

# NEW MEXICO FIRST JUDICIAL DISTRICT ATTORNEY OFFICE RENOVATION

CONFORMED BID SET WITH ADDENDA 1 AND 2

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NM FIRST JUDICIAL DISTRICT ATTORNEY  
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## MECHANICAL SHEETS:

## PROJECT TEAM:

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ORIGINAL DESIGN ARCHITECT:  
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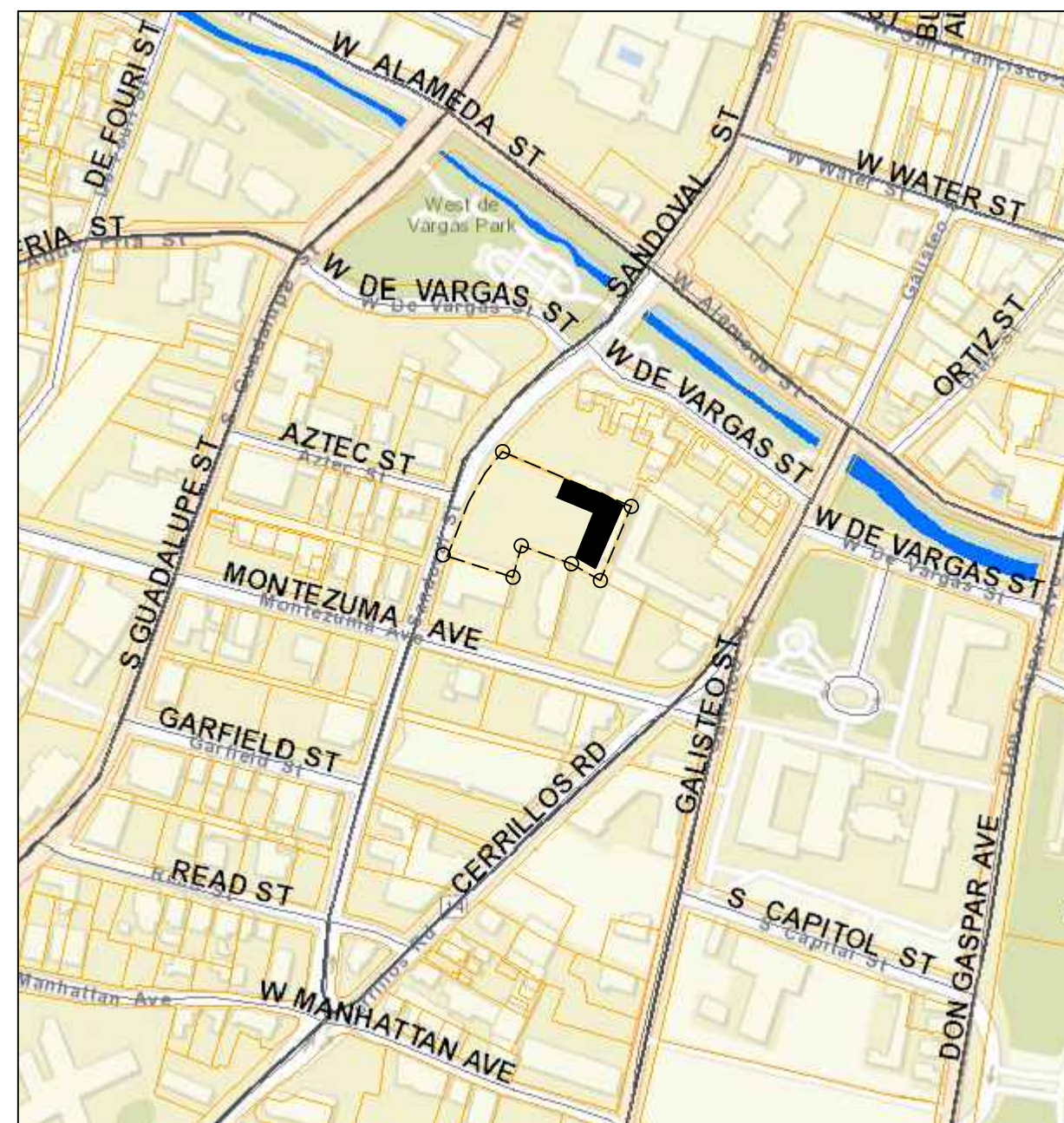
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--  
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## BUILDING CRITERIA

SITE: 327 SANDOVAL STREET, SANTA FE, NM 87501  
PARCEL #: 16008188 UPC#: 1054099107106000000 LEGAL DESCRIPTION: TR B-1 T17N R 9E S24  
ZONING: BCD-3  
NUMBER OF STORIES: THREE STORY BUILDING (EXISTING)  
TYPE OF CONSTRUCTION: (IBC CHAPTER 6) TYPE-V B (EXISTING)  
FIRE PROTECTION SYSTEMS: (IBC CHAPTER 9) SPRINKLED; AUTOMATIC ALARM SYSTEM; BACKUP POWER  
OCCUPANCY AND BUILDING AREA SUMMARY: (IBC CHAPTER 3) GROUP-B (EXISTING/NO CHANGE IN OCCUPANCY).  
USE: (IBC CHAPTER 10) OFFICE BUILDING (EXISTING/ NO CHANGE IN USE)



## VICINITY MAP

NOT TO SCALE



## ADD ALTERNATES (SEE SHEET G-2)

- A - SECURITY FENCES COMPLETE
- B - STUCCO REPAIR & WINDOW REPLACEMENT
- C - ROOF WORK

## GENERAL NOTES

**CONTRACTOR OBLIGATION:**  
THE GC SHALL ABIDE BY AND BE RESPONSIBLE FOR ALL REQUIREMENTS STATED IN SANTA FE COUNTY-CONTRACTOR AGREEMENT; GENERAL CONDITIONS, UNLESS NOTED OTHERWISE.

**GENERAL CONDITIONS:**  
THE GC SHALL PROVIDE ALL LABOR, MATERIAL, EQUIPMENT, TOOLS, UTILITIES, INSURANCE, TRANSPORTATION, AND PAY FOR ALL REQUIRED TAXES, PERMITS, AND SERVICES REQUIRED TO COMPLETE THE ENTIRE SCOPE OF WORK, WHETHER TEMPORARY OR PERMANENT. ALL MATERIALS EXCEPT FOR TEMPORARY FORMS ARE TO BE NEW, UNUSED AND OF THE SPECIFIED QUANTITY. THE GC SHALL MAINTAIN THE PROJECT SITE IN A CLEAN AND ORDERLY FASHION. SOUND RADIOS OR OTHER MUSIC DEVICES WILL NOT BE ALLOWED. TOOLS AND EQUIPMENT SHALL BE SECURED, AND ALL DEBRIS SHALL BE REMOVED DAILY. THE GC SHALL MAINTAIN A VISITOR LOG. ALL VISITORS SHALL BE REQUIRED TO SIGN IN. GC TO SECURE PROJECT SITE FROM UNAUTHORIZED ENTRY AT ALL TIMES. COORDINATE LOCATION OF BARRICADES OR TEMPORARY FENCING WITH DOCUMENTS AND THE OWNER. THE GC SHALL PHOTOGRAPH THE PROJECT SITE AND EXISTING CONDITIONS PRIOR TO BEGINNING WORK. PHOTOGRAPHS SHALL BE TAKEN OF THE PROGRESS OF THE WORK AT INTERVALS NO GREATER THAN 7 CALENDAR DAYS. PHOTOGRAPHS SHALL BE IN COLOR, AND IDENTIFIED WITH DATE AND TIME OF DAY. DELIVER COMPLETED PHOTOGRAPH FILE TO ARCHITECT UPON RECEIPT OF OCCUPANCY PERMIT. THE GC SHALL MAINTAIN ON SITE STAGING AREA AND SHALL KEEP THE APPROVED CONSTRUCTION DOCUMENTS, ALL LICENSING INFORMATION, VISITOR LOGS, PHOTOGRAPH FILE, AND AT LEAST ONE SET OF REPRODUCIBLE CONSTRUCTION DOCUMENTS, TO BE MARKED CURRENTLY WITH THE CONSTRUCTION, TO RECORD THE ACTUAL CONDITIONS OF THE CONSTRUCTION AND DEVICE INSTALLATIONS. DELIVER COMPLETED REPRODUCIBLE SET TO THE ARCHITECT UPON COMPLETION OF THE PROJECT. GC SHALL REMOVE AND DISPOSE OF ALL WASTE AND DEBRIS FROM PROJECT SITE IN A LEGAL MANNER.

**INTERPRETATION:**  
THE ARCHITECT IS SOLELY RESPONSIBLE FOR THE DESIGN INTERPRETATION OF THE CONSTRUCTION DOCUMENTS.

**BID DOCUMENT DISCREPANCIES:**  
WHENEVER THERE ARE DISCREPANCIES IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BASE HIS BID UPON THE BETTER QUALITY OR GREATER QUANTITY OF THE MATERIAL OR WORK DESCRIBED.

**SUBSTRATE PREPARATIONS:**  
ALL SUBSTRATES SHALL BE PROPERLY PREPARED BEFORE APPLICATION OF FINISHES. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR SUBSTRATE CONDITIONS WHERE FINISHES ARE APPLIED.

**DIMENSION STANDARDS:**  
DIMENSIONS ARE NOT ADJUSTABLE UNLESS NOTED WITH A +/- SYMBOL. ONLY NORMAL INDUSTRY STANDARD TOLERANCES ARE ACCEPTABLE DEVIATIONS FROM DIMENSION INDICATED. DO NOT SCALE DRAWINGS. ALL DIMENSIONS NOTED AS "CLEAR" SHALL MAINTAIN THE FULL SPACE INDICATED WITHOUT ENCROACHMENTS. ALL VERTICAL HEIGHTS INDICATED ARE FROM THE FINISH FLOOR ELEVATION AT THE BASE OF THE ITEM INDICATED, UNLESS NOTED OTHERWISE. WHERE WALLS, JAMBS, OR OTHER TERMS ARE NOTED TO "ALIGN" THE FACE OF THE ITEMS INDICATED SHALL BE IN LINE WITH EACH OTHER TO FORM A STRAIGHT LINE, FREE OF OFFSETS OR DEVIATIONS. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. UNLESS OTHERWISE NOTED, DIMENSIONS ARE ACTUAL, NOT NOMINAL, AS FOLLOWS:  
• COLUMNS - FROM CENTER LINE TO CENTER LINE  
• CONCRETE/MASONRY - FROM FINISH FACE TO FINISH FACE  
• EXTERIOR WALLS - FROM EXTERIOR FACE TO INTERIOR FINISH FACE OF WALL

**BUILDING SYSTEMS:**  
THE GC SHALL COORDINATE THE LOCATION AND INSTALLATION OF ALL BUILDING SYSTEMS AND EQUIPMENT. THE GC SHALL COORDINATE ALL BUILDING TRADES TO ASSURE ALL REQUIRED CLEARANCES FOR OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND SYSTEMS AS REQUIRED BY CODE, THESE DOCUMENTS, OR MANUFACTURER'S RECOMMENDATIONS ARE MET OR EXCEEDED. LACK OF SPECIFIC DETAILS SHALL NOT BE AN EXCUSE FOR IMPROPER INSTALLATION OF ANY MATERIAL, DEVICE, OR SYSTEM. WHERE DETAILS ARE NOT PROVIDED, THE GC SHALL REFER TO THE PRINTED MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION GUIDELINES, BUT SHALL NOTIFY THE

ARCHITECT OF THE ACTION TAKEN. ALL INSTALLED SYSTEMS AND DEVICES ARE TO OPERATE QUIETLY AND WITHOUT EXCESSIVE VIBRATION. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING SYSTEMS; MECHANICAL, ELECTRICAL, LIGHTING, PLUMBING, AND TELEPHONE EQUIPMENT.

**CLEARANCES:**  
THE CONTRACTOR SHALL COORDINATE WITH ALL BUILDING TRADES INVOLVED IN THE PROJECT FOR PREPARATION OF COMPOSITE SHOP DRAWINGS FOR EACH FLOOR TO INSURE PROPER CLEARANCES FOR FIXTURES, DUCTS, CEILING, ETC., WHILE MAINTAINING THE SPECIFIED CEILING HEIGHTS NOTED ON THE DRAWINGS. CLARIFY ANY CONFLICTS WITH ARCHITECT.

**LOCATIONS:**  
ELECTRICAL PANELS, TELEPHONE EQUIPMENT, FIRE EXTINGUISHERS, FIRE PULLS, LIGHTS/HORNS, SMOKE DETECTORS, THERMOSTATS, ETC., SHALL BE LOCATED IN ACCORDANCE WITH REQUIREMENTS OF GOVERNING AGENCIES. ANY LOCATION NOT SPECIFICALLY SHOWN SHALL BE VERIFIED WITH ARCHITECT PRIOR TO ROUGH-OUT AND INSTALLATION. UNLESS OTHERWISE NOTED, THE ABOVE PANELS AND/OR EQUIPMENT SHALL BE FULLY RECESSED & SHALL MAINTAIN THE INTEGRITY OF WALL FIRE RATING REQUIREMENTS.

**GOVERNING AGENCIES:**  
THE GC AND ALL OF HIS FORCES SHALL COMPLY WITH ALL REGULATIONS BY ANY GOVERNING AGENCY WITH JURISDICTION OVER THE PROJECT OR PROJECT SITE.

**PERMITS/INSPECTIONS:**  
UNLESS OTHERWISE PROVIDED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SECURE AND PAY FOR THE BUILDING PERMIT AND OTHER PERMITS AND GOVERNMENTAL FEES, LICENSES AND INSPECTIONS NECESSARY FOR PROPER EXECUTION AND COMPLETION OF WORK. THE CONTRACTOR SHALL COMPLY WITH AND GIVE NOTICES REQUIRED BY LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF PUBLIC AUTHORITIES BEARING ON PERFORMANCE OF THE WORK. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL OBTAIN A USE AND OCCUPANCY PERMIT AS REQUIRED FROM THE GOVERNING CODES. SUBMIT ONE COPY OF THE PERMIT TO THE OWNER WITH FINAL APPLICATION OF PAYMENT.

**DRAWING SCALE:**  
THE CONTRACTOR SHALL NOT SCALE THE DRAWINGS.

**FIELD CONDITIONS:**  
THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL CAREFULLY COMPARE SUCH FIELD MEASUREMENTS, CONDITIONS, AND OTHER INFORMATION KNOWN TO THE CONTRACTOR WITH THE CONTRACT DOCUMENTS BEFORE COMMENCING ACTIVITIES. ERRORS, INCONSISTENCIES, OR OMISSIONS DISCOVERED SHALL BE REPORTED TO THE ARCHITECT AT ONCE. NO ALLOWANCE WILL BE MADE ON BEHALF OF THE CONTRACTOR OR SUBCONTRACTOR FOR FAILURE TO VISIT THE SITE.

**CONSTRUCTION MEANS AND PROCEDURES:**  
THE GENERAL CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE CONTRACTOR'S BEST SKILL AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND HAVE CONTROL OVER CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF WORK UNDER THE CONTRACT. UNLESS CONTRACT DOCUMENTS GIVE OTHER SPECIFIC INSTRUCTIONS CONCERNING THESE MATTERS, ANY WORK THAT MUST BE REMOVED OR RELOCATED DUE TO LACK OF COORDINATION OF THE TRADES IS SOLELY THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL MAINTAIN A SECURE SITE THROUGHOUT THE CONSTRUCTION PROCESS.

**PENETRATIONS:**  
PENETRATIONS OF PIPES, TUBES, CONDUIT, WIRES, CABLES, DUCTS, VENTS, CABINETS, LIGHTING, AND OTHER FIXTURES THROUGH FIRE RATED ASSEMBLIES SHALL BE INSTALLED AND PROTECTED TO MAINTAIN FIRE RATING.

**TOXIC MATERIAL:**  
IN THE EVENT THE CONTRACTOR ENCOUNTERS ON THE SITE MATERIAL REASONABLY BELIEVED TO BE ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC

MATERIAL, WHICH HAS NOT BEEN RENDERED HARMLESS, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA AFFECTED, SEAL OFF THE PERIMETER, AND REPORT THE CONDITION TO THE AUTHORIZED COUNTY REPRESENTATIVE AND ARCHITECT IN WRITING. NO NEW BUILDING MATERIAL SHALL CONTAIN ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL AS DEFINED BY STATE AND FEDERAL REGULATORY AGENCIES.

**PROTECTION OF EXISTING TO REMAIN:**  
THE CONTRACTOR SHALL PROVIDE PROTECTIVE COVERING FOR CARPET, FURNISHINGS, AND FINISHES IN EXISTING AREAS NOT DESIGNATED FOR DEMOLITION OR NEW CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE CAUSED BY HIS WORK OR ANY SUBCONTRACTOR.

**SCHEDULING:**  
THE CONTRACTOR SHALL MEET WITH THE OWNER'S AUTHORIZED REPRESENTATIVE WELL IN ADVANCE OF CONSTRUCTION COMMENCEMENT TO:  
• SCHEDULE, SEQUENCE AND COORDINATE ALL WORK  
• MAINTAIN EXITS AND EGRESS WIDTHS REQUIRED BY CODES DURING ALL PHASES OF CONSTRUCTION

**CLEARANCES:**  
THE CONTRACTOR SHALL VERIFY THAT NEW CEILING CAN BE INSTALLED IN EXISTING SPACES TO CLEAR DUCTWORK AND OTHER CONSTRUCTED ITEMS AND MAINTAIN FLOOR TO CEILING HEIGHTS INDICATED ON DRAWINGS. IF DISCREPANCIES OCCUR DUE TO EXISTING CONDITIONS, CONSULT WITH THE ARCHITECT BEFORE PROCEEDING.

**MATERIAL ALIGNMENT:**  
THE FINISH FACE OF MATERIAL OF NEW PARTITIONS SHALL ALIGN ON BOTH SIDES OF THE PARTITION WITH THE FACE OF THE MATERIALS ON EXISTING COLUMNS, WALLS, OR PARTITIONS, UNLESS NOTED OTHERWISE.

**AS BUILT VERIFICATION:**  
THE CONTRACTOR SHALL VERIFY DIMENSIONS OF AS-BUILT CONDITIONS, AND NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES. ALL INFORMATION SHOWN ON THE CONSTRUCTION DOCUMENTS IS BASED ON FIELD OBSERVATIONS AND/OR THE ORIGINAL CONSTRUCTION DOCUMENTS OF THE FACILITY.

**REMOVAL SURVEY:**  
THE CONTRACTOR SHALL SURVEY AND DETERMINE THE REMOVAL OF EXISTING BUILDING ELEMENTS/COMPONENTS, EITHER WHOLE OR IN PART, AS REQUIRED FOR THE INSTALLATION OF THE NEW MECHANICAL, PLUMBING AND ELECTRICAL WORK.

**CONSTRUCTION DEFECTS:**  
THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY CONSTRUCTION DEFECTS FOUND IN UNCOVERING WORK IN THE EXISTING CONSTRUCTION.

**CORRECTING EXISTING DEFECTIVE WORK:**  
THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING DEFECTIVE WORK IN EXISTING CONSTRUCTION WITHIN THE LIMITS OF THE CONSTRUCTION AREA. THIS INCLUDES, BUT IS NOT LIMITED TO, UNEVEN SURFACES AND FINISHES AT PLASTER OR GYPSUM BOARD. THE CONTRACTOR SHALL PATCH AND REPAIR SURFACES TO MATCH NEW ADJACENT SURFACES.

**PIPING:**  
ALL PIPING ABOVE GRADE AND INSIDE THE BUILDING REQUIRED BY THE CONSTRUCTION DOCUMENTS SHALL BE INSTALLED IN AREAS WHERE IT WILL BE CONCEALED. THE CONTRACTOR SHALL CONSULT WITH THE ARCHITECT AND COORDINATE WITH OTHER TRADES TO PROVIDE FURRING FOR PIPING INSTALLED IN FINISH AREAS.

**FIXTURE REMOVAL:**  
REMOVE MECHANICAL AND ELECTRICAL FIXTURES AND CAP OR REMOVE EXISTING BRANCH LINES AS INDICATED IN THE MECHANICAL AND ELECTRICAL DOCUMENTS.

**COORDINATION:**  
COORDINATE PLANS FOR NEW CONSTRUCTION W/ DEMOLITION PLANS FOR EXTENT OF REMOVAL. REMOVE ONLY THOSE PORTIONS OF WALLS, FLOORS, CEILING, ETC., NECESSARY TO ACCOMMODATE NEW CONSTRUCTION.

Current Status:  
CONFORMED SET

## REVISIONS

NO.	DESCRIPTION	DATE
-	-	-
-	-	-
-	-	-
-	-	-

Drawn by: KL  
Checked by: WL/SM  
Date: 01-05-2024  
Sheet Title:

GENERAL PROJECT INFORMATION

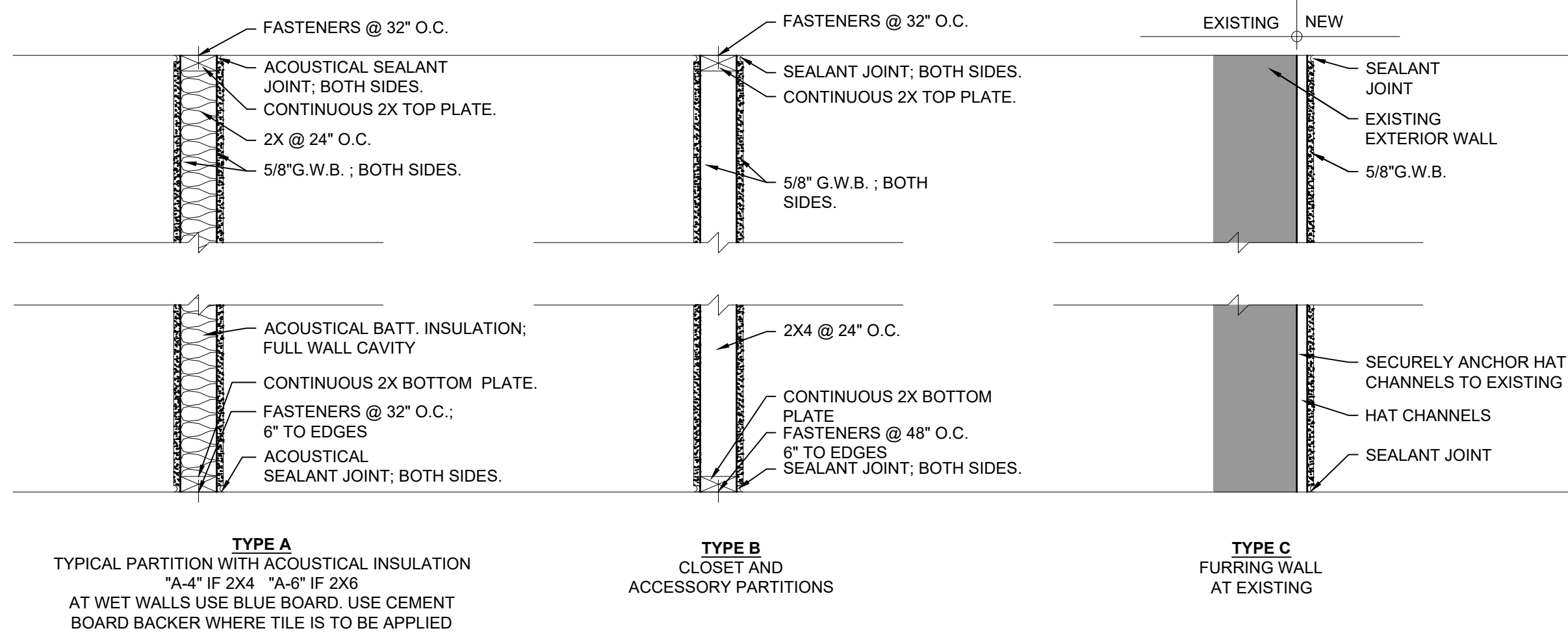
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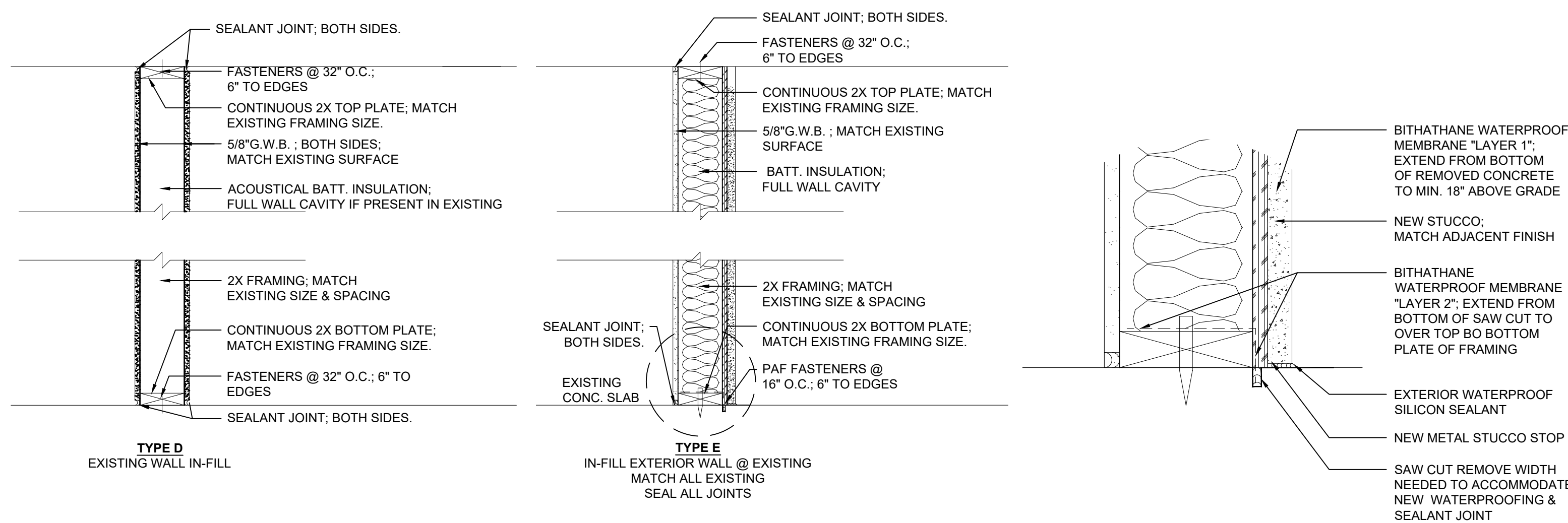
T-1



TYPICAL PARTITION TYPES:



TYP. INTERIOR PARTITIONS  
1" = 1'-0"



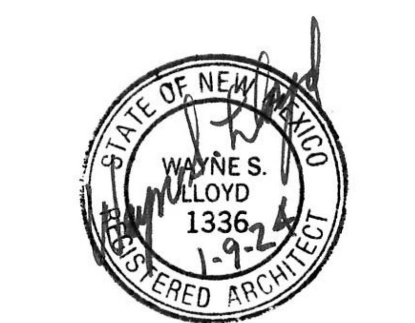
TYP. INTERIOR PARTITIONS CONTINUED  
1" = 1'-0"

TYP. EXTERIOR WALL IN-FILL  
1" = 1'-0"

A.D.A. GENERAL NOTES:

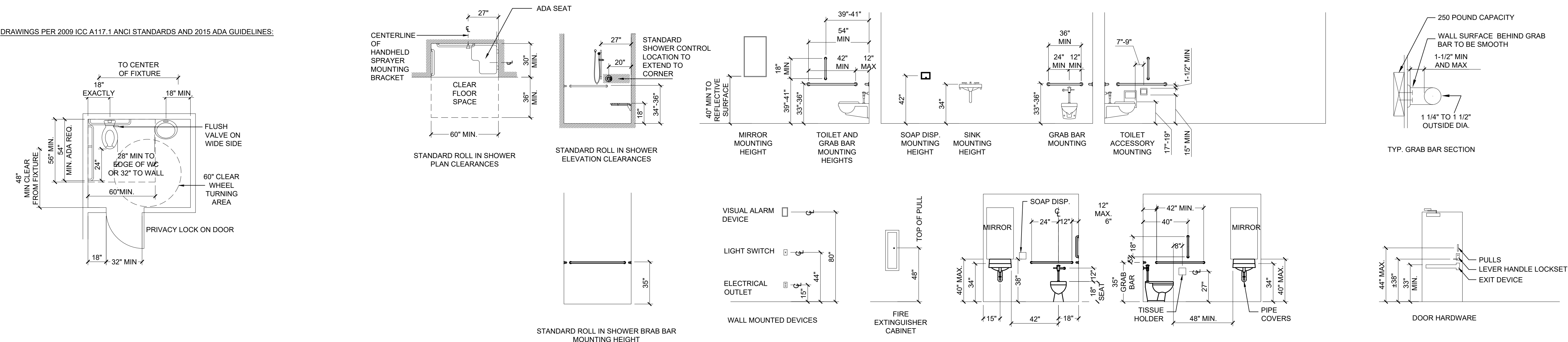
- TOILET FACILITIES**  
WATER CLOSETS IN BATHROOMS REQUIRED TO BE ACCESSIBLE SHALL CONFORM TO THE PROVISIONS OF UPC 2009, TITLE 24, AND 2015 NEX MEXICO COMMERCIAL BUILDING CODE AND THE 2009 ICC A117.1 ANSI STANDARDS. THE WATER CLOSET SHALL BE LOCATED IN A SPACE A MINIMUM OF 60 INCHES IN CLEAR WIDTH WITH 36 INCHES MINIMUM CLEAR SPACE IS PROVIDED IN FRONT OF THE WATER CLOSET. THIS SPACE MAY INCLUDE THE MANEUVERABLE SPACE UNDER THE LAVATORY, IF PROVIDED, ARRANGED SO AS NOT TO IMPEDE ACCESS. THE MINIMUM HEIGHT OF WATER CLOSET SEATS SHALL BE 17 INCHES MINIMUM AND 19 INCHES MAXIMUM, ABOVE THE FLOOR.  
EXCEPTION. IN PRIVATELY-FUNDED MULTIFAMILY DWELLING UNITS, THE WATER CLOSET MAY BE LOCATED IN A SPACE 48 INCHES IN CLEAR WIDTH WITH 36 INCHES OF CLEAR SPACE PROVIDED IN FRONT OF THE WATER CLOSET.
  - LAVATORIES, MIRRORS AND TOWEL FIXTURES**  
AT LEAST ONE ACCESSIBLE LAVATORY SHALL BE PROVIDED WITHIN ANY TOILET FACILITY. WHERE MIRRORS AND TOWEL FIXTURES ARE PROVIDED, AT LEAST ONE OF EACH SHALL BE ACCESSIBLE.
  - GRAB BARS**  
3.1. THE STRUCTURAL STRENGTH OF GRAB BARS, TUB AND SHOWER SEATS, FASTENERS, AND MOUNTING DEVICES MUST WITHSTAND AT LEAST A 250-POUND LOAD.  
3.2. GRAB BARS CANNOT ROTATE WITHIN THEIR FITTINGS.  
3.3. A GRAB BAR AND ANY WALL OR SURFACE ADJACENT TO IT MUST BE FREE OF ANY SHARP OR ABRASIVE ELEMENTS. EDGES MUST HAVE A MINIMUM RADIUS OF 1/8 INCH. GRAB BAR HEIGHT SHALL BE BETWEEN 33 - 36 INCHES ABOVE THE FINISHED FLOOR.  
4. TOILET. WHERE THE TOILET IS NOT PLACED ADJACENT TO A SIDE WALL, THE BATHROOM SHALL HAVE PROVISIONS FOR INSTALLATION OF FLOOR-MOUNTED, FOLD-AWAY OR SIMILAR ALTERNATIVE GRAB BARS. WHERE THE POWDER ROOM (A ROOM WITH A TOILET AND SINK) IS THE ONLY TOILET FACILITY LOCATED ON AN ACCESSIBLE LEVEL OF A MULTISTORY DWELLING UNIT, IT SHALL COMPLY WITH THE REQUIREMENT FOR REINFORCED WALLS FOR GRAB BARS.  
4.1. WHERE THE TOILET IS PLACED ADJACENT TO A SIDE WALL, REINFORCEMENT SHALL BE INSTALLED ON BOTH SIDES OR ONE SIDE AND THE BACK. IF REINFORCEMENT IS INSTALLED AT THE BACK, IT SHALL BE INSTALLED BETWEEN 32 INCHES AND 38 INCHES ABOVE THE FLOOR. THE GRAB BAR REINFORCEMENT SHALL BE A MINIMUM OF 6 INCHES NOMINAL IN HEIGHT. THE BACKING AT THE REAR OF THE WATER CLOSET SHALL BE A MINIMUM OF 40 INCHES IN LENGTH.  
4.2. REINFORCEMENT INSTALLED AT THE SIDE OF THE TOILET SHALL BE INSTALLED 32 INCHES TO 38 INCHES ABOVE THE FLOOR. THE REINFORCEMENT SHALL BE INSTALLED A MAXIMUM OF 12 INCHES FROM THE REAR WALL AND SHALL EXTEND A MINIMUM OF 26 INCHES IN FRONT OF THE WATER CLOSET STOOL. THE GRAB BAR REINFORCEMENT SHALL BE A MINIMUM OF 6 INCHES NOMINAL IN HEIGHT.
- TABLE 1109A.2-1. USE THIS TABLE WHEN ALL BATHROOMS ARE COMPLYING BATHROOMS
- BATHROOM ENTRANCE DOORWAYS SHALL HAVE AN 18-INCH CLEAR SPACE TO THE SIDE OF THE STRIKE EDGE OF THE DOOR ON THE SWING SIDE OF THE DOOR.
  - SUFFICIENT MANEUVERING SPACE SHALL BE PROVIDED FOR A PERSON USING A WHEELCHAIR OR OTHER MOBILITY AID TO ENTER AND CLOSE THE DOOR, USE THE FIXTURES, REOPEN THE DOOR, AND EXIT. DOORS MAY SWING INTO THE CLEAR SPACE AT ANY FIXTURE IF THE MANEUVERING SPACE IS PROVIDED. MANEUVERING SPACES MAY INCLUDE ANY KNEESPACE OR TOESPACE AVAILABLE BELOW BATHROOM FIXTURES.
  - WHERE THE DOOR SWINGS INTO THE BATHROOM, THERE SHALL BE A CLEAR SPACE (APPROXIMATELY 30 INCHES BY 48 INCHES) WITHIN THE ROOM TO POSITION A WHEELCHAIR OR OTHER MOBILITY AID CLEAR OF THE PATH OF THE DOOR AS IT IS CLOSED AND TO PERMIT USE OF FIXTURES.
  - THERE SHALL BE A MINIMUM CLEAR SPACE 48 INCHES PARALLEL BY 30 INCHES PERPENDICULAR TO THE SIDE OF A BATHTUB OR BATHTUB-SHOWER COMBINATION (MEASURED FROM THE FOOT OF THE BATHTUB) TO PROVIDE FOR THE MANEUVERING OF A WHEELCHAIR AND TRANSFER TO AND FROM THE BATHING FACILITIES, WHICH MAY INCLUDE THE MANEUVERABLE AREA UNDER THE LAVATORY. EXCEPTION: PRIOR TO JULY 1, 1994, CONDOMINIUM DWELLING UNITS MAY PROVIDE A MINIMUM CLEAR SPACE 30 INCHES PARALLEL BY 48 INCHES PERPENDICULAR TO THE SIDE OF A BATHTUB OR BATHTUB-SHOWER COMBINATION.
  - WALLS MUST BE REINFORCED TO SUPPORT GRAB BARS AS REQUIRED.
  - NOT USED.
  - SPACE REQUIREMENTS FOR THE INSTALLATION OF WATER CLOSETS SHALL BE AS SPECIFIED.
  - STRUCTURAL REINFORCEMENTS FOR FUTURE GRAB BAR INSTALLATION SHALL BE AS SPECIFIED IN SECTION 1109A.5.
  - USE THIS TABLE WHEN ONLY ONE COMPLYING BATHROOM IS PROVIDED.  
NOTE: IF TABLE IS USED, ALL OTHER BATHROOMS AND POWDER ROOMS WITHIN THE DWELLING UNIT SHALL BE ON AN ACCESSIBLE ROUTE WITH USABLE ENTRY DOORS.
  1. BATHROOM ENTRANCE DOORWAYS SHALL HAVE AN 18-INCH CLEAR SPACE TO THE SIDE OF THE STRIKE EDGE OF THE DOOR ON THE SWING SIDE OF THE DOOR.  
2. SUFFICIENT MANEUVERING SPACE SHALL BE PROVIDED FOR A PERSON USING A WHEELCHAIR OR OTHER MOBILITY AID TO ENTER AND CLOSE THE DOOR, USE THE FIXTURES, REOPEN THE DOOR AND EXIT. DOORS MAY SWING INTO THE CLEAR SPACE AT ANY FIXTURE IF THE MANEUVERING SPACE IS PROVIDED. MANEUVERING SPACES MAY INCLUDE ANY KNEE SPACE OR TOE SPACE AVAILABLE BELOW BATHROOM FIXTURES.  
3. WHERE THE DOOR SWINGS INTO THE BATHROOM, THERE SHALL BE A CLEAR SPACE (APPROXIMATELY 30 INCHES BY 48 INCHES) WITHIN THE ROOM TO POSITION A WHEELCHAIR OR OTHER MOBILITY AID CLEAR OF THE PATH OF THE DOOR AS IT IS CLOSED AND TO PERMIT USE OF FIXTURES.  
4. WHERE THE DOOR SWINGS OUT, A CLEAR SPACE IS PROVIDED WITHIN THE BATHROOM FOR A PERSON USING A WHEELCHAIR OR OTHER MOBILITY AID TO POSITION THE WHEELCHAIR SUCH THAT THE PERSON IS ALLOWED USE OF FIXTURES. THERE ALSO SHALL BE CLEAR SPACE TO ALLOW PERSONS USING WHEELCHAIRS TO REOPEN THE DOOR TO EXIT.
- BATHROOMS**  
1.1. HOT WATER AND DRAIN PIPES UNDER LAVATORIES SHALL BE INSULATED OR OTHERWISE COVERED. THERE WILL BE NO SHARP OR ABRASIVE SURFACES UNDER LAVATORIES.  
1.2. LAVATORY FAUCET CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL BE NO GREATER THAN 5 LBF. LEVER-OPERATED, PUSH-TYPE, AND ELECTRONICALLY-CONTROLLED MECHANISMS ARE EXAMPLES OF ACCEPTABLE DESIGNS. SELF-CLOSING VALVES ARE ALLOWED IF THE FAUCET REMAINS OPEN FOR AT LEAST 10 SECONDS.  
1.3. ALL BATHROOMS SHALL CONFORM TO THE FOLLOWING GENERAL ACCESSIBILITY REQUIREMENTS: TITLE 24, PART 3, ELECTRICAL CODE REQUIREMENTS FOR USABLE LIGHT SWITCHES.  
1.4. ELECTRICAL OUTLETS, THERMOSTATS AND OTHER ENVIRONMENTAL CONTROLS. MINIMUM 36-INCH WIDE ACCESSIBLE ROUTE WITHIN EACH BATHROOM.  
1.5. GENERAL DOOR WIDTHS AND STRIKE SIDE CLEARANCE CONSISTENT WITH APPLICABLE SECTIONS.

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NM FIRST JUDICIAL DISTRICT ATTORNEY  
327 SANDOVAL STREET,  
SANTA FE, NM 87501

DRAWINGS PER 2009 ICC A117.1 ANCI STANDARDS AND 2015 ADA GUIDELINES:



A3 A.D.A. MOUNTING AND CLEARANCE DIMENSIONS  
1/4" = 1'-0"

Current Status:	CONFORMED SET
REVISIONS	
Drawn by:	KL
Checked by:	WL/SM
Date:	01-05-2024
Sheet Title:	TYPICAL ADA INFORMATION & PARTITION TYPES
Job Number:	2021-41
Sheet No.	

G-1

PLOT DATE: Jan 09, 2024, 9:12am  
FILENAME: X:\2021-41\_Santa Fe DAs Office\_RemoCAD Files\_SHEETS\2021-41\_G-1.dwg

CONSTRUCTION NOTES:

GENERAL CONSTRUCTION NOTES:

- A. CONTRACTOR SHALL PROVIDE FULL UTILITY LOCATION SURVEY BEFORE CONSTRUCTION.
B. CONTRACTOR SHALL SUBMIT OVERALL PROJECT SCHEDULE TO COUNTY PROJECT MANAGER UPON APPROVAL OF CONTRACT.
C. CONTRACTOR SHALL SUBMIT A TWO WEEK UPDATED SCHEDULE CONTINUOUSLY BI-WEEKLY THROUGHOUT THE DURATION OF CONSTRUCTION; INCLUDING REVISED SCHEDULES AS NEEDED.
D. CONTRACTOR SHALL DOCUMENT CONSTRUCTION WITH PHOTOS.
E. CONTRACTOR SHALL KEEP AND MAINTAIN AS-BUILT DRAWINGS DURING CONSTRUCTION.

EXTERIOR CONSTRUCTION STAGING GENERAL NOTES:

- 1. CONTRACTOR SHALL BE LIMITED TO ON-SITE PARKING DELINEATED FOR CONSTRUCTION USE ON SITE PLAN 1/C1 UNLESS GIVEN WRITTEN PERMISSION BY COUNTY TO USE ADDITIONAL SPACES.
2. USE OF "GRASSY KNOLL" SHALL FOLLOW LEASE AGREEMENT NO. 2018-00330-PW BETWEEN 200 WEST DE VARGAS STREET ASSOCIATION AND SANTA FE COUNTY; LEASE AGREEMENT PROVIDED IN BID DOCUMENTS.

UTILITY GENERAL NOTES:

- 1. CONTRACTOR SHALL PROVIDE UTILITY LOCATION SURVEY BEFORE CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL UTILITY'S DURING CONSTRUCTION; REPAIR OF DAMAGED LINES DURING CONSTRUCTION AND ANY ASSOCIATED DAMAGE SHALL BE CONTRACTOR'S RESPONSIBILITY.

TERMS AND CONDITIONS OF USE OF "GRASSY KNOLL" / PROPERTY LEASED BY THE COUNTY BY 200 WEST DE VARGAS STREET ASSOCIATION:

- 1. THE GENERAL CONTRACTOR SHALL MAINTAIN A FREE AND OPEN ACCESS AT ALL TIMES TO AND FROM THE ASSOCIATION'S DUMPSTER BIN AREA LOCATED TO THE EAST OF THE GRASSY KNOLL AREA WHERE THE ASSOCIATION TRASH CONTAINERS ARE STORED TO AND FROM THE PEDESTRIAN WALKWAY TO THE NORTH FOR ASSOCIATION / UNIT OWNER/ TENANT USE AT ALL TIMES.
2. THE GENERAL CONTRACTOR SHALL ERECT A SUITABLE, TEMPORARY CONSTRUCTION FENCE SHALL BE ERECTED AROUND THE LEASED PREMISES TO SCREEN THE AREA FROM ASSOCIATION UNIT BUILDINGS DURING THE ENTIRE TIME THIS AGREEMENT IS IN EFFECT.
3. THE MONITORING WELLS LOCATED ON THE LEASED PREMISES OF THE COUNTY AND THE STATE OF NM ED SHALL REMAIN OPEN FOR CONTINUED REMEDIATION MONITORING DURING CONSTRUCTION USE OF THE LEASED PREMISES AT ALL TIMES.
4. THE GENERAL CONTRACTOR SHALL NOT STORE ANY HAZARDOUS WASTE OR PETROLEUM PRODUCTS AT ANY TIME ON THE LEASED PREMISES.
5. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE LEASED PREMISES FROM DAMAGE, CONTROLLING CONSTRUCTION LITTER FROM GOING OFF-SITE AND FRO CLEANING UP THE LEASED PREMISES AND RETURNING IT IN THE SAME CONDITION IT WAS IN AT THE TIME OF THE COMMENCEMENT OF THE LEASE TERM.
6. THE GENERAL CONTRACTOR WILL MAINTAIN THROUGHOUT THE ENTIRE TERM OF THE LEASE COMMERCIAL LIABILITY AND PROPERTY INSURANCE COVERING ITS USE OF THE LEASED PREMISES AND PARKING SPACE AREA, AND THE GENERAL CONTRACTOR'S CERTIFICATE OF INSURANCE SHALL NAME THE "200 WEST DE VARGAS STREET ASSOCIATION" AS AN ADDITIONAL INSURED FOR ITS USE OF THE LEASED PREMISES. THE COUNTY OR THE COUNTY'S GENERAL CONTRACTOR SHALL PROVIDE THE ASSOCIATION PROOF OF SUCH INSURANCE HELD BY THE GENERAL CONTRACTOR BY PROVIDING A CERTIFICATE OF INSURANCE TO THE ASSOCIATION'S PRESIDENT NAMED BELOW REFLECTING SAME.

ADD ALTERNATES:

ADD ALTERNATE A: SECURITY FENCES COMPLETE

- A1 - ASSOCIATED DEMOLITION SEEN ON SHEET D-1 SHALL BE EXCLUDED FROM BASE BID.
A2 - SEE SHEET C-1, C-2 & C-3 FOR NEW FENCES.

ADD ALTERNATE B: STUCCO REPAIR AND WINDOW REPLACEMENT:

- B1 - PATCH EXISTING STUCCO AS NEEDED WITH FIBER-GLASS MESH.
B2 - APPLY EL REY WALLEASE.
B3 - APPLY EL REY CEMENTITIOUS FINISH SYSTEM.
B4 - REPLACE ALL EXISTING WINDOWS WITH NEW COMPOSITE CASEMENT WINDOWS.

ADD ALTERNATE C: ROOF WORK

- C1 - REMOVE EXISTING MODIFIED BITUMEN ROOFING COMPLETE DOWN TO DECK.
C2 - PROVIDE FULLY ADHERED TPO ROOFING; SEE SHEET A-2.2 ROOF PLAN.
C3 - PROVIDE NEW FLASHING AND COPING AS SEEN ON ROOF PLAN.

GENERAL SHEET NOTES:

- A. ALL WORK SHALL FOLLOW CITY, COUNTY, STATE, & FEDERAL CODES.

BUILDING CODE ANALYSIS FOR THE EXISTING BUILDING

APPLICABLE CODES FOR PROJECT:

- A. 2015 NM COMMERCIAL BUILDING CODE (2015 IBC AS AMENDED)
B. 2015 NM EXISTING BUILDING CODE (2015 IEBC AS AMENDED)
C. 2012 CITY OF SANTA FE GREEN BUILDING CODE
D. 2012 NM PLUMBING CODE (2012 UPC AS AMENDED) AND 2011 CITY OF SANTA FE UPC AMENDMENTS
E. 2012 NM MECHANICAL CODE (2012 UMC AS AMENDED)
F. 2014 NM ELECTRICAL CODE (2014 NEC AS AMENDED)
G. 2012 NM ELECTRICAL SAFETY CODE (2012 NESC AS AMENDED)
H. 2009 NM ENERGY CONSERVATION CODE (2009 IECC AS AMENDED)
I. 2009 INTERNATIONAL FIRE CODE AND 2011 CITY OF SANTA FE IFC AMENDMENTS
J. NEW MEXICO ADMINISTRATIVE CODE (NMAC); 14.5.1 GENERAL PROVISIONS; 14.5.2 PERMITS; 14.5.3 INSPECTIONS
K. 2009 ICC A117.1 ANSI STANDARDS
L. 2015 ADA STANDARDS

CODE INFORMATION BELOW PER 2015 INTERNATIONAL BUILDING CODE (2015 NEW MEXICO AMENDMENTS)

OCCUPANCY CLASSIFICATION: GROUP B (BUSINESS) FOR OFFICES

CODE COMPLIANCE: 2015 INTERNATIONAL EXISTING BUILDING CORE - 101.4 EXISTING BUILDINGS: "THE LEGAL OCCUPANCY OF ANY EXISTING BUILDINGS ON THE DATE OF ADOPTION OF THIS CODE SHALL BE PERMITTED TO CONTINUE WITHOUT CHANGE, EXCEPT AS SPECIFICALLY COVERED IN THIS CODE..."

ALLOWABLE BUILDING AREA (TABLE 503):

THE EXISTING DA OFFICE BUILDING IS GROUP B WITH CONSTRUCTION TYPE 5-B (NOT RATED) ALLOWS TWO (2) STORIES AND A 9,000 GSF FOOTPRINT IN AREA OF EACH STORY. THE EXISTING THREE (3) STORY PORTION OF THE BUILDING HAS A 7,665 GSF BUILDING FOOTPRINT.

SECTION 504.2 AUTOMATIC SPRINKLER SYSTEM INCREASE WILL ALLOW A ONE-STORY INCREASE FOR A TOTAL OF THREE STORIES ALLOWED WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM.

THE EXISTING BUILDING HAS A SPRINKLER SYSTEM FOR THE THREE (3) STORY WING AND NONE IN THE TWO (2) STORY WING BUT THEY ARE SEPARATED WITH A BUILDING SEPARATION OF FIRE RESISTIVE WALLS AND DOORS. THIS CONDITION IS ALLOWED BY CODE AS LONG AS THE FIRE SEPARATION IS MAINTAINED. THE COST TO ADD SPRINKLERS TO THE TWO (2) STORY WEST WING FOR COMPLETE FIRE SPRINKLER PROTECTION THROUGHOUT THE BUILDING IS SHOWN IN THE PRELIMINARY COST REVIEW ON PAGE 9.

2009 INTERNATIONAL EXISTING BUILDING CODE CLASSIFICATION OF WORK:

SECTION 304: ALTERATION LEVEL 2:

ALTERATIONS INCLUDE THE RECONFIGURATION OF SPACE, THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE RECONFIGURATION OR EXTENSION OF ANY SYSTEM, OR THE INSTALLATION OF ANY ADDITIONAL EQUIPMENT. THE SCOPE OF WORK MAY CHANGE TO REQUIRE ALTERATION LEVEL 3 IF THE WORK AREA EXCEEDS 50 PERCENT OF THE AGGREGATE OF THE BUILDING.

THE ABOVE CODE CITATIONS AND INTERPRETATIONS ARE SUBJECT TO INTERPRETATION BY NEW MEXICO CODE OFFICIALS, INCLUDING THE GOVERNORS COMMITTEE ON THE CONCERNS OF THE HANDICAPPED, DURING THE DESIGN PHASE OF THE PROJECT.

BUILDING OCCUPANT LOAD: TABLE 1004.1.1. OF THE 2015 IBC:

FLOOR AREA IN SQUARE FEET PER OCCUPANT AT 1 OCCUPANT PER 100 SQUARE FEET OF OFFICE AND 15 SQUARE FEET OF MEETING AREA.

Table with 9 columns: ROOM NAME, AREA, OCCUPANCY, ROOM NAME, AREA, OCCUPANCY, ROOM NAME, AREA, OCCUPANCY. Rows include LOBBY, RECEPTION, WAITING, INTERVIEW 101, OFFICE 102-109, OPEN OFFICE 110-112, OFFICE 113-114, LOUNGE, OPEN OFFICE 115, OFFICE 116, OFFICE VEST, 1, and TOTAL OCCUPANTS.

MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES: 2015 IBC TABLE 2902.1:

BUSINESS OCCUPANCY: 231 OCCUPANTS, ASSUMING 116 MEN AND 116 WOMEN

WATER CLOSETS:

MEN - 1/25 FIRST 50 AND THEN 1/50; 116 MEN = 4 WATER CLOSETS MINIMUM
WOMEN - 1/25 FIRST 50 AND THEN 1/50; 116 WOMEN = 4 WATER CLOSETS MINIMUM

LAVATORIES:

MEN 1/40 FIRST 80 AND THEN 1/80; 116 MEN = 3 LAVATORIES MINIMUM
WOMEN 1/40 FIRST 80 AND THEN 1/80; 116 WOMEN = 3 LAVATORIES MINIMUM

DRINKING FOUNTAIN:

1 PER 100 = 3 DRINKING FOUNTAINS REQUIRED

SERVICE SINK:

1 REQUIRED

THE EXISTING BUILDING HAS NINE (9) PUBLIC WATER CLOSETS FOR ME AND NINE (9) FOR WOMEN; EIGHT (8) LAVATORIES FOR MEN AND NINE (9) LAVATORIES FOR WOMEN; TWO (2) DRINKING FOUNTAINS AND THREE (3) SERVICE SINKS, ALL OF WHICH EXCEED THE REQUIREMENTS OF THE 2015 INTERNATIONAL BUILDING CODE.

LIFE SAFETY BUILDING SURVEY:

ATTACHED IN THE APPENDIX IS THE REPORT FROM THE ACCENT FIRE SAFETY'S SURVEY OF THE EXISTING BUILDING, FIRE SPRINKLER, AND ALARMS. THE FOLLOWING MAJOR VIOLATIONS WERE NOTED:

- THE SURVEY NOTES THAT THE EXISTING SPRINKLER HEADS MUST BE REPLACED THROUGHOUT.
• THE "COMPACT SHELVING" SECTION ON THE SECOND FLOOR LACKS A REQUIRED 18" CLEARANCE TO THE CEILING (IT IS CURRENTLY LESS THAN 10").
• FIRE SPRINKLER SYSTEMS ARE REQUIRED TO BE INSPECTED EVERY 90 DAYS BY THE STATE FIRE CODE. THE EXISTING SYSTEM HAS NOT BEEN INSPECTED IN THE PAST NINE (9) YEARS.
• THERE CAN BE NO STORAGE OF MATERIALS IN THE EXIT PATH.

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Current Status:

CONFORMED SET

REVISIONS

Table with 3 columns for revision tracking, showing a series of dashes indicating no revisions.

Drawn by:

KL

Checked by:

WL/SM

Date:

01-05-2024

Sheet Title:

PHASING PLAN & CODE INFORMATION

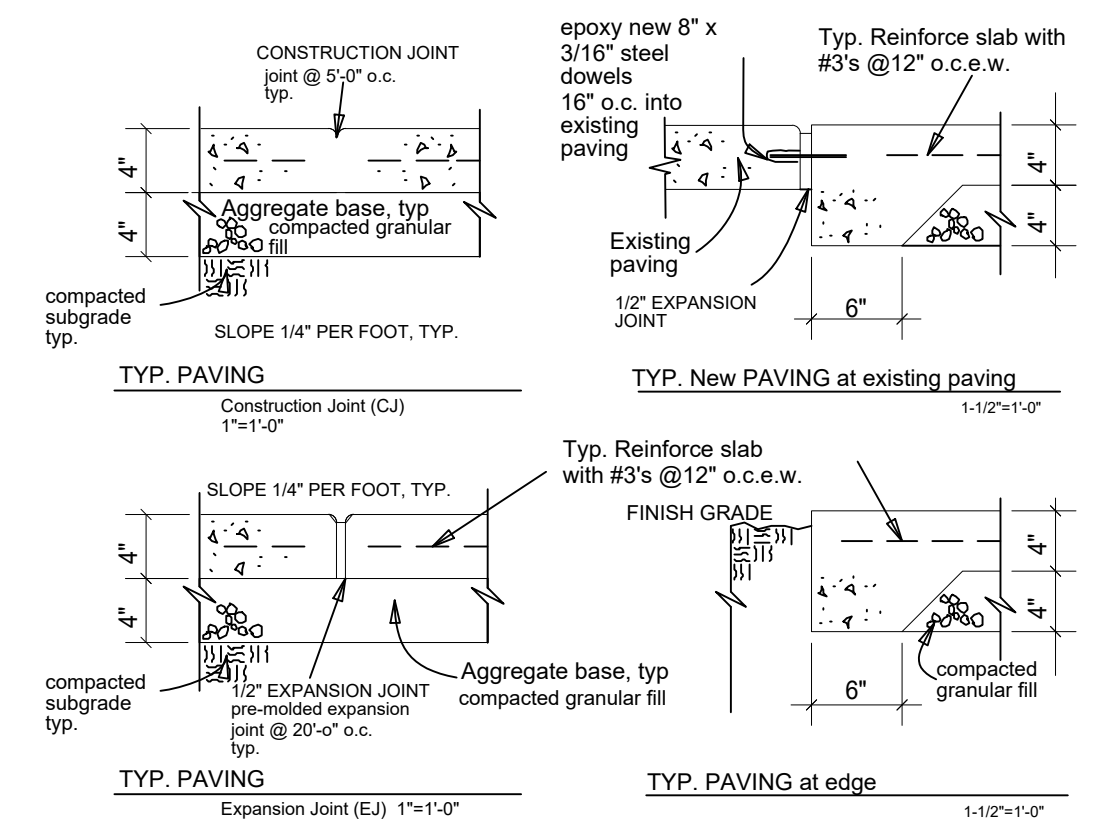
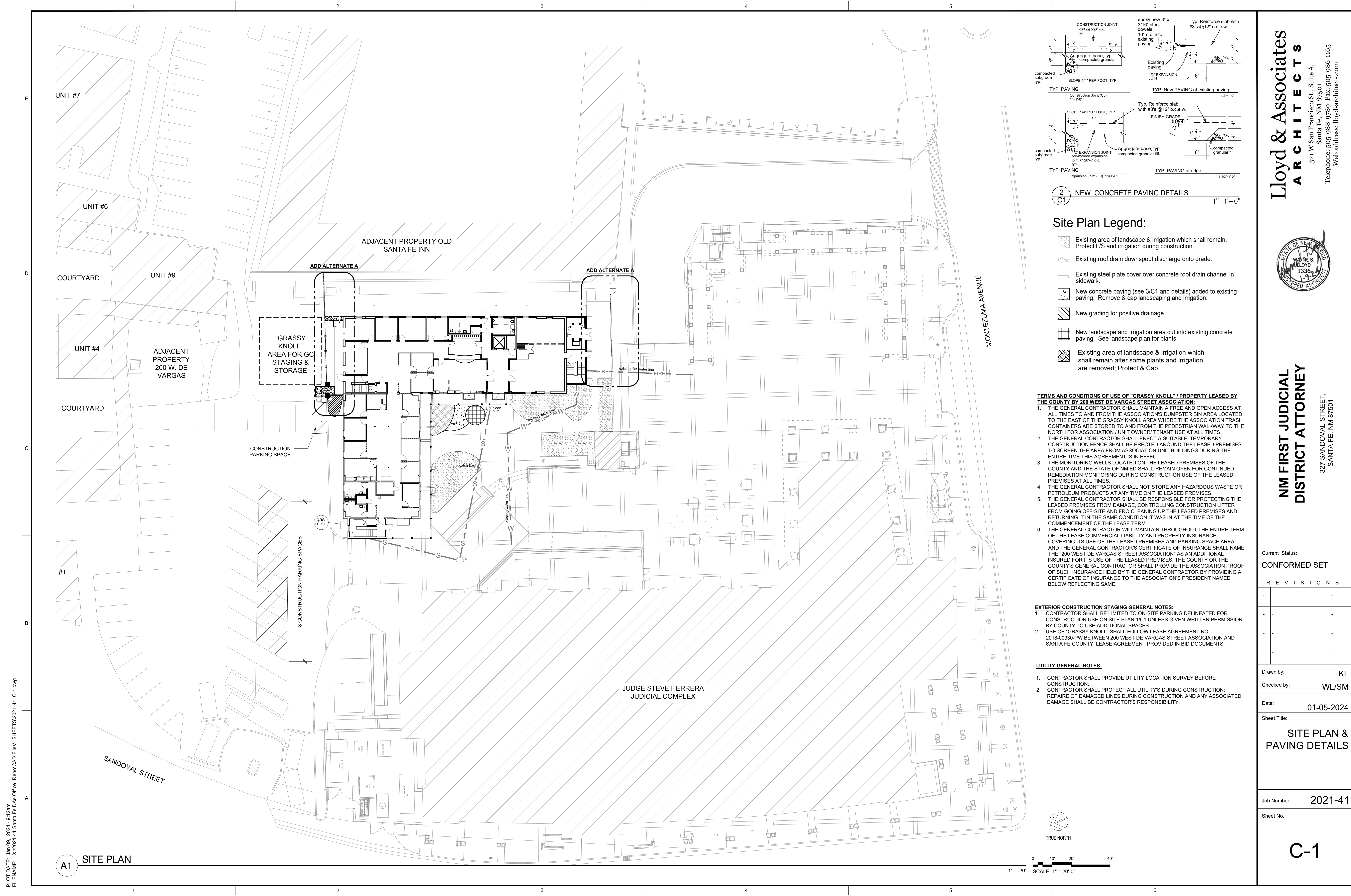
Job Number:

2021-41

Sheet No.

G-2





2  
C1 NEW CONCRETE PAVING DETAILS 1" = 1'-0"

- Site Plan Legend:**
- Existing area of landscape & irrigation which shall remain. Protect L/S and irrigation during construction.
  - Existing roof drain downslope discharge onto grade.
  - Existing steel plate cover over concrete roof drain channel in sidewalk.
  - New concrete paving (see 3/C1 and details) added to existing paving. Remove & cap landscaping and irrigation.
  - New grading for positive drainage
  - New landscape and irrigation area cut into existing concrete paving. See landscape plan for plants.
  - Existing area of landscape & irrigation which shall remain after some plants and irrigation are removed; Protect & Cap.

**TERMS AND CONDITIONS OF USE OF "GRASSY KNOLL" / PROPERTY LEASED BY THE COUNTY BY 200 WEST DE VARGAS STREET ASSOCIATION:**

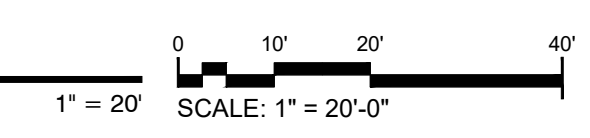
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Current Status:  
**CONFORMED SET**

REVISIONS		

Drawn by: **KL**  
 Checked by: **WL/SM**  
 Date: **01-05-2024**

Sheet Title:  
**SITE PLAN & PAVING DETAILS**

Job Number: **2021-41**

Sheet No.

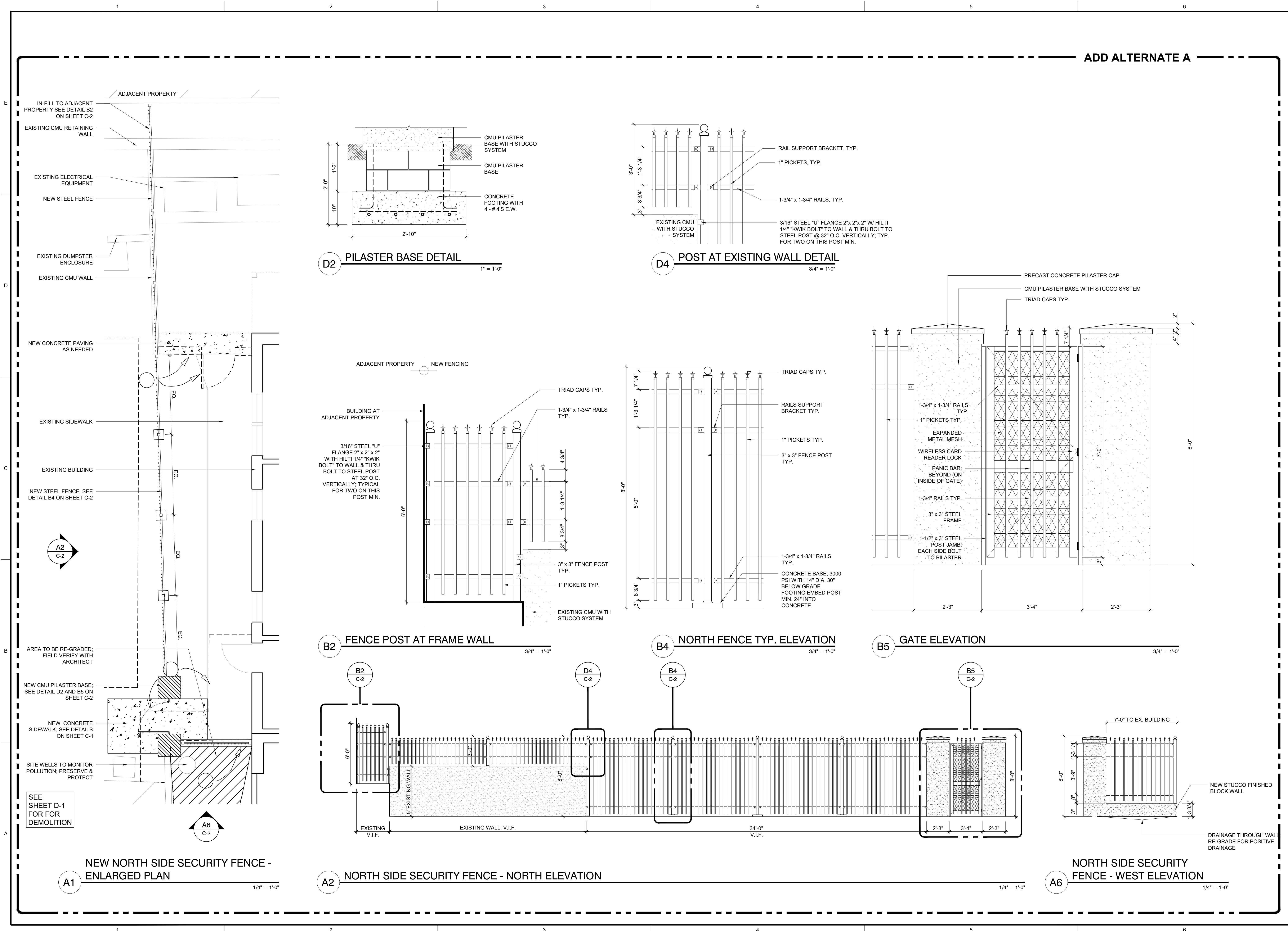
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A1 SITE PLAN



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ADD ALTERNATE A

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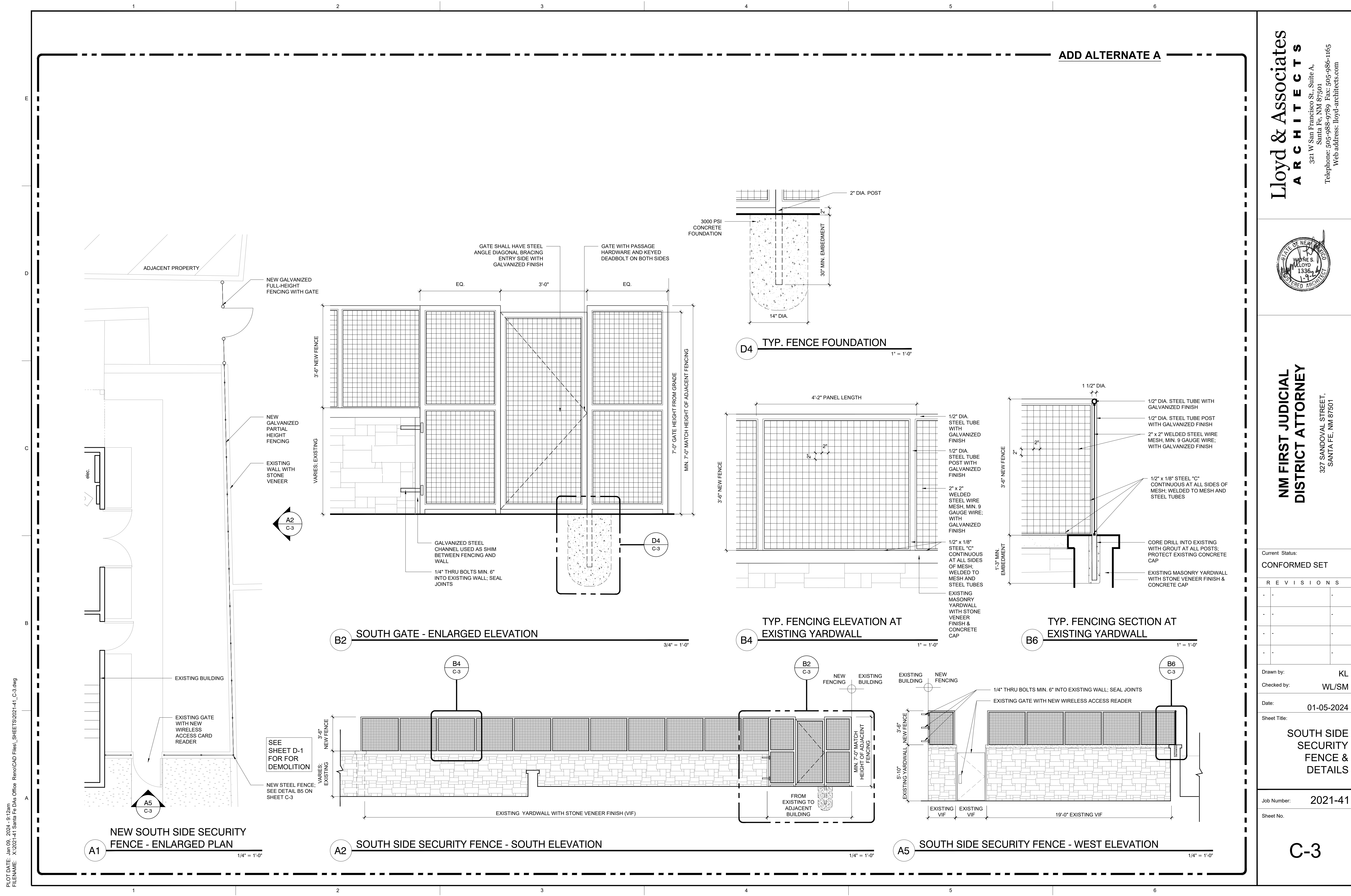
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 Checked by: **WL/SM**  
 Date: **01-05-2024**  
 Sheet Title:

**NORTH SIDE SECURITY FENCE & DETAILS**

Job Number: **2021-41**  
 Sheet No.

**C-2**





ADD ALTERNATE A

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Drawn by: **KL**  
 Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**SOUTH SIDE SECURITY FENCE & DETAILS**

Job Number: **2021-41**

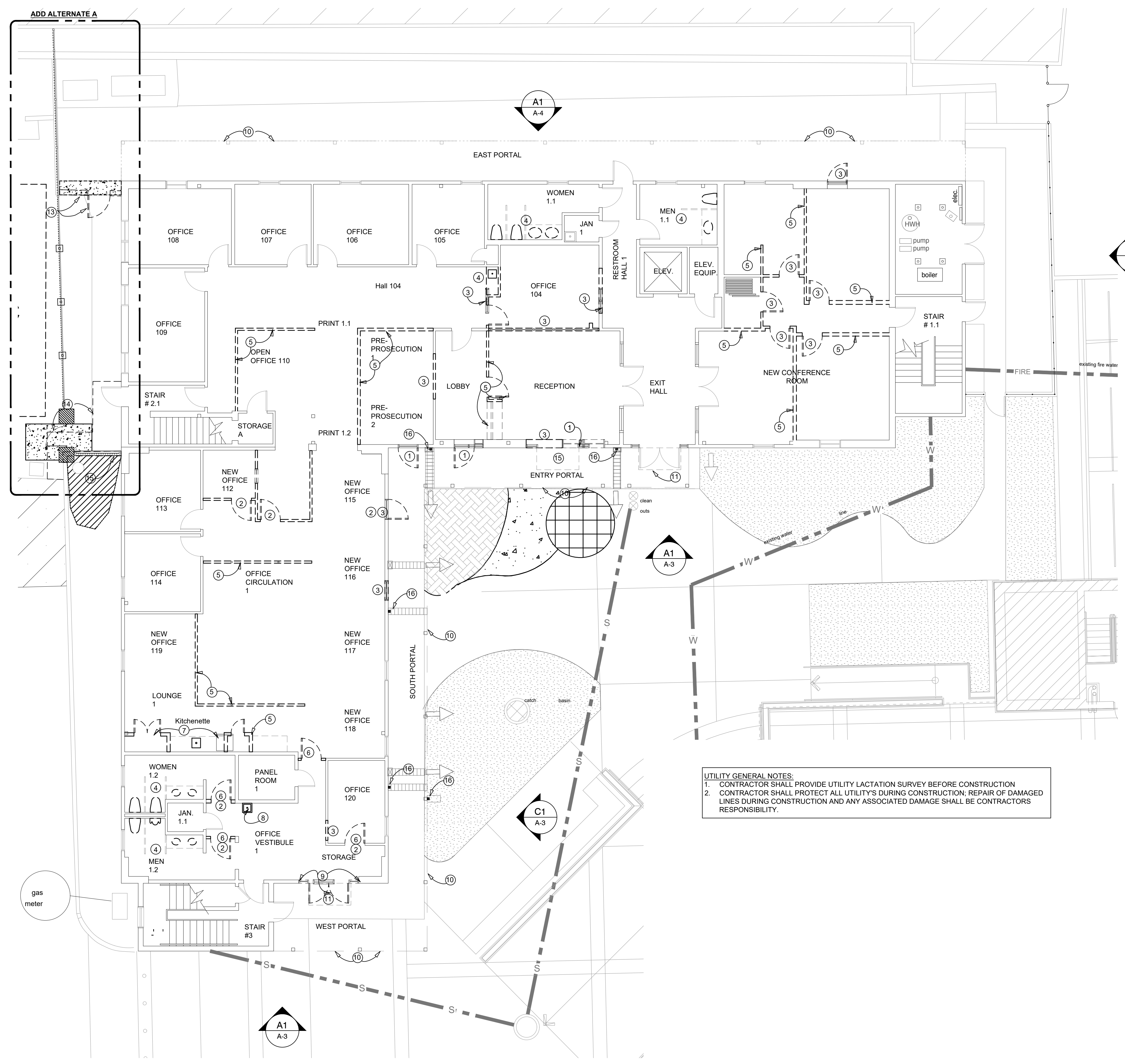
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**C-3**

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**UTILITY GENERAL NOTES:**  
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 2. CONTRACTOR SHALL PROTECT ALL UTILITY'S DURING CONSTRUCTION; REPAIR OF DAMAGED LINES DURING CONSTRUCTION AND ANY ASSOCIATED DAMAGE SHALL BE CONTRACTORS RESPONSIBILITY.

**GENERAL SHEET NOTES**

- A. ALL DIMENSIONS MUST BE VERIFIED IN FIELD.
- B. ALL SITE INFORMATION SHOWN FOR REFERENCE ONLY. ACTUAL LOCATIONS MUST BE VERIFIED IN FIELD.
- C. ALL EXISTING SHALL REMAIN UNLESS OTHERWISE NOTED.
- D. ALL EXISTING IS TO BE PROTECTED DURING ALL PHASES OF WORK.
- E. COORDINATE WITH OWNER FOR SALVAGE OR DISPOSAL OF FIXTURES.
- F. REMOVE EXISTING FLOORING THROUGHOUT PREP FOR NEW SCHEDULED FLOORING.
- G. GENERAL CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND STRUCTURE IN THE FIELD BEFORE STARTING DEMOLITION AND REPORT ANY DISCREPANCIES TO ARCHITECT.
- H. VERIFY THAT CONSTRUCTION INDICATED FOR REMOVAL AND DEMOLITION IS NOT BEARING OR ATTACHED TO ACTIVE UTILITY LINES.
- I. DISPOSAL OF DEMOLISHED MATERIALS SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL DEMOLISHED MATERIALS OFF SITE ANY MATERIALS LEFT ON SITE PAST WORKING HOURS SHALL BE STORED & PROTECTED IN A SAFE & CLEAN MANNER & ACCEPTABLE TO THE PUBLIC.
- J. DEMOLITION SHALL FOLLOW MOA AGREEMENT WITH DEVARGAS ASSOCIATION FOR "GRASSY KNOLL" LEASE. SEE SHEET C-1 AND LEASE AGREEMENT PROVIDED IN CONTRACT DOCUMENTS.
- K. REMOVE ALL HANGERS, STRAPS, BRACKETS, ETC. ASSOCIATED WITH EQUIPMENT, DUCTWORK, CONDUIT AND PIPING THAT IS REMOVED.
- L. ALL EXISTING UTILITIES SHALL BE PROTECTED. DAMAGED LINES MUST BE REPAIRED AND RESTORED TO SERVICE BY THE CONTRACTOR.
- M. REMOVE AND REPLACE ALL EXISTING WINDOWS AS SPECIFIED UNLESS NOTED OTHERWISE.
- N. REMOVE EXISTING FLOORING THROUGHOUT; PREP FOR NEW FLOORING.

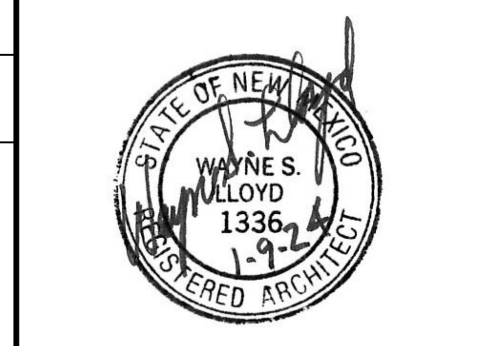
**SHEET KEYED NOTES**

- 1. REMOVE EXISTING DOOR AND/OR WINDOW FOR NEW WINDOW (OR SALVAGED DOOR/WINDOW) INSTALLATION IN NEW ROUGH OPENING. PROVIDE FIELD MEASUREMENTS FOR SALVAGED DOOR/WINDOW NEW WALL CUTS. NEW OPENING WILL INCLUDE HEADER AND JAMB SUPPORT.
- 2. REMOVE EXISTING DOOR FOR THE NEW DOOR INSTALLATION IN THE EXISTING DOOR FRAME WITH NEW HARDWARE.
- 3. REMOVE WALL (AND/OR DOOR) FOR INSTALLATION OF NEW WINDOW (OR DOOR) IN THIS OPENING. PROVIDE NEW WALL FRAMING HEADER AND SUPPORT ON EACH JAMB. FIELD MEASURE OPENING REQUIRED FOR NEW WINDOW. RELOCATE ELECTRICAL AND DATA INTO NEW OR REMAINING WALLS.
- 4. REMOVE PLUMBING FIXTURES, TOILET STALLS, SINKS AND COUNTERS FOR INSTALLATION OF NEW BATHROOM FIXTURES. CUT AND CAP UTILITY AND PLUMBING LINES AS NEEDED TO ALLOW NEW FIXTURE INSTALLATION. PATCH CERAMIC TILE (AND OTHER CUT SURFACES) TO MATCH EXISTING.
- 5. REMOVE WALLS (AND COUNTER) FROM FLOOR TO ABOVE CEILING. RELOCATE ELECTRICAL AND DATA LINES TO NEW AND ADJACENT WALLS.
- 6. REMOVE EXISTING DOOR (OR WINDOW) FOR NEW CONSTRUCTION.
- 7. REMOVE WALLS, COUNTER & CABINETS OF KITCHENETTE. RELOCATE UTILITY, ELECTRICAL AND DATA LINES FOR NEW KITCHENETTE CONSTRUCTION.
- 8. REMOVE EXISTING DRINKING FOUNTAIN AND RELOCATE PLUMBING AND ELECTRICAL LINES FOR NEW DRINKING FOUNTAIN AT THIS LOCATION.
- 9. REMOVE AND SALVAGE DOUBLE DOOR CONSTRUCTION WITH TRANSOM AND SIDE LIGHT WINDOWS AND TRIM TO NEW OPENING AT ENTRY LOBBY AS SHOWN ON A-1.
- 10. REMOVE EXISTING WALK-OFF MAT.
- 11. REMOVE EXISTING SITE WALL & GATE.
- 12. REMOVE SECTION OF CONCRETE SITE WALK.
- 13. REMOVE SECTION OF CONCRETE CURB.
- 14. PREP EXISTING CONCRETE SIDEWALK FOR NEW RECESSED WALK-OFF MAT.
- 15. REMOVE EXISTING DOWNSPOUT; PROTECT ACCLIMATED TRENCH DRAIN AND OR PLASH BLOCK; SEE ELEVATIONS.

**SHEET LEGEND**



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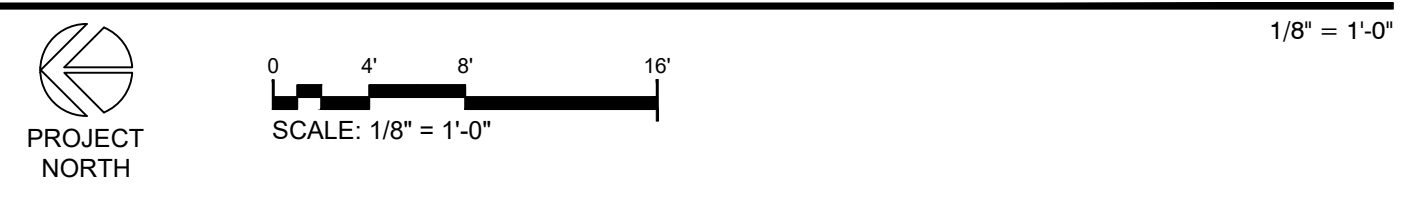
Sheet Title:  
**FIRST FLOOR DEMOLITION FLOOR PLANS**

Job Number: **2021-41**

Sheet No.

**D-1**

**A1 FIRST FLOOR DEMOLITION PLAN**





PLOT DATE: Jan 09, 2024, 9:12am  
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- K. ALL EXISTING UTILITIES SHALL BE PROTECTED. DAMAGED LINES MUST BE REPAIRED AND RESTORED TO SERVICE BY THE CONTRACTOR. REMOVE AND REPLACE ALL EXISTING WINDOWS UNLESS NOTED OTHERWISE.
- M. DEMOLITION SHALL FOLLOW MOA AGREEMENT WITH DEVARGAS ASSOCIATION FOR "GRASSY KNOLL" LEASE; SEE SHEET C-1 AND LEASE AGREEMENT PROVIDED IN CONTRACT DOCUMENTS.

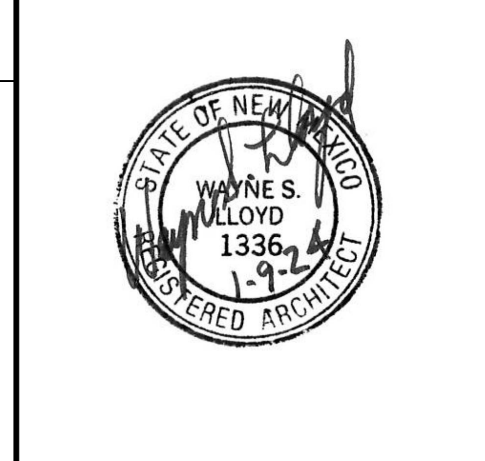
**SHEET KEYED NOTES**

- 1. EXISTING LEAD PAINT AT STAIRS SHALL NOT BE DISTURBED; NOT IN SCOPE OF WORK.
- 2. EXISTING SPRAY FOAM ROOF AROUND COOLING TOWER; PROTECT.
- 3. PREP PORTAL FOR NEW PAINT.
- 4. REMOVE PLUMBING FIXTURES, TOILET STALLS, SINKS AND COUNTERS FOR INSTALLATION OF NEW BATHROOM FIXTURES. CUT AND CAP UTILITY AND PLUMBING LINES AS NEEDED TO ALLOW NEW FUTURE INSTALLATION. PATCH CERAMIC TILE (AND OTHER CUT SURFACES) TO MATCH EXISTING.
- 5. REMOVE ALL 12" SQUARE VINYL FLOOR TILE (APPROXIMATELY 28 SQ. FT.) WITH A LICENSED ASBESTOS REMOVAL COMPANY. REMOVAL DEBRIS SHALL BE PROPERLY PACKAGED AND TRANSPORTED TO A LICENSED ASBESTOS LAND FILL.
- 6. REMOVE WALLS, COUNTER & CABINETS OF KITCHENETTE. RELOCATE UTILITY, ELECTRICAL AND DATA LINES FOR NEW KITCHENETTE CONSTRUCTION.
- 7. REMOVE EXISTING DRINKING FOUNTAIN AND RELOCATE PLUMBING AND ELECTRICAL LINES FOR NEW DRINKING FOUNTAIN AT THIS LOCATION.
- 8. PREP EXISTING EXPOSED WOOD RAILINGS AND CORBELS AND FACING AT BALCONIES FOR NEW FINISH; REMOVE ROTTED WOOD AND LOOSE MATERIAL; INCLUDING CORBELS, LINTELS, TONGUE AND GROOVE DECKING AND COLUMNS; SAND &/ OR PRESSURE WASH CLEAN AS NEEDED.

**SHEET LEGEND**



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**NM FIRST JUDICIAL DISTRICT ATTORNEY**  
 327 SANDOVAL STREET,  
 SANTA FE, NM 87501

Current Status:  
**CONFORMED SET**

REVISIONS		

Drawn by: **KL**  
 Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**SECOND & THIRD FLOOR DEMOLITION PLANS**

Job Number: **2021-41**

Sheet No.

D-2

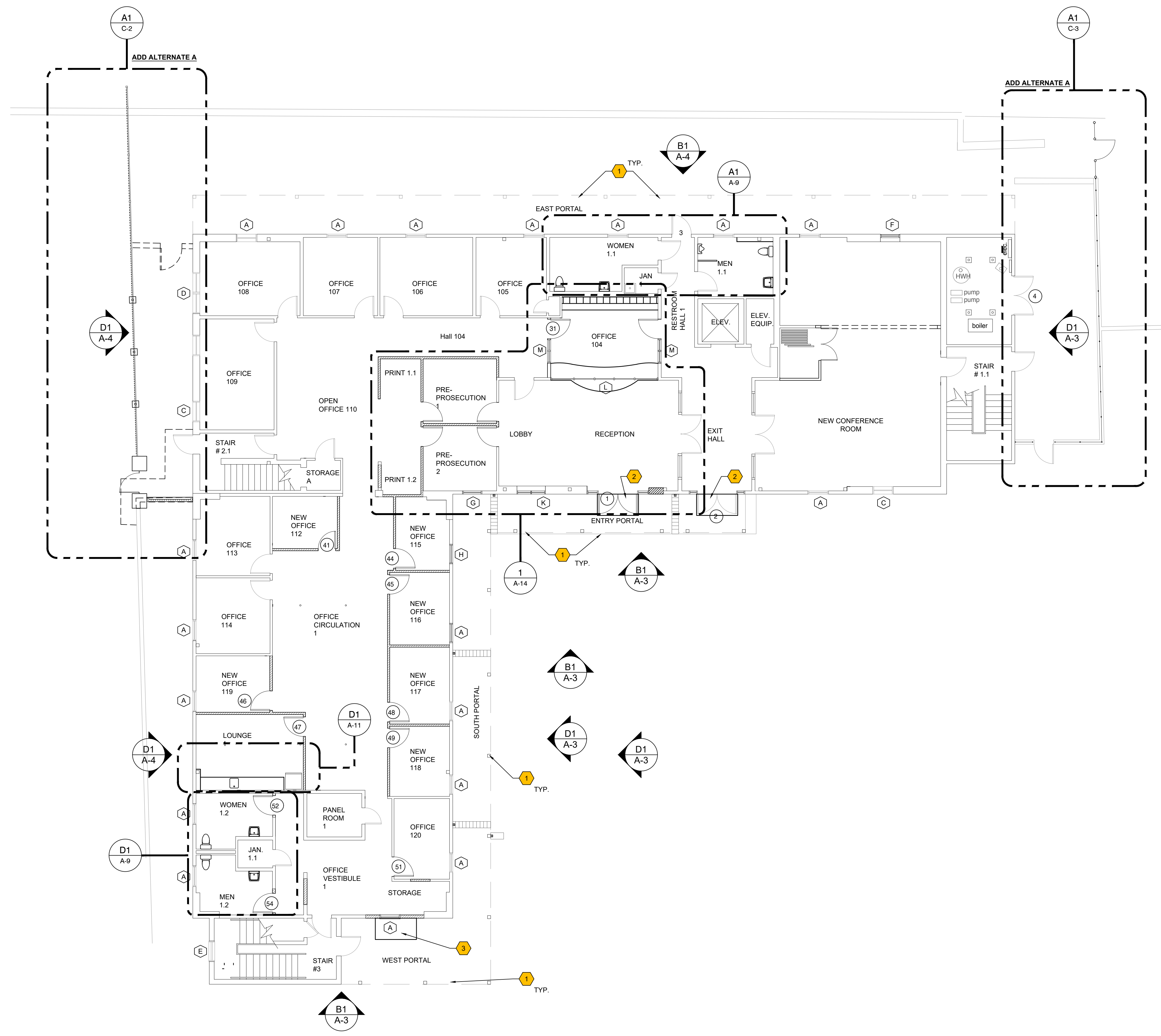


**A1 SECOND FLOOR DEMOLITION PLAN**  
 1/8" = 1'-0"

**A2 THIRD FLOOR DEMOLITION PLAN**  
 1/8" = 1'-0"



PLOT DATE: Jan 09, 2024, 9:12am  
 FILENAME: X:\2021-41 Santa Fe Office Reno\CAD Files\_SHEETS\2021-41\_A-1.dwg



**GENERAL SHEET NOTES**

- A. ALL DIMENSIONS MUST BE VERIFIED IN FIELD.
- B. ALL SITE INFORMATION SHOWN FOR REFERENCE ONLY. ACTUAL LOCATIONS MUST BE VERIFIED IN FIELD.
- C. ALL EXISTING SHALL REMAIN UNLESS OTHERWISE NOTED.
- D. ALL EXISTING TO REMAIN IS TO BE PROTECTED DURING ALL PHASES OF WORK.
- E. COORDINATE WITH OWNER FOR SALVAGE OR DISPOSAL OF FIXTURES.
- F. DOORS 44-49 SHALL BE SALVAGED EXISTING DOORS.
- G. ALL EXISTING WINDOWS SHALL BE REPLACED WITH NEW; SEE SHEET A-13 FOR WINDOW SCHEDULES TYPES & DETAILS.
- H. EXISTING WORK STATIONS SHALL BE DISASSEMBLED, STORED AND REASSEMBLED BY LICENSED FURNITURE CONTRACTOR; OTHER FURNITURE AND FIXTURES SHALL BE STORED ON SITE IN DESIGNATED AREAS. SEE SHEET G-2; ALL MOVING SHALL BE DONE BY LICENSED AND BONDED MOVING COMPANY THROUGH THE GENERAL CONTRACTOR.

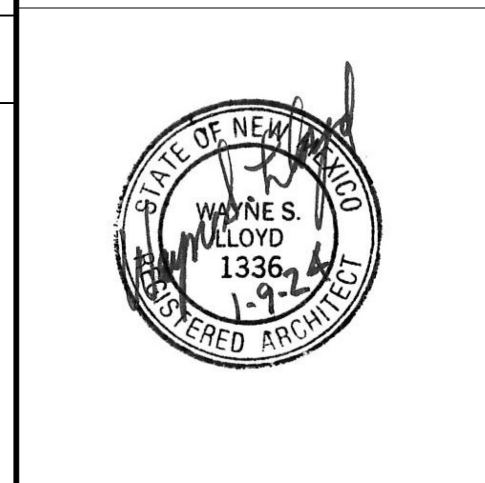
**SHEET KEYED NOTES**

- 1. SEE SHEETS A-2.1 & A-2.2 FOR PORTALS ABOVE.
- 2. NEW RUBBER RECESSED WALK-OFF MAT.
- 3. POUR NEW SECTION OF CONCRETE TO MATCH COLOR OF EXISTING WHERE REMOVED WALK-OFF MATT WAS. CONCRETE MIN. 3,000 PSI AND 2" THICK

**SHEET LEGEND**

- EXISTING
- NEW
- EXISTING DOOR WITH NEW ACCESS CONTROL AND ASSOCIATED HARDWARE; SEE DOOR SCHEDULE
- NEW OR RELOCATED EXISTING DOOR; SEE DOOR SCHEDULE
- NEW OR RELOCATED EXISTING WINDOW; SEE WINDOW TYPES/SCHEDULE

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 327 SANDOVAL STREET,  
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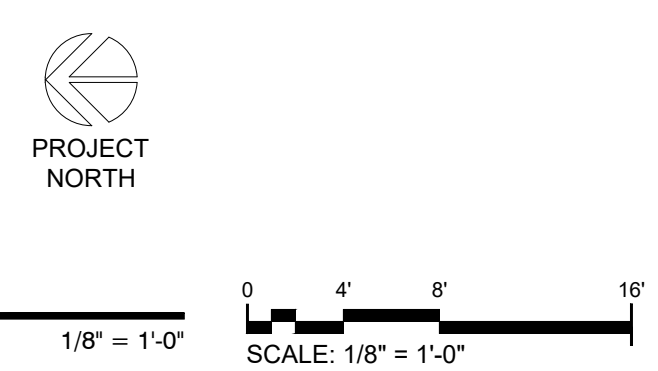
Sheet Title:  
**FIRST FLOOR PLAN**

Job Number: **2021-41**

Sheet No.

A-1

**A1 FIRST FLOOR PLAN**





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**GENERAL SHEET NOTES**

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 D. ALL EXISTING TO REMAIN IS TO BE PROTECTED DURING ALL PHASES OF WORK.  
 E. COORDINATE WITH OWNER FOR SALVAGE OR DISPOSAL OF FIXTURES.  
 F. DOORS 44-49 SHALL BE SALVAGED EXISTING DOORS.  
 G. ALL EXISTING WINDOWS SHALL BE REPLACED WITH NEW; SEE SHEET A-13 FOR WINDOW SCHEDULES TYPES & DETAILS.

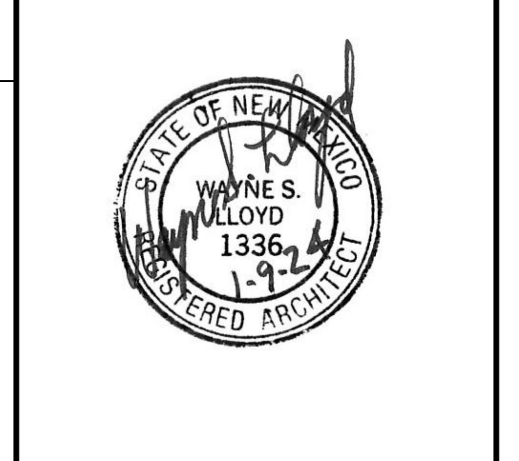
**SHEET KEYED NOTES**

1. PATCH AND SKIM COAT EXISTING WALLS IN AREAS WHERE REMOVED CASEWORK SHELVING HAS DAMAGED WALLS TO PROVIDE A MINIMUM LEVEL 4 PAINTED FINISH.

