# TRUMBULL POLICE DEPARTMENT

### TRUMBULL, CONNECTICUT **158 EDISON ROAD**

### **LIST OF DRAWINGS:**

### TITLE SHEET

### CODE DDA WINCS

	AWINGS	P-0.1	COVER SHEET PLUMBING
		P-0.2	GENERAL NOTES PLUMBING
R-1.0	CODE INFORMATION	PD-1.1	LOWER LEVEL DEMOLITION FLOOR PLAN - PLUMBING
		P-1.1	LOWER LEVEL FLOOR PLAN - PLUMBING
<u>LOGISTIC</u>	CS DRAWINGS	P-3.0	SCHEDULES PLUMBING
		P-3.1	SCHEDULES PLUMBING
SLP-1	OVERALL CONTRACTOR SITE LOGISTICS PLAN	P-4.0	DETAILS PLUMBING
T-1.1	TEMPORARY FACILITIES LOWER LEVEL PLAN	P-5.0	SPECIFICATIONS PLUMBING
LANDSCA	PING DRAWINGS	MECHANI	CAL DRAWINGS
L-1.1	PARTIAL LANDSCAPING PLAN	M-0.1	COVER SHEET - MECHANICAL
		M-0.2	NOTES, SYMBOLS, ABBREVIATIONS - MECHANICAL
ARCHITE/	CTURAL DRAWINGS	M-0.3	FLOW AND CONTROL DIAGRAMS - MECHANICAL
		MD-1.1	LOWER LEVEL DEMOLITION FLOOR PLAN - MECHANICAL
D-1.1	DEMOLITION OVERALL LOWER LEVEL PLANS	MD-1.2	<b>ROOF DEMOLITION PLAN - MECHANICAL</b>
		M-1.1	LOWER LEVEL FLOOR PLAN - MECHANICAL
A-0.1	ARCH. GENERAL INFORMATION AND ABBREVIATIONS	M-1.2	ROOF PLAN - MECHANICAL
A-0.2	WALL AND FLOOR TYPES AND DETAILS	M-3.1	SCHEDULES - MECHANICAL
A-1.1	NEW WORK OVERALL LOWER LEVEL PLANS	M-4.1	DETAILS - MECHANICAL
A-2.1	CEILING DETAILS	M-4.2	DETAILS - MECHANICAL
A-5.1	MOUNTING HEIGHTS AND DETAILS	M-5.1	SPECIFICATIONS - MECHANICAL
A-5.2	LARGE SCALE NEW WORK RESTROOM PLANS	M-5.2	SPECIFICATIONS - MECHANICAL
A-6.1	MISC. DETAILS	M-5.3	SPECIFICATIONS - MECHANICAL
A-6.2	MISC. DETAILS		
A-7.0	OVERALL ROOF PLANS	ELECTRIC	CAL DRAWINGS
A-9.1	DOOR INFORMATION AND DETAILS		
A-10.1	CASEWORK ELEVATIONS AND SECTIONS	E-0.1	COVER SHEET - ELECTRICAL
A-11.1	DETENTION CELL FRONT ELEVATIONS AND DETAILS	E-0.2	LIGHTING FIXTURE SCHEDULE - ELECTRICAL

- DETENTION CELL FRONT ELEVATIONS AND DETAILS A-11.1
- A-11.2 DETENTION CELL FRONT PLAN DETAILS DETENTION DETAILS A-11.3

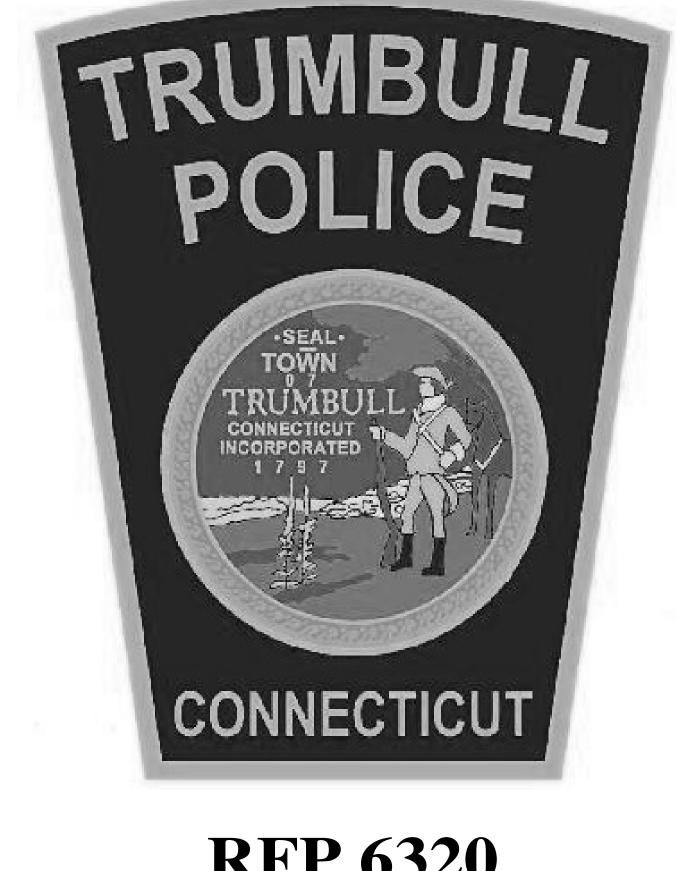
### FINISHES DRAWINGS

- F-1.0 FINISH SCHEDULE NEW WORK OVERALL LOWER LEVEL FINISH PLANS F-1.1
- LIGHTING FIXTURE SCHEDULE ELECTRICAL

- ED-1.1 LOWER LEVEL DEMOLITION FLOOR PLAN - ELECTRICAL
- **ROOF DEMOLITION PLAN ELECTRICAL** ED-1.2
- LOWER LEVEL FLOOR PLAN ELECTRICAL E-1.1 ROOF PLAN - ELECTRICAL E-1.2
- E-2.1 LOWER LEVEL REFLECTED CEILING PLAN - LIGHTING
- E-6.1 **DETAILS - ELECTRICAL** E-7.1 SPECIFICATIONS - ELECTRICAL



## **INTERIOR RENOVATION TO THE**



### ARCHITECT

JACUNSKI HUMES ARCHITECTS, LLC 15 MASSIRIO DRIVE, SUITE 101 BERLIN, CONNECTICUT 06037 TEL 860-828-9221 FAX 860-828-9223

### **P/M/E ENGINEER**



Kohler Ronan, LLC 93 Lake Avenue Danbury, CT 06810 tel: (203) 778-1017

## **NOVEMBER 8, 2018**

## **RFP 6320**

### **INTERIOR DESIGNER**



4D Design & Decorating, LLC 127 Park Road West Hartford, CT 06119 tel: (860) 716-2363

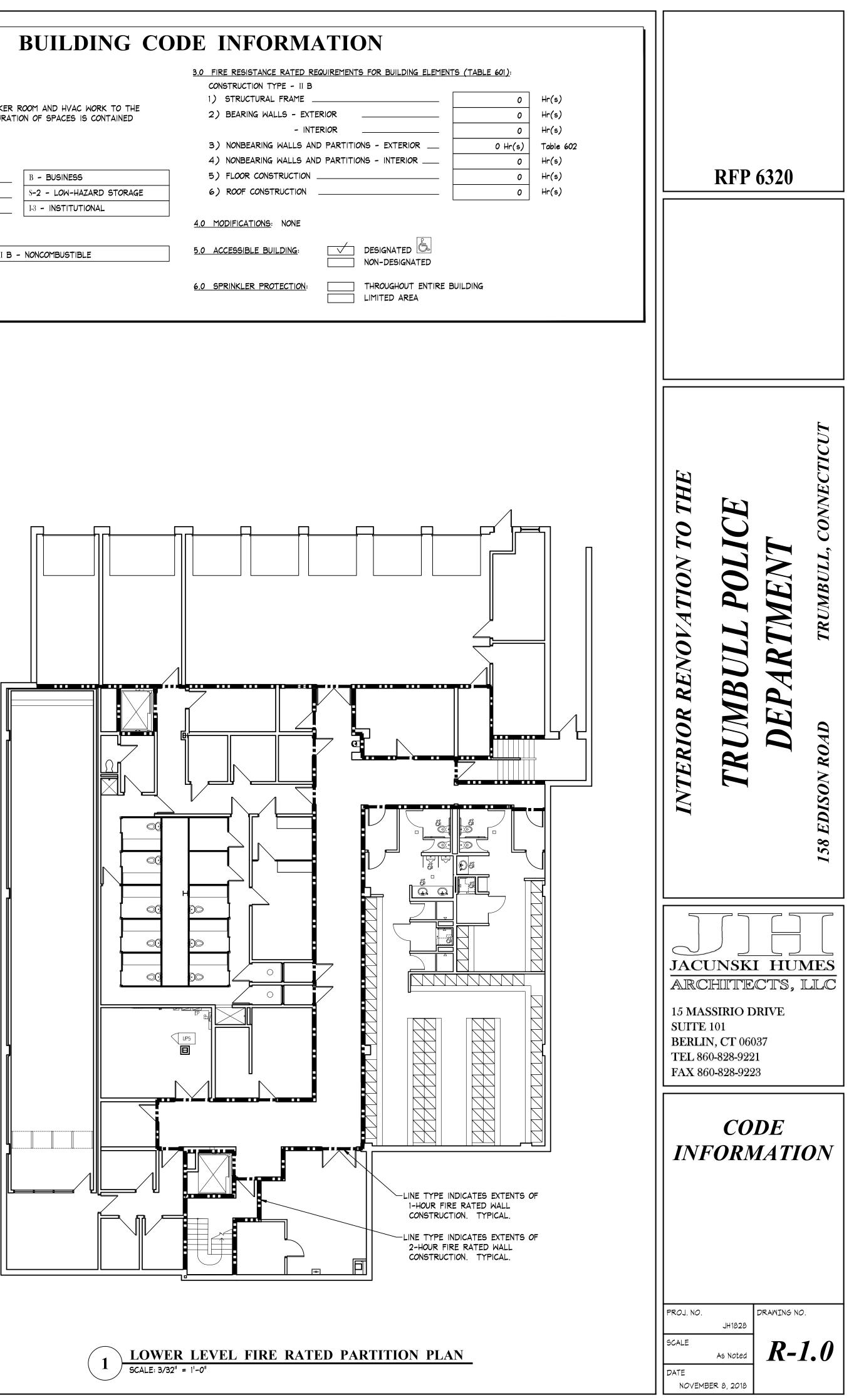
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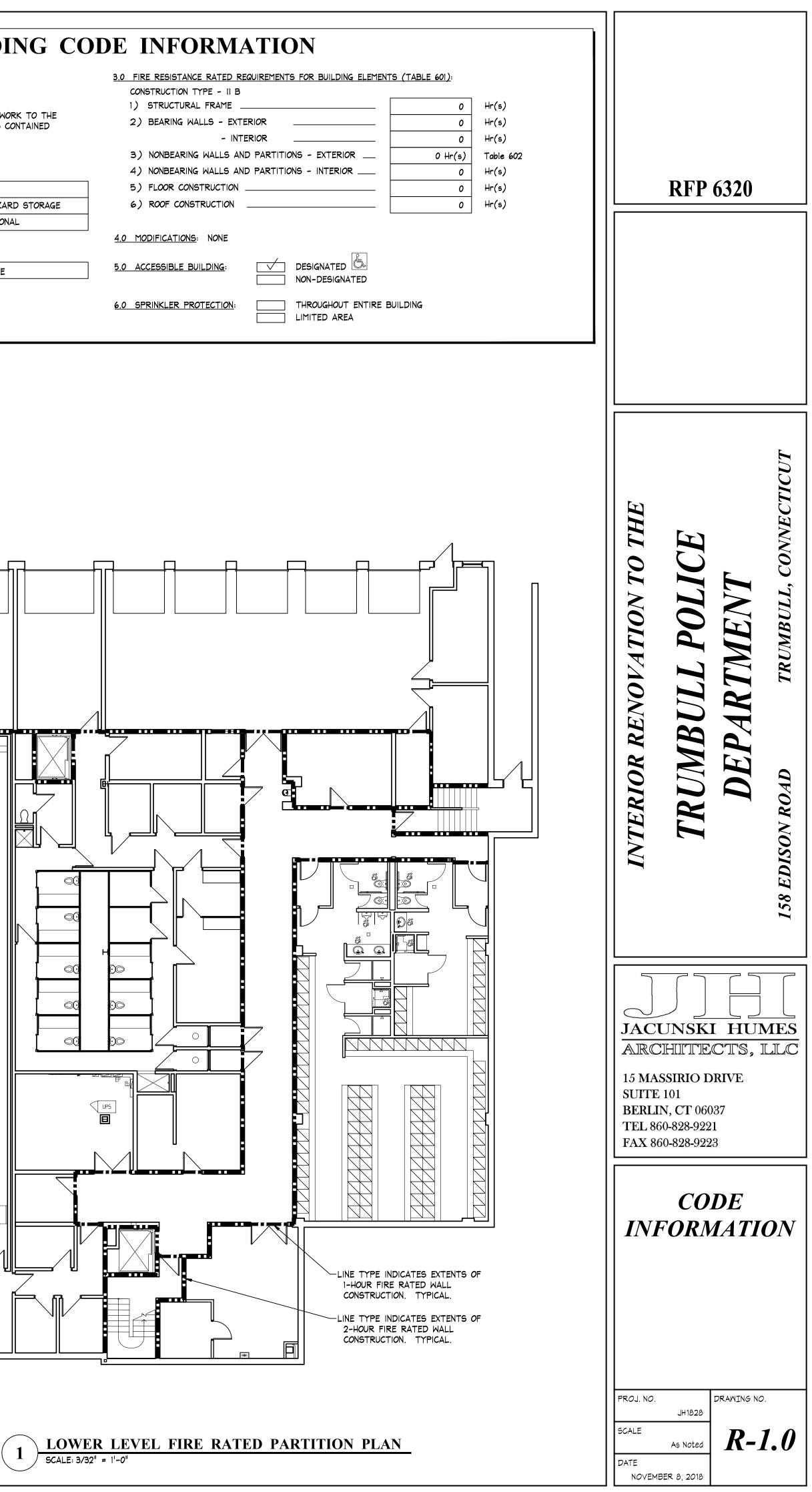
### GOVERNING **BUILDING CODES:**

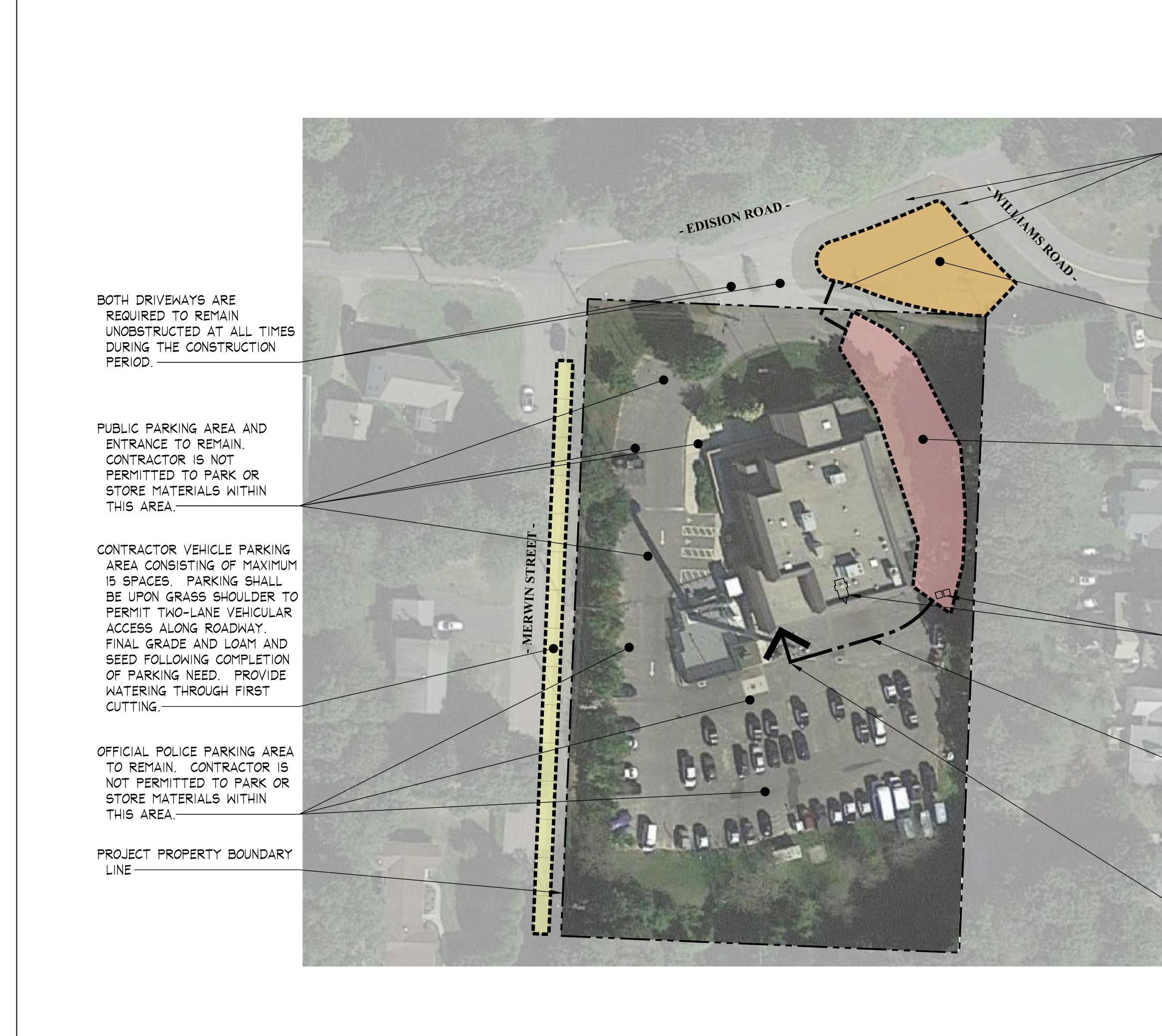
TERNATIONAL EXISTING BUILDING CODE	2015**
TERNATIONAL PLUMBING CODE	2015**
ITERNATIONAL MECHANICAL CODE	2015**
TERNATIONAL ENERGY CONSERVATION CODE	2015**
ATIONAL ELECTRICAL CODE (NFPA 70)	2017
RE CODE (NFPA 1)	2018
FE SAFETY CODE (NFPA 101)	2012
ATIONAL FUEL GAS CODE (NFPA 54)	2018
SHA-TITLE 29/LABOR	LATEST
ECTION 504	1973
MERICANS WITH DISABILITY ACT (ADA)	2010
ANDICAPPED ACCESSIBILITY (ICC ANSI A117.1)	2009
TATE HEALTH CODE	LATEST

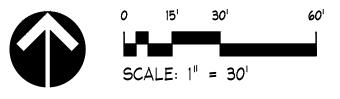
\*\*: INCLUSIVE OF 2018 CONNECTICUT AMENDMENTS

	<b>BUILDING COD</b>	E
DATE OF ORIGINAL CONSTRUCTION - 1980 +/-		<u>3.0</u>
PROPOSED SCOPE IS AN INTERIOR RENOVATION OF A I FIRING RANGE. NO ADDED SQUARE FOOTAGE. RECON WITHIN THE EXISTING LOCKER ROOM AND FITNESS ARE 1.0 OCCUPANCY CLASSIFICATION (CHAPTER 3):	FIGURATION OF SPACES IS CONTAINED	
(PRIMARY)	B - BUSINESS	
(SECONDARY)	S-2 - LOW-HAZARD STORAGE	
(SECONDARY)	I-3 - INSTITUTIONAL	
2.0 CONSTRUCTION TYPE (CHAPTER 6, SECTION 602.5	5): II B - NONCOMBUSTIBLE	<u>4.0</u> 5.0
MINIMUM TYPE REQUIRED:		
		<u>6.0</u>









**RFP 6320** 

MAINTAIN 15'-0" BUFFER FROM CURB LINES AND 5'-0" FROM SIDEWALK EDGES.

-CONTRACTOR LAY-DOWN AND STORAGE AREA. PROVIDE FENCED ENCLOSURE WITH PRIVACY SCREENING DURING CONSTRUCTION. FINAL GRADE AND LOAM AND SEED FOLLOWING REMOVAL OF ALL CONTRACTOR ITEMS AND FENCING. PROVIDE WATERING THROUGH FIRST CUTTING.

-FIRING RANGE MECHANICAL UNIT CONSTRUCTION AREA. PROVIDE FENCED ENCLOSURE WITH PRIVACY SCREENING DURING CONSTRUCTION. FINAL GRADE AND LOAM AND SEED FOLLOWING REMOVAL OF ALL CONTRACTOR ITEMS AND FENCING. PROVIDE WATERING THROUGH FIRST CUTTING. ALL DELIVERY, LOADING, AND UNLOADING OPERATIONS SHALL BE PERFORMED WITHIN THIS SPACE SO AS TO NOT BLOCK ENTRANCE DRIVEWAYS.

-LOCATION OF TEMPORARY TOILET FACILITIES DURING CONSTRUCTION. PROVIDE TRAILER, AS SPECIFIED, INSIDE GARAGE BAY FOR POLICE-ONLY USE. PROVIDING CONTRACTOR UNITS WITHIN CONSTRUCTION AREA. DO NOT BLOCK MORE THAN TWO GARAGE BAYS.

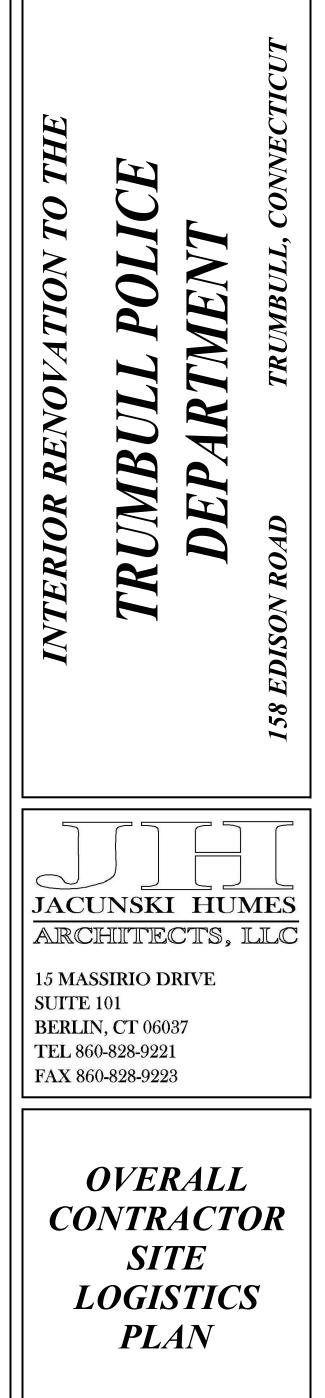
-CONTRACTOR ACCESS PATH BETWEEN WORK, TOILET, AND LAY-DOWN AREAS. CONTRACTOR IS RESPONSIBLE TO FULLY COORDINATE ALL PLANNED ACTIVITIES, ON A DAILY BASIS, WITH POLICE ADMINISTRATION. NO MATERIALS ARE PERMITTED TO BE STORED ALONG PATH WITHOUT DIRECT PERMISSION FROM POLICE ADMINISTRATION.

-CONTRACTOR ENTRANCE. CONTRACTOR IS RESPONSIBLE TO FULLY COORDINATE ALL PLANNED ACTIVITIES AND ACCESS, ON A DAILY BASIS, WITH GARAGE STAFF.

 1
 OVERALL CONTRACTOR SITE LOGISTICS PLAN
 SCALE

 SCALE: 1" = 30'
 As Noted

 DATE
 NOVEMBER 8, 2018

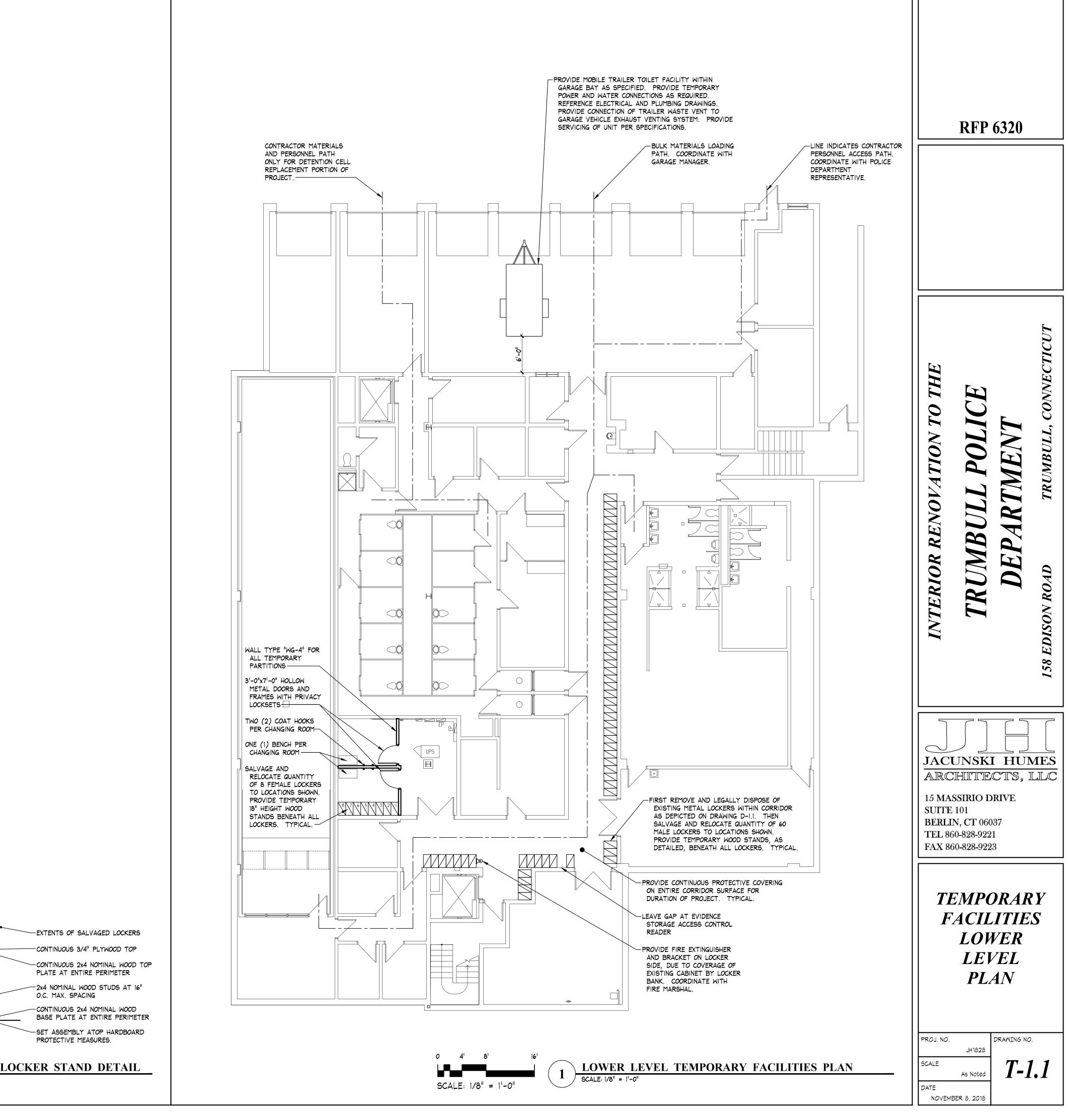


JH1828 As Noted **SLP-1** 

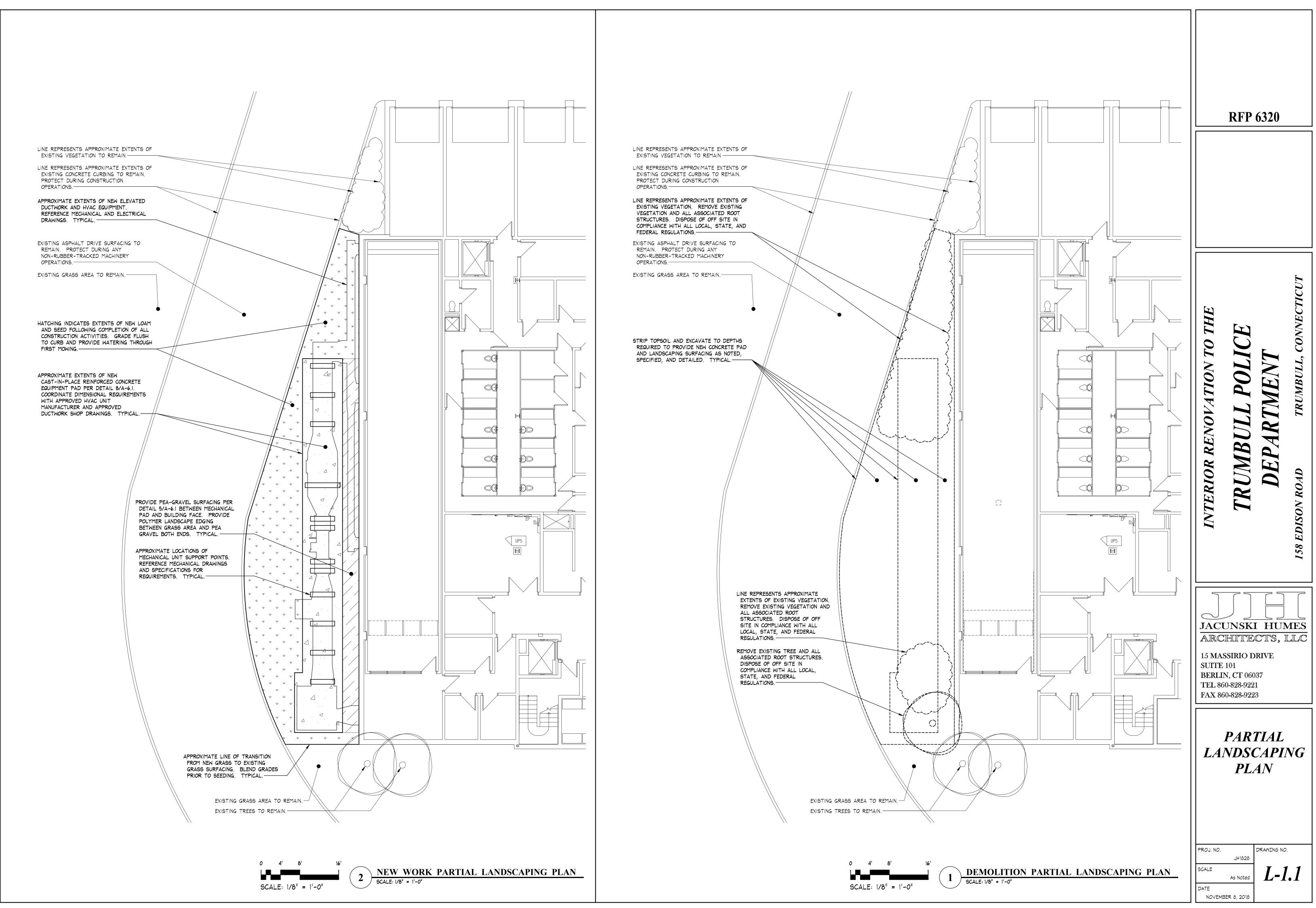
DRAWING NO.

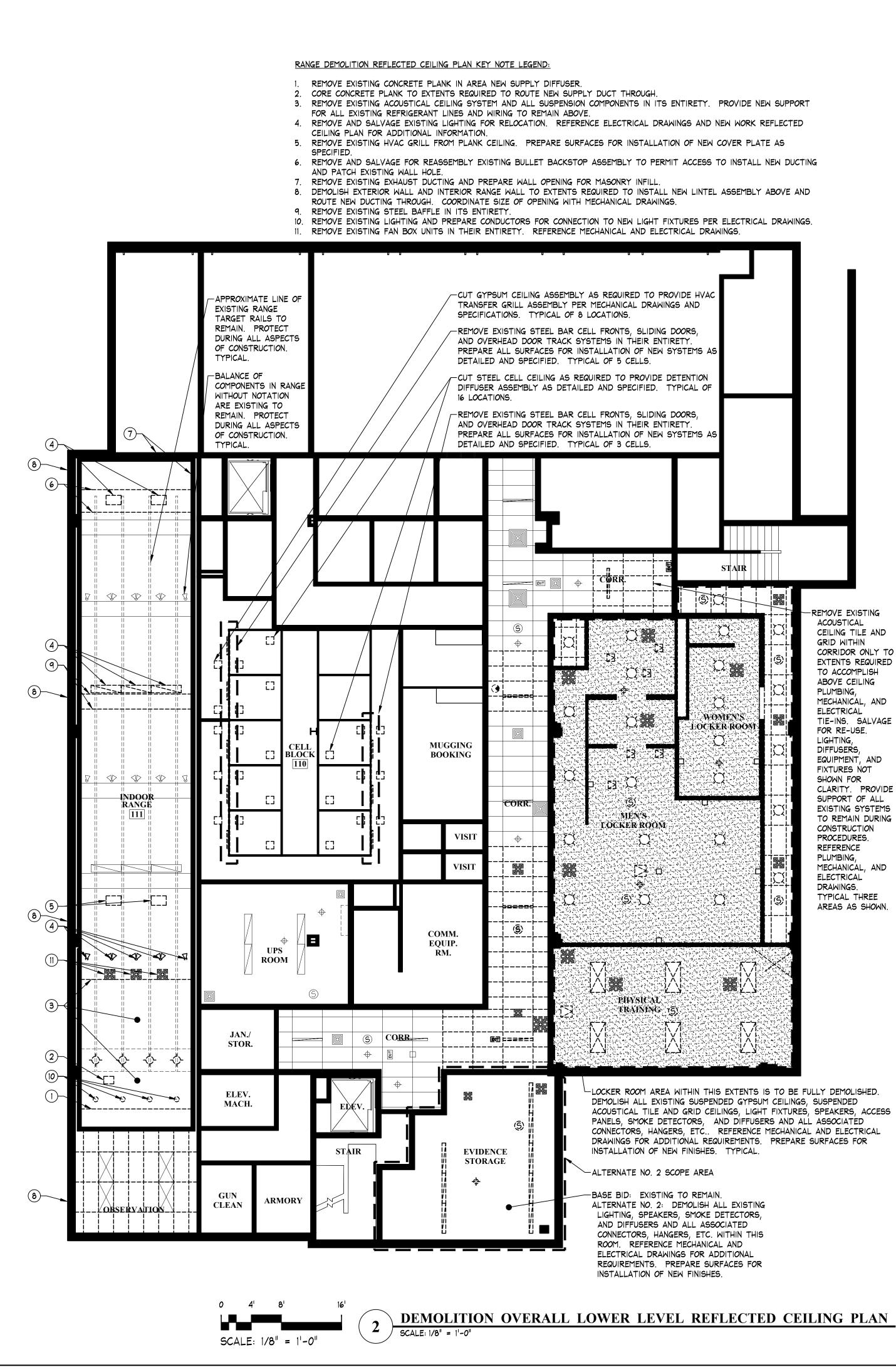
PROJ. NO.



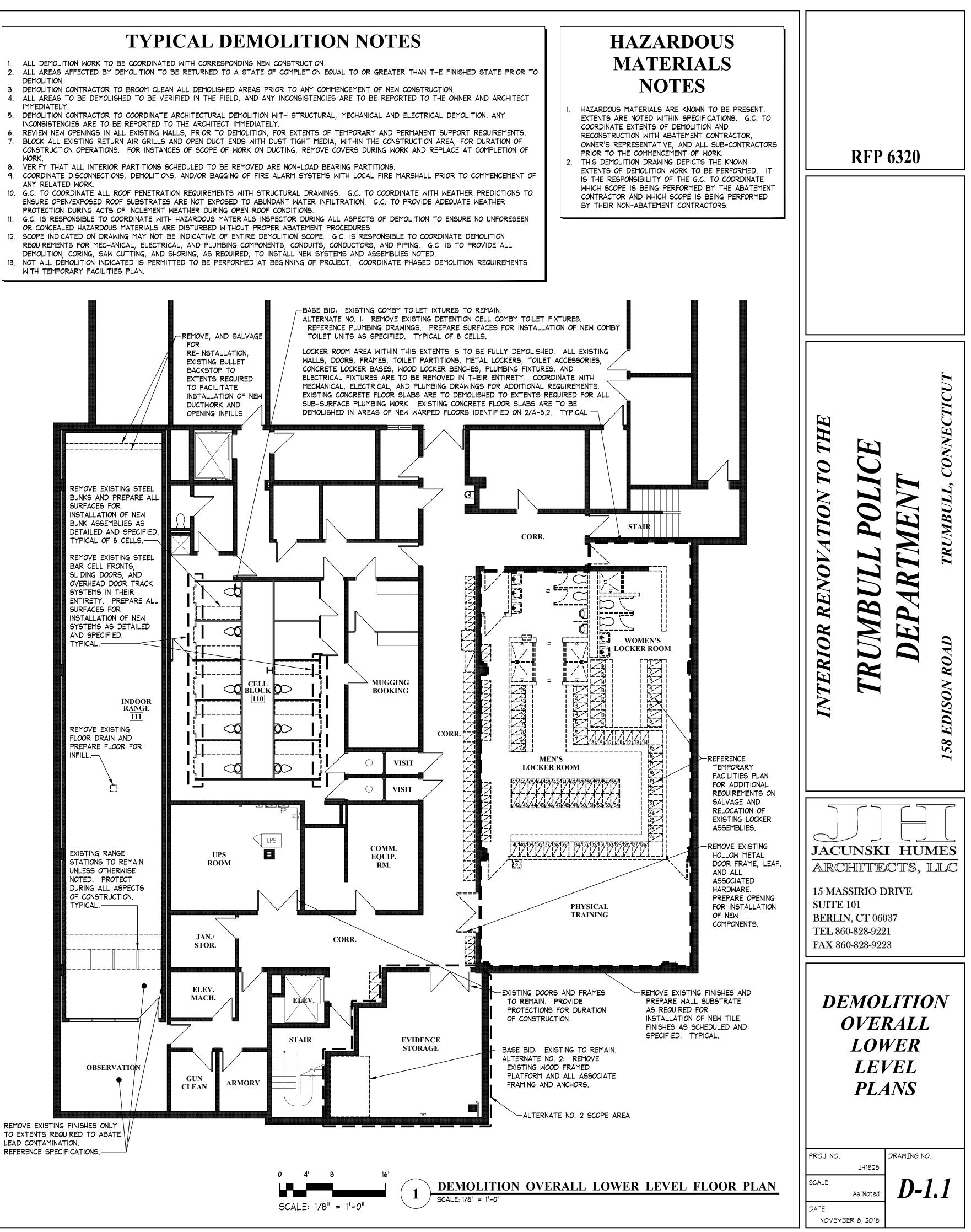


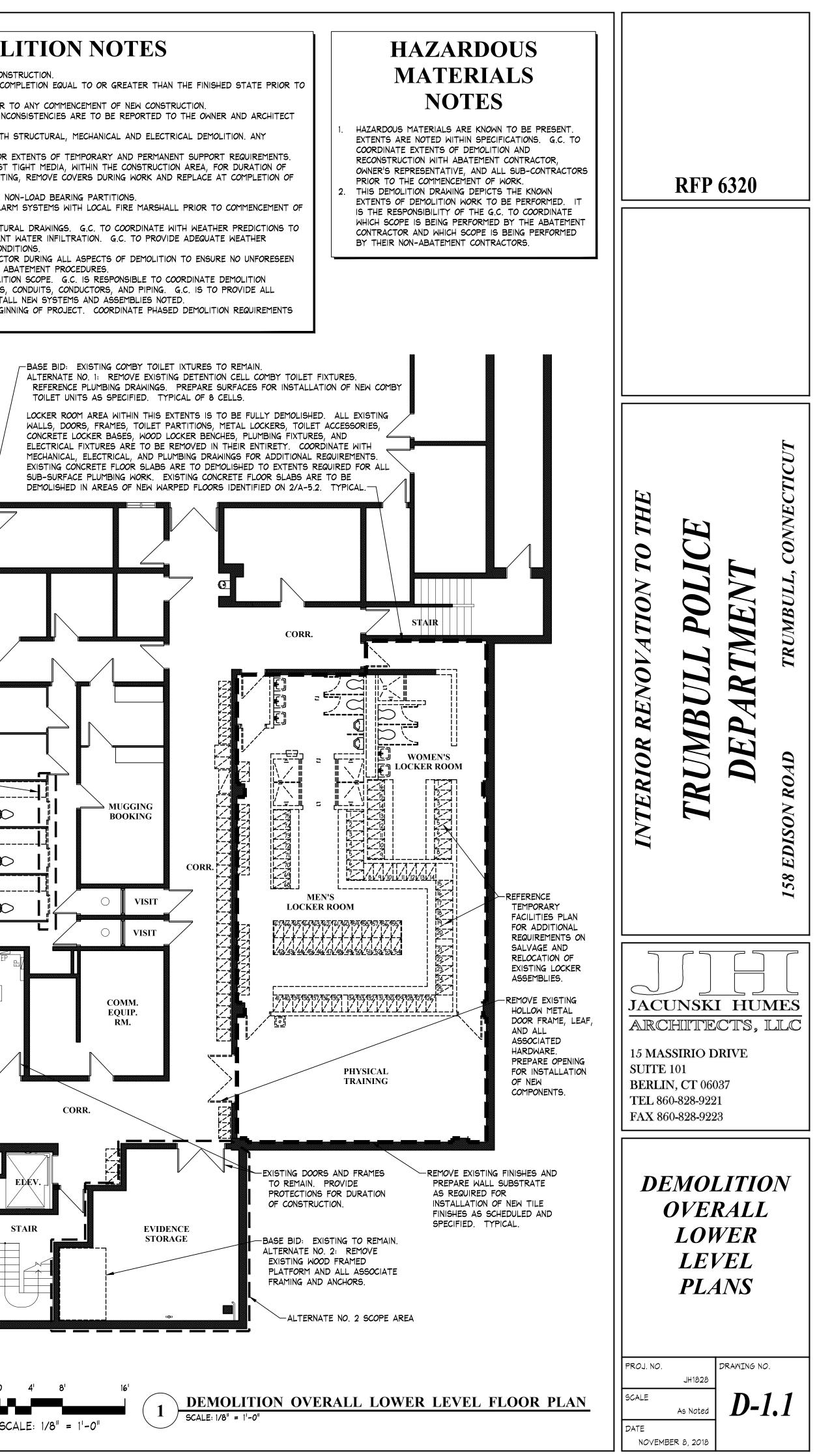
**TEMPORARY LOCKER STAND DETAIL** 





- DEMOLITION.
- IMMEDIATELY.
- INCONSISTENCIES ARE TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.
- WORK.
- ANY RELATED WORK.
- PROTECTION DURING ACTS OF INCLEMENT WEATHER DURING OPEN ROOF CONDITIONS.
- OR CONCEALED HAZARDOUS MATERIALS ARE DISTURBED WITHOUT PROPER ABATEMENT PROCEDURES. 12
- WITH TEMPORARY FACILITIES PLAN.





## **ABBREVIATIONS**

	ABOVE FINISH FLOOR	F.R.	FIRE RETARDENT
	ACOUSTIC, ACOUSTICAL		FIREPROOFING
	ALUMINUM COMPOSITE MATERIAL ACOUSTICAL TILE & GRID		FIXTURE FLASHING
	ADDITION		FLOOR
	AIR COMPRESSOR		FLOOR DRAIN
	AIR HANDLING UNIT		FLOOR FINISH
	ALTERNATE ALUMINUM		FOOTING FOUNDATION
	ALUMINUM FRAME		FULL-HEIGHT MIRROR WITH STAINLESS STE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	FURN.	FURNISH, FURNISHED
	AMERICAN SOCIETY FOR TESTING AND MATERIALS	FURR.	FURRED, FURRING
	AMERICANS WITH DISABILITIES ACT ANCHOR, ANCHORAGE	GA.	GAUGE
	ANCHOR BOLTS	GALV.	GALVANIZED
	AND	G.C.	GENERAL TRADES CONTRACTOR
	ANGLE	GLAZ.	
ANOD. APPR.	ANODIZED APPROXIMATELY	G.B.	GRAB BAR GROUND-FAULT CIRCUIT INTERUPTOR
	APPROXIMATELY		3D. GYPSUM WALLBOARD
	ARCHITECT, ARCHITECTURAL		
	ASBESTOS	H.R.	HANDRAIL
	ASPHALT ASSEMBLY		HANDICAPPED HEIGHT
	ASSISTAND		HIGH POINT
@	AT	H.M.	HOLLOW METAL
	AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM		HOLLOW METAL FRAME
AUTO	AUTOMATIC		HORIZONTAL HOSE BIB
BM	BEAM	п.д. Н.Д.G.	HOSE DID HOT-DIPPED GALVANIZED
	BEARING		
BET or B/W			INCH, INCHES
			INCLUDE, INCLUDING
	BITUMINOUS BLOCK		INFORMATION INSIDE DIAMETER
	BLOCKING		INSULATION
BD.	BOARD		INTEGRATED TECHNOLOGY
BOTT. B.O.	BOTTOM BOTTOM OF	INT. INTOX.	INTERIOR INTOXILYZER
	BOITOM OF BRICK EXPANSION JOINT	INTOX.	INI VALLI ZER
	BUILDING	K.F.E.	KITCHEN FIRE EXTINGUISHER
B.U.R.	BUILT-UP ROOFING	K.P.	KICK PLATE
		LAB	
	CABINET CABINET UNIT HEATER		LABORATORY LAVATORY
	CAPACITY		LIGHTING
	CEILING		LINE OF
	T. CEILING HEIGHT CEMENT		.LOCKER, LOCKERS LOW POINT
	CENTER	L.F.	
	CENTERLINE	MACH.	MACHINE
	CERAMIC TILE		MAIN ELECTRICAL DISTRIBUTION PANEL
	CHALK BOARD	MAINT. MANUF.	MAINTENANCE
-	CHANNEL CLOSET	MANUF. MFR.	MANUFACTURED MANUFACTURER
	COLUMN	M.TH.	MARBLE THRESHOLD
	CONCRETE	M.BD.	MARKER BOARD
		MAS.	MASONRY
	CONTROL JOINT CONTINUOUS		MASONRY OPENING MATERIAL
	CONTRACTOR	MAX.	MAXIMUM
	CORNER GUARD	MECH.	MECHANICAL
	CORRIDOR	MET. or MTL.	
CRS.	COURSE, COURSES	MEZZ. MW	MEZZANINE MICROWAVE OVEN
DMPFG.	DAMPROOFING		MINIMUM
DEG.	DEGREE	M.W.F.	MIRROR WITH STAINLESS STEEL FRAME
	DEMOLITION	MISC.	MISCELLANEOUS
DEPT. DET. or DTL.	DEPARTMENT	MTD.	MOUNTED
DEL. OF DIL. DIA.	DIAMETER	NOM.	NOMINAL
DIM.	DIMENSION	N.S.O.	NON-SIMULTANEOUS OCCUPANCY
D/W	DISHWASHER	N	NORTH
DIST. DP	DISTANCE	N.I.C.	NOT IN CONTRACT
DR D.F.S.	DOOR DOOR FLOOR STOP	N.I.S. N.T.S.	NOT IN SCOPE NOT TO SCALE
D.N.S.	DOOR WALL STOP		NUMBER
DBL.	DOUBLE		
D.H. DN	DOUBLE-HUN DOWN	OFF. O.C.	OFFICE ON CENTER
DN D/F	DOWN FLOW		OPPOSITE HAND
	DOWNSPOUT		ORIENTED STRAND BOARD
	DRAWING	<i>O</i> . <i>D</i> .	OUTSIDE DIAMETER
D.F.	DRINKING FOUNTAIN		PAINTED
EA.	EACH	PTD. PR.	PAINTED PAIR
	ELECTRIC, ELECTRICAL	P.T.D.	PAPER TOWEL DISPENSER
EMT	ELECTRICAL METAL TUBING	PASS.	PASSAGE
	ELECTRIC WATER COOLER		PERPENDICULAR PIPE COVERS (ADA COMPLITANT)
EL. or ELEV. ELEV.	ELEVATION ELEVATOR (AS OCCURS)	P.C. PLAS.	PIPE COVERS (ADA COMPLIANT) PLASTER
	EMERGENCY		PLASTIC LAMINATE
EGAP	EMERGENCY GENERATOR ANNUNCIATOR PANEL	PL.	PLATE
	ETHYLENE PROPYLENE DIENE MONOMER	PLBG. OF PLU PLYMD	MB. PLUMBING
EQ. EQUIP.	EQUAL EQUIPMENT	PLYWD Poly	PLYWOOD Polyethylene
	EXISTING	PVC	POLYVINYLCHLORIDE
E.T.R.	EXISTING TO REMAIN	lbs.	POUNDS
	EXPANSION	PWDR	POWDER
	EXPANSION JOINT EXTERIOR	PC P.E.J.	PRECAST PRECAST EXPANSION JOINT
	EXTERIOR EXTERIOR INSULATIVE FINISH SYSTEM	P.E.J. PREFAB	PRECAST EXPANSION JOINT PREFABRICATED
	EXTRUDED POLYSTYRENE	P.T.	PRESSURE TREATED
XPS		PTR	PRINTER
	FEET, FOOT		
FT	•		
	FIBER-REINFORCED GYPSUM PANELS FIBERGLASS	QTY. Q.T.	QUANTITY QUARRY TILE
FT F.R.G.P.	FIBER-REINFORCED GYPSUM PANELS		
FT F.R.G.P. F.G. FIN. FAAP	FIBER-REINFORCED GYPSUM PANELS FIBERGLASS FINISH, FINISHED FIRE ALARM ANNUNCIATOR PANEL		
FT F.R.G.P. F.G. FIN. FAAP	FIBER-REINFORCED GYPSUM PANELS FIBERGLASS FINISH, FINISHED		

STEEL FRAME

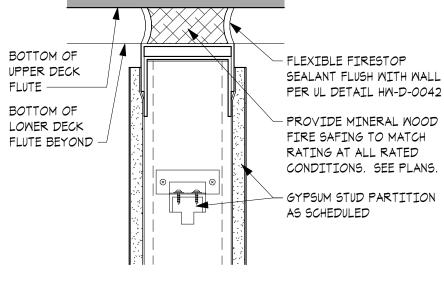
R or RAD. RADIUS RMC RAIN WATER CONDUCTOR RML RAIN WATER LEADER RECT. RECTANGLE RECV. RECEIVING REF. REFERENCE REFR. REFRIGERATOR REINF. REINFORCE, REINFORCING REQ. Or REQ'D REQUIRE, REQUIRED REQUIREMENTS REQM'TS REV. REVISED, REVISION RISER R. R.D. ROOF DRAIN RM. ROOM R.S. ROOM SIGNAGE R.H. ROBE HOOK R.O. ROUGH OPENING SANITARY NAPKIN DISPOSAL S.N.D. SANITARY NAPKIN VENDING MACHINE 5.N.V.M. SCHED. SCHEDULE SC. SCUPPER SECT. SECTION S.J. SEISMIC JOINT SHT SHEET S.C. SHOWER CURTAIN & HOOKS S.C.R. SHOWER CURTAIN ROD SIM. SIMILAR S.D.L. SOAP DISPENSER (SINK/LAVATORY MOUNTED) 5.D.W. SOAP DISPENSER (WALL MOUNTED) SVT SOLID VINYL TILE S.T.C. OF STC SOUND TRANSMISSION CLASS SPEC. SPECIFICATIONS S.B. SPLASH BLOCK SQ. SQUARE S.F. OR SQ.FT. SQUARE FEET STAINLESS STEEL S.S. STD STANDARD STEEL STL STOR. STORAGE STRUCT. STRUCTURAL S.STL. STRUCTURAL STEEL SUSP. SUSPEND, SUSPENSION S.G.B. SWING-UP GRAB BAR T.BD. TACKBOARD THRU THROUGH T.S.S. TILT-UP SHOWER SEAT (ADA COMPLIANT) T.P.D. TOILET PAPER DISPENSER T₿G TOUNGE AND GROOVE Τ.Ο. TOP OF T.O.P. TOP OF PLATE T.O.SL. TOP OF SLAB T.O.ST. TOP OF STEEL TREAD TR.DR. TRENCH DRAIN TYP. TYPICAL UNDERWRITER'S LABORATORY INC. UL. UNDER-COUNTER REFRIGERATOR U/C REF. UNIT DIMENSION U.D. UNIT HEATER U.H. UNIT VENTILATOR U.V. U.O.N. UNLESS OTHERWISE NOTED U. Or UR. URINAL VTR VENT THROUGH ROOF V.I.F. VERIFY IN FIELD V.G.B. VERTICAL GRAB BAR V.L. VERTICAL RAIN LEADER VEST. VESTIBULE VCT VINYL COMPOSITION TILE VET VINYL ENHANCED TILE W.C. WATER CLOSET MP. WATERPROOFING W.W.F. OR WWF WELDED WIRE FABRIC W.BD. WHITE BOARD WIN. OR WDW WINDOW Μ/ WITH ND WOOD

WALL NOTES 1. FIRECODE GYPSUM BOARD IN A ONE OR TWO-HOUR RATED PARTITION MUST BEAR THE U.L. CLASSIFICATION. 2. ALL FIRE AND SMOKE RESISTANT SEPARATIONS ARE TO EXTEND TO THE UNDERSIDE OF FLOOR OR ROOF DECK ABOVE, TYPICAL. 3. FOR SMOKE RESISTANT SEPARATIONS PROVIDE FIRE SAFING AND SEALANT AT FLOOR, ROOF DECK AND ALL PENETRATIONS TO PREVENT THE PASSAGE OF SMOKE. 4. FOR ALL FIRE RATED PARTITIONS PROVIDE FIRE SAFING AND SEALANT AT FLOOR, ROOF DECK AND ALL PENETRATIONS TO PREVENT THE PASSAGE OF SMOKE AND FLAME. THE FIRE SAFING AND SEALANT SYSTEM MUST MAINTAIN THE RATING OF THE SEPARATION. 5. AT ALL NON-RATED PARTITIONS, FILL METAL DECK FLUTES WHERE PARTITIONS MEET THE STRUCTURE ABOVE WITH BATT. INSULATION. 6. AT ALL NON-RATED PARTITIONS, FILL ALL VOIDS BETWEEN PIPES, ELECTRICAL CONDUIT, DUCTWORK, ETC. WHERE THEY PENETRATE WALLS WITH BATT INSULATION. 7. PROVIDE SMOKE DAMPERS AT ALL MECHANICAL PENETRATIONS THROUGH ONE HOUR FIRE RATED SMOKE BARRIERS. 8. PROVIDE FIRE DAMPERS AT ALL MECHANICAL PENETRATIONS THROUGH TWO HOUR FIRE RATED PARTITIONS. 9. EXTEND ALL METAL STUD PARTITIONS TO THE UNDERSIDE OF DECK/ STRUCTURE, UNLESS OTHERWISE NOTED. 10. ALL PARTITIONS, PART OF THE THERMAL ENVELOPE, SHALL BE FULLY AIR SEALED WITH SEALANT TO MITIGATE THE TRANSFERENCE OF AIR. THIS SHALL INCLUDE ALL SILL/SOLE PLATES, TOP PLATES, DISSIMILAR MATERIAL TRANSITIONS, PENETRATIONS, JOINTS, AND SHEATHING PERIMETERS. IN AREAS OF RATED PARTITIONS, SEALANT SHALL BE OF SUFFICIENT GRADE TO COMPLY WITH FIRE RATING REQUIREMENTS. TYPICAL. 11. CONTRACTOR IS TO PERMANENTLY INDICATE LOCATIONS OF RATED WALLS, AS SHOWN ON CODE PLANS, BY PAINTING STENCILS ON SAID WALLS, ABOVE CEILING, AS DETAILED. 12. CONTRACTOR IS TO PROVIDE HANDICAP RESTROOM SIGNAGE AT ALL RESTROOM ENTRANCE DOORS AS DETAILED. **GENERAL NOTES** 1. CONTRACTOR TO TAKE AND VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB AND SHALL BE HELD RESPONSIBLE FOR THE SAME. 2. ALL NOTES AND DIMENSIONS DESIGNATED AS TYPICAL APPLY TO ALL SIMILAR CONDITIONS THROUGHOUT THE PROJECT. 3. ALL DIMENSIONS ARE TO FACE OF FOUNDATION AT EXTERIOR, FACE MASONRY, FACE OF METAL STUD AND CENTERLINE OF STRUCTURAL STEEL COLUMNS UNLESS OTHERWISE NOTED. 4. ROOFING CONTRACTOR TO VERIFY QUANTITY AND LOCATION OF ROOF PENETRATIONS, AND TO FLASH ACCORDING TO MANUFACTURERS' SPECIFICATIONS. 5. PROVIDE A 1" BULLNOSE AT ALL EXPOSED CONCRETE MASONRY UNIT CORNERS. 6. FOR MASONRY REINFORCEMENT SEE SPECIFICATIONS AND STRUCTURAL DRAWINGS. 7. ALL DOOR FRAME EDGES SHALL BE LOCATED 4" FROM WALL INTERSECTIONS UNLESS OTHERWISE NOTED. 8. SEE STRUCTURAL DRAWINGS AND FINISH PLANS FOR POSSIBLE LOCATIONS OF DEPRESSED STRUCTURAL CONCRETE SLABS. 9. THE REQUIREMENTS FOR SEISMIC LOADS HAVE BEEN INCORPORATED INTO THE DESIGN OF THE STRUCTURAL, MECHANICAL AND SUSPENDED CEILING SYSTEMS AS REQUIRED FOR THE NEW CONSTRUCTION. 10. FOR EXTERIOR MASONRY CONTROL JOINTS REFER TO THE EXTERIOR ELEVATION SHEETS. 11. FOR INTERIOR MASONRY EXPANSION JOINTS AND CONTROL JOINTS, JOINTS SHALL BE PLACED AS IDENTIFIED BY THE SPECIFICATION, PREFERABLY AT THE JUNCTION OF WALLS FIRST AND THEN BY THE REQUIRED DISTANCES. PROVIDE A CONTROL JOINT AT ALL EDGES WHERE MASONRY ABUTS STRUCTURAL STEEL. 12. ELECTRICAL CONTRACTOR TO COORDINATE PLACEMENT OF ELEC./ DATA OUTLETS AND SWITCHES WITH THE LOCATION OF CASEWORK. REFER TO CASEWORK DRAWINGS AND ELECTRICAL DRAWINGS. 13. ALL SPRINKLER PIPING TO BE LOCATED ABOVE FINISH CEILING UNLESS OTHERWISE NOTED. 14. SPRINKLER HEADS SHALL BE LOCATED IN THE CENTER OF CEILING PADS. 15. EXPOSED SPRINKLER INSTALLATIONS SHALL BE CAREFULLY COORDINATED IN THE FIELD TO AVOID CONFLICTS WITH LIGHTING AND OTHER CEILING MOUNTED EQUIPMENT. 16. ALL RATED DOORS SHALL HAVE POSITIVE LATCHING LOCK SETS OR LATCH SETS AND CLOSERS. 17. ALL DOOR LEVERS ON DOORS LEADING TO HAZARDOUS SPACES SHALL BE KNURLED. 18. ALL DOORS EXITING 100 OR MORE PERSONS SHALL HAVE PANIC EXIT DEVICES. 19. METAL STUD CONTRACTOR TO PROVIDE AND COORDINATE PLACEMENT OF METAL STUD SLIP TRACKS AT ALL STUD WALLS BUILT ON TOP OF OR UNDER STRUCTURAL STEEL BRACING FRAMES, TYPICAL. 20. PROVIDE AN ALUMINUM DIVIDER STRIP AT ALL DOOR THRESHOLDS WHERE TWO DIFFERENT FINISHES MEET UNLESS OTHERWISE NOTED. 21. METAL STUD CONTRACTOR TO PROVIDE AND COORDINATE PLACEMENT AND BLOCKING FOR ALL WALL MOUNTED ELEMENTS ON METAL STUD OR METAL FURRING WALL CONSTRUCTION. TYPICAL. 22. ALL PARTITIONS, CEILINGS, ROOFS, FENESTRATIONS, AND FLOORS, PART OF THE THERMAL ENVELOPE, SHALL BE FULLY AIR SEALED WITH SEALANT TO MITIGATE THE TRANSFERENCE OF AIR. THIS SHALL INCLUDE ALL SILL/SOLE PLATES, TOP PLATES, DISSIMILAR MATERIAL TRANSITIONS, PENETRATIONS, JOINTS, AND SHEATHING PERIMETERS. IN AREAS OF RATED PARTITIONS, SEALANT SHALL BE OF SUFFICIENT GRADE TO COMPLY WITH FIRE RATING REQUIREMENTS. TYPICAL.

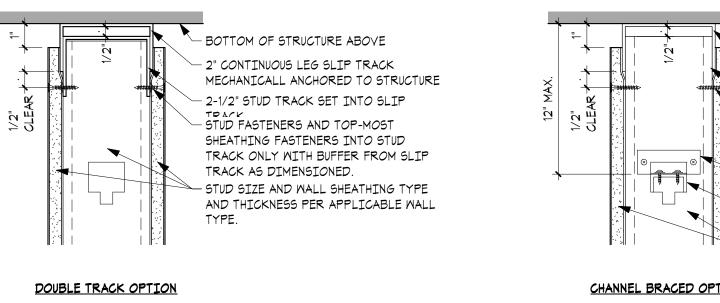
**NNECTICUT** H TOCO N RUMBULI 0 TIOI Ň RENO K RIC RO X TE EDISON  $\mathbf{Z}$ 58 JACUNSKI HUMES ARCHITECTS, LLC **15 MASSIRIO DRIVE SUITE 101 BERLIN, CT** 06037 TEL 860-828-9221 FAX 860-828-9223 ARCH. GENERAL **INFORMATION** AND **ABBREVIATIONS** 

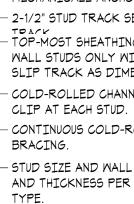
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JH1828	
CALE	
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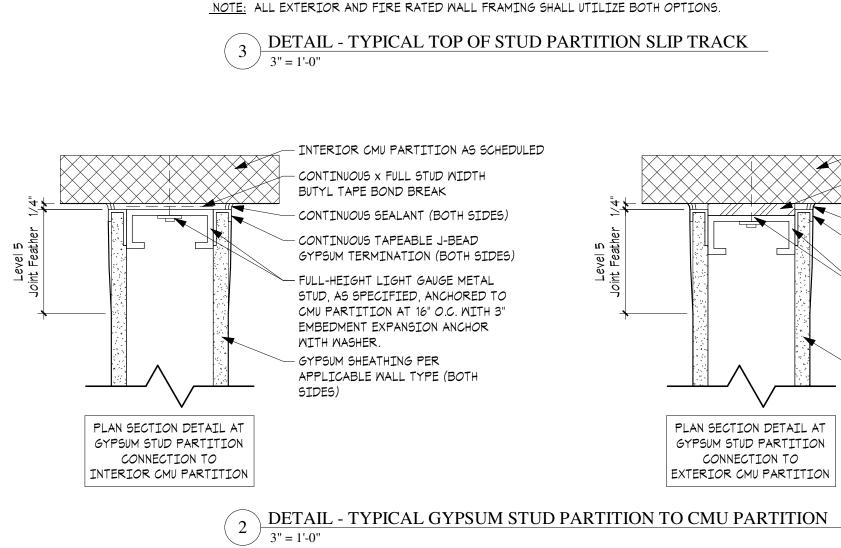




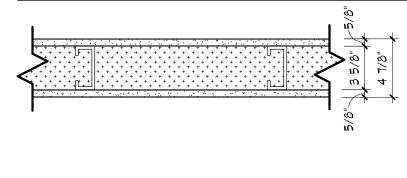


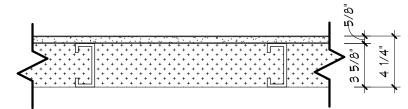
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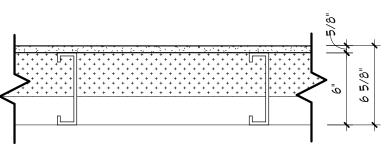
CHANNEL BRACED OPTION



### WGA-SERIES - GYPSUM BOARD (METAL STUD), ATTENUATION







### <u> MGA-4</u>

COMPOSITION: 5/8" GYPSUM BOARD, 3-5/8" METAL STUDS AT 16" ON-CENTER, 3-1/2" ACOUSTIC BATTEN INSULATION, 5/8" GYPSUM BOARD.

TOTAL THICKNESS: 4-7/8"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

RATING: NONE

### <u> MGA-4f</u>

COMPOSITION: 5/8" GYPSUM BOARD, 3-5/8" METAL STUDS AT 16" ON-CENTER, 3-1/2" ACOUSTIC BATTEN INSULATION.

TOTAL THICKNESS: 4-1/4"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

RATING: NONE

### <u> MGA-6f</u>

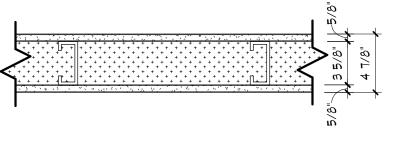
COMPOSITION: 5/8" GYPSUM BOARD, 6" METAL STUDS AT 16" ON-CENTER, 3-1/2" ACOUSTIC BATTEN INSULATION.

TOTAL THICKNESS: 6-5/8"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

RATING: NONE

WFGA-SERIES - FIRE-RATED, GYPSUM BOARD (METAL STUD), ATTENUATION



### <u> WFGA-4(1)</u>

COMPOSITION: 5/8" FIRE-CODE GYPSUM BOARD, 3-5/8" METAL STUDS AT 16" ON-CENTER, 3-1/2" ACOUSTIC BATTEN INSULATION, 5/8" FIRE-CODE GYPSUM BOARD.

TOTAL THICKNESS: 4-7/8"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

RATING: 1-HOUR FIRE RATING (U.L. #U-465)

- BOTTOM OF STRUCTURE ABOVE - 2" CONTINUOUS LEG SLIP TRACK MECHANICALL ANCHORED TO STRUCTURE

- 2-1/2" STUD TRACK SET INTO SLIP - TOP-MOST SHEATHING FASTENERS INTO WALL STUDS ONLY WITH BUFFER FROM

SLIP TRACK AS DIMENSIONED. - COLD-ROLLED CHANNEL ANCHORING

- CONTINUOUS COLD-ROLLED CHANNEL

- STUD SIZE AND WALL SHEATHING TYPE AND THICKNESS PER APPLICABLE WALL

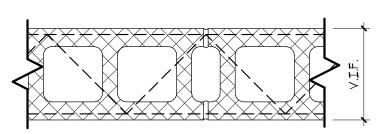
> - EXTERIOR CMU PARTITION AS SCHEDULED CONTINUOUS X FULL STUD WIDTH, R-5 MIN., POLYISOCYANURATE BOARD BOND BREAK

CONTINUOUS SEALANT (BOTH SIDES) CONTINUOUS TAPEABLE J-BEAD GYPSUM TERMINATION (BOTH SIDES)

FULL-HEIGHT LIGHT GAUGE METAL STUD, AS SPECIFIED, ANCHORED TO CMU PARTITION AT 16" O.C. WITH 3" EMBEDMENT EXPANSION ANCHOR WITH WASHER.

GYPSUM SHEATHING PER APPLICABLE WALL TYPE (BOTH SIDES)

### WFB-SERIES - FIRE-RATED, BLOCK



### <u> WFB-E(1)</u>

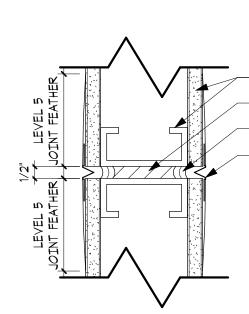
COMPOSITION: U.L. CONCRETE MASONRY UNIT, HORIZONTAL REINFORCING AT 16" ON-CENTER VERTICALLY.

TOTAL THICKNESS: MATCH EXISTING (V.I.F.)

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

### RATING:

6" NOMINAL THICKNESS OR LESS: 1-HOUR FIRE RATING (U.L. #U-906) 8" NOMINAL THICKNESS OR GREATER: 1-HOUR FIRE RATING (U.L. #U-905)



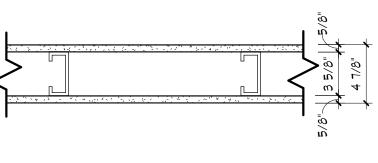
- STUD AND SHEATHING PER APPLICABLE WALL TYPE - FIRE-SHIELD STRIPS AT FIRE RATED WALLS

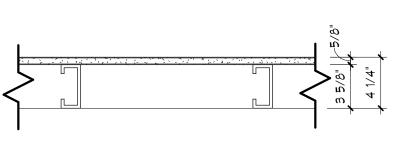
- CAULK JOINT. TYPICAL BOTH SIDES.

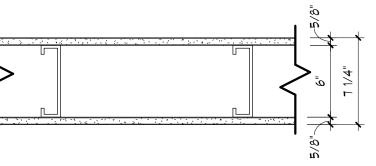
- 1/2" PRE-MANUFACTURED GYPSUM BOARD CONTROL JOINT ASSEMBLY. TYPICAL BOTH SIDES.

NOTE: REFER TO SPECIFICATIONS, DIMENSION FLOOR PLANS, AND COLUMN DETAILS FOR LOCATIONS OF CONTROL JOINTS. OTHERWISE INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS.











<u> MG-4</u>

COMPOSITION: 5/8" GYPSUM BOARD, 3-5/8" METAL STUDS AT 16" ON-CENTER, 5/8" GYPSUM BOARD.

TOTAL THICKNESS: 4-7/8"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

RATING: NONE

### <u> MG-4</u>f

COMPOSITION: 5/8" GYPSUM BOARD, 3-5/8" METAL STUDS AT 16" ON-CENTER. OTAL THICKNESS: 4-1/4"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

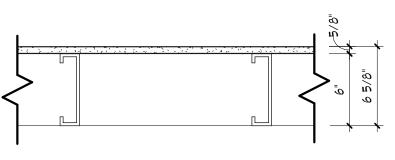
<u>RATING:</u> NONE

### <u> MG-6</u>

COMPOSITION: 5/8" GYPSUM BOARD, 6" METAL STUDS AT 16" ON-CENTER, 5/8" GYPSUM BOARD. TOTAL THICKNESS: 7-1/4"

TOTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

<u>RATING:</u> NONE



### <u> MG-6f</u>

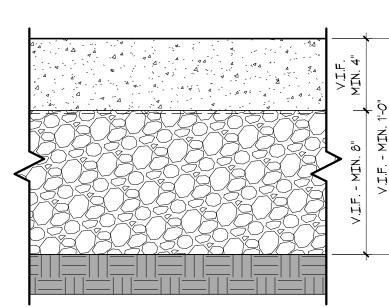
COMPOSITION: 5/8" GYPSUM BOARD, 6" METAL STUDS AT 16" ON-CENTER.

OTAL THICKNESS: 6-5/8

OTAL HEIGHT: FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.

<u>RATING:</u> NONE

### FC-SERIES - CONCRETE



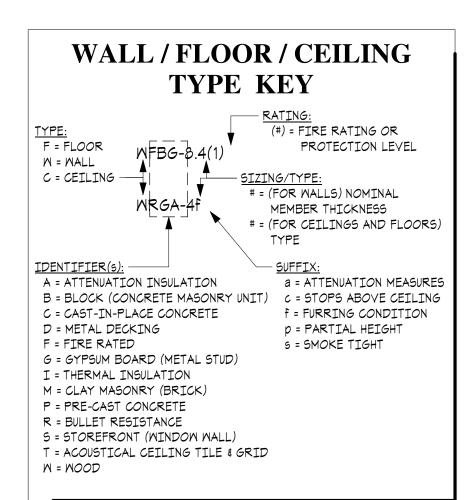
### <u>FC-E</u>

COMPOSITION: FINISHES AS SCHEDULED, REINFORCED CONCRETE SLAB, VAPOR BARRIER, COMPACTED SUB-BASE, EXISTING VIRGIN SUB-GRADE.

TOTAL THICKNESS: V.I.F. - MIN. 1'-O"

RATING: AIR AND MOISTURE SEALED

NOTES: REFERENCE STRUCTURAL DRAWINGS. REFERENCE FLOOR FINISHES DRAWINGS AND SPECIFICATIONS FOR SLAB PREPARATION REQUIREMENTS.



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**15 MASSIRIO DRIVE SUITE 101 BERLIN, CT** 06037 TEL 860-828-9221 FAX 860-828-9223



DRAWING NO.
A-0.2

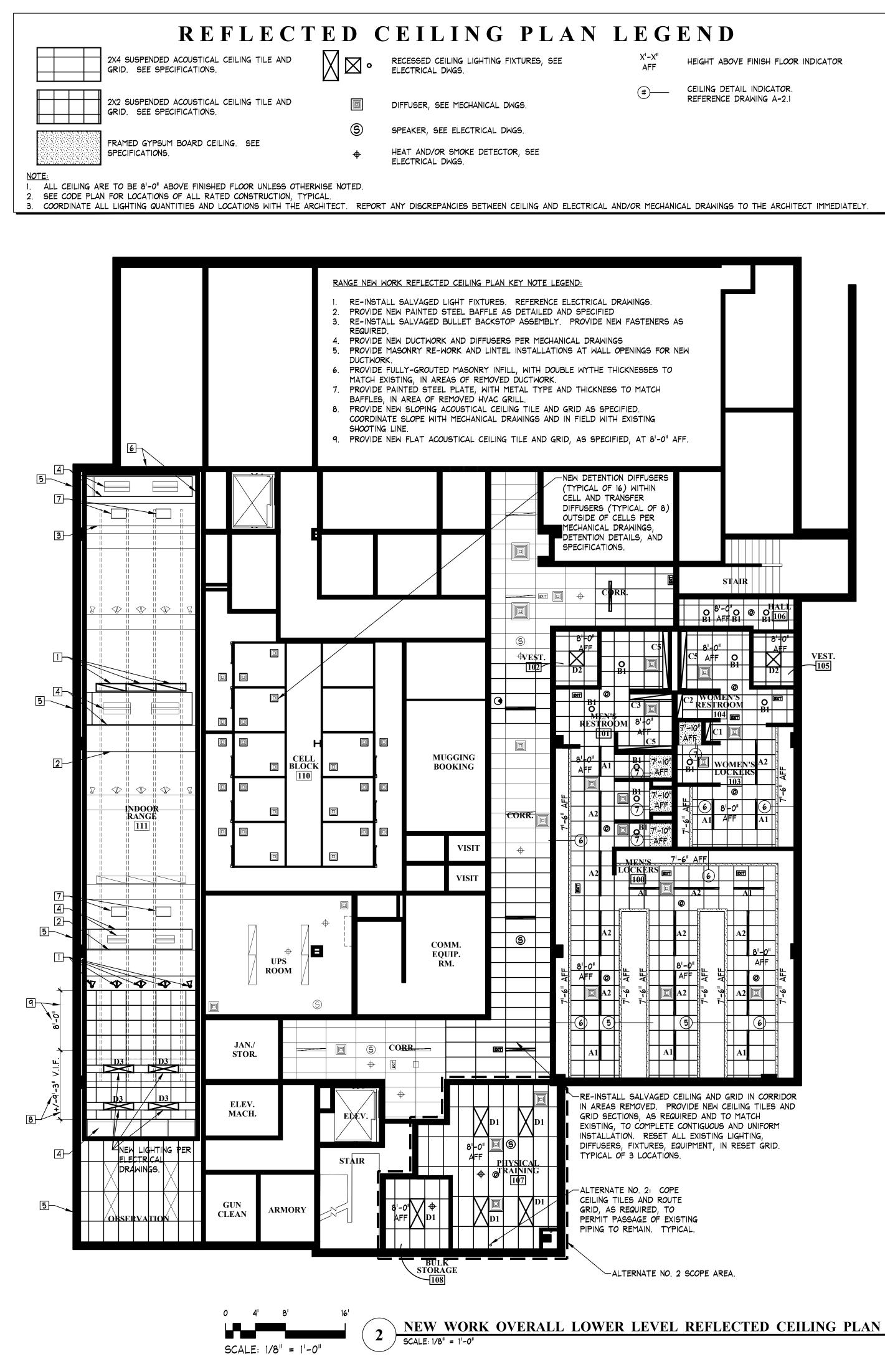
As indicated

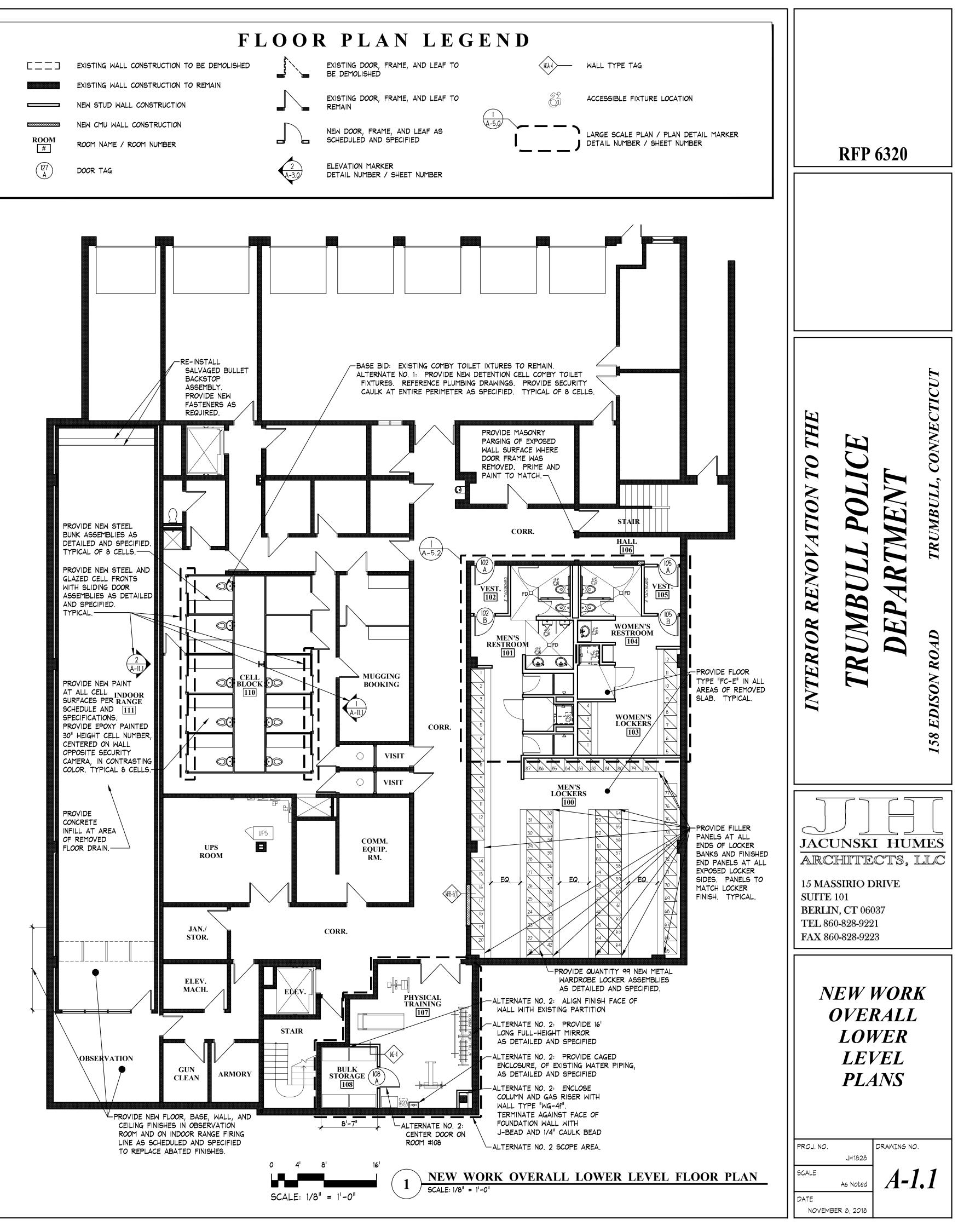
NOVEMBER 8, 2018

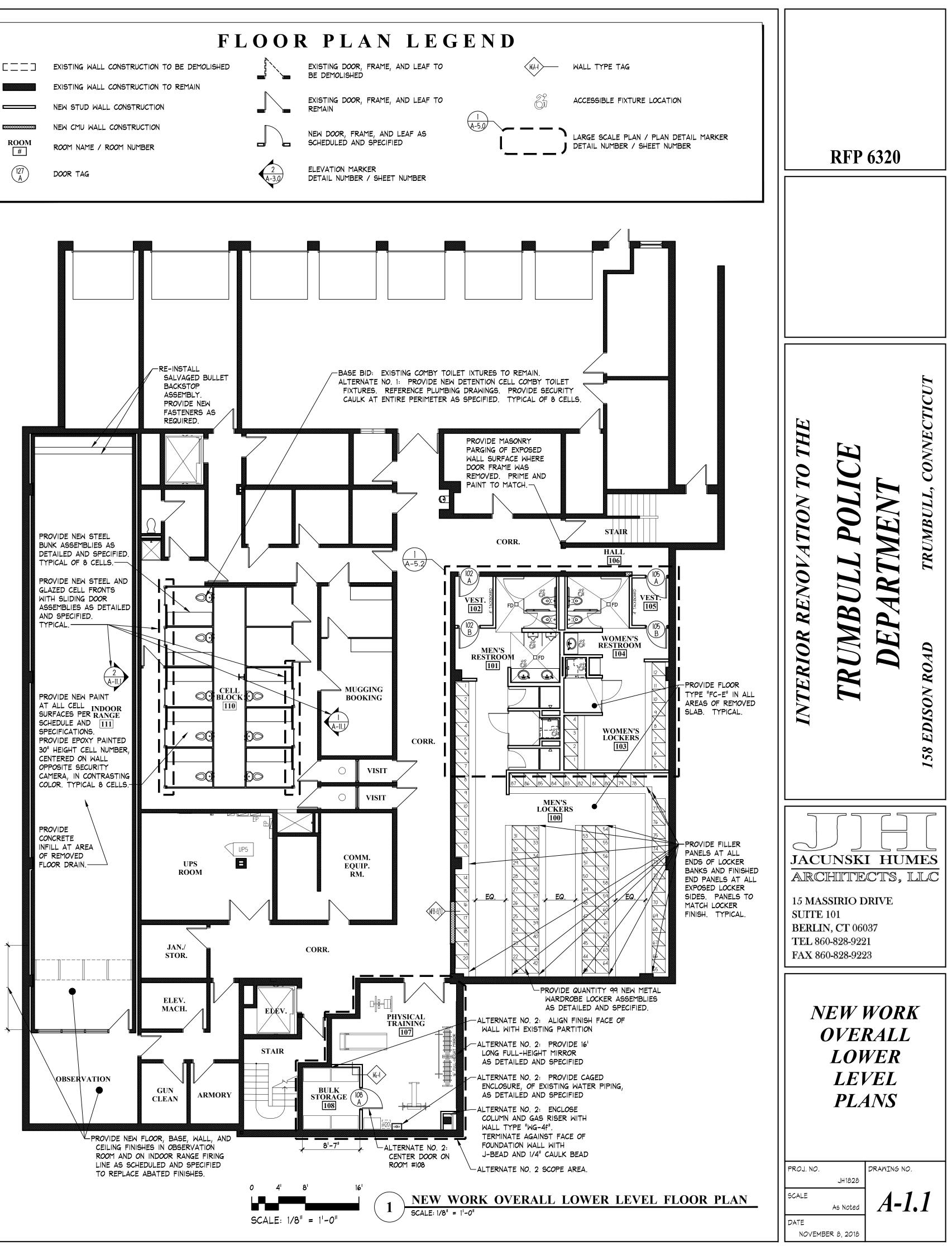
PROJ. NO.

