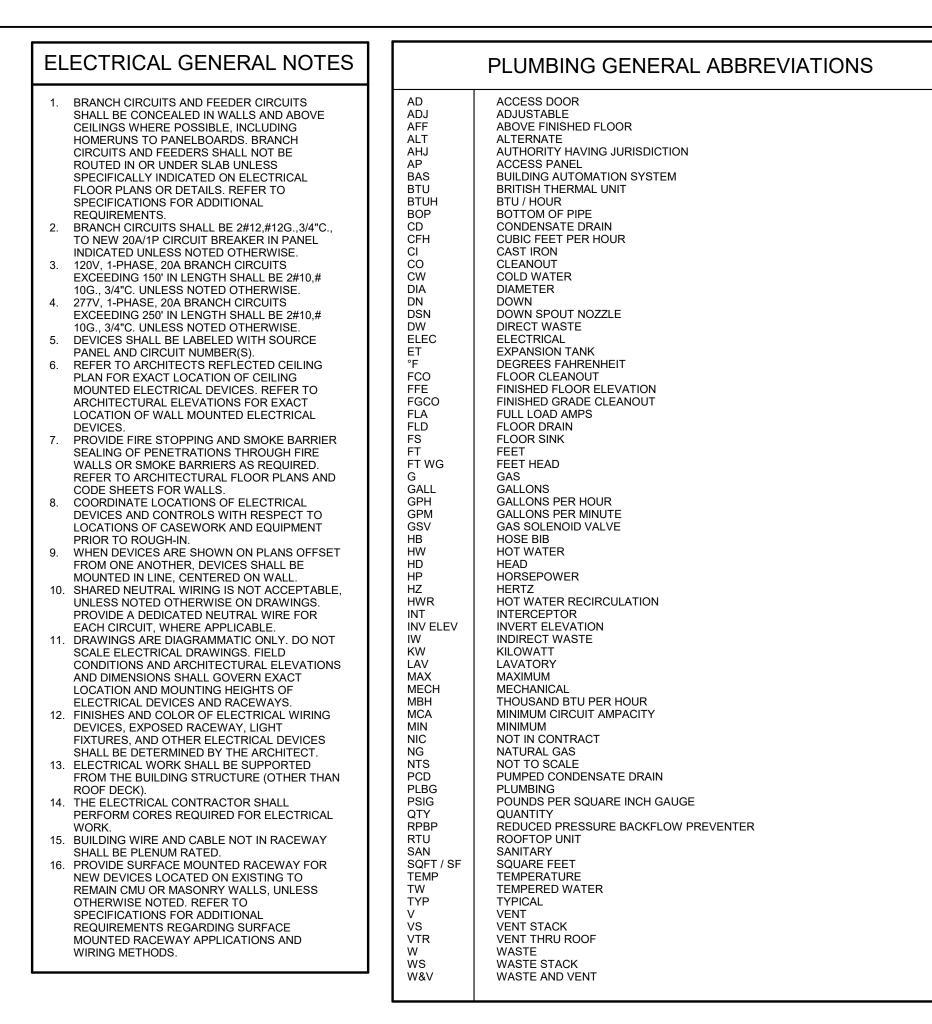
		DETECTABLE WARNING PAD		0/00	NUMBER	
		П				
EE			 HIGH DENSITY POLYETHELYNENE MESH FENCING 			
IGH DENSITY POLYETHELYNENE						
			- TREE TO BE SAVED			
6'-0" STEEL FENCE POSTS. EXTEND						
INE.			- DRIPLINE OF TREE			
=	×					

—— STEEL FENCE POSTS

┝━━━ 10'−0" CENTER TO CENTER (MAX.) ━━━━ TOP RAIL 1 3/4"Ø-╔╤╯╺╱╷╤╧╤╱╲╱╼╤╧╤╱ X BAR BANDSX X BAR BANDSX X BAR BANS WIRE FASTENERS @ 15."XWIĘRVALS - FINISH GRADE \times \times \times - 2'-6" IF HEIGHT OF - CEMENT CONC. BASE (CLASS A) $| \begin{array}{c} & \cup \\ & \cup \\ & \cup \\ & -$ 12" SONOTUBE 6" МІN. ¬ ____12"ø NOTE: LINE POSTS TO BE SPACED 10'-0" C. TO C. MAXIMUM MIN. EXCEPT ON CURVES WHERE THEY <u>POST BASE</u> SHALL BE SPACED AS FOLLOWS: (NOT TO SCALE) RADIUS OF CURVE MAXIMUM SPACING 100' OR LESS5'-0" C. TO C.100' TO 200'6'-0" C. TO C. 200' TO 500' 8'-0" C. TO C. CHAIN LINK FENCE WITH TOPRAIL (OR APPROVED EQUAL)

(NOT TO SCALE)





ELECTRICAL SYMBOL LIST

	ELECTRICAL SYMBOL LIST		ELECTRICAL ABBREVIATIONS
SYMBOL	DESCRIPTION	A/AMP	AMPERE ALTERNATING CURRENT
	SURFACE MOUNTED PANELBOARD	AC AFCI	ARC FAULT CIRCUIT INTERRUPTER AIR CONDITIONING UNIT
	DISCONNECT SWITCH	ACU AFF	ABOVE FINISHED FLOOR ABOVE FINISHED GRADE
	MOTOR	AFG AHU AIC	AIR HANDLING UNIT AMPS INTERRUPTING CURRENT
	BRANCH CIRCUIT WIRING, CONCEALED IN WALLS OR CEILINGS	AL ATS AWG	ALUMINUM AUTOMATIC TRANSFER SWITCH AMERICAL WIRE GAUGE
	HOMERUN TO PANELBOARD	BSMT C CF	BASEMENT CONDUIT CIRCULATION FAN CABLE TELEVISION
/	SWITCHED BRANCH CIRCUIT WIRING	CATV C/B CKT COMP	CIRCUIT BREAKER CIRCUIT COMPRESSOR
U U	JUNCTION BOX	CP CT CU	CONDENSATE PUMP CURRENT TRANSFORMER CONDENSING UNIT OR COPPER
€	DUPLEX WALL MOUNTED RECEPTACLE, 18" AFF UNLESS OTHERWISE NOTED	CUH D DEG.	CABINET UNIT HEATER DRYER DEGREE
⊖ _{xx"}	DUPLEX WALL MOUNTED RECEPTACLE MOUNTED AT XX" ABOVE FINISHED FLOOR	DIA DN DWG	DIAMETER DOWN DRAWING
+	DOUBLE DUPLEX WALL MOUNTED RECEPTACLE, 18" AFF UNLESS OTHERWISE NOTED	ETR EF ELEC	EXISTING TO REMAIN EXHAUST FAN ELECTRICAL
⊖ _a	RECEPTACLE, MOUNT 6" ABOVE COUNTER OR CASEWORK	ELEC ELEV EM	ELEVATOR EMERGENCY
$\ominus_{bc} \oplus_{bc}$	RECEPTACLE MOUNTED BELOW FRONT OF COUNTER	EMT EP	ELECTRIC METALLIC TUBING EMERGENCY PANEL ELECTRIC UNIT HEATER
	RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTION	EUH EWC	ELECTRIC UNIT HEATER ELECTRIC WATER COOLER ELECTRIC WATER HEATER
		EWH F	FAHRENHEIT
		FA FACP	FIRE ALARM CONTROL PANEL FOOT CANDLE
	RECEPTACLE, CEILING MOUNTED	FC FCU G	FAN COIL UNIT GROUND
FACP	FIRE ALARM CONTROL PANEL	GFCI HP HPS	GROUND FAULT CIRCUIT INTERRUPTER HORSE POWER HIGH PRESSURE SODIUM
0	SURFACE MOUNTED LIGHTING FIXTURE	HR HZ	HOUR HERTZ ISOLATED GROUND
••	PENDANT MOUNTED LIGHTING FIXTURE	IG IN JB	INCHES JUNCTION BOX THOUSAND CIRCULAR MILS
	RECESSED LIGHTING FIXTURE	KCMIL KVA KW	KILOVOLT AMPERE KILOWATT MAXIMUM
⊢•	INDUSTRIAL OR STRIP TYPE FIXTURE	MAX MAU MCB	MAKE-UP AIR UNIT MAIN CIRCUIT BREAKER MOTOR CONTROL CENTER
⊦⊗	WALL MOUNTED EXIT SIGN, DOUBLE FACED. CHEVRON ARROW AS INDICATED	MCC MCCB MH MIN	MOLDED CASE CIRCUIT BREAKER METAL HALIDE OR MANHOLE MINIMUM
н⊗	WALL MOUNTED EXIT SIGN. CHEVRON ARROW AS INDICATED	MLO NA	MAIN LUGS ONLY NOT APPLICABLE NEW DEVICE INSTALLED IN SAME LOCATION AS EXISTING
\otimes	CEILING MOUNTED EXIT SIGN. CHEVRON ARROW AS INDICATED	NE NEC	REMOVED DEVICE
	CEILING MOUNTED EXIT SIGN, DOUBLE FACED. CHEVRON ARROW AS INDICATED	NIC NL NR	NATIONAL ELECTRIC CODE NOT IN CONTRACT NEW LOCATION OF RELOCATED DEVICE NEW TO REPLACE EXISTING
	SELF-CONTAINED EMERGENCY LIGHTING UNIT WITH BATTERY BACKUP	NTS P PE	NOT TO SCALE POLE PRIMARY ELECTRIC SERVCE
PP	LIGHTING CONTROL POWER PACK. REFER TO LIGHTING CONTROL DETAILS FOR ADDITIONAL INFORMATION.	PF PH PNL PVC RE	POWER FACTOR PHASE PANEL POLYVINYL CHLORIDE CONDUIT
OS _H	CEILING MOUNTED OCCUPANCY SENSOR (SET TO AUTO-ON, AUTO-OFF MODE) "H"= HIGH BAY OCCUPANCY SENSOR	REF RGS RL	EXISTING TO BE REMOVED REFRIGERATOR RIGID GALVANIZED STEEL CONDUIT EXISTING TO BE RELOCATED
VS	CEILING MOUNTED VACANCY SENSOR (SET TO MANUAL-ON, AUTO-OFF MODE)	RM RN	ROM EXISTING TO BE REMOVED AND REPLACED WITH NEW (EXISTING BACKBOXES, CONDUIT AND WIRING TO REMAIN)
OS	CORNER MOUNTED OCCUPANCY SENSOR. MOUNT TIGHT TO CEILING. SET TO AUTO-ON, AUTO-OFF MODE.	RR	EXISTING TO BE RELOCATED IN SAME LOCATION ON NEW SURFACE
VS	CORNER MOUNTED VACANCY SENSOR. MOUNT TIGHT TO CEILING. SET TO MANUAL-ON, AUTO-OFF MODE.	RTU SE SPEC SWBD	ROOFTOP UNIT SECONDARY ELECTRICAL SERVICE
xx •	WALL MOUNTED COMBINATION HORN / STROBE LIGHT WITH A MULTI-CANDELA STROBE. MOUNT AT 6'-8" AFF. WG= PROVIDE WITH WIREGUARD. "XX"=CANDELA RATING	SPD TELE TV T/TX	SPECIFICATION SWITCHBOARD SURGE PROTECTION DEVICE TELECOMMUNICATIONS/TELEPHONE
I XX	WALL MOUNTED STROBE-ONLY UNIT WITH A MULTI-CANDELA STROBE. MOUNT AT 6'-8" AFF. WG= PROVIDE WITH WIREGUARD. "XX"=CANDELA RATING	TYP UH UON	TELEVISION TRANSFORMER TYPICAL
F	WALL MOUNTED FIRE ALARM MANUAL PULL STATION. MOUNT AT 48" AFF. PROVIDE WITH MANUAL STATION GUARD, STI "STOPPER II" OR EQUAL WHERE REQUIRED.	V VA VAC VIF	UNIT HEATER UNLESS OTHERWISE NOTED VOLTS VOLT AMPERE

<u>GE</u>	<u>NERAL NOTES:</u>
1.	DISCONNECT SWITCHES SHALL BE HEAVY
	LOCATION UNLESS OTHERWISE NOTED.
2.	OVERCURRENT PROTECTION DEVICES (0)
	NOTED WITH AN "F" FOR FUSE
3.	DISCONNECT SWITCHES AND STARTERS S
4	REFER TO ELECTRICAL AND MECHANICAL
••	
5.	STARTERS SHALL BE SQUARE D CLASS 85

VERIFY IN FIELD

WEATHERPROOF

WATT OR WIRE

WASHER

WA

WG WP

VOLTS ALTERNATING CURRENT

PLUMBING GEN	ERAL NOTES		PLUMBING PIPING LE	GEND	
GENERAL		SYMBOL		DESCRIPTIO	Ń
1. GENERAL NOTES, SYMBOLS AND DETAILS ARE A DIVISION 22.	APPLICABLE TO ALL DRAWINGS WITHIN		← COLD WATER)	
2. DRAWINGS ARE DIAGRAMMATIC AND ARE INTEN APPROXIMATE LOCATION AND GENERAL ARRAN		SAN-	SANITARY DRAIN/W	ASTE ABOVE	
SYSTEMS AND COMPONENTS IN FIELD.3. REFER TO SPECIFICATIONS FOR ADDITIONAL REPORT	EQUIREMENTS.		→ → → SANITARY DRAIN/W	ASTE BELOW	FLOOR
4. PROVIDE INFORMATION AND HARDWARE AS NE AND STEEL PLATFORMS REQUIRED FOR PLUMB		CO2-	CO2 PIPING		
5. COORDINATE AND WALL PENETRATIONS WITH V FLASHING REQUIREMENTS. COORDINATE SLAB		→ → →			0
SECTIONS. 6. RUN PIPING CONCEALED, UNLESS SPECIFIED O	THERWISE, AND CLEAR OF CEILING INSERTS.	÷	PIPE TEE TOWARD PIPE TEE AWAY (DO	•	
7. COORDINATE WORK OF THIS SECTION WITH TH TRADES INVOLVED. PROVIDE OFFSETS IN PIPIN	AT OF OTHER SECTIONS AND WITH ALL	→ →			
8. NOT ALL ACCESS DOORS HAVE BEEN SHOWN C	ON THE PLANS FOR CLARITY. PROVIDE ACCESS		PIPE TRAP		
PANELS THROUGH BUILDING ASSEMBLIES TO S SUCH EQUIPMENT IS INSTALLED IN EXPOSED LO COORDINATE THE LOCATION OF ACCESS DOOR	OCATIONS OR ABOVE LAY-IN CEILINGS. AND PANELS AND VERIFY THE EXACT		DIRT LEG		
QUANTITY, SIZE, AND LOCATIONS AFTER THE S HAVE BEEN INSTALLED AND PRIOR TO THE CLO BUILDING ASSEMBLIES. OBTAIN APPROVAL FOR	SURE OF THE AFFECTED CEILINGS AND	<u>ل</u> ب ب ب ب ب ب ب ب ب ب ب ب ب ب ب ب ب ب ب	CO CLEANOUT		
AT SUBSTANTIAL COMPLETION, THE FOLLOWIN AND REASONABLY ACCESSIBLE: CONTROL BOX	G ITEMS, NEW OR EXISTING, SHALL BE FULLY		UNION OR FLANGE		
BOXES, ELECTRICAL PANELS, CLEAN OUTS, DIS EQUIPMENT REQUIRING MAINTENANCE. "FULLY	CONNECT SWITCHES AND ELEMENTS OF AND REASONABLY ACCESSIBLE" SHALL BE		BLIND FLANGE END CAP		
DEFINED AS NATIONAL ELECTRIC CODE REQUIR AND CAPABLE OF BEING ACCESSED OR SERVIC DISTORTING OTHER COMPONENTS OF THE WO	ED WITHOUT REMOVING, MODIFYING OR		REDUCER (ECCENT	TRIC)	
RECOMMENDED CLEARANCE FOR ALL EQUIPME . VERIFY ALL EQUIPMENT CONNECTIONS WITH M				√TRIC)	
VERIFY AND PROVIDE FITTINGS TO TRANSITION AND COORDINATE ALL DIMENSIONS BEFORE FA	TO FURNISHED EQUIPMENT. FIELD VERIFY				
 IN COMPLIANCE WITH THE FEDERAL SAFE WATI SHALL NOT PROVIDE ANY COMPONENTS IN THE MORE THAN 0.25% LEAD ON ANY WETTED PART 	DOMESTIC WATER SYSTEM THAT CONTAIN	PLUME	BING VALVE AND SYM	BOL LE(GEND
LEAD FREE EQUIVALENT OF ANY EQUIPMENT SI THAT ALL PLUMBING PRODUCTS PROVIDED MEI	PECIFIED AND PROVIDE A LETTER CERTIFYING	SYMBOL	DESCRI	PTION	
2. ALL PLUMBING WORK SHALL BE DONE IN ACCOUNT FUEL GAS CODE. THE CONTRACTOR SHALL CO		, — ₁δ,—,	BALL VALVE		
PLUMBING INSPECTIONS. B. IN THE EVENT THAT THERE ARE DISCREPANCIE	S BETWEEN PIPE SIZES SHOWN ON THE	╧┷┷┙	CHECK VALVE		
PLANS, DETAILS AND DIAGRAMS, THE LARGER F			SOLENOID VALVE		
ING SYSTEM SPECIFIC NOTES: PROVIDE ESCUTCHEONS AT EXPOSED PIPE PEI	NETRATIONS OF CEILINGS AND WALLS	ب ـــــې	PRESSURE GAUGE		
TOPS OF FLOOR DRAINS SHALL BE FLUSH WITH	I FINISHED FLOOR.	, P ,	THERMOMETER		
PROVIDE SHUT-OFF VALVES ON ALL BRANCH PI FIXTURES AND EQUIPMENT.		HALL AND	DOUBLE CHECK VALVE ASSEMBLY		
SUPPORT PIPING FROM STRUCTURE. PROVIDE NCHORS AND GUIDES AS NECESSARY TO PRE		Harring H	REDUCED PRESSURE BACKFLOW		
PROVIDE DRAIN WITH BALL VALVE, HOSE END V DOMESTIC WATER LOW POINTS AND PITCH PIP			PREVENTER ASSEMBLY AND DRAIN	1	
PROVIDE ACCESSIBLE CLEANOUTS AT THE BAS		Ĥ			
ALL PLUMBING PIPING AND DRAINS SHALL BE PI CLEAR OF BLOCKAGE DURING CONSTRUCTION.		I	WATER HAMMER ARRESTOR		
PROVIDE DIELECTRIC FITTINGS WHEN JOINING	PIPES OF DISSIMILAR METALS.	<u>ج</u>	ADA ACCESSIBLE FIXTURE		
PROVIDE FIRE STOPPING AND SMOKE BARRIER FIRE WALLS OR SMOKE BARRIERS INCLUDING E					
CONTAINING CABLES, PIPES, DUCTS, CONDUITS ARCHITECTURAL FLOOR PLANS AND CODE SHE SPECIFICATIONS FOR ADDITIONAL REQUIREMENT	S AND OTHER PENETRATING ITEMS. REFER TO ETS FOR WALL RATINGS. REFER TO		SPRINKLER SYSTEM		 }
SPECIFICATIONS FOR ADDITIONAL REQUIREMEN	vi3.	1. THESE GE	NERAL NOTES ARE APPLICABLE TO ALL		CTION DRAWINGS.
	ON SYMBOL LEGEND				
SYMBOL			S ARE DIAGRAMMATIC AND SHOW THE RISERS, AND SPECIFICATIONS FOR ADD		
FP-WET			VINGS INDICATE A SUGGESTED SPRINKI OVERED BY SPRINKLER PROTECTION A		
	SPRINKLER MAIN (WET)	STATE OF BE COUNT	MA BUILDING AND FIRE CODES. THE SF FED. AS A TAKE OFF OR AS EXACT LOCA	PRINKLER QUA	ANTITIES SHALL NOT T SPACING, DENSITY
		4. THE CONT	TION REQUIREMENTS SHALL BE AS DIC	T TO VERIFY F	PRESSURE
	90° ELBOW DOWN 90° ELBOW UP	AVAILABLI	E AT THE SITE. INFORMATION FROM THE USED FOR HYDRAULIC CALCULATIONS.	E CONTRACTO	-
	TEE UP TEE DOWN		RACTOR SHALL VERIFY ALL EXISTING C		
	DROP AND RUN	ANY NEW EXISTING	WORK STARTS, THE CONTRACTOR SHA OUTLETS ARE A MINIMUM OF ONE INCH	ALL DETERMIN	IE THAT ALL RMINED
	JNION	WORK SH	EXISTING OUTLET SIZE IS LESS THAN O ALL STOP AND IT SHALL BE BROUGHT T N. THE CONTRACTOR SHALL NOT PROO	O THE ARCH/E	ENGINEERS
, , , , , , , , , , , , , , , , , , ,		DIRECTIO	N IS GIVEN BY THE ARCH/ENGINEER.		
	CHECK VALVE		D INSIDE AND OUTSIDE HOSE STREAM A FIONS SHALL BE 250 GPM.	LLUVVANCE F	υς πισκαυμίς
	RELIEF VALVE	7. HYDRAULI 10%.	IC CALCULATIONS SHALL INCLUDE A SA	FETY FACTOR	OF
	DOUBLE CHECK VALVE ASSEMBLY	8. PIPE VELC 18FPS.	OCITY AT ANY POINT OF THE SYSTEM SH	HALL NOT EXC	EED
±₿ F	PRESSURE GAUGE		TION OF SPRINKLERS SHALL BE BASED	ON THE FOLL	OWING:
F	PRESSURE REDUCING VALVE	AREA	OCCUPANCY CLASSIFICATION	DENSITY (GPM/SF)	AREA OF APPLICATION (SF)
	CONNECT NEW TO EXISTING	FLOWER, MOM/V ROOMS, DRY	EG	(GPM/SF) 0.15	1500
		ROOMS			1000
	LOW SWITCH	CORRIDOR, LOCKER ROOM	S LIGHT HAZARD	0.10	1500
	TAMPER SWITCH				
	PRESSURE SWITCH		R PIPE SIZE SCHEDUL	_E	L
ATS	AUTOMATIC TRANSFER SWITCH	NO. OF SPRINKLEF HEADS	PIPE SIZE		NOTES:
L		1-2	1"		1. LIGHT FIXTURE ACCEPTABLE F
SPRINKLER	SYMBOL LEGEND	3	1 1/4"		FIXTURE APPR REQUIREMENT EQUAL FIXTUR
SYMBOL	DESCRIPTION	4-5	1 1/2"		A. BE THE SA SHADING. B. BE OF EQU
	CONCEALED PENDANT SPRINKLER				C. BE SUPPL D. PROVIDE E. HAVE THE
L		6 -10	2"		QUALIFICA 2. ALL FIXTURES
		ACTUAL PIPE SIZES	N ARE BASED ON PIPING LAYOUTS ONLY S SHALL BE DETERMINED BY		 ALL NECESSAF JOINERS, ETC. REFER TO ARC
		CONTRACTORS HY CONTRACOTORS II	DRAULIC COLCULATION BASED ON THE NSTALLATION DRAWINGS. CONTRACTOR THIS AND INCLUDE THIS IN THE		SUSPENSION L ARCHITECT. 5. FIXTURES SHA
		CONTRACT PRICE			SHALL BE SUP CEILINGS AND SUPPORTS.
	DRY TYPE TRANSFORME	R SCHEDULE			 6. WIRE EMERGE 7. MINIMUM MOU
					MOUNTING HE DUCTWORK, P WHERE REQU
SIZE KVA AMPS AMPS OVERC	URRENT (NOTE 4) 480 VOLT FEEDE		(NOTE 5) (NOTE 6)		 REFER TO SPE WHERE EXIT S SIGN IS NO MC
	A, 3P 150A, 3P 3#3 & 1#8G - 1 1/4"C	4#1/0 - 2"C	1#6 - 3/4"C 1#6	_ └-	
	IDARY TO THE TRANSFORMER GROUND BAR AND C				
 USE NEAREST AVAILABLE EFFECTIVELY 250-83 FOR THE SEPARATELY DERIVED ALL CONDUCTOR SIZES ARE FOR COPP 	(GROUNDED WATER PIPE, STRUCTURAL STEEL AN SYSTEM GROUNDING ELECTRODE. ER CONDUCTORS. N.E.C. TABLE 310.15(B)(16).	D/OR DRIVEN GROUND ROD I	N ACCORDANCE WITH N.E.C. 250-81 ANI)	. EXIT SIGNS AND E
4. SECONDARY OVERCURRENT PROTECT (MAIN BREAKER), AN INDIVIDUALLY MOU	IN SHALL BE LOCATED WITH IN (10) FEET OF THE JNTED CIRCUIT BREAKER, OR A FUSIBLE DISCONNE TO BE RUN FROM GROUND BAR IN TRANSFORMER	CT SWITCH.		2.	BRANCH CIRCUIT, REFER TO DETAIL
SYSTEM. 6. SYSTEM BONDING JUMPER/SUPPLY SID	E BONDING JUMPER TO BE INSTALLED BETWEEN T	HE TRANSFORMER GROUND	BAR AND CASE AND BETWEEN THE		
	DE DISCONNECTING MEANS (PANELBOARD, ENCLOS MULTIPLE SUPPLY SIDE BONDING JUMPERS OF TH				
					. RECEPTACLES LC
MOTOR / EQUIPMENT C	IRCUIT INSTALLATION NOTE	ES			. ELECTRICAL CON COMMUNICATION
	REMARKS:				. 15A AND 20A, 120 LISTED TAMPER-F
ND SHALL BE LOCATED AT EQUIPMENT	1. FOR EQUIPMENT LOCATED OUTSIDE E		ALL RUN UNDER SLAB FROM PANEL		

VICES (OCPD) SHALL BE MOLDED CASE CIRCUIT BREAKERS UNLESS
ARTERS SHALL BE NEMA 3R RATED WHEN LOCATED OUTSIDE. HANICAL PLANS FOR EXACT LOCATIONS OF EQUIPMENT.
CLASS 8536 OR APPROVED FOUAL

TO UNIT LOCATION. COORDINATE EXACT STUB-UP LOCATION IN FIELD WITH HVAC CONTRACTOR PRIOR TO ROUGH-IN. FOR PUMP ASSEMBLIES, PROVIDE POWER WIRING TO CONTROL PANEL AND FROM CONTROL PANEL TO ALL PUMPS ON PUMP ASSEMBLY.