**SHEET LEGEND**

- EXISTING
- NEW
- ⊕ EXISTING DOOR WITH NEW ACCESS CONTROL AND ASSOCIATED HARDWARE; SEE DOOR SCHEDULE
- ⊕ NEW OR RELOCATED EXISTING DOOR; SEE DOOR SCHEDULE
- ⊕ NEW OR RELOCATED EXISTING WINDOW; SEE WINDOW TYPES/SCHEDULE

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DISTRICT ATTORNEY**  
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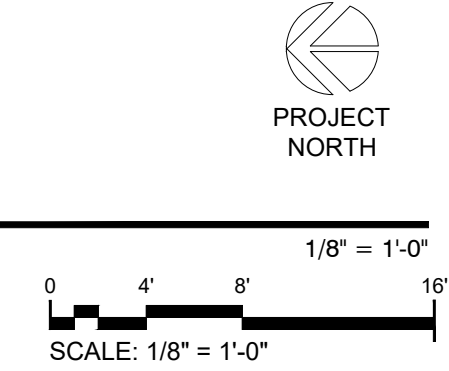
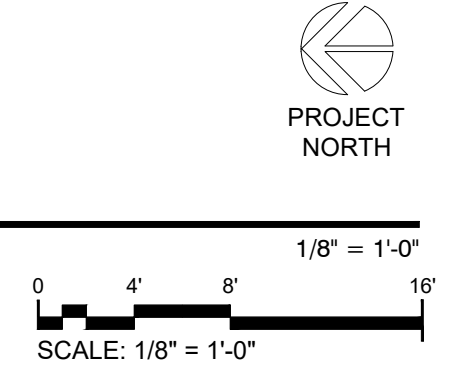
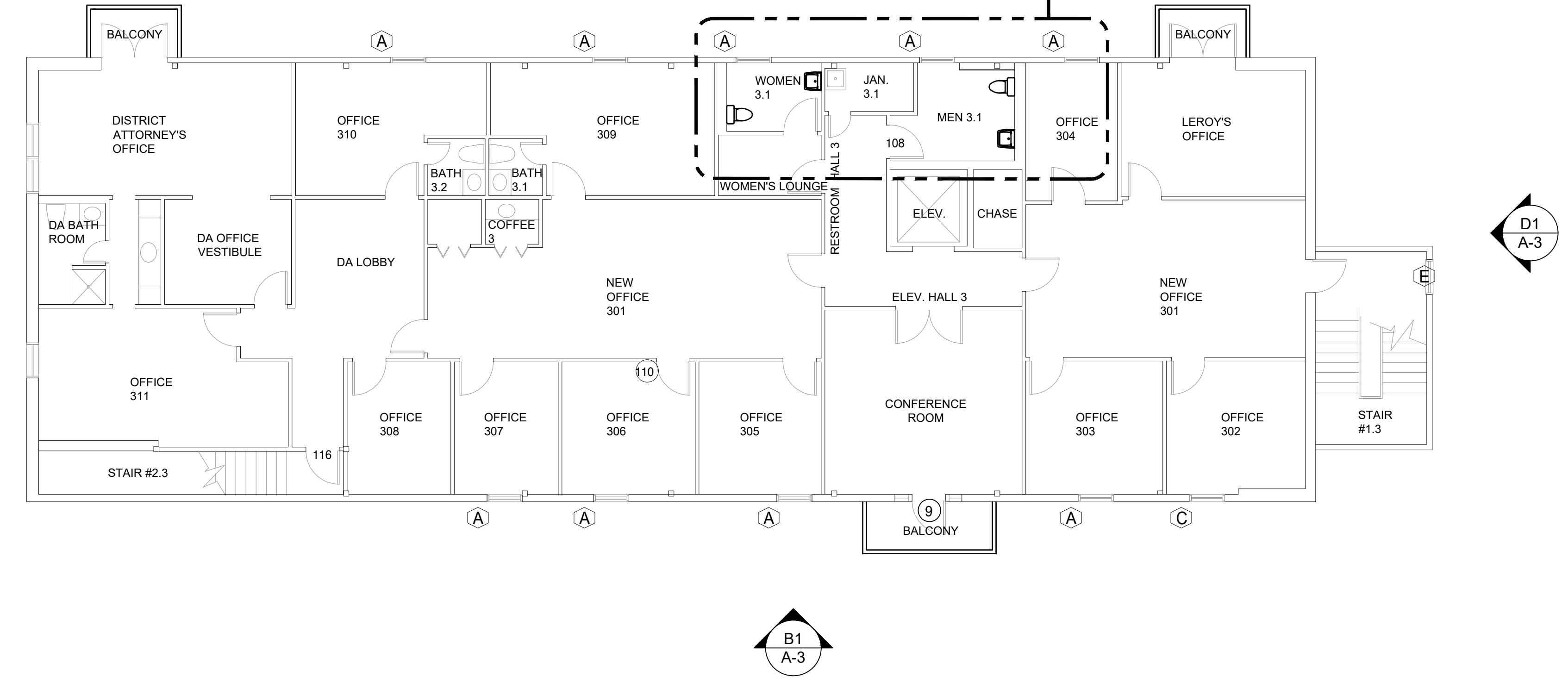
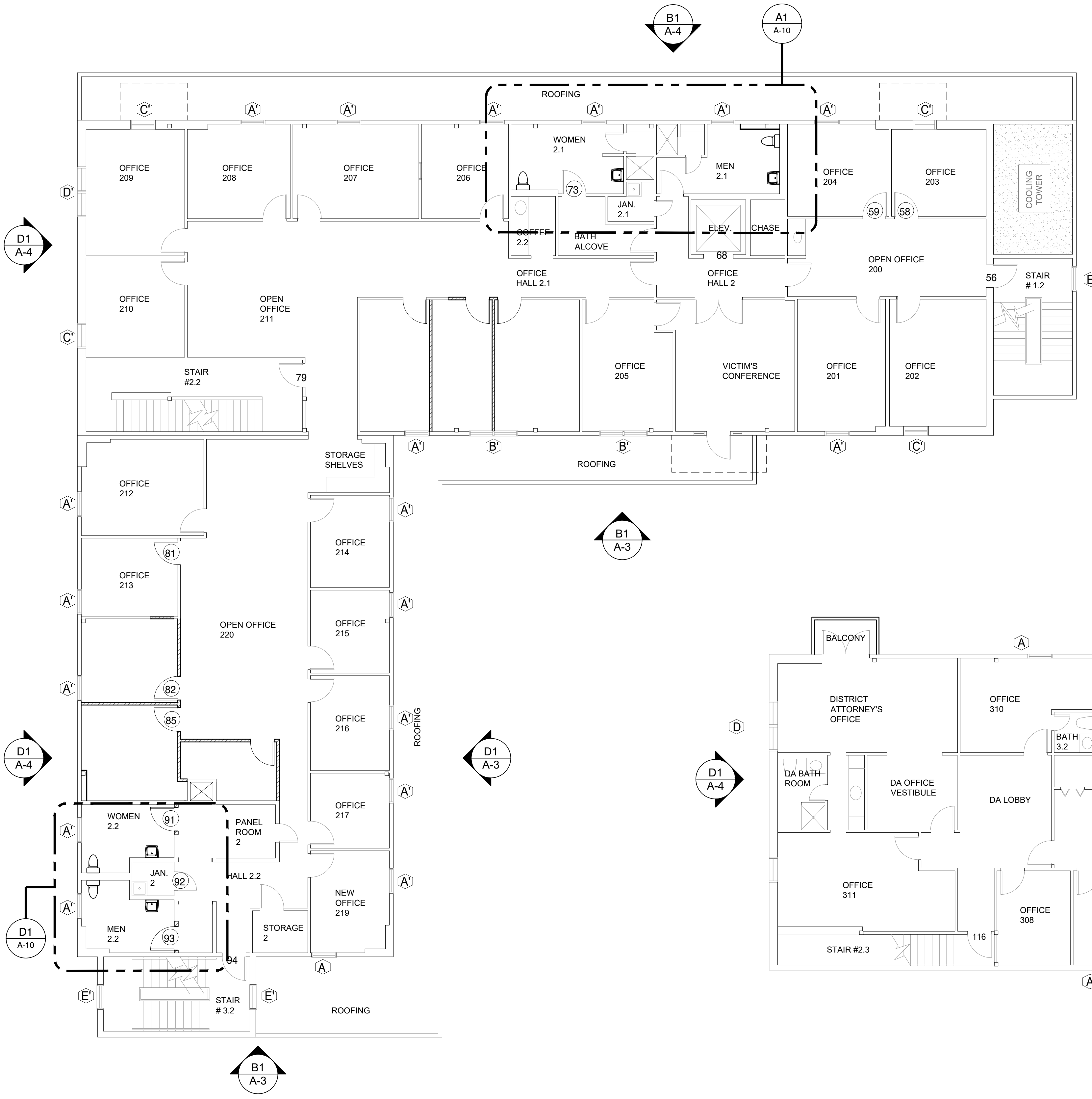
Current Status:  
**CONFORMED SET**

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 Sheet Title:  
**SECOND & THIRD FLOOR PLAN**

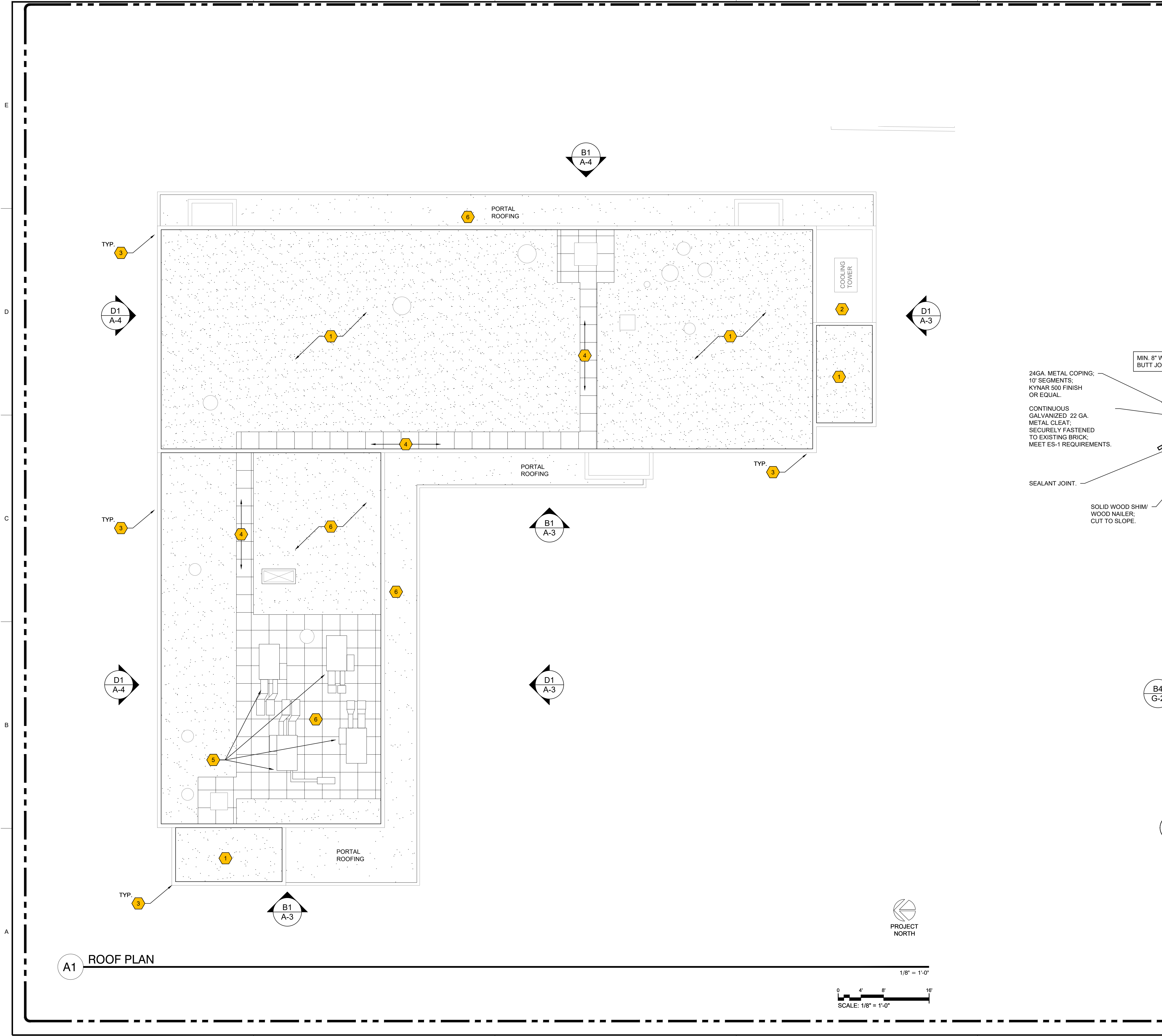
Job Number: **2021-41**  
 Sheet No.

**A-2.1**





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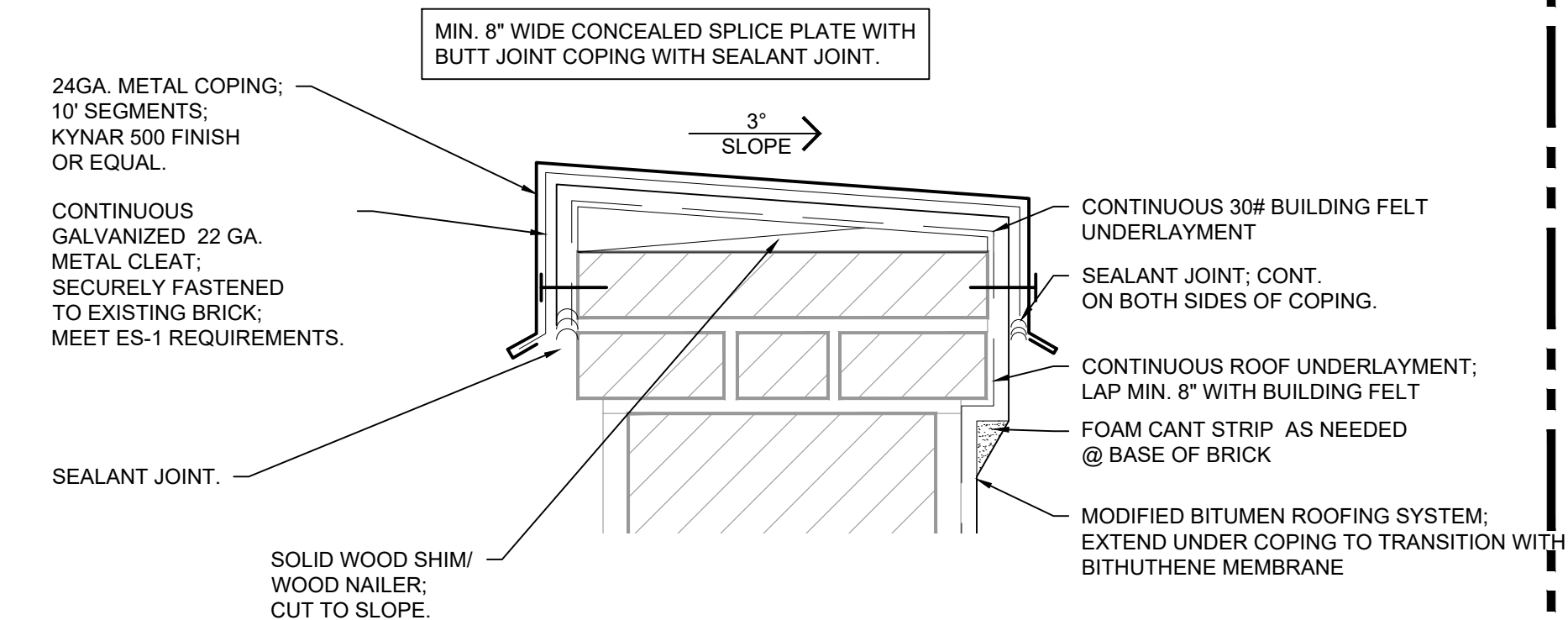
**GENERAL SHEET NOTES**

- A. ALL DIMENSIONS MUST BE VERIFIED IN FIELD.
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- C. ALL EXISTING SHALL REMAIN UNLESS OTHERWISE NOTED.
- D. ALL EXISTING TO REMAIN IS TO BE PROTECTED DURING ALL PHASES OF WORK.
- E. EXISTING CHILLER IS TO BE REMOVED COMPLETE.
- F. ALL NEW AND EXISTING ROOF PENETRATION SHALL BE FLASHED AND SEALED PER ROOFING MANUFACTURES SPECIFICATIONS.
- G. ALL NEW AND EXISTING ROOF TOP EQUIPMENT SHALL BE FLASHED AND SEALED PER ROOFING MANUFACTURES SPECIFICATIONS.
- H. NEW ROOFING SYSTEM SHALL BE SINGLE SOURCE WITH A MIN. 20 YEAR MANUFACTURES WARRANTY.

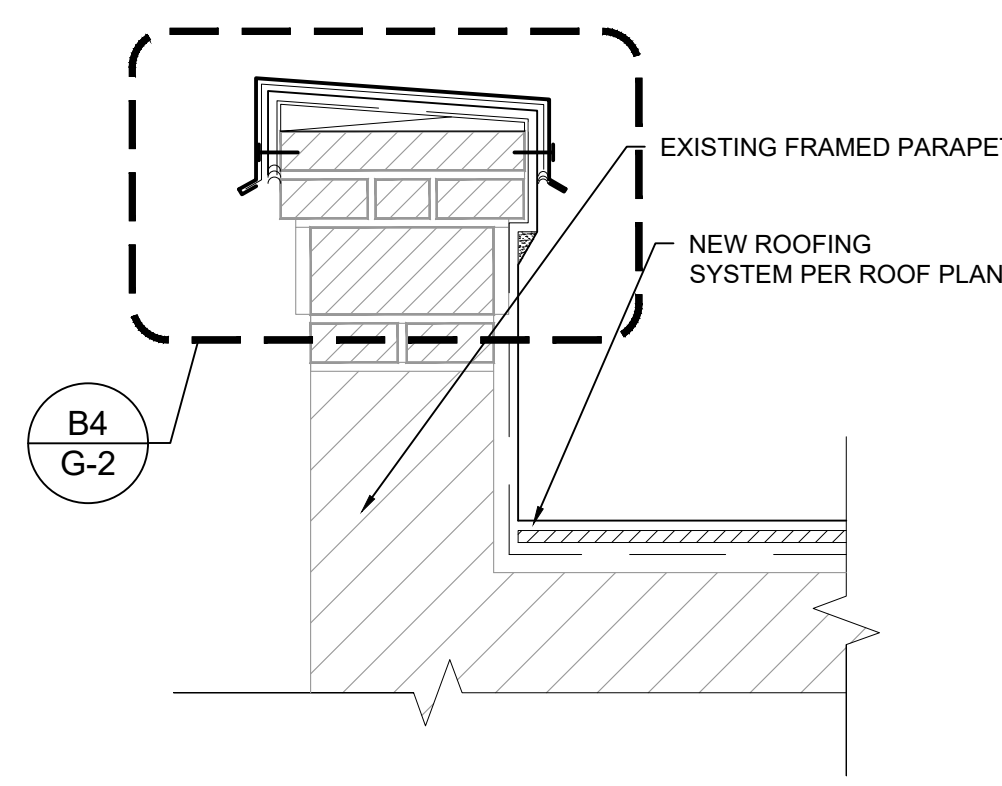
**SHEET KEYED NOTES**

1. NEW MODIFIED BITUMEN ROOFING SYSTEM OVERTOP SINGLE LAYER EXISTING BITUMEN ROOFING.
2. EXISTING ROOFING SYSTEM AT COOLING TOWER SHALL REMAIN.
3. NEW METAL COPING; SEE DETAIL C5/A-2.2
4. NEW WALKABLE MATT. FULLY ADHERED TO BITUMEN MEMBRANE; SEE ROOF PLAN FOR LOCATIONS.
5. NEW RTJ'S WITH NEW FLASHING; SEE MECHANICAL DRAWINGS.
6. REMOVE EXISTING SINGLE LAYER OF BITUMEN ROOFING AND REPLACE WITH NEW MODIFIED BITUMEN ROOFING SYSTEM; PROTECT SLOPED FOAM BELOW.

**SHEET LEGEND**

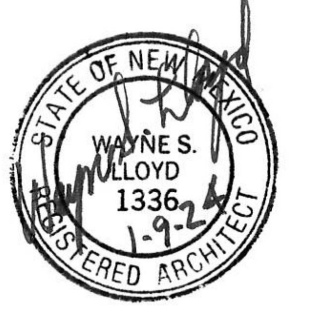


**C5 TYP. ENLARGED COPING DETAIL**  
 3" = 1'-0"



**B5 TYP. NEW ROOFING & COPING DETAIL**  
 1-1/2" = 1'-0"

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 327 SANDOVAL STREET,  
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Date: **01-05-2024**

Sheet Title:  
**ROOF PLAN & DETAILS; ADD ALTERNATE B**

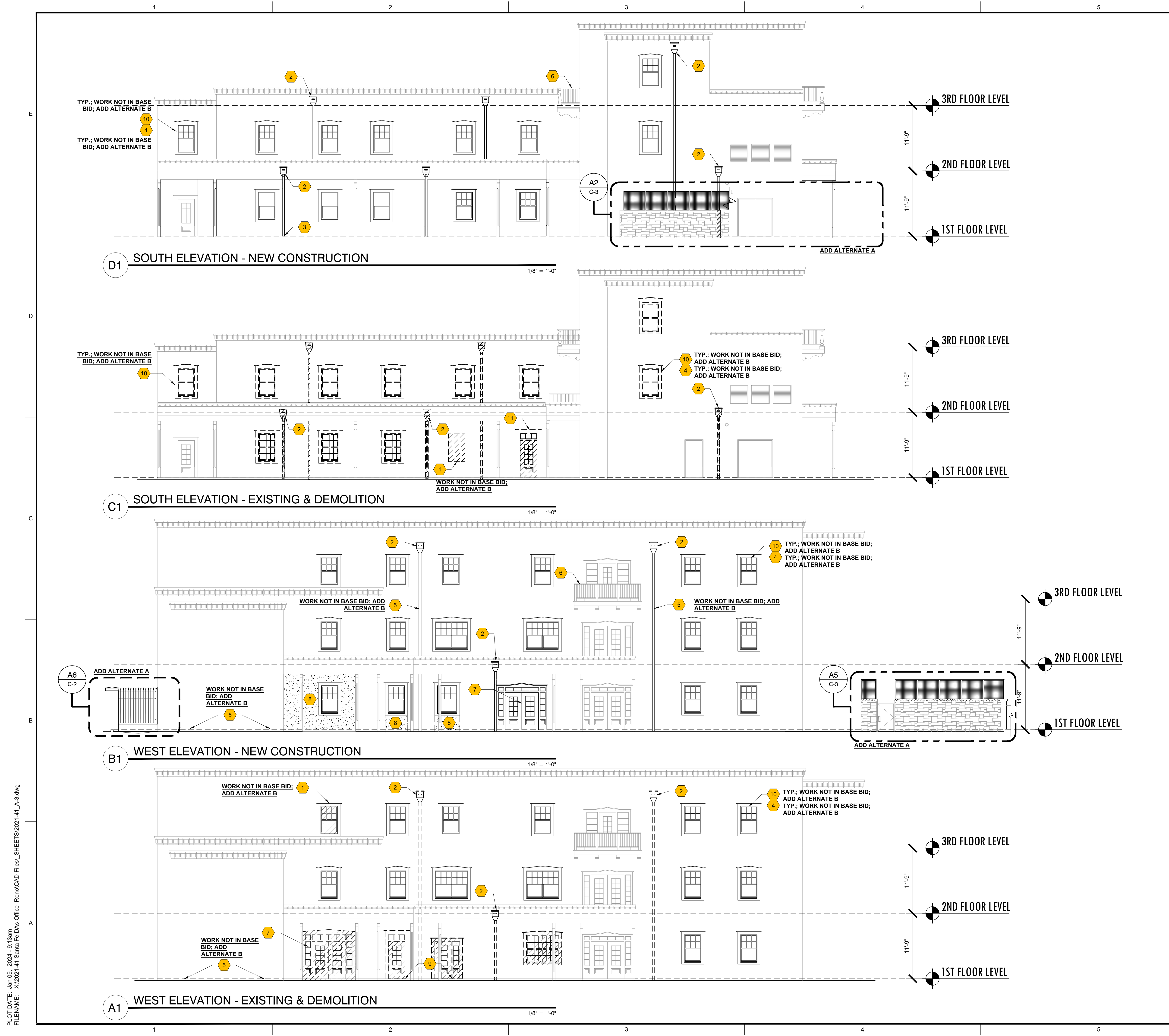
Job Number: **2021-41**

Sheet No.

**A-2.2**

**ADD ALTERNATE B**





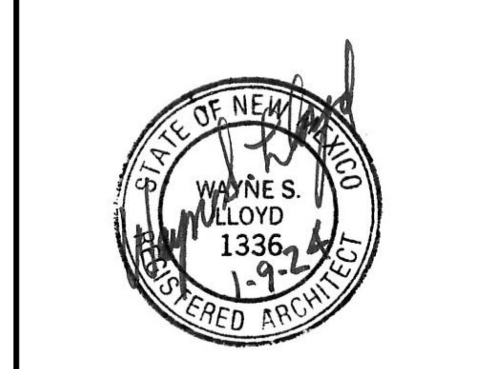
**GENERAL SHEET NOTES**

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- D. ALL EXISTING TO REMAIN IS TO BE PROTECTED DURING ALL PHASES OF WORK.
- E. COORDINATE WITH OWNER FOR SALVAGE OR DISPOSAL OF FIXTURES.
- F. DEMOLITION OF EXISTING WORK SHALL BE DONE IN SUCH A MANNER THAT IT WILL NOT DAMAGE EXISTING STRUCTURES, FIXTURES, ETC. PROTECT WORKERS AND PUBLIC FROM INJURY AND REPORT ANY HAZARDOUS CONDITIONS THAT MAY OCCUR.
- G. GENERAL CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND STRUCTURE IN THE FIELD BEFORE STARTING DEMOLITION AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.
- H. VERIFY ALL UTILITIES PRIOR TO DEMOLITION; CONFIRM ALL TO BE REMOVED DOES NOT INTERACT WITH UTILITIES TO REMAIN.
- I. DISPOSAL OF DEMOLISHED MATERIALS SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL DEMOLISHED MATERIALS OFF SITE.
- J. REMOVE ALL HANGERS STRAPS, BRACKETS, ETC. ASSOCIATED WITH EQUIPMENT, DUCTWORK, CONDUIT AND PIPING THAT IS REMOVED.
- K. ALL EXISTING UTILITIES SHALL BE PROTECTED. DAMAGED LINES MUST BE REPAIRED AND RESTORED TO SERVICE BY THE CONTRACTOR.
- L. REMOVE AND REPLACE ALL WINDOWS IN THE EXISTING BUILDING. SEE NOTES FOR EXCEPTIONS, SALVAGE AND SOME DOOR REPLACEMENT.
- M. REMOVE AND REPLACE ALL ROOFTOP "CONDUCTOR HEADS" AND DOWNSPOUTS AS NOTED.

**SHEET KEYED NOTES**

1. (WORK NOT IN BASE BID; ADD-ALTERNATE B) CUT OPENING INTO EXISTING FRAME/STUCCO WALL FOR NEW TYPE "A" WINDOWS. NOTE: LOWER LEVEL PLANNED OPENING FOR NEW WINDOW MAY HAVE AN EXISTING WINDOW OPENING IN THE FRAME WHICH HAS BEEN CLOSED UP WITH STUCCO AND FRAME WALLS.
2. REPLACE EXISTING ROOF SCUPPER AND COLLECTOR HEAD AND DOWNSPOUT TO GRADE; MATCH EXISTING CONDUCTOR HEAD AND SCUPPER CONSTRUCTION.
3. NEW PRE-CAST CONCRETE SPLASH BLOCK.
4. (WORK NOT IN BASE BID; ADD-ALTERNATE B) REMOVE EXISTING WINDOW AND REPLACE WITH NEW WINDOW AND TRIM; SEE SHEET A-14 FOR REMOVAL AND INSTALLATION DETAILS.
5. (WORK NOT IN BASE BID; ADD-ALTERNATE B) PATCH AREA OF EXISTING STUCCO WITH FIBER MESH AND NEW STUCCO SYSTEM TO MATCH EXISTING.
6. RE-PAINT EXISTING BALCONY.
7. EXISTING DOUBLE DOOR WITH TRANSOM AND SIDELIGHTS; REMOVE COMPLETE & SALVAGE FOR RE-USE ; RE-INSTALL IN NEW LOCATION AND REPLACE DAMAGED AS NEEDED.
8. IN-FILL SECTION OF EXISTING WITH WALL FRAMING AND STUCCO SYSTEM TO MATCH EXISTING.
9. REMOVE EXISTING DOOR WITH TRANSOM & SALVAGE TO OWNER.
10. (WORK NOT IN BASE BID; ADD-ALTERNATE B) REMOVE EXISTING WOOD TRIM AROUND EXISTING OPENINGS; PREP STUCCO IN ADJACENT AREA OF PATCHING IF NEEDED.
11. REMOVE EXISTING DOOR, TRIM AND TRANSOM COMPLETE; SALVAGE FOR RE-USE.

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**NM FIRST JUDICIAL DISTRICT ATTORNEY**  
 327 SANDOVAL STREET,  
 SANTA FE, NM 87501

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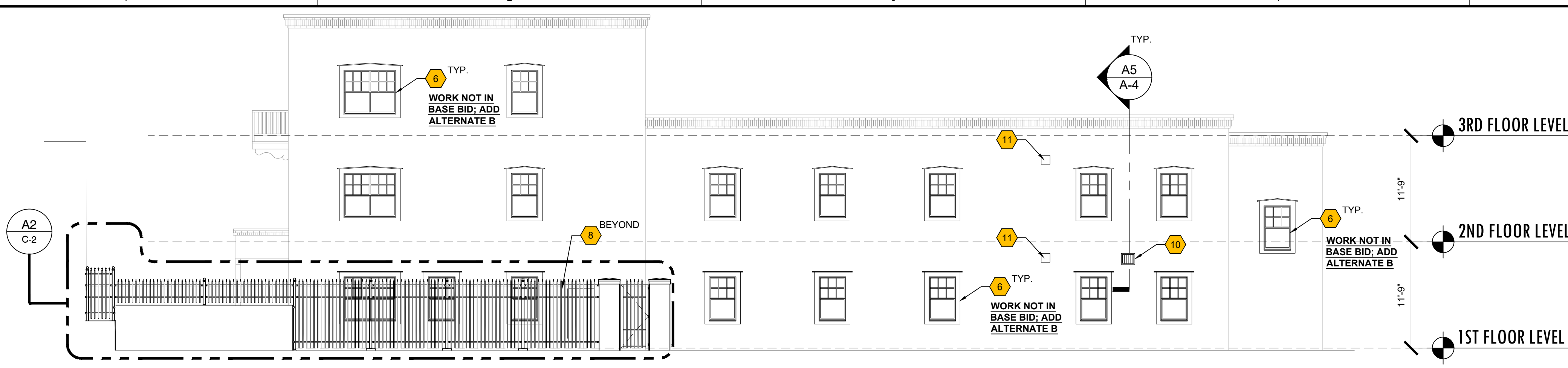
**BUILDING ELEVATIONS; SOUTH & WEST**

Job Number: **2021-41**  
 Sheet No.

**A-3**

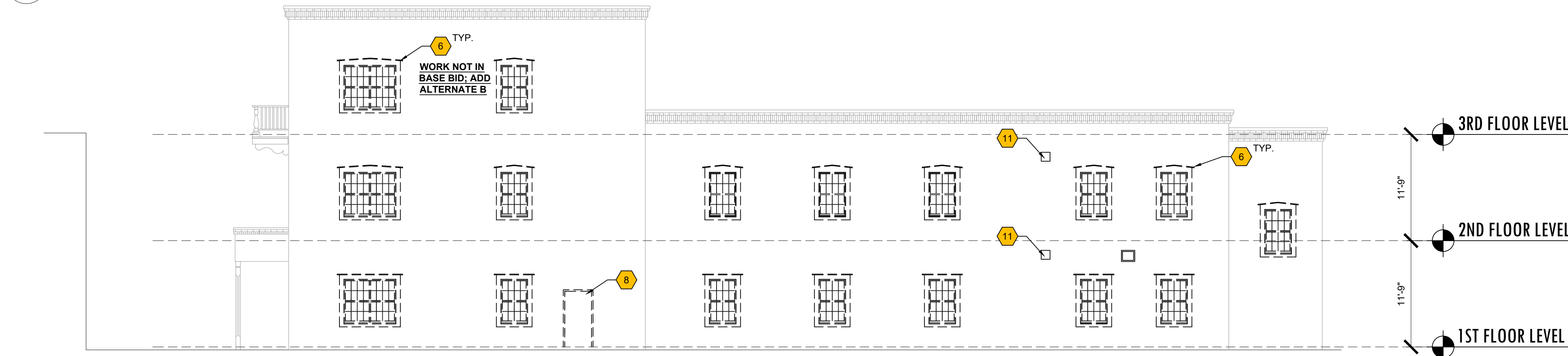
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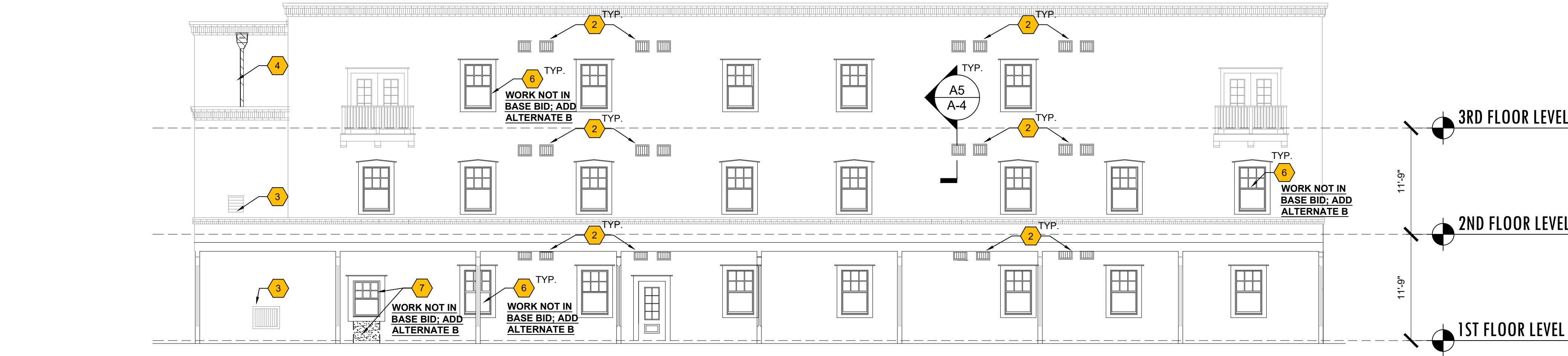
D1 NORTH ELEVATION - NEW CONSTRUCTION

1/8" = 1'-0"



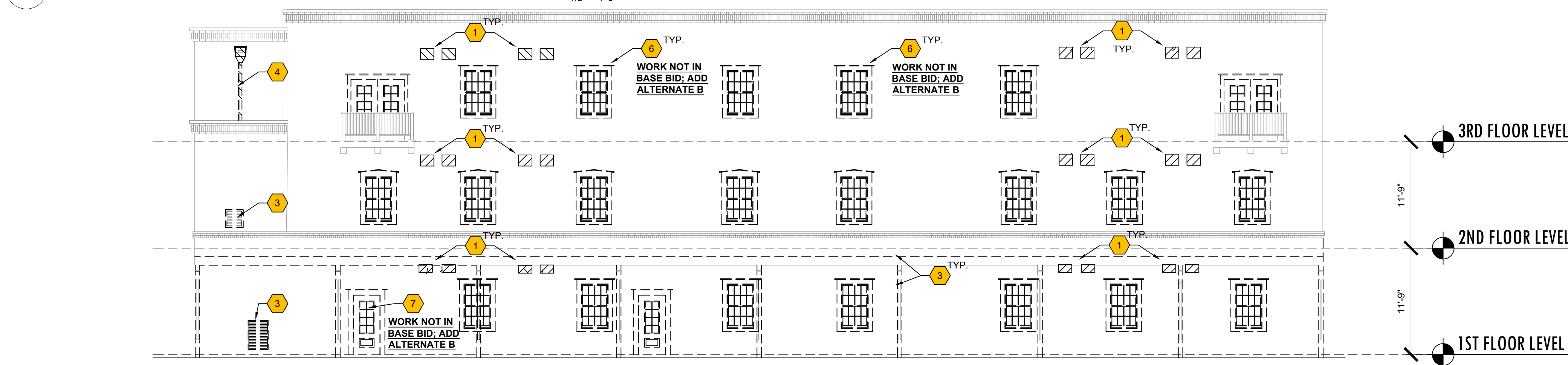
C1 NORTH ELEVATION - EXISTING & DEMOLITION

1/8" = 1'-0"



B1 EAST ELEVATION - NEW CONSTRUCTION

1/8" = 1'-0"



A1 EAST ELEVATION - EXISTING & DEMOLITION

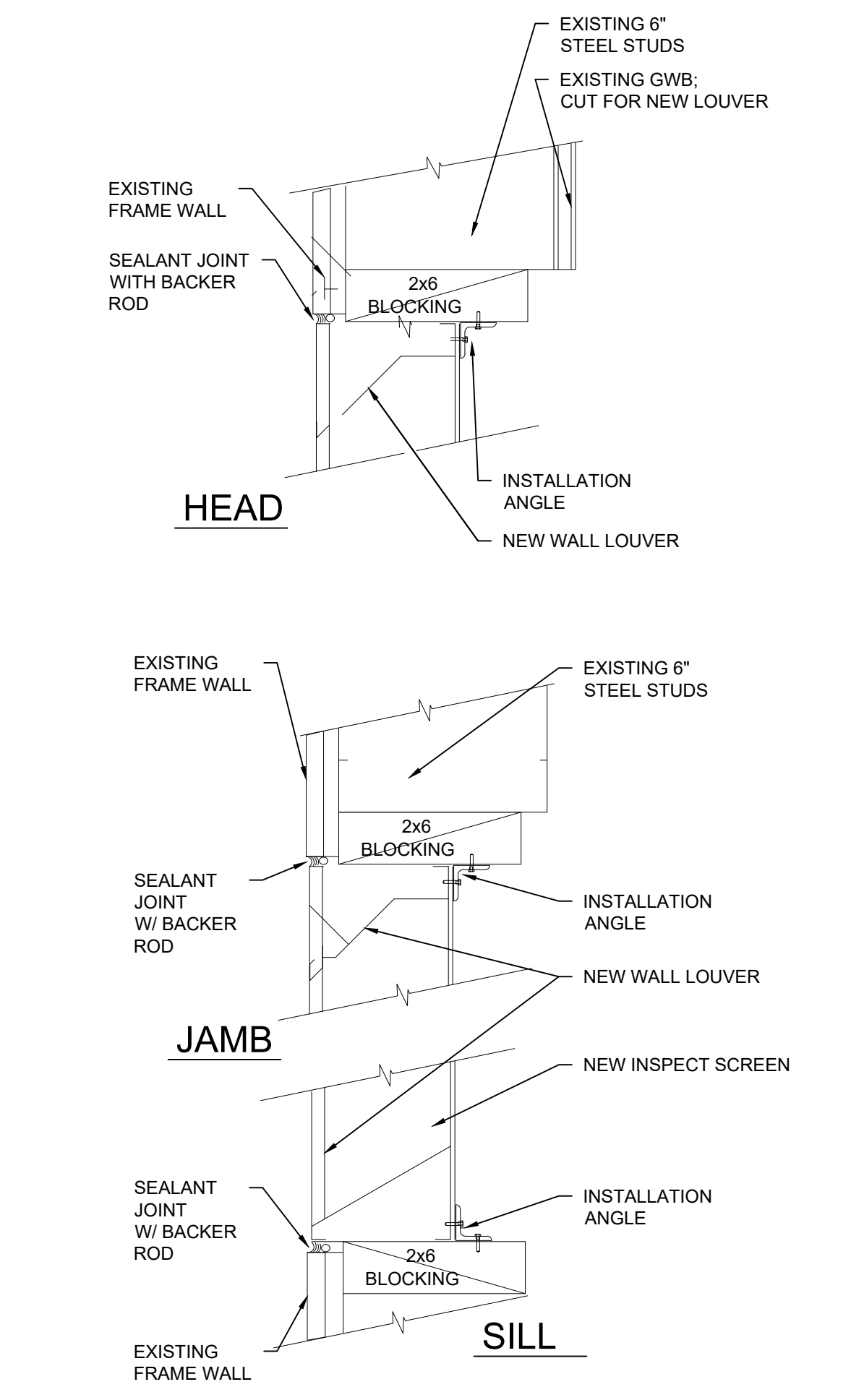
1/8" = 1'-0"

GENERAL SHEET NOTES

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- E. COORDINATE WITH OWNER FOR SALVAGE OR DISPOSAL OF FIXTURES. DEMOLITION OF EXISTING WORK SHALL BE DONE IN SUCH A MANNER THAT IT WILL NOT DAMAGE EXISTING STRUCTURES, FIXTURES, ETC. PROTECT WORKERS AND PUBLIC FROM INJURY AND REPORT ANY HAZARDOUS CONDITIONS THAT MAY OCCUR.
- F. GENERAL CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND STRUCTURE IN THE FIELD BEFORE STARTING DEMOLITION AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.
- G. VERIFY ALL UTILITIES PRIOR TO DEMOLITION; CONFIRM ALL TO BE REMOVED DOES NOT INTERACT WITH UTILITIES TO REMAIN.
- H. DISPOSAL OF DEMOLISHED MATERIALS SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL DEMOLISHED MATERIALS OFF SITE.
- I. REMOVE ALL HANGERS STRAPS, BRACKETS, ETC. ASSOCIATED WITH EQUIPMENT, DUCTWORK, CONDUIT AND PIPING THAT IS REMOVED.
- J. ALL EXISTING UTILITIES SHALL BE PROTECTED. DAMAGED LINES MUST BE REPAIRED AND RESTORED TO SERVICE BY THE CONTRACTOR.
- K. REMOVE AND REPLACE ALL WINDOWS IN THE EXISTING BUILDING. SEE NOTES FOR EXCEPTIONS, SALVAGE AND SOME DOOR REPLACEMENT.
- L. REMOVE AND REPLACE ALL ROOFTOP WATER "CONDUCTOR HEADS" AND DOWNSPOUTS AS NOTED.

SHEET KEYED NOTES

- 1. CUT EXISTING WALL FOR NEW 12"x15" WALL LOUVERS FOR NEW HVAC SYSTEM. SEE DETAIL 5/A-4. LEVEL CUTS & LOUVERS WITH EACH OTHER AND WITHIN THE WALL FOR CONSISTENT HEIGHTS.
- 2. PROVIDE AND INSTALL TWO (2) 12"x15" (LOUVER AREA) GRILLES FOR NEW HVAC SYSTEM IN EXISTING WALLS; SEE DETAIL A1/A-4.
- 3. EXISTING LOUVERS REMAIN.
- 4. REPLACE EXISTING ROOF SCUPPER AND COLLECTOR HEAD AND DOWNSPOUT TO GRADE; MATCH EXISTING CONDUCTOR HEAD AND SCUPPER CONSTRUCTION.
- 5. NOT USED.
- 6. (WORK NOT IN BASE BID; ADD ALTERNATE B) REMOVE EXISTING WINDOW AND REPLACE WITH NEW WINDOW AND TRIM; SEE SHEET A-14 FOR REMOVAL AND INSTALLATION DETAILS.
- 7. (WORK NOT IN BASE BID; ADD ALTERNATE B) REMOVE EXISTING DOOR; PROVIDE WALL OPENING IN EXISTING WALL AND INSTALL NEW (CUSTOM SIZE) WINDOW ASSEMBLY IN DOOR OPENING; INFILL WITH NEW WALL ASSEMBLY TO MATCH EXISTING.
- 8. EXISTING WINDOW AND/OR DOOR ASSEMBLY REMAINS; REPAIR WOOD, FILL HOLES, PATCH AND PAINT TO MATCH EXISTING.
- 9. PATCH AREA OF EXISTING STUCCO WITH FIBER MESH AND NEW STUCCO SYSTEM TO MATCH EXISTING.
- 10. CUT EXISTING WALL OPENINGS AND PROVIDE NEW 18"x14" WALL LOUVERS FOR NEW HVAC SYSTEM. SEE DETAIL A1/A-4.
- 11. CUT EXISTING WALL OPENINGS AND PROVIDE FOR NEW VENT FOR MICROWAVE OVENS.
- 12. RE-PAINT EXISTING BALCONY; FILL AND REPLACE ROTTED OR DAMAGED EXISTING.



A6 TYP. LOUVER DETAILS

3" = 1'-0"

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**NM FIRST JUDICIAL DISTRICT ATTORNEY**  
 327 SANDOVAL STREET,  
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Current Status:  
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REVISIONS		

Drawn by: **KL**  
 Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**BUILDING ELEVATIONS; NORTH & EAST**

Job Number: **2021-41**

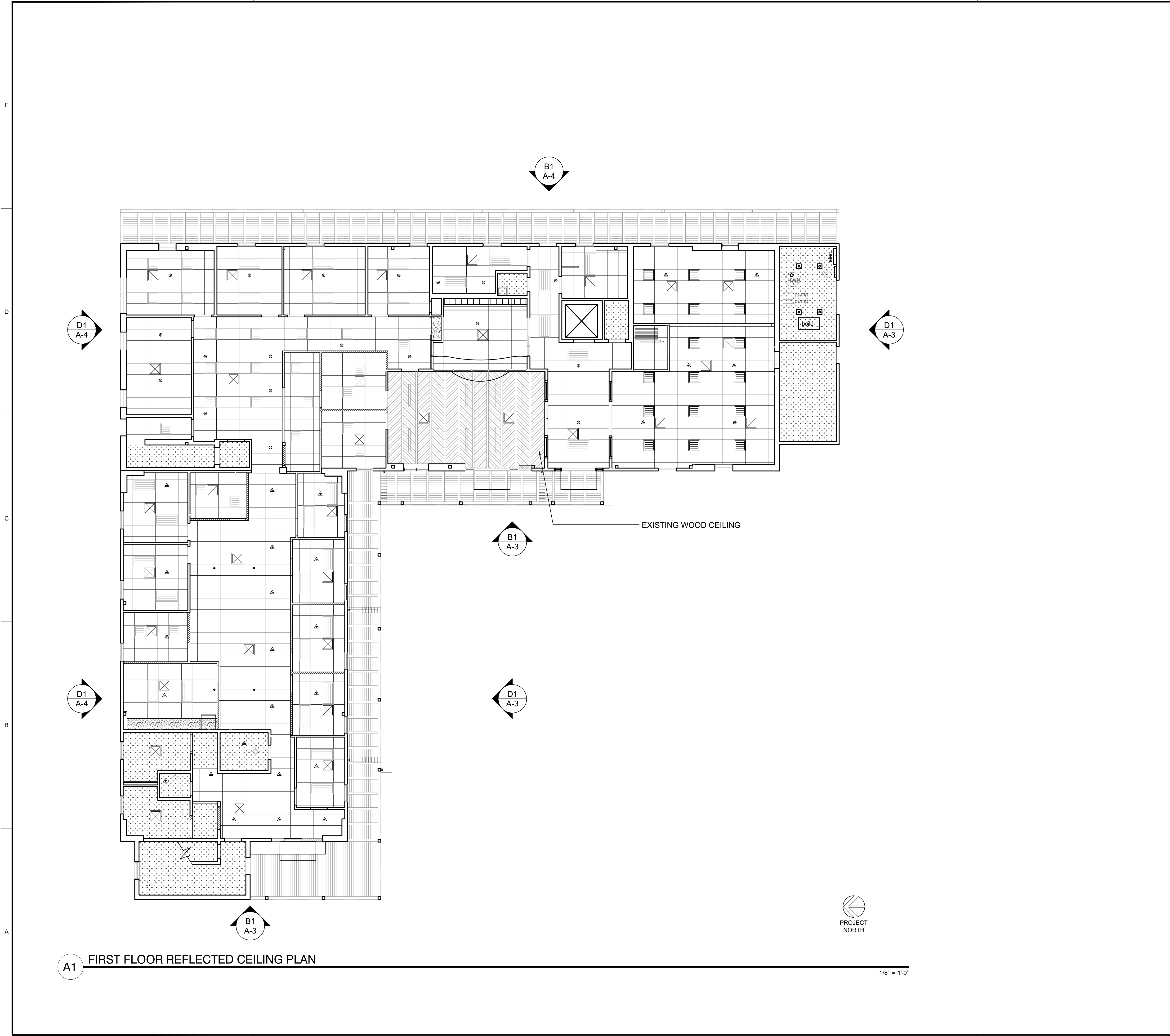
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**CEILING TYPE LEGEND**

- EXISTING SUSPENDED GYPSUM BOARD CEILING
- NEW SUSPENDED GYPSUM BOARD CEILING
- 48"x 24" NEW LAY-IN ACOUSTICAL CEILING
- 24"x 24" NEW LAY-IN ACOUSTICAL CEILING
- EXISTING INTERIOR WOOD CEILING (PAINTED)
- EXISTING EXTERIOR WOOD CEILING (PAINTED)

**LIGHTING FIXTURE LEGEND**

- 48" X 24" EXISTING LAY-IN LIGHT FIXTURE; SHALL BE REMOVED, STORED & RE-INSTALLED
- 24" X 24" EXISTING LAY-IN LIGHT FIXTURE; SHALL BE REMOVED, STORED & RE-INSTALLED
- EXISTING LIGHT FIXTURE; PROTECT
- EXISTING LIGHT FIXTURE; PROTECT
- EXISTING CEILING MOUNTED ELEC. FIXTURES; PROTECT

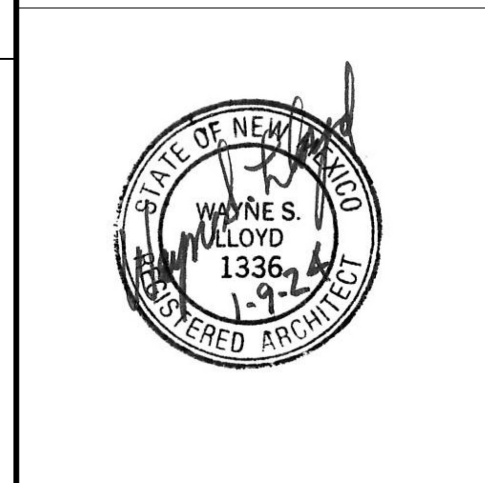
**FIRE LEGEND**

- NEW SMOKE DETECTOR
- EXISTING CEILING SPEAKER IN NEW CEILING
- EXISTING FIRE SPRINKLER HEAD; V.I.F. EXISTING HEAD SHALL BE REPLACED WITH "QUICK RESPONSE" HEAD.
- NEW WALL MOUNTED FIRE SPRINKLER HEAD; EXTEND EXISTING SYSTEM TO REACH NEW AREAS OF COVERAGE
- EXISTING WALL MOUNTED FIRE SPRINKLER HEAD; VIF EXISTING HEAD SHALL BE REPLACED WITH "QUICK RESPONSE" HEAD.
- NEW CEILING MOUNTED FIRE SPRINKLER HEAD; EXTEND EXISTING SYSTEM TO REACH NEW AREAS OF COVERAGE

**HVAC LEGEND**

- HVAC SUPPLY REGISTER
- HVAC RETURN REGISTER
- 12" x 12" CEILING EXTRACT FAN
- 8" x 8" CEILING EXTRACT FAN

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**NM FIRST JUDICIAL DISTRICT ATTORNEY**  
 327 SANDOVAL STREET,  
 SANTA FE, NM 87501

Current Status:  
**CONFORMED SET**

REVISIONS		

Drawn by: **KL**  
 Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**FIRST FLOOR REFLECTED CEILING PLANS**

Job Number: **2021-41**

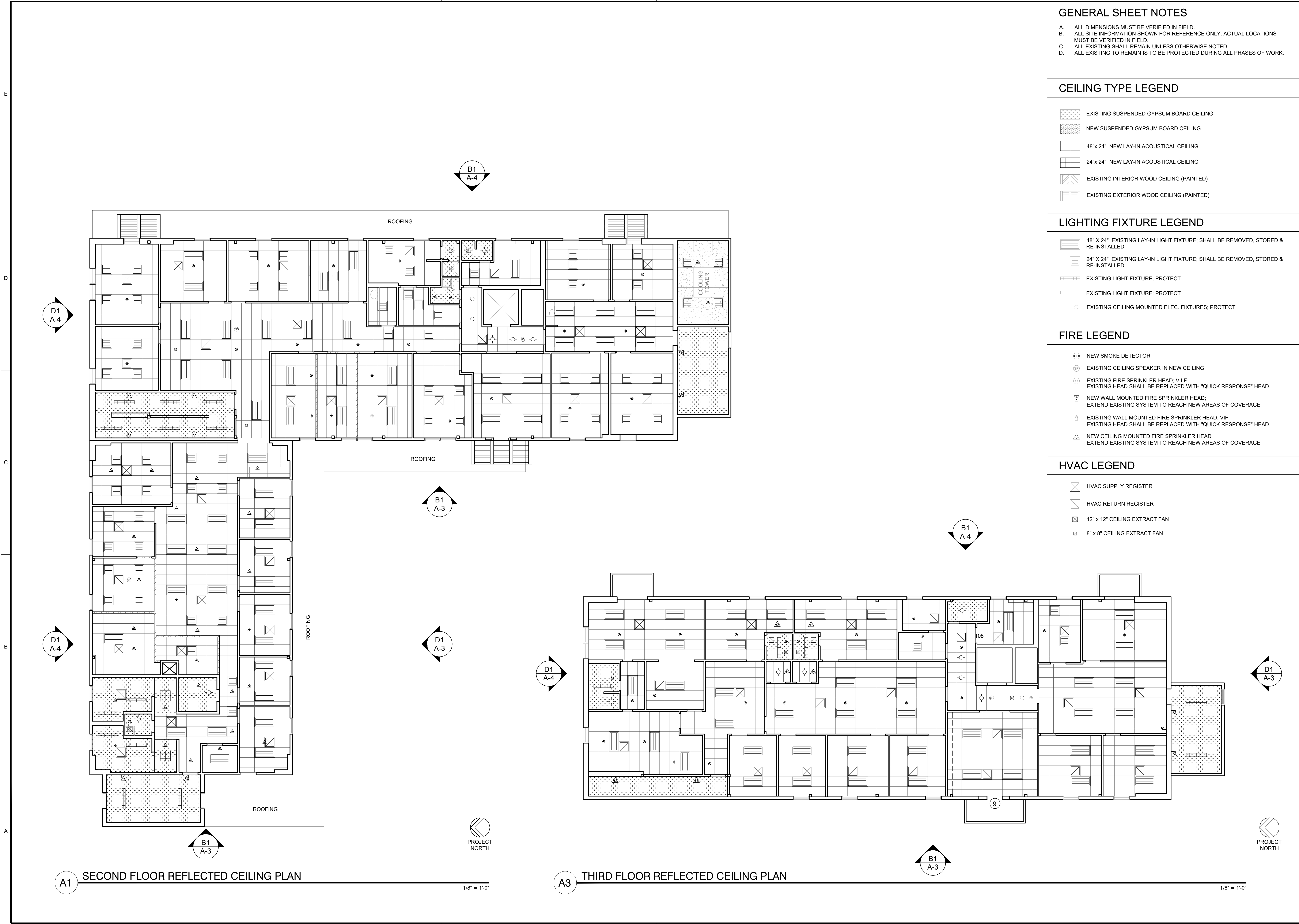
Sheet No.  
**A-5**

**A1** FIRST FLOOR REFLECTED CEILING PLAN



1/8" = 1'-0"

PLOT DATE: Jan 09, 2024, 9:13am  
 FILENAME: X:\2021-41 Santa Fe DAs Office Reno\CAD Files\_SHEETS\2021-41\_A-6.dwg



**GENERAL SHEET NOTES**

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**CEILING TYPE LEGEND**

- EXISTING SUSPENDED GYPSUM BOARD CEILING
- NEW SUSPENDED GYPSUM BOARD CEILING
- 48"x 24" NEW LAY-IN ACOUSTICAL CEILING
- 24"x 24" NEW LAY-IN ACOUSTICAL CEILING
- EXISTING INTERIOR WOOD CEILING (PAINTED)
- EXISTING EXTERIOR WOOD CEILING (PAINTED)

**LIGHTING FIXTURE LEGEND**

- 48" X 24" EXISTING LAY-IN LIGHT FIXTURE; SHALL BE REMOVED, STORED & RE-INSTALLED
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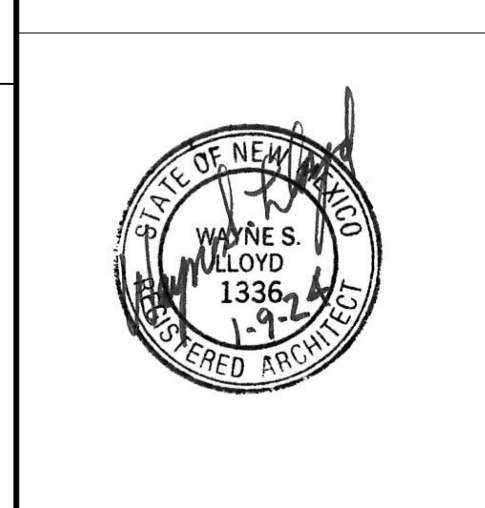
**FIRE LEGEND**

- NEW SMOKE DETECTOR
- EXISTING CEILING SPEAKER IN NEW CEILING
- EXISTING FIRE SPRINKLER HEAD; V.I.F. EXISTING HEAD SHALL BE REPLACED WITH "QUICK RESPONSE" HEAD.
- NEW WALL MOUNTED FIRE SPRINKLER HEAD; EXTEND EXISTING SYSTEM TO REACH NEW AREAS OF COVERAGE
- EXISTING WALL MOUNTED FIRE SPRINKLER HEAD; VIF EXISTING HEAD SHALL BE REPLACED WITH "QUICK RESPONSE" HEAD.
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- HVAC SUPPLY REGISTER
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- 12" x 12" CEILING EXTRACT FAN
- 8" x 8" CEILING EXTRACT FAN

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REVISIONS

NO.	DESCRIPTION	DATE

Drawn by: **KL**  
 Checked by: **WL/SM**  
 Date: **01-05-2024**  
 Sheet Title:  
**SECOND & THIRD FLOOR REFLECTED CEILING PLANS**

Job Number: **2021-41**  
 Sheet No.

**A-6**

**A1** SECOND FLOOR REFLECTED CEILING PLAN

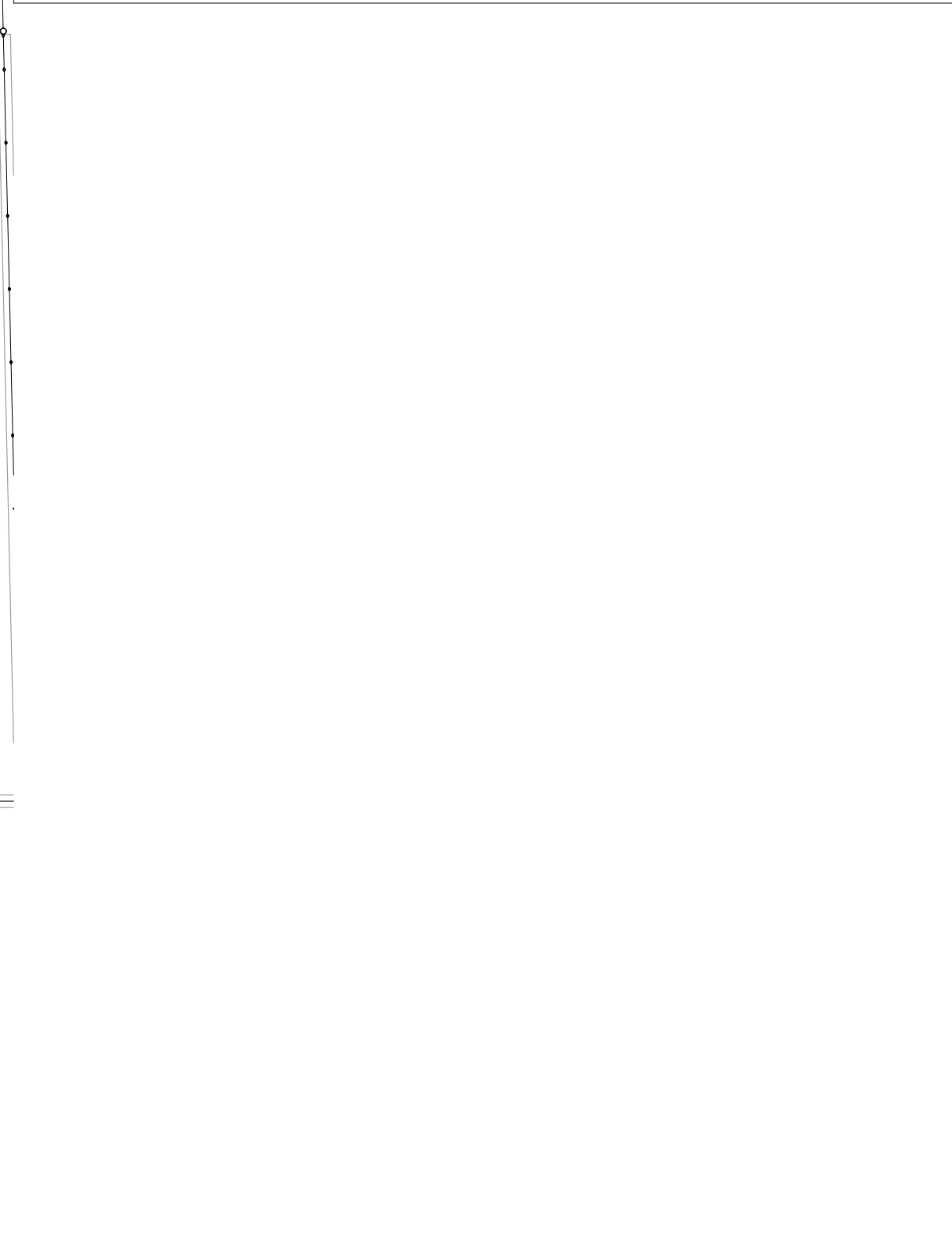
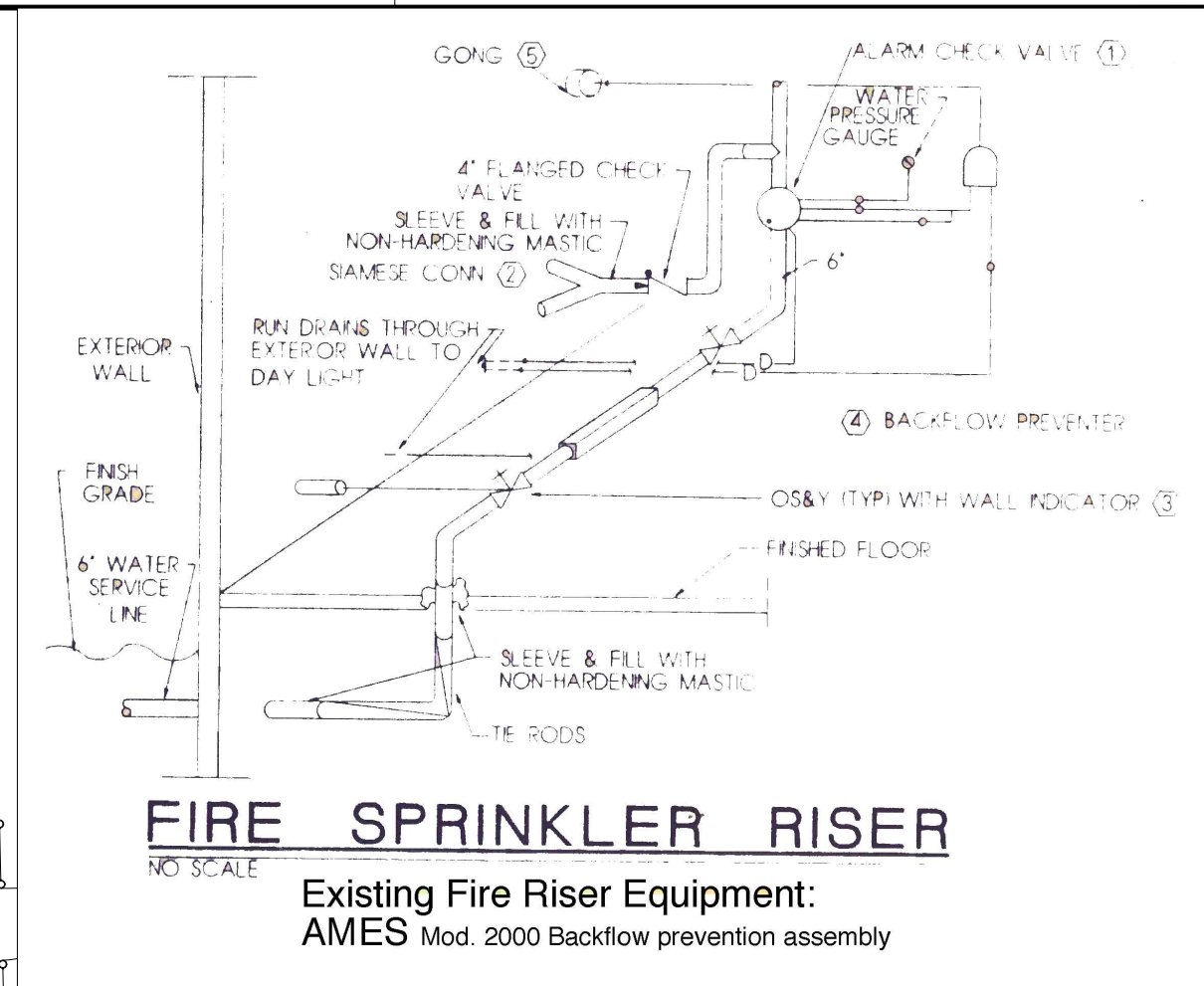
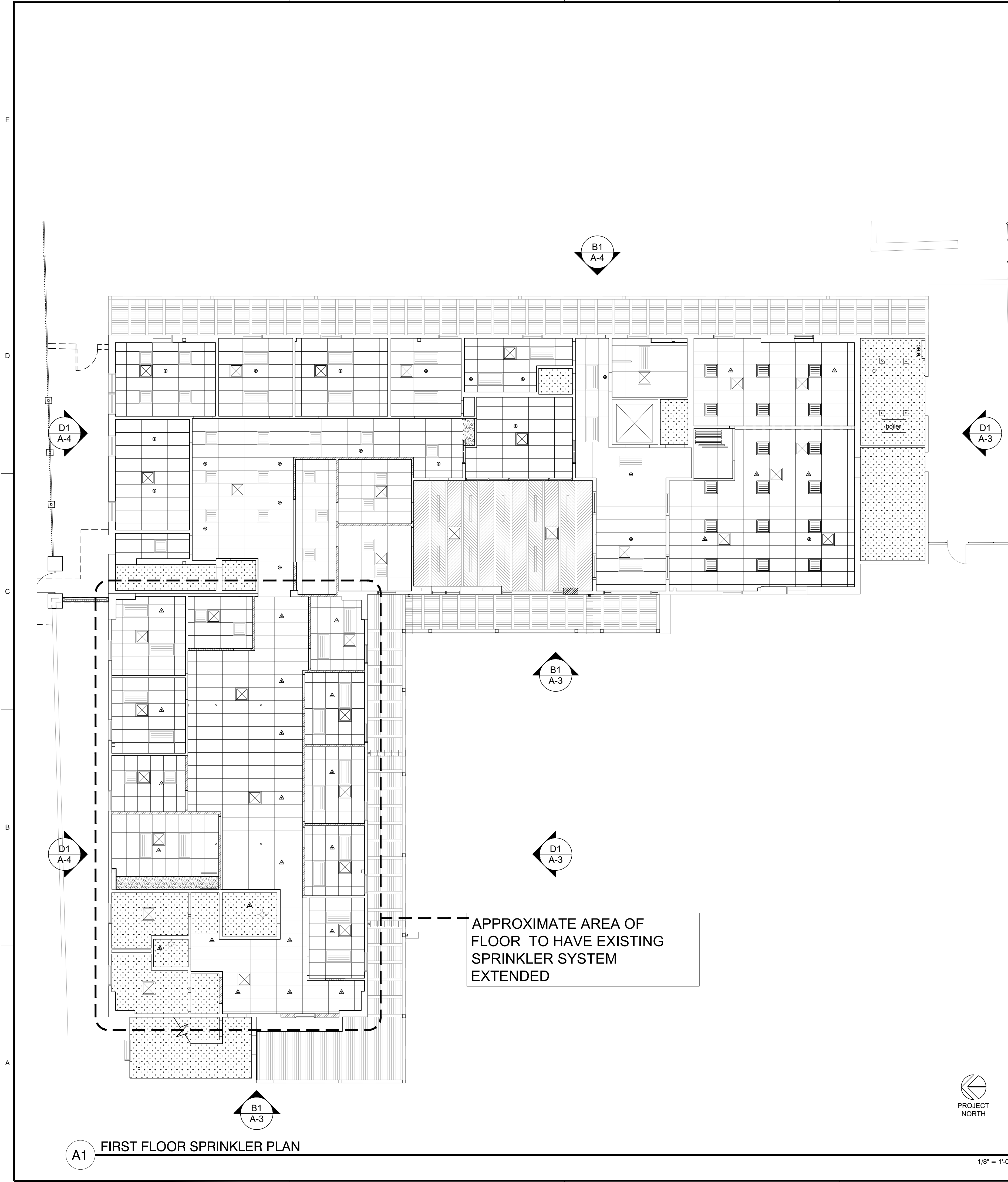
1/8" = 1'-0"

**A3** THIRD FLOOR REFLECTED CEILING PLAN

1/8" = 1'-0"



PLOT DATE: Jan 09, 2024, 9:13am  
 FILENAME: X:\2021-41 Santa Fe Office RenoCAD Files\_SHEETS\2021-41\_A-7.dwg



**FIRE SPRINKLER REQUIREMENTS:**  
 A.H.J.: Santa Fe County Fire Marshal  
 OCCUPANCY: Government Office Building  
 DESIGN STANDARD: NFPA-13 (2010)  
 OCCUPANCY CLASS: Light Hazard  
 TYPE OF SYSTEM: Wet Pipe (Existing)  
 DESIGN DENSITY: 0.10 GPM/100 SF  
 MAX. SPRINKLER COVERAGE: 225 SF  
 TYPE OF PIPE: C.P.V.C. (Preferred)  
 Black Steel Pipe (Acceptable)  
 PIPE FITTINGS: CPVC OR Cast/Ductile Iron  
 PIPE HANGERS/TRAPS: TOLCO  
 STATIC PRESSURE: 115 psi

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- 24" X 24" NEW LAY-IN ACOUSTICAL CEILING
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- EXISTING EXTERIOR WOOD CEILING (PAINTED)

**LIGHTING FIXTURE LEGEND**

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- EXISTING LIGHT FIXTURE; PROTECT
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- EXISTING CEILING MOUNTED ELEC. FIXTURES; PROTECT

**FIRE LEGEND**

- NEW SMOKE DETECTOR
- EXISTING CEILING SPEAKER IN NEW CEILING
- EXISTING FIRE SPRINKLER HEAD, V.I.F.  
EXISTING HEAD SHALL BE REPLACED WITH "QUICK RESPONSE" HEAD.
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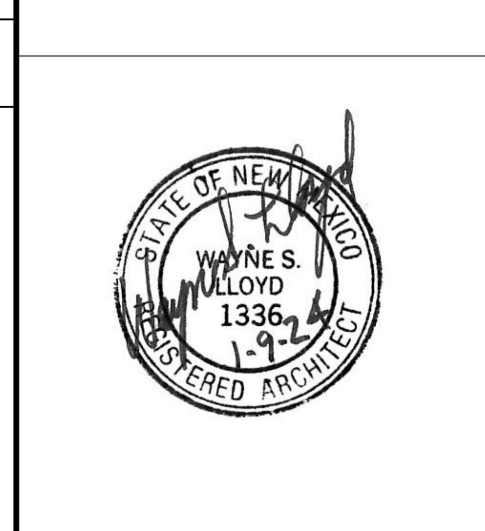
**HVAC LEGEND**

- HVAC SUPPLY REGISTER
- HVAC RETURN REGISTER
- 12" X 12" CEILING EXTRACT FAN
- 8" X 8" CEILING EXTRACT FAN

**FIRE PROTECTION NOTES:**

- ALL WORK SHALL BE IN COMPLIANCE WITH REQUIREMENTS OF THE SANTA FE FIRE DEPARTMENT.
- ALL WORK SHALL BE IN COMPLIANCE WITH REQUIREMENTS OF THE OFFICE OF THE NEW MEXICO STATE FIRE MARSHAL/CODE ENFORCEMENT DIVISION.
- ALL WORK SHALL BE IN CONFORMANCE WITH NFPA STANDARD NO. 13 (2010) GUIDELINES.
- THE OCCUPANCY CLASSIFICATION FOR THIS FACILITY SHALL BE "LIGHT HAZARD" (WET-PIPE SYSTEM).
- THE SYSTEM SHALL BE DESIGNED TO PROVIDE A DENSITY OF 0.15 GPM OVER A REMOTE AREA OF 1,500 SQ. FT.
- ALL MATERIALS SHALL BE NEW AND UL-LISTED AND/OR FACTORY MUTUAL ENGINEERING (FM) "APPROVED".
- CONTRACTOR "SHOP" DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE SUBMITTED TO SANTA FE FIRE DEPARTMENT/FIRE PREVENTION DIVISION FOR REVIEW AND APPROVALS.
- FABRICATION OF PIPE FITTINGS SHALL NOT PROCEED UNTIL APPROVALS ARE RECEIVED FROM SANTA FE FIRE DEPARTMENT.
- REDUCTION OF "REMOTE AREA" SHALL BE ALLOWED WITH "QUICK RESPONSE" SPRINKLERS.
- THE FIRE SPRINKLER CONTRACTOR SHALL COORDINATE ALL INSPECTIONS WITH SANTA FE FIRE DEPARTMENT (505) 955-3110.
- PAINTING OF PIPE, ELECTRICAL WIRING, PAINT/PATCH SHALL BE PERFORMED BY OTHERS.
- THE FIRE SPRINKLER CONTRACTOR WILL START WORK AT THE 6" FLANGE (BASE OF RISER) - UNDERGROUND PIPING BY OTHERS.
- THE FIRE SPRINKLER CONTRACTOR SHALL WARRANTY ALL WORK AND MATERIALS FOR A PERIOD OF ONE CALENDAR YEAR FOLLOWING FINAL ACCEPTANCE BY THE CITY OF SANTA FE.
- THE BUILDING OWNER WILL BE RESPONSIBLE FOR PROVIDING "ADEQUATE HEAT" (MIN. 40°F) THROUGHOUT THE FACILITY.
- SITE CONTRACTOR WILL PROVIDE AND INSTALL 6" BACKFLOW PREVENTION ASSEMBLY IN "HOT-BOX" OUTSIDE OF THE STRUCTURE.
- FIRE SPRINKLER CONTRACTOR SHALL INSTALL PRESSURE RELIEF VALVE/PRV AND SWAY-BRACING ON FIRE RISER ASSEMBLY.
- FIRE SPRINKLER SYSTEM SHALL BE HYDROSTATICALLY TESTED AT A PRESSURE LEVEL OF 200 PSI FOR TWO HOURS.
- ASSUME 8'-8" CEILING HEIGHT THROUGHOUT BUILDING UNLESS OTHERWISE NOTED. Install all new piping above ceilings.
- REPLACE ALL EXISTING SPRINKLERS WITH "QUICK RESPONSE" SPRINKLERS.
- ADD ISOLATION VALVES FOR EACH SPRINKLER SYSTEM SERVING EACH FLOOR LEVEL.

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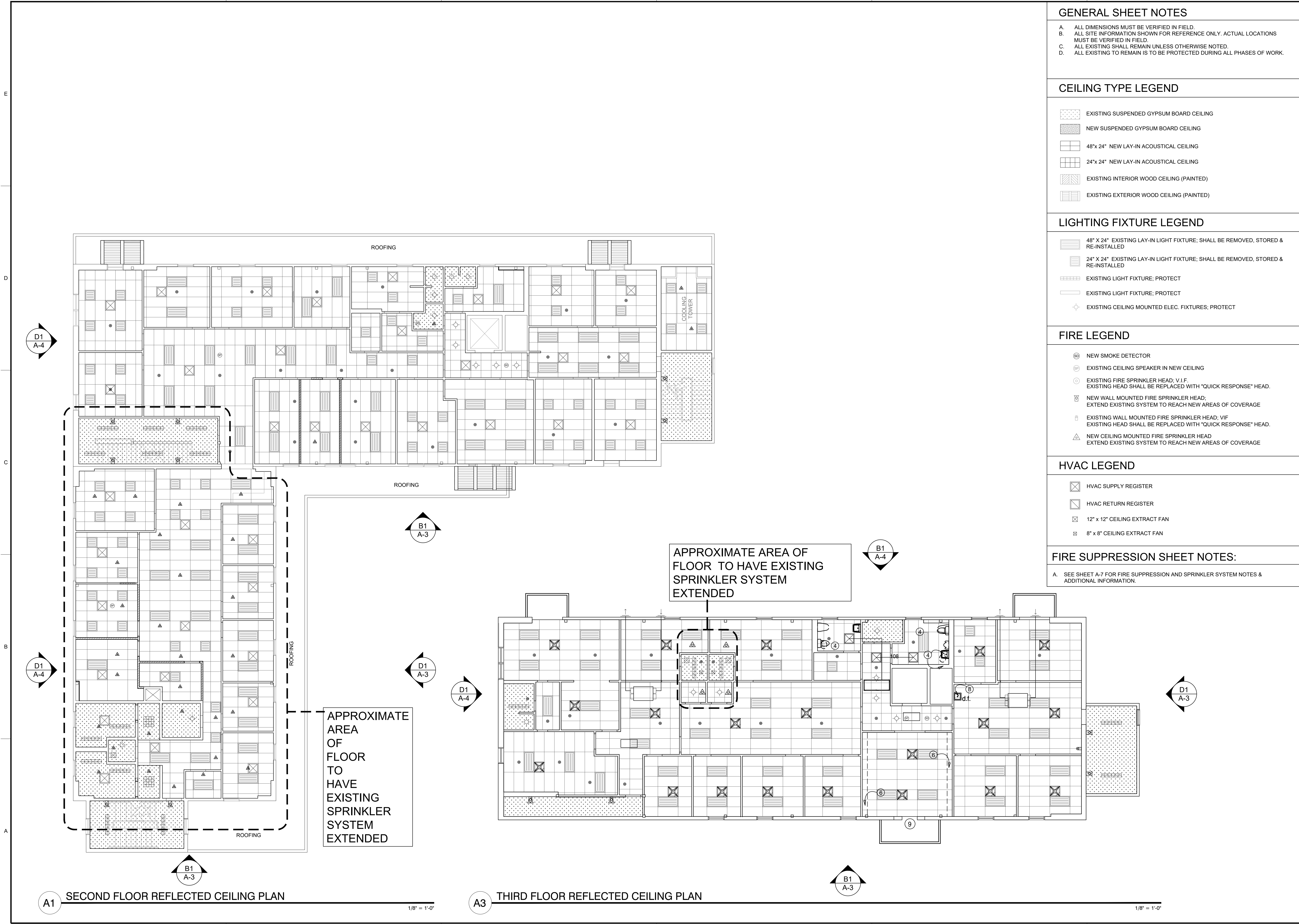
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Current Status:	CONFORMED SET
REVISIONS	
Drawn by:	KL
Checked by:	WL/SM
Date:	01-05-2024
Sheet Title:	<b>FIRST FLOOR FIRE SPRINKLER PLAN</b>
Job Number:	2021-41
Sheet No.	<b>A-7</b>



1/8" = 1'-0"

PLOT DATE: Jan 09, 2024, 9:13am  
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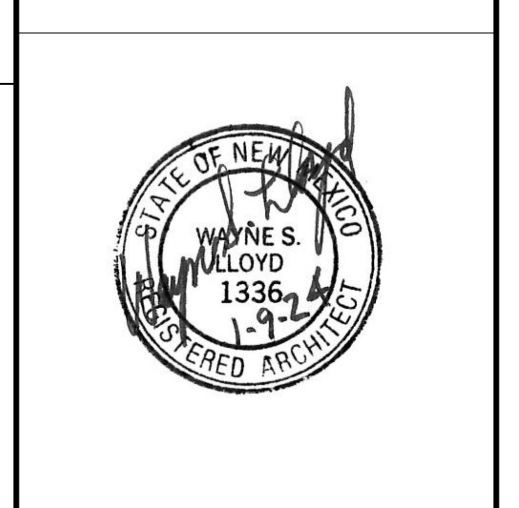
**HVAC LEGEND**

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- 8" x 8" CEILING EXTRACT FAN

**FIRE SUPPRESSION SHEET NOTES:**

- A. SEE SHEET A-7 FOR FIRE SUPPRESSION AND SPRINKLER SYSTEM NOTES & ADDITIONAL INFORMATION.

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Drawn by: KL  
 Checked by: WL/SM  
 Date: 01-05-2024  
 Sheet Title:  
**SECOND & THIRD FLOOR FIRE SPRINKLER PLAN**

Job Number: 2021-41  
 Sheet No.

A-8

**A1 SECOND FLOOR REFLECTED CEILING PLAN**

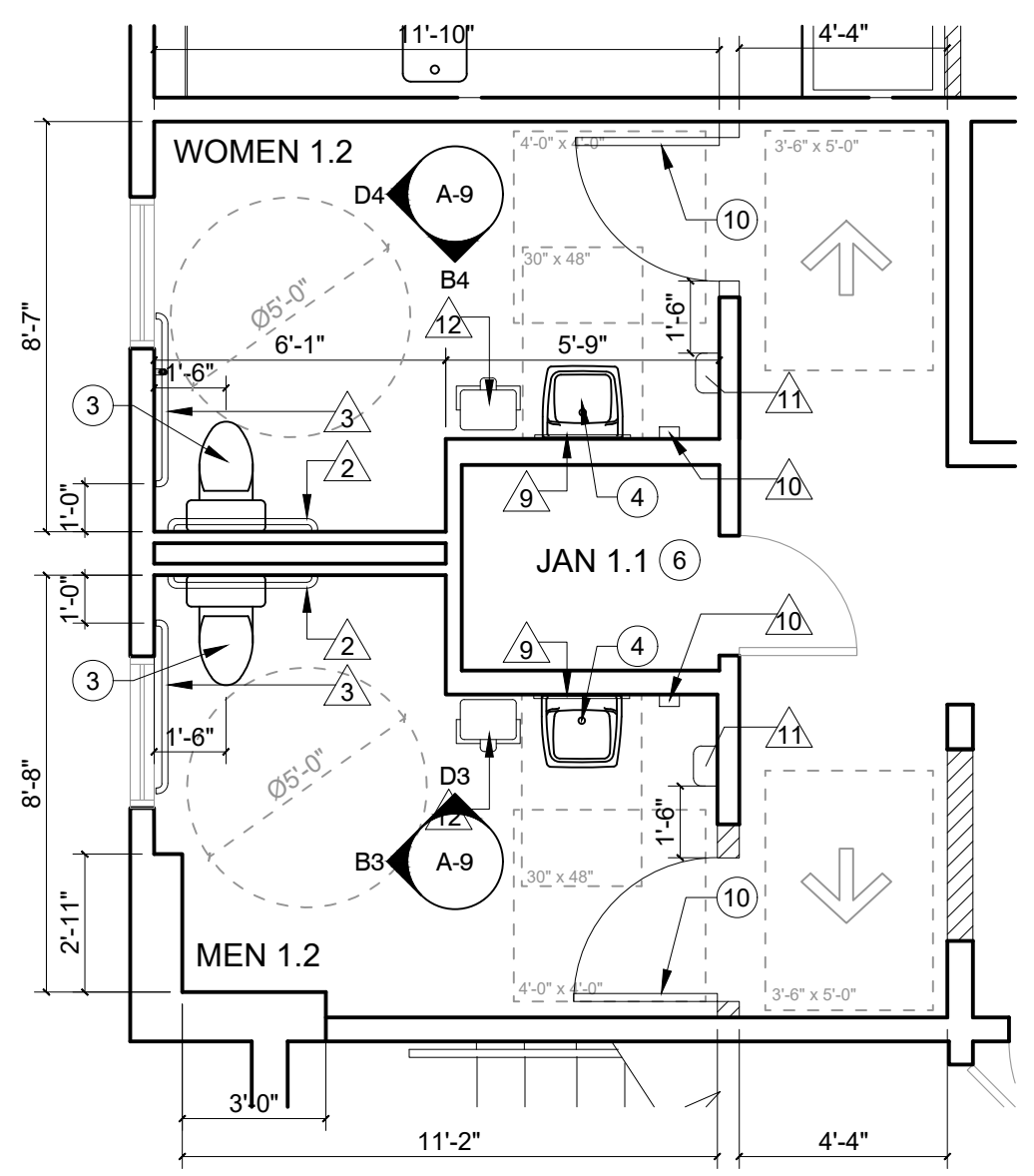
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1/8" = 1'-0"

1/8" = 1'-0"

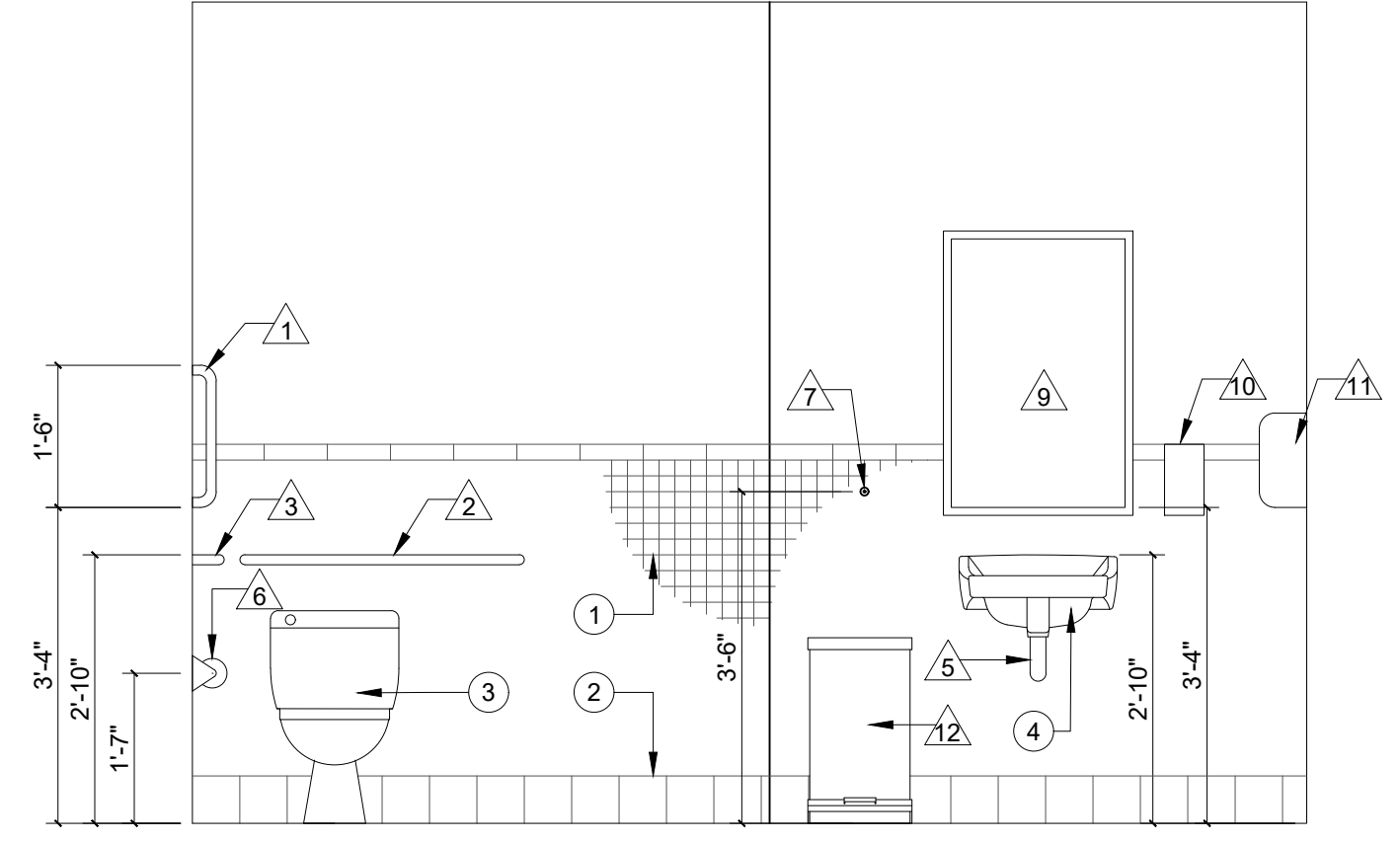


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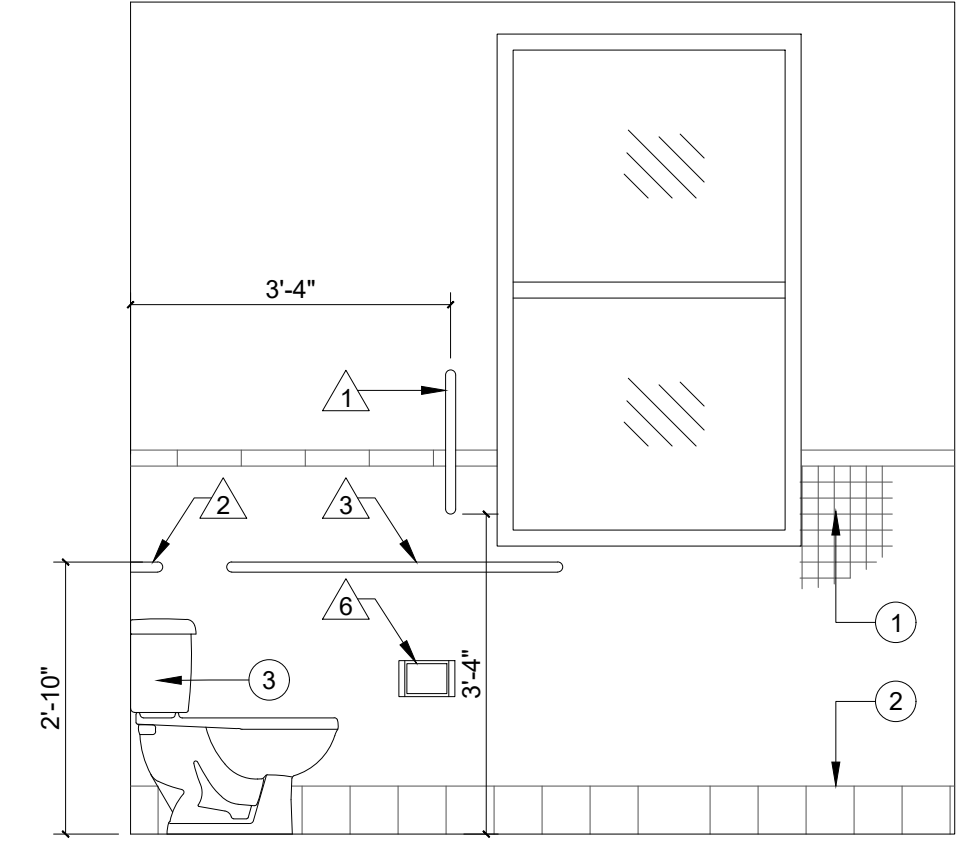


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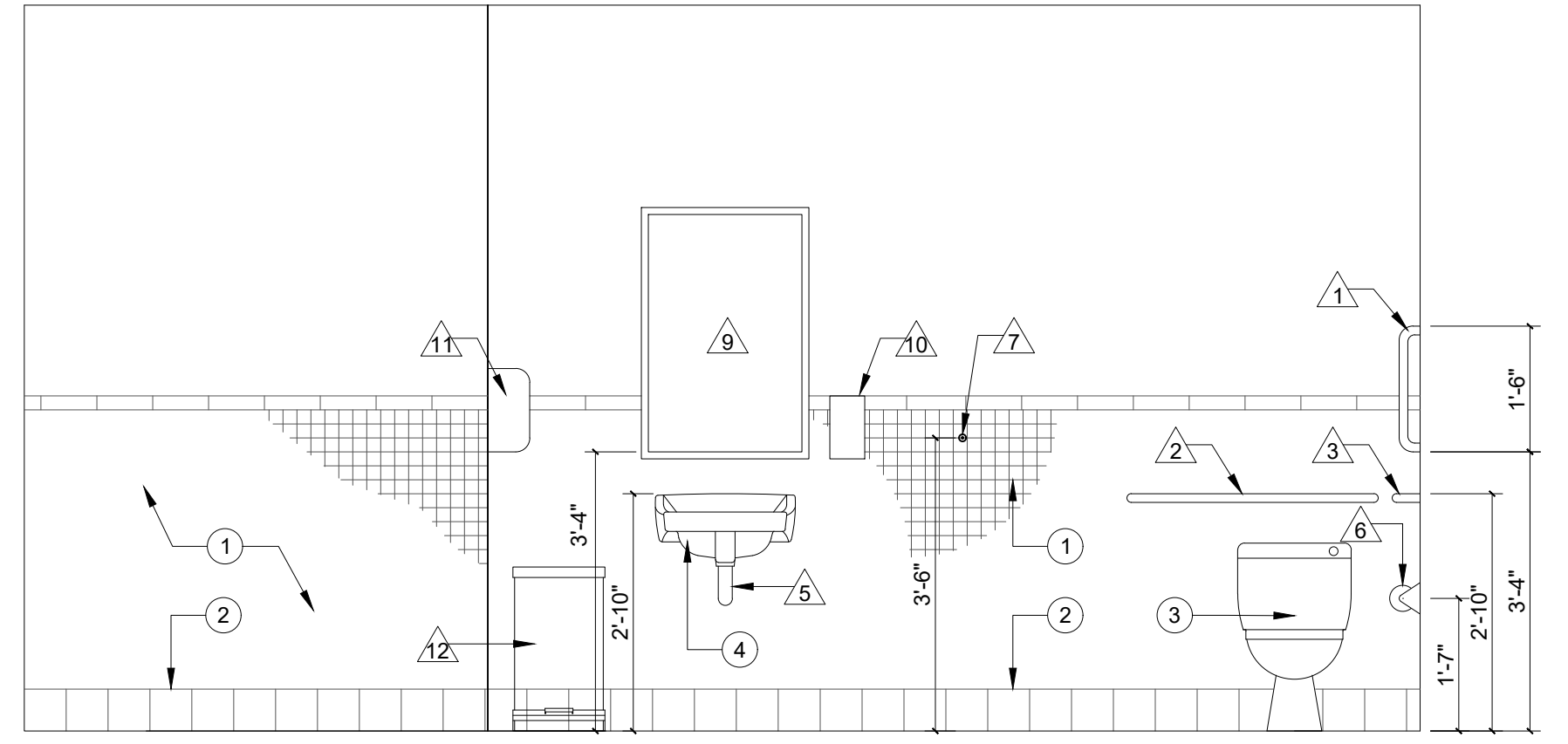
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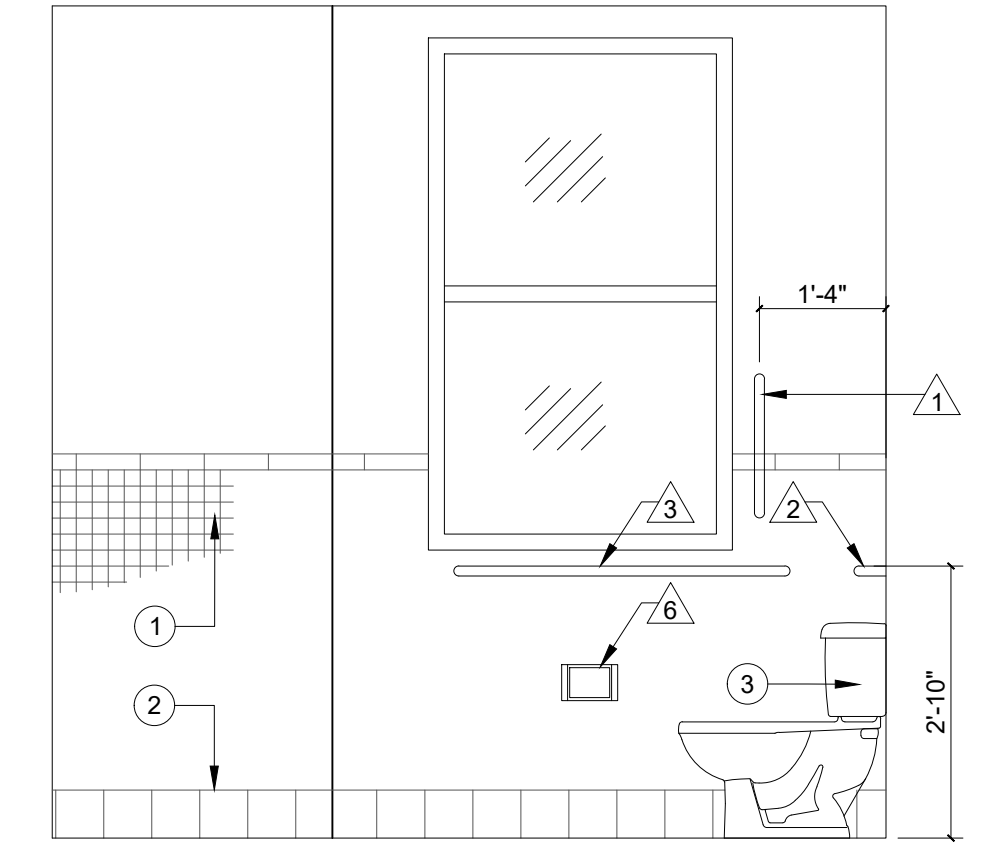
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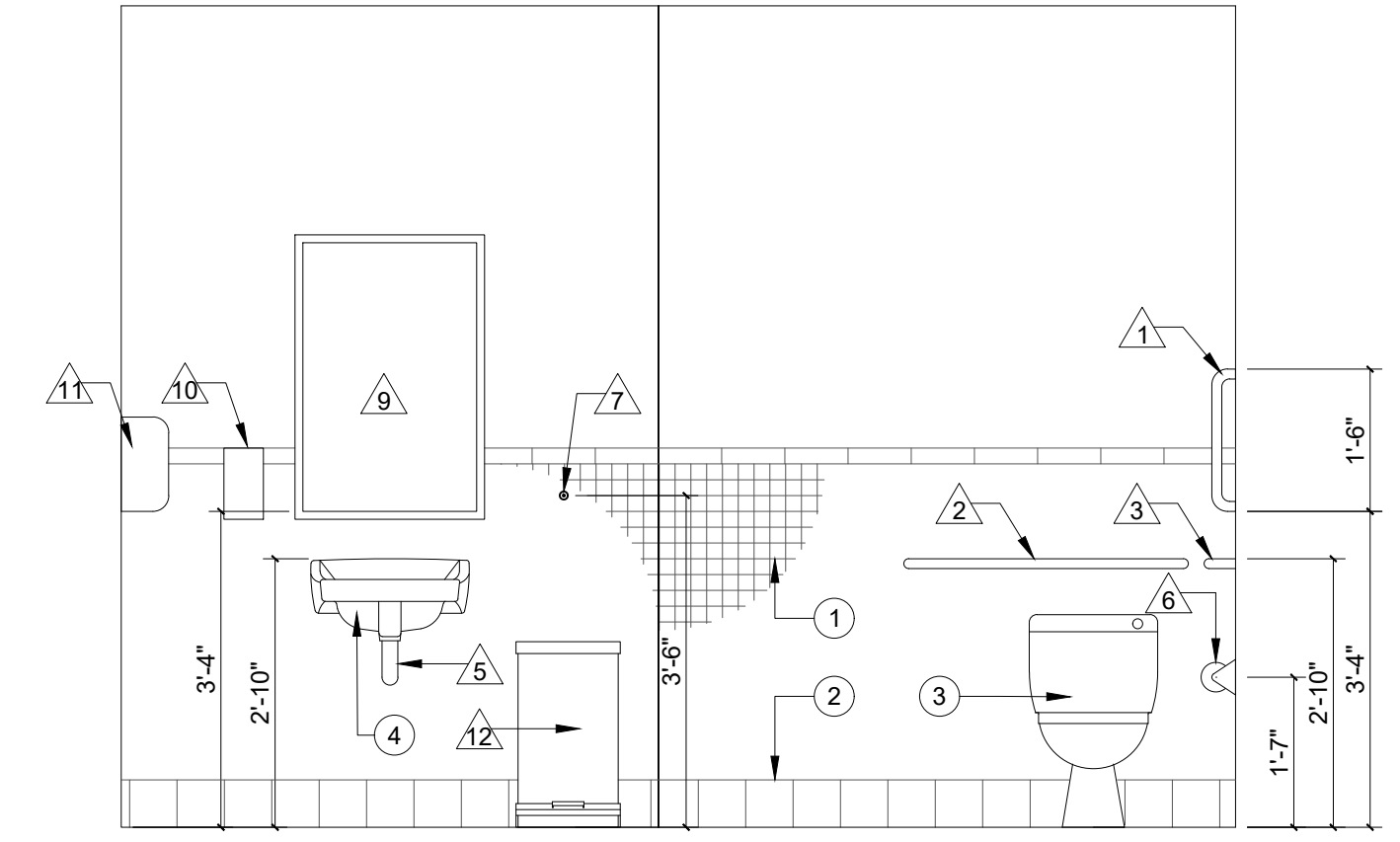
**D4 WOMENS RESTROOM 1.2 - NORTH ELEVATION**



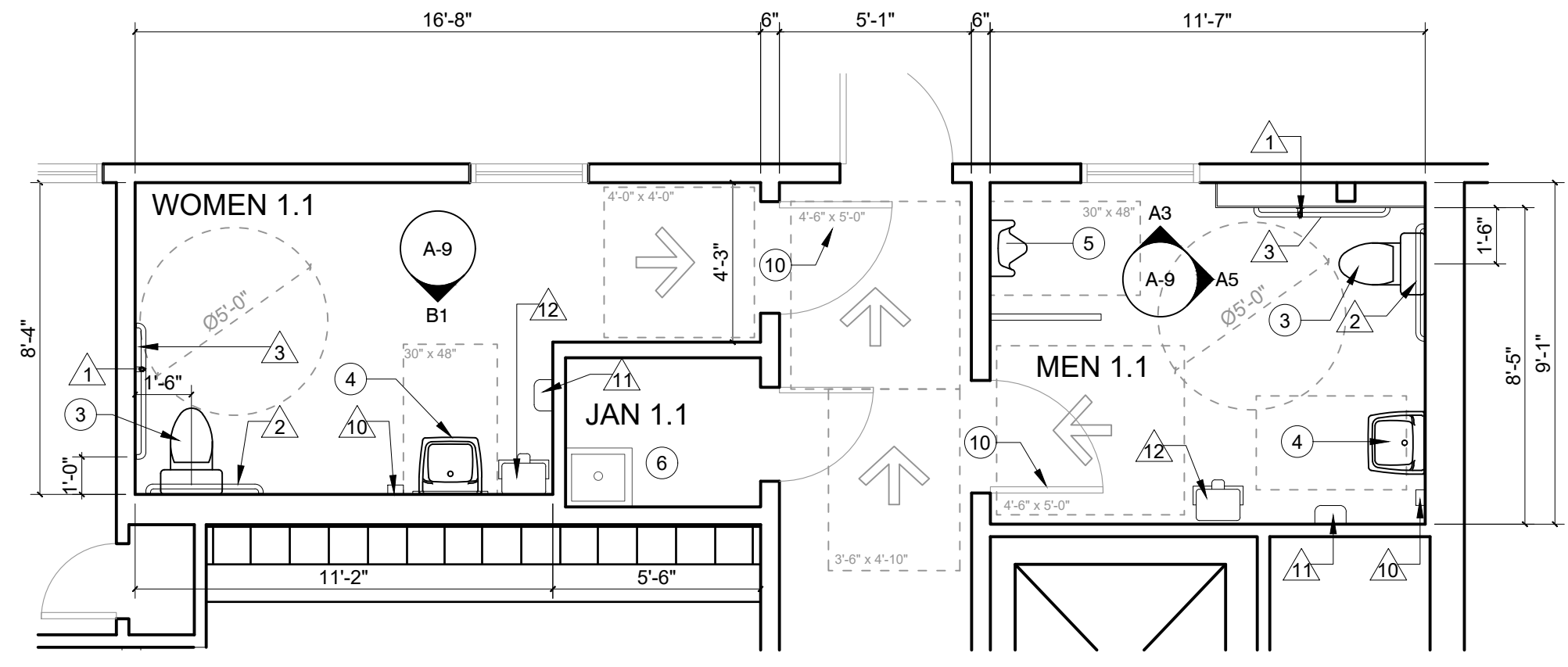
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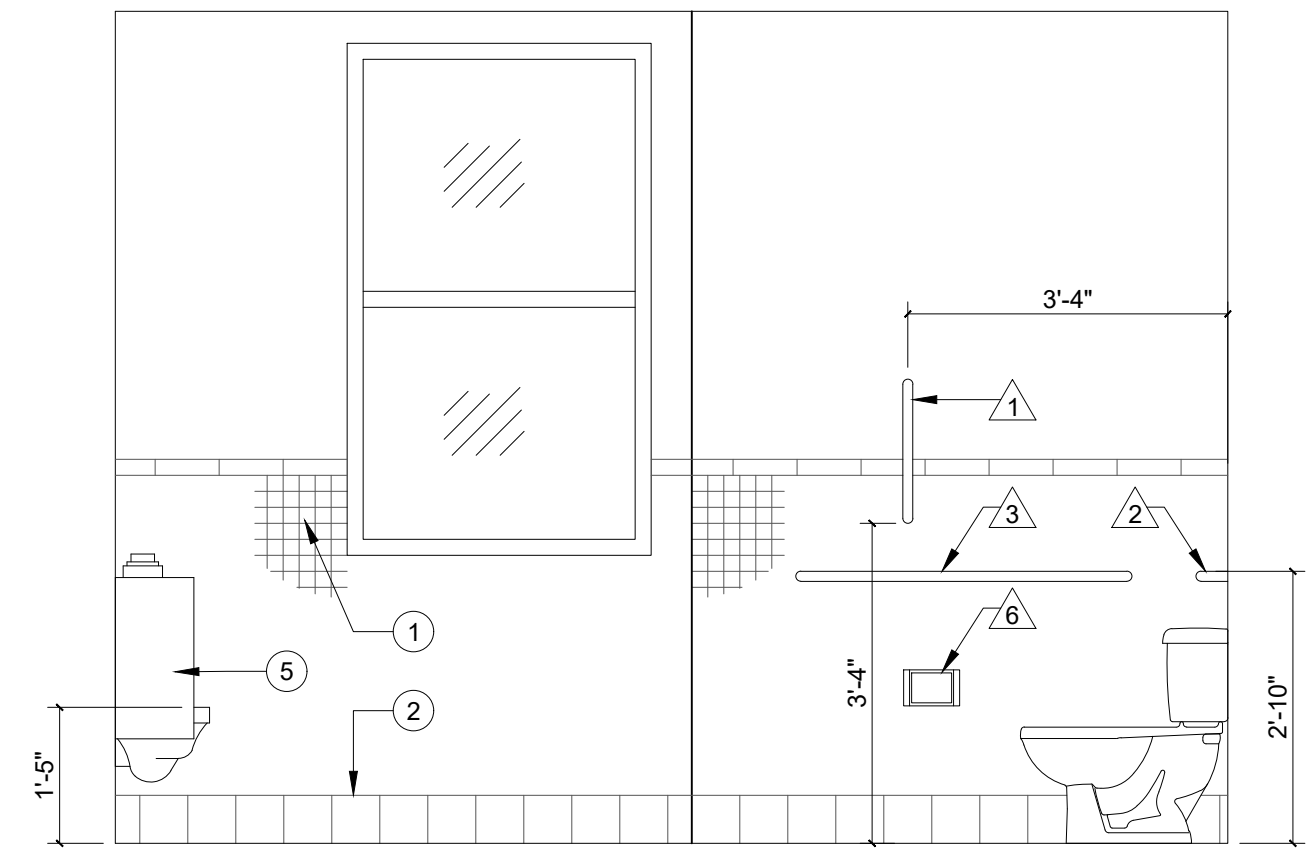
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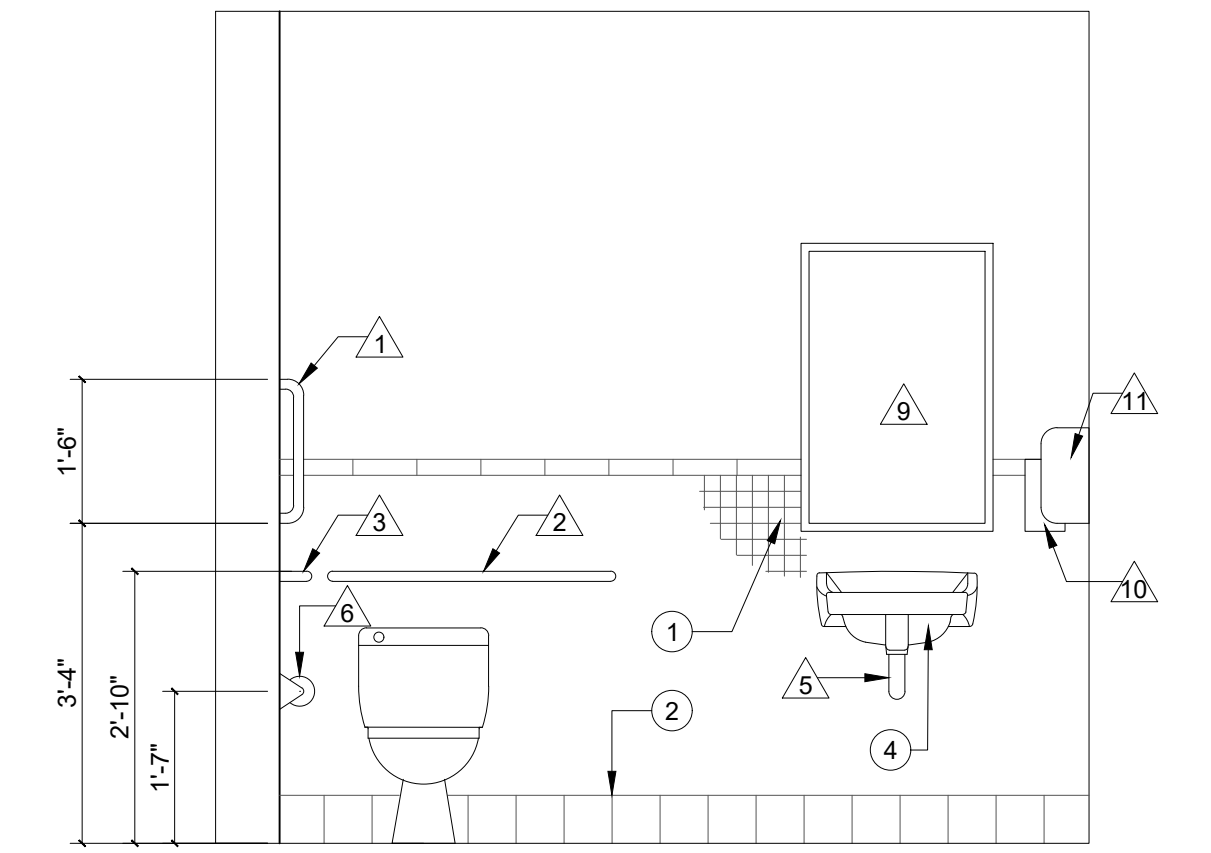
**B4 WOMENS RESTROOM 1.2 - WEST ELEVATION**



**A1 ENLARGED RESTROOM FLOOR PLANS 1.1**



**A3 MENS RESTROOM 1.1 - EAST ELEVATION**



**A5 MENS RESTROOM 1.1 - SOUTH ELEVATION**

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**SHEET KEYED NOTES**

1. NEW 4 X 4 CERAMIC TILE WAINSCOTING TO 4' W/ COVE BASE & BULLNOSE CAP.
2. NEW 6 X 12 CERAMIC TILE BASE AND FLOORING THROUGHOUT.
3. NEW FLOOR MOUNTED WATER CLOSET WITH NEW ROUGH-IN LOCATION; SEE PLUMBING DRAWINGS
4. NEW A.D.A. COMPLIANT WALL MOUNTED LAVATORY; SEE PLUMBING DRAWINGS.
5. NEW URINAL WITH NEW ROUGH-INS; SEE PLUMBING DRAWINGS.
6. EXISTING JANITORS CLOSET AND ACCESSORIES TO REMAIN.
7. EXISTING WASHROOM SCREEN REMAINS; RELOCATE AS SHOWN.
8. CREATE NEW OPENING, RELOCATED FROM EXISTING LOCATION; IN-FILL WALL TO MATCH EXISTING ADJACENT; SKIM COAT WALL FINISH. NEW OPENING SHALL FIT SALVAGED EXISTING DOOR & FRAME; PROVIDE NEW TRANSITION.
9. RELOCATE EXISTING ELECTRICAL OUTLET TO AVOID NEW MIRROR LOCATION.
10. PROVIDE NEW PRIVACY A.D.A. HARDWARE SET TO EXISTING BATHROOM DOOR.
11. NEW 3-5/8" STEEL STUD LINER WITH NEW 5/8" MOISTURE RESISTANT G.W.B. PAINTED WHERE EXPOSED. SEE KEYNOTE 1 & 2

**SHEET LEGEND**

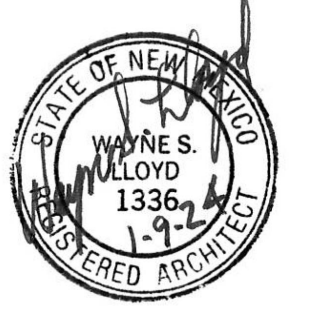
- EXISTING
- ▨ NEW
- - - TO REMOVE

**TOILET ACCESSORY SCHEDULE**

BASIS FOR DESIGN FOR ALL BATHROOM ACCESSORY ITEMS SHALL BE BOBRICK OR EQUAL. (BOBRICK PRODUCT NUMBERS LISTED BELOW) PROVIDE SECURE 2X BLOCKING IN ALL WALLS (OE BOBRICK 251-4 FASTENER) TO SUPPORT GRAB BARS AND TOILET ACCESSORIES

- 1 GRAB BAR 18" LONG B-6806 X 18
- 2 GRAB BAR 36" LONG B-6806 X 36
- 3 GRAB BAR 42" LONG B-6806 X 42
- 4 2 WALL GRAB BAR 42" LONG B-6806 X 42
- 5 LAVATORY PIPE AND DRAIN ENCLOSURE: TRUEBRO "LAV SHIELD"
- 6 TOILET PAPER DISPENSER B-2840
- 7 COAT HOOK B-76727
- 8 CHANGING TABLE KB110-SSWM
- 9 24"x36" TEMP. GLASS CHANNEL FRAME MIRROR; BOBRICK MODEL B1658
- 10 SURFACE MOUNTED S.S. SOAP DISPENSER: BOBRICK MODEL B-818615
- 11 BATTERY POWERED SEMI-RECESSED TOWEL DISPENSER S.S. FINISH; BOBRICK MODEL B-29744
- 12 FOOT-OPERATED WASTE RECEPTACLE; BOBRICK MODEL B-221216
- 13 PARTIAL RECESSED AUTOMATIC TOWEL DISPENSER & WASTE RECEPTACLE; BOBRICK MODEL B-3974

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Current Status:  
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REVISIONS

Drawn by: **KL**  
Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**BATHROOM PLANS & ELEVATIONS**

Job Number: **2021-41**

Sheet No.