SCALE

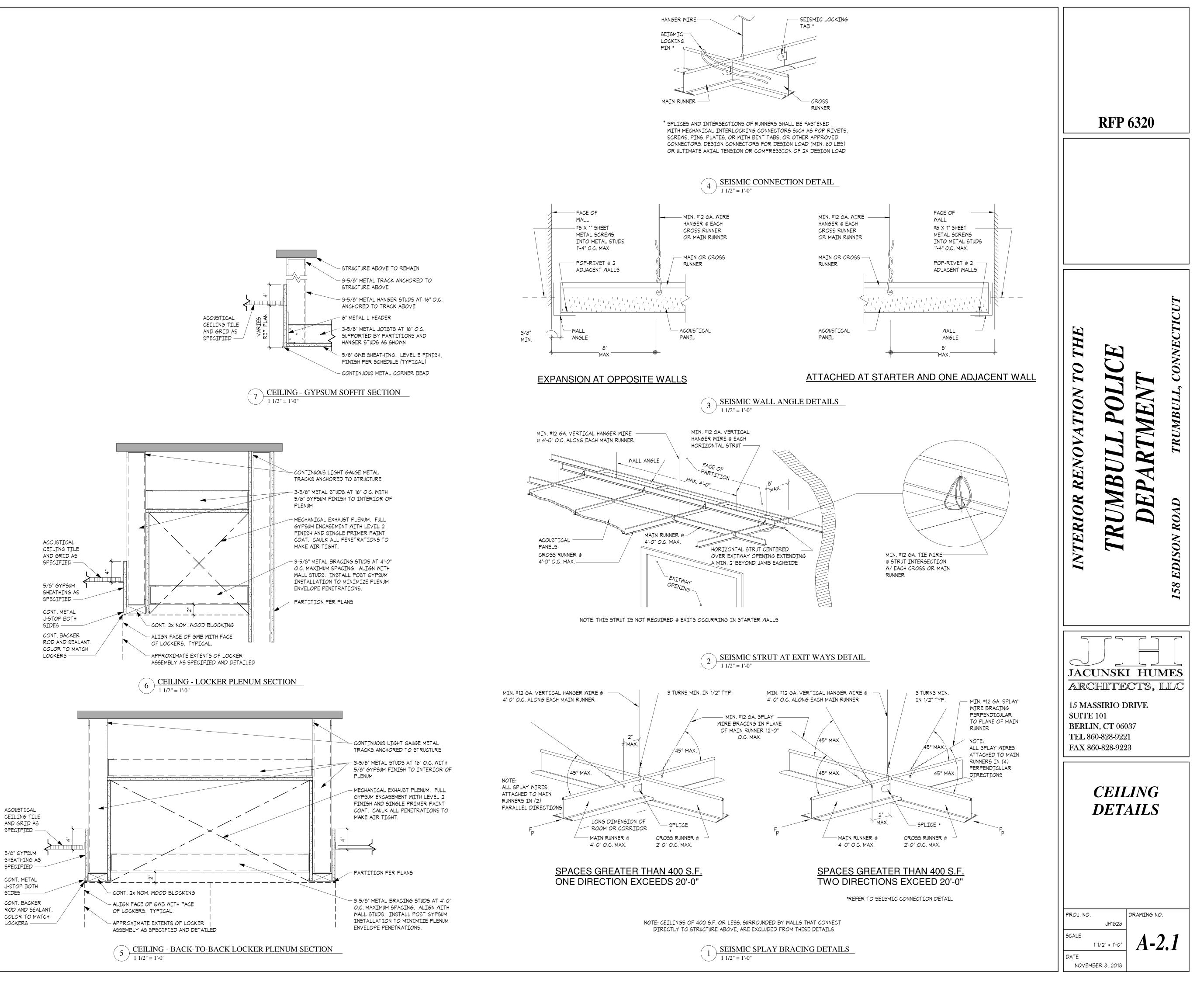
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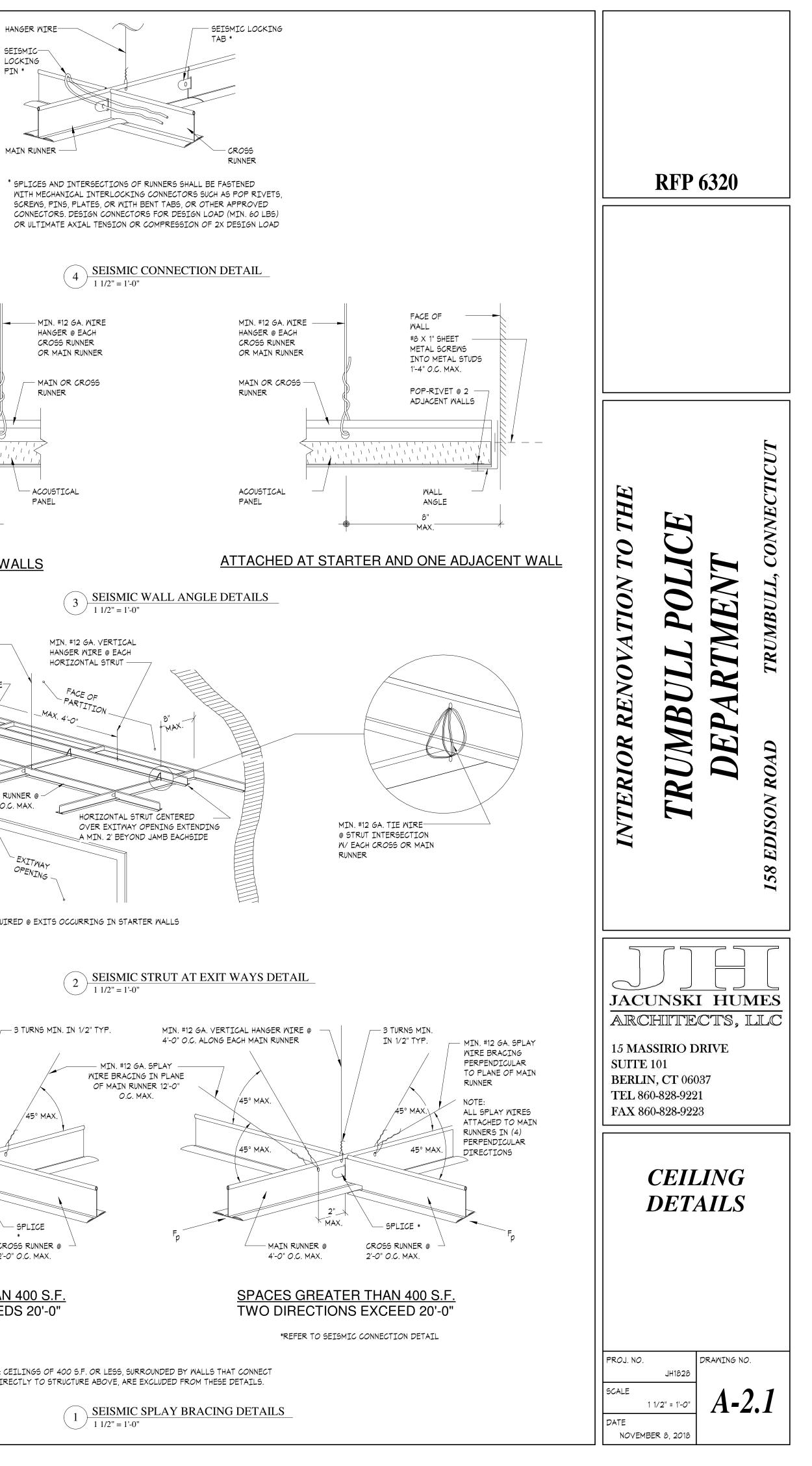


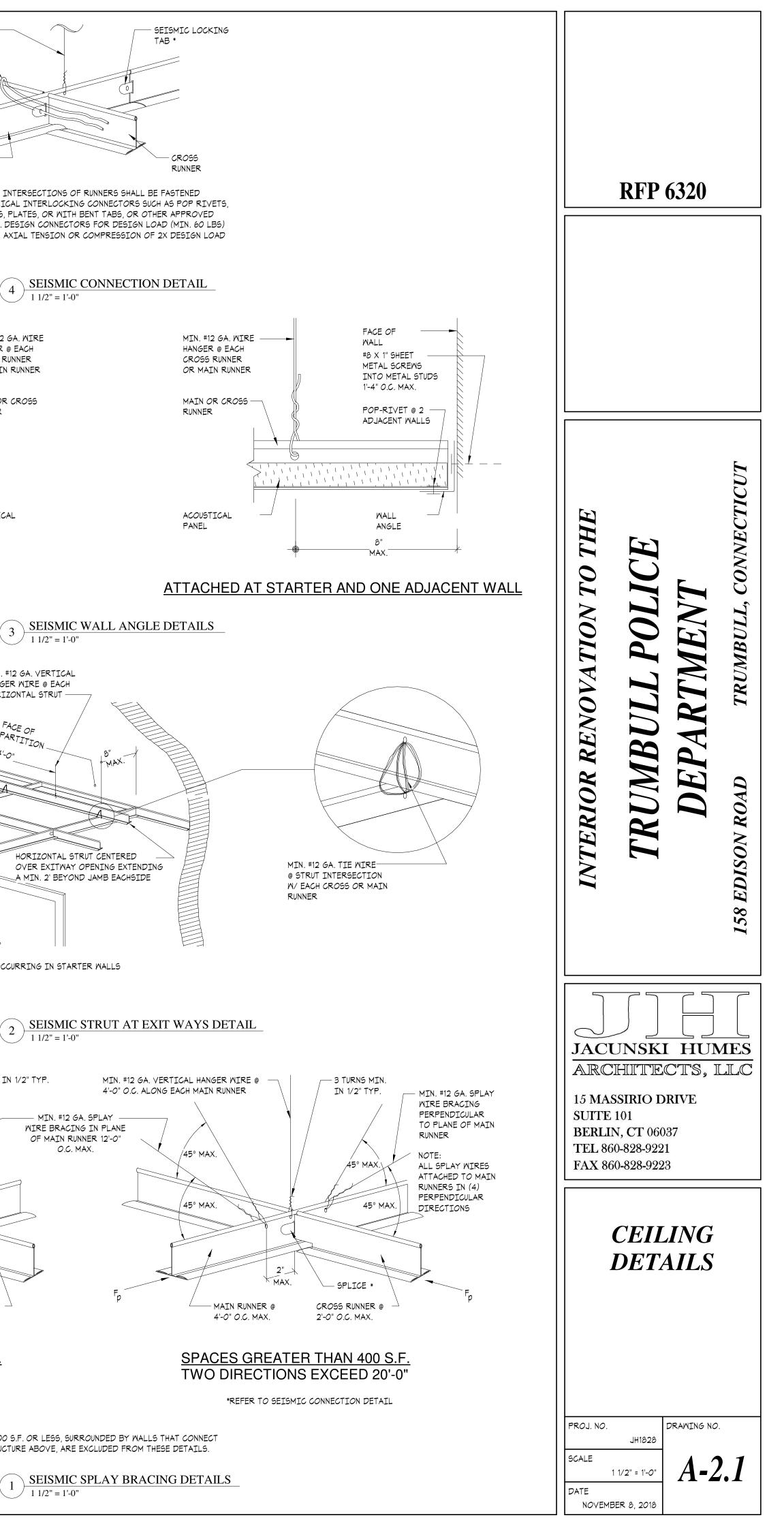


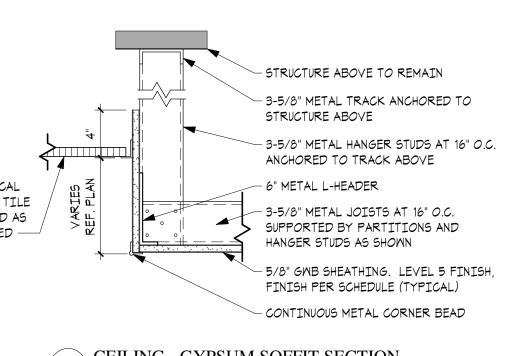


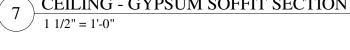


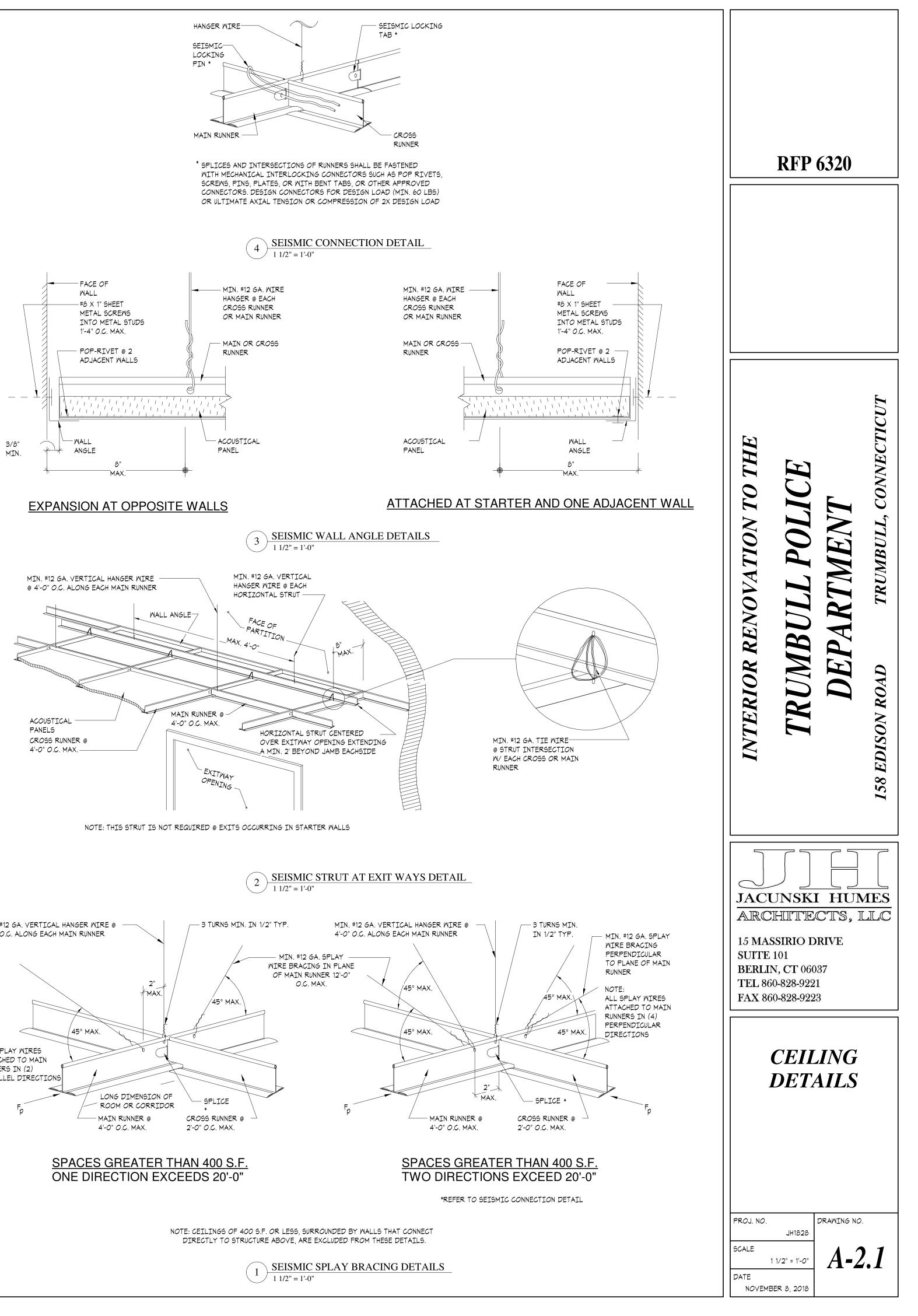




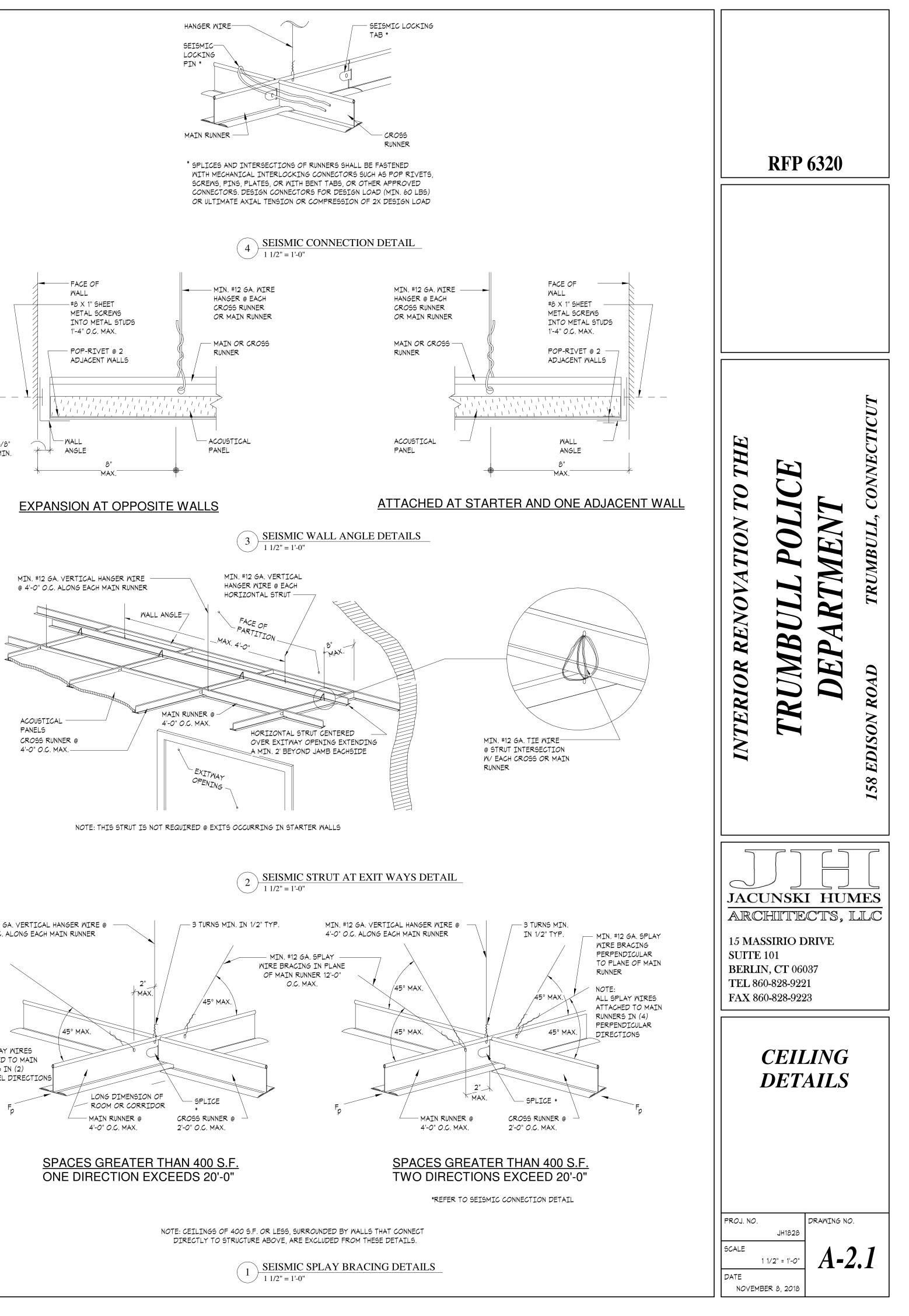




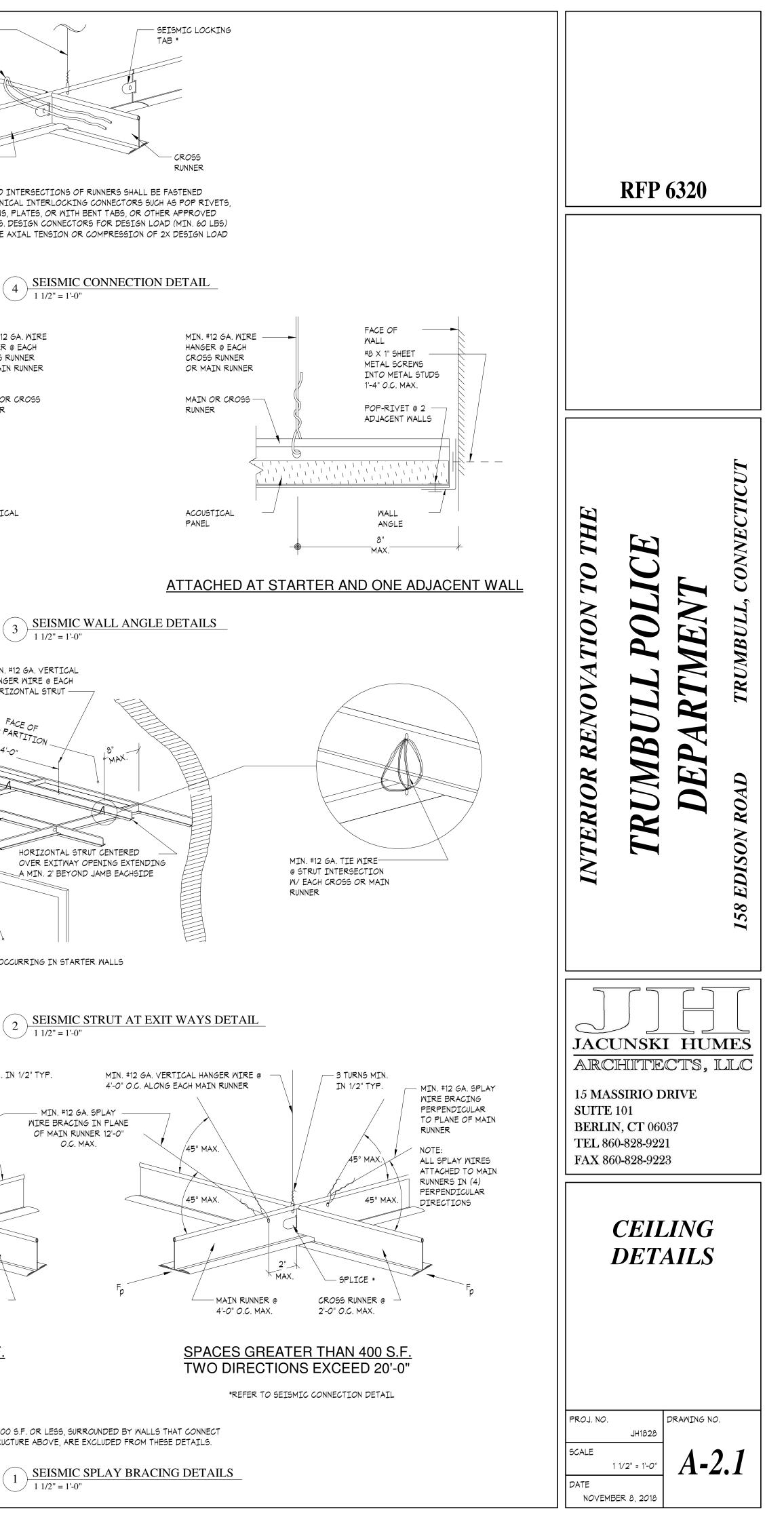


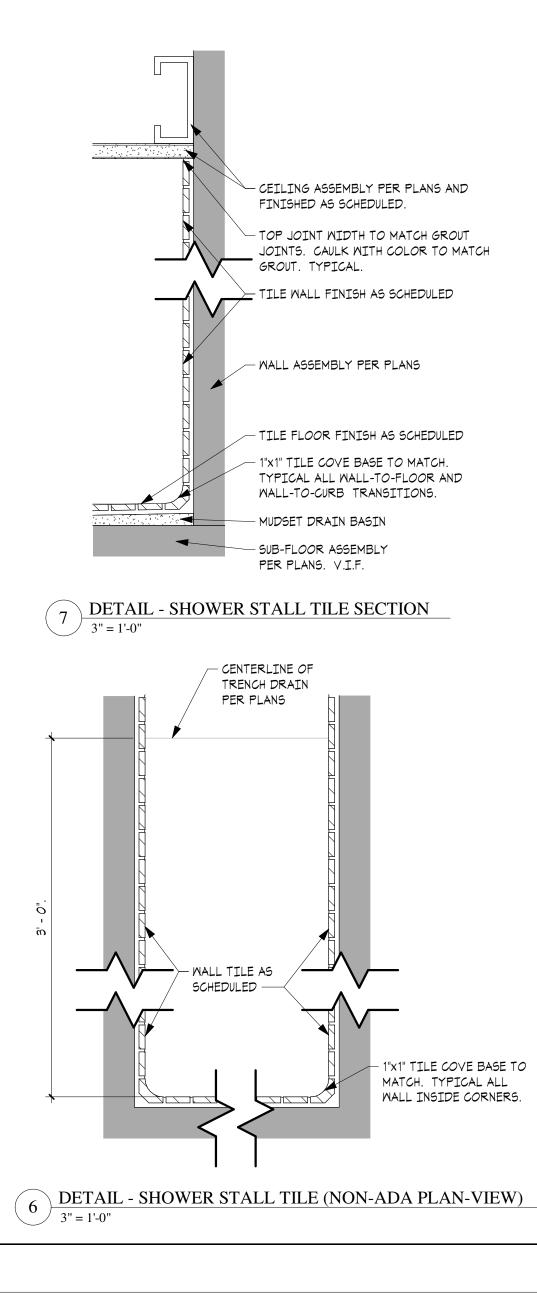


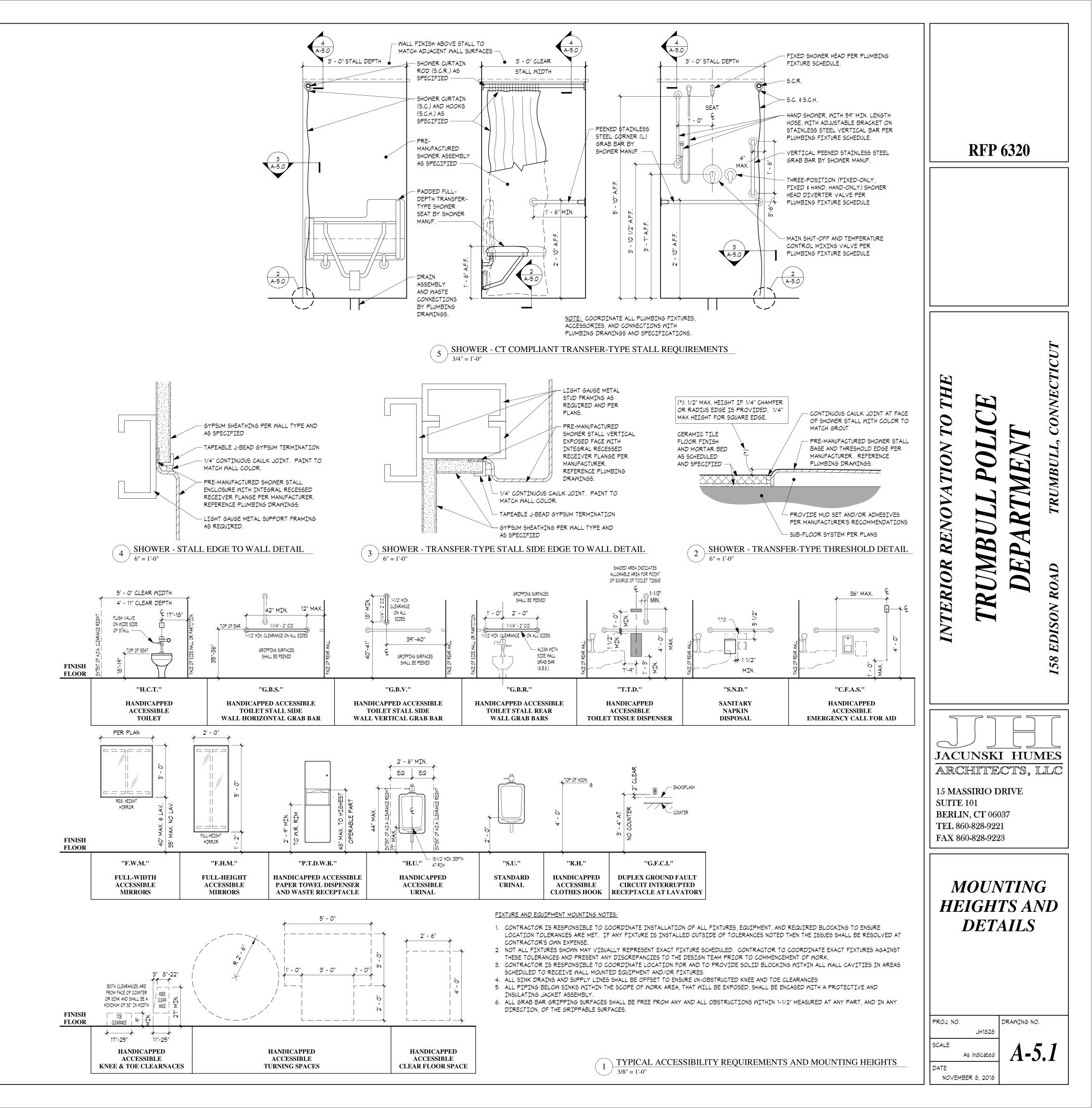


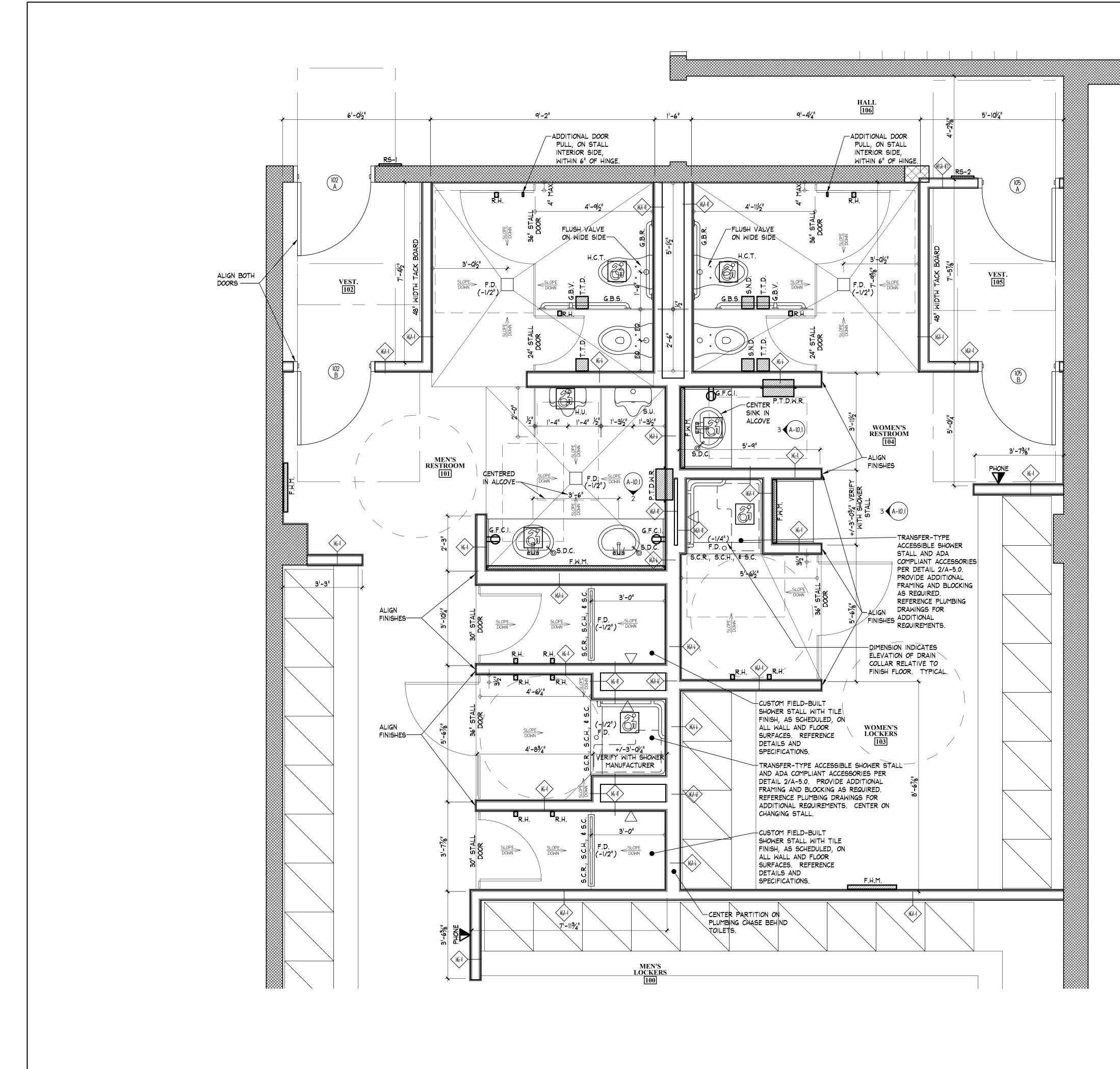


SIDES -



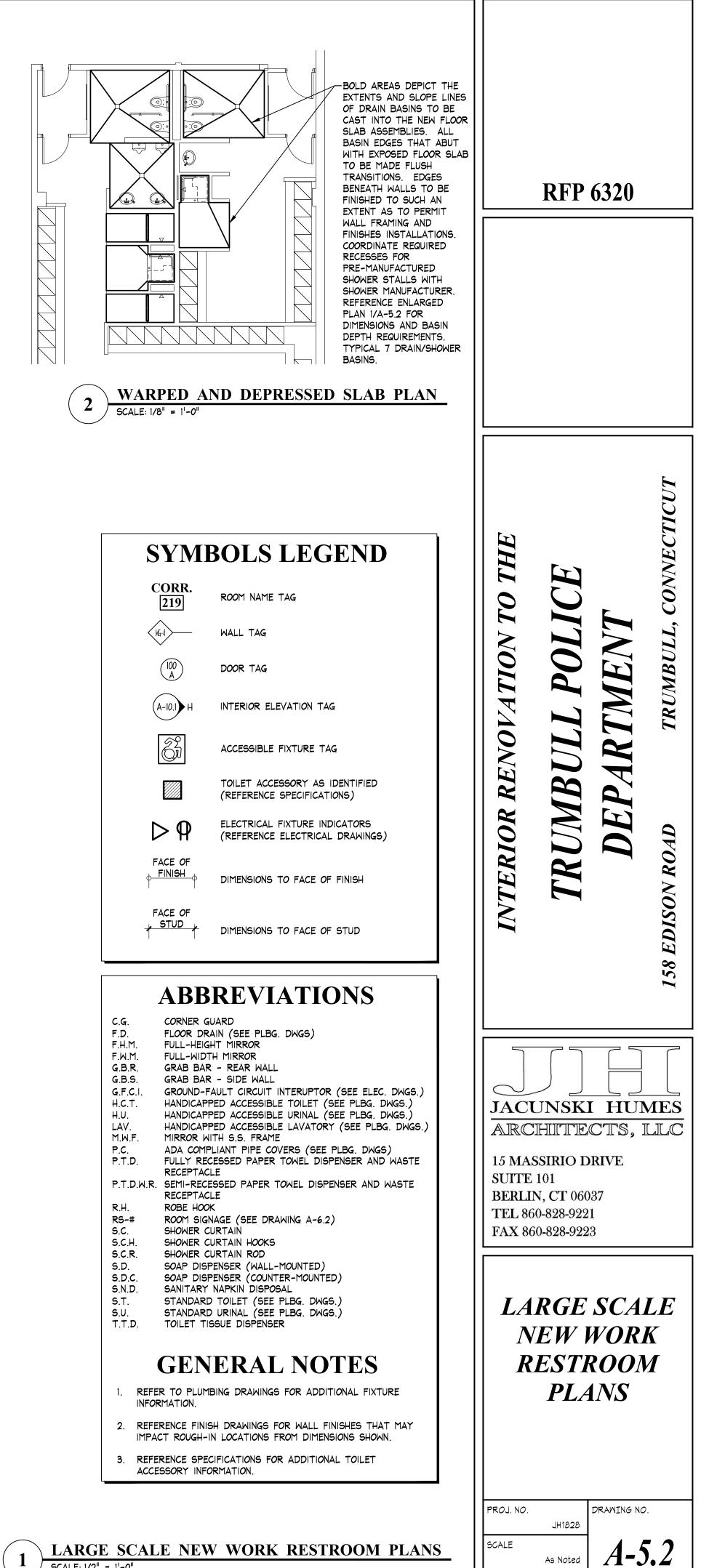








SCALE: 1/2" = 1'-0"

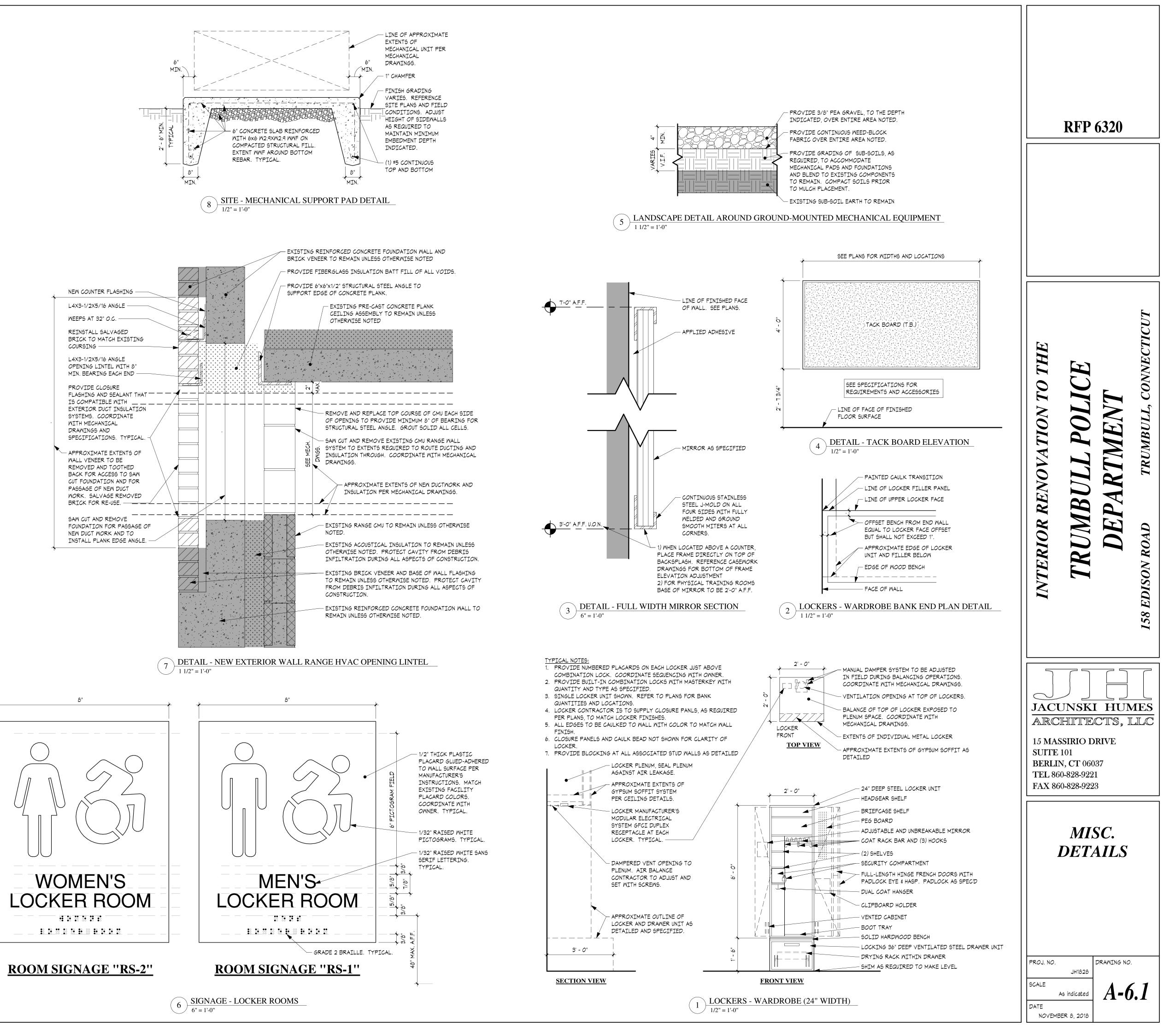


DATE NOVEMBER 8, 2018

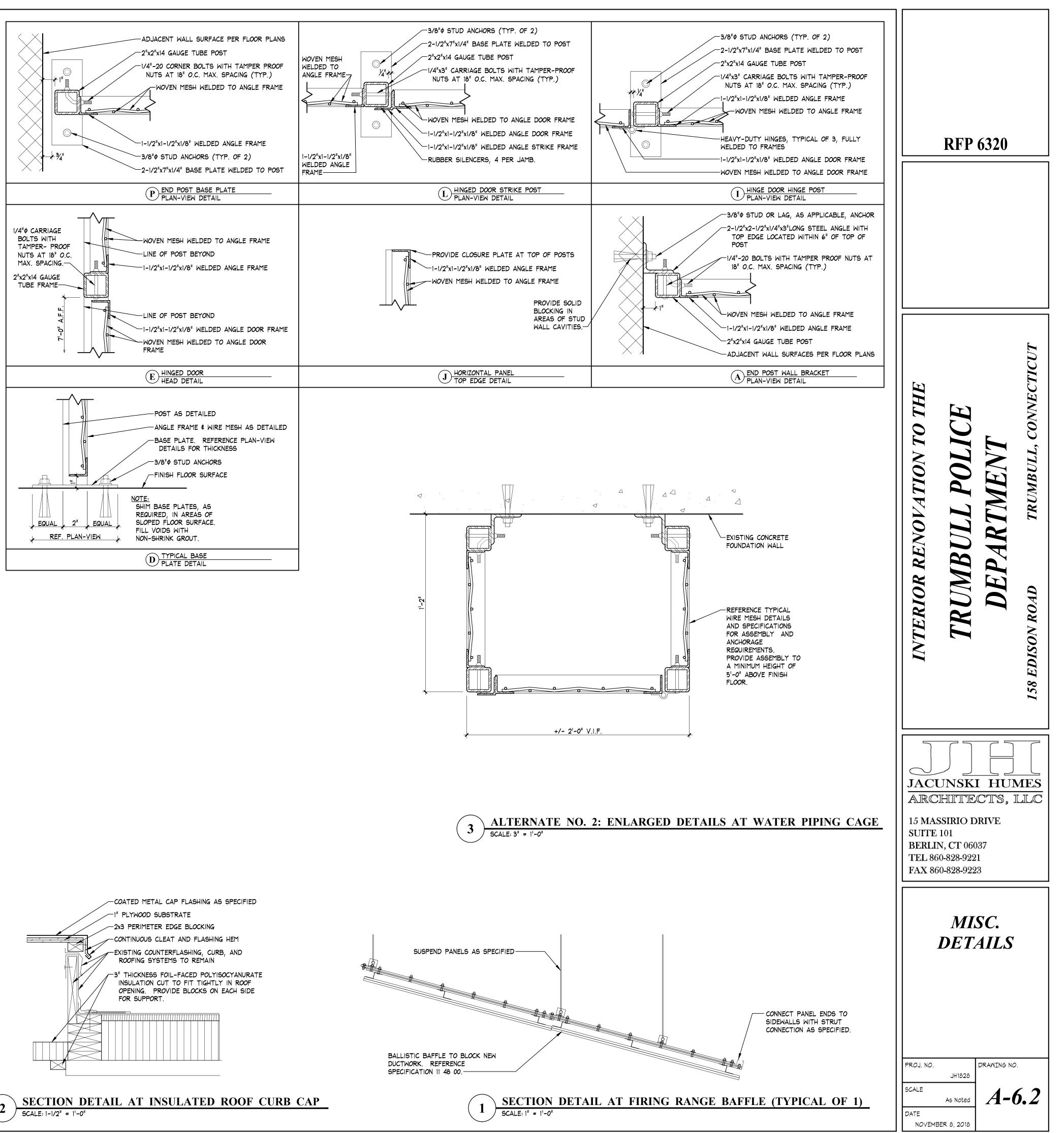
REINSTALL SALVAGED

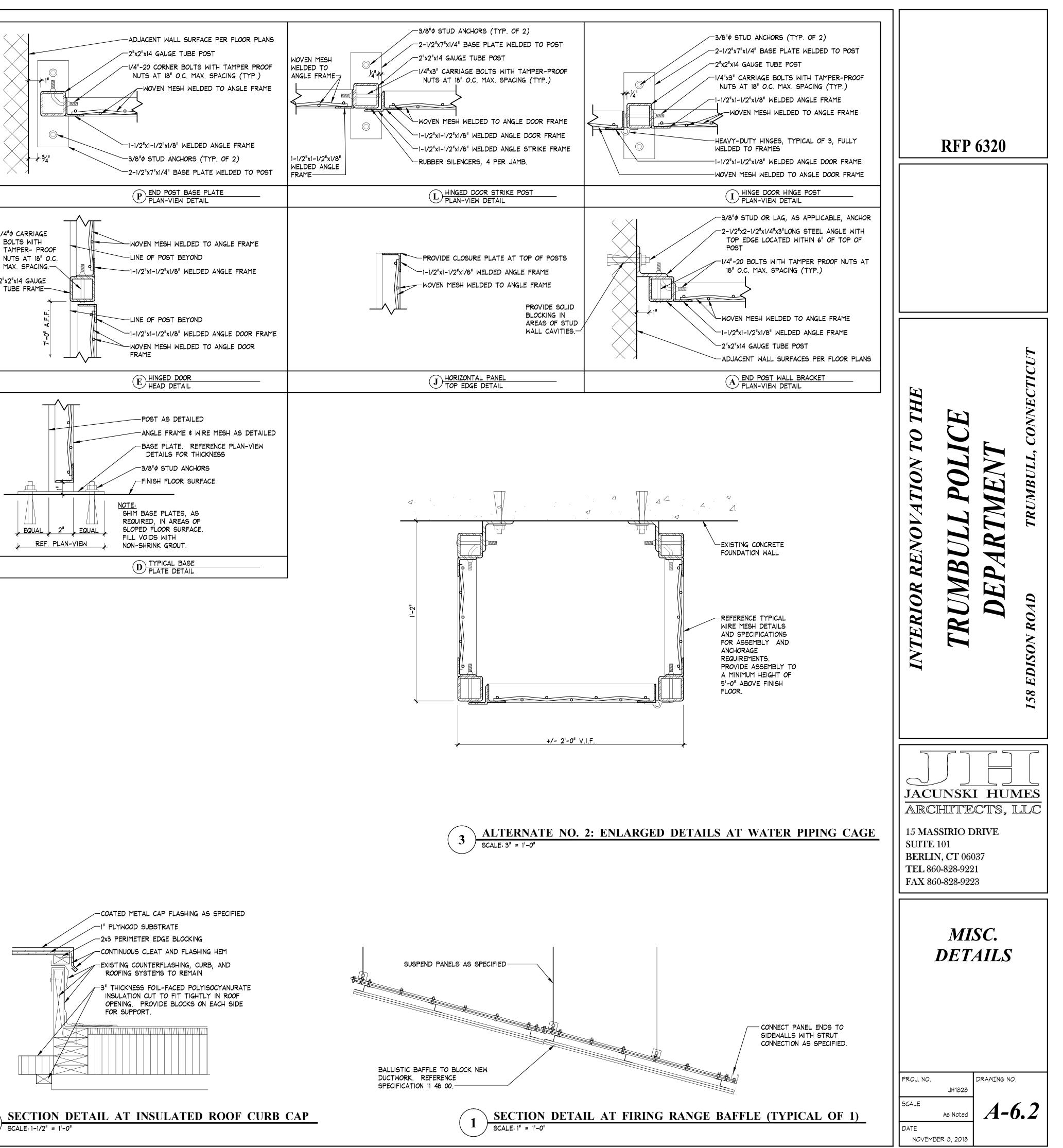
WALL VENEER TO BE REMOVED AND TOOTHED PASSAGE OF NEW DUCT

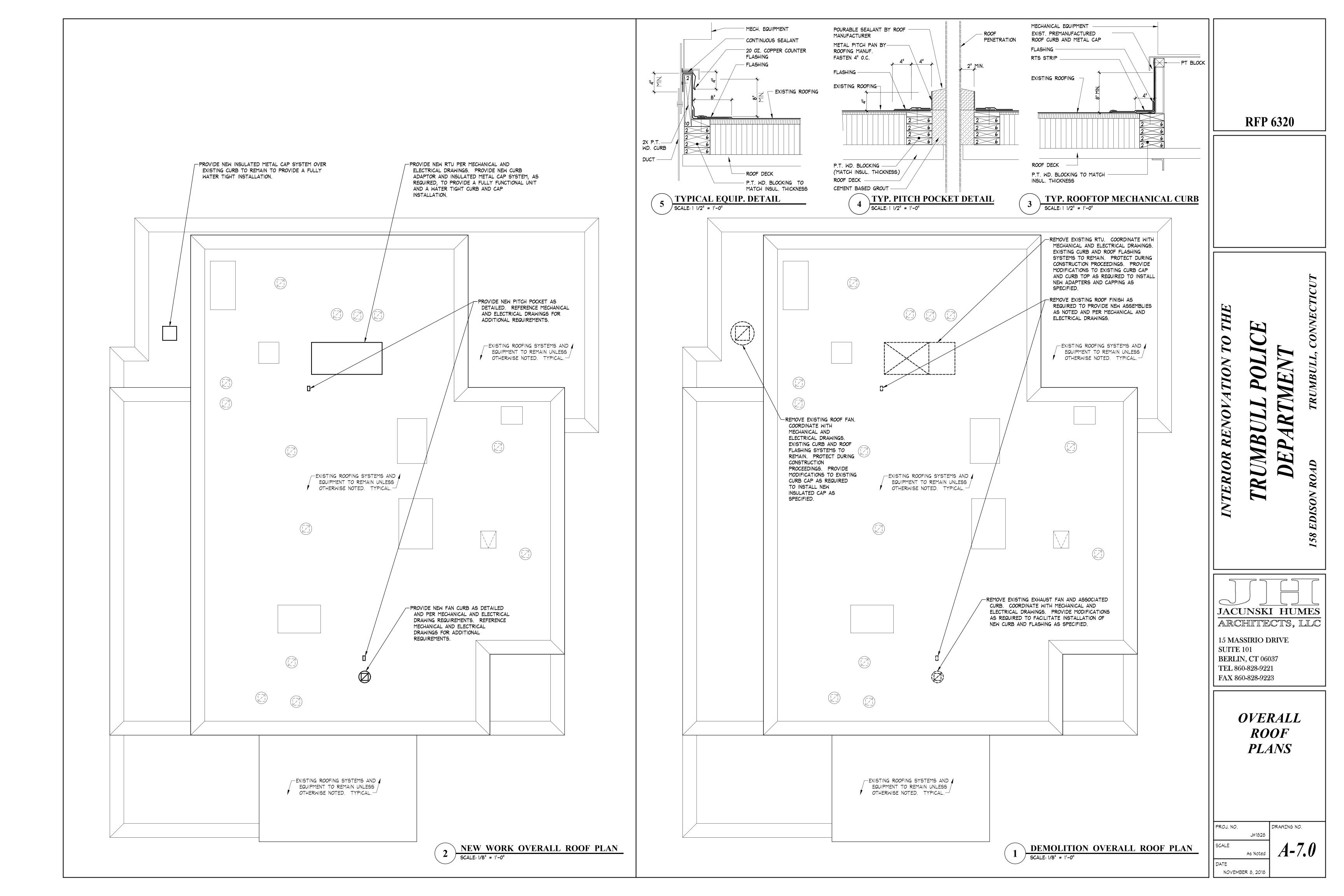
SAW CUT AND REMOVE NEW DUCT WORK AND TO

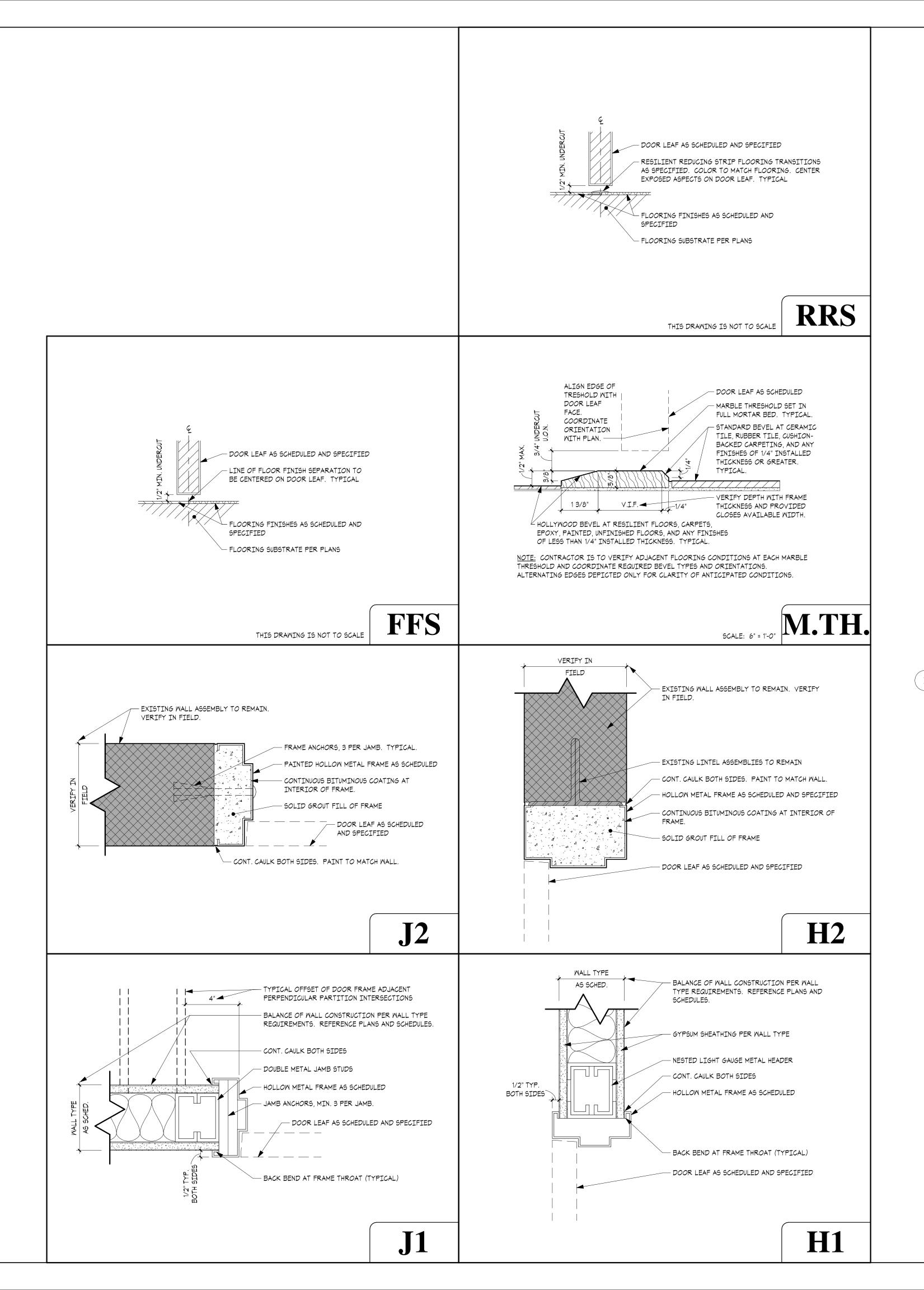


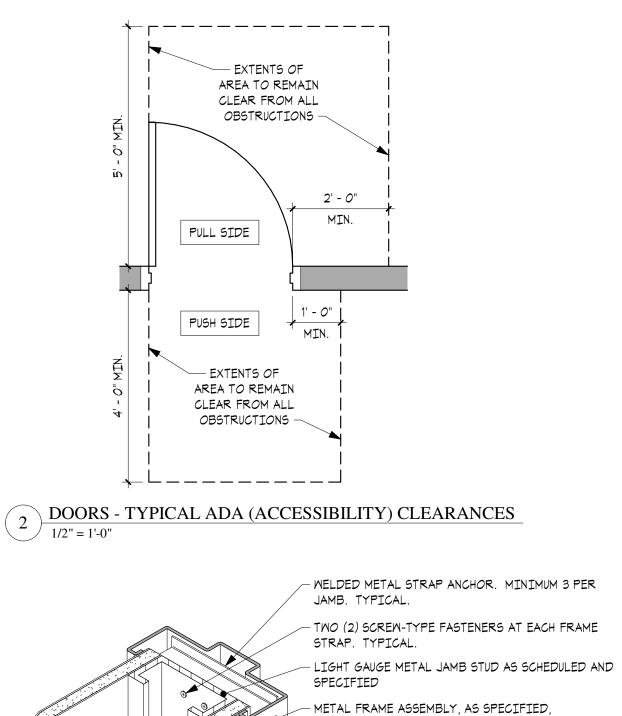


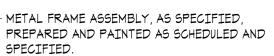












- THE DEMISING LINE BETWEEN WALL PAINT AND TRIM PAINT SHALL BE AT THIS EDGE OF THE CAULK BEAD. TYPICAL BOTH SIDES.

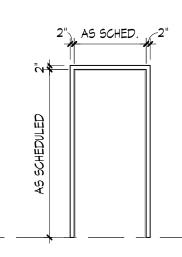
 PAINT CAULK BEAD TO MATCH WALL COLOR.
 LINE OF PAINT EDGE SHALL NOT VARY GREATER THAN 1/16" FOR ENTIRE LENGTH OF FRAME EDGE.
 GYPSUM SURFACE PREPARED AND PAINTED AS

SCHEDULED AND SPECIFIED. - WELDED FIXED BASE ANCHOR AT BASE OF ALL

JAMBS UNLESS OTHERWISE NOTED. MECHANICALLY FASTENED BASE ANCHOR TO FLOOR WITH ONE (1) POWDER ACTUATED FASTENER, WITH WASHER, AT 1-1/2" MINIMUM EMBEDMENT. FRAME EDGE TO SIT TIGHT TO SUB-FLOOR APPROXIMATE OUTLINE OF WALL FRAMING COMPONENTS

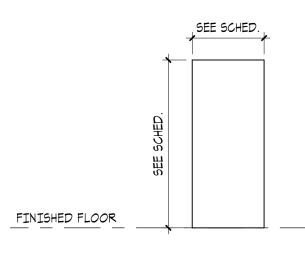
FLOOR COMPONENTS AND FINISHES PER PLANS AND SPECIFICATIONS.

1 DOORS - TYPICAL GYPSUM AND STUD HOLLOW METAL FRAME DETAIL 3" = 1'-0"



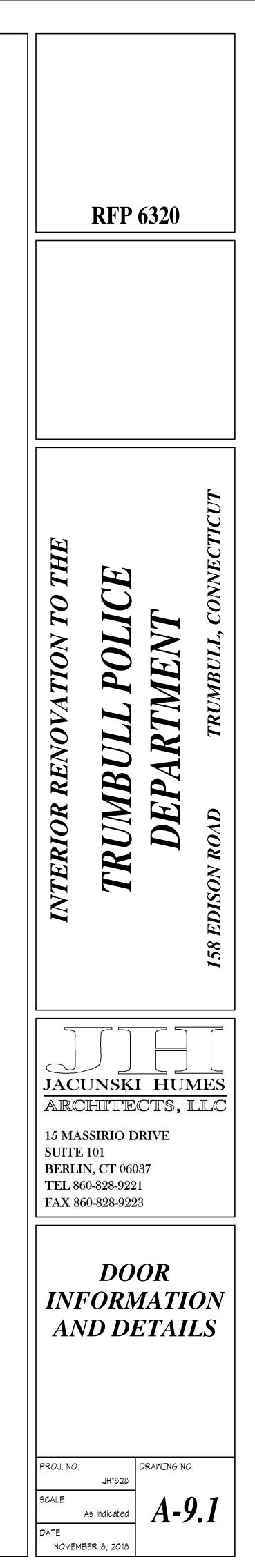
### HMF-1

### **HOLLOW METAL FRAMES**



FINISHED FLOOR

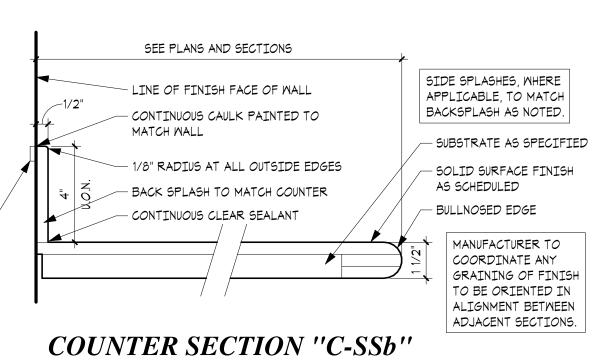


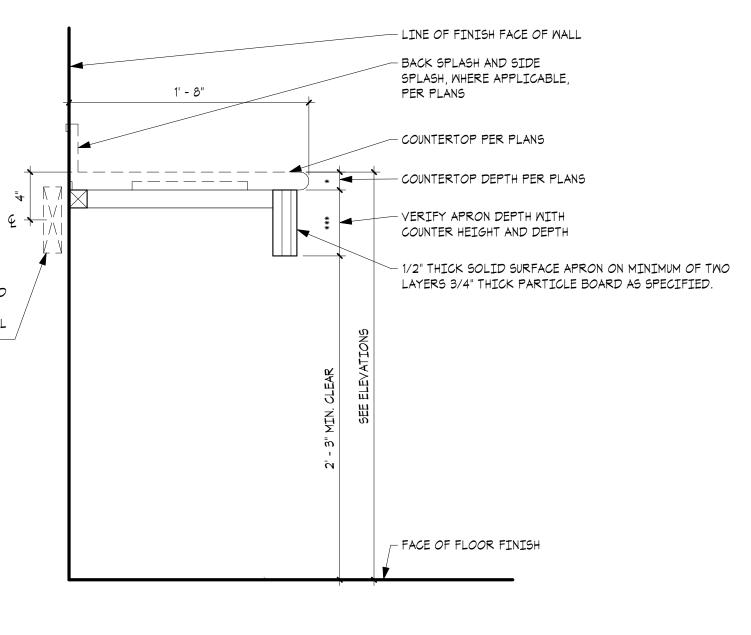


PROVIDE MINIMUM 1/4" LIP AT REAR OF TOP EDGE OF BACK SPLASH. SCRIBE TO WALL SURFACE. ----

> SOLID WOOD BLOCKING WITHIN MALL CAVITIES -----

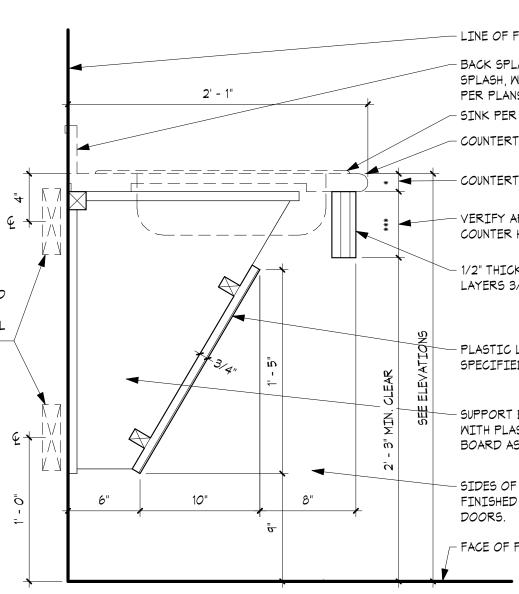
SOLID WOOD BLOCKING WITHIN WALL CAVITIES —





### SECTION "BC-Lns"

LAVATORY COUNTER (OPEN BELOW, NO SINK)



- LINE OF FINISH FACE OF WALL

- BACK SPLASH AND SIDE SPLASH, WHERE APPLICABLE, PER PLANS

- SINK PER PLUMBING DRAWINGS - COUNTERTOP PER PLANS

COUNTERTOP DEPTH PER PLANS

VERIFY APRON DEPTH WITH COUNTER HEIGHT AND DEPTH

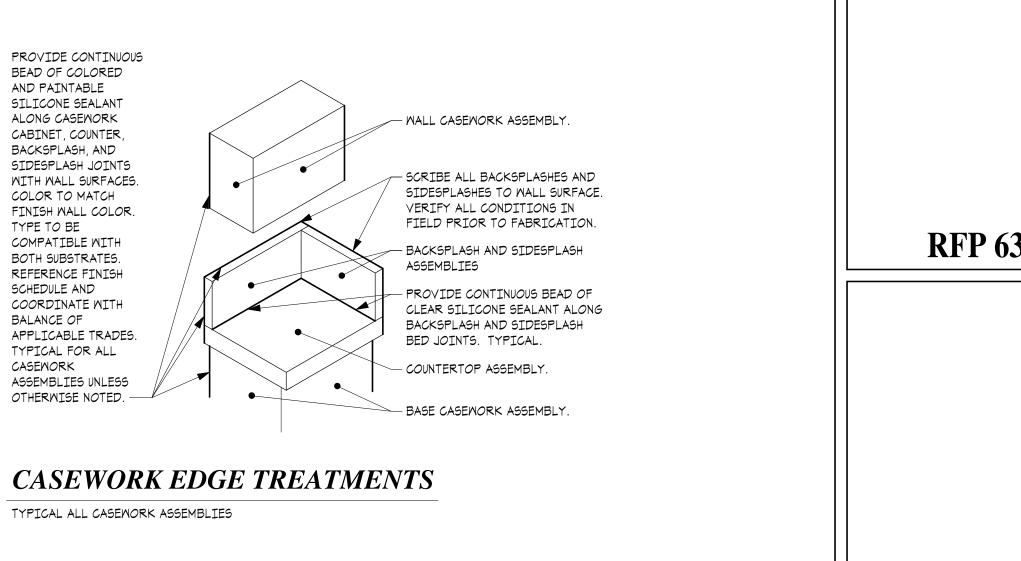
- 1/2" THICK SOLID SURFACE APRON ON MINIMUM OF TWO LAYERS 3/4" THICK PARTICLE BOARD AS SPECIFIED.

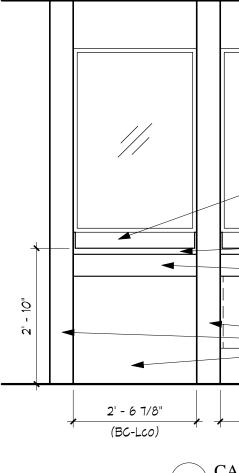
- PLASTIC LAMINATE FINISH ON PARTICLE BOARD AS SPECIFIED. REMOVABLE WITH BALL CATCH HARDWARE.

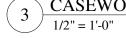
- SUPPORT BRACKETS AT BOTH ENDS, AND BETWEEN ALL SINKS, WITH PLASTIC LAMINATE FINISH ON 3/4" THICK PARTICLE BOARD AS SPECIFIED.