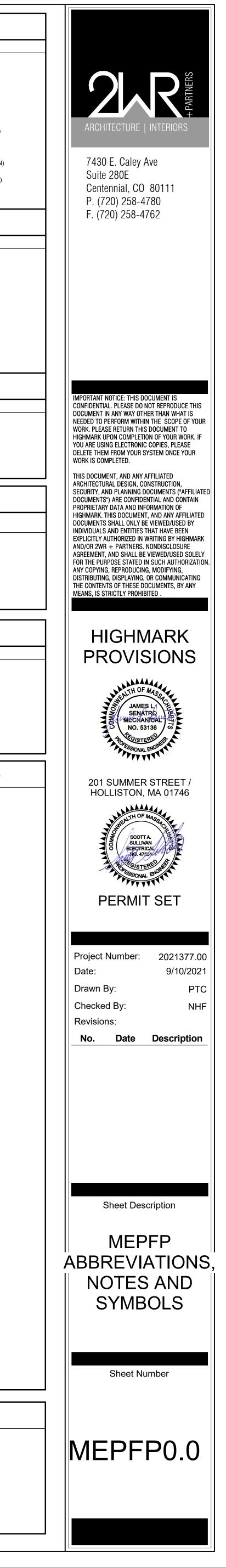
MECHANICAL GENERAL NOTES DUCTWORK LEGEND SYMBOL DESCRIPTION <u>GENERAL</u> GENERAL NOTES, SYMBOLS AND DETAILS ARE APPLICABLE TO ALL DRAWINGS WITHIN **1**2x6 RECTANGULAR DUCTWORK DIVISION 23. 12"ø ROUND DUCTWORK DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE CAPACITY, SIZE, APPROXIMATE LOCATION AND GENERAL ARRANGEMENT. DETERMINE EXACT LOCATIONS OF SUPPLY DUCTWORK TOWARDS (UP IN PLAN) SYSTEMS AND COMPONENTS IN FIELD. X COORDINATE ROOF AND WALL PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH RECTANGULAR SUPPLY DUCTWORK AWAY (DOWN IN PLAN) FLASHING REQUIREMENTS. COORDINATE SLAB PENETRATIONS WITH WORK OF OTHER SECTIONS RECTANGULAR RETURN DUCTWORK TOWARDS (UP IN PLAN) RUN DUCTS AND PIPING CONCEALED, UNLESS SPECIFIED OTHERWISE OR AS APPROVED BY THE ARCHITECT RECTANGULAR RETURN DUCTWORK AWAY (DOWN IN PLAN) INSTALL SENSORS (TEMPERATURE, HUMIDITY, CO2, THERMOSTATS) AT LOCATIONS SHOWN RECTANGULAR EXHAUST DUCTWORK TOWARDS (UP IN PLAN) ON PLANS OR AS DIRECTED BY ARCHITECT. MOUNTING HEIGHT AFF SHALL COMPLY WITH ADA AND SHALL BE MOUNTED LEVEL WITH ADJACENT SWITCHES (IE LIGHT SWITCHES). X RECTANGULAR EXHAUST DUCTWORK AWAY (DOWN IN PLAN) COORDINATE WORK OF THIS SECTION WITH THAT OF OTHER SECTIONS AND WITH ALL TRADES INVOLVED. PROVIDE OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) CAPPED DUCT AND TRANSITIONS AROUND OBSTRUCTIONS. SUPPORT EQUIPMENT, PIPING AND DUCTWORK FROM BUILDING STRUCTURE OR WITH STEEL AIR DEVICE LEGEND SUPPORTS AND PLATFORMS AS REQUIRED. PROVIDE VIBRATION ISOLATION FOR ROTATING EQUIPMENT, DUCTWORK AND PIPING IN ACCORDANCE WITH THE SPECIFICATIONS. CONTROL WIRING METHODS SHALL COMPLY WITH NEC, AND DIVISION 26 SPECIFICATIONS. SYMBOL DESCRIPTION VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S DRAWINGS. VERIFY AND PROVIDE FITTINGS TO TRANSITION TO FURNISHED EQUIPMENT. FIELD VERIFY AND SUPPLY DIFFUSER COORDINATE ALL DIMENSIONS BEFORE FABRICATION. RETURN GRILLE OR REGISTER 10. PERFORM PRESSURE AND LEAKAGE TESTS BEFORE INSULATING DUCTWORK AND PIPING COORDINATE AND PROVIDE HOUSEKEEPING PADS FOR FLOOR-MOUNTED MECHANICAL X EXHAUST GRILLE OR REGISTER EQUIPMENT, HOUSEKEEPING PADS SHALL BE REINFORCED CONCRETE WITH 1" CHAMFERED EDGES. 4" THICK. WITH MINIMUM CLEARANCE OF 6" FROM EQUIPMENT BASE TO EDGE OF PAD. INCREASE DEPTH WHERE REQUIRED FOR PROPER INSTALLATION OF EQUIPMENT, SIDEWALL SUPPLY GRILLE INCLUDING BUT NOT LIMITED TO CONDENSING BOILERS (TO ALLOW PROPER INSTALLATION OF NEUTRALIZATION EQUIPMENT AND GRAVITY DISCHARGE TO FLOOR DRAIN OR SIDEWALL RETURN OR EXHAUST GRILLE OR REGISTER CONDENSATE PUMP) AND AHU (TO ALLOW INSTALLATION OF CONDENSATE TRAP). AIR SYSTEM SPECIFIC NOTES: AIR DEVICE TAG (TAG NO. (AIRFLOW)) XX-# (###) REFER TO SPECIFICATIONS FOR DUCTWORK CONSTRUCTION CLASSES, SEAL, AND I FAKAGE CLASSES DAMPER LEGEND PROVIDE FLEXIBLE CONNECTIONS ON ALL DUCTS CONNECTING TO FANS AND AIR HANDLING UNITS UNLESS INTERNALLY ISOLATED. SYMBOL DESCRIPTION ELBOWS IN DUCT SYSTEMS SHALL BE FULL RADIUS (CENTERLINE RADIUS = 1.0 DUCT WIDTH) WHERE SPACE PERMITS. WHERE LIMITED CLEARANCE OCCURS, PROVIDE SHORT RADIUŚ ELBOW WITH FULL LENGTH SPLITTER VANES PER SMACNA, OR MITERED ELBOW WITH TURNING VANES PER SMACNA _____ MANUAL VOLUME DAMPER ------ MD MOTORIZED CONTROL DAMPER W/ACCESS DOOR PIPING SYSTEM SPECIFIC NOTES: PIPE CONDENSATE DRAIN LINES FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, BD BACKDRAFT DAMPER CONNECTED TO BUILDING DRAINAGE SYSTEMS WITH AIR GAP. SIZE DEPTH OF TRAP FOR ASSOCIATED AIR PRESSURE DIFFERENTIAL. PROVIDE HANGERS, CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING EXCEEDING ASME ALLOWABLE STRESS ON CONTROLS LEGEND PIPING MATERIALS. PROVIDE VENTS AT HIGH POINTS IN PIPING SYSTEMS AND DRAIN VALVES AT LOW POINTS. PLAN DESCRIPTION SYMBOL THOUGH SOME ISOLATION VALVES ARE SHOWN ON THE DRAWINGS, IT IS NOT THE INTENT OF THE DRAWINGS TO SHOW ALL ISOLATION VALVES. PROVIDE ISOLATION VALVES AT CONNECTIONS TO EQUIPMENT AND AS REQUIRED BY SPECIFICATIONS AND DETAILS. CARBON DIOXIDE SENSOR FIRESTOPPING NOTES: PROVIDE FIRE STOPPING AND SMOKE BARRIER SEALING OF ALL PENETRATIONS THROUGH Н HUMIDITY SENSOR FIRE OR SMOKE WALLS, BARRIERS AND PARTITIONS AS REQUIRED TO MAINTAIN RATING. REFER TO ARCHITECTURAL FLOOR PLANS AND CODE SHEETS FOR WALL RATINGS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. (T) THERMOSTAT DRAWING SYMBOLS FIRE PROTECTION ABBREVIATIONS SYMBOL DESCRIPTION ABOVE FINISHED FLOOR AFF AUTOMATIC TRANSFER SWITCH CONNECT TO EXISTING DOUBLE CHECK VALVE EXTENDED COVERAGE) OR (KEYNOTE TAG ELEVATION FIRE ALARM HAT EACH FIRE ALARM CONTROL PANEL FACP EQUIPMENT TAG <u>XXX-#</u> FIRE DEPARTMENT FIRE DEPARTMENT CONNECTION ALL NOT EXISTING LINETYPE DENSITY, FIRE HOSE VALVE FIRE PROTECTION NEW WORK LINETYPE FEET PER MINUTE FLOW SWITCH GALLONS PER HOUR GPH GALLONS PER MINUTE GPM TOTAL DEVELOPED HEAD MECHANICAL GENERAL ABBREVIATIONS HIGH TEMPERATURE CLASSIFICATION INTERMEDIATE TEMPERATURE CLASSIFICATION NORMALLY CLOSED AFF ABOVE FINISHED FLOOR NORMALLY OPEN NTS NOT TO SCALE ALT ALTERNATE AUTHORITY HAVING JURISDICTION OS&Y OUTSIDE STEM AND YOKE AHJ AP ACCESS PANEL PREACTION PRESSURE DROP APD AIR PRESSURE DROP BHP BREAK HORSEPOWER PRESSURE INDICATOR VALVE BTU BRITISH THERMAL UNI PRESSURE REDUCING VALVE BTUH BTU / HOUR PRESSURE SWITCH BOD BOP BOTTOM OF DUCT POUNDS PER SQUARE INCH REDUCED PRESSURE BACKFLOW PREVENTER BOTTOM OF PIPE RPBP **REVOLUTIONS PER MINUTE** CAP COP CAPACITY RPM SUPERVISORY SWITCH COEFFICIENT OF PERFORMANCE TAMPER SWITCH CFM CUBIC FEET PER MINUTE CUFT CUBIC FEET TYP TYPICAL VOLTS DECIBELS dB VELOCITY DRY BULB TEMPERATUR VEL DB DIRECT DIGITAL CONTROL WG WIRE GUARD DDC DIAMETER DOWN DN EXHAUST AIR ENTERING AIR TEMPERATURE (DRY BULB) EDB ENTERING DRY BULB ION (SF) EER ENERGY EFFICIENCY RATIO ELEC ELECTRICAL EXTERNAL STATIC PRESSURE ESP EXISTING TO REMAIN ETR EWB EWT ENTERING WET BULB ENTERING WATER TEMPERATURE DEGREES FAHRENHEIT FT WG FEET WATER GAUGE FI A FULL LOAD AMPS FPM FEET PER MINUTE GPH GPM GRD GALLONS PER HOUF LIGHTING FIXTURE INSTALLATION NOTES GALLONS PER MINUTE GRILLE, REGISTER, DIFFUSER HD HEAD HP HORSEPOWER HSPF HEATING SEASON PERFORMANCE FACTOR H7 HFRT7 IXTURES LISTED SHALL BE CONSIDERED BASIS OF DESIGN. EQUAL FIXTURE SUBSTITUTIONS ARE TABLE FOR ALL FIXTURES IN THE LIGHTING FIXTURE SCHEDULE, UNLESS INDICATED OTHERWISE. EQUAL HVAC HEATING, VENTILATION AND AIR CONDITIONING IN INCHES RE APPROVAL SHALL BE AS JUDGED BY THE ENGINEER AND THE ARCHITECT. IN ADDITION TO THE IN WG INCHES WATER GAUGE REMENTS LISTED IN THE LIGHTING FIXTURE SCHEDULE AND IN THE SPECIFICATIONS, THE PROPOSED IPLV INTEGRATED PART LOAD VALUE FIXTURES SHALL: KW KILOWATTS THE SAME GENERAL SIZE, STYLE AND SHAPE, INCLUDING BUT NOT LIMITED TO LENS CONSTRUCTION AND LOUVER LEAVING AIR TEMPERATURE LAT OF EQUAL QUALITY CONSTRUCTION AND FINISH. SUPPLIED WITH ALL REQUIRED ACCESSORIES TO MATCH THE SPECIFIED (BASIS OF DESIGN) FIXTURE. LEAVING DRY BULB LDB LWB I FAVING WET BUI B OVIDE THE SAME DISTRIBUTION, EFFICACY AND SOURCE LUMEN OUTPUT LEAVING WATER TEMPERATURE LWT VE THE SAME LISTINGS AS THE BASIS OF DESIGN FIXTURE, INCLUDING DLC AND ENERGY STAR MAX MAXIMUM UALIFICATIONS. MECH MECHANICAL (TURES SHALL BE UL LISTED. MBH THOUSANDS OF BTU / HOUR CESSARY MOUNTING HARDWARE, HANGERS, BRACKETS, RAILS, YOKES, CANOPIES, STEMS, CHAINS, ROW MCA MINIMUM CIRCUIT AMPACITY S, ETC. SHALL BE FURNISHED AND INSTALLED. MIN NIC NTS OAT MINIMUM TO ARCHITECTURAL DRAWINGS FOR SPECIFIC DETAILS, ARRANGEMENT, MOUNTING HEIGHTS, NOT IN CONTRACT NSION LENGTHS, CEILING CONSTRUCTION, ETC. ALL COLORS AND FINISHES SHALL BE SELECTED BY NOT TO SCALE OUTSIDE AIR TEMPERATURE RES SHALL BE SEISMICALLY SUPPORTED AS REQUIRED BY THE APPLICABLE BUILDING CODE. FIXTURES OD OUTER DIAMETER BE SUPPORTED FROM THE BUILDING STRUCTURE AND SHALL BE INDEPENDENT OF DUCTS, PIPES, OED OPEN ENDED DUCT GS AND THEIR SUPPORTING MEMBERS. FIXTURES SHALL BE SUPPORTED WITH A MINIMUM OF 2 PUMP PHASE EMERGENCY FIXTURES AND EXIT SIGNS AHEAD OF SWITCHED LEGS. PLBG PLUMBING JM MOUNTING HEIGHT OF FIXTURES IN MECHANICAL AND ELECTRICAL SPACES IS 8'-6" AFF. COORDINATE PRV PSIG QTY PRESSURE REDUCING VALVE ING HEIGHT IN FIELD WITH EQUIPMENT IN ROOM SUCH THAT LIGHTING IS NOT OBSTRUCTED BY POUNDS PER SQUARE INCH GAUGE VORK, PIPING AND CONDUIT. PROVIDE NECESSARY CHAIN-MOUNTING HARDWARE TO SUSPEND FIXTURES QUANTITY REQUIRED. RA RFTURN AIR TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. REVOLUTIONS PER MINUTE RPM EXIT SIGNS ARE SHOWN AS WALL MOUNTED ABOVE A DOOR, MOUNT SUCH THAT THE BOTTOM OF THE SA SUPPLY AIR NO MORE THAN 3" ABOVE THE DOOR FRAME, UNLESS INDICATED OTHERWISE ON PLANS. STATIC PRESSURE SPD STATIC PRESSURE DROP SS STAINI ESS STEEL SST SATURATED SUCTION PRESSURE SQFT / SF SQUARE FEET ELECTRICAL LIGHTING NOTES EMP TEMPERATURE TOTAL STATIC PRESSURE TSP TSTAT THERMOSTAT NS AND EMERGENCY BATTERY UNITS SHALL BE WIRED TO LINE SIDE OF LOCAL LIGHTING TYP TYPICAL CIRCUIT, AHEAD OF ALL SWITCHING DEVICES. UNLESS OTHERWISE INDICED UOI DETAILS SHEET FOR TYPICAL LIGHTING CONTROL WIRING SCHEMATICS. W WITH WITHOUT W/O WET BULB WB WATER COLUMN WC WATER GAUGE WG WMS WPD WIRE MESH SCREEN WATER PRESSURE DROP ELECTRICAL POWER NOTES ACLES LOCATED WITHIN 6' FROM WATER SOURCES SHALL BE GFCI TYPE. AL CONTRACTOR SHALL PROVIDE (1) -2" CONDUIT SLEEVE INTO EACH ROOM SHOWN WITH EQUIPMENT ABBREVIATIONS CATIONS DEVICE(S). LOCATE ABOVE CEILING WHERE POSSIBLE. 20A, 120V AND 250V NON-LOCKING TYPE RECEPTACLES MOUNTED BELOW 5'-6" AFF SHALL BE AMPER-RESISTANT TYPE IN ACCORDANCE WITH NEC 406.12. AIR HANDLING UNIT AHU CONDENSATE PUMP CP CONDENSING UNIT ELECTRIC BASEBOARD ELECTRIC UNIT HEATER EUH EWH ELECTRIC WALL HEATER ERV ENERGY RECOVERY VENTILATOR EG EXHAUST GRILLE FAN

HUMIDIFIER LINEAR BAR GRILLE

SUPPLY DIFFUSER SUPPLY GRILLE

PUMP

LB



FLOWER 128, MOM/VEG 127 SCOPE NOTES

. FP - NEW SPRINKLERS. SEE PART PLAN P - NEW WASTE PUMPS. SEE PART PLAN M - NEW HVAC SYSTEMS. SEE PART PLAN E - ALL NEW ELECTRCIAL SYSTEMS. SEE PART PLAN

LOCKER ROOMS 131 & 132 SCOPE NOTES

. 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

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

FP - ETR SYSTEMS P - ETR SYSTEMS M - ETR SYSTEMS

. FP - ETR SYSTEMS

E - NEW RECEPTACLES AND FIRE ALARM DEVICES. SEE PART PLAN

DRY ROOM 119 SCOPE NOTES

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

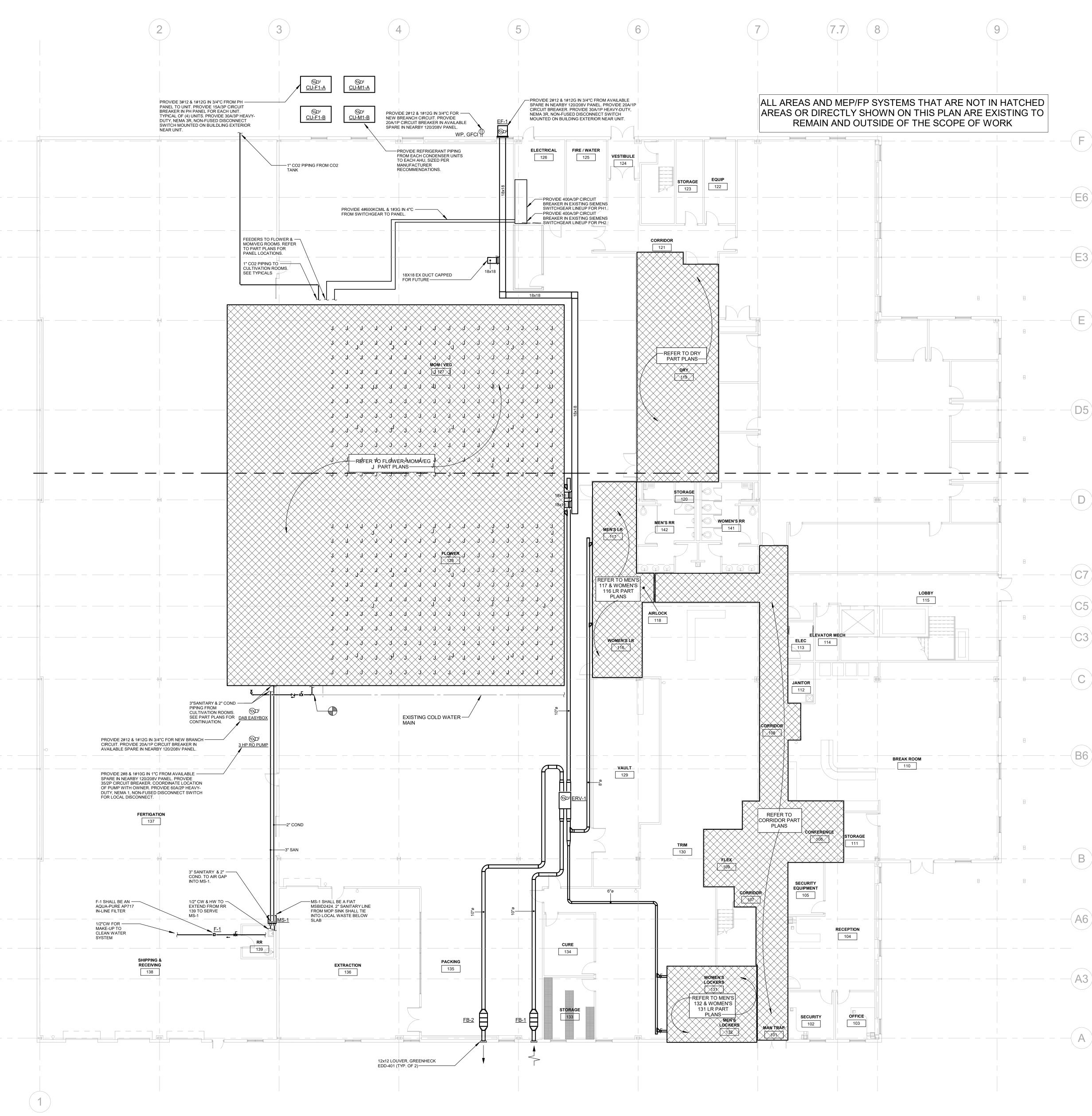
ALL AREAS AND MEP/FP SYSTEMS THAT ARE NOT IN HATCHED AREAS OR DIRECTLY SHOWN ON THIS PLAN ARE EXISTING TO REMAIN AND OUTSIDE OF THE SCOPE OF WORK



(**B5**)

(A5)

(E5)



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



(E3)

(D5)

— (D)

(C7)(C5) (C3)

C

B6

B

(A6)

(A3)

Α

FIRE PROTECTION KEY NOTES

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 $\langle F1 \rangle$ FOR BRANCH PIPE SIZING.

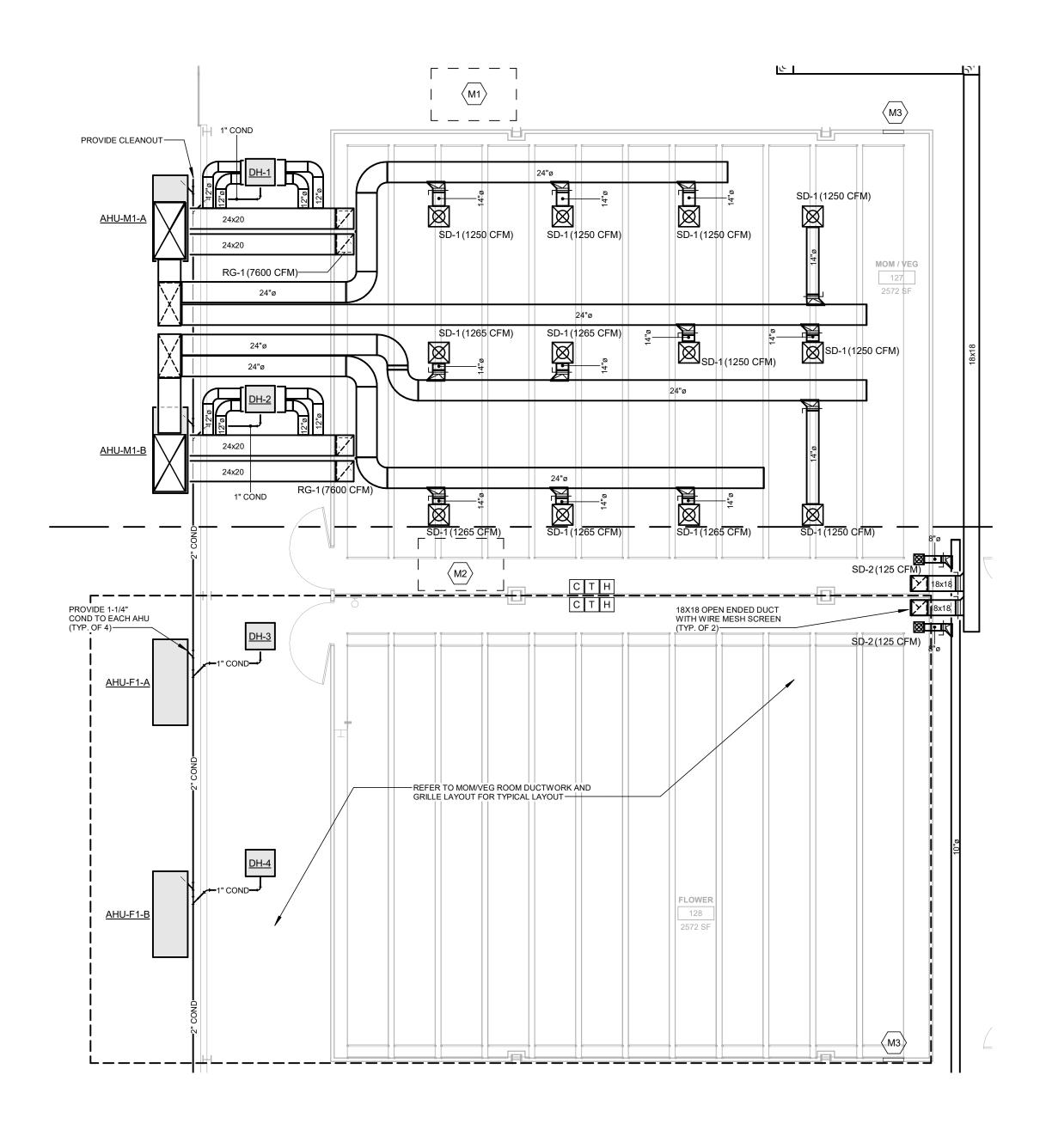
PLUMBING KEY NOTES

 $\langle P1 \rangle$ 1/2" CW LINE TO AHU HUMIDIFIER SERVING CULTIVATION ROOM 1/2 CO2 TO SUPPLY DUCTWORK. PROVIDE SHUTOFF VALVE AND SOLENOID VALVE. $\langle P2 \rangle$ COORDINATE FINAL LOCATION AND TERMINATION POINT OF C02 PIPING WITH OWNER (TYP OF BOTH CULTIVATION ROOMS) SP-1 & SP-2 SHALL BE LIBERTY PUMP P682XLE52. PROVIDE WITH PRO680XL BASIN & PDC-230 **(P3**) DUPLEX CONTROL PACKAGE. WASTE SHALL BE DIRECTED OFF OF THE CULTIVATION TABLE TO A FLEXIBLE HOSE THAT IS DIRECTLY CONNECT TO THE SUMP INLET. $\langle P4 \rangle$ 1" CW. SEE OVERALL PLAN FOR CONTINUATION.

 $\langle P5 \rangle$ 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.
⟨МЗ⟩	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 PROVIDE SURFACE-MOUNT WORK LIGHT FIXTURE, BASIS OF DESIGN GROWLITE GLE-GL, GREEN $\langle E1 \rangle$ LED, 1-10V DIMMING. PROVIDE NEW FIRE ALARM NOTIFICATION APPLIANCE COMPATIBLE WITH EXISTING FIRELITE $\langle E2 \rangle$ ES-200X SYSTEM. INCLUDE MODIFICATION OF EXISTING CIRCUITS, PROVISIONS FOR ADDITIONAL CIRCUITS, UPDATED BATTERY CALCULATION, AND REPROGRAMMING OF SYSTEM TO ACCOMODATE ADDITIONAL DEVICES. (E3) PROVIDE 277/480V, 3P, 4W, 225 MCB, 42-CIRCUIT, NEMA 1 PANELBOARD FOR MOM/VEG ROOM LABELED "PH1". PROVIDE 45 kVA, 480V PRIMARY, 120/208V SECONDARY NEMA TRANSFORMER HUNG FROM $\langle E4 \rangle$ CEILING STRUCTURE. COORDINATE MOUNTING WITH STRUCTURAL ENGINEER. REFER TO TRANSFORMER SCHEDULE. PROVIDE 120/208V, 3P, 4W, 150A MCB, 42-CIRCUIT, NEMA 1 PANELBOARD FOR MOM/VEG AND $\langle E5 \rangle$ FLOWER LABELED "PL1". E6 PROVIDE 277/480V, 3P, 4W, 225A MCB, 42-CIRCUIT, NEMA 1 PANELBOARD FOR FLOWER ROOM LABELED "PH2". PROVIDE LIGHTING CONTROL RELAY PANEL FOR CULTIVATION LIGHTING. REFER TO LIGHTING E CONTROL RELAY DETAIL. BASIS OF DESIGN, HUBBELL NX SERIES. PROVIDE 2#12 & 1#12G IN 3/4"C TO 20A/1P CIRCUIT BREAKER IN PH PANEL. $\langle E8 \rangle$ PROVIDE JUNCTION BOX FOR GROW LIGHT FIXTURES ON CEILING. COORDINATE RECEPTACLE $\langle E9 \rangle$ TYPE AND LOCATION WITH OWNER AND VENDOR. PROVIDE GFI PROTECTION TO CIRCUIT IN COMPLIANCE WITH NEC. PROVIDE 2#12 & 1#12G IN 3/4"C TO 20A/1P CIRCUIT BREAKER IN PH PANEL VIA LIGHTING CONTROL PANEL. (E10) PROVIDE JUNCTION BOX FOR CIRCULATION FAN ON CEILING. COORDINATE LOCATION WITH ARCHITECTURAL PLANS. 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 (E12 CIRCUIT. (E13) PROVIDE 2#12 & 1#12G IN 3/4"C FOR NEW BRANCH CIRCUIT. PROVIDE 20A/1P CIRCUIT BREAKER IN PANEL PL1. 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 E14 SWITCH ON CORRIDOR WALL. PROVIDE 3#10 & 1#10G IN 3/4"C FROM PH PANEL TO UNIT. PROVIDE 30A/2P CIRCUIT BREAKER IN (E15 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.