**A-9**

PLOT DATE: Jan 09, 2024, 9:14am  
 FILENAME: X:\2021-41 Santa Fe Office RenoCAD Files\_SHEETS\2021-41\_A-10.dwg



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**SHEET LEGEND**

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- 13 PARTIAL RECESSED AUTOMATIC TOWEL DISPENSER & WASTE RECEPTACLE; BOBRICK MODEL B-3974

**Lloyd & Associates ARCHITECTS**  
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**NM FIRST JUDICIAL DISTRICT ATTORNEY**  
 327 SANDOVAL STREET,  
 SANTA FE, NM 87501

Current Status: **CONFORMED SET**

REVISIONS		

Drawn by: **KL**  
 Checked by: **WL/SM**  
 Date: **01-05-2024**  
 Sheet Title: **BATHROOM PLANS & ELEVATIONS**

Job Number: **2021-41**  
 Sheet No. **A-10**



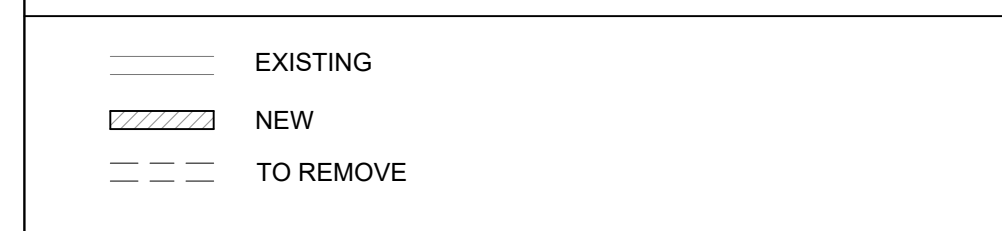
**GENERAL SHEET NOTES**

- A. ALL DIMENSIONS MUST BE VERIFIED IN FIELD.
- B. ALL SITE INFORMATION SHOWN FOR REFERENCE ONLY. ACTUAL LOCATIONS MUST BE VERIFIED IN FIELD.
- C. ALL EXISTING SHALL REMAIN UNLESS OTHERWISE NOTED.
- D. ALL EXISTING TO REMAIN IS TO BE PROTECTED DURING ALL PHASES OF WORK. COORDINATE WITH OWNER FOR SALVAGE OR DISPOSAL OF FIXTURES.

**SHEET KEYED NOTES**

1. NEW 4 X 4 CERAMIC TILE WAINSCOTING TO 4' W/ COVE BASE & BULLNOSE CAP.
2. NEW 6 X 12 CERAMIC TILE BASE AND FLOORING THROUGHOUT.
3. NEW FLOOR MOUNTED WATER CLOSET WITH NEW ROUGH-IN LOCATION; SEE PLUMBING DRAWINGS.
4. NEW A.D.A. COMPLIANT WALL MOUNTED LAVATORY; SEE PLUMBING DRAWINGS.
5. NEW URINAL WITH NEW ROUGH-INS; SEE PLUMBING DRAWINGS.
6. EXISTING JANITORS CLOSET AND ACCESSORIES TO REMAIN.
7. EXISTING WASHROOM SCREEN REMAINS; RELOCATE AS SHOWN.
8. CREATE NEW OPENING, RELOCATED FROM EXISTING LOCATION; IN-FILL WALL TO MATCH EXISTING ADJACENT; SKIM COAT WALL FINISH. NEW OPENING SHALL FIT SALVAGED EXISTING DOOR & FRAME; PROVIDE NEW TRANSITION.
9. RELOCATE EXISTING ELECTRICAL OUTLET TO AVOID NEW MIRROR LOCATION.
10. PROVIDE NEW PRIVACY A.D.A. HARDWARE SET TO EXISTING BATHROOM DOOR.
11. NEW 3-5/8" STEEL STUD LINER WITH NEW 5/8" MOISTURE RESISTANT G.W.B. PAINTED WHERE EXPOSED; SEE KEYNOTE 1 & 2

**SHEET LEGEND**



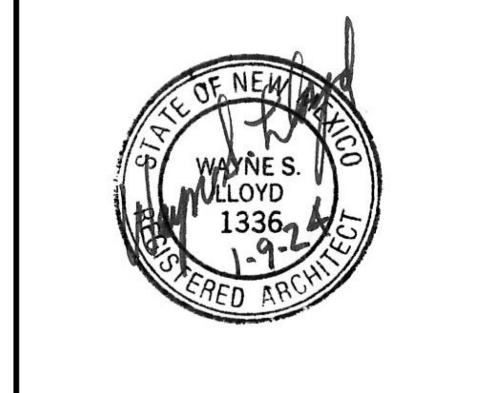
**TOILET ACCESSORY SCHEDULE**

BASIS FOR DESIGN FOR ALL BATHROOM ACCESSORY ITEMS SHALL BE BOBRICK OR EQUAL (BOBRICK PRODUCT NUMBERS LISTED BELOW) PROVIDE SECURE 2X BLOCKING IN ALL WALLS (OE BOBRICK 251-4 FASTENER) TO SUPPORT GRAB BARS AND TOILET ACCESSORIES

- 1 GRAB BAR 18" LONG B-6806 X 18
- 2 GRAB BAR 36" LONG B-6806 X 36
- 3 GRAB BAR 42" LONG B-6806 X 42
- 4 2 WALL GRAB BAR 42" LONG B-6806 X 42
- 5 LAVATORY PIPE AND DRAIN ENCLOSURE: TRUEBRO "LAV SHIELD"
- 6 TOILET PAPER DISPENSER B-2840
- 7 COAT HOOK B-76727
- 8 CHANGING TABLE KB110-SSWM
- 9 24"x36" TEMP. GLASS CHANNEL FRAME MIRROR; BOBRICK MODEL B1658
- 10 SURFACE MOUNTED S.S. SOAP DISPENSER: BOBRICK MODEL B-818615
- 11 BATTERY POWERED SEMI-RECESSED TOWEL DISPENSER S.S. FINISH; BOBRICK MODEL B-29744
- 12 FOOT-OPERATED WASTE RECEPTACLE; BOBRICK MODEL B-221216
- 13 PARTIAL RECESSED AUTOMATIC TOWEL DISPENSER & WASTE RECEPTACLE; BOBRICK MODEL B-3974

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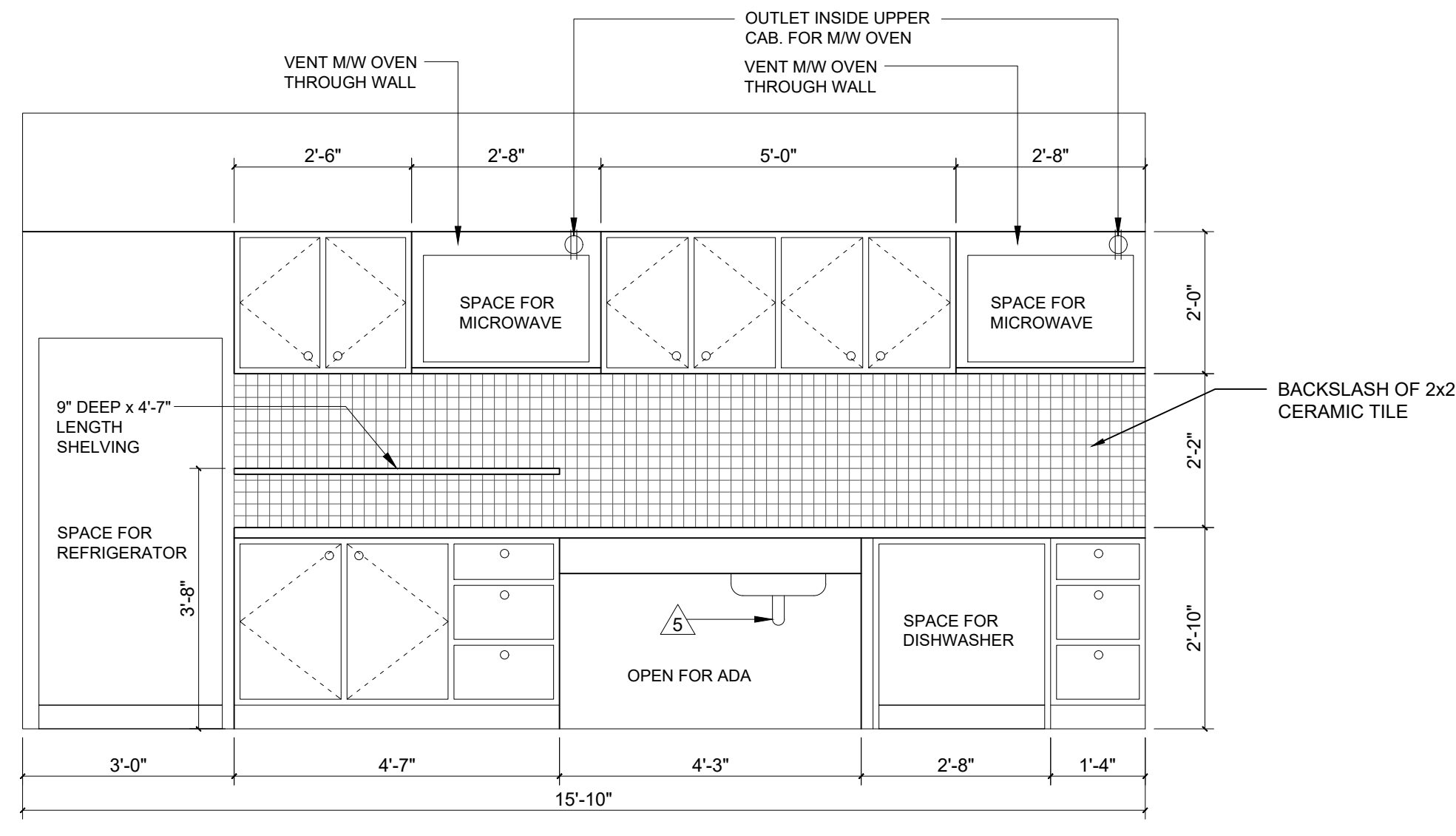
Date: **01-05-2024**

Sheet Title:  
**BATHROOM AND LOUNGE PLANS & ELEVATIONS**

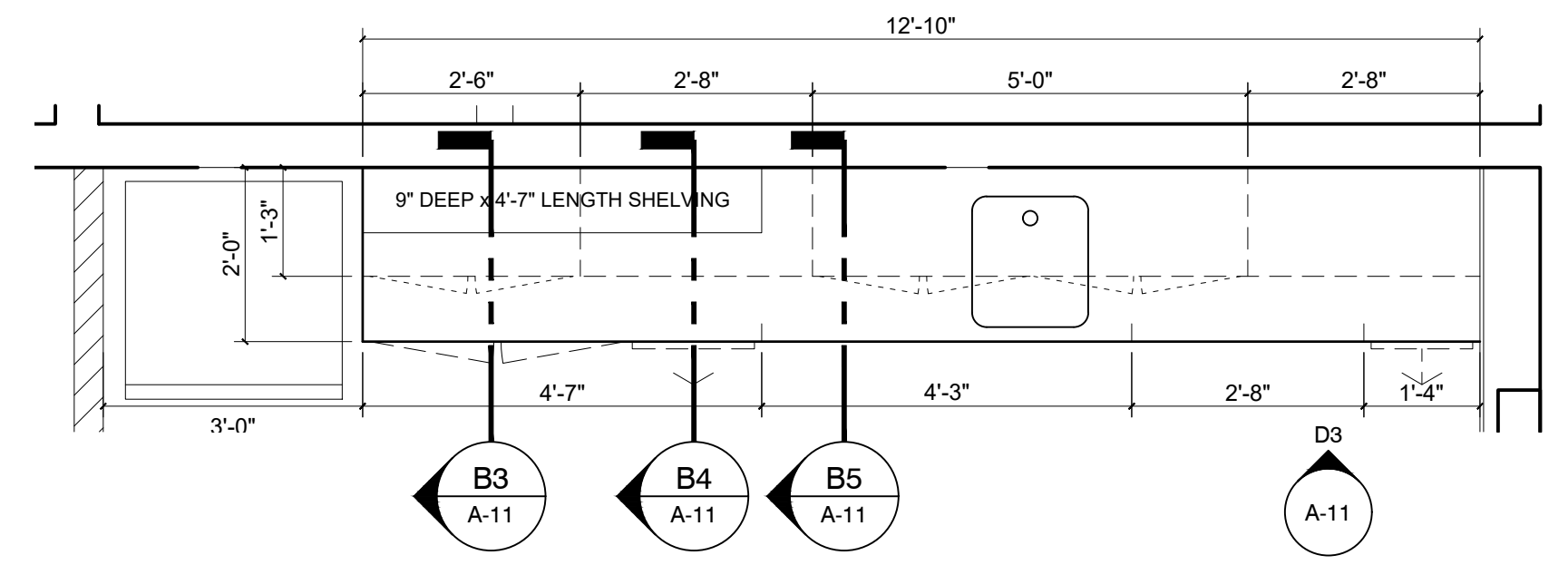
Job Number: **2021-41**

Sheet No.

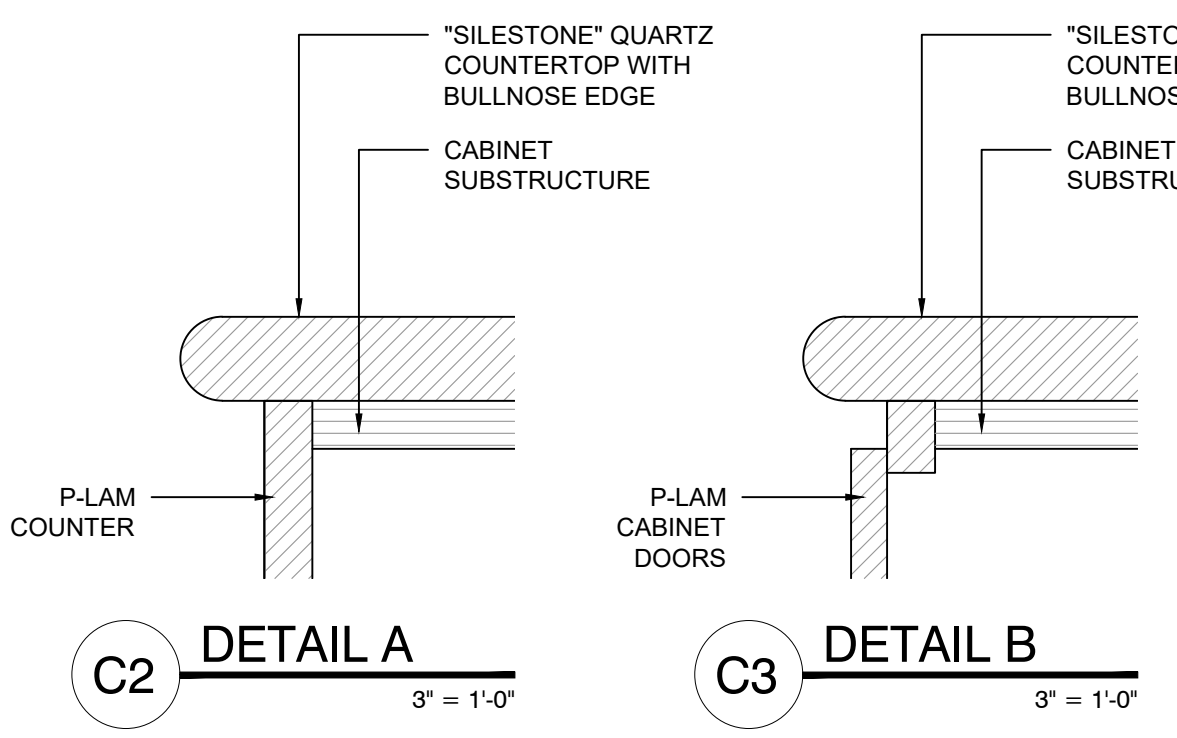
A-11



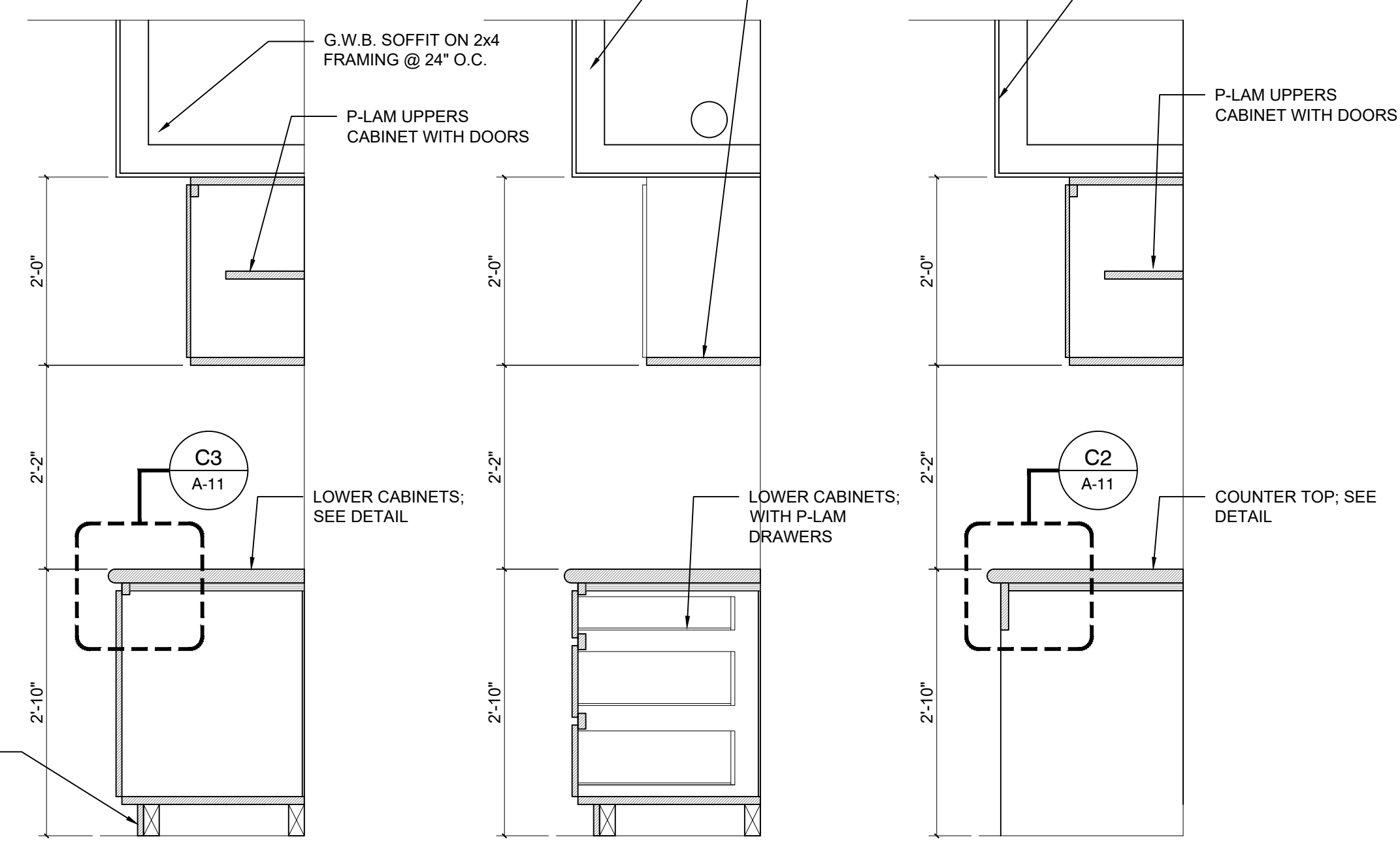
**D3 LOUNGE #1 CASEWORK ELEVATION**  
1/2" = 1'-0"



**D1 ENLARGED CASEWORK PLAN - LOUNGE #1**  
1/2" = 1'-0"

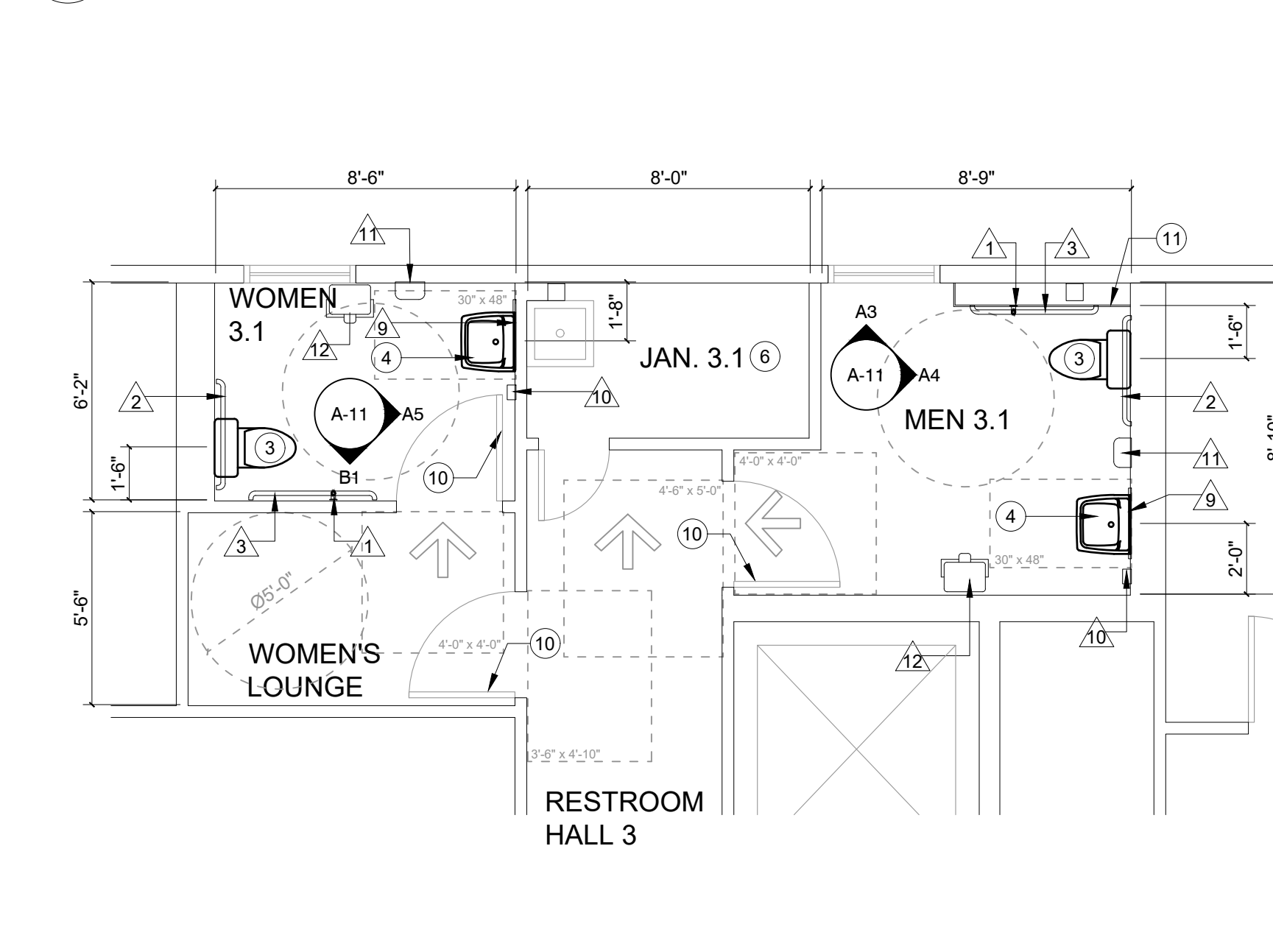


**C2 DETAIL A** 3" = 1'-0"  
**C3 DETAIL B** 3" = 1'-0"

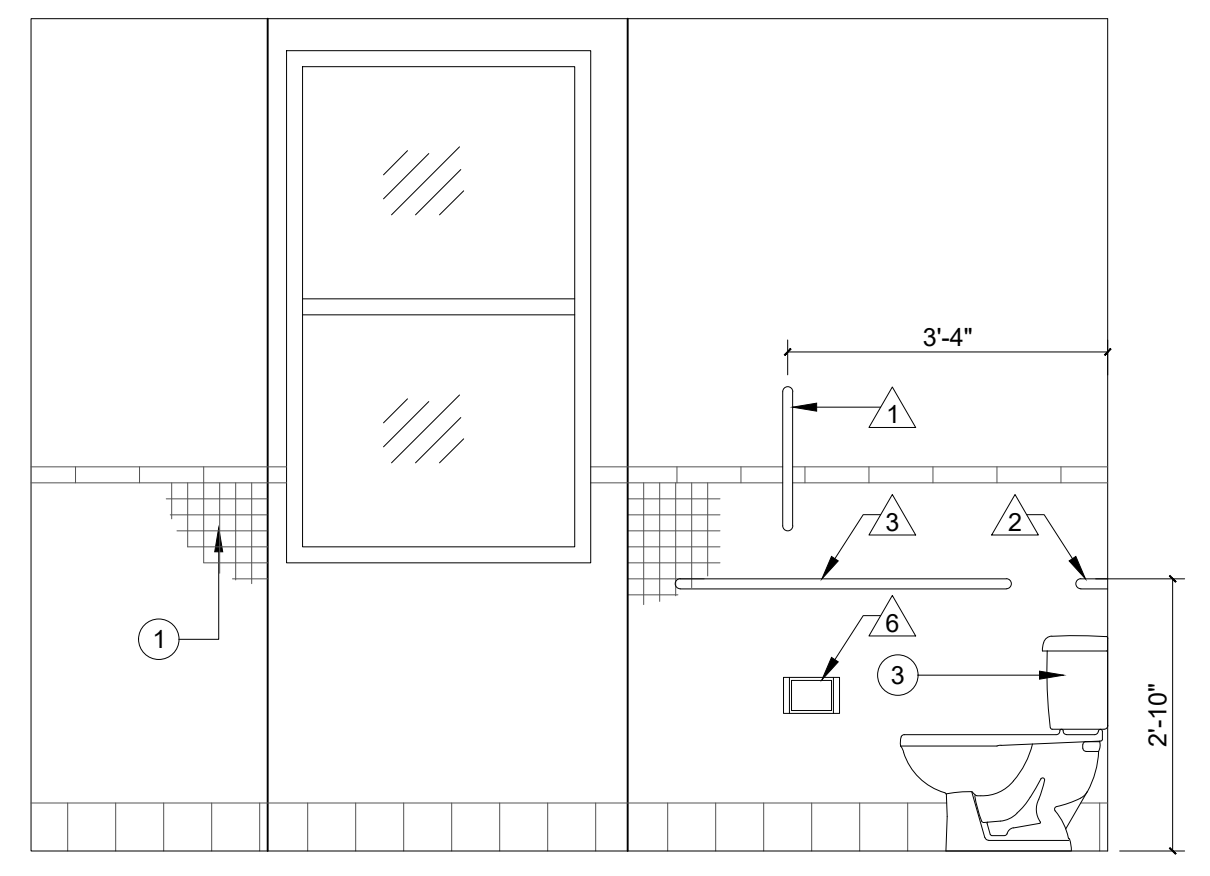


**CASEWORK SECTION A** 3/4" = 1'-0"  
**CASEWORK SECTION B** 3/4" = 1'-0"  
**CASEWORK SECTION C** 3/4" = 1'-0"

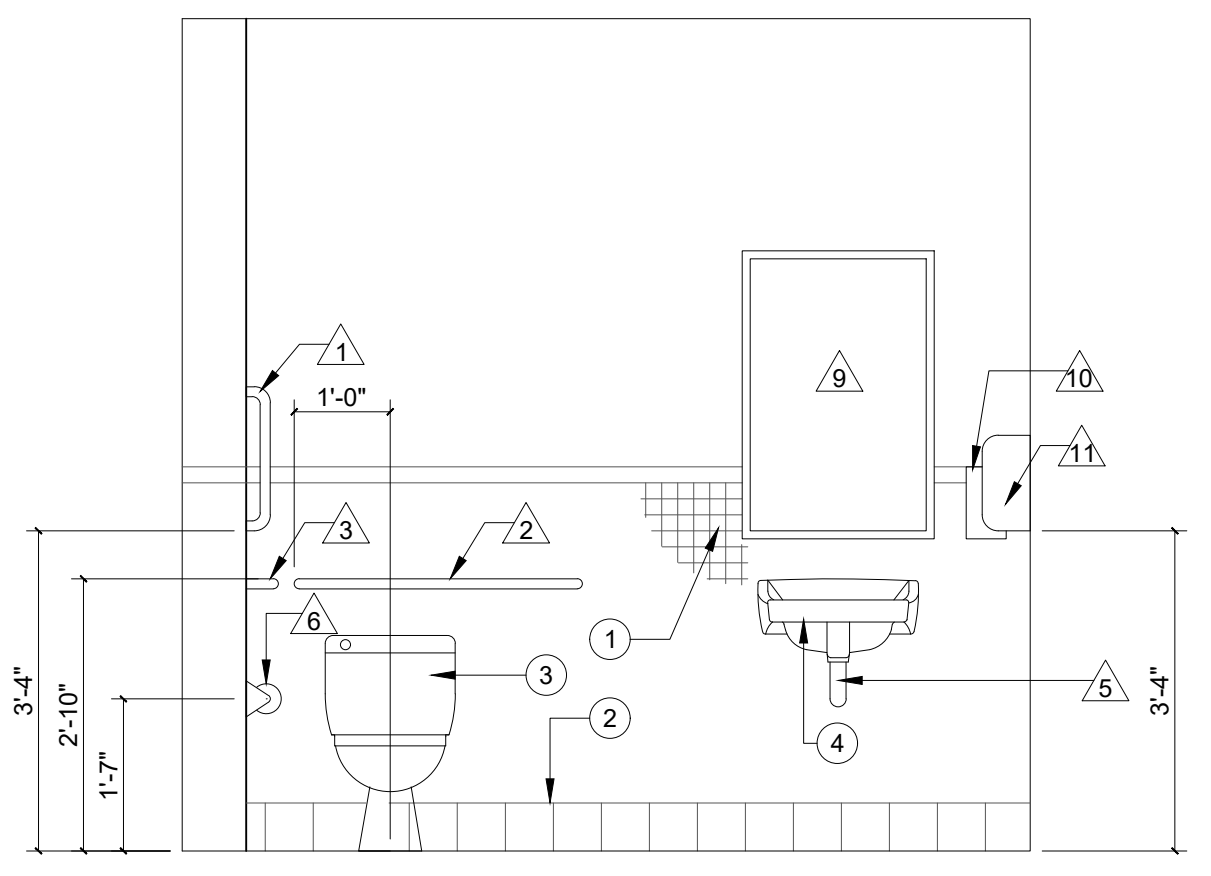
**B1 WOMENS RESTROOM 3.1 - WEST ELEVATION**  
1/2" = 1'-0"



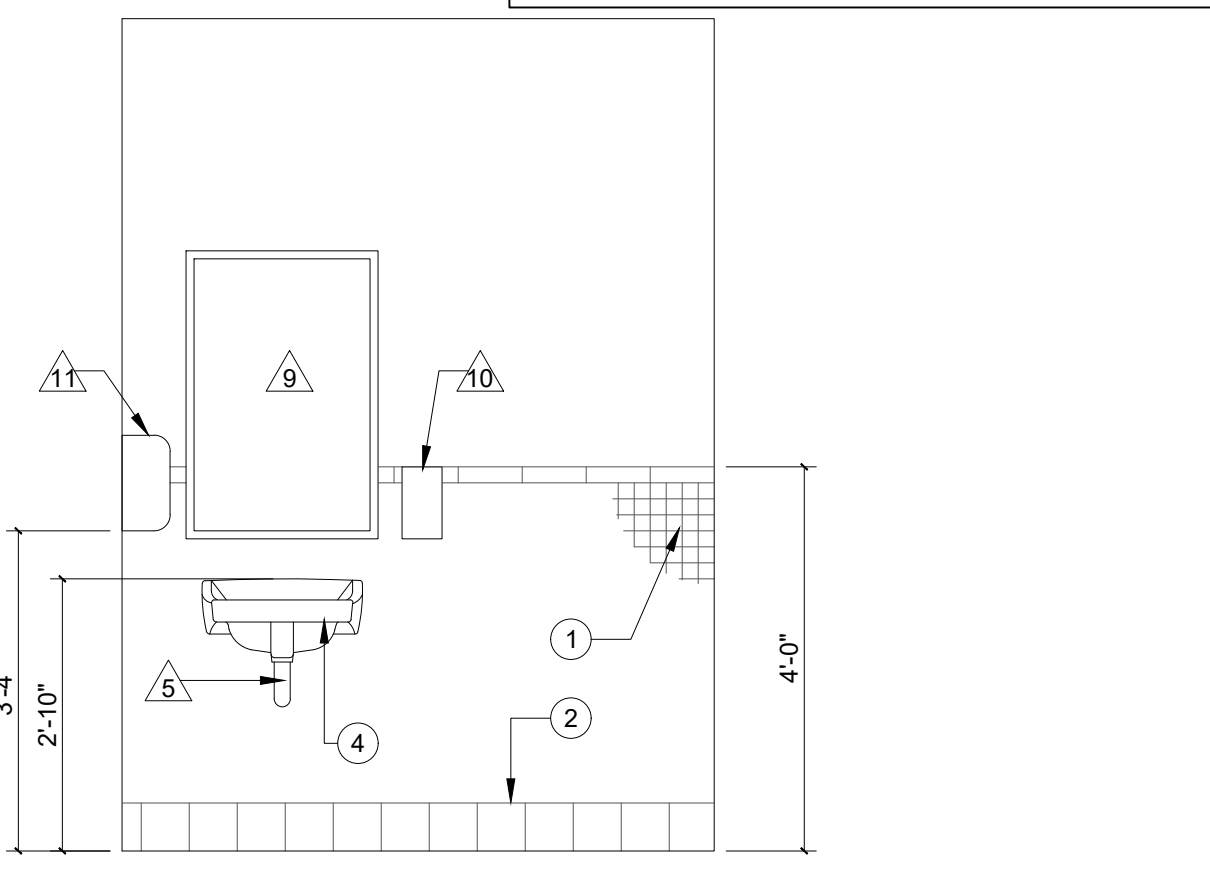
**A1 ENLARGED RESTROOM FLOOR PLANS 3.1**  
1/4" = 1'-0"



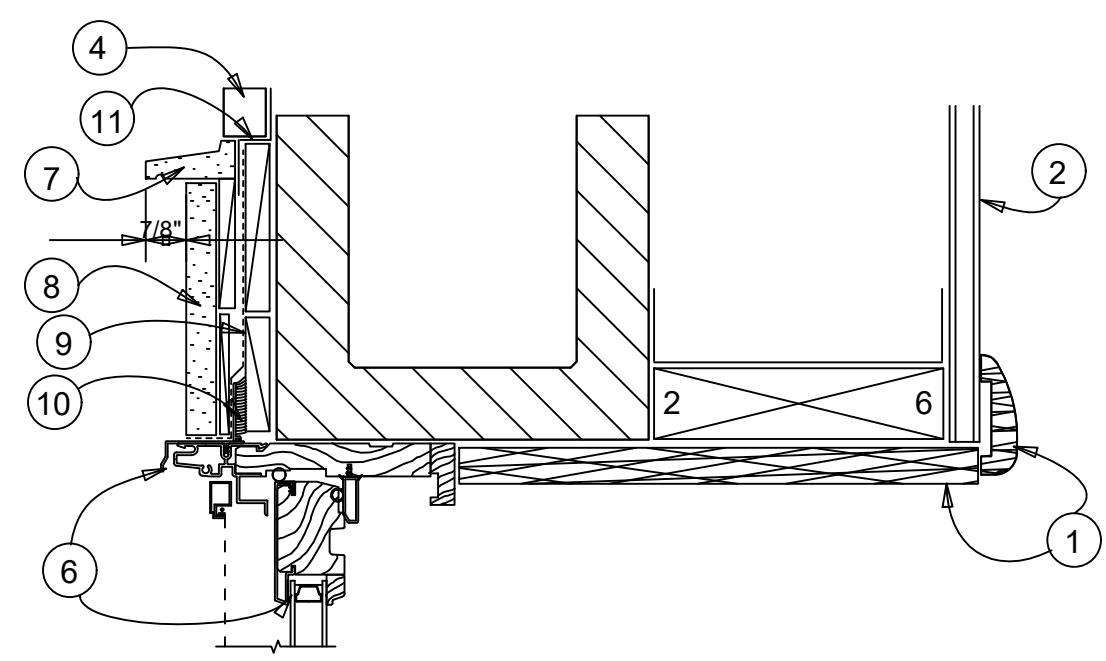
**A3 MENS RESTROOM 3.1 - EAST ELEVATION**  
1/2" = 1'-0"



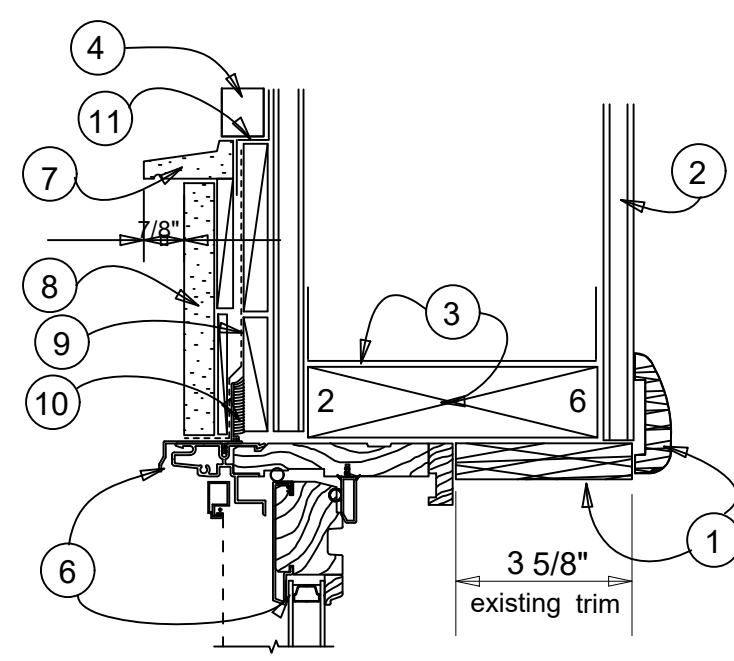
**A4 MENS RESTROOM 3.1 - SOUTH ELEVATION**  
1/2" = 1'-0"



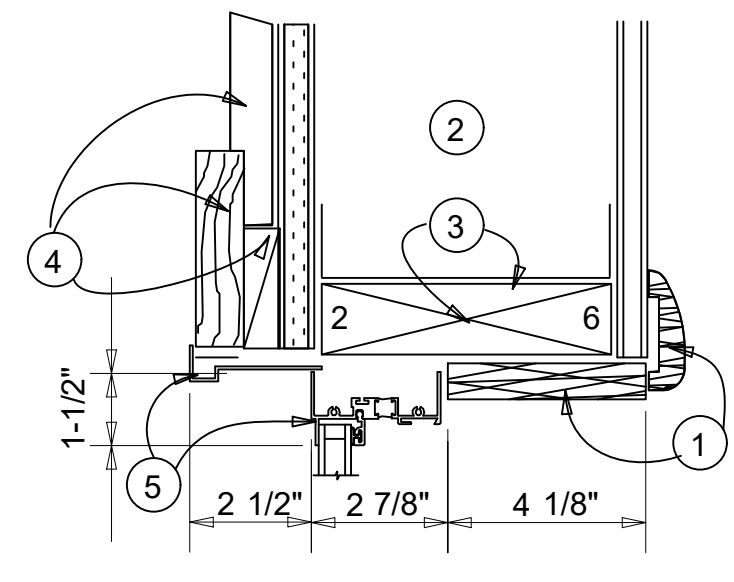
**A5 WOMENS RESTROOM 3.1 - SOUTH ELEVATION**  
1/2" = 1'-0"



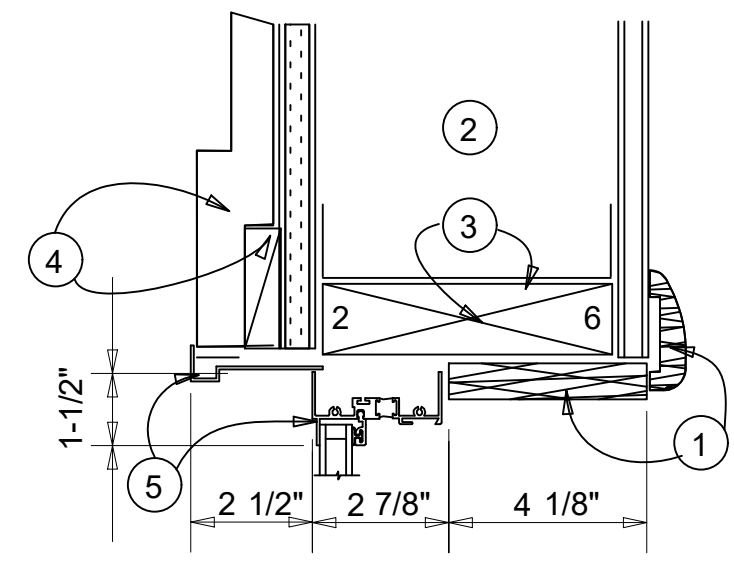
8  
Typ. thick wall Replacement Window Sill  
SCALE 3"=1'-0"



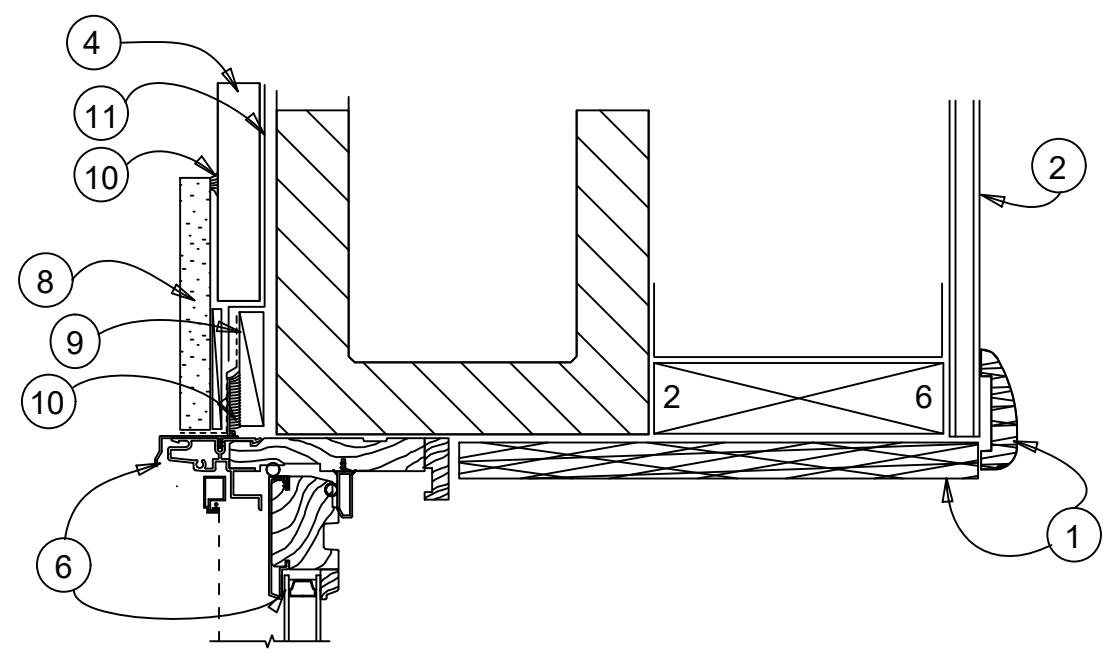
5  
Typ. Replacement Window Head  
SCALE 3"=1'-0"



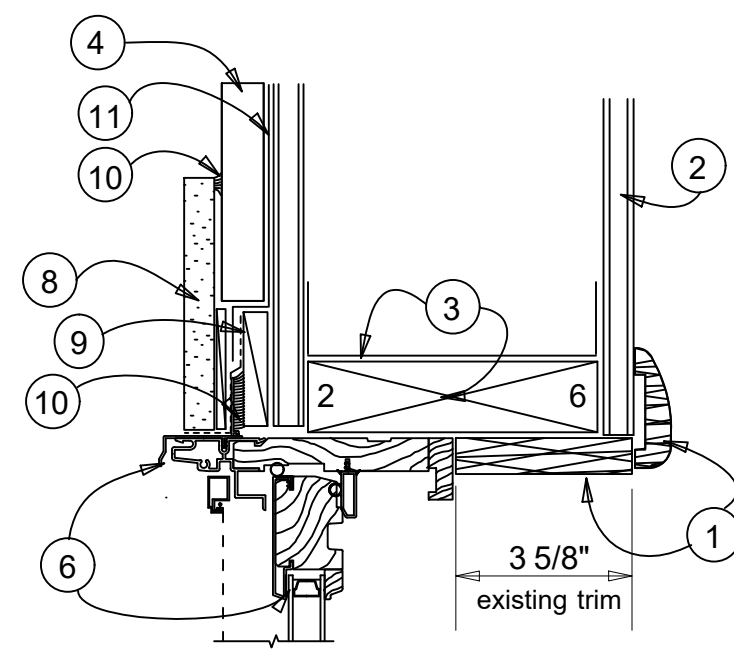
E4  
Existing Window Head Section At Exposed Trim  
SCALE 3"=1'-0"



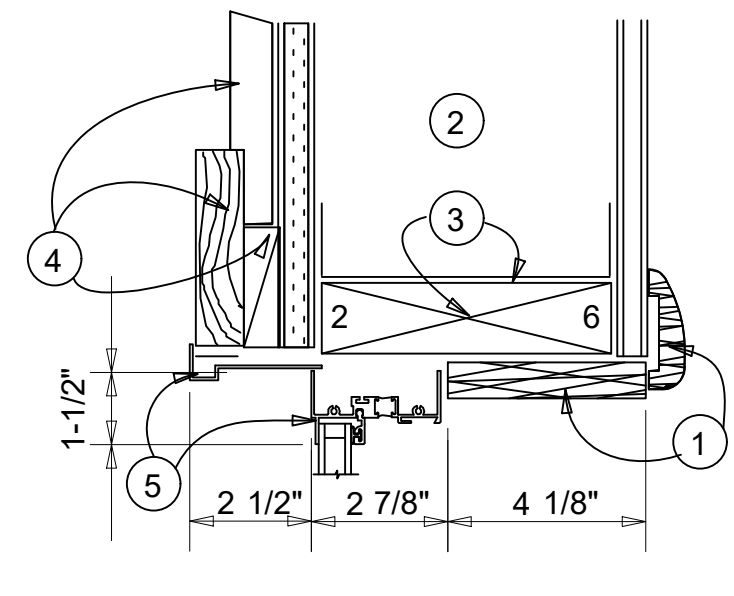
E3  
Existing Window Head Section stucco covered trim  
SCALE 3"=1'-0"



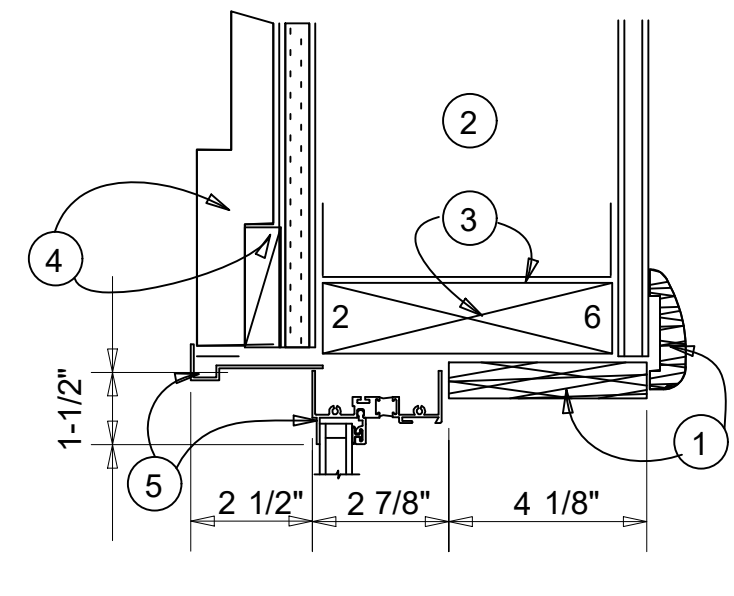
7  
Typ. thick wall Replacement Window Sill  
SCALE 3"=1'-0"



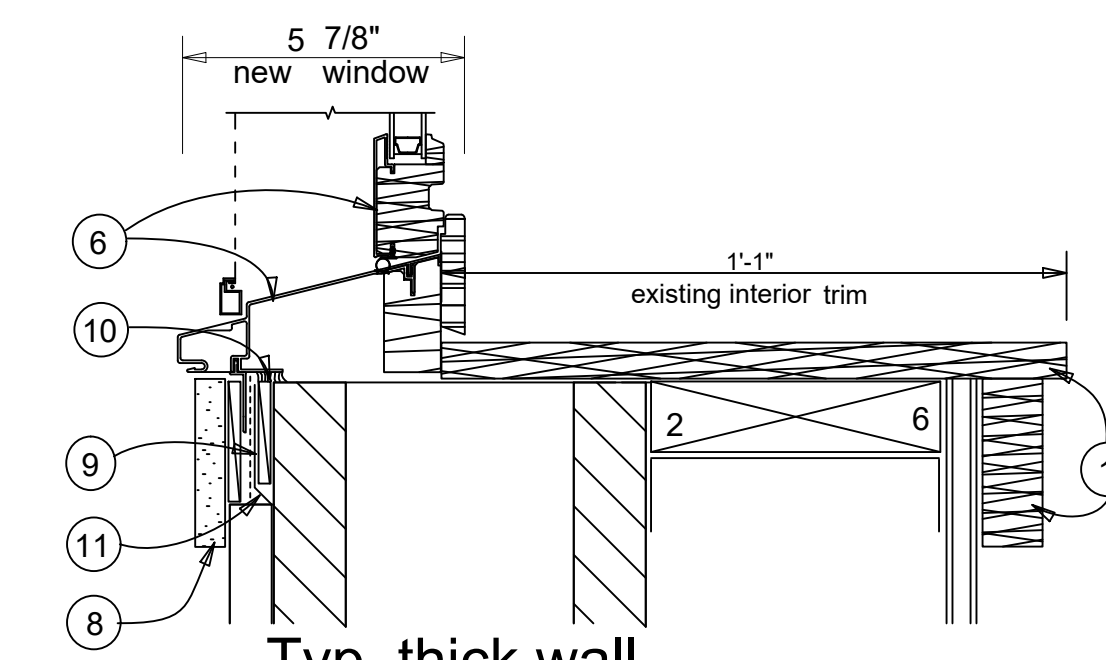
4  
Typ. Replacement Window Jamb  
SCALE 3"=1'-0"



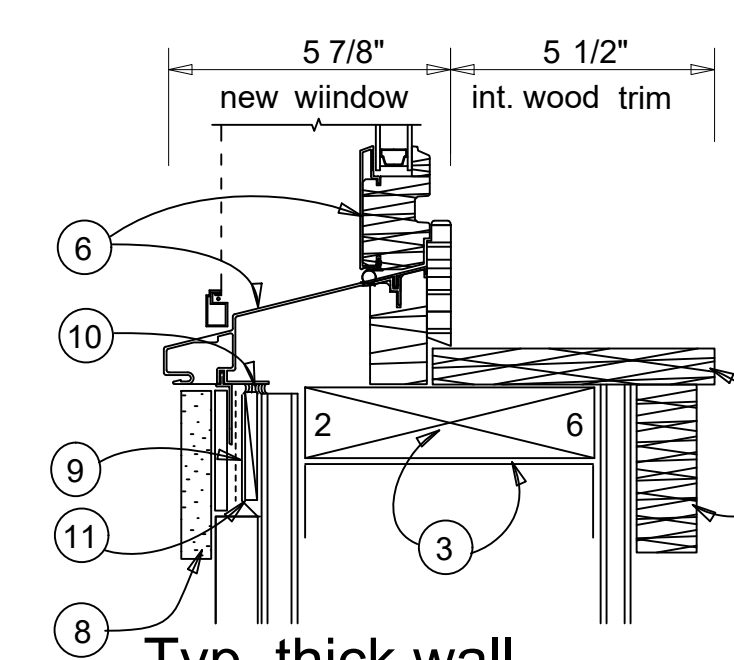
E2  
Existing Window Jamb Section At Exposed Trim  
SCALE 3"=1'-0"



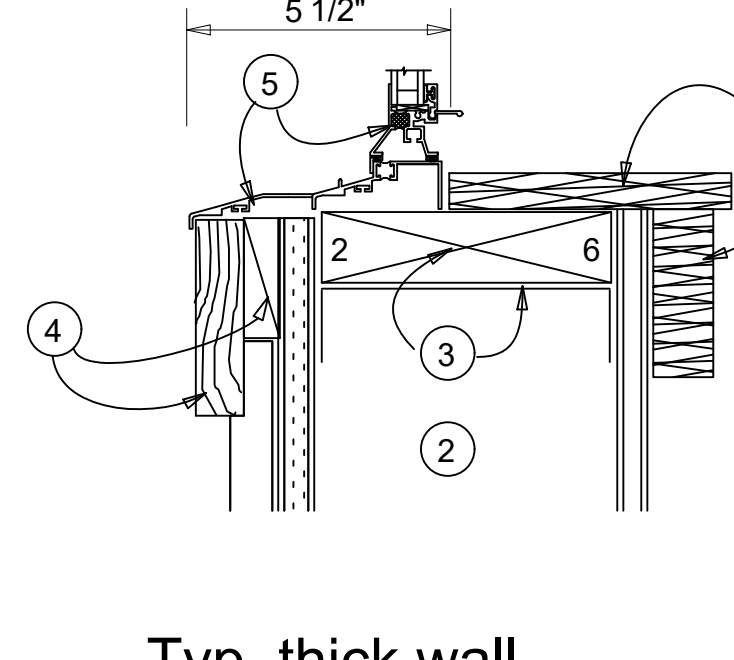
E1  
Existing Window Jamb Section At Stucco Covered Trim  
SCALE 3"=1'-0"



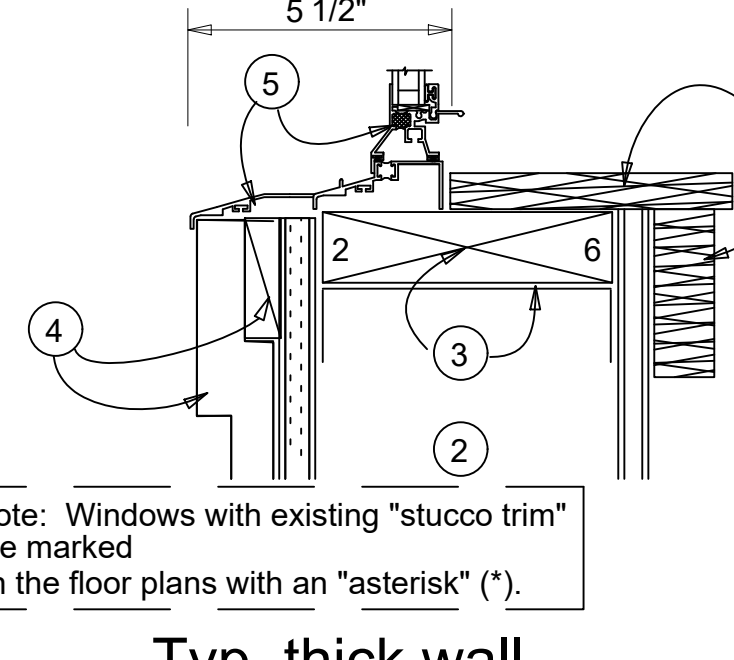
6  
Typ. thick wall Replacement Window Sill  
SCALE 3"=1'-0"



3  
Typ. thick wall Replacement Window Sill  
SCALE 3"=1'-0"



2  
Typ. thick wall Replacement Window Sill  
SCALE 3"=1'-0"

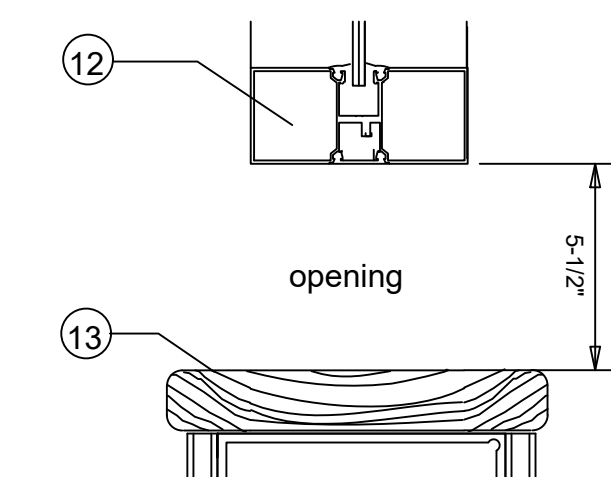


1  
Typ. thick wall Replacement Window Sill  
SCALE 3"=1'-0"

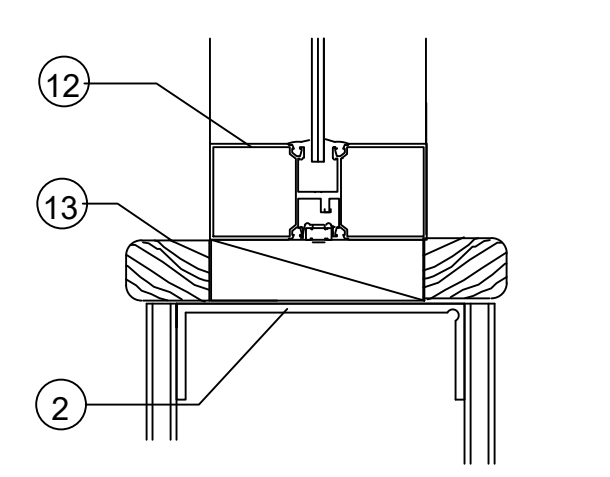
Note: Windows with existing "stucco trim" are marked on the floor plans with an "asterisk" (\*).

ALL DETAILS PART OF ADD ALTERNATE-B EXCEPT DETAILS 9 & 10 FOR INTERIOR WINDOW TYPES M & L WHICH ARE PART OF THE BASE BID

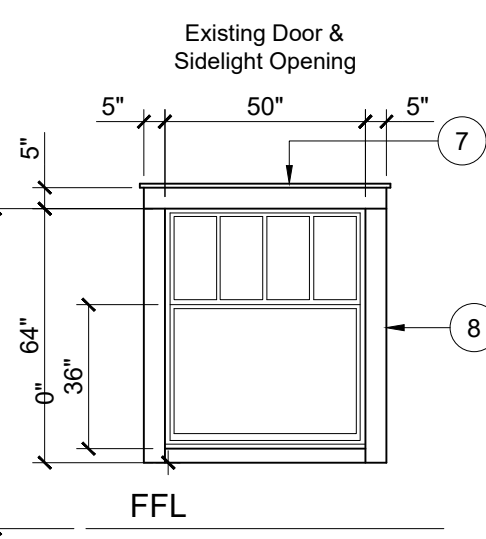
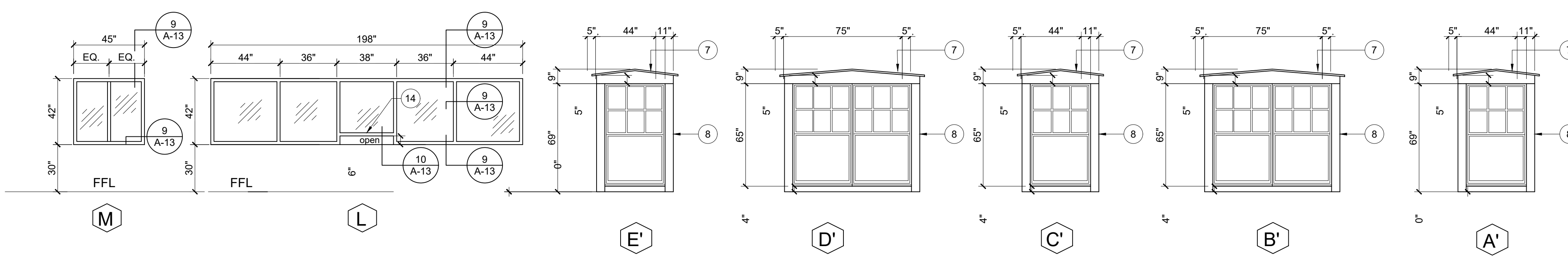
- GENERAL SHEET NOTES**
- WINDOW SCHEDULE DIMENSIONS SHOWN ARE FOR THE EXISTING WINDOW ROUGH OPENINGS (RO) THAT ARE NOMINAL AND SHALL BE VERIFIED WITH FIELD MEASUREMENTS FOR EACH WINDOW.
  - NEW WINDOWS ON THE 1ST LEVEL (GROUND FLOOR) SHALL BE "SINGLE HUNG" IN OPERATION WITH THE LOWER SASH FIXED IN PLACE AND THE UPPER SASH OPERATING AS A SINGLE HUNG WINDOW.
- SHEET KEYED NOTES**
- EXISTING WOOD INTERIOR TRIM REMAINS. PROTECT, CLEAN AND REPLACE AS REQUIRED FOR WINDOW DEMOLITION AND RE-INSTALLATION. WINDOWS HAVE VARIOUS INTERIOR TRIMS (DUE TO WALL THICKNESS) WHICH MAY REMAIN IN PLACE DURING WINDOW REPLACEMENT.
  - EXISTING GWB FRAME WALL REMAINS: PAINT GWB.
  - EXISTING 6" STEEL STUD FRAME WALL WITH 2X6 WINDOW FRAME OPENING REMAINS. SHIM AS NEEDED FOR NEW WINDOW.
  - REMOVE EXISTING STUCCO AND WOOD "TRIM" AROUND WINDOWS (WITH RELATED WOOD TRIM BELOW STUCCO) AND PREPARE FOR NEW WINDOW AND TRIM INSTALLATION. REFER TO ELEVATIONS FOR LOCATION OF THE EXISTING STUCCO TRIM OR THE EXISTING WOOD TRIM FOR DEMOLITION AND REMOVAL. EXISTING STUCCO: REMOVE TO ALLOW NEW WOOD TRIM INSTALLATION, BUT RETAIN EXISTING BUILDING PAPER LAYER (JUMBOTEX) TO LAP NEW VYCOR MEMBRANE.
  - REMOVE EXISTING WINDOW FOR NEW REPLACEMENT WINDOW. PROTECT OPENING DURING REPLACEMENT.
  - NEW WINDOW SECTION.
  - NEW PVC TRIM: DRIP CAP (MITER RETURN AT EACH END)
  - NEW PVC TRIM: 5/8" TRIM X WIDTH SHOWN IN WINDOW SCHEDULE
  - NEW "VYCORE" PEEL-AND-STICK MEMBRANE
  - NEW CONTINUOUS BEAD OF SEALANT
  - EXISTING BUILDING PAPER (JUMBOTEX): LAP "VYCORE" MEMBRANE
  - ALUMINUM STOREFRONT SYSTEM
  - 5/4" OAK TRIM EACH SIDE, EASE EXPOSED EDGES
  - STOREFRONT WITH PASS THROUGH AND SPEAKER HOLE.
- SHEET LEGEND**
- GYPSUM WALL BOARD
  - EXTERIOR WALL SHEATHING
  - INTERIOR WOOD TRIM
  - STUCCO SYSTEM
  - EXISTING BUILDING PAPER (JUMBOTEX)
  - NEW "VYCORE" PEEL-AND-STICK MEMBRANE



10  
Interior Window Opening  
SCALE 3"=1'-0"



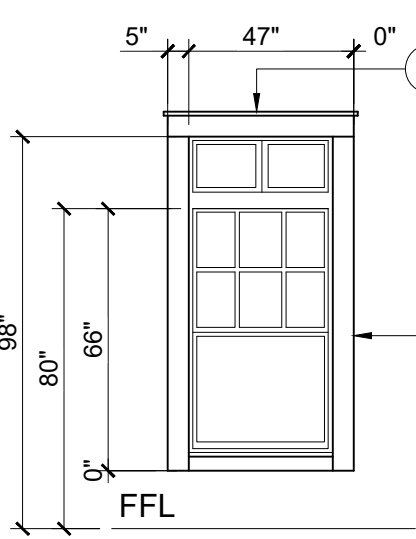
9  
Typ. Interior Window Detail  
SCALE 3"=1'-0"



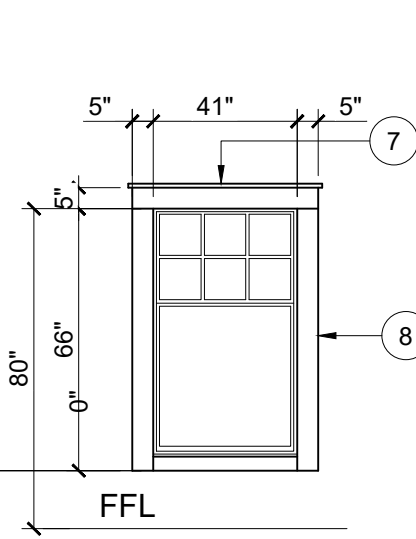
K  
Custom Double Window Fixed

NOT USED

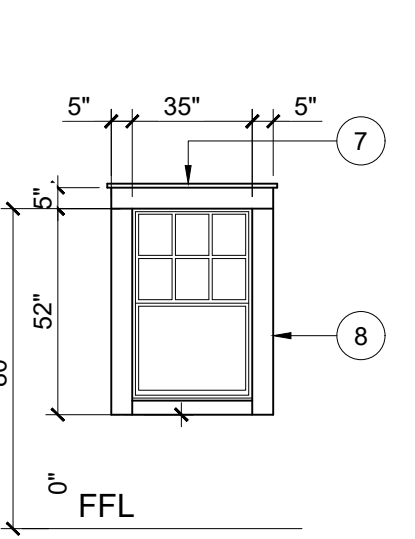
J  
Custom Window Single Hung



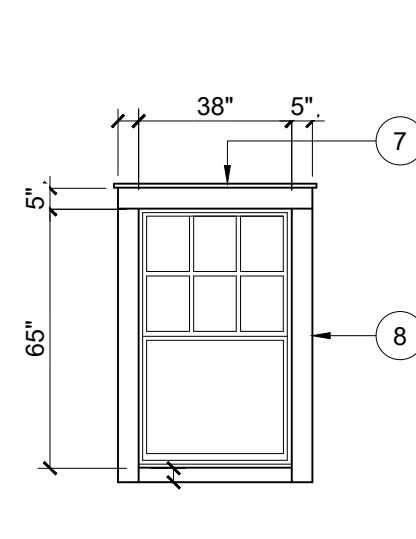
H  
Custom Window Fixed



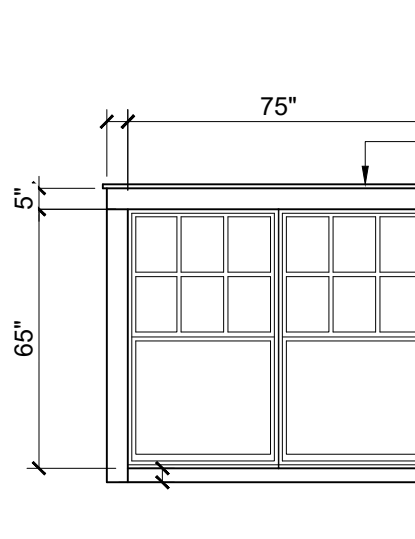
G  
Custom Window Single Hung



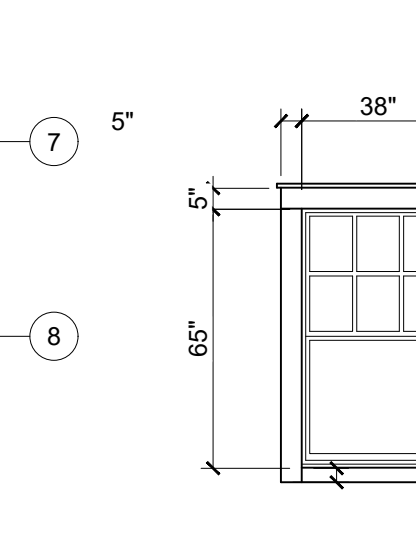
F  
Custom Window Single Hung



E  
Stair Fixed Window



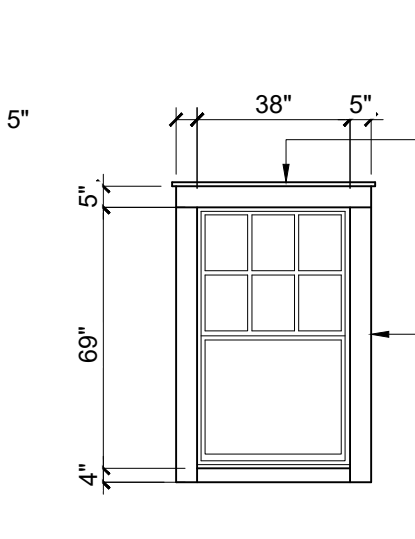
D  
Wide Depth Standard Double Window Single Hung



C  
Wide Depth Standard Single Window Single Hung

NOT USED

B  
Standard "Double" Window Single Hung



A  
Standard Window

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Current Status:  
CONFORMED SET

REVISIONS		

Drawn by: KL  
Checked by: WL/SM

Date: 01-05-2024

Sheet Title:  
WINDOW TYPES, SCHEDULES & DETAILS; ADD ALTERNATE C

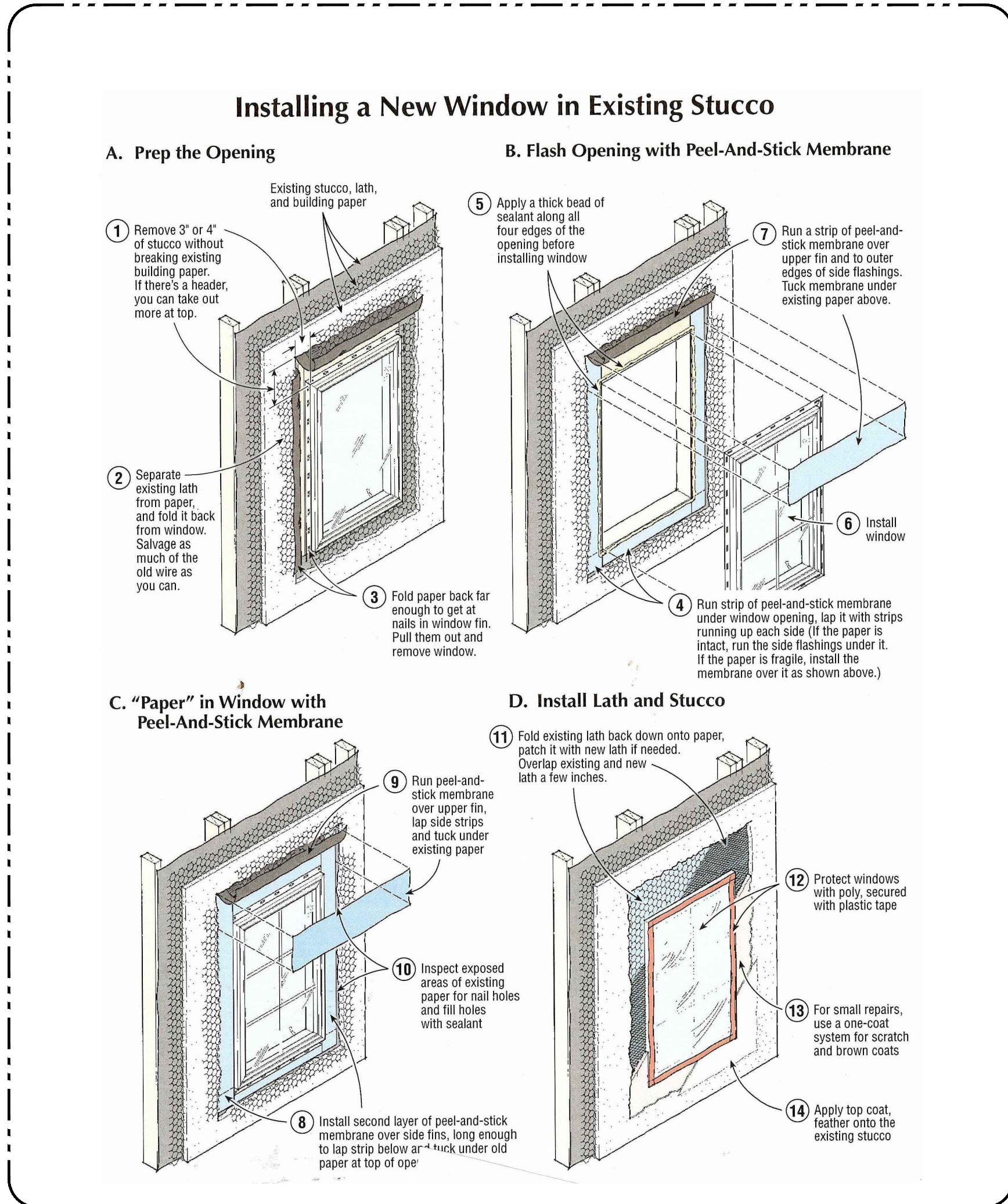
Job Number: 2021-41

Sheet No.

PLOT DATE: Jan 09, 2024, 9:14am  
FILENAME: X:\2021-41 Santa Fe DAs Office Reno\CAD Files\_SHEETS\2021-41\_A-12.dwg



DOOR AND FRAME SCHEDULE												
MARK	TYPE	DOOR			MTL	TYPE	MTL	FRAME			PROVIDE WIRELESS ACCESS LOCK	NOTES
		WIDTH	HGT.	THK.				HEAD	JAMB	SILL		
1	D1	(2) 3'-0"	7'-0"	1-3/4"	WD	F1	WD	-	-	-	NO	SALVAGED EXISTING EXTERIOR DOUBLE DOOR
3	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING DOOR & FRAME WITH NEW WIRELESS ACCESS LOCK SET
5	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING DOOR & FRAME WITH NEW WIRELESS ACCESS LOCK SET
6	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING DOOR & FRAME WITH NEW WIRELESS ACCESS LOCK SET
7	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING DOOR & FRAME WITH NEW WIRELESS ACCESS LOCK SET
12	D4	3'-0"	6'-1 1/2"	1-3/4"	WD	F1	WD	-	-	-	YES	NEW STEEL GATE WITH NEW WIRELESS ACCESS LOCK SET; SEE SHEET C2
13	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING DOOR & FRAME WITH NEW WIRELESS ACCESS LOCK SET
15	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET
18	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET
22	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET
26	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	YES	NEW DOOR WITH NEW WIRELESS ACCESS LOCK SET
27	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET
28	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	YES	NEW DOOR WITH NEW WIRELESS ACCESS LOCK SET
29	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	YES	NEW DOOR WITH NEW WIRELESS ACCESS LOCK SET
30	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET
31	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
37	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET
39	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	YES	NEW DOOR WITH NEW WIRELESS ACCESS LOCK SET
40	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	YES	NEW DOOR WITH NEW WIRELESS ACCESS LOCK SET
41	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
44	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
45	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
46	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
47	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
48	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
49	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
51	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
52	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
54	D3	3'-0"	6'-8"	1-3/4"	WD	F2	HM	-	-	-	NO	NEW DOOR
55	EXISTING	EXISTING	EXISTING	EXISTING	WD	EXISTING	WD	-	-	-	YES	EXISTING ELEVATOR DOOR WITH NEW WIRELESS ACCESS LOCK SET

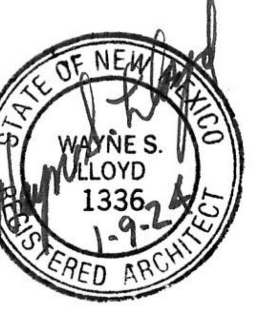


ADD ALTERNATE B

GENERAL SHEET NOTES

- A. REPLACE OR REPAIR ALL HARDWARE AGAINST DEFECTS AS NOTED BELOW:  
 LOCKSETS: 10 YEARS  
 CLOSERS: 10 YEARS  
 ALL OTHER HARDWARE: 2 YEARS.
- B. ALL FRAME DIMENSIONS ARE NOMINAL AND SHALL BE VERIFIED BY CONTRACTOR.
- C. ALL EXTERIOR GLAZING SHALL BE 1" THICK INSULATED, "1/4" SOLARBAN 70 ON SOLEXIA #2 - 1/4 CLEAR".
- F. SEE PLANS FOR DOOR SWING DIRECTION.
- G. MASTER KEY ALL LOCKSETS AND CYLINDERS AS DIRECTED BY OWNER.
- H. SEE SHEET A-401 FOR CASEWORK.
- I. ALL WINDOWS & DOORS REQUIRE SUBMITTALS BEFORE INSTALLATION WITH APPROVAL FROM ARCHITECT.

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 SANTA FE, NM 87501

Current Status:  
**CONFORMED SET**

REVISIONS		

Drawn by: **KL**  
 Checked by: **WL/SM**

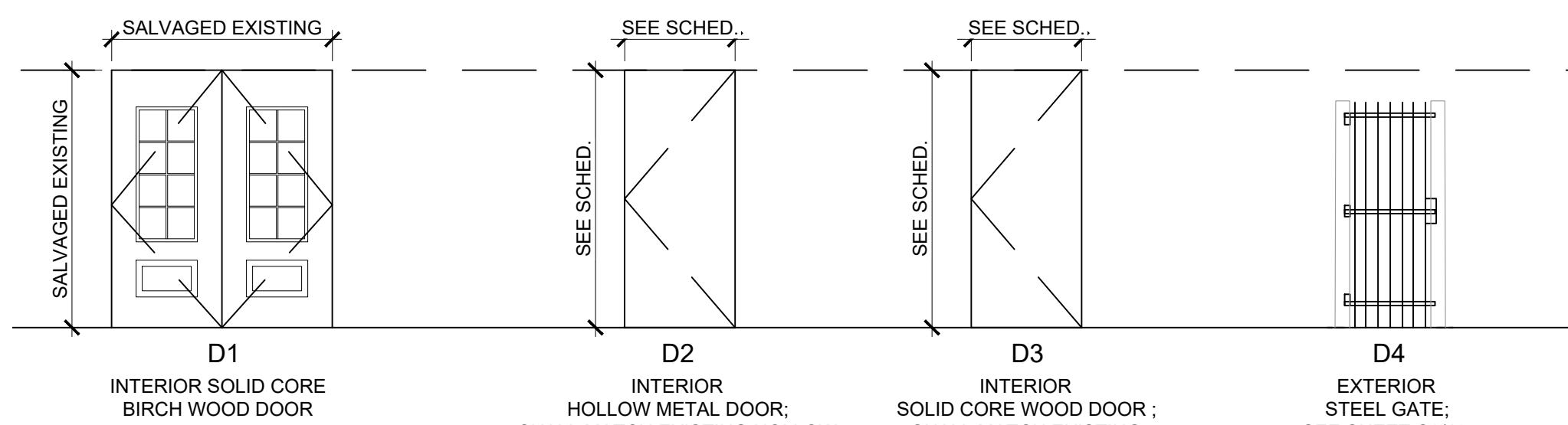
Date: **01-05-2024**

Sheet Title:  
**DOOR TYPES, SCHEDULES & DETAILS**

Job Number: **2021-41**

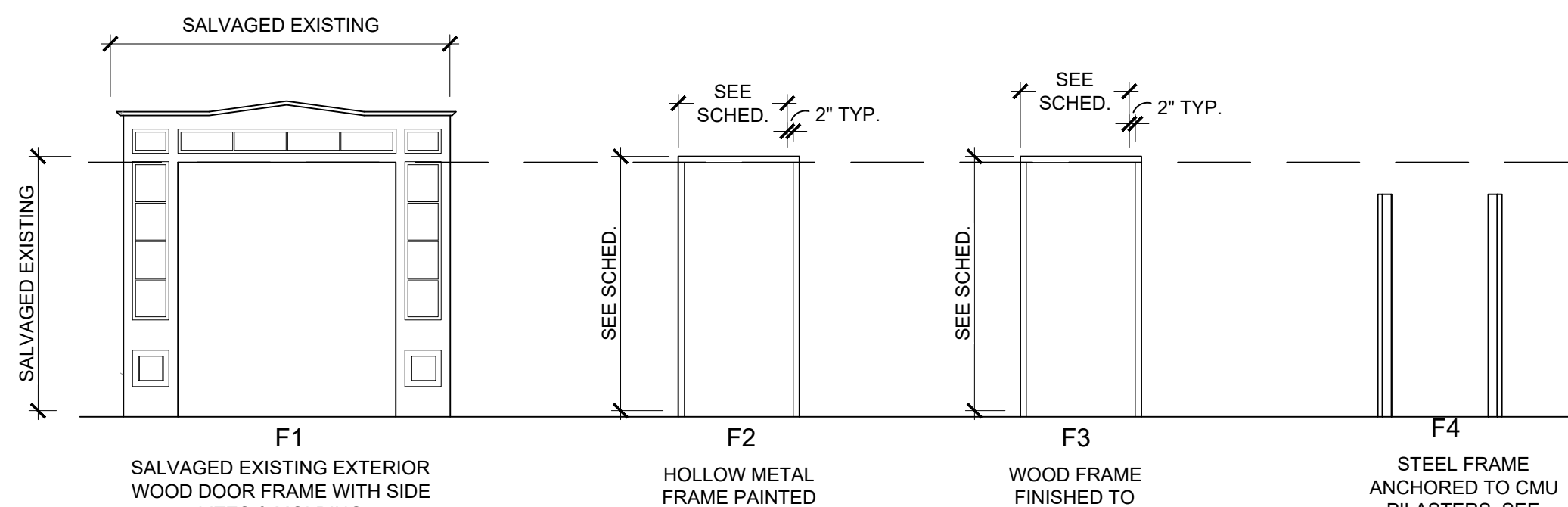
Sheet No.

**A-13**



**A1 DOOR TYPES**

1/4" = 1'-0"



**A3 DOOR FRAME TYPES**

1/4" = 1'-0"



**SHEET KEYED NOTES**

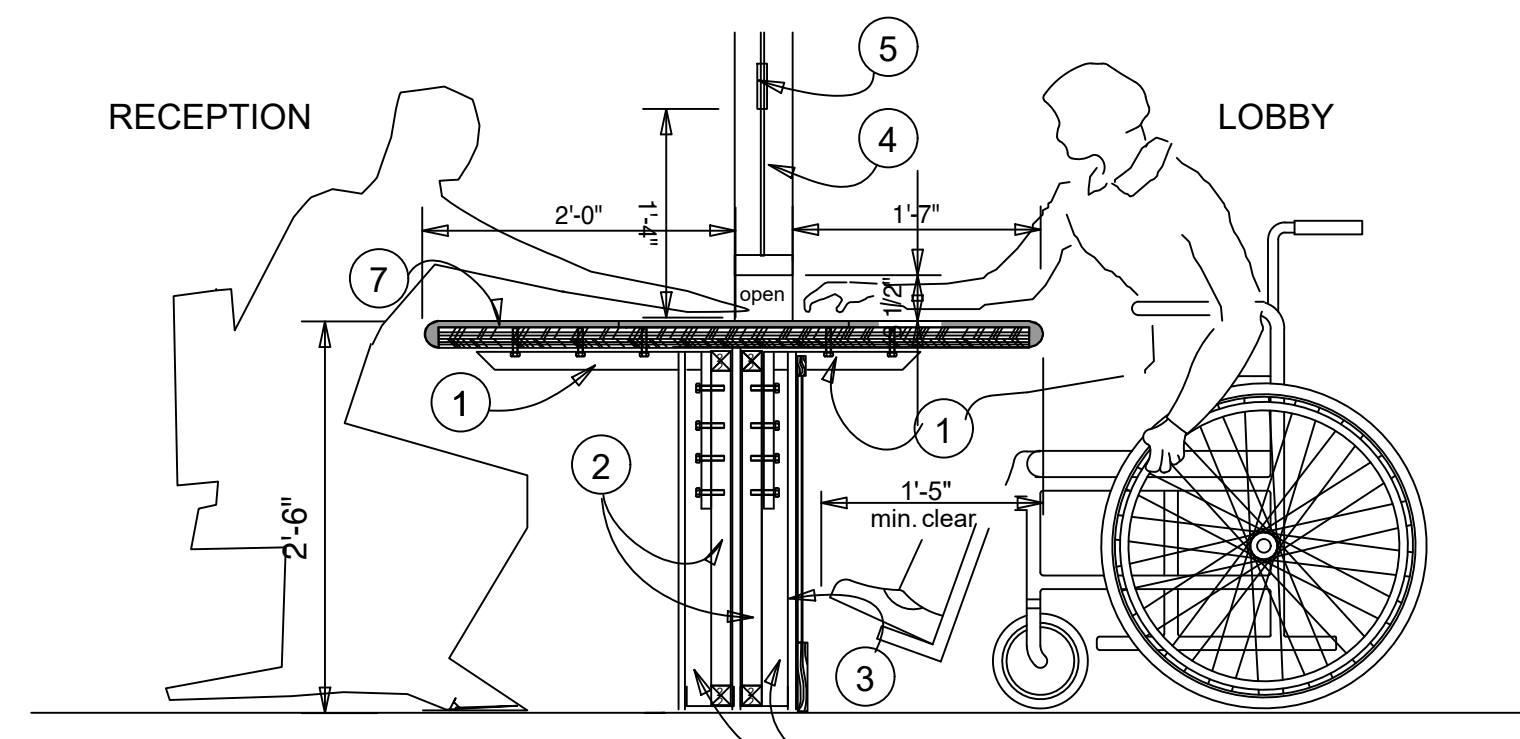
1. A & M HARDWARE COUNTER SUPPORT STEEL HYBRID BRACKET.
2. RIP 2x4 STUD AND MOUNT TO STEEL STUDS FOR BRACKET MOUNTING
3. T & G OAK BEADBOARD WAINSCOT OVER GWB FAME WALL.
4. ALUMINUM STOREFRONT GLAZING SYSTEM.
5. SPEAKER HOLE.
6. 3-5/8" STUDS @ 16" O.C. FRAME WALL WITH GWB EACH SIDE.
7. 1/2" THICK QUARTZ COUNTERTOP WITH BULLNOSE EDGING ON 1-1/2" PLYWOOD BASE, TYP. SEE 10/A13.