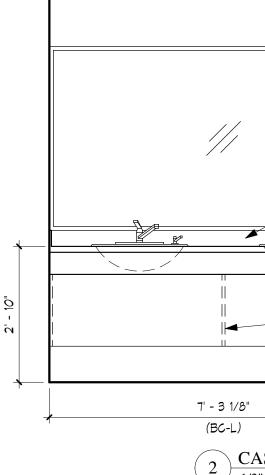
- SIDES OF CABINET EXPOSED WITHIN ALCOVE TO BE FINISHED TO MATCH FACE OF ADJACENT BASE CABINET

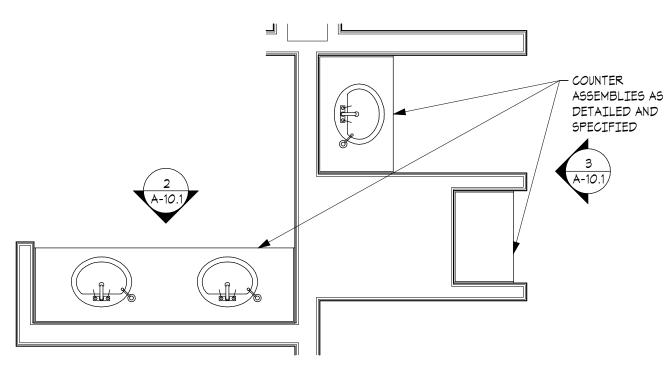
- FACE OF FLOOR FINISH



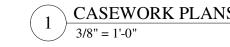


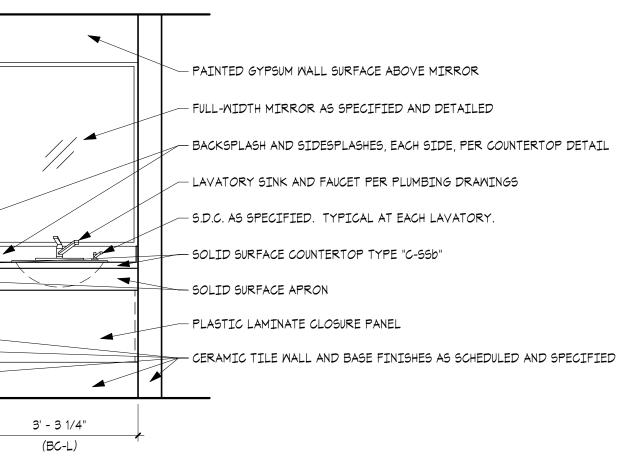




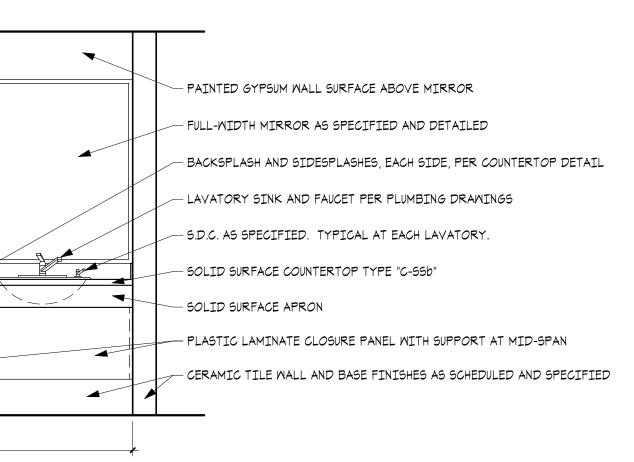


SECTION "BC-L" LAVATORY COUNTER (OPEN BELOW)





CASEWORK ELEVATION AT WOMEN'S RESTROOM #104

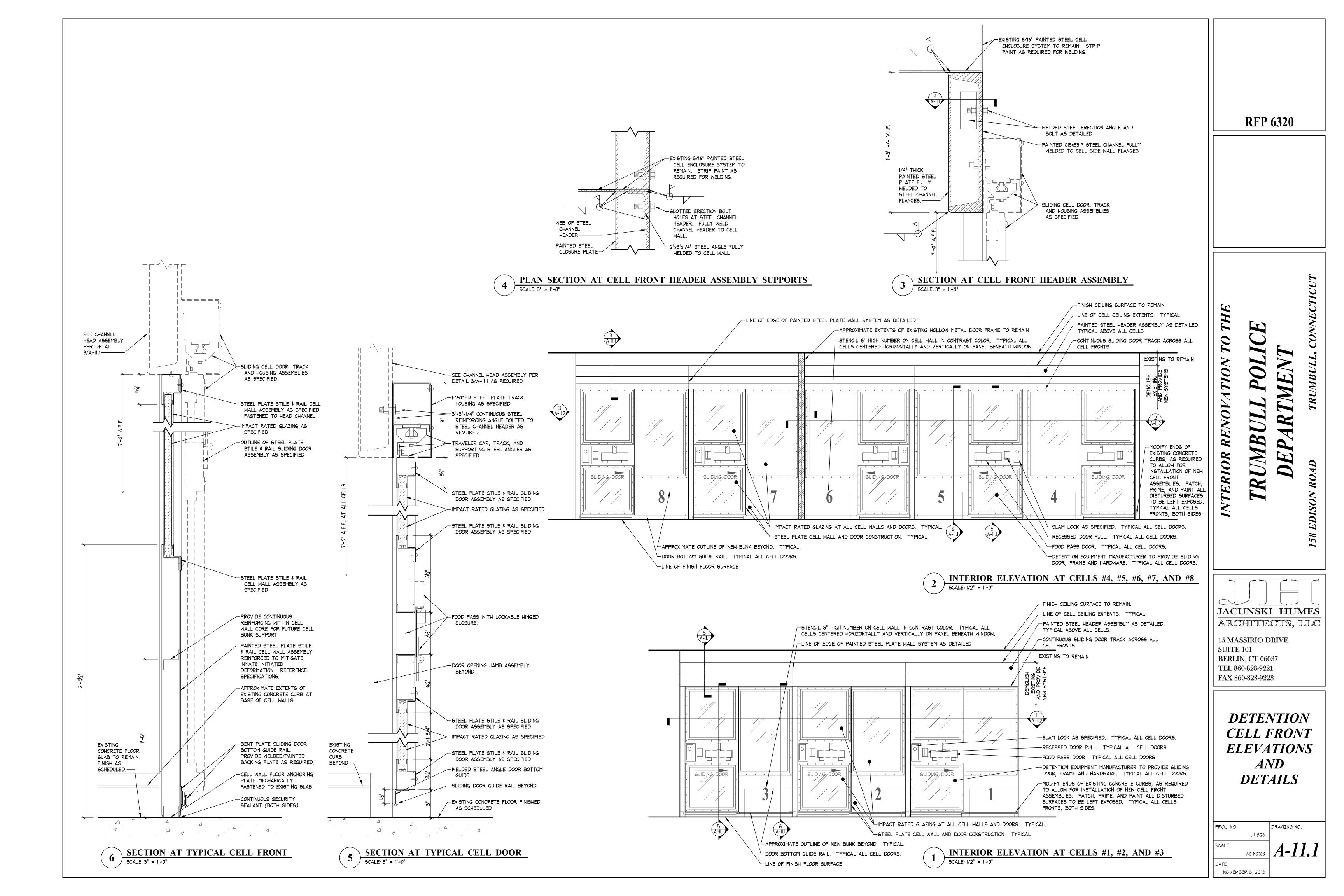


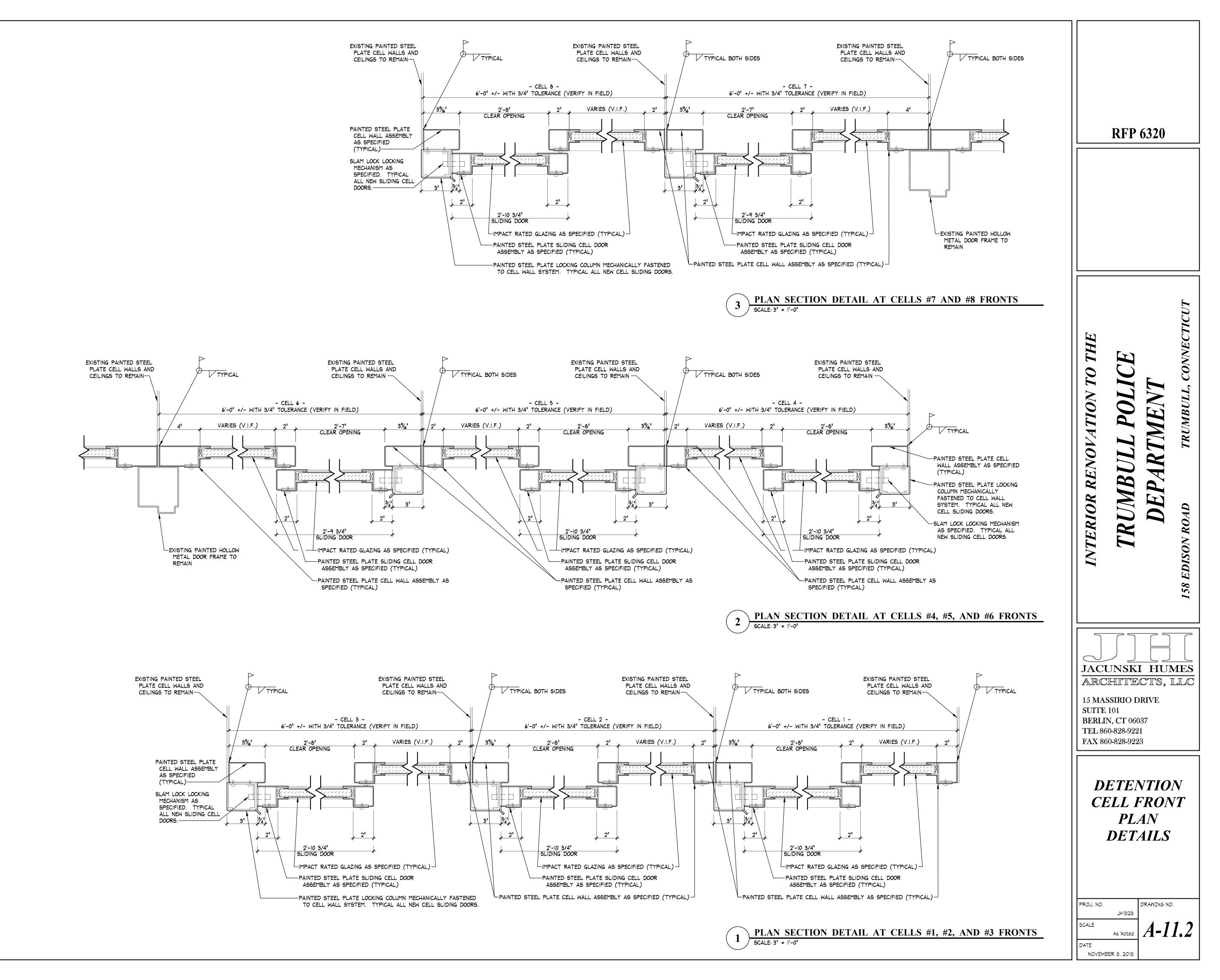
2 CASEWORK ELEVATION AT MEN'S RESTROOM #101 1/2" = 1'-0"

CASEWORK PLANS AT MEN'S RESTROOM #101 AND WOMEN'S RESTROOM #104

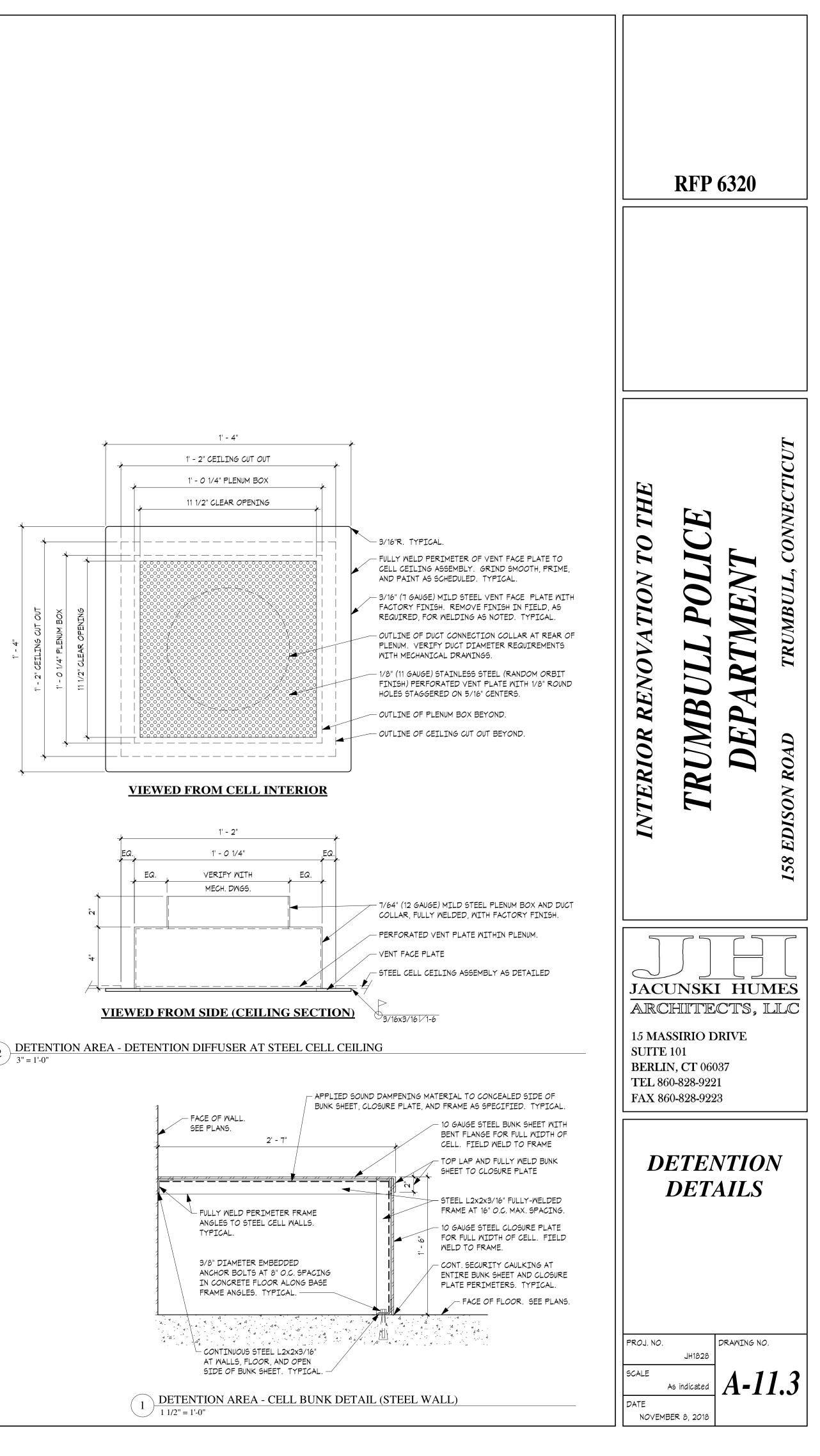
INTERIOR RENOVATION TO THE	TRUMBULL POLICE	DEPARTMENT	ROAD TRUMBULL, CONNECTICUT
INTER	TR	-	
ARCI		HUN CTS, I RIVE	
BERLIN TEL 860 FAX 860 CA EL	ASEV ASEV ASEV AN EVA AN ECT	1 3 WORI TION	V <b>S</b>

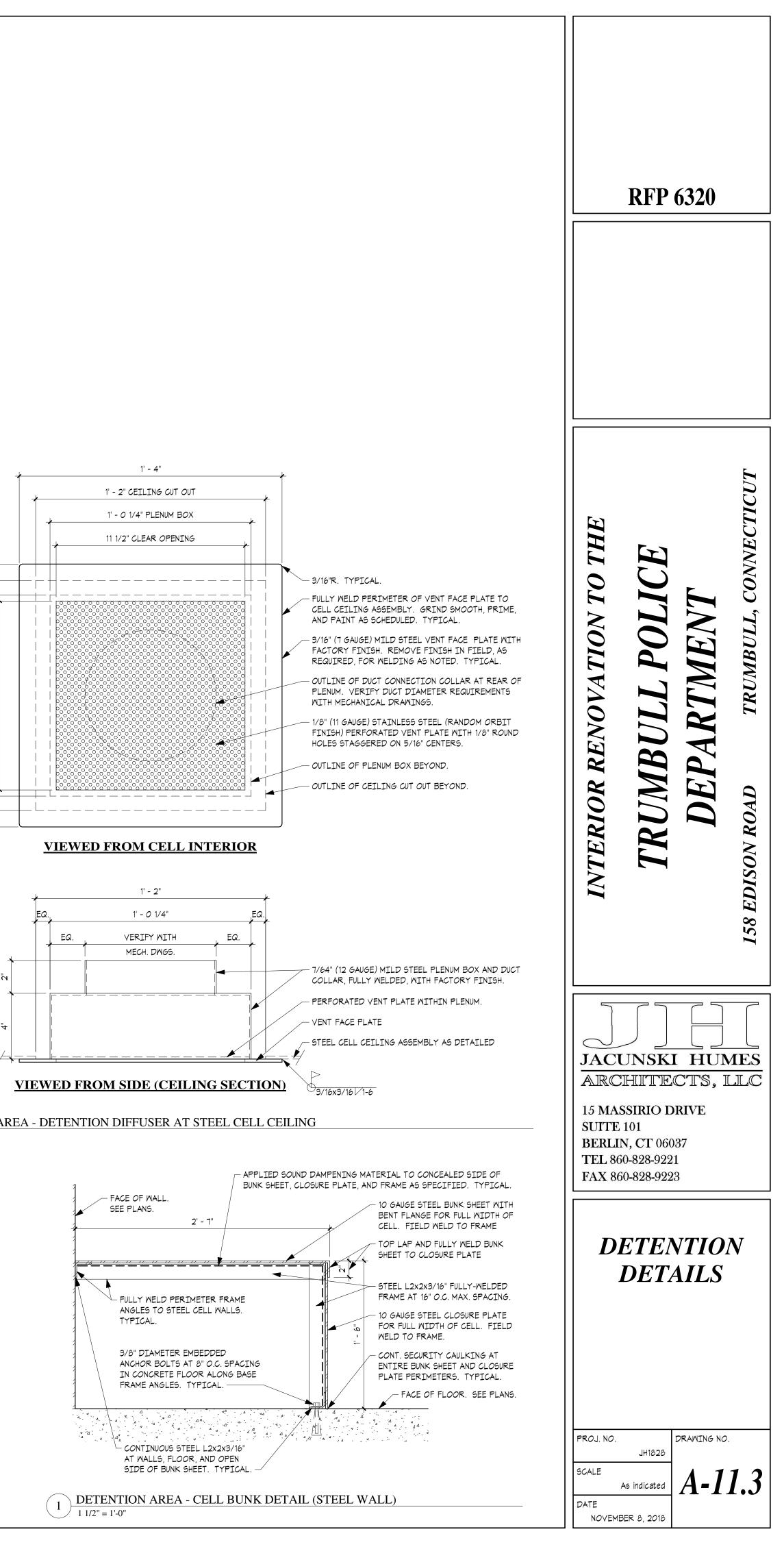
NOVEMBER 8, 2018

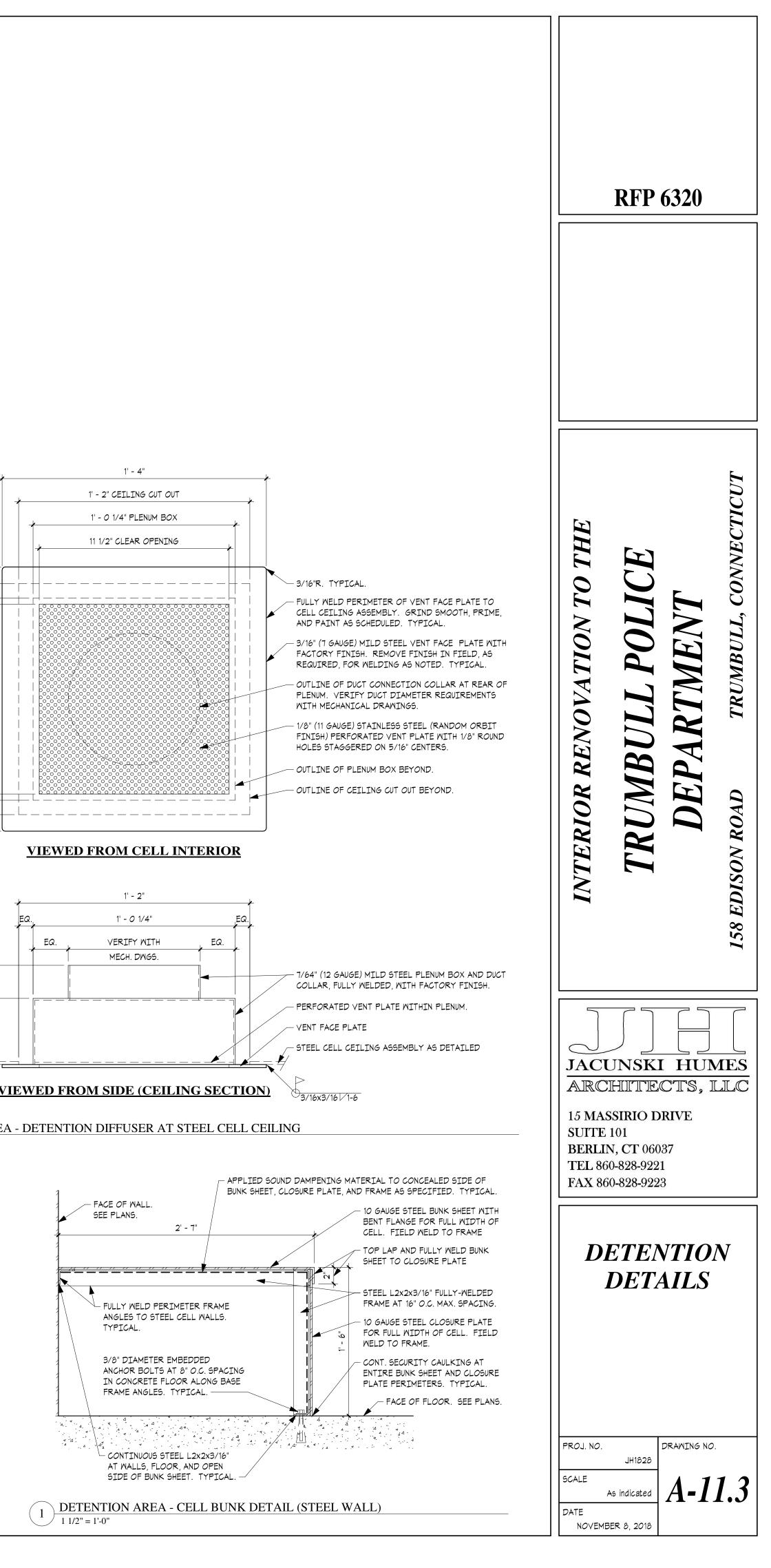


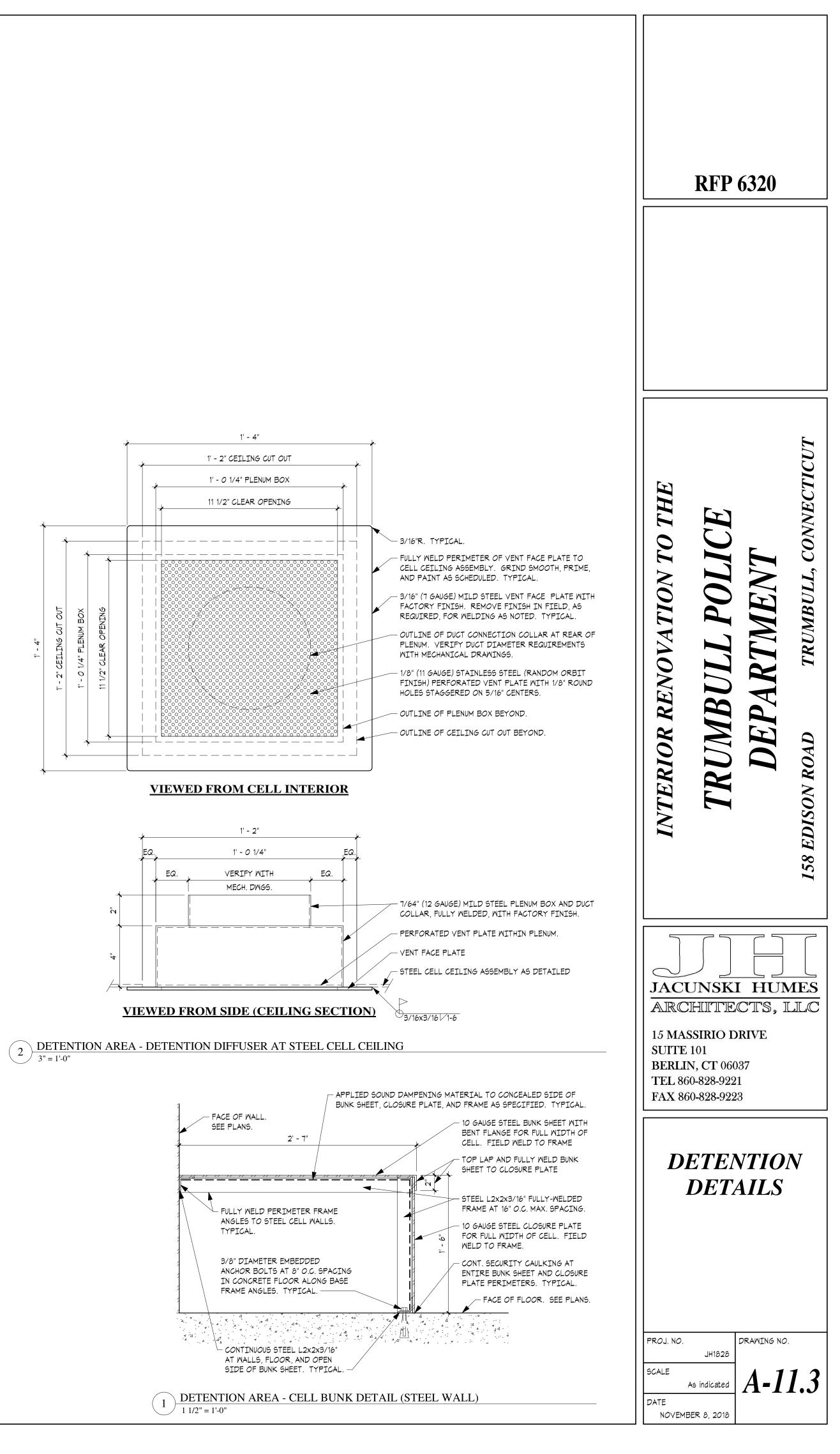


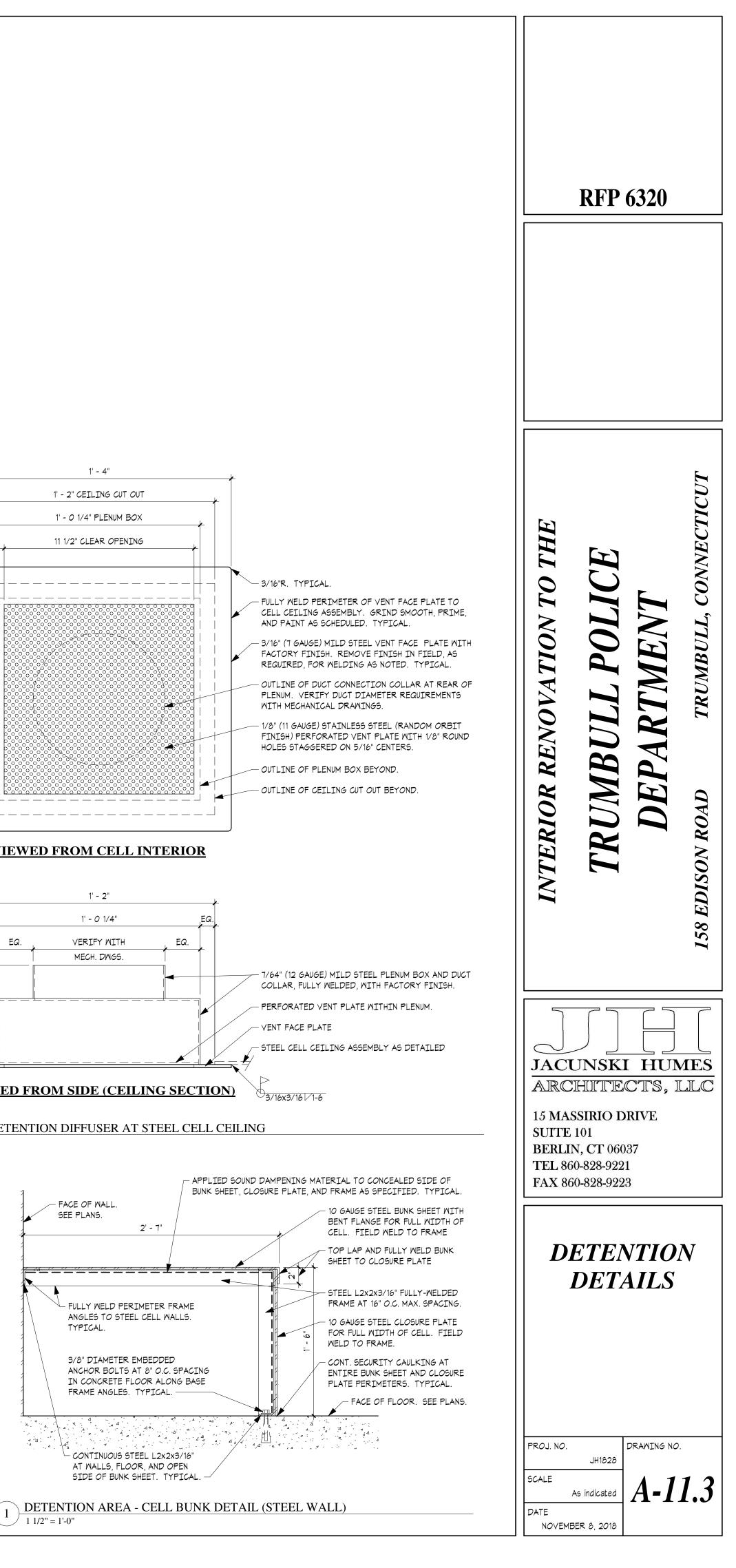


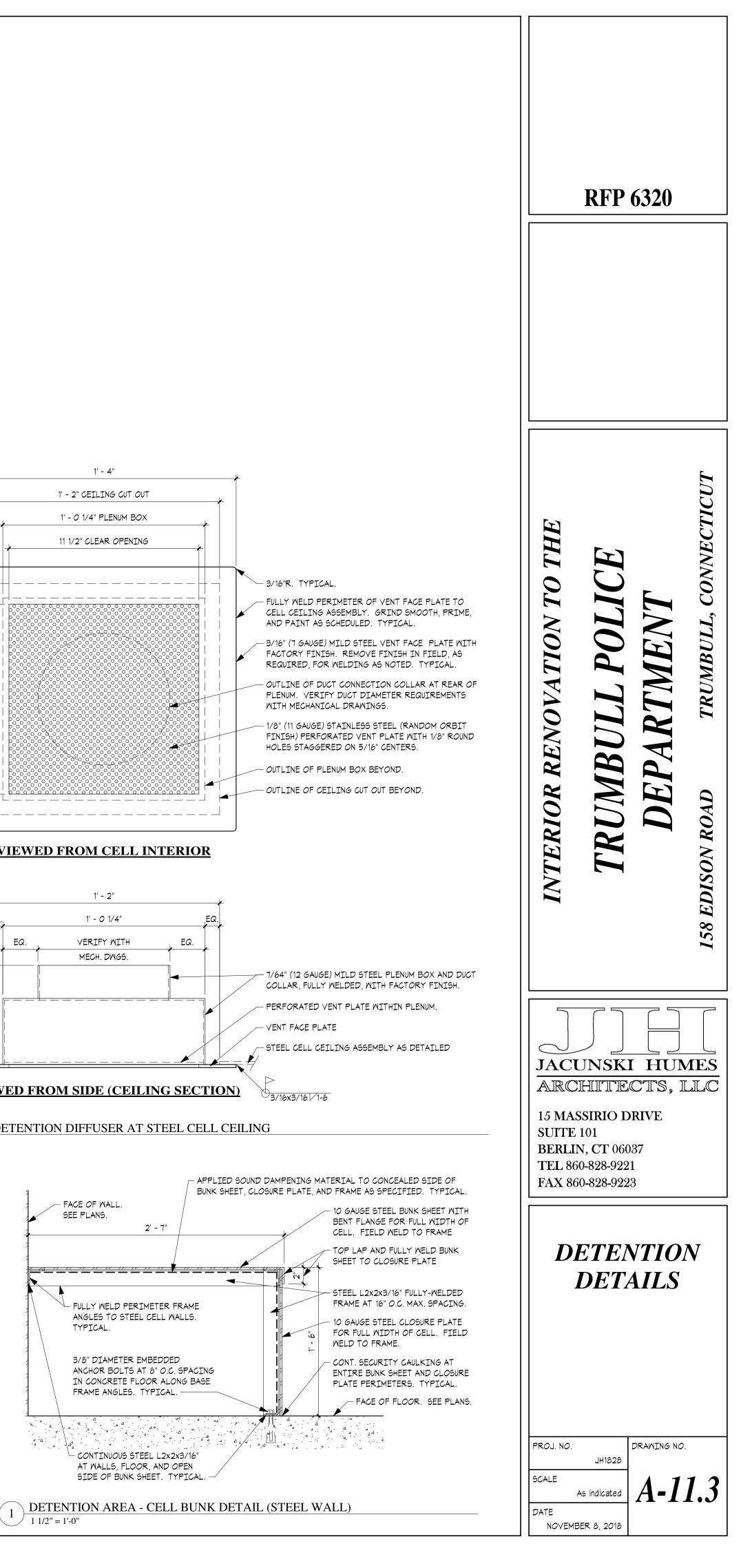












### Legend

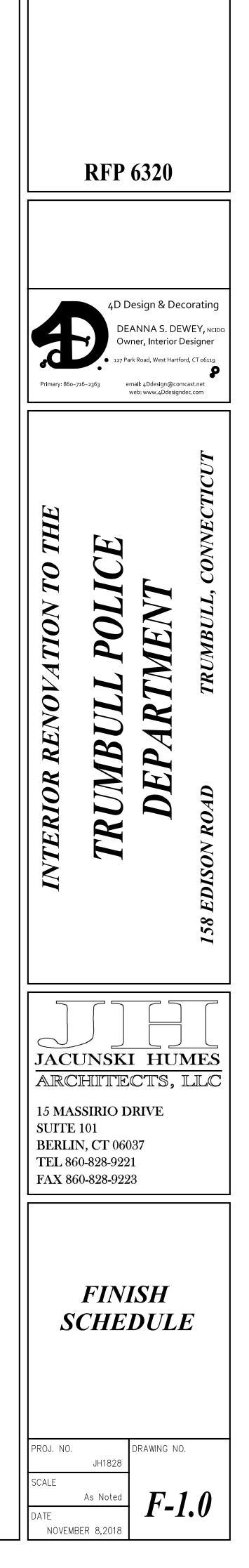
X - # X - # X - # X - #	Floor Finish Base Wall Finish Door Frame Finish
B CB CC CONC CP CPT CT CWT D E EB EP ESD FRP LK M MES	CEILING PAINT CARPET TILE CERAMIC & PORCELAIN TILE CERAMIC WALL TILE DOOR FINISH EPOXY FLOOR FINISH EPOXY BASE EPOXY WALL PAINT ESD VINYL FLOOR FIBER REINFORCED PANEL LOCKERS WALK OFF MAT METAL EDGE STRIP
M. TH P PL R RRS RSTR S/C SHP SS STN	MARBLE THRESHOLD PAINT PLASTIC LAMINATE RUBBER TILE RESILIENT REDUCING STRIP RESILIENT STAIR/TREAD/RISER SEALED CONCRETE SEALED, HARDENED, POLISHED CONCRETE SEE DIV. 09460 SOLID SURFACE MATERIAL STAIN - WATERBASE
STN SVT TH TP TR VCT VET VP WDB WDC WB WMP WP WS WW	SOLID VINYL TILE THRESHOLD TOILET PARTITIONS TRIM (PAINTED) VINYL COMPOSITION TILE VINYL ENHANCED TILE VINYL PLANK WOOD STRAIGHT BASE WOOD CABINETRY WINDOW TREATMENT WIRE MESH PARITIONS SHEET WALL PROTECTION WINDOW SILLS WOOD WAINSCOT-BEADBOARD

### Finish Key

CODE	MANUFACTURER	<u>MATERIAL</u> / <u>STYLE</u>	<u>PATTERN</u>	COLOR	REMARKS / SPECIFICATIONS
Flooring & Base					
SVT-1	AZROCK/TARKETT	SOLID VINYL TILE 16"X16"	CG-404	PUMICE	SVT IS PART OF THE BASE BID AND THE ALTERNATE.
CT-1	DALTILE	HAUT MONDE 12X24	HM07	ARISTOCRAT CREAM	GT-1 MAPEI-CQ- DRIFTWOOD #105
CT-2	DALTILE	HAUT MONDE 2" X 2" MOSAIC	HM07	ARISTOCRAT CREAM	GT-1 MAPEI-CQ- DRIFTWOOD #105
CT-3	DALTILE	KEYSTONES 2"X2"	D201	URBAN PUTTY	GT-1 MAPEI-CQ- DRIFTWOOD #105
RSF-1	SEE BELOW FOR ALTERNATE				
RT-1	BURKE RUBBER FLOORING ENDURA RUBBER-FLECKSIBLES	SCULPTURED SURFACE size: 18.125" x 18.125"	#010	SHALE GRAY	
Bases					
B-1	JOHNSONITE	RUBBER BASE - 4"	TA5	COLONIAL GREY	
B-2 B-3	SEE BELOW FOR ALTERNATE JOHNSONITE	RUBBER BASE - 4"	#82	BLACK PEARL	
CTB-1	DALTILE	HAUT MONDE 6"X12	HM07	ARISTOCRAT CREAM	S-36C9T
CTB-2	DALTILE	KEYSTONES PORCELAIN-MB-5B	URBAN PUTTY	D201	2"x 2" built up base as required to patch
Walls- interior			C)W/ C10C		
EP-1	SHERWIN WILLIAMS	Epoxy Paint, Satin Finish Wall Paint	SW-6106	KILIM BEIGE	SEE NOTE # 7/ F-1.0
EP-2	SHERWIN WILLIAMS	Epoxy Paint, Satin Finish Wall Paint	XXXXX	TBD	
P-1	SHERWIN WILLIAMS	Waterbased- Satin Finish Wall Paint	SW-7562	ROMAN COLUMN	GENERAL WALLS
P-2	SHERWIN WILLIAMS	Waterbased- Satin Finish Wall Paint	SW-6106	KILIM BEIGE	ALTERNATE #1-WALL COLOR
CWT-1	DALTILE	FORMULA 12"X 24"	FM98-POLISHED	PLANES TAUPE	GT-1 MAPEI CQ-BONE #15
CWT-2	DALTILE	KEYSTONES PORCELAIN 2"X2"	URBAN PUTTY	D201	
Door Frames / Misc.					
TR-1	SHERWIN WILLIAMS	Waterbase-Interior Semi-Gloss	SW-6106	KILIM BEIGE	INTERIOR DOOR FRAMES
TR-2	SHERWIN WILLIAMS	Waterbase-Interior Semi-Gloss	SW-XXXX	XXXXXXXX	H.M. DOORS
Ceilings Non-factory Fin.					
CP-1	SHERWIN WILLIAMS	STANDARD Ceiling Paint	Classic	White	Gypsum Board
CP-2	SHERWIN WILLIAMS	Epoxy ceiling paint on Metal Panel	SW-6106	KILIM BEIGE	at cell ceilings (SAME PAINT AS EP-1)
CP-3	SHERWIN WILLIAMS	Water Resistant Ceiling Paint	Classic	White	at shower rooms
	1				
MISC					
MISC SS-1	DUPONT CORIAN	SOLID SURFACE	FOSSIL		
		SOLID SURFACE	FOSSIL 910-9032	SAND	
SS-1	DUPONT CORIAN LINCORA GROUP LINCORA GROUP			SAND PLATINUM	
SS-1 LK-1 LK-2	LINCORA GROUP	LOCKER- PAINT COLOR	910-9032		
LK-1 LK-2	LINCORA GROUP LINCORA GROUP	LOCKER- PAINT COLOR	910-9032		SVT IS PART OF THE BASE BID AND ALTERNATE #2.
SS-1 LK-1 LK-2 PRODUCTS FC	LINCORA GROUP LINCORA GROUP DR ALTERNATE #2	LOCKER- PAINT COLOR LOCKER- PAINT COLOR	910-9032 910-9005	PLATINUM	SVT IS PART OF THE BASE BID AND ALTERNATE #2. ALTERNATE #2

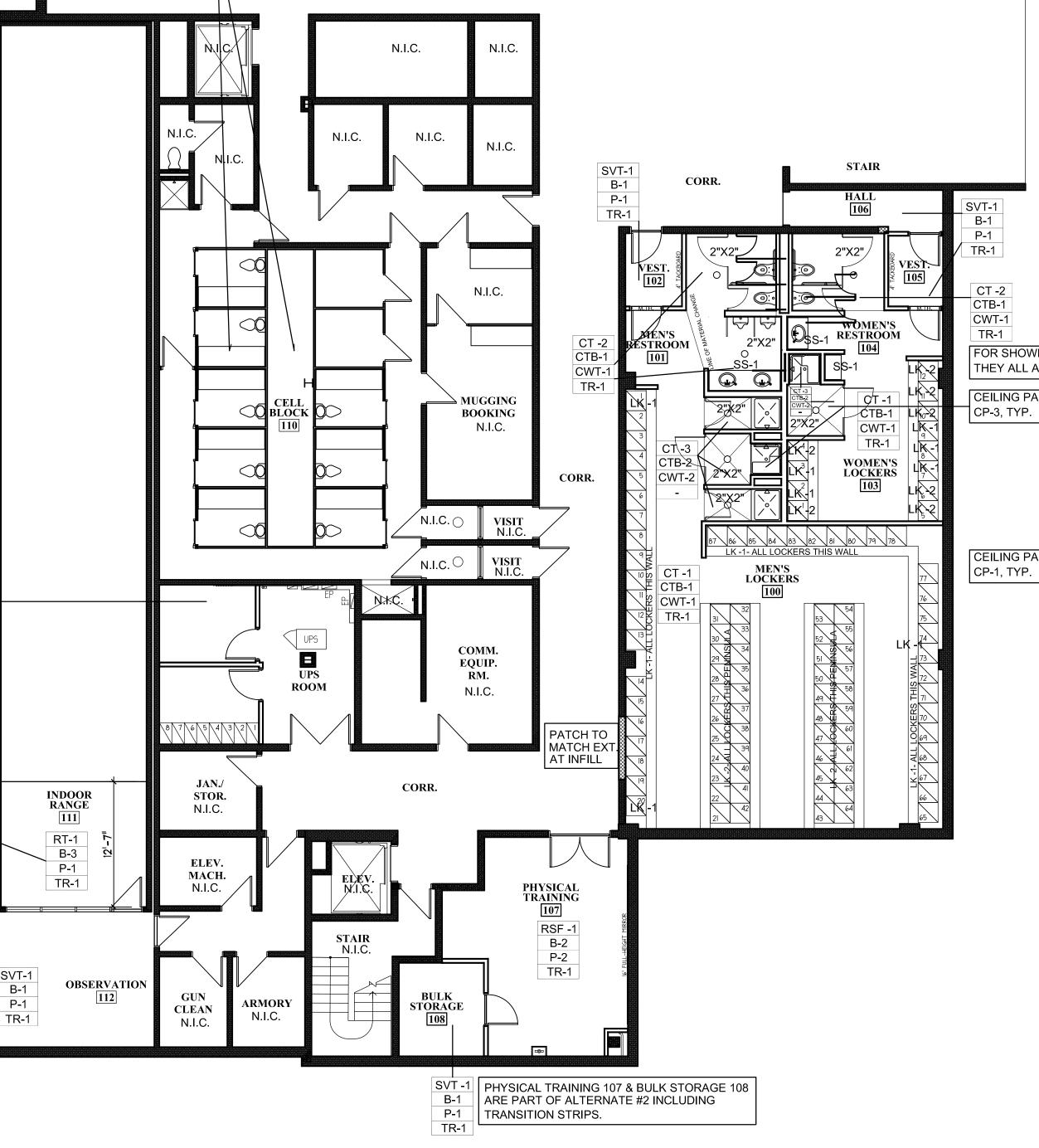
### General Notes

1	All interior faces of non-factory finished doors and door frames to be painted.
2	All floor finishes to extend to the wall, this includes going under casework.
3	In locker rooms, wall tile is tile up to lockers and not behind it. tile is layed out horizontally.
4	See Reflected Ceiling Plans for painted soffits & ceilings. All soffits & ceilings to receive paint. See options.
5	All receptacles, switches, etc as Ivory.
6	All new work marble thresholds to be travertine beige.
7	All new and existing steel cell construction to receive new epoxy paint coatings. New components include the cell fronts, bunks and diffusers. existing cell components include the wall and ceiling panels. All surfaces to view shuld receive new epoxy paint.
	Finish painting, as specified under section 09 90 00 Painting. NOTE: General Trades Contractor shall coordinate finish painting of the Detention Entrance System including requiring the Painting Contractor to be on the job-site DURING INSTALLATION OF THE DETENTION ENTRANCE SYSTEM to assure that the inaccessible portions of the door and fixed wall system are finish painted prior to hanging the doors. Finish Contractor shall start work two (2) days after written notification by Detention Equipment Contractor (11 19 00).



PRIME AND PAINT TEMPORARY GYPSUM PARTITIONS ONLY,P-1

NEW FINISHES ONLY APPLY TO THIS REGION FOR THE INDOOR RANGE.



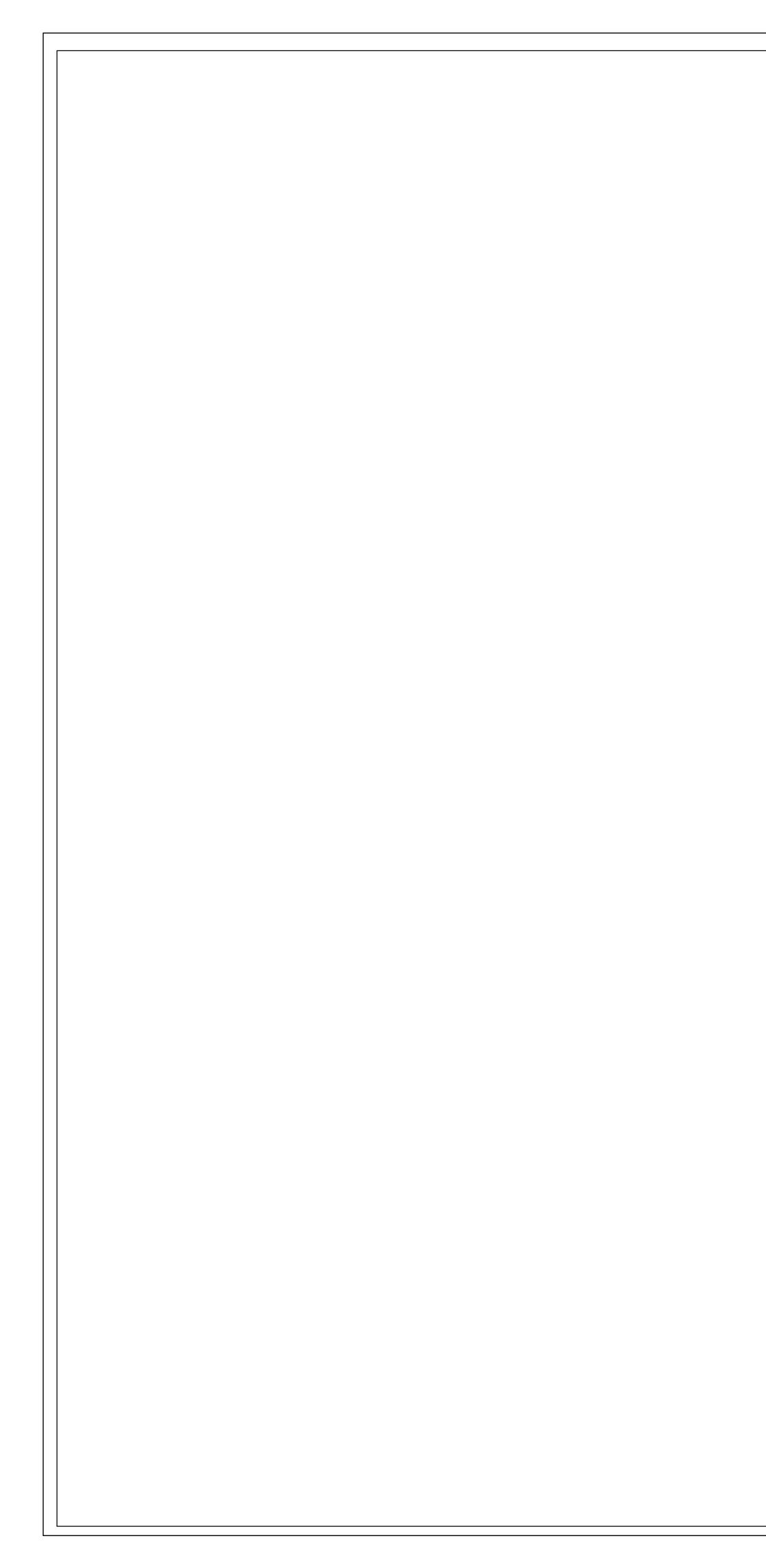
EACH CELL TO RECEIVE AN EPOXY PAINTED 30" HEIGHT CELL NUMBER, CENTERED ON WALL OPPOSITE SECURITY CAMERA, IN CONTRASTING COLOR.

CELL BLOCK 110, TYPICAL 8 CELLS: PROVIDE NEW EPOXY PAINT (EP-1 & CP-2) ON ALL CELL FLOOR, BINK, WALLS AND CEILING SURFACES. SEE NOTE 7/F-1.0 FOR EPOXY PAINTED COMPONENTS.

> FOR SHOWERS WITH PRE-FABRICATED WALLS/ENCLOSURE. THEY ALL ARE TO RECEIVE CT-3 ABOVE ECLOSURE/WALLS. CEILING PAINT AT GYP. BOARD. IN SHOWER.

CEILING PAINT AT VERTICAL SOFFITS AT LOCKER ROOMS, CP-1, TYP.

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Primary: 860-	DEA Ow 127 Pau 716~2363 er	esign & Dec ANNA S. DE\ ner, Interior D rk Road, West Hartfor nail: 4Ddesign@com veb: www.4Ddesignd	WEY, NCIDQ esigner rd, CT 06119
OR RENOVATION TO THE	MBULL POLICE	EPARTMENT	TRUMBULL, CONNECTICUT
<b>INTERIOR I</b>	TRUM	DEF	158 EDISON ROAD
ARC 15 MAS SUITE BERLI TEL 86	UNSK UNSK CHITTE SSIRIO D 101 N, CT 060 50-828-922 50-828-922	CTS, 1 PRIVE 1 1	
	EWV OVER LOV LEV NISH	RALL VER VEL	-
PROJ. NO. SCALE DATE NOVEMBI	JH1828 As Noted	drawing no. <b>F-1</b>	



### GENERAL DEMOLITION NOTES

- ALL EQUIPMENT, FIXTURES, PIPING ETC. TO BE REMOVED SHALL BE DISPOSED OF, TURNED OVER TO THE OWNER, OR SALVAGED AS DIRECTED BY THE OWNER. EQUIPMENT, FIXTURES, PIPING, DEVICES, ETC. SHALL NOT BE REMOVED FROM THE PREMISES WITH OUT THE OWNER'S APPROVAL.
- ALL ABANDONED PIPING TO REMAIN SHALL BE PROPERLY PLUGGED, VALVED, CAPPED AND/OR BY PASSED SUCH THAT UPON COMPLETION OF WORK ALL ABANDONED SYSTEMS ARE PROPERLY CONCEALED, AND THAT EXISTING SYSTEMS TO REMAIN, REMAIN OPERATIONAL.
- 3. NO DEAD ENDS SHALL BE LEFT ON ANY PIPING SYSTEMS UPON COMPLETION OF WORK.
- 4. EXISTING EXPOSED PIPING SYSTEMS NOT TO BE REUSED, AND NOT SPECIFICALLY NOTED FOR REMOVAL SHALL BE COMPLETELY REMOVED. CONTRACTOR SHALL VERIFY PRIOR TO REMOVAL.
- 5. ALL SYSTEMS SHALL BE LEFT IN PERFECT WORKING ORDER UPON COMPLETION OF ALL NEW WORK.
- 6. ALL EXISTING EXPOSED, UNNECESSARY PIPING RELATED TO NEW WORK SHALL BE COMPLETELY REMOVED.
- REROUTE OR REMOVE ALL EXISTING PIPING, AND SYSTEMS WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL, OR MASONRY WORK AS REQUIRED BY THE PROPOSED ALTERATIONS.
- COORDINATE PLUMBING SERVICES SHUT DOWNS (H&CW, GAS, WASTE, VENT & STORM SYSTEMS) WITH THE BUILDING MANAGER AND UTILITY COMPANY.

	Ρ	LUMBING I		)
SYMBOL OR ABBREVIATION		DESCRIPTION		
		EXISTING PIPE/EQU	IPMENT TO REMA	N
		EXISTING PIPE/EQUIPMENT TO BE REMOVED		
	G	GAS PIPING (G)		
S		SANITARY PIPING ABOVE FINISHED FLOOR/SLAB (S, SAN.)		
		WASTE PIPING ABO	VE FINISHED FLOO	DR/SLAB (W)
		SANITARY PIPING U	NDER FINISHED F	LOOR/SLAB (S, SAN.)
		WASTE PIPING UND	ER FINISHED FLO	OR/SLAB (W)
V		VENT PIPING (V)		
CW		DOMESTIC COLD W	ATER PIPING (CW)	
		DOMESTIC HOT WA	TER PIPING (HW)	
		DOMESTIC HOT WA	TER RECIRC. PIPI	NG (HWC)
		PIPE DROP/DOWN (DN)		
Q		PIPE RISE/UP		
		BALL VALVE		
		PLUG VALVE		
<b>T</b>		BALANCING VALVE		
		CLEANOUT (CO), WALLPLATE CLEANOUT (WPCO)		
•		DECKPLATE CLEANOUT (DPCO)		
	<b>•</b>	CONNECT TO EXIST	ING	
C.I.	CAST IRON		GEN.	GENERATOR
BLDG.	BUILDING		L#	LAVATORY - TYPE
CONN.	CONNECT		M1	MOP SINK
DR.	DRAIN		S#	SINK - TYPE
EEWC	EXISTING ELECTRIC W	EXISTING ELECTRIC WATER COOLER		STACK
EFD	EXISTING FLOOR DRAIN		TP	TRAP PRIMER
EL	EXISTING LAVATORY		TYP.	TYPICAL
ESK	EXISTING SINK		U#	URINAL - TYPE
ESS	EXISTING SERVICE SINK		V.I.F.	VERIFY IN FIELD
EU	EXISTING URINAL		V.T.R.	VENT THROUGH ROOF
EW	EXISTING WATER CLOSET		W#	WATER CLOSET - TYPE
EWC	ELECTRIC WATER COOLER		D#	FLOOR DRAIN - TYPE
EXIST.	EXISTING		GALV.	GALVANIZED



DETAIL DESIGNATION SYMBOL

PLUMBING DRAWING LIST					
RAWING UMBER	DRAWING DESCRIPTION				
0.1	DEMOLITION NOTES, LEGENDS & DRAWING LIST - PLUMBING				
0.2	GENERAL NOTES - PLUMBING				
D-1.1	LOWER LEVEL DEMOLITION FLOOR PLAN- PLUMBING				
1.1	LOWER LEVEL FLOOR PLAN - PLUMBING				
3.0	SCHEDULES - PLUMBING				
3.1	SCHEDULES - PLUMBING				
4.0	DETAILS - PLUMBING				
5.0	SPECIFICATIONS - PLUMBING				

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KOHLER RC CONSULTING	New 212.6 Www. E-mai	ladison Avenue, fork, NY 10016 95.2422 F 212.69 kohlerronan.com il krce@kohlerrona	
RIOR RENOVATION TO THE	<b>CUMBULL POLICE</b>	DEPARTMENT	TRUMBULL, CONNECTICUT
INTERIOR R	TRUME	DEP	158 EDISON ROAD
ARC 15 MA SUITE BERLI TEL 80	UNSKI UNSKI CHITTEA SSIRIO D 101 N, CT 060 50-828-922 60-828-922	CTS, 1 RIVE 137 1	
	<b>VER</b> PLUM	~	
PROJ. NO.		DRAWING NO	·.

### <u>GENERAL</u>

### LEAD-FREE STATEMENT

SEVERAL PLUMBING FIXTURES DESCRIBED IN THIS SECTION FALL UNDER JURISDICTION OF THE FEDERAL REDUCTION OF LEAD IN DRINKING WATER ACT (42 USC 300G) WHICH MANDATES THAT EFFECTIVE JANUARY 4, 2014 THE WETTED SURFACES OF ANY VALVE, FITTING OR FIXTURE THAT COMES IN CONTACT WITH POTABLE WATER MUST HAVE A WEIGHTED-AVERAGE LEAD CONTENT OF NO MORE THAN 0.25 PERCENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PRODUCTS THAT ARE LEAD-FREE PRODUCTS AND MEET THE REQUIREMENTS OF SAFE DRINKING WATER ACT SECTION 1417 (E) (SECTION 9 OF NSF/ANSI STANDARD 61) AND AUTHORITIES HAVING JURISDICTION.

WHEN A CONFLICT BETWEEN THE DRAWINGS, NOTES AND/OR SPECIFICATIONS OCCUR, THE MORE STRINGENT AND/OR LARGER QUANTITY AND/OR MORE EXPENSIVE SHALL APPLY. THE REQUIREMENTS LISTED WITHIN NOTES OR SPECIFICATIONS SHALL BE REQUIRED, PROVIDED AND INSTALLED WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT.

IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO PROVIDE FOR FINISHED WORK, TESTED AND READY FOR OPERATION.

ITEMS AND SERVICES NOT SHOWN ON DRAWINGS OR SPECIFICATIONS BUT REQUIRED TO RENDER THE WORK COMPLETE AND READY FOR OPERATION, SHALL BE PROVIDED WITHOUT ADDITIONAL COST.

WORK OF THIS SECTION SHALL BE GOVERNED BY THE CONTRACT DOCUMENTS. PROVIDE MATERIALS, LABOR, EQUIPMENT AND SERVICES NECESSARY TO FURNISH. DELIVER AND INSTALL ALL WORK AS SPECIFIED AND AS REQUIRED BY JOB CONDITIONS. WHERE A CONFLICT EXISTS BETWEEN THESE NOTES, THE DRAWINGS AND THE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.

DRAWINGS ARE DIAGRAMMATIC AND INDICATE A GENERAL ARRANGEMENT OF WORK AND ARE NOT TO BE CONSIDERED SUB-CONTRACTOR DOCUMENTS. IT IS THE INTENT OF THESE DOCUMENTS TO INCLUDE THE PROVISION AND INSTALLATION OF ALL NECESSARY WORK AND MATERIALS FOR COMPLETE, OPERATIONAL AND CODE COMPLIANT SYSTEMS BY THE CONTRACTOR. GENERAL DESIGN CONCEPTS INDICATED MUST BE FOLLOWED OR BETTERED. THE BID SHALL INCLUDE OFFSETS, ADDITIONAL PIPING, VALVES AND EQUIPMENT AND COMPONENTS AS REQUIRED TO MEET CONSTRUCTION CONDITIONS FOR PROPER OPERATION. DO NOT SCALE DRAWINGS. CONSULT ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SPACE CONDITIONS AND ADDITIONAL REQUIREMENTS.

PERFORM THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT GENERAL CONDITIONS AND WITH THE PROVISIONS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND LAWS.

WORK SHALL INCLUDE ALL INCIDENTALS, LABOR, MATERIAL, EQUIPMENT, APPLIANCES, SERVICES, HOISTING, SCAFFOLDING, SUPPORTS, TOOLS, CONSUMABLE ITEMS, FEES, LICENSES, AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE WORK SHOWN ON THE DRAWINGS, SPECIFIED HEREIN AND AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

STORE MATERIALS INSIDE AND PROTECTED FROM DEBRIS, WEATHER AND MOISTURE.

THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL POWER AND CONTROL WIRING REQUIRED FOR EQUIPMENT OPERATION REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THIS CONTRACTOR SHALL PROVIDE MOTOR STARTERS FOR INSTALLATION. COORDINATE REQUIREMENTS.

PROVIDE AND INSTALL ALL MAKE-UP WATER DISTRIBUTION TO HVAC EQUIPMENT INCLUDING BACKFLOW PREVENTER.

PROVIDE AND INSTALL INDIRECT CONDENSATE WASTE PIPING AND TRAP TO FLOOR DRAIN OR DRAIN RECEPTOR FROM ALL HVAC EQUIPMENT. PROVIDE ADDITIONAL FLOOR DRAINS WITH TRAP PRIMERS OR DRAIN RECEPTORS AS REQUIRED.

PLUMBING DEVICES, FAUCETS, VALVES AND FITTINGS REQUIRED FOR SPECIALTY SERVICE EQUIPMENT SHALL BE PROVIDED BY THIS CONTRACTOR UNLESS OTHERWISE SPECIFIED. THIS CONTRACTOR SHALL PROVIDE AND INSTALL PIPING, CONNECTIONS, DEVICES, VALVES AND EQUIPMENT REQUIRED FOR PROPER OPERATION. COORDINATE REQUIREMENT

ALTERATION WORK AND DEMOLITION

ALL EQUIPMENT, FIXTURES, PIPING, ETC. TO BE REMOVED, SHALL BE DISPOSED OF, TURNED OVER TO THE OWNER, OR SALVAGED AS DIRECTED BY THE OWNER. EQUIPMENT, FIXTURES, PIPING, DEVICES, ETC. SHALL NOT BE REMOVED FROM THE PREMISES WITHOUT THE OWNER'S APPROVAL.

UPON COMPLETION OF REMOVALS AND MODIFICATIONS. ALL PIPING TO REMAIN SHALL BE PROPERLY PLUGGED. VALVED, CAPPED AND/OR BY PASSED SUCH THAT UPON COMPLETION OF WORK ALL SYSTEMS TO REMAIN, REMAIN OPERATIONAL.

NO DEAD ENDS SHALL BE LEFT ON ANY PIPING SYSTEMS UPON COMPLETION OF WORK.

EXISTING EXPOSED PIPING SYSTEMS NOT TO BE REUSED, AND NOT SPECIFICALLY NOTED FOR REMOVAL SHALL BE COMPLETELY REMOVED.

ALL SYSTEMS SHALL BE LEFT IN WORKING ORDER TO THE SATISFACTION OF THE OWNER UPON COMPLETION OF ALL NEW WORK.

ALL EXISTING EXPOSED, UNNECESSARY PIPING RELATED TO NEW WORK SHALL BE COMPLETELY REMOVED.

RE-ROUTE OR REMOVE ALL EXISTING PIPING AND SYSTEMS WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL, OR MASONRY WORK AS REQUIRED BY THE PROPOSED ALTERATIONS.

### COORDINATION DRAWINGS

DEVELOP AND SUBMIT COORDINATION DRAWINGS AS OUTLINED.

SHEET METAL, PLUMBING AND FIRE PROTECTION SHOP DRAWINGS THAT HAVE BEEN COORDINATED WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. DRAWINGS MUST BE RETURNED FROM ENGINEER EITHER "REVIEWED" OR "FURNISH AS CORRECTED" PRIOR TO BEING USED AS BASIS FOR COORDINATION DRAWINGS.

AFTER SHEET METAL AND PIPING DRAWINGS HAVE BEEN REVISED PER ENGINEERS COMMENTS, REPRODUCIBLE COPIES SHALL BE SENT TO THE TRADES IN THE FOLLOWING SEQUENCE FOR THE INCLUSION OF THEIR WORK:

> -MECHANICAL SHEET METAL -PLUMBING PIPING -MECHANICAL PIPING -SPRINKLER PIPING

-ELECTRICAL WORK

AFTER ALL TRADES HAVE INCLUDED THEIR WORK ON THE COORDINATION DRAWING AND NOTED CONFLICTS, ALL TRADES SHALL MEET TO RESOLVE CONFLICTS AND AGREE TO ACCEPTABLE SOLUTIONS. EACH TRADE SHALL SIGN COORDINATION DRAWINGS. ITEMS NOT SHOWN ON COORDINATION DRAWING IS RESPONSIBILITY OF OMITTING CONTRACTOR AND CONTRACTOR IS SUBJECT TO ADDITIONAL COSTS INCURRED BY OTHER TRADES.

THE ARCHITECT AND ENGINEER ARE NOT PART OF THE COORDINATION DRAWING PROCESS. THE ENGINEER WILL PROVIDE ASSISTANCE FOR NOTED CONFLICTS ONLY. COORDINATION DRAWINGS ARE NOT TO BE CONSIDERED PIPING OR DUCT SHOP DRAWINGS. THE CONTRACTOR IS REQUIRED TO SUBMIT INDIVIDUAL PIPING AND DUCTWORK SHOP DRAWINGS FOR REVIEW BY THE ENGINEER. PIPING AND DUCTWORK SHOP DRAWINGS SHALL FOLLOW THE DESIGN INTENT OF THE CONTRACT DOCUMENTS.

ANY WORK FABRICATED OR INSTALLED PRIOR TO SIGN OFF BY ALL TRADES WHICH IS DEEMED TO BE IN CONFLICT WITH COORDINATION DRAWINGS SHALL BE REMOVED AND RE-INSTALLED IN CONFORMANCE WITH COORDINATION DRAWINGS.

EACH CONTRACTOR (MENTIONED ABOVE) IS RESPONSIBLE FOR THE COORDINATION OF HIS SUB-CONTRACTORS.

THE OVERALL COORDINATION OF THE COORDINATION PROCESS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER IS NOT RESPONSIBLE FOR THE COORDINATION PROCESS. THE ENGINEER WILL RESPOND TO QUESTIONS THAT ARISE FROM THE COORDINATION PROCESS. DRAWINGS SUBMITTED WILL BE REVIEWED FOR CLEARLY IDENTIFIED CONFLICTS ONLY. SOLUTIONS TO CONFLICTS WILL NOT BEAR ADDITIONAL COST.

SHOP DRAWINGS

AS BUILT DRAWINGS

THE OWNER.

PROVIDE "AS-BUILT DRAWINGS" INDICATING IN A NEAT AND ACCURATE MANNER A COMPLETE RECORD OF ALL REVISIONS OF THE ORIGINAL DESIGN OF THE WORK. INDICATE THE FOLLOWING INSTALLED CONDITIONS:

INCLUDE ALL CHANGES AND AN ACCURATE RECORD, ON REPRODUCTIONS OF THE CONTRACT DRAWINGS OR APPROPRIATE SHOP DRAWINGS, OF ALL DEVIATIONS, BETWEEN THE WORK SHOWN AND WORK INSTALLED.

MAINS AND BRANCHES OF PIPING SYSTEMS, WITH VALVES AND CONTROL DEVICES LOCATED AND NUMBERED, CONCEALED UNIONS LOCATED, AND WITH ITEMS REQUIRING MAINTENANCE LOCATED (I.E., TRAPS, STRAINERS, EXPANSION COMPENSATORS, TANKS, ETC.). VALVE LOCATION DIAGRAMS, COMPLETE WITH VALVE TAG CHART.

EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.

APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.

CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.

SUBMIT FOR REVIEW BOUND SETS OF THE REQUIRED DRAWINGS, MANUALS AND OPERATING INSTRUCTIONS

SUBMIT A COMPLETE MAINTENANCE MANUAL OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT.

HANGERS AND SUPPORT

SEISMIC RESTRAINT: PROVIDE SEISMIC RESTRAINT AND EXPANSION OF ALL PLUMBING EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH STATE AND FEDERAL BUILDING CODE REQUIREMENTS. SUBMIT SHOP DRAWINGS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT INDICATING ALL NECESSARY COMPONENT CUTS, PLAN LOCATIONS AND CALCULATIONS FOR A COMPLETE SYSTEM.

PROVIDE ALL NECESSARY STRUCTURAL MEMBERS INCLUDING ADDITIONAL STRUCTURAL SUPPORT TO SUPPORT PIPING AND EQUIPMENT. HANGERS AND SUPPORTS SHALL BE OF AN APPROVED DESIGN NECESSARY TO SUPPORT PIPING, EQUIPMENT AND TO KEEP PIPING IN PROPER ALIGNMENT AND PREVENT TRANSMISSION OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS, ETC., ARE SUPPORTED FROM CONCRETE CONSTRUCTION, DO NOT WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL HANGERS AND SUPPORTS SHALL BE CAPABLE OF SCREW ADJUSTMENT AFTER PIPING IS ERECTED. HANGERS SUPPORTING PIPING EXPANDING INTO LOOPS, BENDS AND OFFSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT HORIZONTAL ADJUSTMENT PERPENDICULAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT DUE TO EXPANSION. ALL SUCH HANGERS SHALL BE FINALLY ADJUSTED BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION, AS REQUIRED. HANGERS IN CONTACT WITH COPPER OR BRASS PIPE SHALL BE DIELECTRIC, COMPATIBLE WITH COPPER AND BRASS ALLOY OR PROVIDED WITH FELT SLEEVE.

PROVIDE ADDITIONAL SUPPORT FOR PIPING AND EQUIPMENT WHEN DECK IS NOT CAPABLE OF SUPPORT.

BEAM CLAMPS - HANGERS SUPPORTED FROM STEEL SHALL BE CENTER LOADING BEAM CLAMPS FOR HANGERS SUPPORTING PIPING 2 INCHES. FOR PIPING 2-L/2 INCHES AND LARGER, I BEAM CLAMPS SHALL BE FORGED STEEL. "C" CLAMPS ARE NOT TO BE USED.

EQUIPMENT DATA.

### PIPE SEALS

SEAL ALL PIPING PASSING THROUGH ALL FIRE AND/OR SMOKE RATED PARTITIONS AND WALLS WITH A UL LISTED, APPROVED AND TESTED FIRE AND/OR SMOKE SEALING MATERIAL INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

ALL PIPING PENETRATING A SLAB ON GRADE OR FOUNDATION WALL BELOW GRADE AND IN CONTACT WITH EARTH SHALL BE PROVIDED WITH A POURED IN PLACE SCHEDULE 80 GALVANIZED STEEL WATER TIGHT SLEEVE WITH INTEGRAL WATER STOP AND SEAL EQUAL TO "LINK SEAL".

FURNISH AND SET STEEL PIPE SLEEVES OF SCHEDULE 40 BLACK STEEL FOR ALL LOCATIONS OF INTERIOR PARTITIONS, WALLS AND FLOORS PROVIDING AT LEAST 1/2" CLEARANCE BETWEEN PIPE INSULATION AND SLEEVE OR PIPE AND SLEEVE. WALL SLEEVES SHALL BE SMOOTH CUT AND SET FLUSH WITH FINISHED WALLS. FLOOR SLEEVES SHALL EXTENDED 2" ABOVE THE FINISHED FLOOR.

ALL PIPING THROUGH WALLS, FLOORS OR CEILINGS SHALL HAVE SLEEVES AND ESCUTCHEONS. PROVIDE A TWO PIECE CHROME ESCUTCHEON WHERE PIPING PASSES THROUGH WALLS OR FLOORS OF FINISHED SPACES.

### GENERAL PLUMBING NOTES

SUBMIT FINAL SIGNED COORDINATION DRAWING TO ENGINEER FOR REVIEW. ENGINEER WILL REVIEW COORDINATION DRAWINGS FOR GENERAL ARRANGEMENT AND FOR NOTED CONFLICTS ONLY. SPECIFIC INSTALLATION REQUIREMENTS WILL BE REVIEWED ONLY IN INDIVIDUAL TRADE SHOP DRAWINGS.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO BE APPROVED, REVISED, OR RESUBMITTED AS PER THE ENGINEERS COMMENTS, PRIOR TO CONSTRUCTION. INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

-PLUMBING FIXTURES	-CLEAN OUTS	-DRAINS
-PIPING -BRAZING -THERMOSTATIC MIXING VALVES	-PIPE SEALS -HANGERS/SUPPORTS -VALVES	-FITTINGS -INSULATION

PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE ALL INSTALLED CONDITIONS OF SYSTEMS WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION DOCUMENTS AND INCLUDE DETAILS AS NECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND IN A COMPLETE AND CONSECUTIVE SET. SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL BE RETURNED FOR REVISION. THE CONTRACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND CONCISE SET OF DRAWINGS. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC (AUTO-CAD VERSION AS REQUIRED BY THE OWNER) VERSION. NUMBER OF COPIES OF EACH AS REQUESTED BY

PROVIDE AND INSTALL EXPANSION COMPENSATION FOR ALL PIPING. SUBMIT PLANS, CALCULATIONS AND

PLUMBING FIXTURES

PLUMBING FIXTURES SHALL BE NEW, COMPLETE WITH TRIMMINGS AND FITTINGS, INCLUDING FAUCETS, CARRIERS, SUPPLIES, STOPS, TRAPS, TAILPIECES, WASTE PLUGS, CASINGS, HANGERS, PLATES, BRACKETS, ANCHORS, SUPPORTS, HARDWARE AND FASTENING DEVICES. NOTE: ALL FIXTURES SHALL BE OF SAME MANUFACTURER. TRIMMINGS AND FITTINGS SHALL BE CONSTRUCT OF FORGED, CAST, ROLLED OR EXTRUDED BRASS OR BRONZE WITH MONEL AND OTHER SUITABLE NON-CORROSIVE PARTS: DESIGNED WITH EASILY RENEWABLE PARTS THAT ARE SUBJECT TO WEAR OR DETERIORATION. NO DIE CASTINGS AND STAMPINGS OTHER THAN BRASS OR STAINLESS STEEL. PROVIDE PLUMBING FIXTURES AND TRIM WITH ALL NECESSARY TRIM, DEVICES AND ACCESSORIES REQUIRED FOR PROPER OPERATIONS SPECIFICALLY NOTED OR NOT

ESCUTCHEONS SHALL BE ONE-PIECE CHROME PLATED CAST BRASS OR STAINLESS STEEL

P-TRAPS SHALL BE ONE PIECE CHROME PLATED CAST BRASS WITH CLEANOUT PLUG.

EXAMINE ROUGHING-IN WORK OF POTABLE WATER AND WASTE PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS PRIOR TO INSTALLING FIXTURES. CORRECT ANY INCORRECT LOCATION OF PIPING, AND UNSATISFACTORY CONDITIONS FOR INSTALLATION OF PLUMBING FIXTURES. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN A MANNER ACCEPTABLE TO THE ENGINEER. ALL ROUGH-IN TO PLUMBING FIXTURES SHALL CONFORM TO FIXTURE MANUFACTURER PUBLISHED ROUGH-IN DIMENSIONS, AND REQUIREMENTS.

UPON COMPLETION OF INSTALLATION OF PLUMBING FIXTURES AND AFTER UNITS ARE WATER PRESSURIZED, TEST FIXTURES TO DEMONSTRATE CAPABILITY AND COMPLIANCE WITH REQUIREMENTS. CORRECT MALFUNCTIONING UNITS AT SITE, THEN RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REMOVE AND REPLACE WITH NEW UNITS AND PROCEED WITH RETESTING.

CLEAN PLUMBING FIXTURES, TRIM, AND STRAINERS OF DIRT AND DEBRIS UPON COMPLETION OF INSTALLATION.

ADJUST WATER PRESSURE AT DRINKING FOUNTAINS, FAUCETS, SHOWER VALVES, AND FLUSH VALVES TO PROVIDE PROPER FLOW STREAM AND SPECIFIED GPM.

SET FIXTURES LEVEL AND UNIFORMLY, WITH CONNECTIONS AT RIGHT ANGLES TO WALL AND PROPERLY CENTERED. LAY OUT ROUGHING ACCURATELY AND IN COORDINATION WITH SPACE AND FINISH REQUIREMENTS.

LOCATE WASTE OUTLETS AND WATER SUPPLIES AT CONSTANT HORIZONTAL LEVELS, WITH WASTE OUTLET CENTERED ON FIXTURE DRAIN CONNECTION AND WATER SUPPLIES SPACED EQUALLY TO RIGHT AND LEFT

DRAINS AND CLEANOUTS

PROVIDE ALL POURED IN PLACE DRAINS AND CLEANOUTS WITH 24" X 24" FLASHING.

PROVIDE A MANUFACTURED BRONZE OUTLET FITTING FOR ALL SECONDARY ROOF DRAIN OUTLETS.

INSTALL EXTERIOR CLEANOUTS WITH A 18" SQUARE X 6" THICK CONCRETE APRON.

COORDINATE FLOOR DRAIN LOCATIONS WITH RESPECT TO EQUIPMENT HOUSEKEEPING PADS. PLACE DRAINS SUCH THAT EDGE OF THE FLOOR GRATE EXTENDS NO FURTHER THAN 2 INCHES FROM THE SIDE OF THE PAD. CLEANOUT PLUGS SHALL BE BRASS OR PLASTIC, OR OTHER APPROVED MATERIALS. BRASS CLEANOUT PLUGS SHALL BE UTILIZED WITH METALLIC DRAIN, WASTE AND VENT PIPING ONLY, AND SHALL CONFORM TO ASTM A 74. ASME A112.3.1 OR ASME A112.36.2M. CLEANOUTS WITH PLATE-STYLE ACCESS COVERS SHALL BE FITTED WITH CORROSION-RESISTING FASTENERS. PLUGS SHALL HAVE RAISED SQUARE OR COUNTERSUNK SQUARE HEADS. COUNTERSUNK HEADS SHALL BE INSTALLED WHERE RAISED HEADS ARE A TRIP HAZARD. CLEANOUT PLUGS WITH BOROSILICATE GLASS SYSTEMS SHALL BE OF BOROSILICATE GLASS.

CLEANOUTS SHALL BE LOCATED AT MINIMUM INTERVALS OF 50 FEET FOR PIPING NPS 4 AND SMALLER AND 100 FEET FOR LARGER PIPING.

BUILDING SEWERS SHALL BE PROVIDED WITH CLEANOUTS LOCATED NOT MORE THAN 100 FEET APART MEASURED FROM THE UPSTREAM ENTRANCE OF THE CLEANOUT. FOR BUILDING SEWERS 8 INCHES AND LARGER, MANHOLES SHALL BE PROVIDED AND LOCATED NOT MORE THAN 200 FEET FROM THE JUNCTION OF THE BUILDING DRAIN AND BUILDING SEWER. AT EACH CHANGE IN DIRECTION AND AT INTERVALS OF NOT MORE THAN 400 FEET APART. MANHOLES AND MANHOLE COVERS SHALL BE OF AN APPROVED TYPE.

CLEANOUTS SHALL BE INSTALLED AT EACH CHANGE OF DIRECTION OF THE BUILDING DRAIN OR HORIZONTAL WASTE OR SOIL LINES GREATER THAN 45 DEGREES (INCLUDING P-TRAPS). WHERE MORE THAN ONE CHANGE OF DIRECTION OCCURS IN A RUN OF PIPING, ONLY ONE CLEANOUT SHALL BE REQUIRED FOR EACH 40 FEET OF DEVELOPED LENGTH OF THE DRAINAGE PIPING.

A CLEANOUT SHALL BE PROVIDED AT THE BASE OF EACH WASTE OR SOIL STACK.

THERE SHALL BE A CLEANOUT NEAR THE JUNCTION OF THE BUILDING DRAIN AND THE BUILDING SEWER. THE CLEANOUT SHALL BE EITHER INSIDE OR OUTSIDE THE BUILDING WALL AND SHALL BE BROUGHT UP TO THE FINISHED GROUND LEVEL OR TO THE BASEMENT FLOOR LEVEL. AN APPROVED TWO-WAY CLEANOUT IS ALLOWED TO BE USED AT THIS LOCATION TO SERVE AS A REQUIRED CLEANOUT FOR BOTH THE BUILDING DRAIN AND BUILDING SEWER. THE CLEANOUT AT THE JUNCTION OF THE BUILDING DRAIN AND BUILDING SEWER SHALL NOT BE REQUIRED IF THE CLEANOUT ON A 3-INCH OR LARGER DIAMETER SOIL STACK IS LOCATED WITHIN A DEVELOPED LENGTH OF 10 FEET OF THE BUILDING DRAIN AND BUILDING SEWER CONNECTION.

CONCEALED PIPING. CLEANOUTS ON CONCEALED PIPING OR PIPING UNDER A FLOOR SLAB OR IN A CRAWL SPACE OF LESS THAN 24 INCHES IN HEIGHT OR A PLENUM SHALL BE EXTENDED THROUGH AND TERMINATE FLUSH WITH THE FINISHED WALL, FLOOR OR GROUND SURFACE OR SHALL BE EXTENDED TO THE OUTSIDE OF THE BUILDING. CLEANOUT PLUGS SHALL NOT BE COVERED WITH CEMENT, PLASTER OR ANY OTHER PERMANENT FINISH MATERIAL. WHERE IT IS NECESSARY TO CONCEAL A CLEANOUT OR TO TERMINATE A CLEANOUT IN AN AREA SUBJECT TO VEHICULAR TRAFFIC, THE COVERING PLATE, ACCESS DOOR OR CLEANOUT SHALL BE OF AN APPROVED TYPE DESIGNED AND INSTALLED FOR THIS PURPOSE.

MINIMUM SIZE. CLEANOUTS SHALL BE THE SAME NOMINAL SIZE AS THE PIPE THEY SERVE UP TO 4 INCHES. FOR PIPES LARGER THAN 4 INCHES NOMINAL SIZE, THE MINIMUM SIZE OF THE CLEANOUT SHALL BE 4 INCHES.

CAST-IRON CLEANOUT SIZING SHALL BE IN ACCORDANCE WITH ASTM A 74 FOR HUB AND SPIGOT FITTINGS OR ASTM A 888 OR CISPI 301 FOR HUBLESS FITTINGS.

ACCESS SHALL BE PROVIDED TO ALL CLEANOUTS.

MISCELLANEOUS SPECIALTIES

PROVIDE AND INSTALL ACCESS DOORS FOR EACH VALVE, CLEANOUT OR PLUMBING DEVICE REQUIRING ACCESS. ACCESS DOORS SHALL BE RIGID CONSTRUCTION WITH TWO HINGES AND A LATCH. IN PLENUM CEILINGS, PROVIDE FELT BETWEEN THE DOOR AND FRAME TO MAKE AN AIR TIGHT SEAL. ACCESS DOORS SHALL BE RATED TO THE SAME OR GREATER RATING OF THE PARTITION IN WHICH THEY ARE INSTALLED. ACCESS DOORS SHALL BE FLUSH MOUNTED, PRIME COATED WITH RUST INHIBITIVE PAINT, CONCEALED FRAME, FLUSH SCREW DRIVER OPERATED LOCKS WITH METAL CAMS AND ANCHORS AS REQUIRED.

> ACCESS DOOR SIZES SHALL BE: 12" X 12" AT EASILY ACCESSIBLE ITEMS

PROVIDE AND INSTALL DRIP PANS WITH WATER DETECTOR AND DRAIN FOR PIPING REQUIRED BY ACTUAL FIELD CONDITIONS WHERE PIPING PASSES OVER INCLUDING AREA WITHIN 3'-0" OF ELECTRICAL EQUIPMENT.

DO NOT INSTALL AIR GAP BACKFLOW PREVENTERS IN CONCEALED SPACES OR IN AREAS WHERE SPLASHING WATER WILL DAMAGE FINISHES. PROVIDE AND INSTALL AN OVERSIZED COPPER FUNNEL WITH AIR GAP DIRECTLY BELOW RPD PRESSURE RELIEF PORT. PIPE FUNNEL TO SPILL AS AN INDIRECT WASTE TO AN APPROVED DRAIN LOCATION.

INSTALL ELECTRONIC TRAP PRIMERS SERVING ALL DRAINS. INSTALL ALL TRAP PRIMER VALVES IN AN ACCESSIBLE LOCATION. PROVIDE AND INSTALL ACCESS PANELS AND DOORS WHERE REQUIRED TO GAIN ACCESS IN CONCEALED CONSTRUCTION.

PIPING GENERAL

ALL PIPING SHALL BE RUN PERPENDICULAR AND/OR PARALLEL TO FLOORS, INTERIOR WALLS, ETC. PIPING AND VALVES SHALL BE GROUPED NEATLY AND SHALL BE RUN AS TO MAXIMIZE HEADROOM OR PASSAGE CLEARANCE. ALL VALVES, CONTROLS AND ACCESSORIES CONCEALED IN FURRED SPACES AND REQUIRING ACCESS FOR OPERATION AND MAINTENANCE SHALL BE ARRANGED TO ASSURE THE USE OF A MINIMUM NUMBER OF ACCESS DOORS.

ALL PIPE LINES MADE WITH SCREWED FITTINGS MUST BE PROVIDED WITH A SUFFICIENT NUMBER OF FLANGES AND/OR UNIONS TO ALLOW FOR EASY AND CONVENIENT DISMANTLING OF THE SYSTEM WITHOUT BREAKING FITTINGS.

ALL PIPING SHALL RUN CONCEALED IN FURRED SPACES OF OCCUPIED AREAS OR CHASES. CONTRACTOR SHALL OBTAIN PERMISSION TO RUN ANY EXPOSED PIPES.

CAP ALL PIPE AND EQUIPMENT OUTLETS DURING CONSTRUCTION AND KEEP LINES AND INSIDE OF EQUIPMENT FREE OF FOREIGN MATERIALS.

PROVIDE FOR EXPANSION WITHOUT WARPING OR DISLOCATING LINES OR STRAINING CONNECTED EQUIPMENT. INSTALL PIPING TO CLEAR BUILDING CONSTRUCTION AND TO AVOID INTERFERENCE WITH OTHER WORK. THE CONTRACTOR SHALL PROVIDE AND INSTALL COMPLETE PIPING EXPANSION SYSTEM (INCLUDING SEISMIC JOINT EXPANSION) AND DEVICES AS REQUIRED FOR PROPER EXPANSION COMPENSATION STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF THE PROJECT.

THE DRAWINGS INDICATE SCHEMATICALLY THE SIZE AND LOCATION OF PIPING. PIPING SHALL BE SET UP AND DOWN AND OFFSET AS REQUIRED TO MEET CONSTRUCTION CONDITIONS.

THIS CONTRACTOR SHALL INFORM HIMSELF FROM THE GENERAL CONSTRUCTION SPECIFICATIONS AND PLANS, OF THE EXACT DIMENSION OF FINISHED WORK AND OF THE HEIGHT OF FINISHED CEILINGS IN ALL ROOMS WHERE EQUIPMENT OR PIPES ARE TO BE PLACED AND ARRANGE HIS WORK IN ACCORDANCE WITH THE SCHEDULE OF INTERIOR FINISHES, AS INDICATED ON THE ARCHITECTURAL DRAWINGS.

WATER PIPING SHALL BE RUN FREE OF TRAPS AND UNNECESSARY BENDS. ANY TRAPS FORMED SHALL BE PROVIDED WITH HOSE END DRAIN VALVES WITH THREADED CAP AND CHAIN TO COMPLETELY DRAIN THE SYSTEM.

PROVIDE SECTION CUT-OFF VALVES ON ALL MAINS AND BRANCHES. PITCH AND VALVE ALL WATER PIPING FOR CONVENIENT DRAINAGE.

WHEREVER DISSIMILAR METALS ARE JOINED TOGETHER AN APPROVED DIELECTRIC FITTING SHALL BE USED. THE DIELECTRIC FITTING SHALL BE A LISTED ASSEMBLY.