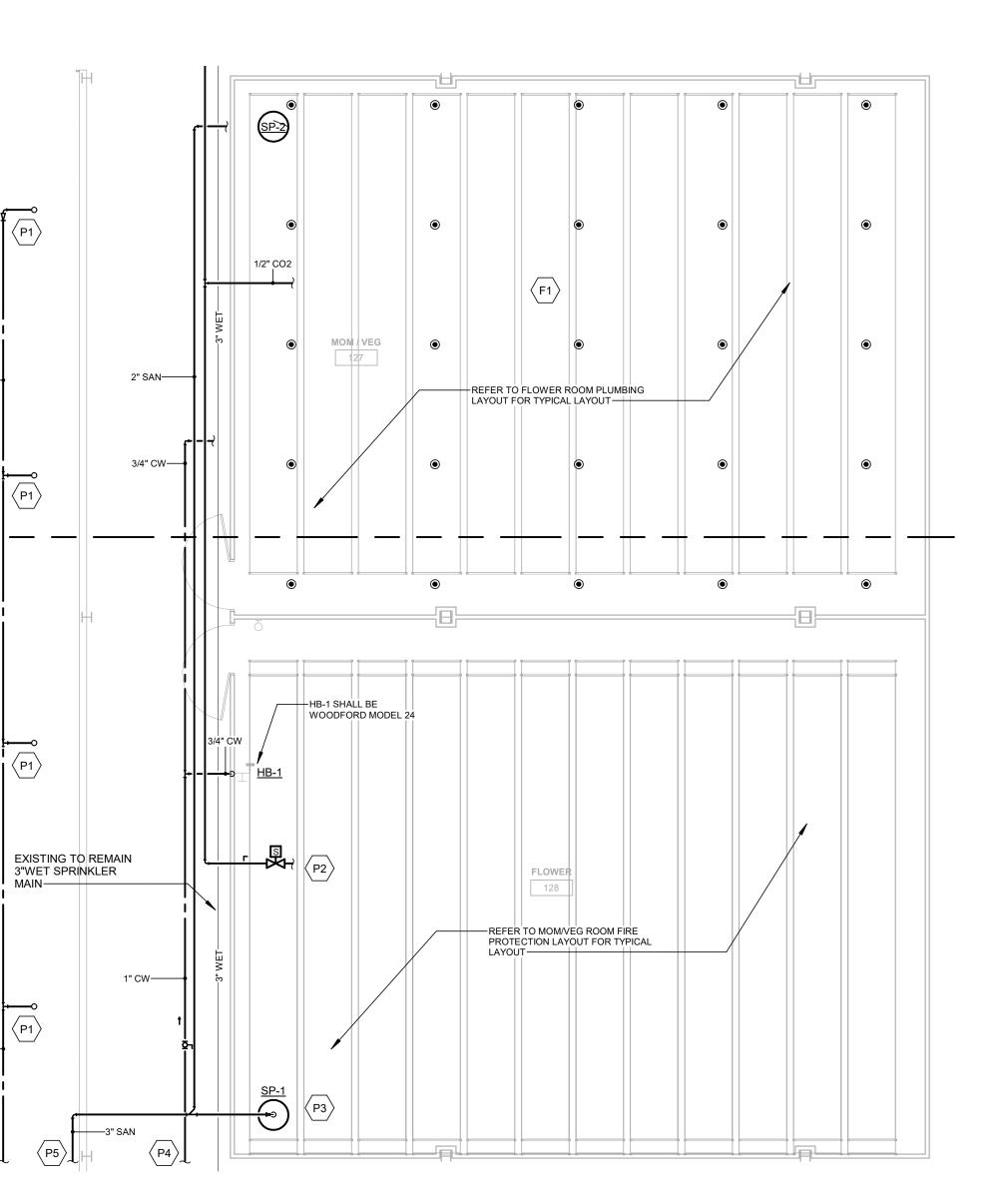


1" CW------

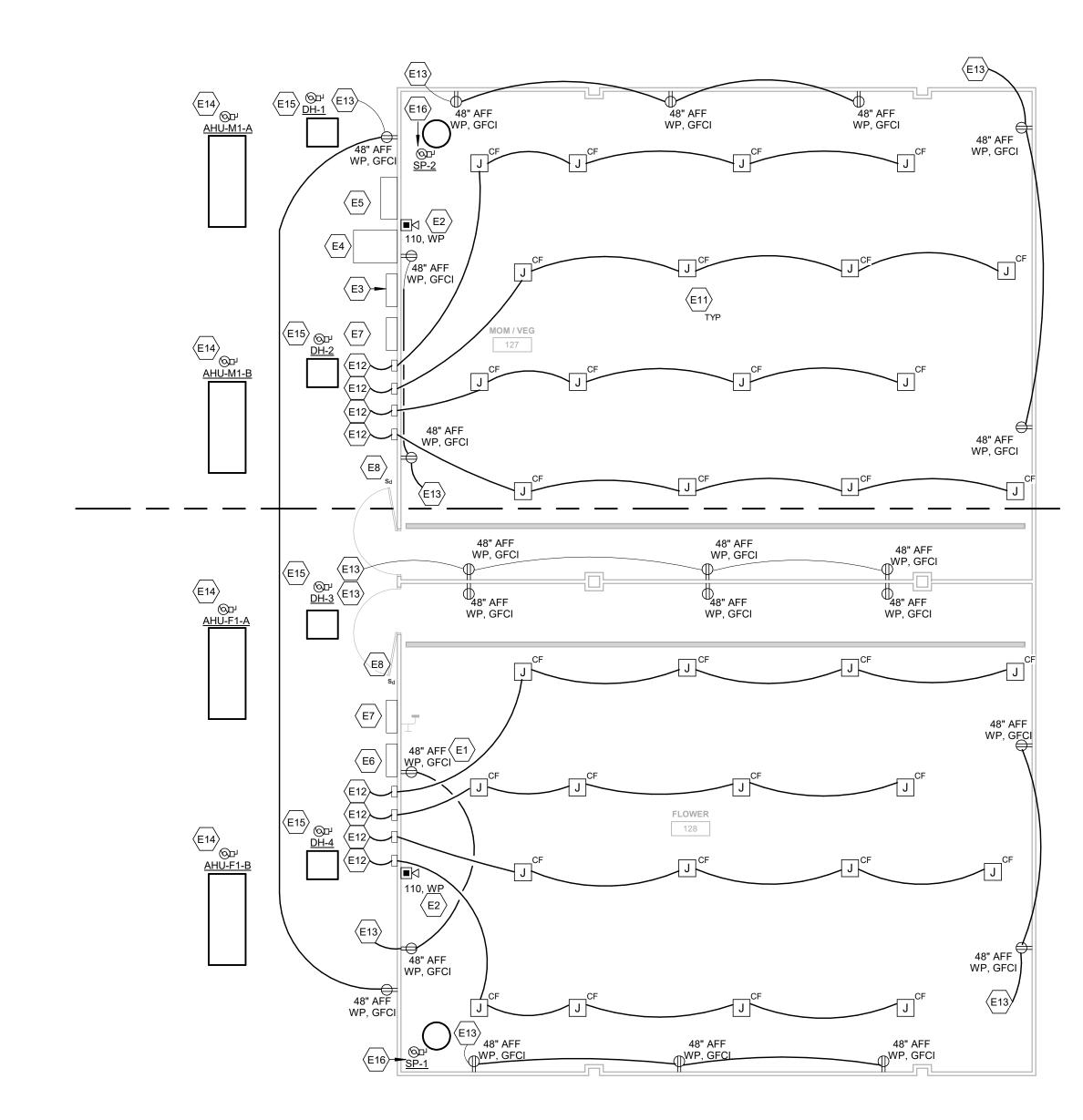
1" CW-----

 $\langle P4 \rangle$

FLOWER & MOM/VEG ROOM MECHANICAL DUCTWORK PART PLAN

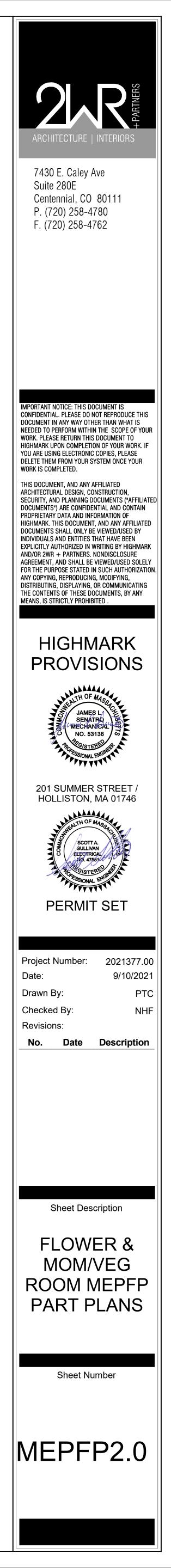


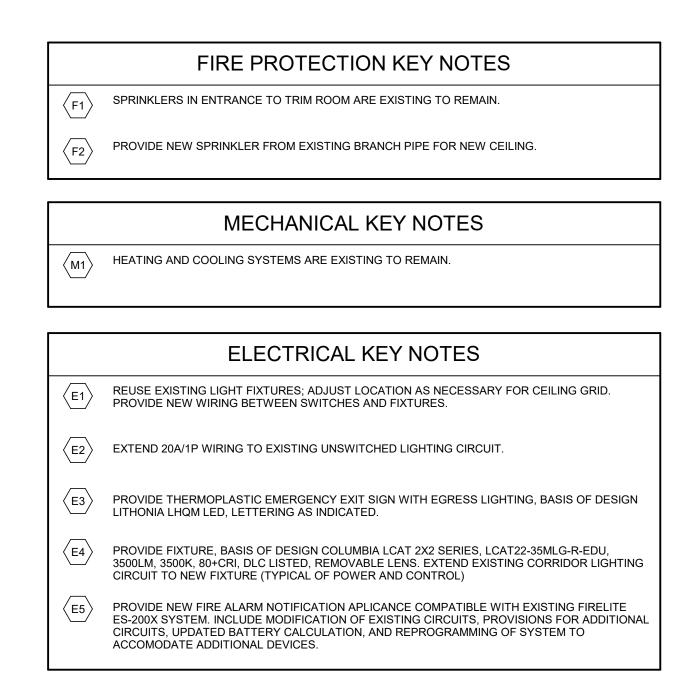
2 FLOWER & MOM/VEG ROOM FIRE PROTECTION & PLUMBING PART PLAN 1/8" = 1'-0"

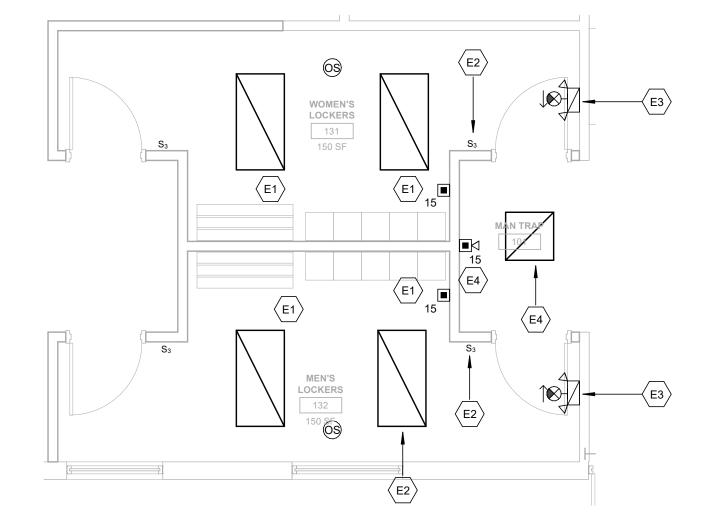


3 FLOWER & MOM/VEG ROOM ELECTRICAL PART PLAN 1/8" = 1'-0"

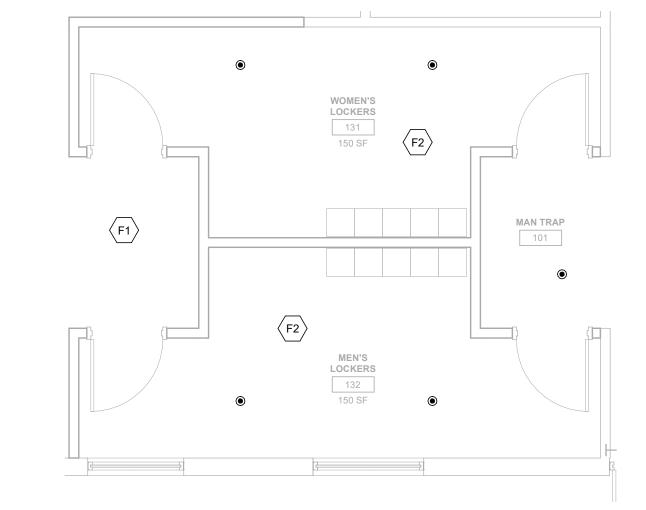
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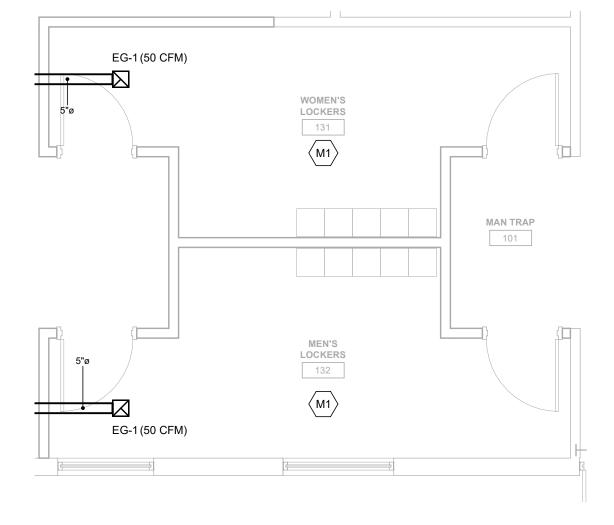


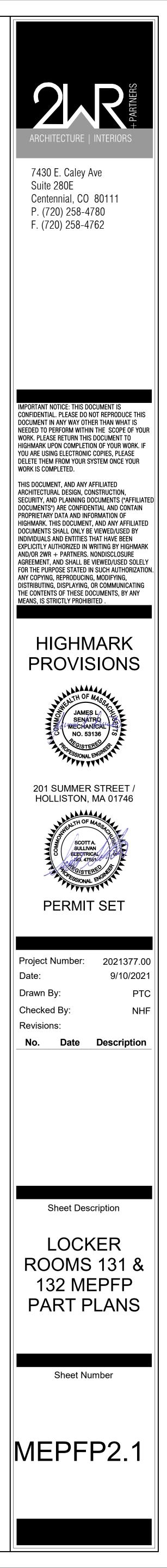


1 LOCKER ROOMS 131 & 132 FIRE PROTECTION PART PLAN 1/4" = 1'-0"









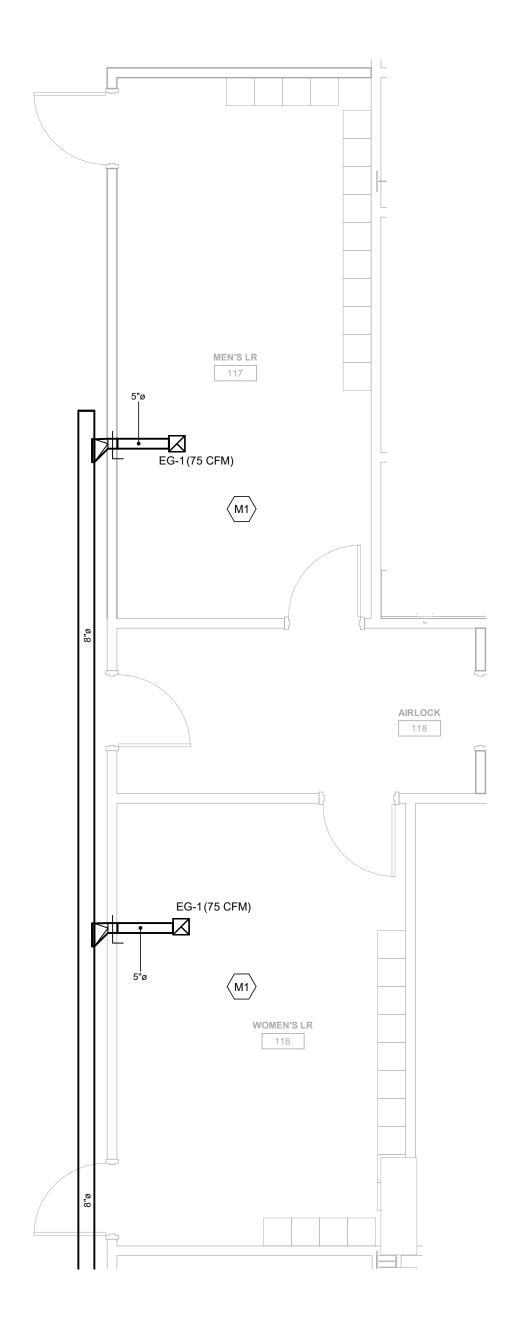
FIRE PROTECTION KEY NOTES

- 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

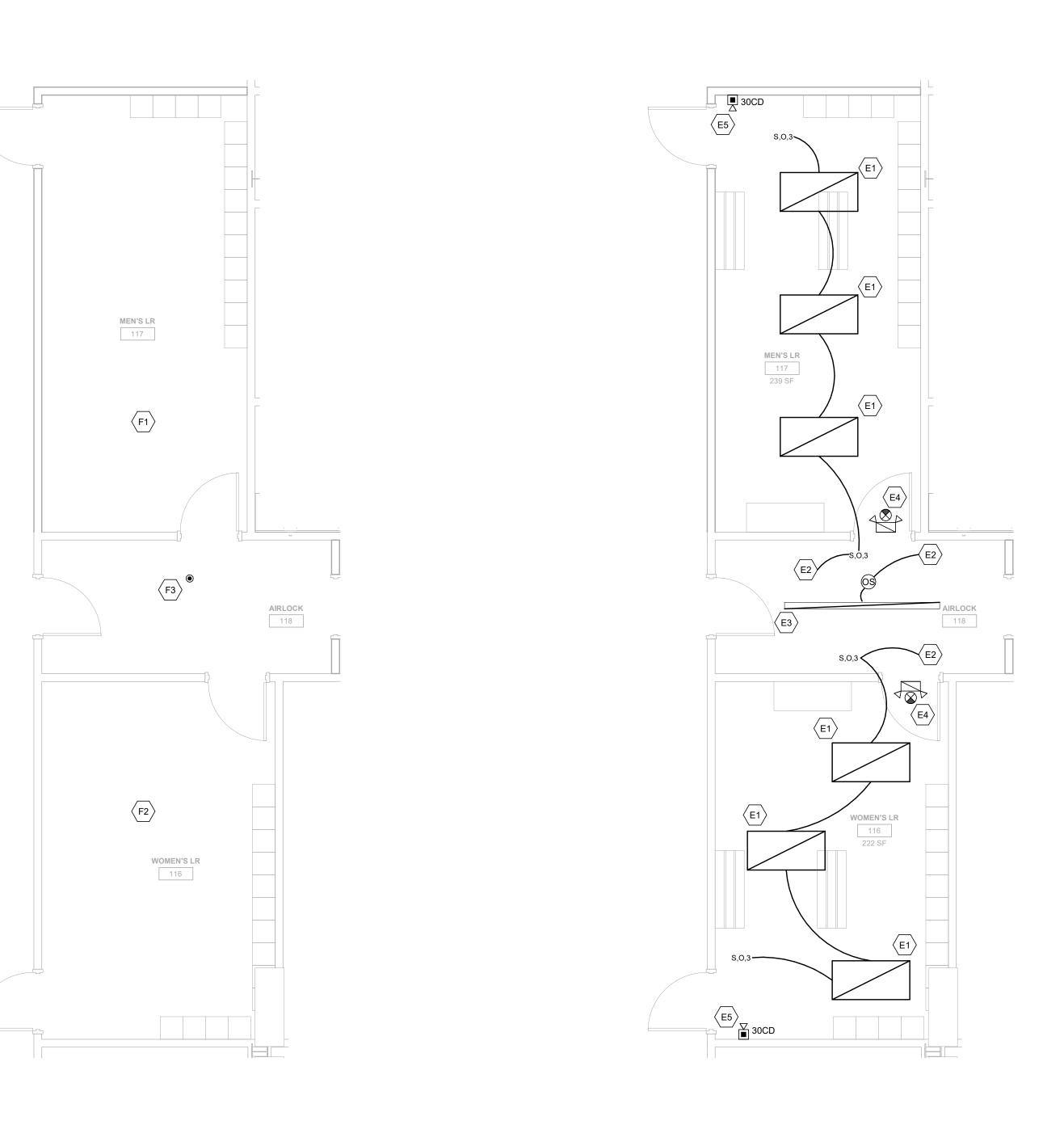
 $\underbrace{\ }_{M1} \qquad \text{EXISTING HEATING AND COOLING SYSTEMS ARE EXISTING TO REMAIN}$

	ELECTRICAL KEY NOTES
(E1)	REUSE EXISTING LIGHT FIXTURES; ADJUST LOCATION AS NECESSERY 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 ADDITIONA CIRCUITS, UPDATE BATTERY CALCULATION, AND REPROGRAMMING OF SYSTEM TO ACCOMODATE ADDITIONAL DEVICES

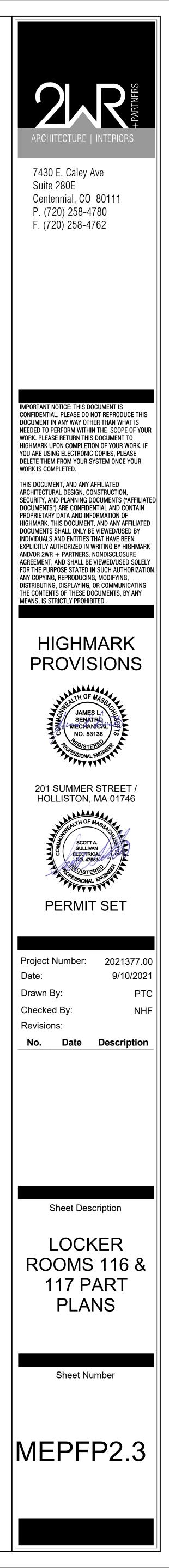


1 LOCKER ROOMS 116 & 117 MECHANICAL DUCTWORK PART PLAN 1/4" = 1'-0"

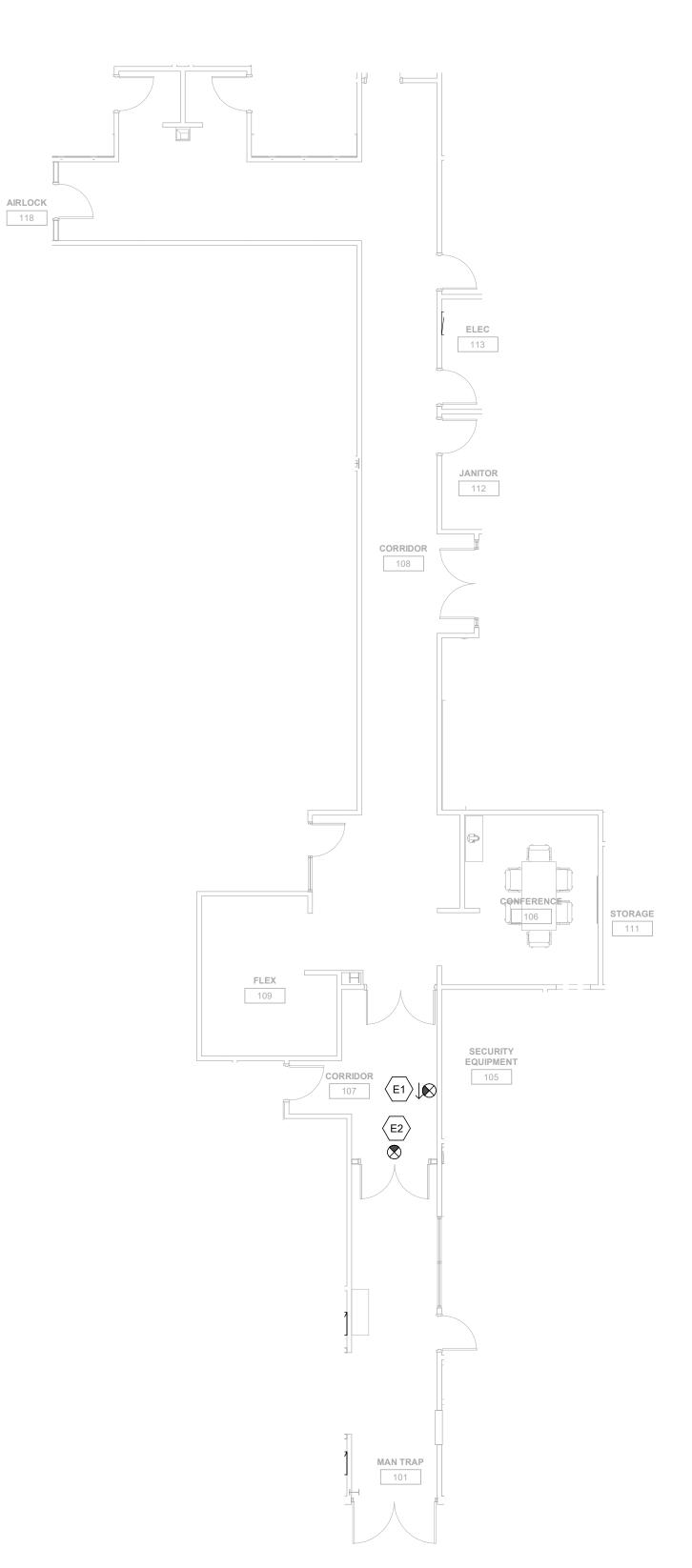
2 LOCKER ROOMS 116 & 117 FIRE PROTECTION PART PLAN 1/4" = 1'-0"



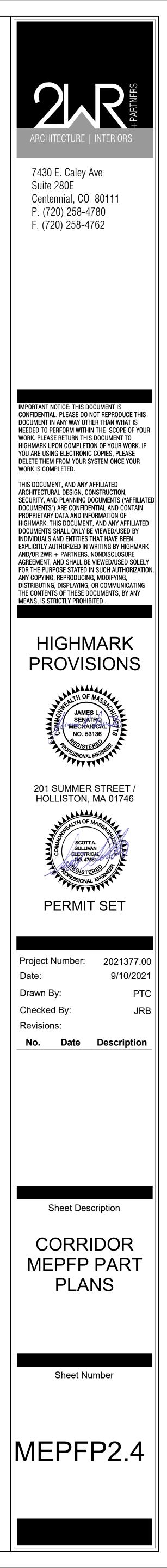
3 LOCKER ROOMS 116 & 117 ELECTRICAL PART PLAN 1/4" = 1'-0"



	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"

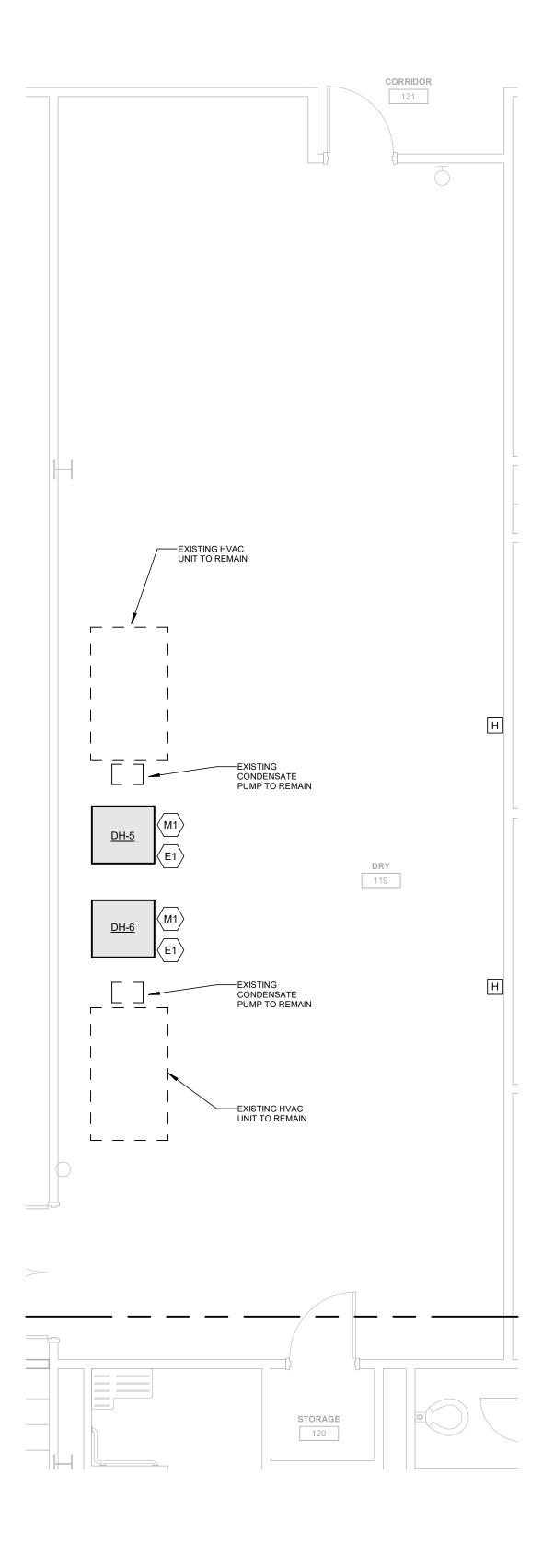


MECHANICAL KEY NOTES

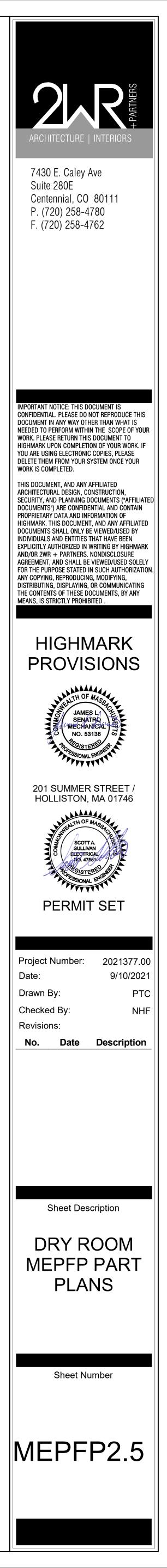
M1 PROVIDE 1" CONDENSATE PIPE FROM DH-5 TO EXISTING CONDENSATE PUMP CURRENTLY SERVING THE EXISTING HVAC UNIT.

ELECTRICAL KEY NOTES

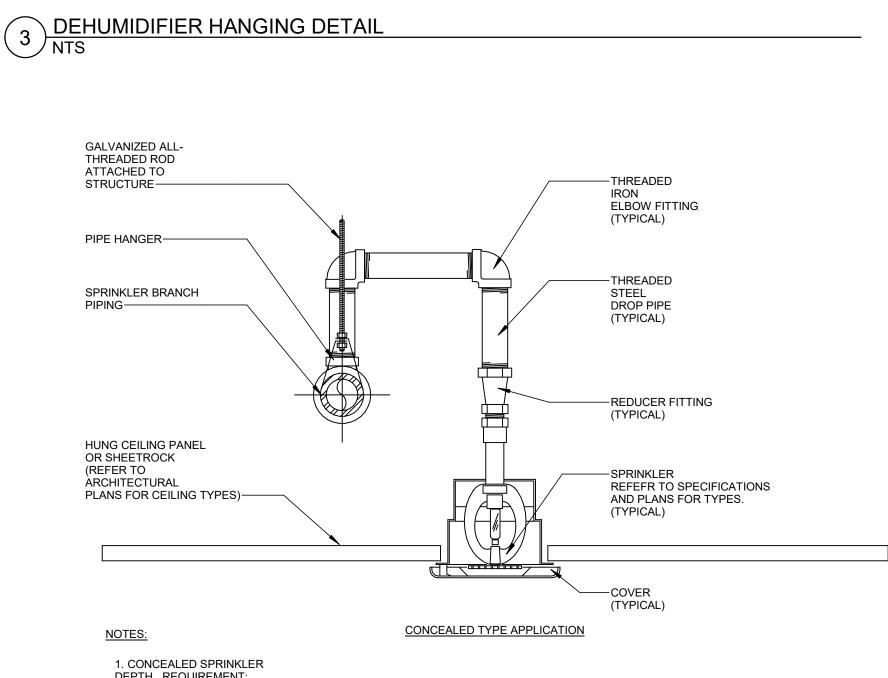
PROVIDE 3#10 & 1#10G IN 3/4"C FROM PH PANEL TO UNIT. PROVIDE 30A/2P CIRCUIT BREAKER IN
PH PANEL FOR EACH UNIT. PROVIDE 30A/2P HEAVY-DUTY, NEMA 1, NON-FUSED DISCONNECT
SWITCH ON CORRIDOR WALL AND L7-30 RECEPTACLE FOR EACH UNIT.