**GENERAL SHEET NOTES**

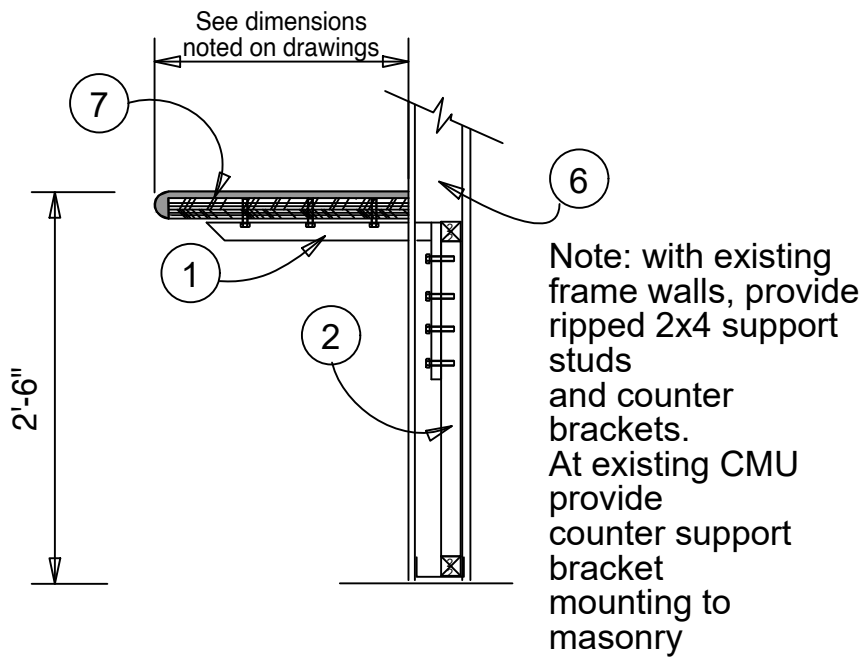
- A. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD.
- B. EXPOSED PLYWOOD SHALL BE FINISH GRADE HARDWOOD WITH 7 LAYERS.
- C. EXPOSED PLYWOOD EDGES SHALL HAVE EDGE BANDING TO MATCH UNLESS OTHERWISE SPECIFIED.

**SHEET LEGEND**

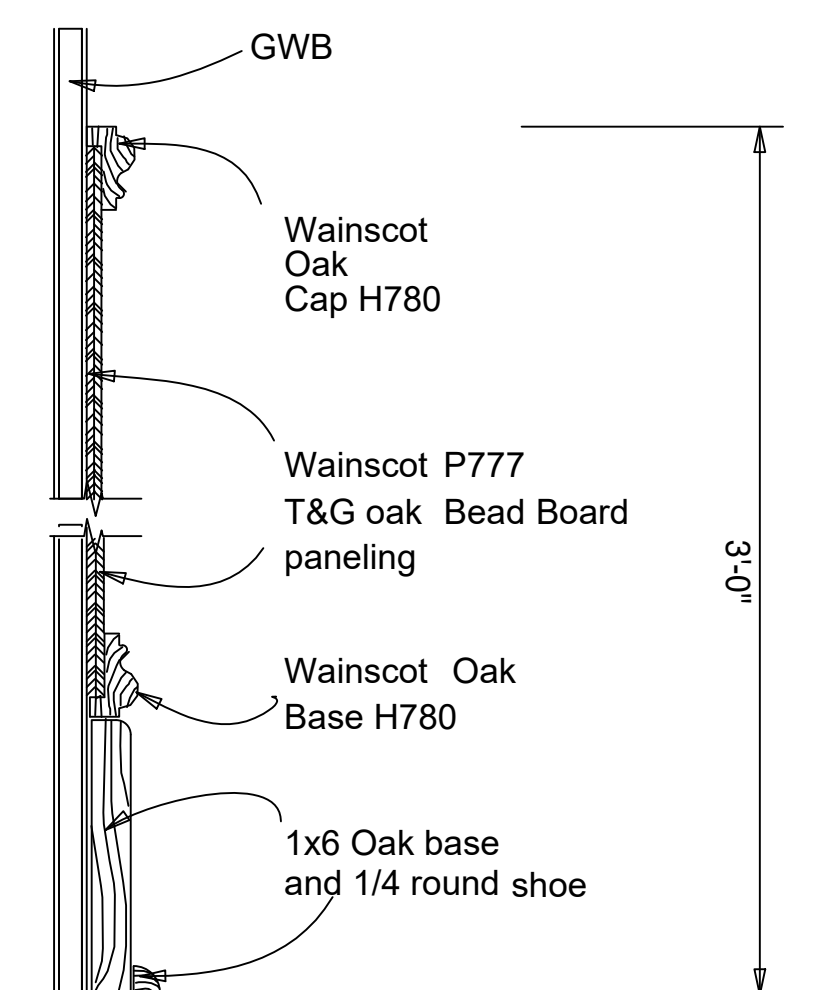
- NEW CASEWORK COUNTER; SEE DETAIL 9/A17 OR 10/A17; 30" A.F.F. TYP. UNLESS NOTED
- NEW COUNTER CONCEALED STEEL SUPPORT BRACKET; SEE KEYNOTE 1.
- NEW WALL WAINSCOT; SEE DETAIL 6/A17
- NEW COUNTER/TABLE STEEL SUPPORT LEG W/ LEVELER; HAFELE #635.35.371
- EXISTING WALL
- NEW WALL
- DATA GROMMET; MCKET SP FLIP TOP WITH 2-1/8" HOLE.



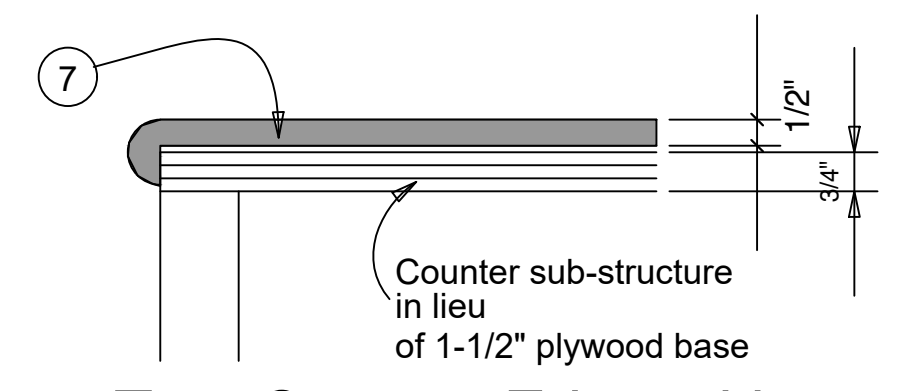
**5 New Reception ADA Clearances**  
SCALE 3/4"=1'-0"



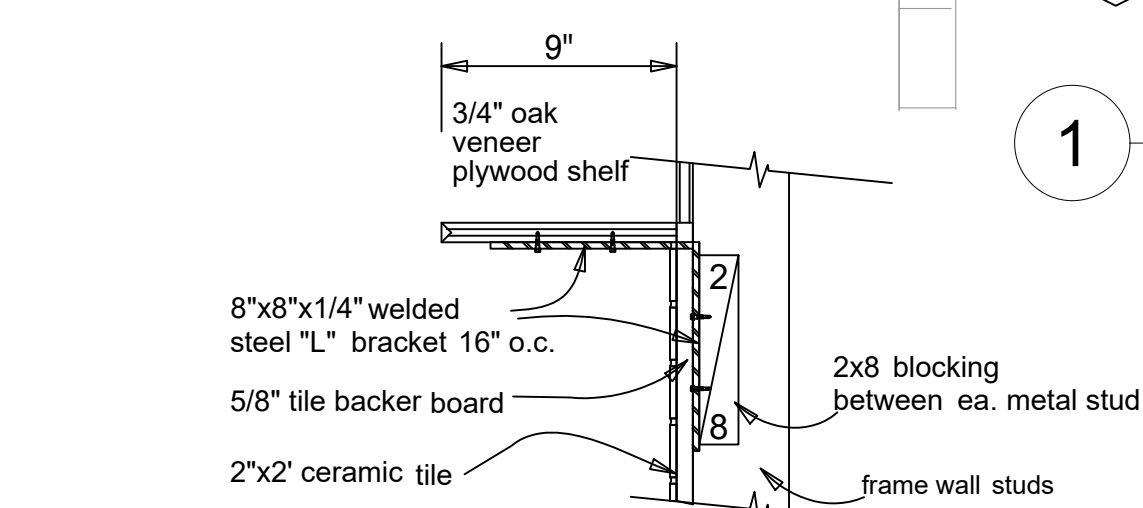
**8 Typical Counter and support**  
SCALE 3/4"=1'-0"



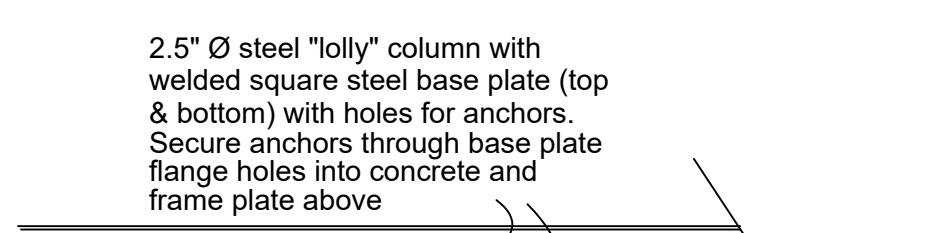
**6 Bead Board Wainscot Typical Section:**  
note: return Wainscot Cap and Base at corners and ends with 45 1/4 miter cuts.  
SCALE 3"=1'-0"



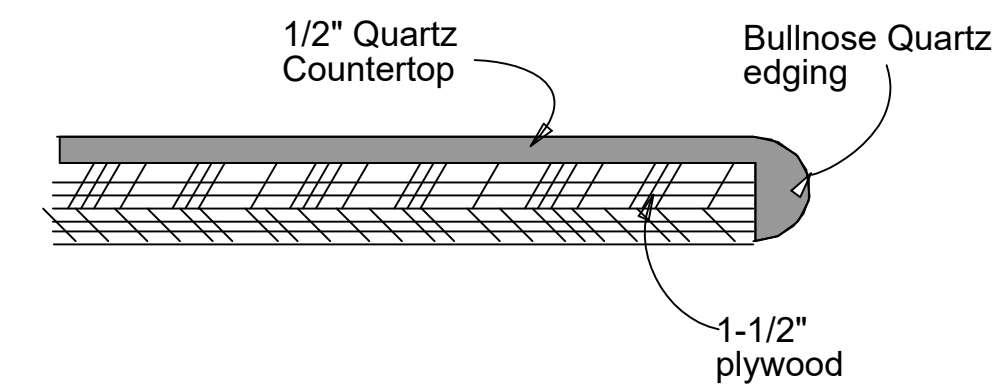
**9 Typ. Counter Edge with Cabinets**  
SCALE 3"=1'-0"



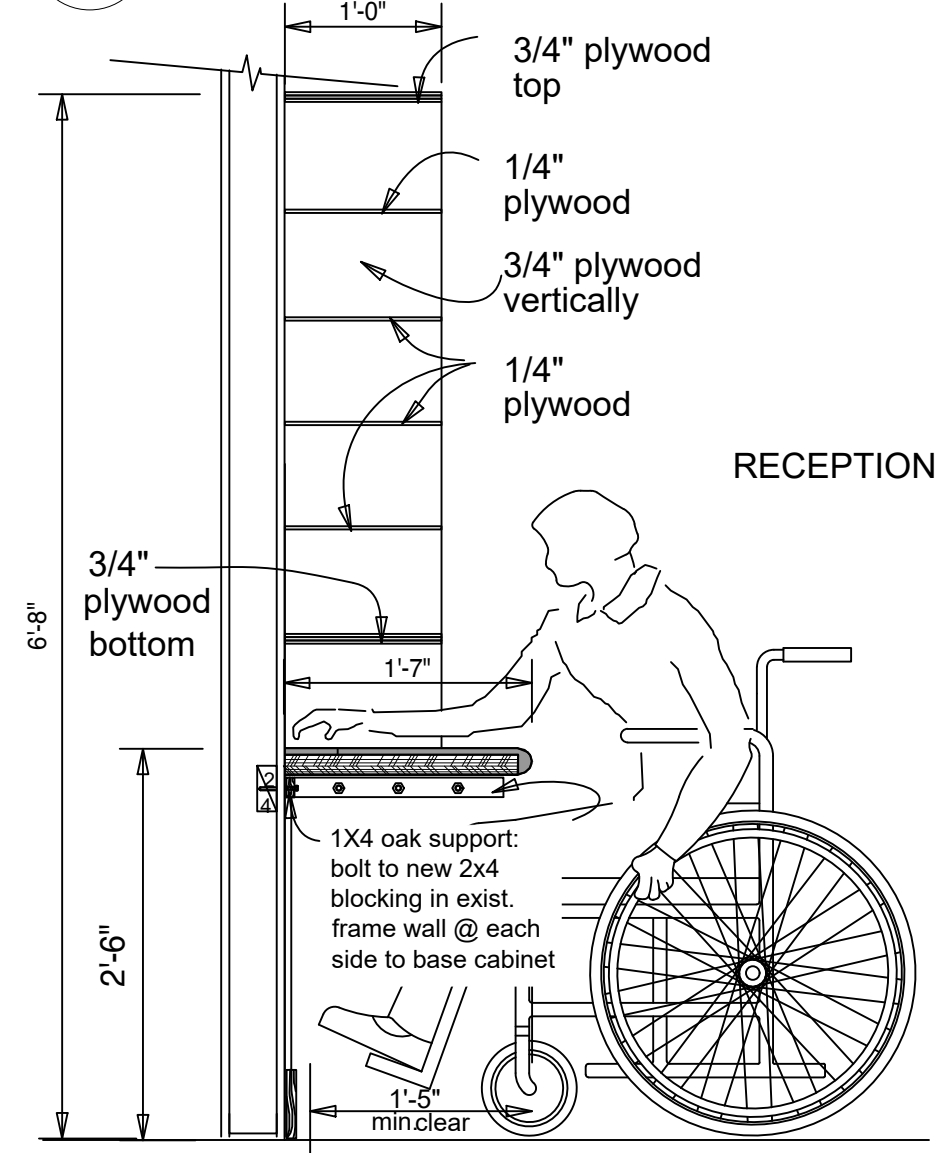
**2 Typ. Shelf Section: New Casework**  
SCALE 3/4"=1'-0" 1'-0"



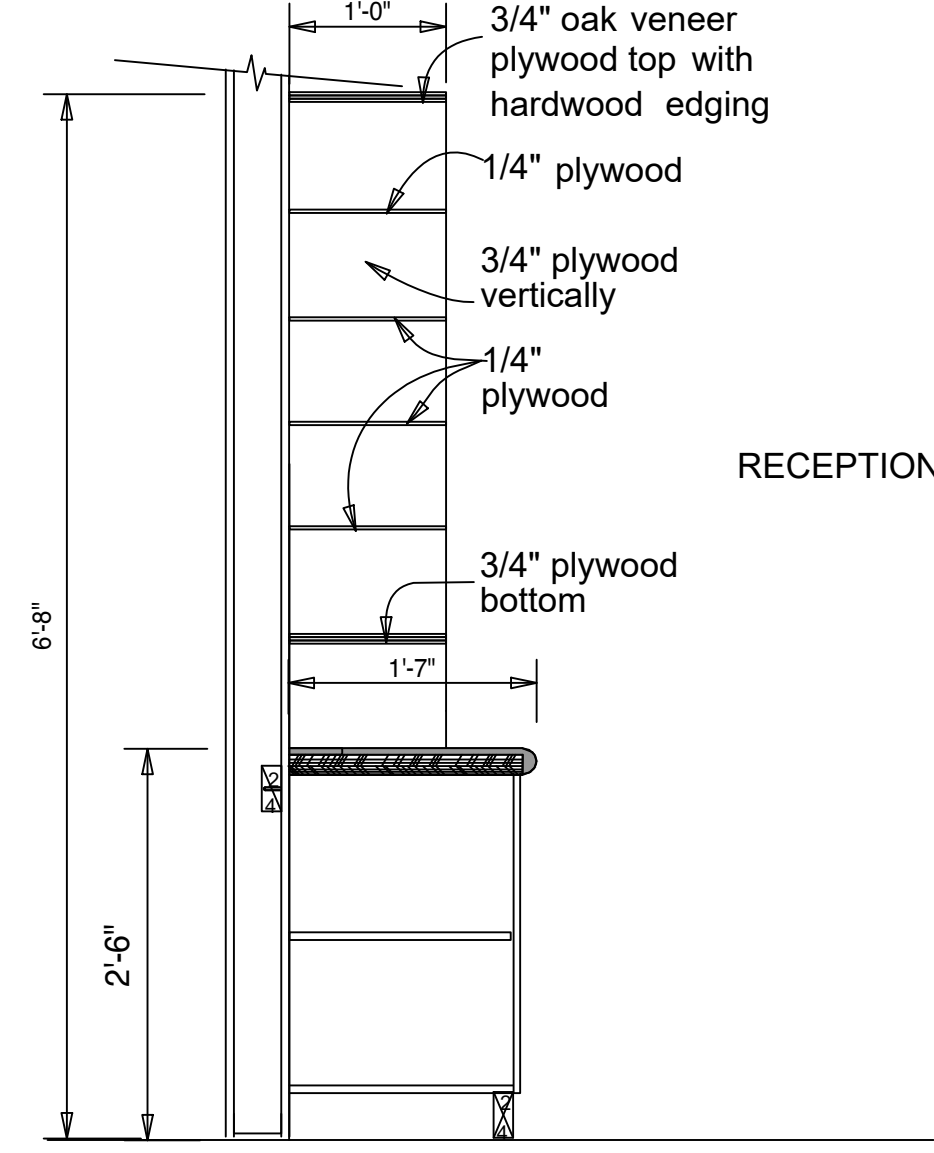
**7 Plan Detail: Steel Post, typ. of 5**  
SCALE 3"=1'-0"



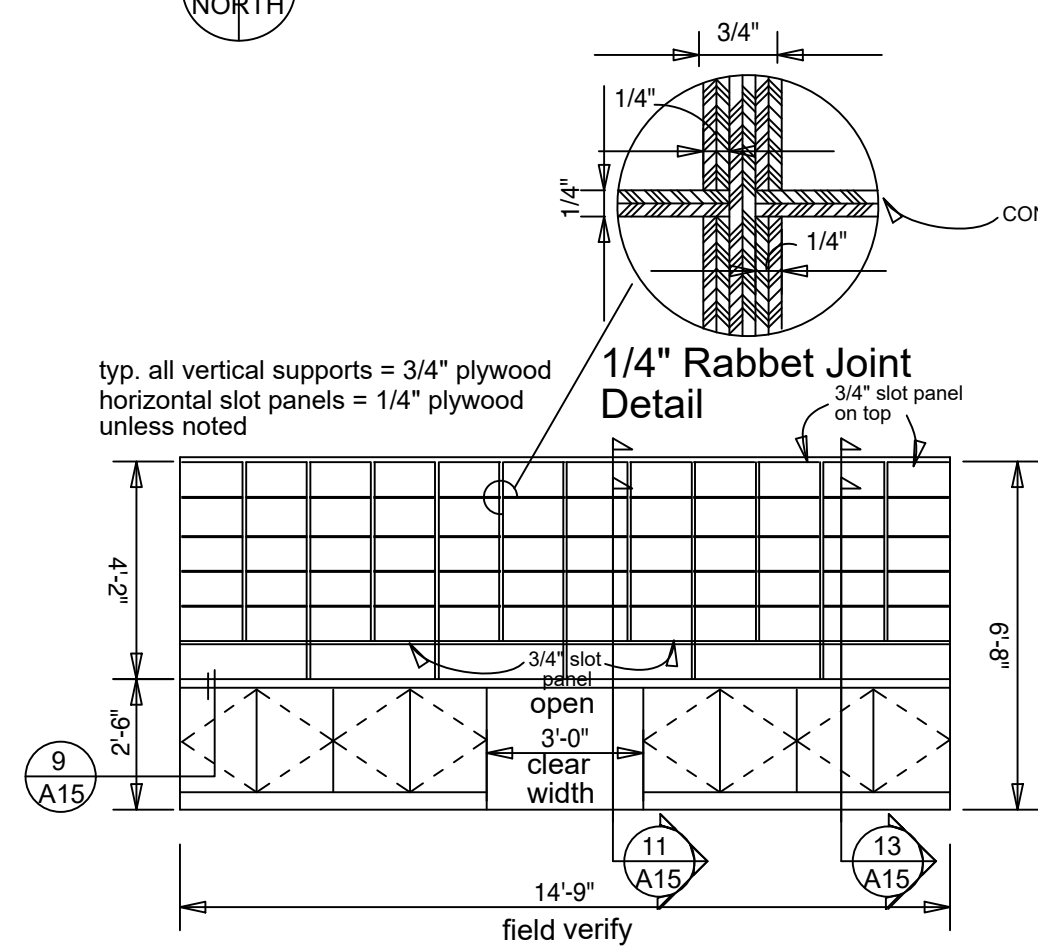
**10 Typical Counter Section**  
SCALE 3"=1'-0"



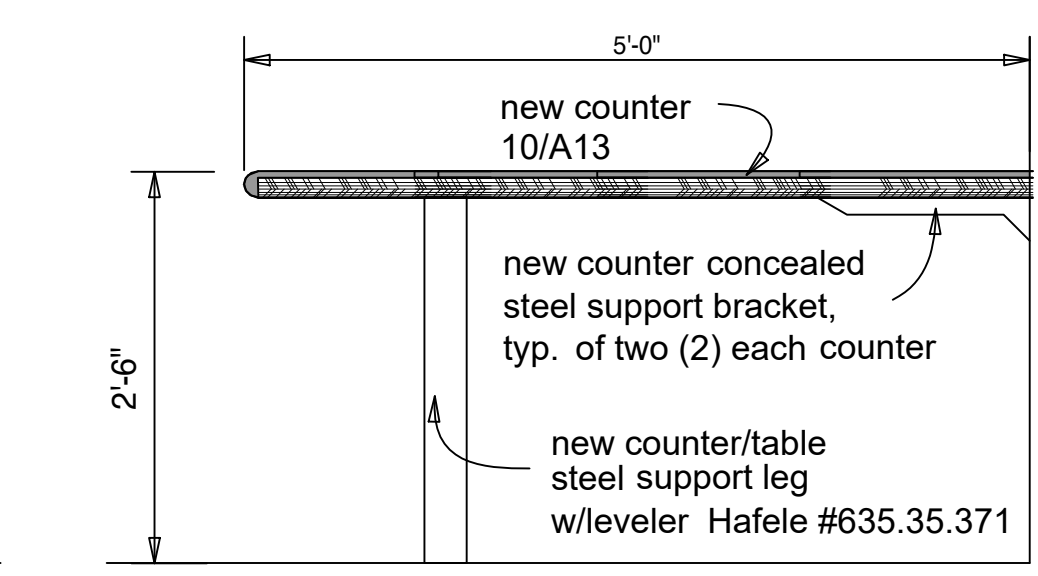
**11 New Mail Slots & Cabinets**  
SCALE 3/4"=1'-0"



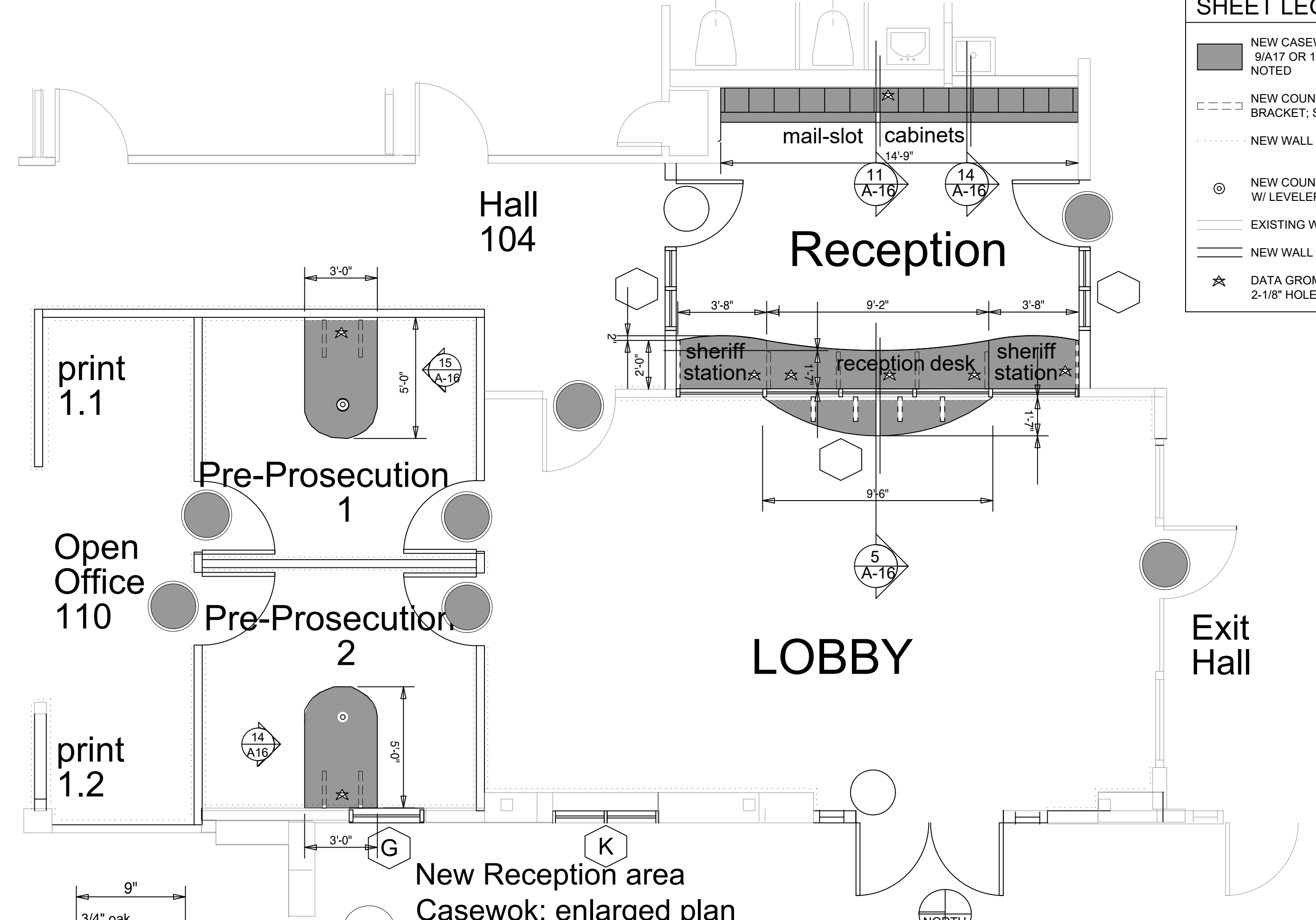
**13 New Mail Slots & Cabinets**  
SCALE 3/4"=1'-0"



**12 New Mail Slots Elevations**  
Note: provide hardwood edging for exposed plywood edges, typ. 1/4" = 1'-0"

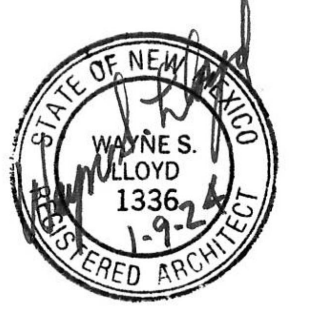


**14 Counter Front Elevation**  
SCALE 3/4"=1'-0"



**1 New Reception area Casework: enlarged plan**  
SCALE 1/4"=1'-0"

**Lloyd & Associates**  
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Current Status:  
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Drawn by: **KL**  
Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**CASEWORK PLANS & DETAILS**

Job Number: **2021-41**

Sheet No.

**A-14**

PLOT DATE: Jan 09, 2024, 9:14am  
FILENAME: X:\2021-41 Santa Fe Office Reno\CAD Files\_SHEETS\2021-41\_A-14.dwg



PLOT DATE: Jan 09, 2024, 9:14am  
 FILENAME: X:\2021-41 Santa Fe Office Reno\CAD Files\_SHEETS\2021-41\_A-15.dwg

ROOM FINISH SCHEDULE					
FLOOR LEVEL	ROOM NAME	FLOOR FINISH	FLOOR BASE	WALL FINISH	NOTES
1	EXIT HALL	EXISTING	WB-1	PT-2	-
1	RECEPTION	CPT-3	WB-1	PT-3	-
1	LOBBY	CPT-3	WB-1	PT-3	-
1	WAITING ROOM	CPT-3	WB-1	PT-3	-
1	INTERVIEW ROOM 101	CPT-3	WB-1	PT-3	-
1	OFFICE 102	CPT-1	WB-1	PT-1	-
1	OFFICE 103	CPT-1	WB-1	PT-1	-
1	CLOSET 1	VCT-1	RB-1	PT-7	-
1	OFFICE HALL 1	CPT-2	WB-1	PT-2	-
1	STAIR 1.1	VCT-1	RB-1	PT-7	-
1	BOILER	VCT-1	RB-1	PT-7	-
1	MEN 1.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
1	WOMEN 1.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
1	JANITOR 1	VCT-1	RB-1	PT-7	-
1	RESTROOM HALL 1	CPT-2	WB-1	PT-2	-
1	OFFICE 104	CPT-1	WB-1	PT-1	-
1	OFFICE 105	CPT-1	WB-1	PT-1	-
1	OFFICE 106	CPT-1	WB-1	PT-1	-
1	OFFICE 107	CPT-1	WB-1	PT-1	-
1	OFFICE 108	CPT-1	WB-1	PT-1	-
1	OFFICE 109	CPT-1	WB-1	PT-1	-
1	OPEN OFFICE 110	CPT-2	WB-1	PT-2	-
1	PRINT 1.1	CPT-3	WB-1	PT-3	-
1	PRINT 1.2	CPT-3	WB-1	PT-3	-
1	PRE-PROSECUTION 1	CPT-3	WB-1	PT-3	-
1	PRE-PROSECUTION 2	CPT-3	WB-1	PT-3	-
1	STAIR 2.1	VCT-1	RB-1	PT-7	-
1	STORAGE A	VCT-1	RB-1	PT-7	-
1	OFFICE CIRCULATION 1	CPT-2	WB-1	PT-2	-
1	JAN 1.2	VCT-1	RB-1	PT-7	-
1	OFFICE 113	CPT-1	WB-1	PT-1	-
1	OFFICE 114	CPT-1	WB-1	PT-1	-
1	OFFICE 115	CPT-1	WB-1	PT-1	-
1	OFFICE 116	CPT-1	WB-1	PT-1	-
1	OFFICE 117	CPT-1	WB-1	PT-1	-
1	OFFICE 118	CPT-1	WB-1	PT-1	-
1	NEW OFFICE 119	CPT-1	WB-1	PT-1	-
1	OFFICE 120	CPT-1	WB-1	PT-1	-
1	LOUNGE 1	CPT-3	WB-1	PT-3	-
1	PANEL ROOM 1	VCT-1	RB-1	PT-7	-
1	WOMEN 1.2	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
1	MEN 1.2	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
1	OFFICE VESTIBULE	CPT-2	WB-1	PT-2	-
1	HALL 104	CPT-2	WB-1	PT-2	-
1	STAIR 3	VCT-1	RB-1	PT-7	-
1	NEW OFFICE 112	CPT-1	WB-1	PT-1	-
1	STORAGE B	VCT-1	RB-1	PT-7	-
1	ELEV. EQUIP	EXISTING	EXISTING	EXISTING	-
2	STAIR 1.2	VCT-1	RB-1	PT-7	-
2	OPEN OFFICE 200	CPT-2	WB-1	PT-2	-
2	OFFICE 202	CPT-1	WB-1	PT-1	-
2	OFFICE 201	CPT-1	WB-1	PT-1	-
2	OFFICE 203	CPT-1	WB-1	PT-1	-
2	OFFICE 204	CPT-1	WB-1	PT-1	-
2	VICTIM'S CONFERENCE	CPT-3	WB-1	PT-3	-
2	OFFICE 205	CPT-1	WB-1	PT-1	-
2	LARGE CONFERENCE ROOM	CPT-3	WB-1	PT-3	-
2	OFFICE HALL 2	CPT-2	WB-1	PT-2	-
2	OFFICE HALL 2.1	CPT-2	WB-1	PT-2	-
2	BATH ALCOVE	CPT-2	WB-1	PT-2	-
2	COFFEE 2.2	CPT-3	WB-1	PT-3	-
2	JAN 2.1	VCT-1	RB-1	PT-7	-
2	WOMEN 2.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
2	MEN 2.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
2	OFFICE 206	CPT-1	WB-1	PT-1	-
2	OFFICE 207	CPT-1	WB-1	PT-1	-
2	OFFICE 208	CPT-1	WB-1	PT-1	-
2	OFFICE 209	CPT-1	WB-1	PT-1	-
2	OFFICE 210	CPT-1	WB-1	PT-1	-
2	OPEN OFFICE 211	CPT-2	WB-1	PT-2	-
2	STAIR 2.2	VCT-1	RB-1	PT-7	-
2	OFFICE 212	CPT-1	WB-1	PT-1	-
2	OFFICE 213	CPT-1	WB-1	PT-1	-
2	OFFICE 214	CPT-1	WB-1	PT-1	-
2	OFFICE 215	CPT-1	WB-1	PT-1	-
2	OFFICE 216	CPT-1	WB-1	PT-1	-
2	OFFICE 217	CPT-1	WB-1	PT-1	-
2	OFFICE 218	CPT-1	WB-1	PT-1	-
2	OFFICE 219	CPT-1	WB-1	PT-1	-
2	OPEN OFFICE 220	CPT-2	WB-1	PT-2	-
2	LOUNGE 2	CPT-3	WB-1	PT-3	-
2	STORAGE 2	VCT-1	RB-1	PT-7	-
2	HALL 2.2	CPT-2	WB-1	PT-2	-
2	WOMEN 2.2	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
2	MEN 2.2	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
2	STAIR 3.2	VCT-1	RB-1	PT-7	-
3	STAIR 1.3	VCT-1	RB-1	PT-7	-
3	OPEN OFFICE 301	CPT-3	WB-1	PT-3	-
3	OFFICE 302	CPT-1	WB-1	PT-1	-
3	OFFICE 303	CPT-1	WB-1	PT-1	-
3	LEROY'S OFFICE	CPT-1	WB-1	PT-1	-
3	OFFICE 304	CPT-1	WB-1	PT-1	-
3	LIBRARY	CPT-3	WB-1	PT-3	-
3	ELEV. HALL 3	CPT-2	WB-1	PT-2	-
3	RESTROOM HALL 3	CPT-2	WB-1	PT-2	-
3	JAN. 3.1	VCT-1	RB-1	PT-7	-
3	MEN 3.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
3	WOMEN 3.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
3	WOMEN'S LOUNGE	CFT-1	CTB-1	PT-3	-
3	OPEN OFFICE	CPT-2	WB-1	PT-2	-
3	OFFICE 305	CPT-1	WB-1	PT-1	-
3	OFFICE 306	CPT-1	WB-1	PT-1	-
3	OFFICE 307	CPT-1	WB-1	PT-1	-
3	OFFICE 308	CPT-1	WB-1	PT-1	-
3	OFFICE 309	CPT-1	WB-1	PT-1	-
3	OFFICE 310	CPT-1	WB-1	PT-1	-
3	BATH 3.1	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
3	BATH 3.2	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
3	COFFEE 3	CPT-3	WB-1	PT-3	-
3	DA LOBBY	CPT-2	WB-1	PT-2	-
3	OFFICE 311	CPT-1	WB-1	PT-1	-
3	DA OFFICE VESTIBULE	CPT-1	WB-1	PT-1	-
3	DA OFFICE	CPT-1	WB-1	PT-1	-
3	DA BATHROOM	CFT-1	CTB-1	PT-3	CERAMIC TILE WAINSCOTING
3	STAIR 2.3	VCT-1	RB-1	PT-7	-

**GENERAL SHEET NOTES**

A. ONE ACCENT WALL COLOR PROVIDED PER OFFICE AND COMMON AREA.

B. TYP. WALL PAINT FINISH IS EGGSHELL.

C. TYP. CEILING FINISH IS FLAT.

D. SEE SPECIFICATIONS FOR ADDITIONAL FINISH REQUIREMENTS.

E. ANY MANUFACTURER LISTED IS A BASIS OF DESIGN THAT CAN BE SUBSTITUTED FOR APPROVED EQUAL WITH SUBSTITUTION REQUEST TO ARCHITECT.

FINISH LEGEND						
FLOOR FINISHES						
MARK	MATERIAL TYPE	MANUFACTURER	MANUFACTURER STYLE	COLOR	UNIT SIZE	NOTES
CPT-1	COMMERCIAL FLOOR CARPET-OFFICES	INTERFACE (BASIS OF DESIGN)	HARMONIZE (BASIS OF DESIGN)	STD.	PLANK	-
CPT-2	COMMERCIAL FLOOR CARPET-HALLWAYS	INTERFACE (BASIS OF DESIGN)	HARMONIZE (BASIS OF DESIGN)	STD.	PLANK	-
CPT-3	COMMERCIAL FLOOR CARPET COMMON AREAS	INTERFACE (BASIS OF DESIGN)	HARMONIZE (BASIS OF DESIGN)	STD.	PLANK	-
CFT-1	CERAMIC FLOOR TILE	*	*	STD.	12"x12"	-
VCT-1	VINYL COMPOSITION TILE			STD.	24"x24"	-
FLOOR BASE FINISHES						
CTB-1	CERAMIC TILE BASE	*	*	STD.	4"x8"	BULLNOSE - MATCH COLOR OF CFT
WB-1	WOOD BASE	*	*	*	*	-
RB-1	RUBBER BASE	*	*	STD.	*	-
CASEWORK FINISHES (SEE SHEET A-15)						
WD-1	OAK VENEER PLYWOOD	*	FINISH GRADE (7 LAYER)	STD.	¾" THICK	WITH EDGE BANDING AND CLEAR FINISH
QC-1	CORRIAN QUARTZ COUNTER TOP	*	*	STD.	½" THICK	WITH EDGING
INTERIOR WALL FINISHES						
P-1	LATEX PAINT IN OFFICES	*	LOW V.O.C.	STD.	*	-
P-2	LATEX PAINT IN HALLWAYS	*	LOW V.O.C.	STD.		
P-3	LATEX PAINT IN COMMON AREAS	*	LOW V.O.C.	STD.		
P-4	LATEX PAINT ACCENT WALLS ONE PER OFFICE AND COMMON ROOM	*	LOW V.O.C.	STD.		
P-5	LATEX PAINT ACCENT WALLS ONE PER OFFICE AND COMMON ROOM	*	LOW V.O.C.	STD.		
P-6	LATEX PAINT ACCENT WALLS ONE PER OFFICE AND COMMON ROOM	*	LOW V.O.C.	STD.		
P-7	LATEX RESILIENT PAINT (IN UTILITY AREAS)	*	LOW V.O.C.	STD.	*	-
WBB-1	BEAD BOARD WAINSCOTING	*	*	STD.	*	-
CWT-1	CERAMIC WALL TILE	*	*	STD.	2"x2"	-
CEILING FINISHES (SEE SHEET A-5 AND A-6 FOR CEILING FINISHES)						
PC-1	LATEX PAINT AT GYPSUM CEILINGS	*	LOW V.O.C.	*		
ACT-1	ACOUSTICAL CEILING TILES AND GRID	*	MATCH EXISTING	*	MATCH EXISTING	MATCH EXISTING

**FLOOR & WALL TILE**

1) EMSER TILE

2) DAL TILE

3) SURFACE

OR APPROVED EQUAL

**VINYL:**

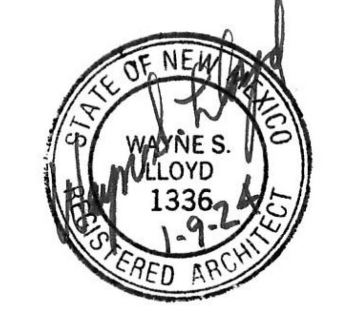
1) CONGOLEM

2) MENARDS

3) NEXUS

OR APPROVED EQUAL

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NO.	DATE	DESCRIPTION	BY

Drawn by: **KL**  
 Checked by: **WL/SM**

Date: **01-05-2024**

Sheet Title:  
**FINISH LEGEND & SCHEDULE**

Job Number: **2021-41**

Sheet No.

**A-15**

## MECHANICAL GENERAL NOTES

- COORDINATE THE LOCATIONS OF ALL DUCTWORK WITH ANY PLUMBING LINES AND ELECTRICAL CONDUIT. VERIFY EXACT JOIST SPACE AND DEPTH, STRUCTURAL CONDITIONS, CEILING HEIGHTS, ETC., TO DETERMINE SPACE LIMITATIONS AND DUCTWORK ROUTING BEFORE BEGINNING ANY WORK. IN THE EVENT THAT ANY DUCT CANNOT BE ROUTED AS SHOWN ON THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL MODIFY THE DUCT AS REQUIRED, MAINTAINING THE SAME NET INSIDE CLEAR FREE AREA AS THE DESIGNED DUCT.
- ALL RECTANGULAR SUPPLY AND RETURN AIR DUCTWORK SHALL BE INSULATED INTERNALLY WITH ACOUSTICAL LINING PER THE SPECIFICATIONS. THE DUCTWORK DESIGN SIZES REFLECT INTERIOR CLEAR FREE DIMENSIONS WITH ACOUSTICAL LINING.
- ALL DUCTWORK INSTALLED SHALL BE ROUTED BETWEEN LIGHTS AS MUCH AS POSSIBLE AND INSTALLED AS HIGH AS POSSIBLE.
- ALL DUCTWORK PENETRATIONS THROUGH THE ROOF SHALL BE CURBED, FLASHED AND COUNTERFLASHED TO ACHIEVE A WATERTIGHT CONSTRUCTION. CAREFULLY COORDINATE ALL ROOF PENETRATIONS WITH THE OWNER, ROOF CONSTRUCTION, STRUCTURAL CONDITIONS, JOISTS, ETC. ALL PENETRATIONS THROUGH THE ROOF SHALL BE FRAMED AS DIRECTED BY THE OWNER. ALL ROOFING WORK SHALL BE APPROVED BY THE OWNER AND BY OWNERS' CONTRACTOR AT THIS CONTRACTORS EXPENSE. VERIFY EXACT REQUIREMENTS BEFORE SUBMITTING BID.
- PRIOR TO CONTRACTOR ORDERING ANY GRILLES, REGISTERS OR DIFFUSERS, HE SHALL VERIFY THE CEILING CONSTRUCTION IN ALL AREAS OF THE PROJECT. IF GRILLES, REGISTERS OR DIFFUSERS SPECIFIED ARE NOT COMPATIBLE WITH THE TYPE OF CEILING CONSTRUCTION, THE CONTRACTOR SHALL ORDER PROPER TYPE OF GRILLE, REGISTER OR DIFFUSER TO BE COMPATIBLE WITH THE CEILING. PAINT ALL EXPOSED DUCTWORK, PIPING, DIFFUSERS, GRILLES, ETC., AS DIRECTED BY THE OWNER (VERIFY EXACT REQUIREMENTS BEFORE SUBMITTING BID AND BEGINNING ANY WORK).
- CAREFULLY COORDINATE EXACT LOCATION OF ALL DIFFUSERS, GRILLES, AND REGISTERS TO BE SYMMETRICAL WITH RESPECT TO LIGHTS, CEILING, PIPING AND STRUCTURAL CONDITIONS. SEE REFLECTED CEILING PLAN AND LIGHTING PLAN.
- INSTALL "SPIN-IN" TYPE FITTINGS WITH BALANCING DAMPERS FOR ROUND BRANCH DUCTWORK RUNOUTS TO EACH DIFFUSER. A. BRANCH DUCTS TO DIFFUSER A SHALL BE EQUAL SIZE TO THE NECK DIAMETER.
- FLEXIBLE ROUND DUCT BRANCHES TO DIFFUSERS A SHALL BE PREINSULATED AND SHALL NOT EXCEED 5 (FIVE) FEET IN TOTAL LENGTH.
- ALL DUCT SEAMS SHALL BE SEALED AIRTIGHT WITH A WATER BASED MASTIC HIGH PRESSURE DUCT SEALER AND HIGH VELOCITY TAPE.
- PROVIDE ALL NECESSARY FITTINGS FOR RISES AND OFFSETS IN DUCTWORK AND PIPING REQUIRED FOR PROPER INSTALLATION WHETHER OR NOT SHOWN ON THE DRAWINGS.
- ALL 90 DEGREE SQUARE ELBOWS IN SUPPLY OR EXHAUST DUCTWORK SHALL BE PROVIDED WITH DOUBLE THICK TURNING VANES.
- ALL FIRE/SMOKE DAMPERS AND CEILING RADIATION DAMPERS (AS APPLICABLE) SHALL BE INSTALLED IN A U.L. APPROVED MANNER AND SHALL BE U.L. LISTED.
- CONTRACTOR SHALL VERIFY THAT ALL PIPING ROUTED THROUGH CEILING SPACE USED AS A RETURN AIR PLENUM (AS APPLICABLE) IS NONCOMBUSTIBLE. ALL NONCOMBUSTIBLE PIPING SHALL BE WRAPPED WITH FIRE WRAP INSULATION MATERIAL TO MEET FIRE RATING AS REQUIRED.
- PROVIDE ACCESS DOORS IN FIXED CEILINGS, CHASES AND DUCTWORK TO ALL FIRE DAMPERS, BALANCING DAMPERS OR OTHER MECHANICAL DEVICES REQUIRING SERVICE ACCESS.
- MECHANICAL EQUIPMENT SUPPLIER SHALL FURNISH TO THE CONTRACTOR, COMPLETE WIRING, PIPING AND INSTALLATION DIAGRAMS AS REQUIRED.
- ALL DISCONNECTS (AS APPLICABLE) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. VERIFY EXACT ELECTRICAL CHARACTERISTICS, ETC., BEFORE SUBMITTING BID AND ORDERING EQUIPMENT. COORDINATE INSTALLATION OF ALL MECHANICAL EQUIPMENT WITH THE ELECTRICAL CONTRACTOR.
- INSTALL SEVEN DAY PROGRAMMABLE THERMOSTATS EQUIVALENT TO HONEYWELL. EXACT THERMOSTAT LOCATIONS AND HEIGHTS (48" AFF) SHALL BE AS DIRECTED BY THE OWNER. INSTALL LOCKING VENTILATING COVER ON EACH THERMOSTAT. VERIFY BEFORE BEGINNING ANY WORK.
- DO NOT SCALE DRAWINGS FOR EXACT DIMENSIONS AND/OR LOCATIONS. REFER TO ARCHITECTURAL DRAWINGS ONLY FOR DIMENSIONS.
- SCHEDULE ALL WORK WITH THE OWNER AND CONFORM TO OWNER'S REQUIREMENTS.



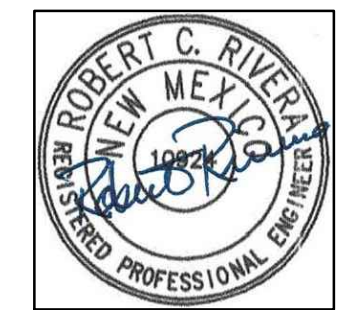
## KEYED NOTES

- COORDINATE THE INSTALLATION AND LOCATION OF THE WALL MOUNTED INDOOR HEAT PUMP AIR CONDITIONING UNIT WITH THE OWNER AND ARCHITECT.
- ROUTE THE CONDENSATE DRAIN PIPING FROM THE INDOOR HEAT PUMP UNIT TO LAVATORY TAILPIECE DRAIN PIPING OR TO OUTSIDE WITH AIR GAP AS REQUIRED.
- COORDINATE THE INSTALLATION OF VRF OUTDOOR UNIT EQUIPMENT AND VRF INDOOR UNIT SYSTEMS WITH THE SUPPLIER. TYPICAL.

## HVAC SYMBOLS

SYMBOL	DESCRIPTION
	SUPPLY AIR DIFFUSER
	RETURN OR EXHAUST AIR GRILLE
	SIDEWALL SUPPLY AIR REGISTER
	SIDEWALL RETURN AIR GRILLE
	SUPPLY DUCT (UP) CROSS SECTION
	SUPPLY DUCT (DOWN) CROSS SECTION
	RETURN OR EXHAUST DUCT (UP) CROSS SECTION
	RETURN DUCT (DOWN) CROSS SECTION
	DUCT (UP) CROSS SECTION
	DUCT (DOWN) CROSS SECTION
	SUPPLY DIFFUSER 200 CFM FLEX DUCT RUNOUT BALANCING DAMPER SIZE 16"
	FIRE DAMPER FOR FIRE RATED WALL
	THERMOSTAT
	DUCT (1ST FIGURE, SIDE SHOW 2ND FIGURE, SIDE NOT SHOWN)
	FLEXIBLE CONNECTION
	POINT OF CONNECTION

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Sheet Title:

**MECHANICAL  
HVAC FIRST  
FLOOR PLAN**

Job Number: 2021-41

Sheet No.

**M-1**

M1 MECHANICAL HVAC - FIRST FLOOR PLAN



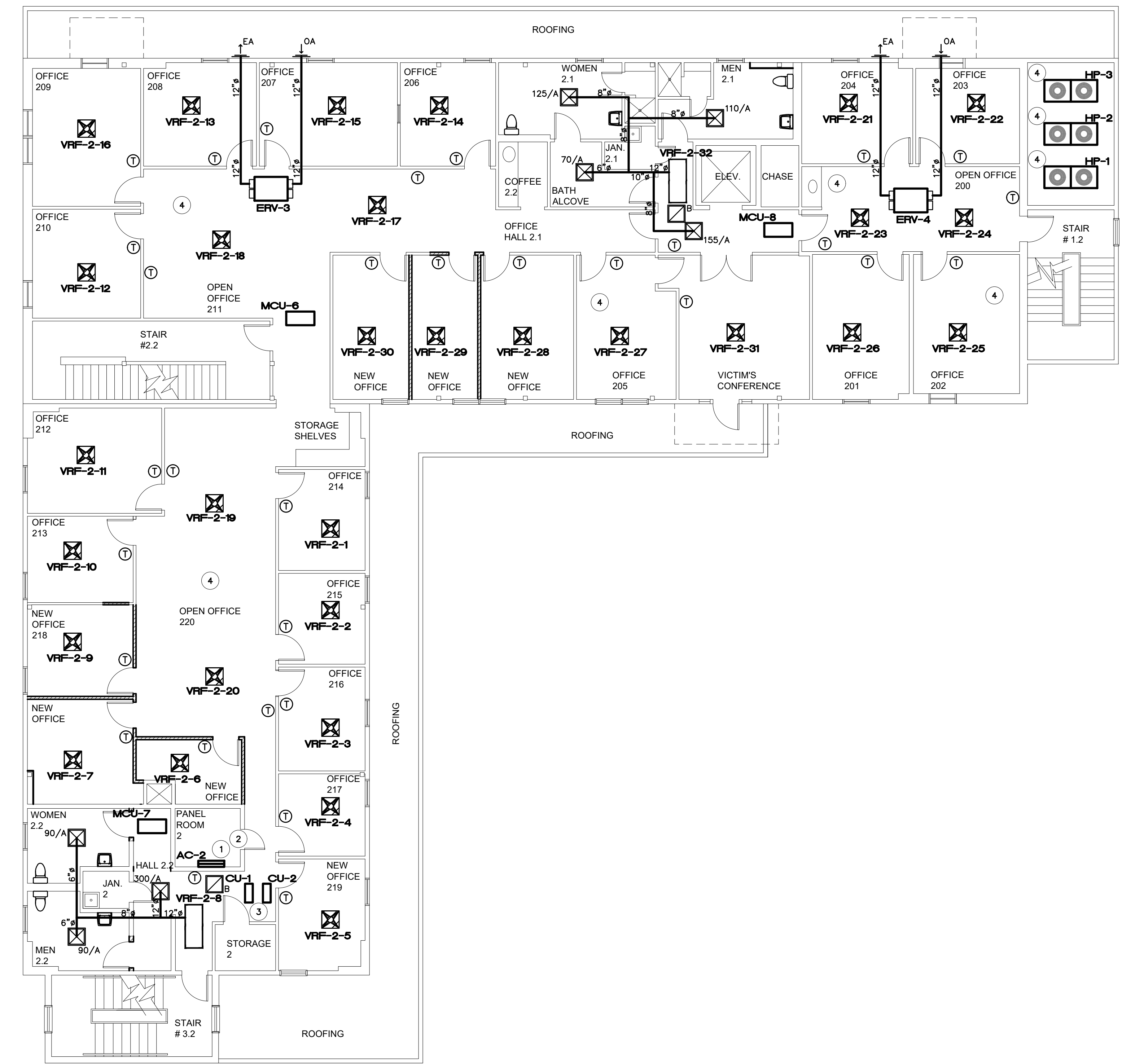
PROJECT  
NORTH

1/8" = 1'-0"  
SCALE: 1/8" = 1'-0"



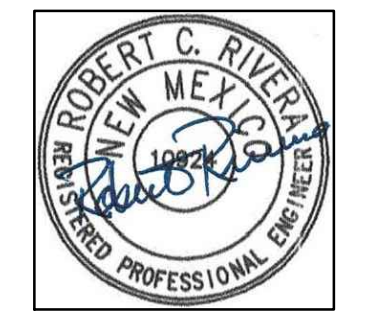
KEYED NOTES

- COORDINATE THE INSTALLATION AND LOCATION OF THE WALL MOUNTED INDOOR HEAT PUMP AIR CONDITIONING UNIT WITH THE OWNER AND ARCHITECT.
- ROUTE THE CONDENSATE DRAIN PIPING FROM THE INDOOR HEAT PUMP UNIT TO LAVATORY TAILPIECE DRAIN PIPING OR TO OUTSIDE WITH AIR GAP AS REQUIRED.
- LOCATE WALL MOUNTED HEAT PUMP CONDENSING UNIT(S) ON THE ROOF.
- COORDINATE THE INSTALLATION OF VRF OUTDOOR UNIT EQUIPMENT AND VRF INDOOR UNIT SYSTEMS WITH THE SUPPLIER. TYPICAL.



HVAC SYMBOLS	
SYMBOL	DESCRIPTION
	SUPPLY AIR DIFFUSER
	RETURN OR EXHAUST AIR GRILLE
	SIDEWALL SUPPLY AIR REGISTER
	SIDEWALL RETURN AIR GRILLE
	SUPPLY DUCT (UP) CROSS SECTION
	SUPPLY DUCT (DOWN) CROSS SECTION
	RETURN OR EXHAUST DUCT (UP) CROSS SECTION
	RETURN DUCT (DOWN) CROSS SECTION
	DUCT (UP) CROSS SECTION
	DUCT (DOWN) CROSS SECTION
	SUPPLY DIFFUSER — CFM — FLEX DUCT RUNNOUT — BALANCING DAMPER — SIZE
	FIRE DAMPER FOR FIRE RATED WALL
	THERMOSTAT
	DUCT (1ST FIGURE, SIDE SHOWN 2ND FIGURE, SIDE NOT SHOWN)
	FLEXIBLE CONNECTION
	POINT OF CONNECTION

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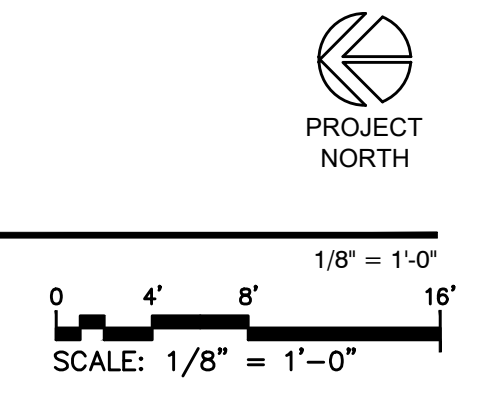
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Sheet Title:  
**MECHANICAL HVAC SECOND FLOOR PLAN**

Job Number: 2021-41  
 Sheet No.

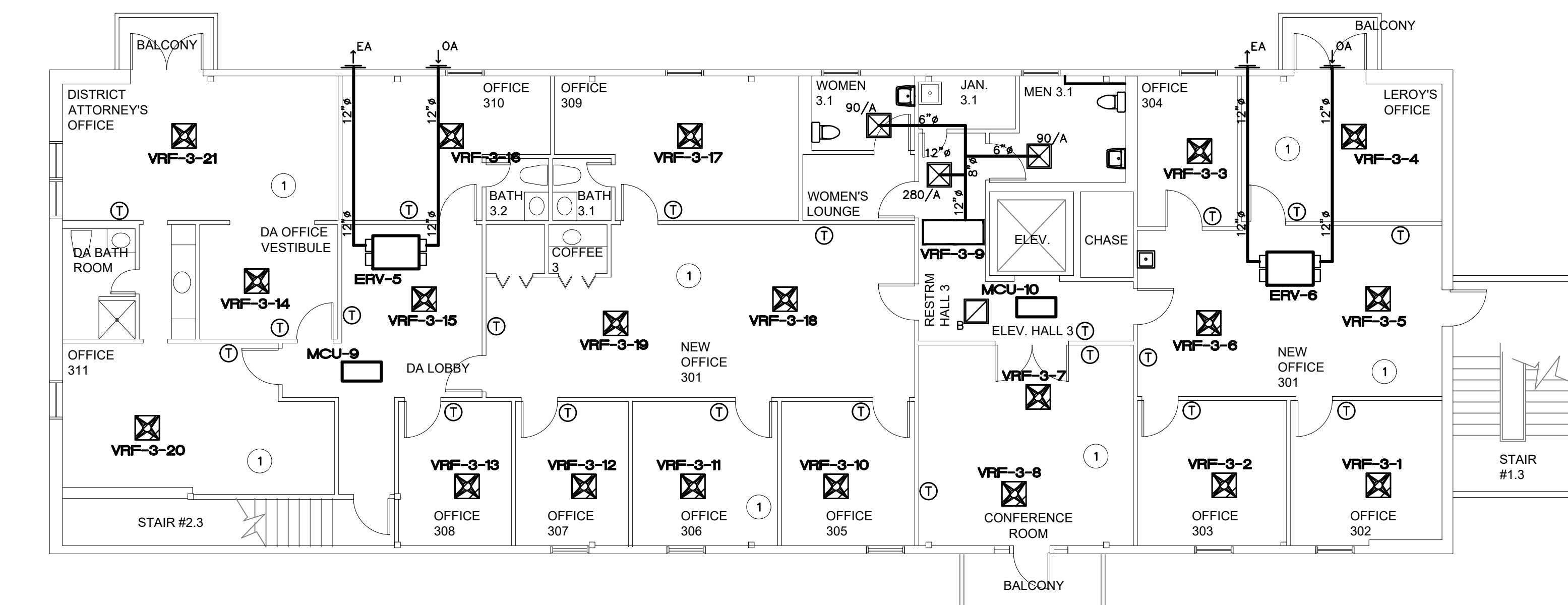
**M-2**

M2 MECHANICAL HVAC - SECOND FLOOR PLAN

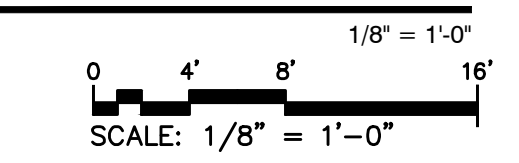


**KEYED NOTES**

- 1 COORDINATE THE INSTALLATION OF VRF OUTDOOR UNIT EQUIPMENT AND VRF INDOOR UNIT SYSTEMS WITH THE SUPPLIER. TYPICAL.

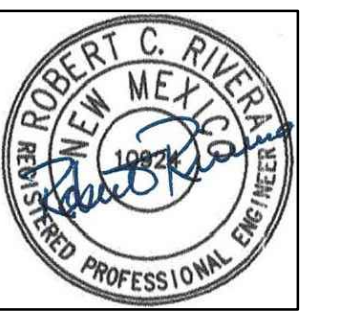


**M3 MECHANICAL HVAC - THIRD FLOOR PLAN**



HVAC SYMBOLS	
SYMBOL	DESCRIPTION
	SUPPLY AIR DIFFUSER
	RETURN OR EXHAUST AIR GRILLE
	SIDEWALL SUPPLY AIR REGISTER
	SIDEWALL RETURN AIR GRILLE
	SUPPLY DUCT (UP) CROSS SECTION
	SUPPLY DUCT (DOWN) CROSS SECTION
	RETURN OR EXHAUST DUCT (UP) CROSS SECTION
	RETURN DUCT (DOWN) CROSS SECTION
	DUCT (UP) CROSS SECTION
	DUCT (DOWN) CROSS SECTION
	SUPPLY DIFFUSER 200 CFM FLEX DUCT RUNNOUT BALANCING DAMPER 6" SIZE
	FIRE DAMPER FOR FIRE RATED WALL
	THERMOSTAT
	DUCT (1ST FIGURE, SIDE SHOWN 2ND FIGURE, SIDE NOT SHOWN)
	FLEXIBLE CONNECTION
	POINT OF CONNECTION

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Sheet Title:  
**MECHANICAL HVAC THIRD FLOOR PLAN**

Job Number: 2021-41

Sheet No.

**M-3**







Variable Refrigerant Flow (VRF) Outdoor Unit Schedule																											
Equipment Name	Manufacturer	Model Code	Product Description	Refrigerant	Rated Performance				Correction Capacity Value in Design Condition				Fan		Electricity Characteristic					Noise (H)	Weight (lbs)	Refrigerant Pipe			Water Pipe (in)	Note	
					Ton	Cooling	Heating	Efficiency	Cooling		Heating		Airflow (CFM)	Power (V)	Phase	Frequency (Hz)	MCA (A)	MOP (A)	SCCR (A)			Liquid (in)	Gas (in)	H.P. Gas (in)			
						(Btu/h)	(Btu/h)	EER	COP	TOTAL (Btu/h)	EAT DB (°F)	TOTAL (Btu/h)															EAT DB (°F)
HP-3	Samsung	AM192BXVGFRAA	DVM S2 Heat Recovery	R410A	16	192000	216000	-	-	171292	90.0	200155	6.1	12855.00	208-230	3	60	60.00	70.00	-	-	837.76	5/8"	1 1/8"	1 1/8"	-	-
HP-1	Samsung	AM240BXVGFRAA	DVM S2 Heat Recovery	R410A	20	240000	270000	-	-	224584	90.0	260578	6.1	13773.00	208-230	3	60	68.00	80.00	-	-	857.60	5/8"	1 3/8"	1 1/8"	-	-
HP-2	Samsung	AM240BXVGFRAA	DVM S2 Heat Recovery	R410A	20	240000	270000	-	-	239359	90.0	276103	6.1	13773.00	208-230	3	60	68.00	80.00	-	-	857.60	5/8"	1 3/8"	1 1/8"	-	-

### MODE CONTROL UNIT(MCU)

MARK	CONDENSER SERVED	BASIS OF DESIGN		# OF PORTS	ELECTRICAL				DRAIN CONN (IN)	PIPE CONNECTION				APPROX. DIMENSIONS (LXWXH)	MAX WT. (LBS)	COMMENTS
		MFR	MODEL		VOLT	PH	MCA	MOCPP		OUTDOOR UNIT		INDOOR UNIT				
										LIQUID(IN)	GAS(IN)	LIQUID(IN)	GAS(IN)			
MCU-1	HP-1	SAMSUNG	MCU-S12NEK1UN	12	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	102	1 THRU 6
MCU-4	HP-1	SAMSUNG	MCU-S12NEK1UN	12	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	102	1 THRU 6
MCU-5	HP-1	SAMSUNG	MCU-S8NEK1UN	8	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	89	1 THRU 6
MCU-6	HP-2	SAMSUNG	MCU-S12NEK1UN	12	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	102	1 THRU 6
MCU-7	HP-2	SAMSUNG	MCU-S8NEK1UN	8	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	89	1 THRU 6
MCU-8	HP-2	SAMSUNG	MCU-S12NEK1UN	12	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	102	1 THRU 6
MCU-9	HP-3	SAMSUNG	MCU-S12NEK1UN	12	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	102	1 THRU 6
MCU-10	HP-3	SAMSUNG	MCU-S12NEK1UN	12	208/230	1	2	15	NONE	See Piping Schematic				19X39X12	102	1 THRU 6

EQUIPMENT PERFORMANCE SHALL MEET SPECIFIED RATINGS AT 7000 FEET ABOVE SEA LEVEL

**NOTES:**

- UNIT WILL BE MOUNTED IN THE CEILING SPACE. PROVIDE ACCESS FOR MAINTANENCE AND ACCESS TO ALL PORTS ON BC CONTROLLER6. SEE PIPING SCHEMATIC FOR OUTDOOR AND INDOOR LINE SIZES
- COORDINATE REFRIGERANT PIPING AND CONDENSATE DRAIN WITH OTHER TRADES.
- DISCONNECT BY ELECTRICAL.
- PROVIDE BALL VALVES WITH SCHRADER PORTS ON ALL PORTS INCLUDING ALL OPEN PORTS
- THE REFRIGERANT PIPE SIZES HALL COMFORM WITH MFR'S RECOMMENDATIONS.

### ENERGY RECOVERY VENTILATOR SCHEDULE

SYMBOL	LOCATION	SERVICE	CFM	S.P. IN. W.G.	EFF. %	FAN TYPE	DRIVE TYPE	MOTOR				EQUAL TO		
								HP	WATTS	FLA	MCA	VOLTS/ PHASE	MAKE	MODEL
ERV-1,2,3,4,5,6	CEILING SPACE	1ST, 2ND, 3RD FLR	480	.50	70	CENTRIFUGAL	DIRECT	0.6	544 W	7.0	8.8	120/1	S&P	TRC500

**NOTES:**

PROVIDE AND INSTALL ENERGY RECOVERY VENTILATOR SYSTEM(S) AS PER THE PLANS. CONSTRUCTION SHALL BE ALUMINUM OR GALVANIZED STEEL, AHRI 1060 CERTIFIED CORE, BACKDRAFT DAMPER(S), VIBRATION ISOLATORS, INTAKE AND DISCHARGE WALL LOUVERS.

INSTALL 7-DAY PROGRAMMABLE TIMECLOCK(S).  
UNIT MOUNTED WEATHERPROOF SAFETY DISCONNECT SWITCHES SHALL BE SUPPLIED AND CONNECTED BY THE ELECTRICIAN.

### INVERTER HEAT PUMP AIR CONDITIONING UNIT SCHEDULE

SYMBOL	LOCATION	CFM	TOTAL MBH	SENSIBLE MBH	HUMIDIFIER CAPACITY LBS/HR.	HEAT MBH	HUMIDITY KW	FAN FLA	VOLTS/ PHASE	FILTERS		EQUAL TO		REMARKS
										EFF. %	TYPE	MAKE	MODEL	
AC-1,2	PANEL ROOM(S)	330-215	8.7	7.1	--	9.4	--	0.2	240/1	30	WASHABLE	DAIKIN	FTXB09AXVJU	

**NOTES:**

FURNISH AND INSTALL WALL MOUNTED INVERTER HEAT PUMP UNITS WITH AUTOMATIC MICROPROCESSOR CONTROL. COORDINATE THE INSTALLATION OF THE UNIT AND REMOTE CONDENSER ON THE ROOF WITH THE ARCHITECT AND THE OWNER.

### AIR-COOLED CONDENSING UNIT SCHEDULE

SYMBOL	SERVES	NOM. TONS	REFRIG.	TOTAL COOLING MBH	AMB. TEMP. °F	FAN QTY	COMPRESSOR RLA	MCA AMPS	VOLTS/ PHASE	EQUAL TO		REMARKS
										MAKE	MODEL	
CU-1,2	AC-1,2	0.75	R-410A	8.7	95	1	6.75	6.95	240/1	DAIKIN	RXB09AXVJU	

**NOTES:**

FURNISH AND INSTALL OUTDOOR CONDENSING UNIT SYSTEM FOR LOW AMBIENT TEMPERATURE AREA AS SPECIFIED. COORDINATE INSTALLATION WITH THE ARCHITECT AND THE OWNER.

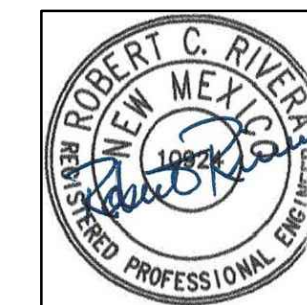
### GRILLE, REGISTER AND DIFFUSER SCHEDULE

SYMBOL	TYPE	SIZE	MATERIAL	FRAME	DAMPER	THROW PATTERN	DEFLECTION	FINISH	EQUAL TO		REMARKS
									MAKE	MODEL	
A	CEILING DIFFUSER	VARIES	STEEL	T-BAR	SPIN-IN	ADJUSTABLE	ADJUSTABLE	*	KRUEGER	1400	W/ PATTERN CONTROLLERS
B	RETURN AIR GRILLE	VARIES	ALUMINUM	T-BAR	-	-	-	*	KRUEGER	ECC-5	1/2"x1/2"x1/2" CORE SPACING

**FINISHES:**

SEMI-GLOSS WHITE FINISH

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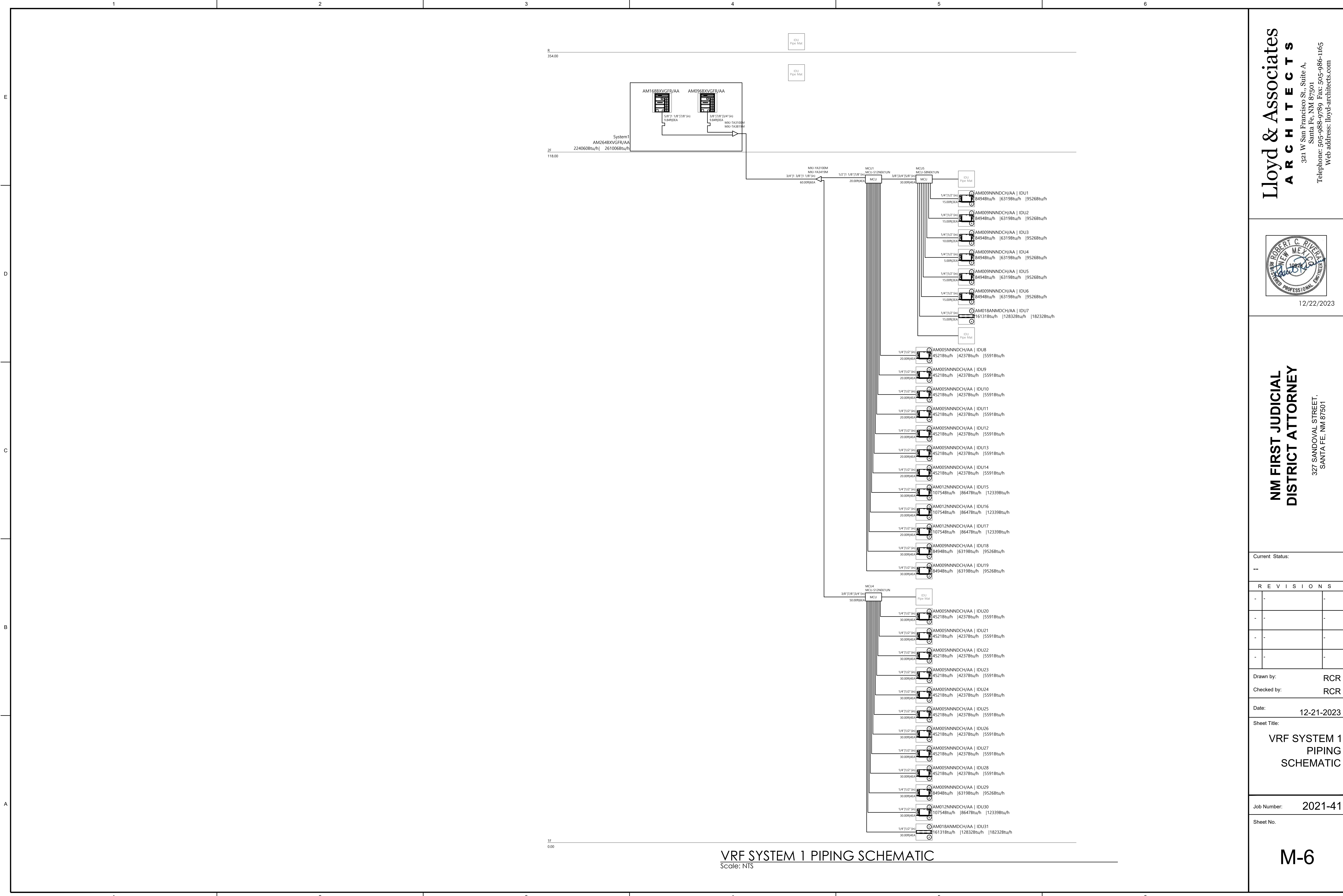
**MECHANICAL EQUIPMENT SCHEDULES**

Job Number: 2021-41

Sheet No.

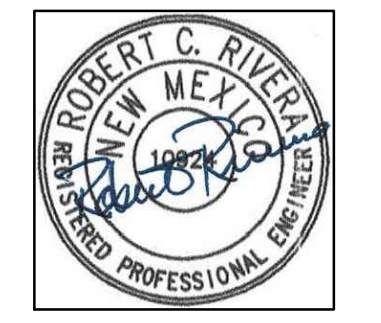
**M-5**





**VRF SYSTEM 1 PIPING SCHEMATIC**  
Scale: NTS

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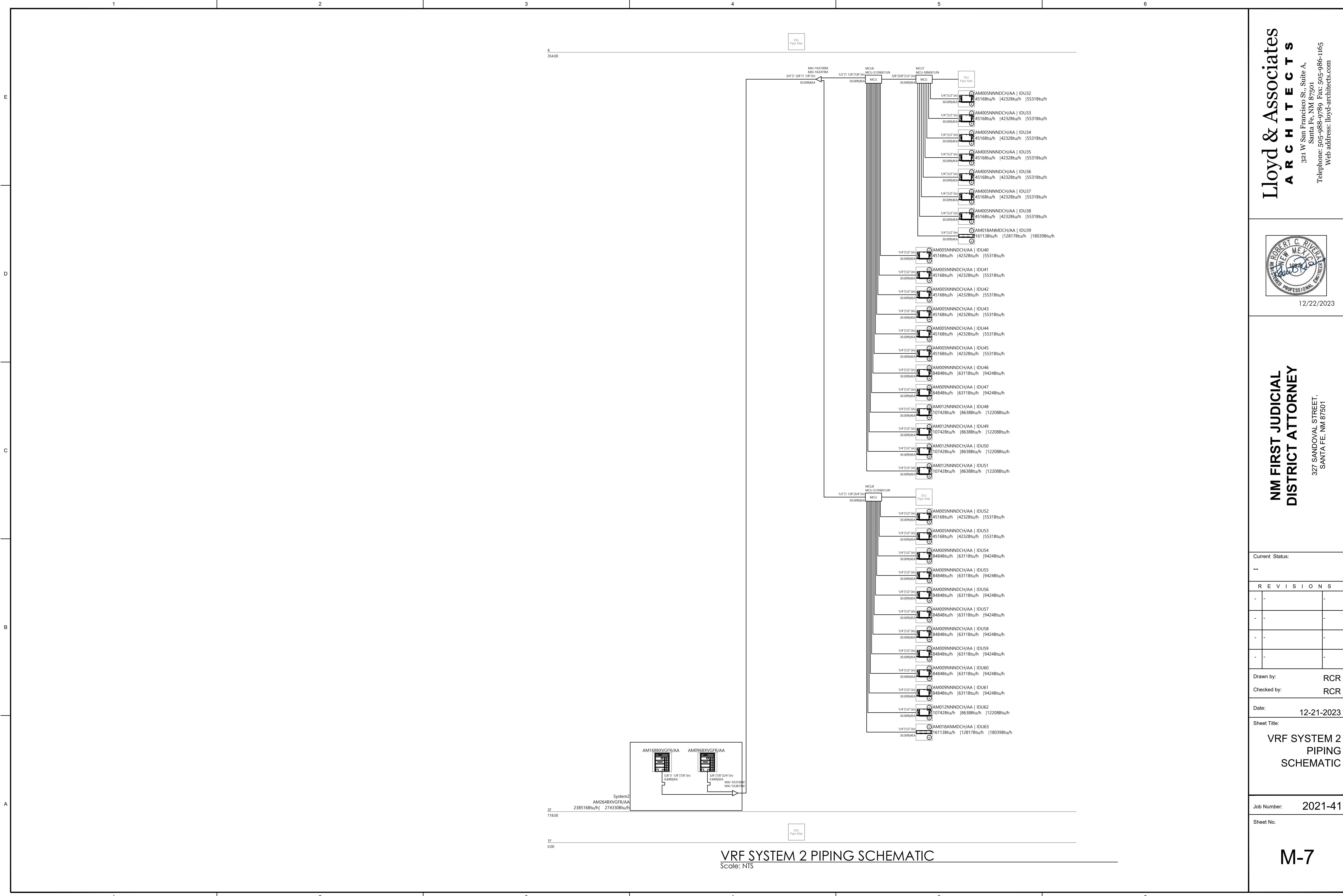
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Sheet Title:  
**VRF SYSTEM 1  
PIPING  
SCHEMATIC**

Job Number: **2021-41**

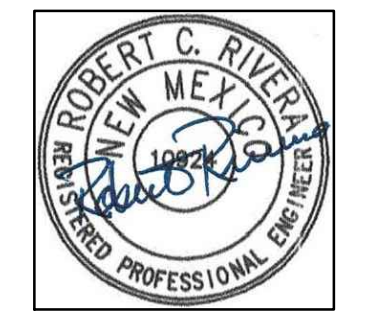
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**M-6**



**VRF SYSTEM 2 PIPING SCHEMATIC**  
Scale: NTS

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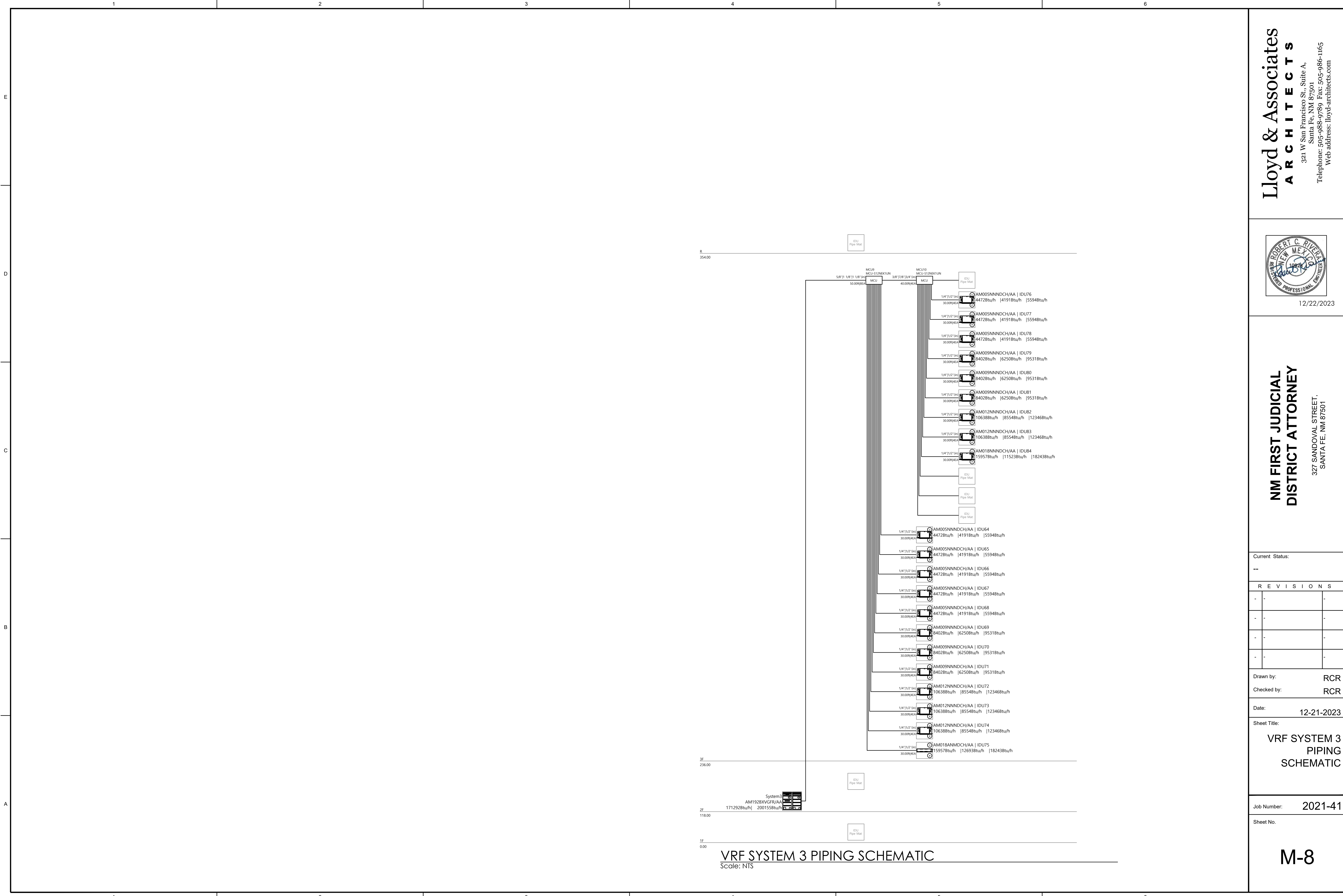
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**VRF SYSTEM 2 PIPING SCHEMATIC**

Job Number: 2021-41

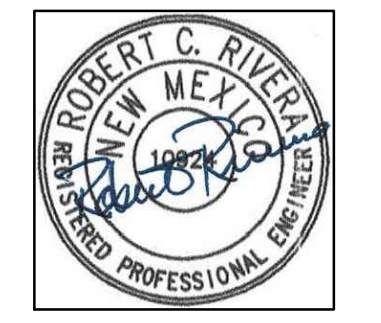
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**M-7**





**VRF SYSTEM 3 PIPING SCHEMATIC**  
Scale: NTS

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**VRF SYSTEM 3 PIPING SCHEMATIC**

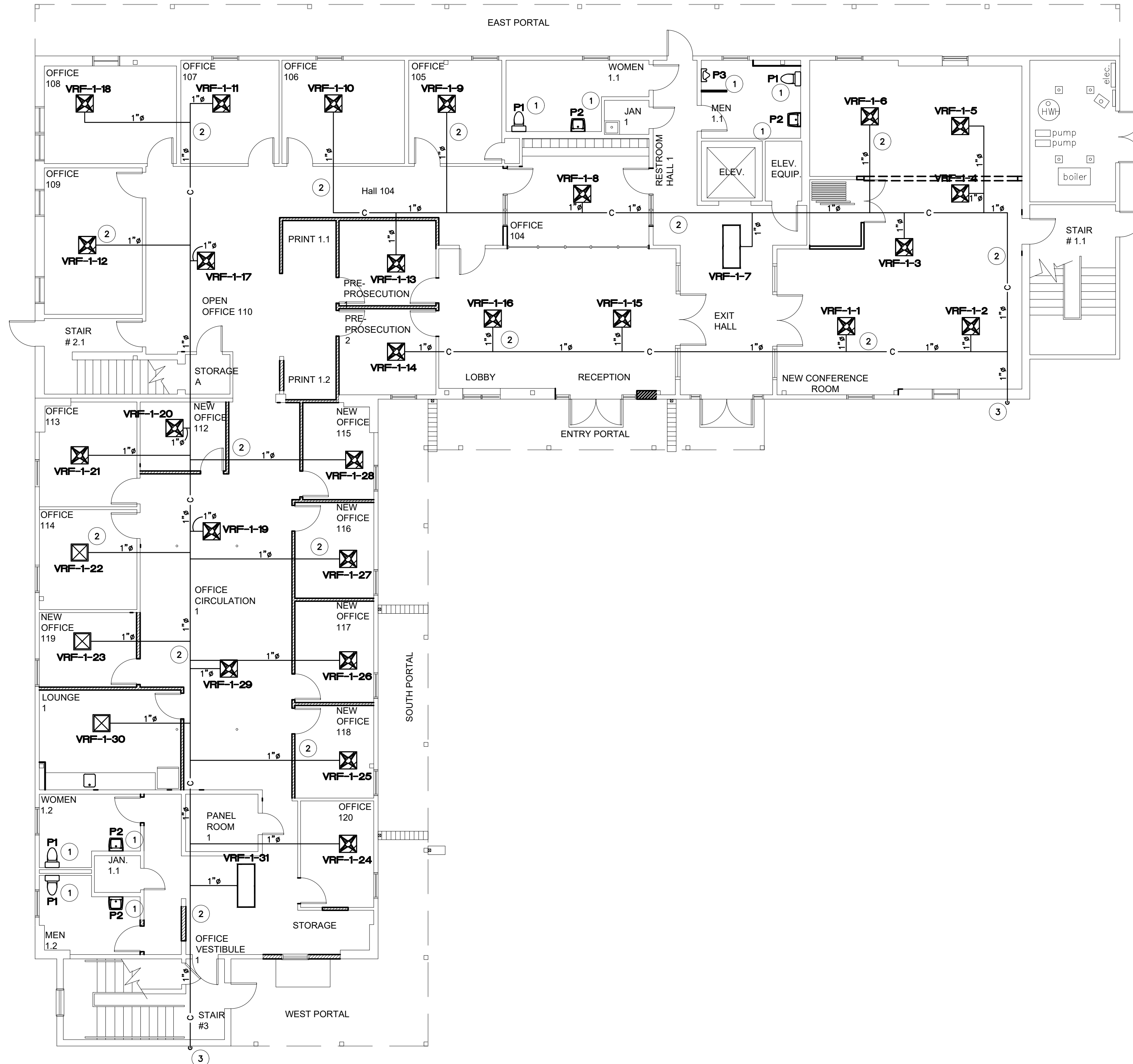
Job Number: **2021-41**

Sheet No.

**M-8**

## PLUMBING GENERAL NOTES

- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ROUGH-IN AND CONNECTION OF EQUIPMENT REQUIRING COLD WATER, HOT WATER, INDIRECT WASTE, DIRECT WASTE, VENT, GAS AND DRAIN PIPING.
- VERIFY EXACT DIMENSIONS, ROUGH-IN AND CONNECTION REQUIREMENTS FOR ALL EQUIPMENT TO BE INSTALLED AND PIPE ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
- COORDINATE FLOOR SLOPE AND DRAINAGE WITH THE INSTALLATION OF ALL FLOOR DRAINS AND FLOOR SINKS AS REQUIRED.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL TRAPS, TAILPIPIES AND SUPPLIES FOR FINAL CONNECTION TO ALL EQUIPMENT.
- ALL PLUMBING AND MECHANICAL SYSTEMS SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES AND O.S.H.A. STANDARDS.
- CARE SHALL BE TAKEN TO AVOID CONFLICTS WITH STRUCTURAL CONDITIONS, PIPING, MECHANICAL DUCTWORK, ELECTRICAL EQUIPMENT AND AIR HANDLING EQUIPMENT ABOVE THE CEILING. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE ROUTING OF PIPING WITH THE CEILING, ELECTRICAL AND SHEETMETAL CONTRACTORS. RELOCATION OF PIPING OR DUCTWORK REQUIRED FROM THE POOR COORDINATION BY THIS CONTRACTOR SHALL BE AT HIS EXPENSE.
- THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL PLUMBING FIXTURES INDICATED ON THE SCHEDULES AND PLANS, WITH CONNECTIONS AS REQUIRED. ALL BRANCHES SHALL BE VALVED AND ALL VALVES SHALL BE ACCESSIBLE WITH ACCESS PANELS AND DOORS PROVIDED BY THIS CONTRACTOR. ALL VALVES SHALL HAVE ADJACENT UNIONS DOWNSTREAM OF THE VALVES. EACH FIXTURE BRANCH RISER SHALL BE TAKEN OFF FROM THE TOP OF THE BRANCH MAIN, AND AN AIR CHAMBER 12" LONG (MINIMUM) SHALL BE LOCATED ABOVE EACH FIXTURE BRANCH, UNDIMINISHED.
- ALL PLUMBING FIXTURES SHALL HAVE CHROME PLATED FINISH ON ALL EXPOSED SUPPLY PIPING, VALVE STOPS, TAILPIECES, P-TRAPS, TRAP ARMS AND ESCUTCHEONS. ESCUTCHEONS SHALL BE PROVIDED AT ALL WALL PENETRATIONS OF SUPPLIES AND WASTE LINES.
- ALL AUTOMATIC OR SELF-CLOSING VALVES FOR FAUCETS SHALL BE ADJUSTED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND SUPERVISED, AS NECESSARY, BY EQUIPMENT SUPPLIERS REPRESENTATIVE AT THE REQUEST OF THE ARCHITECT OR ENGINEER.
- FURNISH AND INSTALL VACUUM BREAKERS WHERE REQUIRED BY LOCAL CODES, ORDINANCES AND THE INSPECTOR.
- ALL PIPING SHALL PITCH TO DRAIN AND CONTRACTOR SHALL PROVIDE VALVING FOR DRAINAGE.
- CONNECT EACH HOT WATER RECIRCULATING RISER TO HOT WATER RISER BEFORE TAKE-OFF FOR LAST FIXTURE.
- ALL PIPING SHALL BE CONCEALED WHERE POSSIBLE. ALL EXPOSED PIPING WHERE CONCEALMENT IS NOT POSSIBLE OR IN EQUIPMENT ROOMS SHALL BE PAINTED.
- PLUMBING DIAGRAMS DO NOT SHOW ALL PIPES AND FITTINGS REQUIRED. THE DIAGRAMS REFLECT ONLY SIZES, SYSTEM COMPONENT SEQUENCE AND POINTS OF CONNECTION.
- ALL PIPING (HOT WATER, COLD WATER AND RECIRCULATING HOT WATER) WITHIN THE BUILDING, INCLUDING MECHANICAL EQUIPMENT ROOMS SHALL BE INSULATED. REFERENCE THE SPECIFICATIONS.
- NO WATER PIPING SHALL BE LOCATED IN OUTSIDE WALLS UNLESS SHOWN, AND THEN PIPING IS TO BE INSULATED AND LOCATED AS CLOSE AS POSSIBLE TO THE INSIDE OF THE WALL CAVITY WITH ADDITIONAL INSULATION BETWEEN PIPING AND EXTERIOR OF THE WALL.
- CONTRACTOR SHALL VERIFY THAT ALL PIPING ROUTED THROUGH CEILING SPACE USED AS A RETURN AIR PLENUM (AS APPLICABLE) IS NONCOMBUSTIBLE. ALL COMBUSTIBLE PIPING SHALL BE WRAPPED WITH FIRE WRAP INSULATION MATERIAL TO MEET FIRE RATING AS REQUIRED.
- CAULK ALL PENETRATIONS THROUGH FIRE RATED WALLS WITH DOW-CORNING No. 165-48, SEMCO No. PR-844 OR EQUAL, TO MEET PROPER FIRE RATING.
- ALL PIPE THROUGH FOOTINGS BELOW FLOOR SLAB (AS APPLICABLE) SHALL HAVE CAST IRON SOIL PIPE SLEEVE (MINIMUM TWO PIPE SIZES LARGER) WHICH EXTENDS FULL WIDTH OF THE FOOTING.
- ALL TRENCHING AND BACKFILL FOR PIPING SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
- GAS PIPING SHALL BE STANDARD WEIGHT BLACK STEEL AND WRAPPED WITH SCOTCHWRAP WHEN BURIED. PIPING SHALL BE PAINTED WHEN EXPOSED.
- SEE ARCHITECTURAL DRAWINGS FOR OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT (AS APPLICABLE) AND MAKE ALL NECESSARY CONNECTIONS REQUIRED FOR PROPER, COMPLETE AND OPERATIONAL INSTALLATION OF SUCH EQUIPMENT.
- ANY CHANGES TO THESE PLANS SHALL BE APPROVED BY THE ARCHITECT / ENGINEER. THE CONTRACTOR SHALL SUBMIT IN WRITING ANY PROPOSED CHANGES FOR APPROVAL AND RECEIVE APPROVAL PRIOR TO MAKING SUCH CHANGES.

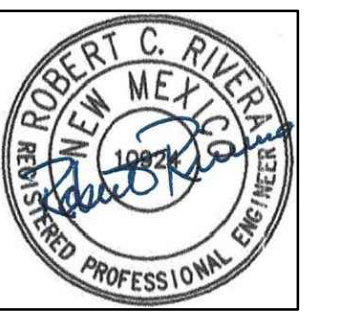


## KEYED NOTES

- INSTALL NEW PLUMBING FIXTURE PER THE EQUIPMENT SCHEDULES TO REPLACE THE EXISTING FIXTURE(S). LOCATE AND CONNECT TO THE EXISTING SEWER DRAIN, VENT AND DOMESTIC HOT AND COLD WATER PIPING SYSTEMS AS REQUIRED. CAP AND SEAL ANY PLUMBING PIPING AT EXISTING FIXTURES WHICH WILL NO LONGER BE IN SERVICE. COORDINATE DEMOLITION AND REMOVAL OF EXISTING FIXTURES WITH THE ARCHITECT. REFERENCE THE ARCHITECTURAL DRAWINGS.
- INSTALL 1" DIAMETER CONDENSATE PIPING IN CEILING SPACE FROM EACH VRF UNIT. ENSURE 1/4" PER FOOT OF SLOPE. TYPICAL.
- ROUTE CONDENSATE DRAIN PIPING DOWN ALONG WALL TO 12" ABOVE GRADE WITH AIR GAP.

PLUMBING SYMBOLS		
SYMBOL	ABBREVIATION	DESCRIPTION
—	CW	DOMESTIC COLD WATER
—	HW	DOMESTIC HOT WATER
—	HWR	RECIRCULATING HW
—	S	SEWER WASTE / SOIL
—	V	VENT
—	G	GAS
—	ES	EXISTING SEWER
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⊖	FD	FLOOR DRAIN
⊗	SOV	SHUT OFF VALVE
⊙	P.O.C.	POINT OF CONNECTION
⊘	VTR	VENT THRU ROOF

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12/22/2023

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 Checked by: RCR

Date: 12-21-2023

Sheet Title:  
**PLUMBING**  
**FIRST FLOOR**  
**PLAN**

Job Number: 2021-41

Sheet No.