RUN ALL SOIL, WASTE AND VENT PIPING SHOWN OR REQUIRED BY LOCAL CODES. PIPING SHOWN IS MINIMUM AND IN ACCORDANCE WITH STATE AND FEDERAL CODES. IF LOCAL CODES REQUIRE ADDITIONAL VENTING OR LARGER SIZES, PROVIDE AS REQUIRED.

MAKE ALL CONNECTIONS THROUGH TRAPS. EACH TRAP TO BE VENTED, EITHER BY CIRCUIT, LOOP, OR INDIVIDUAL VENT, AS REQUIRED, BUT NOT LESS THAN SHOWN, OR AS REQUIRED BY LOCAL CODE.

WEEKS OF OPERATION.

GAS PIPING

REQUIREMENTS.

HAVING JURISDICTION.

PROVIDE AND INSTALL INDEPENDENT GAS PRESSURE REGULATOR VENTS TO THE EXTERIOR AS REQUIRED IN NFPA 54/58 AND THE REGULATOR MANUFACTURERS REQUIREMENTS.

OF ALL VERTICAL RISERS AND DROPS.

MAKE BRANCH CONNECTIONS TO MAINS FROM TOP OR SIDE, NOT FROM BOTTOM OF MAIN.

AND PRESSURE OF GAS BEING SUPPLIED.

PURGING: PURGE GAS TO SAFE LOCATION.

16" X 16" WHERE PARTIAL BODY ACCESS IS REQUIRED 24" X 24" WHERE FULL BODY ACCESS IS REQUIRED

NO PIPING SHALL BE COVERED UNTIL TESTED APPROVED BY THE AUTHORITIES HAVING JURISDICTION.

ALL UNDERGROUND PIPING SHALL BE LAID ON 6" SAND AND BACKFILLED WITH CLEAN FINE EARTH COMPACTED TO 12" ABOVE PIPE. COMPLETE BACKFILL WITH AVAILABLE EARTH FREE OF LARGE BOULDERS AND SHARP ROCKS. TAMP BACKFILL IN 6" ELEVATIONS AND OVERFILL TO ALLOW FOR SETTLEMENT.

SET AND PROPERLY CONNECT ALL FIXTURES WITH HOT AND COLD WATER, VENT AND DRAINAGE PIPING, AS REQUIRED AND PROTECT FIXTURES UNTIL ACCEPTANCE AND TEST. CLEAN ALL FLUSH VALVES AFTER TWO

INSTALL THRUST BLOCKS FOR UNDERGROUND WATER PIPING AT ALL CHANGES IN DIRECTION BOTH HORIZONTALLY AND VERTICALLY. THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH OR EARTH. THRUST BLOCKS SHALL BE INSTALLED IN ACCORDANCE WITH THE DUCTILE IRON PIPE RESEACH ASSOCIATION (DIPRA) MANUAL "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" AND LOCAL UTILITY COMPANY

INSTALL GAS PIPING, AND GAS PIPING SPECIALTIES IN ACCORDANCE WITH NFPA 54, NFPA 58, AND AUTHORITIES

LOCATE GAS PIPING WITH ADEQUATE SEPARATION BETWEEN ELECTRICAL CABLES, EQUIPMENT, AND CONDUIT.

SLOPE GAS PIPING TO LOW POINTS WITHOUT TRAPS. PROVIDE DRIPS (PIPE TEE, NIPPLE, AND CAP) AT BOTTOM

PROVIDE AND INSTALL GAS SHUT-OFF VALVES FOR THE PROPER AND SAFE CONTROL OF THE SYSTEM.

DO NOT LOCATE GAS VALVES IN SPACES USED AS AIR PLENUMS.

VERIFICATION: BEFORE MAKING A GAS CONNECTION, VERIFY THAT EQUIPMENT IS COMPATIBLE WITH THE TYPE





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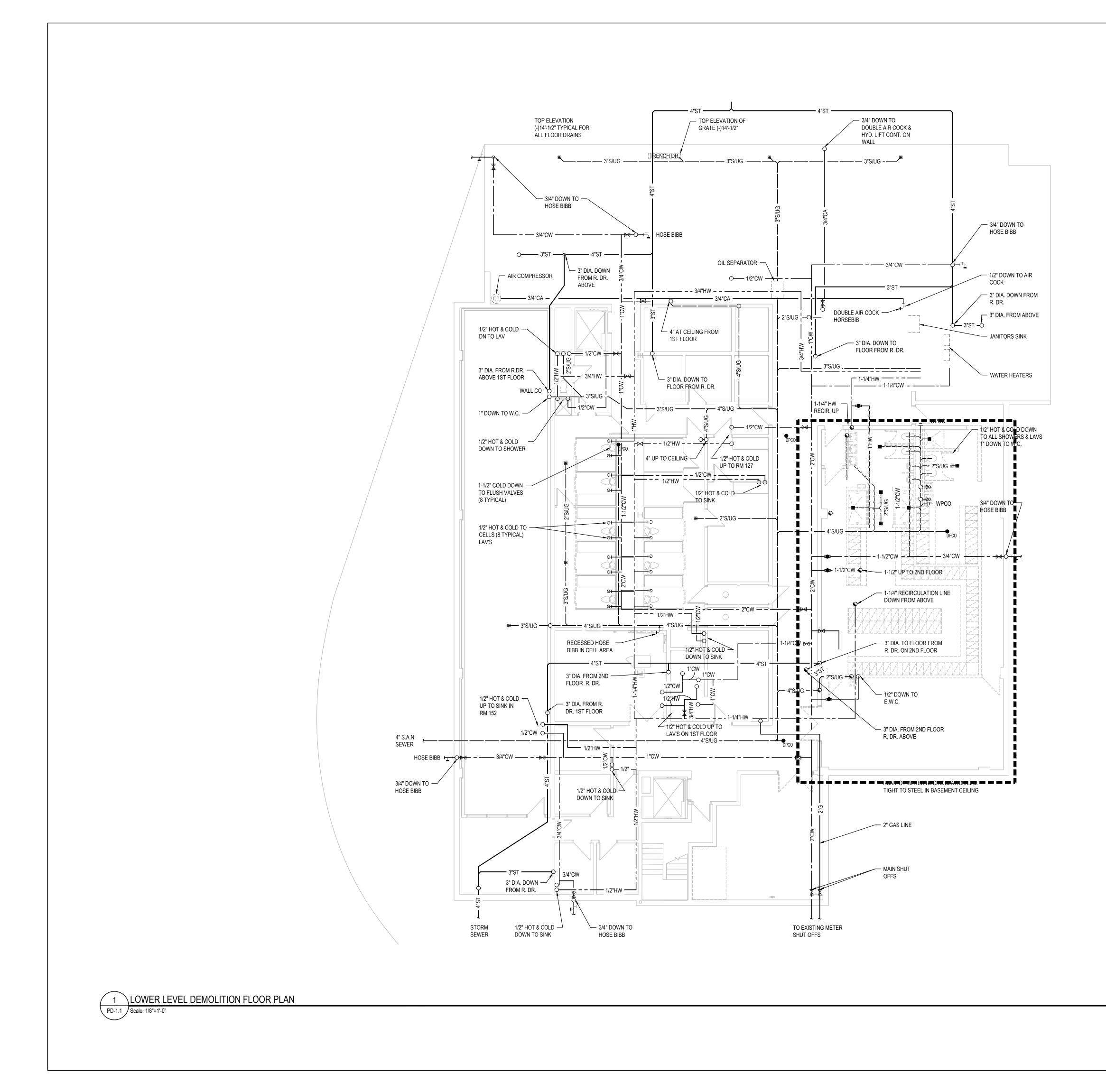
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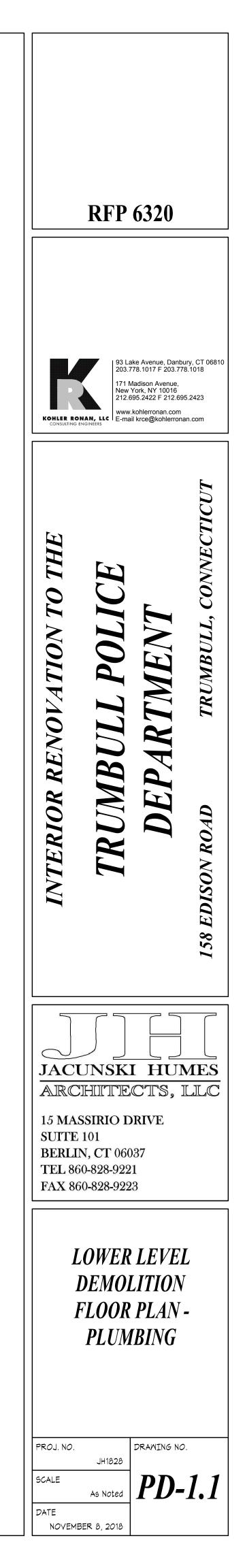
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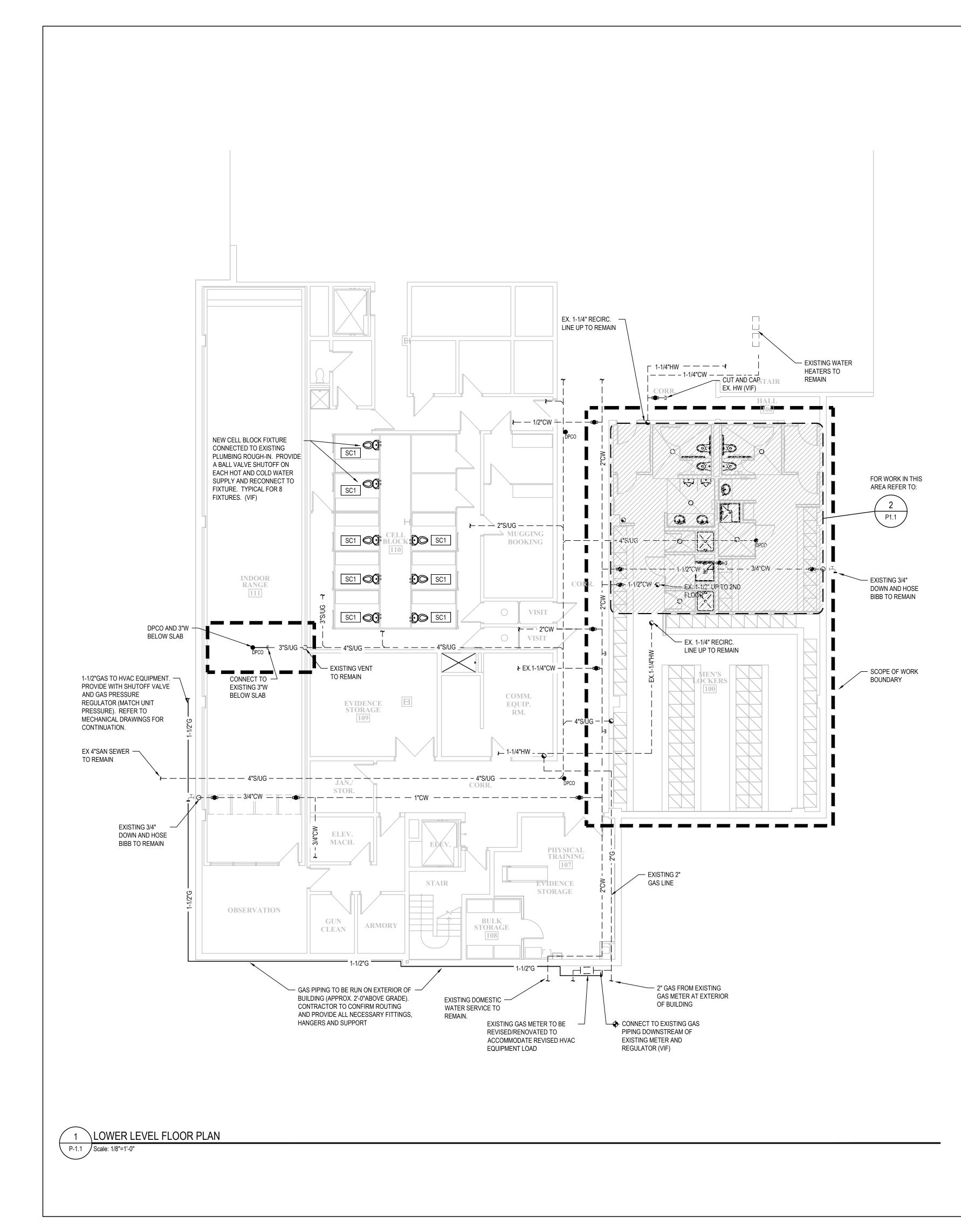
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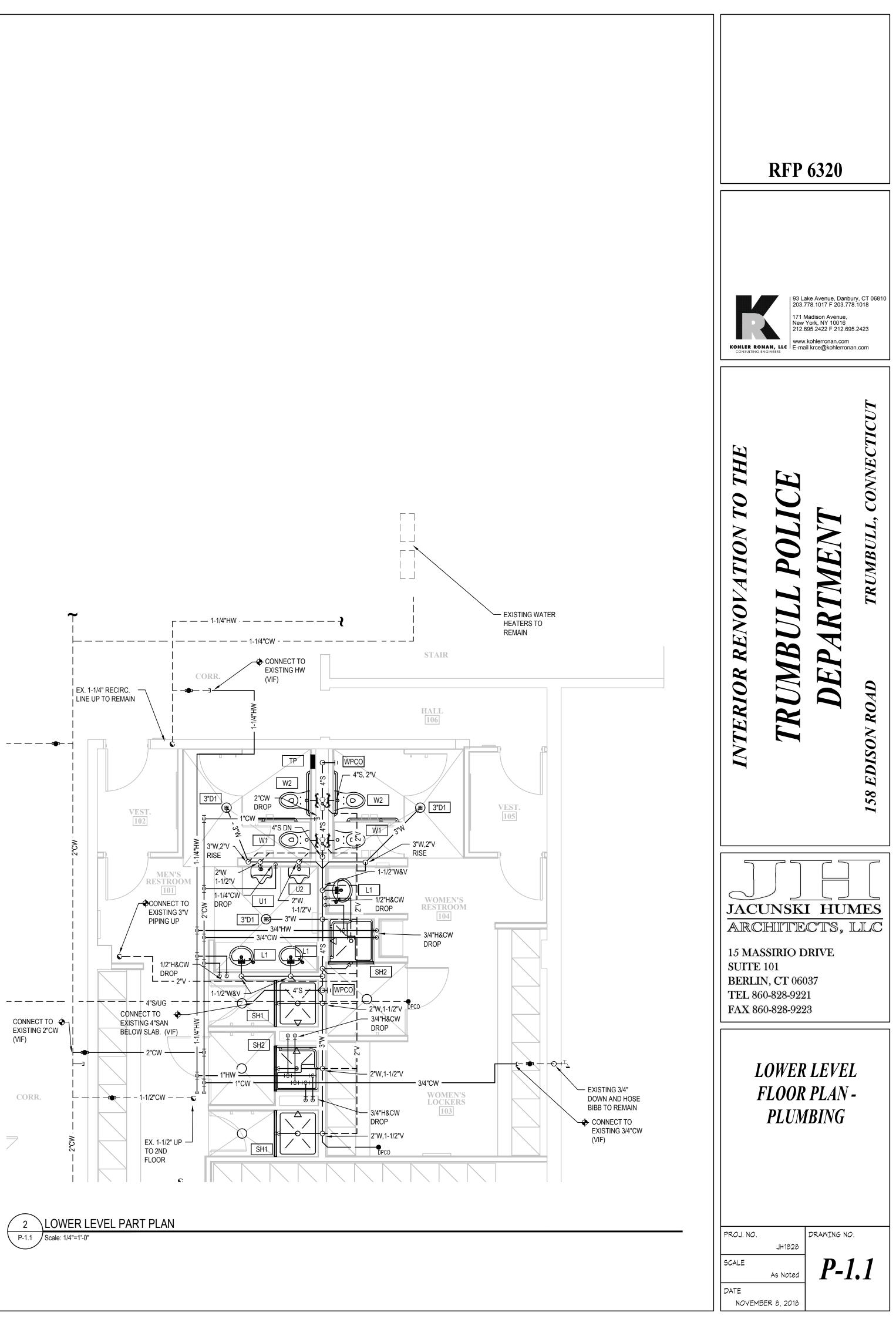
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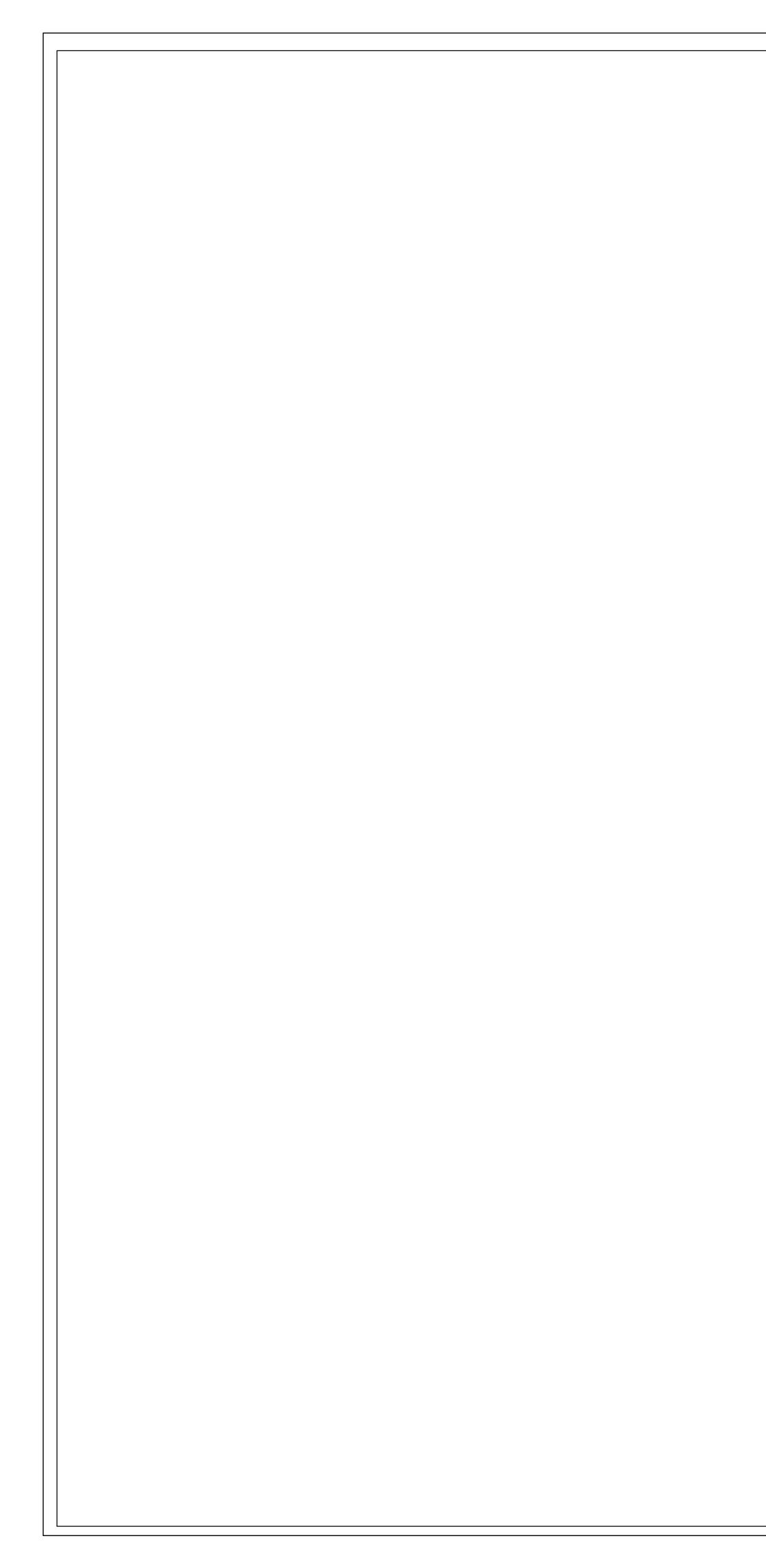




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PIPE-1	EXT	PIPE TAG/SIZING TEXT							
XX	Х	PLUMBING FIXTURE TAG							
XX (XXX So		ROOF DRAIN TAG WITH SQ.FT.							







### PIPE AND FITTING SCHEDULE

		PIPE		F	TITTING		
DESCRIPTION	SIZE	TYPE	SCHEDULE	TYPE	RATING	REMARKS	
SOIL, WASTE AND VENT ABOVE GROUND	ALL	CI - NH	SV	СІ	SV	CHARLOTTE PIPE	
SOIL, WASTE AND VENT BELOW GROUND	ALL	CI - H&S	SV	СІ	SV	-	
DOMESTIC COLD WATER WITHIN BUILDING	2-1/2" AND BELOW	COPPER	TYPE L	CUS	STD	HARD TEMPERED	
DOMESTIC HOT WATER PIPING	2-1/2" AND BELOW	COPPER	TYPE L	CUS	STD	HARD TEMPERED	
DOMESTIC COLD WATER WITHIN BUILDING	3" AND LARGER	COPPER	TYPE L	GJ	MJ	HARD TEMPERED	
DOMESTIC HOT WATER PIPING	3" AND LARGER	COPPER	TYPE L	GJ	MJ	HARD TEMPERED	
DOMESTIC HOT WATER RECIRCULATION PIPING	ALL	COPPER	TYPE L	CUS	STD	HARD TEMPERED	
INDIRECT WASTE AND CONDENSATE PIPING	ALL	COPPER	TYPE L	CUS	STD	HARD TEMPERED	
DOMESTIC HOT & COLD WATER PIPING WITHIN BUILDING, BELOW SLAB	ALL	PEX				NO JOINTS ALLO	
GAS PIPING	2" AND BELOW	STL-BLK	40	МІТ	CLASS 150		
GAS PIPING	ABOVE 2"	STL-BLK	40	WE	SCHED 40		
DOMESTIC WATER SERVICE PIPING	2-1/2" AND BELOW	COPPER	TYPE K	cus	STD	SOFT TEMPERED ALLOWED BELOW	
DOMESTIC WATER SERVICE PIPING	3" AND LARGER	CLDI	CLASS 52	DIMJ	250		
TRAP PRIMER PIPING	ALL	PEX				NO JOINTS ALLO	

NOTE: NO-HUB OR TRANSITION COUPLINGS ARE NOT PERMITTED BELOW GRADE, BELOW SLABS OR BURIED IN CONTACT WITH EARTH.

VALVE SCHEDULE											
					TYPE						ABBREVIATIONS
DESCRIPTION	SIZE	GATE	GLOBE	CHECK	BALL	PLUG	BALAN.	CLASS	REMARKS	ABB.	DESCRIPTION
DOMESTIC COLD WATER	2" AND SMALLER	GVT	GLVT	СVТ	BVT			125 PSI	-	BVT	BALL VALVE THREADED - 2-PIECE, FULL PORT, 400PSI, BRONZE
DOMESTIC HOT WATER	2" AND SMALLER	GVT	GLVT	СУТ	BVT		CBV	125 PSI		CBV	CALIBRATED BALANCING VALVE, BRONZE
								1201 01		CVF	CHECK VALVE FLANGED - IBBM
DOMESTIC COLD WATER	2-1/2" AND LARGER	GVF	<u></u>	CVF				125 PSI	<b></b>	CVT	CHECK VALVE THREADED - BRONZE
		011						1201 01		GVF	GATE VALVE FLANGED - IBBM
DOMESTIC HOT WATER	2-1/2" AND LARGER	GVF		CVF			CBV	125 PSI		GVT	GATE VALVE THREADED - BRONZE
Domestic field water		001						1231 31		GLVT	GLOBE VALVE THREADED - BRONZE
GAS	2" AND SMALLER					PGVT		125 PSI		PGVF	PLUG VALVE FLANGED - AGA APPROVED
								120 P 31		PGVT	PLUG VALVE THREADED - AGA APPROVED
GAS	2-1/2" AND OVER				-	PGVF		125 PSI		ACCORD	TS INCLUDED IN THIS SECTION SHALL BE "LEAD FREE" IN ANCE WITH THE REQUIREMENTS OF THE "REDUCTION OF
SOLENOID VALVE: UL LISTED, FM APPROVED FOR GAS SERVICE, EXPLOSION PROOF, TWO-WAY NORMALLY CLOSED. SOLENOID VALVE: ASCO 8044 SERIES W/ MANUAL RESET. (EMERGENCY GAS SHUT-OFF VALVE ASSEMBLY)									LEAD IN [	ÖRINKING WATER ACT".	

	PLUMBING CLEANOUT SCHEDULE								
TAG	ТҮРЕ	MANUFACTURER & MODEL NUMBER	DESCRIPTION	GENERAL CLEANOUT NOTES					
DPCO	FLOOR CLEANOUT	JOSAM 55000-1-SD-22-41-VP SMITH 4100-NB-FC SERIES WATTS CO-200-RX-C-6 ZURN ZN-1400-HD-KC SERIES	ALL INTERIOR AREAS (EXCEPT CARPETED AREAS) ADJUSTABLE ROUND SCORIATED HEAVY DUTY NICKEL BRONZE SECURED TOP WITH FRAME, CAST IRON BODY, FLASHING FLANGE AND CLAMP, BRONZE PLUG. PROVIDE WITH VANDAL PROOF SCREWS. PROVIDE NICKEL BRONZE FRAME IN WET AREAS.	<ul> <li>INSTALL EXTERIOR CLEANOUTS WITH A 18" SQUARE X 6" THICK CONCRETE APRON.</li> <li>CLEANOUTS SHALL BE LOCATED AT MINIMUM INTERVALS OF 50 FEET FOR PIPING NPS 4 AND SMALLER AND 100 FEET FOR LARGER PIPING.</li> <li>BUILDING SEWERS SHALL BE PROVIDED WITH CLEANOUTS LOCATED NOT MORE THAN 100 FEET APART MEASURED FROM THE UPSTREAM ENTRANCE OF THE CLEANOUT.</li> </ul>					
DPCO	FLOOR CLEANOUT	JOSAM 55000-1-SD-14-22-41-VP SMITH 4100-NB-FC-Y SERIES WATTS CO-200-RC-6 ZURN ZN-1400-HD-KC-CM SERIES	CARPETED AREAS, ADJUSTABLE ROUND SCORIATED HEAVY DUTY NICKEL BRONZE SECURED TOP WITH FRAME, CARPET MARKER, CAST IRON BODY, FLASHING FLANGE AND CLAMP, BRONZE PLUG. PROVIDE WITH VANDAL PROOF SCREWS	<ul> <li>CLEANOUTS SHALL BE INSTALLED AT EACH CHANGE OF DIRECTION OF THE BUILDING DRAIN OR HORIZONTAL WASTE OR SOIL LINES GREATER THAN 45 DEGREES (INCLUDING P-TRAPS). WHERE MORE THAN ONE CHANGE OF DIRECTION OCCURS IN A RUN OF PIPING, ONLY ONE CLEANOUT SHALL BE REQUIRED FOR EACH 40 FEET OF DEVELOPED LENGTH OF THE DRAINAGE PIPING.</li> <li>A CLEANOUT SHALL BE PROVIDED AT THE BASE OF EACH WASTE OR SOIL STACK.</li> </ul>					
DPCO	FLOOR CLEANOUT	JOSAM 58670-5-VP-C04 SMITH 4250-M SERIES WATTS CO-300-MF-6 WITH CO-380 ZURN Z-1474-DC/Z1449 SERIES	EXTERIOR AREAS, ROUND FLANGED HOUSING WITH HEAVY DUTY SCORIATED DUCTILE IRON TOP, CLEANOUT FERRULE BODY WITH BRONZE PLUG. INSTALL CLEANOUTS WITH 18" SQUARE X 6" DEEP CONCRETE APRON IN NON-PAVED AREAS. PROVIDE WITH VANDAL PROOF SCREWS	<ul> <li>THERE SHALL BE A CLEANOUT NEAR THE JUNCTION OF THE BUILDING DRAIN AND THE BUILDING SEWER. THE CLEANOUT SHALL BE EITHER INSIDE OR OUTSIDE THE BUILDING WALL AND SHALL BE BROUGHT UP TO THE FINISHED GROUND LEVEL OR TO THE ASSOCIATED FLOOR LEVEL.</li> <li>MINIMUM SIZE. CLEANOUTS SHALL BE THE SAME NOMINAL SIZE AS THE PIPE THEY SERVE UP TO 4 INCHES. FOR PIPES LARGER THAN 4 INCHES NOMINAL SIZE, THE MINIMUM SIZE OF THE CLEANOUT SHALL BE 4 INCHES.</li> </ul>					
WPCO	WALL PLATE CLEANOUT COVER	JOSAM 58640-CO (*)-VP SERIES SMITH 4730-NB-U SERIES WATTS CO-300-S7-6 ZURN ZANB-1460-VP SERIES	PROVIDE AT CAST IRON CLEANOUTS WITH TAPERED BRONZE PLUG A 6" X 6" (OR 7" X 7") POLISHED NICKEL BRONZE SQUARE FRAME AND COVER SECURED WITH VANDAL PROOF SCREWS. *MATCH CLEANOUT TO FILED CONDITIONS, USE "-COT" OPTION, IF NECESSARY. MAKE ACCESS COVER SIZE APPROPRIATE TO CLEANOUT.	<ul> <li>CLEARANCES: CLEANOUTS ON 6-INCH AND SMALLER PIPES SHALL BE PROVIDED WITH A CLEARANCE OF NOT LESS THAN18 INCHES FOR RODDING. CLEANOUTS ON 8-INCH AND LARGER PIPES SHALL BE PROVIDED WITH A CLEARANCE OF NOT LESS THAN 36 INCHES FOR RODDING.</li> <li>PROVIDE CLEANOUT ON ALL HORIZONTAL RUNS GREATER THAN 3 FEET. FLOOR DRAINS, ROOF DRAINS AND FLOOR SINKS ARE NOT CONSIDERED AN ACCEPTABLE CLEANOUT.</li> </ul>					

	PLUMBING DRAIN/EQUIPMENT SCHEDULE										
					MINIMUM BRANCH S			ANCH SIZES			
FIXTURE TAG	FIXTURE TYPE	FIXTURE MANUFACTURER MODEL, MODEL NO.	MATERIAL	DESCRIPTION	SUPPLY SIZE	TRAP SIZE	WASTE/ SANITARY	VENT	COLD WATER	HOT WATER	REMARKS
D1	6" SQUARE FLOOR DRAIN TOILET ROOMS	JOSAM 30000-S SERIES MIFAB F1100-C-S SERIES SMITH 2010 SERIES WADE 1100-G SERIES WATTS FD-100-M6-7 ZURN Z415S SERIES	CAST IRON	CAST IRON BODY, BOTTOM OUTLET, 6" X 6" SQUARE NICKEL BRONZE TOP, TRAP PRIMER CONNECTION, SEEPAGE PAN AND COMBINATION MEMBRANE FLASHING CLAMP		AS NOTED ON DWG.			-		
D2	SHOWER DRAIN - TILE BASE	PROLINE TRENCH DRAIN	STAINLESS STEEL	18 GAUGE 316L STAINLESS STEEL, FULLY SLOPED, LOW PROFILE 1" DEEP AND 1" WIDE TROUGH, 2" ID SCHEDULE 10 STAINLESS STEEL WASTE OUTLET	-	AS NOTED ON DWG.		-			
NOTE: PROV	IDE TRAP PRIMERS	FOR ALL FLOOR DRAINS. SHOWER DRAINS INCORPORATING A CONSTANT A	ND <del>R</del> EGULAR INDIRECT	WASTE, ARE NOT REQUIRED TO INTEGRATE TRAP PRIMERS.							

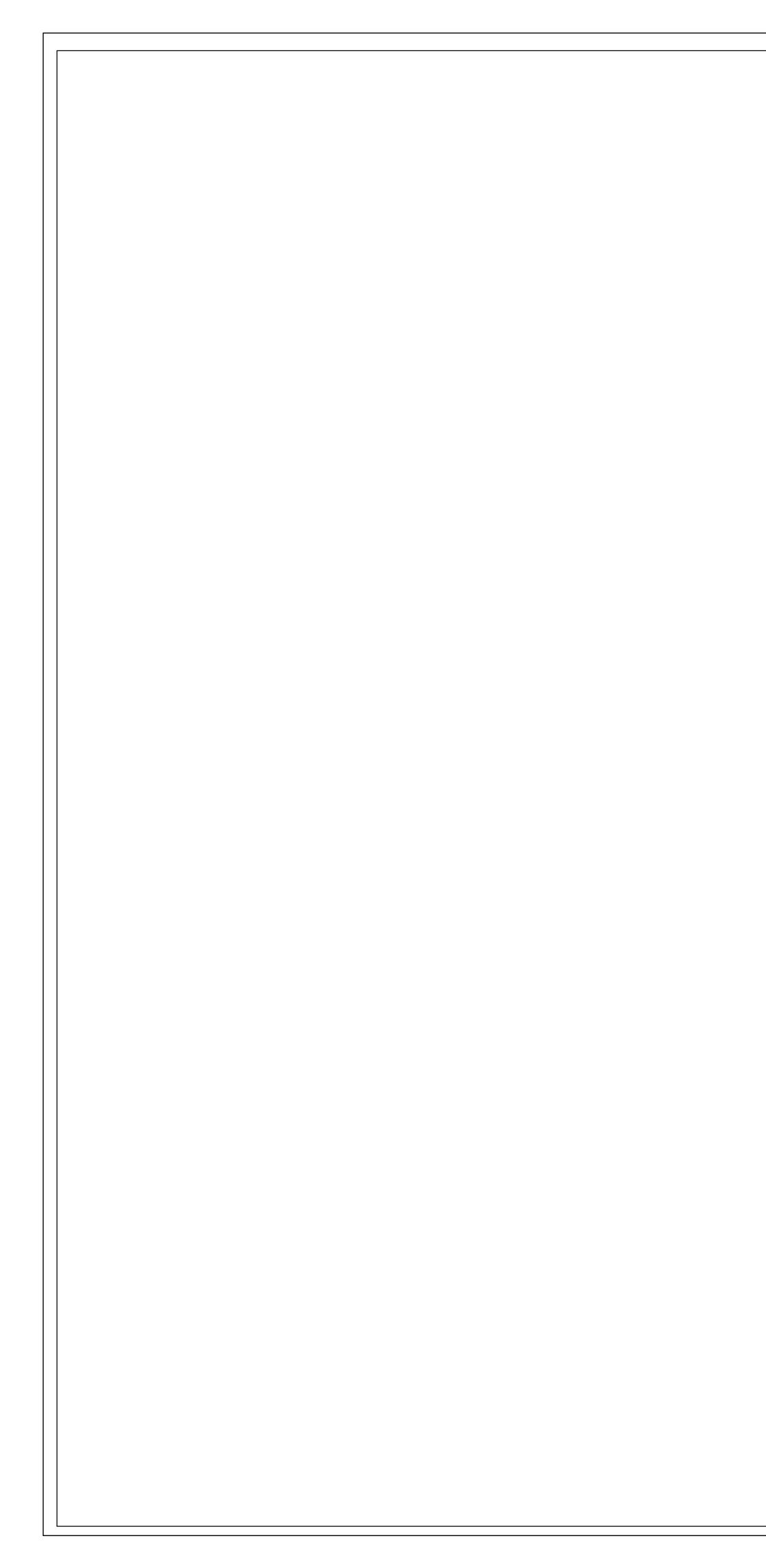
	ABBREV
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PIPE WITH HUSKY SD4000 COUPLINGS	CI
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	PF
LOWED BELOW SLAB	STD
	STL-BLK
	SV
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RED - NO JOINTS	

EV.	DESCRIPTION
١	AMERICAN WATER WORKS ASSOCIATION
	CAST IRON
	CEMENT-LINED DUCTILE IRON
	CHLORINATED POLYVINYL CHLORIDE
	WROUGHT COPPER SOLDER (95/5)
	DUCTILE IRON
	DUCTILE IRON MECHANICAL JOINT
	GROOVED END STEEL
	GROOVED JOINT SYSTEM FITTINGS/COUPLINGS
	GALVANIZED STEEL
	HUB AND SPIGOT
	MECHANICAL JOINT
	MALLEABLE IRON THREADED
	NO HUB W/HEAVY DUTY 4-BAND HUSKY CLAMP
	PEX PIPING
	PRESSURE FITTINGS
	STANDARD
_K	BLACK STEEL SEAMLESS
	SERVICE WEIGHT
	THREADED JOINTS
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### D BELOW SLAB

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### INSULATION SCHEDULE

SYSTEM	PIPE SIZE	PIPE INSULATION TYPE	PIPE INSULATION THICKNESS	FITTINGS, VALVES,			
DOMESTIC COLD WATER	ALL	MINERAL FIBER, ASJ, SSL	1"	MOLDED, PRE-FORI			
DOMESTIC HOT WATER	ALL	MINERAL FIBER, ASJ, SSL	1"	Molded, Pre-Fori			
DOMESTIC WATER UNDERGROUND & IN SLAB INSTALLATION	ALL	FLEXIBLE ELASTOMERIC, CLOSED CELL	1"	ARMAFLEX			
1. FIBERGLASS INSULATION: THERMAL CONDUCTIVITY .22 TO .28 BTU x IN./H x FT x °F W/ 100°F MEAN TEMP. THICKNESS BASED ON IECC 2012							

REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

ALL EXPOSED INDOOR PIPING/TUBING AND FITTINGS WITHIN OCCUPIED SPACES, CORRIDORS, MECHANICAL ROOMS AND OTHER NON-CONCEALED LOCATIONS SHALL BE FITTED WITH PVC FITTING COVERS AND PVC PIPE COVERS FROM THE FLOOR LEVEL TO 12' ABOVE THE FINISHED FLOORS, PLATFORMS, AND MEZZANINES. PVC FITTING AND PIPE COVERS SHALL BE 25/50 FLAME AND SMOKE SPREAD RATED. COVERS AND JACKETING COLOR TO BE SELECTED BY ARCHITECT. PROVIDE TEMPLATE OF JACKET COLORS FOR THE ARCHITECT'S REVIEW.

ALL ELBOWS; CONCEALED OR EXPOSED, SHALL BE INSULATED WITH PRE-MOLDED, FACTORY FORMED FIBROUS GLASS WITH 3.5 PCF MINIMUM DENSITY AS MANUFACTURED BY HAMFAB OR APPROVED EQUAL. ALL ELBOWS; CONCEALED OR EXPOSED, SHALL BE COVERED WITH PVC FITTING COVERS. PVC FITTING COVERS SHALL BE 25/50 FLAME AND SMOKE SPREAD RATED. COVER COLOR TO BE SELECTED BY ARCHITECT. PROVIDE TEMPLATE OF JACKET COLORS FOR THE ARCHITECT'S REVIEW.

DIAPER AND LOOSE FILL STYLE INSULATION ON PIPE FITTINGS IS NOT ACCEPTABLE. ELBOWS WITHOUT PVC COVERS ARE NOT ACCEPTABLE.

				PLUMBING FIXTURE SCHEDULE							
							N	/INIMUM BF		5	
FIXTURE TAG	FIXTURE TYPE	FIXTURE MANUFACTURER MODEL, MODEL NO.	MATERIAL	DESCRIPTION	SUPPLY SIZE	TRAP SIZE	WASTE/ SANITARY		COLD WATER	HOT WATER	REMARKS
W1 W2 (ADA)	WATER CLOSET WALL HUNG FLUSH VALVE	WATER CLOSET: KOHLER KINGSTON K-4325 SEAT: KOHLER LUSTRA K-4670-C FLUSH VALVE: KOHLER WAVE K-7521	VITREOUS CHINA COLOR: AS SELECTED BY ARCHITECT	WATER CLOSET: STANDARD & A.D.A. COMPLIANT, 1.28 GPF LOW FLOW, ELONGATED, SIPHON JET, WITH 1-1/2" TOP SPUD. FLUSH VALVE: ELECTRONIC INFRARED SENSOR FLUSH VALVE WITH WAVE TECHNOLOGY AND 30-YEAR HYBRID ENERGY CELL SEAT: HEAVY DUTY SOLID PLASTIC ELONGATED OPEN FRONT. COMBINED CONCEALED CARRIER & SUPPORT.	1"		4"	2"	1-1/2"		
U1 U2 (ADA)	URINAL FLUSH VALVE	URINAL: KOHLER BARDON K-4991-ETSS FLUSH VALVE: KOHLER WAVE K-7528	VITREOUS CHINA COLOR: AS SELECTED BY ARCHITECT	STANDARD AND ADA COMPLIANT, 0.125 GPF LOW FLOW, WASHOUT URINAL. FLUSH VALVE: ELECTRONIC INFRARED SENSOR FLUSH VALVE WITH WAVE TECHNOLOGY AND 30-YEAR HYBRID ENERGY CELL.	3/4"		2"	1-1/2"	1-1/4"		
L1	LAVATORY COUNTER MOUNTED	LAVATORY: KOHLER BRYANT OVAL K-2699-4 FAUCET: KOHLER TRITON BOWE K-400T20-5AKL MIXING VALVE: ACORN STP7069 INSULATION KIT: TRUEBRO LAV GUARD 2	VITREOUS CHINA COLOR: AS SELECTED BY ARCHITECT	STANDARD & A.D.A. COMPLIANT, OVAL, 1-1/2" CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT PLUG, CHROME PLATED BRASS ANGLE STOPS WITH LOOSE KEY OPERATOR, AND GRID DRAIN. FAUCET: 4" CENTERSET FAUCET, CHROME PLATED 1.0 GPM, LAMINAR FLOW OUTLET, WRISTBLADE HANDLES PROVIDE THERMOSTATIC MIXING VALVE ON HOT WATER SUPPLY	3/8"	1-1/2"	1-1/2"	1-1/2"	1/2"	1/2"	INSULATE TRAP & WATER PIPING BELOW LAVATORY WITH INSULATION KIT. PROVIDE EACH FAUCET WITH AN ASSE 1070 COMPLIANT MIXING VALVE FOR HOT WATER SUPPLY
SH1	SHOWER ASSEMBLY	SHOWER SYSTEM: SYMMONS TEMPTROL C-96-1-X-2.0-X-CHKS SHOWER HEAD: SYMMONS #4-137 MIXING VALVE: ACORN STP7069	BASE AND ENCLOSURE BY ARCHITECT	PRESSURE BALANCING SHOWER VALVE WITH ADJUSTABLE STOP SCREW TO LIMIT HANDLE TURN, SINGLE MODE 2.0 GPM SHOWER HEAD. TYPE D2 SHOWER DRAIN. PROVIDE THERMOSTATIC MIXING VALVE ON HOT WATER SUPPLY	1/2"	-	2"	1-1/2"	3/4"	3/4"	
SH2 (A.D.A.)	SHOWER ENCLOSURE AND ASSEMBLY	SHOWER ENCLOSURE: COMFORT DESIGNS SST 3838 TR .75 RF MS ADA SHOWER VALVE: SYMMONS TEMPTROL C-96-500-B30-V-2.0-CHKS SHOWER HEAD: SYMMONS #4-137 HAND SHOWER: SYMMONS #T-300-V MIXING VALVE: ACORN STP7069	SOLID SURFACE COLOR: AS SELECTED BY ARCHITECT	SHOWER ENCLOSURE, A.D.A. COMPLIANT 36"(I.D.) X 36"(I.D.). ONE PIECE SANITARY GRADE SOLID SURFACE SHOWER UNIT WITH REINFORCED 3/4" THRESHOLD & BASE. MOLDED ADA FOLD DOWN SEAT. (1) 18" X 33-1/2" X 1-1/2" L-GRAB BAR, (1) 24" X 1-1/2" STAINLESS STEEL GRAB BAR VERTICAL ON THE VALVE WALL, INTEGRAL FRONT TRENCH DRAIN. CHROME PLATED SHOWER AND HAND SHOWER SYSTEM WITH 30" SLIDE BAR, DUAL SEPARATE DUAL OUTLET DIVERTER VALVE, 5 FOOT FLEXIBLE METAL HOSE WITH INLINE VACUUM BREAKER, CHECK STOPS, 2.0 GPM SHOWER HEAD. PROVIDE THERMOSTATIC MIXING VALVE ON HW SUPPLY	1/2"		2"	1-1/2"	3/4"	3/4"	
TP1	ELECTRONIC TRAP PRIMER	PRECISION PLUMBING PRODUCTS MPB-500 SERIES PROVIDE WITH CABINET & ACCESS DOOR BASED ON WALL CONDITIONS. COORDINATE ACCESS PANEL FINISH & LOCATION WITH ARCHITECT. (REFER TO PIPE & FITTING SCHEDULE FOR MATERIALS)		ELECTRONIC TRAP PRIMER ASSEMBLY: CONSISTING OF CIRCUIT BREAKER (MINIMUM 2 AMP), SWITCH, TIMER SOLENOID VALVE, 115V, MOUNT PER MANUFACTURER'S REQUIREMENTS & RECOMMENDATIONS. COORDINATE NUMBER OF OUTLETS AS REQUIRED BY QUANTITY OF DRAINS SERVED (1 - 4).	1/2			-		-	*NOTE: RECESSED OR SURFACE MOUNTED CABINET TYPE BASED ON WALL CONDITIONS. CONTRACTOR TO COORDINATE WITH ARCHITECT. INCLUDE ACCESS DOORS/PANELS.
SC1	CELL BLOCK COMBINED WATER CLOSET/ LAVATORY	ACORN PENAL-WARE LR1418-CT-2-04-M-MTP2-1.28 GPF-MTPFV-PHL-MT	14 GAGE 304 STAINLESS STEEL	LIGATURE RESISTANT 18" WIDE LAV/TOILET COMBY. PROVIDE HEMISPHERICAL CABINET DESIGN TO REDUCE RISK OF FIXTURE BEING USED AS A LIGATURE DEVICE. CONSTRUCTION SHALL BE SEAMLESS WELDED AND EXPOSED SURFACES SHALL HAVE A SATIN FINISH. PROVIDE OVAL SHAPED LAVATORY BOWL. FIXTURE SHALL HAVE AN AIR-CONTROL PNEUMATICALLY OPERATED, PUSHBUTTON VALVE. HEMISPHERICAL PENAL BUBBLER AND HEMISPHERICAL PENAL PUSHBUTTON. PROVIDE TOILET BOWL HOUSING TO PROHIBIT THE ATTACHMENT OF OBJECTS. CONCEALED BLOWOUT JET TYPE; ELONGATED BOWL, SELF DRAINING FLUSHING RIM, AND AN INTEGRAL CONTOURED SEAT. TOILET TRAP SHALL HAVE A MINIMUM 3-1/2" SEAL THAT SHALL PASS A 2-1/8" DIAMETER BALL AND SHALL BE FULLY ENCLOSED. CABINET INTERIOR SHALL BE SOUND-DEADENED WITH FIRE-RESISTANT MATERIAL. FIXTURE SHALL WITHSTAND LOADING OF 5,000 POUNDS WITHOUT PERMANENT DAMAGE.			4"	2"	1-1/2"		INCLUDE TRAP PRIMER ON ONE FLUSH VALVE IN EACH TOILET ROOM EQUIPPED WITH FLOOR DRAIN.

S, FLANGES - INSULATION TYPE ORMED MINERAL FIBER PVC JACKET ORMED MINERAL FIBER PVC JACKET

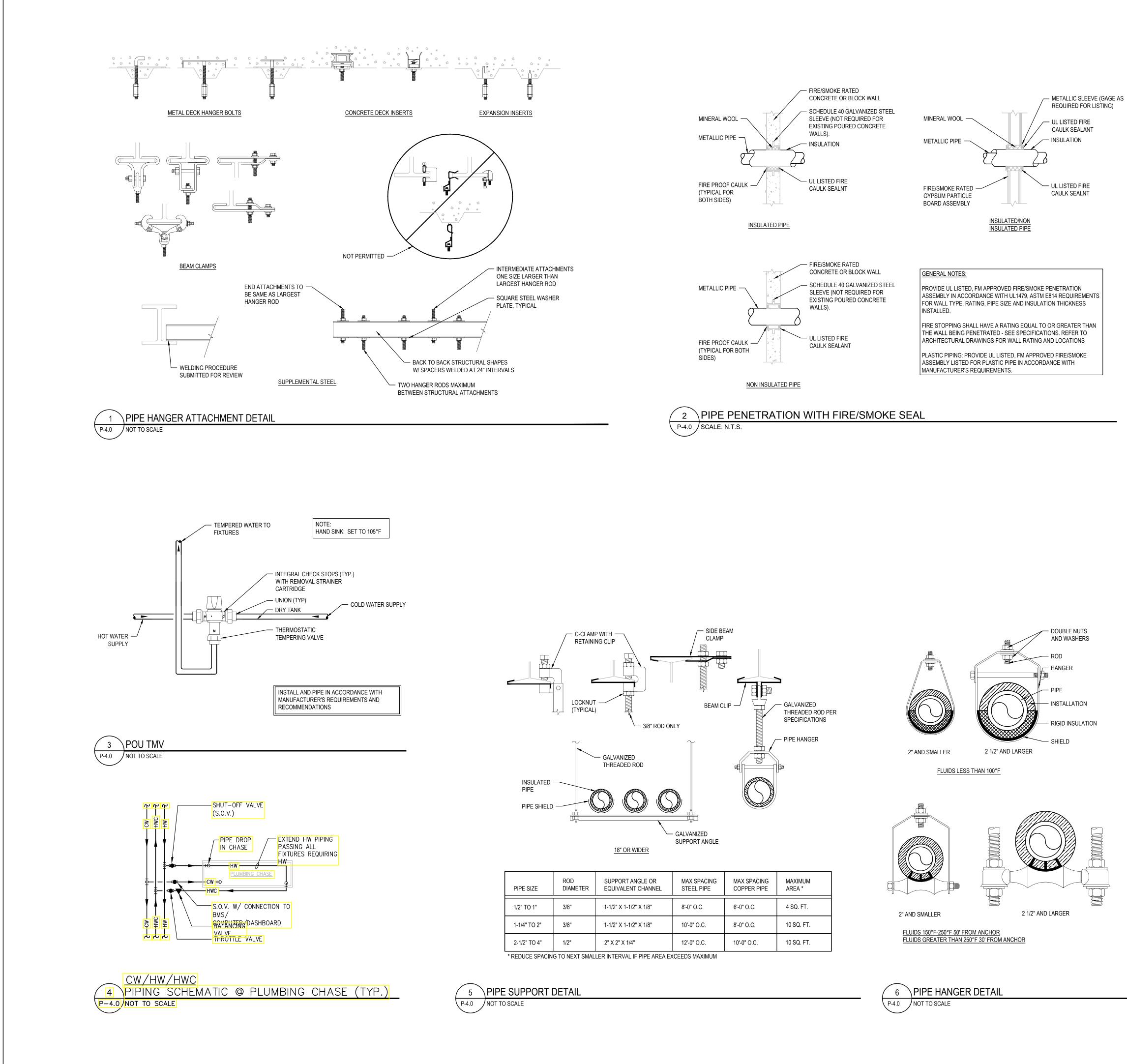
REMARKS

TYPE I

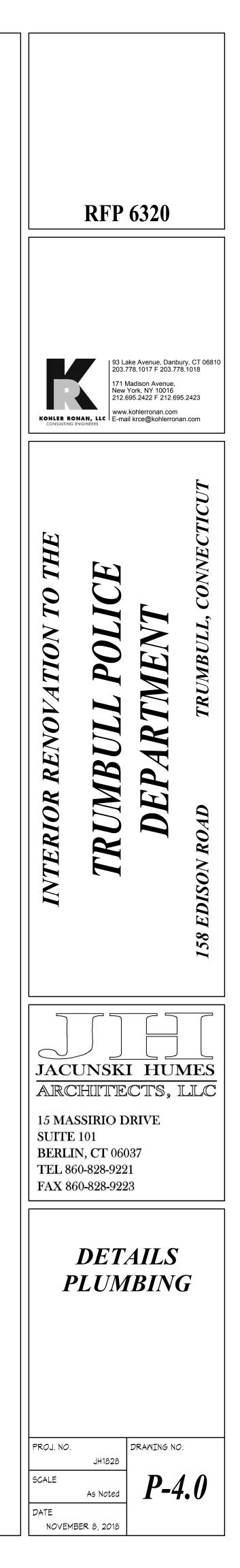
TYPE I

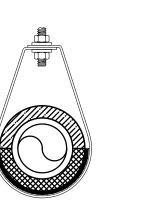
**RFP 6320** 93 Lake Avenue, Danbury, CT 06810 203.778.1017 F 203.778.1018 171 Madison Avenue, New York, NY 10016 212.695.2422 F 212.695.2423 KOHLER RONAN, LLC CONSULTING ENGINEERS  $\mathbf{C}$ CONNECTI [7] TH TO TRUMBULL, **NOIL** POI TN RENOVA X B M OR E Q TRU Q INTERI EDISON ROA 158 JACUNSKI HUMES ARCHITTECTS, LLC 15 MASSIRIO DRIVE **SUITE 101 BERLIN, CT** 06037 TEL 860-828-9221 FAX 860-828-9223 **SCHEDULES** PLUMBING DRAWING NO. PROJ. NO. JH1828 **P-3.1** SCALE As Noted DATE

NOVEMBER 8, 2018

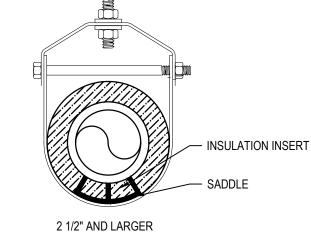


PIPE SIZE	ROD DIAMETER	SUPPORT ANGLE OR EQUIVALENT CHANNEL	MAX SPACING STEEL PIPE	MAX SPACING COPPER PIPE	MAXIMUM AREA *		
1/2" TO 1"	3/8"	1-1/2" X 1-1/2" X 1/8"	8'-0" O.C.	6'-0" O.C.	4 SQ. FT.		
1-1/4" TO 2"	3/8"	1-1/2" X 1-1/2" X 1/8"	10'-0" O.C.	8'-0" O.C.	10 SQ. FT.		
2-1/2" TO 4"	1/2"	2" X 2" X 1/4"	12'-0" O.C.	10'-0" O.C.	10 SQ. FT.		
REDUCE SPACING TO NEXT SMALLER INTERVAL IF PIPE AREA EXCEEDS MAXIMUM							





2" AND SMALLER



FLUIDS GREATER THAN 100°F

HANGER SCHEDULE					
PIPE SIZE	ROD SIZE	MAX. SPACING			
UP TO 1 1/4"	3/8" DIA.	8' STEEL			
UP TO 1 1/4"	3/8" DIA.	6' COPPER & BRASS			
1 1/2" & 2"	3/8" DIA.	10'			
2 1/2" & 3"	1/2" DIA.	10'			
4" & 5"	5/8" DIA.	10'			
6"	3/4" DIA.	10'			
8", 10", 12"	7/8" DIA.	10'			
14" & 16"	1" DIA.	10'			
18"	1 1/8" DIA.	10'			
20" & 24"	1 1/4" DIA.	10'			

<u>GENERAL</u> THE CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT AS NECESSARY TO PROVIDE A COMPLETE INSTALLATION	THE ARCHITECT AND ENGINEER ARE I ASSISTANCE RELATIVE TO ACCEPTAB
INCLUDING COORDINATION, SYSTEM CHECK OUT AND START UP ON EACH ITEM AND SYSTEM.	SUBMIT FINAL SIGNED COORDINATION INSTALLATIONS.
DIMENSION OF FINISHED WORK AND OF THE HEIGHT OF FINISHED CEILINGS IN ALL ROOMS WHERE EQUIPMENT OR PIPES ARE TO BE PLACED AND ARRANGE HIS WORK IN ACCORDANCE WITH THE SCHEDULE OF INTERIOR FINISHES, AS INDICATED ON THE ARCHITECTURAL DRAWINGS.	ANY WORK FABRICATED OR INSTALLE CONFORMANCE WITH COORDINATION EACH CONTRACTOR (MENTIONED AB(
MANUFACTURER'S QUALIFICATIONS: FIRMS REGULARLY ENGAGED IN THE MANUFACTURER OF FIXTURES, APPLIANCES, PIPES AND PIPE FITTINGS OF TYPES AND SIZES REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN 5 YEARS. MATERIAL QUALIFICATIONS: SHALL CONFORM TO ALL LOCAL, STATE, AND NATIONAL/FEDERAL CODES AND REGULATIONS WHICH MAY	THE OVERALL COORDINATION OF THE ENGINEER IS NOT RESPONSIBLE FOR FROM THE COORDINATION PROCESS. SOLUTIONS TO CONFLICTS WILL NOT
APPLY AND NOTHING IN THESE SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS. WELDING: QUALIFY WELDING PROCEDURES, WELDERS, AND OPERATORS IN ACCORDANCE WITH ASME B31.1, OR ASME B31.9, AS APPLICABLE. CERTIFY WELDING OF PIPING WORK USING STANDARD PROCEDURE SPECIFICATIONS BY, AND WELDERS TESTED UNDER SUPERVISION OF, NATIONAL CERTIFIED PIPE WELDING BUREAU (NCPWB).	AS BUILT DRAWINGS PROVIDE A COMPLETE SET OF AS-BU ALL INSTALLED CONDITIONS OF SYST DOCUMENTS AND INCLUDE DETAILS /
BRAZING: CERTIFY BRAZING PROCEDURES, BRAZERS, AND OPERATORS IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE, SECTION IX, FOR SHOP AND JOB-SITE BRAZING OF PIPING WORK. RELATED DOCUMENTS	IN A COMPLETE AND CONSECUTIVE S BE RETURNED FOR REVISION. THE C CONCISE SET OF DRAWINGS. DRAWI REQUIRED BY THE OWNER) VERSION.
DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.	PROVIDE "AS-BUILT DRAWINGS" INDIC ORIGINAL DESIGN OF THE WORK. IND
DEFINITIONS FINISHED SPACES: SPACES OTHER THAN MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS, FURRED SPACES, PIPE CHASES, UNHEATED SPACES IMMEDIATELY BELOW ROOF, SPACES ABOVE CEILINGS, UNEXCAVATED SPACES, CRAWLSPACES, AND TUNNELS.	INCLUDE ALL CHANGES AND AN ACCU DRAWINGS, OF ALL DEVIATIONS, BET MAINS AND BRANCHES OF PIPING SYS
EXPOSED, INTERIOR INSTALLATIONS: EXPOSED TO VIEW INDOORS. EXAMPLES INCLUDE FINISHED OCCUPIED SPACES AND MECHANICAL EQUIPMENT ROOMS.	LOCATED, AND WITH ITEMS REQUIRIN ETC.). VALVE LOCATION DIAGRAMS, C EQUIPMENT LOCATIONS (EXPOSED AN
EXPOSED, EXTERIOR INSTALLATIONS: EXPOSED TO VIEW OUTDOORS OR SUBJECT TO OUTDOOR AMBIENT TEMPERATURES AND WEATHER CONDITIONS. EXAMPLES INCLUDE ROOFTOP LOCATIONS.	APPROVED SUBSTITUTIONS, CONTRA
CONCEALED, INTERIOR INSTALLATIONS: CONCEALED FROM VIEW AND PROTECTED FROM PHYSICAL CONTACT BY BUILDING OCCUPANTS. EXAMPLES INCLUDE ABOVE CEILINGS AND IN CHASES.	CONTRACT MODIFICATIONS, ACTUAL SUBMIT FOR REVIEW BOUND SETS OF
CONCEALED, EXTERIOR INSTALLATIONS: CONCEALED FROM VIEW AND PROTECTED FROM WEATHER CONDITIONS AND PHYSICAL CONTACT BY BUILDING OCCUPANTS BUT SUBJECT TO OUTDOOR AMBIENT TEMPERATURES. EXAMPLES INCLUDE INSTALLATIONS WITHIN UNHEATED SHELTERS.	<u>PIPE MATERIALS</u> REFER TO SCHEDULE ON DRAWING.
QUALITY ASSURANCE STEEL SUPPORT WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO AWS D1.1, "STRUCTURAL WELDING CODESTEEL."	<u>PIPE LABELS</u> DO NOT USE PIPE LABELS OR PLASTI HIGHER.
STEEL PIPE WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS."	HIGHER. GENERAL REQUIREMENTS FOR MANI AND SHOWING FLOW DIRECTION.
COMPLY WITH PROVISIONS IN ASME B31 SERIES, "CODE FOR PRESSURE PIPING." CERTIFY THAT EACH WELDER HAS PASSED AWS QUALIFICATION TESTS FOR WELDING PROCESSES INVOLVED AND THAT	PRETENSIONED PIPE LABELS: PREC TO PIPE WITHOUT FASTENERS OR AD SELF-ADHESIVE PIPE LABELS: PRINT
CERTIFICATION IS CURRENT. ELECTRICAL CHARACTERISTICS FOR PLUMBING EQUIPMENT: EQUIPMENT OF HIGHER ELECTRICAL CHARACTERISTICS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING ELECTRICAL SERVICES, CIRCUIT BREAKERS, AND CONDUIT SIZES ARE APPROPRIATELY MODIFIED. IF MINIMUM ENERGY RATINGS OR EFFICIENCIES ARE SPECIFIED, EQUIPMENT SHALL COMPLY WITH REQUIREMENTS.	PIPE LABEL CONTENTS: INCLUDE ID DRAWINGS, PIPE SIZE, AND AN ARRO FLOW-DIRECTION ARROWS: INTEGF SEPARATE UNIT ON EACH PIPE LABE
DELIVERY, STORAGE, AND HANDLING	LETTERING SIZE: AT LEAST 1-1/2 INC
DELIVER PIPES AND TUBES WITH FACTORY-APPLIED END CAPS. MAINTAIN END CAPS THROUGH SHIPPING, STORAGE, AND HANDLING TO PREVENT PIPE END DAMAGE AND TO PREVENT ENTRANCE OF DIRT, DEBRIS, AND MOISTURE.	VALVE TAGS
STORE PLASTIC PIPES PROTECTED FROM DIRECT SUNLIGHT. SUPPORT TO PREVENT SAGGING AND BENDING.	VALVE TAGS: STAMPED OR ENGRAV TAG MATERIAL: BRASS, 0.032-INCI HARDWARE.
PREPARE AND SUBMIT COORDINATION DRAWINGS. REFER TO OTHER DIVISION 15 SECTIONS FOR REQUIREMENTS. CLOSELY SCHEDULE THE WORK SO THAT WORK WILL BE INSTALLED AT THE PROPER TIME WITHOUT DELAYING THE COMPLETION OF	FASTENERS: BRASS WIRE-LINK OR B VALVE SCHEDULES: FOR EACH PIP SYSTEM ABBREVIATION (AS SHOWN CLOSED, OR MODULATING), AND VAR
THE ENTIRE PROJECT. WHERE THE WORK WILL BE INSTALLED IN CLOSE PROXIMITY TO THE WORK OF OTHER TRADES, OR WHERE THERE IS EVIDENCE THAT THE WORK WILL INTERFERE WITH THE WORK OF OTHER TRADES, ARRANGE SPACE CONDITIONS TO MAKE A SATISFACTORY ADJUSTMENT. IF WORK IS INSTALLED BEFORE COORDINATING WITH OTHER TRADES, MAKE NECESSARY CHANGES TO THE WORK TO CORRECT THE CONDITION WITHOUT ADDITIONAL COST TO THE OWNER.	USES. VALVE-TAG SCHEDULE SHALL BE INC
PREPARE COMPLETE SET OF DRAWINGS SHOWING ALL NECESSARY SLAB OPENINGS AND STRUCTURAL SUPPORTS THAT REQUIRE STRUCTURAL FRAMING. DRAWINGS SHALL CLEARLY INDICATE SIZES AND LOCATION RELATIVE TO ESTABLISHED COLUMN LINES. DRAWINGS SHALL BE COMPLETED IN SUFFICIENT TIME TO ALLOW FOR STRUCTURAL STEEL FABRICATION SO AS NOT TO DELAY PROJECT SCHEDULE.	SEISMIC RESTRAINT: PROVIDE SEISM BUILDING CODE REQUIREMENTS. SU REGISTERED IN THE STATE OF THE P FOR A COMPLETE SYSTEM. REFER TO
SHOP DRAWING SUBMISSIONS SHALL DEMONSTRATE A KNOWLEDGE OF THE WORK OF OTHER TRADES, AND SHALL SHOW THE LOCATIONS OF THE WORK OF OTHER TRADES WHICH AFFECTS THE WORK OF THIS CONTRACT.	PROVIDE NECESSARY STRUCTURAL ALIGNMENT AND PREVENT TRANSMIS ETC., ARE SUPPORTED FROM CONCF
ARRANGE FOR PIPE SPACES, CHASES, SLOTS, AND OPENINGS IN BUILDING STRUCTURE DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR PLUMBING INSTALLATIONS.	HANGERS AND SUPPORTS SHALL BE EXPANDING INTO LOOPS, BENDS AND HORIZONTAL ADJUSTMENT PERPEND
COORDINATE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SET SLEEVES IN POURED-IN-PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE CONSTRUCTED. COORDINATE REQUIREMENTS FOR ACCESS PANELS AND DOORS FOR PLUMBING ITEMS REQUIRING ACCESS THAT ARE CONCEALED	DUE TO EXPANSION. ALL SUCH HANG REQUIRED. HANGERS IN CONTACT V ALLOY OR PROVIDED WITH FELT SLE
BEHIND FINISHED SURFACES. ACCESS PANELS AND DOORS ARE SPECIFIED IN DIVISION 8 SECTION "ACCESS DOORS AND FRAMES."	
SHEET METAL, PLUMBING AND FIRE PROTECTION SHOP DRAWINGS THAT HAVE BEEN COORDINATED WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. DRAWINGS MUST BE RETURNED FROM ENGINEER EITHER "REVIEWED" OR "FURNISH AS CORRECTED" PRIOR TO BEING USED AS BASIS FOR COORDINATION DRAWINGS.	REFER TO SCHEDULE ON DRAWING. ALL INSULATING MATERIALS SHALL
AFTER SHEET METAL AND PIPING DRAWINGS HAVE BEEN REVISED PER ENGINEERS COMMENTS, REPRODUCIBLE COPIES SHALL BE SENT TO THE OTHERS TRADES IN THE FOLLOWING SEQUENCE FOR THE INCLUSION OF THEIR WORK:	FLAMESPREAD -25 SMOKE DEVELOPED -50 FUEL CONTRIBUTED -50
PLUMBING CONTRACTOR ELECTRICAL WORK MECHANICAL PIPING	FIBERGLASS PIPING INSULATION (INT MOLDED FIBROUS GLASS WITH 3.5 F
PRIOR TO INCLUSION OF SPRINKLER PIPING AND EQUIPMENT, CONTRACTOR SHALL HAVE SUBMITTED SPRINKLER PLANS AND CALCULATIONS TO ENGINEER FOR REVIEW AND TO RATING BUREAU FOR REVIEW.	F. THE INSULATION SHOULD BE SEC MANUFACTURERS:
AFTER ALL TRADES HAVE INCLUDED THEIR WORK ON THE COORDINATION DRAWING AND NOTED CONFLICTS, ALL TRADES SHALL MEET TO RESOLVE CONFLICTS AND AGREE TO ACCEPTABLE SOLUTIONS. EACH TRADE SHALL SIGN COORDINATION DRAWINGS. ITEMS NOT SHOWN ON COORDINATION DRAWING IS RESPONSIBILITY OF OMITTING CONTRACTOR AND CONTRACTOR IS SUBJECT TO ADDITIONAL COSTS INCURRED BY OTHER TRADES.	MANUFACTURERS: OWENS-CORNING, TYPE KNAUF - PIPE INSULATIC CERTAINTEED - TYPE 50 MANVILLE - MICRO-LOK (

### PLUMBING SPECIFICATIONS

PART OF THE COORDINATION DRAWING PROCESS. THE ENGINEER WILL PROVIDE WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE OWNER'S AND PROJECT SCHEDULE AND PHASING. PROVIDE Y OF INSTALLATIONS. TEMPORARY SERVICES AND CONNECTIONS TO ACCOMMODATE THESE REQUIREMENTS. THE SHUTDOWN OR TRANSFERENCE OF D.TYPE G - FIBERGLASS INSULATION FOR VALVES, FITTINGS, FLANGES (VAPOR SEAL INSULATION). SYSTEMS SHALL BE COORDINATED WITH THE OWNERS REQUIREMENTS. RAWING TO ENGINEER FOR REVIEW. ENGINEER WILL REVIEW FOR ACCEPTABILITY OF MOLDED, FACTORY-FORMED FIBROUS GLASS WITH 3.5 PCF MINIMUM DENSITY, MAX. K = .3 AT 200F, MEAN, RATED TO 450 DEGREE F. ALL PIPING TO REMAIN SHALL BE PROPERLY PLUGGED, VALVED, CAPPED AND/OR BY PASSED SUCH THAT UPON COMPLETION OF ALL JOINTS TO BE SEALED WITH VAPOR BARRIER ADHESIVE AND WRAPPED WITH GLASS MESH TAPE. EACH FITTING TO BE WORK ALL ABANDON SYSTEMS ARE PROPERLY CONCEALED, AND THAT EXISTING SYSTEMS TO REMAIN, REMAIN OPERATIONAL. FINISHED WITH TWO COATS OF BENJAMIN FOSTER 30-36 VAPOR SEAL. PRIOR TO SIGN OFF BY ALL TRADES SHALL BE REMOVED AND RE-INSTALLED IN AWINGS NO DEAD ENDS SHALL BE LEFT ON ANY PIPING SYSTEMS UPON COMPLETION OF WORK. VALVES ) IS RESPONSIBLE FOR THE COORDINATION OF HIS SUB-CONTRACTORS. EXISTING EXPOSED PIPING SYSTEMS NOT TO BE REUSED, AND NOT SPECIFICALLY NOTED FOR REMOVAL SHALL BE COMPLETELY GENERAL: APPROVED MANUFACTURERS; NOBCO, APOLLO, STOCKHOLM. DORDINATION PROCESS IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. THE REMOVED. COORDINATION PROCESS. THE ENGINEER WILL RESPOND TO QUESTIONS THAT ARISE REFER TO SCHEDULE ON DRAWING. RAWINGS SUBMITTED WILL BE REVIEWED FOR CLEARLY IDENTIFIED CONFLICTS ONLY. ALL SYSTEMS SHALL BE LEFT IN WORKING ORDER TO THE SATISFACTION OF THE OWNER UPON COMPLETION OF ALL NEW WORK. AR ADDITIONAL COST. PIPE SLEEVES AND SEALS ALL EXISTING EXPOSED, UNNECESSARY PIPING RELATED TO NEW WORK SHALL BE COMPLETELY REMOVED. MASONRY WALLS AND SLABS: SCHEDULE 40 GALVANIZED STEEL PIPE WITH INTEGRAL WATER STOP. ALL PIPING NEW AND EXISTING TO REMAIN SHALL BE CONCEALED. RE-ROUTE OR REMOVE ALL EXISTING PIPING, AND SYSTEMS DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL, MASONRY WORK OR AS REQUIRED BY THE PROPOSED WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION SLEEVE ADAPTERS: COATED CAST IRON, EQUIPPED WITH FLASHING CLAMP. ALTERATIONS. IECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL CONTRACTOR SHALL SEAL ALL PENETRATIONS THROUGH PARTITIONS, SLABS AND/OR CEILINGS WITH A U.L. APPROVED FIRE/SMOKE RACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND PLUMBING FIXTURES STOP TO MAINTAIN THE INTEGRITY OF THE RESPECTIVE RATING INCLUDING SMOKE TIGHT PARTITIONS. S SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC (AUTO-CAD VERSION AS JMBER OF COPIES OF EACH AS REQUESTED BY THE OWNER. THE FIXTURES SHALL BE FURNISHED COMPLETE WITH CHROME PLATING ON EXPOSED PIPING OR TRIM. PROVIDE ANCHOR BOLTS, <u>CLEANOUTS</u> HANGERS, STRAINERS, FAUCETS AND OTHER INCIDENTAL ITEMS FURNISHED AS STANDARD. PROVIDE LOOSE KEY STOPS AT EVERY ING IN A NEAT AND ACCURATE MANNER A COMPLETE RECORD OF ALL REVISIONS OF THE FIXTURE. ALL SUPPLY FITTINGS AND EXPOSED FIXTURE TRIM SHALL BE ALL BRASS, CHROME PLATED. TE THE FOLLOWING INSTALLED CONDITIONS: REFER TO SCHEDULE ON DRAWING. EXAMINE ROUGHING-IN WORK OF POTABLE WATER AND WASTE PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING TE RECORD, ON REPRODUCTIONS OF THE CONTRACT DRAWINGS OR APPROPRIATE SHOP PLUMBING FIXTURES CONNECTIONS PRIOR TO INSTALLING FIXTURES. CORRECT ANY INCORRECT LOCATION OF PIPING, AND OTHER UNSATISFACTORY EN THE WORK SHOWN AND WORK INSTALLED. CONDITIONS FOR INSTALLATION OF PLUMBING FIXTURES. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS FIXTURES: NEW, COMPLETE WITH TRIMMINGS AND FITTINGS, INCLUDING FAUCETS, CARRIERS, SUPPLIES, STOPS, TRAPS, HAVE BEEN CORRECTED IN A MANNER ACCEPTABLE TO THE ENGINEER. ALL ROUGH-IN TO PLUMBING FIXTURES SHALL CONFORM TO EMS, WITH VALVES AND CONTROL DEVICES LOCATED AND NUMBERED, CONCEALED UNIONS TAILPIECES, WASTE PLUGS, CASINGS, HANGERS, PLATES, BRACKETS, ANCHORS, SUPPORTS, HARDWARE AND FASTENING DEVICES. FIXTURE MANUFACTURER PUBLISHED ROUGH-IN DIMENSIONS, AND REQUIREMENTS. AINTENANCE LOCATED (I.E., TRAPS, STRAINERS, EXPANSION COMPENSATORS, TANKS, MPLETE WITH VALVE TAG CHART. STAINLESS STEEL: TYPE 302, 304, 316, OR 317, AS NOTED, SOUND DEADENED. UPON COMPLETION OF INSTALLATION OF PLUMBING FIXTURES AND AFTER UNITS ARE WATER PRESSURIZED, TEST FIXTURES TO CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES. DEMONSTRATE CAPABILITY AND COMPLIANCE WITH REQUIREMENTS. CORRECT MALFUNCTIONING UNITS AT SITE, THEN RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REMOVE AND REPLACE WITH NEW UNITS AND PROCEED WITH RETESTING. TRIMMINGS AND FITTINGS: CONSTRUCT OF FORGED, CAST, ROLLED OR EXTRUDED BRASS OR BRONZE WITH MONEL AND OTHER MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED. SUITABLE NON-CORROSIVE PARTS: DESIGNED WITH EASILY RENEWABLE PARTS THAT ARE SUBJECT TO WEAR OR DETERIORATION. NO DIE CASTINGS AND STAMPINGS OTHER THAN BRASS OR STAINLESS STEEL. INSPECT EACH INSTALLED UNIT FOR DAMAGE TO FINISH. IF DAMAGED, RESTORE AND MATCH FINISH TO ORIGINAL AT SITE TO THE JIPMENT AND MATERIALS INSTALLED. SATISFACTION OF THE ARCHITECT/ENGINEER; OTHERWISE, REMOVE FIXTURE AND REPLACE WITH NEW UNIT. REMOVE CRACKED OR DENTED UNITS AND REPLACE WITH NEW UNITS. REFER TO SCHEDULE ON DRAWING. REQUIRED DRAWINGS, MANUALS AND OPERATING INSTRUCTIONS. CLEAN PLUMBING FIXTURES, TRIM, AND STRAINERS OF DIRT AND DEBRIS UPON COMPLETION OF INSTALLATION. MISCELLANEOUS PLUMBING SPECIALTIES SET FIXTURES LEVEL AND UNIFORMLY, WITH CONNECTIONS AT RIGHT ANGLES TO WALL AND PROPERLY CENTERED. LAY OUT WATER HAMMER ARRESTORS: ALL STAINLESS STEEL, MECHANICAL-PNEUMATIC TYPE, HERMETICALLY SEALED BELLOWS, ROUGHING ACCURATELY AND IN COORDINATION WITH SPACE AND FINISH REQUIREMENTS. IF FIELD CUT-OUTS AND HOLES ARE THREADED INLET; 150 PSI WWP. SIZE AND PLACEMENT DETERMINATION: PDI-WH 201. REQUIRED USE PROPER CUTTING AND DRILLING TOOLS TO MAINTAIN INTEGRITY OF FINISHED SURFACE. PROVIDE CUT-OUT TEMPLATES FOR COUNTERTOP INSERT OR UNDERMOUNT ITEMS. MANUFACTURER: PRECISION PLUMBING PRODUCTS SC SERIES. APES FOR BARE PIPES CONVEYING FLUIDS AT TEMPERATURES OF 125 DEG F (52 DEG C) OR LOCATE WASTE OUTLETS AND WATER SUPPLIES AT CONSTANT HORIZONTAL LEVELS, WITH WASTE OUTLET CENTERED ON FIXTURE AIR VENT: BRONZE BODY, STAINLESS STEEL TRIM AND FLOAT, THREADED INLET AND OUTLET; 150 PSI WWP. CTURED PIPE LABELS: PREPRINTED, COLOR-CODED, WITH LETTERING INDICATING SERVICE, DRAIN CONNECTION AND WATER SUPPLIES SPACED EQUALLY TO RIGHT AND LEFT. MANUFACTURER: SARCO 13W SERIES. PENETRATIONS THROUGH FIRE SEPARATIONS ED, SEMIRIGID PLASTIC FORMED TO COVER FULL CIRCUMFERENCE OF PIPE AND TO ATTACH ELECTRICAL HEAT TRACE (FREEZE PROTECTION): UL LISTED HEAT TRACE SYSTEM WITH (2) 16 AWG COPPER BUS WIRES ENCLOSED FIRE AND SMOKE SEAL: UL LISTED, APPROVED AND TESTED FIRE AND/OR SMOKE SEALING MATERIAL INSTALLED IN ALL FIRE AND/OR IN A POLYMER CORE. THE SYSTEM SHALL INCLUDE ALL POWER CONNECTIONS, SEALS, SPLICES, TEE KITS, AND FASTENING LASTIC WITH CONTACT-TYPE, PERMANENT-ADHESIVE BACKING. SMOKE RATED FLOOR AND PARTITIONS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. HARDWARE. CONTROLS SHALL BE THERMOSTATIC AMBIENT SENSING, AND ALL HEAT TRACE SHALL MAINTAIN 50 DEGREE F WITH A FICATION OF PIPING SERVICE USING SAME DESIGNATIONS OR ABBREVIATIONS AS USED ON MINUS 10 DEGREE F AMBIENT TEMPERATURE. RUN TWO (2) PARALLEL HEAT TRACE LINES ALONG ALL PORTIONS OF THE PIPING IDICATING FLOW DIRECTION. DISINFECTION OF POTABLE WATER SYSTEM SYSTEM, ONE ACTIVE AND ONE SPARE. COORDINATE ELECTRICAL POWER CONNECTION LOCATIONS IN ACCORDANCE WITH LAYOUT AND HEAT TRACE MANUFACTURES' RECOMMENDATIONS. WITH PIPING SYSTEM SERVICE LETTERING TO ACCOMMODATE BOTH DIRECTIONS OR AS POTABLE WATER SYSTEMS SHALL BE DISINFECTED IN ACCORDANCE WITH STATE AND LOCAL CODES BUT BY NOT LESS THAN ONE D INDICATE FLOW DIRECTION. OF THE FOLLOWING METHODS BEFORE IT IS PLACED IN OPERATION: MANUFACTURER: RAYCHEM XL SERIES HIGH. THE SYSTEM, OR PART THEREOF, SHALL BE FILLED WITH A SOLUTION CONTAINING 50 PARTS PER MILLION OF AVAILABLE CHLORINE ACCESS DOORS IN WALLS AND CEILINGS AND ALLOWED TO STAND 24 HOURS BEFORE FLUSHING AND RETURNING TO SERVICE. AT EACH VALVE, CLEANOUT OR PLUMBING DEVICE REQUIRING ACCESS, FURNISH AN ACCESS DOOR. RIGID CONSTRUCTION WITH THE SYSTEM. OR PART THEREOF. SHALL BE FILLED WITH A SOLUTION CONTAINING 200 PARTS PER MILLION OF AVAILABLE CHLORINE WITH 1/4-INCH LETTERS FOR PIPING SYSTEM ABBREVIATION AND 1/2-INCH NUMBERS. TWO HINGES AND A LATCH. IN PLENUM CEILINGS, PROVIDE FELT BETWEEN THE DOOR AND FRAME TO MAKE AN AIR TIGHT SEAL. AND ALLOWED TO STAND 3 HOURS BEFORE FLUSHING AND RETURNING TO SERVICE. ACCESS DOORS SHALL BE FLUSH MOUNTED, PRIME COATED WITH RUST INHIBITIVE PAINT, CONCEALED FRAME, FLUSH SCREW INIMUM THICKNESS, AND HAVING PREDRILLED OR STAMPED HOLES FOR ATTACHMENT

DED CHAIN; OR S-HOOK. SYSTEM. ON 8-1/2-BY-11-INCH BOND PAPER. TABULATE VALVE NUMBER. PIPING SYSTEM. VALVE TAG), LOCATION OF VALVE (ROOM OR SPACE), NORMAL-OPERATING POSITION (OPEN, IONS FOR IDENTIFICATION. MARK VALVES FOR EMERGENCY SHUTOFF AND SIMILAR SPECIAL

DED IN OPERATION AND MAINTENANCE DATA.