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





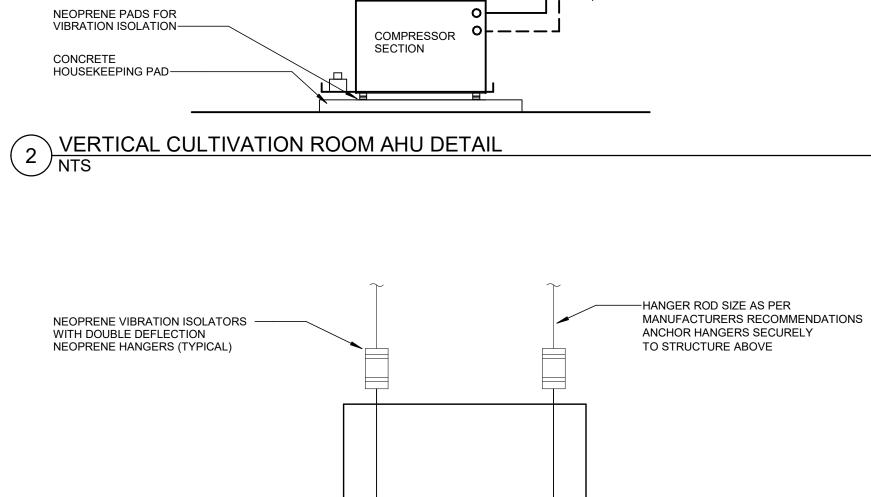


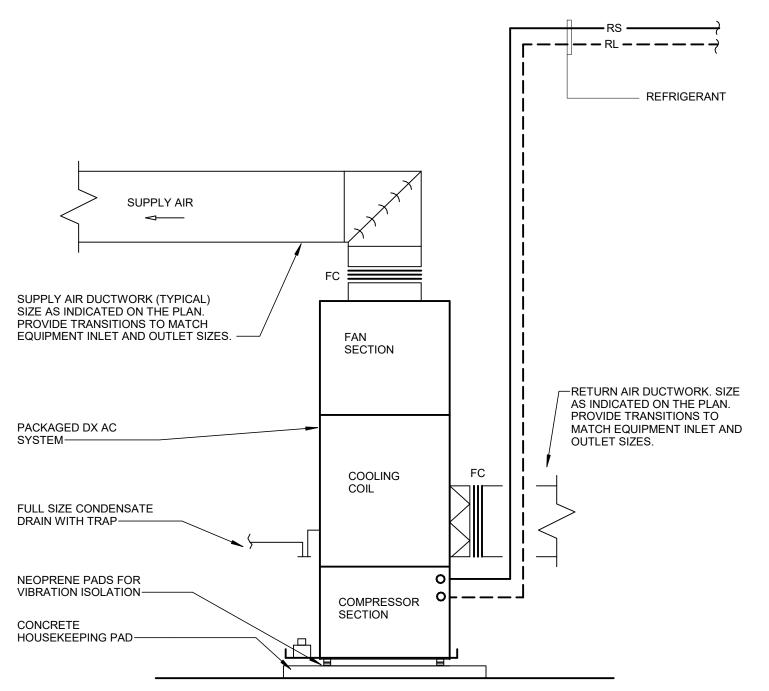
WHERE UNIT DOES NOT COME EQUIPPED WITH HANGER ROD ATTACHMENTS, SUPPORT ON UNISTRUT CHANNELS.

PROVIDE NEOPRENE PADS BETWEEN

MANUFACTURERS RECOMMENDATIONS.

CHANNEL AND EQUIPMENT. SIZE CHANNEL IN ACCORDANCE WITH

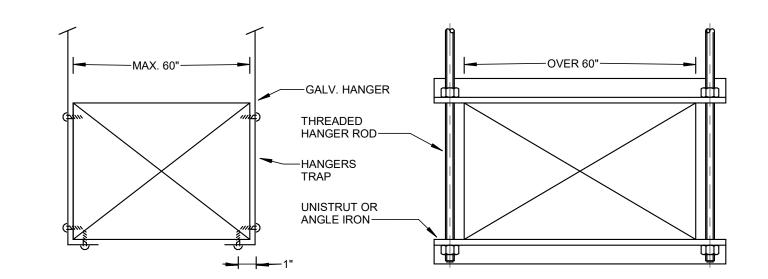




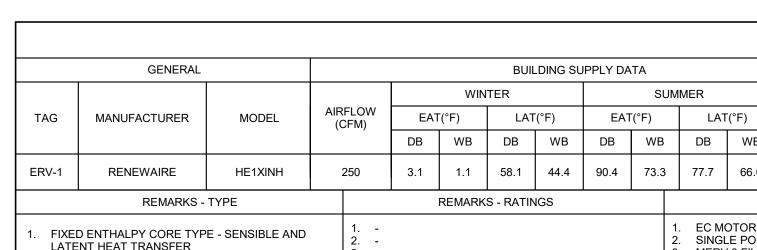
1 DUCT HANGER SUPPORT DETAIL

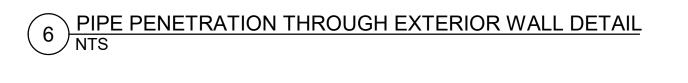
NOTES:

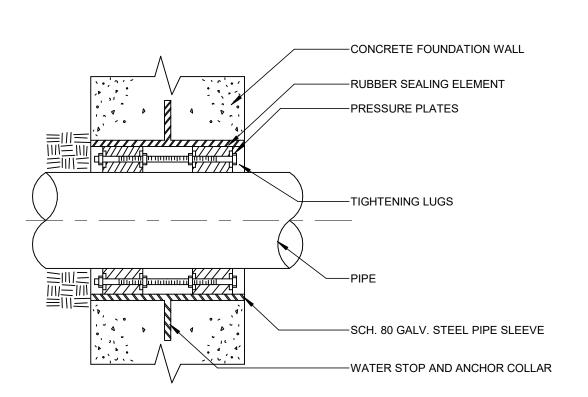
1. ON DUCTS OVER 48" WIDE, BOTTOM SHALL BE BRACED BY ANGLE. FOR CROSS SECTION AREA MORE THAN 8 SQ FT, DUCT SHALL BE BRACED BY ANGLES ON ALL FOUR SIDES. CUTTING AND PATCHING SHALL BE LIMITED TO A MINIMUM AS REQUIRED FOR PROPER INSTALLATION. SUPPORTS SHALL BE SPACED AND SIZED AS PER SMACNA.



													EINE	RGI	REC	OVER	KY VE		LAIC	JR 3	CHEL	ULE											
	GENERAL					В	JILDING S	UPPLY D	ATA							BUILD	ING EXH	IAUST DA	ATA				RECOVE	RED MB	H % EFF	ICIENCY		ELECTRICA	\L		REM	IARKS	
					W	INTER			SU	MMER					WIN	NTER			SU	MMER													
TAG	MANUFACTURER	MODEL	AIRFLOW (CFM)	E	AT(°F)	L	AT(°F)	EA	νT(°F)	LA	AT(°F)	MAX PD (IN WC)	AIRFLOW (CFM)	EA	T(°F)	LAT	Γ(°F)	EA	AT(°F)	L	_AT(°F)	MAX PD (IN WC)	WIN- TER	SUM- MER		SUM- MER	MCA	MOP	VOLTAGE / PHASE	TYPE	RATINGS	FEATURES	INSTA
				DB	WB	DB	WB	DB	WB	DB	WB		. ,	DB	WB	DB	WB	DB	WB	DB	WB												
ERV-1	RENEWAIRE	HE1XINH	250	3.1	1.1	58.1	44.4	90.4	73.3	77.7	66.0	1.5	250	75.0	62.5	-	-	75.0	62.5	-	-	1.5	18.1	6.9	81.2	70.4	10.8	15	208V / 1P	1	-	1-4	-
	REMARKS -	ТҮРЕ		-	REMAF	RKS - RAT	TINGS	-		-		REMARKS - F	EATURES	-			REM	IARKS - I	INSTALL				_ _	-1			•	•	•	•	•	•	
	D ENTHALPY CORE TYP INT HEAT TRANSFER	PE - SENSIBLE AND) 1 2 3							2. SINC 3. MER	RV 8 FILTE	T POWER CO	NNECTION		1 2 3																		



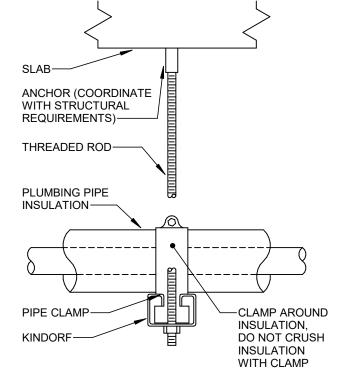


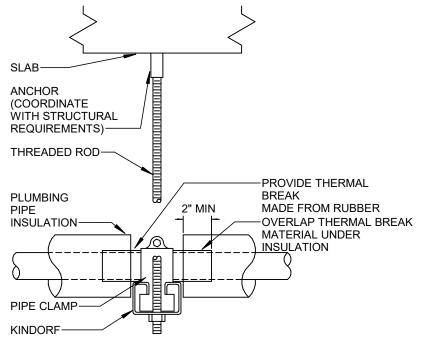


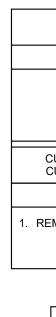
TAG	MANUFACTURER	MODEL										
EF-1	GREENHECK	CUE-160-VG										
REMARKS - TYPE												
1. CENT	REMARKS - TYPE 1. CENTRIFUGAL SIDEWALL DIRECT DRIVE FAN											

GENERAL









									SP	LIT [
		GENI	ERAL			PHYS.		SUPPL	Y FAN	
TAG	MANUFACTURER	MODEL	SERVICE		MATCHED COMP. UNIT	WEIGHT (LBS)	CFM	ESP (IN WG)	FAN QTY.	HF (EA. F
AHU-F1-A/B THRU AHU-F8-A/B	DATA AIRE	G-POD GPAU-09134	FLOWER ROOMS	CL	J-F1-A/B THRU CU-F8-A/B	2,400	7,600	1.0	2	6.3
	REMAR	KS - TYPE					REMAR	RKS - RATING	3S	
1. VERTICAL AHU W/	OUTDOOR AIR-COOLEE	CONDENSER		1. COOLING C	APACITY SH	IOWN IS NE	Т			

T DX	AIR HA	NDLIN	G UNIT	SCH	IEDU	LE														
			DX CO	OLING				HOT-G	GAS REHE	EAT	HUMI	DIFIER		ELEC	FRICAL			REM.	ARKS	
	TOTAL		MIN.	ENTER	ING AIR	LEAVI	NG AIR	TOTAL												
HP EA. FAN)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	DEHUM. CAPACITY (LBS/HR)	DB(°F)	WB(°F)	DB(°F)	WB(°F)	TOTAL CAPACITY (MBH)	EAT (°F)	LAT (°F)	κw	CAPACITY (LB/HR)	FLA	MOP	VOLTAGE	PHASE	TYPE	RATINGS	FEATURES	
6.3	284	198	154.6	75.0	63.0	51.0	49.0	178.3	63.3	80.0	10.2	30	62.7	80	460	3	1	1	1-14	
		REM/						6 - FEATURE	S							REM	IARKS - INST	ALL		
		 MODULATING HOT GAS REHEAT BACNET COMMUNICATION R-410A REFRIGERANT DOUBLE WALL CONSTRUCTION, 3LB INSULATION TANDEM SCROLL COMPRESSORS, DUAL CIRCUIT TOP SUPPLY, REAR RETURN 						10. M 11. PF D0 UI	OWNSTR LTRAVOI	LTERS JVGI COII EAM OF LET CK S				HANE ACCO AND	DLING UNIT A	AND COMPF	ACTURER'S	IT, SIZED AN RECOMMEN	WEEN AIR ID CONFIGUF NDATIONS. F RATIONS SH	PIF

7. BOTH LEFT AND RIGHT HAND CONFIGURATIONS ARE REQUIRED. COORDINATE WITH FLOOR PLANS

8. ECM PLENUM FANS

13. ZONE CONTROL/ZONE MASTER TO ALLOW UNITS TO PROVIDE LEAD/LAG CONTROL AND UNIT ROTATION.

14. STANDARD DAP4 TOUCHSCREEN CONTROLLER

		SPL	IT AIR CONDITIO	ONING	SYSTE	EM COI	NDENS	SER UN	IIT SCI	HEDUL	E					
	GENE	ERAL		PHY	SICAL	PE	RF.		ELEC	RICAL				REM	ARKS	
TAG	MANUFACTURER	MODEL	MATCHED AIR HANDLING UNIT	WEIGHT (LBS)	LxWXH (IN.)	NOMINAL TONS	SOUND POWER (dBA)	MCA	MOP	VOLTAGE	PHAS	Ε ΤΥ	(PE	RATINGS	FEATURES	INS
CU-F1-A/B, CU-M1-A/B	DATA AIRE	GHRC-09934	AHU-F1-A/B, AHU-M1-A/B	750	48.5x92.5x 43	26	-	5.7	15	460	3		1	1	1,2,3	
RI	EMARKS - TYPE	REMAR	KS - RATING	S			REMA	RKS - FEAT	JRES			R	EMARKS - II	NSTALL		
REMOTE CONDEN	SER		1. 95 DEG. F OUTDOOR A	MBIENT			1. DISCO 2. DUAL	ONNECT SW	ITCH			1. PROV	/IDE W	ITH 4" CON	CRETE PAD	

3. EC MOTORS

			DEHU	IMIDIFIE	ER SCHI	EDULE							
				F	PERFORMANC	E		ELE	CTRIC D	ATA			
TAG	MANUFACTURER	MODEL NUMBER	LOCATION	CAPACITY (LB/HR)	AIRFLOW (CFM)	WATTS	VOLTS	PHASE	HZ	FLA	МОР	WEIGHT (LB)	REMARKS
DH-1 THRU 6	ANDEN	A710V3	FLOWER, MOM/VEG, DRY ROOMS	31.1	1,760	4,820	277	1	60	17.4	30	360	1,2,3,4,5,6,7
 R-410A REFRIGER RECEPTACLE BY PROVIDE 3/4" DRA 	DIV.26												

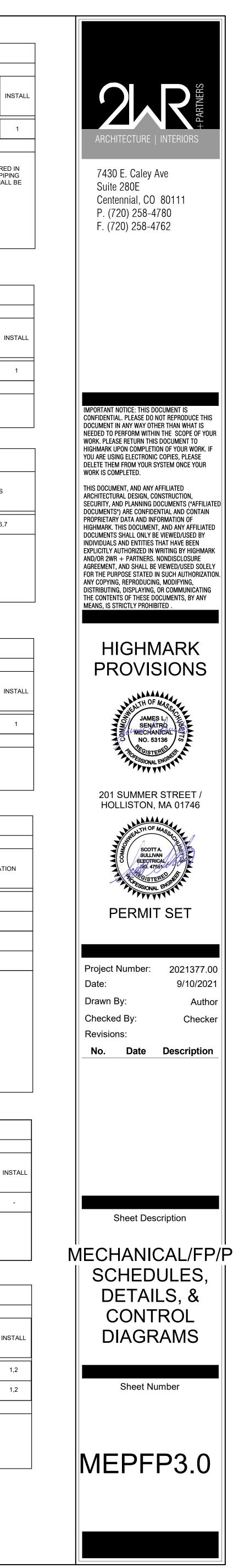
PROVIDE OPTIONAL CONDENSATE PUMP KIT PROVIDE WITH DUCT KIT. PROVIDE WITH WALL MOUNTED HUMIDISTAT.

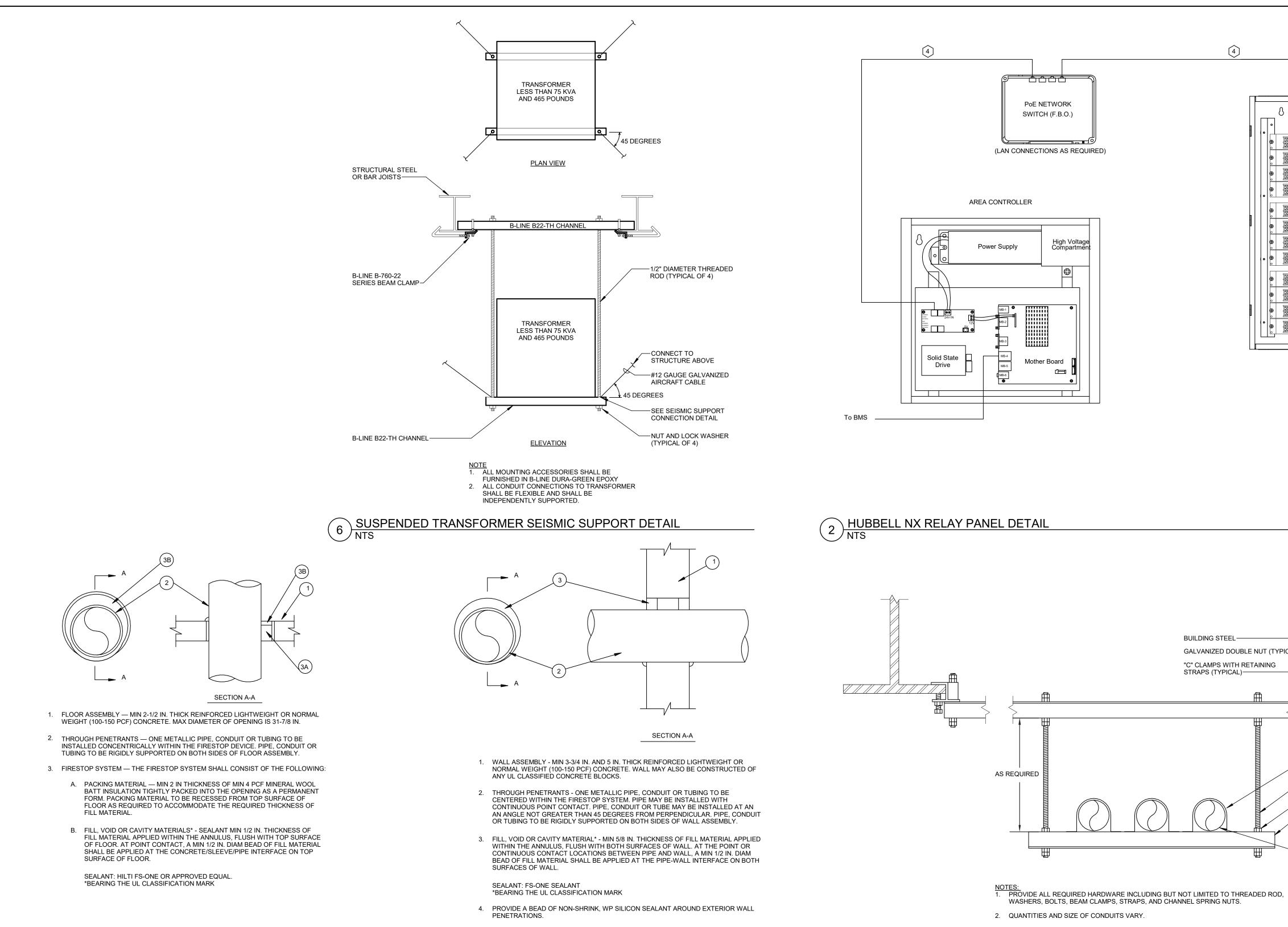
				FA	N SCH	EDULE	Ē										
		PHYS.			PE	ERFORMAN	CE				ELEC	TRICAL			REM	ARKS	
OCATION	SERVICE	WEIGHT (LBS)	CFM	ESP (IN WG)	RPM	FEI	STATIC EFFIC.	BHP	SONES	FLA	HP	VOLTAGE	PHASE	TYPE	RATINGS	FEATURES	IN
SIDEWALL	CULTIVATION ROOMS	89	2,600	1.0	1,270	-	52%	0.78	16.0	13	1.0	115	1	1	1, 2	1-3	
			REMA	ARKS - FEAT	URES						REM	IARKS - INST	TALL				
	 AIR PERFORMAN SOUND PERFORI 311 					_	OTOR FUSED DISC		-	OPEN		1					

3. CONTROL DAMPER, TWO POSITION, FAIL OPEN

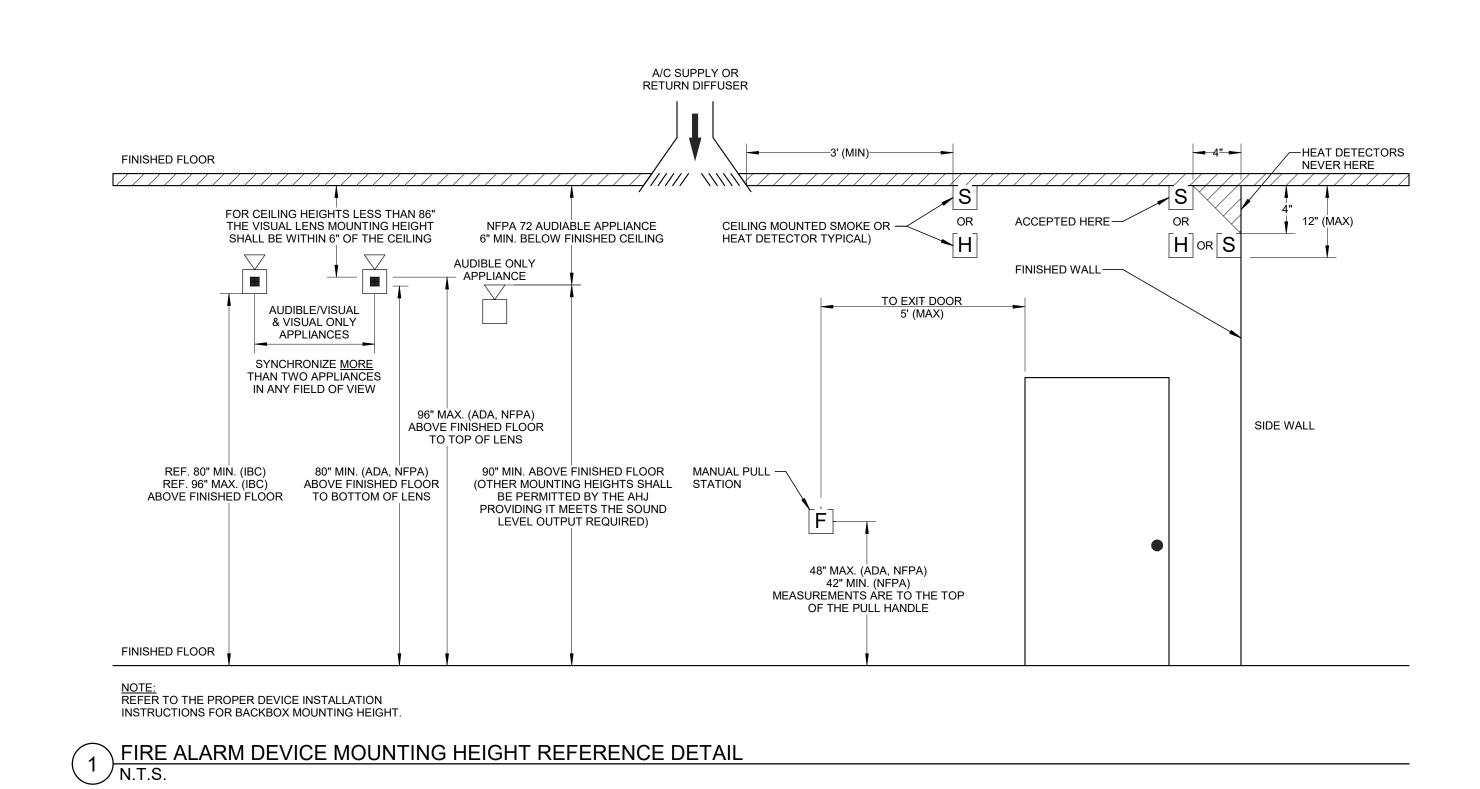
				DIFFUSEF	r, GRI	LLE &	REGISTER SCHED	DULE		
									REMA	ARKS
SYMBOL	NECK SIZE/ RUNOUT SIZE (IN)	FACE SIZE (IN)	AIRFLOW SELECTION RANGE (CFM)	SERVICE	MAX. AIR P.D.	MAX. N.C. LEVEL	MOUNTING	MANUFACTURER / MODEL NUMBER	FEATURES & ACCESSORIES	INSTALLATI
SD-1	8	12x12	0-200	SUPPLY	0.1	30	12"x12" SURFACE MOUNT	TITUS TDC	-	-
SD-2	14	24x24	201-1300	SUPPLY	0.1	35	24"x24" SURFACE MOUNT	TITUS TDC	-	-
EG-1	5	6x6	0-100	EXHAUST / RETURN	0.1	30	24"x24" LAY-IN MODULE	TITUS 350RL	-	-
RG-1	24x48	24x48	0-7200	EXHAUST / RETURN	0.1	35	24"x24" LAY-IN MODULE	TITUS 350RL	-	-
WHICH IT IS REFLECTED 2. FINISHES, 0 3. REFER TO EACH DEVI 4. PROVIDE A AREAS INC 5. PROVIDE C	YPES SHALL BE S LOCATED. COI D CEILING PLAN COLOR AND BOF PLANS FOR LOC CE. LUMINUM CONS LUDING TOILET ABLE-OPERATE	Compatible with NTRACTOR Shall R S FOR SPECIFIC CE RDER TYPES SHALL CATION, AIR QUANTI TRUCTION FOR DE ROOMS, SHOWER F D DAMPER WITH RE E GYP AND INACCES	EVIEW THE ARCH ILING TYPES IN EA BE APPROVED BY TIES, TYPE AND B /ICES INSTALLED ROOMS, KITCHEN, MOTE ACTUATOR	ITECTURAL ACH SPACE. 7 THE ARCHITECT LOW PATTERN OF IN HIGH MOISTURE ETC.	REMAR	<u>KS - FEATUł</u>	RES & ACCESSORIES	<u>REMARKS - INSTALI</u>	<u>ATION</u>	

								FIL	TER B	ANK SO	CHEDU	JLE						
GEN'L.							PHYS	SICAL					PE	RF.		REMA	ARKS	
	5	SIZE A		SIZE B		SIZE C		SIZE D	FACE				FACE					
TAG	QTY	DIM (IN)	QTY	DIM (IN)	QTY	DIM (IN)	QTY	DIM (IN)	AREA (SQ FT)	LOCATION	TYPE	DEPTH (IN)	VEL. (FT/MIN)	INITIAL PD (IN WG)	TYPE	RATINGS	FEATURES	INSTA
FB-1	1	24X12	_	_	_	_	_	_	2.0 PRE 8 2 FINAL HEPA 12			500	-	1	1	1	1.2	
10-1		24/12	_	_	_	-	-	_	2.0	FINAL	HEPA	12	500	0.5				1,2
FB-2	1	24X12	-	-	_	-	-	-	2.0	PRE	8	2	500	-	1	1	2	1,2
										FINAL	CARBON	12		0.5			_	.,_
	REM	IARKS - TYF	ΡE			REMARK	S - RA	TINGS		REMARKS	S - FEATURE	ES		REMARKS	- INSTALL			
GAUC	1. SIMILAR TO CAMFIL SIDELOCK, 14 GAUGE GALVANIZED STEEL, ACCESS DOOR BOTH SIDES 1. PRESSURE DROP (SPD) AT CLEA CONDITION (INITIAL RESISTANCE AT VELOCITY INDICATED (NOT A ACTUAL VELOCITY)						E), AT	HEPA/ULPA TO CAMFIL 855013-210 CARBON FII CAMFIL CAM ACTIVATED	ABSOLUTE ' NAL FILTER, MSORB RIGA	VG, MODEL SIMILAR TO	3. SU AB	OVIDE A SP SPEND UNI OVE AT FOU	FROM STR	UCTURE				