**P-1**

P1 PLUMBING - FIRST FLOOR PLAN

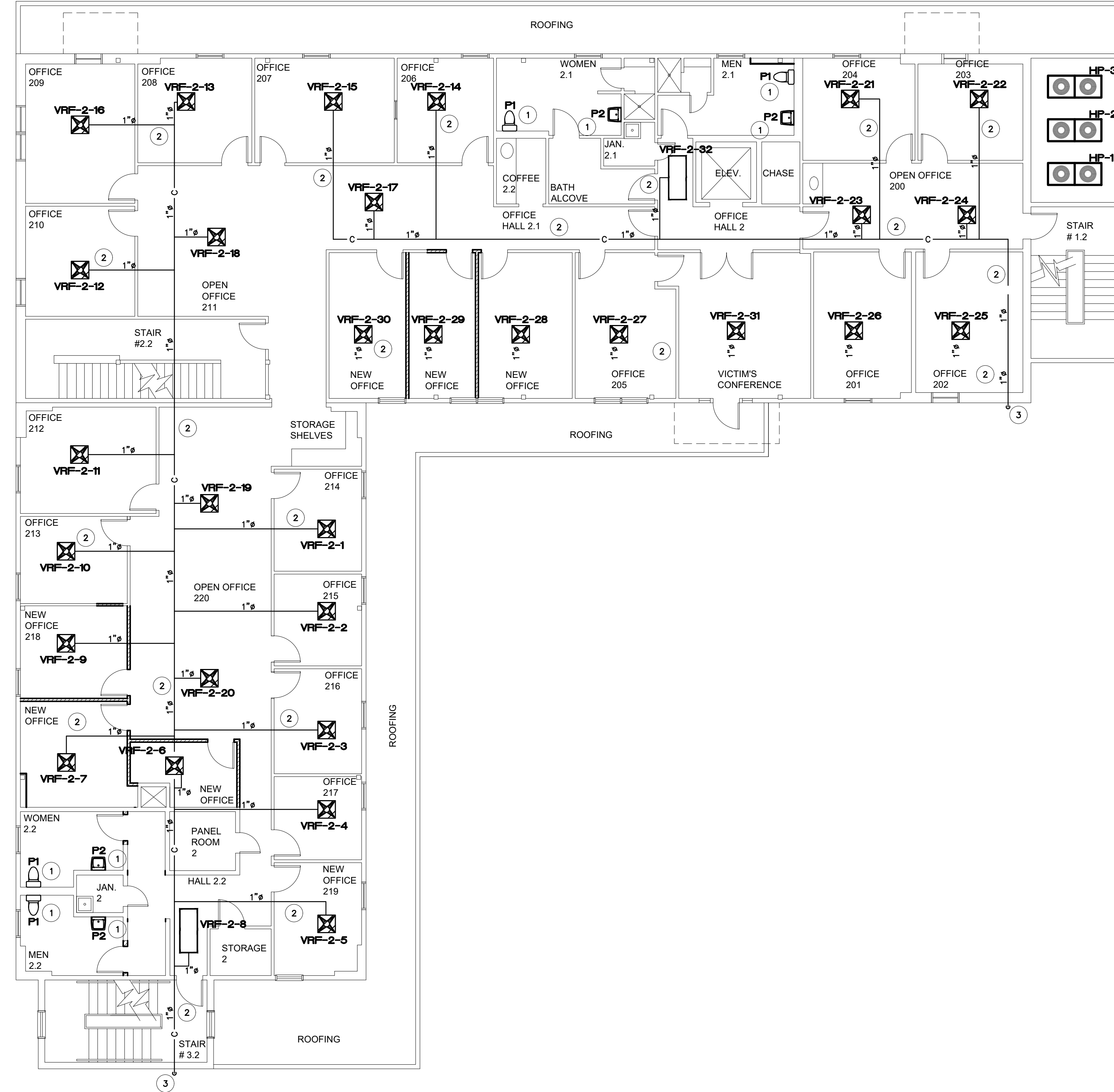


1/8" = 1'-0"  
 SCALE: 1/8" = 1'-0"



# PLUMBING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION
<b>P1</b>	<p><b>WATER CLOSET (ADA)</b></p> <p>TYPE FLOOR MOUNTED, 17" HIGH TO TOP OF RIM, ELONGATED BOWL, PRESSURE ASSIST TECHNOLOGY, TWO-PIECE TANK TYPE, 12" ROUGH-IN, 2 BOLT CAPS, 1.6 GPF WATER SAVER, VITREOUS CHINA, SUPPLY WITH TANK COVER LOCK. INSTALL CLEANOUT.</p> <p>EQUAL TO: KOHLER NO. K-3493-TR "HIGHLINE PRESSURE LITE", - SPECIFIC WATER CLOSET TO BE SELECTED BY THE OWNER.</p> <p>SEAT CHIP RESISTANT POLYPROPYLENE, OPEN-FRONT TOILET SEAT, FIRE RETARDANT, ELONGATED, STANDARD CHECK HINGE.</p> <p>EQUAL TO: KOHLER NO. K-4650 "LUSTRA"</p> <p>SUPPLY ANGLE LOOSE KEY STOP FOR FLEXIBLE RISER. (3/8" IPS X 1/2" O.D. FLEXIBLE RISER.)</p> <p>EQUAL TO: MCGUIRE NO. 169LK</p> <p>SERVICE 4" WASTE, 2", 3" OR 4" VENT (REF. DRAWINGS), 1/2" CW.</p>
<b>P2</b>	<p><b>LAVATORY</b></p> <p>TYPE WALL MOUNTED, VITREOUS CHINA, 4" CENTERS, OVERALL DIMENSIONS 19" X 17", BASIN SIZE 15" X 10". INSTALL CLEANOUT.</p> <p>EQUAL TO: KOHLER NO. K-2861 "HUDSON"</p> <p>SPECIFIC LAVATORY TO BE SELECTED BY THE OWNER.</p> <p>FAUCET SINGLE LEVER, 4" CENTERS, ROSE SPRAY WITH 0.5 GPM FLOW RATE, VANDAL PROOF, FURNISH COMPLETE WITH GRID DRAIN ASSEMBLY AND WITH 1-1/4" O.D. TAILPIECE.</p> <p>EQUAL TO: KOHLER NO. K-15199 "CORALAIS"</p> <p>DRAIN FURNISH WITH FAUCET.</p> <p>SUPPLIES POLISHED CHROME, WHEEL HANDLE ANGLE STOPS WITH FLEXIBLE RISER. (3/8" IPS X 3/8" O.D. FLEXIBLE RISER). EQUAL TO: MCGUIRE NO. 165</p> <p>PROVIDE HOT AND COLD WATER MIXING VALVE, EQUAL TO SLOAN, TO LIMIT / MANAGE HOT WATER SUPPLY TEMPERATURE.</p> <p>TRAP CAST BRASS, CHROME PLATED, ADJUSTABLE, CLEANOUT PLUG, TUBULAR P-TRAP. (1-1/4" IN X 1-1/2" OUT).</p> <p>EQUAL TO: MCGUIRE NO. 8902</p> <p>SERVICE 1-1/2" WASTE, 2" VENT, 1/2" CW AND 1/2" HW.</p> <p>MOUNTING HEIGHT AS SPECIFIED ON THE ARCHITECTURAL DRAWINGS. HOT WATER SUPPLY LINE AND WASTE SHALL BE INSULATED WITH ARMAFLEX.</p>
<b>P3</b>	<p><b>URINAL (ADA)</b></p> <p>TYPE WALL HUNG, SIPHON JET FLUSH ACTION, VITREOUS CHINA, 14" ELONGATED RIM, 3/4" TOP SPUD INLET, WATER SAVER (1.0 GPF).</p> <p>EQUAL TO: KOHLER NO. K-4991-ET "BARDON"</p> <p>SPECIFIC URINAL TO BE SELECTED BY THE OWNER.</p> <p>CARRIER FLOOR SUPPORTED, CONCEALED IN WALL.</p> <p>EQUAL TO: ZURN, WADE, JOSAM OR SMITH.</p> <p>VALVE EXPOSED FLUSH VALVE, VANDAL RESISTANT STOP CAP.</p> <p>EQUAL TO SLOAN ROYAL MODEL 186-1</p> <p>MOUNTING HEIGHT: AS INDICATED ON THE ARCHITECTURAL DRAWINGS.</p> <p>SERVICE 2" WASTE, 2" VENT, 3/4" CW.</p>
<b>P4</b>	<p><b>DRINKING FOUNTAIN (ADA)</b></p> <p>TYPE SINGLE-LEVEL WHEELCHAIR ACCESS MODEL WITH WALL MOUNTING PLATE ON CONCEALED CARRIER. #18 GAUGE, TYPE 304, STAINLESS STEEL POLISHED TO A SATIN FINISH. VANDAL RESISTANT SELF-CLOSING FRONT PUSH-BUTTON, POLISHED CHROME-PLATED SAFETY BUBBLER. INSTALL CLEANOUT.</p> <p>EQUAL TO: ELKAY MODEL NO. EDFP214C</p> <p>SUPPORT CONCEALED CARRIER BY ZURN, WADE, JOSAM OR SMITH.</p> <p>SUPPLY 1/2" NPT</p> <p>TRAP 1-1/4" X 1-1/2" OUT, 17 GAUGE, ROUGH UNPLATED TUBULAR P-TRAP.</p> <p>FINISH ALL STAINLESS STEEL CONSTRUCTION WITH SATIN FINISH.</p> <p>SERVICE 1-1/2" WASTE, 1-1/2" VENT, AND 1/2" CW.</p> <p>MOUNTING HEIGHT AS SPECIFIED ON THE ARCHITECTURAL DRAWINGS.</p>

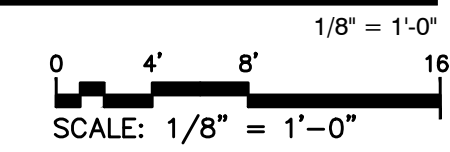


## KEYED NOTES

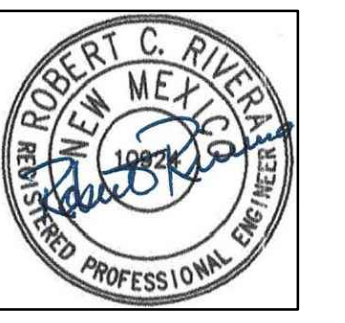
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---	P.O.C.	POINT OF CONNECTION
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P2 PLUMBING - SECOND FLOOR PLAN



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12/22/2023

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Date: 12-21-2023

Sheet Title:  
**PLUMBING SECOND FLOOR PLAN**

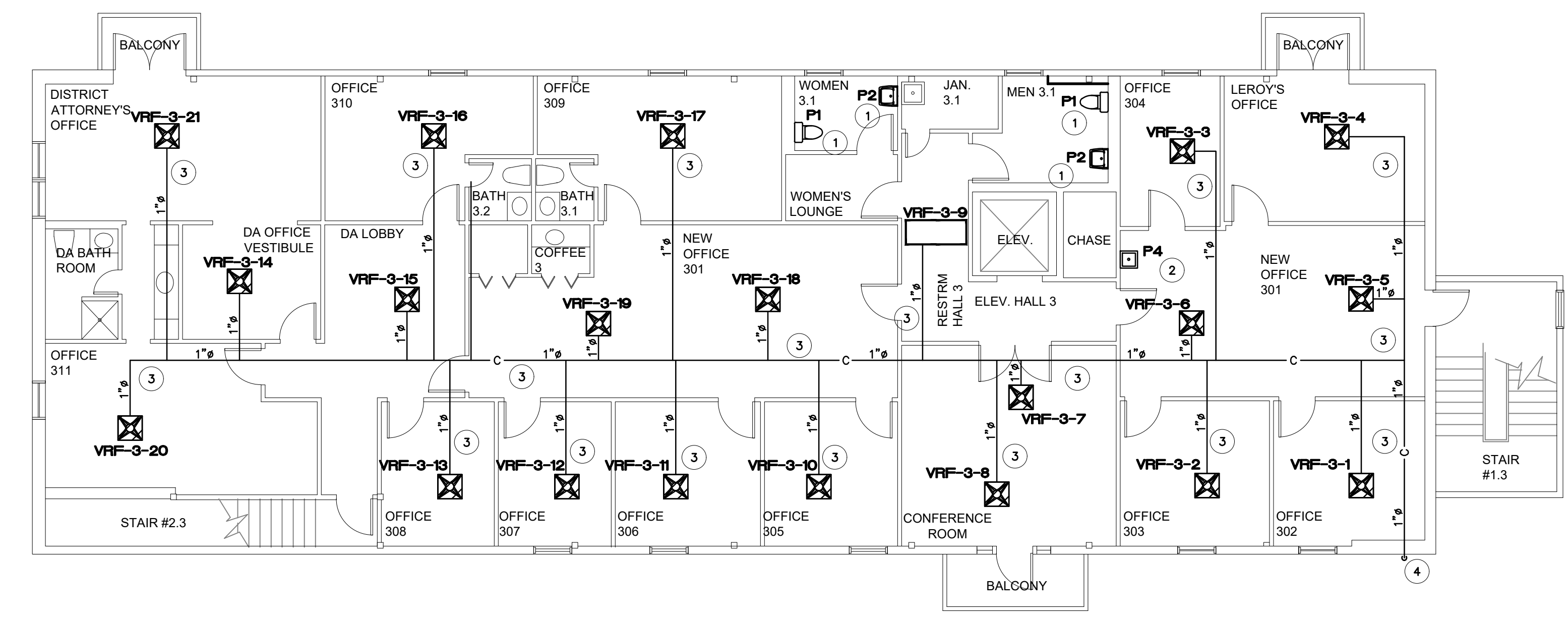
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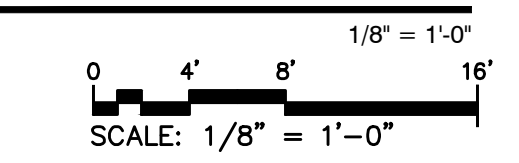
**P-2**

**KEYED NOTES**

- 1 INSTALL NEW PLUMBING FIXTURE PER THE EQUIPMENT SCHEDULES TO REPLACE THE EXISTING FIXTURE(S). LOCATE AND CONNECT TO THE EXISTING SEWER DRAIN, VENT AND DOMESTIC HOT AND COLD WATER PIPING SYSTEMS AS REQUIRED. CAP AND SEAL ANY PLUMBING PIPING AT EXISTING FIXTURES WHICH WILL NO LONGER BE IN SERVICE. COORDINATE DEMOLITION AND REMOVAL OF EXISTING FIXTURES WITH THE ARCHITECT. REFERENCE THE ARCHITECTURAL DRAWINGS.
- 2 LOCATE THE EXISTING DOMESTIC SEWER DRAIN AND COLD WATER PIPING NEAR THE EXISTING RESTROOM AND EXTEND NEW 2" DIAMETER DRAIN PIPING AND 1/2" COLD WATER PIPING TO NEW DRINKING FOUNTAIN. INSTALL NEW 2" DIAMETER VENT AND EXTEND TO ABOVE THE ROOF AS REQUIRED.
- 3 INSTALL 1" DIAMETER CONDENSATE PIPING IN CEILING SPACE FROM EACH VRF UNIT. ENSURE 1/4" PER FOOT OF SLOPE. TYPICAL.
- 4 ROUTE CONDENSATE DRAIN PIPING DOWN ALONG WALL TO 12" ABOVE GRADE WITH AIR GAP.

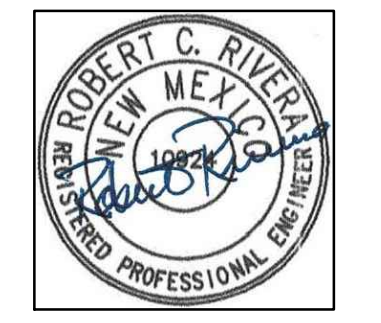


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**P3 PLUMBING - THIRD FLOOR PLAN**

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**PLUMBING**  
**THIRD FLOOR**  
**PLAN**

Job Number: 2021-41

Sheet No.

**P-3**



FIXTURE SCHEDULE								
TYPE	MANUFACTURER	CATALOG NUMBER	DESCRIPTION/ LOCATION	LED LAMPING - 3500K			MOUNTING INSTRUCTIONS	REMARKS
				WATTS	LUMENS	CCT		
A	COLUMBIA	#VSY24-2765T-VWHE G-ED-U	2'x4' LED GRID LAY-IN TROFFER	25	3,267	4000K	RECESSED GRID	
A1	COLUMBIA	#VSY22-2765T-VWHE G-ED-U	2'x2' LED GRID LAY-IN TROFFER	11	1,449	4000K	RECESSED GRID	
B	AXIS	#EXAS-400-80-40-SO 4-C-120-DP-1-SC	4' LINEAR LED	37.6	1,225	4000K	SURFACE	
C	LUMINATION	#LRX-S6-10-8-40-MD	RECESSED DOWNLIGHT	13	1,050	4000K	RECESSED	
D	STERNBERG	#SH-1230LED-1RND-27 T-MDL03-SV1	LED PENDANT	30.0	2,727	4000K	STEM HUNG	
D1	VISA	#0W191-L40K-MVOLT 0W1291-BRNZ	EXTERIOR WALL SCIENCE	15.0	1,300	4000K	WALL UP 8'-0" AFG	
F	COLUMBIA	#CRW4-LSCS	4' LED WRAP	28.0	4,142	4000K	SURFACE	
F1	COLUMBIA	#CUC4-CS-ED120	LOW PROFILE UNDERCABINET LIGHT	13	T5	120	UNDER CABINET	
EXIT	COMPASS	#CCRX0SQ	COMBINATION EXIT AND EMERGENCY	---	---	---	UNIVERSAL	
EM	COMPASS	#CU2SQ	COMBINATION EXIT AND EMERGENCY	---	---	---	WALL UP 8'-0" AFF	

### FIXTURE SCHEDULE GENERAL NOTES

- A. THE ARCHITECTURAL REFLECTED CEILING PLANS TAKE PRECEDENCE OVER THE LIGHTING PLANS SHOWN ON THE ELECTRICAL DRAWINGS. COORDINATE WITH ARCHITECTURAL REFLECTED PLANS AND COMPLY AS REQUIRED.
- B. MOUNTING HEIGHTS OF FIXTURES ARE GENERALLY SHOWN ON THE ARCHITECTURAL ELEVATIONS. COORDINATE AND COMPLY AS REQUIRED.
- C. FIXTURE VOLTAGES SHALL BE COORDINATED WITH BUILDING VOLTAGE SYSTEM. ALL LIGHTING DRIVERS SHALL BE 120V, UNLESS OTHERWISE NOTED ON THE PLANS.
- D. FIXTURES SHALL BE COMPATIBLE WITH THE CEILING TYPE INSTALLED WITHIN; PROVIDE GRID TYPE FIXTURES INSTALLED IN LAY-IN GRID CEILINGS.

### LEGEND

- ◯◯ CEILING OR WALL BRACKET FIXTURE. SEE FIXTURE SCHEDULE.
- LED FIXTURE. SEE FIXTURE SCHEDULE.
- ↔ EXIT LIGHT. ARROWS INDICATE DIRECTIONAL ARROW ON FIXTURE.
- EM EMERGENCY EGRESS LIGHTING FIXTURE WITH BATTERY PACK. SEE LIGHTING FIXTURE SCHEDULE. MH- 7'-6" TO BOTTOM
- PUSH BUTTON SWITCH
- TC TIMECLOCK
- LC LIGHTING CONTACTOR
- ◯ PHOTO CELL
- SINGLE POLE WALL SWITCH, UP +48"
- WALL MOUNTED OCCUPANCY SENSOR SWITCH
- PILOT LIGHT SWITCH
- DIMMER SWITCH. SEE PLANS AND SPECS FOR CHARACTERISTICS
- KEYSWITCH, UP +48". SEE PLANS
- THREE WAY SWITCH, UP +48" TO CENTER.
- MOMENTARY CONTACT SWITCH 1P2T, 3 POSITIONS.
- DUPLEX CONVENIENCE OUTLET, GROUNDING TYPE, UP +18" UNLESS OTHERWISE INDICATED
- FOURPLEX CONVENIENCE OUTLET, GROUNDING TYPE, UP +18" UNLESS OTHERWISE INDICATED
- SPECIAL PURPOSE OUTLET SEE PLANS FOR RATINGS
- 250V-2P-4W SPECIAL PURPOSE GROUNDING OUTLET. AMPERAGE AS INDICATED.
- JUNCTION BOX FLUSH IN WALL WITH CONNECTION TO EQUIPMENT. J-BOX ABOVE LAY-IN CEILING W/ FLEX CONDUIT TO LAY-IN FIXTURES
- ◀ COMBINATION DATA VOICE, TWO GANG BOX MOUNTED +18" AFF OR COUNTER TOP OR AS NOTED. PROVIDE 3/4" EMPTY CONDUIT WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING SPACE. DATA/VOICE CABLING AND DEVICE BY OWNER.
- ◀ TELEVISION OUTLET MOUNTED ON WALL. SEE PLANS
- ◀ FIRE ALARM PULL STATION UP +48" SEE SPECS AND PLANS
- ◀ FIRE ALARM STROBE UP +80". SEE SPECS AND PLANS
- ◀ FIRE ALARM HORN/STROBE UP +80" SEE SPECS AND PLANS
- ◀ FIRE ALARM SMOKE DETECTOR. COMINATION IONIZATION PHOTOELECTRIC
- ◀ FIRE ALARM DUCT DETECTOR
- ◀ FIRE ALARM HEAT DETECTOR
- ◀ FIRE ALARM CONDUIT REFER TO SPECIFICATIONS 16721 AND #14 FOR SIGNAL
- ◀ PUSH BUTTON. SEE PLANS FOR TYPE. UP 4" UNLESS OTHERWISE NOTED.
- ◀ THERMOSTAT, UP 48" UNLESS OTHERWISE INDICATED.
- ◀ MOTION DETECTOR PASSIVE INFRARED +96" TYPICAL. 34°C WITH PULLSTRING TO ABOVE ACCESSIBLE CEILING SPACE.
- ◀ MAGNETIC DOOR SWITCH, FIRE ALARM SYSTEM. SEE PLANS AND SPECS.
- ◀ DISCONNECT SWITCH. SIZE AND POLES FOR LOAD CONNECTED NEMA 3R
- ◀ SPECIAL SYSTEMS CABINET W/ HINGED DOOR AND KEYED LOCK
- ◀ SURFACE MOUNTED PANEL. SEE PANEL SCHEDULE FOR CHARACTERISTICS.
- ◀ FLUSH MOUNTED PANEL. SEE PANEL SCHEDULE FOR CHARACTERISTICS.
- ◀ PAD MOUNTED TRANSFORMER
- ◀ WALL MOUNTED TRANSFORMER
- ◀ GROUND
- ◀ GROUND ROD
- ◀ LIGHTING ARRESTOR
- ◀ MOTOR CONNECTION, FRACTIONAL H.P (LESS THAN 1/3 HP)
- ◀ MOTOR CONNECTION WITH HP INDICATED.
- ◀ C.E.S. CEILING MOUNTED OCCUPANCY SENSOR
- ◀ O.S. SWITCH MOUNTED OCCUPANCY SENSOR
- ◀ BRANCH CIRCUIT IN WALLS OR CEILING WITH CONDUCTORS INDICATED. (NEUTRAL, HOT, SWITCHED, AND GROUNDING CONDUCTOR LEFT TO RIGHT RESPECTIVELY)
- ◀ BRANCH CIRCUIT IN WALLS OR UNDER FLOOR, CONDUCTORS INDICATED.
- ◀ HOME RUN TO PANEL, WITH BRANCH CIRCUIT NUMBERS INDICATED.
- ◀ KEYED NOTE SYMBOL
- ◀ MECHANICAL EQUIPMENT SYMBOL

### DEMO GENERAL NOTES

- A. THE CONTRACTOR SHALL VERIFY EXTENT OF DEMOLITION WITH EXISTING CONDITIONS. PRIOR TO BID, AND SHALL INCLUDE ALL WORK REQUIRED TO COMPLETELY DISCONNECT ASSOCIATED EQUIPMENT AND TO COMPLETELY REMOVE ALL ASSOCIATED BRANCH CIRCUIT WIRING, WHERE REQUIRED.
- B. COMPUTER/DATA PHONE CABLES SHALL BE REROUTED IF NECESSARY. CABLES SHALL BE RELOCATED PER OWNER REPRESENTATIVE REQUIREMENTS.
- C. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ELECTRICAL EQUIPMENT TO BE REMOVED.
- D. ALL EQUIPMENT REMOVED, NOT CLAIMED BY THE OWNER, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND THE CONTRACTOR SHALL BE RESPONSIBLE TO PROPERLY DISPOSE OF ELECTRICAL EQUIPMENT REMOVED.
- F. NOT ALL BUILDING DETAILS AND BRANCH CIRCUIT CONDUIT WIRING TO BE REMOVED ARE SHOWN ON THE PLANS. THE CONTRACTOR MAY REQUEST, AT HIS DISCRETION, TO REVIEW EXISTING ELECTRICAL, MECHANICAL, AND ARCHITECTURAL PLANS, AT THE OFFICE OF THE ARCHITECT OR PERFORM A SITE VISIT.
- G. COORDINATE DEMOLITION FOR EXISTING ELECTRICAL EQUIPMENT BEING REMOVED. ALL ELECTRICAL EQUIPMENT DOWNSTREAM, WHICH REMAIN, AND OUT OF THE DEMOLITION AREA, SHALL REMAIN 'ON' AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE GENERAL DEMOLITION WITH THE OWNER TO AVOID PROBLEMS WITH CIRCUITS BEING DISCONNECTED AND REMOVED WHICH MAY AFFECT OTHER AREAS OUTSIDE OF THE WORK AREA.
- H. THE CONTRACTOR SHALL FIELD SURVEY OUTLETS TO REMOVE AND WHICH OUTLETS OR DEVICES REMAIN PRIOR TO BID. NOT ALL OUTLETS/DEVICES TO BE REMOVED ARE SHOWN ON THE PLAN. DURING DEMO PROCESS, COORDINATE REMOVALS WITH ARCHITECT IN THE FIELD. RE-FEED ALL OUTLETS THAT ARE DISCONNECTED DURING DEMO THAT SHALL REMAIN TO NEAREST AVAILABLE RECEPTACLE CIRCUIT. THE CONTRACTOR SHALL DETERMINE AND FIELD VERIFY CAPACITY OF CIRCUITS TO COMBINE NEW AND EXISTING RECEPTACLES AND INTERCEPTED CIRCUITS. COMPLY AS REQUIRED FOR CODE RESTRICTIONS AND SPECS.
- J. THE CONTRACTOR SHALL SURVEY SPACES ABOVE CEILING FOR UPGRADE WORK OF DEFICIENT EXISTING ELECTRICAL EQUIPMENT. THIS REMEDIAL ABOVE CEILING WORK MAY INCLUDE PROVIDING ADEQUATE CONDUIT SUPPORTS, REPLACING CODE DEFICIENT FLEXIBLE ELECTRICAL POWER CABLE, PROVIDING MISSING JUNCTION BOX COVERS, REPAIRING BROKEN OR SEVERED CONDUIT, AND PROVIDING EXTENSION RINGS FOR OVER-CROWDED JUNCTION BOXES. ALL THIS WORK SHALL BE INCLUDED IN THE BID PRICE.
- K. THE CONTRACTOR SHALL BE RESPONSIBLE TO RESOLVE DEFICIENT CABLE RELATED WORK IN EXPOSED CEILING AREAS. THIS MAY INCLUDE ITEMS SUCH AS SUPPORT OF EXISTING CABLE AND REPLACEMENT OF NON-PLENUM RATED CABLE OR REMOVAL OF ABANDONED CABLES.
- L. NOT ALL OUTLETS/DEVICES TO REMAIN ARE SHOWN ON THE PLAN. DURING THE DEMO PROCESS, COORDINATE REMAINING DEVICES WITH ARCHITECT IN THE FIELD. RE-FEED ALL OUTLETS/DEVICES TO REMAIN THAT ARE DISCONNECTED DURING DEMO.
- M. EVERYWHERE IN THIS AREA, FOR THE DURATION OF THE PROJECT, THE CONTRACTOR IS RESPONSIBLE FOR DISCONNECT AND RECONNECT OF BRANCH CIRCUITS AND REPLACEMENT OF ELECTRICAL MATERIALS AND LABOR TO RESTORE COMPLETE AND OPERATIONAL SYSTEMS. THIS INCLUDES THE CORRECTION OF ANY CODE DEFICIENCIES RELATED TO RENOVATIONS ON THIS PROJECT.
- N. COORDINATE WITH ARCHITECT/ENGINEER AND FIELD VERIFY STATUS OF DEVICES, OUTLETS, CONDUIT AND WIRE AS A RELOCATION, DEMOLITION, OR TO REMAIN. FIELD VERIFY RE-FEEDING EXISTING DEVICES, RE-ROUTING OR NEW CIRCUITING. FIELD VERIFY CAPACITY OF CIRCUITS TO COMBINE NEW AND EXISTING RECEPTACLES AND INTERCEPTED CIRCUITS. COMPLY AS REQUIRED FOR CODE RESTRICTIONS AND SPECS.
- P. PROVIDE NEW CIRCUIT BREAKERS OF THE SAME TYPE OR BLANK SPACE COVERS AS MAY BE NECESSARY TO FILL PANEL FOR SAFETY. FIELD SURVEY CIRCUITS THAT MAY BE ABANDONED, RELOCATE, IF NECESSARY, CIRCUIT RUNS EXPOSED BY DEMO WORK THAT SHALL BE KEPT OPERATIONAL.
- Q. DISCONNECT POWER TO ELECTRICAL CIRCUITS AND EQUIPMENT IN THESE AREAS ENTIRELY BACK TO PANEL CIRCUIT BREAKER. DISCONNECT AND REMOVE ALL EXISTING CONDUIT, CONDUCTORS, CABLE, CONTROLS, AND BOXES, ETC. FOR THIS DEMO. THE ONLY EXCEPTION WILL BE FOR NEW CONTROLS AND DEVICES WHERE EXISTING AND UNDAMAGED BOXES/CONDUIT CAN BE UTILIZED BY THE CONTRACTOR. THE CONTRACTOR SHALL REFER TO NEW WORK PLANS AND SPECIFICATIONS IN ALL DIVISIONS THAT RELATE TO ELECTRICAL WORK IN THIS PROJECT. COORDINATE DEMOLITION AND INSTALLATION WITH FIELD CONDITIONS AS THEY MAY APPLY. ALL EQUIPMENT SHALL BE MADE OPERATIONAL. NO EXCEPTIONS. COORDINATE WITH REPRESENTATIVES OF THE OWNER, ARCHITECT, AND ENGINEERS FOR CONDUIT LOCATION AND TERMINATION POINTS IF NOT SPECIFIED ON PLANS.
- R. DASHED WALLS INDICATE REMOVAL OF WALL PARTIAL OR ENTIRELY. REMOVE ALL ELECTRICAL DEVICES SHOWN ON DASHED WALLS BACK TO SOURCE THAT WILL BE ASSOCIATED WITH REMOVAL OF WALL UNLESS NOTED OTHERWISE. COORDINATE WITH ARCHITECTURAL PRIOR TO START OF WORK.

### GENERAL NOTES

- A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROVIDING ALL WORK INDICATED BY THESE DRAWINGS. THIS CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT SUPPLIES AND MATERIALS IN ADDITION TO PERFORMING ALL OPERATIONS INCLUDING CUTTING, CHANNELS, UNDERGROUND TRENCHING, BACKFILL AND TAMPING NECESSARY FOR THE INSTALLATION OF COMPLETE POWER, LIGHTING OR OTHER ELECTRICAL SYSTEMS AS SHOWN.
- B. PERFORM ALL ELECTRICAL WORK IN NEAT WORKMANLIKE MANNER IN FULL COMPLIANCE WITH ALL APPLICABLE, ADOPTED, CODES, INCLUDING BUT NOT LIMITED TO THE NATIONAL ELECTRICAL CODE (NEC), UFG, NFPA AND ADA. ALL LOCAL AND STATE REQUIREMENTS WILL BE OBSERVED DURING THE PERFORMANCE OF THIS WORK.
- C. SHOULD THE CONTRACTOR DETECT DISCREPANCIES BETWEEN CONTRACT DOCUMENTS AND ANY ASSOCIATED LEGAL, OR SAFETY REQUIREMENTS HE SHALL PROMPTLY NOTIFY THE ENGINEER IN WRITING ONCE NOTIFIED THE ENGINEER SHALL MODIFY THE CONTRACT DOCUMENTS ACCORDINGLY. IF THE CONTRACTOR PROCEEDS WITH ANY WORK WHICH IS IN VIOLATION OF KNOWN LEGAL OR SAFETY REQUIREMENTS, THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THIS WORK AND SHALL PROMPTLY CORRECT THE WORK, WHEN NOTIFIED WITHOUT ADDITIONAL COST TO THE OWNER.
- D. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK. NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING. NO CLAIM FOR ADDITIONAL COST OR TIME EXTENSION WILL BE ALLOWED WITHOUT PROPER NOTICE PLUS PRIOR DETERMINATION OF TIME AND COST TO THE OWNER.
- E. AFTER COMPLETION OF THE INSTALLATION, THE ENTIRE SYSTEM SHALL BE THOROUGHLY CLEANED. REMOVE ALL FOREIGN MATTER, PAINT, OR DIRT, GREASE, UNNEEDED LABELS OR STICKERS FROM FIXTURES AND EQUIPMENT. REMOVE ALL RUBBISH AND DEBRIS ACCUMULATED DURING INSTALLATION FOR THE PREMISES.
- F. ALL PHASES OF THE ELECTRICAL WORK SHALL BE COORDINATED WITH THE ARCHITECT AND GENERAL CONTRACTOR. WORK SHALL BE PERFORMED TO CAUSE AS LITTLE INCONVENIENCE AS POSSIBLE TO THE OWNER.
- G. CONTRACTOR SHALL RECEIVE, FROM SYSTEM SUPPLIERS, ALL WIRING DIAGRAMS FOR ALL EQUIPMENT. PRIOR TO ANY ROUGH-IN, TO ASSURE THAT PROPER ELECTRICAL CHARACTERISTICS ARE PROVIDED. ANY INCORRECT WIRING OR DEVICES INSTALLED BY ELECTRICAL CONTRACTOR WITHOUT THE WIRING DIAGRAM SHALL BE CORRECTED AT ELECTRICAL CONTRACTOR'S EXPENSE.
- H. ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL DEVICES LOCATIONS WITH ARCHITECTURAL CASE WORK DETAILS PRIOR TO ANY ROUGH-IN.
- I. ELECTRICAL CONTRACTOR SHALL VERIFY FINAL LOCATIONS OF ALL ELECTRICAL DEVICES AND EQUIPMENT TO BE INSTALLED. ANY ELECTRICAL DEVICES LOCATED ABOVE COUNTER AND BEHIND FINAL SINK LOCATIONS SHALL BE SHIFTED A MINIMUM OF 8" TO EITHER SIDE OF SINK. ANY ELECTRICAL DEVICES LEFT BEHIND SINK AT THE TIME OF FINAL ELECTRICAL WALK THROUGH SHALL BE RELOCATED AT ELECTRICAL CONTRACTOR'S EXPENSE.
- J. PRIOR TO INSTALLATION, THE OWNER RESERVES THE RIGHT TO RELOCATE ANY ELECTRICAL DEVICE, UP TO A DISTANCE OF 12" WITHOUT ADDITIONAL CHARGE.
- K. THE EXACT LOCATION OF ALL SYSTEMS AND EQUIPMENT SHALL BE FIELD VERIFIED AND COORDINATED WITH OTHER TRADES PRIOR TO ANY INSTALLATION. WHERE EXACT LOCATIONS ARE NECESSARY, THEY ARE DIMENSIONED ON THESE DRAWINGS. WHERE THERE IS A QUESTION OF ADEQUATE CLEARANCE OR COORDINATION BETWEEN TRADES, THIS CONTRACTOR SHALL PREPARE AS BUILT DRAWINGS FOR ENGINEERS REVIEW.
- L. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 VOLTS TYPE THHN/THWN. INSULATION, UNLESS OTHERWISE INDICATED MINIMUM WIRE SIZE SHALL BE #12 AWG AND STRANDED FOR #10 AWG OR LARGER. ALL WIRING SHALL BE RUN IN CONDUIT INCLUDING LOW VOLTAGE AND CONTROL WIRING, UNLESS OTHERWISE NOTED.
- M. GENERALLY, CONDUIT SHALL BE EMT, 1/2 INCH MINIMUM. WHERE REQUIRED TO PROTECT FROM PHYSICAL DAMAGE, CONDUIT SHALL BE RIGID OR IMC TYPE. RUN CONDUIT CONCEALED UNLESS OTHERWISE SHOWN ON THE DRAWINGS. USE FLEXIBLE METALLIC CONDUIT OR SURFACE MOUNTED RACEWAY ONLY WHERE INDICATED. PROVIDE EXPANSION FITTINGS FOR CONDUIT CROSSING EXPANSION JOINTS.
- N. SUPPORT ALL CONDUIT INDEPENDENTLY FROM THE BUILDING STRUCTURE. DO NOT SUPPORT FROM VENTILATION DUCTS, MECHANICAL PIPING, SUSPENDED CEILING GRIDS, OR THEIR HANGERS. USE ONLY ACCEPTABLE METHODS OF SUPPORT.
- N1. EXTERIOR LIGHTING SHALL COMPLY WITH THE SANTA FE OUTDOOR LIGHTING ORDINANCE AND THE NEW MEXICO NIGHT SKY PROTECTION ACT.
- O. TERMINATING AND SPLICING: ALL #10 GAUGE AND SMALLER JOINTS WITH SPLICES IN BRANCH CIRCUIT WIRING SHALL BE MADE WITH AN APPROVED, SOLDER LESS TOOL APPLICATION OR TWIST ON CONNECTORS. #8 GAUGE AND LARGER WITH HIGH COMPRESSION BARREL SPLICES WITH SHRINK WRAP AND MANUFACTURER'S COMPATIBLE CONNECTORS IN GUTTERS AND SIMILAR LOCATIONS; AND NOT ALLOWED IN RACEWAYS.
- O. EMT CONDUIT FITTINGS: IN DRY LOCATIONS ALL EMT COUPLERS AND CONNECTORS SHALL BE STEEL SET SCREW TYPE OR 'REGAL' TYPE SET SCREW COUPLERS AND CONNECTORS. DIE CAST FITTINGS SHALL NOT BE USED ON THIS PROJECT. DAMP/WET LOCATIONS USE STEEL COMPRESSION GLAND TYPE COUPLER AND CONNECTIONS.
- P. SURFACE RACEWAY: ALL CONDUIT TO BE CONCEALED. WHEREVER CONCEALED CONDUIT IN FINISHED AREAS IS NOT POSSIBLE, ELECTRICAL CONTRACTOR SHALL INSTALL SURFACE MOUNTED RACEWAYS EQUAL TO WIRE MOLD. RUN SURFACE RACEWAYS IN CORNER OF WALL AND CEILING. ALL RACEWAYS THAT ARE EXPOSED SHALL BE APPROVED BY ARCHITECT PRIOR TO ROUGH-IN.
- Q. TYPE NMC, MC & AC CABLE SHALL BE LISTED FOR THAT USE AND WILL BE ALLOWED ON THIS PROJECT TO COMPLY WITH NEC 320, 330 & 334. ROMEX WILL NOT BE ALLOWED ON THIS PROJECT.
- R. IN ADDITION TO RACEWAY BONDING REQUIRED BY CODE AND OUTLET BOX BONDING JUMPS, CONTRACTOR SHALL INSTALL A GREEN EQUIPMENT GROUND CONDUCTOR FOR EACH BRANCH CIRCUIT.
- S. MAINTAIN A MINIMUM OF 24 INCH SEPARATION BETWEEN POWER CONDUITS AND SIGNAL CONDUITS. ROUTE CONDUITS SO AS NOT CROSS EACH OTHER.
- T. PROVIDE WIRING DEVICES RATED FOR THE GIVEN APPLICATION AS REQUIRED BY CODE. SPECIAL DEVICES SHALL BE PROVIDED AS INDICATED.
- U. INSTALL EXTERIOR WIRING IN CONDUIT. UTILIZE WEATHERPROOF FITTINGS AND WEATHERPROOF BOXES/COVERS.
- V. SIZE ALL BOXES AND ENCLOSURES PER THE NATIONAL ELECTRICAL CODE. WORKING SPACE FOR ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE ARTICLE 314.
- W. PROVIDE A 20 AMP, 120 VOLT, GFCI PROTECTED RECEPTACLE WITH WEATHERPROOF CAST BOX AND WEATHERPROOF COVER PLATE MOUNTED ONTO A THREE/4" I.D. CONDUIT WITH TWENTY-FIVE (25) FEET OF EACH ROOFTOP MECHANICAL UNIT, IF UNIT IS NOT SUPPLIED WITH THIS TYPE OF GFCI RECEPTACLE AND BOX.
- X. BRANCH CIRCUITS: UTILIZE #10 CONDUCTORS ON ALL RUNS OVER 100' 0".
- Y. MULTIPLE PHASE HOME RUNS MAY SHARE A COMMON NEUTRAL EXCEPT WHEN A DIMMER/DIMMING SYSTEM IS USED, AND WHEN DEDICATED COMPUTER EQUIPMENT CONNECTIONS ARE REQUIRED. VERIFY WITH ENGINEER PRIOR TO ROUGH-IN.
- Z. SHORT CIRCUIT RATING OF PANEL BOARDS AND OVER-CURRENT PROTECTION TO BE COORDINATED WITH UPSTREAM OVER-CURRENT PROTECTION AND AVAILABLE SCA. PROPERLY IDENTIFY ALL PANEL BOARDS WITH A LAMINATE LABEL AND TYPE WRITE ALL PANEL SCHEDULES. INSTALL PANEL BOARDS AS INDICATED ON DRAWINGS AND SCHEDULES. PROVIDE CIRCUIT BREAKERS AS REQUIRED. USE 'MAG' BREAKERS FOR HEATING /AIR CONDITIONING LOADS. PROVIDE GROUND-FAULT CIRCUIT-INTERRUPTER BREAKERS AS REQUIRED.
- BB. ALL NEW OR EXISTING SMOKE DETECTORS SHALL BE BAGGED OR REMOVED. IF REMOVED, STORE IN A SEALED BAG UNTIL ALL REMODELING WORK IS COMPLETE. IF SMOKE DETECTORS ARE NOT BAGGED OR REMOVED AND ARE DAMAGED. THEY SHALL BE REPLACED WITH NEW DETECTORS AT CONTRACTOR'S EXPENSE WHEN THE PROJECT IS COMPLETE.
- DD. THE FIRE ALARM SYSTEM SHALL BE APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION PRIOR TO ROUGH-IN. ANY MODIFICATIONS OR ADDITIONS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BASE BID.
- EE. EXTEND ALL CONDUIT AND CONDUCTORS. INSTALL ELECTRICAL EQUIPMENT AS NECESSARY, AND MAKE ALL FINAL CONNECTIONS TO MECHANICAL AND OWNER FURNISHED EQUIPMENT. LEAVE ALL EQUIPMENT IN OPERABLE CONDITION WITH APPROPRIATE OVERLOAD AND SERVICE DISCONNECT PROTECTION AS REQUIRED BY THE APPLICABLE CODES. FOLLOW MANUFACTURERS INSTALLATION GUIDELINES, WHERE APPLICABLE.
- FF. THE ELECTRICAL CONTRACTOR MUST COORDINATE WITH THE MECHANICAL/PLUMBING/CONTROLS CONTRACTOR TO INSURE THAT ALL REQUIRED COMPONENTS OF CONTROL WIRING/WORK ARE INCLUDED AND FULLY UNDERSTOOD. NO ADDITIONAL COST SHALL ACCRUE TO THE OWNER AS A RESULT OF LACK OF SUCH COORDINATION.
- GG. ELECTRICAL DEVICE INSTALLATION SHALL COMPLY WITH ACCESSIBILITY CODES ADOPTED FOR NEW MEXICO. SPECIFICALLY, MOUNT APPLICABLE SWITCHES, RECEPTACLES, AND ENVIRONMENTAL CONTROLS SO THAT THEY ARE MOUNTED TO THE TOP OF THE DEVICE NO HIGHER THAN FORTY-EIGHT INCHES (48") ABOVE FINISHED FLOOR AND THE BOTTOM OF THE DEVICE NO LOWER THAN FIFTEEN INCHES (15") ABOVE THE FINISHED FLOOR. ELECTRICAL DEVICES ABOVE THE COUNTER TOP OR OTHER OBSTRUCTION SHOULD COMPLY WITH ICC/ANSI 117.1-2003, SECTION 308.

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Drawn by: ACE

Checked by: FJT

Date: 09-26-2023

Sheet Title:

**FIXTURE SCHEDULE GENERAL NOTES SYMBOL LEGEND**

Job Number: 2021-41

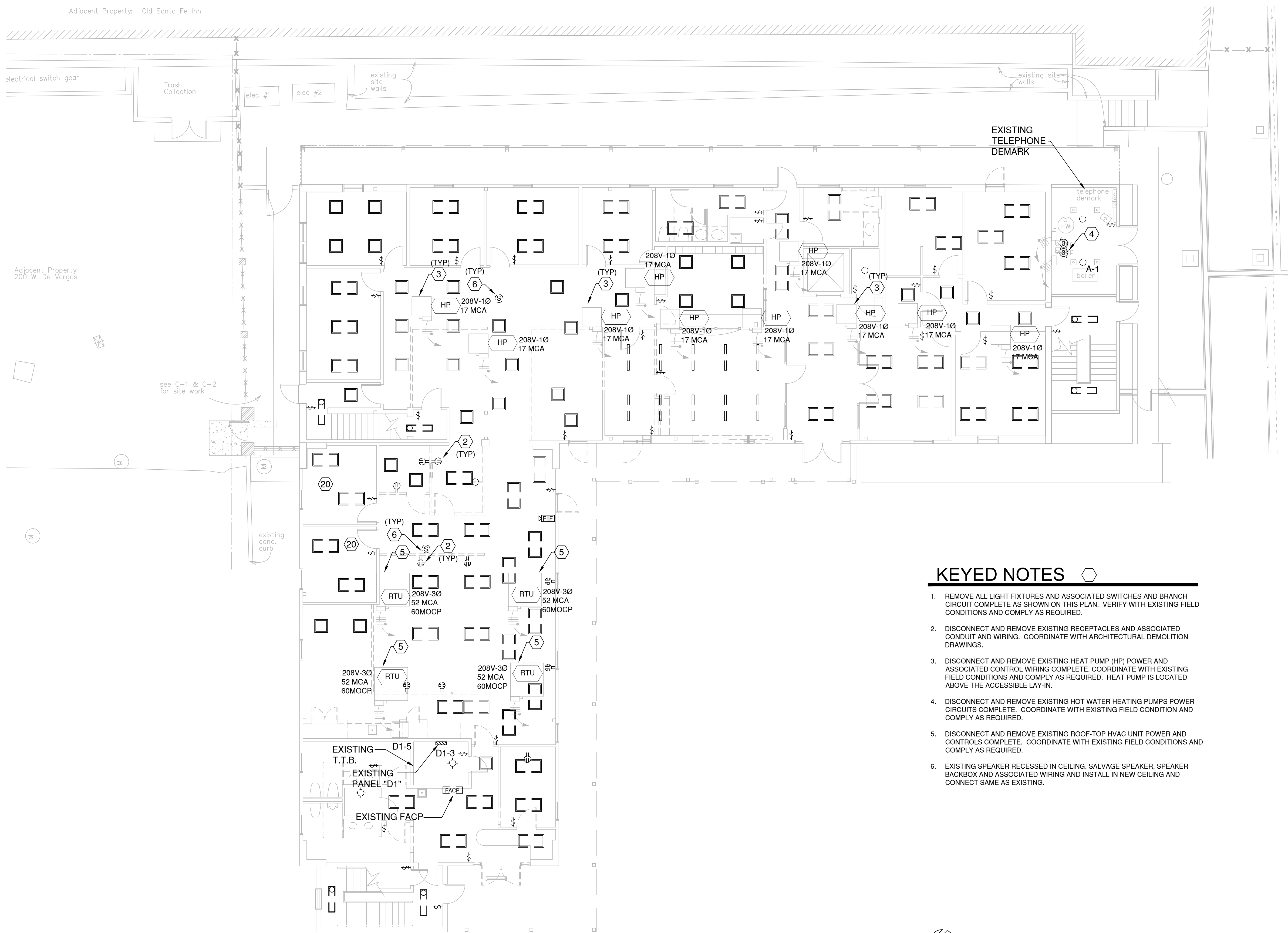
Sheet No.

**E-001**



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### DEMO GENERAL NOTES

- A. THE CONTRACTOR SHALL VERIFY EXTENT OF DEMOLITION WITH EXISTING CONDITIONS, PRIOR TO BID, AND SHALL INCLUDE ALL WORK REQUIRED TO COMPLETELY DISCONNECT ASSOCIATED EQUIPMENT AND TO COMPLETELY REMOVE ALL ASSOCIATED BRANCH CIRCUIT WIRING, WHERE REQUIRED.
- B. COMPUTER/DATA/PHONE CABLES SHALL BE REROUTED IF NECESSARY. CABLES SHALL BE RELOCATED PER OWNER REPRESENTATIVE REQUIREMENTS.
- C. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ELECTRICAL EQUIPMENT TO BE REMOVED.
- D. ALL EQUIPMENT REMOVED, NOT CLAIMED BY THE OWNER, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND THE CONTRACTOR SHALL BE RESPONSIBLE TO PROPERLY DISPOSE OF ELECTRICAL EQUIPMENT REMOVED.
- F. NOT ALL BUILDING DETAILS AND BRANCH CIRCUIT CONDUIT/WIRING TO BE REMOVED ARE SHOWN ON THE PLANS. THE CONTRACTOR MAY REQUEST, AT HIS DISCRETION, TO REVIEW EXISTING ELECTRICAL, MECHANICAL, AND ARCHITECTURAL PLANS, AT THE OFFICE OF THE ARCHITECT.
- G. COORDINATE DEMOLITION FOR EXISTING ELECTRICAL EQUIPMENT BEING REMOVED. ALL ELECTRICAL EQUIPMENT DOWNSTREAM, WHICH REMAINS, AND OUT OF THE DEMOLITION AREA, SHALL REMAIN "ON" AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE GENERAL DEMOLITION WITH THE OWNER TO AVOID PROBLEMS WITH CIRCUITS BEING DISCONNECTED AND REMOVED WHICH MAY AFFECT OTHER AREAS OUTSIDE OF THE WORK AREA.
- H. THE CONTRACTOR SHALL FIELD SURVEY OUTLETS TO REMOVE AND WHICH OUTLETS OR DEVICES REMAIN PRIOR TO BID. NOT ALL OUTLETS/DEVICES TO BE REMOVED ARE SHOWN ON THE PLAN. DURING DEMO PROCESS, COORDINATE REMOVALS WITH ARCHITECT IN THE FIELD. RE-FEED ALL OUTLETS THAT ARE DISCONNECTED DURING DEMO THAT SHALL REMAIN TO NEAREST AVAILABLE RECEPTACLE CIRCUIT. THE CONTRACTOR SHALL DETERMINE AND FIELD VERIFY CAPACITY OF CIRCUITS TO COMBINE NEW AND EXISTING RECEPTACLES AND INTERCEPTED CIRCUITS. COMPLY AS REQUIRED FOR CODE RESTRICTIONS AND SPECS.
- J. THE CONTRACTOR SHALL SURVEY SPACES ABOVE CEILING FOR UPGRADE WORK OF DEFICIENT EXISTING ELECTRICAL EQUIPMENT. THIS REMEDIAL ABOVE CEILING WORK MAY INCLUDE PROVIDING ADEQUATE CONDUIT SUPPORTS, REPLACING CODE DEFICIENT FLEXIBLE ELECTRICAL POWER CABLE, PROVIDING MISSING JUNCTION BOX COVERS, REPAIRING BROKEN OR SEPARATED CONDUIT, AND PROVIDING EXTENSION RINGS FOR OVER-CROWDED JUNCTION BOXES. ALL THIS WORK SHALL BE INCLUDED IN THE BID PRICE.
- K. THE CONTRACTOR SHALL BE RESPONSIBLE TO RESOLVE DEFICIENT CABLE RELATED WORK IN EXPOSED CEILING AREAS. THIS MAY INCLUDE ITEMS SUCH AS SUPPORT OF EXISTING CABLE AND REPLACEMENT OF NON-PLENUM RATED CABLE OR REMOVAL OF ABANDONED CABLES.
- L. NOT ALL OUTLETS/DEVICES TO REMAIN ARE SHOWN ON THE PLAN. DURING THE DEMO PROCESS, COORDINATE REMAINING DEVICES WITH ARCHITECT IN THE FIELD. RE-FEED ALL OUTLETS/DEVICES TO REMAIN THAT ARE DISCONNECTED DURING DEMO.
- M. EVERYWHERE IN THIS AREA, FOR THE DURATION OF THE PROJECT, THE CONTRACTOR IS RESPONSIBLE FOR DISCONNECT AND RECONNECT OF BRANCH CIRCUITS AND REPLACEMENT OF ELECTRICAL MATERIALS AND LABOR TO RESTORE COMPLETE AND OPERATIONAL SYSTEMS. THIS INCLUDES THE CORRECTION OF ANY CODE DEFICIENCIES RELATED TO RENOVATIONS ON THIS PROJECT.
- N. COORDINATE WITH ARCHITECT/ENGINEER AND FIELD VERIFY STATUS OF DEVICES, OUTLETS, CONDUIT AND WIRE AS A RELOCATION, DEMOLITION, OR TO REMAIN. FIELD VERIFY RE-FEEDING EXISTING DEVICES, RE-ROUTING OR NEW CIRCUITING. FIELD VERIFY CAPACITY OF CIRCUITS TO COMBINE NEW AND EXISTING RECEPTACLES AND INTERCEPTED CIRCUITS. COMPLY AS REQUIRED FOR CODE RESTRICTIONS AND SPECS.
- P. PROVIDE NEW CIRCUIT BREAKERS OF THE SAME TYPE OR BLANK SPACE COVERS AS MAY BE NECESSARY TO FILL PANEL FOR SAFETY. FIELD SURVEY CIRCUITS THAT MAY BE ABANDONED. RELOCATE, IF NECESSARY, CIRCUIT RUNS EXPOSED BY DEMO WORK THAT SHALL BE KEPT OPERATIONAL.
- Q. DISCONNECT EXISTING LIGHTING & POWER TO ELECTRICAL CIRCUITS AND EQUIPMENT IN THESE AREAS ENTIRELY BACK TO PANEL CIRCUIT BREAKER WHERE DASHED WALLS ARE BEING REMOVED. DISCONNECT AND REMOVE ALL EXISTING CONDUIT, CONDUCTORS, CABLE, CONTROLS, AND BOXES, ETC. FOR THIS DEMO, THE ONLY EXCEPTION WILL BE FOR NEW CONTROLS AND DEVICES WHERE EXISTING AND UNDAMAGED BOXES/CONDUIT CAN BE UTILIZED BY THE CONTRACTOR. THE CONTRACTOR SHALL REFER TO NEW WORK PLANS AND SPECIFICATIONS IN ALL DIVISIONS THAT RELATE TO ELECTRICAL WORK IN THIS PROJECT. COORDINATE DEMOLITION AND INSTALLATION WITH FIELD CONDITIONS AS THEY MAY APPLY. ALL EQUIPMENT SHALL BE MADE OPERATIONAL, NO EXCEPTIONS. COORDINATE WITH REPRESENTATIVES OF THE OWNER, ARCHITECT, AND ENGINEERS FOR CONDUIT LOCATION AND TERMINATION POINTS IF NOT SPECIFIED ON PLANS.
- R. ALL ELECTRICAL LIGHTING, RECEPTACLES THAT ARE NOT SHOWN ARE EXISTING TO REMAIN. FIELD VERIFY PRIOR TO BID TO INCLUDE FEE FOR REMOVALS. COORDINATE WITH ALL NOTES AND WALLS TO BE REMOVED WITH ARCHITECTURAL.
- S.

### KEYED NOTES

1. REMOVE ALL LIGHT FIXTURES AND ASSOCIATED SWITCHES AND BRANCH CIRCUIT COMPLETE AS SHOWN ON THIS PLAN. VERIFY WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED.
2. DISCONNECT AND REMOVE EXISTING RECEPTACLES AND ASSOCIATED CONDUIT AND WIRING. COORDINATE WITH ARCHITECTURAL DEMOLITION DRAWINGS.
3. DISCONNECT AND REMOVE EXISTING HEAT PUMP (HP) POWER AND ASSOCIATED CONTROL WIRING COMPLETE. COORDINATE WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED. HEAT PUMP IS LOCATED ABOVE THE ACCESSIBLE LAY-IN.
4. DISCONNECT AND REMOVE EXISTING HOT WATER HEATING PUMPS POWER CIRCUITS COMPLETE. COORDINATE WITH EXISTING FIELD CONDITION AND COMPLY AS REQUIRED.
5. DISCONNECT AND REMOVE EXISTING ROOF-TOP HVAC UNIT POWER AND CONTROLS COMPLETE. COORDINATE WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED.
6. EXISTING SPEAKER RECESSED IN CEILING. SALVAGE SPEAKER, SPEAKER BACKBOX AND ASSOCIATED WIRING AND INSTALL IN NEW CEILING AND CONNECT SAME AS EXISTING.

**A1** FIRST FLOOR DEMOLITION PLAN 1/8"=1'-0"



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Date:	09-26-2023
Sheet Title:	FIRST FLOOR DEMO LIGHTING AND POWER PLAN
Job Number:	2021-41
Sheet No.	

**ED-101**

PLOT DATE: Dec 10, 2023, 10:20am  
FILENAME: S:\2023 Projects\23-1087 First Judicial DA Office Renovation\Elect12\_ED-101.dwg

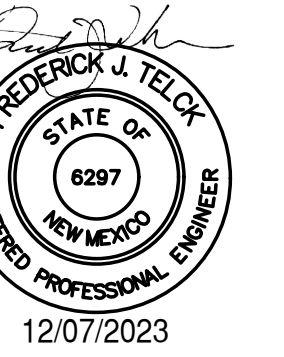


## DEMO GENERAL NOTES

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Checked by: FJT

Date: 09-26-2023

Sheet Title:

**SECOND AND THIRD FLOOR DEMO LIGHTING AND POWER PLANS**

Job Number: 2021-41

Sheet No.

**ED-102**



**C1 3rd FLOOR DEMOLITION PLAN**  
1/8"=1'-0"

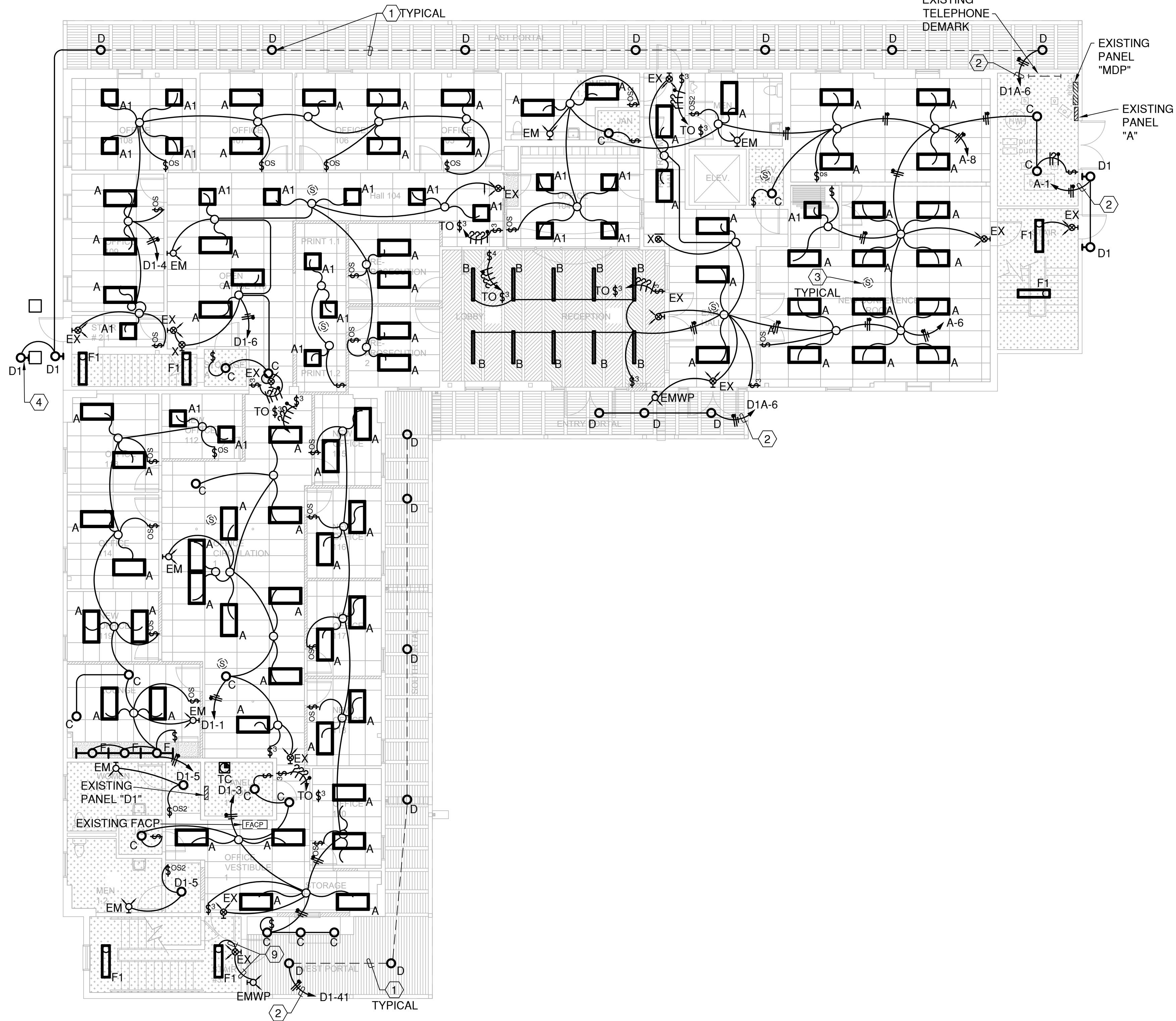


### KEYED NOTES

1. REMOVE ALL LIGHT FIXTURES AND ASSOCIATED SWITCHES AND BRANCH CIRCUIT COMPLETE IN THIS AREA. VERIFY WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED.
2. EXISTING SPEAKER RECESSED IN CEILING. REMOVE SPEAKER, SALVAGE, AND INSTALL IN NEW CEILING. CONNECT SAME AS EXISTING.
3. DISCONNECT AND REMOVE EXISTING HEAT PUMP (HP) POWER AND ASSOCIATED CONTROL WIRING COMPLETE. COORDINATE WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED. HEAT PUMP LOCATED ABOVE THE ACCESSIBLE LAY-IN.
4. DISCONNECT AND REMOVE EXISTING COOLING TOWER BLOWER POWER CIRCUIT AND HEATER POWER COMPLETE. COORDINATE WITH EXISTING FIELD CONDITION AND COMPLY AS REQUIRED.

**A1 2nd FLOOR DEMOLITION PLAN**  
1/8"=1'-0"





NORTH 1st Floor - Lighting Plan  
 Scale: 1/8" = 1'-0" 7,941 Sq ft

**LIGHTING GENERAL NOTES**

- A. ALL LAY-IN GRID TROFFERS SHALL HAVE FLEXIBLE CONDUIT CONNECTION WITH MINIMUM #12 BRANCH CIRCUITS AND MINIMUM #12 GROUND - NO EXCEPTIONS IN WORK AREA.
- B. EMERGENCY LIGHT FIXTURES SHALL BE MOUNTED MAXIMUM 8'-0" AFF.
- C. COORDINATE THE EXACT LOCATIONS OF ALL CEILING MOUNTED LIGHT FIXTURES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS.
- D. ALL HOME RUNS OVER 100' TO BE MINIMUM 3/4" WITH MINIMUM #10 BRANCH CIRCUITS.
- E. ALL LIGHTING BRANCH CIRCUITS SHALL BE MINIMUM 2#12 + 1#12GR IN .5" UNLESS OTHERWISE INDICATED.
- F. ALL LIGHT SWITCHES IN NEW WORK AREA WHERE NEW OR RE-LOCATED LIGHTING TO BE PERFORMED SHALL BE RELOCATED FROM 54" A.F.F. TO ADA HEIGHT OF 48" A.F.F.
- J. ALL BRANCH CIRCUITS SHALL BE MINIMUM 2#12 + 1#12 GROUND IN .5" CONDUIT, UNLESS OTHERWISE INDICATED.

**KEYED NOTES**

- 1. REPLACE PORTAL LIGHT FIXTURE WITH NEW FIXTURE TYPE AS INDICATED. CONNECT TO THE EXISTING EXTERIOR LIGHTING BRANCH CIRCUIT CONDUIT AND WIRE. VERIFY WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED.
- 2. EXTEND THE NEW EXTERIOR LIGHTING BRANCH CIRCUIT THROUGH THE EXISTING LIGHTING CONTRACTOR TO THE EXISTING OVERCURRENT PROTECTIVE DEVICE IN PANEL INDICATED.
- 3. REMOVE THE EXISTING SPEAKER AND ASSOCIATED WIRING AND INSTALL THE SPEAKER IN THE NEW CEILING. RE-CONNECT SAME AS EXISTING.
- 4. INSTALL NEW LIGHT FIXTURE AS THE GUARD STATION. VERIFY LOCATION WITH EXISTING FIELD CONDITION AND COORDINATE WITH THE ARCHITECT IN FIELD.

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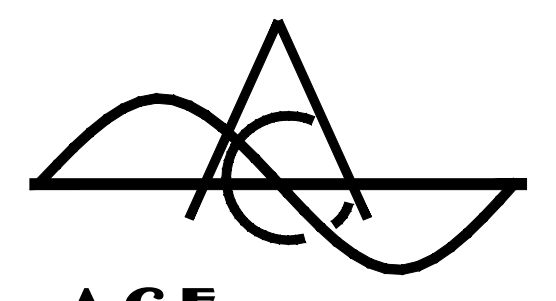
Date: 09-26-2023

Sheet Title:  
**FIRST FLOOR LIGHTING PLAN**

Job Number: 2021-41

Sheet No.

**EL-101**



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Date: 09-26-2023

Sheet Title:  
**SECOND AND THIRD FLOOR LIGHTING PLANS**

Job Number: 2021-41

Sheet No.

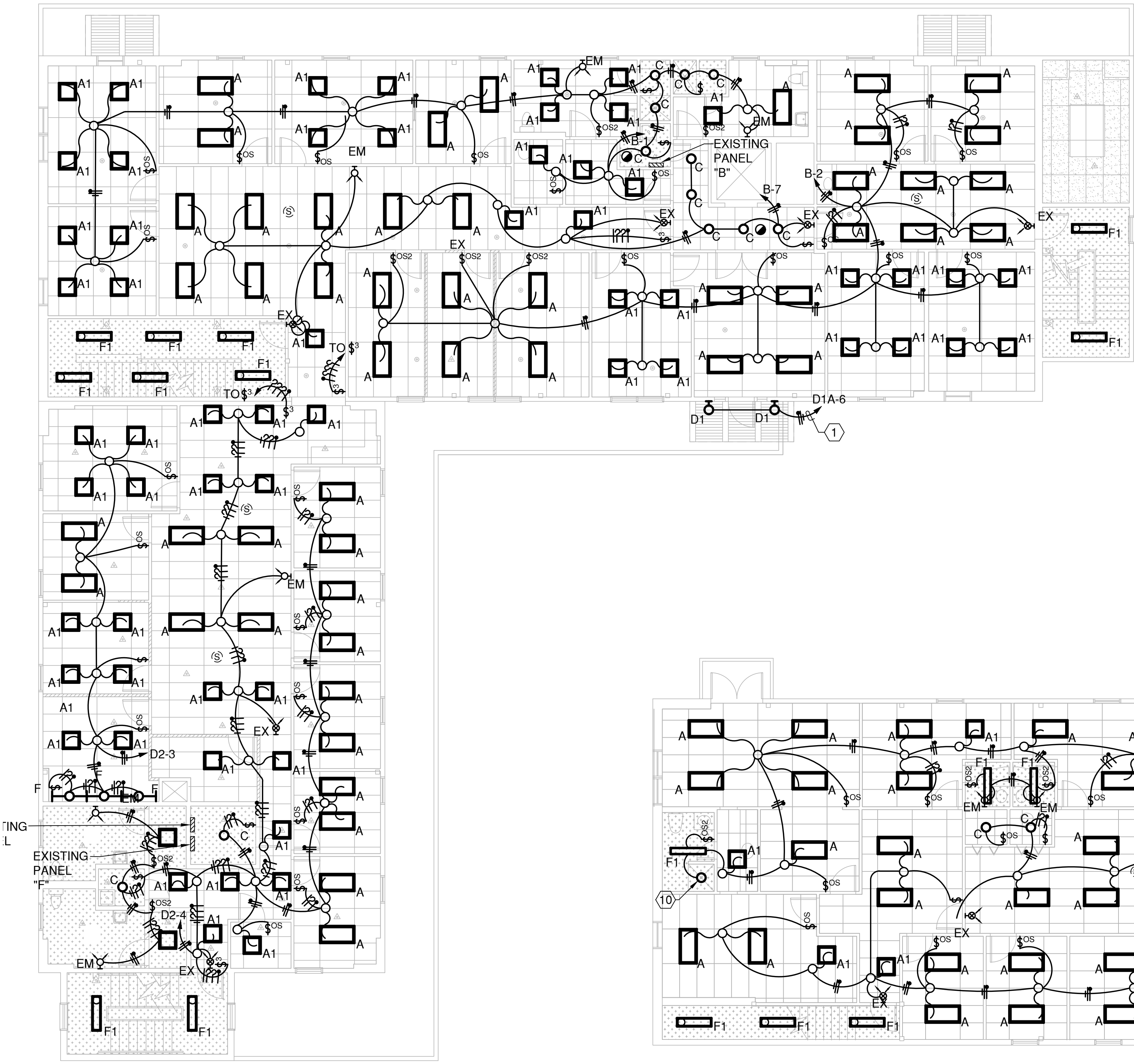
**EL-102**

**SHEET GENERAL NOTES**

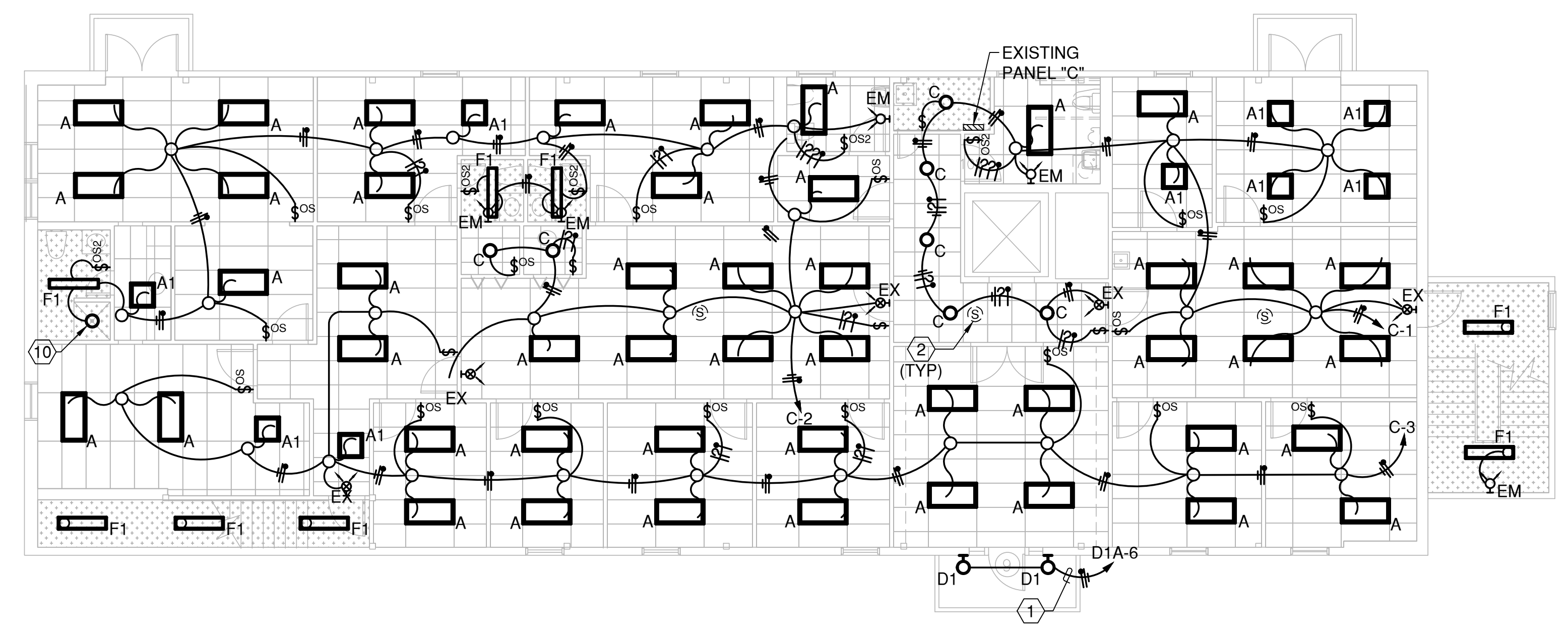
- A. REFER TO SHEET E-1 FOR SHEET GENERAL NOTES.

**KEYED NOTES**

1. EXTEND THE NEW EXTERIOR LIGHTING BRANCH CIRCUIT THROUGH THE EXTERIOR LIGHTING CONTACTOR TO EXISTING PANEL INDICATED.
2. REMOVE AND RE-INSTALL EXISTING CEILING SPEAKER AT SAME LOCATION TO ACCOMMODATE CEILING RENOVATION. CONNECT SAME AS PREVIOUSLY CONNECTED. COORDINATE WITH ARCHITECT PRIOR TO START OF WORK.



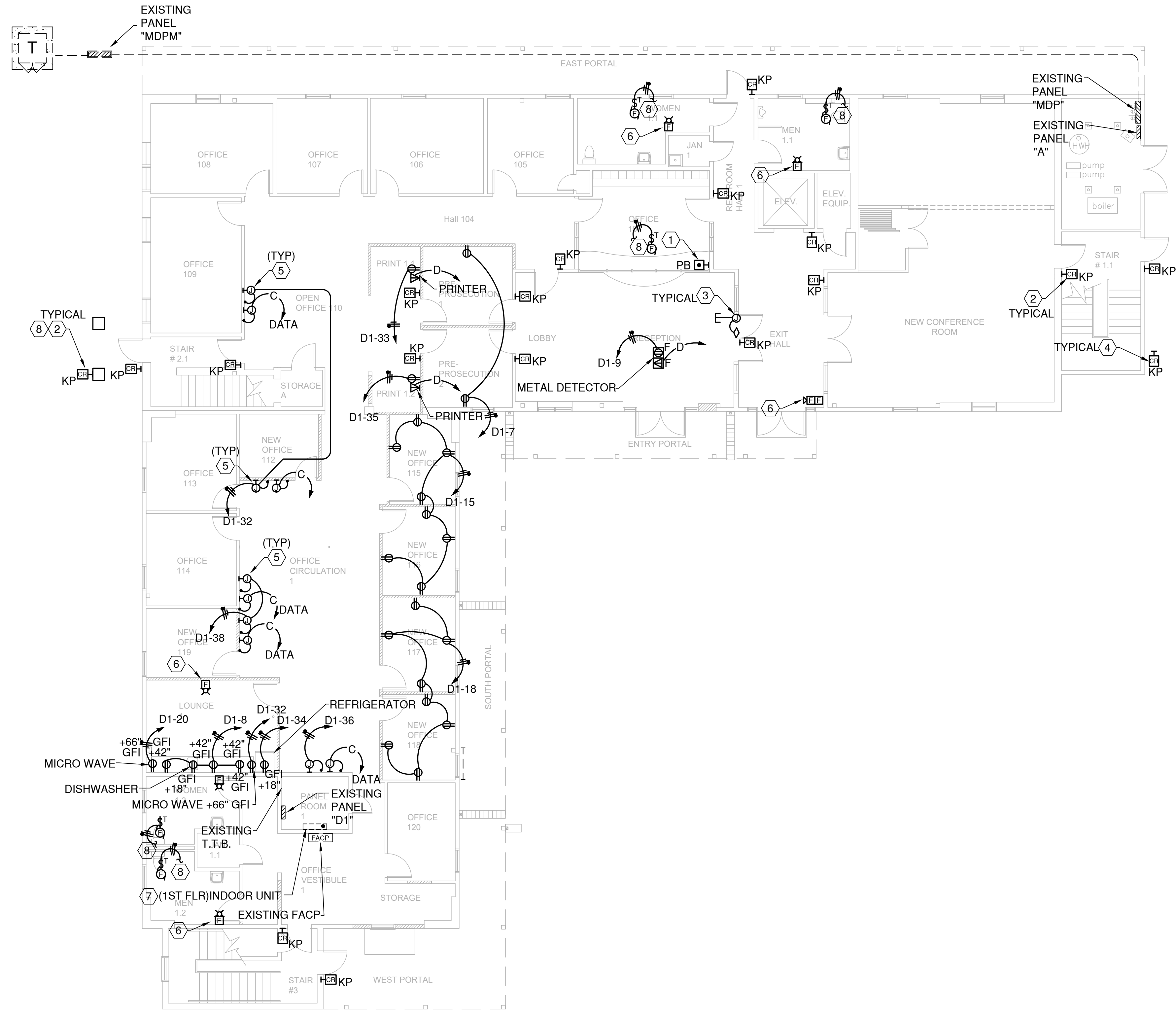
NORTH 2nd Floor - Lighting Plan  
 Scale: 1/8" = 1'-0" 7,941 Sq ft

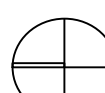


NORTH 3rd Floor - Lighting Plan  
 Scale: 1/8" = 1'-0" 7,941 Sq ft







NORTH  First Floor – Power Plan  
Scale: 1/8" = 1'-0"

**POWER GENERAL NOTES**

- A. ALL DEVICE PLATES SHALL MATCH EXISTING DEVICE PLATES. FIELD VERIFY.
- B. ALL SWITCHES SHALL BE PROVIDED WITH PERMANENT LABELING IDENTIFYING PANEL AND BRANCH CIRCUIT CONNECTED TO.
- C. ALL HOME RUNS OVER 100' TO BE MINIMUM 3/4" C WITH MINIMUM #10 BRANCH CIRCUITS.
- D. ALL RECEPTACLES SHALL BE PROVIDED WITH PERMANENT LABELING IDENTIFYING PANEL AND BRANCH CIRCUIT CONNECTED TO.
- J. ALL OUTLETS TO BE MOUNTED IN CONFORMANCE WITH ADA RULES AND REGULATIONS.
- K. COORDINATE OUTLET HEIGHTS AND LOCATION WITH ARCHITECTURAL INTERIOR ELEVATIONS (CASEWORK, SINKS, LAVATORIES, ETC.)
- L. ALL DUPLEX OUTLETS LOCATED WITHIN 6' OF ALL SINKS, IN ALL RESTROOMS, IN ALL JANITOR CLOSETS, EXTERIOR OF BUILDING, ON THE ROOF AND, ELSEWHERE AS DICTATED BY NEC, SHALL BE 20A GFI TYPE.
- M. ALL HOMERUNS OVER 100' TO BE MINIMUM 3/4" C WITH MINIMUM #10 BRANCH CIRCUITS.
- N. ALL BRANCH CIRCUITS SHALL BE MINIMUM 2#12 + 1#12 GROUND IN .5" CONDUIT, UNLESS OTHERWISE INDICATED.
- O. ALL OTHER RECEPTACLES, LIGHTING, DEVICES OR ELECTRICAL EQUIPMENT NOT SHOWN SHALL REMAIN, UNLESS OTHERWISE NOTED.

**KEYED NOTES**

- 1. REMOTE PUSHBUTTON FOR MAGNETIC LOCK FOR DOOR LEADING FROM LOBBY TO WAITING AREA.
- 2. PROVIDE WIRELESS CARD KEY "SWIPE CARD" ACCESS. (IDENTI-CARD PREMISYS CARD ACCESS) WITH SCHLAGE AND VON DUPRIN HARDWARE OR APPROVED EQUAL. COORDINATE WITH ARCHITECT FOR DIRECTION.
- 3. JUNCTION BOX IN HEADER SPACE FOR MAGNETIC LOCK STUB CONDUIT INTO CEILING SPACE. WIRE PROVIDED BY DA IT CONTRACTOR.
- 4. MOUNT LIGHT AND WIRELESS CARD KEY ACCESS AT SECURITY GATE AS DIRECTED BY ARCHITECT. CONNECT TO LIGHTING TO EXISTING PORTAL LIGHTING.
- 5. PROVIDE NEW POWER AND DATA FOR MODULAR FURNITURE. PROVIDE J-BOX WITH FLEX CONDUIT CONNECTION. COORDINATE LOCATION WITH MODULAR FURNITURE CONTRACTOR PRIOR TO ROUGH-IN.
- 6. NEW FIRE ALARM DEVICE. PROVIDE 4" SQ. J-BOX W/SINGLE GANG MUD PLATE. ROUTE 3/4" C. WITH PULL STRING TO EXISTING FA PANEL.
- 7. DISCONNECT EXISTING PORTABLE COOLING UNIT BACK TO SOURCE ONLY AFTER THE NEW MINI SPLIT SYSTEM AC UNIT IS INSTALLED AND OPERATIONAL. SEE 2ND FLOOR-POWER & S.S. PLAN, SHEET E-3. COORDINATE WITH MECHANICAL.

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Date: 09-26-2023

Sheet Title:  
**FIRST FLOOR POWER PLAN**

Job Number: 2021-41

Sheet No.

**EP-101**



PLOT DATE: Dec 10, 2023, 10:30am  
 FILENAME: S:\2023 Projects\23-387 First Judicial DA Office Renovation\Electr\EP-102.dwg

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 Sheet Title:

**SECOND AND THIRD FLOORS POWER AND SPECIAL SYSTEMS PLANS**

Job Number: 2021-41  
 Sheet No.

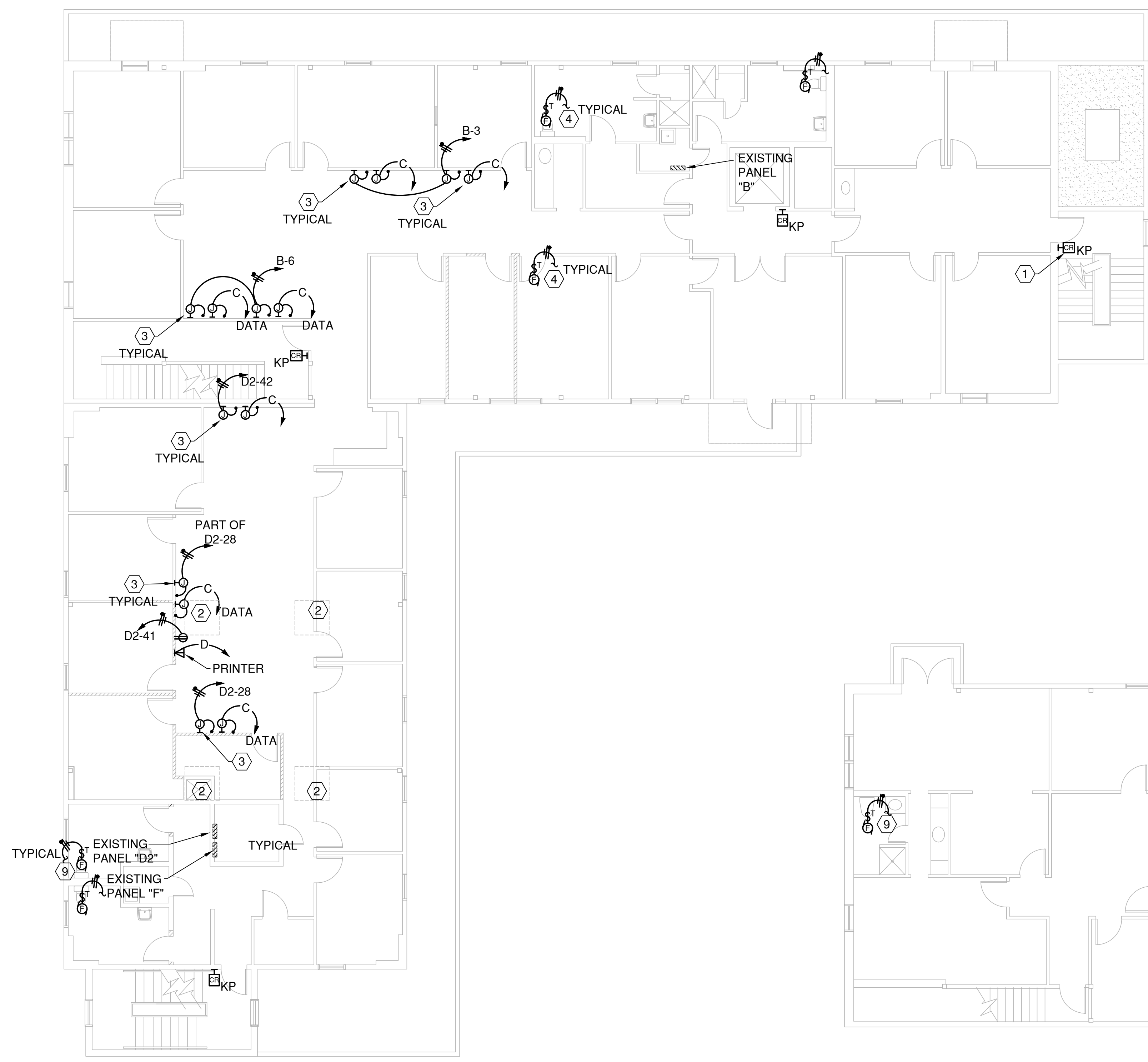
**EP-102**

**SHEET GENERAL NOTES**

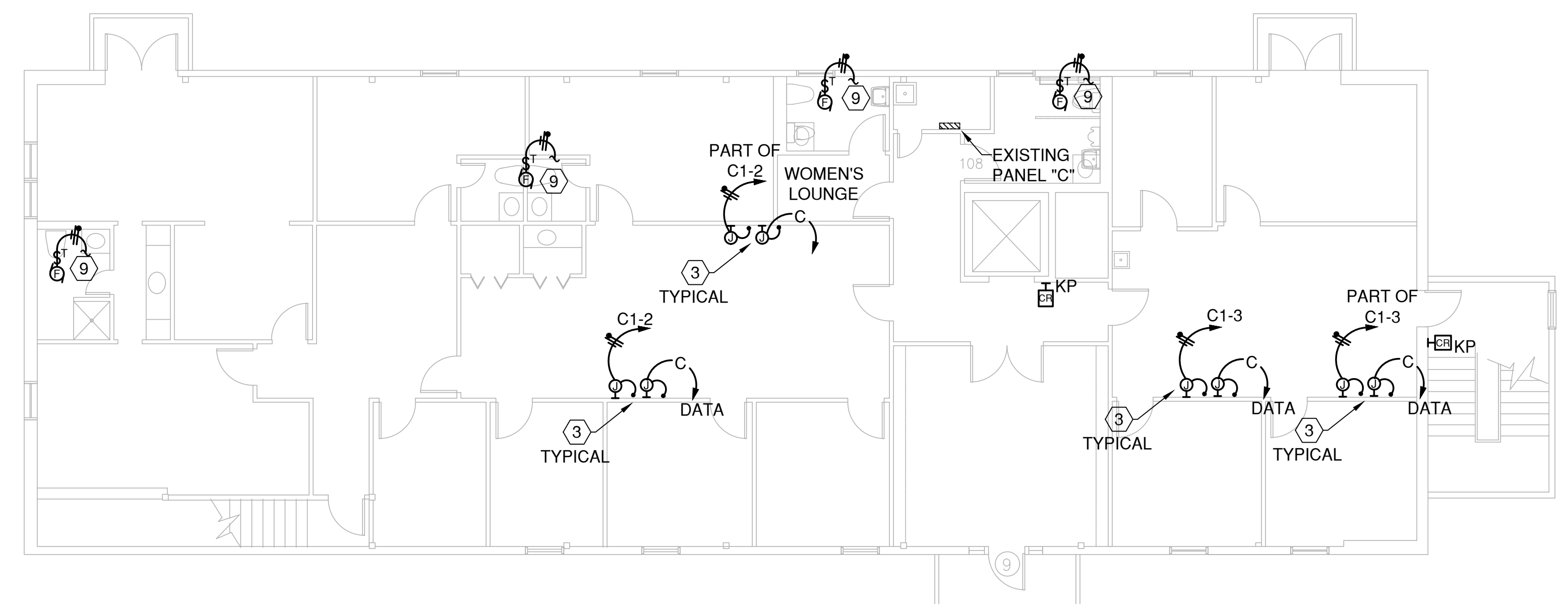
A. REFER TO SHEET EP-101 FOR SHEET GENERAL NOTES.

**KEYED NOTES**

1. PROVIDE 4" SQ. JUNCTION BOX WITH SINGLE GANG MUD PLATE AND 3/4" C. STUBBED INTO CEILING SPACE FOR PROXIMITY CARD READER. PROVIDE PLASTIC BUSHING AT THE END OF CONDUIT STUB. SEE DETAIL SHEET. TYPICAL FOR ALL CARD READERS.
2. DISCONNECT AND REMOVE ALL ELECTRICAL CONNECTIONS TO EXISTING PACKAGED HVAC ROOFTOP UNITS AND ALL ASSOCIATED EQUIPMENT BACK TO PANEL. COORDINATE WITH MECHANICAL CONTRACTOR PRIOR TO START OF WORK.
3. J-BOX FOR CONNECTION TO MODULAR FURNITURE. PROVIDE FLEX CONDUIT CONNECTION AND COORDINATE LOCATION WITH THE MODULAR FURNITURE CONTRACTOR PRIOR TO ROUGH-IN.
4. NEW EXHAUST FAN. PROVIDE 120V CONNECTION AND EXTEND NEW WIRING TO LIGHT FIXTURE CIRCUIT. VERIFY WITH EXISTING FIELD CONDITIONS AND COMPLY AS REQUIRED.



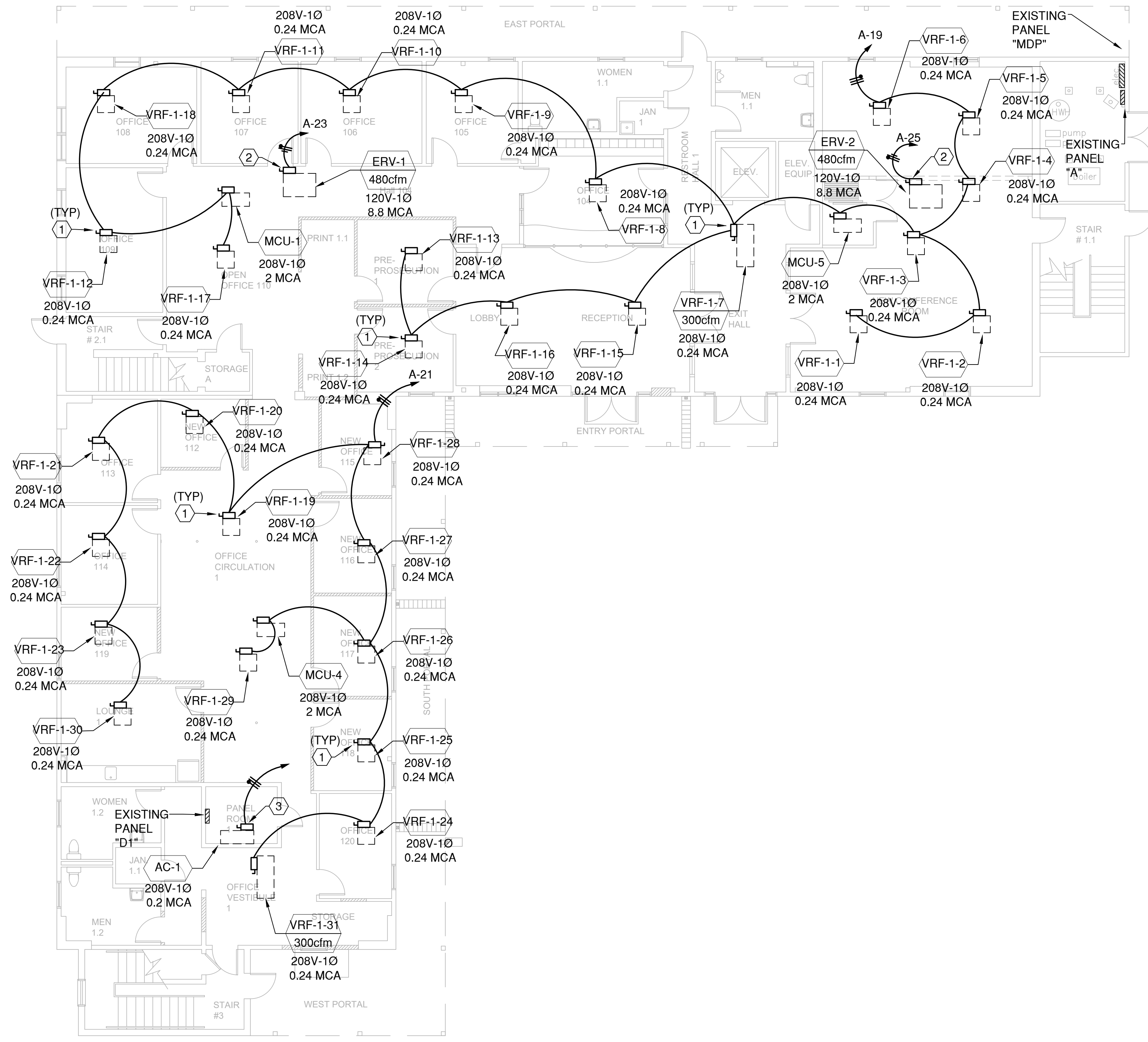
NORTH **2nd Floor – Power & Special Systems Plan**  
 Scale: 1/8" = 1'-0" 7,941 Sq ft



NORTH **3rd Floor – Power & Special Systems Plan**  
 Scale: 1/8" = 1'-0" 7,941 Sq ft







NORTH **First Floor – HVAC Power Plan**  
Scale: 1/8" = 1'-0"

### KEYED NOTES

- NEW VRF UNIT RATED 208V-1PH. PROVIDE 30A/2P, 240V, HD, NON-FUSIBLE DISCONNECT SWITCH. CONNECT TO THE NEW 208V-1PH 20A BRANCH CIRCUIT. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.
- NEW ENERGY RECOVERY VENTILATOR, RATED 120V, 8.8 MCA. PROVIDE NEW 120V, 20A BRANCH CIRCUIT AND 20A/1P HP RATED TOGGLE SWITCH. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.
- NEW INDOOR AIR-COOLED CONDENSING UNIT. PROVIDE 20A/2P, HD NON-FUSIBLE DISCONNECT SWITCH. CONNECT NEW 208V-1PH 20A BRANCH CIRCUIT. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.

### HVAC GENERAL NOTES

- COORDINATE ALL HVAC EQUIPMENT LOCATION, VOLTAGE, PHASE, AND MINIMUM CIRCUIT AMPS WITH THE MECHANICAL TO AVOID CONFLICTS.
- PROVIDE PERMANENT LABELS ON ALL HVAC EQUIPMENT DISCONNECT SWITCHES INDICATING BRANCH CIRCUIT AND PANEL CONNECTED TO.
- ALL BRANCH CIRCUIT WIRING SHALL BE COLOR CODED THROUGHOUT THE ENTIRE ELECTRICAL DISTRIBUTION SYSTEM AS FOLLOWS: PHASE A - BLACK, PHASE B - RED, PHASE C - BLUE, NEUTRAL - WHITE, EQUIPMENT GROUND - STRIPPED GREEN.
- PROVIDE STRANDED CONDUCTORS FOR ALL MECHANICAL EQUIPMENT FROM THE UNIT TO THE NEAREST TERMINATION POINT THAT IS VIBRATION FREE.
- PROVIDE WEATHER-TIGHT FLEXIBLE CONDUIT CONNECTION AT ALL HVAC EQUIPMENT.
- ALL CONTROL AND ALARM CABLES SHALL BE IN CONDUIT IN INACCESSIBLE AREAS, UNLESS NOTED OTHERWISE.
- MAINTAIN CLEARANCES IN FRONT OF DISCONNECT SWITCHES IN ACCORDANCE WITH N.E.C.
- ALL PENETRATIONS SHALL BE CAULKED WITH APPROVED MATERIAL TO MAINTAIN THE FIRE RATING OF WALLS, FLOORS AND ROOFS.
- ALL T-STATS PROVIDED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO FURNISH BOX, CONDUIT & PULLSTRING.
- ALL MECHANICAL POWER AND ROUGH-IN TO BE COORDINATED WITH MECHANICAL CONTRACTOR FOR ALL LOCATIONS AND POWER REQUIREMENTS PRIOR TO ROUGH-IN. NO EXCEPTIONS WILL BE GIVEN.
- ALL MECHANICAL UNITS WITH 2000 CFM OR LARGER SHALL BE SUPPLIED WITH DUCT SMOKE DETECTOR IN SUPPLY SIDE DUCT WITH 3/4" C. AND CONTROL CONDUCTORS TO FACTP. SMOKE DETECTORS SHALL CAUSE THE MECHANICAL UNIT TO AUTOMATICALLY SHUT-DOWN IF ANY SIGN OF COMBUSTIBLES ARE DETECTED.
- PROVIDE DUPLEX OUTLETS LOCATED WITHIN 25 FEET OF HVAC EQUIPMENT ON ROOF SHALL BE RATED 20A, GFI, WEATHERPROOF TYPE OR AS DICTATED BY N.E.C. "PLASTIC BUBBLE" IN-USE COVERS WILL NOT BE ALLOWED-SUBMIT TYPE FOR APPROVAL.
- PROVIDE NON-FUSIBLE DISCONNECT SWITCHES FOR ALL 120V EVAPORATIVE COOLERS (PUMP AND FANS ARE PROVIDED WITH INHERENT MOTOR OVERLOAD PROTECTION).
- TOILET EXHAUST FANS SHALL BE SWITCHED WITH LIGHTING IN TOILETS (ON OCCUPANCY SENSORS), WHERE LIGHTING IS CONNECTED FOR 277V OPERATION, PROVIDE RELAY WITH 277V COIL AND 20A CONTACT TO CONTROL THE EXHAUST FAN AND LOCATE RELAY IN ACCESSIBLE LOCATION.
- PROVIDE PILOT LIGHT, THERMAL OVERLOAD SWITCHES FOR CONTROL OF ALL EXHAUST FANS, UNLESS OTHERWISE CONTROLLED BY TIME CLOCK, LIGHTING BRANCH CIRCUIT, OR FROM THE BUILDING AUTOMATION SYSTEM.
- COORDINATE WITH MECHANICAL FOR LOCATION AND WIRING REQUIREMENTS OF COMBINATION FIRE/SMOKE DAMPERS. DESIGN FOR 120V CONTROL POWER, SYSTEMS DUCT SMOKE DETECTOR (LOCATED IN DUCT AND WITHIN 3' OF FIRE SMOKE DAMPER), AND FIRE ALARM CONNECTIONS.
- COORDINATE HVAC SYSTEMS CONTROLS WITH MECHANICAL. COORDINATE LOCATION OF T-STATS AND ASSOCIATED WIRING.
- PROVIDE LIGHT FIXTURE AND RECEPTACLE AT MECHANICAL EQUIPMENT, WHERE INSTALLED IN CEILING SPACE.

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Checked by: FJT  
Date: 09-26-2023  
Sheet Title:

**FIRST FLOOR HVAC POWER PLAN**

Job Number: 2021-41  
Sheet No.

**EH-101**



PLOT DATE: Dec 10, 2023, 10:30am  
FILENAME: S:\2023 Projects\23-487 First Judicial DA Office Renovation\Electrical\EH-101.dwg

**KEYED NOTES**

1. NEW VRF UNIT RATED 208V-1PH. PROVIDE 30A/2P, 240V, HD, NON-FUSIBLE DISCONNECT SWITCH. CONNECT TO THE NEW 208V-1PH 20A BRANCH CIRCUIT. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.
2. NEW ENERGY RECOVERY VENTILATOR, RATED 120V, 8.8 MCA. PROVIDE NEW 120V, 20A BRANCH CIRCUIT AND 20A/1P HP RATED TOGGLE SWITCH. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.
3. NEW INDOOR AIR-COOLED CONDENSING UNIT. PROVIDE 30A/2P, HD NON-FUSIBLE DISCONNECT SWITCH. CONNECT NEW 208V-1PH 20A BRANCH CIRCUIT. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.
4. NEW OUTDOOR REMOTE CONDENSING UNIT ON ROOF. PROVIDE 30A/2P, FUSIBLE DISCONNECT SWITCH IN NEMA 3R ENCLOSURE, WITH BUSSMAN FRN DUAL-ELEMENT FUSES SIZED AS RECOMMENDED BY THE HVAC UNIT MANUFACTURER. COORDINATE LOCATION AND REQUIREMENTS WITH MECHANICAL TO AVOID CONFLICTS OF RESPONSIBILITIES.
5. NEW 100A/3P, 240V, HD, FUSIBLE DISCONNECT SWITCH IN NEMA 3R ENCLOSURE. FUSE WITH BUSSMAN FRN DUAL-ELEMENTS FUSES SIZED AS RECOMMENDED BY THE HVAC UNIT MANUFACTURER. COORDINATE LOCATION AND ELECTRICAL CHARACTERISTICS TO AVOID CONFLICTS OF RESPONSIBILITIES. EXTEND 3/4" THHN/THWN (CU) + 1#6 THHN/THWN (CU) GR IN 1.5" TO NEW CIRCUIT BREAKER IN EXISTING PANEL "MDP" ON THE GROUND LEVEL.
6. PROVIDE WP/GFI DUPLEX RECEPTACLE ON ROOF WITH CAST ALUMINUM IN-USE COVER, AND CONNECT TO SPARE 20A/1P CIRCUIT BREAKER IN EXISTING PANEL "B".