TRAINT, AND VIBRATION ISOLATION

RESTRAINT OF ALL PLUMBING EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH STATE SHOP DRAWINGS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER ECT INDICATING ALL NECESSARY COMPONENT CUTS, PLAN LOCATIONS AND CALCULATIONS THER DIVISION 15 REQUIREMENTS.

MBERS, HANGERS AND SUPPORTS OF APPROVED DESIGN TO KEEP PIPING IN PROPER ON OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS CONSTRUCTION, DO NOT WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL ABLE OF SCREW ADJUSTMENT AFTER PIPING IS ERECTED. HANGERS SUPPORTING PIPING FSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT ILAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT SHALL BE FINALLY ADJUSTED BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION, AS COPPER OR BRASS PIPE SHALL BE DIELECTRIC, COMPATIBLE WITH COPPER AND BRASS

PLY WITH THE FOLLOWING RATINGS:

INDS MINIMUM DENSITY, MAXIMUM K = .3 AT 200 DEGREE F, MEAN AND RATED TO 450 DEGREE VAL PIPE JACKETED WITH AN EMBOSSED VAPOR BARRIER LAMINATE.

TH ASJ AP-ON WITH ASJ VITH AP JACKET

DIMENSION OF FINISHED WORK AND OF THE HEIGHT OF FINISHED CEILINGS IN ALL ROOMS WHERE EQUIPMENT OR PIPES ARE TO BE PLACED AND ARRANGE HIS WORK IN ACCORDANCE WITH THE SCHEDULE OF INTERIOR FINISHES, AS INDICATED ON THE ARCHITECTURAL DRAWINGS.

THIS CONTRACTOR SHALL INFORM HIMSELF FROM THE GENERAL CONSTRUCTION SPECIFICATIONS AND PLANS, OF THE EXACT

DRIVER OPERATED LOCKS WITH METAL CAMS AND ANCHORS AS REQUIRED. REFER TO DIVISION 8 FOR ADDITIONAL REQUIREMENTS.

MANUFACTURER'S QUALIFICATIONS: FIRMS REGULARLY ENGAGED IN THE MANUFACTURER OF FIXTURES, APPLIANCES, PIPES AND PIPE FITTINGS OF TYPES AND SIZES REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN 5 YEARS.

MATERIAL QUALIFICATIONS: SHALL CONFORM TO ALL LOCAL, STATE, AND NATIONAL/FEDERAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THESE SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

WELDING: QUALIFY WELDING PROCEDURES, WELDERS, AND OPERATORS IN ACCORDANCE WITH ASME B31.1, OR ASME B31.9, AS APPLICABLE. CERTIFY WELDING OF PIPING WORK USING STANDARD PROCEDURE SPECIFICATIONS BY, AND WELDERS TESTED UNDER SUPERVISION OF, NATIONAL CERTIFIED PIPE WELDING BUREAU (NCPWB).

BRAZING: CERTIFY BRAZING PROCEDURES, BRAZERS, AND OPERATORS IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE, SECTION IX, FOR SHOP AND JOB-SITE BRAZING OF PIPING WORK.

COORDINATION OF WORK

ACCESS DOOR SIZES SHALL BE:

EXECUTION

<u>GENERAL</u>

12" X 12" AT EASILY ACCESSIBLE ITEMS.

16" X 16" WHERE PARTIAL BODY ACCESS IS REQUIRED.

MANUFACTURER: MILCOR TYPE M SERIES, CESCO SERIES.

24" X 24" WHERE FULL BODY ACCESS IS REQUIRED.

CAREFULLY COORDINATE SPACE REQUIREMENTS WITH OTHER TRADES TO INSURE THAT ALL MATERIALS CAN BE INSTALLED IN SPACES ALLOTTED THERETO, INCLUDING FINISHED SUSPENDED CEILINGS.

PREPARE AND SUBMIT COORDINATION DRAWINGS.

### ALTERATION WORK

ALL EQUIPMENT, FIXTURES, PIPING, ETC. TO BE REMOVED, SHALL BE DISPOSED OF, TURNED OVER TO THE OWNER, OR SALVAGED AS DIRECTED BY THE OWNER. EQUIPMENT, FIXTURES, PIPING, DEVICES, ETC. SHALL NOT BE REMOVED FROM THE PREMISES WITHOUT THE OWNER'S APPROVAL.

GENERAL: TEST PLUMBING SYSTEMS TO SATISFACTION OF BUILDING OFFICIAL. DO NOT CLOSE IN, CONCEAL, OR COVER UP ANY PLUMBING WORK UNTIL IT HAS BEEN TESTED, INSPECTED, AND APPROVED.

FLUSH PIPING, PRIOR TO TESTING, TO REMOVE FOREIGN MATERIALS WHICH MAY HAVE ENTERED DURING COURSE OF INSTALLATION.

REPAIR ALL LEAKS, DEFECTS OR DAMAGE REVEALED BY THE RESULTS OF THE TESTING AND RE-TEST THE SYSTEM.

DO NOT INSULATE OR CONCEAL PIPING UNTIL THE SYSTEM HAS BEEN TESTED AND THE RESULTS APPROVED.

<u>TESTS</u>

PERFORM TESTS IN THE PRESENCE OF THE AUTHORITY HAVING JURISDICTION. NOTIFY ARCHITECT AND/OR ENGINEER.



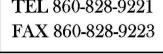


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DRAWING NO.

JH1828

As Noted

DATE		
NOVEMBER	8,	2018

PROJ. NO.

SCALE

## **GENERAL MECHANICAL NOTES**

WHEN A CONFLICT BETWEEN THE DRAWINGS, NOTES AND/OR SPECIFICATIONS OCCUR, THE MORE STRINGENT, AND/OR LARGER QUANTITY AND/OR MORE EXPENSIVE SHALL APPLY. THE REQUIREMENTS LISTED WITHIN NOTES OR SPECIFICATIONS SHALL BE REQUIRED, PROVIDED AND INSTALLED WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT.

**GENERAL** 

- 2. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO PROVIDE FOR FINISHED WORK, TESTED AND READY FOR OPERATION.
- 3. ITEMS AND SERVICES NOT SHOWN ON DRAWINGS OR SPECIFICATIONS BUT REQUIRED TO RENDER THE WORK COMPLETE AND READY FOR OPERATION. SHALL BE PROVIDED WITHOUT ADDITIONAL COST.
- 4. WORK OF THIS SECTION SHALL BE GOVERNED BY THE CONTRACT DOCUMENTS. PROVIDE MATERIALS, LABOR, EQUIPMENT AND SERVICES NECESSARY TO FURNISH, DELIVER AND INSTALL ALL WORK AS SPECIFIED AND AS REQUIRED BY JOB CONDITIONS. WHERE A CONFLICT EXISTS BETWEEN THESE NOTES, THE DRAWINGS AND THE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.
- 5. DRAWINGS ARE DIAGRAMMATIC AND INDICATE A GENERAL ARRANGEMENT OF WORK AND ARE NOT TO BE CONSIDERED SUB-CONTRACTOR DOCUMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND ALL SUBCONTRACTORS TO INCLUDE THE PROVISIONS AND INSTALLATION OF ALL NECESSARY WORK AND MATERIALS FOR COMPLETE, OPERATIONAL AND CODE COMPLIANT SYSTEMS, GENERAL DESIGN CONCEPTS INDICATED MUST BE FOLLOWED OR BETTERED, THE BID SHALL INCLUDE OFFSETS, AND EQUIPMENT AND COMPONENTS AS REQUIRED TO MEET CONSTRUCTION CONDITIONS FOR PROPER OPERATION. DO NOT SCALE DRAWINGS. CONSULT ARCHITECTURAL DRAWINGS FOR SPACE CONDITIONS AND ADDITIONAL REQUIREMENTS.
- 6. PERFORM THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT GENERAL CONDITIONS AND WITH THE PROVISIONS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND LAWS.
- WORK SHALL INCLUDE ALL INCIDENTALS, LABOR, MATERIAL, EQUIPMENT, APPLIANCES, SERVICES, HOISTING, SCAFFOLDING, SUPPORTS, TOOLS, CONSUMABLE ITEMS, FEES, LICENSES, AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE WORK SHOWN ON THE DRAWINGS, SPECIFIED HEREIN AND AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
- 8. STORE MATERIALS INSIDE AND PROTECTED FROM DEBRIS, WEATHER AND MOISTURE.
- 9. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL POWER AND CONTROL WIRING REQUIRED FOR EQUIPMENT OPERATION NOT SPECIFICALLY PROVIDED BY OTHERS BUT REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THIS CONTRACTOR SHALL PROVIDE MOTOR STARTERS. COORDINATE **REQUIREMENTS WITH DIVISION 26.**
- 10. COORDINATE ALL HVAC WORK AND EQUIPMENT WITH STRUCTURAL STEEL, FIRE PROTECTION PIPING, PLUMBING PIPING, LIGHT FIXTURES, ELECTRICAL EQUIPMENT AND OWNER'S EQUIPMENT.
- 11. ALL EXISTING CONDITIONS AS INDICATED ARE APPROXIMATIONS OF EXACT CONDITIONS TO BE VERIFIED IN THE FIELD. CONTRACTOR SHALL VISIT THE SITE TO VERIFY THE CONSTRUCTION CONDITIONS BEFORE SUBMITTING BID.
- 12. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL CEILING GRILLES, REGISTERS AND DIFFUSERS.
- 13. PROVIDE VOLUME DAMPERS IN EACH BRANCH DUCTWORK SERVING REGISTERS, GRILLES AND DIFFUSERS WHETHER INDICATED OR NOT.
- 14. PROVIDE CABLE OPERATED DAMPERS IN BRANCH DUCTWORK SERVING REGISTERS, GRILLES, AND DIFFUSERS IN INACCESSIBLE CEILING LOCATIONS WHETHER INDICATED OR NOT.
- 15. LOCATE ALL BALANCING DAMPERS AT MAIN DUCTWORK ABOVE ACCESSIBLE CEILINGS. OR PROVIDE ACCESS DOORS.
- 16. PROVIDE TRAPPED CONDENSATION DRAIN PIPING FROM COOLING COIL DRAIN PAN TO AN APPROVED POINT OF DISCHARGE WHETHER INDICATED OR NOT.
- 17. PROVIDE FIRE DAMPERS, SMOKE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS AS REQUIRED TO MAINTAIN WALL & FLOOR RATINGS AS DEFINED IN ARCHITECTURAL DRAWINGS.
- 18. PROVIDE PITCH CORRECTION CURBS FOR ALL MECHANICAL EQUIPMENT AS REQUIRED. ROOF MOUNTED EQUIPMENT TO BE INSTALLED PLUMB AND LEVEL ACCORDING TO EQUIPMENT MANUFACTURERS INSTALLATION INSTRUCTIONS.
- 19. PROVIDE SEISMIC EXPANSION JOINTS AT ALL PIPING AND DUCTWORK PASSING THROUGH SEISMIC EXPANSION JOINTS.
- 20. REFER TO THESE DRAWINGS AND DIVISION 7 FOR ADDITIONAL PENETRATION SEALING REQUIREMENTS. PENETRATIONS TO COMPLY WITH ASTM E84 & E814 AND APPROVED UL 1479 AND SPECIFIC UL ASSEMBLIES AS REQUIRED TO SUIT PENETRATION CONDITIONS.
- 21. LOCATE ALL ROOF MOUNTED EQUIPMENT REQUIRING SERVICE A MINIMUM OF 10'-0" FROM EDGE OF ROOF. CONTRACTOR MUST COMPLY W/ THIS SET BACK.
- 22. DO NOT RUN ANY MECHANICAL OR CONTROL SERVICES THROUGH RATED STAIR ENCLOSURES UNLESS SYSTEMS ARE DESIGNED AND DESIGNATED TO SERVICE STAIRS.
- 23. COORDINATE ALL ROOF AND WALL PENETRATIONS W/ EXISTING CONDITIONS AND PROVIDE STRUCTURAL CONTRACTOR W/ WALL & ROOF OPENING SIZES.
- 24. TEMPERATURE CONTROL CONTRACTOR (TCC) IS RESPONSIBLE FOR ALL CONTROL WIRING 120 VOLT AND LESS. REFER TO ELECTRICAL DRAWINGS FOR LOCATIONS. SHARED TRANSFORMERS ARE NOT ALLOWED. RUN POWER PER DIVISION 26 REQUIREMENTS.
- 25. TCC SHALL EXTEND ALL POWER FOR DAMPER ACTUATORS, AND OTHER CONTROL DEVICES FROM LOCAL ELECTRICAL PANEL. DIVISION 26 TO SUPPLY POWER TO TCPS. REFER TO ELECTRICAL DRAWINGS FOR PANEL LOCATIONS.
- 26. THE DRAWINGS AND SPECIFICATIONS ARE DIVIDED INTO SECTIONS TO MEET THE NEEDS OF THE ARCHITECT, THE ENGINEERS, AND THE DESIGN CONSULTANTS. THEY ARE NOT PREPARED AS INSTRUCTIONS TO THE CONTRACTOR FOR HOW TO BUY OUT OR SUBCONTRACT THE WORK. THE

CONTRACTOR IS RESPONSIBLE FOR ALL THE WORK DESCRIBED IN THE CONTRACT DOCUMENTS, REGARDLESS OF WHERE IT IS SHOWN. FOR EXAMPLE, ELECTRICAL WORK IS SHOWN ON M-SERIES DRAWINGS AS WELL AS ON A-SERIES DRAWINGS AND P-SERIES DRAWINGS. MISCELLANEOUS METALS AND STRUCTURAL ELEMENTS ARE SHOWN ON A-SERIES DRAWINGS AS WELL AS ON M-SERIES DRAWINGS. TO AVOID OMITTING ANY COMPONENT OF THE PROJECT, REFER TO ALL THE CONTRACT DOCUMENTS IN THEIR ENTIRETY.

- 27. CONTRACTOR TO PROVIDE INTERNAL MIXING BAFFLES IN AIR HANDLING UNITS. PLENUMS AND FAN COILS TO ALLOW PROPER MIXING OF OUTSIDE AIR AND RETURN AIR IN THE EVENT THERE IS INSUFFICIENT SPACE FOR MIXING TO PREVENT NUISANCE FREEZE STAT TRIPS. CONTRACTOR REVIEW DRAWING AND INSTALLATION AND PROVIDE BAFFLES AS REQUIRED.
- 28. WHEREVER EXISTING SYSTEMS ARE ALTERED OR EXTENDED THE INTEGRITY OF THE SYSTEM IS TO BE MAINTAINED AND FUNCTION FULLY AS BEFORE. COORDINATE SCHEDULE FOR HOOK-UPS TO EXISTING SYSTEMS AND EQUIPMENT REMOVAL OR RELOCATION WITH THE OWNER AND PERFORM THIS WORK AT SUCH TIMES TO ENSURE THAT PERIODS OF SHUTDOWN WILL BE ACCEPTABLE TO THE OWNER.
- 29. VERIFY EXACT LOCATION OF CONNECTION POINTS (NEW TO EXISTING) IN FIELD PRIOR TO CONSTRUCTION.
- 30. RELOCATE EXISTING DUCTWORK AND/OR PIPE WORK IN EXISTING CEILING SPACES TO ACCOMMODATE ALL RENOVATIONS AND ADDITIONS.
- 31. TAKE DOWN AND REINSTALL EXISTING CEILINGS IN ALL AREAS WHERE MECHANICAL WORK IS INDICATED AND EXISTING CEILINGS REMAIN. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN DRAWINGS FOR LOCATIONS WHERE EXISTING CEILINGS REMAIN. REPLACE CEILING TILES DAMAGED DURING WORK.
- 32. PATCH ALL WALLS, FLOORS, CEILINGS, AND ROOFS TO MATCH EXISTING IN ALL CASES WHERE EXISTING WALLS, FLOORS, CEILINGS, AND ROOFS REMAIN AND HVAC DEMOLITION IS INDICATED.
- 33. THIS PROJECT CONSISTS OF MULTIPLE PHASES OF CONSTRUCTION OVER A SPECIFIED TIME PERIOD. PROVIDE ALL WORK NECESSARY TO KEEP EXISTING SYSTEMS IN SAFE OPERATION. PROVIDE ISOLATION (SHUTOFF) VALVES AT ALL CONNECTION POINTS TO EXISTING SYSTEMS.

### ALTERATION WORK AND DEMOLITION

- 1. ALL EQUIPMENT, DUCTWORK, PIPING, CONTROL DEVICES, ETC. TO BE REMOVED, SHALL BE DISPOSED OF, TURNED OVER TO THE OWNER, OR SALVAGED AS DIRECTED BY THE OWNER. EQUIPMENT, DUCTWORK, PIPING, CONTROL DEVICES, ETC. SHALL NOT BE REMOVED FROM THE PREMISES WITHOUT THE OWNER'S APPROVAL.
- UPON COMPLETION OF REMOVALS AND MODIFICATIONS, ALL DUCTWORK AND PIPING TO REMAIN SHALL BE PROPERLY VALVED, CAPPED AND/OR BY PASSED SUCH THAT UPON COMPLETION OF WORK ALL SYSTEMS TO REMAIN, REMAIN OPERATIONAL.
- 3. NO DEAD ENDS SHALL BE LEFT ON ANY DUCTWORK OR PIPING SYSTEM UPON COMPLETION OF
- 4. EXISTING DUCTWORK AND PIPING SYSTEMS NOT TO BE REUSED, AND NOT SPECIFICALLY NOTED FOR REMOVAL SHALL BE COMPLETELY REMOVED.
- 5. ALL SYSTEMS SHALL BE LEFT IN WORKING ORDER TO THE SATISFACTION OF THE OWNER UPON COMPLETION OF ALL NEW WORK.
- 6. ALL EXISTING UNNECESSARY DUCTWORK AND PIPING NOT RELATED TO NEW WORK SHALL BE COMPLETELY REMOVED.
- 7. RE-ROUTE ALL EXISTING DUCTWORK, PIPING AND SYSTEMS WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL, OR MASONRY WORK AS REQUIRED BY THE PROPOSED ALTERATIONS.
- 8. WHERE PORTIONS OF EXISTING DUCT SYSTEMS ARE TO REMAIN CONTRACTOR SHALL TAKE AIRFLOW READINGS AT ALL AIR REGISTER, GRILLES AND DIFFUSERS ASSOCIATED WITH THE DUCT SYSTEM TO BE MODIFIED BEFORE COMMENCEMENT OF WORK AND AFTER ALTERATION WORK IS COMPLETE. AIR BALANCING WORK SHALL BE PERFORMED BY AN INDEPENDENT NEEB CERTIFIED COMPANY, NOT ASSOCIATED WITH THE CONTRACTOR. REPORTS ARE TO BE ISSUED TO THE OWNER AND ENGINEER AT BOTH OCCURRENCES. IF AS-BUILTS ARE AVAILABLE, DISCREPANCIES NOTED BETWEEN THE AS BUILT DRAWINGS AND THE INITIAL AIR FLOW READINGS ARE TO BE NOTED ON THE AIR FLOW REPORT. EXISTING AIR REGISTERS, GRILLES AND DIFFUSERS ARE TO BE BALANCED TO THE ORIGINAL READINGS AT COMPLETION OF WORK UNLESS OTHERWISE IDENTIFIED.

### SHOP DRAWINGS

- 1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO BE REVIEWED BY THE ENGINEER PRIOR TO CONSTRUCTION, SHOP DRAWINGS SHALL BE SUBMITTED FOR DUCTWORK LAYOUT, PIPING LAYOUT, SHEET METAL SHOP STANDARDS AND ALL EQUIPMENT FURNISHED.
- 2. ELECTRONIC DRAWING FILES SHALL BE GENERATED BY THE CONTRACTOR. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC VERSION (AUTOCAD VERSION AS REQUIRED BY THE OWNER) OR AUTOCAD VERSION 2010 IF NOT SPECIFIED.
- 3. PRIOR TO THE SUBMISSION AND REVIEW OF SHEET METAL SHOP DRAWINGS, THE CONTRACTOR SHALL SUBMIT FOR REVIEW SHEET METAL SHOP STANDARDS. ANY SHEET METAL SHOP DRAWINGS SUBMITTED PRIOR TO THE SUBMISSION OF THE SHOP STANDARDS SHALL BE RETURNED "NOT REVIEWED".

### **COORDINATION DRAWINGS**

- ELECTRONIC DRAWING FILES SHALL BE GENERATED BY THE CONTRACTOR. IF REQUESTED, ELECTRONIC FILES OF THE MECHANICAL FLOOR PLANS, SECTIONS AND ELEVATIONS ONLY WILL BE MADE AVAILABLE. ELECTRONIC FILES WILL BE RELEASED ONLY UPON RECEIPT OF THE SIGNED AGREEMENT FOR TRANSFER OF ELECTRONIC FILE DATA, AGREEMENT FOR TRANSFER OF BUILDING INFORMATION MODEL AND ALL FEES INDICATED THEREIN.
- 2. DEVELOP AND SUBMIT COORDINATION DRAWINGS AS OUTLINED.
- A. SHEET METAL AND PLUMBING SHOP DRAWINGS THAT HAVE BEEN COORDINATED WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. DRAWINGS MUST BE RETURNED FROM ENGINEER EITHER "REVIEWED" OR "FURNISH AS CORRECTED" PRIOR TO BEING USED AS BASIS FOR COORDINATION DRAWINGS.

### B. AFTER SHEET METAL DRAWINGS HAVE BEEN REVISED PER ENGINEERS COMMENTS, REPRODUCIBLE COPIES SHALL BE SENT TO THE TRADES IN THE FOLLOWING SEQUENCE FOR THE INCLUSION OF THEIR WORK:

-MECHANICAL SHEET METAL -PLUMBING PIPING -ELECTRICAL WORK

- 3. AFTER ALL TRADES HAVE INCLUDED THEIR WORK ON THE COORDINATION DRAWING AND NOTED CONFLICTS, ALL TRADES SHALL MEET TO RESOLVE CONFLICTS AND AGREE TO ACCEPTABLE SOLUTIONS. EACH TRADE SHALL SIGN COORDINATION DRAWINGS. ITEMS NOT SHOWN ON COORDINATION DRAWING IS RESPONSIBILITY OF OMITTING CONTRACTOR AND CONTRACTOR IS SUBJECT TO ADDITIONAL COSTS INCURRED BY OTHER TRADES.
- 4. THE ARCHITECT AND ENGINEER ARE NOT PART OF THE COORDINATION DRAWING PROCESS. THE ENGINEER WILL PROVIDE ASSISTANCE FOR NOTED CONFLICTS ONLY. COORDINATION DRAWINGS ARE NOT TO BE CONSIDERED PIPING OR DUCT SHOP DRAWINGS. THE CONTRACTOR IS REQUIRED TO SUBMIT INDIVIDUAL PIPING AND DUCTWORK SHOP DRAWINGS FOR REVIEW BY THE ENGINEER. PIPING AND DUCTWORK SHOP DRAWINGS SHALL FOLLOW THE DESIGN INTENT OF THE CONTRACT DOCUMENTS
- 5. SUBMIT FINAL SIGNED COORDINATION DRAWING TO ENGINEER FOR REVIEW. ENGINEER WILL REVIEW COORDINATION DRAWINGS FOR GENERAL ARRANGEMENT AND FOR NOTED CONFLICTS ONLY. SPECIFIC INSTALLATION REQUIREMENTS WILL BE REVIEWED ONLY IN INDIVIDUAL TRADE SHOP DRAWINGS.
- 6. ANY WORK FABRICATED OR INSTALLED PRIOR TO SIGN OFF BY ALL TRADES WHICH IS DEEMED TO BE IN CONFLICT WITH COORDINATION DRAWINGS SHALL BE REMOVED AND RE-INSTALLED IN CONFORMANCE WITH COORDINATION DRAWINGS.
- 7. EACH CONTRACTOR (MENTIONED ABOVE) IS RESPONSIBLE FOR THE COORDINATION OF HIS SUB-CONTRACTORS
- 8. THE OVERALL COORDINATION OF THE COORDINATION PROCESS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER IS NOT RESPONSIBLE FOR THE COORDINATION PROCESS. THE ENGINEER WILL RESPOND TO QUESTIONS THAT ARISE FROM THE COORDINATION PROCESS. DRAWINGS SUBMITTED WILL BE REVIEWED FOR CLEARLY IDENTIFIED CONFLICTS ONLY. SOLUTIONS TO CONFLICTS WILL NOT BEAR ADDITIONAL COST.

### AS BUILT DRAWINGS

- 1. PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE ALL INSTALLED CONDITIONS OF SYSTEMS WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION DOCUMENTS AND INCLUDE DETAILS AS NECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND IN A COMPLETE AND CONSECUTIVE SET. SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL BE RETURNED FOR REVISION. THE CONTRACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND CONCISE SET OF DRAWINGS. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC VERSION (AUTO-CAD VERSION AS REQUIRED BY THE OWNER) OR AUTOCAD VERSION 2010 IF NOT SPECIFIED. NUMBER OF COPIES OF EACH AS REQUESTED BY THE OWNER.
- PROVIDE "AS-BUILT DRAWINGS" INDICATING IN A NEAT AND ACCURATE MANNER A COMPLETE RECORD OF ALL REVISIONS OF THE ORIGINAL DESIGN OF THE WORK. INDICATE THE FOLLOWING INSTALLED CONDITIONS:
- INCLUDE ALL CHANGES AND AN ACCURATE RECORD IN AUTOCAD DRAWING OR APPROPRIATE SHOP DRAWINGS, OF ALL DEVIATIONS, BETWEEN THE WORK SHOWN AND WORK INSTALLED.
- EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.
- APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
- CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
- 3. SUBMIT FOR REVIEW BOUND SETS OF THE REQUIRED DRAWINGS, MANUALS AND OPERATING INSTRUCTIONS.
- 4. SUBMIT A COMPLETE MAINTENANCE MANUAL OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT.

### HOUSEKEEPING PADS

1. PROVIDE CONCRETE HOUSEKEEPING PADS FOR FLOOR-MOUNTED EQUIPMENT. COORDINATE EXACT LOCATIONS, DIMENSIONS, PIPING LOCATIONS, AND ANCHOR BOLT REQUIREMENTS. PROVIDE CONCRETE HOUSEKEEPING PADS UNDER ALL FLOOR MOUNTED EQUIPMENT. PADS SHALL BE CONSTRUCTED OF 3,000 PSI CONCRETE. PADS SHALL BE MINIMUM 4 INCHES HIGH (OR THE MINIMUM HEIGHT TO ACCOMMODATE THE CONDENSATE TRAP HEIGHT) UNLESS OTHERWISE NOTED, AND MINIMUM 4 INCHES WIDER THAN THE EQUIPMENT IN BOTH DIRECTIONS.

### HANGERS AND SUPPORT

- 1. PROVIDE ALL NECESSARY STRUCTURAL MEMBERS INCLUDING ADDITIONAL STRUCTURAL SUPPORT TO SUPPORT PIPING AND EQUIPMENT. HANGERS AND SUPPORTS SHALL BE OF AN APPROVED DESIGN NECESSARY TO SUPPORT DUCTWORK, PIPING, EQUIPMENT AND TO KEEP IN PROPER ALIGNMENT AND PREVENT TRANSMISSION OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS, ETC., ARE SUPPORTED FROM CONCRETE CONSTRUCTION, DO NOT WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL HANGERS AND SUPPORTS SHALL BE CAPABLE OF SCREW ADJUSTMENT AFTER EQUIPMENT AND PIPING IS ERECTED. HANGERS SUPPORTING PIPING EXPANDING INTO LOOPS, BENDS AND OFFSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT HORIZONTAL ADJUSTMENT PERPENDICULAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT DUE TO EXPANSION. ALL SUCH HANGERS SHALL BE FINALLY ADJUSTED BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION, AS REQUIRED. HANGERS IN CONTACT WITH COPPER OR BRASS PIPE SHALL BE DIELECTRIC, COMPATIBLE WITH COPPER AND BRASS ALLOY OR PROVIDED WITH FELT SLEEVE.
- PROVIDE ADDITIONAL SUPPORT FOR DUCTWORK AND EQUIPMENT WHEN DECK IS NOT CAPABLE OF 2. SUPPORT.

	MECHANICA
DRAWING NUMBER	DRAWING DESCRIPTION
M-0.1	COVER SHEET - MECHANICAL
M-0.2	NOTES, SYMBOLS, ABBREVIATIO
M-0.3	FLOW AND CONTROL DIAGRAMS
MD-1.1	LOWER LEVEL DEMOLITION FLOC
MD-1.2	ROOF DEMOLITION PLAN - MECH
M-1.1	LOWER LEVEL FLOOR PLAN - ME
M-1.2	ROOF PLAN - MECHANICAL
M-3.1	SCHEDULES - MECHANICAL
M-4.1	DETAILS - MECHANICAL
M-4.2	DETAILS - MECHANICAL
M-5.1	SPECIFICATIONS - MECHANICAL
M-5.2	SPECIFICATIONS - MECHANICAL
M-5.3	SPECIFICATIONS - MECHANICAL

PROJECT ALTERNATE # 1: DETENTION CELL PLUMBING REFURBISHMENT SCOPE (REFER TO P-SERIES AND A-SERIES DRAWINGS FOR SCOPE) PROJECT ALTERNATE # 2: NEW PHYSICAL TRAINING ROOM RELOCATION SCOPE

### MECHANICAL DRAWING LIST

IONS - MECHANICAL

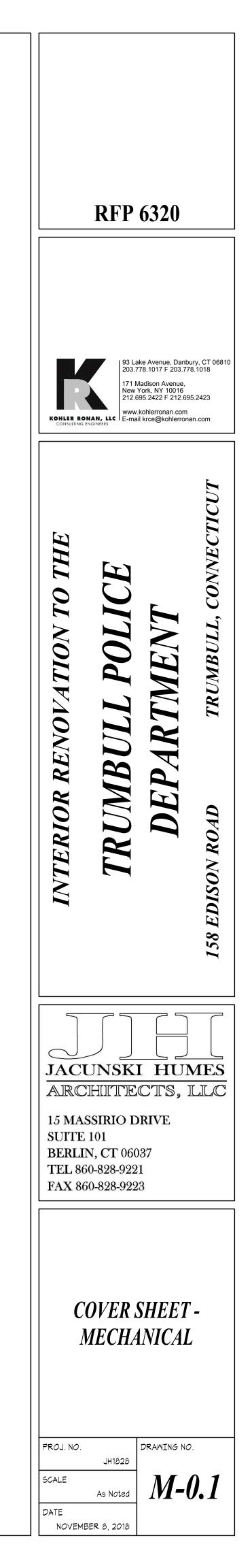
**MS - MECHANICAL** 

LOOR PLAN - MECHANICAL

CHANICAL

MECHANICAL

### PROJECT ALTERNATES

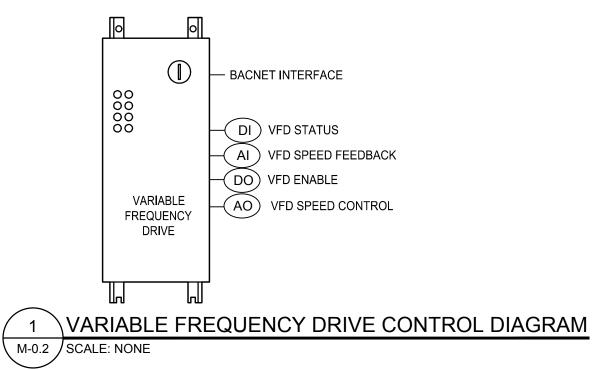


	GENERAL MECHAN	IICAL SYMBOLS	
	EXISTING DUCTWORK TO REMAIN	Ō	THERMOSTAT
<b>xxx</b> xx	EXISTING DUCTWORK TO BE REMOVED	Ī	TEMPERATURE SEM
		$\mathbb{H}$	
Ĺĺ	HIDDEN DUCTWORK	(S)	SMOKE DETECTOR
	SUPPLY DUCT UP / DOWN	SP T	STATIC PRESSURE
	RETURN AIR DUCT UP / DOWN	SD SD	SMOKE DAMPER
	EXHAUST AIR DUCT UP / DOWN	FD FD	FIRE DAMPER
	DOUBLE LINE DUCTWORK WITH INDICATION	FSD FSD	COMBINATION SMO
24x12	OF INSIDE DIMENSIONS	MD MD	MOTORIZED DAMPE
24x12	DOUBLE LINE DUCTWORK WITH INTERNAL ACOUSTICAL INSULATION AND INDICATION OF INSIDE DIMENSIONS		MANUAL VOLUME D
24x12	DOUBLE LINE DUCTWORK WITH DUCT LAGGING AND INDICATION OF INSIDE DIMENSIONS	XXX	UNDERLINED TEXT REFER TO SCHEDU
	ACCESS DOOR IN DUCT	<b>LTR</b>	
12"Ø	ROUND DUCT DIAMETER SIZE	CFM-#	LTR = TYPE DESIGN CFM = CFM QUANTI
	FLEXIBLE DUCT CONNECTION		# = BLOW ARRANGE
	UNDERCUT DOOR		OTHERWISE NOTED
	SUPPLY AIR FLOW		3 = 3-WAY BLOW
-4- <b>-</b>	EXHAUST / RETURN AIR FLOW		2 = 2-WAY BLOW 1 = 1-WAY BLOW
	MITERED ELBOW WITH TURNING VANES	VFD	VARIABLE FREQUEI
	DUCT TAKE-OFF	MS	COMBINATION MOT
×ו	VANE EXTRACTOR		TEMPERATURE CO
$\bowtie$ X	CEILING DIFFUSER REFER TO SCHEDULE FOR SIZE & TYPE	<b>+</b>	POINT OF CONNEC
		$\dot{\mathbf{\Phi}}$	POINT OF DEMOLIT
	RETURN / EXHAUST GRILLE REFER TO SCHEDULE FOR SIZE & TYPE	O	OCCUPANCY SENS
المسيعا		CO	CARBON MONOXIDI
		CO <sub>2</sub>	CARBON DIOXIDE S

\* ALL SYMBOLS MAY NOT BE USED IN THESE DOCUMENTS.

### MECHANICAL DEMOLITION NOTES

- COORDINATE PHASING OF DEMOLITION WITH C.M./G.C. AND PROPOSED CONSTRUCTION SCHEDULE TO MAINTAIN MECHANICAL SERVICES (HEATING, TEMPERATURE CONTROLS, EXHAUSTS, MAKE UP AIR ETC.) TO OCCUPIED AREAS OF THE BUILDING DURING CONSTRUCTION.
- 2. THE EXISTING FACILITY WILL BE OCCUPIED AND IN OPERATION DURING THE PERFORMANCE OF THE WORK.
- WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING PIPING OR DUCTWORK WHICH MAY CAUSE DISRUPTION TO OCCUPIED FACILITIES, CONFER WITH THE OWNER, AND SCHEDULE A MUTUALLY AGREEABLE PERIOD OF INTERRUPTION.
- WHERE REPLACEMENT, RELOCATION OR MODIFICATION OF EXISTING EQUIPMENT IS INDICATED, 4. PROVIDE AND MAINTAIN ALL TEMPORARY SERVICES, CONNECTIONS, CONTROLS, AND ANY OTHER MATERIALS AND APPURTENANCES REQUIRED TO MAINTAIN SERVICES TO OCCUPIED AREAS.
- NO WORK SHALL BE LEFT INCOMPLETE, NOR ANY HAZARDOUS SITUATION CREATED, WHICH 5 WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. AT NO TIME SHALL THE WORK INTERFERE WITH OR CUT OFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S PRIOR WRITTEN PERMISSION.
- THE OWNER RESERVES THE RIGHT TO OPERATE ALL EXISTING MECHANICAL EQUIPMENT UNTIL 6. THE NEW SYSTEMS COME ON LINE.
- IT IS REQUIRED THAT THE WORK INDICATED AND/OR SPECIFIED SHALL BE CARRIED OUT WITH A MINIMUM OF INTERFERENCE TO THE ESTABLISHED OPERATIONS OF THE BUILDING.
- REMOVED MATERIALS SHALL BE DISPOSED OF USING LICENSED CARTING SERVICE. 8
- 9. HAZARDOUS MATERIALS SHALL BE DISPOSED OF BY AN EPA APPROVED, LICENSED DISPOSAL SERVICE. CONTRACTOR SHALL OBTAIN AND HAVE ON FILE, AFFIDAVIT, AND RECEIPTS STATING HOW AND WHERE THE WASTE WAS DISPOSED OF OR CONVERTED.
- 10. IT IS THE INTENTION OF THESE DEMO DRAWINGS TO INDICATE GENERAL SYSTEMS AND MATERIALS TO BE REMOVED. CONTRACTOR SHALL REMOVE ALL OBSOLETE PIPING, DUCTWORK, EQUIPMENT, CONTROLS, ETC, INDICATED OR NOT.
- 11. DUCTWORK, EQUIPMENT AND TERMINAL DEVICES HAVE BEEN TAKEN FROM FIELD OBSERVATION AND ARE TO BE USED FOR REFERENCE AND SHALL NOT BE CONSTRUED TO BE ACTUAL FIELD CONDITIONS. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL SYSTEMS PRIOR TO COMMENCEMENT OF DEMOLITION WORK.
- 12. ALL EQUIPMENT TO BE REMOVED SHALL BE DISPOSED OF PER OR STORED PER DIRECTION OF OWNER. ANY ITEM NOT RETAINED BY OWNER SHALL BE REMOVED FROM SITE AND DISCARDED IN AN APPROVED MANNER.
- 13. IT IS THE INTENTION OF THESE SPECIFICATION TO REMOVE ALL MATERIALS ABANDONED BY THE SCOPE OF THIS CONSTRUCTION PROJECT. NO OBSOLETE MATERIALS (I.E. HANGERS, SUPPORTS, INSULATION, DUCTWORK, ETC.) SHALL REMAIN.
- 14. DISCONNECT AND REMOVE ALL DUCTWORK AND ASSOCIATED SUPPLY, RETURN OR EXHAUST GRILLES INCLUDING BUT NOT LIMITED TO ALL HANGERS, SUPPORTS, VOLUME DAMPERS AND FLEXIBLE DUCTWORK.
- 15. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION TO ANY EXPOSED OR UNCAPPED NEW OR EXISTING DUCTWORK TO REMAIN TO MINIMIZE DUST CONTAMINATION IN ANY AND ALL OF THE AIR SYSTEMS. THIS SHALL INCLUDE BUT IS NOT LIMITED TO TEMPORARY FILTERS, CAPS, ENCLOSURES, ETC.



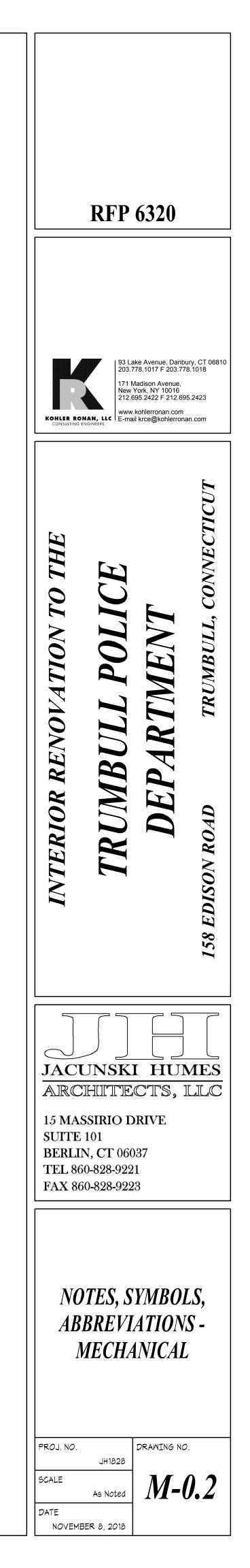
		GEN	ERAL M	ECHANICAL ABBREVIA	TIONS
	ABV	ABOVE	FA	FACE AREA	NTS
	AC	AIR COMPRESSOR	FC	FORWARD CURVE	OA
SENSOR	ACC-#	AIR COOLED CONDENSER	F.C.	FLEX CONNECTION	OAT
DITY SENSOR OR HUMIDISTAT	ACU-# ACCU-#	AIR CONDITIONING UNIT AIR COOLED CONDENSING UNIT	FC-# FCU-#	FAN COIL FAN COIL UNIT	OAI OBD
	ACCO-# AD	ACCESS DOOR	FCO <del>-</del> # FD	FIRE DAMPER WITH ACCESS DOOR	OD
OR IN DUCT	AF	AIRFOIL	FF	FINAL FILTER	0.E. T.D.
RE SENSOR	AFC	ADJUSTABLE FREQUENCY CONTROLLER	FIN FL	FINISH FLOOR	OED
	AFF	ABOVE FINISHED FLOOR	FL	FLOOR	P <b>-</b> #
	AFMS	AIR FLOW MEASURING STATION	FLA	FULL LOAD AMPERES	PB
	AHU-#		FLEX	FLEXIBLE	PBD
MOKE & FIRE DAMPER	AL ALD	ACOUSTIC LINING AUTOMATIC LOUVER DAMPER	FO FPF	FLAT OVAL FINS PER FOOT	PD PF
	ALP	ACOUSTICALLY LINED PLENUM	FT	FEET	PH
<i>I</i> PER	APD	AIR PRESSURE DROP	F.T.	FLOAT & THERMOSTATIC TRAP	PHC
E DAMPER / CABLE OPERATED DAMPER (COD)	AUTO	AUTOMATIC	FT <b>-</b> #	FIN TUBE RADIATION	PPH
	B-#	BOILER	FV	FACE VELOCITY	PRV
XT DENOTES EQUIPMENT	BC	BACKWARD CURVED	GC	GENERAL CONTRACTOR	PSI
DULES	BD BMCS	BYPASS DAMPER BUILDING MANAGEMENT & CONTROL SYSTEM	gih Gph	GRAVITY INTAKE HOOD GALLONS PER HOUR	RA RAD
	BMCS	BRITISH THERMAL UNIT	GPM	GALLONS PER MINUTE	RAF-#
	BV	BYPASS VALVE	H/C	HEATING/COOLING	RAT
ND	CH-#	CHILLER	H-#	HUMIDIFIER	REG
IGNATION. REFER TO SCHEDULES	CHR	CHILLED WATER RETURN	H-O-A	HAND-OFF-AUTOMATIC	RH
NTITY	CHS	CHILLED WATER SUPPLY	HC-#	HEATING COIL	RHC
NGEMENT, 4-WAY BLOW IS TYPICAL UNLESS	CAP CB-#		HD HP		RLA RM
TED	CC-#	CONTROL BOX COOLING COIL	HTG	HORSEPOWER HEATING	RM
	CD	CEILING DIFFUSER	HTR	HEATER	RPM
	CFM	CUBIC FEET PER MINUTE	HV-#	HEATING AND VENTILATING UNIT	RTU-#
	CG	CEILING GRILLE	HVAC	HEATING, VENTILATING &	RV
	CLG	CEILING		AIR CONDITIONING	SA
UENCY DRIVE	C-#		HX-#		SAF-#
	C.O.D. CP	CABLE OPERATED DAMPER CONDENSATE RECEIVER/PUMPING SYSTEM	IBT ID	INVERTED BUCKET TRAP INSIDE DIMENSION	SAT SB
	CR	CEILING REGISTER	IN	INCHES	VSC
IOTOR STARTER / DISCONNECT	CT-#	COOLING TOWER	IP	INTAKE PENTHOUSE	HSC
	CTD	CEILING TRANSFER DUCT	IV	INLET GUIDE VANES	SD
	CUH-#	CABINET UNIT HEATER	KW	KILOWATT	SG
CONTROL PANEL	CV		KWH		SP
	D&T DB	DRIP AND TRAP DRY BULB	IL LAT	INLINE LEAVING AIR TEMPERATURE	SQ FT ST
FOTION	DD	DIRECT DRIVE	LAT	LINEAR DIFFUSER	T'STAT
ECTION	DDC	DIRECT DIGITAL CONTROL	LIN	LINEAR	ТВ
LITION	DIFF	DIFFUSER	LRA	LOCKED ROTOR AMPERES	TCP
NSOR	DL	DOOR LOUVER	LPR	LOW PRESSURE RETURN	TD
	DN	DOWN	LPS	LOW PRESSURE SUPPLY	TEMP
(IDE SENSOR	DP DR	DEWPOINT TEMPERATURE DROP	LVG LWT	LEAVING	TG TOT
E SENSOR	DR	DROP DIRECT EXPANSION	MAN	LEAVING WATER TEMPERATURE MANUAL	TN-HR
	EF-#	EXHAUST FAN	MAT	MIXED AIR TEMPERATURE	TR
	EAT	ENTERING AIR TEMPERATURE	MAX	MAXIMUM	TRD
	EER	ENERGY EFFICIENCY RATIO	MBH	1000 BTU'S	TT
	EG	EXHAUST GRILLE	MCA		TYP
	EHC-# ENT	ELECTRIC HEATING COIL ENTERING	MD MER		UC UH-#
	HEPA	HIGH EFFICIENCY PARTICULATE FILTER	MEZZ	MECHANICAL EQUIPMENT ROOM MEZZANINE	UV-#
	ER	EXHAUST REGISTER	MFS	MAXIMUM FUSE SIZE	VD
	ES	END SUCTION	MIN	MINIMUM	VE
	ESP	EXTERNAL STATIC PRESSURE	MTR	MOTOR	VFD
	ET-#	EXPANSION TANK	MUA	MAKE-UP AIR	VI
	ETR		MV		VSF
	EUH-# EWT	ELECTRIC UNIT HEATER ENTERING WATER TEMPERATURE	NC NFA	NOISE CRITERIA NET FREE AREA	W/ WB
	EXP-#	EXPANSION LOOP	NIC	NOT IN THIS CONTRACT	WFM
	EX #	EXISTING	NO	NORMALLY OPEN	WMS
	EXH	EXHAUST			WPD
	EXT	EXTERNAL			WT
	°۲				70

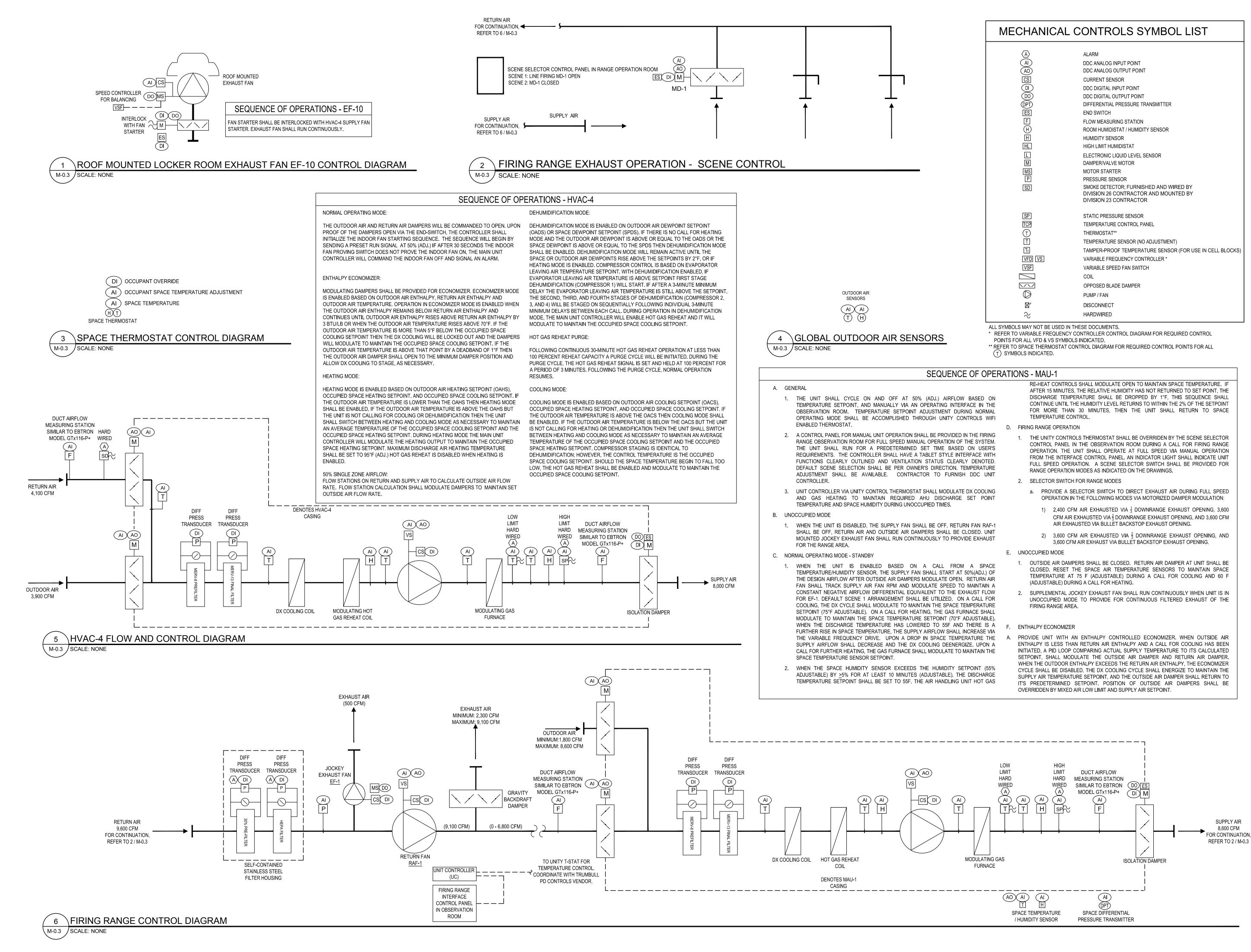
F&B FACE & BYPASS DAMPER \* ALL ABBREVIATIONS MAY NOT BE USED IN THESE DOCUMENTS.

DEGREES FAHRENHEIT

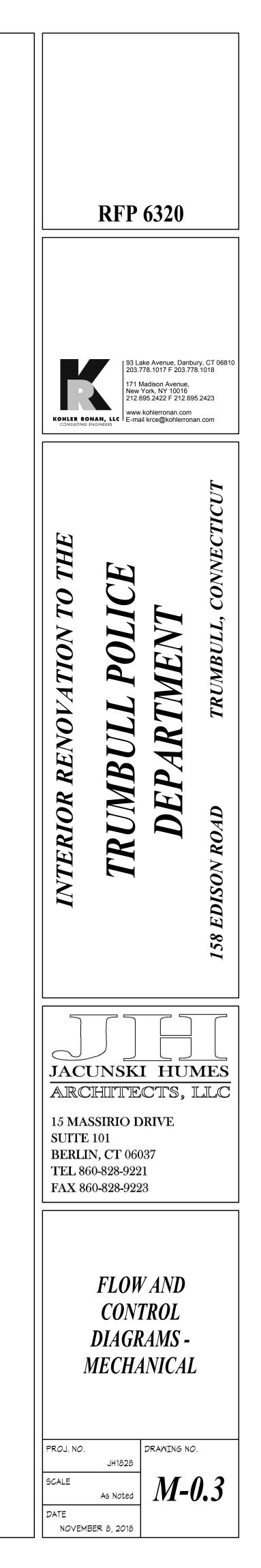
NOT TO SCALE OUTSIDE AIR OUTDOOR AIR TEMPERATURE OUTDOOR AIR INTAKE OPPOSED BLADE DAMPER OUTSIDE DIMENSION OPEN END TRANSFER DUCT OPEN END DUCT PUMP PUSH BUTTON PARALLEL BLADE DAMPER PRESSURE DROP PREFILTER PHASE PREHEAT COIL POUND PER HOUR PRESSURE REDUCING VALVE POUND PER SQUARE INCH RETURN AIR RETURN AIR DAMPER RETURN AIR FAN RETURN AIR TEMPERATURE REGISTER RELATIVE HUMIDITY REHEAT COIL RATED LOAD AMPERES ROOM RELIEF PENTHOUSE REVOLUTIONS PER MINUTE ROOFTOP AIR CONDITIONING UNIT RADIATION VALVE SUPPLY AIR SUPPLY AIR FAN SUPPLY AIR TEMPERATURE SECURITY BARS VERTICAL SPLIT CASE HORIZONTAL SPLIT CASE SMOKE DAMPER SUPPLY GRILLE STATIC PRESSURE SQUARE FOOT (AREA) SINGLE POLE SWITCH THERMOSTAT TERMINAL BOX TEMPERATURE CONTROL PANEL TEMPERATURE DIFFERENCE TEMPERATURE AIR TRANSFER GRILLE TOTAL TON HOUR REFRIGERATION TOP REGISTER TRANSFER DUCT THERMOSTATIC TRAP TYPICAL UNDERCUT DOOR UNIT HEATER HOT WATER UNIT VENTILATOR VOLUME DAMPER VOLUME EXTRACTOR VARIABLE FREQUENCY DRIVE VIBRATION ISOLATOR VARIABLE SPEED FAN SWITCH WITH WET BULB WATER FLOW MEASURING STATION WIRE MESH SCREEN WATER PRESSURE DROP WEIGHT (LBS) ZONE DAMPER

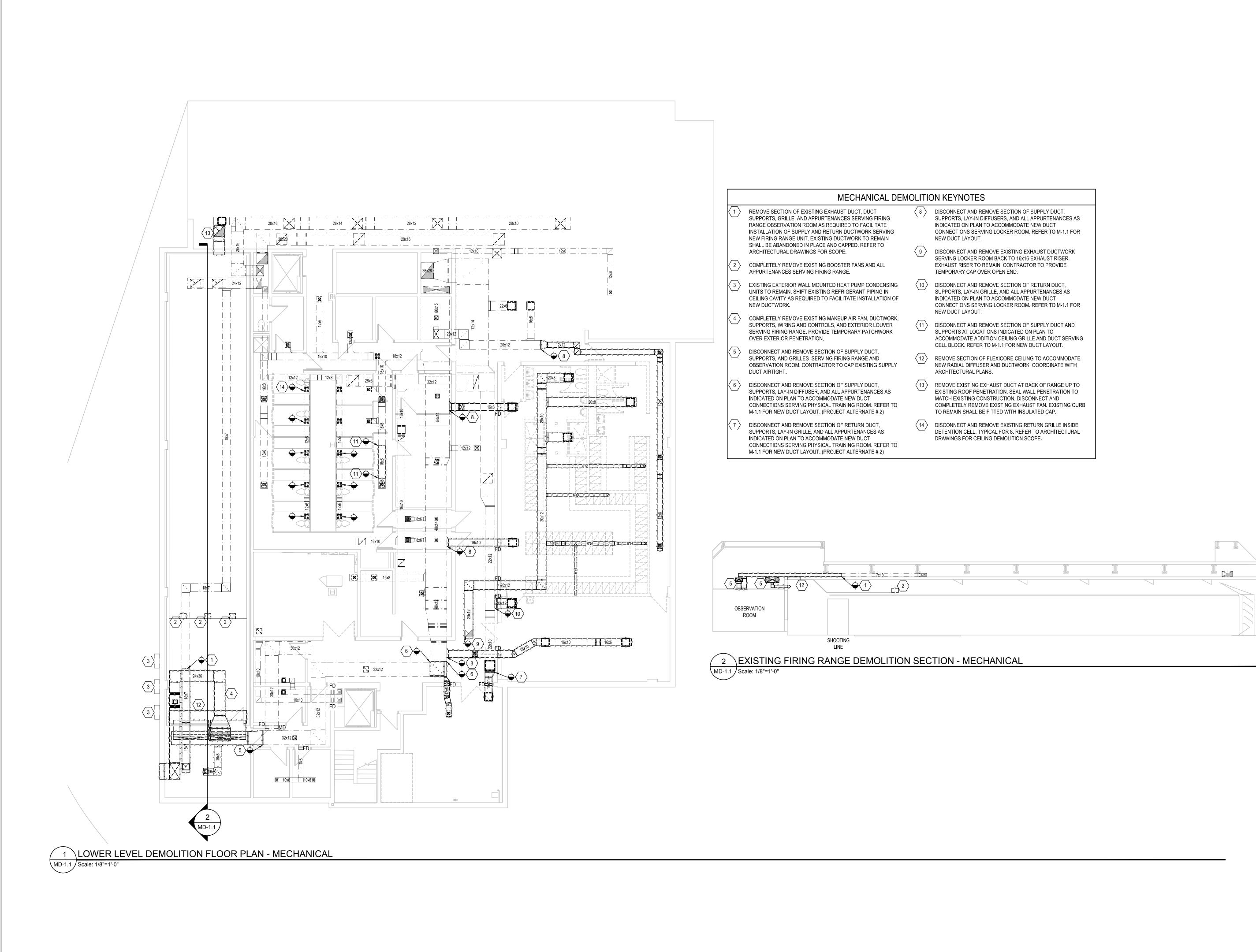
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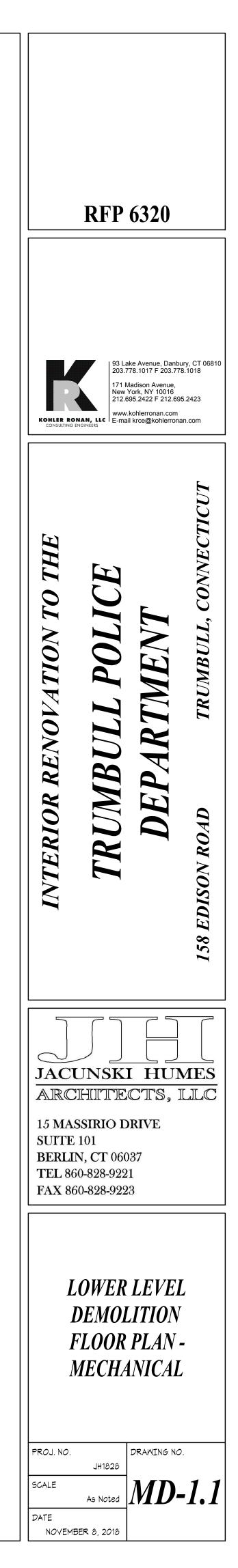


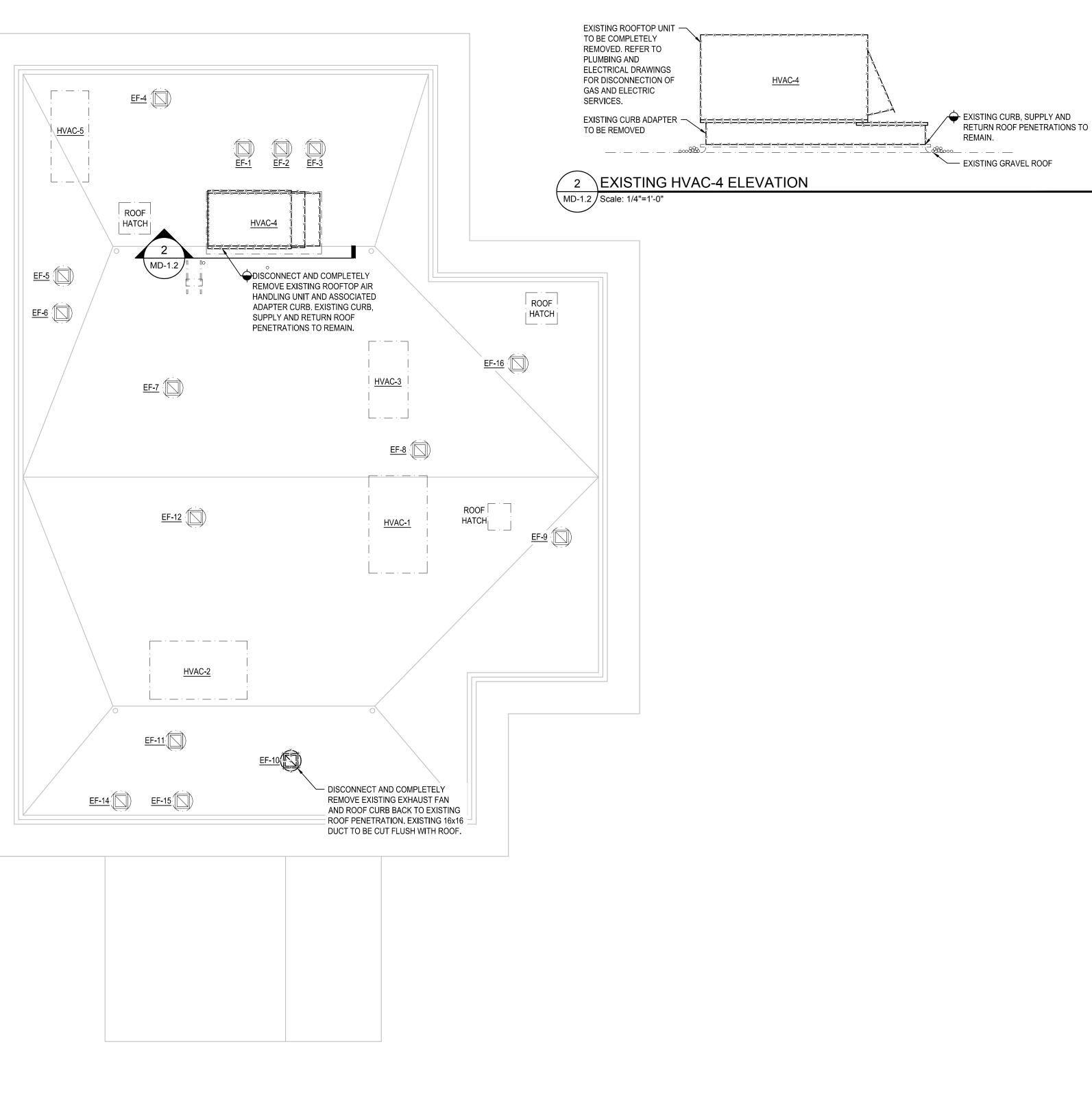


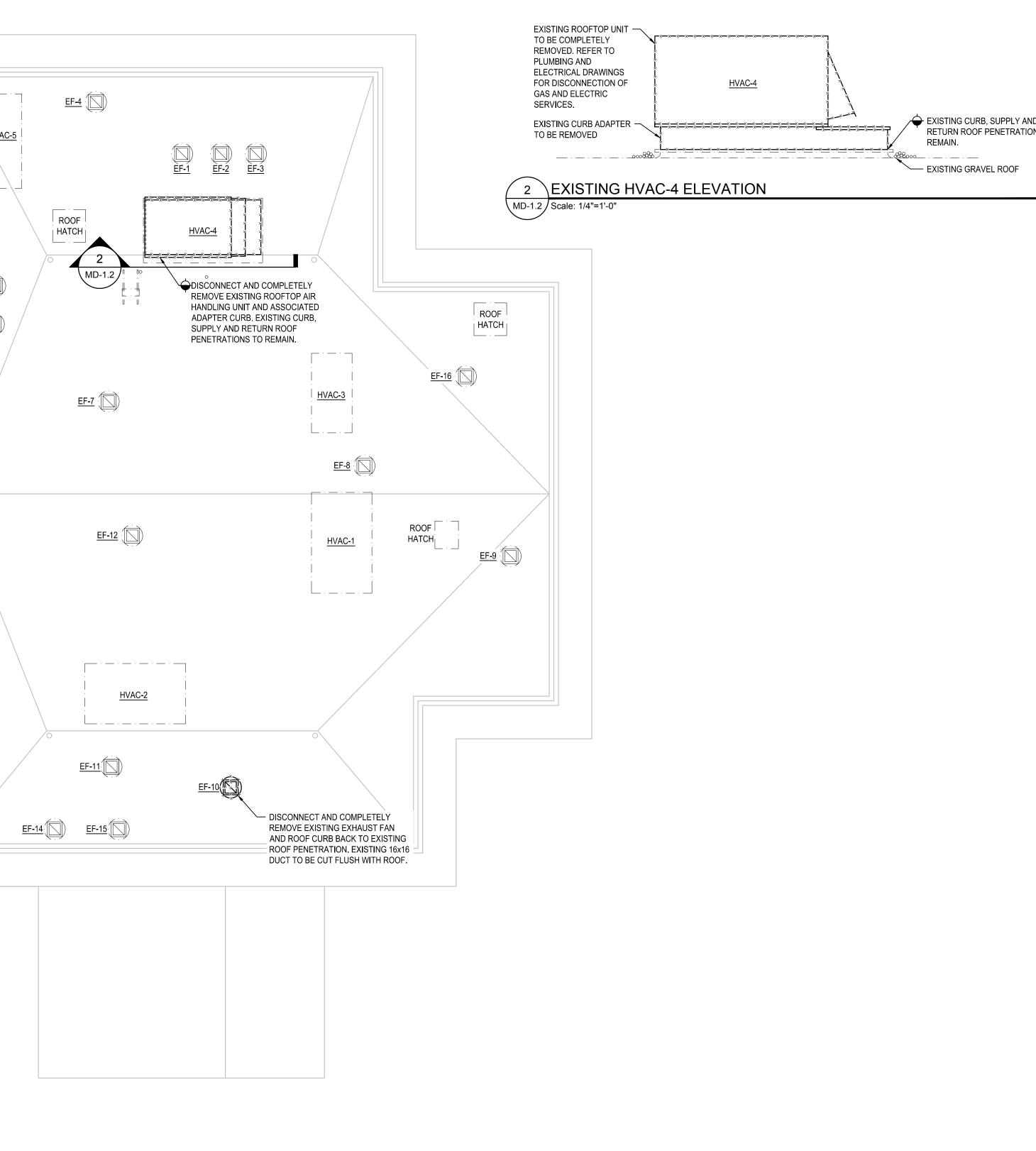




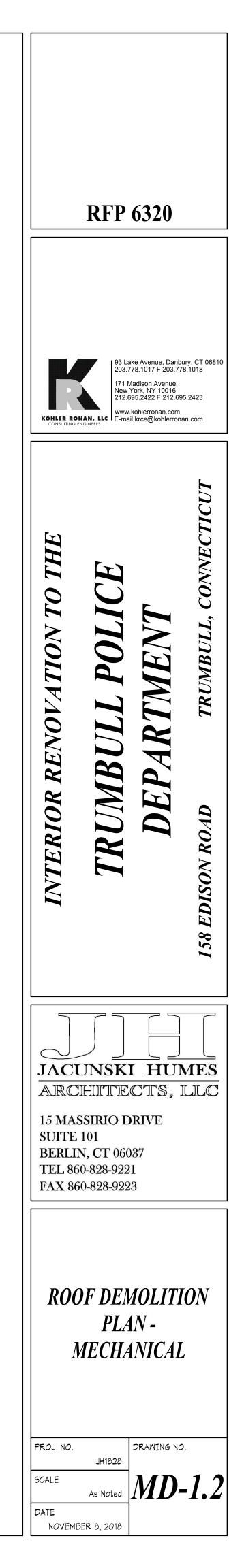


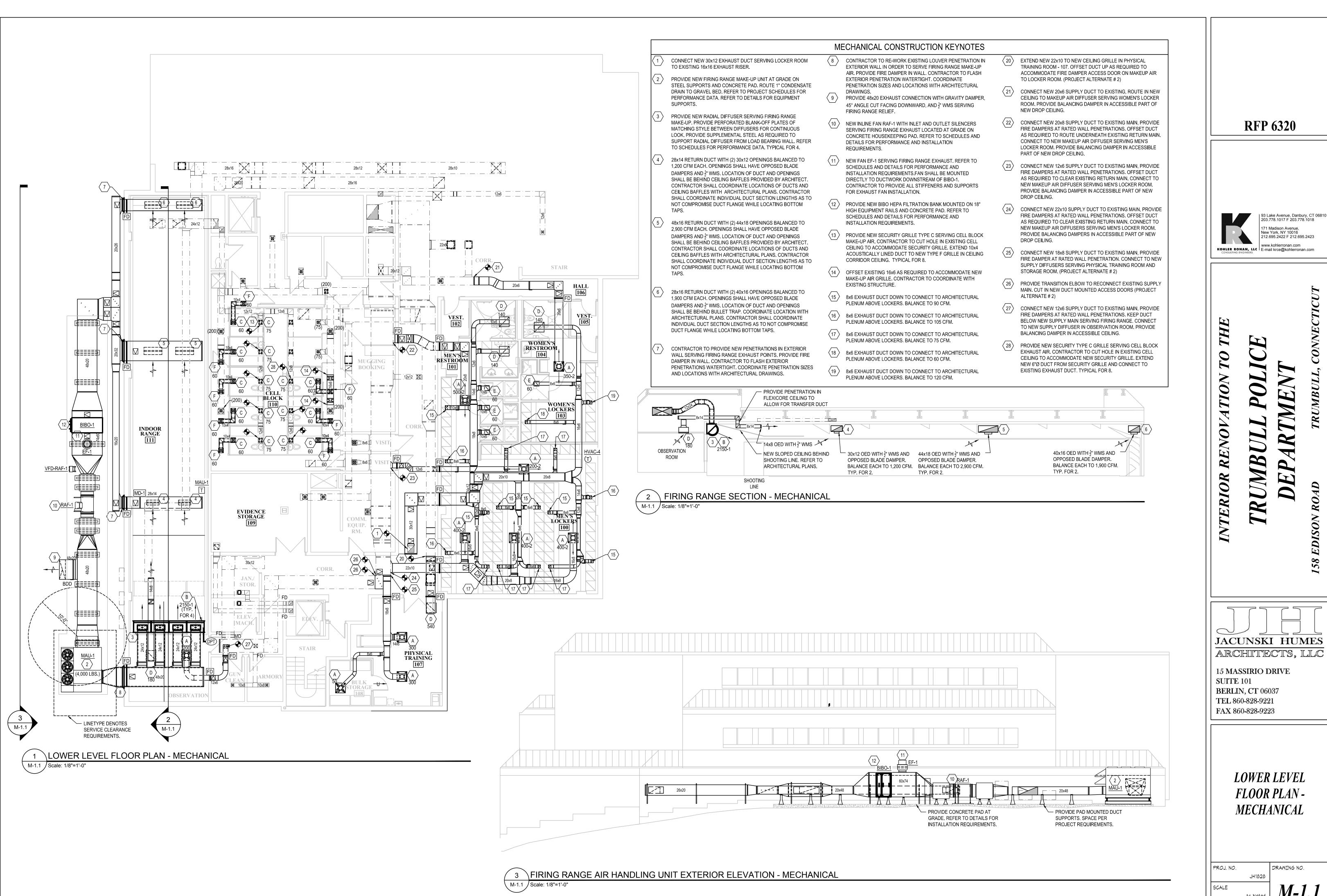






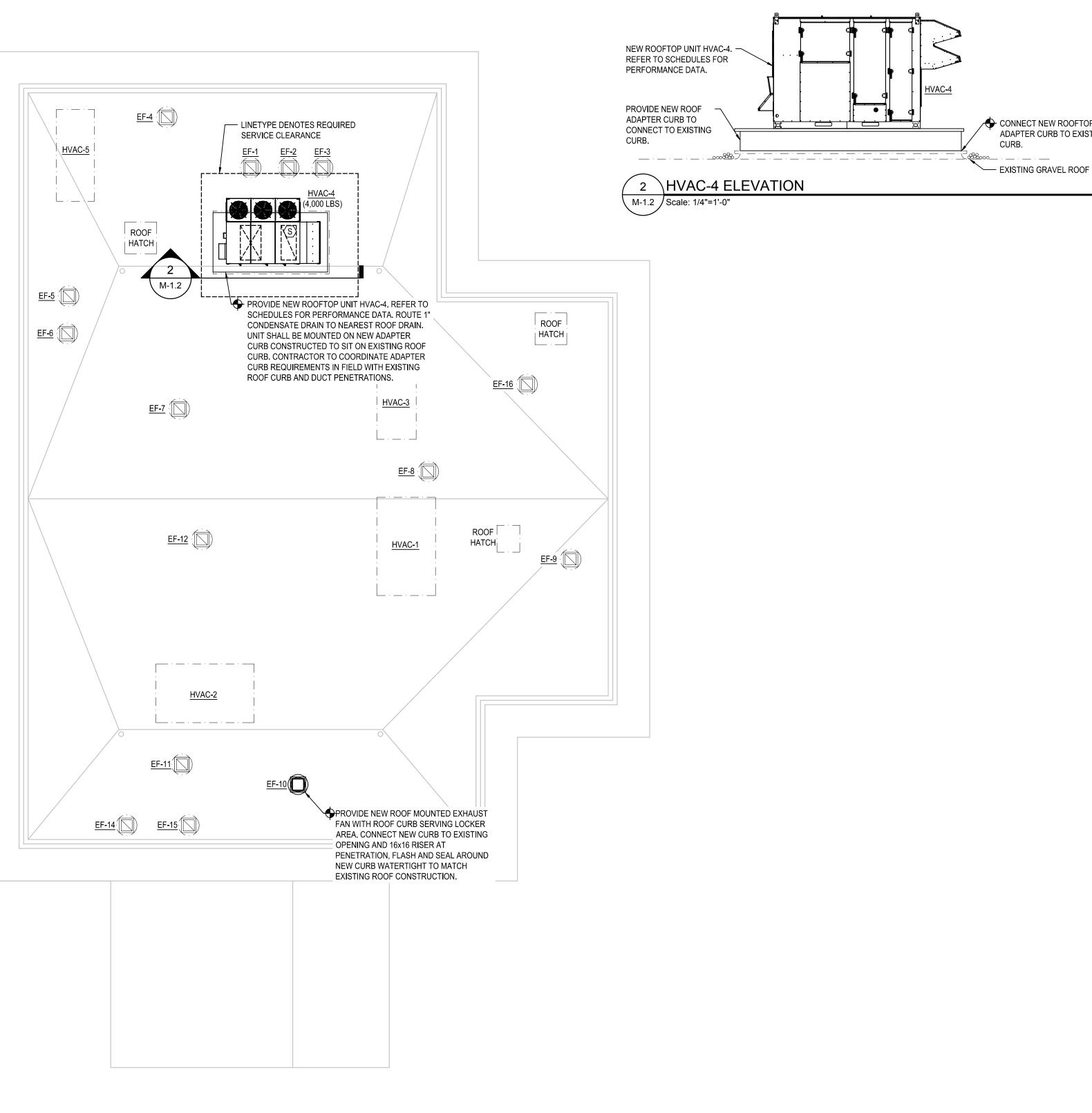






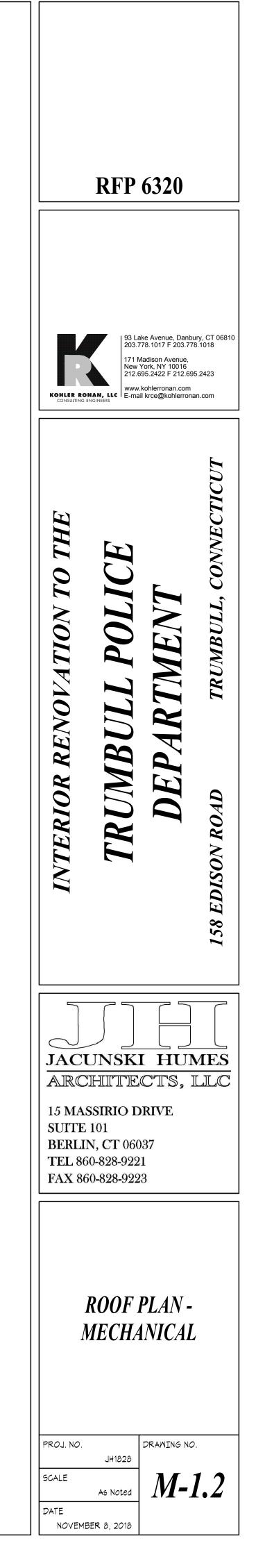
INTERIOR RENOVATION TO THE	<b>TRUMBULL POLICE</b>	DEPARTMENT	158 EDISON ROAD TRUMBULL, CONNECTICUT					
ARC 15 MAS SUITE BERLI TEL 86	JACUNSKI HUMES JACUNSKI HUMES ARCHITTECTS, LLC 15 MASSIRIO DRIVE SUITE 101 BERLIN, CT 06037 TEL 860-828-9221 FAX 860-828-9223							
	FLOOR	LEVEI PLAN NICAL	- - -					

NOVEMBER 8, 2018





FOP UNIT
ISTING ROOF



	AIR HANDLING UNITS																											
	INDIRECT GAS FIRED FURNACE								DIRECT EXPANSION COOLING COIL					SUPPLY FAN DATA			ELECTRICAL											
SYMBOL	AREA SERVED	SUPPLY AIR	VENT. AIR	HEATIN	IG (MBH)		%	А	IR DATA		AMB.	ENT.	AIR	LEAV. A	R CAP	PACITY	EFRIG.	EOD	TOTAL	MOTOR DATA			UNIT	UNIT			MAKE/MODEL	REMARKS
	SERVED	АІК	АК	INPUT	OUTPUT	FUEL	AFUE	CFM	EAT	LAT	TEMP.	DB°		DB° V			TYPE	ESP	CFM	H.P.	VOLTS	PH	MCA	MOP	PRE-FILTER	FILTER		
HVAC-4	BASEMENT LEVEL	8,000	3,900	400.0	320.0	NAT. GAS	80	8,000	50.0	87.0	95.0	81.3	67.9	55.4 5	5.4 31	315.9 F	R-410A	1.0"	8,000	7.5	208	3	143.2	-	MERV-8	MERV-13	TRANE HORIZON K-300	PROVIDE MOD. HOT GAS REHEAT
MAU-1	FIRING RANGE	8,600	1,800	300.0	240.0	NAT. GAS	80	8,600	56.9	82.7	95.0	79.2	66.8	55.2 5	l.8 31	319.5 F	R-410A	1.0"	8,600	10	208	3	145.9	175	MERV-8	MERV-13	GREENHECK RV-45-25	PROVIDE MOD. HOT GAS REHEAT
NOTES:				8			•					·		·							*							

ALL FAN MOTORS SHALL BE INVERTER DUTY RATED FOR USE WITH A VARIABLE FREQUENCY DRIVES. 1 FANS SHALL BE SELECTED BASED ON THE PRESSURE DROP ACROSS DIRTY FILTERS.