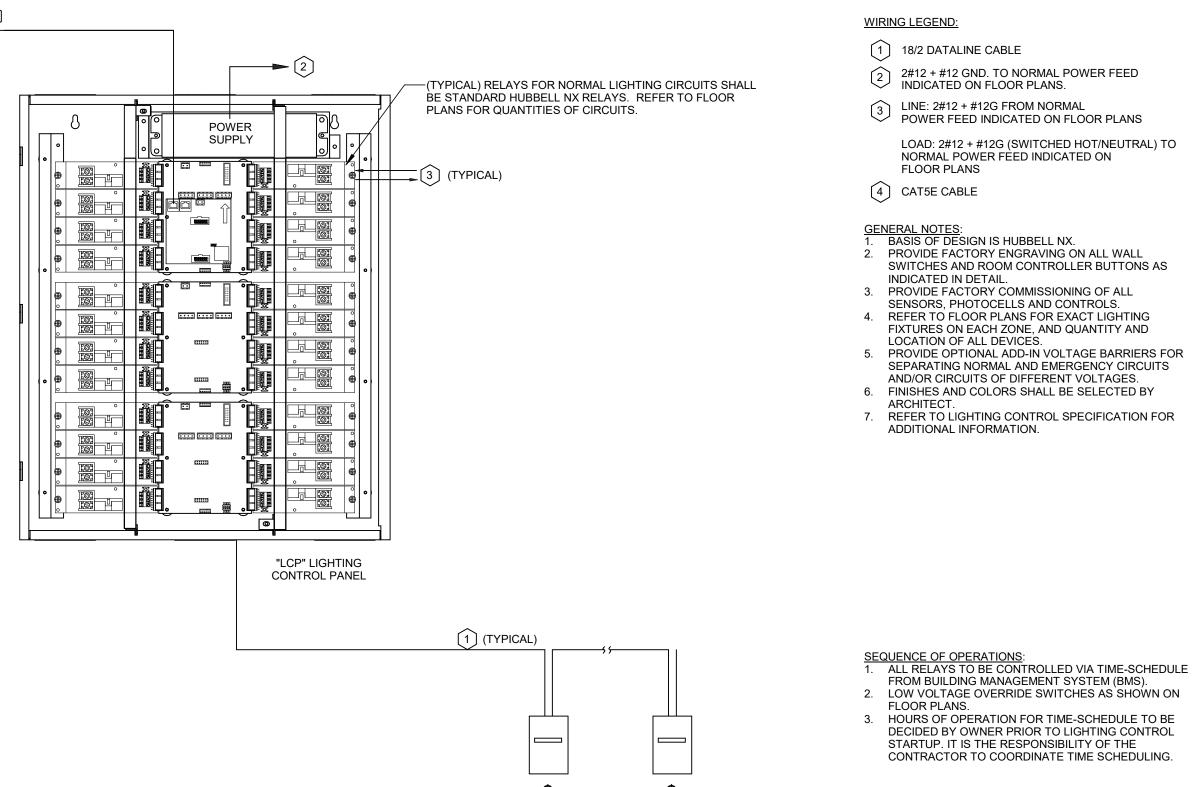


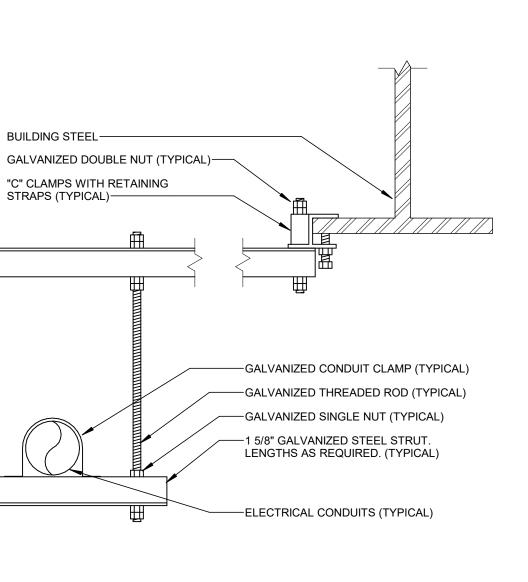
7 UL LISTED CONDUIT SLEEVE FIRESTOPPING SPECIFICATIONS

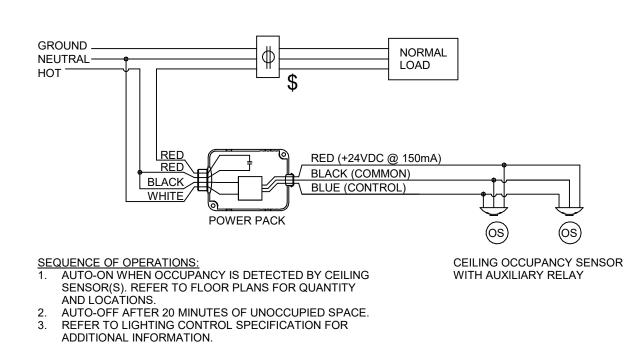


3 TYPICAL CONDUIT HANGING DETAIL

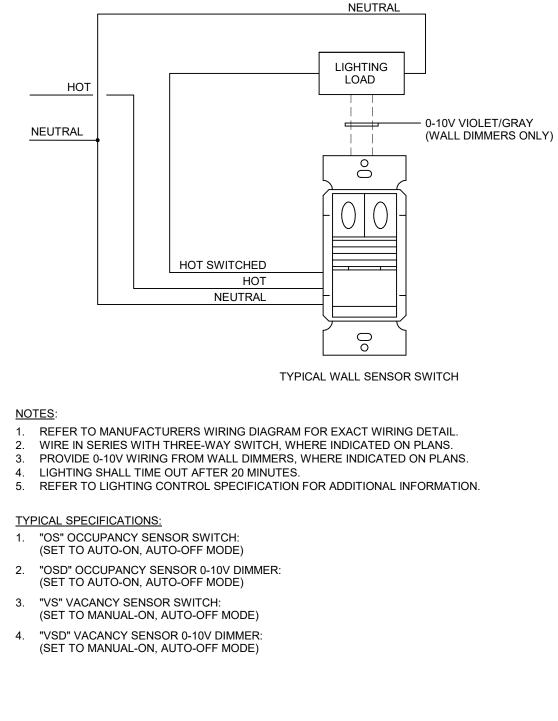
/ 1/8" = 1'-0"



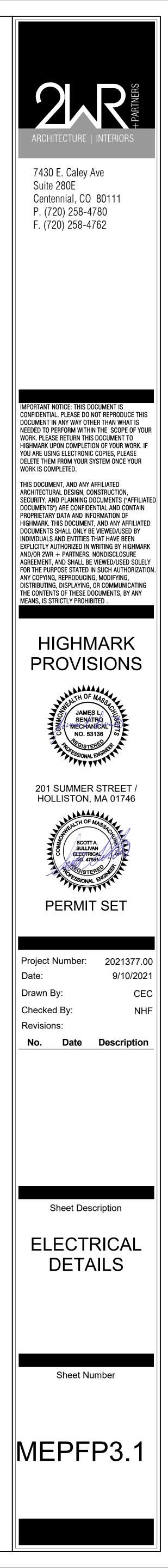




4 TYPICAL STANDALONE OCCUPANCY SENSOR DETAIL



5 TYPICAL LINE VOLTAGE SENSOR SWITCH DETAIL



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
- . THESE SPECIFICATIONS ARE APPLICABLE TO ALL PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS UNLESS NOTED OTHERWISE. REVIEW THE ARCHITECTURAL, STRUCTURAL, LECTRICAL, PLUMBING DRAWINGS FOR NOTES, DIMENSIONS, ETC., AND COORDINATE WITH OTHER TRADES INVOLVED.
- DESCRIPTION
- THIS PROJECT COMPRISES ALTERATIONS AND RENOVATIONS TO THE EXISTING BUILDING. 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: THE FOLLOWING DEFINITIONS APPLY TO THIS CONTRACT
- FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE,
- READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS" 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." PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."
- REMOVE: THE TERM "REMOVE" MEANS TO DISCONNECT FROM ITS PRESENT POSITION.
- REMOVE FROM THE PREMISES AND TO DISPOSE OF IN A LEGAL MANNER." SUBSTITUTIONS: "SUBSTITUTIONS" ARE REQUESTS FOR CHANGES IN PRODUCTS, MATERIALS AND/OR METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF THE CONTRACT."
- DRAWINGS 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 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
- CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE
- FOLLOWING: 1. NFPA 13 - INSTALLATION OF SPRINKLER SYSTEMS.
- 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. LOCAL AUTHORITIES HAVING JURISDICTION.
- B. PERMITS AND FEES:

PROFESSIONAL

- 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
- EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER. 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. SURVEY AND MEASUREMENTS
- 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.
- DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS. 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 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. SUBMITTALS AND SHOP DRAWINGS
- 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. SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"=1'0". HIGHLIGHT, ENCIRCLE, 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. HYDRAULIC CALCULATIONS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF
- DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION AKEN IN CONNECTION WITH CONSTRUCTION.
- 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.
- K. AS-BUILT DRAWINGS
- 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
- OPERATION AND MAINTENANCE 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.
- 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.
- 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. CLEANING
- EQUIPMENT: AFTER COMPLETION OF PROJECT, CLEAN THE EXTERIOR SURFACE OF EQUIPMENT INCLUDED IN THIS SECTION, INCLUDING REMOVAL OF CONCRETE RESIDUE.
- WORK AREA: AFTER COMPLETION OF PROJECT, REMOVE ALL CONSTRUCTION DEBRIS EMPORARY FACILITIES AND EQUIPMENT FROM WORK AREA. CLEAN WORK AREA TO PERMIT OCCUPATION. N. GUARANTEE
- 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 VATERIALS, 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
- 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 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 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. THI 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 FIRESTOPPING 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 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 MECHANICAL PLANS TO DETERMINE THE LOCATION AND QUANTITY OF ACCESS PANELS REQUIRED. COORDINATE TYPE AND LOCATION WITH ARCHITECTURAL PLANS.

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

- - c. 10" AND LARGER: VICTAULIC ZERO-FLEX STYLE 07. 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.

21 05 00 - COMMON WORK RESULTS FOR FIRE SUPPRESSION SYSTEMS

STOCKHAM, NIBCO, WATTS, HAMMOND, MILWAUKEE.

MECHANICAL COUPLINGS ARE USED.

AND/OR FACTORY MUTUAL (FM).

GROOVED COMPONENTS.

D. PIPE & FITTINGS (ABOVE GRADE)

SCREWED FITTINGS.

FITTINGS

CONFORM TO ANSI/ASTM A47.

AS THE ADJOINING COUPLINGS.

DISASSEMBLY, VICTAULIC STYLE 009 EZ.

b. 5" THROUGH 8": VICTAULIC FIRELOCK STYLE 005

A. WORKMANSHIP AND QUALIFICATIONS: MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN

ACCORDANCE WITH NFPA AND APPLICABLE LOCAL CODES AND ORDINANCES. THE SPRINKLER

DEVICES USED SHALL BE LISTED AND APPROVED BY UNDERWRITERS LABORATORIES (UL)

B. GROOVED JOINT COUPLINGS, FITTINGS, VALVES, AND SPECIALTIES SHALL BE THE PRODUCTS OF

OF THE SAME MANUFACTURER. MANUFACTURERS: KENNEDY VALVE MFG. CO., VICTAULIC,

A SINGLE MANUFACTURER. GROOVING TOOLS SHALL BE OF THE SAME MANUFACTURER AS THE

VALVES: SHALL BEAR UL AND/OR FM LABEL OR MARKING. PROVIDE MANUFACTURER'S NAME AND

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

. CAST IRON FITTINGS: ANSI/ASME B16.1, FLANGES AND FLANGED FITTINGS, ANSI/ASME B16.4,

MALLEABLE IRON FITTINGS: ANSI/ASME B16.3, SCREWED CLASS 300 TYPE. THREADS SHALL

GRADE 65-45-12 DUCTILE IRON, ASTM A234 GRADE WPB, OR FACTORY FABRICATED FROM

GROOVED MECHANICAL COUPLINGS: ASTM A536 GRADE 65-45-12, DUCTILE IRON HOUSING,

ELASTOMER GASKET WITH NUTS AND BOLTS TO SECURE ROLL GROOVED PIPE AND

a. 1-1/4" THROUGH 4": FACTORY ASSEMBLED FOR INSTALLATION WIHTOUT FIELD

CARBON STEEL PIPE CONFORMING TO ASTM A53, WITH GROOVES OR SHOULDERS DESIGNED

FO ACCEPT GROOVED END COUPLINGS. FITTINGS SHALL BE OF THE SAME MANUFACTURER

RIGID TYPE COUPLINGS: HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN BOLT PADS TO

PROVIDE RIGIDITY AND SYSTEM SUPPORT AND HANGING IN ACCORDANCE WITH NFPA-13.

. GROOVED MECHANICAL FITTINGS: ANSI A21.10/AWWA C-110 DUCTILE IRON, ASTM A536

PRESSURE RATING MARKED ON VALVE BODY. ITEMS OF SIMILAR CLASS SHALL BE THE PRODUCTS

CONTRACTOR SHALL BE STATE LICENSED TO INSTALL SPRINKLER SYSTEMS. FIRE PROTECTION

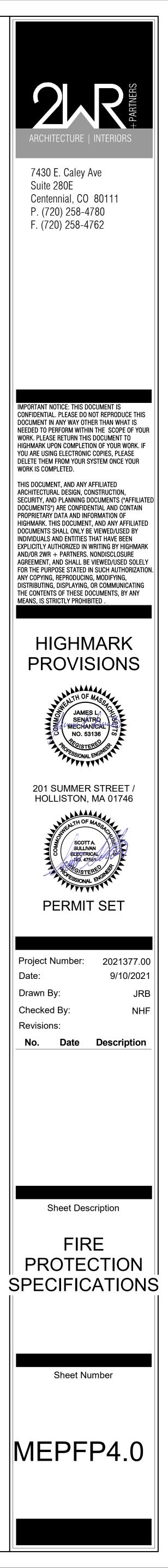
- F. JOINTS GROOVED MECHANICAL COUPLINGS: ASTM A536 GRADE 65-45-12, DUCTILE IRON HOUSING. FLUSHSEAL OR QUICKVIC ELASTOMER GASKET WITH NUTS AND BOLTS TO SECURE ROLL GROOVED PIPE AND FITTINGS HOUSINGS CAST WITH OFFSETTING, ANGLE-PATTERN BOLT PADS TO PROVIDE RIGIDITY. AND MANUFACTURED TO CONNECT COPPER TUBING AND FITTINGS WITHOUT FLARING. VICTAULIC STYLE 606 OR STYLE 607 QUICKVIC STAB-ON COUPLINGS.
- 2. ASTM B32, SOLDER, GRADE 95TA OR ANSI/AWS A5.8 BCUP SILVER BRAZE.
- . 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 TO ENGAGE AND LOCK, "C" SHAPED COMPOSITION SEALING GASKET, STEEL BOLTS, NUTS, AND WASHERS, GALVANIZED FOR GALVANIZED PIPE. G. GATE VALVES
- 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 YOKE, SOLID TAPER BRONZE OR CAST IRON WEDGE, GROOVED OR FLANGED
- 3. OVER 4": IRON BODY, BRONZE TRIM, 175 POUND COLD WATER, NON-SHOCK WORKING PRESSURE, VALVE SHALL HAVE SOLID TAPER WEDGE: OUTSIDE SCREW AND YOKE, RISING STEM: FLANGED BONNET WITH BODY AND BONNET CONFORMING TO ASTM A126 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 JNDER PRESSURE, WITH VALVE WIDE OPEN.
- H. GLOBE VALVES
- 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
- I. 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-67, 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.
- . HORIZONTAL SWING OVER 2": 300 PSI CWP, DUCTILE IRON BODY AND COUPLED CAF 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 REFITTED 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
- 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 NIPPLE AND CAP. N. BALL VALVE: BRASS WITH CAP AND CHAIN, 3/4" HOSE THREAD
- O. BACKFLOW PREVENTERS
- REDUCED PRESSURE BACKFLOW PREVENTERS: ANSI/ASSE 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.
- REDUCED PRESSURE DETECTOR CHECK VALVE ASSEMBLIES: ANSI/ASSE 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
- 3. DOUBLE CHECK VALVE ASSEMBLY: ANSI/ASSE 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/ASSE 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.
- 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
- 4. WALL SUPPORT FOR PIPE SIZES 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, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.

- R. GENERAL INSTALLATION REQUIREMENTS FOR PIPE AND FITTINGS
- 1. INSTALL PIPING IN ACCORDANCE WITH NFPA 13 FOR SPRINKLER SYSTEM STANDPIPE AND HOSE SYSTEMS AND NEPA 24 FOR SERVICE MAINS
- 2. PLACE PIPING IN CONCEALED SPACES ABOVE FINISHED CEILINGS UNLES OTHERWISE
- 3. ROUTE PIPING IN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDIN MAINTAIN GRADIENT
- 4. INSTALL PIPING TO CONSERVE BUILDING SPACE, TO NOT INTERFERE W
- AND OTHER WORK 5. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
- 6. INSTALL PIPE SLEEVE AT PIPING PENETRATIONS THROUGH FOOTINGS, AND FLOORS. SEAL PIPE AND SLEEVE PENETRATIONS TO MAINTAIN FIRE EQUIVALENT TO FIRE SEPARATION.
- 7 INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT JOINTS, OR CONNECTED EQUIPMENT. USE VICTAULIC STYLE 77 OR 75 (
- ACCORDANCE WITH VICTAULIC INSTRUCTIONS FOR EXPANSION AND CO 8. GROOVED JOINT COUPLINGS AND FITTINGS SHALL BE INSTALLED IN AC MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. GROOVED I CLEAN AND FREE FROM INDENTATIONS. PROJECTIONS, AND ROLL MAR PIPE END TO GROOVE, GASKETS SHALL BE VERIFIED AS SUITABLE FOR SERVICE PRIOR TO INSTALLATION. GASKETS SHALL BE MOLDED AND PR COUPLING MANUFACTURER. THE GROOVED COUPLING MANUFACTURE TRAINED REPRESENTATIVE SHALL PROVIDE ON-SITE TRAINING FOR CO PERSONNEL IN THE USE OF GROOVING TOOLS, APPLICATION OF GROC INSTALLATION OF GROOVED JOINT PRODUCTS. THE MANUFACTURER'S I SHALL PERIODICALLY VISIT THE JOBSITE AND REVIEW INSTALLATION. C REMOVE AND REPLACE ANY JOINTS DEEMED IMPROPERLY INSTALLED.
- 9. PITCH PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS. USE REDUCERS TO MAINTAIN TOP OF PIPE LEVEL.
- 10. PREPARE PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PA SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDING.
- 11. DO NOT PENETRATE BUILDING STRUCTURAL MEMBERS UNLESS INDICAT 12. WHERE MORE THAN ONE PIPING SYSTEM MATERIAL IS SPECIFIED INST SYSTEM COMPONENTS AND JOINTS. INSTALL FLANGES, UNION, AND COM LOCATIONS REQUIRING SERVICING.
- 13. DIE CUT THREADED JOINTS WITH FULL CUT STANDARD TAPER PIPE THR LEAD AND LINSEED OIL OR OTHER NON-TOXIC JOINT COMPOUND APPLIE THREADS ONLY.
- 14. PROVIDE DIELECTRIC FITTINGS WHENEVER JOINING TWO DISSIMILAR MI
- 15. PROVIDE SURGE RESTRAINERS ON ALL END OF BRANCHES AND ARM C
- S. GENERAL INSTALLATION REQUIREMENTS FOR VALVES
- 1. INSTALL DRAIN VALVES AT MAIN SHUT-OFF VALVES, LOW POINTS OF PIP APPARATUS
- 2. VALVES SHALL BE ACCESSIBLE FOR OPERATION AND SERVICING. PROV WHERE REQUIRED.
- 3. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED PROTECTIVE COATINGS AFTER INSTALLATION.
- 4. INSTALL GATE OR BUTTERFLY VALVES FOR SHUT-OFF OR ISOLATING SE
- 5. INSTALL BURIED SHUT OFF VALVES IN VALVE BOX.
- T. GENERAL INSTALLATION REQUIREMENTS FOR PIPE HANGERS AND SUPPORT 1. INSTALL IN ACCORDANCE WITH NFPA 13 AND NFPA 14. 2. INSTALL HANGERS TO WITH MINIMUM 1/2" SPACE BETWEEN FINISHED CO
- ADJACENT WORK. 3. PLACE HANGERS WITHIN 12" OF EACH HORIZONTAL ELBOW.
- 4. USE HANGERS WITH 1-1/2" MINIMUM VERTICAL ADJUSTMENT. DESIGN H
- MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE. 5. SUPPORT VERTICAL PIPING AT EVERY FLOOR. SUPPORT RISER PIPING CONNECTED HORIZONTAL PIPING.
- 6. WHERE INSTALLING SEVERAL PIPES IN PARALLEL AND AT SAME ELEVAT MULTIPLE OR TRAPEZE HANGERS.
- 7. INSTALL COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPIN 8. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AN LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING CONSIDERED EXPOSED
- U. TESTING: PRESSURE TEST THE ABOVE GROUND SYSTEM IN ACCORDANCE SHALL BE COMPLETED PRIOR TO PERMANENT SEALING OF WALLS AND PAR TEST BELOW GRADE PIPING IN ACCORDANCE WITH NFPA 24.

	<u>21 ′</u>	13 10	0 - FIRE-SUPPRESSION SPRINKLER SYSTEMS	<u>SPRIN</u>	KLER SCHEDULE:
TEMS, NFPA 14 FOR	A.	SY	STEM DESCRIPTION (EXISTING BUILDING)	1.	QUICK-RESPONSE CONCEALED: BRASS FIN
LESS NOTED		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.		PLATE, VICTAULIC MODEL V3802.
DING STRUCTURE.		2.	PROVIDE ALTERATIONS AND RENOVATIONS TO THE EXISTING SPRINKLER SYSTEM. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS INCLUDING BUT NOT		
WITH USE OF SPACE			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 SPRINKLER PIPING AS REQUIRED FOR THE LAYOUT OF NEW SPRINKLER HEADS, INCLUDING MODIFICATIONS TO EXISTING PIPING.		
S, PARTITIONS, WALLS, FIRE RESISTANCE		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.		
OUT STRESSING PIPE,		4.	INTERFACE SYSTEM WITH BUILDING FIRE ALARM SYSTEM.		
5 COUPLINGS IN CONTRACTION OF PIPE.		5.	THE SPRINKLER LOCATIONS AND PIPING ARRANGEMENTS INDICATED ON THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC.		
ACCORDANCE WITH THE D ENDS SHALL BE ARKS IN THE AREA FROM DR THE INTENDED PRODUCED BY THE		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		
RER'S FACTORY	В.	SU	BMITTALS		
DOVE, AND X'S REPRESENTATIVE I. CONTRACTOR SHALL D.		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.		
SE ECCENTRIC		2.	SUBMIT HYDRAULIC CALCULATIONS PREPARED IN ACCORDANCE WITH NFPA 13.		
H PAINTING. WHERE PIPE NG, SCRAPE, BRUSH		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.		
CATED. STALL COMPATIBLE COUPLINGS AT		5.	AFTER REVIEW BY THE OWNER'S REPRESENTATIVE, SUBMIT SPRINKLER LAYOUT SHOP DRAWINGS, PRODUCT DATA, AND HYDRAULIC CALCULATIONS TO THE AUTHORITY HAVING JURISDICTION, FIRE MARSHALL, AND OWNER'S INSURANCE UNDERWRITER FOR APPROVAL. SUBMIT PROOF OF APPROVAL FROM SUCH AUTHORITIES/ORGANIZATIONS.		
HREADS WITH RED	C.	SP	RINKLERS		
PLIED TO MALE			MANUFACTURERS: VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP.		
R METALS.			SPRINKLERS SHALL BE ADJUSTABLE, GLASS BULB, AUTOMATIC SPRINKLERS WITH 1/2" ORIFICE AND 5.6 K-FACTOR UNLESS OTHERWISE INDICATED. TYPE OF SPRINKLER HEAD		
OVERS IN EXCESS OF		3.	SHALL BE AS INDICATED ON THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING. 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		
PIPING AND		4	INSTALLATION.	1	
OVIDE ACCESS PANELS		4.	UNLESS OTHERWISE INDICATED, ORDINARY TEMPERATURE RATED SPRINKLER HEADS SHALI BE PROVIDED.	_	
TED. REMOVE		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		
SERVICE.		6.	WHERE PLANS CALL FOR EXTENDED COVERAGE SPRINKLER HEADS, COORDINATE COVERAGE REQUIREMENTS WITH REQUIRED PRESSURE AND K-FACTOR.		
DRTS		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 SPRINKLEF WRENCHES, OR MINIMUM ONE WRENCH FOR EACH CONTAINER OR SPRINKLER BOX, WHICHEVER IS GREATER.	२	
OVERING AND		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		
I HANGERS FOR PIPE			STAIRWAYS, IN ELECTRICAL ROOMS, BOILER ROOMS AND OTHER MECHANICAL ROOMS, 7'-0" OR LESS ABOVE FINISHED FLOORS, AND IN GYMNASIUM/FITNESS CENTER AREAS.		
G INDEPENDENTLY OF	E.		PING SPECIALTIES		
/ATION, PROVIDE		1.	MANUFACTURERS: POTTER-ROEMER, VIKING, TYCO, VICTAULIC, GRINNELL CORP., RELIABLE SPRINKLER CORP. SUBSTITUTIONS: ALLOWED.		
PING.		2.	ELECTRIC ALARM: ELECTRICALLY OPERATED RED ENAMELED GONG WITH PRESSURE ALARM SWITCH, 120 VOLT WITH WEATHERPROOF BACK BOX.		
AND SUPPORTS G SPACES ARE NOT		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 PCVS-1. OVER 2" SWITCH SHALL BE POTTER MODEL OSYSU-2.		
E TO NFPA 13. TESTING ARTITIONS. PRESSURE		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.	GE	NERAL 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 13D, 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 THE EXISTING WATER SUPPLIES. NOTIFY THE OWNER'S REPRESENTATIVE BEFORE AFFECTING THE OPERATION OF ANY EXISTING FIRE PROTECTION EQUIPMENT.	<u>:</u>	
		4.	SPRINKLERS LOCATED IN FULL SIZE CEILING TILES SHALL BE CENTERED IN THE TILE. PROVIDE PIPING OFFSETS AS REQUIRED.		

- 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.

FINISH WITH FACTORY PAINTED WHITE COVER



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 SPECIFICAITON 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 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.
- 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" 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 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.
- 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 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/HER 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
- I. EXISTING TO BE REUSED/RELOCATED EQUIPMENT: REPORT ANY EXISTING EQUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER.
- 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.
- 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
- 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 PRODUCTS FROM THE DESIGN. b. SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"=1'0". HIGHLIGHT, ENCIRCLE, OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS. DO NOT
- EPRODUCE 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
- 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 APPROVAI
- M. OPERATION AND MAINTENANCE

OCCUPATION.

- 1. UPON COMPLETION OF ALL WORK AND TESTS, THE CONTRACTOR SHALL INSTRUCT THE DWNER 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 SPINE OF EACH BINDER.
- 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
- 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
- 3. DOMESTIC WATER PIPING: PRIOR TO STARTING WORK, VERIFY SYSTEM IS COMPLETE LUSHED AND CLEANED. ENSURE ACIDITY (pH) OF WATER TO BE TREATED IS BETWEEN 7.4 AND 7.6 BY ADDING ALKALI (CAUSTIC SODA OR SODA ASH) OR ACID (HYDROCHLORIC). INJECT DISINEECTANT FREE CHI ORINE IN LIQUID POWDER TABLET OR GAS FORM THROUGHOUT SYSTEM TO OBTAIN 50 TO 80 mg/L RESIDUAL. BLEED WATER FROM OUTLETS TO ENSURE DISTRIBUTION AND TEST FOR DISINFECTANT RESIDUAL AT MINIMUM 15 PERCENT OF OUTLETS. MAINTAIN DISINFECTANT IN SYSTEM 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 YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIV 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 MANUFACTURER'S 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 FTC, 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.

CONTRACT AS REQUIRED TO RESTORE THEM TO THEIR ORIGINAL CONDITION.

- 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
- 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.

- 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. TH CONTRACTOR SHALL FURNISH ALL NECESSARY SLEEVES, CAULKING AND FLASHING REQUIRED TO MAKE OPENINGS ABSOLUTELY WATERTIGHT.
- 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
- 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: MANUFACTURERS: CRAFTMARK IDENTIFICATION SYSTEMS, SAFETY SIGN CO., SETON
- IDENTIFICATION PRODUCTS, NORTHTOWN, KOLBI. SUBSTITUTIONS: DIVISION 01 GENERAL REQUIREMENTS AND 22 04 00 – GENERAL REQUIREMENTS.
- 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
- 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 ANODIZED 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 SPRING FASTENER. MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND IDENTIFICATION OF FLUID BEING CONVEYED.
- 2. PLASTIC TAPE PIPE MARKERS: FLEXIBLE, VINYL FILM TAPE WITH PRESSURE SENSITIVE ADHESIVE BACKING AND PRINTED MARKINGS. 5. CEILING TACKS
- a. DESCRIPTION: STEEL WITH 3/4 INCH DIAMETER COLOR-CODED HEAD.
- b. COLOR CODE AS FOLLOWS: PLUMBING VALVES: GREEN
- 6. LABELS DESCRIPTION: POLYESTER FOR ABOVE GRADE AND LAMINATED MYLAR FOR BELOW GRADE, SIZE 1.9 X 0.75 INCHES, ADHESIVE BACKED WITH PRINTED IDENTIFICATION. B. SLEEVES
- MANUFACTURERS: FLEXICRAFT INDUSTRIES; PIPE WALL SLEEVE, METRAFLEX; PIPE WALL SLEEVE, CCI PIPELINE; PIPE WALL SLEEVE, GPT – CENTURYLINE SLEEVE SERIES, GPT/THUNDERLINE LINK-SEAL, INC, METRAFLEX - METRASEAL, BWM – PIPE SEAL/ PS SERIES. SUBSTITUTIONS: SEE DIVISION 01 - GENERAL REQUIREMENTS AND 22 04 00 - GENERAL REQUIREMENTS.
- 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 OPENING. d. DRILLED PENETRATIONS: PROVIDE 1-1/2 INCH ANGLE RING OR SQUARE SET IN SILICONE
- ADHESIVE AROUND PENETRATION.
- 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.
- 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.
- ALL RATED OPENINGS: CAULKED TIGHT WITH FIRE STOPPING MATERIAL CONFORMING TO HYPERLINK "HTTP://GLOBAL.IHS.COM/DOC DETAIL.CFM? RID=BSD&DOCUMENT NAME=ASTM E814" AST $\overline{ extsf{M}}$ 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
- 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

3. PREPARATION

PIPE.