**HVAC GENERAL NOTES**

- A. COORDINATE ALL HVAC EQUIPMENT LOCATION, VOLTAGE, PHASE, AND MINIMUM CIRCUIT AMPS WITH THE MECHANICAL TO AVOID CONFLICTS.
- B. PROVIDE PERMANENT LABELS ON ALL HVAC EQUIPMENT DISCONNECT SWITCHES INDICATING BRANCH CIRCUIT AND PANEL CONNECTED TO.
- C. ALL BRANCH CIRCUIT WIRING SHALL BE COLOR CODED THROUGHOUT THE ENTIRE ELECTRICAL DISTRIBUTION SYSTEM AS FOLLOWS: PHASE A - BLACK, PHASE B - RED, PHASE C - BLUE, NEUTRAL - WHITE, EQUIPMENT GROUND - STRIPPED GREEN.
- D. PROVIDE STRANDED CONDUCTORS FOR ALL MECHANICAL EQUIPMENT FROM THE UNIT TO THE NEAREST TERMINATION POINT THAT IS VIBRATION FREE.
- E. PROVIDE WEATHER-TIGHT FLEXIBLE CONDUIT CONNECTION AT ALL HVAC EQUIPMENT.
- F. ALL CONTROL AND ALARM CABLES SHALL BE IN CONDUIT IN INACCESSIBLE AREAS, UNLESS NOTED OTHERWISE.
- G. MAINTAIN CLEARANCES IN FRONT OF DISCONNECT SWITCHES IN ACCORDANCE WITH N.E.C.
- H. ALL PENETRATIONS SHALL BE CAULKED WITH APPROVED MATERIAL TO MAINTAIN THE FIRE RATING OF WALLS, FLOORS AND ROOFS.
- I. ALL T-STATS PROVIDED BY MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR TO FURNISH BOX, CONDUIT & PULLSTRING.
- J. ALL MECHANICAL POWER AND ROUGH-IN TO BE COORDINATED WITH MECHANICAL CONTRACTOR FOR ALL LOCATIONS AND POWER REQUIREMENTS PRIOR TO ROUGH-IN. NO EXCEPTIONS WILL BE GIVEN.
- K. ALL MECHANICAL UNITS WITH 2000 CFM OR LARGER SHALL BE SUPPLIED WITH DUCT SMOKE DETECTOR IN SUPPLY SIDE DUCT WITH 3/4" C. AND CONTROL CONDUCTORS TO FACP. SMOKE DETECTORS SHALL CAUSE THE MECHANICAL UNIT TO AUTOMATICALLY SHUT-DOWN IF ANY SIGN OF COMBUSTIBLES ARE DETECTED.
- L. PROVIDE DUPLEX OUTLETS LOCATED WITHIN 25 FEET OF HVAC EQUIPMENT ON ROOF SHALL BE RATED 20A, GFI, WEATHERPROOF TYPE OR AS DICTATED BY N.E.C. "PLASTIC BUBBLE" IN-USE COVERS WILL NOT BE ALLOWED-SUBMIT TYPE FOR APPROVAL.
- M. PROVIDE NON-FUSIBLE DISCONNECT SWITCHES FOR ALL 120V EVAPORATIVE COOLERS (PUMP AND FANS ARE PROVIDED WITH INHERENT MOTOR OVERLOAD PROTECTION).
- N. TOILET EXHAUST FANS SHALL BE SWITCHED WITH LIGHTING IN TOILETS (ON OCCUPANCY SENSORS), WHERE LIGHTING IS CONNECTED FOR 27V OPERATION, PROVIDE RELAY WITH 27V COIL AND 20A CONTACT TO CONTROL THE EXHAUST FAN AND LOCATE RELAY IN ACCESSIBLE LOCATION.
- O. PROVIDE PILOT LIGHT, THERMAL OVERLOAD SWITCHES FOR CONTROL OF ALL EXHAUST FANS, UNLESS OTHERWISE CONTROLLED BY TIME CLOCK, LIGHTING BRANCH CIRCUIT, OR FROM THE BUILDING AUTOMATION SYSTEM.
- P. COORDINATE WITH MECHANICAL FOR LOCATION AND WIRING REQUIREMENTS OF COMBINATION FIRE-SMOKE DAMPERS, DESIGN FOR 120V CONTROL POWER, SYSTEMS DUCT SMOKE DETECTOR (LOCATED IN DUCT AND WITHIN 3' OF FIRE SMOKE DAMPER), AND FIRE ALARM CONNECTIONS.
- Q. COORDINATE HVAC SYSTEMS CONTROLS WITH MECHANICAL. COORDINATE LOCATION OF T-STATS AND ASSOCIATED WIRING.
- R. PROVIDE LIGHT FIXTURE AND RECEPTACLE AT MECHANICAL EQUIPMENT, WHERE INSTALLED IN CEILING SPACE.

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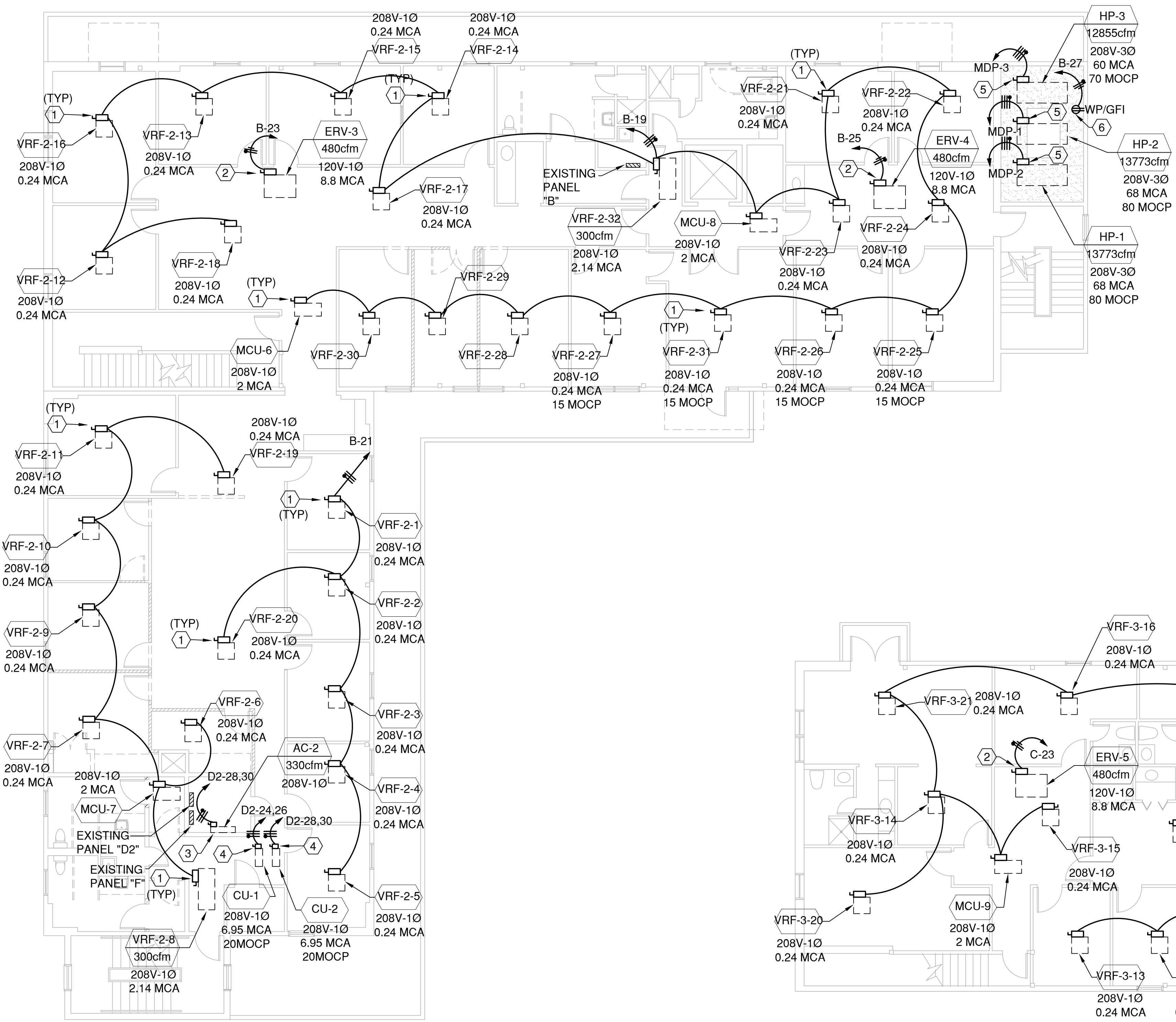
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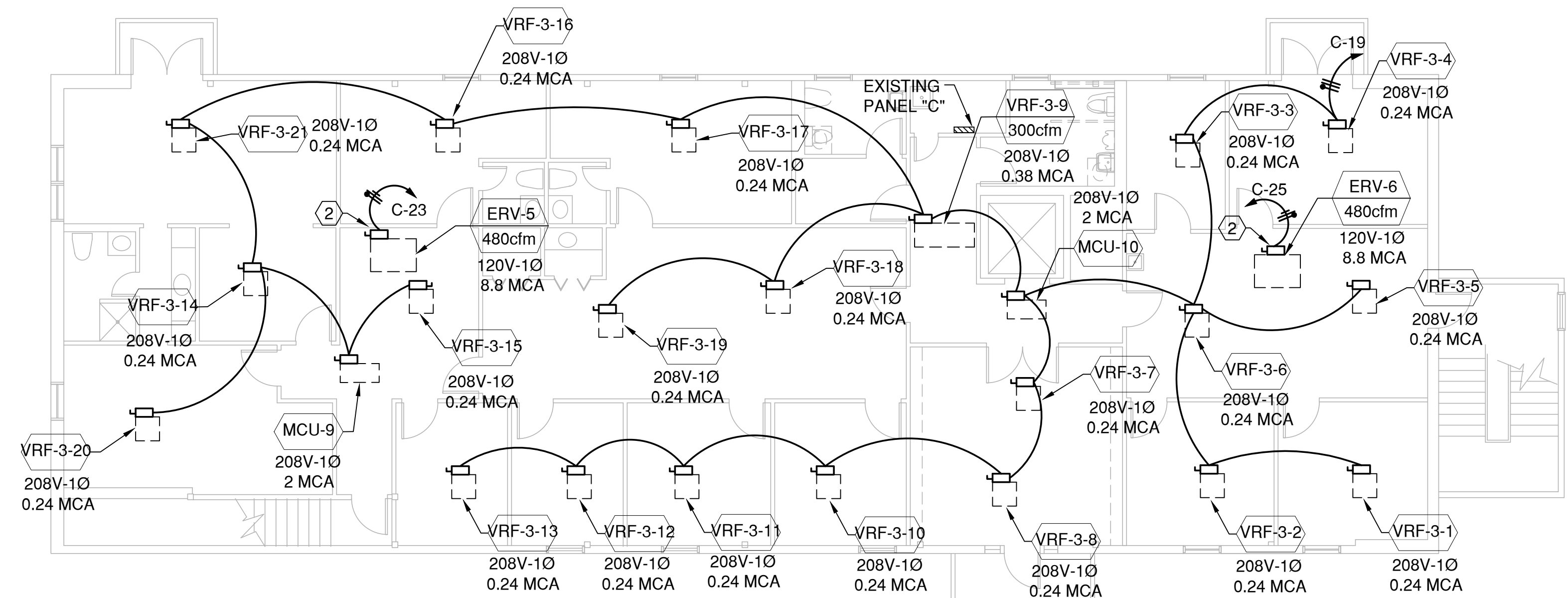
**SECOND AND THIRD FLOORS HVAC POWER PLANS**

Job Number: 2021-41  
 Sheet No.

**EH-102**



**2nd Floor - HVAC Power Plan**  
 Scale: 1/8" = 1'-0" 7,941 Sq ft

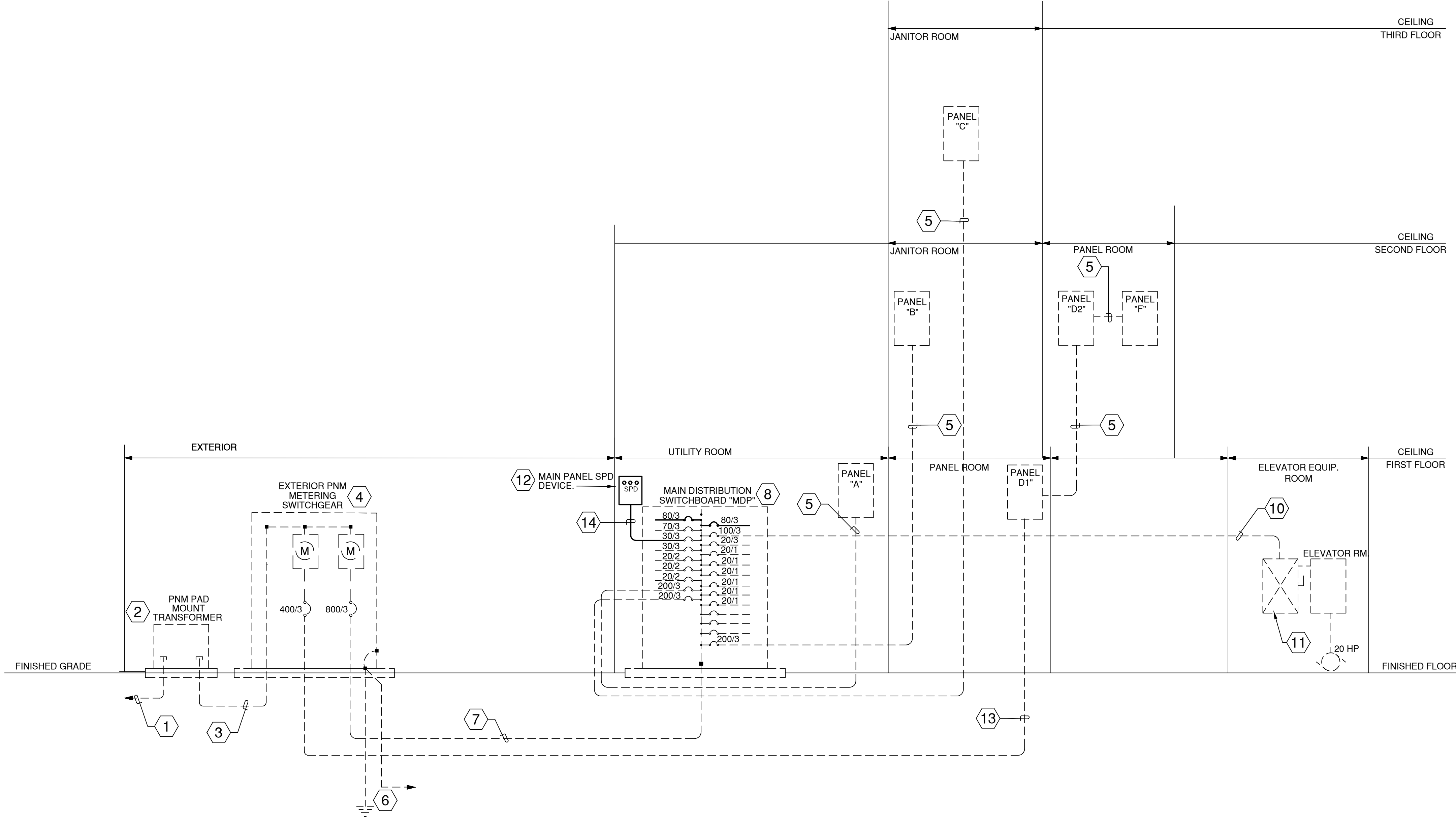


**3rd Floor - HVAC Power Plan**  
 Scale: 1/8" = 1'-0" 7,941 Sq ft



**SHEET KEYNOTES**

- EXISTING SECONDARY SERVICE ENTRANCE FEEDER FROM THE PNM PAD MOUNT TRANSFORMER. NO WORK. SHOWN FOR REFERENCE ONLY.
- EXISTING PNM PAD MOUNT TRANSFORMER. NO WORK. SHOWN FOR REFERENCE ONLY.
- EXISTING PNM PRIMARY FEEDER. NO WORK. SHOWN FOR REFERENCE ONLY.
- EXISTING 1200A BUSSED CT/METER ENCLOSURE. PROVIDE ENGRAVED MICARTA NAMEPLATE WITH 1" HIGH WHITE LETTERS ON RED BACKGROUND, "BUILDING MAIN DISCONNECTING MEANS - PANEL MDP (800A) AND PANEL "D1" (400A) 120/208V, 3PH, 4W". CLEAN INTERIOR OF THE METERING SWITCHBOARD OF DIRT AND DEBRIS. VERIFY CODE COMPLIANT GROUNDING AND BONDING. PROVIDE ADDITIONAL GROUNDS PER THE GROUNDING DETAIL, TWO (2) .75" X 10'-0" COPPERCLAD DRIVEN GROUND RODS WITH 1#1/0 BSD (CU) GROUNDING CONDUCTOR. ENSURE NEUTRAL TO EQUIPMENT GROUND BOND LINK IS INSTALLED. COORDINATE OUTAGE WITH PNM AND OWNER.
- EXISTING FEEDERS TO EXISTING PANELS. SHOWN FOR REFERENCE. VERIFY AND AS-BUILT EXISTING FEEDER CONDUCTOR SIZE AND CONDUIT SIZE.
- EXISTING SERVICE GROUND TO DRIVEN GROUND ROD. REFER TO KEYNOTE 4 FOR WORK REQUIRED.
- EXISTING TWO (2) 3"C. EACH WITH 4-500KCMIL (CU). SHOWN FOR REFERENCE ONLY.
- EXISTING PANELBOARD "MDP" RATED 120/208V, 3PH, 4W, 800A BUS. REMOVE ALL LABELS AND HAND WRITTEN CIRCUIT NUMBERS AND PROVIDE NEW ENGRAVED MICARTA NAMEPLATES, MINIMUM 1" HIGH WHITE LETTERS ON RED BACKGROUNDS, IDENTIFYING NEW LOADS. PROVIDE NEW LABEL AT THE TOP OF THE PANELBOARD "FED FROM PNM METERING SWITCHGEAR LOCATED AT THE NE CORNER OF THE SITE ADJACENT TO THE PNM PAD MOUNT TRANSFORMER". REMOVE TWO (2) EXISTING 70A/3P CIRCUIT BREAKERS AND PROVIDE AND INSTALL TWO (2) NEW 80A/3P CIRCUIT BREAKERS FOR THE NEW VRF HEAT PUMP UNITS. REFER TO EH-102.
- PANEL FEEDER, 4#4/0 THHW/THHN (CU) + 1#2 THWN/THHN (CU) GR IN 2.5"C, OR EQUIVALENT ALUMINUM.
- EXISTING ELEVATOR FEEDER. SHOWN FOR REFERENCE ONLY.
- EXISTING ELEVATOR DISCONNECT SWITCH/CONTROL PANEL. SHOWN FOR REFERENCE ONLY.
- PROVIDE NEW MAIN PANEL SURGE PROTECTIVE DEVICE (SPD) AND ASSOCIATED OVERCURRENT PROTECTIVE DEVICE AND ASSOCIATED FEEDER.
- EXISTING PANEL FEEDER. SHOWN FOR REFERENCE ONLY.
- 4#6 THWN & 1#6 CU. GRD. IN 1.25" C.



NOTE: (E) AND ALL DASHED LINES INDICATE EXISTING ELECTRICAL EQUIPMENT, CONDUIT, CONDUCTORS AND ASSOCIATED DEVICES. THE DARKER LINES INDICATE NEW ELECTRICAL EQUIPMENT, CONDUIT CONDUCTORS AND ASSOCIATED DEVICES.

LOAD SUMMARY - 120/208V - 3PH - 4W		
LOAD	CONNECTED LOAD	DEMAND LOAD
LIGHTS - INTERIOR	28.6 KW	28.6 KW
LIGHTS - EXTERIOR	4.3 KW	5.4 KW
RECEPTACLES	106.6 KW	87.1 KW
HVAC	170.3 KW	170.3 KW
<b>TOTAL</b>	<b>309.8 KW</b>	<b>291.4 KW = 809 AMPERES</b>

EXISTING 1200A SERVICE IS ADEQUATELY RATED FOR THE PROPOSED DEMAND LOAD

SHORT CIRCUIT CALCULATIONS	
NOTE: THE EXISTING ELECTRICAL SERVICE AND ASSOCIATED PANELS AND FEEDERS ARE EXISTING TO REMAIN. NO NEW PANELS AND ASSOCIATED FEEDERS ARE BEING ADDED AS PROVIDED AS PART OF THIS PROJECT.	
ALL EXISTING FLUORESCENT LIGHTING WILL BE REMOVED AND REPLACED WITH NEW LED FIXTURES.	
ALL EXISTING ELECTRIC HEAT IS BEING REMOVED AND REPLACED WITH A NEW VARIABLE REFRIGERANT FLOW (VRF) MECHANICAL SYSTEM.	

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Current Status: ##

REVISIONS		
#	#	#
#	#	#
#	#	#
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Drawn by: ACE  
 Checked by: FJT

Date: 09-26-2023

Sheet Title: POWER RISER DIAGRAM

Job Number: 2021-41

Sheet No.

**E-501**





PANEL SCHEDULE

Panel schedule table for Panel MDP, 1st Judicial DA, 120/208V, 3PH 4W, 80A bus rating. Includes description, load, and phase loading summary.

NOTE: 1. ALL BOLD TEXT ARE NEW LOADS AND BREAKERS AS SHOWN. NOTE: REMOVE TWO (2) 20A/2P CB'S AND PROVIDE TWO (2) NEW 80A/3P CB'S

PANEL SCHEDULE

Panel schedule table for Panel A, 1st Judicial DA, 120/208V, 3PH 4W, 225A bus rating. Includes description, load, and phase loading summary.

NOTE: REMOVE THREE (3) 20A/2P CB'S AND PROVIDE AND INSTALL SIX (6) NEW 20A/1P CB'S

PANEL SCHEDULE

Panel schedule table for Panel B, 1st Judicial DA, 120/208V, 3PH 4W, 225A bus rating. Includes description, load, and phase loading summary.

NOTE: REMOVE THREE (3) 20A/2P CB'S AND PROVIDE AND INSTALL SIX (6) NEW 20A/1P CB'S

PANEL SCHEDULE

Panel schedule table for Panel C, 1st Judicial DA, 120/208V, 3PH 4W, 225A bus rating. Includes description, load, and phase loading summary.

NOTE: REMOVE THREE (3) 20A/2P CB'S AND PROVIDE AND INSTALL SIX (6) NEW 20A/1P CB'S

PANEL SCHEDULE

Panel schedule table for Panel D1, 1st Judicial DA, 120/208V, 3PH 4W, 400A bus rating. Includes description, load, and phase loading summary.

NOTE: REMOVE TWO (2) 60A/3P CB'S AND PROVIDE AND INSTALL SEVEN (7) NEW 20A/1P CB'S

PANEL SCHEDULE

Panel schedule table for Panel D2, 1st Judicial DA, 120/208V, 3PH 4W, 225A bus rating. Includes description, load, and phase loading summary.

NOTE: REMOVE ONE (1) 30A/3P AND TWO (2) 60A/3P CB'S AND PROVIDE AND INSTALL FOUR (4) NEW 20A/2P AND TWO (2) 20A/1P CB'S

PANEL SCHEDULE

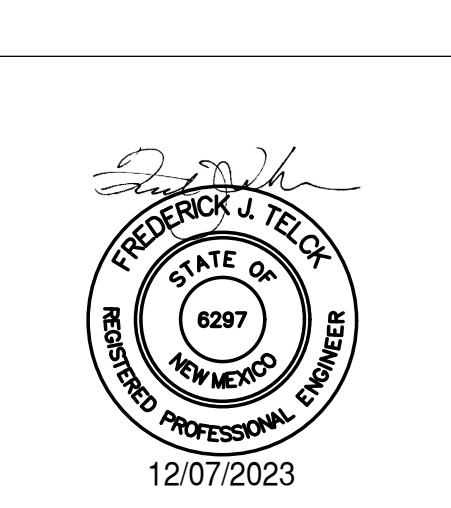
Panel schedule table for Panel F, 1st Judicial DA, 120/208V, 3PH 4W, 100A bus rating. Includes description, load, and phase loading summary.

NOTE: REMOVE TWO (2) 20A/2P CB'S AND PROVIDE AND INSTALL SEVEN (7) NEW 20A/1P CB'S

PANEL SCHEDULE GENERAL NOTES

- A. ALL PANEL BOARDS SHALL HAVE TYPED CIRCUIT DIRECTORIES... B. ALL PANEL BOARDS SHALL BE PROVIDED WITH NAMEPLATES SECURED TO EQUIPMENT... C. ALL PANEL BOARDS SHALL BE PROVIDED WITH GROUND BUS/GROUND STRIP MOUNTED ON A CLEAN SURFACE... D. ALL PANEL BOARDS SHALL HAVE FACTORY FURNISHED CIRCUIT BREAKER NUMBERING... E. ALL BRANCH CIRCUIT CONDUCTORS EXTENDING FROM PANEL BOARDS TO RESPECTIVE DEVICES SHALL BE COLOR CODED... F. ALL BRANCH CIRCUIT CONDUCTORS EXTENDING FROM PANEL BOARDS TO RESPECTIVE DEVICES SHALL BE COLOR CODED AND SHALL BE INSTALLED CONTINUOUS IN EACH RUN AND SHALL HAVE A TAG DESIGNATING THE BRANCH CIRCUIT NUMBERS LOCATED AT ALL JUNCTION BOXES... G. ALL CONDUCTORS IN PANEL BOARDS SHALL BE NEATLY INSTALLED AND TIE-WRAPPED WITHIN PANEL BOARDS.

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Current Status: ###

Revisions table with columns for revision number, description, and date.

Drawn by: ACE

Checked by: FJT

Date: 09-26-2023

Sheet Title: PANEL SCHEDULES

Job Number: 2021-41

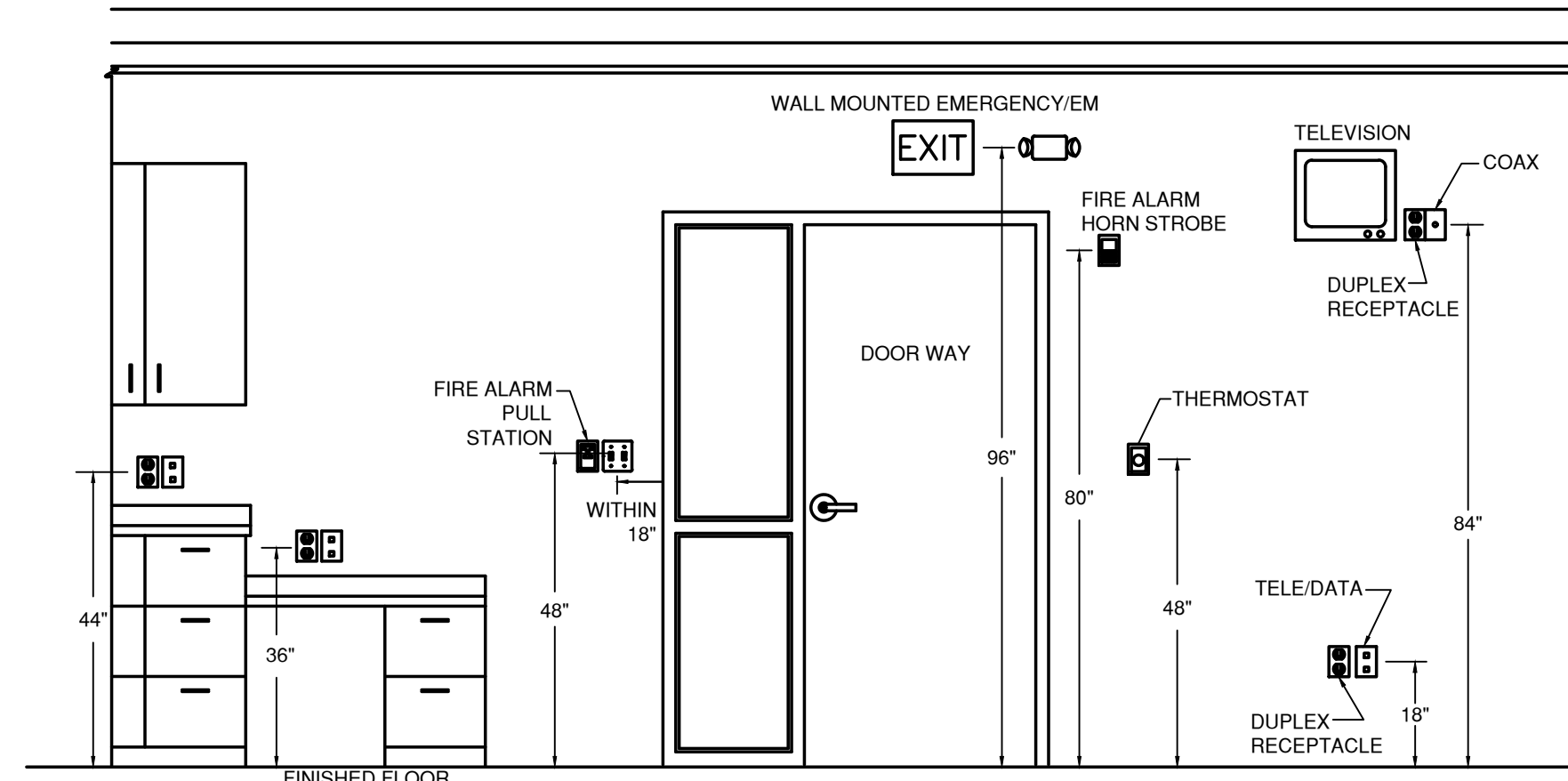
Sheet No.

E-502



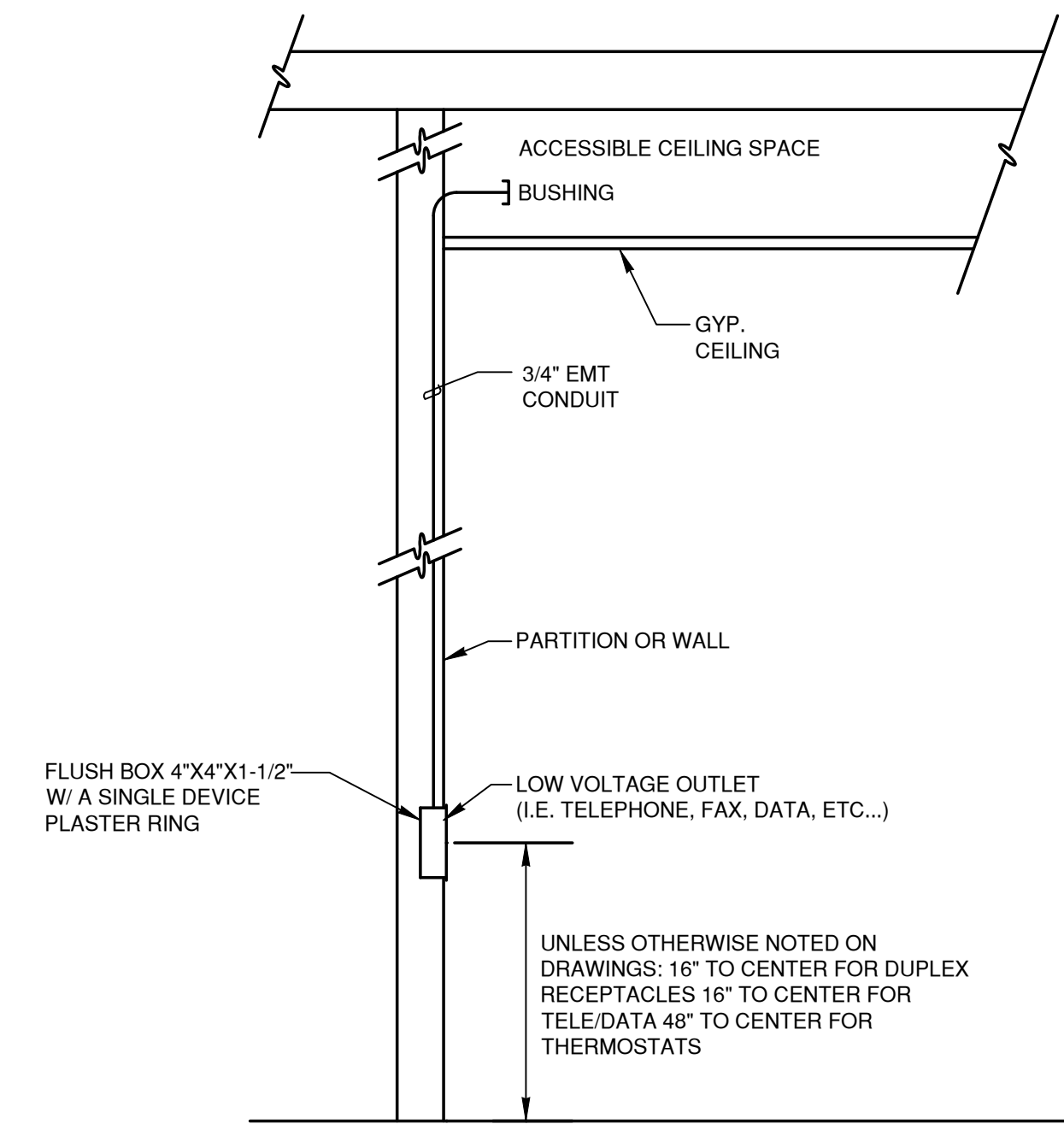
PLOT DATE: Dec 10, 2023 - 10:33am FILENAME: S:\2023\Projects\23-187 - First Judicial DA Office Renovation\Electr11 - E-502.dwg





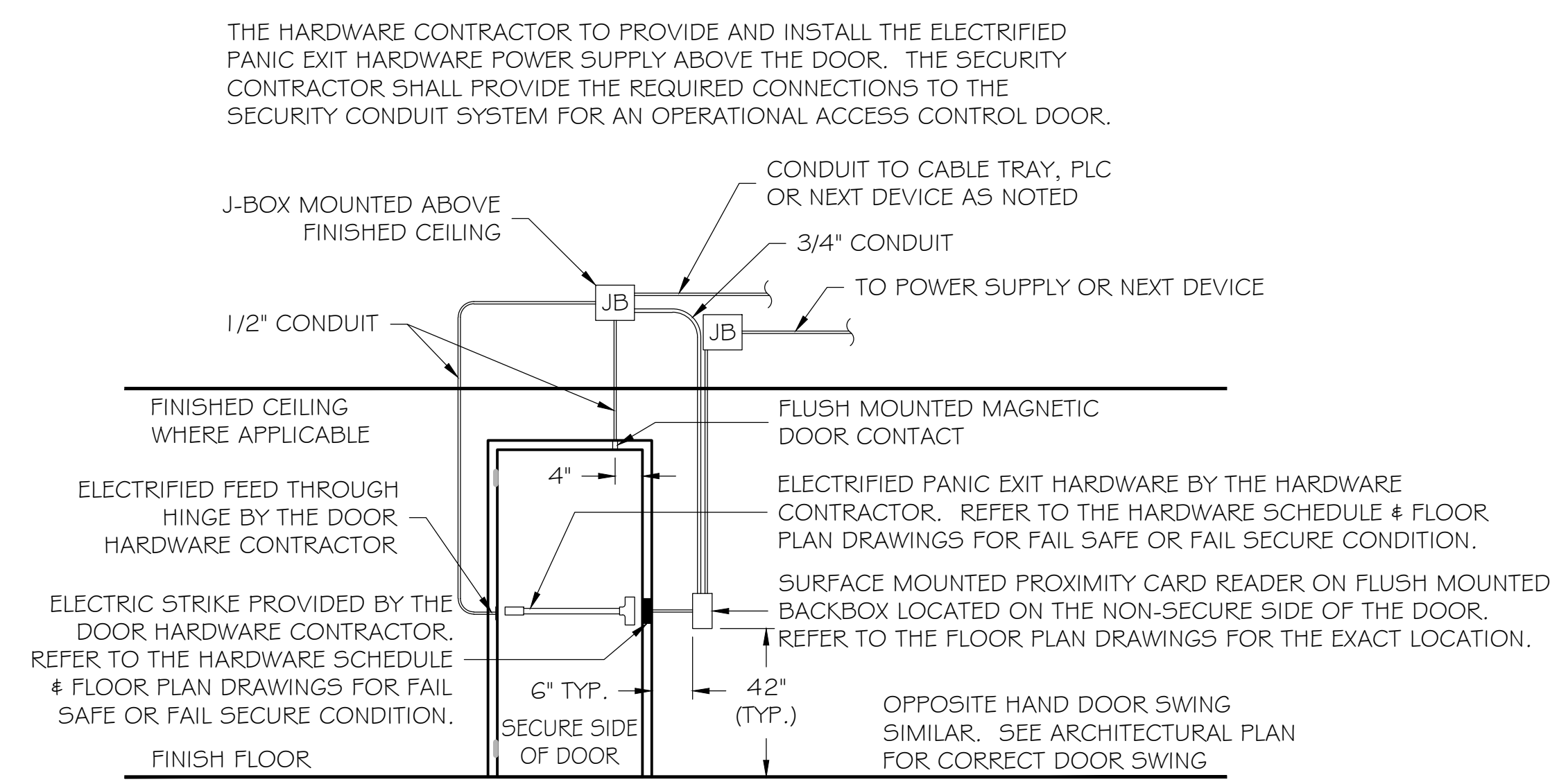
- NOTES:
1. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL TELEVISION OUTLETS WITH THE ARCHITECT PRIOR TO INSTALLATION.
  2. ALL DEVICES SHOWN ON THIS DETAIL ARE FOR REFERENCES OF MOUNTING HEIGHTS ONLY. THE ELECTRICAL CONTRACTOR SHALL FIELD ADJUST THE HEIGHTS OF THE DEVICES AS REQUIRED FOR PROPER MOUNTING OF THE DEVICES.
  3. ALL DEVICES REQUIRED FOR THIS PROJECT MAY NOT APPEAR ON THIS DETAIL. ALL ITEMS SHOWN ON THIS DETAIL MAY NOT BE REQUIRED FOR THIS PROJECT.
  4. THE LIGHT SWITCH HEIGHT SHALL BE 48" TO THE TOP OF THE SWITCH AT THE "ON" POSITION.

1 DEVICE MOUNTING DETAIL  
SCALE: NONE



- NOTES:
1. ALL LOW VOLTAGE CABLE IS TO BE PLENUM RATED.
  2. CABLE INSTALLED ABOVE NON-ACCESSIBLE CEILINGS AND WHERE EXPOSED SHALL BE IN CONDUIT.
  3. CABLING INSTALLED ABOVE ACCESSIBLE CEILINGS SHALL BE INSTALLED WITHIN A CABLE MANAGEMENT SYSTEM SUCH AS BRIDAL RINGS, LOOPS OR OTHER APPROVED HANGERS.
  4. SUPPORT CABLING A MINIMUM OF EVERY 6'.

2 LOW VOLTAGE OUTLET DETAIL  
SCALE: NONE



3 SINGLE DOOR DEVICE DETAIL (TYPE 3)  
SCALE: NONE

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Drawn by: ACE  
Checked by: FJT

Date: 09-26-2023

Sheet Title:  
**ELECTRICAL DETAILS**

Job Number: 2021-41

Sheet No.

**E-601**



DISTRICT ATTORNEY OFFICE RENOVATION

PROJECT MANUAL

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GENERAL REQUIREMENTS - DIVISION 1  
SECTION 01000: GENERAL REQUIREMENTS

1. ACCESS

- 1.1 The Contractors shall provide full means of access to all parts of the Work of the Project, including ladders, lighting, etc. as may be required for the Architect's observation of the work under construction, for Substantial and Final Completion and Inspection after eleven months for warranty.

2 FIELD ENGINEERING AND MEASUREMENTS

- 2.1 The Contractor shall perform all necessary engineering and survey work and exercise proper precautions to achieve correct location and layout of elevations, lines and measurements of demolition and construction required for the project. Review results with architect. Before ordering materials for performing work, verify all measurements and drawing dimensions noted for the project in the field and notify the architect of any discrepancies.

3. COORDINATION OF TRADES

The Contract Documents do not necessarily arrange the work of any one trade, subcontractor or supplier into one section of the Specifications or one portion of the Drawings. It is the responsibility of the Contractor and each subcontractor and supplier to review all sections of the Specifications and all Drawings to determine the full extent of the Work for which they are responsible.

END OF SECTION 01000



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GENERAL REQUIREMENTS — DIVISION I  
SECTION 01015: CONTRACTORS USE OF PREMISES

1. GENERAL

- 1.1 Keys to the existing building will be available to the Contractor in accomplishing his work as required.

2. PROJECT LIMITS

- 2.1 The Project limits will be set in a meeting with the owner. The Contractor is required to work within these limitations and maintain vehicular traffic undisturbed.

- A. For temporary loading outside the Project limits, proper directional signs, flashers and barricades are required.

2.2 UTILITIES

- A. Temporary Electricity  
Power for temporary service connected to the owner's power system, or after the owner's service meter will be furnished by the Owner at no charge. Three phase electricity is not available. The contractor shall supply a 3 phase generator if needed.
- B. Temporary service for heavy loads outside of the current service capacity will be provided by the Contractor.
- C. Water for construction may be obtained from the Owner's service.
- D. Toilets for construction workers must be provided by the Contractor.
- E. Natural gas will be furnished for temporary heat without charge to the Contractor when it is obtained after the Owner's meter.

3. PROTECTION

- 3.1 Barricades and barriers will be provided, installed and maintained by the Contractor as necessary to protect the public, property and plant growth.

END OF SECTION 01015



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GENERAL REQUIREMENTS – DIVISION I  
SECTION 01040: COORDINATION

I. GENERAL

- 1.1 DESCRIPTION: The General Contractor shall coordinate the work of all trades and all Subcontractors on the job. It shall be his responsibility to see that all aspects of the work and the interrelationship of all work to be fully understood by all persons performing any part of the work. No additional costs shall occur to the Owner as a result of any lack of such coordination or understanding.
- 1.2 The General Contractor shall cooperate with the authorities of the Santa Fe County and District Attorney's personnel in every respect so as not to disturb the normal activities of the building wherever possible. The General Contractor shall not interrupt any utilities of services to the surroundings except for the time needed to make connections to, or to remove and relocate such service. They shall consult with the staff regarding scheduling times for his work.
- 1.3 The General Contractor shall submit three (3) days in advance to schedule for approval of any possible hours the electricity, domestic water or gas will be shut off.
- 1.4 UTILITIES: The Contractor shall be responsible for the destruction of or damage to, all existing structures, pipe lines, conduits, cables, sewers, drains, or other utilities encountered in or adjacent to any excavations and he shall use all responsible measures and precautions to protect such properties and shall maintain or replace them in good condition as they were prior to the construction operations. He shall make a diligent effort to locate all underground properties in advance of excavation work and support or protect them so that they will not be broken or their functions interrupted. If utility lines are encountered that are not indicated on the drawings, Contractor shall contact Owner's staff.
- 1.5 Should on site conditions necessitate changes in dimensions or materials, or the rearrangement of piping, fixtures, and electrical equipment, such departures and the reasons therefore shall be submitted to the architect for approval in the form of detail drawings showing the proposed changes. The Contractor shall maintain a set of drawings on which all changes are marked which shall be turned over to the architect at the close of the job.

END OF SECTION 01040



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GENERAL REQUIREMENTS - DIVISION 1  
SECTION 01045: CUTTING AND PATCHING

1. GENERAL

1.1 DESCRIPTION OF REQUIREMENTS : "Cutting and Patching is hereby defined to include, but is not necessarily limited to, the cutting and patching of nominally completed and previously existing work , or to uncover other work for access or inspection, or to obtain samples for testing, or for similar purposes. Cutting and patching is also defined to include all work of demolition , repair and modification required by the drawings.

1.2 QUALITY ASSURANCE

- A. REQUIREMENTS FOR STRUCTURAL WORK: Do not cut and patch structural work in a manner resulting in a reduction of load carrying capacity or load deflection ratio.
- B. OPERATIONAL AND SAFETY LIMITATIONS: Do not cut and patch operational elements and safety related components in a manner resulting in reduction of capacity to perform in a manner intended or resulting in decreased operational life, increased maintenance or decreased safety.
- C. PROTECTION OF THE EXISTING CONDITION: During progress of the work, use care to protect existing surfaces, which are to remain, from damage due to construction operations. Repair such damage as required to restore original condition .

1.3 RESPONSIBILITIES: In remodeling , all cutting and patching shall be the responsibility of the General Contractor. Where it becomes necessary to cut and patch work that is already completed, it shall be the responsibility of the trade or craft for whom the cutting and patching is necessary.

2. PRODUCT

2.1 MATERIALS: Except as otherwise indicated or approved by the Architect, provide materials for cutting and patching which will result in equal or better work being cut and patched , in terms of performance characteristics and including visual effects where applicable . Use materials identical with the original material where feasible and where recognized that satisfactory results can be produced thereby.

3. EXECUTION

3.1 PREPARATION

- A. TEMPORARY SUPPORT: Provide adequate support for work to be cut, to prevent failure, and do not endanger other work.
- B. PROTECTION: Employ skilled tradesmen to perform cutting and patching, to prevent damage and provide protection of the work from



adverse weather exposure.

- 3.2 CUTTING AND PATCHING: Employ skilled tradesmen to perform cutting and patching. Except as otherwise indicated or approved by the architect, proceed with cutting and patching at the earliest feasible time, in each instance, and perform the work promptly.
- A. CUTTING: Cut work by methods least likely to damage work to be retained and work adjoining. In general where physical action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.
  - B. PATCHING: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work. Restore exposed finishes of patched areas; and where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.

END OF SECTION 01045

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GENERAL REQUIREMENTS - DIVISION 1  
SECTION 01046: REMODELING REQUIREMENTS

1. GENERAL

- 1.1 PROTECTION: During remodeling operations use special care to prevent damage to adjacent materials and surfaces which are to remain. Remove furnishings and equipment from the work area where possible. If removal is not possible, cover furnishings and equipment with suitable protective coverings.
- 1.2 DEMOLITION: Remove existing walls, flooring, windows, doors, equipment and similar existing installations to the extent necessary for the addition and remodeling. Remove debris from the site to disposal area approved by Local Civil Authority.
- 1.3 CLEANING UP: Keep demolition debris cleaned up and neat.

2. PRODUCTS

- 2.1 GENERAL: Except as otherwise required, products and materials used in remodeling shall be selected and used to blend and match existing adjacent surfaces and finishes. Where exact matching is not possible, the match shall be as close as possible.

3. EXECUTION

- 3.1 WORKMANSHIP: Carry the cutting and patching of remodeling operations into existing work and to the extent required to minimize the effect of patching and repair. Properly feather and bond new materials to old. Finish new surfaces to match adjacent surfaces in materials and texture. Where precise blending of new to old is not possible, carry the repair and refinishing to the nearest corner or control joint where a change in finish can be accomplished in straight lines and uniform planes.
- A. PAINTING: See PAINTING, Section 09900, where patch work occurs in a painted surface, extend final paint coat over the entire unbroken surface containing the patch, after patched area has received prime and base coats.

END OF SECTION 01046



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GENERAL REQUIREMENTS - DIVISION 1

## SECTION 01340: SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

## PART 1. GENERAL

## 1.1 SHOP DRAWINGS:

Shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on contract drawings. Minimum sheet size: 8-112" x 11".

## 1.2 PRODUCT DATA:

## A. Preparation

1. Clearly mark each copy to identify pertinent products or models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show wiring for piping diagrams and controls.

## B. Manufacturer's standard schematic drawings and diagrams:

1. Modify drawings and diagrams to delete information which is not applicable to the work.
2. Supplement standard information to provide information specifically applicable to the work.

## 1.3 SAMPLES:

Samples shall be sufficient size and quantity to clearly illustrate:

- A. Functional characteristics of the product with integrally related parts and attachment devices.
- B. Full range of color, texture and pattern.

## 1.4 SUBMISSION REQUIREMENTS:

Make submittal promptly and in such sequence as to cause no delay in the work or in the work of any other contractor.

## A. Number of submittals required:

Shop drawings and product data:

Submit the number of copies which the Contractor requires, plus 2, which will be retained by the Owner.

Samples: Submit the number stated in each specification section.

## B. Submittals shall contain:

1. The date of submission and the dates of any previous submissions
2. The project title and project number
3. Submittal number
4. Names of Contractor, Supplier, Manufacturer



5. Identification of the product with the specification section number
6. Field dimensions, clearly identified as such
7. Relation to adjacent or critical features of the work or materials
8. Applicable standards, such as ASTM or Federal Specification numbers
9. Identification of deviations from Contract Documents
10. Identification of revisions on resubmittals
11. A 3" x 12" blank space for Contractor and Owner stamps.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, Field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of the Contract Documents.

#### 1.5 RESUBMISSION REQUIREMENTS:

Make any corrections or changes in the submittals required by the engineer and resubmit until approved.

- A. Shop Drawings and Product Data:
  1. Revise initial drawings or data and resubmit as specified for the initial submittal.
  2. Indicate any changes which have been made other than those requested by the engineer.
- B. Samples:

Submit new samples required for the initial submittal.

#### 1.6 ARCHITECT'S AND ENGINEER'S DUTIES:

- A. Checking of shop drawings shall be regarded as gratuitous assistance to Contractors. Review status by the Architect and/or Engineer shall refer only to size and weight of materials and design of detail, and will in no way relieve the Contractor of his responsibilities for the correctness of measurements and the alignment of the work, nor from the necessity of furnishing material and work required by the contract drawings.
- B. The Architect and/or Engineer assumes no responsibilities for errors or omissions on shop drawings and should such be discovered later, all subsequent work, materials, etc., shall be furnished and installed for a complete and proper installation and at the Contractor's expense.
- C. All shop drawings submitted for approval shall be certified thereon by the General Contractor to effect that Contractor or Subcontractor has carefully checked these shop drawings and found them to be correct with respect to dimensions and available space and that the equipment complies with all requirements of the specifications.

END OF SECTION 01340

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GENERAL REQUIREMENTS.- DIVISION 1  
SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Provide products of same kind from a single source. The term "product" includes the terms "material," "equipment," "system," and similar terms.
- B. Deliver, store, and handle products according to manufacturer's written instructions, using means and methods that will prevent damage, deterioration, and loss, including theft.
  - 1. Schedule delivery to minimize long-term storage and to prevent overcrowding construction spaces.
  - 2. Deliver in manufacturer's original sealed packaging with labels and written instructions for handling, storing, protecting, and installing.
  - 3. Inspect products at time of delivery for compliance with the Contract Documents and to ensure items are undamaged and properly protected.
  - 4. Store heavy items in a manner that will not endanger supporting construction.
  - 5. Store products subject to damage on platforms or pallets, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required.
- C. Product Substitutions: Reasonable and timely requests for substitutions will be considered. Substitutions include products and methods of construction differing from that required by the Contract Documents and proposed by Contractor after award of Contract.
  - 1. Submit **[four]** <insert number> copies of each request for product substitution. Identify product to be replaced and provide complete documentation showing compliance of proposed substitution with applicable requirements. Include a full comparison with the specified product, a list of changes to other Work required to accommodate the substitution, and any proposed changes in Contract Sum or Contract Time should the substitution be accepted.
  - 2. Submit requests for product substitution in time to permit processing of request and subsequent Submittals, if any, sufficiently in advance of when materials are required in the Work. Do not submit unapproved substitutions on Shop Drawings or other submittals.
  - 3. Architect will review the proposed substitution and notify Contractor of its acceptance or rejection.

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. Provide products that comply with the Contract Documents, are undamaged, and are new at the time of installation.
  - 1. Provide products complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.



- B. Do not attach manufacturer's labels or trademarks, except for required nameplates, on surfaces exposed to view in occupied spaces or on the exterior.
- C. Select products as follows:
  - 1. Where only a single product or manufacturer is named, provide the item indicated. No substitutions will be permitted.
  - 2. Where two or more products or manufacturers are named, provide one of the items indicated. No substitutions will be permitted.
  - 3. Where products or manufacturers are specified by name, accompanied by the term "or equal," provide the named item or comply with provisions concerning "product substitutions" to obtain approval for use of an unnamed product or manufacturer.
  - 4. Where a product is described with required characteristics, with or without naming a brand or trademark, provide a product that complies with those characteristics and other Contract requirements.
  - 5. Where compliance with performance requirements is specified, provide products that comply and are recommended in writing by the manufacturer for the application.
  - 6. Where compliance with codes, regulations, or standards, is specified, select a product that complies with the codes, regulations, or standards referenced.
- D. Unless otherwise indicated, Architect will select color, pattern, and texture of each product from manufacturer's full range of options.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01600

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GENERAL REQUIREMENTS - DIVISION 1  
SECTION 01700: CONTRACT CLOSE OUT

1. GENERAL
  - 1.1 In order for the Project to be considered Substantially Complete, all items of the work must be complete and demonstrated operational with only minor items back ordered or needing to be corrected, and all items required under paragraph 2.1 must be provided.
1. SUBSTANTIAL COMPLETION
  - 1.1 When the Contractor considers the Work is substantially complete, submit to the Architect:
    - A. A written notice that the Work is substantially complete.
    - B. A list of items to be completed or corrected, and the cost and time required to complete them.
    - C. A written certification that all mechanical, plumbing and electrical equipment and systems have been demonstrated and explained in the presence of the Owner's Representative and are fully operational.
    - D. Close Out submittals required at Substantial Completion in paragraph 4.1 below.
  - 1.2 Within ten (10) days after the receipt of all items required under paragraph 2.1 above, the Architect will make an inspection to determine the status of completion.
  - 1.3 Should the Architect determine that the Work is not substantially complete:
    - A. The Architect will promptly notify the Contractor in writing.
    - B. The Contractor shall remedy the deficiencies and send a second written notice of substantial completion to the Architect.
    - C. The Architect will review the work.
  - 1.4 When the Architect concurs that the Work is substantially complete, he will:
    - A. Prepare a Certificate of Substantial Completion on AIA form G704 accompanied by the Contractor's list of items to be completed or corrected as verified or amended by the Architect.
    - B. Submit the Certificate to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.
    - C. Retainage at the time of Substantial Completion shall be not less than the Architect's estimate of the cost to the Owner to have an architect describe and administer the remaining work and a contractor bid and complete the work remaining.



## 2. FINAL COMPLETION

- 2.1 When the Contractor considers that the entire Work is finally complete, submit to the Architect:
- A. Written certification that the Work has been completed in accordance with the Contract Documents and is ready for final inspection.
  - B. Close Out Submittals required at Final Completion required in paragraph 4.2 below.
  - C. The Architect will review the work.
- 2.2 When the Architect finds that the Work is acceptable under the Contract Documents, he will prepare a final Change Order if needed and prepare a final Certificate for Payment, and submit these to the Owner for Final Acceptance and Payment.

## 3. CLOSE OUT SUBMITTALS

- 3.1 At Substantial Completion, provide sets of the following:
- A. Evidence of compliance with requirements of governing authorities: Certificates of Inspections and Certificates of Occupancy
  - B. Operating and Maintenance Manuals with data on all systems and equipment as well as the Test and Balance Report (2 sets) .
  - C. All Warranties and Bonds (2 sets)
  - D. Spare parts and maintenance manuals
  - E. Statement of all unsettled claims and approved adjustments to the Contract Sum (if any) which have not been included in Change Orders (2 sets)
  - F. Test and Balance Reports (see Mechanical Equipment requirements in Section 15)
- 3.2 At Final Completion, provide two (2) copies of the following:
- A. Affidavit of Payment, Release of Liens and Consent of Surety (AIA forms G706, G706A and 0707)
  - B. Record Documents complete and annotated per General Conditions paragraph 4.11 (one copy)
  - C. Application for payment in accordance with procedures and requirements stated in the Condition of the Contract and reflecting the Contract Sum (four copies)

## 4. WARRANTY INSPECTION AT ELEVEN (11) MONTHS

- 4.1 Approximately one (1) month prior to the anniversary date of Substantial Completion, the Architect will schedule an Inspection which shall be attended by the Contractor, the Owner and the Architect.
- 4.2 A punch -list of any items of Correction of Work will be issued by the Architect.
- 4.3 The Contractor shall correct all items on the punch list within fourteen (14) days or provide the Owner and Architect with written explanation and schedule for completion.
- 4.4 Expiration of Warranties shall not be cause for release of Contractor's obligation to perform any of this correction of work.
- 4.5 Correction of punch -list items at this time shall not release Contractor from obligations under any warranties, guarantees or statute of limitation extending beyond the anniversary date of Substantial Completion.

END OF SECTION 01700



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GENERAL REQUIREMENTS - DIVISION I  
SECTION 01710: CLEANING

1. GENERAL

1.1 During Construction:

- A. The Contractor shall execute cleaning to ensure that the building and adjacent grounds are maintained free from accumulations of waste material and rubbish. At reasonable intervals during progress of Work, clean site and dispose of waste materials, debris and rubbish.
- B. Provide on-site containers for collection of waste materials, debris and rubbish. Remove waste materials, debris and rubbish from site and legally dispose of it at dumping areas off Museum's property.
- C. Extreme precautions shall be taken in protecting all surrounding finished surfaces. Contractor shall be responsible for returning any damaged area to its original condition.

1.2 Final Cleaning:

- A. Remove grease, dust, dirt stains, and other foreign materials from sight-exposed exterior finished surfaces. Repair, patch up marred surfaces to original finish. Broom clean and shop vacuum the Basement work area and the entire access path to the work area from outside the building.
- B. Owner will assume responsibility for cleaning at Owner's acceptance of the work.

2. PRODUCTS

Not used

3. EXECUTION

Not used

END OF SECTION 01710



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GENERAL REQUIREMENTS.- DIVISION 1  
SECTION 01720:PROJECT RECORD DOCUMENTS & MAINT. MANUAL

1. PROJECT RECORD DOCUMENTS

1.1 Form and Content:

Annotate one complete set of Contract Documents with red-colored felt-tip pen, showing all conditions of the Work as actually installed , and fully documenting in detail the following concealed conditions:

A. Utilities:

Show location of all lines, major junctions, bends, valves, clean-outs, stub-outs, etc., by horizontal dimension to surface improvements and vertical dimension from finished grades for all utilities underground or concealed within the building.

B. Assemblies:

Show all changes or variations not otherwise documented, of materials, products and installations concealed from view .

2. MAINTENANCE MANUAL

2.1 Form:

Provide three (3) complete copies of manual. All materials included in the Manual shall be originals or clearly legible copies of typewritten, drawn or printed manufacturer's brochure sheets, 8-1/2" x 11" size. Fold or photo-reduce oversized sheets. Bind in three- ring loose-leaf binders with indexed dividers designating the major Sections and labeled with the Project name on the outside.

2.2 Contents:

Each Maintenance Manual shall contain:

A. Directory listing the name, address, telephone of:

General Contractor

Surety (also list Bond numbers and local Agent) Subcontractors and their respective suppliers and installers General Contractor's suppliers

B. Maintenance Submittals:

Provide Table of Contents organized similar to the Technical Specifications.

For all systems, items of equipment , operable components, and materials which require any maintenance, provide the following information:

1. Basic Data:

Item of Work; Installer's name; where appropriate provide manufacturer's name, model, and type number, color name or number for each component installed.

2. Replacement Materials and Special Tools:

A list of replacement materials and tools provided by the Contractor, including a place for the Owner's representative to sign that s/he has received same. (The



delivery of these items and receipt signatures to be accomplished during the Building Systems Training Session.)

3. Preventive Maintenance:  
A description of the methods required for the Owner to properly clean, inspect, adjust and, if feasible, repair and/or replace work or damaged components.
4. Basic Operations:  
A description of the methods of operation, inspection, emergency procedures, and seasonal adjustments required by the various components and systems installed in the Project.

Note: Manufacturer's brochures, catalogs and other industry literature, shop drawings, etc., may be used for the above required information where such materials provide easily accessible data to the non-technically trained person.

- C. Test and Balance Report as specified under Division 15 of these Specifications.
- D. Attendance Record to be filled out on completion of the Training Session showing who was present.

END OF SECTION 01720

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SITWORK – DIVISION 2

## SECTION 02111: DEMOLITION AND SALVAGE

## 1. GENERAL

## 1.1 Scope:

Perform all salvage work, including removal of demolished materials as required or implied by the Documents.

## 1.2 Notification:

Notify Architect immediately of any conditions not anticipated in the Documents. Notify Architect prior to patching, repair, new construction or otherwise covering of completed salvage and demolition to observe the then-existing conditions.

## 1.3 General Procedure:

Schedule demolition to avoid conflict with activities of Owner and adjacent property owners. Prior to commencing salvage and demolition work, assure coordination of trades involved, adequate transfer of structural loads, including temporary shoring, proper bypass of utility services, and Owner's removal of all not-in-contract items. Take all necessary precautions to provide continuous protection for safety of workmen and all surrounding Work to remain, as well as to minimize noise and dirt disturbance or any hazard to adjacent population and property.

## 2. SUBMITTALS

- 2.1. Submit warning and advice to Owner of any potential interruption of utility service to other buildings or other areas within the project site area.

## 3. SALVAGE

All items from demolition not scheduled for salvage will be the property of the Contractor and should be removed from the site without delay. Only items noted and scheduled for demolition will be demolished. Many items in this construction will remain in service and be used in the new construction.

## 4. DEMOLITION

- 4.1 General: Prior to commencing demolition, assure that all items of Paragraph 1.3 above have been addressed.

## 4.2 Execution:

Perform all demolition shown or implied and notify Architect immediately of any conditions not anticipated in the Documents. In particular, identify all utility lines and structural details encountered that are at variance with Contract Documents.

5. REPAIR: Cap utility lines flush unless otherwise required. Flag utility locations for observation of Architect and utility companies.

- 5.1 Secure all openings from vandals and unsupervised entry. Notify Architect of any



unforeseen openings or conditions.

END OF SECTION 02111

## SECTION 02751 - CEMENT CONCRETE PAVING

## PART 1 - GENERAL

## 1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, design mixes for concrete, and laboratory test reports.
- B. Comply with ACI 301, "Specification for Structural Concrete."

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Welded Steel Wire Fabric: ASTM A 185, flat sheets not rolls.
- C. Air-Entraining Admixture: ASTM C 260.
- D. Chemical Admixtures: ASTM C 494. Calcium chloride shall not be used.
- E. Liquid Membrane-Forming Curing Compound: ASTM C 309, clear, Type I, Class B, water-borne.

## 2.2 MIXES

- A. Proportion normal-weight concrete mixes to provide the following properties:
  - 1. Compressive Strength: 4000 psi at 28 days.
  - 2. Slump Limit: 4 inches (at point of placement).
  - 3. W/C Ratio: 0.45 maximum at point of placement.
  - 4. Air Content: 5.5 to 7.0 percent.

## PART 3 - EXECUTION

## 3.1 PAVING

- A. Accurately position and support reinforcement, and secure against displacement.
- B. Locate and install contraction, construction, isolation, and expansion joints as indicated or required.

- C. Place concrete in a continuous operation within planned joints or sections. Do not add water to adjust slump.
- D. Float surfaces to true planes within a tolerance of 1/4 inch in 10 feet medium-to-coarse-textured broom finish.
- E. Tool edges and joints to a radius of 3/8 inch.
- F. Begin curing after finishing concrete. Keep concrete continuously moist for at least seven days or apply membrane-forming curing compound to concrete.
- G. Owner will employ a testing agency to sample concrete, perform tests, and submit test reports during concrete placement.
- H. Remove and replace concrete paving that is broken, damaged, or defective. Exclude traffic from paving for at least 14 days.

END OF SECTION 02751



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CONCRETE – DIVISION 3  
SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes. Cast-in-place concrete includes the following:
  - 1. Foundations and footings.
- B. Submittals: Product Data, concrete mix designs, laboratory test reports].
- C. Comply with ASTM C 94; ACI 301, "Specification for Structural Concrete"; ACI 117, "Specifications for Tolerances for Concrete Construction and Materials"; and CRSI's "Manual of Standard Practice."
- D. Engage a qualified independent testing agency to design concrete mixes.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Deformed Reinforcing Bars: ASTM A 615/A 615M, **Grade 60 (Grade 420)**.
- B. Plain Steel Wire: ASTM A 82, as drawn.
- C. Steel Welded-Wire Fabric: ASTM A 185, flat sheets not rolls.
- D. Portland Cement: ASTM C 150, Type I or II.
- E. Fly Ash: ASTM C 618, Type C or F.
- F. Aggregates: ASTM C 33, uniformly graded.
- G. Air-Entraining Admixture: ASTM C 260.

2.2 MIXES

- A. Proportion normal-weight concrete mixes to provide the following properties:
  - 1. Compressive Strength: **3000 psi** at 28 days.
  - 2. Slump Limit: **5 inches** at point of placement.
  - 3. Air Content: 5.5 to 7.0 percent for concrete exposed to freezing and thawing, 2 to 4 percent elsewhere.

## PART 3 - EXECUTION

## 3.1 CONCRETING

- A. Construct formwork and maintain tolerances and surface irregularities within ACI 117 limits of Class A for concrete exposed to view and Class C for other concrete surfaces.
- B. Accurately position, support, and secure reinforcement.
- C. Install construction, isolation, and contraction joints where indicated. Install full-depth joint-filler strips at isolation joints.
- D. Place concrete in a continuous operation and consolidate using mechanical vibrating equipment.
- E. Protect concrete from physical damage, premature drying, and reduced strength due to hot or cold weather during mixing, placing, and curing.
- F. Begin curing concrete slabs after finishing. [Keep concrete continuously moist for at least seven days] [Apply membrane-forming curing compound to concrete] [Apply membrane-forming curing and sealing compound to concrete].
- G. Owner will engage a testing agency to perform field tests and to submit test reports.
- H. Protect concrete from damage. Repair surface defects in formed concrete and slabs.

END OF SECTION 03300

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MASONRY—DIVISION 4  
SECTION 04220: CONCRETE UNIT MASONRY

## PART 1 GENERAL

- 1.1 Scope: Furnish and install all masonry complete with all necessary accessories.
- 1.2 Submittals: For masonry units delivered to the site: submit current test results within 90 days verifying compressive strength, moisture content and absorption; within one year for linear shrinkage. Submit samples of any specialty units for approval before manufacturing. Submit mortar and grout design mix (with additives) from a laboratory approved by the Architect. Shop drawings, design mix and test results must be reviewed by architect prior to placement of any masonry.
- 1.3 Notification: Contractor shall notify Architect for inspection of reinforcing prior to placement of grout and during all grout placements. Notification shall be given at least two weekdays before the grout placement is scheduled.
- 1.4 Quality Assurance: Perform field tests for mortar and grout in accordance with U.B.C. Standard 24-22. Make four specimens for each test. Test two specimens for compressive strength at 7 days. Test second two specimens at 28 days. Suitable equipment for making mortar and grout specimens shall be available at the site during masonry work. Minimum tests required shall be one mortar test and one grout test (four specimens for each) for every 2000 sq.ft. of wall surface, and in no case fewer than one test (four specimens) for each day of work.

## PART 2 MATERIALS

- 1.5 Portland Cement: ASTM C-150, Type I or II.
- 1.6 Water: Clean, non-alkali and potable.
- 1.7 Aggregates: Aggregate for Mortar: ASTM C-144, Aggregate for Grout: ASTM C-404.
- 1.8 Hydrated Lime: ASTM C-207, Types, or "Easy Spread" mortar plasticizer by American Colloid Company.
- 1.9 Reinforcing:
  - A. Bars: ASTM A-615, Grade 60, Ties and Stirrups, Grade 40.
  - B. Joint Reinforcing: ASTM A-82 for High Tensile Steel. Truss type with prefabricated corner and intersection sections, standard "Dur-O-Wall" joint reinforcing, or equal with deformed side rods such that minimum surface bond stress developed is 527 psi when incorporated in Standard ASTM Class A mortar cubes.
- 1.10 Concrete Masonry Units: "Slump Block" Units; ASTM C-90-75, Grade N, Type I, for hollow load-bearing, and ASTM C-129-75 for hollow non-load-bearing units. Aggregate shall be volcanic scoria and shall meet all other requirements of ASTM C-331. Curing



shall be accomplished by high pressure steam (auto-claved method) at 140 psi pressure and 360F steam temperature.

A. Minimum compressive strength 1350psi average gross area.

B. Linear shrinkage may not exceed .03.

C. Moisture content shall not exceed 25% of total absorption. Block manufacturer shall submit current test results on units: within 90 days for compressive strength, moisture content and absorption; within one year for linear shrinkage.

1.11 Anchors and Ties: Galvanized, minimum 20 gauge steel, or approved design.

1.12 Masonry Control Joints: Rubber, cross shape ASTM D-2000 2AA-805 80 durometer hardness when tested in accordance with ASTM C-2240.

1.13 Mortar:

A. Type "S": Type "S" mortar with compressive strength 1800 psi at 28 days.

B. Requirements: Follow requirements of U.B.C. Standard 24-30 (ASTM C-270).

C. Proportions: (by volume):

1. Portland Cement: 1/2
2. Masonry Cement (Type II): 1
3. Aggregate: 2-1/4 to 3 times the sum of volumes of the cements used when measured in loose, damp condition.

-OR-

I. Portland Cement: 1

2. Hydrated Lime or Lime Putty: 1/4 to 1/2 (or "Easy Spread": 1/2)

3. Aggregate: 2-1/4 to 3 times the sum of the volume of the cement and lime used when measured in loose, damp condition.

2.10 Grout:

A. Strength: Compressive strength 2000 psi at 28 days.

B. Proportions (by volume):

1. Portland Cement: 1 part
2. Sand: 2-1/2 to 3 parts
3. Pea Gravel: 1-1/2 to 2 parts
4. Hydrated Lime: 1/10 part
5. Water: To yield slump of 9 to 10 inches
6. Grout Admixture- optional. Approval required. Grout Admixture: "Grout-Aid" as manufactured by Super Concrete Emulsions Ltd., or equal Minimum Cement: 7.9 sacks per yard without admixture; 6.3 sacks per yard with admixture.

- C. Ready Mix Grout: conform to ASTM C-94.
- 2.11 Masonry Fill Insulation (See Section 07210 Building Insulation): "Core-Fill 500" or "Thermco" Foam Insulation, two component system (Amino-Plast Resin and catalyst foaming agent surfactant), together with compressed air to form a foam insulation in all open cells adjacent to heated building spaces to achieve "R" rating of 14.2 in eight inch (8") hollow concrete block. Install with licensed contractor, approved and licensed by manufacturer. Incorporate the patented product "Bancho" to assure that no measurable outgassing of formaldehyde will occur. Meet Fire Wall Rating test ASTM E-119.
- A. Approved Manufacturers: Tailored Chemical Products (800) 627-1687 for Core-Fill 500, and Thermco Foam Insulation.
  - B. Approved and Licensed installer: Marvin Allen (505) 293-9348, Albuquerque, NM

### PART 3. EXECUTION

- 3.1 Handling: Protect masonry units, cementitious materials and reinforcing from moisture by storing off ground and keeping protected from weather. Remove any damaged materials from site.
- 3.2 Reinforcing:
- A. Vertical Reinforcing: Install where shown on drawings and approved shop drawings. Lap vertical reinforcing a minimum of 40 bar diameters (in no case less than 16") at all splices. Maintain a minimum of 1" clear between bars and masonry units. Fill vertically reinforced cells with grout only after all reinforcing is in place and properly tied in position. Support vertical bars in position at maximum spacing of 192 bar diameters.
  - B. Horizontal Reinforcing: Install bond beams, (knock out blocks) and lintels (U-blocks) where shown on drawings and approved shop drawings. Lap reinforcing 40 bar diameters (16" minimum) at all splices. Provide corner bars at all corners and intersections as detailed on the drawings. Grout bond beams and lintels as top course only. Do not lay standard masonry units above an ungrouted bond beam.
  - C. Horizontal Joint Reinforcing: Install where shown on drawings and approved shop drawings. Lap a minimum of 6" at all splices. Maintain a minimum of 5/8" mortar coverage on the weather side.
- 3.3 Scaffolding: Erect all scaffolding independent of masonry walls.
- 3.4 Bracing: Brace all walls and other masonry work against lateral loads, such as wind and earth pressure, until masonry and grout has cured and until the floor and roof diaphragms are in place.
- 3.5 Setting Procedures:

- A. Culling: Cull out defective units to avoid cracked face webs. If placed in wall, these units will be rejected by Architect. Units with chipped corners will be allowed where finishes other than paint are to be applied or where units are concealed from view if chipped areas are pointed up flush before applying coating. Otherwise, chipped corners exposed to view will be rejected.
  - B. Mortar: Mix mortar in a mechanical mortar mixer for a minimum of three minutes before using. Mix proportions shall be accurately followed on site. Place mortar within 1\_ hours after mixing. Retempering is not permitted.
  - C. Setting: Do not wet concrete units before laying. Remove any units that are disturbed after mortar has stiffened, and re-lay with fresh mortar. Provide full mortar coverage (face and webs) around cells to be grouted and on starting courses on solid foundation walls. Clean cells to be grouted of any protruding mortar fins. Completely fill all horizontal face joints with mortar, furrowing slightly with trowel. Fill cross joints with mortar applied against the end of the block before setting tight to block already in place. Set units in running bond.
  - D. Mortar Joints: Set units with 3/8 inch nominal mortar joints in accordance with modular coursing. Wipe off excess mortar from surface of block work before mortar sets. Tool mortar joints exposed to view (whether or not the surface is to receive a paint or other coating that will reveal joints). Tool joints slightly concave, smooth and dense so the mortar will be fully compacted and pressed against the edges of the concrete units.
  - E. Prepare foundations to assure surfaces to support concrete masonry are at the proper elevations and free of all dirt and other deleterious materials.
- 3.6 Mix grout a minimum of five minutes before using. Place grout within 1-1/2 hours after mixing. Solidly fill all cells containing reinforcing and where shown on Drawings. Maximum height of grout lift shall be four feet. Vibrate or rod (completely penetrating grout in cell with a rebar in an up and down motion) in-place grout while placing, and reconsolidate by further redding after grout takes a plastic consistency, but before it takes initial set. Stop vertical lifts 1-1/2\_ inches below the top of a course to form a key for the next lift. Be certain cells to be grouted are clean of debris and mortar droppings. Grout all horizontal masonry lintels and bond beams. Grout lintels in a continuous operation over the openings and the end bearings, as shown on Drawings. Clean off all grout spills from surface of work immediately, before grout has a chance to set.
- 3.7 Cutting: Cut blockwork accurately and neatly with saw-cuts only. Make cut-outs sufficient for minimum clearance of equipment or item to be recessed. Cut-outs that exceed the dimensions of cover plates, escutcheons or flanges will not be accepted.
- 3.8 Built-in Items: Build in all equipment, boxes, panels, door frames, windows, accessories, access panels, flashing and other items as the work progresses. Fill spaces around metal frames and other built-in items with mortar in lifts not to exceed 24". Carefully review roofing and waterproofing systems for reglets and flashing before erecting masonry to that point. Chase or recesses are not permitted except where indicated on drawings. Place conduits in ungrouted cells only. Where masonry fill insulation is used in walls where cut-



outs are required, plug all holes to prevent loss of insulation. Provide a grouted lintel above all openings in masonry walls even if not specifically called out on the structural drawings.

- 3.9 Unfinished Work: Step back unfinished masonry work for joining with new work. Tothing may be resorted to only when specifically approved. Before new work is started, remove all loose mortar and thoroughly clean out exposed joints.
- 3.10 Tolerances:
- A. Plumb: Maximum variation from plumb in lines and surfaces of columns, walls, expansion joints and other conspicuous lines shall not exceed 1/4" in 20 feet.
  - B. Level: Maximum variation from level or grades for exposed lintels, sills, parapets, horizontal mortar joints and other conspicuous lines shall not exceed 1/4" any bay or 20 feet.
- 3.11 Protection: Keep work dry during erection by covering with waterproof membranes at the end of each day or during any shutdown period. Overhang membranes at least 24" on each side of wall and securely anchor.
- 3.12 Cold Weather Procedures:
- A. Do not erect masonry when the air temperature is below 32°F. Do not use masonry unit having frost, snow or a temperature less than 32° F. Do not build on concrete or masonry that is below 32° F.
  - B. If air temperature is between 32° and 40° F, use heated mortar materials.
  - C. If temperature is even remotely expected to fall below 32° F in the 48 hours after placing masonry, provide proper heated enclosure to maintain temperature of masonry above 40° F for 48 hours. Enclosure shall be strong enough to resist wind loads.
  - D. Do not grout any masonry when the air temperature is below 32° F. Do not place grout in walls that are themselves less than 32° F. If air temperature is between 32° and 40° F, use heated grout materials. If temperature is even remotely expected to fall below 32° F in the 48 hours after grouting, provide proper heated enclosure to maintain temperature of masonry above 40° F for 48 hours. Enclosure shall be strong enough to resist wind loads.
  - E. Contractor shall have blankets, tents, and heaters on site prior to the onset of cold weather.
- 3.13 Control Joints: Build vertical joints at 30 feet spacing, maximum, unless noted otherwise on the Drawings. Control joints are built-in type. Sawed type will not be accepted. Fill control joints with specified elastic caulking and specified control joint filler in place of mortar. Bearing to non-bearing wall intersections shall also have caulking in place of mortar. Use backing rods where recommended by sealant manufacturer.

- 3.14 Pointing and Cleaning: Upon completion of masonry work, rake out all defects in joints, and point and fill all holes and cracks with fresh mortar, tooled as specified. Clean all mortar daubs from surface. Clean exposed surfaces from top down to remove stains and mortar deposited during construction. Soap and mild cleaning solutions are permitted only after 48 hours after construction of walls. Acid solutions are permitted only after seven days after construction of walls, using one part muriatic acid in ten parts water. Wet walls before applying solution, and protect metal, stone and other work. Scrub a small area at a time with stiff fiber brushes. Immediately rinse surface thoroughly with clean water to avoid etching or staining masonry.
- 3.15 Waterproofing: For exposed masonry, where no finish is called for, waterproof with a full application of silicon based waterproofing such as Protex "Silicon Seal," "Thoroclear 777" or approved equal installed in strict accordance with manufacturer's recommendations. Brush apply on all interior applications.
- 3.16 See Section 09222 Stucco for wall finish required.

END OF SECTION 04220

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METALS: DIVISION 5  
SECTION 05400: COLD FORMED METAL FRAMING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General and Supplementary Conditions and Division Specification sections, apply to work of this section.

1.2 SUMMARY

- A. Extent of cold-formed metal framing is shown on drawings.
- B. Types of cold-formed metal framing units include the following:
  - 1. Load-bearing punched channel studs.
  - 2. "C" shaped load-bearing steel studs.
  - 3. "C" shaped steel joists.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product information and installation instructions for each item of cold-formed metal framing and accessories.
- B. Shop Drawings: Submit shop drawings for special components and installations not fully dimensioned or detailed in manufacturer's product data.
- C. Include placing drawings for framing members showing size and gage designations, number, type, location and spacing. Indicate supplemental strapping, bracing, splices, bridging, accessories and details required for proper installation.

1.4 QUALITY ASSURANCE

- A. Component Design: Calculate structural properties of studs and joists in accordance with American Iron and Steel Institute (AISI) "Specification for Design of Cold-Formed Steel Structural Members".
- B. Welding: Use qualified welders and comply with American Welding Society (AWS) D1.3, "Structural Welding Code- Sheet Steel".
- C. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide units which have been approved by governing authorities having jurisdiction.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect metal framing units from rusting and damage. Deliver to project site in



manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off ground in a dry, ventilated space or protect with breathable waterproof tarpaulins. PART 2- PRODUCTS

## 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
1. Alabama Metal Industries Corp.
  2. Bostwick Steel Framing Co.
  3. Dale Industries, Inc.
  4. Milcor Division Inryco, Inc.
  5. Marino Industries Corp.
  6. U.S. Gypsum Co.

## 2.2 METAL FRAMING

- A. System Components: With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners and accessories as recommended by manufacturer for applications indicated, as need to provide a complete metal framing system.
- B. Materials and Finishes: For 18-gage and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi, ASTM A446, A570 or A611.
- C. For 16-gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 50,000 psi, ASTM A446, A570 or A611.
- D. Provide prime coated finish with one coat of shop-applied red-oxide, zinc-chromate or other similar rust-inhibitive primer.
- E. Provide galvanized finish to metal framing components complying with ASTM A525 for minimum G60 coating.
- F. Finish of installation accessories to match that of main framing components, unless otherwise indicated.
- G. "C" Shape Studs: Manufacturer's standard load-bearing steel studs of size, shape and gage indicated, with 1.625" flange and flange return lip.
- H. Punched Channel Studs: Manufacturer's standard, factory punched, load-bearing steel studs of size, shape and gage indicated with 1.375" flange.
- J. Joists: Manufacturer's standard "C" shape sections of size, shape and gage indicated.
- K. Electrodes for Welding: Comply with AWS Code.
- L. Galvanizing Repair Paint: High zinc dust content paint for repair of galvanized surfaces

damaged by welding, complying with M.I. Spec. MIL-P-21035.

### 2.3 FABRICATION

- A. General: Framing components may be prefabricated into panels prior to erection. Fabricate panels plumb, square, true to line and braced against racking with joints welded. Perform lifting of prefabricated panels in a manner to prevent damage or distortion.
- B. Fabricate panels in jig templates to hold members in proper alignment and position and to assure consistent component placement.
- C. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting or screw fasteners as standard with manufacturer.
- D. Wire tying of framing components is not permitted.
- E. Fabrication Tolerances: Fabricate panels to a maximum allowable tolerance variation from plumb, level and true to line of 1/8" in 10'-0".

## PART 3- EXECUTION

### 3.1 INSPECTION AND PREPARATION

- A. Pre-Installation Conference: Prior to start of installation of metal framing systems, meet at project site with installers of other work including door and window frames and mechanical and electrical work. Review areas of potential interference and conflicts, and coordinate layout and support provisions for interfacing work.

### 3.2 INSTALLATION

- A. Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24" o.c. spacing for nail or power-driven fasteners, or 16" o.c. for other types of attachment. Provide fasteners at comers and ends of tracks.
- C. Set studs plumb, except as needed for diagonal bracing or required for non plumb walls or warped surfaces and similar requirements.
- D. Where stud system abuts structural columns or walls, including masonry walls, anchor end of stiffeners to supporting structure.
- E. Install supplementary framing, blocking and bracing in metal framing system wherever

walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.

- F. Installation of Wall Stud System: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
- G. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
- H. Frame both sides of expansion and control joints with separate studs, do not bridge the joint with components of stud system.
- J. Install horizontal stiffeners in stud system, spaced (vertical distance) at not more than 4'-6" o.c. Weld at each intersection.
- K. Erection Tolerances: Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even, true to line joints.
- L. Step in face and jog in alignment between panels not to exceed 1/16".
- M. Installation of Joists: Install level and plumb, complete with bracing and reinforcing as indicated on drawings. Provide not less than 1-1/2" end bearing.
- N. Reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, end grain wood block or as otherwise recommended by joist manufacturer.
- O. Where required, reinforce joists at interior supports with single short length of joist section located directly over interior support, snap-on shoe, 30% side-piece lapped reinforcement, or other method recommended by joist manufacturer.
- P. Secure joists to interior support systems to prevent lateral movement of bottom flange.
- Q. Field Painting: Touch-up shop-applied protective coatings damaged during handling and installation. Use compatible primer for prime coated surfaces; use galvanizing repair paint for galvanized surfaces.

END OF SECTION 05400



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METALS- DIVISION 5  
SECTION 05500: METAL FABRICATIONS

PART 1. GENERAL

- 1.1 Scope: Furnish and install all metal fabrications (including fasteners) complete with all necessary accessories required for a completed project.
- 1.2 Standards: Conform to minimum standards of the American Institute of Steel Construction (AISC) "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings" and applicable publications of the National Association of Architectural Metal Manufacturers. Welding shall be in accordance with AWS Structural Welding Code.
- 1.3 Description of Work:
- A. Definition: Metal fabrications include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of other metal systems specified elsewhere.
  - B. Extent of metal fabrications is indicated on the drawings and schedules.
  - C. Types of work in this section include metal fabrications for:
    - 1. Loose bearing and leveling plates.
    - 2. Loose steel lintels.
    - 3. Miscellaneous framing and supports.
    - 4. Steel ladders.
    - 5. Shelf angles.
    - 6. Steel pipe railings .
    - 7. Stair treads and grating
- 1.4 Quality Assurance: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly.
- 1.5 Shop Drawings: Submit shop drawings of stair for review and approval prior to fabrication .

PART 2. MATERIALS

- 2.1 Miscellaneous Steel
- A. Tubing: Cold formed ASTM A-500 or hot-rolled A-501, Minimum yield 36,000 psi .
  - B. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading: black finish; standard weight schedule 40.
  - C. Steel Plates, shapes and bars: AST A36. As required or:
    - 1. 20 ga. Galv. steel plate for roof deck openings less than 12" inches square. Secure plate with #10 TEK screws @ 12" o.c. to steel deck and extend plate a minirnun of 12" from penetration in all directions.
    - 2. Roof openings in metal deck larger than 12" square require welded steel frames from 3.5" x 5" x 114" steel angles sized to provide an opening for the equipment or opening needed. See roof plan, mechanical plan and plumbing plans for openings

required.

- D. Structural Sheet Steel: Hot rolled ASTM A 500; or hot rolled, ASTM A 501.
- E. Brackets, flanges and anchors: cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- F. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel ASTM A 27. Provide bolts, washers and shims as required , hot-dip galvanized ASTM A 153.
- G. Metallic non-shrink grout: pre-mixed, factory packaged , ferrous aggregate grout complying with CE CRD-C588 type M.
- H. Fasteners: provide zinc coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
  - 1. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
  - 2. Lag Bolts: Square head type, FS FF-B-561.
  - 3. Machine Screws: Cadmium plated steel, FS FF-S-92.
  - 4. Wood Screws: Flat head carbon steel, FS FF-W-92.
  - 5. Plain Washers: Round, carbon steel, FS FF-WW-92.
  - 6. Masonry anchorage devices: Expansion shields, FS FF-S-325.
  - 7. Toggle Bolts: tumble-wing type, FS FF-B-588, type, class and style as required.
  - 8. Lock Washers: Helical spring type carbon steel, FS FF-W-84.
- I. Paint: Shop Primer for Ferrous Metal: Manufacturer's or Fabricator's standard, fast-curing lead free, "universal" primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.

## 2.2 FABRICATION, GENERAL:

- A. Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components.
  - 1. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal comers to smallest radius possible without causing grain separation or otherwise impairing work.
  - 2. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
  - 3. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
  - 4. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate .

- B. Shop Painting:
1. Apply shop primer to surfaces of metal fabrications except those which are galvanized or as indicated to be embedded in concrete or masonry, unless otherwise indicated, and in compliance with requirements of SSPC-PA1 "paint application specification # 1" for shop painting.
  2. Prepare ferrous metal surfaces to comply with SSPC-SP6 "commercial blast cleaning" for exteriors (SSPC Zone 1B) and SSPC-SP3 "Power Tool Cleaning" for interiors.
- C. Rough Hardware: Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere furnish steel washers.
- D. Loose Bearing Plates and Leveling Plates: Drill plates to receive anchor bolts and for grouting as required.
- E. Loose Steel Lintels: Weld adjoining members together to form a single unit where indicated. Provide not less than 8" bearing at each side of openings, unless otherwise indicated.
1. Galvanize loose steel lintels to be installed in exterior walls.
- F. Miscellaneous Framing and Supports: Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed .
- G. Steel Pipe Railings and Handrails:
1. Fabricate steel pipe railings to design, dimensions and details indicated. Provide railings and handrails members formed of pipe of sizes and wall thickness indicated, but not less than that required to support design loading.
  2. At tee and cross intersections provide coped joints.
  3. At bends interconnect pipe by means of prefabricated elbow fittings or flush radius bends, as applicable, or radiuses indicated.
  4. At elbow bends provide mitered joints.
  5. Form bends by use of prefabricated elbow fittings and radius bends or by bending pipe, at fabricator's option.
  6. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of pipe throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces of pipe.
  7. Provide wall returns at ends of wall-mounted handrails, except as otherwise indicated.
  8. Close exposed ends of pipe by welding 3/16" thick steel plate in place or by use of prefabricated fitting.

### PART 3 EXECUTION:

#### 3.1 PREPARATION:



- A. Take field measurements prior to fabrication. Coordinate and furnish anchorages, setting, and integral anchors which are to be embedded in concrete or masonry.

### 3.2 INSTALLATION:

- A. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack. Provide bracing and anchors in formwork for items to be built into concrete or masonry.
- B. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded. Grind exposed weld joints smooth and touch-up shop paint coat.
- C. Field Welding: comply with ASW code for procedures of manual shielded metal- arc welding, appearance and quality of welds made, and methods used in correcting welding work.
- D. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but cut off flush if protruding, before packing with grout. Use metallic non-shrink grout in exposed locations unless otherwise indicated.
- E. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.3 ADJUST AND CLEAN

Touch-up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

- A. Cleaning and touch-up painting of field welds, bolted connections and abraded areas of the shop paint on miscellaneous metal is specified in Section 09900.
- B. For galvanized surfaces: Clean field welds, bolted connections and abraded area and apply galvanizing repair paint to comply with ASTM A-780.

END OF SECTION 05550

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WOOD AND PLASTICS – DIVISION 6  
SECTION 06100: ROUGH CARPENTRY

PART 1. GENERAL

- 1.1 Scope: Furnish and install all rough carpentry with all necessary accessories.
- 1.2 Submittals: Submit samples of rough carpentry materials which will be exposed to view in finished work and all metal framing connectors and accessories prior to use.
- 1.3 Quality Assurance: Grading rules of the West Coast Lumber Inspection Bureau, the Western Wood Products Association, the American Plywood Association and the Redwood Inspection Service, California Redwood Association apply to materials furnished under this Section. Identify all lumber and plywood by official grade mark of these Associations.

PART 2. MATERIALS

- 2.1 Dimensions: Nominal sizes are indicated. Actual dimensions conform to Product Standard 20.
- 2.2 Structural Light Framing and Studs: When grade and type are not called for on Drawings, use grade equal to WWP No. 2 Ponderosa Pine, Grade Fb = 1000 psi, E = 1,100,000 pos, and WWP "Standard" or "Stud" grade for studs, culling out any warped or split studs prior to use.
- 2.3 Plywood: Unless otherwise required on the drawings, use not less than 5/8" Exterior Grade C-C of thickness and structural grade required. Unless otherwise shown, use 5/8" Exterior Grade A-C for exposed to view applications and all paint applications other than millwork.
- 2.4 Preservative Treatment:  
Solid Stock: Pressure treated to the standards of the American Wood Preservers' Association for Use Category designation UC3A, UC3B OR UC3C for above ground applications and UC4A and UC4B for ground contact applications. Dissolved Copper-Based Formula of ammoniacal copper quaternary or alkaline copper quaternary (ACQ).

PART 3. EXECUTION

- 3.1 Storage and Handling:  
Store all materials to ensure proper ventilation and full protection from moisture. Do not bring any finish lumber to the job until plaster is completely dry.
- 3.2 Wood Treatment: Treat with preservative treatment all wood called for on the drawings, and all wood cut that will be in contact with the ground, concrete, or masonry, and wood that will be covered by roofing or flashing.
- 3.3 Nailing and Bolting: Bore holes slightly larger than bolts so wood will not be strained. Use galvanized type bolts and nails for all applications exposed to weather, as well as under roofing. Avoid use of nails long enough to penetrate plywood decking which will produce condensation drop points. Avoid hammer marks in exposed wood.

END OF SECTION 06100



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WOOD AND PLASTICS - DIVISION 6  
SECTION 06160: WALL SHEATHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Wall Sheathing
  2. Building Wrap
  3. Sheathing joint-and-penetration treatment
  4. Flexible flashing at openings in sheathing
- B. Related Sections:
1. Section 06100, Rough Carpentry.
  2. Section 09250, Gypsum Board.
  3. Section 09300, Tile.
  4. Section 07500, EPDM Roofing.

1.2 SUBMITTALS

- A. Product Data: Manufacturers' specifications and literature for each product.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by

PART 2 PRODUCTS

2.1 WALL SHEATHING

- A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M. Cellulose Fiber-Reinforced Gypsum Sheathing: ASTM C 1278/C 1278M, gypsum sheathing.
1. Product: Subject to compliance with requirements, provide "Fiberock Sheathing with Aqua-Tough" by United States Gypsum Co.
  2. Type and Thickness: Type X, 5/8 inch thick.
  3. Size: 48 by 96 inches.
- B. Cement Board: Cementitious Fiber-Mat Reinforced Sheathing: ASTM C 1325, ANSI A118.9, cementitious backer.
1. Product: DUROCK Brand Cement Board by United States Gypsum Company.
    - a. Type and Thickness: 5/8 inch thick.
    - b. Size: 32 inches wide, min.

2.1 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  - 1. For roof sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
  - 1. For steel framing less than 0.0329 inch thick, attach sheathing to comply with ASTM c 1002.
  - 2. For steel framing from 0.033 to 0.112 inch thick, attach sheathing to comply with ASTM C954.

## 2.2 WEATHER-RESISTANT SHEATHING PAPER

- A. Building Wrap: ASTM E 1677, Type I air retarder; with flame-spread and smoke developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dow Chemical Company (The); Styrofoam Weathermate Plus Brand Housewrap.
    - b. DuPont (E. I. du Pont de Nemours and Company); Tyvek Commercial Wrap
    - c. Raven Industries Inc.; Rufco-Wrap.
  - 2. Water-Vapor Permeance: Not less than 50 g through 1 sq. m of surface in 24 hours per ASTM E 96, Desiccant Method (Procedure A).
  - 3. Allowable UV Exposure Time: Not less than three months.
- B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap Manufacturer for sealing joints and penetrations in building wrap.

## 2.3 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Gypsum Sheathing Board: Silicone emulsion sealant complying with ASTM c834.

## 2.4 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498.
- B. Flexible Flashing : Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, not less than 0.030 inch.
  - 1. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
  - 2. Grace Construction Products, a unit of W. R. Grace & Co.- Conn.; Vycor Plus Self-Adhered Flashing.

3. Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. . Comply with GA-253 and with manufacturer's written instructions.
  1. Fasten gypsum sheathing to cold-formed metal framing with screws.
  2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
  3. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking .
- B. Apply fasteners so heads bear tightly against face of sheathing boards but do not cut into facing.

#### 3.2 WEATHER-RESISTANT SHEATHING-PAPER INSTALLATION

- A. Cover sheathing with weather-resistant sheathing paper as follows: Cut back barrier 112 inch on each side of the break in supporting members at expansion- or control-joint locations. Apply barrier to cover vertical flashing with a minimum 4-inch overlap, unless otherwise Indicated.
- B. Building Wrap: Comply with manufacturer's written instructions . Seal seams, edges, fasteners, and penetrations with tape. Extend into jamb s of openings and seal comers with tape .

#### 3.3 SHEATHING JOINT-AND-PENETRATION TREATMENT

- A. Seal sheathing joints according to sheathing manufacturer's written instructions.
  1. Apply elastomeric sealant to joints and fasteners and trowel flat.
  2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant.

#### 3.4 FLEXIBLE FLASHING INSTALLATION

- A. Apply flexible flashing where indicated to comply with manufacturers written instructions .

END OF SECTION 06160



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WOOD AND PLASTICS: DIVISION 6  
SECTION 06200: FINISH CARPENTRY

PART 1. GENERAL

1.1 Scope:

Finish carpentry includes carpentry work which is exposed to view, is non-structural and which is not specified as part of other Sections. Types of finish carpentry work in this Section include: running and standing trim, wood door frames, wood door and window trim and laminate work not included in Cabinetry.

1.2 Submittals:

Submit a sample for each species and cut or pattern of Finish Carpentry standing and running trim. Sample shall be two feet (2') long by full board width, unfinished.

1.3 Quality Assurance:

Comply with the requirements of the "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute (AWI) for grading, assembly and finishing all Finish Carpentry.

PART 2. PRODUCTS

1.4 General:

Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber manufactured to sizes or patterns indicated.

1.5 Finish Carpentry Materials:

The species of all woodwork is to be indicated on the Drawings, or if not listed shall be "Ash."

A. Materials to receive transparent finish or as finish shall be AWI "Custom Grade" for transparent finish. Finger joints not allowed.

B. Materials to receive opaque finish shall be AWI "Custom Grade" for opaque finish.

C. Exception No. 1: AWI Economy Grade Materials are allowed for utility shelving.

PART 3. EXECUTION

1.6 Storage and Handling:

Store all materials to ensure proper ventilation and full protection from moisture. Do not bring any finish lumber to the job until plaster is completely dry, glazing is complete and temperature within the building will remain above 50°F. Thereafter, allow the finish lumber 72 hours inside the building to become acclimated.

1.7 Job Measurements:

Take measurements of actual conditions at the job site before fabricating or purchasing finish carpentry. Notify Architect of any major discrepancies.

1.8 Construction:

All construction and assembly of Finish Carpentry shall conform to Architectural Woodwork Institutes <sup>11</sup>Architectural Woodwork Quality Standards<sup>11</sup> for Custom Grade.

1.9 Standing and Running Trim:

All corners, intersections and running joints shall be mitered or coped as appropriate to produce a tight joint. Running joints less than eight feet (8) on center shall not be accepted. All nails and screws shall be countersunk, filled and sanded. Fillers used with transparent finishes shall be stained to match finish prior to placement in nail hole. Joints shall be spliced or pinned as necessary to maintain alignment of faces.

END OF SECTION 06200



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WOOD AND PLASTICS: DIVISION 6  
SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data for solid surfacing materials, Shop Drawings and Samples showing the full range of colors, textures, and patterns available for each type of finish.
- B. Quality Standard: Architectural Woodwork Institute's "Architectural Woodwork Quality Standards."
- C. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet-work is completed, and HVAC system is operating.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hardboard: AHA A135.4.
- B. Medium-Density Fiberboard: ANSI A208.2.
- C. Particleboard: ANSI A208.1-2009, Grade M-2.
- D. Softwood Plywood: PS 1.
- E. Hardwood Plywood and Face Veneers: HPVA HP-1.
- F. Solid Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements of ANSI Z124.3, Type 5 or Type 6, without a precoated finish.
  - 1. Corian.