3. UNITS SHALL BE FURNISHED WITH FACTORY MOUNTED VARIABLE FREQUENCY DRIVE FOR THE SUPPLY FAN. VFD' SHALL BE MOUNTED

ON THE OUTSIDE OF THE UNIT IN A NEMA 3X ENCLOSURE FURNISHED WITH AN ELECTRONIC BYPASS WITH SERVICE SWITCH.

4. UNITS SHALL BE FURNISHED WITH FACTORY INSTALLED DISCONNECT SWITCH.

UNITS SHALL BE FURNISHED WITH WEATHERHOOD AND INTEGRAL BIRDSCREEN. PROVIDE (1) SPARE SET OF FILTERS AND BELTS. 6

CONTRACTOR SHALL COORDINATE CONTROLS AND ELECTRICAL WIRING WITH TRUMBULL POLICE DEPARTMENT CONTROLS VENDOR.

8. UNITS SHALL BE PROVIDED WITH FACTORY MOUNTED AND WIRED 120V NEMA 3R RECEPTACLE

	HVAC PIPING/TUBING MATERIAL, JOINTS & FITTINGS											
SYSTEM	PIPE SIZE	CONSTRUCTION	PIPING	FITTINGS	UNIONS	FLANGES						
COOLING COIL CONDENSATE DRAINS	ALL	SOLDER JOINT CONSTRUCTION WITH THREADED ADAPTERS AS REQUIRED. 95-5 TIN/ANTIMONY SOLDER.	COPPER, TYPE L, HARD DRAWN, ANSI H23.1, ASTM B88.	CAST BRONZE OR WROUGHT COPPER, SOLDER ENDS, ANSI B16.9 OR ANSI B16.22.	BRONZE SOLDER ENDS, GROUND JOINTS, ANSI B16.19 OR ANSI B16.22.	USE UNIONS						

HVAC DUC	T/PLENU	M MATE	RIAL	DUCT PR
APPLICATION	SUPPLY	RETURN	EXHAUST	APPLICATION
TYPICAL (UNLESS OTHERWISE SPECIFIED)	G90 GALVANIZED STEEL	G90 GALVANIZED STEEL	G90 GALVANIZED STEEL	AHU SUPPLY AIR DUCTWORK TO R (HORIZONTAL MAINS)
EXPOSED AND CONCEALED EXHAUST DUCTWORK AND				SUPPLY AIR DUCTWORK FROM MAIN OUTLET.
PLENUMS SERVING TOILET ROOMS, SHOWER ROOMS. ALL EXPOSED DUCTWORK RUNNING THROUGH, OVER OR WITHIN SHOWER ROOMS.		3003 H-14 ALUMINUM	3003 H-14 ALUMINUM	RETURN AIR DUCTWORK
EXPOSED DUCTWORK LOCATED IN AND SERVING AIR-CONDITIONED SPACES TO BE FIELD PAINTED	A60	A60	A60	GENERAL EXHAUST DUCTWOF
OTHER THAN DUCTWORK LOCATED IN SPACES REQUIRED TO BE ALUMINUM.	GALVANNEALED STEEL	GALVANNEALED STEEL	GALVANNEALED STEEL	TOILET EXHAUST DUCTWOR
EXPOSED DUCTWORK LOCATED IN AND SERVING CONDITIONED SPACES OTHER THAN DUCTWORK LOCATED IN SPACES REQUIRED TO BE ALUMINUM OR TO BE FIELD PAINTED.	G90 GALVANIZED STEEL	G90 GALVANIZED STEEL	G90 GALVANIZED STEEL	NOTES: 1. LEAKAGE CLASS SHALL BE DETERM 2. PRESSURE CLASS SHALL BE DEFIN 3. DUCTWORK, JOINTS, SEALING, AND WITH SMACNA THIRD EDITION - 201
EXPOSED DUCTWORK OUTDOOR, ABOVE GRADE	ALUMINUM	ALUMINUM	ALUMINUM	4. ALL EXTERIOR RETURN DUCTWORI PRESSURE-TESTED

1. DUCT CONSTRUCTION SHALL MEET SMACNA METAL & FLEXIBLE 2005 3RD EDITION STANDARDS.

	FANS														
UNIT NO	LOCATION	SYSTEM SERVED	TYPE	CFM	ESP	MAX BHP	FAN RPM	TIP SPEED	SOUND SONES	HP	ELECTR		RPM	MAKE/MODEL	REMARKS
RAF-1	GRADE	FIRING RANGE EXHAUST	INLINE	9,600	3.65"	8.26	1,731	12,235	11.0	10	208	3	1,725	GREENHECK QEI-22-I-100	PROVIDE INLET AND OUTLET SILENCERS
EF-1	GRADE	FIRING RANGE JOCKEY	CENTR.	500	0.50"	0.09	1,561	4,445	7.5	1/10	120	1	860	GREENHECK CUE-090-VG	
EF-10	ROOF	LOCKER ROOMS	CENTR.	2,400	0.75"	0.75	1,584	6,063	13.2	1	208	3	1,725	GREENHECK CUE-141-VG	

NOTES: 1. ALL FANS SHALL BE BALANCED TO AIRFLOW QUANTITY INDICATED ON PLANS AT INLETS AND OUTLETS.

2. FANS SHALL BE FURNISHED WITH SPEED CONTROLLER FOR BALANCING.

3. FAN MOTORS SHALL BE INVERTER DUTY RATED FOR USE WITH VARIABLE FREQUENCY DRIVES.

	HIGH-EFFICIENCY FILTERS															
SERVES	LOCATION	TAG	CFM	SI. H X W	ZE DEPTH	TYPE	CLASS	EFF	QU H	AN W	VEL FPM	INITIAL SP	PRE F DEPTH	ILTER TYPE	MAKE/MODEL	REMARKS
FIRING RANGE EXHAUST	GRADE	BIBO-1	9,600	24 x 24	36.5	HEPA	-	99.97	2	3	400	1.0	4	MERV-8	AAF	SHALL UTILIZE ASTROCEL I HCX CORES

BIBO HOUSING SHALL BE CONSTRUCTED OF SEAM WELDED 14 GAUGE 304 STAINLESS STEEL TESTED TO +10" W.G.

DOORS SHALL BE WELDED LIFT-OFF TYPE WITH WELDED HANDLES AND DEEP CHAMBER FOR CONTAINMENT BAG.

EACH DOOR STANDING SEAL EDGE SHALL BE FITTED WITH HIGH INTEGRITY "U" SHAPED NEOPRENE GASKET SPECIFICALLY DESIGNED FOR CONTAINMENT SERVICE. DOORS SHALL BE SECURED BY LARGE THREADED STAINLESS STEEL STUDS LOCATED ON THE HOUSING AND SPIN-ON THREADED KNOBS

PROVIDE WEATHER COVER FOR OUTSIDE SERVICE

PROVIDE (4) STATIC TAPS; ONE BEFORE AND AFTER PRE-FILTER, ONE BEFORE AND AFTER HEPA FILTER 7. FURNISH UNIT WITH ADDITIONAL (4) BAGS, (1) ADDITIONAL SECURITY STRAP, AND (1) ADDITIONAL CINCHING STRAP

	REGISTERS, GRILLES, DIFFUSERS													
SYM														
	SUPPLY	CD	PRICE	ASPD	ALUMINUM PER ARCHITECT	0-125 126-215 216-330 331-550	6" 8" 10" 12"	24" x 24"	SELECTION SHALL BE <u>&lt;</u> NC-30					
В	SUPPLY	LAM. FLOW DIFFUSER	RVD	RD-2400	-	2150	24" x 12"	48" x 24"	-					
C	X-FER / SUPPLY	CD	-	-	-	-	-	-	-	FURNISHED BY DETENTION EQUIPMENT CONTRACTOR				
	RETURN / EXHAUST	CR	PRICE	10	ALUMINUM PER ARCHITECT	0-1250	-	24" x 24"	SELECTION SHALL BE <u>&lt;</u> NC-30					
E	EXHAUST	CR	PRICE	10	ALUMINUM PER ARCHITECT	0-100	-	12" x 12"	SELECTION SHALL BE <u>&lt;</u> NC-30					
F	X-FER	CR	PRICE	10	ALUMINUM PER ARCHITECT	0-125	6"	12" x 12"	SELECTION SHALL BE <u>&lt;</u> NC-30					

## T PRESSURE CLASS

	PRESSURE CLASS
ORISERS	4" W.G.
IAIN TO AIR	2" W.G.
к	2" W.G.
VORK	2" W.G.
ORK	2" W.G.

BE DETERMINED PER ASHRAE 90.1-2010 REQUIREMENTS. L BE DEFINED PER SMACNA THIRD EDITION - 2015. EALING, AND FITTINGS SHALL BE CONSTRUCTED IN ACCORDANCE

DITION - 2015. N DUCTWORK UP TO SUCTION SIDE OF RAF-1 SHALL BE

ŀ	IVAC VIBRATIC	ON-CONTROL
EQUIPMENT	BASE	ISOLATOR*
ROOF MOUNTED AIR HANDLING UNITS	RC	-
BAG-IN / BAG-OUT FILTER HOUSING	18" HIGH EQUIPMENT RAILS	NP

AHU'S, FLOOR MOUNTED	HOUSEKEEPING PAD, BSF

ROOF MOUNTED FANS

DUCTWORK WITHIN 50FT OF CONNECTED VIBRATION-ISOLATED EQUIPMENT

REMARKS:

1. REFER TO SPECIFICATION SECTION 230548 - "VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT" FOR A DESCRIPTION OF EACH VIBRATION CONTROL DEVICE. BSF - BASE, STEEL FRAME

RC

FPC - FLEXIBLE PIPE CONNECTIONS

FNC - FLOOR NEOPRENE RESTRAINED MOUNTS FSN - FLOOR SPRING AND NEOPRENE SPRING ISOLATOR

INLINE FANS, FLOOR MOUNTED

FSNTL - FLOOR SPRING AND NEOPRENE TRAVEL LIMITED RESTAINED SPRING ISOLATOR

HN - NEOPRENE HANGER HSN - SPRING AND NEOPRENE HANGER

NP - NEOPRENE PAD

RC - ROOF CURB 2. PROVIDE SUPPLEMENTAL STEEL WITHIN THE ROOF CURB TO SUPPORT DUCTWORK INDEPENDENT FROM THE ROOF CURB.

\* IN ADDITION TO ANY INTERNAL VIBRATION ISOLATION.

\*\* SYSTEM SHALL BE DESIGNED TO BE 90% EFFICIENT. \*\*\* WHERE OUTDOORS ALL COMPONENTS SHALL BE CADMIUM PLATED

## HVAC DUCT/PLENUM INSULATION

SYSTEM	INSULATION TYPE	MINIMUM INSTALLED INSULATION VALUES	NOMINAL DENSITY
INDOOR DUCT/PLENUM CONCEALED SA, RA, OA:	MINERAL FIBER BLANKET	2" R-6.0	3/4 LB/FT <sup>3</sup>
OTHER THAN PRE-MANUFACTURED LINEAR SUPPLY AND RETURN GRILLE PLENUMS.	MINERAL FIBER BOARD WITH REFLECTIVE VAPOR BARRIER.	2" R-6.0	3 LB/FT <sup>3</sup>
INDOOR DUCT/PLENUM EXPOSED SA AND RA: LOCATED WITHIN THE AIR-CONDITIONED SPACE IT SERVES.	NONE; UNLESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATION.	-	-
DUCT LINING DUCTS/PLENUMS INSTALLED OUTDOORS, ATTICS, AND CRAWL SPACES SA AND RA. SA AND RA DUCTWORK WHERE INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION, 15 FT UPSTREAM & DOWNSTREAM OF SUPPLY FANS, RETURN FANS WHETHER INDICATED OR NOT.	FIBROUS-GLASS DUCT LINER WITH CLEANABLE COMPOSITE COATING ON AIRSTREAM SIDE. METAL NOSING SHALL BE FURNISHED ON ALL LEADING EDGES. (REFER TO NOTES #1, #2, #4)	2" R-8.0	1.5 LB/FT <sup>3</sup>
DUCT LINING DUCTS/PENUMS INSTALLED IN INDOOR SPACES: EXPOSED AND CONCEALED SA OR RA DUCTWORK WHERE INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION, 15 FT UPSTREAM & DOWNSTREAM OF SUPPLY FANS.	FIBROUS-GLASS DUCT LINER WITH CLEANABLE COMPOSITE COATING ON AIRSTREAM SIDE. METAL NOSING SHALL BE FURNISHED ON ALL LEADING EDGES. (REFER TO NOTES #2, #4)	1-1/2" R-6.0	1.5 LB/FT³
ABOVEGROUND, OUTDOOR DUCT/PLENUM CONCEALED OR EXPOSED SA, RA, AND OA.	MINERAL FIBER BOARD (REFER TO NOTE #1)	2" R-8.0	3 LB/FT <sup>3</sup>

1. ALL DUCTWORK INSTALLED OUTDOOR: PROVIDE A PRE-MANUFACTURED SELF ADHERING PRODUCT WITH AN UV RESISTANT, STUCCO EMBOSSED FACING. WATER VAPOR TRANSMISSION OF THE INSTALLED PRODUCT SHALL BE .020 PERMS OR LESS. PRODUCT SHALL BE SUITABLE FOR CONTINUOUS USE IN LOW TEMPERATURES OF -10°F. MANUFACTURERS SHALL BE SIMILAR TO FLEX-CLAD 400, MFM BUILDING PRODUCTS CORP. OR ALUMAGUARD 60, POLYGUARD PRODUCTS, INC.

2. INSULATION TYPES INDICATED IN THE SCHEDULE SHALL USED UNLESS OTHERWISE INDICATED ON THE PLANS OR SPECIFICATIONS.

3. CLOSED CELL, FIBER FREE, ANTI-MICROBIAL COATED, LOW VOC CERTIFIED, MOISTURE AND MOLD RESISTANT DUCT LINING SHALL BE PROVIDED IN DUCTWORK AND EQUIPMENT WITHIN HOSPITAL AND HEALTHCARE FACILITIES AND ROOMS CLASSIFIED AS MOIST OR WET ENVIRONMENTS WHERE THIS SCHEDULE, DRAWINGS AND SPECIFICATION INDICATE DUCT LINING.

4. DUCTWORK SHALL BE FIRE WRAPPED FROM THE APPLIANCE CONNECTION TO THE TERMINATION POINT.

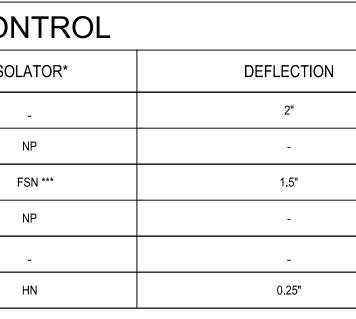
OA = OUTDOOR AIR DUCTWORK

SA = SUPPLY AIR DUCTWORK

RA = RETURN AIR DUCTWORK EA = EXHAUST AIR DUCTWORK

ITEM	MANUFACTURER	MODEL	LOCATION	HORSEPOWER	VOLT/PHASE		EQUIPME
					IN	OUT	SERVE
VFD-1	AESA BROWN BOVERI	ACH550 + F267	OUTDOOR AT GRADE	REFER TO NOTE #1	208/3	208/3	RAF-1
NOTES							

NOTES: 1. REFER TO EQUIPMENT SCHEDULES FOR HORSEPOWER REQUIREMENTS. THE CONTRACTOR SHALL COORDINATE FINAL VFD SIZING WITH RATED MOTOR AMPS INDICATED ON APPROVED SHOP DRAWINGS FOR THE EQUIPMENT SERVED. 2. ALL VFD'S SHALL BE PROVIDED WITH ELECTRONIC BYPASS AND SERVICE SWITCH.

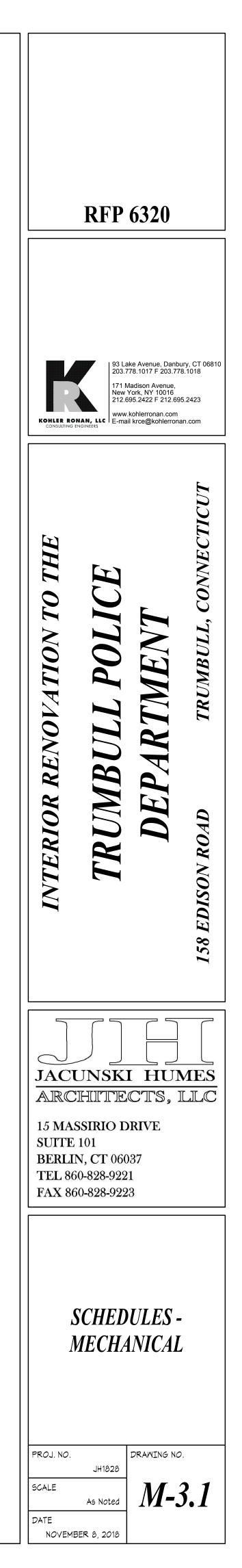


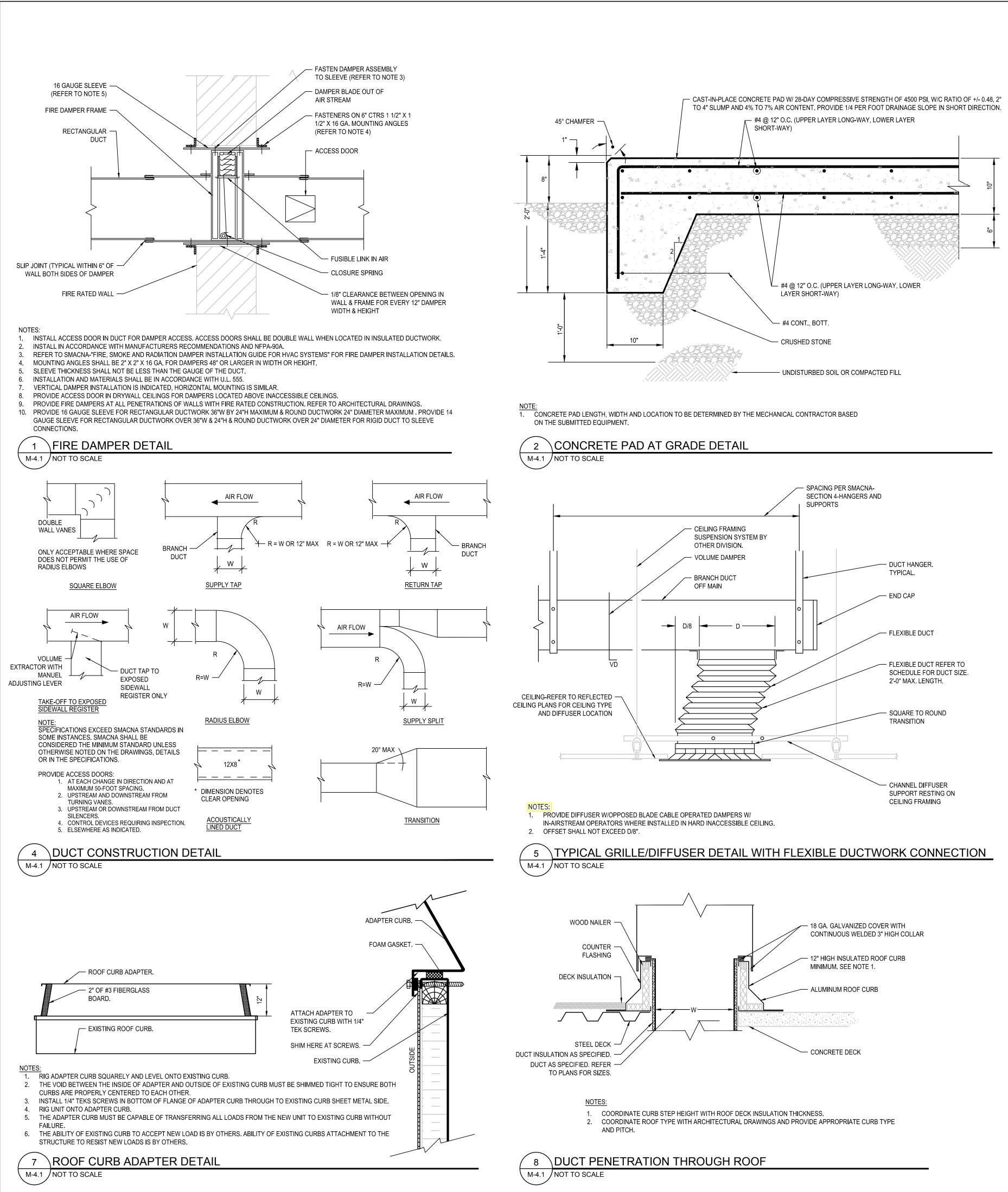
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MENT REMARKS /ED FREE-STANDING WITH UNI-STRUT SUPPORTS. PROVIDE NEMA 4X ENCLOSURE

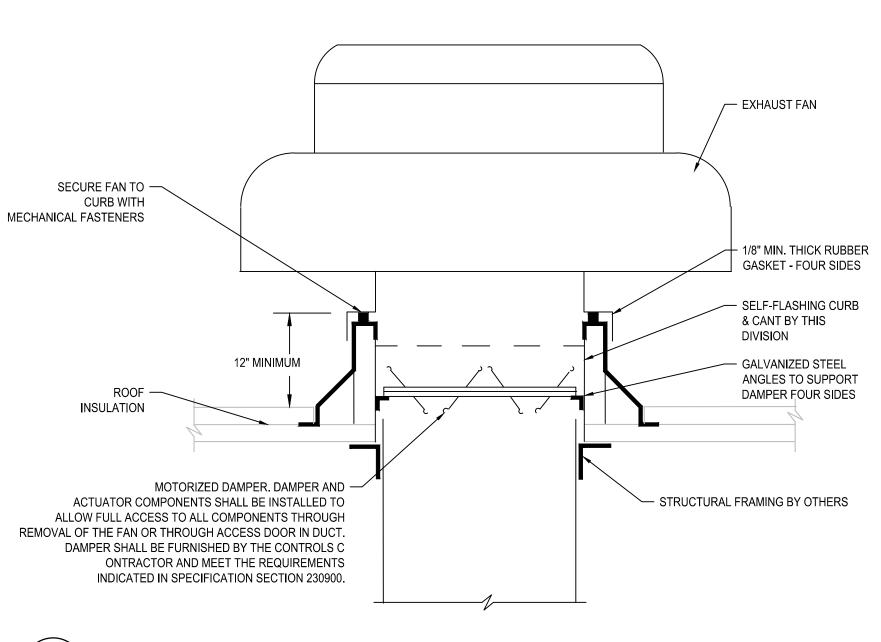




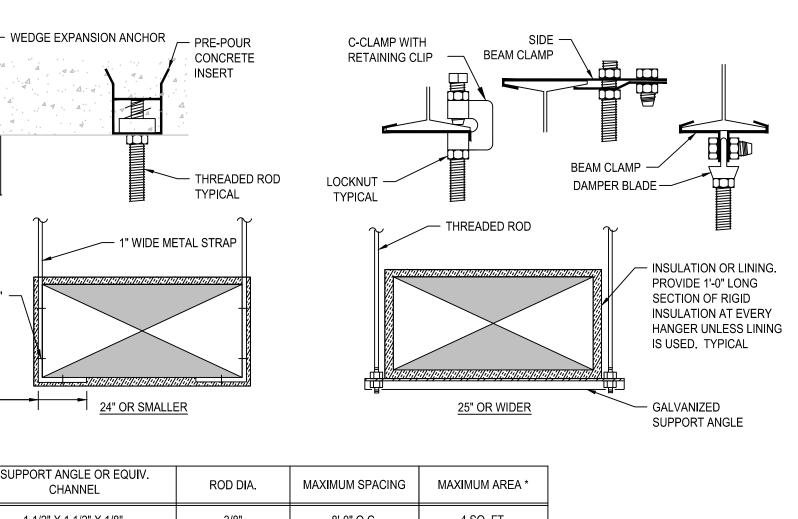
## 冒 首 NUT & WASHER -METAL STRAP -SHEET METAL SCREWS EVERY 6" O.C. FOR FULL HEIGHT OF DUCT. PROVIDE MINIMUM OF TWO ON DUCTS SMALLER THAN 6" 2" MINIMUM —— 24" OR SMALLER

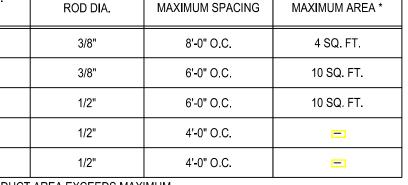
DUCT WIDTH	SUPPORT ANGLE OR EQUIV. CHANNEL
25" TO 30"	1 1/2" X 1 1/2" X 1/8"
31" TO 42"	1 1/2" X 1 1/2" X 1/8"
43" TO 60"	1 1/2" X 1 1/2" X 1/8"
61" TO 84"	2" X 2" X 1/4"
85" AND UP	2" X 2" X 1/4"
* REDUCE SPACING	G TO NEXT SMALLER INTERVAL IF D



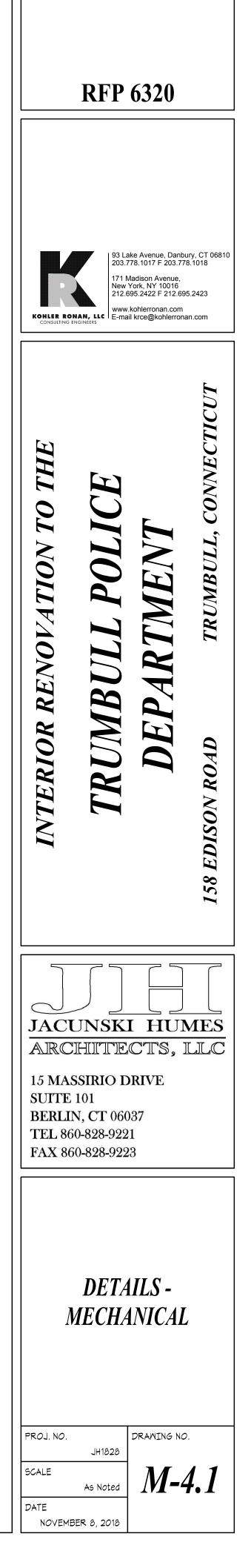


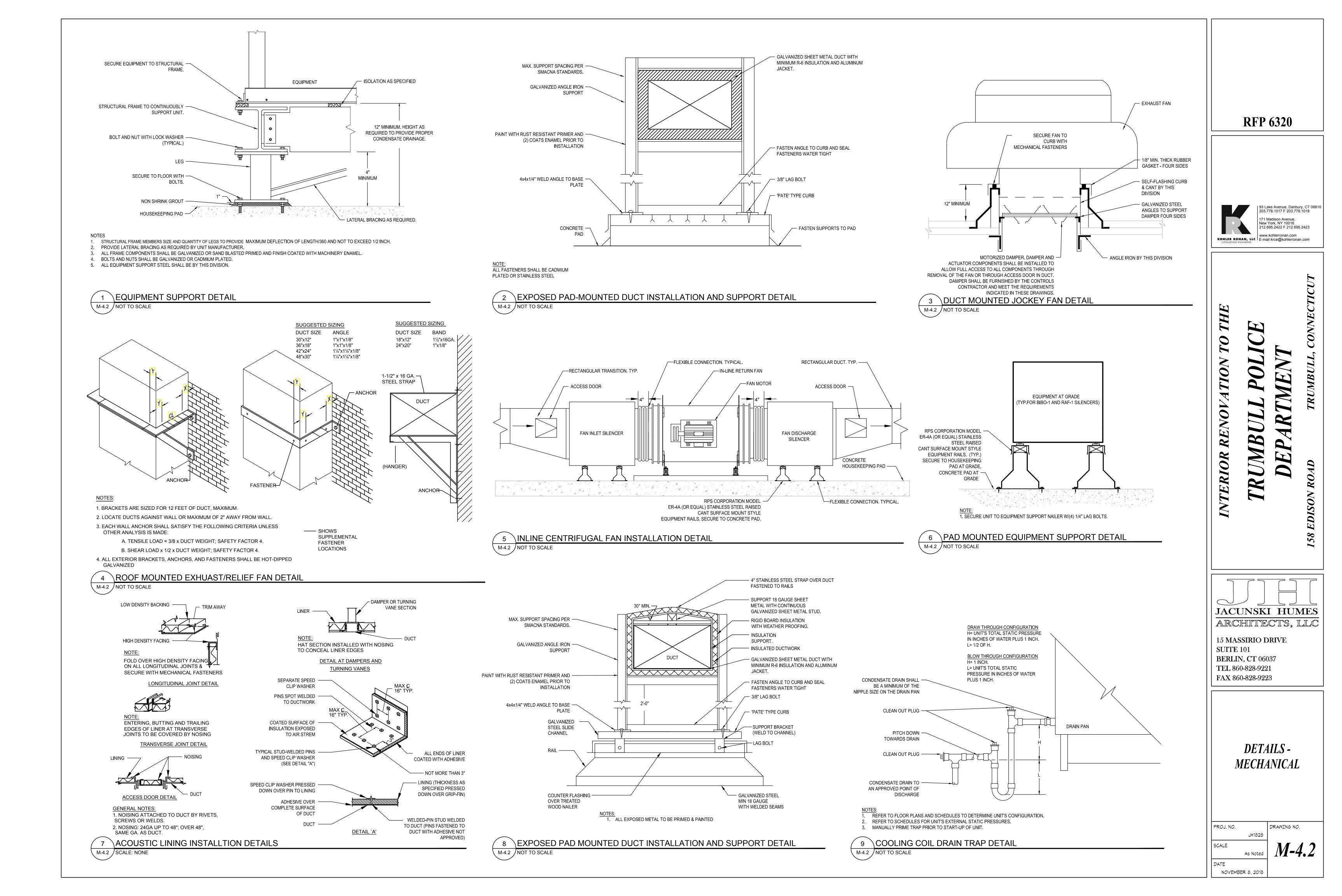






DUCT AREA EXCEEDS MAXIMUM





#### EQUIPMENT AND DUCTWORK IDENTIFICATION

CONSULT THE OWNER AS TO ANY LABELING STANDARDS INCLUDING NAMING CONVENTIONS, STANDARD LABELING MATERIALS AND LABELING COLOR CONVENTIONS. ALL NEW VALVE AND EQUIPMENT TAGS SHALL MATCH THE BUILDING STANDARD, WHERE NO STANDARD EXISTS, PROVIDE THE FOLLOWING:

ACTION SUBMITTALS:

PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.

SAMPLES: FOR COLOR, LETTER STYLE, AND GRAPHIC REPRESENTATION REQUIRED FOR EACH IDENTIFICATION MATERIAL AND DEVICE.

EQUIPMENT LABEL SCHEDULE: INCLUDE A LISTING OF ALL EQUIPMENT TO BE LABELED WITH THE PROPOSED CONTENT FOR EACH LABEL.

#### COORDINATION:

COORDINATE INSTALLATION OF IDENTIFYING DEVICES WITH COMPLETION OF COVERING AND PAINTING OF SURFACES WHERE DEVICES ARE TO BE APPLIED. COORDINATE INSTALLATION OF IDENTIFYING DEVICES WITH LOCATIONS OF ACCESS PANELS AND DOORS. INSTALL IDENTIFYING DEVICES BEFORE INSTALLING CEILINGS AND SIMILAR CONCEALMENT.

### EQUIPMENT LABELS:

PLASTIC LABELS FOR EQUIPMENT:

MATERIAL AND THICKNESS: MULTILAYER, MULTICOLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING, 1/8" THICK, AND HAVING PREDRILLED HOLES FOR ATTACHMENT HARDWARE.

LETTER COLOR: WHITE.

BACKGROUND COLOR: BLACK.

MINIMUM LABEL SIZE: LENGTH AND WIDTH VARY FOR REQUIRED LABEL CONTENT, BUT NOT LESS THAN 5 BY 3 INCHES.

MINIMUM LETTER SIZE: 1 INCH FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 24 INCHES, 2 INCH FOR VIEWING DISTANCES UP TO 72 INCHES, AND PROPORTIONATELY LARGER LETTERING FOR GREATER VIEWING DISTANCES. INCLUDE SECONDARY LETTERING TWO-THIRDS TO THREE-FOURTHS THE SIZE OF PRINCIPAL LETTERING.

FASTENERS: STAINLESS-STEEL RIVETS OR SELF-TAPPING SCREWS; ADHESIVE FOR LOCATIONS WERE SCREWS OR RIVETS WOULD VOID WARRANTY OF EQUIPMENT.

LABEL CONTENT: INCLUDE EQUIPMENT'S DRAWING DESIGNATION OR UNIQUE EQUIPMENT NUMBER, EQUIPMENT DESCRIPTION, AND ELECTRICAL PANEL DESIGNATION SERVING THE EQUIPMENT.

EQUIPMENT LABEL SCHEDULE: FOR EACH ITEM OF EQUIPMENT TO BE LABELED, ON 8-1/2-BY-11-INCH BOND PAPER. TABULATE EQUIPMENT IDENTIFICATION NUMBER AND IDENTIFY DRAWING NUMBERS WHERE EQUIPMENT IS INDICATED (PLANS, DETAILS, AND SCHEDULES), PLUS THE SPECIFICATION SECTION NUMBER AND TITLE WHERE EQUIPMENT IS SPECIFIED. EQUIPMENT SCHEDULE SHALL BE INCLUDED IN OPERATION AND MAINTENANCE DATA.

IDENTIFICATION FOR HVAC DUCTWORK:

#### DUCT LABELS

STENCILS: MINIMUM LETTER HEIGHT OF 2 INCHES FOR DUCTS; AND MINIMUM LETTER HEIGHT OF 1 INCH FOR ACCESS PANEL AND DOOR LABELS, EQUIPMENT LABELS, AND SIMILAR OPERATIONAL INSTRUCTIONS.

STENCIL MATERIAL: FIBERBOARD OR METAL.

PAINT: EXTERIOR, ACRYLIC ENAMEL IN COLORS AS INDICATED.

LABEL CONTENTS: INCLUDE IDENTIFICATION OF DUCT SERVICE USING SAME DESIGNATIONS AS USED ON DRAWINGS, DUCT SIZE, AND AN ARROW INDICATING FLOW DIRECTION.

### EXECUTION

#### PREPARATION

CLEAN EQUIPMENT SURFACES OF SUBSTANCES THAT COULD IMPAIR BOND OF IDENTIFICATION DEVICES, INCLUDING DIRT, OIL, GREASE, RELEASE AGENTS, AND INCOMPATIBLE PRIMERS, PAINTS, AND ENCAPSULATIONS.

#### EQUIPMENT LABEL INSTALLATION

PERMANENTLY FASTEN LABELS ON EACH MAJOR ITEM OF MECHANICAL EQUIPMENT.

LOCATE EQUIPMENT LABELS WHERE ACCESSIBLE AND VISIBLE. WHERE EQUIPMENT IS LOCATED WITHIN FINISHED SPACES, EQUIPMENT LABELS SHALL NOT BE LOCATED ON THE FACE OF THE EQUIPMENT; WHERE POSSIBLE, THE LABEL SHALL BE LOCATED ON THE LEAST CONSPICUOUS SIDE.

ALL MOTOR DRIVEN EQUIPMENT, HVAC COMPONENTS, AND MAJOR ELECTRICAL BOXES SHALL BE INDIVIDUALLY NUMBERED. (EXAMPLE: FOR UNIT HEATERS, USE UH-1, UH-2, ETC., EVEN THOUGH BOTH UNITS ARE OF THE SAME SIZE AND TYPE.) ALL DESIGNATIONS SHALL BE UNIQUE, INTEGRATED WITH AND DISTINGUISHED FROM OTHER DESIGNATIONS.

THE CONTRACTOR SHALL MAKE IT POSSIBLE FOR THE PERSONNEL OPERATING AND MAINTAINING THE EQUIPMENT AND SYSTEMS IN THIS PROJECT TO READILY IDENTIFY THE VARIOUS PIECES OF EQUIPMENT, VALVES, PIPING, ETC., BY MARKING THEM. ALL ITEMS OF EQUIPMENT SUCH AS FANS, PUMPS, ETC., SHALL BE CLEARLY MARKED USING ENGRAVED NAMEPLATES AS HEREINAFTER SPECIFIED. THE ITEM OF EQUIPMENT SHALL INDICATE THE SAME NUMBER AS SHOWN ON THE DRAWINGS.

DUCT LABEL INSTALLATION

STENCILED DUCT LABEL: STENCILED LABELS, SHOWING SERVICE AND FLOW DIRECTION.

LETTERING AND ARROWS COLOR SHALL MEET THE OWNER'S STANDARDS. IF NO STANDARD EXISTS, CONFIRM THE FOLLOWING COLOR SCHEME IS ACCEPTABLE PRIOR TO COMMENCEMENT OF WORK:

BLUE: FOR OUTSIDE AIR SUPPLY DUCTS.

YELLOW: FOR HOT AIR SUPPLY DUCTS, COLD AIR SUPPLY DUCTS, AND COMBINED HOT/COLD AIR SUPPLY DUCTS.

GREEN: FOR EXHAUST, RELIEF, RETURN, AND MIXED AIR DUCTS.

#### LOCATE LABELS/STENCILS:

NEAR POINTS WHERE DUCTS ENTER INTO CONCEALED SPACES.

AT MAXIMUM INTERVALS OF 25 FEET IN EACH SPACE WHERE DUCTS ARE EXPOSED OR CONCEALED BY REMOVABLE CEILING SYSTEM.

AT ALL CHANGES OF DIRECTION.

### ENCLOSURES.

NEAR MAJOR EQUIPMENT ITEMS AND OTHER POINTS OF ORIGINATION AND TERMINATION.

## ENGINEER PRIOR TO THE COMMENCEMENT.

DUCTWORK

DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESSES, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, ELBOWS, TURNING VANES, AND HANGERS AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" LATEST EDITION, AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA BASED ON PRESSURE & LEAKAGE CLASSES INDICATED IN THE "DUCT PRESSURE CLASS" SCHEDULE; UNLESS OTHERWISE NOTED. ROUND DUCTWORK SHALL BE SPIRAL SEAM. MINIMUM DUCT SHEET METAL THICKNESS SHALL BE 24 GAUGE.

LEAKAGE CLASS: FLEXIBLE SUPPLY-AIR DUCT: 6 CFM/100 SQ. FT. AT 1-INCH WG.

DUCT ACCESS DOORS SHALL BE CONSTRUCTED OF DOUBLE WALL OF THE SAME OR GREATER GAUGE AS DUCTWORK. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. GASKET ALL EDGES AIRTIGHT. SIZE ACCESS DOORS TO PERMIT MAINTENANCE. MINIMUM SIZE 15" x 15" OR AS LARGE AS AVAILABLE DUCT SPACE WILL ALLOW. ACCESS DOORS LESS THAN 12 INCHES SQUARE: PIANO HINGE AND LOCKS, ACCESS DOORS UP TO 18 INCHES SQUARE: TWO HINGES AND TWO LOCKS, SIMILAR TO VENTLOCK 100.

WATER-BASED JOINT AND SEAM SEALANT: APPLICATION BRUSH ON, SYNTHETIC RUBBER RESIN BASE SOLVENT: TOLUENE AND HEPTANE, SOLIDS CONTENT: MINIMUM 60 PERCENT, SHORE A HARDNESS: MINIMUM 60, WATER RESISTANT, MOLD AND MILDEW RESISTANT, VOC: MAXIMUM 395 G/L., MAXIMUM STATIC-PRESSURE CLASS: 10-INCH WG, POSITIVE OR NEGATIVE. SERVICE: INDOOR OR OUTDOOR. SUBSTRATE: COMPATIBLE WITH GALVANIZED SHEET STEEL (BOTH PVC COATED AND BARE), STAINLESS STEEL, OR ALUMINUM SHEETS.

FLANGED JOINT SEALANT: COMPLY WITH ASTM C 920.; GENERAL: SINGLE-COMPONENT, ACID-CURING, SILICONE, ELASTOMERIC, TYPE: S, GRADE: NS, CLASS: 25, USE: O.

FLANGE GASKETS: BUTYL RUBBER, NEOPRENE, OR EPDM POLYMER WITH POLYISOBUTYLENE PLASTICIZER.

MAKE CONNECTIONS TO EQUIPMENT WITH FLEXIBLE CONNECTORS OF FLAME-RETARDANT OR NONCOMBUSTIBLE FABRICS. MANUFACTURERS; DUCTMATE INDUSTRIES, INC., DURO DYNE INC., VENTFABRICS, INC., WARD INDUSTRIES, INC.; A DIVISION OF HART & COOLEY, INC.

VOLUME DAMPERS: PROVIDE SOLID, SQUARE AXLES FULL LENGTH OF DAMPER BLADES, ZERO LEAK BEARINGS AT BOTH ENDS OF OPERATING SHAFT AND POSITIVE LOCKING QUADRANTS. PROVIDE STAND-OFFS FOR EXTERNALLY LINED DUCTS. DAMPER BLADES SHALL BE MINIMUM 22 GAUGE. DAMPER BLADES, END BEARINGS, LOCKING QUADRANTS SHALL BE SIMILAR TO ROSSI EVERLOCK OR ELGEN.

SEAL OPENING AROUND DUCTS THROUGH WALLS WITH MINERAL WOOL OR OTHER NON-COMBUSTIBLE MATERIAL.

STOPPING MATERIALS.

CONSTRUCT FLEXIBLE CONNECTIONS OF NEOPRENE-COATED FLAMEPROOF FABRIC CRIMPED INTO DUCT FLANGES FOR ATTACHMENT TO DUCT AND EQUIPMENT.

FLEXIBLE DUCT SHALL BE CONSTRUCTED OF TWO-PLY LAMINATE MECHANICALLY CORRUGATED BONDED ALUMINUM INNER CORE COVERED BY ONE INCH THICK FIBERGLASS INSULATION OF ONE POUND DENSITY. FIBERGLASS SHALL BE COVERED WITH A 2.5 MIL POLYETHYLENE VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET THE LATEST REQUIREMENTS OF UL STANDARD 181, CLASS 1, FLEXIBLE AIR DUCT. DUCT TO BE RATED FOR 10 INCHES POSITIVE OR NEGATIVE PRESSURE.. MANUFACTURERS; FLEXMASTER U.S.A., INC., MCGILL AIRFLOW LLC., WARD INDUSTRIES, INC.; A DIVISION OF HART & COOLEY, INC.

DUCT LINING

REFER TO "HVAC DUCT INSULATION" SCHEDULE FOR APPLICATIONS & VALUES.

FLEXIBLE ELASTOMERIC DUCT LINER: PREFORMED, CELLULAR, CLOSED-CELL, SHEET MATERIALS COMPLYING WITH ASTM C 534, TYPE II, GRADE 1; AND WITH NFPA 90A OR NFPA 90B.

FOLLOWING:

AEROFLEX USA INC. AEROCELL ARMACELL LLC SA DUCT LINER K-FLEX DUCTLINER

SURFACE-BURNING CHARACTERISTICS: MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO UL 723; CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY.

LINEAR ADHESIVE: AS RECOMMENDED BY INSULATION MANUFACTURER AND COMPLYING WITH NFPA 90A OR NFPA 90B.

FOR INDOOR APPLICATIONS, ADHESIVE SHALL HAVE A VOC CONTENT OF 50 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).

INSULATION PINS AND WASHERS: CUPPED-HEAD, CAPACITOR-DISCHARGE-WELD PINS: COPPER-OR-ZINC-COATED STEEL PIN, FULLY ANNEALED FOR CAPACITOR-DISCHARGE WELDING, 0.135-INCH-DIAMETER SHANK, LENGTH TO SUIT DEPTH OF INSULATION INDICATED WITH INTEGRAL 1-1/2-INCH GALVANIZED CARBON-STEEL WASHER

#### DUCT INSULATION

REFER TO "HVAC DUCT INSULATION" SCHEDULE FOR APPLICATIONS & VALUES. COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION CODE. LATEST ADOPTED VERSION.

PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY, OR MERCURY COMPOUNDS. ACCEPTABLE MANUFACTURERS INCLUDE: CERTAINTEED CORP.; COMMERCIAL BOARD., FIBREX INSULATIONS INC.; FBX., JOHNS MANVILLE; 800 SERIES SPIN-GLAS., KNAUF INSULATION; INSULATION BOARD., MANSON INSULATION INC.; AK BOARD., OWENS CORNING;, FIBERGLAS 700 SERIES.

PIPING, FITTINGS & PIPING ACCESSORIES

REFER TO "HVAC PIPING/TUBING MATERIAL, JOINTS & FITTINGS" SCHEDULE FOR PIPE MATERIALS, APPLICATION, RATINGS & FITTINGS.

### DIVISION OF WATTS WATER TECHNOLOGIES, INC

DIELECTRIC UNIONS: FACTORY-FABRICATED UNION ASSEMBLY, FOR 250-PSIG MINIMUM WORKING PRESSURE AT 180°F.

BOTH SIDES OF PENETRATIONS THROUGH WALLS, FLOORS, CEILINGS, AND INACCESSIBLE

LABELING/STENCILING OF ALL EXPOSED DUCTWORK SHALL BE COORDINATED WITH THE ARCHITECT AND

REFER TO "HVAC DUCT MATERIAL" SCHEDULE, FOR DUCT MATERIALS PER APPLICATION.

RECTANGULAR SUPPLY-AIR DUCT: 6 CFM/100 SQ. FT. AT 1-INCH WG.

SEAL ALL PENETRATIONS THROUGH FIRE SEPARATION WITH AN APPROVED UL LISTED ASSEMBLY AND FIRE

MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE

DIELECTRIC FITTINGS; MANUFACTURERS, HART INDUSTRIES INTERNATIONAL, INC., WATTS REGULATOR CO.; A

DESCRIPTION: COMBINATION FITTING OF COPPER-ALLOY AND FERROUS MATERIALS WITH THREADED, SOLDER-JOINT, PLAIN, OR WELD-NECK END CONNECTIONS THAT MATCH PIPING SYSTEM MATERIALS. INSULATING MATERIAL: SUITABLE FOR SYSTEM FLUID, PRESSURE, AND TEMPERATURE.

DIELECTRIC COUPLINGS: GALVANIZED-STEEL COUPLING WITH INERT AND NON-CORROSIVE THERMOPLASTIC

LINING; THREADED ENDS; AND 300-PSIG MINIMUM WORKING PRESSURE AT 225°F.	
PIPE JOINT CONSTRUCTION REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS. REMOVE SCALE, SLAG, DIRT, AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPE AND FITTINGS BEFORE ASSEMBLY.	
SOLDERED JOINTS: APPLY ASTM B 813, WATER-FLUSHABLE FLUX, UNLESS OTHERWISE INDICATED, TO TUBE END. CONSTRUCT JOINTS ACCORDING TO ASTM B 828 OR CDA'S "COPPER TUBE HANDBOOK," USING LEAD-FREE SOLDER ALLOY COMPLYING WITH ASTM B 32.	T
COOF MOUNTED EXHAUST FANS	<u>TI</u>
BELT-DRIVEN CENTRIFUGAL FAN CONSISTING OF HOUSING, WHEEL, FAN SHAFT, BEARINGS, MOTOR AND DISCONNECT SWITCH, DRIVE ASSEMBLY, CURB BASE, AND ACCESSORIES. ACCEPTABLE MANUFACTURERS INCLUDE GREENHECK, COOK, AND EQUIVALENT PRODUCTS.	
FAN WHEEL: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES.	<u>SI</u>
BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY MOUNTED TO THE HOUSING, WITH THE FOLLOWING FEATURES: PULLEYS: CAST-IRON, ADJUSTABLE-PITCH.	
SHAFT BEARINGS: PERMANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS. FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL DRIVE SHAFT KEYED TO WHEEL HUB.	
FAN DRIVE AND MOTOR ISOLATED FROM EXHAUST AIR STREAM. DISCONNECT SWITCH: NONFUSIBLE TYPE, (WITH INTERNAL MOTOR THERMAL OVERLOAD PROTECTION MOUNTED	
INSIDE FAN HOUSING), FACTORY-WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT. DAMPERS: COUNTERBALANCED, PARALLEL-BLADE, MOTORIZED DAMPERS MOUNTED IN CURB BASE, FACTORY SET TO CLOSE WHEN FAN STOPS.	
BLADES: DIE-FORMED SHEET ALUMINUM.	

FRAME: EXTRUDED ALUMINUM, WITH WATERPROOF, FELT BLADE SEALS.

LINKAGE: NONFERROUS METALS, CONNECTING BLADES TO COUNTER WEIGHT OR OPERATOR.

CLEANING, BALANCING AND ADJUSTMENT

THOROUGHLY CLEAN ALL NEW APPARATUS AND EQUIPMENT (AHUS, FANS, COILS, REPLACE FILTERS) PRIOR TO PLACING IN OPERATION. CALIBRATE COMPONENTS AND REPLACE FAULTY COMPONENTS AS REQUIRED.

AIR BALANCING SHALL BE PROVIDED UNDER THIS CONTRACT IN COMPLIANCE WITH THE BELOW. AIR BALANCING WORK SHALL BE PERFORMED BY AN INDEPENDENT NEEB CERTIFIED COMPANY, NOT ASSOCIATED WITH THE CONTRACTOR.

PROVIDE AIR READINGS BEFORE THE COMMENCEMENT OF WORK AS INDICATED ON THE CONTRACT DRAWINGS.

MARK EQUIPMENT SETTINGS, INCLUDING DAMPER CONTROL POSITIONS, DEVICES, TO SHOW FINAL SETTINGS AT COMPLETION OF BALANCING. PROVIDE MARKINGS WITH PAINT OR OTHER SUITABLE PERMANENT IDENTIFICATION MATERIALS.

TEST, ADJUST, AND BALANCE AIR DISTRIBUTION SYSTEMS TO PROVIDE AIR QUANTITIES INDICATED WITHIN PLUS 5 PERCENT.

SUBMIT A TEST REPORT INDICATING QUANTITY OF AIR AT EACH OUTLET AFTER BALANCING. LIST OBVIOUS NOISE AND AIR DRAFT PROBLEMS AND RECOMMENDED CORRECTIVE ACTION.

### CUTTING, ALTERING AND PATCHING

PROVIDE ALL CUTTING, CHASING, DRILLING, ALTERING AND ROUGH PATCHING REQUIRED FOR THE WORK OF THIS DIVISION.

INCLUDING THE RESTORING OF EXISTING WORK CUT FOR OR DAMAGED BY INSTALLATION OF NEW WORK, AND WHERE PRESENT WORK IS REMOVED.

ALL MATERIALS AND WORKMANSHIP REQUIRED IN CONNECTION WITH CUTTING, ALTERING AND ROUGH PATCHING SHALL MATCH THE EXISTING WORK IN EVERY RESPECT.

DO ALL SHORING, BRACING, CUTTING, PATCHING, PIECING OUT, FILLING IN, REPAIRING AND REFINISHING OF ALL PRESENT WORK AS MADE NECESSARY BY THE ALTERATION AND THE INSTALLATION OF NEW WORK.

ALL HOLES AND OPENINGS OCCURRING IN THE EXISTING FLOORS AFTER EQUIPMENT, PARTITIONS, FLOORS, STEEL WORK, CONDUITS AND PIPES ARE REMOVED OR INSTALLED SHALL BE CLOSED UP WITH MATERIALS SIMILAR TO THE ADJACENT WORK.

THE SIZE AND LOCATION OF ITEMS REQUIRING AN OPENING, CHASE OR OTHER PROVISIONS TO RECEIVE IT SHALL BE GIVEN BY THE TRADE REQUIRING SAME IN AMPLE TIME TO AVOID UNDUE CUTTING OF ANY NEW WORK TO BE INSTALLED. THESE PROVISIONS SHALL NOT RELIEVE THE CONTRACTOR FROM KEEPING INFORMED AS TO THE REQUIRED OPENING, CHASES, ETC., NOR FROM RESPONSIBILITY FOR THE CORRECTNESS THEREOF, NOR FOR CUTTING AND REPAIRING AFTER THE NEW WORK IS IN PLACE.

INCLUDE ALL CUTTING, REPAIRING AND PATCHING IN CONNECTION WITH THE WORK THAT MAY BE REQUIRED TO MAKE THE SEVERAL PARTS COME TOGETHER PROPERLY AND FIT IT TO RECEIVE OR BE RECEIVED BY THE WORK OF OTHER TRADES, AS SHOWN ON THE DRAWINGS AND/OR SPECIFIED, OR REASONABLY IMPLIED BY THE DRAWINGS AND SPECIFICATIONS.

ALL REPAIRING, PATCHING, PIECING-OUT, FILLING-IN, RESTORING AND REFINISHING SHALL BE NEATLY DONE BY MECHANICS SKILLED IN THEIR TRADE TO LEAVE SAME IN CONDITION SATISFACTORY TO THE OWNER.

MATERIALS AND THEIR METHODS OF APPLICATION FOR PATCHING SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF THE SPECIFICATIONS.

MATERIALS AND WORKMANSHIP NOT COVERED BY THE SPECIFICATIONS AND ITEMS OF WORK EXPOSED TO VIEW ADJOINING EXISTING WORK; TO REMAIN SHALL; CONFORM TO SIMILAR MATERIALS AND WORKMANSHIP EXISTING IN OR ADJACENT TO THE SPACES TO BE ALTERED.

CUTTING, REPAIRING AND PATCHING SHALL INCLUDE ALL ITEMS SHOWN ON THE DRAWINGS, SPECIFIED IN THE SPECIFICATIONS OR REQUIRED BY THE INSTALLATION OF NEW WORK OR THE REMOVAL OF EXISTING WORK.

REMOVE PARTITIONS, WALLS, SUSPENDED CEILINGS, ETC., AS NECESSARY TO PERFORM THE REQUIRED ALTERATIONS OR NEW CONSTRUCTION WORK.

AVOID DAMAGE TO CONSTRUCTION AND FINISHES THAT ARE TO REMAIN.

PROTECT AND BE RESPONSIBLE FOR THE EXISTING BUILDING, FACILITIES AND IMPROVEMENTS.

ANY DISTURBANCE OR DAMAGE TO THE WORK, THE EXISTING BUILDING, AND IMPROVEMENTS, OR ANY IMPAIRMENTS OF FACILITIES RESULTING FROM THE CONSTRUCTION OPERATIONS, SHALL BE PROMPTLY RECTIFIED, WITH THE DISTURBED, DAMAGED, OR IMPAIRED WORK, RESTORED, REPAIRED OR REPLACED AT NO EXTRA COST.

ALL ALTERATIONS WHICH ARE NOT INDICATED ON THE DRAWINGS NOR SPECIFIED HEREIN BUT NECESSARY TO MAKE GOOD EXISTING WORK DISTURBED BY REASON OF THE WORK SHALL BE RESTORED TO A CONDITION SATISFACTORY TO THE OWNER.

DISTURBED CONCRETE AND /OR CEMENT FLOOR AREAS SHALL BE PATCHED WITH APPROVED TYPE LATEX MORTAR.

WHEN CEMENT MORTAR IS USED FOR PATCHING, THE SURFACES SHALL BE DEPRESSED A MINIMUM DEPTH OF

EMPORARY OPENINGS

ALL TEMPORARY OPENINGS CUT IN WALLS, FLOORS OR CEILINGS FOR PIPE OR DUCTWORK SHALL BE CLOSED OFF WITH TRANSITE OR AN EQUALLY NON-COMBUSTIBLE MATERIAL EXCEPT WHEN MECHANICS ARE ACTUALLY WORKING AT THE PARTICULAR OPENING.

HUTDOWN OF EXISTING BUILDING SYSTEMS

DO NOT INTERRUPT EXISTING SERVICES OR SYSTEMS IN THE BUILDING UNLESS ABSOLUTELY NECESSARY. SUCH INTERRUPTIONS AND INTERFERENCES MUST BE MADE AS BRIEF AS POSSIBLE AND ONLY AFTER COORDINATION WITH THE OWNER. THE OWNER REQUIRES A MINIMUM OF SEVEN (7) DAYS NOTICE. OBTAIN PRIOR PERMISSION, IN WRITING.

WHERE THE WORK MAKES TEMPORARY INTERRUPTIONS UNAVOIDABLE, THEY SHALL BE MADE DURING OFF HOURS OR AS OTHERWISE DIRECTED BY THE OWNER.

ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVERTIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO EXISTING WORK.

ELECTRICAL WORK

ELECTRICAL POWER SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

CONTROL WIRING SHALL BE BY THE HVAC CONTRACTOR. CONTROL WIRING SHALL BE DEFINED AS ANY 12V, 24V OR 120V WIRING INSTALLED FOR PURPOSED OTHER THAN PROVIDING PRIMARY ELECTRICAL POWER TO EQUIPMENT.

MOTOR STARTERS SHALL BE FURNISHED BY THE HVAC CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

EXECUTION

THE PLANS AND SPECIFICATIONS ARE INTENDED TO PROVIDE A GENERAL SCOPE OF WORK.

WORK COORDINATION AND JOB OPERATIONS: THE MECHANICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES, PROVIDING TIMELY INFORMATION ON HIS NEEDS AND RESPOND IN A TIMELY MANNER TO REQUESTS BY OTHERS.

MATERIALS AND WORKMANSHIP: ALL MATERIALS SHALL BE NEW AND WITHOUT DAMAGED PARTS. ALL WORK SHALL BE ACCOMPLISHED BY WORKMEN TRAINED IN THAT PARTICULAR FUNCTION OR TASK.

PROTECTION AND CLEANUP: ALL MATERIALS SHALL BE SUITABLY STORED DURING CONSTRUCTION TO PREVENT DAMAGE AND/OR DETERIORATION. KEEP THE SITE CLEAN OF DEBRIS DUE TO THESE OPERATIONS. CAP/SEAL OR OTHERWISE PROTECT PIPING AND DUCTWORK FROM FOREIGN MATERIAL DURING CONSTRUCTION. AIR FILTERS UPSTREAM OF COILS SHALL BE CHANGED REGULARLY TO PREVENT BUILDUP OF MATERIAL ON COIL. FILTERS SHALL BE CHANGED AT LEAST WEEKLY OR WHEN FULLY LOADED.

SYSTEM STARTUP AND OPERATION: PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT TO PLACE THE HVAC SYSTEMS INTO OPERATION. MAINTAIN OPERATION DURING BALANCING AND INSTRUCTION PERIODS. INSURE ALL EQUIPMENT IS RUNNING PROPERLY WITH PROPER LUBRICATION, WITHOUT EXCESSIVE VIBRATION, AND PROPER ELECTRICAL CHARACTERISTICS. PROVIDE OWNER WITH ANY MANUALS, AIR BALANCE REPORTS PRODUCT MAINTENANCE SPECIFICATIONS, BROCHURES AND/OR DRAWINGS NEEDED FOR THE OPERATION AND MAINTENANCE OF NEW EQUIPMENT.

WARRANTY

THE CONTRACTOR SHALL WARRANTY ALL WORK FOR A PERIOD OF 12 MONTHS FROM ACCEPTANCE BY OWNER. DURING THIS WARRANTY PERIOD. CONTRACTOR SHALL RESPOND TO ALL CALLS FOR SERVICE, REPAIRS AND ADJUSTMENTS REQUIRED BY OWNER. CONTRACTOR SHALL INSTALL REPLACEMENT PARTS AND MATERIAL REQUIRED AT NO COST TO THE OWNER. ALL EQUIPMENT WARRANTIES SHALL BE TRANSFERRED TO OWNER AND SERVICED BY CONTRACTOR AS PART OF THIS CONTRACT.

**HVAC INSTRUMENTATION & CONTROLS** 

QUALITY ASSURANCE

ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

COMPLY WITH ASHRAE 135 FOR DDC SYSTEM COMPONENTS.

COORDINATION:

COORDINATE LOCATION OF THERMOSTATS, HUMIDISTATS, AND OTHER EXPOSED CONTROL SENSORS WITH PLANS AND ROOM DETAILS BEFORE INSTALLATION.

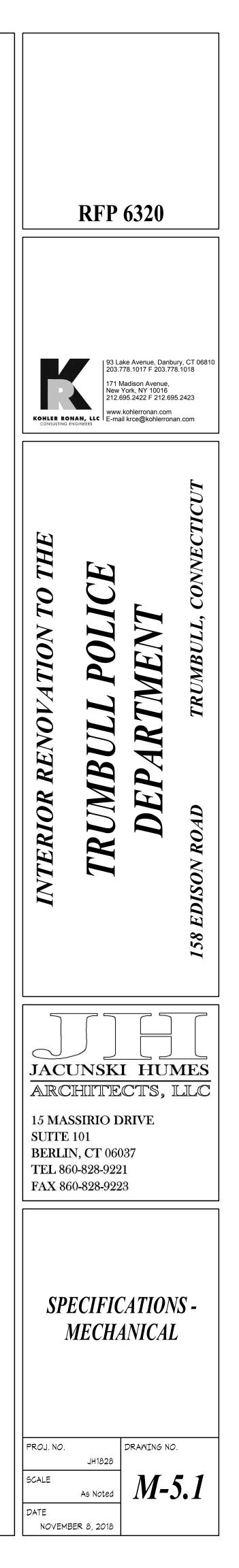
COORDINATE EQUIPMENT WITH DIVISION 16 TO ACHIEVE COMPATIBILITY WITH EQUIPMENT THAT INTERFACES WITH THE LIGHTING SYSTEM. COORDINATE EQUIPMENT WITH DIVISION 13 TO ACHIEVE COMPATIBILITY WITH EQUIPMENT THAT

INTERFACES WITH THE FIRE ALARM SYSTEM. COORDINATE SUPPLY OF CONDITIONED ELECTRICAL BRANCH CIRCUITS FOR CONTROL UNITS AND

OPERATOR WORKSTATION. COORDINATE EQUIPMENT WITH DIVISION 16 TO ACHIEVE COMPATIBILITY WITH STARTER COILS AND ANNUNCIATION DEVICES IN PANEL BOARDS.

MANUFACTURER:

CONTROL SYSTEM SHALL CONSIST OF SENSORS, INDICATORS, ACTUATORS, FINAL CONTROL ELEMENTS, INTERFACE EQUIPMENT, OTHER APPARATUS, ACCESSORIES, AND SOFTWARE CONNECTED TO DISTRIBUTED CONTROLLERS OPERATING IN MULTIUSER, MULTITASKING ENVIRONMENT ON TOKEN-PASSING NETWORK AND PROGRAMMED TO CONTROL MECHANICAL SYSTEMS. AN OPERATOR WORKSTATION PERMITS INTERFACE WITH THE NETWORK VIA DYNAMIC COLOR GRAPHICS WITH EACH MECHANICAL SYSTEM, BUILDING FLOOR PLAN, AND CONTROL DEVICE DEPICTED BY POINT-AND-CLICK GRAPHICS.



#### ROOFTOP AIR HANDLING UNIT HVAC-4

THE CONTRACTOR SHALL FURNISH AND INSTALL PACKAGED OUTDOOR AIR UNIT(S) AS SHOWN AND SCHEDULED ON THE CONTRACT DOCUMENTS. THE UNIT(S) SHALL BE INSTALLED IN ACCORDANCE WITH THIS SPECIFICATION AND PERFORM AT THE SPECIFIED CONDITIONS AS SCHEDULED.

APPROVED MANUFACTURERS:

TRANE: HORIZON SERIES

ADDISON: TRS-SERIES

VENMAR

SUBSTITUTIONS: AS INDICATED UNDER THE GENERAL AND/OR SUPPLEMENTAL CONDITIONS OF THESE SPECIFICATIONS. BIDDING CONTRACTOR SHALL BE RESPONSIBLE FOR ELECTRICAL AND MECHANICAL AND STRUCTURAL MODIFICATIONS REQUIRED WHEN SUBSTITUTING A PRODUCT OTHER THAN THE SPECIFIED PRODUCT. IT SHALL BE THE RESPONSIBILITY OF THE BIDDING CONTRACTOR TO MAKE THE SPECIFIER AWARE OF ANY MODIFICATIONS. AS BUILT DRAWING CHANGES IS THE RESPONSIBILITY OF THE CONTRACTOR SUBMITTING THE SUBSTITUTION.

GENERAL UNIT DESCRIPTION

UNIT(S) FURNISHED AND INSTALLED SHALL BE DX PACKAGED OUTDOOR AIR UNIT (S) AS SCHEDULED ON CONTRACT DOCUMENTS AND THESE SPECIFICATIONS. UNIT(S) SHALL CONSIST OF INSULATED WEATHER-TIGHT CASING WITH COMPRESSOR(S), AIR-COOLED CONDENSER COIL, CONDENSER FANS, EVAPORATOR COIL, AIR FILTERS, SUPPLY MOTORS AND UNIT CONTROLS.

BEFORE SHIPMENT, EACH UNIT(S) SHALL BE LEAK TESTED, DEHYDRATED, CHARGED WITH REFRIGERANT (R-410A) AND COMPRESSOR OIL, AND FACTORY RUN TESTED FOR PROPER CONTROL OPERATION.

CONDENSER COILS MUST HAVE A SERIES OF FLAT TUBES CONTAINING A SERIES OF MULTIPLE, PARALLEL FLOW MICROCHANNELS LAYERED BETWEEN THE REFRIGERANT MANIFOLDS. COIL CONSTRUCTION SHALL CONSIST OF ALUMINUM ALLOYS FOR FINS, TUBES, AND MANIFOLDS IN COMBINATION WITH A CORROSION-RESISTANT COATING.

DIRECT-DRIVE, VERTICAL DISCHARGE CONDENSER FANS MUST BE PROVIDED WITH BUILT-IN THERMAL OVERLOAD PROTECTION.

UNIT(S) SHALL HAVE LABELS, DECALS, AND/OR TAGS TO AID IN THE SERVICE OF THE UNIT AND INDICATE CAUTION AREAS.

UNIT(S) SHALL BE DEDICATED DOWNFLOW OR DEDICATED, THRU CURB HORIZONTAL AIRFLOW AS MANUFACTURED.

WIRING INTERNAL TO THE UNIT SHALL BE COLORED AND NUMBERED FOR IDENTIFICATION.

UNIT CASING

CABINET: ZINC-COATED, HEAVY GAUGE, GALVANIZED STEEL. EXTERIOR SURFACES SHALL BE CLEANED, PHOSPHATIZED, AND FINISHED WITH A WEATHER-RESISTANT BAKED ENAMEL FINISH. UNIT'S SURFACE SHALL BE TESTED 672 HOURS IN A SALT SPRAY TEST IN COMPLIANCE WITH ASTM B45. STRUCTURAL MEMBERS SHALL BE A MINIMUM OF 16 GAUGE WITH ACCESS DOORS AND REMOVABLE PANELS OF MINIMUM 20 GAUGE.

PANELS: 2" DOUBLE-WALL FOAMED PANEL CONSTRUCTION THROUGHOUT THE INDOOR SECTION OF UNIT TO PROVIDE NONPOROUS, CLEANABLE INTERIOR SURFACES. ALL INTERIOR SEAMS EXPOSED TO AIRFLOW SHALL BE SEALED.

INSULATION: 2" POLYISOCYANURATE FOAM METAL ENCAPSULATED WITH NO EXPOSED EDGES. INITIAL R VALUE OF 6.6 PER INCH OF THICKNESS.

CABINET CONSTRUCTION SHALL PROVIDE ACCESS PANELS FOR ALL PARTS REQUIRING SERVICE.

CABINET TOP COVER SHALL BE ONE PIECE CONSTRUCTION OR WHERE SEAMS EXIST, IT SHALL BE DOUBLE-HEMMED AND GASKET-SEALED.

PANELS: WATER- AND AIR-TIGHT HINGED PANELS WITH HANDLES SHALL PROVIDE ACCESS TO FILTERS, HEATING SECTION; OPTIONAL ERV AND POWER EXHAUST FAN SECTION, SUPPLY AIR FAN SECTION, EVAPORATOR COIL SECTION, AND UNIT CONTROL SECTION. DOOR HARDWARE SHALL BE ORIENTED TO ALLOW THE DOOR SWING TO BE REVERSED.

LATCHES WITH HOLD DOWN HOOKS WILL BE FACTORY INSTALLED ON HINGED ACCESS DOORS.

UNIT SHALL INCLUDE A MOTOR OPERATED OUTSIDE AIR DAMPER AND OPTIONAL RETURN AIR DAMPER ASSEMBLY CONSTRUCTED OF GALVANIZED STEEL, AND AIR FOIL BLADES WITH RUBBER EDGE SEALS. DAMPER BLADES SHALL BE DESIGNED TO HAVE NO MORE THAN 4 CFM OF LEAKAGE PER SQ FT OF DAMPER AREA AND SHALL EXCEED ASHRAE 90.1 REQUIREMENTS. LINKAGE SHALL BE CONCEALED OUT OF AIRSTREAM, WITHIN THE DAMPER FRAME TO REDUCE PRESSURE AND NOISE. DAMPER ASSEMBLY SHALL BE CONTROLLED BY A SPRING RETURN TWO POSITION FOR FULLY MODULATING ACTUATOR. DAMPERS SHALL NOT BE SIZED FOR AIR VELOCITIES EXCEEDING 2000 FPM.

TYPE 430 STAINLESS STEEL DRAIN PAN SLOPED IN TWO DIRECTIONS TO ENSURE POSITIVE DRAINAGE. PAN SHALL HAVE A MINIMUM DEPTH OF 2". SEAMS EXPOSED TO STANDING WATER SHALL BE WELDED LIQUID TIGHT. BASE OF PAN SHALL BE INSULATED WITH 1" THICK FOAM INSULATION.

PROVIDE OPENINGS EITHER ON SIDE OF UNIT OR THRU THE BASE FOR POWER, CONTROL AND GAS CONNECTIONS.

THE BASE OF THE UNIT SHALL HAVE PROVISIONS FOR FORKLIFT AND CRANE LIFTING

POWER WIRING

FIELD WIRING ACCESS TO BE PROVIDED THRU UNIT BASE INTO ISOLATED ENCLOSURE WITH REMOVABLE COVER.

POWER WIRING TO BE SINGLE POINT CONNECTION.

UNIT SHALL BE FACTORY WIRED TO FIELD WIRING TERMINAL BLOCK MOUNTED IN ISOLATED ENCLOSURE.

FACTORY WIRED MAIN POWER DISCONNECT DEVICE, OVERCURRENT AND SCCA RATED FOR TOTAL UNIT POWER CONNECTION.

FACTORY INSTALLED SAFETY BARRIER SHALL ISOLATE ALL HIGH VOLTAGE COMPONENTS. MOUNTED INSIDE ELECTRICAL COMPARTMENT, TO PROTECT SERVICE PERSONNEL FROM INCIDENTAL CONTACT.

FACTORY WIRED PHASE MONITOR SHALL BE INCLUDED AS STANDARD.

OUTLET NOT ACCEPTABLE.

FACTORY MOUNT AND WIRE LINE TO 120 VOLT CONVENIENCE OUTLET TRANSFORMER. FIELD WIRING OF CONVENIENCE OUTLET NOT ACCEPTABLE LOW VOLTAGE CONTROLS

FUSING

ON PROGRAMMED SETTINGS FOR:

OUTDOOR AIR CONDITIONS AND DISCHARGE AIR TEMPERATURE

MCM SHALL ACCEPT SEPARATE SETPOINTS FOR OCCUPIED AND UNOCCUPIED STATES.

SUPPLY AIR SENSOR SHALL BE FURNISHED WITH UNIT. INSTALLING CONTRACTOR SHALL INSTALL REMOTE MOUNTED SUPPLY AIR SENSOR IN SUPPLY AIR DUCT AND LAND FIELD WIRE TO CONNECTIONS TO THE UNIT.

SPACE TEMP AND RH HUMIDITY STAT(S) SHALL BE FURNISHED AND FIELD WIRED TO UNIT BY THE INSTALLING CONTRACTOR.

TEMPERATURE).

SYSTEMS CONTROLS SHALL BE DIGITAL, PROGRAMMABLE TYPE WITH ACCESS VIA FACTORY INSTALLED AND WIRED TOUCHSCREEN, OR THROUGH PORTABLE COMPUTER CONNECTION. ALL SETPOINTS, UNIT FUNCTIONS, AND STATUS SHALL BE ACCESSIBLE VIA THE TOUCHSCREEN OR PORTABLE COMPUTER.

OF TRUMBULL.

FANS AND MOTORS

INDOOR FAN SHALL BE DIRECT DRIVE PLENUM FAN, FACTORY INSTALLED AND WIRED TO ON-BOARD VARIABLE FREQUENCY DRIVE AND SHALL BE EQUIPPED WITH SLIDE OUT SERVICE ACCESS.

ALL FAN MOTORS SHALL BE PREMIUM EFFICIENCY ODP AND MEET THE U.S. ENERGY POLICY ACT OF 2005/10 (EPACT).

ALL FAN MOTORS SHALL EITHER BE PERMANENTLY LUBRICATED AND/ OR HAVE INTERNAL THERMAL OVERLOAD PROTECTION.

OUTDOOR FANS SHALL BE DIRECT DRIVE WITH PREMIUM EFFICIENCY MOTORS, STATICALLY AND DYNAMICALLY BALANCED, DRAW THROUGH IN THE VERTICAL DISCHARGE POSITION.

THE UNIT SHALL HAVE FULLY MODULATING, HIGH TURNDOWN AND INDIRECT GAS-FIRED HEAT. THE HEATING SECTION WILL INCLUDE HIGH TURN-DOWN BURNERS FIRING INTO INDIVIDUAL STAINLESS STEEL TUBULAR HEAT EXCHANGERS. THE HEAT EXCHANGERS SHALL BE CONSTRUCTED OF TYPE 409 STAINLESS STEEL AND BE A TUBULAR DESIGN CAPABLE OF DRAINING INTERNAL CONDENSATE. EXTERNAL FLUE TO BE CONSTRUCTED OF STAINLESS STEEL AND BE FULLY INSULATED. UNITS WITH MULTIPLE HEATERS SHALL INCLUDE ONE FULLY MODULATING HIGH TURNDOWN HEATER WITH ADDITIONAL ON-OFF HEATER SECTIONS. TOTAL HEATER TURNDOWN SHALL BE MINIMUM LISTED BELOW OR HIGHER.

GAS BURNER SAFETY CONTROLS: PROVIDE SAFETY CONTROLS FOR THE PROVING OF COMBUSTION AIR PRIOR TO IGNITION, AND CONTINUOUS FLAME SUPERVISION.

TIMED FREEZE STAT SHALL MONITOR HEAT OUTPUT AND SHALL DISCONTINUE ALL HEATING ATTEMPTS AND OR UNIT OPERATION IN THE EVENT THE HEATING SECTION FAILS TO IGNITE OR FAILS TO MAINTAIN PROGRAMMED SUPPLY AIR TEMPERATURE/TIME.

INDUCER FAN SHALL BE DIRECT DRIVE HIGH PRESSURE CENTRIFUGAL TYPE WITH TWO SPEEDS AND SHALL INCLUDE BUILT- IN THERMAL OVERLOAD PROTECTION.

OF INDOOR AIRFLOW OR FLAME ROLLOUT.

EVAPORATOR CONDENSER AND REHEAT COILS:

EVAPORATOR AND HOT GAS REHEAT COILS SHALL BE CONSTRUCTED OF COPPER TUBES MECHANICALLY BONDED TO A CONFIGURED ALUMINUM PLATE FIN. HOT GAS REHEAT COIL SHALL HAVE A SERIES OF FLAT TUBES CONTAINING A SERIES OF MULTIPLE PARALLEL FLOW MICRO-CHANNELS LAYERED BETWEEN THE REFRIGERANT MANIFOLDS. COIL CONSTRUCTION SHALL CONSIST OF ALUMINUM ALLOYS FOR FINS, TUBES, AND MANIFOLDS IN COMBINATION WITH A CORROSION-RESISTANT COATING.

TESTED TO 500 PSIG.

THE CONDENSER COIL SHALL HAVE A FIN DESIGNED FOR EASE OF CLEANING.

FACTORY TO MOUNT AND WIRE 120 VOLT CONVENIENCE OUTLET. FIELD WIRING OF CONVENIENCE

FACTORY WIRED 24 VOLT CONTROL SYSTEM COMPLETE WITH REQUIRED TRANSFORMERS AND

MAIN CONTROL MODULE (MCM) SHALL PREVENT SIMULTANEOUS OPERATION OF ANY MODES AND SHALL ENABLE OPERATION IN DEHUMIDIFICATION, COOLING, HEATING OR ECONOMIZER MODE BASED

MCM SHALL CONTROL BASED ON DEW POINT DESIGN SETTINGS FOR DEHUMIDIFICATION AND ECONOMIZER MODES, AND SENSIBLE TEMPERATURE SETTINGS FOR HEATING AND COOLING MODES.

MCM SHALL HAVE ONBOARD CLOCK AND SCHEDULING FUNCTION FOR OCCUPANCY.

MCM SHALL INCLUDE NON-VOLATILE MEMORY TO RETAIN ALL PROGRAMMED VALUES WITHOUT THE USE OF A BATTERY, IN THE EVENT OF A POWER FAILURE.

FACTORY INSTALLED AND WIRED SENSORS SHALL MONITOR OUTDOOR AIR (OA) TEMPERATURE, HUMIDITY AND EVAPORATOR LEAVING AIR TEMPERATURE.

FULLY MODULATING HOT-GAS REHEAT SHALL BE ENABLED IN DEHUMIDIFICATION MODE AND COOLING MODE WITH MODULATION CONTROLLED BY MCM TO MAINTAIN (SUPPLY AIR TEMPERATURE / SPACE

FACTORY PROVIDED DDC CONTROLLER WITH INTERFACE TO UNITY CONTROLLER SHALL BE PROVIDED. COORDINATE UNITY CONTROLLER INTEGRATION REQUIREMENTS WITH CONTROLS VENDOR FOR TOWN

PROVIDE SHAFTS CONSTRUCTED OF SOLID HOT ROLLED STEEL, GROUND AND POLISHED, WITH KEY-WAY, AND PROTECTIVELY COATED WITH LUBRICATING OIL.

MODULATING INDIRECT GAS-FIRED BURNER HEATING SECTION

COMPLETELY ASSEMBLED AND FACTORY INSTALLED HEATING SYSTEM SHALL BE INTEGRAL TO UNIT AND APPROVED FOR USE DOWNSTREAM FROM REFRIGERANT COOLING COILS IN UNITS MOUNTED OUTDOORS. THREADED GAS CONNECTION SHALL TERMINATE AT MANUAL SHUT-OFF VALVE PROVIDED WITH UNIT. PROVIDE CAPABILITY FOR SIDEWALL OR THRU-BASE GAS PIPING.

LIMIT CONTROLS: HIGH TEMPERATURE AUTOMATIC RESET LIMIT CONTROLS WILL SHUT OFF GAS FLOW IN THE EVENT OF EXCESSIVE TEMPERATURES RESULTING FROM RESTRICTED INDOOR AIRFLOW, LOSS

COILS SHALL BE LEAK TESTED AT THE FACTORY TO ENSURE PRESSURE INTEGRITY. THE EVAPORATOR COIL, REHEAT COIL AND CONDENSER COIL SHALL BE LEAK TESTED TO 500 PSIG AND PRESSURE

EVAPORATOR COIL SHALL HAVE SIX INTERLACED ROWS FOR SUPERIOR SENSIBLE AND LATENT COOLING WITH A MAXIMUM OF 12 FPI.