- 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.
- PROVIDE NSF 61 CERTIFIED ASSEMBLY WHEN USED IN POTABLE WATER STORAGE TANK APPLICATIONS
- C. FORMED STEEL CHANNEL
- MANUFACTURERS: B-LINE SYSTEMS, UNISTRUT CORP., ANVIL INTERNATIONAL SUBSTITUTIONS: DIVISION 01 - GENERAL REQUIREMENTS AND 22 04 00 - GENERAL
- REQUIREMENTS. PRODUCT DESCRIPTION: GALVANIZED 12 GAGE THICK STEEL. WITH HOLES 1-1/2 INCHES ON
- GENERAL INSTALLATION REQUIREMENTS FOR PLUMBING
- CONNECTIONS BETWEEN COPPER & STEEL PIPING SHALL BE MADE WITH DIELECTRIC

e. AFTER COMPLETION, FILL, CLEAN, AND TREAT SYSTEM.

4. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.

5. SLEEVE PIPE PASSING THROUGH PARTITIONS, WALLS AND FLOORS.

8. PROVIDE ACCESS WHERE VALVES AND FITTINGS ARE NOT EXPOSED.

12. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.

ECCENTRIC REDUCERS TO MAINTAIN TOP OF PIPE ALIGNED.

WATERWAYS, WITH BRONZE BODY VALVES, OR WITH BRASS ADAPTER FITTINGS.

TEMPORARY PLUGS OR CAPS.

E. INSTALLATION REQUIREMENTS FOR PLUMBING PIPING

JOINTS, OR CONNECTED EQUIPMENT.

ASME B31.9, AS APPLICABLE.

F. TESTING

ASME B31.9 AS APPLICABLE.

2. INSTALL AND TEST GAS PIPING IN ACCORDANCE WITH THE FUEL GAS CODE AND NFPA 54.

b. REMOVE SCALE AND DIRT ON INSIDE AND OUTSIDE BEFORE ASSEMBLY

ROUTE PIPING PARALLEL TO BUILDING STRUCTURE AND MAINTAIN GRADIENT.

22 05 29 - HANGERS AND SUPPORTS

B. ALL HANGERS SHALL BE GALVANIZED.

ADJACENT WORK.

A. PROVIDE PIPE STANDS, SUPPORTS, HANGERS AND OTHER SUPPORTING APPLIANCES AS

BRACKETS, ETC., SHALL BE AS APPROVED BY THE ENGINEER.

E. INSTALLATION REQUIREMENTS FOR HANGERS AND SUPPORTS

MULTIPLE PIPE HANGERS OR TRAPEZE HANGERS.

2. SUPPORT HORIZONTAL PIPING AS SCHEDULED.

CONNECTED HORIZONTAL PIPING.

CONSIDERED EXPOSED

22 07 00 - PLUMBING INSULATION

SMOKE DEVELOPED.

A. PRODUCTS AND APPLICATIONS

THICKNESS.

THICKNESS

A. GENERAL REQUIREMENTS

22 05 48 - VIBRATION AND SEISMIC CONTROLS

B. PROVIDE SEISMIC RESTRAINTS AS REQUIRED BY CODE.

PREFORMED REMOVABLE INSULATION SECTION

K FACTOR OF AT LEAST 0.23 AT 75F MEAN TEMPERATURE.

2. PROVIDE INSULATION FOR THE FOLLOWING SYSTEMS:

MANUFACTURER'S REQUIREMENTS.

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,

ATTACH HANGERS AND SUPPORTS DIRECTLY ONTO THE STRUCTURE BY FIRST REMOVING

EXISTING FIRE PROOFING AND AFTER SECURING THE ATTACHMENT, REPAIRING THE FIRE

SHIELD, LOAD RATED. DO NOT USE DRILLED ANCHORS IN POST TENSION SLABS WITHOUT

3. INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND

5. USE HANGERS WITH 1-1/2 INCH MINIMUM VERTICAL ADJUSTMENT. DESIGN HANGERS FOR

6. SUPPORT VERTICAL PIPING AT EVERY FLOOR. SUPPORT RISER PIPING INDEPENDENTLY OF

7. WHERE INSTALLING SEVERAL PIPES IN PARALLEL AND AT SAME ELEVATION, PROVIDE

9. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS

LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT

10. PROVIDE CLEARANCE IN HANGERS AND FROM STRUCTURE AND OTHER EQUIPMENT FOR

PROVIDE VIBRATION ISOLATION FOR EACH PIECE OF ROTATING OR RECIPROCATING EQUIPMENT

SHOWN ON THE DRAWINGS. ALL ISOLATION COMPONENTS SHALL BE SUPPLIED BY A SINGLE

REQUIRED DEFLECTIONS, AND INSTALLATION PRACTICES SHALL BE IN STRICT ACCORDANCE

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-

RECOMMENDATIONS. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50

2. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH SAME MATERIAL AND TO SAME

1. INSULATION SHALL BE FIBROUS GLASS PIPE INSULATION WITH FACTORY-APPLIED ASJ WITH

a. DOMESTIC HOT WATER PIPE INSULATION: MINIMUM 1 INCH THICKNESS. PROVIDE 1-1/2

b. DOMESTIC COLD WATER: MINIMUM 1/2 INCH THICKNESS. PROVIDE 1 INCH THICKNESS

c. SANITARY PIPING HORIZONTAL ABOVE GROUND WITHIN BUILDING: MINIMUM 1 INCH

d. SANITARY PIPING VERTICAL ABOVE GROUND WITHIN BUILDING: MINIMUM 1 INCH

INCH THICKNESS FOR DOMESTIC HOT WATER PIPES 1-1/2 INCH DIAMETER AND LARGE

3. FOR STRAINERS AND OTHER VALVES OR FITTINGS WHICH NEED MAINTENANCE, PROVIDE

PROTECTION AND OTHER WORK IN STRICT ACCORDANCE WITH MANUFACTURER'S

THICKNESS AS ADJOINING PIPE INSULATION, WITH PRESENT SECTIONS.

4. INCREASE PIPE INSULATION AS REQUIRED FOR PIPING WITH HEAT TRACING PER

FOR COLD WATER PIPES 1-1/2 INCH DIAMETER AND GREATER.

MANUFACTURER - MASON INDUSTRIES KINETICS OR AMBER BOOTH TYPES OF ISOLATORS

PROOFING TO ITS ORIGINAL CONDITION, CONTINUOUSLY OVER THE ATTACHMENT.

APPROVAL OF OWNER. DO NOT CUT REINFORCING STEEL WITH DRILLED INSERTS.

1. INSTALL IN ACCORDANCE WITH ASME B31.9, ASTM F708 AND MSS SP 89.

4. PLACE HANGERS WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.

PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.

8. PROVIDE COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.

INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.

WITH THE RECOMMENDATIONS OF THE VIBRATION ISOLATION MANUFACTURER.

D. FOR EXPANSION BOLTS/SHIELDS USE RED HEAD, HILTI OR WEJ-IT SELF DRILLING OR STEEL

a. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL OR GROOVE PLAIN END FERROUS

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

INSTALL PIPING IN ACCORDANCE WITH ALL APPLICABLE PLUMBING CODES, ASME B31.1, AND

3. INSTALL PIPING TO CONSERVE BUILDING SPACE, AND NOT INTERFERE WITH USE OF SPACE.

INSTALL FIRESTOPPING AT PENETRATIONS OF RATED ASSEMBLIES. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND RATINGS OF RATED ASSEMBLIES.

INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE

9. SLOPE DOMESTIC WATER PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS. USE

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

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

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 95-5 TIN-ANTIMONY OR TIN AND SILVER SOLDER, OR

- BRAZED TYPE WITH AWS A5.8 BCUP ALLOY BRAZE TEES SHALL BE FITTINGS: MECHANICALLY EXTRACTED COLLARS TEES ARE NOT ALLOWED. 2. GROOVED: ASTM B88, TYPE L WITH ROLLED GROOVED ENDS, WITH ASME B16.18 CAST COPPER ALLOY, ASME B16.22 WROUGHT COPPER AND BRONZE, OR ASTM B584 BRONZE SAND CASTINGS, GROOVED END FITTINGS, AND ASTM F1476 GROOVED MECHANICAL COUPLINGS JOINTS WITH ENAMEL COATED ASTM A395 DUCTILE IRON AND ASTM A536 DUCTILE IRON HOUSING 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/GRUVLOK, TYCO/GRINNELL, 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 TH SHOULDER OF THE FITTING. THE FITTING ALIGNMENT SHALL BE CHECKED AGAINST THI 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 C564 RUBBER GASKET JOINT DEVICES OR LEAD AND OAKUM.
- 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 SB5 TINANTIMONY 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 D2564 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, 600 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/ANSI372 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
- . 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, IN-LINE SPRING LIFT CHECK, SILENT CLOSING, DI INTEGRAL SEAT, SOLDERED OR THREADED ENDS. 2-1/2" AND LARGER, MSS SP 125, CLASS 125. LEAD FREE. WAFER 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 BELLOWS MOUNTED OUT OF WATER, ROUGH BRASS FINISH, LEAD FREE BRONZE OR BRASS VALVE BODY.

H. MISCELLANEOUS FITTINGS

- 1. DIELECTRIC WATERWAYS
- a. MANUFACTURERS: TYCO/GRINNELL 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 TEFLON SEATS, BLOW-OUT
- PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, FULL 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 TEFLON SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, CONVENTIONAL PORT.

22 30 00 - PLUMBING EQUIPMENT

H. GENERAL

FIXTURES

LOCATIONS.

WADE, WATTS, WOODFORD, ZURN.

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.

PLUMBING PRODUCTS (PPP), WADE, WATTS, WOODFORD, ZURN.

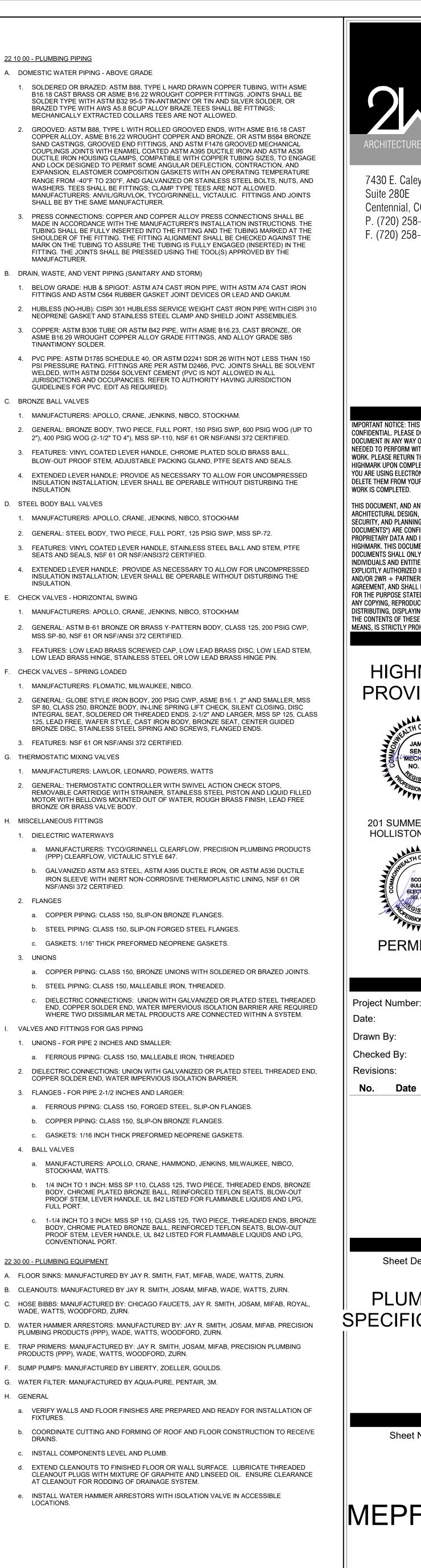
PRODUCTS (PPP), WADE, WATTS, WOODFORD, ZURN.

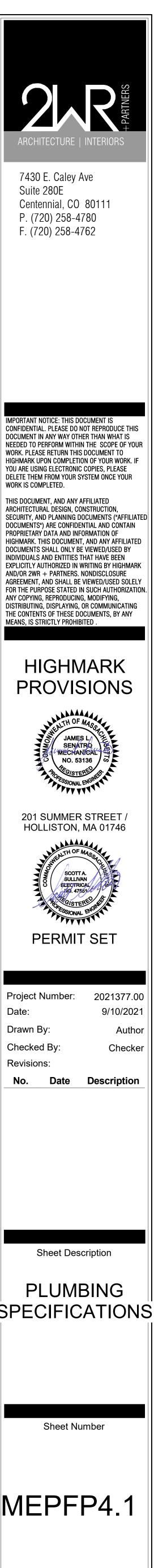
c. INSTALL COMPONENTS LEVEL AND PLUMB.

F. SUMP PUMPS: MANUFACTURED BY LIBERTY, ZOELLER, GOULDS.

AT CLEANOUT FOR RODDING OF DRAINAGE SYSTEM.

G. WATER FILTER: MANUFACTURED BY AQUA-PURE, PENTAIR, 3M.





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 COMPLIMENTARY REQUIREMENTS TO THE SCOPE OF WORK CONTAINED WITHIN DIVISION 23.
- B. DESCRIPTION
- 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 FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE. READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS"
- 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."
- . 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
- 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 OFESETS & 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 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
- E. CODES AND STANDARDS: WORK SHALL CONFORM TO THE CURRENT EDITIONS OF THE FOLLOWING
- SHEET METAL SMACNA STANDARDS INTERNATIONAL MECHANICAL CODE
- INTERNATIONAL ENERGY CONSERVATION CODE INTERNATIONAL EXISTING BUILDING CODE ALL OTHER APPLICABLE STATE AND LOCAL CODES AND ORDINANCES. OWNER STANDARDS AND BASE BUILDING SPECIFICATIONS AND STANDARDS
- F. PERMITS AND FEES:
- . 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.
- G. EXISTING SYSTEMS AND EQUIPMENT
- EXISTING TO BE REUSED/RELOCATED FOUIPMENT. REPORT ANY EXISTING FOUIPMENT DEFICIENCIES TO THE OWNER AND THE ARCHITECT AND/OR ENGINEER.
- 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
- 3. PROVIDE THE FOLLOWING SERVICES ON ALL EXISTING HVAC EQUIPMENT INDICATED TO
- a. CLEAN CONDENSATE PAN AND TRAP CALIBRATE CONTROLS
- FILTER CHANGES VERIFY FAN ROTATION AND OPERATION
- BAI ANCING VERIFY PITCH OF CONDENSATE DRAIN PIPES AND DRAIN PAN VERIEV FOURPMENT CONTROL OPERATION
- LUBRICATION OF FANS, MOTORS, ETC. CLEAN HEATING/COOLING COILS
- H. SURVEY AND MEASUREMENTS
- . 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 GIVERN ALL DIMENSIONS.
- PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT, THOROUGHLY REVIEW THE SITE CONDITIONS TO DETERMINE IF ADEQUATE CLEARANCES AND ACCESS IS ALLOWED TO NSTALL 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.
- . 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
- SUBMIT FOR REVIEW, ELECTRONIC SHOP DRAWINGS IN SEARCHABLE PDF FORMAT FOR THE FOLLOWING.
- SUBMITTAL DATA FOR ALL MATERIAL AND EQUIPMENT. CLEARLY IDENTIFY DEVIATIONS OF THE SUBMITTED PRODUCTS FROM THE DESIGN.
- DUCTWORK SHOP DRAWINGS: DRAWN TO ACCURATE SCALE OF 1/4"=1'0". HIGHLIGHT ENCIRCLE, 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.
- CONTROLS SHOP DRAWINGS: INCLUDE EQUIPMENT AND SYSTEM CONTROL CHEMATICS, SEQUENCES OF OPERATIONS, LOGIC DIAGRAMS AND SYSTEM COMPONENTS
- DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION
- AKEN 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
- 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
- K. OPERATION AND MAINTENANCE
- 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.
- 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 FOI DERS. FOR FOLDED SHEET INFORMATION AND DESIGNATION PARTITIONS WITH IDENTIFICATION TABS. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER.
- . OPERATION AND MAINTENANCE MANUAL SHALL INCLUDE THE FOLLOWING: a. MANUFACTURER'S PRINTED OPERATING AND MAINTENANCE PROCEDURES.
- MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING.
- c. COPIES OF WARRANTIES.
- d. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
- e. BALANCE REPORTS.
- 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.
- 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
- FIGHTNESS. 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.
- 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 FOURPMENT 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

- N. MEANS AND METHODS ALL TRADES
- 1. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. 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 FTC 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
- 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. 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 WATERTIGHT
- 8. PROVIDE FIRESTOPPING AROUND ALL FIRE PROTECTION. PLUMBING, MECHANICAL AND FLECTRICAL 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.
- 9. PROVIDE ACCESS PANELS IN WALLS, FLOORS AND GYPSUM WALL BOARD CEILINGS TO ALLOW ACCESS TO: DAMPERS, VALVES, AND OTHER APPARATUS AND EQUIPMENT 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 05 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: 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 SEALS 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 CHROMIUM-PLATED CAST BRASS, SIZED TO COVER SLEEVE OPENING AND TO ACCOMMODATE PIPE AND INSULATION. 23 05 29 - HANGERS AND SUPPORTS
- 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 (8 FT SPACING). DO NOT SUPPORT RISERS FROM SLEEVES IN SLABS
- 23 05 48 VIBRATION AND SEISMIC CONTROLS FOR HVAC
- PROVIDE VIBRATION ISOLATION FOR EACH PIECE OF ROTATING OR RECIPROCATING HVAC 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
- 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.
- 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; SHUTOFF VALVES; FAUCETS; CONVENIENCE AND LAWN-WATERING HOSE CONNECTIONS; AND HVAC TERMINAL DEVICES AND SIMILAR ROUGHING-IN CONNECTIONS OF END-USE FIXTURES AND UNITS. LIST TAGGED VALVES IN A VALVE SCHEDULE
- MACHINERY SUCH AS CU'S, FANS, ETC., SHALL BE LABELED WITH PLASTIC LABELS WITH ENGRAVED EQUIPMENT NUMBER CORRESPONDING TO DRAWING SCHEDULE NUMBERS. 23 05 93 - TESTING ADJUSTING AND BALANCING
- 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
- 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 HAVE 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.
- PRIOR TO TESTING, ADJUSTING, AND BALANCING, THE MECHANICAL CONTRACTOR SHALL VERIFY THAT THF 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.
- PERFORM TESTING AND BALANCING PROCEDURES ON FACH 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 ALL PUMPING SYSTEMS ALL SUPPLY AIR SYSTEMS
- ALL RETURN AIR SYSTEMS VERIFY OPERATION OF ALL TEMPERATURE CONTROL SYSTEMS
- TEST SYSTEMS FOR PROPER SOUND AND VIBRATION LEVELS 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, ERMINAL 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
- 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.
- FURNISH ALL TEST MEDIUMS AND DISPOSE OF ALL TEST MEDIUMS AT AN APPROVED OFF-SITE LOCATION AFTER TESTING IS COMPLETE.

HORIZONTALLY TOWARDS THE INTERIOR SPACE.

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

THE BALANCING CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL DIRECTIONAL ADJUSTMENT

DIFFUSER SHALL BE DIRECTED VERTICALLY, IF PERIMETER LINEAR DIFFUSERS HAVE MULTIPLE SLOTS THE PERIMETER SLOT DIRECTED VERTICALLY, AND THE INTERIOR SLOT DIRECTED

OF ALL LINEAR DIFFUSERS AS INDICATED ON PLANS. IF NO DIRECTIONAL FLOW IS INDICATED

INTERIOR LINEAR DIFFUSERS SHALL BE DIRECTED HORIZONTALLY AND PERIMETER LINEAR

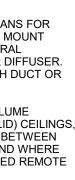
<u>23 C</u>	7 13 - HVAC INSULATION
Δ	GENERAL REQUIREMENTS

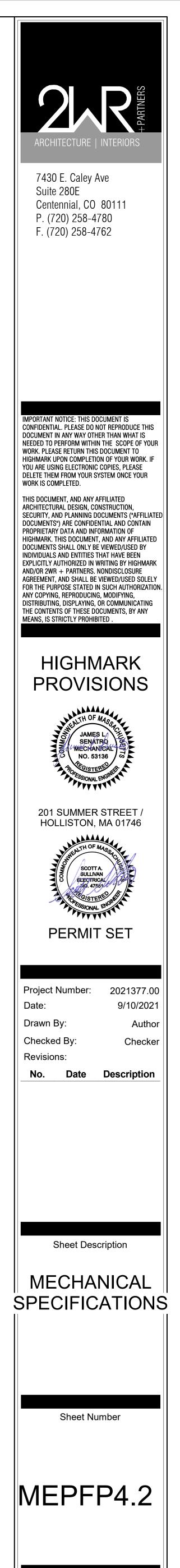
- A. GENERAL REQUIREMENTS INSULATION SHALL BE CERTAIN-TEED, KNAUF, MANVILLE, OR OWENS CORNING. MATERIALS SHALL MEET REQUIREMENTS OF ADHESIVE AND SEALANT COUNCIL STANDARDS AND SMACNA. INSTALL INSULATION, MASTICS, ADHESIVES, COATINGS, COVERS, WEATHER-PROTECTION AND OTHER WORK IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ASTM E-84 FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50
- SMOKE DEVELOPED. 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 TRAPEZE TYPE HANGERS UNDER DUCTS SHALL HAVE 6 LB. DENSITY RIGID INSULATION PROVIDED BETWEEN DUCT AND HANGER INSULATION SHALL BE SAME THICKNESS AND VAPOR BARRIER AS SPECIFIED FOR SPECIFIC
- DUCT TYPE RIGID INSULATION SECTION SHALL BE FULL WIDTH OF DUCT AND MINIMUM 12 LONG. TAPE AND SEAL ALL SEAMS WHERE RIGID INSULATION MEETS OTHER INSULATION. 3. FITTINGS, VALVES AND FLANGES SHALL BE INSULATED WITH SAME MATERIAL AND TO SAME
- HICKNESS AS ADJOINING PIPE INSULATION, WITH PRESENT SECTIONS. 4. FOR STRAINERS AND OTHER VALVES OR FITTINGS WHICH NEED MAINTENANCE, PROVIDE PREFORMED REMOVABLE INSULATION SECTION.
- B. PRODUCTS AND APPLICATIONS
- INDOOR DUCT INSULATION SHALL BE MINERAL FIBER BLANKET DUCT INSULATION WITH FACTORY APPLIED FSK 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 DIFFERENT FROM DUCT TEMPERATURE) 2. OUTDOOR DUCT INSULATION SHALL BE RIGID MINERAL FIBER BOARD DUCT INSULATION WITH FACTORY APPLIED FSK JACKET. PROVIDE MINIMUM OF R-12 (AS INSTALLED) INSULATION FOR SUPPLY, RETURN, EXHAUST AND FRESH AIR DUCTS WHEN LOCATED OUTSIDE THE BUILDING **ENVELOPE**
- REFRIGERANT LINE AND CONDENSATE DRAIN LINE INSULATION SHALL BE 1 INCH THICK LEXIBLE 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 AS J. 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
- a. PROVIDE OUTDOOR PIPING WITH WATERPROOF 0.016" THICK ALUMINUM JACKET WITH 2" TRANSVERSE AND LONGITUDINAL LAPPED SEAMS 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 MOUNTING HEIGHTS ABOVE FINISHED FLOOR IN ACCORDANCE WITH
- "ADA" REQUIREMENTS, OR AS DIRECTED OTHERWISE BY ARCHITECT 2. ALL SAFETY SWITCHES AND CUT OUTS SHALL BE FIELD CALIBRATED AND SET PRIOR TO START-
- UP EQUIPMENT D. ALL CONTROL WIRING SHALL COMPLY WITH THE REQUIREMENTS OF THE ELECTRICAL
- 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

SPECIFICATIONS.

- 1. PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS INDICATED IN SCHEDULE OF PIPE AND FITTING MATERIALS. PROVIDE DIELECTRIC FITTINGS TO CONNECT DIFFERENT PIPING MATERIAI S
- B. SCHEDULE OF PIPE AND FITTING MATERIALS . CONDENSATE DRAIN (INCLUDING PUMPED CONDENSATE): 125 PSI WORKING PRESSURE.
- TYPE L COPPER WITH SOLDERED COPPER JOINTS. 2. REFRIGERANT PIPING: TYPE ACR COPPER
- C. VALVES AND STRAINERS
- 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 PROVIDE CALIBRATED COMBINATION BALANCING SHUT-OFF VALVES AS INDICATED ON THE PLANS. ACCEPTABLE MANUFACTURERS SHALL BE ARMSTRONG, BELL AND GOSSET, FLOWSET, OR TACO.
- E. AUTOMATIC FLOW CONTROL VALVES PROVIDE AUTOMATIC PRESSURE COMPENSATING FLOW CONTROL VALVES BY GRISWOLD, FDI OR T&A 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
- FOR GALVANIZED DUCTWORK, SEAL AIR DUCT JOINTS AND JOINTS BETWEEN FITTINGS AND DUCTS WITH HARDCAST 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 EFLECTED 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. 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 FOUAL DIFFUSER NECK SIZE
- DUCT BRANCH CONNECTIONS AND TAKE OFFS 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 FIMES DUCT WIDTH WHEREVER POSSIBLE. WHERE CENTERLINE RADIUS IS LESS THAN 1.5
- TIMES DUCT WITH, 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 ARCHITECT'S AND/OR ENGINEER'S WRITTEN APPROVAL. B. SHEETMETAL DUCTWORK
- 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"(wg) PRESSURE CLASS, SEAL CLASS A, LEAKAGE CLASS 6. ALL LOW-PRESSURE DUCTWORK BETWEEN TERMINAL DEVICE AND AIR OUTLETS SHALL BE MINIMUM 2"(wg) PRESSURE CLASS. SEAL CLASS B, LEAKAGE CLASS 12
- C. FLEXIBLE DUCTWORK
- 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 VELOCITY OF 4000 FPM. FLEXDUCT MUST BE LISTED AS A CLASS 1 CONNECTOR ACCORDING TO UL 181 AND SHALL MEET THE REQUIREMENTS OF NFPA 90A - MAXIMUM ASTM F-84 FIRE HAZARD RATING SHALL BE 25 FLAME SPREAD 50 FUEL CONTRIBUTED AND 50 SMOKE DEVELOPED. UNINSULATED FLEXIBLE DUCT SHALL BE EQUIVALENT TO FLEXMASTER
- 2. FLEXIBLE DUCT CONNECTED TO INSULATED OR LINED DUCT SHALL BE INSULATED WITH /2 LB. DENSITY FIBERGLASS INSULATION AND FLAME RETARDANT (ULLISTED) VAPOR
- BARRIER MEETING ASTM F-84 RATING AS REFERENCED ABOVE 3. FLEXIBLE DUCTS SHALL NOT EXCEED 5 FEET LONG AND SHALL BE USED FOR STRAIGHT RUN
- ONLY, NO OFFSETS OR TURNS. MAXIMUM SAG OF 1/2" PER 1"-0". I. HANGER AND SADDLE IN CONTACT WITH FLEXIBLE DUCT SHALL BE WIDE ENOUGH TO PREVENT RESTRICTION OF INTERNAL DUCT DIAMETER WHEN WEIGHT OF SUPPORTED
- SECTION RESTS ON HANGER OR SADDLE MATERIAL. 5. COLLARS TO WHICH FLEXIBLE DUCTS ARE ATTACHED SHALL BE AT LEAST 2" LONG. SLEEVES
- FOR JOINING SECTIONS OF FLEXIBLE DUCT SHALL BE AT LEAST 4" LONG. 6. APPLY SEALING COMPOUND TO METALLIC SURFACE AT CONNECTION OF FLEXIBLE DUCT WITH SHEET METAL DUCTS, COLLARS AND MIXING BOXES. SLIP FLEXIBLE DUCTWORK OVER SEALING COMPOUND. COMPLETE SEAL WITH 1/2" WIDE, COMMERCIALLY-MADE METAL DRAW