2.2 CABINET HARDWARE AND ACCESSORY MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated Softwood or hardwood lumber, kiln dried to 15 percent moisture content.

2.3 INTERIOR WOODWORK

- A. Complete fabrication before shipping to Project site to maximum extent possible. Disassemble only as needed for shipping and installing. Where necessary for fitting at Project site, provide for scribing and trimming.
- B. Backout or groove backs of flat trim members, kerf backs of other wide, flat members, except for members with ends exposed in finished Work.
- C. Install glass to comply with FGMA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

- D. Interior Standing and Running Trim for Transparent Finish: Premium Custom Economy grade, made from red oak, rift sawn eastern white pine, sugar pine, or Idaho white pine.
- E. Wood Cabinets (Casework) for Transparent Finish: Premium Custom Economy grade.
  - 1. Wood Species for Exposed Surfaces: Red oak, rift sawn/cut Hickory, plain sawn/sliced Insert species and cut.
  - 2. Grain Matching: Run and match grain vertically horizontally for drawer fronts, doors, and fixed panels.
- F. Solid Surfacing Material Countertops: Premium Custom Economy grade.
  - 1. Fabricate tops in one piece with shop-applied backsplashes and edges as shown on drawings.
  - 2. Solid Surfacing Material Thickness: **1/2 inch (13 mm)**.

#### 2.4 SHOP FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

- A. Finishes: Same grades as items to be finished.
- B. Finish architectural woodwork at the fabrication shop; defer only final touch up until after installation.
  - 1. Apply one coat of sealer or primer to concealed surfaces of woodwork. Apply two coats to back of paneling.
  - 2. Apply a vinyl wash coat to woodwork made from closed-grain wood before staining and finishing.
  - 3. After staining, if any, apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.
- C. Transparent Finish: AWI Finish System TR-6, catalyzed polyurethane.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Condition woodwork to prevailing conditions before installing.
- B. Install woodwork to comply with AWI Section 1700 WIC Section 26 for grade specified.
- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install to a tolerance of **1/8 inch in 96 inches (3 mm in 2400 mm)** for level and plumb.
- D. Scribe and cut woodwork to fit adjoining work, seal cut surfaces, and repair damaged finish at cuts.
- E. Install trim with minimum number of joints possible, using full-length pieces to the greatest extent possible. Stagger joints in adjacent and related members.
- F. Anchor countertops securely to base units. Seal space between backsplash and wall.

END OF SECTION 06402

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THERMAL AND MOISTURE PROTECTION-DIVISION 7  
SECTION 07210: BUILDING INSULATION

## PART 1 GENERAL

- 1.1 Scope:  
Furnish and install insulation complete with all necessary accessories.
- 1.2 Construction Submittals:  
Submit manufacturer's catalog data for all insulating materials and accessories.
- 1.3 Notification:  
Notify Architect prior to covering up installed insulation work.

## PART 2 - PRODUCTS

- 2.1 Blanket type building insulation:  
Glass fiber batts with foil reinforced Kraft paper facing (FRK-faced), flame spread of twenty-five (25) or less, vapor barrier perm rating of 0.5. R-rating of 19 or better in 6" stud walls; R-rating of 11 in 3-5/8" stud walls, and R-rating of 38 in all existing ceiling areas, and R-rating of 30 in new construction where it is required (except as noted and required on drawings). Conform to ASTM C665, Type III Class A and ASTM E136.
- A. Acceptable Manufacturers:
1. Owens Corning
  2. Manville
- 2.2 Perimeter Insulation:  
Extruded cellular polystyrene type, square edges, aged thermal conductivity .25 BTU per square foot per hour per degrees Fahrenheit per inch at 75" Fahrenheit. Minimum compressive strength of 35 psi. Maximum water absorption of less than 1.0% by volume. 2" thick, typical at perimeter , 16" beneath grade, typical.
- 2.3 Accessories:  
Staples, stick pins, adhesives, 18 gauge wire, and other accessories as recommended by the insulation manufacturer for the installation used, and as indicated on the drawings.
- A "Pro Wire" insulation supports (1-800--776-9473).
- 2.5 Masonry Fill Insulation: (see Section 04220) Required on new exterior CMU wall construction.
- A. "Core-Fill 500" Foam Insulation, two component system (Amino-Plast Resin and catalyst foaming agent surfacant), together with compressed air to form a foam insulation all open cells adjacent to heated building spaces to achieve "R" rating of 20 in twelve inches (12") hollow concrete block. Install with licensed contractor, approved and licensed by Manufacturer. Incorporate the patented product "Bancho" to assure that no measurable out-gassing of formaldehyde will occur. Meet Fire Wall Rating test ASTM E-119.



- B. Approved Manufacturer:  
Tailored Foam West (405) 946-5813 , Midwest City, OK.  
Local Installer: Marvin Allen , 293-9348 Albuquerque, NM.

### PART 3 - EXECUTION

- 3.1 Handling:  
Protect insulation materials from damage and keep dry at all times.
- 3.2 All surfaces shall be fully erected, clean, dry, and have all openings completed prior to installation of insulation.
- 3.3 Batt and Blanket type insulation:
  - A. Achieve firmly anchored, continuous membrane with all joints, edges, and gaps properly sealed or patched to achieve uniform performance.
  - B. Install insulation with factory applied membrane facing occupied side of interior spaces. Cap ends and side flanges of membrane over framing members. Tape all butt joints and lap joints not held by staples.
  - C. Wire up ceiling insulation (R = 30) under roof decks by running 18 gauge wire perpendicular to the insulation every 18 inches to 24 inches on center. Use wire-up fastening devices (staples, stick pins and adhesives) as required by the insulation manufacturer.
- 3.4 Perimeter Insulation
  - A. Insure that walls are clean and level. Secure insulation on foundation wall with adhesive using spot bead method. Place long length horizontally.
  - B. When more than one (1) level of perimeter insulation is used, offset joints on adjacent panels.

END OF SECTION 07210

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THERMAL AND MOISTURE PROTECTION - DIVISION 7  
SECTION 07215: SOUND INSULATION FIRE BATT/MINERAL WOOL

1. GENERAL

1.1 Scope:

Furnish and install insulation complete with all necessary accessories.

1.2 Construction Submittals:

Submit manufacturer's catalog data for all insulating materials and accessories.

1.3 Acceptable Manufacturer: Owens Corning.

2. PRODUCTS

2.1 Sound Insulation Fire Batt/Mineral Wool:

Un-faced Inorganic Fibers bonded and formed into flexible batts. Noncombustible classification per ASTM E 136. Complies with ASTM C665, Type I. Surface burning characteristics derived from tests per ASTM E 84 for a flame spread of 5.

A. Thickness: Three (3) inches.

B. R value per inch = 3.8

3. INSTALLATION

3.1 Handling:

Protect insulation materials from damage and keep dry at all times. Use goggles or safety glasses and an approved dust respirator when handling Sound Insulation Fire Batt! Mineral Wool.

3.2 Cut Sound Insulation Fire Batt/Mineral Wool with a knife for installation and a snug fit above acoustical ceiling.

3.3 Lay Sound Insulation Fire Batt/Mineral Wool over designated ceiling area laying batts directly on ceiling panels.

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THERMAL & MOISTURE PROTECTION - DIVISION 7  
SECTION 07542: TPO ROOFING SYSTEM

PART 1 -GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract , including General and Supplementary Conditions, general project requirements, and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

- A. Provide a white, scrim reinforced Ethylene Propylene based elastomeric sheet roofing membrane system, insulation, flashing, sealants and all accessories and labor necessary for a complete insulated sheet roofing system.
- B. Furnish and install this membrane roofing system in strict accordance with Drawings and Specifications approved by Roof Systems Manufacturer.
- C. Related Sections:
  - 1. Section 06100 -Wood Blocking and Curbing
  - 2. Section 07620- Roof Products and Flashing
  - 3. Section 07900 - Sealants

1.3 REFERENCES

- A. ASTM -American Society for Testing and Materials.
- B. Factory Mutual (FM) Engineering Corporation- Roof Assembly Classifications.
- C. NRCA- National Roofing Contractors Association.
- D. SMACNA- Sheet Metal and Air Conditioners National Association.
- E. Underwriters Laboratories (UL)- Fire Hazard Classifications.
- F. FS -Federal Standard
- G. ANSI I SPRI ES-1 - (see also, 2003 IBC Section 1504.5)

1.4 BIDDER'S REPRESENTATION

- A. A large part of the value of this work is contained in the bidder's and the bidder's proposed manufacturer 's capacity to provide long-term responsibility for the satisfactory performance of the roof. A 10-year, no dollar limit warranty is required. To that end, the following requirements are essential provisions of this specification:
  - 1. By offering a bid for this work, the bidder certifies that he has visited the site and determined that all the conditions of the surrounding and underlying

work are consistent with his proposed manufacturer's requirements for the specified warranty. In the event that the bidder discovers any condition of the surrounding and underlying work that would prevent him or his manufacturer from providing the specified warranty, he shall report it to the design professional not less than ten days before the bid opening.

2. By offering a bid for this work, the bidder certifies that he has examined the Contract Documents, can meet all imposed time completion requirements and has found all the details and requirements of the scope of work are complete and consistent with his proposed manufacturer's requirements for the specified warranty. In the event that the bidder discovers any detail or requirement in the Contract Documents that would prevent him or his manufacturer from providing the specified warranty, he shall report it to the design professional not less than ten days before the bid opening.
3. By offering a bid for this work, the bidder certifies that he can, within ten calendar days of a notice of award from the Owner, provide a surety bond for the performance of the work, a surety bond for payment of labor and materials, and a specimen warranty certificate from the manufacturer whose system that is proposed to be used on the project.

## 1.5 QUALITY ASSURANCE

### A. Manufacturer Qualifications

1. The manufacturer of the roofing system shall be the actual manufacturer of the roofing materials. The insulation and the component materials can be made by others, all testing requirements and implied warranties must be verifiable and labeled under the roofing manufacturer's name. All manufacturers and sub-manufacturers shall have not less than fifteen (15) years experience in the production of the specified system components.
2. The manufacturer shall certify the scrim reinforced TPO membrane meets the physical properties specified.
3. The contractor shall include a certification from the manufacturer, on the manufacturer's letterhead, that the proposed membrane, insulation and accessories will be covered in the warranty by the manufacturer of record.

### B. Installer Qualifications

1. Applicator: A company approved by Manufacturer, and specializing in single-ply roofing systems with at least twenty (20) installations of TPO solid adhered, scrim reinforced membrane. The crew shall be composed of experienced and skilled workers in this work. The installer will be required to properly staff the project at all times.

### C. Inspections

1. Manufacturer's Technical Representative: The manufacturer of the roofing system shall be required to attend the roof pre-installation conference to accept the conditions of the work and to perform interim inspections during installation. After the roof installation is complete, the manufacturer's technical representative, unrelated to the sales department of the manufacturer, shall inspect the work and inform (by written report) the design professional, contractor, owner/owners consultant and the installer of defective/incomplete work to be remedied. Those areas indicated shall be corrected to the full

satisfaction of the design professional, Owner, and manufacturer. Copies of all inspection reports from the manufacturer shall be promptly submitted to the design professional and the roofing consultant. The manufacturer shall submit written acceptance of the project to the design professional in issuance of the weather-tightness warranty and that the system has been installed according to the Manufacturer's published specifications and details. Report describing inspections, corrective actions and certifying manufacturer's acceptance of installation shall be submitted to the Architect in accordance with Section 01400 - Quality Requirements.

2. Roofing Consultant: The Owner reserves the right to retain, at the Owner's expense, an independent consultant service to review construction documents and provide full-time inspection of the roofing system installation. The inspector shall have free access to inspect and test all items related to the project and the work area. The consultant/inspector will be responsible for accepting the installed roofing on behalf of the owner. The roofing contractor/general contractor will keep the consultant informed of all schedules, delays and inspections of the manufacturer (2 week notice)

D. Work shall conform to:

1. NRCA Roofing and Waterproofing Manual, Latest Editions .  
2. SMACNA Architectural Sheet Metal Manual, 2003 Edition.  
3. Underwriters Laboratories, Inc. (UL): Class A Fire Hazard Classification.
4. Factory Mutual Engineering Corporation (FM): Roof assembly classification with wind uplift of I-75, FM Construction Bulletin 1-28, Class 1 Construction, latest Edition.

## 1.6 SUBMITTALS

- A. Provide in accordance with Conditions of Contract and Division 1 Specification Sections.
  1. Shop Drawings : Submit shop drawings indicating
    - a. Roof size, location , and type of penetrations.
    - b. Roof assembly composition and attachment to deck.
    - c. Insulation system and cricket layout plan with cross sections.
    - d. Insulation fastening patterns that meets FM 1-75 insulation fastening requirements for the field, perimeter and comers.
    - e. Roof perimeter and comer areas as defined by FM with the width dimensioned for each roof section.
    - f. Complete set of details for all perimeters , drains, penetration and roof accessories flashings and termination s and manufacturer's published installation procedure details.
    - g. All roof related sheet metal items submitted in conformance with the submittal requirements of Sheet Metal Flashing & Trim specification section.
  2. Product Data Submittals:
    - a. Provide technical product data sheets on ALL materials and accessories that are to be used in the roof assembly and associated with the roof including UL product listing and FM System listing for

- each type of insulation. The data sheets should be clearly marked where choices occur for type and thicknesses.
- b. The Insulation manufacturer shall certify a warranty to the membrane manufacturer in order to meet the complete system warranty.
  - c. For fasteners that are to penetrate into, or through, pressure preservative treated lumber use stainless steel, hot dipped galvanized coated or provide certification from manufacturer that coating is compatible with preservative used for wood treatment.
3. Fire Resistance: Provide roofing system, insulation, and component materials that have been tested for application and slopes indicated and are listed by UL for Class A external fire exposure over decks specified herein. Provide confirmation in submittal package.
  4. Wind Uplift: Provide rigid insulation, fully adhered roofing system, and component materials suitable for the structural deck and that have been tested as a complete system for application and slopes indicated and are listed in Factory Mutual Research Approval Guide as a Class 1 System.. Provide attachment to the deck that meets FM 1-75 membrane/insulation fastening requirements. Submit data that confirms this requirement.
  5. Copy of certificate documenting manufacturer's approval of installer as required in Paragraph 1.4-B-1.
  6. Copies of test reports showing compliance with requirements as specified in Paragraph 2.02.
  7. Samples:
    - a. 12 inch square minimum sample of roofing membrane including lap seam
  8. Provide copy of manufacturers' printed installation instructions and requirement
  9. Provide certification that Manufacture has accepted the proposed roof assembly and that the assembly will be eligible for their 20 year total system N.D.L. warranty.
  10. Provide copy of warranties required in Paragraph 1.6 for review and approval by design professional.

#### 1.7 WARRANTY

- A. Manufacturer's Warranty: Provide roofing manufacturer's total system leak-tight 10-year labor and 10-year material "No Dollar Limit Warranty," including insulation and all components. The warranty shall contain no exclusion or limitation for improper installation, damage from water that ponds, or does not drain freely. Provide all details necessary to qualify for manufacturer's "No Dollar Limit Warranty" and the manufacturer will respond within 48 hours and repair, within five (5) business days, any leaks in the roofing assembly for the warranty period stated above at no cost to the Owner, unless the leak is determined to be caused by others. The warranty shall cover wind speeds up to and including 72 mph.
- B. Roofer's Guarantee: Provide written guarantee from the Contractor stating that the Contractor will respond within 24 hours and repair within five (5) business days, any leaks in the roofing assembly for 2 years at no cost to the Owner.



## 1.8 PRE INSTALLATION CONFERENCE

- A. Conduct a pre-installation conference prior to commencing work of this section at project site under provisions in Division 1 Section "Project Management and Coordination". Review methods and procedures related to roofing system including, but not limited to, the following:
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  - 4. Review structural loading limitations of roof deck during and after roofing.
  - 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
  - 6. Review governing regulations and school safety requirements.
  - 7. Review temporary protection requirements for roofing system during and after installation.

## 1.9 DELIVERY, STORAGE, HANDLING

- A. Deliver products to site in unopened containers showing brand names and instructions.
- B. Store and protect temperature sensitive products in 55° to 80° F environment prior to usage. Store flammable or toxic material according to label instruction. Store each product in weather protected environment, clear of ground and moisture.
- C. Mark wet, damaged & defective materials and remove from site the same day

## 1.10 JOB SITE CONSIDERATIONS (CAUTIONS AND WARNINGS)

- A. Keep all adhesives, sealants and cleaning materials away from ALL ignition sources (i.e., torches, flames, fire, sparks, etc.).
- B. Consult container labels and Material Safety Data Sheets for specific safety instructions for all products used on the project.
- C. All bonding, splicing, and sealing surfaces must be free of dirt, moisture, and any other contaminants.
- D. When the outside temperature is below 40° F (4.44° C), certain combinations of temperature and humidity may cause condensation on the surface of the TPO Bonding Adhesive. If this condition occurs, do not mate the surfaces. When the ambient air-

conditions no longer cause condensation, apply additional TPO Bonding Adhesive and proceed.

- E. If Bonding Adhesive is used, temperature must be 40° F (4.44° C) and rising for the material to perform as designed.
- F. Do not use open flame sources (i.e., propane torches, etc.) to expedite drying of adhesives, sealants, etc. Allow to air dry only.
- G. Do not thin or modify any materials.
- H. Deliver materials to job site in their original containers as labeled by the manufacturer.
- I. Fumes from adhesive solvents may be drawn into the building during installation, through rooftop intakes. Refer to the Technical Information Sheet "Recommended Guidelines for Application of Roofing Materials to an Occupied Building" in the manufacturer's manual for specific guidelines.
- J. Store the TPO Membrane in the original undisturbed plastic wrap in a cool shaded area and cover with light-colored, breathable tarpaulins, in a manner to protect it from damage. TPO Membrane that has been exposed to the elements for approximately 12 hours must be prepared with (Splice Wash) prior to hot air welding.
- K. Follow directions for protection of materials prior to and during installation. Do not use materials that have been damaged to the point that they will not perform as specified.
- L. Care should be used when installing fasteners to avoid possible conduits and other piping in and under the deck.
- M. TPO is a reflective membrane. Adequate UV eye protection is necessary during installation.
- N. Do not use oil base or bituminous base roof cement with TPO Membrane.
- O. Contact Manufacturer's Technical Services for procedures when installing the TPO Membrane during temperatures less than 40° F (4.44° C).

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Roof System shall be a class A rated system and attached to the deck in accordance with FM I-75 fastening requirements

### 2.2 MEMBRANE

- A. Base Specification is 80mil TPO fully adhered system.

- B. Approved Manufacturers:
1. Carlisle
  2. Firestone
  3. J.P. Stevens
- C. Requests for approval for manufacturers with equivalent products shall be submitted a minimum of 10 days prior to bid, in order to give the Owner adequate time to review the proposal in accordance with Instructions to Bidders Product Substitution Procedure. The request shall be a complete package as noted below and should be submitted on manufacturer 's letterhead.
1. Complete specification with details for Architects review, along with certification from Manufacturer of substitute membrane, which proposed material and system, is in compliance with all other requirements of this specification.
  2. Proof of experience as a manufacturer of the proposed membrane, with a minimum of fifteen (15) years experience
  3. Provide manufacturer certification that membrane contains no plasticizers, or PVC polymers .
  4. Provide manufacturers listing of common chemicals that may affect the membrane or the roof system in general.
  5. Verification of UL Class A, FM Class 1 system rating with a minimum 6 foot wide membrane full sheet, in order to minimize seams on the roof. Every roll of membrane shall be UL labeled.
  6. Provide adequate background information to the owner, to demonstrate that manufacturer has the capability to service, and back the Warranty for the term herein specified.

### 2.3 ROOFING SYSTEM MEMBRANE

- A. Membrane Sheet Material: Membrane shall be 80 mil overall thickness, white Ethylene Propylene membrane reinforced with a polyester, 1000D scrim encapsulated in one pass through the calendar. There shall be more than 20 mils of Ethylene Propylene membrane between the scrim and the weathering surface of the roof. The Ethylene Propylene sheet physical properties must be actual tested properties of the sheet, not typical or hypothetical values . In order to minimize seams on the roof, the minimum width of the membrane full sheet shall be 6 feet. The membrane shall have the following minimum physical properties.

TABLE 1 - Physical Properties

Physical property	Test method	Specification
Weight, minimum (Mass)	ASTM D-751	0.24/bs./ft' (1.41 Kg/ fM2)
Thickness tolerance	ASTM D-751	80 mil ±10%
Breaking strength, minimum	ASTM D- 751, Grab Method	25 lbs.
Tear Strength, minimum	ASTM D-751, ongue Tear	100 lbs.
Vapor transmission	IASTM E-96	.035 perm s
Elongation*	IASTMD-412	500%
Hydrostatic resistance, minimum	iASTM D-751 Method	350 psi
Ozone resistance*	STM D-1149 70 hrs .@ 100 F.	Pass
IEmmaqua® concentrated natural sunlight, 4 million langleys	IASTMG-90	No visible surface cracking or stiffening
Dimensional stability	ASTM D-1204	0.3%
!Puncture resistance, minimum	FTM 101 B, Method 2031	1450 lbs.
Test performed on nonreinforced material		

## 2.4 RELATED MATERIALS

- A. Flashing: Same membrane as Roofing (60 mil reinforced). For field fabricated vent stacks, pipes and corners provide unreinforced 55 mil uncured white TPO.
- B. Bonding Adhesive: As provided by Manufacturer to hold flashings in place. Do not apply in seam areas.
- C. TPO Coated Metal: as detailed in the plans other wise use specified colored finished metal as detailed .
- D. \_Sealant: Provide to serve as water cut-off mastic, pitch-box sealer, and to caulk Ethylene Propylene membrane edge to metal. Provide cut edge sealant where required.
- E. Primer: For preparing contaminated membrane for hot-air welding.
- F. Seam Caulk: Shall be provided for the purpose of sealing any non encapsulated edge of reinforced membrane.
- G. Overnight Seal: As provided by Manufacturer. All seals must be maintained every night.
- H. Sealants: Sealants not a part of the Roofing System shall be compatible with



Ethylene Propylene materials and applied according to manufacturer's instructions.  
Acceptable sealants are one part polysulfide and one part urethane.

- I. Mechanical Fasteners: Manufacturer provided fasteners designed for use on Project roof deck. Where installation incorporates insulation within the system, provide fasteners with anti-blackout devices
- J. Polyurethane Insulation Foam Adhesive: One part or two part as recommended by the Manufacturer to adhere insulation in place and applied to meet wind uplift requirements.
- K. Foam Backer Rod: Provide acceptable foam backer rod materials for expansion joints.
- L. Nailers: No. 2 or better, pressure preservative treated lumber using specified preservatives.
- M. Seam Cleaner: Use a surface cleaner at dirty or contaminated membrane prior to heat weld.
- N. Termination Bar: As provided by manufacturer fastened 6" O.C.
- O. Pipe Boots & Corners: Provide 0.055 inches unsupported TPO flashing at 1" to 6" diameter pipes and at inside and outside corners.
- P. Edge Metal Systems: As specified in Section 07620- Sheet Metal Flashing and Trim and/or as detailed in plans.
- Q. Counterflashings: As specified in Section 0760- Sheet Metal Flashing and Trim and/or as detailed in plans.
- R. Where plastic drain strainers exist replace with new cast Iron baskets
- S. Clean drains and pipes to insure that blockage doesn't exist.
- T. Walk Pad: Provide heavy embossed tread pad by TPO manufacture

## 2.5 ROOF INSULATION PRODUCTS

- A. Polyisocyanurate Insulation
  - 1. Description: Roof insulation consisting of closed cell polyisocyanurate foam core and a perforated black glass reinforced mat laminated to the face. Nominal Size is 48"x 48" or 48"x 96"

- a. Reference Standards:
  - (1). FS HH-I-1972/Gen.
  - (2). FSHH-I-1973/3.
  - (3). ASTM C 209 - Water Absorption.
  - (4). ASTM E 96-Water Vapor Transmission of Materials.
  - (5). ASTM D 1621 -Compressive Strength.
  - (6). ASTM D 1622 -Density.
  - (7). ASTM D 2 126- Dimensional Stability.
  - (8). ASTM E 84 - Flame Spread.
- B. Cover Board
  1. Cover board shall be either of the following as required and approved by membrane manufacturer for total system warranty and roof system code requirements, see drawings.
    - a. DensDeck Prime, or equal
    - b. High Density Polyisocyanurate
- C. Insulation Attachment
  1. Mechanical Fasteners:
    - a. Heavy duty threaded fastener with 3-coat waterborne fluorocarbon polymer coating and drill point tip capable of penetrating 20 gauge steel. Fastener shall meet minimum thread size of .260" and a 13 threads per inch. Length shall be sufficient to penetrate deck a minimum of  $\frac{1}{8}$ " for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a  $\frac{7}{32}$ " carbide drill bit to a depth W' deeper than the fastener engagement.
    - b. Reference Standard: SAE 1022, Heat Treated.
    - c. Product/Producer: Heavy Duty (HD) fasteners.
    - d. Provide fasteners sufficient to produce FM I-75 uplift resistance attachment to deck.
  2. Insulation Foam Adhesive: One part or two part Polyurethane foam adhesive as recommended by the manufacturer to attach insulation to the deck so as to meet FM 1-75 attachment to the deck requirements .
- D. Job Requirements:
  - I. Insulation on all new areas over heated space unless otherwise indicated in drawings:
    - a. Cover board:  $\frac{1}{2}$ " Dens Deck.
    - c. Polyisocyanurate tapered Insulation with average R=30 where indicated in drawings:  $\frac{1}{4}$ " per Ft minimum or as indicated in drawings.
    - d. Polyisocyanurate Crickets: Installed crickets must provide at least a  $\frac{1}{4}$ " per foot reverse slope. Crickets drawn on drawings are shown for intent only. All crickets should be installed at a minimum 3 to 1 length to width ration and increased as necessary to provide positive drainage.

## PART 3 - EXECUTION

### 3.1 GENERAL INSTALLATION

- A. Install membrane and accessories in accordance with plans, specifications and manufacturer's requirements following the most stringent requirement of the three.
- B. Do not expose the building and materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day
- C. Protect building surfaces against damage from roofing work.

### 3.2 DECK EXAMINATION AND PREPARATION

- A. Inspect roof decks for deficiencies and report to the Design Professional immediately any deficiencies. Do not proceed with installation of roof, until all deficiencies have been corrected. Start of roofing shall constitute acceptance of deck.
  - 1. Verify that deck is supported, secured and free of depressions.
  - 2. Verify that metal deck surfaces are dry and free of snow or ice.
  - 3. Verify that roof openings, curbs, pipes, sleeves, ducts & vents through roof are solidly set and wood nailers are in place
  - 4. On roofs to be recovered, remove and replace any wet roofing and insulation, and remove base flashings, penetration flashings, gravel surfacing, blisters and ridges.
  - 5. On roofs to be replaced, remove all roofing to the deck. Clean deck of all debris.

### 3.3 PHASED CONSTRUCTION & COMPLETION REQUIREMENTS

- A. Phased construction will not be permitted on this project.
- B. Once roofing operations are started, the roofing application, including all associated metal work, must be continuous and finalized with all punch lists completed in the number of work days calculated as follows:  
700 SF/Day Completion Rate based on a 5 day 40 hour work week, or 875 SF/Day Completion Rate based on a 4 day 40 hour work week.
- C. The contractor will be responsible for additional fees for additional inspection time resulting from the contractor not completing the roofing installation in the allotted time period. The additional inspection fee is \$700.00 per day.

### 3.4 WOOD NAILER LOCATION AND INSTALLATION

- A. Install wood nailers at roof edges, metal flashings, gutters, and elsewhere as shown on Drawings and approved shop drawings or as required by system manufacturer  
Install wood nailers as follows:
  - 1. Position Wood Nailer: Wood nailers should be installed with a 1/8" gap between each length and each change of direction.
  - 2. Nailer Height: The nailer height must match the total thickness of insulation. Where tapered insulation is used, the wood nailer must be tapered so that it will always be flush at the point of contact with the insulation (refer to Details).

3. Secure Wood Nailer: Fasten to structural roof and wall framing or deck with fastener heads countersunk with the surface of the nailer. Mechanically fasten wood nailers to resist 200 pounds force per linear foot of nailer in any direction. Nailers must be firmly fastened to the deck at 18 inches o.c.
4. Chemical Treating of Wood Nailer: Chemical treating for fire resistance or other purposes (other than pressure treating for rot resistance) may affect the performance of the TPO Membrane and accessories. Consult Manufacturer's Technical Services Department regarding compatibility.
5. Treated Wood Fasteners: All fasteners used in wood that has been pressure treated with preservatives must be hot dipped galvanized coated, stainless steel or approved in writing by the fastener manufacturer for use in treated wood.

### 3.5 INSULATION INSTALLATION

- A. Install Insulation: Install only as much insulation as can be covered with roofing membrane and completed before the end of the day's work or before the onset of inclement weather.
- B. Fit Insulation: Neatly fit insulation to all penetrations, projections, and nailers. Insulation should be loosely fitted, with gaps greater than 1/4" being filled with acceptable insulation. Under no circumstances should the membrane be left unsupported over a space greater than 1/4". Tapered or feathered insulation should be installed around roof drains so as to provide proper slope for drainage.
- C. Crickets: Crickets on plans are shown for intent only. The contractor is responsible for installing the crickets with a sufficient length to width ratio to provide positive drainage to drains/scuppers. If the crickets are overlaid with a layer of insulation, a row of fasteners should be applied along the cricket valley line to insure the overlay conforms to the cricket configuration. If the crickets are installed on top of all insulation, a tapered edge strip sized from the cricket edge height down to 0" shall be installed.
- D. Insulation Attachment To Deck:
  1. Mechanically Attachment: Attach insulation using Fasteners and Insulation Plates. Refer to the Technical Information on FM 1-75 and manuals for attachment patterns and rates for specific insulation types and thickness. In a multi-layer insulation assembly, the type and thickness of the top layer of insulation determine fastening pattern. Insulation fasteners shall penetrate the top of the flutes and shall not extend into the building interior. Fastener length shall be sufficient to penetrate deck a minimum of 3/8" for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a 7/32" carbide drill bit to a depth W' deeper than the fastener engagement. Roofing contractor is liable for replacing fasteners that extend beyond the bottom of the flutes.
  2. Polyurethane Adhesive Attachment: Apply Manufacturer's approved foam adhesive in accordance with the manufacturer's recommended quantities and patterns so as to meet FM 1-75 attachment to the deck requirements.
- E. Stagger Insulation Joints: All joints are to be staggered. When installing multiple layers of insulation, all joints between layers should be staggered.



## 3.6 MEMBRANE INSTALLATION

- A. The contractor shall be responsible for suitable substrate to accept Ethylene Propylene membrane.
- B. Installer of flexible sheet roofing system shall examine substrate and conditions under which roofing work is to be performed and shall notify the Architect and Owner immediately of unsatisfactory conditions. Do not proceed with roofing work until unsatisfactory conditions have been corrected in manner acceptable to installer and manufacturer.
- C. Place Membrane and Allow to relax: Place membrane panel over the substrate in its final position. Allow membrane to relax one half hour prior to any seaming or flashing. The TPO Adhered System must be installed so that the seams do not impede the flow of water.
- D. Fold the Membrane Back: After making sure the sheet is placed in its final position allowing for a minimum 1-112" seam, fold it back evenly onto itself so as to expose the underside. (Note: The sheet fold should lay smooth so as to minimize the formation of wrinkles during and after installation.)
- E. Remove Dust and Dirt: Sweep the mating surface of the membrane with a stiff broom to remove any dirt that may have accumulated.
- F. Apply the Bonding Adhesive:
  1. General Application: Apply TPO Bonding Adhesive at about the same time to both the exposed underside of the sheet and the substrate to which it will be adhered so as to allow approximately the same drying time. Apply bonding adhesive so to provide an even and uniform film thickness. Refer to Technical Information Sheets and container labels for specific application instruction.
  2. Apply Bonding Adhesive With A Roller: Apply TPO Bonding Adhesive with a roller at about the same time to both the exposed underside of the sheet and the substrate to which it will be adhered so as to allow approximately the same drying time. Roll the adhesive on to the mating surfaces, assuring a relatively even and uniform thickness. When applying bonding adhesive to surfaces lighter in color than the back of the membrane, apply adhesive to the light colored surface and shady surfaces before the dark membrane surface to aid in drying. Refer to Technical Information Sheets and container labels for specific application instruction.
  3. Stop Bonding Adhesive Short of Splice Area: Care must be taken not to apply TPO Bonding Adhesive over an area that is to be later heat welded to another sheet or flashing. All bonding adhesives must be completely removed before heat welding.
  4. Apply Bonding Adhesive at Specified Coverage Rate: Refer to container label and the Technical Information Sheet for specific application requirements. Adhesive is to be applied at the approximate rate as specified in the Technical Information Sheet for the specific adhesive product.
  5. Test Bonding Adhesive for Readiness: Allow bonding adhesive to flash off until tacky. Touch the bonding adhesive surface in the thickest area with a clean, dry finger to be certain that the adhesive film is dry to the touch and there is no wet adhesive beneath the top adhesive film. If either motion

exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions. This is especially true for adhesive products.

- G. Bond the Membrane to the Substrate: Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly so as to minimize wrinkles.
- H. Broom the Membrane : To ensure proper contact, compress the bonded half of the sheet to the substrate with a stiff push broom.
- I. Repeat Procedure to Complete the Sheet Installation: Fold the un-adhered half of the membrane sheet back onto itself, and repeat the procedure to complete the bonding of the sheet. Care should be taken at fold area to insure membrane is 100 %adhered .

NOTE: Orient TPO panels such that the exposed (cut) edges of the membrane are used as the bottom panel in splices whenever possible. If cut edges are exposed , they must be sealed with TPO Cut Edge Sealant or TPO General Purpose Sealant.

### 3.7 MEMBRANE WELDING

- A. Clean the Lap Splice Area: Using a clean white cotton rag dampened with (Splice Wash), thoroughly clean an area on both sheets at least 6 inches (15.24 em) wide if seam area has become contaminated with dirt, debris, moisture, etc. Membrane left exposed for more than 12 hours must be cleaned prior to any welding activity.
- B. Hot Air Weld Lap Splices:
  - 1. Horizontal field splices: All field splices on the horizontal surface (including flashing) should be completed using an automatic heat welder wherever possible that has been designed for hot air welding of thermoplastic membranes. (Refer to the welding equipment requirements in the Technical Information Sheets for minimum requirements. For specifics, consult the welder manufacturer 's data sheets.)
  - 2. Vertical field splices: Hand held welders can only be used on vertical welds or where an automatic welder is not practical or cannot be used.
  - 3. Equipment and Test splice requirements: The air intake, temperature and speed of the machine must be adjusted to provide proper seam strength. An ample power supply must be provided to all heat welding equipment. A generator, which is dedicated to the heat welding equipment, must be used on all installations. Refer to the welding and generator equipment requirements in Technical Information Section of this manual, for minimum requirements. For specifics, consult the welder manufacturer's data sheets. When weather conditions vary, adjustments to the welding machine must be made. It is recommended that this be done using spare material before beginning the finished product sheet. In addition, there must be destructive tests performed daily and at the beginning and every time there is an interruption in the welding process. (i.e. Power failure, welder shut down, job site conditions change and after lunch). There should be periodic checks (including at the start of each day) to verify good peel strength.
  - 4. Seam width requirements: Seams made with the automatic welder must be a minimum of 1-1/2" (38.1 mm) wide. Seams made with hand welders must be a

minimum of 2" (50.8 mm) wide. Use silicone hand rollers to assure proper mating of surfaces as hand heat welding proceeds.

5. Seam inspection : Probe all completed welds using a slotted screwdriver or dull cotter pin puller type tool to verify seam integrity daily. Do not probe welds until they have had time to cool. Any welds found to be insufficiently welded need to be repaired on a daily basis.
6. T-Joint Patches: T-joint patches must be installed at all intersections of field seams.
7. Cut Edge Sealing: All cut edges with scrim exposed must be sealed with TPO Cut Edge Sealant or TPO General Purpose Sealant.  
NOTE: SOLVENT WELDING IS NOT ACCEPTABLE

### 3.8 MEMBRANE SECUREMENT (BASE TIE-IN) LOCATION AND INSTALLATION

- A. Provide Membrane Securement: Secure the membrane (base tie-in) at all locations where the membrane ends or goes through an angle change greater than 1" in 12" (i.e., roof edges, curbs, interior walls, etc.).
- B. Install TPO 2-3/8" Barbed Seam Plates as shown in Details:
  1. Mechanically fasten 2-3/8" Barbed Seam Plates with Fasteners in accordance with Details.
  2. Refer to the System Design Guide or Technical Information Sheets of this manual to determine the applicable fastener and the associated penetration requirements for the specific substrate conditions.

### 3.9 FLASHING- PENETRATIONS

- A. General:
  1. Remove all loose existing flashing (i.e., lead, bituminous materials, mastic, etc.).
  2. Flash all penetrations passing through the membrane.
  3. The flashing seal must be made directly to the penetration.
- B. Round Supports, etc.:
  1. Flash pipes with TPO Pre-Molded Pipe Flashing welded to membrane where their installation is practical. Peel and stick flashings are not permitted.
- C. Roof Drains: These specifications apply for installation of cast iron drains only. For all other drain types contact Technical Services Department.
  1. Remove all existing flashing (including lead flashing), roofing materials and cement from the existing drain in preparation for membrane and Water Block Seal.
  2. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
  3. Install tapered insulation with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain can not be greater than 1" in 12".
  4. Position the membrane, then cut a hole for the roof drain to allow a 1/2"

- minimum and 3/4" maximum inside the clamping ring.
5. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
  6. Place Water Block Seal on the clamping ring seat flange below the membrane (use a minimum of one half of a 10-oz. tube for a 10") drain).
  7. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve constant compression. Install new Cast Iron basket.

### 3.10 FLASHING WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, SKYLIGHTS, ETC.

- A. General: Using the largest pieces of continuous TPO Membrane practical, flash all walls, parapets, curbs, etc., to the height as specified by the project designer. Where applicable, TPO Coated Metal may be utilized.
- B. Existing Flashing: All loose existing flashing must be removed.
- C. Attach flashing to the wall surface first: Apply TPO Bonding Adhesive or Bonding Adhesive at about the same time to both the membrane flashing and the surface to which it is being bonded so as to allow approximately the same drying time. Apply TPO Bonding Adhesive by rolling the adhesive on to the mating surfaces evenly, avoiding globs or puddles.
- D. Apply TPO Bonding Adhesive at Specified Coverage Rate: Apply TPO Bonding Adhesive at the approximate rate as specified in the Technical Information Sheets of this manual for the specific adhesive product. Note: Coverage rate will differ with various substrates and/or climatic conditions.
- E. Roll Membrane Flashing up the Vertical: Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles.
- F. Broom the Membrane Flashing : To ensure proper contact, compress the flashing to the substrate with a stiff push broom.
- G. Complete splice to roof membrane: Complete the splice between membrane flashing and the main roof sheet by hot air welding. Provide lap splices in accordance with details.
- H. Provide Termination:
  1. Provide termination directly to the vertical substrate as shown in Details.
  2. Where metal counter flashings are to be installed over top of flashing, apply water block mastic behind top of membrane flashing, terminate top of flashing with termination bar fastened 6" or 8" O.C. (depending on how termination bar is pre-punched) and apply recommended caulking above top of termination bar tooled to facilitate water runoff.

### 3.11 PROTECTION

- A. Protect building surfaces against damage from roofing work.
- B. Where traffic must continue over finished roof membrane, protect surfaces.



### 3.12 TEMPORARY CLOSURE

- A. Temporary closures to ensure that moisture does not damage any completed section of the new roofing system are the responsibility of the roofing contractor.
- B. Completion of flashing, terminations, and temporary closures should be completed as required to provide a watertight condition. Any material contaminated by a temporary closure must be cut out and discarded prior to resumption of installation.

### 3.13 ROOF WALKWAYS

- A. Install walkways from roof hatch to new HVAC units. Walkways may consist of 30" wide TPO Walkway material. Heat weld the edges of the walkway material to the TPO Membrane using the welding procedures stated in Section 2.08. Discontinue at joints in roof membrane.

### 3.14 CLEANUP

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.
- C. In areas where finished surfaces are soiled by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.
- D. Remove excess materials, trash, debris, equipment, and parts from the Work.
- E. Repair or replace defaced or disfigured finishes caused by work of this Section.

END OF SECTION 07542

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THERMAL AND MOISTURE PROTECTION -DIVISION 7  
SECTION 07620: ROOF PRODUCTS AND FLASHING

PART 1. GENERAL

- 1.1 Scope:  
The extent of metal roofing patches and flashing work shall be as herein specified and as indicated on the drawings. Furnish and install all roofing and flashing complete with all necessary accessories .
- 1.2 Submit manufacturer's brochure and color samples for Architect's review , color selection, and approval. Submit shop drawings for new roofing curbs for review and approval prior to fabrication.
- 1.3 Quality Assurance :
- A. Applicator's Qualifications:Applicator shall have installed, for a minimum of three (3) years, roofing similar to that specified herein.
- 1.4 Protection:  
Protect products and accessories against scratches and damage. Inside dry storage is required to prevent condensate from forming between sheets and components. Do not permit material storage or excessive traffic on completed roof surfaces. Products excessively scratched or damaged in the field shall be replaced without further cost to the Owner.

PART 2. MATERIALS

- 2.1 Sheet Metal:  
ASTM A526, minimum 26 gauge, with minimum 1.25 ounce per square foot galvanized coating (380g/sm.), to be finished with Kynar 500 coating; color to match panels. all paint shall be applied per manufacturer's instructions.
- 2.2 Roofing panels for Patching and Replacement:  
MBCI 26 ga "PBR" panels, with Signature 200 white paint (to match existing).
- 2.3 Liquid Applied Roofing Seals: GAF Top Coat at all laps, screw heads and penetrations
- A. TopCoat flashing grade base coat
- B. TopCoat Topester Reinforcing Fabric
- C. TopCoat membrane base coat
- D. TopCoat Fastener Grade Sealant
- 2.4 Pre-Fabricated Roof Curbs and Equipment Supports:
- A. Fabricate curbs of structural quality aluminum or galvalume sheet, with mitered and welded corner joints, factory primed and prepared for painting. Provide

integral base plates and water diverters/crickets. Front base plate must be a minimum of 15 inches from beginning to cricket to the end of the base plate. Curbs shall be designed to install under metal roof system on the high side and over metal roof system on the low side.

- B. Approved roof curb manufacturers:
  - 1. LM Curb, Longview, TX 800-284-1412
  - 2. Mallory Metal Products: Santa Teresa, NM 800-388-1031
  - 3. Metallic Products, Houston, TX 800-356-7746
- C. Refer to project drawings and on site measurements for correct curb height.
- D. Curbs shall be constructed to match the slope of the roof and provide a level top surface for mounting equipment.
- E. Curb flanges must be constructed to match the configuration of the metal roof panels.
- F. Coordinate the size of the curbs with the mech. equipment prior to fabrication .
- G. Prefabricated Roof jacks by ITW Builder Retrofit Dektite: Through the roof pipe flashings shall be a one piece EPDM molded rubber boot with flanged base ring.

### PART 3. EXECUTION

#### 3.1 Preparation:

- A. Remove all roof elements scheduled for replacement or removal.
- B. Thoroughly clean the existing roof.

#### 3.2 Roof Cuts:

- A. Cut out existing roof and structural steel deck for new penetrations.

#### 3.3 Seal all Roofing Seams with GAF TopCoat flashing grade, and Matt tape (GAF Topester reinforcing tape).

#### 3.4 Install Roofing and Flashing in accordance with manufacturer's recommendations.

END OF SECTION 07620



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THERMAL AND MOISTURE PROTECTION- DIVISION 7  
SECTION 07725: ROOF SCUTTLE

PART 1. GENERAL

- 1.1 Scope:  
Furnish and install roof scuttle complete with all necessary accessories.
- 1.2 Submittals:  
Submit manufacturer's product data, indicating flashing detail, for approval by Architect .
- 1.3 Guarantee:  
Provide manufacturer's guarantee of proper operation and freedom from defects in materials and workmanship for a period of five (5) years.

PART 2. PRODUCTS

- 2.1 Roof Scuttle:  
"Bilco" Type GS, Size 2'-6" x 3'-0". Cover shall be GS-50 aluminum with clear acrylic plastic dome and three inch (3") beaded flange, neatly welded. One inch ( 1") rigid glass fiber insulation in curbs, fully covered by aluminum liner. Curb shall be twelve inches (12") in height , and of aluminum. It shall be formed with a three and a half inch (3-1/2") flange with holes provided for securing to the roof deck and equipped with integral metal cap flashing fully welded at corners for weather tightness. Scuttle shall be assembled with heavy pintle hinges, compression spring operators enclosed in telescopic tubes, positive snap latch with twin handles and padlock hasps inside and thermal plastic rubber gasket. Cover shall be equipped with automatic hold-open arm, complete with red vinyl grip handle and permit one-hand control of the cover to its closed and latched position.
- 2.2 Hatch Rail System:  
Bil-Guard Hatch Rail System: Posts and rails are pultruded from a fire retardant, fiberglass reinforced polymer (FRP) . Mounting brackets are fabricated from 1/4" thick hot dip galvanized steel. Gate hinges and post guides are 6063-T5 aluminum and the torsion rod is type 302 stainless steel.
- A. Hatch Rail System must satisfy the requirements of OSHA 29 CFR 1910.23 and meet OSHA strength requirements with a safety factor of 2.
- B. Provide a 25 year warranty against defects in material and workmanship.
- 2.3 LADDER SAFETY POST
- A. Furnish and install where indicated on plans ladder safety post Model LU-1. The ladder safety post shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
1. Tubular post shall lock automatically when fully extended.
  2. Safety post shall have controlled upward and downward movement.

3. Release lever shall disengage the post to allow it to be returned to its lowered position.
  4. Post shall have adjustable mounting brackets to fit ladder rung spacing up to 14" on center and clamp brackets to accommodate ladder rungs up to 1-3/4" in diameter.
- C. Post Shall be manufactured of high strength square tubing. A pull up loop shall be provided at the upper end of the post to facilitate raising the post.
- D. Material of construction: Shall be steel Model LU-1.
- E. Balancing spring: A stainless steel spring balancing mechanism shall be provided to provide smooth, easy, controlled operation when raising and lowering the safety post. [For installation in highly corrosive atmospheres, Model LU-3 incorporates a special alloy spring mechanism].
- F. Hardware: All mounting hardware shall be Type 316 stainless steel.

### PART 3. EXECUTION

- 2.4 Install roof scuttle, ladder safety post and hatch rail system in strict accordance with manufacturer's recommendations.

END OF SECTION 07725

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THERMAL AND MOISTURE PROTECTION - DIVISION 7  
SECTION 07920: SEALANTS AND CAULKING

PART 1. GENERAL

1.1 Scope: Sealants and joint filler.

PART 2. PRODUCTS

2.1 Materials:

- A. Sealant for exterior use: 2 component urethane, Sonneborne Sonolastic polysulfide sealant or Temco Dymeric 240 .
- B. Sealant for interior use: 1 component acrylic latex, Sonneborne Sonolac sealant or Tremco Acrylic Latex Tremftex 834.
- C. Acoustical Sealant: USG Acoustical Sealant or Tremco Acoustical Sealant.
- D. Joint Filler: Preformed compressible, resilient, non-waxing, non-extruding, non-staining strips of polyethylene foam. Sonofoam closed cell polyethylene backer rod.
- E. Sill Sealer: 3/8" closed cell polyethylene foam with self adhesive waterproofing membrane that conforms and seals off the voids and irregularities between the top of the foundation and sill plate .
  - 1. Protecto Premium Energy Sill Sealer (303 .777.3001) or equal.
- F. Low Expansion Polyurethane Foam (LEPF): UL Classified, one-component polyurethane foam designed specifically for window and door installation applications. Applied in bead form it shall cure to a semi-rigid closed cell foam upon reaction to moisture such as ambient humidity.
  - 1. Tremco "TremGlaze" Low Expansion Polyurethane Foam or equal.
  - 2. Tremco "TremGlaze" Polyurethane Cleaner for cleaning the fresh foam over-spray and dispensing gun.

PART 3. EXECUTION

3.1 Preparation :

- A. Clean, prepare and size joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.
- B. Use joint filler to achieve required joint depths, to allow sealants to perform properly .

3.2 Application:

- A. . Do not apply when temperature is under 50 degrees or over 100 degrees F.
- B. Mask sensitive adjacent surfaces and apply sealant with handgun or pressure

equipment.

- C. Tool joints to provide smooth , even surface and concave joint.
- D. Clean adjacent non-porous surface before sealant cures , and remove masking tape immediately after tooling .

3.3 Acoustical Sealants: Provide continuous beads of sealant to walls as indicated on the wall section details in the drawings, and set all interior wall electrical boxes in a full bed of sealant to cover any openings.

END OF SECTION 07920



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DOORS AND WINDOWS - DIVISION 8  
SECTION 08100: STEEL DOORS AND FRAMES

## PART 1. GENERAL

- 1.1 Scope:  
The extent of steel doors and frames is shown and scheduled on the Drawings.
- 1.2 Reference Standards:  
Underwriters' Laboratories (UL) as applicable to fire-rated steel doors and frames.  
American National Standards Institute (ANSI) 151.1 Performance testing.
- 1.3 Submittals:  
Submit shop drawings for review, indicating location for each door and frame, elevation of each type, details of construction, method of assembly, location and extent of hardware reinforcement, description of materials used and methods of finishing.

## PART 2. MATERIALS

- 2.1. Quality Standards:
- A. ANSI-A115 on door and frame preparation.
  - B. Steel Door Institute (SDI) 100-116 recommended specifications for steel doors and frames.
- 2.2 Acceptable Manufacturers:  
Steelcraft, Fenestra, Steeltech, Curries, Elco, Willco and Southwestern
- 2.3 Steel:  
ASTM A366-72 cold-rolled, commercial quality carbon sheet steel
- 2.4 Primer:  
Rust inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified paint finish.
- 2.5 Core Filler Material:  
Manufacturer's standard honeycomb .
- 2.6 Vision Panels:  
One-quarter inch safety glass (or tempered: see Door Schedule), metal stops and frames.
- 2.7 Minimum Gauges:
- A. Door Framing:
    - 1. Openings up to and including 24 square feet, 16 gauge.
    - 2. Openings over 24 square feet, 14 gauge .
  - B. Adjustable anchors, slides, fasteners, accessories, floor knees, 14 gauge.

- C. Interior Channel spreader, Type T anchor, 16 gauge.
- D. Interior flush door, 18 gauge.
- E. Exterior flush door, 16 gauge.
- F. Interior hardware reinforcement s, 12 gauge. (butts, checks, pulls, overhead door holders locks , latches)
- G. Exterior hardware reinforcement- 5/ 16 inch thick

#### 2.8 Frames:

- A. Fabricate frames with neat arc welded reinforced miters. Reinforce frames according to ANSI standards. Do not use filler plates to convert oversize openings to the specified hardware. On frames with closers, reinforce head for closer and prepare hinges for high frequency use with extra 10 gauge reinforcement. Grind smooth all exposed welds .
- B. Prior to shipment, install temporary spreader at bottom of frame. Do not remove spreader until frames are secured in place.
- C. Door Silencers:  
Except in weather-stripped frames, drill stops to receive two (2) silencers on strike jambs of single-swing frames and two (2) silencers on heads of double-swing frames.
- D. Plaster Guards:  
Provide 26 gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation.
- E. Fire-Rated Frames:  
Fabricate in accordance with NFPA 80. Place UL/labels on frames visible from installed position.

#### 2.9 Doors:

- A. Doors shall be flush 1-3/4 inch steel doors with face sheets of cold-rolled, leveled sheet steel. Both faces of the door shall have smooth, seamless and unbroken surfaces, with top and bottom edges closed flush to the door face sheets. No inverted channels.
- B. Lock and hinge edges shall be formed by full overlap of each face sheet around the perimeter vertical channels of a unitized grid structure, meeting at the centerline of each.
- C. All structural components shall be manufactured of steel, utilized maximum strength welding design and techniques throughout.
- D. All doors shall be mortised and reinforced for hinges and locks to allow field application. Hinge reinforcement for doors shall be eight gauge steel, die-formed to provide screw thread depth equivalent to No. 10 U.S. Steel gauge. Do not use filler

plates to convert oversize openings to the specified hardware.

2.10 Glazing:

- A. Use manufacturers' standard screw-on type glazing bead attached with screws countersunk flush.
- B. For interior glazing, utilize manufacturers' standard extruded elastomeric "dry" type sealant bead both sides of glass.

2.11 Finish:

- A. Frames:  
After fabrication is completed and metal cleaned, bonderize entire units . Follow with a heavy coat of zinc chromate rust inhibitive paint, baked on.
- B. Doors:  
Before doors are assembled, bonderize metal and give surfaces a coat of manufacturer's standard primer. After doors are fully assembled , apply one heavy coat of rust inhibitive paint on exposed surfaces, baked on.

2.12 Anchors :

Provide minimum three jamb anchors for each side of frames. Provide floor anchorage in every case and floor jamb anchors each side.

- A. Existing wall anchors: Provide flush bolt heads, grind smooth and patch with "bondo" before painting.

3. EXECUTION

- 3.1 Install metal frames plumb and square, in correct locations indicated and with a maximum diagonal distortion of 1/16 inch (2 mm). Ensure frames are securely and rigidly anchored to adjacent construction.
- 3.2 Install borrowed light frames with stops anchored with countersunk screws. Coordinate the installation of glass and glazing and glass block masonry.
- 3.3 Install steel doors plumb and square, and with a maximum diagonal distortion of 1/16 inch (2 mm). Install hardware in accordance with requirements of Section 08710. Allow a 3/8 inch door clearance at door bottom.
- 3.4 Fill all steel door frames with grout, unless otherwise specified.

END OF SECTION 08100

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DOORS AND WINDOWS - DIVISION 8  
SECTION 08200: WOOD DOORS

PART 1. GENERAL

- 1.1 Scope:  
Furnish and install wood doors complete with all necessary accessories .
- 1.2 Submittals:  
Submit shop drawings and catalog cuts prior to ordering. Include location of each door, elevation of each type , and details of construction .
- 1.3 Quality Assurance:  
The "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute apply and by reference are hereby made part of this Section .
- A. Fire-Rated Wood Doors:  
Provide wood doors with fire resistance ratings labeled and listed by a testing organization acceptable to Building Code Officials.
- 1.4 Approved Manufacturer: Weyerhaeuser (800)869-3667.

PART 2. PRODUCTS

- 2.1 Doors
- A. Solid-Core Flush Doors:  
Meeting the requirements of AWI "Premium" grade for flush solid core doors, maximum allowable twist or warp of 1/4 inch, core of particleboard which complies with ANSI A208.1LD2, with two-ply 1-1/2" laminated stiles.
1. Laminate faced: high pressure laminate.
    - a. Submit standard color palette for selection on this project.
  2. Bevel strike edge 1/8 inch in 2 inches .
- B. Fire Label Doors:  
Fire retardant doors shall be Factory Mutual or Underwriters' Laboratory approved fire doors constructed in strict accordance with specifications approved by Underwriters' Laboratories. Doors shall meet the label construction indicated on the Drawings and have the proper label attached. Provide metal frames for view panels in labeled doors as required.

PART 3. EXECUTION

- 3.1 Handling:  
Deliver doors free from visible markings or scratches on surfaces to be exposed. Store in a clean, dry, well-ventilated space, stacked flat and level with ventilation spaces of sufficient number to avoid warping doors .
- 3.2 Installation of Doors:

Install doors only after completion of all other work which would raise the moisture content of the doors or damage the surface of the doors . Bevel the lock edge at the rate of 1/8 inch in 2 inches. Provide the minimum clearance necessary for smooth operation of the door, not to exceed 1/4 inch at top and sides, and 1/2 inch at bottom. Machine , or otherwise prepare doors for hardware as specified in Section 08710 -"Finish Hardware." Obtain all templates necessary prior to any machining. Seal cuts made on the job as soon as possible to avoid swelling from moisture . Finish doors absolutely as soon as practicable .

3.3 Warranty:

Provide a full warranty on all doors for the life of the installation equal to the Weyerhaeuser Full Warranty by the Door Manufacturer.

END OF SECTION 08200

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DIVISION 8 – DOORS AND WINDOWS  
SECTION 08540– COMPOSITE WINDOWS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Composite-framed windows of the following types: single-hung.
- B. Related Sections: Section(s) related to this section include:
1. Removal of existing windows: Section 02111 Demolition and Salvage

1.2 REFERENCES

- A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.
- B. American Architectural Manufacturers Association (AAMA):
1. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
  2. AAMA 615 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Plastic Profiles.
  3. NAFS - North American Fenestration Standard/Specification for windows, doors and skylights.
- C. Andersen Unit Installation Guide.
- D. ASTM International (ASTM):
1. ASTM C1036 - Standard Specification for Flat Glass.
  2. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
  3. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
  4. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  5. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls.
  6. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
  7. ASTM F2090 - Standard Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms.
- E. Insulating Glass Certification Council (IGCC):
1. Insulating Glass Unit Certification.
- F. Insulating Glass Manufacturers Alliance of Canada (IGMAC) and Canadian General Standards Board (CGSB):
1. Insulating Glass Units Standard CAN/CGSB 12.8-97.

G. International Standards Organization (ISO):

1. ISO 14021 - Environmental Labels and Declarations -- Self-Declared Environmental Claims (Type II Environmental Labeling).

H. National Fenestration Rating Council (NFRC):

1. NFRC 100 - Procedure for Determining Fenestration Product U-factors.
2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

I. U.S. Environmental Protection Agency (EPA):

1. ENERGY STAR.

J. Window and Door Manufacturers Association (WDMA):

1. WDMA Hallmark Certification Program for Manufacturers.

### 1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings: Conduct pre-installation meeting to clarify Project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

### 1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance Requirements:

1. Comply with requirements of NAFS.

### 1.5 SUBMITTALS

A. Product Data: For each type of product required.

B. Shop Drawings: Showing methods of installation, plans, sections, elevations and details of walls, specified loads, flashings, vents, sealants, and interfaces with all materials not supplied by the window manufacturer, and identification of proposed component parts and finishes.

C. Samples: Selection and verification samples for finishes, colors and textures. Submit two complete sample sets of each type of material required.

D. Certificates: Signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

E. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

F. Manufacturer's Instructions: Manufacturer installation, storage, and other instructions.

H. Qualification Statements: For manufacturer and installer.

### 1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Member in good standing of The Insulating Glass Certification Council (IGCC).



2. Hallmark Certified Manufacturer and member in good standing of the Window and Door Manufacturers Association (WDMA).
3. Member in good standing of U.S. Green Building Council.
4. U.S. ENERGY STAR Partner.
5. Capable of demonstrating an extended history of window and door design, production and innovation.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver materials to Project in manufacturer's original unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials and accessories protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by manufacturer off ground, under cover and not exposed to weather and construction activities.

#### 1.8 WARRANTY

- A. Special Warranty: Manufacturer's transferrable, non-prorated limited warranty.
  1. Warranty Period, Glass: 20 years.
  2. Warranty Period, Non-Glass Parts: 10 years.
  3. Warranty Period, Color Fade: 5 years.

### PART 2 PRODUCTS

#### 2.1 COMPOSITE WINDOWS

- A. General: Provide composite windows complying with the performance requirements indicated and tested according to NAFS.
- B. Basis-of-Design Product: Subject to compliance with requirements provide Andersen Corporation: Andersen 100 Series windows.
- C. Substitution Limitations: All other manufacturers: Submit substitution request in accordance with Section 01600 – Product Requirements.

#### 2.2 MATERIALS

- A. Material Composition: Extruded composite profile consisting of 40 percent reclaimed pre-consumer wood fiber and 60 percent thermoplastic polymer, by weight.
- B. Manufacturer Designation: Fibrex material.
- D. Interior Color: White.
- E. Exterior Color: White.

F. Exterior Color Retention: Resist fading with a change of no more than 5 Delta E units over 10 years in compliance with color retention provisions of AAMA 615 and ASTM D2244.

## 2.3 WINDOW

A. Window Type: Single-Hung.

B. Performance Requirements: Comply with NAFS.

1. Single-hung, Performance Class and Grade: LC-PG30 (47-1/2 inches by 89-1/2 inches).

C. Environmental Qualifications:

D. Weatherstrip Type and Material: Three fins and pile, polypropylene.

F. Overall Depth: 3-1/4 inches (82.6 mm).

G. Attachment Flange: 1-3/8 inches flange setback.

H. Hardware:

1. Hardware Type and Material: Self-latching, polycarbonate with integral color.
2. Balance Type and Material: Spring loaded block and tackle, galvanized steel.

I. Grilles:

1. Type and Designation: Factory installed sculpted profile Finelight between-glass grilles with exterior grilles top and bottom.
2. Pattern: As shown in Drawings.
3. Exterior Color: White.
4. Interior Color: White.

J. Insect Screens:

1. Frame Material: Aluminum.
2. Frame Color: Match window frame.
3. Insect Screen Material: Fiberglass cloth.

## 2.4 GLAZING

A. Thermal Transmission (U-Factor), NFRC 100:

1. 0.30 with grilles.

B. Solar Heat Gain Coefficient (SHGC), NFRC 200:

3. 0.28 with grilles.

C. Visible Light Transmittance (VLT), NFRC 200:

1. 0.48 with grilles

D. Sound Transmission Class (STC)/Outdoor-Indoor Transmission Classification (OITC), ASTM E90:

1. 25/21.

E. Glass Units: Provide insulating glass units certified through Insulating Glass Certification Council as conforming to the requirements of IGCC and ASTM E2190.

1. Manufacturer Designation: Andersen High-Performance Low-E Glass.
2. Seal and Spacer Type: Dual sealed insulating glass units with polyisobutylene primary seal, silicone secondary seal and metal spacers with bent or soldered corners.
3. Glass Type: Heat strengthened tempered glass, ASTM C1048.
4. Glass Pattern: None.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that all substrate conditions are suitable for installation in compliance with manufacturer's recommendations.
- B. Do not begin installation until substrates have been properly prepared and any conditions not in compliance with manufacturer's recommendations have been corrected.

### 3.2 INSTALLATION

- A. General: Comply with manufacturer's product recommendations, including but not limited to the Andersen Unit Installation Guide, and installation information in product literature and on product packaging. Comply with Drawings [and Shop Drawings] for installing windows, hardware, accessories, and other components.
- B. Install windows plumb, level and square. Anchor windows securely to structure in correct orientation to flashing and adjacent construction as indicated. Comply with installation instructions for proper flashing integration of window into wall system. Install windows so as to drain water penetration to the exterior.
- C. Adjust sashes, insect screens, ventilators, hardware and accessories as applicable for correct fit. Adjust weatherstrip for smooth operation and weather-tight closure.

### 3.4 CLEANING

- A. Remove protective films and non-permanent labels prior to 90 days after installation.
- B. Remove excess sealant, soiling, dirt and other substances. Clean window frame and glass surfaces. Avoid damaging coatings and finishes.
- C. Touch-up, repair or replace glass or other window components broken, scratched or damaged during construction prior to Substantial Completion.
- D. Remove and lawfully dispose of construction debris from Project site.

### 3.5 PROTECTION

- A. Protect installed windows and finish surfaces from damage during construction until completion of Project and acceptance by Owner.

END OF SECTION 08540

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DOORS AND WINDOWS - DIVISION 8  
SECTION 08631: ALUMINUM STOREFRONT

## PART 1. GENERAL

- 1.1 Scope:  
Furnish and install aluminum framing system and glazing with all necessary accessories for a complete installation.
- 1.2 Submittals:  
Submit shop drawings, catalog cuts, and manufacturer's data, including indication of profiles, sizes, glazing, reinforcing, anchorage, connections, welds, and types of fasteners. Submit to architect for review prior to fabrication.
- 1.3 Acceptable Manufacturer:
- A. Kawneer .
  - B. Efco.
  - C. Tubelite.
  - D. Arcadia

## PART 2 MATERIALS

- 2.1 Exterior Aluminum Framing System:  
Basis of Design: Kawneer 451 T (or Efco 403-S).
- A. Air Infiltration:  
ASTM E283. Not to exceed .06 CFM per square foot of fixed area.
  - B. Water Infiltration:  
ASTM E331. No water penetration at a test pressure of 8 PSF.
  - C. Structural Restrictions:  
Maximum deflection of 1/175 of span. Allowable stress with a safety factor of 1.65. The system shall perform to these requirements under a wind load of seventy (70) mph, basic wind speed (20 PSF).
  - D. Thermal Performance:  
When tested in accordance with AAMA 1502.7-1981 and 1503.1-1980, the "U" value maximum equals .58, with a CRF minimum of 59.
  - E. Extrusions:  
6063-TS alloy and temper (ASTM B221 allow G.S . 10A-T5). Fasteners, where exposed, shall be aluminum, stainless steel, or zinc plated steel in accordance with ASTM A164. Perimeter anchors shall be aluminum or steel with proper isolation. Glazing gaskets shall be elastomeric extrusions.

- F. Finish:  
An Architectural Class I Anodic Coating conforming with Aluminum Association Standard AA-M12C22A42/44. Clear anodized.
- G. Glass for Exterior Windows:  
Hermetically sealed double glazed units , Sigma #65-7-2. One inch (1") thick insulating glass (see Section 08800) .
- H. Break Metal:  
Clear anodized Class I Coating, .060 inches minimum thickness, see plans for sizes.

## 2.2 Accessories

- A. Fasteners :Where exposed, shall be Stainless Steel.
- B. Gaskets: Glazing gaskets shall be extruded EPDM rubber.
- C. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

## 2.3 Related Materials

- A. Sealants: Refer to Joint Treatment (Sealants) Section.
- B. Glass: Refer to Glass and Glazing Section.

## 2.4 Fabrication:

- A. All members shall have a nominal face dimension of 2" and overall depth of 4-1/2".

## PART 3 EXECUTION

### 3.1 Installation :

All framing shall be set level, square, plumb, and in alignment with other work. All joints to the building shall be sealed . All frame materials shall be fastened in place using backing, masonry plugs , or anchor straps as required. Make all necessary final adjustments to attain normal operation of each door and its hardware.

- 3.2 Protect work from damages during construction and clean for final completion.

END OF SECTION 08631

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DOORS AND WINDOWS - DIVISION 8  
SECTION 08800: GLAZING

PART 1 - GENERAL

- 1.1 Scope: Furnish and install all glazing complete with all necessary accessories.
- 1.2 Submittals: Provide manufacturer's data, applicable test reports, and cut sheets for all glazing materials proposed to be used.
- 1.3 Delivery, Storage & Handling: Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage from condensation, temperature changes and direct exposure to sun or other causes.
- A. For insulating glass units that will be exposed to altitude changes, comply with manufacturer's recommendations for venting and sealing to avoid hermit seal ruptures.
- 1.4 Acceptable Manufacturer: PPG Industries 800-377-5267 or approved equal.

PART 2 - PRODUCTS

- 2.1 Glazing Types: Glazing types are defined below. See Drawings for locations of specific types and for thickness.
- A. Annealed Float Glass : ASTM C 1036, Type I (transparent flat glass), Quality-3.
- B. Tempered Glass: Clear float, heat tempered safety glazing conforming to Fed.Spec. DD-G-1403.B, Kind FT, Condition A, Horizontal (tongless) tempering. All lites must be permanently marked with manufacturer's type identification. Tempered glass shall be used if no type is called for on Drawings and safety glass is required by applicable codes. 1/4" thick unless otherwise required.
- C. Insulating Glass: Factory-assembled units certified by Insulating Glass Certification Council (or other authority approved by Architect) as meeting Class CBA of ASTM E 774. Units shall contain desiccants or dehydrating agents to reduce the units dew point to -60° F (-51OC) or less. 1" thickness, typical.
1. Interior sheet clear.
2. Exterior sheet Emerald Green color, low-reflective glass outdoor appearance: "Solarban" 70XL (2) "Atlantica".
- a. Visible Light Transmission: 48%
- b. Shading Coefficient: 0.26
- c. U-Value Winter: 0.28
- d. U-Value Summer: 0.26
3. Provide Kind HS (heat strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of

- glass lites.
4. Provide Kind Ff (fully tempered) glass lites where safety glass is indicated or required.
  5. Sealing System: Dual seal, with primary and secondary sealants of polyisobutylene and silicone.
  6. Spacer Material: Aluminum with clear anodic finish.
  7. Desiccant: Molecular sieve or silica gel, or blend of both.
- 2.2 Sealants and Primers: General Electric "Silglaze" Glazing System including tapes and primers.
- 2.3 Accessories: Clips, shims, spacers, setting blocks as necessary for a complete and weatherproof installation. Setting blocks 70 to 90 durometer (Shore "A").
- 2.4 Compression Wedges: Tremko Poly-Wej or approved equal.

### PART 3 - EXECUTION

- 3.1 Storage and Handling: Deliver all materials to the site and store with manufacturer's labels intact. Handle and protect at all times to avoid stains, scratches, or other damage. Store glass vertically with space between sheets. Avoid standing insulating units in water. Protect all glass from exposure to alkaline or ferrous solutions before, during, and after construction. Take extreme care not to chip edges of tempered glass lites.
- 3.2 Expansion: Size all lites with allowance for expansion as recommended by the glazing manufacturer.
- 3.3 Visible Variations: Install glass with any visible lines or waves in the horizontal direction.
- 3.4 Installation:
- A. Items to be glazed must be free of projections and shall be prime-painted as recommended by the sealant manufacturer to assure sealant adhesion.
  - B. Follow sealant manufacturer's instructions using Silglaze Tape with cap bead of Silglaze Sealant on the exterior side whenever exterior glazing is practical, and using silglaze Tape with toe bead of Silglaze Sealant when interior glazing must be used. Tool sealant with light pressure to completely fill and seal against backup material and joint surfaces. Tool to a slight concave sloping toward center of glass slightly. Sealant line must be perfectly smooth and uniform without excess on adjacent surfaces or glass.
  - C. On interior side, use compression gasket or compression wedge along site line.
  - D. At exterior installations (or areas of high condensation) where wire glass is used, apply sealant to edge of glass prior to installation to prevent wire rusting.



- E. Install insulating glass units in accordance with SIGMA 70-7-1, "Glazing Recommendations." All edges must float free with glazing system properly drained.
- 3.5 On completion of installation and just prior to Substantial Completion, clean all glazing as recommended by the manufacturer. Replace scratched, defective and/or broken glazing at no cost to the Owner until the date of Substantial Completion.

END OF SECTION 08800

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## FINISHES -DIVISION 9

SECTION 09221: RESTUCCO: NEW BASECOAT OVER SELECTED AREAS,  
CRACK REPAIR & NEW CEMENT STUCCO FINISH OVER ENTIRE PROJECT

## PART 1-GENERAL

## 1.1 DESCRIPTION OF WORK

- A. The extent of the work includes removal of loose flaking material by high pressure water or sand blasting, removing loose stucco down to solid substrate, installing new stucco metal lath followed by two coat system, patching large cracks utilizing a fiberglass reinforcement and a new cement stucco finish over entire project.
- B. Texture and color samples to be supplied to Owner/Architect showing manufacturers full range.

## 1.2 JOB CONDITIONS

- A. Environmental Requirements (Cold Weather):
  - 1. Do not use frozen materials in exterior wall finish.
  - 2. Do not apply exterior wall finish to frozen surfaces or surfaces containing frost, or when the forecast it to be less than 40 deg. F. within a 48 hour period following application.
- B. Environmental Requirements (Hot Weather):
  - 1. Do not apply exterior wall finish when ambient temperature is above 100 deg. F.

## 1.3 SUBMITTALS

- A. Manufacturer's technical information including installation instructions and recommendations.
- B. Manufacturer's certification that products meet specification requirements.

## 1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver manufactured materials in original unopened packages or containers, with manufacturer's label intact and legible.
- B. Keep materials dry, stored off ground, under cover and away from damp surfaces.
- C. Remove wet or deteriorated materials from site.

## 1.5 JOB CONDITIONS

- A. Environmental Requirements (Cold Weather):
  - 1. Do not use frozen materials in cement stucco mixes.
  - 2. Do not apply cement stucco to frozen surfaces or surfaces containing frost.
  - 3. Do not apply cement stucco when ambient temperature is forecast to be less than

40 deg. F. within a 24-hour period following application.

- B. Environmental Requirements (Hot Weather) :
  - 1. Protect cement stucco from uneven and excessive evaporation during hot, dry weather.
  - 2. Do not apply cement stucco when ambient temperature is above 100 deg. F.
- C. Protection:
  - 1. Protect finish surfaces installed prior to stuccoing.
  - 2. Maintain protection in place until completion of work.
  - 3. Protect finished work when stopping or when completing an area.

## PART 2- PRODUCTS

2.1 MATERIALS: New two coat system over areas that have been removed.

- A. Specification Base Material Manufacturer: El Rey Stucco Company Inc., 4100 Broadway SE, Albuquerque, New Mexico 87105, (505)873-1180
- B. Metal Accessories: Manufacturer's standard steel products unless otherwise indicated as Zinc Alloy.
  - 1. 3.4 lb diamond shaped metal lath, over all surfaces to receive stucco base and finish coat systems.
  - 2. Round-top masonry nails or screws with at least a minimum 1" in length to be fully secured into concrete or masonry walls.
- B. Basecoat and patching material:
  - 1. "Fastwall FRS" sanded as manufactured by El Rey Stucco.
- C. Secondary Fiberglass Reinforcement:
  - 1. "Krak-Master" mesh as manufactured by El Rey Stucco Co.
- D. Bonding Agent:
  - 1. "Superior Bond 100" as manufactured by El Rey Stucco Company.
- E. Finish coat: "Premium Colored Stucco": Consisting of Portland Cement, Lime, properly graded aggregate, colorant and proprietary ingredients. Color and texture shall match existing building
- F. Color Stabilizing Spray:
  - 1. "Fog-Kote": Consisting of Portland Cement, Lime, Colorant and proprietary ingredients. (For use at Architects/Owners discretion).
- G. Water Repellent:
  - 1. "Crown Seal": A water based repellent designed for exterior cement based substrate applications.

## PART 3- EXECUTION

### 3.1 INSPECTION

- A. Verify that surfaces to be stuccoed are free of dust, loose particles, oil and other deleterious materials which would affect bond or proper hydration of cement stucco.
- B. Verify that lath is tight, properly secured and overlapped, and that all accessories are properly set and secured.
- C. Isolation: Where lathing and metal support system abuts building structure horizontally, and where the partition wall work abuts the overhead structure, isolate work from structure movements. Install expansion or control joints to absorb deflections but maintain lateral support. Frame both sides of expansion or control joints separately and do not bridge joints with furring or lathing.
- D. Examine substrates, grounds and accessories to insure that finished stuccowork will be true to line, plane, level and plumb.
- E. Verify that masonry and concrete surfaces to receive direct bond applications of stucco basecoats are rough or otherwise properly prepared to provide adequate bond.
- F. Installer notify general contractor and Architect/Engineer in writing of any conditions detrimental to proper and successful installation of stucco basecoats. Do not proceed with installation until unsatisfactory conditions are corrected to satisfaction of Architect/Engineer and installer.

### 3.2 SURFACE PREPARATION: (Loose, delaminating areas)

- A. Remove loose stucco system down to solid substrate.
- B. Install lathing and metal accessories.
- C. Install basecoat in a number of coats and consistency in order to bring flush with Surrounding areas.

### 3.3 SURFACE PREPARATION- (Existing Stucco)

- A. Remove all loose flaking material at cracking and delaminating areas by Sand or Water-Blasting and or by scraping with a wire brush.
- B. Liberally apply bonding agent over areas to receive patching.
- C. Patch large cracks, (Larger than 1/8" wide) with fiber-reinforced sanded basecoat material and feather smooth 2 inches over existing surfaces, and bring patching material to level and plum with surrounding surfaces. b
- D. While patching material in still wet, embed the fiberglass mesh, taking care to completely embed mesh and the smooth to feather edge onto surrounding surfaces.
- E. Wet cure by misting with water two times a day for two to three days, allow to air cure an additional 7-10 days.
- F. After patching material has fully cured, liberally apply the surface bonding agent to



entire walls to receive new stucco finish.

#### 3.4 FINISH COAT APPLICATION: (All Areas)

- A. Apply exterior walls finish coat to thickness recommended by manufacturer to achieve texture indicated, using sufficient trowel pressure or spray velocity to bond finish coat to basecoat.
- B. Apply exterior wall finish in number of coats and consistency required to completely cover substrate.
- C. Apply in one pass, working from corner to corner and top to bottom, taking care to avoid staging marks, cold joints etc., these will not be acceptable, and will be required to be repaired.
- D. Apply finish coat over all wall surfaces.

#### 3.5 ADJUST AND CLEAN

- B. Patching:
  - 1. Upon completion, point up exterior wall finish coat around trim and locations where finish coat terminates or meets dissimilar materials.
  - 2. Cut out and replace defective or damaged exterior wall finish coat.
  - 3. Match pointing and patches to surrounding finish coat in form and texture.
- B. Curing:
  - 1. Mist cure patches and stucco finish coat with water 2-3 times a day for 3-4 days, taking care to apply water uniformly, and allowing it to dry before water is re-applied.
- C. Cleaning:
  - 1. Remove exterior wall finish and protective materials from perimeter trim and adjacent surfaces.
  - 2. Remove all excess materials from the project site.

END OF SECTION 09221.

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DIVISION 9 - FINISHES  
SECTION 09250: GYPSUM BOARD SYSTEMS

## PART 1 GENERAL

- 1.1 Provide all labor and materials required for installation of Gypsum board systems, tape, texturing and joint treatment.
- 1.2 Provide sample panel in place , indicating finish texture for Architect's approval.
- 1.3 Submittals: Provide manufacturer's warranty, and descriptive literature indicating material composition, thickness, sizes and fire resistance for all products (including control joint s).
- 1.4 Warranty: Exterior gypsum sheathing shall have a 5 year warranty against manufacturing defects and for six months of exterior exposure.

## PART 2 PRODUCTS

- 2.1 Gypsum Wallboard:
  - A. Standard 5/8" thick gypsum board , maximum permissible lengths, ends square cut, tapered edges .
  - B. Water Resistant gypsum board in all toilets and shower.
  - C. Metal corner beads, edge trim at joints with dissimilar materials and unprotected ends.
  - D. Self-tapping screws, one inch (1") long at single layer GWB.
  - E. Reinforcing tape, joint compound, adhesive and vinyl -based ready-mixed texture compound.
  - F. Acoustical Sealant:  
Non -hardening, non-drying and non-bleeding sealant specifically manufactured for acoustic installations.
  - G. GWB Control Joints:  
USG 093 , Provide control joints 30 feet o.c. minimum in unbroken wall or ceiling planes. Provide seal behind joints for sound or fire rating throughout.
- 2.2 Exterior Wall Sheathing and Cement Board: See Section 06160 Wall Sheathing .
- 2.3 Furring Channels: Roll-formed, hot shaped section of 20 ga. galvanized steel.  
Face width: 1-3/8", depth: 7/8". As manufactured by U.S. Gypsum.

## PART 3 EXECUTION

- 3.1 Gypsum Board Installation:

- A. Apply gypsum board with long length perpendicular to framing.
  - B. Bed electrical boxes and seal wall penetrations with acoustical sealant.
  - C. Install GWB with 1/4" wide gap between wallboard and floor slab.
- 3.2 Texture:  
Spray apply medium texture material. Trowel and finish to match existing building wall texture. Provide sample drywall texture for approval prior to placing texture. Level 4.
- 3.3 FINISHING
- A. General: Comply with ASTM C 840, GA 214 and GA 216. Level 3.
    - 1. Level 1: Plenums, service corridors; above ceilings
    - 2. Level 2: Areas of water resistant gypsum backing board under tile; exposed areas where appearance is not critical.
    - 3. Level 3: Areas to receive heavy or medium textured coatings; heavy - grade wall coverings (not in this project).
    - 4. Level 4: Areas to receive flat sheen paint finish; light textured coatings; lightweight wall coverings .
    - 5. Level 5: Areas to receive gloss, semi-gloss sheen paints; critical lighting conditions .

END OF SECTION 09250

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FINISHES - DIVISION 9  
SECTION 09310 - CERAMIC TILE

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Samples.
- B. Floor Tiles: Static coefficient of friction not less than 0.6, per ASTM C 1028.

PART 2 - PRODUCTS

2.1 CERAMIC TILE

- A. Ceramic tile that complies with standard grade requirements of ANSI A137.1, "Specifications for Ceramic Tile."
- B. Ceramic Mosaic Floor Tile: Glazed, porcelain cushion-edged tile.
  - 1. Module Size: **2 by 2 inches**.
  - 2. Color: To be selected from full range of manufacturer's product.
  - 3. Surface Finish: Standard finish.
  - 4. Tiles mounted, by manufacturer's standard method, into sheets.
- C. Glazed Wall Tile: Cushion-edged, flat tile.
  - 1. Module Size: **2 by 2 inches**.
  - 2. Color: To be selected from full range of manufacturer's product.
  - 3. Tiles mounted, by manufacturer's standard method, into sheets and grouted with silicone rubber grout complying with ANSI A118.6.
- D. Tile trim units that match characteristics of adjoining flat tile.
  - 1. Bull nose trim tile at top of wall tile.
  - 2. Cove base.
- E. Where indicated, protect exposed surfaces of tile against adherence of mortar and grout by factory pre-coating them with a hot-applied continuous film of petroleum paraffin wax. Do not coat unexposed tile surfaces.

2.2 INSTALLATION MATERIALS

- A. Setting and Grouting Materials: Comply with material standards in ANSI's "Specifications for the Installation of Ceramic Tile" that apply to materials and methods indicated.
  - 1. Grout Color: To be selected from full range of manufacturer's product..
- B. Setting-Bed Accessories: Comply with ANSI A108.1A.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with tile installation standards in ANSI's "Specifications for the Installation of Ceramic Tile" that apply to materials and methods indicated.
- B. Comply with TCA's "Handbook for Ceramic Tile Installation."
  - 1. Floor Tile Installation Method[s]: TCA F113 (thin-set mortar bonded to concrete slab).
  - 2. Wall Tile Installation Method: W243 (thin-set mortar bonded to gypsum board).
- C. Lay tile in grid pattern, unless otherwise indicated. Align joints where adjoining tiles on floor, base, walls, and trim are the same size.
- D. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

END OF SECTION 09310



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FINISHES - DIVISION 9  
SECTION 09510: ACOUSTICAL CEILING

PART 1. GENERAL

- 1.1 Scope: Furnish and install acoustic ceilings complete with all necessary accessories.
- 1.2 Submittals: Provide brochure of product and a sample tiles for approval before ordering.
- 1.3 Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
  - A. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E580
  - B. UBC Standard 25-2, "Metal Suspension Systems for Acoustical Tile and for Lay-in Panel Ceilings."
- 1.4 Maintenance
  - A. For ceiling projects above. 900 square feet, furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing the contents.
    1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.
    2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

PART 2. MATERIALS

- 2.1 Standards: Installation shall be in accordance with the current bulletin of the Acoustical Materials Association and the manufacturer's recommendations and instructions.
- 2.2 Acoustical Ceiling Tile in suspension systems shall be:
  - A. New Acoustical Ceiling Tile: USG Interiors Inc., Frost "ClimaPlus", white color, 24" x 48" x 3/4" panels, Class "A", item #488, FLedge, Omni fissured surface. NRC= .75, CAC min.= 40, 71% recycled content.
- 2.3 New Ceiling Panel Suspension system shall be the USG Interiors Inc., Fine line 1/8 (DXFF) Exposed Tee System of double web electro-galvanized steel, with baked polyester paint. ASTM E 580 conformance required;
  - A. Wall molding: USG Interiors Inc., Shadow Molding MS174.
- 2.4 Attachment Devices for Suspension System :
  - A. Anchors: Provide sizes capable of sustaining 5 times the load-carrying capabilities shown in ASTM C635, Table 1.

- B. Deck inserts and hanger clips: Fabricate from hot-dip galvanized steel.
- C. Hanger wire: Zinc-coated (galvanized) carbon steel wire , ASTM A641 , soft temper, with Class 1 coating, minimum 12 gage (0.106 inch diameter) .

### PART 3. EXECUTION

- 3.1 Environmental Conditions: Temperature shall remain between 55°F and 70°F prior, during, and after installation. Stabilize moisture and temperature by opening carton ends at least 48 hours before installation, with cartons stored at required temperatures .
- 3.2 Install tile in strict accordance with the manufacturer's recommendations. Align all tiles for time, level surface , and straight lines to a tolerance of 1/12" in 10 feet.
  - A . Coordinate ceiling system installation with work of other sections as required, including the following:
    - 1. Light fixtures.
    - 2. HVAC components.
    - 3. Fire suppression system components.
    - 4. Partitions.
    - 5. Ceiling penetrations .
    - 6. Seismic bracing and fixture hold-down clips.
    - 7. The acoustical ceiling installer shall install all wires and anchors. The mechanical and electrical installers shall terminate all seismic wires to fixtures in ceiling suspension system. The mechanical and electrical installers shall furnish all hold-down clips as indicated by Division 22 Mechanical and Division 23 Electrical Sections for seismic installation.
- 3.3 Ceiling suspension system shall be installed per the recommendations of ASTM C636. Loading of any component shall not cause deflection of more than 1/1360 of the span.
  - A. Main runners shall be installed 24" o.c. and be directly suspended by not less than 12 gauge galvanized steel wire spaced 48" o.c. along the main runners. Hanger wires shall be wrapped lightly at least 3 full turns.
  - B. Main runners shall be interconnected by cross tees of 24" long to form 24" x 24" modules.
  - C. Wall moldings shall be installed wherever suspension components meet vertical surfaces.
- 3.4 PREPARATION
  - A. Layout: Position ceiling components to maximize use of full-sized acoustical units and to provide border units which are equal in size and shape at opposing ceiling edges. Conform to reflected ceiling plans to greatest extent possible.

END OF SECTION 09510

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FINISHES -DIVISION 9  
SECTION 09660: RESILIENT FLOORING

## PART 1. GENERAL

- 1.1 Scope:  
Furnish and install all resilient flooring and base complete with all necessary accessories.
- 1.2 Submittals:  
Provide catalogue data and physical samples for review and Architect's approval.
- 1.3 Quality Assurance:
- A. Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants and leveling compounds.
  - B. Fire Test Performance:  
Provide resilient flooring having the following classifications or properties when tested in accordance with the standard fire tests referenced below:
    - 1. Flame Spread: Not more than 75 as per ASTM E-84.
    - 2. Smoke Developed: Not more than 450 as per ASTM E-84.
    - 3. Smoke Density: Not more than 450 as per NFPA 258.
  - C. Maintenance Instructions:  
Submit two copies of manufacturer's recommended maintenance practices for each type of resilient flooring.
  - D. Replacement Material:  
After completion of work, deliver to project site replacement materials from same manufactured lot as materials installed as follows:  
Tile Flooring: one box for each 50 boxes installed.
- 1.4 Product Delivery, Storage and Handling:  
Deliver material in good condition to the job site with manufacturer's original unopened containers with label information clearly marked thereon. Material shall be stored in a heated space protected from weather and maintained at 65o F.
- 1.5 Job Conditions:
- A. Maintain minimum temperature of 65o F in spaces to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 65o F in areas where work is completed.
  - B. Install resilient flooring and accessories after other finishing operations, including painting, have been completed. Do not install resilient flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesives as determined by manufacturer's recommended bond and moisture test.

## PART 2. PRODUCTS

## 2.1 Acceptable Manufacturers:

- A. Premium Vinyl Composition Tile: Federal specifications SS-T-31B(1) Type IV, Composition 1.
  - 1. Armstrong Bio Based Tile
    - a. 3 colors in a pattern selected by the architect
  - 2. Approved equal
- B. Rubber Wall Base
  - 1. Aexco
  - 2. Johnsonite
  - 3. Roppe
  - 4. Approved equal

## 2.2 Materials :

Colors and patterns as shown or scheduled in the drawings .

- A. Vinyl Composition Tile: Premium Vinyl Composition Tile
  - 1. Federal Specification s: SS-T-31B(1) Type IV, Composition 1.
  - 2. Composed of vinyl resins , plasticizers, coloring pigment s and fillers, 1/8" gauge.
  - 3. Indentation Resistance: 75 lbs. per square inch.
- B. Wall Base:
  - 4" high, (.125") thick, extruded rubber base, vulcanized. Conform to Federal Specification SS-W-40a Type 1. All rubber base shall be standard toe base cove with toe for resilient vinyl and rubber flooring, and straight (toeless) for carpet.
- C. Resilient Edge Strips:
  - 1/2" thick, homogeneous vinyl or rubber composition. Color as selected by Architect from standard colors available , not less than 1" wide.
- D. Adhesives:
  - Waterproof, stabilized type as recommended by flooring manufacturer to suit material and substrate conditions.
- E. Concrete Slab Primer:
  - Nonstaining type as recommended by flooring manufacturer.
- F. Leveling Compound:
  - Latex type as recommended by flooring manufacturer.

## PART 3. INSTALLATION

## 3.1 Inspection:

Examine substrate and conditions under which flooring is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected . Sub-floor shall be broom clean before installation.

## 3.2 Existing Concrete:

Remove surface coatings by surface wet grinding or by applying the manufacturer's recommended solution of trisodium phosphate and water, followed by thorough rinsing and drying. A bond test should be performed over existing floors in question. All cracks, minor holes and crevices in concrete should be filled with Armstrong S-175 Floor Patch.

3.3 General:

Install flooring using method indicated in strict compliance with manufacturer's recommendations. Extend flooring into the spaces, door reveals, and into closets and similar openings. Tightly cement flooring to sub-base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand-roll flooring at perimeter of each covered area to assure adhesion. Flooring shall be laid with a minimum number of seams consistent with prudent use of material. Avoid cross-seams, filler pieces, and strips. Observe the recommended trowel notching, spread rates, and open times for adhesives. All seams shall be finished flush to the floor and free from voids, recesses and raised areas.

3.4 Tile Roofs:

Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room are of equal width. Adjust as necessary to avoid use of cut widths less than one-half tile at room perimeters. Lay tile square to room axis, unless otherwise shown. Broken, cracked, chipped or deformed tiles are not acceptable. Cut tile neatly around all fixtures. Lay tile with grain running in one direction.

3.5 Wall Base:

Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with pre-formed outside corner units, mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece with continuous contact at horizontal and vertical surfaces. On masonry surfaces, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.

3.6 Place resilient edge strips at edges of flooring which would otherwise be exposed. Coordinate with metal thresholds in Hardware Schedule.

3.7 Cleaning:

Remove any excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring manufacturer. Protect installed flooring with heavy Kraft paper or other covering.

3.8 Finishing:

After completion of the project and just prior to final inspection of work, thoroughly clean floors and accessories. Apply polish and buff, with type of polish, number of coats, and buffing procedures in compliance with flooring manufacturer's instructions.

END OF SECTION 09660



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FINISHES – DIVISION 9  
SECTION 09681 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes modular, tufted carpet tile.
- B. Related Requirements:
1. Section 02111 "Selective Demolition" for removing existing floor coverings.
  2. Section 09666 "Resilient Flooring" for resilient wall base and accessories installed with carpet tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include manufacturer's written specifications and lab documents for any physical testing.
  2. Include manufacturer's written installation recommendations for each type of substrate as specified in carpet manufacturer's installation guidelines and/or Carpet & Rug Institute Installation Standard 2011, where applicable.
  3. Include carpet maintenance recommendations as outlined by the carpet manufacturer.
  4. Carpet Manufacturer shall also submit a plan for recycling the specified carpet at the end of the useful life of the carpet.
- B. Shop Drawings: For carpet tile installation, plans showing the following:
1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
  2. Carpet tile type, color, and dye lot.
  3. Type of subfloor.
  4. Type of installation.
  5. Pattern of installation.
  6. Pattern type, location, and direction.
  7. Installation method (monolithic, quarter turn, ashlar, brick random, interactive patterning).
  8. Type, color, and location of insets and borders.
  9. Type, color, and location of edge, transition, and other accessory strips.
  10. Transition details to other flooring materials.

- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
  - 1. Carpet Tile: Full-size Sample.
  - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet tile, for tests performed by a qualified independent testing agency.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
  - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
  - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10.67 sq. yd.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Carpet manufacturer shall have no less than 5 years experience of producing recyclable carpet tile and shall have published product literature clearly indicating compliance with requirements of this section.
  - 1. Certification: ISO 9001 and ISO 14001 certified manufacturer.
  - 2. Commitment to Sustainability: Carpet manufacturer must practice environmental responsibility through programs of recycling, reuse, conservation, and source reduction. Manufacturer should have a public demonstration of such efforts through reporting documents such as an annual sustainability report that contains third party verification and confirmation.
  - 3. Carpet manufacturer must take back modular carpet tile to be recycled free of charge for quantities of 500 sq. yards (418 sq. m) or more within continental U.S. Program variations exits for other some geographical locations.

- B. Installer Qualifications: An installer with a minimum of 5 years commercial carpet installation experience.
- C. Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard 2011 where applicable.

## 1.8 FIELD CONDITIONS

- A. Comply with carpet manufacturer's installation recommendations and the Carpet & Rug Institute Installation Standard 2011 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- C. HVAC system should be operational and running prior to carpet installation and remain running after carpet installation.

## 1.9 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
  - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
  - 2. Failures include, but are not limited to, the following:
    - a. More than 10 percent face fiber loss or edge raveling.
    - b. Dimensional instability.
    - c. Excess static discharge.
    - d. Loss of tuft-bind strength.
    - e. Delamination.
    - f. Where face fiber is 100 percent solution dyed, inability to remove acid based stains.
    - g. Lack of colorfastness to atmospheric contaminants.
    - h. Carpet must be manufactured and warranted by same manufacturer.

## PART 2 - PRODUCTS

### 2.1 CARPET TILE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
  - 1. Interface, LLC.
  - 2. J&J Invision; J&J Industries, Inc.
  - 3. Mannington Mills, Inc.

4. Tandus; a Tarkett company.
- B. Source Limitations:
1. Single Source Responsibility: Provide products that have components manufactured by a single source. Fiber and backing, as well as final carpet product, should be manufactured and warranted by same company.
  2. Commitment to sustainability: Carpet manufacturer must practice environmental responsibility through programs of source reduction, recycling, reuse, and conservation.
- C. Color: As selected by Architect from manufacturer's full range.
- D. Pile Characteristics: Level-loop pile.
- E. Fiber Content: Nylon - 100 percent trilobal, minimum 24 denier per filament (DPF) nylon 6. Fiber must contain a minimum of 45 percent recycled content (20 percent pre consumer recycled content and 25 percent post consumer recycled content.)
- F. Dye Method: 100 percent Solution Dye.
- G. Gauge: 1/13 | 50.4 rows/ 10 cm
- H. Stitches: 9.5 stitches / inch >.
- I. Pile Thickness: .135 inch.
- J. Surface Pile Weight: 15 oz/sq yd
- K. Primary Backing: Nonwoven synthetic.
- L. Secondary Backing: High performance precoat laminated to a proprietary thermoplastic polyolefin compound with a fiberglass reinforced layer. Backing must contain a minimum of 40 percent recycled content and be SCS NSF 140 Platinum certified. Backing should be recyclable, PVC free, free of 4-PCH, brominated flame retardants, and phthalate plastizers.
1. Total Backing Weight: Not to exceed 80 oz./sq yd (339.1 g/sq m).
- M. Applied Treatments:
1. Soil-Resistance Treatment:.
- N. Size: 24 by 24 inches .
- O. Texture Appearance Retention Rating (T.A.R.R.):
1. Texture Appearance Retention Rating (T.A.R.R.): Moderate Traffic.
- P. Recycling Requirements:
1. Total Carpet Product Recycled Content:
    - a. Pre-Consumer Recycled Content: 30 percent.



- b. Post-Consumer Recycled Content: 20 percent.
  - c. Total Recycled Content: 50 percent minimum.
2. Recycled Content: Preference will be given to manufacturer's recycling reclaimed carpet tile backing into new carpet tile, thus backing to backing.
  3. Carpet Disassembly and Recycling: Carpet capable of disassembly and recycling, with nylon being recycled and backing being recycled into new backing.
  4. Carpet product must meet guidelines of Presidential Executive Order 13101, and must meet the spirit of section 6002 of the Resource and Recovery Act (RCRA).
  5. Carpet and cushion shall comply with testing and product requirements of Carpet & Rug Institute's "Green Label Plus" testing program.
- Q. Performance Characteristics:
1. Critical Radiant Flux Classification, Flooring Radiant Panel ASTM E 648: Not less than 0.45 W/sq. cm.
  2. Smoke Density: Less than 450 per ASTM E662.
  3. Methanamine Pill Test CPSC FF1-70: Must pass pill test.
  4. Tuft Bind: Not less than 8 lbf (36 N) according to ASTM D 1335.
  5. Delamination: Not less than 3.5 lbf/in. (0.6 N/mm) according to ASTM D 3936.
  6. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.
  7. Dimensional Stability: 0.0119percent or less according to ISO 2551 (Aachen Test).
  8. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 129 and AATCC 164.
  9. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.
  10. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

## 2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Trowelable Adhesives: Water-resistant, mildew-resistant, nonstaining, premium grade, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation such as Shaw 5000 or Shaw 5100 or available equivalent where slab moisture does not exceed 85 percent per ASTM F 2170 or 5 lbs (2.27 kg) per ASTM F 1869. Where slab moisture does not exceed 85 percent and antimicrobial protection is needed to pass AATCC 174, use Shaw 5036. Where moisture exceeds 85 percent or 5 lbs (2.27 kg) but does not exceed 90 percent or 10 lbs (4.56 kg), use Shaw 5900 or available equivalent.
- C. Metal Edge/Transition Strips: Extruded aluminum with profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects prior to installation. See manufacturer's requirements for substrate conditions and ambient conditions.
- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
  - 1. Lightweight concrete and gypcrete subfloors may require a primer such as Shaw 9050 or equivalent to reduce surface porosity.
  - 2. Where previous surface treatments are unknown, or where other concerns exist as to the ability of the adhesive to bond to the substrate, a 24 hour bond test is recommended.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. General: Comply with Carpet & Rug Institute Installation Standard 2011 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- B. Use trowelable leveling and patching compounds that contain a cementitious base with a latex additive, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

## 3.3 INSTALLATION

- A. General: Comply with Carpet & Rug Institute Installation Standard 2011 "Modular Carpet" and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive. Any non-spreadable adhesive system must adhere the carpet to the substrate.