REHEAT COIL SHALL BE FULLY INTEGRATED INTO THE SUPPLY AIR AND FAN SYSTEM AND CAPABLE OF DELIVERING DESIGN SUPPLY AIR TEMPERATURE.

TO PREVENT RE-HYDRATION OF CONDENSATE FROM EVAPORATOR COIL, THE EVAPORATOR COIL FACE AND THE HOT GAS REHEAT COIL FACE SHALL BE SEPARATED A MINIMUM OF SIX INCHES.

CONDENSER COIL SHALL BE PROVIDED WITH FACTORY INSTALLED HAIL GUARDS.

UNIT SHALL BE EQUIPPED WITH AN ADJUSTABLE 6" FILTER RACK UPSTREAM OF THE EVAPORATOR TO MATCH THE FILTER REQUIREMENTS SPECIFIED IN THE AIR FILTRATION SECTION

CONDENSER SECTION:

OUTDOOR FANS: VERTICAL DISCHARGE, DIRECT DRIVE FANS WITH CONSTRUCTED OF POLYMER GLASS REINFORCED POLYPROPYLENE BLADES. FANS SHALL BE LOW-NOISE AND CORROSION RESISTANT. OTHER FAN CONSTRUCTION IS NOT ACCEPTABLE.

FANS SHALL BE STATICALLY BALANCED.

REFRIGERANT CAPACITY CONTROL:

UNITS WITH SCROLL COMPRESSORS SHALL BE EQUIPPED WITH REFRIGERANT CAPACITY CONTROL (RCC) ON THE LEAD CIRCUIT TO MODULATE COMPRESSOR CAPACITY DURING DEHUMIDIFICATION OR COOLING MODES TO MAINTAIN EVAPORATOR DEHUMIDIFICATION OR COOLING SETPOINT AND PREVENT EVAPORATOR FROSTING OR FREEZING. RCC SHALL BE (STANDARD MECHANICAL / OPTIONAL ELECTRICAL). HOT GAS BY PASS IS NOT ACCEPTABLE AS A CAPACITY CONTROL.

THE RCC SETPOINT IS FACTORY SET, AND FIELD ADJUSTABLE, TO MAINTAIN DESIRED SUCTION PRESSURE AND COMPRESSOR DISCHARGE PRESSURE.

CAPACITY CONTROL FOR UNITS EQUIPPED WITH DIGITAL SCROLL COMPRESSORS AND SHALL BE ACCOMPLISHED THROUGH A 0-10V SIGNAL BY THE MCM TO THE COMPRESSOR CONTROLS.

**REFRIGERATION SYSTEM:** 

COMPRESSOR(S): ALL UNITS SHALL HAVE DIRECT-DRIVE, HERMETIC, SCROLL TYPE COMPRESSORS OR DIGITAL SCROLL WITH CENTRIFUGAL TYPE OIL PUMPS.

MOTOR SHALL BE SUCTION GAS-COOLED AND SHALL HAVE A VOLTAGE UTILIZATION RANGE OF PLUS OR MINUS 10 PERCENT OF UNIT NAMEPLATE VOLTAGE.

INTERNAL OVERLOADS SHALL BE PROVIDED WITH THE SCROLL COMPRESSORS.

EACH COMPRESSOR SHALL HAVE A CRANKCASE HEATER TO MINIMIZE THE AMOUNT OF LIQUID REFRIGERANT PRESENT IN THE OIL SUMP DURING OFF CYCLES.

EACH COMPRESSOR SHALL BE MOUNTED ON RUBBER VIBRATION ISOLATORS, TO REDUCE THE TRANSMISSION OF NOISE.

PROVIDE EACH UNIT WITH HERMETICALLY SEALED REFRIGERANT CIRCUIT(S) FACTORY-SUPPLIED COMPLETELY PIPED WITH LIQUID LINE FILTER-DRIER, LIQUID LINE CHARGING PORT, SUCTION AND LIQUID LINE PRESSURE PORTS, SIGHT GLASS, AND THERMAL EXPANSION VALVE.

PROVIDE EACH CIRCUIT WITH AUTOMATIC RESET HIGH AND LOW PRESSURE SWITCHES FOR SAFETY CONTROL

BUILDING MANAGEMENT SYSTEM:

INTERFACE CONTROL MODULE SYSTEM TO BE FURNISHED AND MOUNTED BY ROOFTOP UNIT MANUFACTURER. THE INTERFACE MODULE WITH NECESSARY CONTROLS AND SENSORS SHALL ALL BE FACTORY MOUNTED (NOT FIELD MOUNTED).

CONTROL FUNCTIONS: OCCUPIED/UNOCCUPIED MODE, DEMAND LIMITING, CONDITIONING MODE SET POINTS, DISCHARGE AIR SET POINT ADJUSTMENT, AND ALARM SHUTDOWN

DIAGNOSTIC FUNCTIONS: INCLUDE SUPPLY FAN STATUS, FILTER STATUS, OUTSIDE AIR DAMPER STATUS.

PROVIDE CAPABILITIES FOR BOOLEAN PROCESSING AND TREND LOGS AS WELL AS "TEMPLATED" REPORTS AND LOGS.

### ROOF CURB:

CONTRACTOR SHALL PROVIDE ROOF ADAPTER CURB WITH 2" SPRING ISOLATORS. 18 GAUGE PERIMETER MADE OF ZINC COATED STEEL WITH SUPPLY AND RETURN AIR GASKETING AND WOOD NAILER STRIPS. SHIP KNOCKED DOWN AND PROVIDED WITH INSTRUCTIONS FOR EASY ASSEMBLY.

CURB SHALL BE MANUFACTURED IN ACCORDANCE WITH THE NATIONAL ROOFING CONTRACTORS ASSOCIATION GUIDELINES.

ACCESSORIES:

DUPLEX RECEPTACLE: FACTORY MOUNTED IN UNIT SUPPLY-FAN SECTION, WITH 20 AMP 120 V GFI DUPLEX RECEPTACLE AND WEATHERPROOF COVER.

#### FIRING RANGE UNIT (MAU-1)

AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH SPECIFICATIONS CONTAINED WITHIN THIS DOCUMENT, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE BUT ARE NOT LIMITED TO: GREENHECK FAN CORPORATION

#### MANUFACTURED UNITS :

UNIT SHALL BE FULLY ASSEMBLED AT THE FACTORY AND CONSIST OF AN INSULATED METAL CABINET, [DOWNTURN OUTDOOR AIR INTAKE WITH 2" ALUMINUM MESH FILTER ASSEMBLY], EVAPORATOR COIL, CONDENSATE DRAIN PAN, HOT GAS REHEAT COIL, INDIRECT GAS FURNACE, PACKAGED DX SYSTEM, [PHASE AND BROWNOUT PROTECTION], [MOTORIZED DAMPERS], MOTORIZED RECIRCULATING DAMPER, SENSORS, CURB ASSEMBLY, SERVICE RECEPTACLE, FILTER ASSEMBLY FOR INTAKE AIR, SUPPLY AIR BLOWER ASSEMBLY, AND AN ELECTRICAL CONTROL CENTER. ALL SPECIFIED COMPONENTS AND INTERNAL ACCESSORIES FACTORY INSTALLED ARE TESTED AND PREPARED FOR SINGLE-POINT HIGH VOLTAGE CONNECTION.

CABINET

MATERIALS: FORMED, DOUBLE WALL INSULATED METAL CABINET, FABRICATED TO PERMIT ACCESS TO

#### INTERNAL COMPONENTS FOR MAINTENANCE.

OUTSIDE CASING: 18 GAUGE, GALVANIZED (G90) STEEL MEETING ASTM A653 FOR COMPONENTS THAT DO NOT RECEIVE A PAINTED FINISH. UNIT'S EXTERIOR SHALL BE SUPPLIED FROM THE MANUFACTURER USING G60 GALVANEAL STEEL WITH A BAKED ENAMEL FINISH

INTERNAL ASSEMBLIES: 22 GAUGE, GALVANIZED (G90) STEEL EXCEPT FOR MOTOR SUPPORTS WHICH SHALL BE MINIMUM14 GAUGE GALVANIZED (G90) STEEL.

CABINET INSULATION: COMPLY WITH NFPA 90A AND NFPA 90B AND EROSION REQUIREMENTS OF UL

MATERIALS: RIGID URETHANE FOAM

THICKNESS: 2 INCH (50.8 MM)

THERMAL RESISTANCE: R13

MEETS UL94HF-1 FLAME REQUIREMENTS

LOCATION AND APPLICATION: FULL COVERAGE OF ENTIRE EXTERIOR TO INCLUDE WALLS, ROOF OF UNIT, UNIT BASE AND DOORS

MATERIALS: FIBERGLASS INSULATION, IF INSULATION OTHER THAN FIBERGLASS IS USED. IT MUST ALSO MEET THE FIRE HAZARD CLASSIFICATION SHOWN BELOW.

THICKNESS: 2 INCH (50.8 MM)

THERMAL RESISTANCE: R8

FIRE HAZARD CLASSIFICATION: MAXIMUM FLAME SPREAD OF 25 AND SMOKE DEVELOPED OF 50, WHEN TESTED IN ACCORDANCE WITH ASTM C 411.

ROOF INSULATION: 2 INCH (50.8 MM) FIBERGLASS LOCATED ABOVE THE 1 INCH (25.4 MM) FOAM PANEL.

ACCESS PANELS / DOORS: UNIT SHALL BE EQUIPPED WITH INSULATED, HINGED DOORS OR REMOVABLE ACCESS PANELS TO PROVIDE EASY ACCESS TO ALL MAJOR COMPONENTS. DOORS AND ACCESS PANELS SHALL BE FABRICATED OF [18] GAUGE GALVANIZED G90 STEEL OR PAINTED GALVANNEALED STEEL.

SUPPLY AIR BLOWER ASSEMBLIES: BLOWER ASSEMBLY SHALL CONSIST OF AN ELECTRIC MOTOR AS SPECIFIED AND DIRECT-DRIVE FAN. ASSEMBLY SHALL BE MOUNTED ON HEAVY GAUGE GALVANIZED STEEL RAILS AND FURTHER MOUNTED ON 1.125 INCH THICK NEOPRENE VIBRATION ISOLATORS. BLOWER MOTOR SHALL BE CAPABLE OF CONTINUOUS SPEED MODULATION AND CONTROLLED BY A VFD.

EVAPORATOR COIL: EVAPORATOR COIL SHALL BE AHRI CERTIFIED AND SHALL BE (SILVER) SOLDERED OR BRAZED INTO THE COMPRESSED REFRIGERANT SYSTEM. COIL SHALL BE CONSTRUCTED OF COPPER TUBING, PERMANENTLY BONDED TO ALUMINUM FINS AND ENCLOSED IN A GALVANIZED STEEL FRAME. IF TWO COMPRESSORS ARE USED AS COMPONENTS OF THE UNIT, THEN THE EVAPORATOR COIL SHALL BE OF "INTERLACED" CONFIGURATION. PERMITTING INDEPENDENT OPERATION OF EITHER COMPRESSOR WITHOUT CONFLICT WITH THE OTHER COMPRESSOR.

CONTROL PANEL / CONNECTIONS: UNIT SHALL HAVE AN ELECTRICAL CONTROL CENTER WHERE ALL HIGH AND LOW VOLTAGE CONNECTIONS ARE MADE. CONTROL CENTER SHALL BE CONSTRUCTED TO PERMIT SINGLE-POINT HIGH VOLTAGE POWER SUPPLY CONNECTIONS. UNIT SHALL BE EQUIPPED WITH A UNIT DISCONNECT SWITCH

CONDENSATE DRAIN PAN: DRAIN PAN SHALL BE AN INTEGRAL PART OF THE UNIT WHENEVER A COOLING OPTION IS INCLUDED. PAN SHALL BE FORMED OF WELDED AUSTENITIC STAINLESS STEEL SHEET MATERIAL AND PROVIDED WITH A WELDED STAINLESS STEEL DRAIN CONNECTION AT THE FRONT FOR CONNECTION TO A P TRAP. DRAIN PAN SHALL BE SLOPED IN TWO DIRECTIONS TO PROVIDE POSITIVE DRAINING AND DRAIN CONNECTOR SHALL BE SEALED AT PENETRATION THROUGH CABINET WALL.

P TRAP: CONTRACTOR SHALL PROVIDE, OR FABRICATE, AND INSTALL AN APPROPRIATE P TRAP, IN ACCORDANCE WITH ALL LOCAL AND AREA CODES AND BEST PRACTICES.

REHEAT COIL WITH FACTORY INSTALLED MODULATING HOT GAS REHEAT VALVE

INDIRECT GAS FURNACE:

SHALL BE ETL CERTIFIED AS A COMPONENT OF THE UNIT.

SHALL HAVE AN INTEGRAL COMBUSTION GAS BLOWER.

SHALL BE ETL CERTIFIED FOR INSTALLATION DOWNSTREAM OF A COOLING COIL.

SHALL HAVE FAULT SENSORS TO PROVIDE FAULT CONDITIONS TO OPTIONAL DIGITAL CONTROLLER OR BUILDING CONTROLS.

SHALL HAVE 4-PASS TUBULAR HEAT EXCHANGERS, CONSTRUCTED OF TYPE 409 STAINLESS STEEL. HEAT EXCHANGER TUBES SHALL BE INSTALLED ON THE VEST PLATE BY MEANS OF SWAGED ASSEMBLY, WELDED CONNECTIONS ARE NOT ACCEPTABLE. HEAT EXCHANGER TUBES

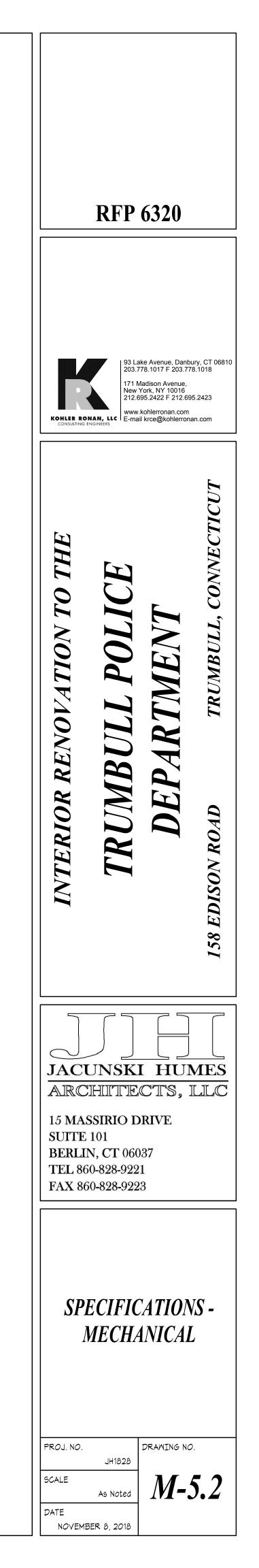
SHALL BE SUPPORTED AND ALSO PERMIT EXPANSION AND CONTRACTION OF THE TUBES.

HEAT EXCHANGER SHALL HAVE A 10 YEAR EXTENDED WARRANTY

FURNACE CONTROL SHALL BE 12:1 MODULATING

SHALL BE ENCASED IN A WEATHER-TIGHT METAL HOUSING WITH INTAKE AIR VENTS. LARGE, METAL DOOR SHALL PROVIDE EASY ACCESS TO THE ENCLOSED VEST PLATE, CONTROL CIRCUITRY, GAS TRAIN, BURNER ASSEMBLY

SHALL HAVE SOLID STATE CONTROLS PERMITTING STAND-ALONE OPERATION OR CONTROL BY BUILDING CONTROLLERS.



PACKAGED DX SYSTEM: UNIT SHALL HAVE AN INTEGRAL COMPRESSOR(S) AND EVAPORATOR COIL LOCATED WITHIN THE WEATHER-TIGHT UNIT HOUSING. CONDENSER COILS AND APPURTENANT CONDENSER FAN ASSEMBLIES SHALL BE FACTORY INSTALLED AS INTEGRAL SUBASSEMBLIES OF THE UNIT AND MOUNTED ON THE EXTERIOR OF THE UNIT. UNIT CONDENSER FANS SHALL FEATURE SWEPT BLADE DESIGN RESULTING IN REDUCED SOUND LEVELS. CONDENSER FAN MOTORS SHALL BE THREE PHASE, EXTERNAL ROTOR, TYPE 56 FRAME, OPEN AIR OVER AND SHAFT UP. EACH CONDENSER FAN MOTOR SHALL HAVE A VENTED FRAME, RATED FOR CONTINUOUS DUTY AND BE EQUIPPED WITH AN AUTOMATIC RESET THERMAL PROTECTOR. LEAD CONDENSER FAN WILL HAVE AN ELECTRONICALLY COMMUTATED (EC) MOTOR THAT WILL MODULATE TO MAINTAIN A HEAD PRESSURE SET POINT. MOTORS SHALL BE UL RECOGNIZED AND CSA CERTIFIED. THE REFRIGERANT COMPRESSOR(S) SHALL BE DIGITAL HERMETIC SCROLL-TYPE AND SHALL BE EQUIPPED WITH LIQUID LINE FILTER DRIER, THERMOSTATIC EXPANSION VALVES (TXV)(S), MANUAL RESET HIGH PRESSURE AND LOW PRESSURE CUTOUTS AND ALL APPURTENANT SENSORS, SERVICE PORTS AND SAFETY DEVICES. COMPRESSED REFRIGERANT SYSTEM SHALL BE FULLY CHARGED WITH R-410A REFRIGERANT. EACH COMPRESSOR SHALL BE FACTORY-EQUIPPED WITH AN ELECTRIC CRANKCASE HEATER TO BOIL OFF LIQUID REFRIGERANT FROM THE OIL.

PACKAGED DX CONTROL AND DIAGNOSTICS: THE PACKAGED DX SYSTEM SHALL BE CONTROLLED BY AN ONBOARD DIGITAL CONTROLLER (DDC) THAT INDICATES BOTH OWNER-SUPPLIED SETTINGS AND FAULT CONDITIONS THAT MAY OCCUR. THE DDC SHALL BE PROGRAMMED TO INDICATE THE FOLLOWING FAULTS:

GLOBAL ALARM CONDITION (ACTIVE WHEN THERE IS AT LEAST ONE ALARM)

SUPPLY AIR PROVING ALARM

DIRTY FILTER ALARM

COMPRESSOR TRIP ALARM

COMPRESSOR LOCKED OUT ALARM

SUPPLY AIR TEMPERATURE LOW LIMIT ALARM

SENSOR #1 OUT OF RANGE (OUTSIDE AIR TEMPERATURE) SENSOR #2 OUT OF RANGE (SUPPLY AIR TEMPERATURE) SENSOR #3 OUT OF RANGE (COLD COIL LEAVING AIR TEMPERATURE)]

PHASE AND BROWNOUT PROTECTION: UNIT SHALL HAVE A FACTORY-INSTALLED PHASE MONITOR TO DETECT ELECTRIC SUPPLY PHASE LOSS AND VOLTAGE BROWN-OUT CONDITIONS. UPON DETECTION OF A FAULT, THE MONITOR SHALL DISCONNECT SUPPLY VOLTAGE TO ALL MOTORS.

MOTORIZED DAMPERS / OUTDOOR AIR, RETURN AIR: AMCA CLASS 1A CERTIFIED MOTORIZED DAMPER OF [LOW LEAKAGE] [INSULATED LOW LEAKAGE] TYPE AND A LEAKAGE RATE OF 3 CFM/FT2 @ 1 IN. WG. SHALL BE FACTORY INSTALLED.

AMCA CLASS 1A MOTORIZED RECIRCULATING AIR DAMPER DESIGNED TO PERMIT 100% MAXIMUM RECIRCULATION OF RETURN AIR SHALL BE FACTORY INSTALLED.

SERVICE RECEPTACLE: 120 VAC GFCI SERVICE OUTLET SHALL BE FACTORY-PROVIDED. UNIT CONTAINS A 120 VAC TRANSFORMER TO PROVIDE POWER TO SERVICE OUTLET.

HAIL GUARDS: PROTECTS THE CONDENSING UNIT FROM DAMAGE DUE TO EXTREME WEATHER CONDITIONS SUCH AS HAIL AND FLYING DEBRIS.

VAPOR TIGHT LIGHTS: PROVIDE SERVICE LIGHTS MOUNTED IN THE UNIT TO BE USED DURING TIMES OF ROUTINE MAINTENANCE. THE LIGHTS WILL BE FACTORY MOUNTED AND WIRED.

BLOWER:

BLOWER SECTION CONSTRUCTION SUPPLY AIR: DIRECT DRIVE MOTOR(S) AND BLOWER(S) SHALL BE ASSEMBLED ON A 14 GAUGE GALVANIZED STEEL PLATFORM AND SHALL BE EQUIPPED WITH 1.125 INCH THICK NEOPRENE VIBRATION ISOLATION DEVICES.

BLOWER ASSEMBLIES: SHALL BE STATICALLY AND DYNAMICALLY BALANCED AND DESIGNED FOR CONTINUOUS OPERATION AT MAXIMUM RATED FAN SPEED AND HORSEPOWER.

FAN: DIRECT DRIVE, AIRFOIL PLENUM FAN WITH STEEL WHEELS STATICALLY AND DYNAMICALLY BALANCED AND AMCA CERTIFIED FOR AIR AND SOUND PERFORMANCE.

BLOWER SECTION MOTOR SOURCE QUALITY CONTROL: BLOWER PERFORMANCE SHALL BE FACTORY TESTED FOR FLOW RATE, PRESSURE, POWER, AIR DENSITY, ROTATION SPEED AND EFFICIENCY. RATINGS ARE TO BE ESTABLISHED IN ACCORDANCE WITH AMCA 210, "LABORATORY METHODS OF TESTING FANS FOR RATING."

#### MOTORS:

GENERAL: BLOWER MOTORS GREATER THAN ¾ HORSEPOWER SHALL BE "NEMA PREMIUM™" UNLESS OTHERWISE INDICATED. COMPLIANCE WITH EPACT MINIMUM ENERGY-EFFICIENCY STANDARDS FOR SINGLE SPEED ODP AND TE ENCLOSURES IS NOT ACCEPTABLE. MOTORS SHALL BE HEAVY-DUTY, PERMANENTLY LUBRICATED TYPE TO MATCH THE FAN LOAD AND FURNISHED AT THE SPECIFIED VOLTAGE, PHASE AND ENCLOSURE. MOTORS SHALL BE 60 CYCLE, 3 PHASE 208 VOLTS.

#### UNIT CONTROLS:

THE UNIT SHALL BE CONSTRUCTED SO THAT IT CAN FUNCTION AS A STAND-ALONE HEATING AND COOLING SYSTEM CONTROLLED BY FACTORY-SUPPLIED CONTROLLERS, THERMOSTATS AND SENSORS, OR IT CAN BE OPERATED AS A HEATING AND COOLING SYSTEM WITH TEMPERATURE SETPOINT ADJUSTMENT VIA A UNITY CONTROLLER THERMOSTAT. THIS UNIT SHALL BE CONTROLLED BY A FACTORY-INSTALLED MICROPROCESSOR PROGRAMMABLE CONTROLLER (DDC) THAT IS CONNECTED TO VARIOUS OPTIONAL SENSORS. PROVIDE ALL SENSORS AND DEVICES REQUIRED FOR DUAL ENTHALPY ECONOMIZER.

UNIT SHALL INCORPORATE A DDC CONTROLLER WITH INTEGRAL LCD SCREEN THAT PROVIDES TEXT READOUTS OF STATUS. DDC CONTROLLER SHALL HAVE A BUILT-IN KEYPAD TO PERMIT OPERATOR TO ACCESS READ-OUT SCREENS WITHOUT THE USE OF ANCILLARY EQUIPMENT, DEVICES OR SOFTWARE. DDC CONTROLLERS THAT REQUIRE THE USE OF EQUIPMENT OR SOFTWARE THAT IS NOT FACTORY-INSTALLED IN THE UNIT ARE NOT ACCEPTABLE. ALARM READOUTS CONSISTING OF FLASHING LIGHT CODES ARE NOT ACCEPTABLE. NOTE: SOME MANUFACTURERS ARE KNOWN TO INCORPORATE DDC CONTROLLERS THAT REQUIRE THE USE OF SEPARATELY-PURCHASED HANDHELD HARDWARE OR A PC AND/OR SOFTWARE TO VIEW OR CHANGE SETTINGS. OWNER-SPECIFIED VENTILATING CONDITIONS CAN BE INPUT BY MEANS OF PUSHBUTTONS.

SUPPLY FAN SHALL BE CONFIGURED FOR SINGLE ZONE VAV

OUTSIDE AIR / RETURN AIR DAMPER CONTROL SHALL BE PERFORMED BY THE UNIT CONTROLLER.

ECONOMIZER CONTROL SHALL BE ENTHALPY CONTROLLED.

DIRTY FILTER SENSOR SHALL BE FACTORY-INSTALLED.

#### VARIABLE FREQUENCY DRIVE (VFD) [UNIT SHALL HAVE FACTORY INSTALLED VARIABLE FREQUENCY DRIVE FOR MODULATION OF THE SUPPLY AIR BLOWER ASSEMBLY.

ROOM SENSOR SHALL BE PROVIDED AS A SHIPPED LOOSE ITEM. THE ROOM SENSOR SHALL AVERAGE 1 TEMPERATURE SENSOR AND 1 RELATIVE HUMIDITY SENSOR.

FILTERS:

UNIT SHALL HAVE PERMANENT 2 INCH (50.8 MM) ALUMINUM MESH FILTERS LOCATED IN THE OUTDOOR AIR INTAKE AND SHALL BE ACCESSIBLE FROM THE EXTERIOR OF THE UNIT. MERV 8 DISPOSABLE PLEATED FILTERS SHALL BE PROVIDED IN THE SUPPLY AIR STREAM. MERV 13 DISPOSABLE PLEATED FILTERS SHALL BE PROVIDED IN THE SUPPLY FINAL AIR STREAM.

CONTROL DEVICES - INPUT DEVICES

TEMPERATURE SENSORS GENERAL REQUIREMENTS:

SEQUENCE OF OPERATIONS. 1000 OHM NICKEL RTD, OR TWO-WIRE 1000 OHM PLATINUM RTD. CONVERSION:

> ROOM TEMPERATURE: <u>+</u>0.5° F DUCT TEMPERATURE: <u>+</u>0.5° F

ROOM TEMPERATURE SENSORS

OUTSIDE AIR SENSORS OUTSIDE AIR SENSORS SHALL BE DESIGNED TO WITHSTAND THE ENVIRONMENTAL CONDITIONS TO WHICH THEY WILL BE EXPOSED. THEY SHALL ALSO BE PROVIDED WITH A SOLAR SHIELD. SENSORS EXPOSED TO WIND VELOCITY PRESSURES SHALL BE SHIELDED BY A PERFORATED PLATE THAT SURROUNDS THE SENSOR ELEMENT. TEMPERATURE TRANSMITTERS SHALL BE OF NEMA 3R CONSTRUCTION AND RATED FOR AMBIENT TEMPERATURES.

DUCT MOUNT SENSORS

DUCT MOUNT SENSORS SHALL MOUNT IN AN ELECTRICAL BOX THROUGH A HOLE IN THE DUCT, AND BE POSITIONED SO AS TO BE EASILY ACCESSIBLE FOR REPAIR OR REPLACEMENT. DUCT SENSORS SHALL BE INSERTION TYPE AND CONSTRUCTED AS A COMPLETE ASSEMBLY, INCLUDING LOCK NUT AND MOUNTING PLATE. FOR OUTDOOR AIR DUCT APPLICATIONS, A WEATHERPROOF MOUNTING BOX WITH WEATHERPROOF COVER AND GASKET SHALL BE USED.

ACCEPTABLE MANUFACTURERS: ALERTON CONTROLS, SETRA.

HUMIDITY SENSORS

THE SENSOR SHALL BE A SOLID-STATE TYPE, RELATIVE HUMIDITY SENSOR OF THE BULK POLYMER DESIGN. THE SENSOR ELEMENT SHALL RESIST SERVICE CONTAMINATION.

THE HUMIDITY TRANSMITTER SHALL BE EQUIPPED WITH NON-INTERACTIVE SPAN AND ZERO ADJUSTMENTS, A 2-WIRE ISOLATED LOOP POWERED, 4-20 MA, 0-100% LINEAR PROPORTIONAL OUTPUT.

FLSEWHERE.

OUTSIDE AIR RELATIVE HUMIDITY SENSORS SHALL BE INSTALLED WITH A RAIN PROOF, PERFORATED COVER. THE TRANSMITTER SHALL BE INSTALLED IN A NEMA 3R ENCLOSURE WITH SEALTITE FITTINGS AND STAINLESS STEEL BUSHINGS.

BUILDING DIFFERENTIAL AIR PRESSURE APPLICATIONS (-1" TO +1" W.C.)

PRESSURE SENSING POINTS.

PERFORMANCE SPECIFICATIONS:

-1.00 TO +1.00 W.C. INPUT DIFFERENTIAL PRESSURE RANGES. (SELECT RANGE APPROPRIATE FOR SYSTEM APPLICATION)

4-20 MA OUTPUT.

ACCEPTABLE MANUFACTURERS: BAPI AND SETRA.

CURRENT SENSOR/TRANSDUCER

THE CURRENT SENSORS SHALL BE LOOP OR SELF-POWERED WITH SOLID-STATE CIRCUITRY AND A DRY CONTACT OUTPUT. IT SHALL CONSIST OF A CURRENT TRANSFORMER, A SOLID STATE CURRENT SENSING CIRCUIT, ADJUSTABLE TRIP POINT, SOLID STATE SWITCH, SPDT RELAY, AND AN LED INDICATING THE ON OR OFF STATUS. A CONDUCTOR OF THE LOAD SHALL BE PASSED THROUGH THE WINDOW OF THE DEVICE. IT SHALL ACCEPT OVER-CURRENT UP TO TWICE ITS TRIP POINT RANGE.

ANALOG OUTPUT CURRENT SENSORS PROVIDING A SIGNAL CORRESPONDING TO ACTUAL AMPERAGE DRAW OF THE MONITORED LOAD. CURRENT SENSORS SHALL BE USED FOR FANS, PUMPS, AND OTHER MISCELLANEOUS MOTOR LOADS.

NEGATIVE RUN STATUS.

### MECHANICAL SPECIFICATIONS

AIRFLOW MONITORING REQUIRED IN THE RETURN AIR AND SUPPLY AIRSTREAMS.

SENSORS AND TRANSMITTERS SHALL BE PROVIDED, AS OUTLINED IN THE INPUT/OUTPUT SUMMARY AND

THE TEMPERATURE SENSOR SHALL BE OF THE RESISTANCE TYPE, AND SHALL BE EITHER TWO-WIRE

THE FOLLOWING POINT TYPES (AND THE ACCURACY OF EACH) ARE REQUIRED. AND THEIR ASSOCIATED ACCURACY VALUES INCLUDE ERRORS ASSOCIATED WITH THE SENSOR, LEAD WIRE, AND A TO D

ROOM SENSORS SHALL BE CONSTRUCTED FOR EITHER SURFACE OR WALL BOX MOUNTING.

THE HUMIDITY TRANSMITTER SHALL MEET THE FOLLOWING OVERALL ACCURACY, INCLUDING LEAD LOSS AND ANALOG TO DIGITAL CONVERSION. 3% BETWEEN 20% AND 80% RH @ 77 DEG F UNLESS SPECIFIED

A SINGLE POINT HUMIDITY CALIBRATOR SHALL BE PROVIDED. IF REQUIRED, FOR FIELD CALIBRATION. TRANSMITTERS SHALL BE SHIPPED FACTORY PRE-CALIBRATED.

DUCT TYPE SENSING PROBES SHALL BE CONSTRUCTED OF 304 STAINLESS STEEL, AND SHALL BE EQUIPPED WITH A NEOPRENE GROMMET, BUSHINGS, AND A MOUNTING BRACKET.

ACCEPTABLE MANUFACTURERS: VERIS INDUSTRIES, AND MAMAC.

THE DIFFERENTIAL PRESSURE TRANSMITTER SHALL BE OF INDUSTRIAL QUALITY AND TRANSMIT A LINEAR, 4 TO 20 MA OUTPUT IN RESPONSE TO VARIATION OF DIFFERENTIAL PRESSURE OR AIR

THE DIFFERENTIAL PRESSURE TRANSMITTER SHALL HAVE NON-INTERACTIVE ZERO AND SPAN ADJUSTMENTS THAT ARE ADJUSTABLE FROM THE OUTSIDE COVER AND MEET THE FOLLOWING

MAINTAIN ACCURACY UP TO 20 TO 1 RATIO TURNDOWN.

REFERENCE ACCURACY: +0.2% OF FULL SPAN.

CURRENT SENSORS SHALL BE CALIBRATED TO SHOW A POSITIVE RUN STATUS ONLY WHEN THE MOTOR IS OPERATING UNDER LOAD. A MOTOR RUNNING WITH A BROKEN BELT OR COUPLING SHALL INDICATE A AIR FILTER STATUS SWITCHES

DIFFERENTIAL PRESSURE SWITCHES USED TO MONITOR AIR FILTER STATUS SHALL BE OF THE AUTOMATIC RESET TYPE WITH SPDT CONTACTS RATED FOR 2 AMPS AT 120VAC.

A COMPLETE INSTALLATION KIT SHALL BE PROVIDED, INCLUDING: STATIC PRESSURE TOPS, TUBING, FITTINGS, AND AIR FILTERS.

PROVIDE APPROPRIATE SCALE RANGE AND DIFFERENTIAL ADJUSTMENT FOR INTENDED SERVICE.

ACCEPTABLE MANUFACTURERS: DWYER, CLEVELAND CONTROLS

AIR FLOW SWITCHES

DIFFERENTIAL PRESSURE FLOW SWITCHES SHALL BE BELLOWS ACTUATED MERCURY SWITCHES OR SNAP ACTING MICRO-SWITCHES WITH APPROPRIATE SCALE RANGE AND DIFFERENTIAL ADJUSTMENT FOR INTENDED SERVICE.

ACCEPTABLE MANUFACTURERS: DWYER, CLEVELAND CONTROLS

CONTROL DEVICES - OUTPUT DEVICES

ELECTRONIC DAMPER ACTUATORS

ELECTRONIC DAMPER ACTUATORS SHALL BE DIRECT SHAFT MOUNT.

MODULATING AND TWO-POSITION ACTUATORS SHALL BE PROVIDED AS REQUIRED BY THE SEQUENCE OF OPERATIONS. DAMPER SECTIONS SHALL BE SIZED BASED ON ACTUATOR MANUFACTURER'S RECOMMENDATIONS FOR FACE VELOCITY, DIFFERENTIAL PRESSURE AND DAMPER TYPE. THE ACTUATOR MOUNTING ARRANGEMENT AND SPRING RETURN FEATURE SHALL PERMIT NORMALLY OPEN OR NORMALLY CLOSED POSITIONS OF THE DAMPERS, AS REQUIRED. ALL ACTUATORS (EXCEPT TERMINAL UNITS) SHALL BE FURNISHED WITH MECHANICAL SPRING RETURN UNLESS OTHERWISE SPECIFIED IN THE SEQUENCES OF OPERATIONS. ALL ACTUATORS SHALL HAVE EXTERNAL ADJUSTABLE STOPS TO LIMIT THE TRAVEL IN EITHER DIRECTION, AND A GEAR RELEASE TO ALLOW MANUAL POSITIONING.

MODULATING ACTUATORS SHALL ACCEPT 24 VAC OR VDC POWER SUPPLY, CONSUME NO MORE THAN 15 VA, AND BE UL LISTED. THE CONTROL SIGNAL SHALL BE 2-10 VDC OR 4-20 MA, AND THE ACTUATOR SHALL PROVIDE A CLAMP POSITION FEEDBACK SIGNAL OF 2-10 VDC. THE FEEDBACK SIGNAL SHALL BE INDEPENDENT OF THE INPUT SIGNAL AND MAY BE USED TO PARALLEL OTHER ACTUATORS AND PROVIDE TRUE POSITION INDICATION. THE FEEDBACK SIGNAL OF ONE DAMPER ACTUATOR FOR EACH SEPARATELY CONTROLLED DAMPER SHALL BE WIRED BACK TO THE BMS HEAD END AND INDICATE DAMPER POSITION.

TWO-POSITION OR OPEN/CLOSED ACTUATORS SHALL ACCEPT 24 OR 120 VAC POWER SUPPLY AND BE UL LISTED. ISOLATION, SMOKE, EXHAUST FAN, AND OTHER DAMPERS, AS SPECIFIED IN THE SEQUENCE OF OPERATIONS, SHALL BE FURNISHED WITH ADJUSTABLE END SWITCHES TO INDICATE OPEN/CLOSED POSITION OR BE HARD WIRED TO START/STOP ASSOCIATED FAN. TWO-POSITION ACTUATORS, AS SPECIFIED IN SEQUENCES OF OPERATIONS AS "QUICK ACTING," SHALL MOVE FULL STROKE WITHIN 20 SECONDS. ALL SMOKE DAMPER ACTUATORS SHALL BE QUICK ACTING.

PROVIDE 5-YEAR WARRANTY.

ACCEPTABLE MANUFACTURERS: BELIMO.

CONTROL DAMPERS

HE BMS CONTRACTOR SHALL FURNISH ALL AUTOMATIC DAMPERS. ALL AUTOMATIC DAMPERS SHALL BE SIZED FOR THE APPLICATION BY THE BMS CONTRACTOR.

MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

RUSKIN COMPANY CD50, CD60, CDTI-50 GREENHECK FAN CORPORATION, VCD-33, ICD-45 TAMCO 9000BF

LOW-LEAKAGE RATING, WITH LINKAGE OUTSIDE AIRSTREAM, AND BEARING AMCA'S CERTIFIED RATINGS SEAL FOR BOTH AIR PERFORMANCE AND AIR LEAKAGE.

### FRAMES:

HAT SHAPED.

GALVANIZED-STEEL CHANNELS, 0.0625 INCH THICK EXCEPT OUTSIDE AIR DAMPERS SHALL BE 0.125 THICK EXTRUDED ALUMINUM AND REQUIRED TO BE THERMALLY BROKEN.

MITERED AND WELDED CORNERS. BLADES:

AIRFOIL SHAPE, MULTIPLE BLADE WITH MAXIMUM BLADE WIDTH OF 8 INCHES.

PARALLEL- AND OPPOSED-BLADE DESIGN.

GALVANIZED STEEL EXCEPT OUTDOOR AIR DAMPER BLADES SHALL BE ALUMINUM.

16 GAUGE THICKNESS (STEEL) OR 0.063 INCH THICKNESS (ALUMINUM).

BLADE AXLES: 1/2-INCH- DIAMETER; GALVANIZED STEEL; BLADE-LINKAGE HARDWARE OF

ZINC-PLATED STEEL AND BRASS; ENDS SEALED AGAINST BLADE BEARINGS.

OPERATING TEMPERATURE RANGE: FROM MINUS 40 TO PLUS 200 DEG F.

BEARINGS

MOLDED SYNTHETIC OR STAINLESS STEEL.

ALL DAMPERS SHALL HAVE AXLES FULL LENGTH OF DAMPER BLADES AND BEARINGS AT BOTH ENDS OF OPERATING SHAFT.

THRUST BEARINGS AT EACH END OF EVERY BLADE.

PERFORMANCE DATA:

LENGTH.

TEMPERATURE RATING: WITHSTAND -72 TO 275 DEGREES F (-58 TO 135 DEGREES C).

CLOSED POSITION: MAXIMUM PRESSURE OF 13 INCHES W.G. (3.2 KPA) @ A 12 INCH BLADE

OPEN POSITION: MAXIMUM AIR VELOCITY OF 6,000 FEET PER MINUTE (1,829 M/MIN).

BMS WIRING

LEAKAGE: MAXIMUM 5.2 CUBIC FEET PER MINUTE PER SQUARE FOOT (0.6 M³/MIN/M²) AT 4 INCHES W.G. (1 KPA) FOR SIZE 48 X 48 INCHES (1219 X 1219 MM). PRESSURE DROP: MAXIMUM 0.03 INCH W.G. (0.01 KPA) AT 1,500 FEET PER MINUTE (457 M/MIN) ACROSS 24 INCH X 24 INCH (610 X 610 MM) DAMPER.

ALL CONDUIT, WIRING, ACCESSORIES AND WIRING CONNECTIONS REQUIRED FOR THE INSTALLATION OF THE BUILDING MANAGEMENT SYSTEM. AS HEREIN SPECIFIED. SHALL BE PROVIDED BY THE BMS CONTRACTOR UNLESS SPECIFICALLY SHOWN ON THE ELECTRICAL DRAWINGS UNDER DIVISION 26 ELECTRICAL, ALL WIRING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE PORTIONS OF DIVISION 26 AND ALL LOCAL AND NATIONAL ELECTRIC CODES, UNLESS SPECIFIED OTHERWISE IN THIS

ALL BMS WIRING MATERIALS AND INSTALLATION METHODS SHALL COMPLY WITH BMS MANUFACTURER RECOMMENDATIONS.

THE SIZING, TYPE AND PROVISION OF CABLE, CONDUIT, CABLE TRAYS, AND RACEWAYS SHALL BE THE DESIGN RESPONSIBILITY OF THE BMS CONTRACTOR. IF COMPLICATIONS ARISE, HOWEVER, DUE TO THE INCORRECT SELECTION OF CABLE, CABLE TRAYS, RACEWAYS AND/OR CONDUIT BY THE BMS CONTRACTOR, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED IN REPLACING THE SELECTED COMPONENTS.

CLASS 2 WIRING

SECTION.

ALL CONTROLS WIRING (INCLUDING WIRING FOR METERS) SHALL BE PLENUM RATED, SHIELDED CABLE

ALL CLASS 2 (24VAC OR LESS) WIRING SHALL BE INSTALLED IN CONDUIT UNLESS OTHERWISE SPECIFIED.

CONDUIT IS NOT REQUIRED FOR CLASS 2 WIRING IN CONCEALED ACCESSIBLE LOCATIONS. CLASS 2 WIRING NOT INSTALLED IN CONDUIT SHALL BE SUPPORTED EVERY 5' FROM THE BUILDING STRUCTURE UTILIZING METAL HANGERS DESIGNED FOR THIS APPLICATION. WIRING SHALL BE INSTALLED PARALLEL TO THE BUILDING STRUCTURAL LINES. ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS.

CLASS 2 SIGNAL WIRING AND 24VAC POWER CAN BE RUN IN THE SAME CONDUIT. POWER WIRING 120VAC AND GREATER CANNOT SHARE THE SAME CONDUIT WITH CLASS 2 SIGNAL WIRING.

PROVIDE FOR COMPLETE GROUNDING OF ALL APPLICABLE SIGNAL AND COMMUNICATIONS CABLES, PANELS AND EQUIPMENT SO AS TO ENSURE SYSTEM INTEGRITY OF OPERATION. GROUND CABLING AND CONDUIT AT THE PANEL TERMINATIONS. AVOID GROUNDING LOOPS.

# **RFP 6320** 93 Lake Avenue, Danbury, CT 06810 203.778.1017 F 203.778.1018 1 Madison Avenue, New York, NY 10016 212.695.2422 F 212.695.2423 www.kohlerronan.com KOHLER RONAN, LLC E-mail krce@kohlerronan.com 0 C 2 0 X Ö TER TR 2 EDISO 8 JACUNSKI HUMES ARCHITTECTS, LLC **15 MASSIRIO DRIVE SUITE 101 BERLIN, CT 06037** TEL 860-828-9221 FAX 860-828-9223 **SPECIFICATIONS** -MECHANICAL PROJ. NO. DRAWING NO. JH1828

SCALE

DATE

As Noted

NOVEMBER 8, 2018

### GENERAL

WHEN A CONFLICT BETWEEN THE DRAWINGS, NOTES AND/OR SPECIFICATIONS OCCUR, THE MORE STRINGENT, AND/OR LARGER QUANTITY AND/OR MORE EXPENSIVE SHALL APPLY. THE REQUIREMENTS LISTED WITHIN NOTES OR SPECIFICATIONS SHALL BE REQUIRED, PROVIDED AND INSTALLED WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT.

#### WIRING & RACEWAY:

- THE DRAWINGS SHOW THE GENERAL LAYOUT AND TYPICAL DETAILS. PROVIDE COMPLETE SYSTEMS. DRAWINGS ARE BASED ON THE SPECIFIED EQUIPMENT. RACEWAY LAYOUTS, BOXES, AND WIRING OF THE SYSTEMS ARE SUBJECT TO APPROVED SHOP DRAWINGS.
- ENSURE THAT ITEMS TO BE FURNISHED FIT THE SPACE AVAILABLE. MAKE NECESSARY FIELD MEASUREMENTS TO ASCERTAIN SPACE REQUIREMENTS, INCLUDING THOSE FOR CONNECTIONS, AND PROVIDE SUCH SIZES AND SHAPES OF EQUIPMENT THAT FINAL INSTALLATION SHALL SATISFY THE INTENT OF THE DRAWINGS AND SPECIFICATIONS.
- LOCATIONS OF OUTLETS, SWITCHES, APPLIANCES, ETC. AS SHOWN ON ELECTRICAL PLANS ARE APPROXIMATE; COORDINATE WITH ARCHITECTURAL AND MECHANICAL PLANS AND DETAILS, AND WITH JOB CONDITIONS. INSTALL SWITCHES WITH "OFF" POSITION DOWN. INSTALL RECEPTACLES WITH GROUNDING POLE IN THE UP POSITION FOR VERTICAL MOUNTING AND AT LEFT FOR HORIZONTAL MOUNTING.
- LOCATE AND INSTALL ELECTRICAL EQUIPMENT, JUNCTION AND PULL BOXES, SWITCHES, CONTROLS, AND OTHER APPARATUS REQUIRING MAINTENANCE, INSPECTION, AND OPERATION SO AS TO BE READILY ACCESSIBLE.

#### RACEWAY INSTALLATION:

- IN ALL ARCHITECTURALLY FINISHED SPACES, CONDUITS AND CABLES SHALL BE RUN CONCEALED IN HUNG OR FURRED CEILINGS, SLABS, MASONRY, AND PARTITIONS UNLESS OTHERWISE INDICATED. SAW CUTTING AND FINISHED PATCHING SHALL BE REQUIRED IN EXISTING SLABS AND MASONRY WALLS. IN UNFINISHED SPACES, RACEWAYS MAY BE RUN EXPOSED.
- UNLESS OTHERWISE INDICATED, EXACT ROUTING OF RACEWAYS SHALL BE DETERMINED BY THE CONTRACTOR TO SUIT PROJECT REQUIREMENTS AND FIELD CONDITIONS.
- PROVIDE SEPARATE RACEWAYS, JUNCTION BOXES, PULL BOXES AND WIREWAYS FOR ALL EMERGENCY SYSTEM WIRING.

#### WIRING INSTALLATION:

DO NOT USE WIRE SMALLER THAN NO. 12 AWG FOR ANY POWER OR LIGHTING CIRCUIT. USE LARGER SIZES WHERE INDICATED, AS REQUIRED BY CODES, AND AS FOLLOWS:

30 AMPERE CIRCUIT: NO. 10
40 AMPERE CIRCUIT: NO. 8
50 AMPERE CIRCUIT: NO. 6
60 AMPERE CIRCUIT: NO. 4

MINIMUM HOMERUN AND BRANCH CIRCUIT WIRING SIZES AND MAXIMUM HOMERUN CONDUIT FILL FOR 120 VOLT, 20 AMPERE CIRCUITS SHALL BE AS FOLLOWS:

LENGTH	<u>CIRCUIT</u> WIRE SIZE	HOME RUN WIRE SIZE	CONDUIT SIZE (8 WIRES/CONDUIT
0' TO 50'	#12	#12	3/4"
51' TO 100'	#12	#10	3/4"
101' TO 200'	#10	#8	1"

GREATER THAN 200' - REQUEST DIRECTION FROM ARCHITECT.

NOTE: PROVIDE DERATING PER CODE WHEN INSTALLING MORE THAN 3 CURRENT CARRYING CONDUCTORS IN CONDUIT.

- DO NOT USE WIRE SMALLER THAN NO. 14 AWG FOR CONTROL CIRCUITS UNLESS OTHERWISE RECOMMENDED BY THE EQUIPMENT OR SYSTEM MANUFACTURER ON WIRING SHOP DRAWINGS, AND SO APPROVED BY THE ARCHITECT.
- WHERE GREATER THAN THREE (3) CURRENT-CARRYING CONDUCTORS ARE INSTALLED IN ANY ONE CONDUIT OR CABLE, CONDUCTORS MUST BE DERATED AND SIZES INCREASED, IF NEEDED, TO ACCOMMODATE CONDUCTOR DERATING AS REQUIRED BY NEC ARTICLE 310.
- CONDUCTORS SHALL BE COMPLETELY INSTALLED AND CONNECTED. PROVIDE ALL TERMINALS, LUGS, AND CONNECTORS TO SUIT THE APPLICATION, AND IN COMPLIANCE WITH EQUIPMENT MANUFACTURERS' RECOMMENDATIONS.
- UNDER NO CIRCUMSTANCES SHALL ANY SWITCH OR CIRCUIT BREAKER BREAK A NEUTRAL CONDUCTOR.
- THE CIRCUIT NUMBERS INDICATED ON THE DRAWINGS ARE INTENDED AS A GUIDE FOR PROPER CONNECTION OF CIRCUITS AT PANELBOARDS; HOWEVER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE FINAL CIRCUITING WORK FULFILLS THE FOLLOWING CONDITIONS:
- LOADS ON PANELBOARD BUSSES SHALL BE PHASE-BALANCED AS EVENLY AS POSSIBLE.
- PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT. WHERE MULTIPLE CIRCUITS ARE INSTALLED IN THE SAME RACEWAY OR ENCLOSURE, IDENTIFY NEUTRALS WITH CORRESPONDING BRANCH CIRCUIT PHASE CONDUCTOR NUMBERS.

#### UNIT PRICING:

CONTRACTOR SHALL PROVIDE UNIT COST FOR THE PROVISION AND INSTALLATION OF AN EXIT SIGN AND 50' OF CONDUIT AND WIRE AT TIME OF BID. THIS PRICING WILL BE HELD FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL ASSUME 6 EXIT SIGNS SHALL BE PROVIDED. WORK SHALL BE COMPLETED PRIOR TO SYSTEM APPROVAL AND AS-BUILT DOCUMENTATION. PATCH AND PAINT WORK SHALL NOT BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S UNIT PRICE VALUES. FIRE STOPPING PENETRATIONS SHALL BE INCLUDED.

GROUNDING INSTALLATION:

- EQUIPMENT GROUNDING
- INCLUDE AN INSULATED GROUND CONDUCTOR IN ALL CONDUIT RUNS CONTAINING SECTIONS OF FLEXIBLE CONDUIT UNLESS OTHERWISE NOTED.
- INCLUDE AN INSULATED GROUND CONDUCTOR IN ALL BRANCH CIRCUIT RACEWAYS OR CABLES UNLESS OTHERWISE NOTED.

#### RACEWAYS FOR TELECOMMUNICATION SYSTEMS:

- PROVIDE EMPTY CONDUIT SYSTEMS FOR TELECOMMUNICATION WORK, COMPLETE WITH PULL BOXES, OUTLET BOXES, AND CONDUIT AS INDICATED ON THE DRAWINGS.
- PROVIDE MINIMUM INSIDE BENDING RADIUS OF 10 TIMES CONDUIT INSIDE DIAMETER FOR TELECOMMUNICATIONS RACEWAYS.
- WHEN COMPLETED THE CONDUIT SYSTEMS SHALL BE READY FOR THE INSTALLATION OF WIRING AND EQUIPMENT.
- FROM EACH OUTLET PROVIDE AN EMPTY EMT CONDUIT ROUTED INTO THE CEILING CAVITY OR TO THE CLOSEST TELECOMMUNICATIONS CLOSET. PROVIDE A DRAG LINE IN EACH RUN AND TERMINATE IN A BUSHED ELBOW. REFER TO DETAIL 3/E-6.1.

### **GENERAL NOTES**

MECHANICAL EQUIPMENT WIRING:

- 1. UNLESS OTHERWISE INDICATED OR SPECIFIED HEREIN, ALL MOTORS, MOTOR STARTERS, MOTOR CONTROLLERS, VARIABLE SPEED/FREQUENCY DRIVES, AND ASSOCIATED CONTROL DEVICES ARE FURNISHED UNDER OTHER DIVISIONS AND INSTALLED UNDER THIS DIVISION. COORDINATE INSTALLATION AND LOCATIONS WITH OTHER DIVISION CONTRACTORS.
- 2. POWER WIRING FROM THE INDICATED SOURCE TO THE STARTER/CONTROLLER/DRIVE UNIT, AND FROM THE STARTER/CONTROLLER/DRIVE UNIT TO THE MOTOR, INCLUDING ANY LOCAL DISCONNECT SWITCHES PROVIDED AND INSTALLED BY THIS DIVISION, AND ALL ASSOCIATED LUGS, TERMINALS, AND CONNECTIONS, IS THE WORK OF THIS DIVISION.
- 3. CONTROL CIRCUIT WIRING IS GENERALLY FURNISHED AND INSTALLED UNDER OTHER DIVISIONS, EXCEPT THAT ANY SUCH WIRING SHOWN ON ELECTRICAL DRAWINGS IS WORK OF THIS DIVISION.
- 4. COOPERATE AND COORDINATE WITH THE OTHER TRADES IN THE INSTALLATION, CONNECTION, AND TESTING OF MECHANICAL EQUIPMENT. PERFORM WORK OF THIS SECTION IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS' INSTRUCTIONS.

### COORDINATION DRAWINGS:

- 1. DEVELOP AND SUBMIT COORDINATION DRAWINGS AS OUTLINED.
- A. SHEET METAL AND PLUMBING SHOP DRAWINGS THAT HAVE BEEN COORDINATED WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. DRAWINGS MUST BE RETURNED FROM ENGINEER EITHER "REVIEWED" OR "FURNISH AS CORRECTED" PRIOR TO BEING USED AS BASIS FOR COORDINATION DRAWINGS.
- B. AFTER SHEET METAL AND PIPING DRAWINGS HAVE BEEN REVISED PER ENGINEERS COMMENTS. REPRODUCIBLE COPIES SHALL BE SENT TO THE TRADES IN THE FOLLOWING SEQUENCE FOR THE INCLUSION OF THEIR WORK:

-MECHANICAL SHEET METAL -PLUMBING PIPING -MECHANICAL PIPING -ELECTRICAL WORK

- 2. AFTER ALL TRADES HAVE INCLUDED THEIR WORK ON THE COORDINATION DRAWING AND NOTED CONFLICTS, ALL TRADES SHALL MEET TO RESOLVE CONFLICTS AND AGREE TO ACCEPTABLE SOLUTIONS. EACH TRADE SHALL SIGN COORDINATION DRAWINGS. ITEMS NOT SHOWN ON COORDINATION DRAWING IS RESPONSIBILITY OF OMITTING CONTRACTOR AND CONTRACTOR IS SUBJECT TO ADDITIONAL COSTS INCURRED BY OTHER TRADES.
- 3. THE ARCHITECT AND ENGINEER ARE NOT PART OF THE COORDINATION DRAWING PROCESS. THE ENGINEER WILL PROVIDE ASSISTANCE FOR NOTED CONFLICTS ONLY. COORDINATION DRAWINGS ARE NOT TO BE CONSIDERED PIPING OR DUCT SHOP DRAWINGS. THE CONTRACTOR IS REQUIRED TO SUBMIT INDIVIDUAL PIPING AND DUCTWORK SHOP DRAWINGS FOR REVIEW BY THE ENGINEER. PIPING AND DUCTWORK SHOP DRAWINGS SHALL FOLLOW THE DESIGN INTENT OF THE CONTRACT DOCUMENTS.
- 4. SUBMIT FINAL SIGNED COORDINATION DRAWING TO ENGINEER FOR REVIEW. ENGINEER WILL REVIEW COORDINATION DRAWINGS FOR GENERAL ARRANGEMENT AND FOR NOTED CONFLICTS ONLY. SPECIFIC INSTALLATION REQUIREMENTS WILL BE REVIEWED ONLY IN INDIVIDUAL TRADE SHOP DRAWINGS.
- 5. ANY WORK FABRICATED OR INSTALLED PRIOR TO SIGN OFF BY ALL TRADES WHICH IS DEEMED TO BE IN CONFLICT WITH COORDINATION DRAWINGS SHALL BE REMOVED AND RE-INSTALLED IN CONFORMANCE WITH COORDINATION DRAWINGS.
- 6. EACH CONTRACTOR (MENTIONED ABOVE) IS RESPONSIBLE FOR THE COORDINATION OF HIS SUB-CONTRACTORS.
- 7. THE OVERALL COORDINATION OF THE COORDINATION PROCESS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER IS NOT RESPONSIBLE FOR THE COORDINATION PROCESS. THE ENGINEER WILL RESPOND TO QUESTIONS THAT ARISE FROM THE COORDINATION PROCESS. DRAWINGS SUBMITTED WILL BE REVIEWED FOR CLEARLY IDENTIFIED CONFLICTS ONLY. SOLUTIONS TO CONFLICTS WILL NOT BEAR ADDITIONAL COST.

### AS BUILT DRAWINGS

- PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE ALL INSTALLED CONDITIONS OF SYSTEMS WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION DOCUMENTS AND INCLUDE DETAILS AS NECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND IN A COMPLETE AND CONSECUTIVE SET. SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL BE RETURNED FOR REVISION. THE CONTRACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND CONCISE SET OF DRAWINGS. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC (AUTO-CAD VERSION AS REQUIRED BY THE OWNER) VERSION. NUMBER OF COPIES OF EACH AS REQUESTED BY THE OWNER.
- 2. PROVIDE "AS-BUILT DRAWINGS" INDICATING IN A NEAT AND ACCURATE MANNER A COMPLETE RECORD OF ALL REVISIONS OF THE ORIGINAL DESIGN OF THE WORK. INDICATE THE FOLLOWING INSTALLED CONDITIONS:
- A. INCLUDE ALL CHANGES AND AN ACCURATE RECORD, ON REPRODUCTIONS OF THE CONTRACT DRAWINGS OR APPROPRIATE SHOP DRAWINGS, OF ALL DEVIATIONS, BETWEEN THE WORK SHOWN AND WORK INSTALLED.
- B. EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.
- C. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
- D. CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
- E. SUBMIT FOR REVIEW BOUND SETS OF THE REQUIRED DRAWINGS, MANUALS AND OPERATING INSTRUCTIONS.
- F. SUBMIT A COMPLETE MAINTENANCE MANUAL OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT.

ELECTRICAL DRAWING LIST		
DRAWING NUMBER	DRAWING DESCRIPTION	
E-0.1	COVER SHEET - ELECTRICAL	
E-0.2	LIGHTING FIXTURE SCHEDULE - ELECTRICAL	
ED-1.1	LOWER LEVEL DEMOLITION FLOOR PLAN - ELECTRICAL	
ED-1.2	ROOF DEMOLITION PLAN - ELECTRICAL	
E-1.1	LOWER LEVEL FLOOR PLAN - ELECTRICAL	
E-1.2	ROOF PLAN - ELECTRICAL	
E-2.1	LOWER LEVEL REFLECTED CEILING PLAN - LIGHTING	
E-6.1	DETAILS - ELECTRICAL	
E-7.1	SPECIFICATIONS - ELECTRICAL	

# ELECTRICAL ABBREVIATIONS AMPERES ABOVE FINISHED FLOOR

AFF	ABOVE FINISHED FLOOR	
С	CONDUIT	
C/B	CIRCUIT BREAKER	
СКТ	CIRCUIT	
E.C.	ELECTRICAL CONTRACTOR	
EM	EMERGENCY	
ER	EXISTING RELOCATED	
ETBR	EXISTING TO BE RELOCATED	
ETR	EXISTING TO REMAIN	
FBO	FURNISHED BY OTHERS	
G	GROUND	
JB	JUNCTION BOX	
МСВ	MAIN CIRCUIT BREAKER	
MLO	MAIN LUG ONLY	
MTD	MOUNTED	
PNL	PANEL	
TP	TRAP PRIMER	
U.O.N.	UNLESS OTHERWISE NOTED	
V	VOLTS	
VA	VOLT-AMPERES	
WP	WEATHER PROOF	

### **ALTERNATES**

- ADD ALTERNATE #1: EXISTING CELL COMBY TOILETS SHALL BE REPLACED. PROVIDE 20A/1P CIRCUIT BREAKER IN PANEL A TO ENERGIZE ALL COMBY TOILET ELECTRONIC VALVES. PROVIDE BOXES AS REQUIRED AND CONNECT WITH 2#12 + G - 3/4"C.
- ADD ALTERNATE #2: ALL WORK ASSOCIATED WITH EVIDENCE STORAGE AND PHYSICAL TRAINING ROOMS.

## TEMPORARY TOILET FACILITY

PROVIDE (4) 20A/1P CIRCUIT BREAKERS IN PANEL A TO ENERGIZE TEMPORARY TOILET FACILITY. CIRCUIT BREAKERS SHALL BE COMPATIBLE WITH EXISTING PANELBOARD. COORDINATE EXACT LOCATION WITH OWNER. TEMPORARILY CONNECT WITH 2#12 + G MC CABLE.

### ELECTDICAL DDAM/ING LIST

A#a	LIGHTING FIXTURE, UPPERCASE LETTER INDICATES TYPE, # INDICATES CIRCUIT, LOWERCASE LETTER INDICATES LIGHTING ZONE (TYP)
A #a	EMERGENCY LIGHTING FIXTURE WITH EMERGENCY BATTERY
Sa	SINGLE POLE SWITCH, LETTER INDICATES LIGHTING ZONE (TYP)
SLV	LOW VOLTAGE SWITCH
SLV,P	LOW VOLTAGE PILOT LIGHT SWITCH
<b>S</b> LV,D	LOW VOLTAGE DIMMER SWITCH
Soc	WALL MOUNTED OCCUPANCY SENSOR WITH MANUAL OVERRIDE
<0S>	CEILING MOUNTED DUAL TECHNOLOGY 360° OCCUPANCY SENSOR
	CEILING MOUNTED DUAL TECHNOLOGY 360° VACANCY SENSOR
R	EMERGENCY LIGHTING BYPASS RELAY - COORDINATE WITH ARCHITECT FOR MOUNTING HEIGHT AND LOCATION. (REFER TO DETAIL)
φ	DUPLEX CONVENIENCE RECEPTACLE - 18" AFF U.O.N.
	DUPLEX CONVENIENCE RECEPTACLE - GROUND FAULT INTERRUPTING - 18" AFF U.O.N.
P	DUPLEX CONVENIENCE RECEPTACLE MOUNTED ABOVE COUNTERTOP
$igoplus^{GFI}$	DUPLEX CONVENIENCE RECEPTACLE - GROUND FAULT INTERRUPTING - MOUNTED ABOVE COUNTERTOP
<b>#</b>	QUAD CONVENIENCE RECEPTACLE - 18" AFF U.O.N.
Ъ	NON-FUSED DISCONNECT SWITCH
Ъ	FUSED DISCONNECT SWITCH
#	MOTOR, # INDICATES HORSEPOWER
F	FIRE ALARM MANUAL PULL STATION - 48"AFF U.O.N.
	FIRE ALARM SPEAKER/STROBE - 80"AFF U.O.N.
	FIRE ALARM STROBE LIGHT - 80"AFF U.O.N.
\$	SMOKE DETECTOR
	HEAT DETECTOR
S D	DUCT MOUNTED SMOKE DETECTOR
	SURFACE MOUNTED PANELBOARD AND CLEARANCE
	CONDUCTOR
X/# <del></del>	BRANCH CIRCUIT HOMERUN (X = PANELBOARD, # = CIRCUIT NO.)

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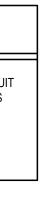
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COVER SHEET ELECTRICAL

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As Noted	<b>E</b> -

DRAWING NO.

DATE NOVEMBER 8, 2018

PROJ. NO.

SCALE

	DEMOLITION AND REMOVALS		LIG
1.	THE EXISTING FACILITY WILL BE OCCUPIED AND IN OPERATION DURING THE PERFORMANCE OF THE	SPACE TYPE	
	WORK. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING FEEDER OR BRANCH CIRCUIT SUPPLYING OCCUPIED FACILITIES, CONFER WITH THE OWNER, AND SCHEDULE A MUTUALLY	LOCKER ROOM LIGHTING	LOCKER ROOM LIGHTIN MINUTES), OR A LOW V SWITCH SHALL NOT ALI CONTROL TYPE.
3.	AGREEABLE PERIOD OF INTERRUPTION. WHERE REPLACEMENT, RELOCATION OR MODIFICATION OF EXISTING EQUIPMENT IS INDICATED, PROVIDE AND MAINTAIN ALL TEMPORARY FEEDERS, CONNECTIONS, CIRCUIT PROTECTION, AND ANY	CLOSET, STORAGE, AND MISC. ROOM LIGHTING	STORAGE, CLOSET, AN AUTOMATIC OFF AFTEF MINUTES). REFER TO T
4	OTHER MATERIALS AND APPURTENANCES REQUIRED TO MAINTAIN SERVICES TO OCCUPIED AREAS. NO WORK SHALL BE LEFT INCOMPLETE, NOR ANY HAZARDOUS SITUATION CREATED, WHICH WILL		, 
	AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. AT NO TIME SHALL THE WORK INTERFERE WITH OR CUT OFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S PRIOR WRITTEN PERMISSION.	HALL LIGHTING	HALL LIGHTING SHALL E
5.	THE OWNER RESERVES THE RIGHT TO OPERATE ALL EXISTING ELECTRICAL AND MECHANICAL EQUIPMENT NOT INCLUDED IN THIS WORK, AND TO PERFORM ALL REQUIRED SERVICING AND REPAIRS TO SAME, AT ALL TIMES.		·
6.	IT IS REQUIRED THAT THE WORK INDICATED AND/OR SPECIFIED SHALL BE CARRIED OUT WITH A MINIMUM OF INTERFERENCE TO THE ESTABLISHED OPERATIONS OF THE BUILDING.	LIGH	ITING FIXTURE
7.	REMOVE, ABANDON, REROUTE, OR RELOCATE ANY CONDUIT, WIRING, LIGHTING FIXTURES, OUTLETS, AND OTHER ELECTRICAL ITEMS, WHICH ARE LAID BARE IN THE COURSE OF, OR INTERFERE WITH, THE ALTERATIONS. REMOVE ALL EXPOSED OUTLETS, CONDUIT, AND BRANCH CIRCUIT WORK, WHICH INTERFERE WITH THE ALTERATIONS.	1. ELECTRICAL CONTRACTOR SHA MOUNTING HARDWARE, LAMPS	, DRIVERS, TRANSFORMERS,
8.	IT IS THE INTENTION OF THESE SPECIFICATIONS TO PROVIDE FOR THE CONTINUANCE OF ALL ELECTRICAL SERVICES PRESENTLY INSTALLED IN THE UNALTERED AREAS. PROVIDE ALL CONDUIT,	2. REFER TO ARCHITECTURAL RE FOR EXACT LOCATIONS AND M	DUNTING HEIGHTS OF ALL LI
9.	WIRING, AND DEVICES NECESSARY TO MAINTAIN SERVICES TO THESE AREAS. COMPARE THE PLANS WITH THE EXISTING CONDITIONS TO DETERMINE THE AMOUNT OF WORK	3. THE ELECTRICAL CONTRACTOF TRIMS PRIOR TO PURCHASE OF     4. WHERE DRIVERS AND CONTRO	FLIGHT FIXTURES.
10	AFFECTED. REMOVE ALL UNUSED EXPOSED CIRCUIT WORK, OUTLETS, FIXTURES AND THE LIKE NOT REQUIRED BY THE ALTERATIONS. ALL MATERIALS REQUIRED TO BE REMOVED AND NOT REINSTALLED UNDER THIS DIVISION OF THE	4. WHERE DRIVERS AND CONTRO CONTRACTOR SHALL PROVIDE EQUIPMENT. CONTRACTOR SH/ SUCH REMOTE MOUNTED EQUI	ALL CONDUIT, WIRE, BOXES
U.	ALL MATERIALS REQUIRED TO BE REMOVED AND NOT REINSTALLED UNDER THIS DIVISION OF THE WORK, UNLESS OTHERWISE INDICATED, SHALL BECOME THE PROPERTY OF THE CONTRACTOR, AND SHALL BE REMOVED FROM THE SITE.	INDICATED ON MARKED-UP LAY	
.1.	WHERE FEEDERS AND BRANCH CIRCUITS OR DEVICES AND EQUIPMENT ARE INDICATED TO BE REMOVED, CONDUCTORS AND CABLES SHALL BE COMPLETELY REMOVED BACK TO THEIR SOURCE. EXPOSED OR ACCESSIBLE CONDUITS SHALL BE REMOVED COMPLETELY; CONDUITS EMBEDDED IN CONCRETE OR MASONRY SHALL BE CUT OFF FLUSH AND THE SURFACE PATCHED SMOOTH AND LEVEL.	LIGH	TING CONTROI
2.	WHERE DEVICES AND/OR EQUIPMENT ARE INDICATED TO BE RELOCATED, CONDUCTORS AND RACEWAY SHALL BE EXTENDED TO THE NEW LOCATION AND RECONNECTED TO PROVIDE A COMPLETE WORKING SYSTEM. IF THERE ARE ASSOCIATED DEVICES WITH THE RELOCATED EQUIPMENT THEY SHALL BE RELOCATED AS WELL, UNLESS OTHERWISE NOTED, AND CONNECTED INTO THE SYSTEM.	1. IT IS THE RESPONSIBILITY OF T FIXTURES, LIGHTING CONTROL ETC. REFER TO LIGHTING LIGH REQUIREMENTS AND SPECIFIC, PROVIDED	DEVICES, LOW-VOLTAGE & 1 TING FIXTURE SCHEDULE AN
13.	REMOVED MATERIALS SHALL BE DISPOSED OF USING LICENSED CARTING SERVICE.	PROVIDED. 2. FIXTURES DESIGNATED FOR US	
4.	HAZARDOUS MATERIALS - CONTAINING PCB'S (BALLASTS), AND THE LIKE SHALL BE DISPOSED OF BY AN EPA APPROVED, LICENSED DISPOSAL SERVICE. CONTRACTOR SHALL OBTAIN AND HAVE ON FILE, AFFIDAVIT, AND RECEIPTS STATING HOW AND WHERE THE WASTE WAS DISPOSED OF OR CONVERTED.	CONTROLS AND WIRING NECES LIGHTING SERVING THE AREA. SHALL BE ACCESSIBLE FROM F STATUS OF EMERGENCY SYSTE COORDINATED WITH THE ARCH	THE CONTROL MECHANISMS LOOR FOR MAINTENANCE, TI EM OPERATION. THE LOCATIO
5.	CONTRACTOR SHALL REMOVE ALL ELECTRICAL EQUIPMENT IN OR ON WALLS THAT ARE TO BE REMOVED - MAINTAIN CONTINUITY OF ALL EXISTING BRANCH CIRCUITRY TO EXISTING ROOMS NOT BEING RENOVATED. REWIRE ALL EXISTING BRANCH CIRCUITS (THAT ARE TO REMAIN) AS REQUIRED. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR WALLS BEING REMOVED - REFER TO CONSTRUCTION SCHEDULE FOR TIME DELAY.	DRAWING FOR REVIEW.	
16.	CONDUIT IN EXISTING OR NEW CEILINGS THAT IS NOT INTENDED FOR REUSE SHALL BE REMOVED BACK TO THE PANEL FROM WHICH IT ORIGINATES.		
17.	CONDUCTORS THAT ARE NOT DEEMED REUSABLE SHALL BE REMOVED BACK TO THE NEAREST JUNCTION BOX. WHERE THE ENTIRE CIRCUIT IS TO BE REMOVED, THE CONDUCTORS SHALL BE REMOVED BACK TO THE PANELBOARD FROM WHICH THEY ORIGINATE.		
8.	OUTAGES OF EXISTING ELECTRICAL (LIGHTING, POWER, AND SIGNAL) SYSTEMS NECESSITATED BY WORK OF ALL TRADES SHALL BE IN ACCORDANCE WITH FIELD SCHEDULES BY THE GENERAL CONTRACTOR AND OWNER - INCLUDE ALL ELECTRIC WORK OVERTIME AND SUPERVISION TO COMPLY - CONTRACTOR SHALL OBTAIN OWNER'S GENERAL CONTRACTOR'S APPROVAL PRIOR TO DISRUPTING EXISTING ELECTRICAL SYSTEM.		
19.	CONTRACTOR TO MAINTAIN CONTINUITY AND ACCESSIBILITY OF ALL EXISTING SYSTEMS AND SYSTEM EQUIPMENT FEEDERS WHICH MAY BE DISRUPTED FOR WORK OF ANY TRADE.		
	CONTRACTOR TO MAINTAIN CONTINUITY AND ACCESSIBILITY OF ALL EXISTING ELECTRICAL (POWER, LIGHTING, AND SIGNAL) SYSTEMS, EQUIPMENT FEEDERS AND BRANCH CIRCUITS ON FLOORS OR AREAS THAT ARE NOT AFFECTED BY DEMOLITION OR NEW CONSTRUCTION - REFER TO CONSTRUCTION SCHEDULE FOR ADDITIONAL INFORMATION.		
21.	ANY EXISTING ELECTRICAL WORK WHICH IS PULLED OUT OR CUT AWAY SHALL BE REMOVED FROM THE SITE AS DIRECTED BY THE GENERAL CONTRACTOR AND THE OWNER.		
22.	EXISTING ELECTRICAL EQUIPMENTS WHICH IS NOT TO BE REUSED SHALL BE REMOVED FROM DRYWALL PARTITIONS. ANY OPENING IN EXISTING PARTITIONS LEFT BY REMOVAL OF EXISTING ELECTRICAL EQUIPMENT SHALL BE PATCHED BY THIS CONTRACTOR WITH MATERIALS TO MATCH EXISTING.		
23.	FOR PURPOSES OF THE CONTRACT, WHAT IS NOTED OR SHOWN ON DRAWINGS INDICATES THE SCOPE OF WORK REQUIRED AND QUALITY OF MATERIALS REQUIRED.		
4.	CONTRACTOR TO EXAMINE ALL CONTRACT DOCUMENTS AND PERFORM ALL DEMOLITION BOTH FOR AREAS BEING RENOVATED AND FOR AREAS WHICH MUST BE REWORKED TO PERMIT THE INSTALLATION OF WORK BY THE VARIOUS TRADES.		
<u>2</u> 5.	CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE EXTENT OF DEMOLITION AND REMOVALS PRIOR TO THE SUBMISSION OF BIDS. NO CONSIDERATION SHALL BE GIVEN FOR FAILURE TO VISIT THE SITE.		
26.	CONTRACTOR SHALL UTILIZE ALL THE BREAKERS IN THE EXISTING PANELS THAT BECOME AVAILABLE WHEN BRANCH CIRCUITS ASSOCIATED WITH THEM ARE DISCONNECTED AND REMOVED DUE TO DEMOLITION OF THE ELECTRICAL WORK.		

LIGHTING CONTROL SEQUENCE OF OPERATIONS				
LIGHTING CONTROL STRATEGY	DETAIL / DRAWING			
KER ROOM LIGHTING SHALL BE CONTROLLED BY EITHER A WALL SWITCH OCCUPANCY SENSOR (AUTOMATIC ON / AUTOMATIC OFF AFTER 30 UTES), OR A LOW VOLTAGE SWITCH(ES) AND OCCUPANCY SENSOR(S) (AUTOMATIC ON / AUTOMATIC OFF AFTER 30 MINUTES). LOW VOLTAGE TCH SHALL NOT ALLOW THE OCCUPANT TO MANUALLY TURN OFF THE LIGHTING FIXTURES WITHIN THE SPACE. REFER TO THE RCPS FOR ITROL TYPE.	4 / E-6.1			
RAGE, CLOSET, AND ALL OTHER MISC. ROOM LIGHTING SHALL BE CONTROLLED BY EITHER A WALL SWITCH VACANCY SENSOR (MANUAL ON / OMATIC OFF AFTER 30 MINUTES), OR A LOW VOLTAGE SWITCH(ES) AND VACANCY SENSOR(S) (MANUAL ON / AUTOMATIC OFF AFTER 30 UTES). REFER TO THE RCPS FOR CONTROL TYPE.	4 / E-6.1			
L LIGHTING SHALL BE CONTROLLED BY AN OCCUPANCY SENSOR(S) (AUTOMATIC ON / AUTOMATIC OFF AFTER 30 MINUTES).	4 / E-6.1			

JRE	NO	TES	

SH AND INSTALL ALL LIGHTING FIXTURES COMPLETE WITH TRANSFORMERS, ETC.

EILING PLANS AND ARCHITECTURAL INTERIOR ELEVATIONS EIGHTS OF ALL LIGHT FIXTURES.

RIFY ALL CEILING TYPES AND/OR COORDINATE ALL FIXTURE

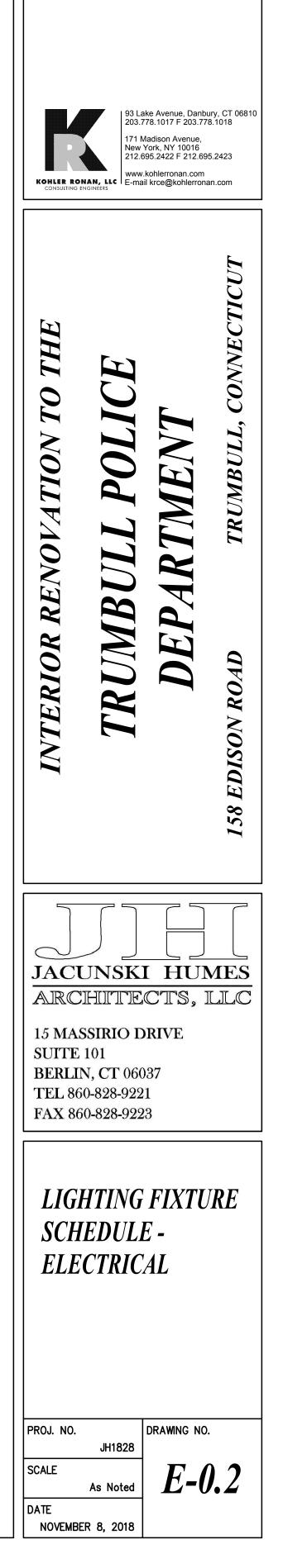
S ARE TO BE MOUNTED REMOTE FROM FIXTURE, UIT, WIRE, BOXES AND MOUNTING HARDWARE FOR SUCH DINATE LOCATION WITH FINISHES AND MILLWORK IN SPACE. ALL BE NOTED ON SUBMITTAL AND PROPOSED LOCATION VING FOR REVIEW BY ARCHITECT AND ENGINEER.