- 23 33 00 AIR DUCT ACCESSORIES B. ADJUSTABLE MANUAL BALANCING DAMPERS:
- GENERAL: NOT ALL MANUAL BALANCING DAMPERS MAY BE SHOWN ON THE PLANS FOR CLARITY. PROVIDE MANUAL ADJUSTABLE VOLUME DAMPERS, WITH EXTENDED MOUNT INDICATING AND LOCKING QUADRANTS ON EACH SUPPLY, RETURN, AND GENERAL EXHAUST DUCT TAKEOFF. AND AT EACH TAKEOFF TO A REGISTER. GRILLE. OR DIFFUSER DAMPERS SHALL BE LOCATED AS FAR UPSTREAM AS POSSIBLE IN THE BRANCH DUCT OR TAKE OFF TO MINIMIZE DOWNSTREAM NOISE
- REMOTE ADJUSTABLE VOLUME DAMPERS: PROVIDE REMOTE ADJUSTABLE VOLUME DAMPERS IN AREAS WHERE CEILING CAVITY ACCESS IS LIMITED BY HARD (SOLID) CEILINGS EQUIPMENT OBSTRUCTIONS, ARCHITECTURAL FEATURES, ETC. COORDINATE BETWEEN MECHANICAL PLANS AND ARCHITECTURAL CEILING PLANS TO DETERMINE IF AND WHERE REMOTE ADJUSTABLE VOLUME DAMPERS ARE REQUIRED. MANUALLY ADJUSTED REMOTE VOLUME DAMPERS SHALL BE SIMILAR TO YOUNG REGULATOR MODEL 270.
- FLEXIBLE CONNECTIONS
- MAKE ALL CONNECTIONS BETWEEN AIR HANDLING UNITS AND DUCTWORK AND BETWEEN FANS AND DUCTWORK WITH FLEXIBLE CONNECTIONS. FOR INDOOR APPLICATIONS, FLEXIBLE CONNECTIONS SHALL BE NEOPRENE-COATED FIBROUS GLASS FIRE RETARDANT FABRIC, BY VENTFABRICS, OR DURODYNE. FOR OUTDOOR APPLICATIONS, FLEXIBLE CONNECTIONS SHALL BE DUPONT HYPALON-COATED FIBROUS GLASS FIRE-, WEATHER-, AND UV-RESISTANT BY VENTFABRICS OR DURODYNE
- <u>23 34 00 HVAC FANS</u>
- ALL FANS SHALL HAVE THEIR AIR PERFORMANCE RATED IN ACCORDANCE WITH AMCA AND SHALL BE LICENSED TO BEAR THE AMCA SEAL.
- B. ACCEPTABLE MANUFACTURERS: GREENHECK, COOK, TWIN CITY.
- 23 37 00 AIR OUTLETS AND INLETS
- PROVIDE DIFFUSERS, REGISTERS, AND GRILLES FOR SUPPLY, RETURN, AND EXHAUST OUTLETS OF SIZE, TYPE, MATERIAL AND DESIGN SHOWN ON DRAWINGS. ACCEPTABLE MANUFACTURERS: KRUEGER, NAILOR, METALAIRE, TITUS, OR PRICE. SOUND PRESSURE LEVELS SHALL NOT EXCEED NC 30. COLOR AND FINISH SHALL BE SELECTED BY THE ARCHITECT
- B. EXISTING TO REMAIN/BE REUSED DIFFUSERS/REGISTIERS/GRILLES SHALL BE CLEANED, TOUCH-UP PAINTED AND RENDERED IN 'LIKE-NEW-CONDITION' BY THE CONTRACTOR. 23 36 00 - AIR TERMINAL UNITS
- A. ALL BOXES SHALL HAVE PRESSURE INDEPENDENT ELECTRONIC CONTROLLERS AND MULTI-POINT FLOW SENSORS. UNITS SHALL NOT DEVIATE FROM THE SET MINIMUM OR MAXIMUM FLOW SETTINGS BY MORE THAN 10% REGARDLESS OF INLET PRESSURE. INLET VELOCITIES SHALL NOT EXCEED 2000 FPM_SOUND DATA SHALL BE IN ACCORDANCE WITH NOISE CRITERIA DATA SHOWN ON SCHEDULES AND SHALL BE CERTIFIED IN ACCORDANCE WITH ADC STANDARD 1062 BOX AIR LEAKAGE SHALL NOT BE MORE THAN 2% OF MAXIMUM AIRFLOW. PROVIDE INTEGRAL (HOT WATER) (ELECTRIC) REHEAT COILS SIZED AS INDICATED ON DRAWINGS. CASING SHALL BE SALVANIZED STEEL LINED WITH 1-1/2 POUND INSULATION. INSULATION SHALL BE TOTALLY ENCAPSULATED TO PREVENT FIBERS FROM ENTERING AIRSTREAM. PROVIDE CONTROL TRANSFORMER AS REQUIRED. ACCEPTABLE MANUFACTURERS: TITUS, ENVIROTEC, PRICE OR
- KRUFGFR B. FAN-POWERED BOXES SHALL BE PROVIDED WITH FULLY MODULATING EC MOTORS
- 23 81 00 DECENTRALIZED UNITARY HVAC EQUIPMENT A. SPLIT SYSTEM AIR HANDLING UNITS
- 1. PROVIDE COMPLETE DX SYSTEM OF TYPES, SIZES, AND CAPACITIES SHOWN ON SCHEDULES, SYSTEM SHALL CONSIST OF MATCHING AIR COOLED CONDENSER UNITS. COMPRESSORS, PIPING, CONTROLS, WIRING, AND OTHER ACCESSORIES AND APPURTENANCES NECESSARY TO PROVIDE FULLY AUTOMATICALLY FUNCTIONING SYSTEM. ACCEPTABLE MANUFACTURERS: ANNEXAIRE, CARRIER, YORK OR DAIKIN.
- 2. DX AIR CONDITIONING SYSTEM SHALL BE CAPABLE OF STARTING AND OPERATING DOWN TO 0°F AMBIENT. LOW AMBIENT OPERATION SHALL BE ACCOMPLISHED BY VARYING THE SPEED OF CONDENSER FAN BASED ON SENSING OF HEAD PRESSURE IN REFRIGERANT LIQUID LINE. BY MODULATING DAMPER IN CONDENSER FAN DISCHARGE BASED ON REFRIGERANT HEAD PRESSURE SENSING OR BY ELOODING THE CONDENSER COIL WITH LIQUID REERIGERANT TO MAINTAIN THE DESIRED CONDENSER PRESSURE. PROVIDE TIME DELAY RELAY FOR TIMED BYPASS OF THE LOW PRESSURE SWITCH OR OTHER MEANS TO START CONDENSING UNIT AT 0°F WITHOUT NUISANCE SAFETY TRIP UNITS. WHEN SPECIFIED, HOT GAS BYPASS IS TO BE PRE-PIPED INTEGRAL TO THE UNIT.
- PROVIDE REFRIGERANT PIPING BETWEEN AIR-COOLED CONDENSER UNIT AND AIR HANDLING UNIT, PROVIDE ALL NECESSARY AUXILIARIES AND APPURTENANCES. REFRIGERANT PIPING SHALL BE ACR COPPER TUBING WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS. REFRIGERANTS SHALL BE R-410A.
- B. HVAC FANS
- 1. PROVIDE AS SCHEDULED ON THE DRAWINGS, FANS BY THE MANUFACTURER SHOWN OR AN APPROVED EQUAL. 2. CENTRIFUGAL INLINE TYPE (DIRECT DRIVE):
- A. FAN HOUSING CONSTRUCTED OF GALVANIZED SHEET STEEL, SUPPLIED WITH EXTERNALLY MOUNTED ELECTRICAL TERMINAL BOX WITH PRE-WIRED TERMINAL STRIP CONNECTIONS. B. FAN AIRFLOW PERFORMANCE SHALL BE BASED ON AMCA STANDARD 211 AND 311 TESTING C. DEHUMIDIFIERS
- 1. PROVIDE AS SCHEDULED ON THE DRAWINGS, DEHUMIDIFIERS BY THE MANUFACTUERS SHOWN OR AN APPROVED EQUAL 2. PROVIDE WITH EXTERNAL HUMIDISTAT CONTROL





26 00 00 - GENERAL CONDITIONS FOR ELECTRICAL

A. DESCRIPTION

 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 MINIMIZE ANY INCONVENIENCE TO THE BUILDING OCCUPANTS.
 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, 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:

- FURNISH: THE TERM "FURNISH" MEANS TO "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."
 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 DISCONNECTFROM 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 METHODS OF CONSTRUCTION AS PROPOSED BY THE CONTRACTOR AFTER AWARD OF

C. EQUIPMENT EQUIVALENTS AND SUBSTITUTIONS:

THE CONTRACT

- 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 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. WELDED, RIVETED, BOLTED, ETC., CONSTRUCTION
- c. FINISH, UNDERCOATING, CORROSION PROTECTION B. THE EQUIVALENT SHALL PERFORM WITH 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:

- PROVIDE ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO COMPLETE THE WORK OUTLINED ON THESE CONTRACT DOCUMENTS. THE CONTRACTOR IS TO NOTE THAT THESE DOCUMENTS 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 EITHER OF THE DOCUMENTS, THE ITEM OR ARRANGEMENT OF BETTER QUALITY, HIGHER RATING, OR HIGHER VALUE SHALL BE INCLUDED IN THE CONTRACT PRICE. THE OWNER AND ENGINEER SHALL DECIDE ON THE ITEM AND THE MANNER IN WHICH THE WORK SHALL BE INSTALLED.

E. SURVEY AND MEASUREMENTS:

- 1. 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 CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY IDENTIFIED BY EXPERIENCED OBSERVERS. INCLUDE IN THE BID ALL
- DEMOLITION WORK REQUIRED.
 DO NOT SCALE DRAWINGS. SCALE INDICATED ON DRAWINGS IS FOR ESTABLISHING REFERENCE POINTS ONLY. ACTUAL FIELD CONDITIONS SHALL GOVERN ALL DIMENSIONS.
 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. 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:
- STATE BUILDING CODE INCLUDING ALL SUPPLEMENTS.
 STATE FIRE SAFETY CODE INCLUDING ALL SUPPLEMENTS.
- STATE FIRE PREVENTION CODE INCLUDING ALL SUPPLEMENTS
 THE INTERNATIONAL BUILDING CODE
- THE INTERNATIONAL EXISTING BUILDING CODE
 THE INTERNATIONAL FIRE CODE
- THE INTERNATIONAL MECHANICAL CODE
 THE INTERNATIONAL PLUMBING CODE
 THE INTERNATIONAL ENERGY CONSERVATION CODE
- THE INTERNATIONAL ENERGY CONSERVATI
 NFPA 1: FIRE CODE
 NEPA 20: NATIONAL ELECTRICAL CODE WITH
- NFPA 70: NATIONAL ELECTRICAL CODE WITH STATE AMENDMENTS
 NFPA 72: NATIONAL FIRE ALARM AND SIGNALING CODE
 NECA 1: STANDARD FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION

G. PERMITS AND FEES:

14. NETA ATS.

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, 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. SHOP DRAWINGS:

- PROVIDE SHOP DRAWINGS FOR ALL DEVICES SPECIFIED UNDER EQUIPMENT SPECIFICATIONS FOR ALL SYSTEMS INCLUDING FIRE ALARM, SWITCHGEAR, CLOCK, LIGHTING, ETC., OR WHERE CALLED FOR ELSEWHERE IN THE SPECIFICATIONS, OR WHERE SCHEDULED ON THE DRAWINGS, OR WHERE CALLED OUT ON THE DRAWINGS. SHOP DRAWINGS SHALL INCLUDE MANUFACTURERS' NAMES, CATALOG NUMBERS, CUTS, DIAGRAMS, DIMENSIONS, IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED, COMPLIANCE WITH SPECIFIED STANDARDS, NOTATION OF COORDINATION REQUIREMENTS, NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT AND OTHER SUCH DESCRIPTIVE DATA AS MAY BE REQUIRED TO IDENTIFY AND ACCEPT THE EQUIPMENT. A COMPLETE LIST IN EACH CATEGORY (EXAMPLE: ALL FIXTURES) OF ALL SHOP DRAWINGS, CATALOG CUTS, MATERIAL LISTS. ETC., SHALL BE SUBMITTED TO THE ENGINEER AT ONE TIME. NO CONSIDERATION
- WILL BE GIVEN TO A PARTIAL SHOP DRAWING SUBMITTAL.
 SHOP DRAWINGS SHALL INCLUDE EQUIPMENT SUBMITTALS, FABRICATION AND INSTALLATION DRAWINGS, SETTING DIAGRAMS, SCHEDULES, PATTERNS, TEMPLATES AND SIMILAR DRAWINGS. INCLUDE THE FOLLOWING INFORMATION:
- A. DIMENSIONS
 B. WIRING DIAGRAMS AND RISER DIAGRAMS
- C. CALCULATIONS
 D. IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED.
 E. COMPLIANCE WITH SPECIFIED STANDARDS AND PERFORMANCE DATA AS INDICATED.
- COMPLIANCE WITH SPECIFIED STANDARDS AND PERFORMANCE DATA AS INDICATE
 NOTATION OF COORDINATION REQUIREMENTS.
 G NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT.
- H. DO NOT USE SHOP DRAWINGS WITHOUT AN APPROPRIATE FINAL STAMP INDICATING ACTION TAKEN IN CONNECTION WITH CONSTRUCTION.
- DO NOT ORDER ANY MATERIALS OR EQUIPMENT PRIOR TO RECEIVING FINAL APPROVED SHOP DRAWINGS.
 SHOP DRAWINGS SHALL BE IN PDF/OCR FORMAT. PHOTOCOPIES ARE NOT ACCEPTABLE.

I. COORDINATION DRAWINGS:

- PREPARE COORDINATION DRAWINGS AT A SCALE TO MATCH THE CONTRACT DOCUMENT FLOOR PLANS; DETAILING MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF ELECTRICAL EQUIPMENT AND MATERIALS IN RELATIONSHIP WITH OTHER SYSTEMS, INSTALLATIONS, AND BUILDING COMPONENTS. INDICATE LOCATIONS WHERE SPACE IS LIMITED FOR INSTALLATION AND ACCESS AND WHERE SEQUENCING AND COORDINATION OF INSTALLATIONS ARE OF IMPORTANCE TO THE EFFICIENT FLOW OF THE WORK, INCLUDING (BUT NOT NECESSARILY LIMITED TO) THE FOLLOWING:
- A. INDICATE THE PROPOSED LOCATIONS OF LIGHT FIXTURES, PANELBOARDS, CONDUITS, CABINETS, ETC.
 B. CLEARANCES FOR INSTALLING AND MAINTAINING INSULATION.
 C. CLEARANCES FOR SERVICING AND MAINTAINING EQUIPMENT, INCLUDING NEC
- CLEARANCES FOR SERVICING AND MAINTAINING EQUIPMENT, INCLUDING NEC REQUIREMENTS AND SPACE FOR EQUIPMENT DISASSEMBLY REQUIRED FOR PERIODIC MAINTENANCE.
 D. EQUIPMENT CONNECTIONS AND SUPPORT DETAILS.
 E. EXTERIOR WALL AND FOUNDATION PENETRATIONS.
- E. EXTERIOR WALL AND FOUNDATION PENETRATIONS.
 F. FIRE-RATED WALL AND FLOOR PENETRATIONS.
 G. SIZES AND LOCATIONS OF REQUIRED CONCRETE PADS AND BASES.
- SIZES AND ECCATIONS OF REQUINED CONCRETE FADS AND DASES.
 INDICATE SCHEDULING, SEQUENCING, MOVEMENT, AND POSITIONING OF LARGE EQUIPMENT INTO THE BUILDING DURING CONSTRUCTION.
- 3. PREPARE FLOOR PLANS, ELEVATIONS, AND DETAILS TO INDICATE PENETRATIONS IN FLOORS, WALLS, AND CEILINGS AND THEIR RELATIONSHIP TO OTHER PENETRATIONS AND
- INSTALLATIONS.
 PREPARE REFLECTED CEILING PLANS TO COORDINATE AND INTEGRATE INSTALLATIONS, AIR OUTLETS AND INLETS. LIGHT FIXTURES. COMMUNICATION SYSTEMS COMPONENTS,

SPRINKLERS, AND OTHER CEILING-MOUNTED ITEMS. J. AS-BUILT DRAWINGS:

- PREPARE AS-BUILT DRAWINGS TO A SCALE TO MATCH THE CONTRACT DOCUMENT FLOOR PLANS; DETAILING THE ACTUAL INSTALLATION OF MAJOR ELEMENTS, COMPONENTS, AND SYSTEMS OF MECHANICAL EQUIPMENT AND MATERIALS. WHERE SHOP DRAWINGS ARE USED, RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE AS-BUILT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD AT A LATER DATE.
 MARK NEW INFORMATION THAT IS IMPORTANT TO THE OWNER, BUT WAS NOT SHOWN ON
- CONTRACT DRAWINGS OR SHOP DRAWINGS.
 3. NOTE RELATED CHANGE ORDER NUMBERS WHERE APPLICABLE.
 4. FINAL RECORD DOCUMENTS SHALL BE PREPARED IN THE LATEST AUTOCAD VERSION AND DIGITAL MEDIA FOR ALL DRAWINGS AND A CLEAN SET OF REPRODUCIBLE PAPER COPIES

SHALL BE TURNED OVER TO THE OWNER AT THE COMPLETION OF THE WORK.

- K. OPERATIONS AND MAINTENANCE MANUALS:
- 1. THE CONTRACTOR SHALL PREPARE (1) PDF COPY AND (3) HARD COPIES OF A COMPLETE MAINTENANCE AND OPERATING INSTRUCTIONS 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. MARK APPROPRIATE
- IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER. MANUAL SHALL INCLUDE THE FOLLOWING: A. DESCRIPTION OF FUNCTION, NORMAL OPERATING CHARACTERISTICS AND LIMITATIONS
- PERFORMANCE CURVES, ENGINEERING DATA AND TESTS, AND COMPLETE NOMENCLATURE AND COMMERCIAL NUMBERS OF REPLACEMENT PARTS. B. MANUFACTURER'S PRINTED OPERATING PROCEDURES TO INCLUDE START-UP, BREAK-IN,
- AND ROUTINE AND NORMAL OPERATING INSTRUCTIONS; REGULATION, CONTROL, STOPPING, SHUTDOWN, AND EMERGENCY INSTRUCTIONS; AND SUMMER AND WINTER OPERATING INSTRUCTIONS.
- C. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING; DISASSEMBLY, REPAIR, AND REASSEMBLY; ALIGNING AND ADJUSTING INSTRUCTIONS.
- SERVICING INSTRUCTIONS AND LUBRICATION CHARTS AND SCHEDULES. EMERGENCY INSTRUCTIONS.
- F. SPARE PARTS LIST.G. COPIES OF WARRANTIES.H. WIRING DIAGRAMS.
- RECOMMENDED "TURN AROUND" CYCLES.
 INSPECTION PROCEDURES.
 APPROVED SHOP DRAWINGS AND PRODUCT DATA.
- L. EQUIPMENT START-UP REPORTS. L. WARRANTIES
- ALL EQUIPMENT PROVIDED IN THIS PROJECT SHALL CARRY A MANUFACTURER'S WARRANTY FOR NO LESS THAN ONE(1) YEAR FROM DATE OF BENEFICIAL USE - UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
 MISCELLANEOUS REQUIREMENTS:
- THE CONTRACTOR SHALL COORDINATE ALL INTERRUPTIONS OF SERVICES AND LIMITATIONS OF ACCESS WITH THE OWNER NO LESS THAN (5) DAYS PRIOR TO THE INTERRUPTION
- OBTAIN IN OWNER'S NAME WRITTEN EQUIPMENT AND MATERIAL WARRANTIES OFFERED IN MANUFACTURER'S PUBLISHED PRODUCT DATA WITHOUT EXCLUSION OR LIMITATION.
 CLUBRANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN OF
- 3. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF BENEFICIAL USE. 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 REPAIRSAND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE
 4. SUBMIT TO THE OWNER AN OFFICIAL CERTIFICATE OF INSURANCE FOR THEIR RECORDS.
 <u>26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL</u>

A. ELECTRICAL ACCEPTANCE TESTING

- 1. TESTING SHALL BE PERFORMED ON ELECTRICAL EQUIPMENT AND SYSTEMS TO ASSURE THE EQUIPMENT AND SYSTEMS ARE OPERATIONAL AND WITHIN APPLICABLE STANDARDS AND MANUFACTURING TOLERANCES. TESTING SHOULD VERIFY THAT EQUIPMENT AND SYSTEMS ARE INSTALLED IN ACCORDANCE WITH DESIGN SPECIFICATIONS. ALL TESTING SHALL OCCUR AT THE BUILDING SITE.
- 2. QUALIFIED TECHNICIANS WHO ARE TRAINED AND REGULARLY EMPLOYED FOR TESTING SERVICES SHALL DO ALL THE TESTING.
- THE TESTING ORGANIZATION SHALL CONFORM TO THE GENERAL GUIDLEINS OF SECTION 5 OF THE LATEST NETA ACCEPTANCE TESING SPECIFICATIONS. THIS INCLUDES THE FOLLOWING:

 a. SAFETY AND PRECAUTIONS.
- b. SUITABILITY OF TEST EQUIPMENTc. TEST INSTURMENT CALIBRATION.d. TEST REPORTS
- 4. NOTIFY THE ARCHITECT, ENGINEER AND OWNER AT LEAST SEVEN (7) DAYS IN ADVANCE OF ANY TESTING.
- INSPECTION AND TESTING OF ALL APPLICABLE ELECTRICAL EQUIPMENT LISTED BELOW SHALL BE DONE IN ACCORDANCE WITH THE LATEST VERSION OF NETA ATS.
 a. SWITCHBOARDS AND SWITCHGEAR ASSEMBLIES.
 b. TRANSFORMERS.
 c. CABLES
- d. LOW VOLTAGE CIRCUIT BREAKERS.
- C. ELECTRICAL POWER CONDUCTORS AND CABLES
- COORDINATION:

 a. COORDINATE SIZES OF RACEWAYS, BOXES, AND EQUIPMENT ENCLOSURES INSTALLED UNDER OTHER SECTIONS WITH THE ACTUAL CONDUCTORS TO BE INSTALLED, INCLUDING ADJUSTMENTS FOR CONDUCTOR SIZES INCREASED FOR VOLTAGE DROP.
 b. COORDINATE WITH ELECTRICAL EQUIPMENT INSTALLED UNDER OTHER SECTIONS TO
- PROVIDE TERMINATIONS SUITABLE FOR USE WITH THE CONDUCTORS TO BE INSTALLED.
- 2. PROVIDE SINGLE CONDUCTOR BUILDING WIRE INSTALLED IN SUITABLE REACEWAY UNLESS OTHERWISE INDICATED, PERMITTED OR REQUIRED.
- 3. CONDUCTOR SIZES AND AMPACITIES SHOWN ARE BASED ON COPPER.
- 4. MINIMUM CONDUCTOR SIZES: a. BRANCH CIRCUITS: 12 AWG
- 20A, 120V CIRCUITS LONGER THAN 75 FEET 10 AWG MINUMUM AND SIZED FOR VOLTAGE DROP.
 20A, 120V CIRCUITS LONGER THAN 150 FEET - 8 AWG AND SIZED FOR VOLTAGE DROP.
 20A, 277V CIRCUITS LONGER THAN 150 FEET - 10 AWG MINIMUM AND SIZED FOR VOLTAGE DROP.
 CONTROL CIRCUITS: 14 AWG.
- CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER SHALL BE SOLID ANNEALED COPPER, EXCEPT THAT CONDUCTORS FOR REMOTE CONTROL, ALARM, AND SIGNAL CIRCUITS, CLASSES 1, 2, AND 3, SHALL BE STRANDED UNLESS SPECIFICALLY INDICATED OTHERWISE.
 CONDUCTORS NO. 8 AWG AND LARGER DIAMETER SHALL BE STRANDED ANNEALED COPPER.
- 7. UNLESS SPECIFIED OR INDICATED OTHERWISE OR REQUIRED BY NFPA 70, POWER AND LIGHTING WIRES SHALL BE 600-VOLT, TYPE THWN/THHN OR THWN/THWN-2 ANNEALED COPPER, CONTROL AND SIGNAL CIRCUITS SHALL BE TYPE TW, THW, OR TF ANNEALED COPPER. UNDERGROUND CONDUCTORS SHALL BE TYPE XHHW-2.
- WHERE LIGHTING FIXTURES REQUIRE 90 DEGREES C CONDUCTORS, PROVIDE ONLY CONDUCTORS WITH 90 DEGREE C INSULATION OR BETTER.
 MAKE ALL SPLICES IN ACCESSIBLE LOCATIONS. MAKE SPLICES IN CONDUCTORS NO. 10 AWG
- AND SMALLER DIAMETER WITH INSULATED, SPRING WIRE CONNECTORS WITH PLASTIC CAPS. MAKE SPLICES IN CONDUCTORS NO. 8 AWG AND LARGER DIAMETER WITH SOLDERLESS PRESSURE CONNECTORS WITH INSULATING COVERS. MAKE SPLICES IN CONDUCTORS NO. 6 AND LARGER WITH PRESSURE CONNECTYORS OR SPLIT BOLT CONNECTORS.
- 10. MAKE WIRE TERMINATIONS USING CRIMPED TERMINALS FOR CONDUCTORS NO. 10 AND SMALLER. MAKE WIRE TERMINATIONS FOR CONDUCTORS NO. 8 AND LARGER USING MECHANICAL OR PRESSURE CONNECTORS. PROVIDE SUITABLE REDUCERS WHERE OVERSIZED CONDUCTORS ARE LARGER THAN THE EQUIPMENT TERMINATION.
- PHASE CONDUCTORS SHALL BE IDENTIFIED BY COLOR CODING. THE COLOR OF THE INSULATION ON PHASES A, B, AND C RESPECTIVELY (FOR THREE PHASE) OR PHASES A AND B RESPECTIVELY (FOR SINGLE PHASE) OF DIFFERENT VOLTAGE SYSTEMS SHALL BE AS FOLLOWS:

 a. 120/208 VOLT, THREE PHASE: BLACK, RED, AND BLUE.
 b. 277/480 VOLT, THREE PHASE: BROWN, ORANGE, AND YELLOW.
- 12. UNLESS OTHERWISE INDICATED, THE WIRING METHOD SHALL CONSIST OF THE INSTALLATION OF INSULATED CONDUCTORS INSTALLED IN ELECTRICAL METALLIC AND/OR WIREMOLD RACEWAY.
- METALLIC-ARMORED TYPE MC CABLES, WHERE ALLOWED, SHALL SHALL INCLUDE 600V INSULATION RATING, TYPE THHN/THWN-2 COPPER CONDUCTORS, DEDICATED NEUTRAL CONDUCTOR AND STEEL INTERLOCKING ARMOR. USES PERMITTED:

 WHERE CONCEALED ABOVE ACCESSIBLE CEILINGS FOR FINAL CONNECTIONS TO LUMINAIRES (MAXIMUM LENGTH 6 FEET).
 WHERE CONCEALED IN HOLLOW STUD WALLS, ABOVE ACCESSIBLE CEILINGS, AND UNDER RAISED FLOOR FOR BRANCH CICUITS UP TO 20A.
- c. EXCEPTION: PROVIDE SINGLE CONDUCTOR BUILDING WIRING IN RACEWAY FOR CIRCUIT HOMERUN FROM FIRST DEVICE IN SPACE TO PANELBOARD.
 14. PROVIDE INSULATED, GREEN EQUIPMENT GROUNDING CONDUCTOR IN FEEDER AND BRANCH
- CIRCUITS, INSTALLED IN CONDUIT OR RACEWAYS, INCLUDING LIGHTING CIRCUITS. GROUNDING CONDUCTOR SHALL BE SEPARATE FROM ELECTRICAL SYSTEM NEUTRAL CONDUCTOR. GROUNDING
- 1. GROUNDING SHALL BE COMPLETED IN ACCORDANCE WITH NFPA 70. GROUND EXPOSED, NON-CURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN METALLIC AND NONMETALLIC RACEWAYS AND NEUTRAL CONDUCTOR OF WIRING SYSTEMS. WHERE GROUND FAULT PROTECTION IS EMPLOYED, ENSURE THAT CONNECTION OF GROUND AND NEUTRAL DOES NOT INTERFERE WITH CORRECT OPERATION OF FAULT PROTECTION.
- 2. EXISTING WORK: WHERE EXISTING GROUNDING AND BONDING SYSTEM COMPONENTS ARE INDICATED TO BE REUSED, THEY MAY BE REUSED ONLY WHERE THEY ARE FREE FROM CORROSION, INTEGRITY AND CONTINUITY ARE VERIFIED, AND WHERE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
- 3. WHERE CONDUCTOR SIZE IS NOT INDICATED, SIZE TO COMPY WITH NFPA 70.
- 4. USE INSULATED COPPER CONDUCTORS UNLESS OTHERWISE INDICATED. USE BARE COPPER CONDUCTORS WHERE INSTALLED UNDERGROUND OR ENCASED IN CONCRETE.
- USE LISTED MECHANICAL CONNECTORS, COMPRESSION CONNECTORS OR EXOTHERMIC WELDED CONNECTIONS FOR ACCESSIBLE CONNECTIONS. USE EXOTHERMIC WELDED CONNECTIONS FOR UNDERGROUND, CONCEALED OR OTHERWISE INACCESSIBLE CONNECTIONS.
- 6. GRONDING ELECTRODE SYSTEM: PROVIDE CONNECTION TO REQUIRED AND SUPPLEMENTAL GROUNDING ELECTRODES INDICATED TO FORM GROUNDING ELECTRODE SYSTEM. PROVIDE CONTINUOUS GROUNDING ELECTRODE CONDUCTORS WITHOUT SPLICE OR JOINT. INSTALL GROUNDING ELECTRODE CONDUTORS IN RACEWAY WHERE EXPOSED OR SUBJECT TO PHYSICAL DAMAGE. BOND GRONDING ELECTRODE CONDUCTOR TO METALLIC RACEWAY AT EACH END WITH BONDING JUMPER.
- 7. SEPARATELY DERIVED SYSTEM GROUNDING: PROVIDE GROUNDING ELECTRODE CONDUCTOR TO CONNECT DERIVED SYSTEM GROUNDED CONDUCTOR TO NEAREST EFFECTIVELY GROUNDED METAL BUILDING FRAME. PROVIDE SYSTEM BONDING JUMPER TO CONNECT SYSTEM GROUNDED CONDUCTOR TO EQUIPMENT GROUNDING BUS. MAKE CONNECTION AT SAME LOCATION AS GROUDING ELECTRODE CONDUCTOR CONNECTION. WHERE GROUNDED METAL BUILDING FRAME DOES NOT EXIST, BOND TO METAL WATER PIPE AT POINT OF ENTRY TO BUILDING.