## CONTROL NOTES

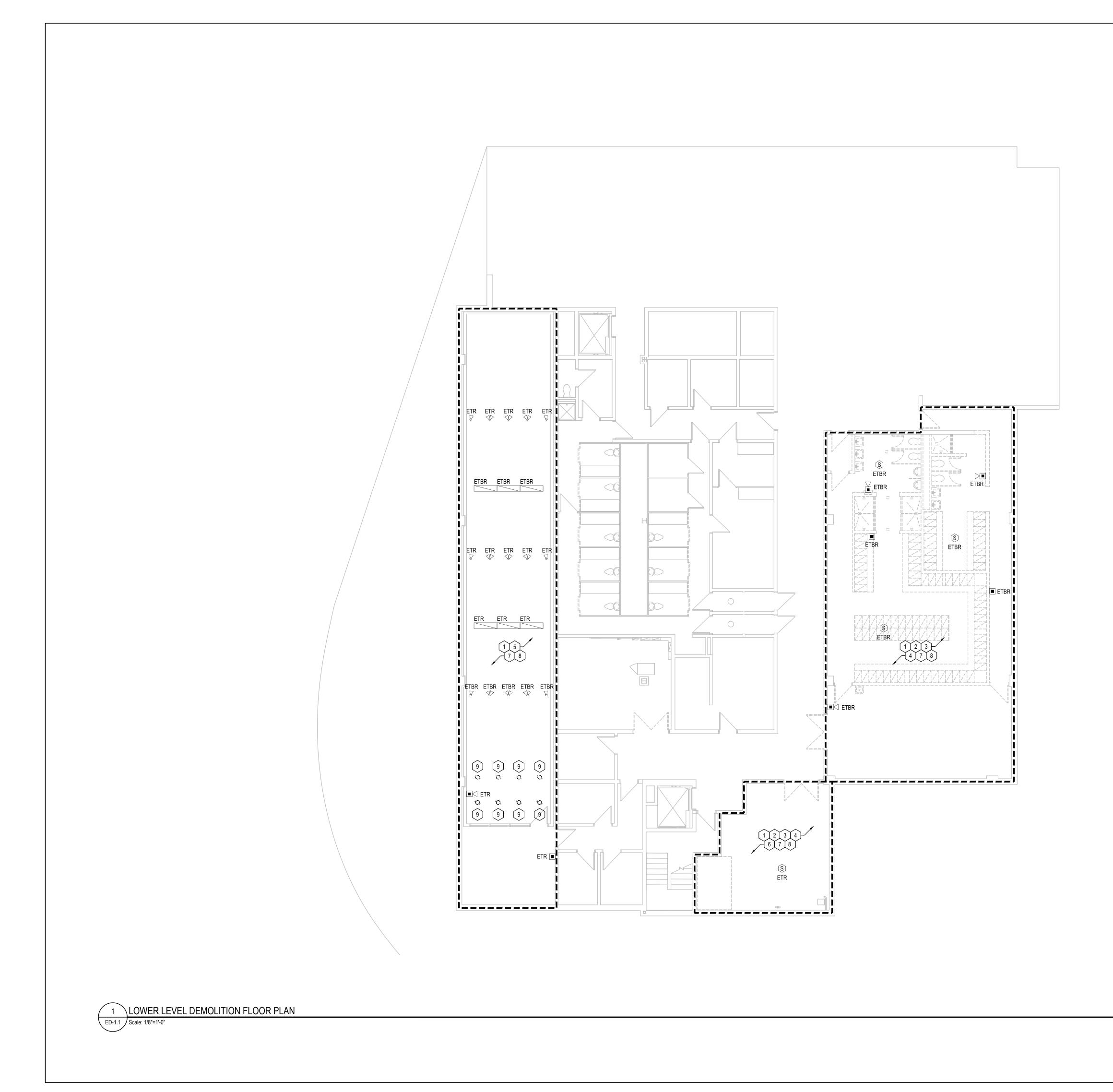
RICAL CONTRACTOR TO FURNISH AND INSTALL ALL LIGHTING LOW-VOLTAGE & 120V WIRING, RACEWAYS, TRANSFORMERS, JRE SCHEDULE AND LIGHTING CONTROL DIAGRAMS FOR ALL I LIGHT FIXTURES, EQUIPMENT, DEVICES AND WIRING TO BE

RGENCY LIGHTING SHALL BE PROVIDED WITH ALL R AUTOMATIC ACTIVATION UPON LOSS OF POWER TO ROL MECHANISMS FOR ALL EMERGENCY LIGHTING FIXTURES R MAINTENANCE, TESTING, AND VISUAL INDICATION OF ITION. THE LOCATION OF SUCH DEVICES SHALL BE D ENGINEER PRIOR TO INSTALLATION. SUBMIT LAYOUT

	LIGHTING FIXTURE SCHEDULE				
TYPE	LAMP	VOLTAGE	LUMENS	MOUNTING	DESCRIPTION
8 8	LED	120/277V	-	CEILING SURFACE	EDGE LIT LED EXIT SIGN, ALUMINUM HOUSING, RED STANDARD LETTER COLOR, MIRROR BACKGROUND, PROVIDE CHEVRONS AND SINGLE OR DOUBLE FACE AS INDICATED ON RCP, BATTERY BACKUP EVENLITE SOVEREIGN #SOV
₽	LED	120/277V	-	WALL SURFACE	EDGE LIT LED EXIT SIGN, ALUMINUM HOUSING, RED STANDARD LETTER COLOR, MIRROR BACKGROUND, SINGLE FACE, PROVIDE CHEVRONS AS INDICATED ON RCP, BATTERY BACKUP EVENLITE SOVEREIGN #SOV
A1	5.5W / FT LED	120/277V	650 LM / FT	CEILING SURFACE	4' FIXTURE, 3000K, MEDIUM OUTPUT, SATIN ACRYLIC SHIELDING, TEXTURED MATTE WHITE, T-BAR EXPOSED, 10% 0-10V DIMMING, #EMH BATTERY WHERE IDENTIFIED ON DRAWINGS PRUDENTIAL LIGHTING #AERO-LED3-MO-4'-SAL-TMW-UNV-SUR-X1-DM10
A2	5.5W / FT LED	120/277V	650 LM / FT	CEILING SURFACE	6' FIXTURE, 3000K, MEDIUM OUTPUT, SATIN ACRYLIC SHIELDING, TEXTURED MATTE WHITE, T-BAR EXPOSED, 10% 0-10V DIMMING, #EMH BATTERY WHERE IDENTIFIED ON DRAWINGS PRUDENTIAL LIGHTING #AERO-LED3-MO-6'-SAL-TMW-UNV-SUR-X1-DM10
B1	11W LED	120/277V	750 LM	CEILING RECESSED	6" SHALLOW ROUND DOWNLIGHT, 0-10V DIMMING, 93+ CRI, 3000K, SMOOTH STYLE, WHITE FINISH DMF LIGHTING #DRDH-N-IC-6S-70/DRD2M-7-9-30-A/DRD2T-R-6-S-WH
C1	8W / FT LED	120V	533 LM / FT	CEILING RECESSED	2' WALL WASH FIXTURE, 6" APERTURE, STANDARD OUTPUT, 3000K, TELESCOPING END, 0-10V DIMMING, RECESSED WALL TO WALL, ADJUSTMENT TRIM, GYP OR GRID FLAGNE, WHITE GAMMALUX LIGHTING #GPCAR6N-1SOLED30T-120V-ZTVL-2'N-RECW/AT/GFW-OP-WH
C2	8W / FT LED	120V	533 LM / FT	CEILING RECESSED	3' WALL WASH FIXTURE, 6" APERTURE, STANDARD OUTPUT, 3000K, TELESCOPING END, 0-10V DIMMING, RECESSED WALL TO WALL, ADJUSTMENT TRIM, GYP OR GRID FLAGNE, WHITE GAMMALUX LIGHTING #GPCAR6N-1SOLED30T-120V-ZTVL-3'N-RECW/AT/GFW-OP-WH
C3	8W / FT LED	120V	533 LM / FT	CEILING RECESSED	5' WALL WASH FIXTURE, 6" APERTURE, STANDARD OUTPUT, 3000K, TELESCOPING END, 0-10V DIMMING, RECESSED WALL TO WALL, ADJUSTMENT TRIM, GYP OR GRID FLAGNE, WHITE GAMMALUX LIGHTING #GPCAR6N-1SOLED30T-120V-ZTVL-5'N-RECW/AT/GFW-OP-WH
C4	8W / FT LED	120V	533 LM / FT	CEILING RECESSED	6' WALL WASH FIXTURE, 6" APERTURE, STANDARD OUTPUT, 3000K, TELESCOPING END, 0-10V DIMMING, RECESSED WALL TO WALL, ADJUSTMENT TRIM, GYP OR GRID FLAGNE, WHITE GAMMALUX LIGHTING #GPCAR6N-1SOLED30T-120V-ZTVL-6'N-RECW/AT/GFW-OP-WH
C5	8W / FT LED	120V	533 LM / FT	CEILING RECESSED	7' WALL WASH FIXTURE, 6" APERTURE, STANDARD OUTPUT, 3000K, TELESCOPING END, 0-10V DIMMING, RECESSED WALL TO WALL, ADJUSTMENT TRIM, GYP OR GRID FLAGNE, WHITE GAMMALUX LIGHTING #GPCAR6N-1SOLED30T-120V-ZTVL-7'N-RECW/AT/GFW-OP-WH
D1	24W LED	120/277V	3,000 LM	CEILING RECESSED	2' X 4' FIXTURE, FLAT WHITE STEEL DOOR, A12 .095 HP SHIELDING, 3000K, 10% 0-10V DIMMING, 1 DRIVER, #EL14W BATTERY WHERE IDENTIFIED ON DRAWINGS METALUX LIGHTING #24GR-LD5-30-F1-UNV-L830-CD-1
D2	20W LED	120/277V	2,400 LM	CEILING RECESSED	2' X 2' FIXTURE, FLAT WHITE STEEL DOOR, A12 .095 HP SHIELDING, 3000K, 10% 0-10V DIMMING, 1 DRIVER, #EL14W BATTERY WHERE IDENTIFIED ON DRAWINGS METALUX LIGHTING #22GR-LD5-24-F1-UNV-L830-CD-1
D3	24W LED	120/277V	2,400 LM	CEILING RECESSED	1' X 4' FIXTURE, FLAT WHITE STEEL DOOR, A12 .095 HP SHIELDING, 3000K, 10% 0-10V DIMMING, 1 DRIVER, #EL14W BATTERY WHERE IDENTIFIED ON DRAWINGS METALUX LIGHTING #14GR-LD5-24-F1-UNV-L830-CD-1

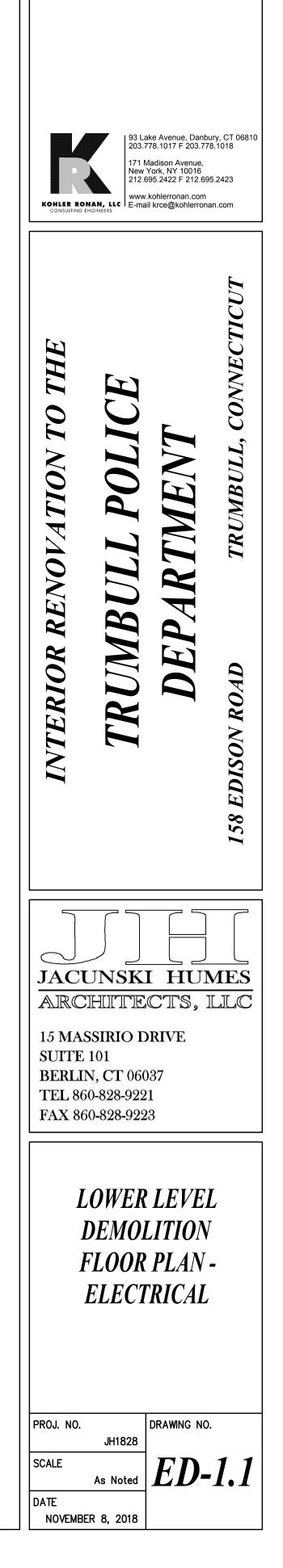


**RFP 6320** 

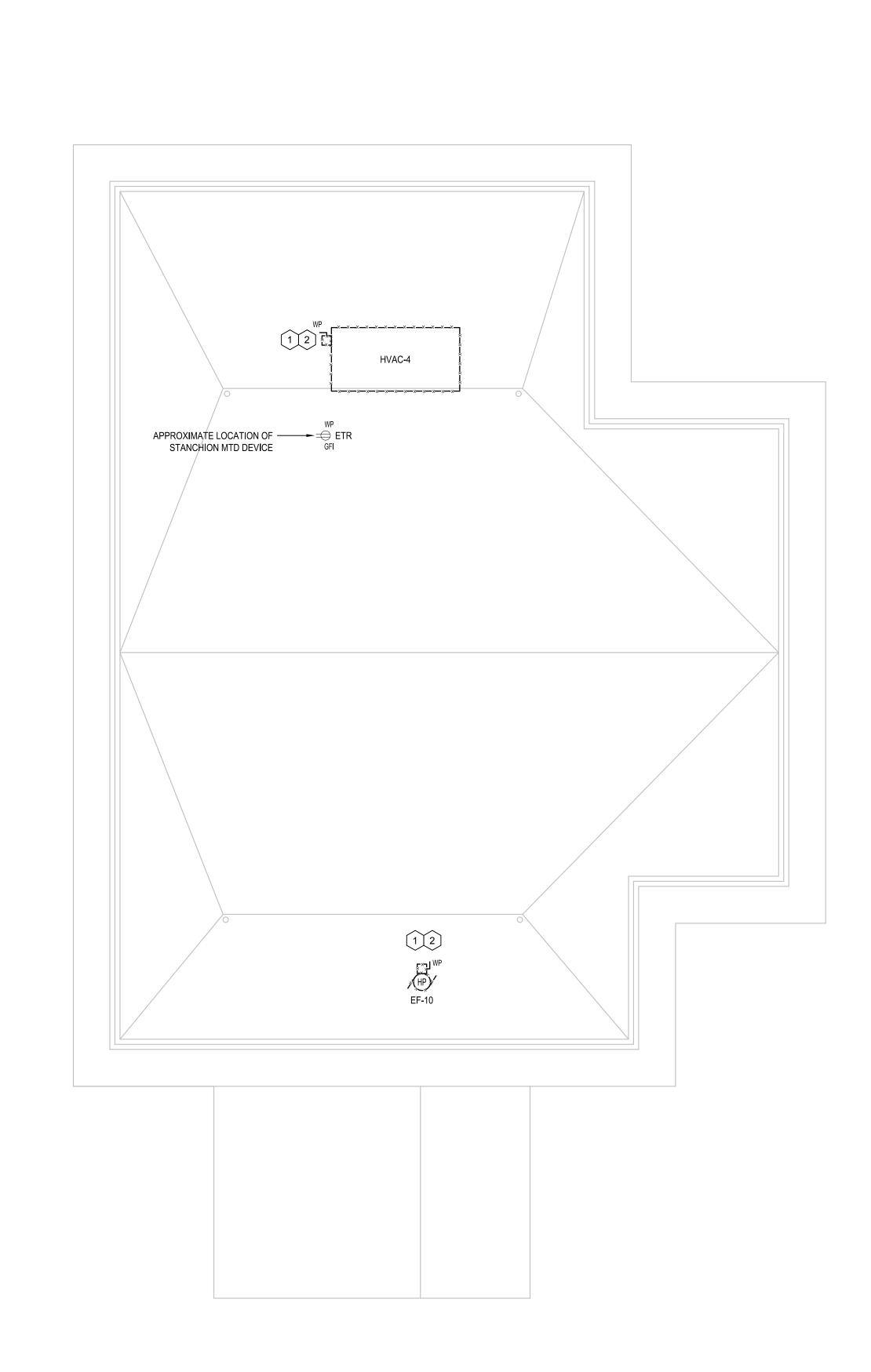


## DEMOLITION KEY NOTES

1	REFER TO ARCHITECTURAL DRAWINGS FOR EXACT EXTENT OF DEMOLITION WORK.
2	DISCONNECT AND REMOVE ALL EXISTING INTERIOR LIGHTING FIXTURES, CONTROLS, AND BACKBOXES. DISCONNECT EXISTING ASSOCIATED CONDUIT AND WIRING AND COIL IN CEILING FOR FUTURE REUSE (TYPICAL FOR ALL AREAS).
3	DISCONNECT AND REMOVE ALL EXISTING RECEPTACLES, BACKBOXES, CONDUIT AND WIRING BACK TO PANELBOARD (TYPICAL FOR ALL AREAS, U.O.N.).
4	DISCONNECT AND REMOVE ALL EXISTING TELEPHONE/DATA OUTLETS, JUNCTION BOXES, RACEWAYS AND WIRING BACK TO TELECOMMUNICATIONS BACKBOARD (TYPICAL FOR ALL AREAS). COORDINATE CABLE REMOVAL WITH OWNER.
5	DISCONNECT AND REMOVE ALL FINAL CONNECTIONS, DISCONNECT SWITCHES, OUTLETS, CONDUIT AND WIRING FOR HVAC EQUIPMENT BACK TO PANELBOARD (TYPICAL FOR ALL EQUIPMENT TO BE REMOVED).
6	DISCONNECT AND REMOVE ALL EXISTING HARDWIRED FIRE ALARM DEVICES, BACKBOXES, CONDUIT AND WIRING BACK TO RESPECTIVE FIRE ALARM TERMINAL CABINET OR NEXT ETR UPSTREAM DEVICE. SMOKE DETECTORS SHALL BE REMOVED PRIOR TO OTHER DEMOLITION SCOPE. (TYPICAL FOR ALL AREAS, U.O.N).
7	PROVIDE TEMPORARY HEAT DETECTORS AND WIRING CONNECTED TO THE EXISTING FIRE ALARM SYSTEM DURING CONSTRUCTION. UPON COMPLETION OF NEW WORK, HEAT DETECTORS SHALL BE TURNED OVER TO OWNER.
8	MAINTAIN/RECONNECT ALL EXISTING BRANCH CIRCUIT WIRING DISTURBED DURING CONSTRUCTION BUT OUTSIDE OF NEW CONSTRUCTION AREA.
9	DISCONNECT AND REMOVE EXISTING INTERIOR LIGHTING FIXTURE AND BACKBOX. DISCONNECT EXISTING ASSOCIATED CONDUIT AND WIRING AND COIL IN CEILING FOR FUTURE REUSE.



**RFP 6320** 

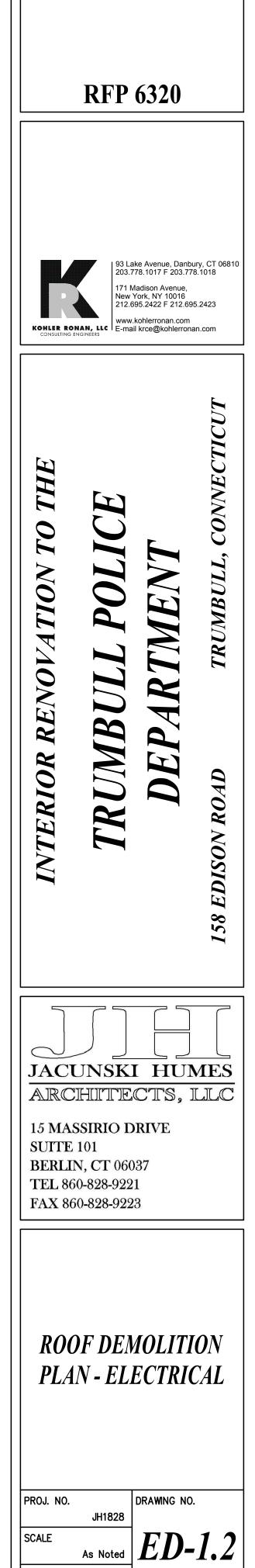




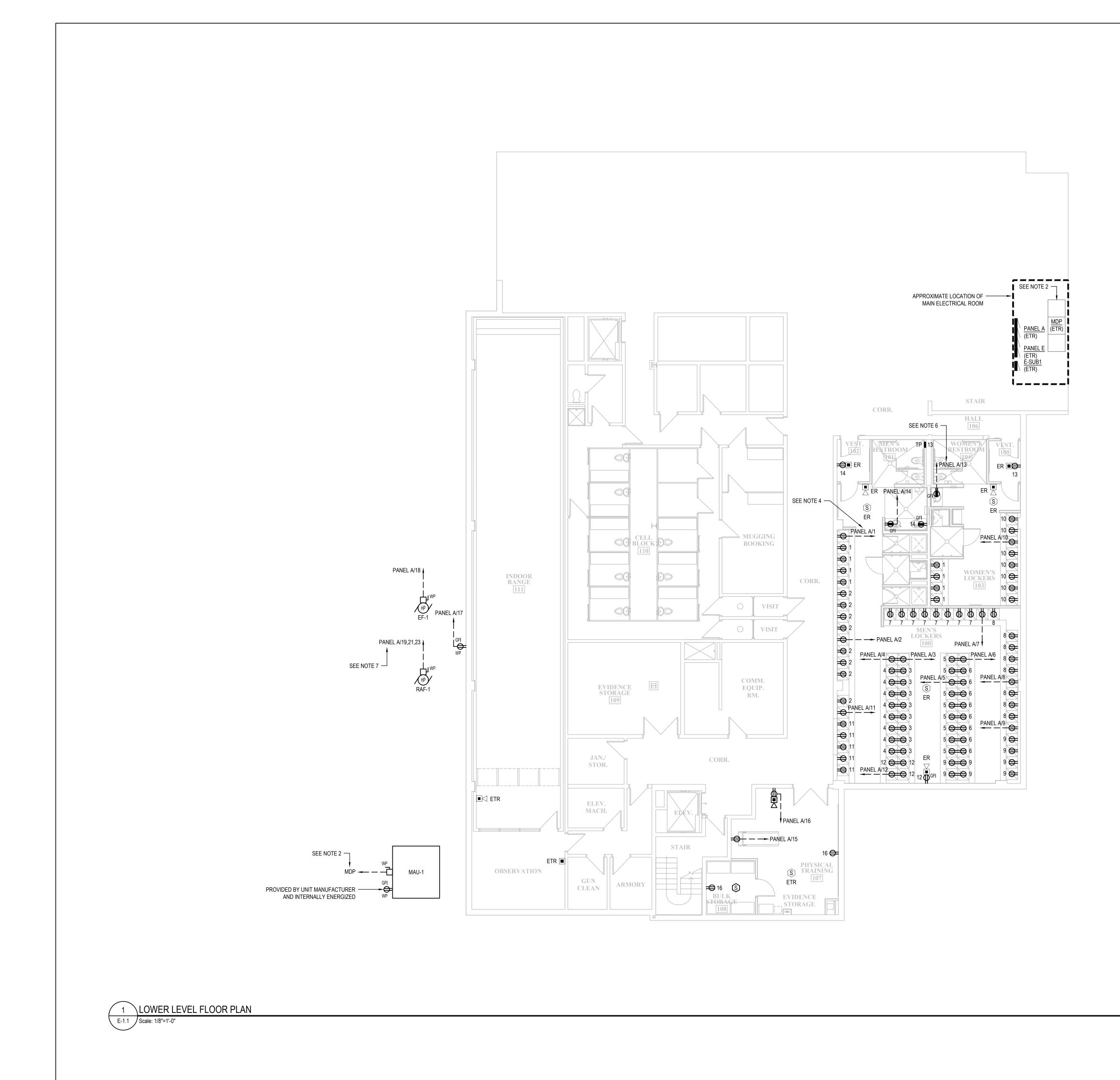
## DEMOLITION KEY NOTES

(1) REFER TO ARCHITECTURAL DRAWINGS FOR EXACT EXTENT OF DEMOLITION WORK.

DISCONNECT AND REMOVE ALL FINAL CONNECTIONS, DISCONNECT SWITCHES, AND WIRING SERVING HVAC EQUIPMENT BACK TO SOURCE. DISCONNECT CONDUIT. CONDUIT SHALL BE REUSED FOR NEW EQUIPMENT.

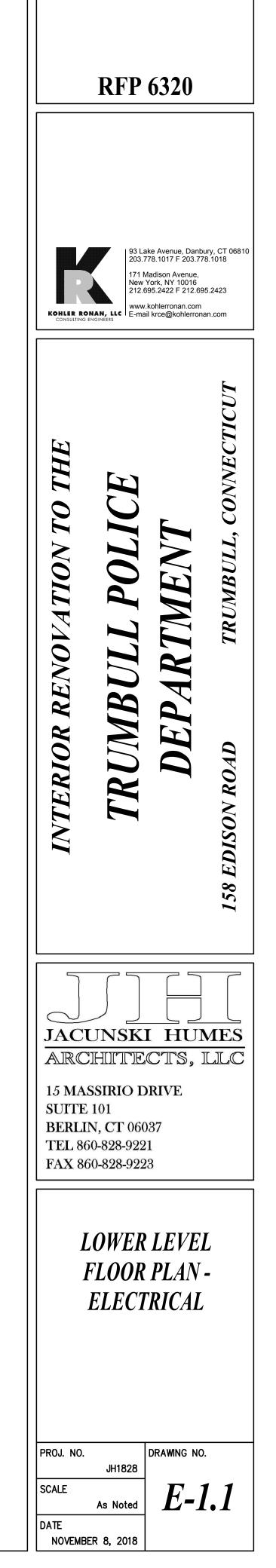


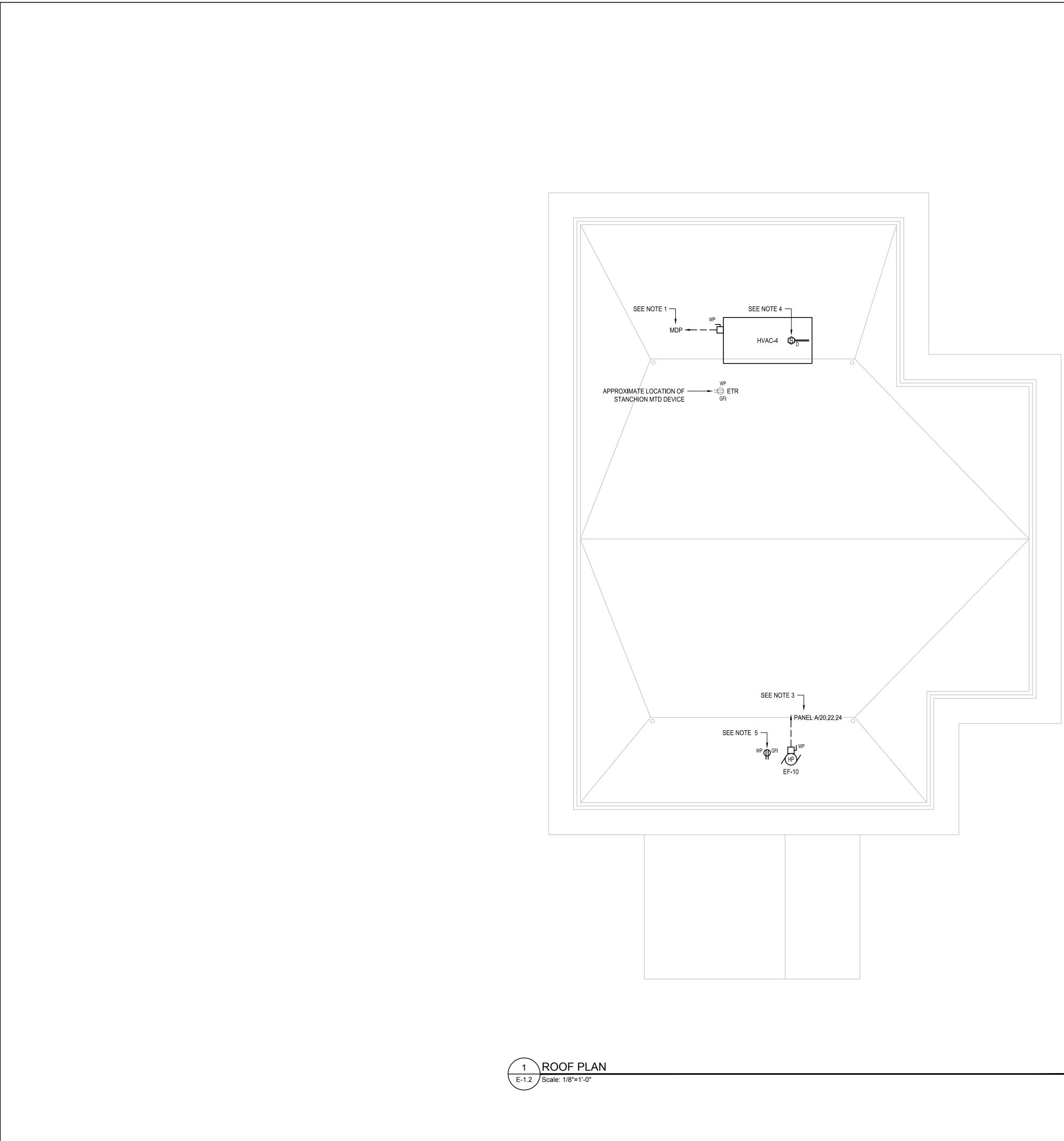
DATE NOVEMBER 8, 2018



### NOTES

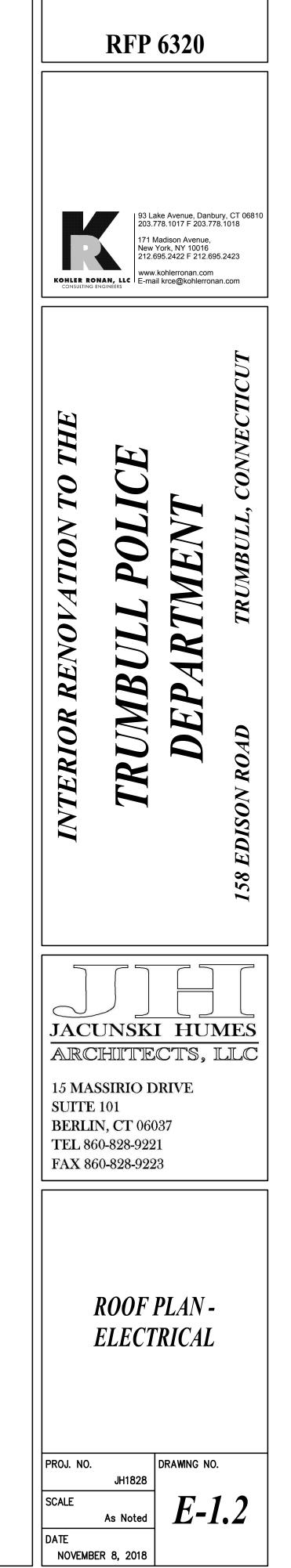
- 1. EXTEND EXISTING FIRE ALARM BRANCH CIRCUITS TO EXISTING RELOCATED FIRE ALARM DEVICES. EXTEND EXISTING NEARBY FIRE ALARM BRANCH CIRCUITS TO NEW FIRE ALARM DEVICES. PROVIDE ALL NECESSARY HARDWARE AND PROGRAMMING (TYP FOR ALL FIRE ALARM DEVICES).
- 2. REPLACE EXISTING 175A/3P CIRCUIT BREAKER LABELED "SPARE" IN NORMAL DISTRIBUTION SECTION OF MDP WITH 175/3P CIRCUIT BREAKER TO ENERGIZE MAU-1. CIRCUIT BREAKER SHALL BE COMPATIBLE WITH EXISTING SWITCHBOARD. CONNECT WITH 3#2/0 + #6G - 2"C.
- 3. PANELBOARD CIRCUIT NUMBERS ARE NOT TO INDICATE ACTUAL AVAILABLE CIRCUIT NUMBERS IN THE PANELBOARD, BUT SHOULD BE USED TO DELINEATE BETWEEN CIRCUITS. E.C. SHALL FIELD VERIFY AVAILABLE CIRCUITS AND UPDATE ALL PANELBOARD DIRECTORIES.
- 4. PROVIDE 20A/1P GFCI CIRCUIT BREAKER COMPATIBLE WITH EXISTING PANELBOARD (TYP FOR BRANCH CIRCUITS A/1 THROUGH A/12).
- 5. ALL BRANCH CIRCUITS SHALL BE 2#12 + G 3/4"C, U.O.N.
- 6. PROVIDE 20A/1P CIRCUIT BREAKER COMPATIBLE WITH EXISTING PANELBOARD (TYP FOR ALL BRANCH CIRCUITS, U.O.N.).
- 7. PROVIDE 60A/3P CIRCUIT BREAKER COMPATIBLE WITH EXISTING PANELBOARD. CONNECT WITH 3#4 + #10G 1-1/4"C.

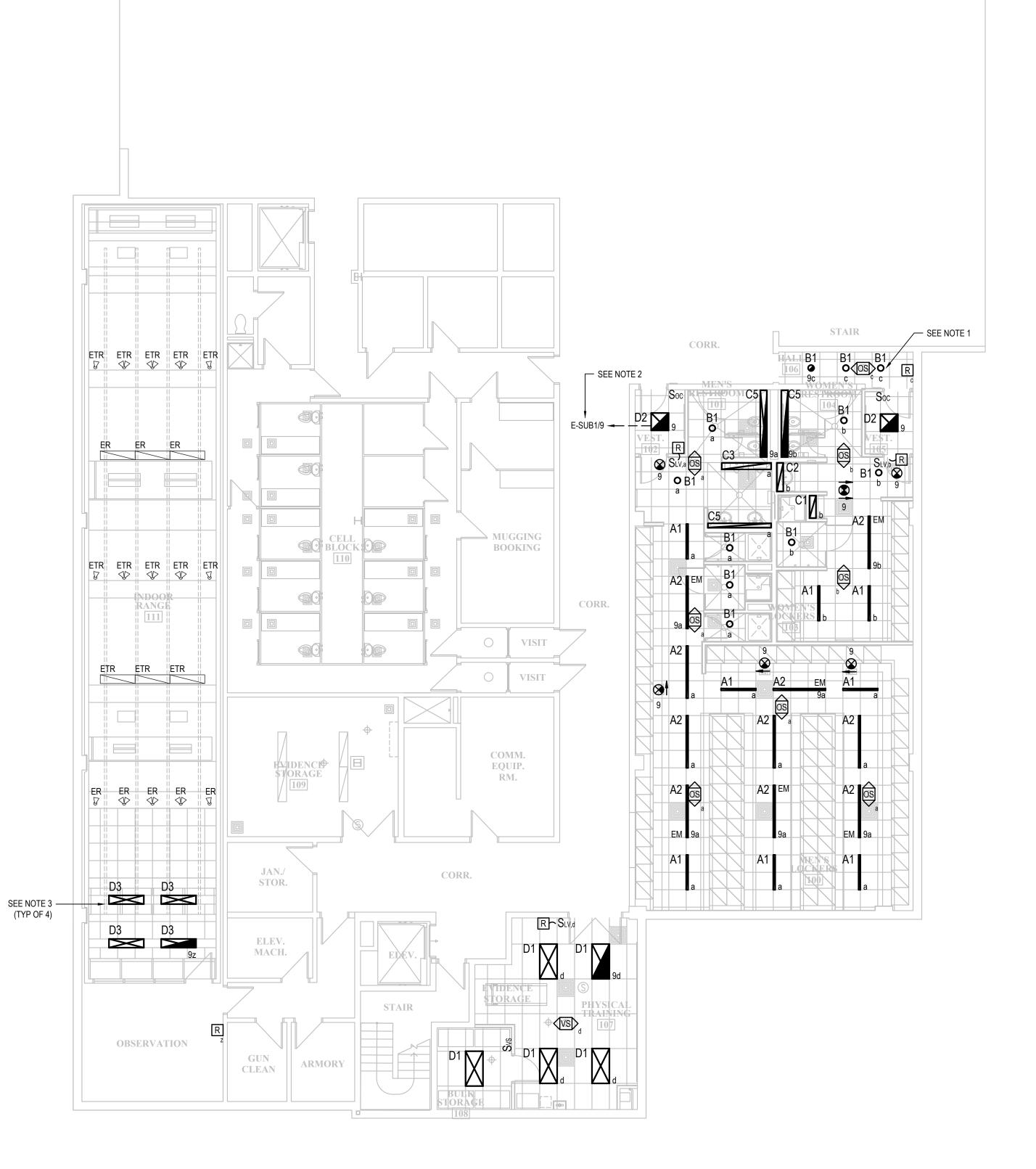




### NOTES

- REPLACE EXISTING 125A/3P CIRCUIT BREAKER LABELED "BASEMENT A/C" IN NORMAL DISTRIBUTION SECTION OF MDP WITH 150/3P CIRCUIT BREAKER TO ENERGIZE HVAC-4. CIRCUIT BREAKER SHALL BE COMPATIBLE WITH EXISTING SWITCHBOARD. CONNECT WITH 3#1/0 + #6G. REUSE EXISTING CONDUIT PREVIOUSLY SERVING REMOVED UNIT. EXTEND CONDUIT AS REQUIRED.
- PANELBOARD CIRCUIT NUMBERS ARE NOT TO INDICATE ACTUAL AVAILABLE CIRCUIT NUMBERS IN THE PANELBOARD, BUT SHOULD BE USED TO DELINEATE BETWEEN CIRCUITS. E.C. SHALL FIELD VERIFY AVAILABLE CIRCUITS AND UPDATE ALL PANELBOARD DIRECTORIES.
- PROVIDE 20A/3P CIRCUIT BREAKER COMPATIBLE WITH EXISTING PANELBOARD. CONNECT WITH 3#12 + G. REUSE EXISTING CONDUIT PREVIOUSLY SERVING REMOVED FAN. EXTEND CONDUIT AS REQUIRED.
- EXTEND EXISTING FIRE ALARM BRANCH CIRCUIT ON FLOOR BELOW TO NEW FIRE ALARM DEVICE. PROVIDE ALL NECESSARY HARDWARE AND PROGRAMMING.
- 5. RECEPTACLE SHALL BE ENERGIZED BY EXISTING NEARBY BRANCH CIRCUIT SERVING CORRIDOR ON FLOOR BELOW. EXTEND CONDUIT AND WIRE AS REQUIRED.





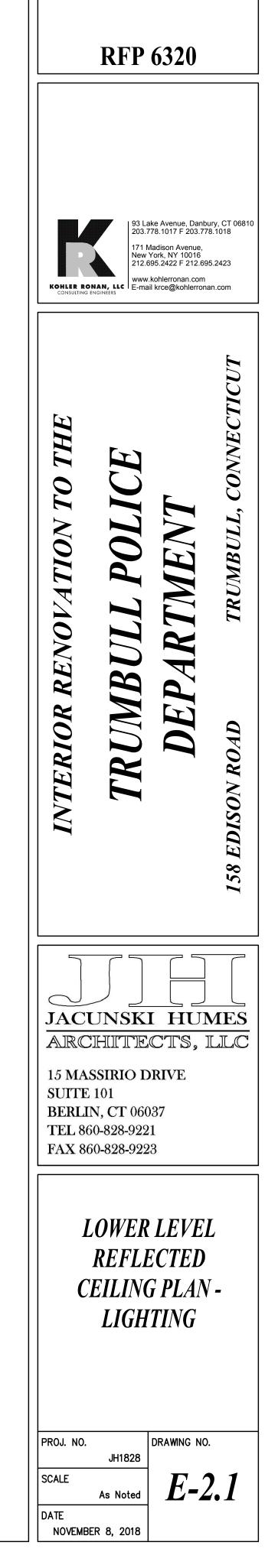
1 LOWER LEVEL REFLECTED CEILING PLAN E-2.1 Scale: 1/8"=1'-0"

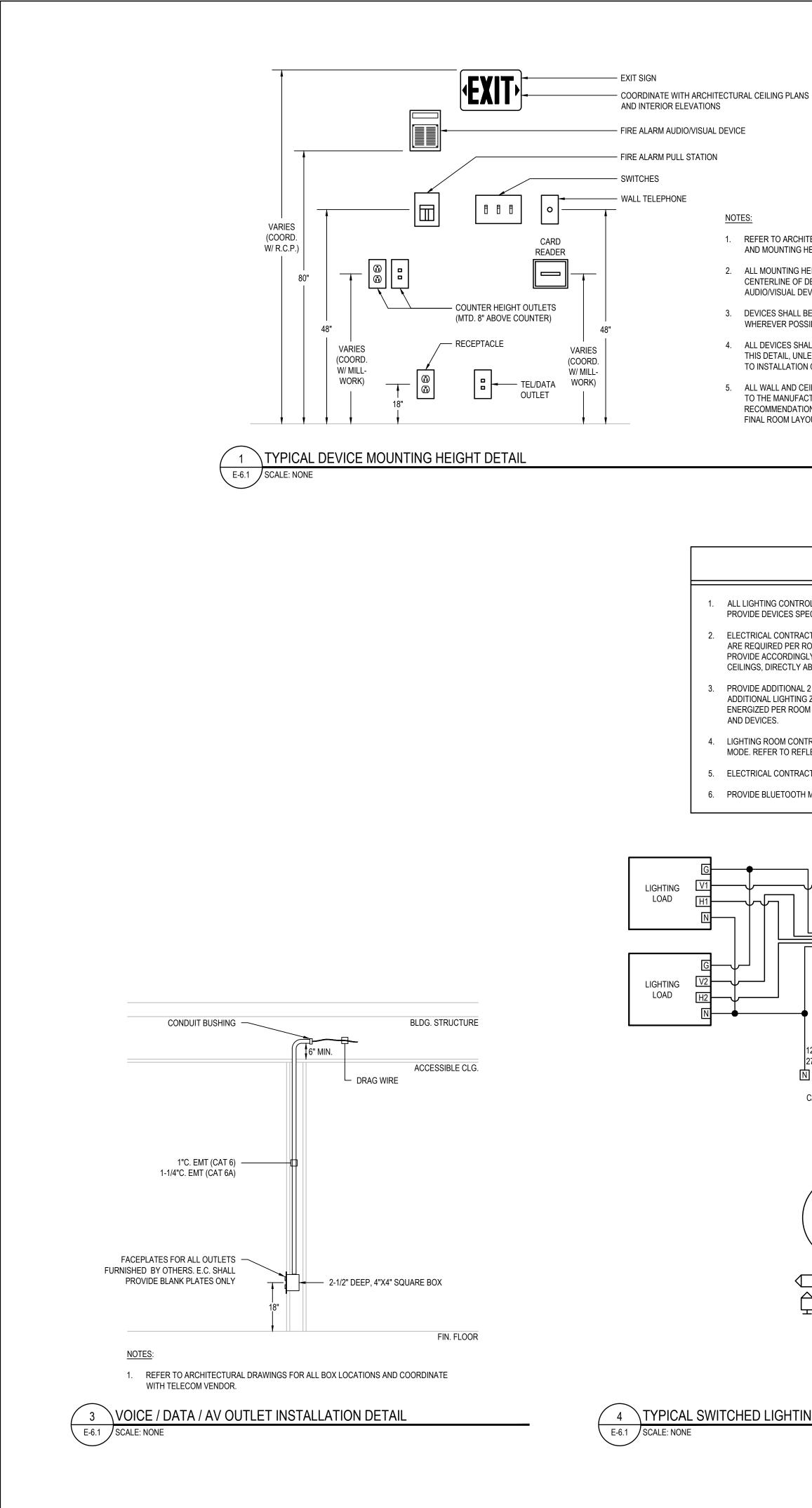
### NOTES

1. EXTEND EXISTING COILED LIGHTING BRANCH CIRCUITS TO NEW LIGHTING FIXTURE (TYP FOR ALL, U.O.N.).

2. PROVIDE 20A/1P CIRCUIT BREAKER COMPATIBLE WITH EXISTING PANELBOARD. CONNECT WITH 2#12 + G - 3/4"C. UPDATE PANELBOARD DIRECTORY (TYP FOR ALL BRANCH CIRCUITS, U.O.N.).

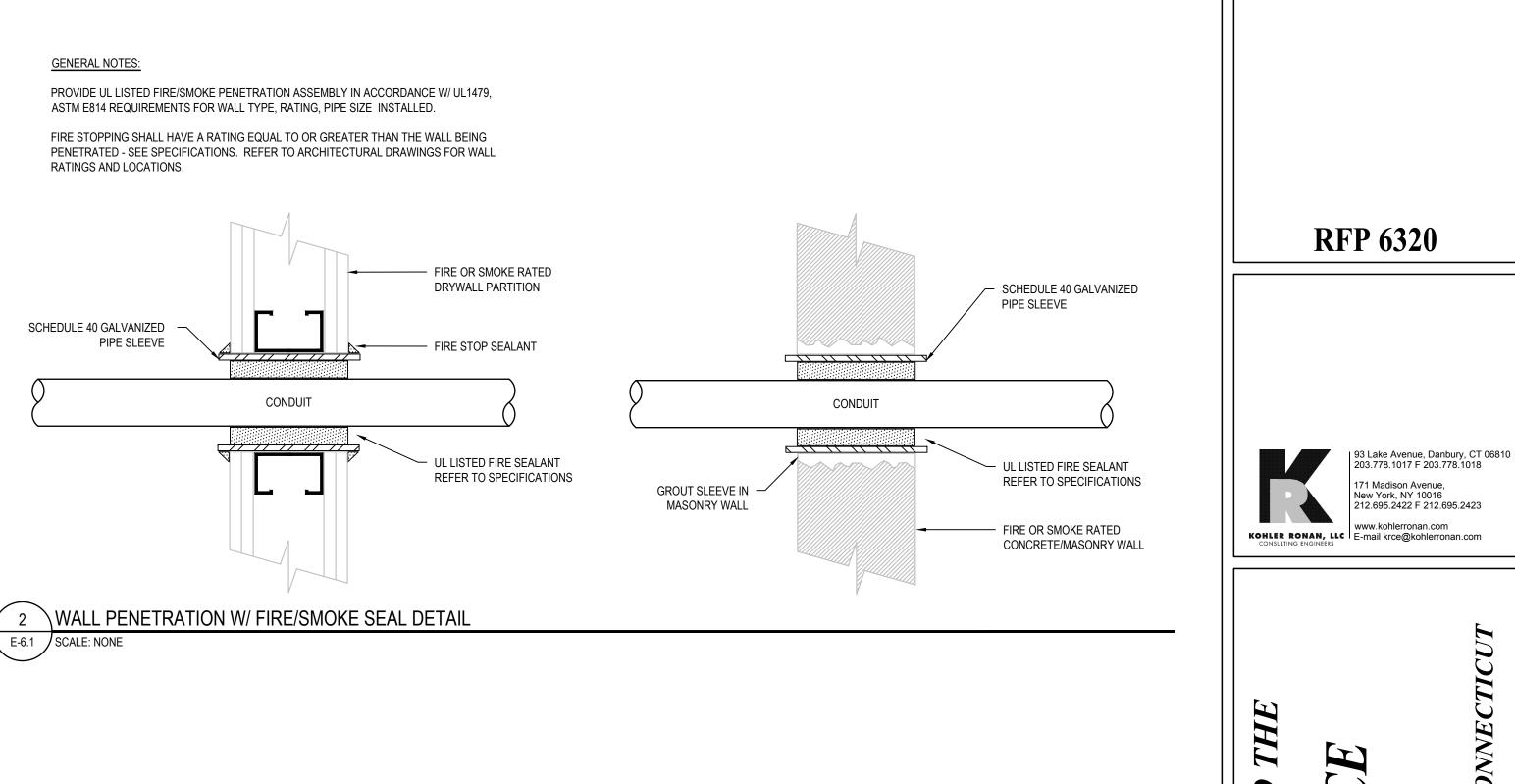
3. EXTEND EXISTING COILED LIGHTING BRANCH CIRCUITS TO NEW LIGHTING FIXTURE. NEW LIGHTING FIXTURE SHALL BE CONTROLLED AS PER PREVIOUS LIGHTING FIXTURE. CONTROLS ARE EXISTING TO REMAIN (TYP FOR ALL, U.O.N.).





### NOTES:

- 1. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT LOCATION AND MOUNTING HEIGHT OF ALL DEVICES.
- 2. ALL MOUNTING HEIGHTS SHALL BE MEASURED FROM FIN. FLOOR TO CENTERLINE OF DEVICE (EXCEPT FOR EXIT SIGNS AND FIRE ALARM AUDIO/VISUAL DEVICES).
- 3. DEVICES SHALL BE INSTALLED ON A COMMON VERTICAL CENTERLINE WHEREVER POSSIBLE.
- 4. ALL DEVICES SHALL BE INSTALLED AT THE MOUNTING HEIGHTS INDICATED ON THIS DETAIL, UNLESS OTHERWISE NOTED. VERIFY ADA REQUIREMENTS PRIOR TO INSTALLATION OF ALL DEVICES.
- 5. ALL WALL AND CEILING MOUNTED DEVICES SHALL BE LOCATED ACCORDING TO THE MANUFACTURERS INSTALLATION REQUIREMENTS AND RECOMMENDATIONS. THE OWNER AND THE ARCHITECT SHALL REVIEW THE FINAL ROOM LAYOUT FOR APPROVAL.



### NOTES

ALL LIGHTING CONTROL DEVICES ARE MANUFACTURED BY HUBBELL CONTROL SOLUTIONS. PROVIDE DEVICES SPECIFIED.

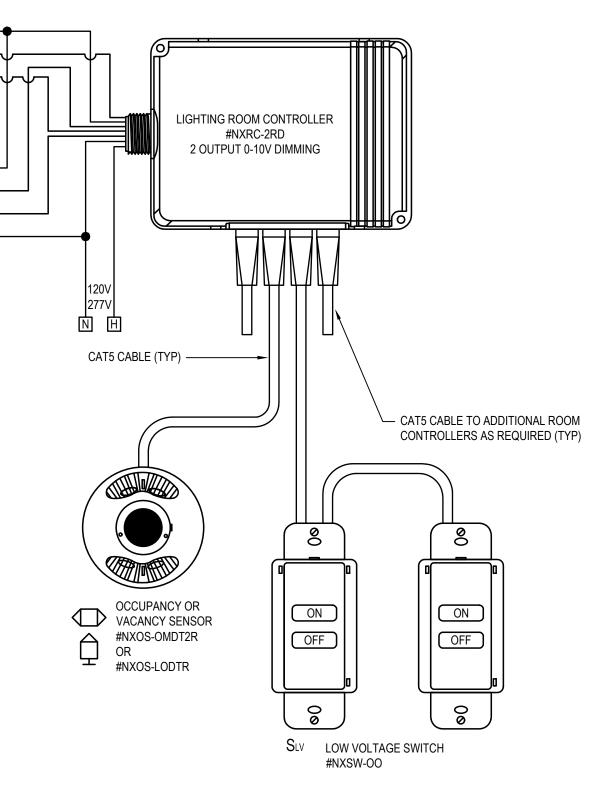
ELECTRICAL CONTRACTOR SHALL VERIFY QUANTITIES OF ALL DEVICES. NOT ALL DEVICES SHOWN ARE REQUIRED PER ROOM. REFER TO REFLECTED CEILING PLANS FOR ADDITIONAL DEVICES AND PROVIDE ACCORDINGLY. ALL ROOM CONTROLLERS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS, DIRECTLY ABOVE SWITCHES.

PROVIDE ADDITIONAL 2 OUTPUT, 0-10V DIMMING ROOM CONTROLLERS AS REQUIRED TO SUPPORT ADDITIONAL LIGHTING ZONES OR DEVICES WITHIN A ROOM. A MAXIMUM OF 7 DEVICES SHALL BE ENERGIZED PER ROOM CONTROLLER. REFER TO REFLECTED CEILING PLANS FOR LIGHTING ZONES AND DEVICES.

4. LIGHTING ROOM CONTROLLER MAY BE PROGRAMMED FOR EITHER OCCUPANCY OR VACANCY MODE. REFER TO REFLECTED CEILING PLANS FOR CONTROL TYPE AND PROGRAM ACCORDINGLY.

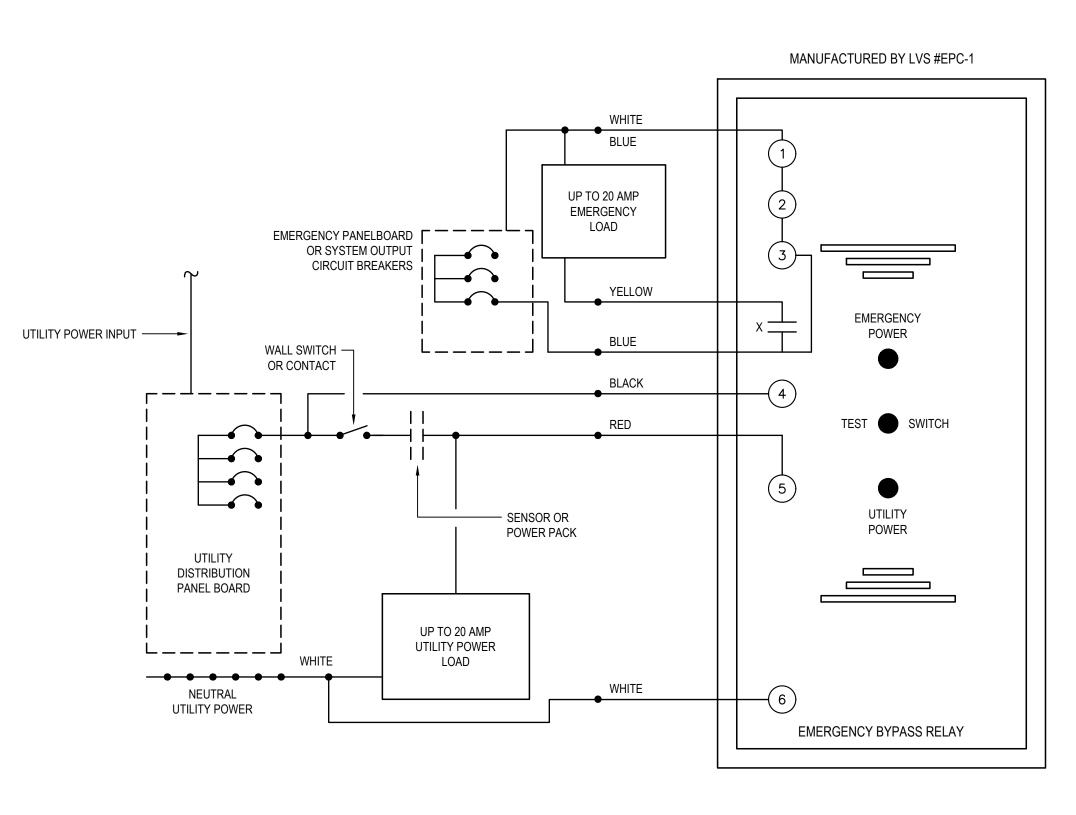
5. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CAT5 CABLE WITH TERMINATION AS REQUIRED.

6. PROVIDE BLUETOOTH MODULE #NXBTR FOR PROGRAMMING.



TYPICAL SWITCHED LIGHTING CONTROL DIAGRAM

- TO THE EMERGENCY LOAD.
- REFER TO REFLECTED CEILING PLANS FOR LIGHTING ZONES.



EMERGENCY LIGHTING BYPASS RELAY WIRING DIAGRAM E-6.1 SCALE: NONE

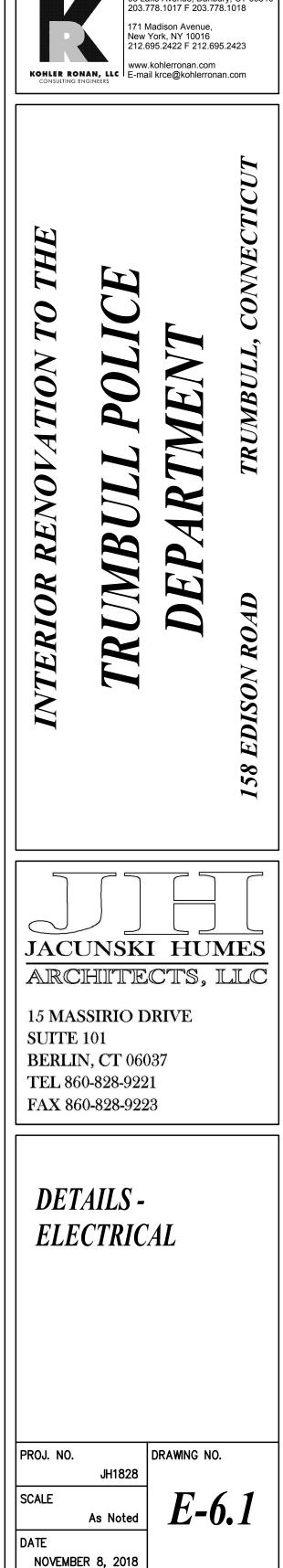
### NOTES

CIRCUIT # 1 2 3 MONITOR THE 24 HOUR EMERGENCY PANEL POWER, ANY INTERRUPTION OF THE EMERGENCY POWER WILL GENERATE AN AUDIBLE ALARM AT THE EPC DEVICE (BY LVS).

CIRCUIT # ④ ⑥ MONITORS UTILITY POWER AND PROVIDES POWER TO THE AUDIBLE DEVICE. ANY INTERRUPTION WILL CLOSE CONTACT X. CIRCUIT # (5) SENSES WHEN ROOM SWITCH IS ON AND THEN CLOSES CONTACT X, PROVIDING POWER

(1) BYPASS RELAY SHALL BE PROVIDED PER LIGHTING ZONE WITH EMERGENCY LIGHTING FIXTURES.

5. PROVIDE DIMMING BYPASS RELAY LVS #EPC-1-D FOR DIMMED LOADS.



#### GENERAL:

TEMPORARY LIGHT AND POWER DURING CONSTRUCTION.

PROVIDE ALL LABOR MATERIAL AND EQUIPMENT TO ACCOMPLISH ANY REQUIRED DEMOLITION OR REMOVAL WORK. ALL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. ALL MATERIALS SHALL BE OF THE BEST QUALITY

FOR THE PURPOSE INTENDED. TRADE NAMES AND CATALOG NUMBERS ARE INTENDED TO INDICATE THIS GRADE AND QUALITY.

WORK OF OTHER TRADES. THE CONTRACTOR SHALL ASSIST IN WORKING OUT SPACE CONDITIONS. VERIFY POWER REQUIREMENTS WITH ALL OTHER TRADES.

NOT LESS THAT ONE (1) YEAR FROM DATE OF INITIAL OPERATION. MANUFACTURED EQUIPMENT SHALL CARRY FULL PERIOD OF MANUFACTURER'S GUARANTEE, AND SHALL NOT BE LESS THAN ONE (1) YEAR.

THE CONTRACTOR SHALL PERFORM ALL CUTTING NECESSARY FOR THE PROPER INSTALLATION OF ELECTRICAL WORK.

KEEP CONDUITS AND OTHER OPENINGS CLOSED TO PREVENT ENTRY OF FOREIGN MATTER. COVER FIXTURES, EQUIPMENT AND APPARATUS AND PROTECT AGAINST DIRT, WATER, CHEMICAL OR MECHANICAL DAMAGE BEFORE AND DURING THE CONSTRUCTION PERIOD UNTIL THE FINAL ACCEPTANCE. EQUIPMENT SHALL BE DELIVERED AND STORED AT SITE, PROPERLY PACKED AND CREATED UNTIL FINALLY INSTALLED.

FURNISH, INSTALL, SET AND LAMP NEW LIGHTING FIXTURES. INCLUDE ALL NECESSARY SUPPORTS AND HANGERS WHERE REQUIRED. ALL FIXTURES SHALL HAVE U.L. LABEL. LIGHTING FIXTURES SHALL BE AS INDICATED ON ARCHITECTURAL DRAWINGS AND SHALL BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

IT IS THE INTENT OF THESE SPECIFICATIONS AND DRAWINGS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATION. IF AN ITEM OF WORK IS SHOWN ON THE DRAWINGS, IT SHALL BE CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION, WHERE SPECIFICALLY MENTIONED OR NOT.

SHOP DRAWINGS AND OTHER INFORMATION REQUIRED: PRIOR TO PURCHASING ANY EQUIPMENT OR MATERIALS, A MANUFACTURER'S LIST SHALL BE SUBMITTED FOR REVIEW. PRIOR TO ASSEMBLING OR INSTALLING THE WORK, THE FOLLOWING SHALL BE SUBMITTED FOR REVIEW:

CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS AND FIELD INSTALLATION DRAWINGS AS REQUIRED FOR A COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OR EQUIPMENT. THE PURPOSE FOR REVIEW SHOP DRAWINGS IS TO MAINTAIN INTEGRITY OF THE DESIGN, UNLESS THE CONTRACTOR CLEARLY INDICATED IN WRITING AND ON HIS LETTERHEAD, ANY CHANGES, SUBSTITUTIONS, DELETIONS OR ANY OTHER DIFFERENCES BETWEEN THE SUBMISSION AND CONTRACT DOCUMENTS, APPROVAL BY THE ENGINEER DOES NOT CONSTITUTE ACCEPTANCE. IT IS NOT TO BE ASSUMED THAT THE ENGINEER HAS READ THE TEXT NOR REVIEWED THE TECHNICAL DATA OF A MANUFACTURED ITEM AND ITS COMPONENTS EXCEPT WHERE THE VENDOR HAS POINTED OUT DIFFERENCES BETWEEN HIS PRODUCT AND THE SPECIFIED MODEL.

THE CONTRACTOR SHALL VISIT THE SITE TO DETERMINE THE CONSTRAINTS OF THE EXISTING AVAILABLE SPACE PERTAINING TO EQUIPMENT SIZE AND CONFIGURATION AND TO EXAMINE THE CONDITIONS UNDER WHICH THE EQUIPMENT WILL BE INSTALLED. CONTRACTOR SHALL AT THIS TIME REPORT ANY DISCREPANCIES OR QUESTIONS TO THE ARCHITECT/ENGINEER.

WHERE CONFLICTS OCCUR BETWEEN DRAWINGS AND SPECIFICATIONS, OR WITHIN EITHER DOCUMENT, THE CONTRACTOR SHALL ASK FOR AND OBTAIN A WRITTEN CLARIFICATION FROM THE ENGINEER PRIOR TO SUBMITTING HIS BID. OTHERWISE, THE ITEMS OR ARRANGEMENTS OF SUPERIOR QUALITY, GREATER QUANTITY OR HIGHER COST SHALL PREVAIL AND BE INCLUDED IN THE CONTRACT PRICE.

WHERE DEVICES AND/OR EQUIPMENT ARE INDICATED TO BE RELOCATED. CONDUCTORS AND RACEWAY SHALL BE EXTENDED TO THE NEW LOCATION AND RECONNECTED TO PROVIDE A COMPLETE WORKING SYSTEM. IF THERE ARE ASSOCIATED DEVICES WITH THE RELOCATED EQUIPMENT THEY SHALL BE RELOCATED AS WELL, UNLESS OTHERWISE NOTED, AND CONNECTED INTO THE SYSTEM.

#### WIRING DEVICES:

WIRING DEVICES SHALL BE "PREMIUM SPECIFICATION GRADE" MANUFACTURED BY LEVITON, HUBBELL, OR LEGRAND.

RECEPTACLES SHALL BE NEMA 5-20R, TWO-POLE, THREE-WIRE GROUNDING TYPE, WITH MOLDED NYLON BODY AND FACE, PREMIUM SPECIFICATION GRADE, RATED 20 AMPS AT 125 VOLTS. RECEPTACLES SHALL COME WITH A 10 YEAR LIMITED WARRANTY FROM THE MANUFACTURER. GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLES SHALL BE 15 AMP, 125 VOLT DUPLEX, NEMA 5-15R, WITH 20 AMP, 125 VOLT FEED-THROUGH AND TRIP INDICATOR. RECEPTACLES MARKED "WP" SHALL BE WEATHER RESISTANT TYPE.

ALL OCCUPANCY/VACANCY SENSORS AND OCCUPANCY/VACANCY SWITCH SENSORS SHALL BE DUAL TECHNOLOGY TYPE. ALL OCCUPANCY/VACANCY SENSOR SWITCHES SHALL BE CAPABLE OF CONTROLLING 120 VOLT LOADS, WITH INTEGRAL SWITCH FOR MANUAL OVERRIDE TO "OFF", AND ADJUSTABLE TIME DELAY TO "OFF". REFER TO LIGHTING CONTROL DIAGRAMS FOR ADDITIONAL SPECIFICATIONS.

OCCUPANCY/VACANCY SWITCH SENSORS SHALL BE MODEL #LHMTS-1 AS MANUFACTURED BY HUBBELL CONTROL EMERGENCY BYPASS RELAY SHALL BE LVS #EPC-1

1. WIRING DEVICES CONNECTED TO NORMAL POWER SYSTEM: AS SELECTED BY ARCHITECT, UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70 OR DEVICE LISTING.

COVERPLATES SHALL BE SATIN-FINISHED STAINLESS STEEL OR AS SELECTED BY ARCHITECT.

RECEPTACLES: IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH SERVED. USE PRESS ON LABEL, BLACK LETTERING ON WHITE BACKGROUND ON FACE OF PLATE AND IN EASILY READABLE LOCATION INSIDE DEVICE BACKBOX, AND DURABLE WIRE MARKERS OR TAGS ON CONDUCTORS INSIDE OUTLET BOXES.

#### OUTLET BOXES:

PROVIDE GALVANIZED PRESSED STEEL OUTLET BOXES OF PROPER SIZE AND TYPE AS REQUIRED BY THE BUILDING CONDITIONS TO SERVE ALL INTERIOR OUTLETS FOR MOTOR CIRCUITS, LIGHTING, SWITCHES, RECEPTACLES, SIGNALS, AND THE LIKE.

#### LIGHTING:

REFER TO LIGHTING FIXTURE SCHEDULE FOR LIGHTING FIXTURE SPECIFICATIONS.

CONTRACTOR SHALL PERFORM A COORDINATION REVIEW BETWEEN THE SUBMITTED LIGHTING CONTROLS AND LIGHTING FIXTURES TO ENSURE THEY ARE COMPATIBLE WITH EACH OTHER. CONTRACTOR SHALL SUBMIT LETTER WITH SHOP DRAWINGS CONFIRMING COMPATIBILITY OF THE ABOVE.

### ELECTRICAL SPECIFICATIONS

#### PROVIDE LABOR, MATERIALS, EQUIPMENT AND SERVICES FOR COMPLETE ELECTRICAL SYSTEMS FOR EXISTING AND NEW SYSTEMS AND AS REQUIRED BY APPLICABLE BUILDING CODES, NATIONAL ELECTRICAL CODES, INCLUDING OSHA. PAY ALL FEES, OBTAIN ALL PERMITS, CERTIFICATES AND ALL CONTROLLED INSPECTIONS. USE NEW U.L. APPROVED EQUIPMENT. INCLUDE ALL

RENDER FULL COOPERATION TO OTHER TRADES WHERE WORK OF CONTRACTOR WILL BE INSTALLED IN CLOSE PROXIMITY TO

ON ACCEPTANCE OF CONTRACT, CONTRACTOR AGREES TO GUARANTEE ALL OF HIS WORK AND EQUIPMENT FOR A PERIOD OF

DEVICE COLOR: WIRING DEVICE CATALOG NUMBERS IN SECTION TEXT DO NOT DESIGNATE DEVICE COLOR.

TELECOMMUNICATIONS SERVICE AND RACEWAY SYSTEMS:

AND WIRING SHALL BE PROVIDED AND INSTALLED BY OTHERS.

THE EMPTY CONDUIT SYSTEM SHALL CONSIST OF ALL INTERIOR CONDUIT, PULL BOXES, OUTLET BOXES, BUSHED COVER PLATES AND OTHER MATERIALS TO LEAVE THE SYSTEM READY FOR INSTALLATION OF DEVICES.

EMPTY CONDUIT SYSTEMS SHALL BE PROVIDED FOR TELECOMMUNICATIONS AND CABLE TELEVISION SYSTEMS. OUTLET DEVICES

FIRE ALARM AND SMOKE DETECTION SYSTEM:

WORK CONSISTS OF ADDITIONS AND EXTENSIONS TO AN EXISTING NOTIFIER FIRE ALARM SYSTEM, PRIOR TO STARTING WORK, ESTABLISH THAT SYSTEM IS IN PROPER WORKING ORDER. IF CONDITION EXISTS WHICH PREVENTS NORMAL OPERATION OF SPECIFIED ADDITIONS AND EXTENSIONS, BRING THIS FACT TO ARCHITECT'S ATTENTION PRIOR TO DOING WORK AFFECTING EXISTING SYSTEM.

WHERE WORK IS DONE WITHOUT SUCH NOTIFICATION, IT SHALL BE ASSUMED THAT CONNECTIONS HAVE BEEN MADE TO A WORKING SYSTEM, AND PERFORMANCE REQUIREMENTS AND GUARANTEE WILL APPLY TO ENTIRE SYSTEM.

ALL FIRE ALARM AND DETECTION SYSTEM WIRING SHALL BE TYPE NPLF IN EMT CONDUIT.

THE EXISTING FIRE ALARM AND SMOKE DETECTION SYSTEM CONSISTS OF A CENTRAL CONTROL PANEL FOR MONITORING AND CONTROL OF SMOKE DETECTING DEVICES, MANUAL ALARM SYSTEMS, WATER FLOW AND TAMPER SWITCHES, AUDIBLE AND VISUAL ALARM SYSTEMS, DOOR RELEASE, AND FAN SHUTDOWN SYSTEMS, PROVIDE ALL MODIFICATIONS AS REQUIRED TO ACCOMMODATE NEW DEVICES SHOWN ON PLANS OR INDICATED IN SPECIFICATION.

ALL NEW INITIATING DEVICES SHALL BE MULTIPLEXED ADDRESSABLE TYPES, COMPATIBLE WITH EXISTING SYSTEM.

SPEAKER/STROBE ALARM UNITS SHALL BE PROVIDED AND SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 101, NFPA 72, AND THE AMERICANS WITH DISABILITIES ACT (ADA), AND SHALL THEREFORE HAVE A MINIMUM STROBE OUTPUT OF 15 /75 CANDELA.

AFTER DATE OF SUBSTANTIAL COMPLETION, CONTRACTOR SHALL TEST THE FIRE ALARM SYSTEM COMPLYING WITH TESTING AND VISUAL INSPECTION REQUIREMENTS IN NFPA 72. CONTRACTOR SHALL SUPPLEMENT AUDIBLE DEVICES TO MEET CODE SOUND LEVELS.

MECHANICAL EQUIPMENT CONNECTIONS:

ALL POWER CONNECTIONS TO HEATING, AIR CONDITIONING, AND PLUMBING EQUIPMENT, WHICH SHALL INCLUDE SUPPLYING AND MOUNTING OF SAFETY DISCONNECT SWITCHES, SHALL BE PROVIDED. INCLUDE THE MOUNTING OF MOTOR STARTERS, WHICH SHALL BE FURNISHED BY THE SUPPLIERS OF MECHANICAL EQUIPMENT.

SAFETY SWITCHES SHALL BE PROVIDED AND SHALL CONSIST OF METAL ENCLOSED, EXTERNALLY OPERATED FUSED, OR UNFUSED SAFETY SWITCHES OF SUCH TYPE AND SIZE AS REQUIRED TO PROTECT AND DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.

WHERE WEATHERPROOF SWITCHES ARE INDICATED OR REQUIRED, NEMA 3R RAIN-TIGHT ENCLOSURES SHALL BE PROVIDED.

SUPPORTS:

PROVIDE SUPPORTS, BRANCHES AND HANGERS FOR THE INSTALLATION OF OUTLETS, CONDUITS, PANELS, STARTING AND CONTROL EQUIPMENT.

600 VOLT CABLE:

ALL WIRE NO. 10, 12, AND 14 AWG SHALL BE SOLID CONDUCTOR TYPE THHN/THWN; NO. 8 AWG THROUGH NO. 1 AWG SHALL BE STRANDED CONDUCTOR TYPE THHN/THWN; NO. 1/0 AWG AND LARGER SHALL BE STRANDED CONDUCTOR TYPE XHHW.

TYPE MC CABLE SHALL CONFORM TO UL AND NEC ARTICLE 330, AND SHALL BE CONSTRUCTED OF MINIMUM NO. 12 AWG STRANDED COPPER CONDUCTORS, WITH THHN INSULATION.

CONDUIT:

ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:

ALL BRANCH CIRCUITS TO MECHANICAL EQUIPMENT, AND HOMERUNS SHALL BE INSTALLED IN EMT. FINAL CONNECTIONS TO MECHANICAL EQUIPMENT SHALL BE IN FLEXIBLE METALLIC CONDUIT.

ALL BRANCH CIRCUIT WORK RUN CONCEALED ABOVE INACCESSIBLE CEILINGS AND WITHIN STUD PARTITIONS OF FINISHED AREAS SHALL BE MC CABLE.

ALL BRANCH CIRCUIT WORK RUN ABOVE ACCESSIBLE CEILINGS OR IN AREAS WITHOUT CEILINGS SHALL BE INSTALLED IN EMT.

BRANCH CIRCUIT HOMERUNS FROM LAST J-BOX TO PANELBOARD SHALL BE EMT CONDUIT. J-BOX SHALL BE LOCATED IN AREA SERVED BY BRANCH CIRCUIT. DOWNSTREAM FROM J-BOX SHALL BE MC CABLE.

ELECTRICAL METALLIC TUBING (EMT) SHALL BE GALVANIZED STEEL, CONFORMING TO ANSI C80.3, UL 797, AND NEC ARTICLE 358. PROVIDE WITH COMPRESSION TYPE FITTINGS, COUPLINGS, AND CONNECTORS.

CONNECTORS FOR METAL CONDUIT SHALL BE INSULATED THROAT TYPE. PROVIDE GROUNDING BUSHINGS OR LOCKNUTS AT ALL METALLIC RACEWAY CONNECTIONS TO SHEET STEEL BOXES AND ENCLOSURES.

EXTERIOR CONDUIT SHALL BE LIQUIDTIGHT FLEXIBLE METAL CONDUIT.

<u>GROUNDING</u>:

A COMPLETE CONTINUOUS GROUNDING SYSTEM TO THOROUGHLY GROUND THE NON-CURRENT CARRYING METAL PARTS OF EVERY NEW PIECE OF INSTALLED EQUIPMENT SHALL BE PROVIDED. THE SYSTEM SHALL BE CONNECTED TO PROVIDE AN INDEPENDENT FAULT RETURN TO SOURCE.

FIRE-STOPPING:

FIRE STOPPING SHALL BE PROVIDED FOR ALL PENETRATIONS OF CONDUIT, WIREWAYS, ETC., THROUGH FIRE-RATED WALLS AND FLOORS AND OTHER FIRE-RATED SEPARATIONS AS FOLLOWS:

CONDUIT PENETRATION THROUGH POURED CONCRETE OR MANSORY WALLS SHALL BE GROUTED IN WITH CONCRETE AND PROVIDED WITH TIGHT FITTING ESCUTCHEON PLATES ON BOTH SIDES.

CONDUIT PENETRATIONS THROUGH FIRE-RATED DRY WALLS SHALL BE WITH SLEEVES THROUGH THE WALL FITTED WITH ESCUTCHEON PLATES ON BOTH SIDES WITH EXCESS OPENINGS FILLED WITH FIRE STOP MATERIAL SPECIFICALLY MANUFACTURED FOR THE PURPOSE.

CORRECT OR REPLACE ANY CIRCUIT. MATERIAL OR EQUIPMENT WHICH IS FOUND TO BE DEFECTIVE BY THESE TESTS. CORRECT DEFECTS. WHETHER DUE TO FAULTY WORKMANSHIP OR MATERIAL FURNISHED. IN A MANNER ACCEPTABLE TO ENGINEER WITHOUT ADDITIONAL COST

INSTALLATION: INSTALL WORK IN A NEAT AND WORKMAN LIKE MANNER.

CONTRACTOR SHALL BALANCE THE LOAD CONNECTED ON THE PANELBOARDS EQUALLY AMONG THE PHASES. MEASURED PHASE IMBALANCE SHALL NOT EXCEED 10%. AS INSTALLED CIRCUIT NUMBERS SHALL BE REFLECTED ON THE PANELBOARD DIRECTORIES.

EXCESS SPACE WITHIN CONDUIT SLEEVES OR STUBS THROUGH FLOOR SLAB OR WALLS WHERE LOW VOLTAGE CABLES PASS THROUGH SHALL BE FILLED WITH FIRESTOPPING MATERIAL SPECIFICALLY MANUFACTURED FOR THE PURPOSE.

ALL MATERIALS USED FOR FIRESTOPPING SHALL BE APPROVED FOR THE PURPOSE AND THE RATING OF THE WALL OR FLOOR AND ALL METHODS EMPLOYED SHALL MEET WITH THE APPROVAL OF THE LOCAL AUTHORITIES.

SLEEVE AND SLEEVE SEALS:

PROVIDE STEEL PIPE SLEEVES ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, ZINC COATED, PLAIN ENDS. PROVIDE SLEEVES FOR CONDUITS PENETRATING NON-FIRE-RATED GYPSUM BOARD ASSEMBLIES WITH GALVANIZED-STEEL SHEET.

PROVIDE SLEEVE-SEAL SYSTEMS MODULAR SEALING DEVICE, DESIGNED FOR FIELD ASSEMBLY, TO FILL ANNULAR SPACE BETWEEN SLEEVE AND RACEWAY OR CABLE.

PROVIDE MODULAR SEALING DEVICE, DESIGNED FOR FIELD ASSEMBLY, TO FILL ANNULAR SPACE BETWEEN SLEEVE AND RACEWAY OR CABLE. PROVIDE SEALING ELEMENTS (EDPM), PRESSURE PLATES (CARBON STEEL) AND CONNECTING BOLTS AND NUTS (CARBON STEEL).

PROVIDE SLEEVE-SEAL FITTINGS MANUFACTURED PLASTIC, SLEEVE-TYPE, WATERSTOP ASSEMBLY MADE FOR EMBEDDING IN CONCRETE SLAB OR WALL. UNIT SHALL HAVE PLASTIC OR RUBBER WATERSTOP COLLAR WITH CENTER OPENING TO MATCH PIPING

PROVIDE SILICONE SEALANTS WITH SINGLE COMPONENT, SILICONE-BASED, NEUTRAL-CURING ELASTOMETRIC SEALANTS. SILICON FOAMS SHALL BE PROVIDED MULTICOMPONENT, SILICONE-BASED LIQUID ELASTROMERS.

CONTRACTOR SHALL SEAL ALL PENETRATIONS THROUGH PARTITIONS OR SLABS WITH A U.L. APPROVED SMOKE STOP TO MAINTAIN THE INTEGRITY OF THE RESPECTIVE FIRE RATING.

FOR EXACT LOCATIONS OF LIGHTING FIXTURES, RECEPTACLES, DATA AND TELEPHONE OUTLETS, REFER TO ARCHITECT'S DRAWINGS. COORDINATE ALL WORK WITH DATA AND TELEPHONE CONTRACTORS.

PRIOR TO FINAL ACCEPTANCE, CLEAN ALL LIGHTING FIXTURES, GLASSWARE, CABINETS, DEVICE PLATES AND OTHER ITEMS FURNISHED UNDER THIS CONTRACT.

### AS-BUILT DRAWINGS:

PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE ALL INSTALLED CONDITIONS OF SYSTEMS WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION DOCUMENTS AND INCLUDE DETAILS AS NECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND IN A COMPLETE AND CONSECUTIVE SET. SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL BE RETURNED FOR REVISION. THE CONTRACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND CONCISE SET OF DRAWINGS. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC (AUTO-CAD VERSION AS REQUIRED BY THE OWNER) VERSION. NUMBER OF COPIES OF EACH AS REQUESTED BY THE OWNER.

TESTS:

TEST ALL WIRING, LIGHTING FIXTURES, SWITCHES, CONTROLLERS, STARTERS, MOTORS, ETC., WIRED UNDER THIS DIVISION. LEAVE FREE FROM GROUNDS, CROSSES, SHORTS, OPENS, ETC., AND LEAVE MATERIALS AND APPARATUS IN PROPER AND SATISFACTORY WORKING CONDITION.

PERFORM ADDITIONAL TESTS REQUIRED BY OWNER, ARCHITECT OR ANY OTHER AUTHORITIES HAVING JURISDICTION.

TEST FOR PROPER OPERATION OF EMERGENCY LIGHTING EQUIPMENT UNDER SIMULATED EMERGENCY CONDITIONS.

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