E. HANGERS AND SUPPORTS PROVIDE ALL REQUIRED HANGERS, SUPPORTS, ANCHORS, FASTENERS, FITTINGS ACCESORIES AND HARDWARE NECESSARY FOR THE COMPLETE INSTALLATION OF THE ELECTRICAL WORK. HANGERS AND SUPPORTS SHALL MEET ASTM STANARDS FOR COATINGS, NECA 1 STANDARDS FOR WORKMANSHIP, NFPA 70, AND UL 5B FOR STRUT-TYPE CHANNEL RACEWAY AND FITTINGS WHERE SUPPORT AND ATTACHMENT COMPONENT TYPES AND SIZES ARE NOT INIDCATED. SELECT IN ACCORDANCE WITH MANUFACTURER'S APLICATION CRITERIA AS REQUIRED FOR THE LOAD TO BE SUPPORTED. STEEL COMPONENTS: USE CORROSION RESISTANT MATERIALS SUITABLE FOR THE ENVIRONMENT WHERE INSTALLED. USE ZINC-PLATED STELL FOR INDOOR DRY LOCATIONS. USE GALVANIZED STEEL, STAINLESS STEEL, FIBERGLASS OR APPROVED EQUIVALENT FOR UTDOOR, DAMP AND WET LOCATION INSTALLATIONS. 5 CONDUIT AND CABLE SUPPORTS CONDUIT STRAPS: ONE-HOLE OR TWO-HOLE, ZINC PLATED. b. CONDUIT CLAMPS: BOLTED TYPE. 6. OUTLET BOX SUPPORTS: HANGERS AND BRACKETS SUITABLE FOR BOXES TO BE METAL CHANNEL (STRUT) FRAMING SYSTEMS: FACOTRY FABRICATED CONTINUOUS-SLOTTEDE METAL CHANNEL AND ASSOCIATED FITTINGS, ACCESSORIES, AND HARDWARE FOR FIELD-ASSEMBLY OF SUPPORTS. ALL LOCATIONS: USE 12 GA. GALVANIZED STEEL. 8. HANGER RODS: CONTINUOUS THREADING, ZINC-PLATED STEEL. USE OF POWER-ACTUATED FASTENERS REQUIRES APPROVAL OF ARCHITECT AND STRUCTURAL ENGINEEER. 10. UNLESS SPECIFICALLY INDICATED, DO NOT SUPPORT ANY ELECTRICAL COMPONENT FROM THE ROOF DECK. 11. PLASTIC AND LEAD ANCHORS ARE NOT PERMITTED. RACEWAYS AND BOXES PROVIDE A COMPLETE WIRING SYSTEM OF RACEWAYS AND BOXES LOCATED AS INDICATED ON DRAWINGS AND AT LOCATIONS AS REQUIRED FOR SPLICES. TAPS, WIRE PULLING EQUIPMENT CONNECTIONS AND COMPLIANCE WITH REGULATORY REQUIREMENTS. LOCATIONS INDICATED ON DRAWINGS ARE APPROXIMATE UNLESS DIMENSIONED. STANDARDS: MATERIALS SHALL COMPLY WITH ANSI C80.(X), NEMA AND UL REQUIREMENTS AS APPLICABLE FOR TYPE AND MATERIAL. 3. MINIMUM CONDUIT SIZE, UNLESS OTHERWISE NOTED: INTERIOR - 3/4", EXTERIOR EXPOSED -3/4". EXTERIOR UNDERGROUND - 1". 4. CONDUIT APPLICATIONS a. UNDERGROUND 1) EXTERIOR IN TRENCH - USE SCHEULDE 40 OR SCHEDULE 80 PVC CONDUIT WITH RIGID METAL CONDUIT SWEEPS. CONCEALED IN MASONRY WALLS: USE EMT WITH FLUSH MOUNTED MASONRY BOXES. c. CONCEALED IN HOLLOW STUD WALLS: USE EMT CONDUIT OR MC CABLE (WHERE ALLOWED), PROVIDE FLUSH SHEET-METAL BOXES d. INTERIOR DAMP OR WET LOCATIONS: USE RIGID METAL CONDUIT, INTERMEDIATE METAL CONDUIT OR SCHEDULE 40 PVC CONDUIT. PROVIDE CAST METAL OR NONMETALLIC OUTLET, JUNCTION AND PULL BOXES. EXPOSED, INTERIOR DRY LOCATIONS: USE EMT CONDUIT. EXPOSED FINISHED LOCATIONS: PROVIDE SURFACE METAL RACEWAY AND FITTINGS UNLESS SPECIFIED ON DRAWINGS, REQUIRES DESIGN TEAM APPROVAL. COORDINATE ALL VERTICAL RUNS OF SURFACE RACEWAY WITH ARCHITECT PRIOR TO INSTALLATION g. CONNECTIONS TO LUMINAIRES ABOVE ACCESSIBLE CEILINGS: USE FLEXIBLE METAL CONDUIT. MAXIMUM LENGTH OF 6 FEET. h. CONNECTIONS TO VIBRATING EQUIPMENT: DRY LOCATIONS - USE FLEXIBLE METAL CONDUIT OR MC CABLE; DAMP, WET OR CORROSIVE LOCATIONS - USE LIQUIDTIGHT FLEXIBLE METAL CONDUIT; MAXIMUM LENGTH 6 FEET 5. FITTINGS a. EMT - COMPLY WITH NEMA FB 1 AND UL 514B. STEEL WITH COMPRESSION FITTINGS IN DAMP OR WET LOCATIONS, SET SCREW TYPE FLSEWHERE RIGID METAL CONDUIT - COMPLY WITH ANSI C80.1 AND UL 6. THREADED STEEL OR MALLEABLE IRON. USE FITING LISTED AND LABELED AS COMPLYING WITH UL 514B IN HAZARDOUS LOCATIONS. c. FLEXIBLE METAL CONDUIT - COMPLY WITH NEMA FB 1 AND UL 514B. USE STEEL d. LIQUIDTIGHT FLEXIBLE METAL CONDUIT - COMPLY WITH NEMA FB 1 AND UL 514B. USE STEEL FITTINGS e SURFACE METAL RACEWAY - PROVIDE FITTINGS FROM SAME MANUFACTUERER AS SURFACE RACEWAY. INCLUDE ALL REQUIRED ELBOWS, COUPLINGS MOUNTING CLIPS, COVERS, END FITTINGS AND DEVICE MOUNTING BRACKETS. 6. BOXES: WHERE A BOX SIZE IS NOT INDICATED, SIZE TO COMPLY WITH NFPA 70, BUT NOT LESS THAN APPLICABLE MINIMUM SIZE SPECIFIED a. USE SHEET METAL STEEL BOXES IN DRY LOCATIONS USE CAST IRON OR CAST ALUMINUM BOXES WITH THREADED HUBS WHERE EXPOSED RIGID METAL CONDUIT IS USED c. USE NONMETALLIC BOXES WHERE EXPOSED RIGID PVC DONUIT IS USED. USE SUITABLE CONCRETE TYPE BOXES WHERE FLUSH-MOUNTED IN CONCRETE. USE SUITABLE MASONRY TYPE BOXES WHERE FLUSH-MOUNTED IN MASONRY WALLS. USE RAISED COVERS SUITABLE FOR TYPE OF WALL CONSTRUCTION AND DEVICE CONFIGURATION WHERE REQUIRED USE MULTI-GANG BOXES OF SINGLE-PIECE CONSTRUCTION, DO NOT USE FIELD-

- MINIMUM BOX SIZE, UNLESS OTHERWISE INDICATED: WIRING DEVICE 4 INCH SQUARE BY 1-1/2" DEEP; COMMUNICATIONS SYSTEM OUTLET 4 INCH SQUARE BY 2-1/8" DEEP.
- CABINETS AND ENCLOSURES: COMPLY WITH NEMA 250, UL 50 AND UL 50E OR UL 508A.
 a. USE NEMA TYPE 1, PAINTED STEEL FOR INDOOR CLEAN, DRY LOCATIONS.
 b. USE NEMA TYPE 3R, PAINTED STEEL FOR OUTDOOR AND WET LOCATIONS.
 c. PROVIDE SCREW COVER ENCLOSURES FOR PULL AND JUNCTION BOXES.
 d. PROVIDE LOCKABLE, HINGE COVER TYPE FOR EQUIPMENT ENCLOSURES.
- 8. MECHANICAL SLEEVE SEALS: MODULAR MECHANICAL TYPE, WITH INTERLOCKING RUBBER LINKS SHAPED TO COMNTINUOUSLY FOILL ANULAR SPACE BETWEEN OBJECTS AND SLEEVE, CONNECTED WITH BOLTS AND PRESSURE PLATES TO PROVIDE A WATERTIGHT SEAL AND ELECTRICAL INSULATION.
- REMOVE EXPOSED ABANDONED RACEWAY, INCLUDING ABANDONED RACEWAY ABOVE ACCESSIBLE CEILING FINISHES. CUT RACEWAY FLUSGH WITH WALLS AND FLOORS, PATCH SURFACES TO MATCH ADJACENT SURFACES.
- DISCONNECT AND REMOVE ABANDONED OUTLETS AND DEVICES.
 INSTALL BLANK PLATES ON ABANDONED, EMPTY BOXES.

ONNECTED GANGABLE BOXES.

- EXTEND EXISTING RACEWAY AND BOX INSTALLATION USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATION OR AS SPECIFIED.
 IDENTIFICATION FOR ELECTRICAL SYSTEMS
- EXISTING WORK: UNLESS SPECIFICALLY EXCLUDED, IDENTIFY EXISTING ELEMENTS TO REMAIN THAT ARE NOT ALREADY IDENTIFIED IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS.
- USE IDENTIFICATION NAMEPLATES TO IDENTIFY EACH PIECE OF ELECRICAL DISTRIBUTION AND CONTROL EQUIPMENT AND ASSOCIATED SECTIONS, COMPARTMENTS AND COMPONENTS. IDENTIFY: NAME, AMPERE RATING, LOADS SERVED (DISCONECT SWITCHES, ENCLOSED CONTROLLERS, AND TRANSFORMERS ONLY), VOLTAGE AND PHASE, AND POWER SOURCE/CIRCUIT NUMBER. INCLUDE LOCATION OF SOURCE/LOAD SERVED IF NOT WITHIN SIGHT OF EQUIPMENT
- 9. PROVIDE LAMINATED ACRYLIC OR NON-CONDUCTIVE PHENOLIC WITH BEVELED EDGES. NAMEPLATES FOR EACH EQUIPMENT ENCLOSURE, RELAY, SWITCH, AND DEVICE. NAMEPLATES SHALL BE, 1/8" THICK, WHITE WITH BLACK CENTER CORE, MATTE FINISH SURFACE, BEVELED EDGES, SQUARE CORNERS. ACCURATELY ALIGN LETTERING AND ENGRAVE INTO THE CORE. MINIMUM SIZE OF NAMEPLATES SHALL BE 1" BY 2-1/2". LETTERING SHALL BE A MINIMUM OF 1/4" HIGH NORMAL BLOCK STYLE.
- . PROVIDE WIRE AND CABLE MARKERS OR IDENTIFICATION LABELS TO IDENTIFY CIRCUIT NUMBER AT EACH SOURCE LOCATION; WITHIN BOXES WHERE MORE THAN ONE CIRCUIT IS PRESENT; WITHIN EQUIPMENT ENCLOSURES WHERE CONDUCTORS ENTER AND EXIT THE ENCLOSURE; AND IN CABLE TRAYS (MAXIMUM 20 FT. INTERVALS). PROVIDE WRAP-AROUND SELF-ADHESIVE VINYL CLOTH, WRAP-AROUND SELF-ADHESIVE VINYL SELF-LAMINATING, HEAT-SHRINK SLEEVE, PLASTIC SLEEVE, PLASTIC CLIP-ON, OR VINYL SPLIT SLEEVE TYPE MARKERS SUITABLE FOR THE CONDUCTOR OR CABLE TO BE IDENTIFIED.
- PROVIDE VOLTAGE MARKERS TO IDENTIFY HIGHEST VOLTAGE PRESENT FOR ACCESSIBLE CONDUITS (MAXIMUM 20 FT. INTERVALS).
 PROVIDE PRE-LABELED, SNAP AROUND PIPE MARKERS ON ALL CONDUITS. MARKERS SHALL
- COMPLY WITH ANSI A 13.1-1988 STANDARDS AND INDICATED VOLTAGE.
 WARNING LABELS: USE FACTORY PRE-PRINTED OR MACHINE-PRINTED SELF-ADHESIVE POLYESTER OR SELF-ADHESIVE VINYL LABELS; UV, CHEMICAL, WATER, HEAT AND ABRASION RESISTANT.
- 8. CLEAN SURFACES TO RECIEVE ADHESIVE PRODUCTS ACCORDING TO MANUFACTURERS INSTRUCTIONS.
- INSTALL IDENTIFICATION PRODUCTS TO BE PLAINLY VISIBLE FOR EXAMINATION, ADJUSTMENT, SERVICING AND MAINTENANCE.
- 10. INSTALL IDENTIFICATION PRODUCTS CENTERED, LEVEL AND PARALLEL WITH LINES OF ITEM BEING IDENTIFIED.

H. WIRING DEVICES1. RECEPTACLES:

- a. SELF-GROUNDING COMPLYING WITH NEMA WD 1 AND NEMA WD 6 AND LISTED COMPLYING WITH UL 498.
- b. SINGLE AND DUPLEX RECEPTACLES SHALL BE RATED 20 AMPERES, 125 VOLTS, TWO-POLE, THREE-WIRE, GROUNDING TYPE WITH POLARIZED PARALLEL SLOTS.
 b. COLOR OF BODIES SHALL BE SELECTED BY THE ARCHITECT.
- c. RECEPTACLE SHALL BE SIDE-WIRED OR BACK-WIRED WITH TWO SCREWS PER TERMINAL. THE THIRD GROUNDING POLE SHALL BE CONNECTED TO THE METAL MOUNTING YOKF
- d. RECEPTACLES WITH GROUND FAULT CIRCUIT INTERRUPTERS SHALL HAVE THE CURRENT RATING AS INDICATED, AND SHALL BE UL 943, CLASS A TYPE UNLESS OTHERWISE
- e. GROUND FAULT CIRCUIT PROTECTION SHALL BE PROVIDED AS REQUIRED BY NFPA 70 OR AS INDICATED ON THE DRAWINGS.
- f. USB CHARGING DEVICES: PROVIDE DEVICES LIASTED PER UL 1310 WITH TWO-PORT CHARGING CAPACITY OF 2.1 A, MINIMUM OR 4.2 A MINIMUM FOR FOUR-PORT DEVICES.
 g. LOCKING DEVICES: REFER TO DRAWINGS FOR NEMA LOCKING CONIFGURATIONS.
- MOUNT RECEPTACLES AND DATA OUTLETS 18" ABOVE FINISHED FLOOR, AND OTHER DEVICES AS INDICATED. MEASURE MOUNTING HEIGHTS OF WIRING DEVICES AND OUTLETS TO TOP OF DEVICE OR OUTLET.
- . PROVIDE TAMPER RESISTANT RECEPTACLES WHERE INDICATED ON DRAWINGS.
- LINE VOLTAGE WALL SWITCHES:
 a. AC ONLY, QUIET OPERATING GENERAL USE SNAP SWITCHES WITH SILVER ALLOY CONTACTS COMPLYING WITH NEMA WD 1 AND NEMA WD 6 AND UL 20, TYPE AS
- INDICATED ON DRAWINGS.
 b. INDUSTRIAL SPECIFICATION GRADE, 20A, 120/277 V WITH STANDARD TOGGLE TYPE SWITCH ACTUATOR AND MAINTAINED CONTACTS. SINGLE POLE SINGLE THROW,
- THREE-WAY, OR FOUR-WAY AS INDICATED ON DRAWINGS.b. COLOR OF BODIES SHALL BE SELECTED BY THE ARCHITECT.
- c. SWITCH SHALL BE SIDE-WIRED OR BACK-WIRED WITH BINDING CLAMP, WITH SEPARATE GROUND SREW TERMINAL.
 d. LOCKING (KEYED) TYPE SWITCHES SHALL INCLUDE LEVER TYPE THREE POSITION SWITCH ACTUATOR WITH OFF POSITION IN CENTER.
- LINE VOLTAGE DIMMER SWITCHES:

 SOLID-STATE WITH CONTINUOUS FULL-RANGE EVEN CONTROLL FOLLOWING SQUARE LAW DIMMING CURVE WITH INTEGRAL RF INTERFERENCE FILTERING, POWER FAILURE PRESET MEMORY AND AIRE GAP SWITCH COMPLYING WITH NEMA WD 1 AND NEMA WD 6 AND UL1472. TYPE AND RATING SUITABLE FOR LOAD CONTROLLED AS INDICATED ON
- DRAWING. b. SLIDE CONTROL TYPE WITH SEPARATE ON/OFF SWITCH. c. COLOR OF BODIES SHALL BE SELECTED BY THE ARCHITECT.
- d. POWER RATING, UNLESS OTHERWISE INDICATED ON DRAWINGS: INCANDESCENT 600 VA; FLUORESCENT 600 VA; ELECTRONIC LOW VOLTAGE 400 VA; MAGNETIC LOW VOLTAGE 600 VA.
 e. PROVIDE WITH LOCATOR LIGHT, ILLUMINATED WITH LOAD OFF.
- DEVICE PLATES

 a. DEVICE PLATES SHALL BE ONE-PIECE TYPE AND SHALL BE PROVIDED FOR
- RECEPTACLES, OUTLETS, SWITCHES AND FITTINGS.
 b. PLATES ON UNFINISHED WALLS AND ON FITTINGS SHALL BE GALVANIZED SHEET STEEL
 c. FINISH SELECTION BY ARCHITECT.
 d. PLATES SHALL BE INSTALLED WITH ALL FOUR EDGES IN CONTINUOUS CONTACT WITH
- FINISHED WALL SURFACES WITHOUT THE USE OF MATS OR SIMILAR DEVICES. PLASTER FILLINGS WILL NOT BE PERMITTED.
- e. PLATES INSTALLED IN WET LOCATIONS SHALL BE GASKETED AND PROVIDED WITH A HINGED, GASKETED COVER, UNLESS OTHERWISE SPECIFIED.
- <u>26 22 00 ELECTRICAL DISTRIBUTION</u>1. PANELBOARDS SHALL MEET THE FOLLOWING SPECIFICATIONS:
- A. MANUFACTURERS: a. SIEMENS, TO MATCH EXISTING
- B. PRODUCT DESCRIPTION: NEMA PB 1, CIRCUIT BREAKER TYPE PANELBOARD, COMPLYING WITH UL 67.C. PANELBOARD BUS: COPPER CURRENT CARRYING COMPONENTS, RATINGS AS SHOWN ON
- DRAWINGS. FURNISH COPPER GROUND BUS IN EACH PANELBOARD. D. MINIMUM INTEGRATED SHORT CIRCUIT RATING: 10KAIC. E. MOLDED CASE CIRCUIT BREAKERS: NEMA AB 1, CIRCUIT BREAKERS WITH INTEGRAL
- THERMAL AND INSTANTANEOUS TRIP FUNCTION, BOLT-ON TYPE. PROVIDE ELECTRONIC TRIP CIRCUIT BREAKERS WHERE INDICATED.
 F. MAGNETIC TRIP IN EACH POLE.
 G. CIRCUIT BREAKERS RATED 1,000 AMPS OR MORE ON SOLIDLY GROUNDED 480V SYSTEMS
- SHALL INCLUDE GROUND FAULT PROTECTION.
 CIRCUIT BREAKERS RATED 1,200 AMPS OR MORE SHALL HAVE LONG TIME, SHORT TIME, INSTANTANEOUS, AND GROUND FAULT PROTECTION (LSI) FUNCTIONS. CIRCUIT BREAKERS SHALL HAVE ENERGY REDUCTION MAINTENANCE SETTING (ERMS) SYSTEM.
- BREAKERS SHALL HAVE ENERGY REDUCTION MAINTENANCE SETTING (ERMS) SYSTE
 ENCLOSURE: NEMA PB 1, TYPE 1 (INDOOR, DRY LOCATIONS) UNLESS OTHERWISE INDICATED ON PANEL SCHEDULE.
 J. CABINET FRONT: LOCKABLE HINGED DOOR, METAL DIRECTORY FRAME, FINISHED IN
- MANUFACTURER'S STANDARD GRAY ENAMEL. DISCONNECT SWITCHES SHALL MEET THE FOLLOWING SPECIFICATIONS:
- A. MANUFACTURERS: a. SQUARE D b. SIEMENS
- c. EATON
 d. ABB
 B. PRODUCT DESCRIPTION: HEAVY-DUTY, NEMA KS 1, ENCLOSED LOAD INTERRUPTER KNIFE
- SWITCH. HANDLE LOCKABLE IN "OFF" POSITION.
 C. PROVIDE WITH FUSE CLIPS DESIGNED TO ACCOMMODATE NEMA FU 1 FUSES.
 D. ENCLOSURE: NEMA KS 1. TO MEET CONDITIONS. FABRICATE ENCLOSURE FROM STEEL
- FINISHED WITH MANUFACTURER'S STANDARD GRAY. INTERIOR DRY LOCATIONS: TYPE 1 UNLESS OTHERWISE INDICATED. EXTERIOR LOCATIONS: TYPE 3R UNLESS OTHERWISE INDICATED.
- G. SERVICE ENTRANCE: SWITCHES IDENTIFIED FOR USE AS SERVICE EQUIPMENT ARE TO BE LABELED FOR THIS APPLICATION. FURNISH SOLID NEUTRAL ASSEMBLY AND EQUIPMENT GROUNDING BAR
- H. FURNISH SWITCHES WITH ENTIRELY COPPER CURRENT CARRYING PARTS.
 I. SWITCH VOLTAGE, PHASE AND AMPERAGE RATINGS AS INDICATED ON DRAWINGS.
 J. WHERE SPECIFIED AS FUSED DISCONNECT SWITCHES, PROVIDE WITH DUAL-ELEMENT, TIME DELAY, CLASS RK1 FUSES. FUSE RATINGS AND QUANTITIES AS INDICATED ON DRAWINGS. FUSES SHALL BE MANUFACTURED BY BUSSMAN, GOULD SHAWMUT OR
- LITTEL FUSE. FURNISH (3) SPARE FUSES OF EACH TYPE. PANELBOARD & DISCONNECT SWITCH INSTALLATION STANDARDS
- A. MOUNT PANELBOARDS, CIRCUIT BREAKERS, AND DISCONNECTING SWITCHES SO HEIGHT OF OPERATING HANDLE AT ITS HIGHEST POSITION IS MAXIMUM 78 INCHES ABOVE FLOOR.
 B. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 C. ARRANGE EQUIPMENT TO PROVIDE MINIMUM CLEARANCES IN ACCORDANCE WITH MANUFACTURE DID INSTRUCTIONS AND NEDA 70
- MANUFACTURER'S INSTRUCTIONS AND NFPA 70.D. INSTALL PANELBOARDS PLUMB. INSTALL FLUSH-MOUNTED PANELBOARDS SO THAT TRIMS FIT COMPLETELY FLUSH TO WALL WITH NO GAPS AND ROUGH OPENING
- COMPLETELY COVERED.. E. MOUNT FLOOR-MOUNTED PANELBOARDS ON PROPERLY SIZED 3" HIGH CONCRETE PAD IN ACCORDANCE WITH DIVISION 03, AS APPLICABLE.
- F. INSTALL A PERMANENT LABEL INDICATING THE PANEBLOARD OR TRANSFORMER WHERE THE POWER SUPPLY TO THE DEVICE ORIGINATES.
 G. PROVIDE FILLER PLATES TO COVER UNUSED SPACES IN PANELBOARDS.
 H. PROVIDE CIRCUIT BREAKER LOCK-ON DEVICES TO PREVENT UNAUTHORIZED
- PERSONNEL FROM DE-ENERGIZING ESSENTIAL LOADS AS INDICATED.
- 4. TRANSFORMERS SHALL MEET THE FOLLOWING SPECIFICATIONS:
 A. MANUFACTURERS:
 a. SQUARE D
- b. SIEMENS c. EATON d ABB
- B. PRODUCT DESCRIPTION: NEMA ST20, FACTORY-ASSEMBLED, AIR-COOLED, ENERGY STAR RATED, NEMA 3R OUTDOOR, DRY-TYPE TRANSFORMER. RATINGS SHALL BE AS INDICATED ON DRAWINGS.
 C. EFFICIENCY: COMPLY WITH THE DEPARTMENT OF ENERGY 2016 EFFICIENCY STANDARDS
- FOR THREE-PHASE DRY-TYPE TRANSFORMERS D. PRIMARY VOLTAGE: 480V DELTA, 3-PHASE
- E. SECONDARY VOLTAGE: 208Y/120V, 3-PHASE
 F. INSULATION SYSTEM AND AVERAGE WINDING TEMPERATURE: CLASS 220 WITH 150°C RISE.
 G. CASE TEMPERATURE: DO NOT EXCEED 35 DEGREES C RISE ABOVE AMBIENT AT WARMEST POINT AT FULL LOAD.
- H. WINDING TAPS: NEMA ST 20.
 I. COIL CONDUCTORS: CONTINUOUS COPPER WINDINGS WITH TERMINATIONS BRAZED OR
- J. NEUTRAL BUS: SIZED TO ACCOMMODATE TWICE THE RATED SECONDARY CURRENT.
 K. ENCLOSURE: NEMA ST20, TYPE 1 (INDOOR, DRY LOCATIONS) OR TYPE 3R (OUTDOOR LOCATIONS). FURNISH LIFTING EYES OR BRACKETS.
 L. INSULATE CORE AND COIL FROM ENCLOSURE USING VIBRATION-ABSORBING MOUNTS.
- INSULATE CORE AND COLE FROM ENCLOSING VIBRATION-ABSORING MOUNTS.
 NAMEPLATE: INCLUDE TRANSFORMER CONNECTION DATA, RATINGS, WIRING DIAGRAMS, AND OVERLOAD CAPACITY BASED ON RATED WINDING TEMPERATURE RISE.
 TRANSFORMER INSTALLATION STANDARDS
- A. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION.
 B. INSTALL TRANSFORMERS IN ACCORDANCE WITH NECA 409 AND IEEE C57.94.
 C. USE FLEXIBLE CONDUIT, 2' MINIMUM LENGTH, FOR CONNECTIONS TO TRANSFORMER
- CASE. MAKE CONDUIT CONNECTIONS TO SIDE PANEL OF ENCLOSURE. D. ARRANGE EQUIPMENT TO PROVIDE MINIMUM CLEARANCES AS SPECIFIED ON TRANSFORMER NAMEPLATE AND IN ACCORDANCE WITH NFPA 70.
- E. MOUNT WALL-MOUNTED TRANSFORMERS USING INTEGRAL FLANGES OR ACCESSORY BRACKETS FURNISHED BY THE MANUFACTURER.
 F. MOUNT FLOOR-MOUNTED TRANSFORMERS ON PROPERLY SIZED 3" HIGH CONCRETE PAD
- IN ACCORDANCE WITH DIVISION 03, AS APPLICABLE. PROVIDE WITH VIBRATION ISOLATORS SUITABLE FOR ISOLATING TRANSFORMER NOISE FROM BUILDING STRUCTURE. G. PROVIDE SEISMIC RESTRAINTS WHERE REQUIRED BY LOCAL CODES.
- H. PROVIDE GROUNDING AND BONDING IN ACCORDANCE WITH NFPA 70.
 I. REMOVE SHIPPING BRACES AND ADJUST BOLTS THAT ATTACH THE CORE AND COIL MOUNTING BRACKET TO THE ENCLOSURE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS IN ORDER TO REDUCE AUDIBLE NOISE TRANSMISSION.
 J. WHERE NOT FACTORY INSTALLED, INSTALL LUGS SIZED AS REQUIRED FOR TERMINATION

OF CONDUCTORS AS SHOWN ON THE DRAWINGS