- C. Maintain dye-lot integrity. Do not mix dye lots in same area unless the specific carpet style is manufactured as a merge-able dye lot product.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern parallel to walls and borders.
- H. Roll the entire installation with a 75 lb roller once installation is completed.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
  - 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
  - 2. Remove yarns that protrude from carpet tile surface.
  - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with Carpet & Rug Institute Installation Standard, "Protecting Indoor Installations."
- C. When construction or move-in activities will continue where new carpet is installed, provide non-staining building material paper to protect carpet. Do not use plastic sheeting as it can trap moisture, and self-sticking plastic sheeting can transfer adhesive residue to carpet that will attract soil.
- D. When heavy objects are moved over carpet within 24 hours of installation, use plywood over carpet to prevent buckling and wrinkling.
- E. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

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FINISHES - DIVISION 9  
SECTION 09900: PAINTING

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes surface preparation and field painting of exposed interior items and surfaces.
1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Do not paint pre-finished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
1. Pre-finished items include the following factory-finished components:
    - a. Architectural woodwork.
    - b. Acoustical wall panels.
    - c. Metal toilet enclosures.
    - d. Metal lockers.
    - e. Unit kitchens.
    - f. Elevator entrance doors and frames.
    - g. Elevator equipment.
    - h. Finished mechanical and electrical equipment.
      1. Light fixtures.
  2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
    - a. Foundation spaces.
    - b. Furred areas.
    - c. Ceiling plenums.
    - d. Utility tunnels.
    - e. Pipe spaces.
    - f. Duct shafts.
    - g. Elevator shafts.



3. Finished metal surfaces include the following:
  - a. Anodized aluminum.
  - b. Stainless steel.
  - c. Chromium plate.
  - d. Copper and copper alloys.
  - e. Bronze and brass.
4. Operating parts include moving parts of operating equipment and the following:
  - a. Valve and damper operators.
  - b. Linkages.
  - c. Sensing devices.
  - d. Motor and fan shafts.
5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections:

1. Division 5 Section "Structural Steel" for shop priming structural steel.
2. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
3. Division 6 Section "Interior Architectural Woodwork" for shop priming interior architectural woodwork.
4. Division 8 Section "Steel Doors and Frames" for factory priming steel doors and frames.
5. Division 9 Section "Gypsum Board Assemblies" for surface preparation of gypsum board .

### 1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
  2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
  3. Semi gloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
  4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

### 1.4 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating , finish system , and application. Identify each material by manufacturer' s catalog number and general classification.
  2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Initial Selection: For each type of finish-coat material indicated.
1. After color selection, Architect will furnish color chips for surfaces to be coated.

- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
  2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
  3. Submit Samples on the following substrates for Architect's review of color and texture only :
    - a. Concrete: Provide two 4 inch square samples for each color and finish .
    - b. Painted Wood: Provide two 12 inch square samples of each color and material on hardboard .
    - c. Stained or Natural Wood: Provide two 4 x 8 inch samples of natural- or stained-wood finish on actual wood surfaces.
    - d. Ferrous Metal : Provide two 4 inch square samples of flat metal and two 8 inch long samples of solid metal for each color and finish .
- D. Qualification Data: For Applicator, include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material , design , and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mock ups): Provide a full -coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate .
    - a. Wall Surfaces: Provide samples on at least 100 sq. ft.
    - b. Small Areas and Items: Accent colors at classroom and toilet entry's. Provide samples on at least 100 sq. ft..
  2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
    - a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
  3. Final approval of colors will be from job-applied samples.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material s to Project site in manufacturer's original , unopened packages and containers bearing manufacturer' s name and label and the following information:
  - 1. Product name or title of material.
  - 2. Product description (generic classification or binder type).
  - 3. Manufacturer's stock number and date of manufacture.
  - 4. Contents by volume, for pigment and vehicle constituents.
  - 5. Thinning instructions.
  - 6. Application instructions.
  - 7. Color name and number.
  - 8. VOC content.
  
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F and 95 degrees F. Maintain storage containers in a clean condition, free of foreign materials and residue.
  - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

## 1.7 PROJECT CONDITIONS

- A. Apply waterborne paint s only when temperatures of surfaces to be painted and surrounding air are between 50 degrees and 90 degrees F.
  
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 degrees and 95 degrees F.
  
- C. Do not apply paint in snow , rain, fog, or mist; or when relative humidity exceed s 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
  - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

## 1.8 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the material s applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra material s to Owner.
  - 1. Quantity: Furnish Owner with extra paint material s in quantities indicated below:  
Quantity: Furnish Owner with an additional five percent, but not less than 1 gal. or 1 case, as appropriate , of each material and color applied.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, product s that may be incorporated into the Work include, but are not limited to, products listed in the paint schedules.

- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
- C. Specified Manufacturer: Products of the Sherwin-Williams Company are the basis of design products specified to establish the level of quality and VOC Product Requirements.
- D. Substitutions: Requests for substitutions will be considered of equal products in quality and VOC Product Requirements. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product. Acceptable Manufacturers: Must use equal products and VOC Product Requirements.
  - 1. Dunn Edwards
  - 2. Sherwin-Williams Co. (S-W).
  - 3. ICI Dulux/Glidden
  - 4. Benjamin Moore & Co. (Moore).
  - 5. PPG Industries, Inc. (PPG).

## 2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field expense.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
  - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Match colors indicated by reference to manufacturer's color designations
  - 1. Interior Paint colors will be selected by the architect from the manufacturer's available colors. Interior colors will be limited to eight (8) different color selections and exterior colors will be limited to six (6) different color selections.

## PART 3- EXECUTION

### 3.1 EXAMINATION

- A. Examine substrate, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.
  - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
  - 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  - 1. Notify Architect about anticipated problems when using the materials specified over

substrates primed by others.

### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
  
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
  - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
  
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Cementitious Materials: Prepare concrete surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
  - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, under sides, and back sides of wood, including cabinets, counters, cases, and paneling.
    - c. If transparent finish is required, back prime with spar varnish.
    - d. Back prime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
    - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
  - 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
    - a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
  - 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.



- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
  - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
  - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
  
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
  - 1. Paint colors:
    - a. Exterior:
      - 1) Ferrous Metals: 1 color.
    - b. Interior:
      - 1) Gypsum wall board and plaster: Three (3) colors for the majority of wall surfaces,
      - 2) Woodwork: one paint color for painted woodwork.
      - 3) Stained woodwork: one stain.
      - 4) Ferrous Metals: one color.
      - 5) Galvanized Metal: One color.
  - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  - 3. Provide finish coats that are compatible with primers used.
  - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
  - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 6. Paint interior surfaces of ducts with a flat, non-specular black paint where visible through registers or grilles.
  - 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  - 9. Sand lightly between each succeeding enamel or varnish coat.
  
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. The number of coats and film thickness required are the same regardless of application

- method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted.
  3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
  2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
  3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- F. Mechanical items to be painted include, but are not limited to, the following:
1. Uninsulated metal piping.
  2. Uninsulated plastic piping.
  3. Pipe hangers and supports.
  4. Tanks that do not have factory-applied final finishes.
  5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
  6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
  7. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
- G. Electrical items to be painted include, but are not limited to, the following:
1. Switchgear.
  2. Panelboards.
  3. Electrical equipment that is indicated to have a factory-primed finish for field painting.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by

manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
  - 1. Provide satin finish for final coats.
- L. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

### 3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
  - 1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
  - 2. Testing agency will perform appropriate tests for the following characteristics as required by Owner:
    - a. Quantitative material analysis.
    - b. Abrasion resistance.
    - c. Apparent reflectivity.
    - d. Flexibility.
    - e. Washability.
    - f. Absorption.
    - g. Accelerated weathering.
    - h. Dry opacity.
      - 1. Accelerated yellowness.
    - J. Recoating.
    - K. Skinning.
      - 1. Color retention.
    - m. Alkali and mildew resistance.
  - 3. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

### 3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
  - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

### 3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
  - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA Pl.

### 3.7 EXTERIOR PAINT SCHEDULE

#### **Exterior Ferrous & Galvanized Metals:**

Semi-Gloss Finish

Primer: Pro Industrial Pro-Cry! Universal Metal Primer, 866-310, <100 g/L VOC

1st coat: Pro Industrial Zero VOC Acrylic Semi-Gloss, 866-650 series, 0 g/L VOC

2nd coat: Pro Industrial Zero VOC Acrylic Semi-Gloss, 866-650 series, 0 g/L VOC

#### **High Performance System - Guardrails and Handrails**

Gloss Finish

Primer: Pro Industrial Pro-Cry! Universal Metal Primer, 866-310, <100 g/L VOC

1st coat: Water-Based Acrolon 100 Polyurethane Gloss, 865-700 series, < 100 g/L VOC

2nd coat: Water-Based Acrolon 100 Polyurethane Gloss, 865-700 series, < 100 g/L VOC

#### **Exterior Wood:**

Satin Finish

Primer: Exterior Latex Wood Primer, B42W8041, < 100 g/L VOC

1st coat: A-100 Exterior Latex Satin, A82 series, <50 g/L VOC

2nd coat: A-100 Exterior Latex Satin, A82 series, <50 g/L VOC

### 3.8 INTERIOR PAINT SCHEDULE

#### **Commercial Concrete Floors**

1st coat: H & C Low VOC Concrete Sealer

2nd coat: H & C Low VOC Concrete Sealer

#### **CMU- Concrete Masonry Units**

Eg-Shel Finish - Low Odor Zero VOC Topcoat

Primer: PrepRite Block Filler, B25W25, <50 g/L VOC

1st coat: ProMar 200 Zero VOC Eg-Shel 826-2600 series, 0 g/L VOC

2nd coat: ProMar 200 Zero VOC Eg-Shel 826-2600 series, 0 g/L VOC

**CMU- Concrete Masonry Units**

Semi-Gloss Finish - Low Odor Zero VOC Topcoat

Primer: PrepRite Block Filler, B25W25, <50 g/L VOC

1st coat: ProMar 200 Zero VOC Semi-Gloss 831-2600 series, 0 g/L VOC

2nd coat: ProMar 200 Zero VOC Semi-Gloss B31-2600 series, 0 g/L VOC

**Gypsum Board (Water-Based Epoxy)**

Egg-Shell Finish

Primer: ProMar 200 Zero VOC Primer, B28W2600 , 0 g/L VOC

1st coat: \*Pro Industrial Pre-Catalyzed Water-Based Epoxy Eg-Shel, K45 series, <150 g/L voc.

2nd coat: \*Pro Industrial Pre-Cataly zed Water-Based Epoxy Eg-Shel, K45 series, <150 g/L voc.

Semi-Gloss Finish in Janitor Room

Primer: ProMar 200 Zero VOC Primer, B28W2600, 0 g/L VOC

1st coat: \*Pro Industrial Pre-Catalyzed Water-Based Epoxy Semi-Gloss, K46 series, <150 g/L voc.

2nd coat: \*Pro Industrial Pre-Catalyzed Water-Based Epoxy Semi-Gloss, K46 series, <150 g/L voc.

**Wood -Stained Doors, Frames, Trim and Chair Rails**

Stained Finish

Stain: Wood Classics 250 g/l Stain,A49W800 series, 250 g/L VOC

2nd coat: Wood Classics WB Polyurethane A68, <350 g/L VOC

3rd coat: Wood Classics WB Polyurethane A68 , <350 g/L VOC

**Non-Ferrous Metal & Ferrous Metal -Doors, Frames and Miscellaneous Metals**

Semi-Gloss Finish

Primer: Pro Industrial Pro-Cry! Universal Primer, B66-310 series, <100 g/L VOC

1st coat: Pro Industrial Zero VOC Acrylic Semi-Gloss, B66-650 series , 0 g/L VOC

2nd coat: Pro Industrial Zero VOC Acrylic Semi-Gloss, B66-650 series, 0 g/L VOC

**Non-Ferrous Metal & Ferrous Metal - High Performance System for Handrails**

Eg-Shel or Gloss Finish

Primer: Pro Industrial Pro-Cry! Universal Primer, B66-310 series, <100 g/L VOC

1st coat: Pro Industrial Zero VOC Water-Based Epoxy Eg-Shel, B73-360 series or Gloss, B73-300 series, 0 g/L VOC

2nd coat: Pro Industrial Zero VOC Water-Based Epoxy Eg-Shel, 873-360 series or Gloss, 873-300 series, 0 g/L VOC

**Galvanized Metal Decking & Ferrous Decking- Including Bar Joists High Performance System**

Primer: Pro Industrial Pro-Cry!Universal Primer, 866-310 series, <100 g/L VOC

1st coat: \*Pro Industrial Multi-Surface Acrylic Eg-Shel, B66-560 series, <150 g/L VOC

2nd coat: \*Pro Industrial Multi-Surf ace Acrylic Eg-Shel, 866-560 series, <150 g/L VOC

END OF SECTION 09900



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## PART 1 –GENERAL

### 1.1 SCOPE

A. This Section includes aluminum flagpoles .

### 1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance : Provide flagpoles capable of withstanding the effects of wind loads as determined according to NAAMM FP 1001, "Guide Specifications for Design Loads of Metal Flagpoles." Base flagpole design on maximum standard-size flag suitable for use with pole.

### 1.3 SUBMITTALS

A. Product Data: For each type of flagpole indicated.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Available Manufacturers : Subject to compliance with requirements , manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Baartol Co., Inc.
2. Concord Industries, Inc.
3. Eder Flag Manufacturing Co., Inc.
4. Ewing, John & Co. Inc.
5. ICC Manufacturing Co.; Morgan-Francis Div.; AABEC Pole Div.
6. Kearney-National Inc.; American Flagpole Div.
7. Lingo, Inc.; Acme Flagpole Co. Div.
8. Michigan Flagpole Inc.
9. Olympus Flag & Banner ; EMC Div.
10. Pole-Tech Co., Inc.

### 2.2 FLAGPOLES

- A. Pole Construction, General: Construct poles and ship to Project site in one piece, if possible. If more than one piece is necessary, provide snug-fitting, weathertight, hairline joints.
- B. Aluminum Flagpoles: Cone-tapered and fabricated from seamless , extruded tubing complying with ASTM B 241, alloy 6063, with a minimum wall thickness of 3/16 inch, heat treated after fabrication to comply with ASTM B 597, temper T6.
- C. Wall Mount: Metal mounting units complete with through-wall anchorage , mounting plates, and lateral-bracing accessories, as recommended by manufacturer, to suit size of

flagpole and type of installation.

- D. Fittings: Manufacturer's standard fittings to suit the size and type of flagpole indicated, including finial and halyard system with swivel snaps for attaching flag.
  - 1. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling and with flush access door secured with cylinder lock. Finish truck assembly to match flagpole .

## 2.3 FINISHES

- B. Anodic Finish: Class I, [clear anodic finish, complying with AAMA 607.1] [color anodic finish complying with AAMA 606.1 or AAMA 608.1].
  - 1. Color: to be selected by architect

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Wall Mount Installation: Install mounting plates with through-wall anchors and laterally brace flagpole.

END OF SECTION 10350

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DIVISION 10 - SPECIALTIES  
SECTION 10520 - FIRE- PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.
- B. Fire Extinguishers: NFPA 10, listed and labeled for the type, rating, and classification of extinguisher.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS AND CABINETS

- A. Portable Fire Extinguishers: Multipurpose dry-chemical type, UL-rated 2-A:10-B:C.
  - 1. Larsen MP 10 extinguishers (A, B, C rated) or equal.
- B. Fire Protection Cabinets: Enameled steel, semirecessed cabinets for fire extinguisher.
  - 1. Trim Style: Flat trim.
  - 2. Door and Trim Material: Enameled steel.
  - 3. Door Glazing: Tempered float glass.
  - 4. Door Style: Fully glazed with frame.
  - 5. Accessories: Identification lettering.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cabinets and brackets at heights indicated or, if not indicated, at heights to comply with applicable regulations of authorities having jurisdiction.
- B. Mount in strict accordance with manufacturer 's recommendations and in accordance with all code requirements. See Drawings for mounting locations. Mount semi-recessed cabinets in stud wall with screws into full blocking.

END OF SECTION 10520

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SPECIALTIES - DIVISION 10  
SECTION 10900: SIGNAGE

## PART 1. GENERAL

- 1.1 Scope: Furnish and install signs complete with all necessary accessories.
- 1.2 Submittals: Provide manufacturer's data indicating materials, details of construction, mounting methods, font, color samples for selection and schedule of sign location and text for review and approval prior to producing signs.

## PART 2. MATERIALS

- 2.1 Interior Signs:  
Best Sign Systems: "Graphic Blast" Engraved Melamine Signs:  
Engraved signs on 1/4" melamine plastic with 1/32" raised text, braille and graphics. Pre-drilled holes in fiberglass sign and mount to wall with four screws and appropriate substrate anchors at ADA recommended mounting heights.
  - A. Copy: typical of ten (10) signs:
    1. Women (international handicapped symbol) typical of 5
    2. Men (international handicapped symbol) typical of 5
  - B. 1/4" Melamine Plastic.
  - C. Helvetica Medium copy with Grade 2 Braille.
  - D. Braille, text and graphics raised 1/32" to conform to the ADA
  - E. Size: 8" x 12"
- 2.2 Exterior Signs:  
Gemini Signs: 800-270-3343, sales@giminisignletters.com. Cast Aluminum Metal Sign Letters with flush mounted aluminum studs set in adhesive cement to solid wood blocking provided between studs in stucco frame wall.
  - A. Copy: "NM First Judicial District Attorney" (typical of one sign of letters).
  - B. Cast Aluminum Letters (black anodized) with aluminum studs set into exterior wall blocking.
  - C. Font: Times Bold Italic
  - D. Size: 6" high capital letters

## PART 3. EXECUTION

- 3.1 Install in accordance with recommended mounting procedure and according to approved



mounting schedule and locations. Install interior signs within recommendations for ADA interior signage. See plans and building elevations for exterior sign location.

END OF SECTION 10900

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FURNISHINGS - DIVISION 12  
SECTION 12700: RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 GENERAL PROCEDURES

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. This Section includes the following types of Residential Appliances and accessories:
- C. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, power and operating instructions.
- D. Deliver Appliances in factory packages, marked with manufacturer and product name, utility characteristics, and location of installation using same room designations indicated on Drawings and in a window treatment schedule.
- E. Field Measurements: Verify dimensions of other construction by field measurements before delivery and indicate measurements on Shop Drawings. Allow clearances for operable units' operation hardware throughout the entire operating range. Notify Architect of discrepancies.

PART 2 - PRODUCTS

2.1 Residential Appliances

- A. Microwave Oven:
  - 1. Frigidaire model #FGMV154CL F
    - a. NEMA 14-30R wall receptacle and 30 amp disconnect switch. 1640 watts, 15 amps; 120V/60 Hz/15A.
    - b. Horizontal ducting to exterior wall is required with 2 speed exhaust fan.
      - I. Provide exhaust duct adapter and wall grille for exhaust to mate with standard 3-1/4" x 10" rectangular duct or round duct of 6" diameter.
    - 11. Refer to installation instructions for detailed duct preparation and converting exhaust vent blower system for exterior exhaust ventilation.
    - 111. Provide stainless steel filter panel kit PN# MWFILKTSS.
  - c. Consult manufacturer's installation instructions packed with Oven for mounting requirements: 16-13/32" high x 29-7/8" wide x 15-7/16" deep.
  - d. Provide an adequately wired 120-volt, 15 amp circuit having 2 wire service with a separate ground wire.
- B. Dishwasher
  - 1. Frigidaire Model #FGHT2148PF
    - a. Stainless Steel Finish
    - b. Plumbing attachment required for supply water and sewer
    - c. Electrical outlet required 120 Voltage AC, 60 Hertz, 10 amps total connected load amperage.

- d. Provide an adequately wired 120-volt, 15 amp circuit having 2 wire service with a separate ground wire.
  - e. Consult manufacturer's installation instructions for Dishwasher.
  - f. Height 32-11/2" x width 24" x 23" deep
- C. Refrigerator
- 1. GE Profile Energy Star 22 Cu. Ft. Stainless Steel Refrigerator with External Dispenser: Model #PFSS2MJYSS
    - a. Stainless steel (clean steel)
    - b. Electrical outlet required behind Refrigerator
    - c. Water connection required.
    - d. Height 69-3/8" x width 30" x 32" deep

### PART 3 -EXECUTION

#### 3.1. EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 ADJUSTING

- B. Adjust Residential Appliances to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

#### 3.3 CLEANING AND PROTECTION

- C. Clean residential appliances after installation, according to manufacturer's written instructions.
- D. Provide manufacturer's operating manuals and instructions.

END OF SECTION 12700

## PART 1 GENERAL

## 1.1 SCOPE

- A. Scope of Work: Provide design, shop drawings, project record drawings (as-built), equipment, fabrication, labor, transportation and supervision necessary to install, flush, test and place into service a complete hydraulically designed automatic wet pipe sprinkler system.
- B. Components: Provide system that consists of, but not be limited to, interconnecting piping, fittings, control valves, check valves, alarm valve with trim, fire department connection, sprinkler heads, hangers, bracing, Inspector's test stations, drains, sprinkler alarm, and other devices for a complete installation in accordance with codes, standards and recommended practice referenced in this Section.

## 1.2 DESIGN

- A. Design system in accordance with NFPA 13.
  - 1. Minimum classification Ordinary Hazard Group II, or as specified by the Santa Fe County Fire Marshal.
  - 2. Conform to extra or special hazard requirements where required or indicated.
  - 3. Conform to NFPA 13 for storage occupancies with potential storage height greater than 12 feet and other special hazard occupancies.
  - 4. System to operate at 7000 feet altitude.
  - 5. Provide necessary devices to separate system into individual and distinct alarm zones. Provide a minimum of one zone per floor.

## 1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
- B. Hydraulic Calculations prepared in accordance with NFPA 13. Submit calculations with shop drawings.
  - 1. Calculate demand point for each system so that it remains a minimum of 5 psi below design basis water supply curve. Design basis water supply curve after required 500 gpm hose streams and friction loss to base of riser have been deducted.
  - 2. Include in calculations elevation differences between point of water test and base of riser. Include graphical representation of design basis water supply curve and system demand.
  - 3. The following preliminary flow data is provided to the Contractor for bidding purposes: static 80 psig, residual 70 psig, flow 979 gpm.
  - 4. Base system design on actual flow information provided by Sangre de Cristo Water Company. Request actual flow data in a timely manner to maintain project schedules.
- C. Catalog Data with selected options marked.
- D. Certifications for welders in accordance with NFPA 13.
- E. Installation Instructions
- F. Materials Part List (Bill of Materials) with manufacturer, model number, and quantity.
- G. Drawings using a minimum scale of 1/8" = 1'-0" for plans and 1/4" = 1'-0" for details. All lettering to be a minimum of 1/8 inch high.

1. Show information required by NFPA 13, including piping, sprinklers, hangers, flexible couplings, roof construction, electro-mechanical devices, occupancy of each area, and ceiling and roof heights.
2. Base working plans on actual survey of existing conditions.
3. Show hydraulic reference points and remote areas.

#### H. Test Reports

- I. Operation and Maintenance Manual: Submit system description, system final inspection, and Contractor's material and test certificates per NFPA 13, of the completed system project record documents.
  1. Include in operation and maintenance manuals, instructions, a brief description of type of system installed, routine maintenance work defined by step-by-step instructions, and recommended frequency of performance.
  2. Also include in instructions, possible malfunctions with diagnostic methods and suggested correction of each.
  3. Describe function of each component or subassembly.
  4. List recommended spare parts (manufacturer, model number, and quantity).

- J. Project Record Drawings (As-Built) on CO's and prints reflecting as-built conditions showing Work completed under this Section.
  1. Base as-built drawings on actual survey of the completed installation.
  2. Include notes on all special systems or devices such as dry pendent heads, antifreeze loops and inspector's test stations.
  3. Provide revised hydraulic calculations demonstrating water supply restrictions have not been exceeded when conditions of installation are different from those anticipated during preparation of Project Record Documents.

### 1.4 QUALITY ASSURANCE

- A. Provide proof that installation firm has satisfactorily performed at least ten projects of equivalent nature and scope of the Projects herein; and is licensed within the USA to engage in design, fabrication and installation of automatic sprinkler systems for fire protection.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Materials and Equipment: Protect materials and equipment from damage during shipping, storage and installation.
- B. Plugs and Cover Plates: Protect threaded ends, flanged openings with gasketed metal cover plates to prevent damage during shipment and to prevent foreign materials from entering. Cap or plug drains, vents, small piping, and gauge connections.

## PART 2 PRODUCTS

### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

### 2.2 MATERIALS

- A. Provide new fire protection materials and equipment, UL Listed or FM Approved, conforming to NFPA 13.

### 2.3 PIPING AND FITTING MATERIALS



- A. Provide in accordance with NFPA 13.
- B. Piping 2 inches and smaller to be Schedule 40 minimum.

#### 2.4 VALVES AND STRAINERS

- A. Provide Listed or Approved valves and strainers rated at 175 psi or greater working pressure.
- B. Check Valves: In sizes 3 inch and larger, provide 3/4 inch NPT drainage taps.
- C. Strainers: Provide "Y" type strainers with cast iron body and 30 mesh stainless steel screen.
- D. Arm Valve: Minimum acceptable size is 4 inches. Provide retardant chamber, 2 water pressure gauges and necessary valves and trim for alarm valve operation.
  - 1. Provide bypass valve in trim to allow test operation of pressure alarm switch.
  - 2. Equipment alarm valve with retard chamber and pressure alarm switch with one normally open contact and one normally closed contact, suitable for 24 VDC.
  - 3. Provide check valve in retard chamber drain line when retard chamber drain line ties into main riser drain.

#### 2.5 PRESSURE GAUGES

- A. Provide listed pressure gauges designed for use with air or water.
  - 1. Gauge Scale: Dial marking subdivision no finer than 1 percent of maximum scale reading and accurate to 3 percent or less. Provide minimum scale range twice the maximum working pressure (when possible).

#### 2.6 VALVE SUPERVISION (TAMPER SWITCHES)

- A. Equip valves which control water to automatic sprinkler heads with supervisory switches.
  - 1. Provide valve supervisory switches with single pole double throw switching contacts, housed in gasketed weather tight enclosure, suitable for 24 VDC.
  - 2. Supply supervisory device specifically designed to mount on, and operate reliably with, type of control valve being monitored.
  - 3. Adjust valve position switches to transmit a supervisory signal within two revolutions of valve operating hand wheel or crank (away from its full open position).
- B. Provide alarm control valve with supervisory switch, Potter Electric part number BVS, or approved equivalent, suitable for 24 VDC.

#### 2.7 WATER FLOW SWITCHES

- A. Provide Potter Electric vane-type flow switches, or approved equivalent, with field adjustable pneumatic retard and 175 psi working pressure.
  - 1. Use single pole double throw, normally open switches, suitable for 24 VDC.
  - 2. Adjust water flow switches to transmit an alarm within 90 seconds of opening the inspector's test valve.
- B. Provide a minimum of one water flow switch per floor.

#### 2.8 SPRINKLERS AND ACCESSORIES

- A. Tested by a nationally recognized testing laboratory and selected in accordance with their Listing, manufacturer's instructions, and applicable NFPA requirements. Provide sprinklers as follows:

1. Upright Sprinklers: Brass upright type. Use in areas without suspended ceilings.
2. Pendent Sprinklers: Chrome plated. Use below suspended ceilings.
3. Sprinkler Guards: Provide where sprinkler heads are exposed to external damage.
4. Corrosion-Resistant Sprinklers: Provide in locations where chemicals, moisture or other corrosive vapors exist.
5. Concealed Sprinklers: Use concealed type sprinklers in clean rooms.

B. Where indicated, provide other types of sprinklers in accordance with their Listing.

## 2.9 WATER SHIELDS

- A. Provide in areas where there is no ceiling, and when multiple level protection is required, e.g., at open grating or open high roofed areas.
1. Provide compatible Listed/Approved water shields and/or intermediate level sprinklers in accordance with NFPA 13.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Prior to installation carefully inspect installed Work of other trades, whether pre-existing or part of this Project, and verify that such work is complete to the point where installation of sprinkler system may start.
- B. Notify the Contract Administrator should conditions exist, not resulting from Work of this Project, that prohibits the installation from conforming to referenced codes, regulations, standards and approved design.
- C. Install materials and equipment that are free of moisture, scale, corrosion, dirt and other foreign materials.

### 3.2 INSTALLATION

#### A. General:

1. Install system in accordance with NFPA 13.
2. Do not locate sprinkler heads closer than 12 inches to supply air registers.
3. Visually examine pipe, fittings, valves, equipment and accessories to ensure they are clean and free of burrs, cracks and other imperfections before installation. Clean pipe interiors by flushing.
4. Verify dimensions in field.
5. Drawings show only approximate building outlines and interior construction details as an aid in understanding the scope of Work. Investigate structural and finish conditions affecting the Work and arrange Work accordingly, providing such sprinkler heads, fittings, traps, draining valves, piping, and accessories as required to meet such conditions. Show relevant structural details on Drawings.
6. Do not render inoperative any system without the prior approval of the Contract Administrator. Coordinate necessary shutdowns of existing systems by notifying the Contract Administrator a minimum of 7 working days before rendering such systems inoperative.
7. Coordinate sprinkler piping, sprinkler heads and associated equipment with existing ceiling or roof materials, lighting, ductwork, conduit, piping, suspended equipment, structural and other building components.
8. Dispose of equipment removed for completion of this Project as directed by the County Construction Inspector or Owner's representative.
9. Provide access openings in areas where concealed sprinkler piping is installed.

- B. Piping:
1. Mark and identify sprinkler piping in accordance with Section 15075, Mechanical Identification.
  2. Conceal sprinkler piping in areas with suspended ceilings. Install piping in exposed areas as high as possible using necessary fittings and auxiliary drains. Keep sprinkler piping a minimum of 7 feet 6 inches above finish floor. Where not possible, run piping at same elevation as existing piping and ducts. Obtain prior approval from the Construction Inspector.
  3. Install Inspector's Test piping at the hydraulically most remote point of automatic sprinkler system and discharge to the exterior of building. Install inspector's test piping for each water flow switch. Where possible, conceal test piping in wall and provide access panels for valve and sight glass and protect from freezing. Locate Inspector's Test Station in an easily accessible location approved by the County Construction Inspector or Owner's representative.
  4. Diamond core drill or sleeve concrete penetrations, then grout and seal with fire-resistant material, securely held in place. Use Listed/ through penetration fire stop system assemblies for piping penetrating fire resistance rated construction.
- C. Support: Install pipe hangers for pipe supports inside buildings in accordance with NFPA
1. Install concrete anchors by drilling using UL Listed or FM anchors. Do not use explosive-driven fasteners as a method of installing anchors or hangers. Do not hang other piping or equipment from sprinkler pipe.
- D. Welding:
1. Shop weld pipe and fittings using approved welding fittings. Comply with NFPA 13 for welding methods.
  2. Provide a blind flange or grooved cap at each end of welded headers.
  3. Use certified welders. Check certificates before Work commences.
- E. Arm Valve: Set plumb and unobstructed. Provide minimum clear distances from walls to centerline of alarm valve as follows:
1. Rear- 12 inches
  2. Sides 20 inches
  3. Front 36 inches
- F. Control Valves: Provide Listed OS&Y fire protection control valves. Installed so open or closed status can be readily seen from finish floor.
1. Install control valves on supply lines (outside protected area) into elevator shaft and elevator equipment room, computer rooms, and identified special protection areas. Control valves to be accessible from floor level. Provide valve with tamper supervision switches.
- G. Sprinklers and Accessories:
1. Provide upright sprinklers on exposed piping below ceiling. Pendent sprinklers may be used where necessary due to spacing, location and position requirements.
  2. Provide chrome plated pendent, recessed, or flush mounted sprinklers below finish ceilings. Route supply piping above ceiling.
  3. Align sprinklers below ceiling parallel to ceiling features and walls, and locate as close to center as possible in halls and corridors.
  4. Provide chrome-plated escutcheons where exposed piping passes through finished floors, walls, partitions and ceilings. Secure to pipe with set screws or spring clips.
  5. Protect sprinklers subject to mechanical injury with guards as follows:
    - a. Provide guards in mechanical equipment rooms, electrical equipment rooms, janitor's closets, and storage areas where distance from sprinkler

- deflector to finish floor is less than 15 feet.
      - b. In all other areas, provide guards where distance from sprinkler deflector to finish floor is less than 7 feet.
    - 6. To prevent freezing, extend dry pendent sprinklers a minimum of 6 inches into heated area before connection to wet sprinkler piping.
    - 7. Provide one spare sprinkler cabinet, complete with sprinklers of assorted temperature ratings of the type necessary and in use throughout the installation, at each main riser valve. Equip each cabinet per NFPA 13.
  - H. Signs: Install as required by NFPA 13.
  - I. Painting: Paint sprinkler risers, unfinished pumper connection piping, exposed piping in stairwells, and sprinkler piping in all equipment rooms with 2 coats of Fire Protection Red. Apply one coat of primer and one coat of paint to match background, on new exposed piping in occupied spaces. Do not paint automatic sprinkler heads.
  - J. Unsupervised Water Supplies: Install approved water flow detection device on underground water supplies entering buildings when fire protection riser is more than 10 lineal feet from exterior of building.
  - K. Water Supply Control Valve: Where not otherwise provided for, provide water supply control valve(s) conforming to the requirements of NFPA 24.
    - 1. Provide UL Listed or FM valves, with Listed indicating post. When possible, locate valve at least 40 feet from building.
    - 2. When valve is located less than 20 feet from building, or a wall post indicating valve is provided, the wall 10 feet in all directions of the valve to be blank masonry or one hour fire resistance rated construction.
  - L. Special Tools and Devices: Provide one complete set of special tools or special devices required for operation, testing and/or maintenance of equipment furnished under this Section.
- 3.3 EQUIPMENT INSTALLATION
  - A. Install devices or equipment not specifically covered by these Specifications in accordance with manufacturer's instructions.
- 3.4 CONNECTIONS TO EXISTING SYSTEMS
  - A. Final connection of new systems to existing underground piping systems will be made by the Contractor with the supervision of City of Santa Fe Sangre De Cristo Water Division.
  - B. Final connection of new systems to other existing systems above grade to be done by the Contractor after contacting the Project Construction Inspector who will implement County Fire Protection Impairment Procedure. Do all final connections of this type with only one outage per existing system.
- 3.5 STERILIZATION
  - A. Sterilize sprinkler system underground piping upstream of alarm valve in accordance with Section 15141, Disinfection of Potable Water Piping.
  - B. Do not sterilize sprinkler system downstream of alarm valve.
- 3.6 EXISTING CONDITIONS
  - A. Area Restoration: Restore areas disturbed by the fire protection system installation to the

condition existing prior to start of construction.

- B. Field Inspection: Field inspect areas of sprinkler installation for potential interference with ducts, cable trays, electrical or mechanical equipment, and other similar interferences. Carefully coordinate Work under this section with other Work.

### 3.7 TESTING

- A. Hydrostatically test piping in accordance with Section 15992, Testing Piping Systems, and NFPA 13.
- B. Flush system with water in accordance with NFPA 13 and 24.
- C. Comply with the discharge requirements in Section 01325, Water Discharge Requirements.
- D. Notify Construction Manager at least 5 working days in advance to witness tests.

### 3.8 INSPECTION

- A. Inspect new fire protection system in accordance with NFPA 13 and 24, in the presence of the Construction Manager. Give advance notice, as specified below, to the Construction Inspector prior to any tests.
  - 1. Notify the Construction Manager upon completion of installation of all materials and equipment. Construction Manager will schedule inspection of installation within 5 working days after Contractor notification.
  - 2. Correct deficiencies noted during this inspection and correct prior to further testing.

END OF SECTION 13930

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MECHANICAL: DIVISION 15

## SECTION 15060: HANGERS AND SUPPORTS FOR PIPING AND TUBING

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Pipe hangers, supports, hanger rods, inserts, and sleeves.

## 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures.
  - 1. Catalog data of hangers and supports.

## PART 2 PRODUCTS

## 2.1 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inches: Carbon steel, adjustable, clevis, or malleable iron or carbon steel, adjustable swivel, split ring.
- B. Hangers for Cold Pipe Sizes 2 inches and over: Carbon steel, adjustable, clevis.
- C. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
- D. Hangers for Hot Pipe Sizes 6 inches and over: Adjustable steel yoke, cast iron roll, double hanger.
- E. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- F. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and over: Steel channels with welded spacers and hanger rods, cast iron roll.
- G. Wall Support for Pipe Sizes to 3 inches: Strut clamp.
- H. Wall Support for Pipe Sizes 4 inches and over: Welded steel bracket and wrought steel clamp.
- I. Wall Support for Hot Pipe Sizes 6 inches and over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
- J. Vertical Support: Steel riser clamp.
- K. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- L. Floor Support for Hot Pipe Sizes to 4 inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- M. Floor Support for Hot Pipe Sizes 6 inches and over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
- N. Copper Pipe Support: Copper-plated, carbon steel ring.

## 2.2 HANGER RODS

- A. Mild steel threaded both ends, threaded on one end, or continuous threaded.



### 2.3 INSERTS

- A. Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment; top slot for reinforcing rods; lugs for attachment to forms; size inserts to suit threaded hanger rods.

### 2.4 SLEEVES

- A. Sleeves for Pipes through Non-Fire Rated Beams, Walls, Footings, and Floors: Steel pipe or 18 gage galvanized steel.
- B. Sleeves for Pipes through Fire Rated and Fire Resistive Floors, Walls, and Roof: Prefabricated fire rated sleeves including seals, approved by a nationally recognized testing laboratory.
- C. Sleeves for Ductwork: Galvanized steel.

## PART 3 EXECUTION

### 3.1 INSERTS

- A. Provide inserts for placement in concrete forms.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hook rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut.

### 3.2 PIPE HANGERS AND SUPPORTS

- A. Support piping to maintain its alignment, and prevent sagging.
- B. Place hangers within 12 inches of each horizontal elbow.
- C. Support vertical piping with riser clamps secured to the piping and resting on the building structure at each floor.
- D. Install hangers to provide minimum 1/2 inches space between finished covering and adjacent work.
- E. Use hangers with 1-1/2 inches minimum vertical adjustment.
- F. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- G. Support riser piping independently of connected horizontal piping.
- H. Provide copper plated hangers and supports for copper piping.
- I. Provide insulation continuous through hangers and rollers. Protect insulation by steel shields in accordance with Section 15080, Mechanical Insulation.
- J. Provide hangers on piping on each side of, and within 6 inches of, hubless pipe couplings so the couplings bear no weight.

- K. Provide supports that allow free axial movement and only support the weight of the piping or tubing. Provide additional hangers or brackets to support valves, flanges, specialties, etc., to prevent excessive deflection.
- L. Prime coat exposed steel hangers and supports. Refer to Section 09900. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.3 HANGER SPACING

- A. Plumbing Piping - Water, Gas, DWV
  - 1. Comply with the requirements of the Uniform Plumbing Code, (IAPMO), Hangers and Supports.
- B. Fire Protection Piping
  - 1. Comply with the requirements of NFPA-13, for hanger spacing and materials.
- E. Water Building Services Piping, up to 150 psig (Heating, Cooling, and Tower Water)
  - 1. Comply with the requirements of ASME B31.9, Building Services Piping.
  - 2. Maximum Hanger Spacing

Size (Inches)	Less Than 1	1	1 1/4	1 1/2	2	3	4	6	8
Spacing (Feet) Steel Pipe	6	9	11	12	13	15	17	20	21
Spacing (Feet) Copper Tube	5	7	7	8	9	10	12	14	16

- F. Air and Laboratory Gas Building Services Piping, up to 150 psig
  - 1. Comply with the requirements of ASME B31.9, Building Services Piping.
  - 2. Maximum Hanger Spacing:

Size (Inches)	1/4 to 1/2	5/8 to 7/8	1	1 1/4	1 1/2	2	3	4	6	8

Spacing (Feet) Steel Pipe	6	6	9	11	13	15	17	21	25	28
Spacing (Feet) Copper/SS Tube	3	5	7	9	10	12	15	17	21	24

3.4 HANGER ROD SIZE

A. Plumbing (UPC) Piping (Water, Gas, DWV)

Pipe Size (Inches)	1/2 - 4	5 - 8
Rod Size (Inches)	3/8	1/2

B. HVAC Piping (Steam, Condensate, Water, Air, Laboratory Gas)

Pipe Size (Inches)	1/2 - 2	2	4 - 6	8 - 12
Rod Size (Inches)	3/8	1/2	5/8	7/8

END OF SECTION 15060

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MECHANICAL: DIVISION 15

## SECTION 15075: MECHANICAL IDENTIFICATION

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Valve Tags.
- B. Pipe Markers/Arrow Tape Above Ground.
- C. Underground Piping Warning Tape.
- D. Ceiling Tacks.
- E. Duct Markers.
- F. Mechanical Equipment and HVAC Controls Identification.
- G. Safety Signs.
- H. Fire Hydrants and Isolation Valves Numbering.

## 1.2 CONTRACTOR PERFORMED WORK

- A. Permanent labeling for mechanical equipment and HVAC controls will be furnished and installed by the Contractor.

## 1.3 DEFINITIONS

- A. Exposed Areas: Finished areas and other areas used by personnel in normal use of building, such as equipment rooms and storage rooms.
- B. Concealed Areas: Duct or pipe tunnels, duct or pipe chases, spaces above accessible ceilings, and crawl spaces.

## 1.4 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Catalog data.
  - 2. Installation instructions.

## PART 2 PRODUCTS

## 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

## 2.2 MANUFACTURER

- A. W. H. Brady Co. catalog numbers are used as a basis of identification.
- B. Stock catalog numbers are listed in PART 2 and PART 3 schedules. Contractor is responsible to review schedules and provide required markers. In some instances, "non-stock" markers (special) may be required.

### 2.3 VALVE TAGS

- A. Metal Tags: No. 23211, brass with stamped letters; tag sizes minimum 2 1/2 inches diameter with smooth edges.
- B. Beaded Chain: No. 23306, size 6 brass 4 1/2 inches long with locking link.

### 2.4 PIPE MARKERS/ARROW TAPE ABOVE GROUND

- A. Color: Conform to ANSI A13.1.
- B. Self-Sticking Pipe Markers/Arrow Tape: Material B-946, flexible, vinyl film tape with pressure sensitive permanent adhesive backing and printed markings.
  - 1. Suitable for indoor/outdoor application.
  - 2. Temperature range: Minus 40 degrees to 180 degrees F.

### 2.5 UNDERGROUND PIPING WARNING TAPE

- A. Comply with Section 02310, Grading, Excavating, and Trenching.

### 2.6 CEILING TACKS

- A. No. 23250 series, steel with 7/8-inch diameter color-coded head.
- B. Color code as follows:
  - 1. Yellow HVAC Equipment
  - 2. Red Fire Dampers / Smoke Dampers
  - 3. Green Plumbing Valves, Trap-Priming Devices, etc.
  - 4. Blue Heating / Cooling Valves

### 2.7 DUCT MARKERS

- A. Plastic Tape Duct Marker and Arrows: Material No. B-946, flexible vinyl film tapes with pressure sensitive permanent adhesive backing and printed markings.
  - 1. Suitable for indoor/outdoor application.
  - 2. Temperature range: Minus 40 degrees to 180 degrees F.
- B. Letter style block, 2 inches height minimum.

### 2.8 MECHANICAL EQUIPMENT AND HVAC CONTROLS IDENTIFICATION

- A. Identify mechanical equipment and HVAC controls, e.g., air handling units, pumps, heat transfer equipment, controls instruments, and similar items, with nameplates or tags.
  - 1. Provide nameplates made of durable non-corrosive, non-conductive, and impact resistant plastic material with standard over laminate (use UV resistant over laminate for outdoors) on one side.
    - a. Size: 1-1/2 x 3 inch or 2-1/2 or 4 inch
    - b. Color:
    - c. Manufacturer: Brady No. B418.

2. Provide lettering as follows:
  - a. Size: 10 point minimum (larger preferred).
  - b. Spacing: 1/4 inch from top, 1/8 inch from bottom, 1/16 inch between lines.

## 2.9 SAFETY SIGNS

- A. Colors associated with specific words such as "Danger," "Warning," "Caution," or "Notice" to conform to ANSI Z35.1.
- B. Provide signage identifying each fixture, including fume hood cup sinks, being served by non-potable water.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

### 3.2 INSTALLATION

- A. Valve Tags:
  1. Install with brass beaded chain.
  2. Steel stamp or engrave valve tag in accordance with schedule herein.
  3. Letter style block, 1/4-inch height minimum.
  4. Tag all valves in concealed or exposed areas except isolation and by-pass valves installed adjacent to the equipment they serve.
  5. Provide typewritten letter size list of applied tags and location. [Frame under glass and hang where directed].
- B. Pipe Markers Above Ground:
  1. Install in accordance with manufacturer's instructions.
  2. Seal markers with clear lacquer.
  3. Identify piping in exposed or concealed areas in accordance with schedule herein.
  4. Pipe marker consists of pipe contents identification with flow direction arrow tape. Provide consistent color scheme, unless otherwise noted.
  5. Wrap arrow tape completely around pipe at both ends of pipe markers.
  6. Install in clear view and align with axis of piping.
  7. Label piping at intervals of not more than 20 feet on horizontal and vertical runs, at each branch connection, and where pipe penetrates walls, ceilings and floors (both sides).
  8. Label waste piping below laboratory sinks to indicate destination.



- 9. Size of label depends on outside diameter (OD) of pipe. Pipe OD includes insulation or protective coating.
- 10. Minimum length of marker including arrows:

<u>Outside Diameter</u>	<u>Length (inches)</u>
2 inches or smaller	8
Greater than 2 inches to less than 8 inches	12
8 inches to 10 inches	24
Over 10 inches	32

- C. Ceiling Tacks: Provide ceiling tacks to locate HVAC equipment, valves or dampers above accessible suspended ceilings. Locate tacks in corner of panel closest to equipment.
- D. Duct Markers:
  - 1. Install in accordance with manufacturer's instructions.
  - 2. Seal markers with clear lacquer.
  - 3. Identify ducts in exposed or concealed areas in accordance with the schedule.
  - 4. Duct markers consist of duct identification name with flow direction arrows. Provide consistent color scheme.
  - 5. Install in clear view and align with axis of duct.
  - 6. Label ducts at intervals of not more than 20 feet on horizontal and vertical runs, at each branch connection, and where duct penetrates walls, ceilings and floors (both sides).
- E. Safety Signs: Install in clear view.

3.3 SCHEDULES

A. PIPE MARKERS AND VALVE TAG LEGEND:

Pipe Identification	Background Color/ Letter Color	Outside Diameter (Letter Height)				Valve Tag Legend
		6" or greater (3 1/2" high) Style 1HV*	3" to less than 6" (2" high) Style 1*	1" to less than 3" (3/4" high) Style 4*	Less than 1" (5/16" high) Style 3C*	
		Pipe Marker Catalog Numbers				
Drain	Grn/Wht	7090				D
Fire Protection Water	Red/Wht	7110				F
Electric Traced	Yel/Blk	7096				-----
High Pressure Natural Gas (Above 5 PSIG)	Yel/Blk	7139				NG
Low Pressure Natural Gas (Less than 14" W.C.)	Yel/Blk	7177				NGL

Pipe Identification	Background Color/ Letter Color	Outside Diameter (Letter Height)				Valve Tag Legend
		6" or greater (3 1/2" high) Style 1HV*	3" to less than 6" (2" high) Style 1*	1" to less than 3" (3/4" high) Style 4*	Less than 1" (5/16" high) Style 3C*	
		Pipe Marker Catalog Numbers				
Medium Pressure Natural Gas (14" W.C. to 5 PSIG)	Yel/Blk	7190				NGM
Potable/Cold Water	Grn/Wht	7217/7055				PWC
Potable/Hot Water (Use Grn/Wht Arrows)	GrnWht/ YelBlk	7217/7146				PWH
Potable/Hot Water Recirculation	GrnWht/	7217/7147				PWHR
Sanitary Vent	Yel/Blk	7252				SWV
Sanitary Waste	Yel/Blk	7253				SW
Storm Water	Grn/Wht	7275				STW

\* Include style number in parenthesis ( ) following the catalog number.

B. AIR DUCT MARKERS

Duct Identification	Background Color/ Letter Color	Catalog Number
Air Return	Blu/Wht	7008
Air Supply	Blu/Wht	7010
Mixed Air	Blu/Blk	Special/7006
Outside Air	Blu/Wht	7206
Relief Air	Blu/Wht	7240
Toilet Exhaust Air	Blu/Wht	Special/7100

END OF SECTION 15075

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MECHANICAL : DIVISION 15

## SECTION 15080: MECHANICAL INSULATION

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Piping insulation
- B. Ductwork insulation

## 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Catalog data of insulation, jackets, covers, adhesives, coatings, and cements.

## 1.3 QUALITY ASSURANCE

- A. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84.
- B. Provide insulation material 100 percent asbestos free.
- C. Provide products that do not promote or support the growth of mold, fungi, or bacteria.

## 1.4 QUALIFICATIONS

- A. Installers: Company specializing in performing work of this Section with minimum of 3 years experience.

## 1.5 DEFINITIONS

- A. Finished Areas: Areas where floor, walls, ceilings, trim, or exposed steel are painted, tiled, or similarly finished.
- B. Unfinished Areas: Areas with unpainted walls.
- C. Exposed Areas: Finished areas and other areas used by personnel in the normal use of the building, such as fan rooms, mechanical room, and storage rooms.
- D. Concealed Areas: Pipe tunnels, covered pipe trenches, spaces inside walls, duct or pipe shafts, spaces above dropped ceilings, unfinished attic spaces and crawl spaces.

## 1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufactures of adhesive, mastic, and insulation cements.
- B. Maintain temperature during installation per manufacture's instructions.

## PART 2 PRODUCTS

## 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

## 2.1 GENERAL

- A. K-factors (thermal conductivity) shown are expressed in  $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot\text{F}$ .

## 2.2 MANUFACTURERS

- B. Knauf Fiber Glass, Owens/Corning Fiberglass, Armstrong, Certain Teed, Johns Manville, Rockwool Manufacturing, Armaflex, and others specified herein.

## 2.4 FIBERGLASS PIPE INSULATION

- A. Insulation: Rigid molded in compliance with ASTM C547, Class 1, minimum density 3.5 pounds/cubic foot, K-factor of approximately 0.24 at 75 degrees F, suitable for temperatures from minus 20 degrees F to 450 degrees F.
- B. Jacket: Factory applied vapor barrier all-service type with self-sealing lap and butt strips.
- C. Valves and Fitting Covers: Pre-molded PVC covers with fiber glass insert. Manufacturers: Proto Corp., Ceelco, and others specified herein.

## 2.3 ELASTOMERIC PIPE INSULATION

- A. Insulation: Cellular closed cell in compliance with ASTM C534, Type 1, minimum density 5 pounds/cubic foot, K-factor of approximately 0.29 at 75 degrees F, suitable for temperatures up to 220 degrees F.
- B. Valve and fitting covers: Same as pipe insulation, cut to fit.

## 2.4 GLASS FIBER BLANKET DUCT INSULATION

- A. Insulation: Flexible blanket, in compliance with ASTM C612, minimum density 3/4 pounds/cubic foot, K-factor of approximately 0.29 at 75 degrees F, suitable for temperature from 35 degrees F to 250 degrees F.
- B. Jacket: Factory applied Foil-Scrim-Kraft (FSK) facing.
- C. Fittings: Same material as insulation.

## 2.5 GLASS FIBER BOARD DUCT INSULATION

- A. Insulation: Rigid, in compliance with ASTM C612, Class 1, minimum density 3 pounds/cubic foot, K-factor approximately 0.23 at 75 degrees F, suitable for temperature from minus 20 degrees F to 450 degrees F.
- B. Jacket: Factory applied Foil-Scrim-Kraft (FSK) facing.
- C. Fittings: Same material as insulation.

## 2.6 AIR DUCT BOARD

- A. Rigid resin-bonded fiberglass board faced on exterior side with foil-scrim-kraft (FSK) vapor retarder, and air stream surface [faced with a tightly bonded non-woven black mat facing] or [impregnated with a polymer coating]. Service temperature 250 degrees F maximum, air velocity 5000 fpm maximum and internal static pressure +/- 2 inches water maximum.

## 2.7 METAL JACKETING - PIPING/DUCTWORK

- A. Jacketing: Aluminum, 0.016 inches thick, embossed surface, with factory bonded moisture barrier.
- B. Valve and Fitting Insulation Covers: Fabricate from same material as jacketing or use prefabricated insulation covers made in two matching halves.
- C. Metal Jacketing Bands: 1/2 inch wide, aluminum or stainless.
- D. Manufacturer: Pabco-Childers\_Metals\_

## 2.8 PROTECTION SADDLES AND SHIELDS

- A. Provide factory engineered galvanized steel hanger shields on horizontal insulated pipe complying with MSS SP-58 and MSS SP-59 standards for gauge and length of saddle.
- B. Saddles (Piping/tubing up to 2 inches):
  - 1. Use 180 degree saddle on systems utilizing teardrop type hangers.
  - 2. Use 360 degree saddle on systems utilizing trapeze hangers or clamps.
- C. Inserts and Shields (Piping/tubing over 2 inches):
  - 1. Use 360 degree calcium silicate insert with a 180 degree shield on systems utilizing clevis or teardrop type hangers.
  - 2. Use 360 degree calcium silicate with a 360 degree shield on systems utilizing trapeze hangers or clamps.
  - 3. Provide unit with an integral moisture barrier consisting of a tri-laminate All-Service Jacket equal and similar to the jacketing on the adjoining insulation.
  - 4. Insert: Calcium silicate, minimum density 9 pounds/cubic foot.  
Use 180 degree saddle on systems utilizing teardrop type hangers.
- D. Use 360 degree saddle on systems utilizing trapeze hangers or clamps.
- E. Saddle: Galvanized steel, 14 gauge and 8 inches long.

## 2.9 INSERTS AND SHIELDS (PIPING/TUBING OVER 2 INCHES)

- A. Use 360 degree calcium silicate insert with a 180 degree shield on systems utilizing clevis or teardrop type hangers.
- B. Use 360 degree calcium silicate with a 360 degree shield on systems utilizing trapeze hangers or clamps.
- C. Provide unit with an integral moisture barrier consisting of a tri-laminate All-Service Jacket equal and similar to the jacketing on the adjoining insulation.
- D. Shield: Galvanized steel, length and gauge in accordance with insert and shield schedule.
- E. Insert: Calcium silicate, minimum density 9 pounds/cubic foot, length in accordance with insert and shield schedule.
- F. Insert and Shield Schedule: Bottom shield only; top shield may be one gauge lighter.



- G. Manufacturer: Value Engineered Products, Shaw Pipe Shields.
  - 5. Quick-Shield (clevis/teardrop type hangers).
  - 6. Pro-Shield (trapeze type hangers).
  - 7. Weather-shield (outdoor installations).

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify that items to be insulated have been pressure tested and approved before applying insulation material.
- B. Verify that surfaces are clean, foreign material removed, and dry.

#### 3.2 INSTALLATION - GENERAL

- C. Install materials in accordance with manufacturer's instructions.
- A. Do not insulate factory-insulated equipment.
- B. Do not insulate nameplates.
- C. Fit insulation tightly against surface to which it is applied.
- D. Do not insulate flexible connections.
- E. For non-fire rated barriers (e.g., wall, floor, ceiling, or roof) Continue insulation and vapor barrier through penetrations, except where walls or floors are required to be fire stopped or required to have a fire resistive rating for fire rated barriers, provide UL/FM approved through penetration stop systems.
- F. Weatherproof outdoor installations of piping or ductwork covered with aluminum jacket. Provide watershed lap joints and seal with mastic as required.
- G. Do not install metal jacketing with raw edges; provide a safety edge.

#### 3.3 INSTALLATION - PIPING

- A. On exposed piping located in finished areas, locate cover seams in least visible area.
- B. Provide continuous insulation through pipe hangers or supports. Do not notch insulation.
- C. Where insulation terminates, taper to pipe and finish with insulating cement or acrylic mastic.
- D. Cover insulated pipes located outdoors or in utility tunnels with aluminum jacket. Secure with aluminum bands and screws as required.
- E. Tape circumferential joints of pipe insulation with 3 inch wide white vinyl tape.
- F. Insulate fitting and valves where required with same material thickness as specified for adjacent pipe.
- G. Insulate potable and non-potable cold water piping within walls, chases, or ceiling plenums where return air is present.
- H. Insulate potable and non-potable cold water piping in equipment rooms.

- I. Do not insulate unions, flanges and valves in potable or non-potable piping systems of 140 degrees F or less, except for chilled water.
- J. Insulate refrigerant discharge line (hot gas discharge) when there is a danger of personnel coming in contact with piping or when the line is passing through a conditioned space. Insulate refrigerant liquid line when it is passing through spaces having temperatures greater than the refrigerant condensing temperatures.

3.4 INSTALLATION - DUCTWORK

- A. Secure rigid board insulation to ductwork with metal fasteners (stick-clip) and scrim washer on 12 inch centers each way. Secure fasteners to duct work with recommended adhesive.
- B. Tape ductwork insulation joints and penetrations caused by mechanical fasteners with 3 inch wide FSK tape.
- C. Cover insulated ductwork located outdoors with aluminum jacketing. Secure with bands and screws as required.

3.5 INSULATION SCHEDULE

- A. HVAC PIPING SYSTEMS: USE FIBERGLASS PIPE INSULATION.

**NOTE:** For piping exposed to outdoor temperatures, increase thickness 1/2 inch.

Service	Nominal Pipe Diameter (inches)	Insulation Thickness (inches)
Heating hot water (to 200 degrees F)	All sizes	1 ½
Potable hot water (105 degrees F & greater)	Up to 2 over 2	1 1 ½
Non-potable hot water (105 degrees F & greater)	Up to 2 over 2	1 1 ½

Service	Nominal Pipe Diameter (inches)	Insulation Thickness (inches)
Refrigerant suction	All sizes	1
Refrigerant discharge	All sizes	1
Refrigerant liquid	All sizes	1
Chilled water (40-55 degrees F)	All sizes	1
Potable cold water	All sizes	1
Non-potable cold water	All sizes	1
Roof drain bowl and storm water piping	All sizes	1

- B. Handicapped Lavatory Piping: Use elastomeric pipe insulation meeting ADA Standard Section 4.19.4, ANSI/ICC A117.1:

Service	Pipe Sizes (inches)	Insulation Thickness (inches)
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Exposed drain and hot water lines	All sizes	½
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C. Exhaust Piping: Use hydrous calcium silicate insulation. Wrap with aluminum jacketing.

Service	Insulation Thickness (inches)
Generator Exhaust Piping/Muffler	1 ½

D. Concealed Ductwork: Use glass fiber (flexible) duct insulation.

Service	Insulation Thickness (inches)
Supply and return air	1 ½

E. Exposed Rectangular Ductwork: Use glass fiberboard (rigid) duct insulation on the exterior of the ductwork.

**NOTE:** Use 2 inch thick insulation for ductwork exposed to outdoor temperatures.

Service	Insulation Thickness (inches)
Supply and return air	1 ½

F. Exposed Round Ductwork: Use glass fiber (flexible) duct insulation. **NOTE:** Use 2 inch thick insulation for ductwork exposed to outdoor temperatures.

Service	Insulation Thickness (inches)
Supply and return air	1 1/2

END OF SECTION

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MECHANICAL : DIVISION 15

## SECTION 15140: POTABLE AND NON-POTABLE WATER PIPING

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Building potable and non-potable water piping, valves, fittings, water heater, circulator pump, and accessories within the building envelope.

## 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Catalog data on pipe materials, pipe fittings, valves, water heater, circulator pump, and accessories.
  - 2. Installation instructions for valves and accessories.

## PART 2 PRODUCTS

## 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

## 2.2 PIPING, BURIED WITHIN THE BUILDING ENVELOPE

- A. Ductile Iron Pipe: AWWA C151.
  - 1. Fittings: AWWA C110, Ductile-Iron or Gray-Iron, Class 350 or AWWA C153, Ductile Iron Compact Fittings, Class 350.
- B. Copper Tubing: ASTM B88, Type K, hard drawn or annealed.
  - 1. Fittings: ANSI/ASME B16.22, wrought copper and copper alloy solder-joint.
  - 2. Joints: AWS A5.8, BCuP silver braze.

## 2.3 PIPING ABOVE GRADE

- A. Copper Tubing: ASTM B88, Type L, hard drawn or annealed.
  - 1. Fittings: ANSI/ASME B16.22, wrought copper and copper alloy solder-joint.
  - 2. Joints: ASTM B32, Solder, Grade 95TA.
  - 3.
- B. CPVC Pipe: ASTM D2846, for water service up to 180 degrees F.
  - 1. Fittings: ASTM D2846, CPVC.
  - 2. Joints: ASTM D2846, solvent weld with ASTM F493 solvent cement.

## 2.4 UNIONS

- A. Copper Tubing: Class 150 bronze unions with soldered joints.

## 2.5 VALVES, ABOVE GRADE

- A. Ball Valves up to 2 inches:
  - 1. Manufacturer: Nibco, Series 585-70.
  - 2. MSS SP-110, 600 psi CWP, bronze, two piece body, chrome plated brass ball, full port, teflon seats and stuffing box ring, blowout proof stem, lever handle, solder or threaded ends.
- B. Butterfly Valves over 2 inches:
  - 1. Manufacturer: Nibco, Series LD 2000.
  - 2. MSS SP-67, 200 psi CWP, ductile iron body, aluminum bronze disc, resilient replaceable EPDM seat, lug style, extended neck, lever handle, for use between ANSI Class 125/150 flanges.
- C. Globe Valves up to 2 inches:
  - 1. Manufacturer: Nibco, Series 211.
  - 2. MSS SP-80, Class 125 bronze body, bronze trim, hand wheel, bronze disc, solder or threaded ends.
- D. Gate Valves up to 2 inches:
  - 1. Manufacturer: Nibco, Series 111.
  - 2. MSS SP-80, Class 125 bronze body, bronze trim, rising stem, hand wheel, inside screw, solid wedge disc, solders or threaded ends.
- E. Manufacturer: CLA-VAL, No. 90-01-AS.
- F. Single seated, hydraulically operated, pilot controlled, diaphragm type valve, 175 psi pressure rating, 180 degree F maximum water temperature and 15 to 75 psi adjustment range. Pilot control; direct acting, adjustable, spring loaded, and normally open. Valve construction; globe, ductile iron main valve body and cover, bronze main valve trim, and cast bronze pilot control with stainless steel trim. Repairs must be done without removing valve from line.
  - 1. Optional Features: Flow clean features and CV flow control (opening speed control).

## 2.6 PRESSURE REDUCING VALVE (PRV)

- A. Manufacturers:
  - 1. CLA-VAL, No. 990.
  - 2. Wilkins, No. 500YSBR.
- B. Balanced single seat with bronze valve body and cover, stainless steel trim, integral strainer, 175 psi maximum water temperature, and standard adjustment range 8-80 psi. Repairs must be done without removing valve from line.

## 2.7 CIRCULATOR PUMP, HOT WATER

- A. Manufacturer: Bell and Gossett, Series 100.

- B. Bronze body, brass impeller, steel shaft, suitable for 125 psi working pressure and 225 degrees F water temperature, mechanical seal, direct drive, and oil lubricated drip proof motor, 1750 rpm.
- C. Performance:
  - 1. See sheet P-7000.

## 2.8 STRAINERS

- A. Sizes up to 2 inches:
  - 1. Threaded brass body for 175 psi CSP, Y pattern with 1/32 inch stainless steel perforated screen.
- B. Size over 2 inches:
  - 1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

## 2.9 HOSE BIB (WALL HYDRANT)

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. ANSI A112.21.3, non-freeze, integral vacuum breaker, bronze or brass [nickel plated], 3/4 inch exposed hose connection, 1/4 turn, T-handle key.
- C. ANSI A112.21.3, exterior use, non-freeze, integral vacuum breaker, bronze or brass, concealed 3/4 inch hose connection, 1/4 turn, T-handle key, stainless steel box with hinged locking cover.

## 2.10 BACKFLOW PREVENTER, FLANGED ENDS

- A. Provide models listed in the latest edition of Approved Backflow Prevention Assemblies by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research.
  - 1. Suggested Manufactures:
    - a. Conbraco, Series 40200.
    - b. Wilkins, Series 375.
    - c. Watts, Series 909.
- B. Assembly, reduced pressure type, cast iron body epoxy coated internal and external, with OS & Y shut-off valves, flanged ends, test cocks for in-line field testing, and an air gap drain funnel. Maximum water temperature range 33 to 140 degrees F, maximum rated working pressure 175 psi.
  - 1. Size: 2" inch.

## 2.11 BACKFLOW PREVENTERS, THREADED ENDS:

- 1. Manufacturers:
  - a. Watts, Model 009.
- 2. Reduced Pressure Backflow Preventers: ASSE 1013; bronze body with bronze internal parts and stainless steel springs; two independently operating, spring



loaded check valves; pressure relief valve located between check valves; third check valve opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two ball valves, strainer, and four test cocks.

#### 2.12 PRESSURE GAUGE

- A. Manufacturer: Reotemp Instruments.
- B. ANSI B40.1, Grade A, 1 percent full scale accuracy, minimum 2 1/2 inch dial, phenolic or steel case, phosphor bronze bourden tube and 1/4 inch NPT brass bottom connection. Furnish with brass ball valve.
  - 1. Range: 0-200 psi .

#### 2.13 EXPANSION TANK

- A. Manufacturer: Amtrol
- B. Construction: Welded steel, ASME tested and stamped; rated for working pressure of 125 psig (860 kPa), with flexible diaphragm sealed into tank, and steel legs or saddles. Accessories: Pressure gage and air-charging fitting and drain.

#### 2.14 CIRCUIT SETTER BALANCE VALVES

- A. Manufacturer: Bell and Gossett
- B. Construction: Valves to be of bronze/brass body ball valve construction with glass and carbon filled TFE seat rings. Valves to have differential pressure read out ports across valve seat area. Read out ports to be fitted with internal EPT insert and check valve. Valve bodies to have 1/4" NPT tapped drain/purge port. Valves to have internal memory stop to allow valve to be closed for service without disturbing the balance position. Valves to be leak-tight at full rated working pressure.

#### 2.15 TRAP PRIMERS

- A. Manufacturer: J.R. Smith
- B. Cast bronze with 1/2" connection and anti-siphon port

#### 2.16 WATER HAMMER ARRESTORS

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. Stainless steel construction, bellows type, pre-charged suitable for operation in temperature range -100 to 300 degrees F (-73 to 149 degrees C) and maximum 250 psi (1700kPa) working pressure.

### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.

#### 3.2 INSTALLATION

- A. Comply with Uniform Plumbing Code (IAMPO).

- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls
- D. Install piping to maintain headroom and neither interfere with use of space nor take more space than necessary.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide access where valves and other equipment are not exposed.
- H. Install valves with stems upright or horizontal, not inverted.
- I. Pipe relief from safety valves and backflow preventers to nearest floor drain.
- J. Slope water piping and provide drain valves at low points.
- K. Pressure test piping system in accordance with Section 15992.
- L. Label piping system in accordance with Section 15075.
- M. Insulate piping system in accordance with Section 15080.
- N. Support piping system in accordance with Section 15060.
- O. Sleeve and caulk pipes penetrating exterior walls or interior bearing walls. Provide waterproof installation for exterior walls. Provide UL/FM approved through-penetration fire stop system when penetrating fire-rated barriers (i.e., walls, floors, etc.).
- P. Paint exposed piping in occupied spaces to match background color.
- Q. Install chrome-plated steel escutcheons where pipes are not insulated in finished areas.
- R. Provide stops on waterlines for plumbing fixtures.
- S. Above Grade Piping: Provide ball valves or gate valves in piping 2 inches and smaller and butterfly valves in piping 2 1/2 inches and larger. Provide globe valves for throttling application.

END OF SECTION

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MECHANICAL : DIVISION 15

## SECTION 15150: SANITARY WASTE AND VENT PIPING

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Building piping, fittings, and accessories within 5 feet of building wall.

## 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Catalog data on pipe materials, fittings and accessories.

## PART 2 PRODUCTS

## 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

## 2.2 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

- . Cast Iron Pipe and Fittings: ASTM A74 service weight, bell and spigot ends.
  - 1. Joints: Hub and spigot, CISPI HSN compression type with ASTM C564 rubber gaskets.
- A. PVC Pipe and Fittings: ASTM D2665, polyvinyl chloride (PVC) material, Schedule 40 DWV.
  - 1. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

## 2.3 SANITARY WASTE AND VENT PIPING, ABOVE GRADE INSIDE BUILDING

- A. Cast Iron Pipe and Fittings: CISPI 301 hubless, service weight.
  - 1. Joints: CISPI 310, neoprene gaskets and stainless steel clamp/shield assemblies.
- B. Cast Iron Pipe and Fittings: ASTM A74 service weight, bell and spigot ends.
  - 1. Joints: Hub and spigot, CISPI HSN compression type with ASTM C564 rubber gaskets.
- C. PVC Pipe and Fittings: ASTM D2665, polyvinyl chloride (PVC) material, Schedule 40 DWV.
  - 1. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
- D. Ductile Iron Pipe: AWWA C151, Class 150, bell and spigot ends.
  - 1. Fittings: AWWA C110, Ductile-Iron or Gray-Iron, Class 350 or AWWA C153, Ductile-Iron Compact Fittings, Class 350.
  - 1. Joints: Hub and spigot, AWWA C111 rubber gaskets.

## 2.4 FLOOR DRAINS

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. Floor Drain: Lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer.

## 2.5 FLOOR SINKS

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. Floor Sink: Square lacquered cast iron body with integral seepage pan, epoxy coated interior, aluminum dome strainer, clamp collar, epoxy coated, nickel bronze frame and full grate.

## 2.6 CLEANOUTS

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. Finished Floor: Lacquered cast iron body with anchor flange, reversible clamping collar, and adjustable nickel-bronze round scored cover in service areas and round depressed cover to accept floor finish in finished floor areas.

## 2.7 ROOF DRAINS

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. Coordinate with roofing type. Lacquered cast iron body with sump. Strainer: Removable metal dome.

## PART 3 EXECUTION

### 3.1 PREPARATION

- . Ream pipe ends and remove burrs.

### 3.2 INSTALLATION

- A. Comply with Uniform Plumbing Code (UPC).
- B. Extend cleanouts to finish floor or wall surface. Lubricate threaded cleanout plugs with non-hardening thread lubricant. Ensure clearance at cleanout for snaking drainage system.
- C. Encase exterior cleanouts in concrete, flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- F. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- G. Install bell and spigot pipe with bell end upstream.
- H. Sleeve and caulk pipes penetrating exterior walls or interior bearing walls. Provide waterproof installation for exterior walls. Provide UL/FM approved through-penetration fire stop system when penetrating fire-rated barriers (i.e., walls, floors, etc.).

- I. Test piping system with water in accordance with Section 15992.
- J. Label piping in accordance with Section 15075.
- K. Support piping in accordance with Section 15060.

END OF SECTION 15150



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MECHANICAL : DIVISION 15

## SECTION 15195: NATURAL GAS PIPING

## PART I GENERAL

## 1.1 SECTION INCLUDES

- A. Building gas piping system (above grade) downstream of the site low-pressure gas regulator station.

## 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Catalog data on pipe materials, pipefittings, valves, pipe coating, and accessories.
  - 2. Certification of welders and qualified welding procedure.

## 1.3 QUALITY ASSURANCE

- A. Welders Certification and Qualified Procedure Standards
  - 1. Interior Steel Pipe: Section IX of ASME Boiler and Pressure Vessel Code.

## PART 2 PRODUCTS

## 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

## 2.2 STEEL PIPING, ABOVE GRADE

- A. Pipe: Standard wall, black steel, ASTM A53. Welded for pipe sizes above 2 inches, threaded for pipe sizes 2 inches or less.
- B. Fittings: Malleable iron, threaded type, ANSI B16.3, Class 150 or standard wall, black steel, butt welding type, ASTM A234, Grade WPB.
- C. Flanges: Steel, weld neck, class 150, raised face, ANSI B16.5.
- D. Gasket Material: Neoprene, durometer hardness 50-65.

## 2.3 VALVES, ABOVE GRADE

- A. Manufacturer: A.Y. McDonald, Series 10685B.
- B. Valve: Iron body, FIP threaded ends, plug style, flat head wrench operated, 100 psig working pressure.

## 2.4 TEST PLUG (PETE's PLUG)

- A. 1/4 inch NPT, brass body, neoprene core, rated for 1,000 psig, complete with sealing cap and gasket, to receive 1/8 inch O.D. probe.

## PART 3 EXECUTION

## 3.1 INSTALLATION

- A. Furnish and install gas piping in accordance with Uniform Plumbing Code, Uniform Mechanical Code, ASME B31.1 Power Piping, and 49 CFR 192 Code of Federal Regulations.
- B. Do not run gas piping below buildings, structures, or in crawl spaces.
- C. Do not run gas piping under walks and equipment pads adjacent to building unless properly sleeved.
- D. Pressure test piping in accordance with Section 15992.
- E. Label piping in accordance with Section 15075.
- F. Paint outside gas regulator piping, valves, and appurtenances above ground to match building exterior.
- G. Support piping in accordance with Section 15060.
- H. Use threaded joints for above grade piping 2 inches and smaller and butt-welded joints for piping above 2 inches.
- I. Sleeve and caulk pipes penetrating exterior walls or interior bearing walls. Provide waterproof installation for exterior walls. Provide UL/FM approved through-penetration fire stop system when penetrating fire-rated barriers (i.e., walls, floors, etc.).

END OF SECTION 15195

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MECHANICAL : DIVISION 15

## SECTION 15410: PLUMBING FIXTURES

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Water closet
  - 2. Lavatories and insulation kits

## 1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Product Data: Submit catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes of fixtures as shown on drawings or identified in these specifications, which ever is applicable.
- B. Manufacturer's Installation Instructions: Submit installation methods and procedures.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

## 1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit fixture, trim, exploded view and replacement parts lists.

## 1.4 QUALITY ASSURANCE

- A. Provide products requiring electrical connections listed and classified by a nationally recognized testing laboratory as suitable for purpose specific and indicated.
- B. Provide ADA compliant products.
- C. Provide water conserving fixtures and fittings complying with the Uniform Plumbing Code.

## PART 2 PRODUCTS

## 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.

## 2.2 TANK TYPE WATER CLOSETS (See Drawings)

## 2.3 WALL HUNG URINALS (Not Applicable)

## 2.4 LAVATORIES

- A. Vitreous China Wall Hung Lavatory: ASME A112.19.2M; vitreous china wall mount lavatory, with 4 inch high back, 21 x 18 inches rectangular basin with splash lip and front overflow.
  - 1. Manufacturer: Kohler, Model K-2005 (4 inch centers), Kingston.
- B. Metered Faucet: ASME A112.18.1; chrome plated metered mixing faucet with 0.5 gpm battery-operated solenoid operator and infrared sensor, aerator, trim plate, open grid strainer, back check for hot and cold supply, and thermostatic mixing valve.
  - 1. Manufacturer: Sloan, Model EBF-85-A, Optima Plus.
- C. Accessories:

1. Chrome plated 17-gage brass P-trap with clean-out plug and arm with escutcheon.
  2. Chrome plated rigid supplies to fixtures with chrome plated brass [loose key] [screwdriver] [wheel handle] stops, reducers, and escutcheons.
  3. Offset waste with perforated open strainer.
  4. Trap and waste insulated and offset to meet ADA compliance.
- D. Wall Mounted Carrier: ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, concealed arm supports, bearing plate and studs.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Verify walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify electric power is available and of correct characteristics.

#### 3.2 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

#### 3.3 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Install fixture supplies with smooth bends and no kinks.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports or wall carriers and bolts.
- E. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07900, color to match fixture.

#### 3.4 INTERFACE WITH OTHER PRODUCTS

- A. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough in and installation.

#### 3.5 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

#### 3.6 CLEANING

- A. Clean plumbing fixtures and equipment.

#### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit use of fixtures before final acceptance.

END OF SECTION 15410

## MECHANICAL : DIVISION 15

## SECTION 15710: HYDRONIC PIPING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Related Documents:
1. Drawings and general provisions of the Subcontract apply to this Section.
  2. Review these documents for coordination with additional requirements and information that apply to work under this Section.
- B. Section Includes:
1. Hot water piping system.
  2. Chilled water piping system.
  3. Tower water piping system.
  4. Low conductivity water piping system.
  5. Treated water piping system.
  6. Boiler feed water.
  7. Boiler blow off and drain.
  8. Condensate drain.
- C. Related Sections:
1. Division 01 Section "General Requirements."
  2. Division 01 Section "Special Procedures."
  3. Division 31 Section "Excavation".
  4. Division 31 Section "Backfilling".
  5. Division 31 Section "Trenching."
  6. Division 26 Section "Cathodic Protection".
  7. Division 40 Section "Corrosion Protection".
  8. Division 09 Section "Painting".
  9. Division 23 Section "Expansion Fittings and Loops for HVAC Piping".
  10. Division 23 Section "Hangers and Supports for HVAC Piping and Equipment".
  11. Division 23 Section "Identification for HVAC Piping and Equipment".
  12. Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment".
  13. Division 23 Section "HVAC Piping Insulation".
  14. Division 23 Section "HVAC Equipment Insulation".
  15. Division 23 Section "Hydronic Specialties".

## 1.2 REFERENCES

- A. General:
1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
  2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
  3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
  4. Refer to Division 23 Section "Common Results for HVAC" for codes and standards, and other general requirements.



- B. American National Standards Institute (ANSI):
  - 1. ANSI/ASME B31.9 Piping and Piping Systems
  - 2. ANSI/AWS A5.8 Brazing Filler Metal
  - 3. ANSI B2.1 Pipe Threads (Except Dryseal)
  - 4. ANSI B16.3 Malleable-Iron Threaded Fittings
  - 5. ANSI B16.5 Pipe Flanges and Flanged Fittings
  - 6. ANSI B16.9 Factory-Made Wrought Steel Buttwelding Fittings
  - 7. ANSI B16.11 Steel Socket Welding Fittings
  - 8. ANSI B16.18 Cast Brass Solder Fittings
  - 9. ANSI B16.22 Wrought Copper and Wrought Bronze Solder Joint Fittings
  - 10. ANSI B16.24 Bronze Flanges and Flanged Fittings
  - 11. ANSI B16.28 Wrought Steel Buttwelding Short Radius Elbows and Returns
  - 12. ANSI B31.2 Fuel Gas Piping
  - 13. ANSI B36.10 Wrought Steel and Wrought Iron Pipe
  
- C. ASTM International:
  - 1. ASTM A 47 Malleable Iron Castings
  - 2. ASTM A 53 Pipe, Steel, Black and Hot Dipped Zinc-Coated, Welded and Seamless
  - 3. ASTM A 106 Seamless Carbon Steel Pipe for High-Temperature Service
  - 4. ASTM A 120 Pipe, Steel, Black and Hot Dipped Zinc-Coated, Welded and Seamless, for Ordinary Uses
  - 5. ASTM A 181 Forgings, Carbon Steel for General Purpose Piping
  - 6. ASTM A 197 Cupola Malleable Iron
  - 7. ASTM A 234 Piping and Fittings of Wrought Carbon Steel and Alloy Steel For Moderate and Elevated Temperatures
  - 8. ASTM B 32 Solder Metal
  - 9. ASTM B 62 Composition Bronze or Ounce Metal Castings
  - 10. ASTM B 88 Seamless Copper Water Tube
  
- D. National Fire Protection Association (NFPA)
  - 1. NFPA 31 Oil Burning Equipment
  - 2. NFPA 51 Oxygen-Fuel Gas Systems for Welding and Cutting
  - 3. NFPA 58 Liquefied Petroleum Gases, Storage and Handling
  
- E. Sheet Metal and Air Conditioning Contractors National Association SMACNA Guidelines for Seismic Restraints of Mechanical Systems.

### 1.3 SUBMITTALS

- A. Submit under provisions of Division 23 Section "Common Results for HVAC, Review of Materials" and Division 01 Section "General Requirements."
  
- B. LEED Submittals:
  - 1. Product Data for Credit EQ 4.1: For solvent cements and adhesive primers, including printed statement of VOC content.

1.4 QUALITY ASSURANCE

- A. Welding: The Subcontractor is responsible for the quality of welding done by its organization, and shall conduct the required qualification tests to qualify the welding procedures and welders in accordance with ASME/ANSI -B31.3, ASME/ANSI B31.9. Provide welding procedures for LBNL review.
- B. Valves: Manufacturer's name and pressure rating shall be marked on the valve body.
- C. Welders Certification: In accordance with ANSI/AWS D1.1 and AWS/API- 1104. The subcontractor shall provide welder's certificate indicating the welder's qualification for conducting welds on the specific materials provided for the project.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Division 01 Section "Special Procedures."
- B. Deliver and store valves in shipping containers with labeling in place

PART 2 - PRODUCTS

2.1 MATERIAL SCHEDULE

- A. Refer to following subparts for complete material specifications for each pipe class specified below.

Piping System	Material Specification
Chilled Water Supply & Return 3 inches (75 mm) or less	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Chilled Water Supply & Return 4 inches (100 mm) or larger	Pipe Class BS2, (black steel)
Indoor Tower Water Supply & Return 3 inches (75 mm) or less	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Indoor Tower Water Supply & Return 4 inches (100 mm) or larger	Pipe Class BS2, (black steel)
Above Grade Tower Water Supply & Return	Pipe Class BS2, (black steel)
Below Grade Tower Water Supply and Return	Pipe Class BS2, (black steel) with cathodic protection per Division 26 Section "Cathodic Protection" and wrapping per Division 40 Section "Corrosion Protection."
Below Grade Tower Water Makeup	Pipe Class BS2, (black steel) with cathodic protection per Division 26 Section "Cathodic Protection" and wrapping per Division 40 Section "Corrosion Protection."

Treated Water Supply & Return	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Low Conductivity Water Supply & Return	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Heating Hot Water Supply & Return 3 inches (75 mm) or less	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Heating Hot Water Supply & Return 4 inches (100 mm) or larger	Pipe Class BS2 (black steel)
Boiler Feedwater	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Boiler Blowoff & Drain	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E
Condensate Drain	Pipe Class C1, Type L with soft solder per Paragraph 2.04.E

## 2.2 PIPE CLASS BS2: BLACK STEEL PIPE AND FITTINGS

- A. Pipe: Black Steel, welded or seamless wall pipe, schedule 40 ASTM A 120 or A 53, ANSI B36.10. Welded joints.
- B. Fittings:
  - 1. Pipe Sizes 2 Inch or Smaller: Socket-welding fittings, 2000 lb, ASTM A 181, ANSI B16.11.
  - 2. Pipe Sizes 2-1/2 Inch or Larger: Butt-welding fittings, schedule 40, ASTM A 234, ANSI B16.9. Short radius elbows (ANSI B16.28) will be allowed on gas piping systems, but long radius elbows are preferred and shall be used on other piping systems.
- C. Flanges: Slip-on or weld-neck type, 150 lb (68 Kg), raised face, carbon steel, ASTM A 181, Grade 1, dimensions in accordance with ANSI B16.5.
- D. Unions:
  - 1. Pipe Sizes 2 Inch or Smaller: 150 lb, screwed, black, malleable iron, ground joint, brass to iron seat.
  - 2. Pipe Sizes 2-1/2 Inch or Larger: Use flanges.

- E. Local Connections (2 inches or smaller): Threaded joints using 150 lb (68 Kg), black, banded, threaded, malleable iron fittings may be used for exposed local connections. Fittings shall conform to ANSI B16.3, dimensions, ASTM A 197, materials, ANSI B2.1, threads.

2.3 PIPE CLASS C1: COPPER TUBE AND FITTINGS (TYPE K OR L)

- A. Tubing: Copper tubing, hard drawn temper, type K or type L, as specified, ASTM B 88. Soldered joints.
- B. Fittings: Wrought copper, socket solder-type joint, ASTM B 88 and ANSI B16.22. Couplings shall be of the staked stop type.
- C. Flanges: Socket solder-type joint. 150 lb (68 Kg), plain (flat) face, cast bronze, ASTM B 62. Dimensions shall be in accordance with ANSI B16.24.
- D. Unions: Socket solder-joint ends, cast bronze, ASTM B 62. Dimensions shall be in accordance with ANSI B16.18.
- E. Solder: 95 percent tin, 4 percent copper, 0.5 percent silver, with non-acid flux. 95-5 tin antimony solder is not allowed. Solder with lead content is not allowed. Use silver brazing alloy, as scheduled. or silver brazing alloy, as specified. All solder joints of piping that convey flammable materials shall be made with brazing alloys having melting points above 1000 deg F (538 deg C), (ANSI B31.2; NFPA 51, 31, 58). Silver brazing alloy shall be ANSI/AWS A5.8, classification BCUP-5 containing 15 percent silver, 80 percent copper, 5 percent phosphorous.

2.4 GROOVED JOINT PIPING SYSTEMS

- A. Grooved joint piping systems may be used as option to welding. If a grooved joint piping system is selected, it must be used exclusively, except in special cases where welding is essential.
- B. Grooved Joint Couplings: Victaulic 07 rigid grooved end joint couplings for steel pipe, and 606 rigid grooved end joint coupling for copper pipe, , Grinnell or equal. Units shall be clamp-on and secured with two bolts rated up to 750 PSI. Gaskets shall be EPDM rated up 230 deg F (110 deg C) service.
  - 1. Use only for above-grade chilled water, tower water, treated water, and heating hot water.
- C. Grooved End Pipe Fittings: Victaulic, Grinnell, Gustin-Bacon, or equal. Allowable items are limited to pipe, radius turns, tees, valves, and strainers. Strap-on tees, etc. are not allowed. Grooved piping system manufacturers must be ISO 9001 certified. Gaskets must be manufactured under ISO 9001 certification
- D. Grooved system components must be from the same manufacturer.
- E. Galvanized outdoors.

2.5 VALVE SCHEDULE

Service	Size	Type
	3 inches (75 mm) or smaller	VB-1.01 Ball Valve
	4 inches (200 mm) and larger	VB-2.01 Butterfly Valve

Service	Size	Type
HHW, CHW, TRW, TW, LCW, COND, 200 psig non- shock	2 inches (50 mm) or smaller	VB-5.01 Balance/Shutoff VB-6.01 Swing Check VB-7.01 Circuit Balancing Valve
	2-1/2 inches (63 mm) or larger	VB-5.02 Balance/Shutoff VB-6.02 Spring Loaded Check

2.6 BALL VALVES

A. Type VB-1.01 (through 3 inches): 3-piece construction, threaded bronze body with stainless steel or chrome plated brass ball, Teflon seats and packing, blowout-proof stem, 600 PSI WOG. Full port sizes through 2-1/2 inch and conventional port size for 3 inches. Install increasing and reducing fittings as required. Provide extended stem where required to clear insulation. All valves for the natural gas systems shall be AGA certified and UL listed. Red-White, NIBCO T-595-Y-66 through 2-1/2 inches and NIBCO T-590-V for 3 inches, or equal.

2.7 BUTTERFLY VALVES

A. Type VB-2.01: Iron body, aluminum bronze ASTM B-148 alloy 9-C disc, Type 410 stainless steel stem and steel operating handle. All valves shall have full lug style bodies and extended stem so that handle clears the insulation. Valves shall have seven (7) positions to positively lock the valve disc against turning including a positive stop at "OPEN" and "CLOSED" positions. Butterfly valves for throttling and balancing service shall be complete with throttling handle capable of locking in position from "FULL OPEN" to "FULL CLOSED", position indicator, marked dial plate, and built-in concealed set screw type memory stop. All valves shall have EPDM seats suitable for 250-degree F (121 deg C) water service. Valve shall close bubble tight against 150 psig, 200 deg F (93 deg C) water. Valves shall be fitted between specified flanges and bolted with specified threaded studs, hex nuts and lock washers. All valves shall have a means of mechanically locking in final fixed position. NIBCO CD-2000, DEMCO Series NE, or equal.

1. Where required, provide electric actuators for air suitable for tight shut-off against 150 PSIG water. Include actuator, linkage, mounting assembly and controls. See Drawings.

2.8 CHECK VALVES

A. Type VB-6.01 (1/4 inches to 3 inches): 125-psig SP/200-psig WOG, swing type, bronze body, renewable bronze disc, screwed ends. Lunkenheimer No. 2144, Jenkins 92A, Stockham No. B-319, or equal.

B. Type VB-6.02 (2 inches to 8 inches): 150-psig, spring-loaded clapper, nonslam operation, wafer-type body of ductile iron, with type 316 stainless steel seat or viton seat seals. Use plastic lined, nickel or chromium plated bodies for LCW service. K & F Machine & Mfg. Co. series CV-3 (DEMCO), Mission DUO-CHEK, or equal.

2.9 CIRCUIT BALANCING VALVES

A. VB-7.01: Mult-turn, globe style circuit balancing valve. Valve body shall be threaded bronze for sizes up to 2 inches, and flanged cast iron for larger sizes. Valve shall provide tight shut-off against a working pressure of 200 PSI at 250 degrees F. Flow measuring taps shall provide positive shut-off against system pressure and be suitable for quick connection to a portable differential pressure meter. Valve shall have a vernier type ring scale with at least four 360-degree turns between full open and full closed, and a

memory stop locking device. Insulate valve with removable formed block insulation. Armstrong, CBV, Tour and Anderson, Nibco, or equal.

1. Furnish one portable electronic meter kit, Armstrong Compuflo or equal, with dual pressure gauges, hose connections and same pressure/temperature rating as circuit balancing valve. Furnish two bound copies of full size flow charts. Meter kit shall be made available to balancing contractor hired by University, and after testing and balancing, shall become property of the University.

## 2.10 AIR VENT VALVES

- A. Provide and install manual air vents, Crane 88, Lunkenheimer 906-BS, or equal, in hot-water heating and chilled-water cooling systems at locations shown on drawings, at high points, and other points necessary to free the piping system of air. The air vent assemblies shall consist of 1/4-inch copper tubing connected to the top of the high point, or other location, and extended down to easily accessible 1/4-inch globe valves mounted, grouped and tagged, approximately 5 feet above the floor. The valves shall individually discharge through 1/4-inch copper tubing to nearest floor drain, hopper drain, or to the outside, if drain line routing is not shown on the drawings.
- B. Use 1/2-inch (13 mm), automatic-type air vent valves only where specifically shown on the drawings; Bailey 241, Armstrong 1-AV, or equal. The automatic valves shall be installed on a short, 3/4-inch minimum, riser with globe valve in riser. A full-sized copper tubing drain line shall be provided from the automatic valve to the nearest floor drain, hooper drain, or to the outside if drain line routing is not shown on the drawings.

## 2.11 LUBRICATED GAS COCKS

- A. Over 2-inch size: Homestead 602, Nordstrom 115, or equal lubricated semi-steel, 150 PSI, flanged (for 2 inches and under, use specified ball valves); AGA certified and UL listed.

## 2.12 GAUGE COCKS

- A. Use specified ball valves.

# PART 3 - EXECUTION

## 3.1 PREPARATION



- A. Six-inch pipes, fittings, and valves may be used in lieu of 5-inch, when 5-inch sizes are not available and only with the approval of the University.
- B. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- C. Remove scale and dirt on inside and outside before assembly.
- D. Prepare piping connections to equipment with flanges or unions.
- E. After completion, fill, clean, and treat systems. Refer to Division 23 Section "HVAC Water Treatment".

### 3.2 INSTALLATION

- A. Route piping plumb and parallel to building structure and maintain gradient.
- B. Install piping to conserve building space, and not interfere with use of space and other work.
- C. Group piping whenever practical at common elevations.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Division 23 Section "Expansion Fittings and Loops for HVAC Piping".
- E. Provide clearance for installation of insulation, and access to valves and fittings.
- F. Provide access where valves and fittings are not exposed.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Prepare pipe, fittings, supports, and accessories for finish painting. Refer to Division 09 Section "Painting".
- J. Install valves with stems upright or horizontal, not inverted.
- K. Perform excavation, trenching, and backfilling for buried pipes per Division 31 Sections "Excavation", "Trenching", and "Backfilling".
- L. Provide buried pipes with cathodic protection per Division 26 Section "Cathodic Protection."
- M. Wrap buried pipes with protective materials per Division 40 "Corrosion Protection."
- N. Perform buried pipe installation per Division 33 Section "Schedules for Water Utilities"<sup>1</sup>.

### 3.3 PIPE JOINT CONNECTIONS

- A. Threaded Pipe: Use Crane No. JC-40, Rector Seal No. 5, or equal, for general service applications, temperatures from -50 to +400 deg F (-45 deg C to 204 deg C), metal or plastic

threads, nontoxic, nonhardening, gas pressures to 2600 psi (18 MPa), liquid pressures to 10,000 psi (69 MPa).

- B. Copper Tubing with Solder Joint Fittings: Use silver brazed joints for piping located in or under concrete slab on ground, condensate piping located in underground conduits and manholes, and for attaching "Brazolet" fittings for service.
1. Silver brazing alloy shall comply with ANSI/AWS A5.8, class BCUP-5. Use care in silver brazing to prevent overheating of pipe and fittings. Disassemble solder type valves before silver brazing and keep bodies cool.
  2. Make other joints with soft solder per Paragraph 2.04.E.
- C. Grooved Joint Coupling Systems:
1. Install only on piping systems allowed.
  2. Install in accordance with manufacturer's recommendations.
  3. Cut grooves are acceptable, all sizes.
  4. Rolled grooves are acceptable for pipe sizes 3 inches (75 mm) and larger.
  5. Only standard full flow, long radius fittings and specified couplings are acceptable. Clamp-on, drilled-in tee connections are specifically prohibited.
  6. Use specified valves.
  7. Indicate extent of welding, if still required.
  8. Coordinate insulation and jacketing requirements.

#### 3.4 DIELECTRIC INSULATING FITTINGS

- A. Insulating unions or flanges shall be provided at locations described herein unless noted otherwise.
- B. A shutoff valve shall be provided locally, upstream of dielectric insulating fittings, so that repairs can be made easily on these fittings.
- C. Locations requiring insulating couplings or flanges are as follows:
1. At connection points where copper water lines connect to steel domestic water heater tanks.
  2. At points in water lines where ferrous and other dissimilar metallic pipes are connected together.
  3. In metallic water and gas service connections into each building within 5 feet of the building wall. Install adjacent to the shutoff valve or cock, and aboveground where possible.
  4. Where steel or cast iron pipe in the ground connects to copper or brass piping above the ground, the transition from steel or cast iron pipe to the copper or brass pipe shall be made aboveground in an accessible location.
  5. Where copper or brass piping is connected to steel or cast iron piping and the connection is buried in the ground, the connection shall be covered with a protective coal tar tape wrap extending outward at least 5 feet on pipes, from the point of connection. The tape shall be Protecto Wrap No. 200, or equal. A primer, specifically designed for use with the tape, shall be used. The piping shall be thoroughly cleaned before tape or primer is applied.

## 3.5 VALVE INSTALLATION

- A. Piping systems shall be supplied with valves at points shown on the drawings or herein specified, arranged so as to give shut-off and regulating control of piping systems throughout the building.
- B. Valves shall be the full size of the line in which they are installed.
- C. Valves shall be installed in neat arrangements with accessibility for maintenance. No valve shall be installed with its stem pointing down. Globe valves may be installed with stems horizontal, but the preferred position is vertical. All globe and angle valves shall be installed to close against pressure.

## 3.6 PIPE SLEEVES

- A. On existing concrete construction, holes for new piping shall be made with power-driven circular cutters. No pipe sleeves are required.
- B. On new concrete construction, provide pipe sleeves where piping passes through concrete floors, walls, or ceilings. Extend sleeve for the full thickness of the concrete with 1/2-inch clearance around pipe for insulation.
- C. On pipe penetrations below grade, caulk space between pipes and pipe sleeves with oakum and mastic, and make watertight.
- D. On other floor and wall locations, secure sleeves to forms so they will not become displaced during pouring of concrete. Fill metal or fiber sleeves on decks with sand. Remove sleeves from openings after removal of forms. Cut-in proper sized holes in concrete to replace sleeves crushed or knocked out of position during pouring of concrete. Caulk space around pipe with mastic and oakum.

## 3.7 SEISMIC RESTRAINTS

- A. Ductwork, piping, and mechanical equipment, with or without vibration isolation, shall be provided with seismic restraints in accordance with Division 01 Section "Lateral Force Procedures."

END OF SECTION 15710

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**PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Heat Pumps.
- B. Related Sections:
  - 1. Section 15080 - Mechanical Insulation: Product requirements for power ventilators for placement by this section.
  - 2. Section 15810 - Ducts: Product requirements for hangers for placement by this section.
  - 3. Section 15820 - Duct Accessories: Product requirements for duct accessories for placement by this section.

**1.2 REFERENCES**

- A. American Bearing Manufacturers Association:
  - 1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
  - 2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- B. Air Movement and Control Association International, Inc.:
  - 1. AMCA 99 - Standards Handbook.
  - 2. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
  - 3. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
  - 4. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- C. National Electrical Manufacturers Association:
  - 1. NEMA MG 1 - Motors and Generators.
- D. Underwriters Laboratories Inc.:
  - 1. UL 705 - Power Ventilators.

**1.3 SUBMITTALS**

- A. Section 01330 - Submittal Procedures: Submittal procedures.
  - 1. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.
  - 2. Product Data: Submit data on fans and accessories including fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
  - 3. Manufacturer's Installation Instructions: Submit fan manufacturer's instructions.
  - 4. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

**1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Protect motors, shafts, and bearings from weather and construction dust.

## 1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

## PART 2 PRODUCTS

## 2.1 HEAT PUMPS

- A. Manufacturers:
  - 1. Trane
  - 2. FHP Manufacturing
  - 3. Carrier
  - 4. McQuay
- B. Product Requirements:
  - 1. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
  - 2. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
  - 3. Fabrication: Conform to AMCA 99.
  - 4. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.

## C. Construction

Equipment shall be completely assembled, piped, internally wired, fully charged with R-410A refrigerant and test operated at the factory. Filters, thermostat field interface terminal strip, and all safety controls are furnished and factory installed. The system water inlet and outlet connections shall be female NPT composed of copper. The 5-ton and below equipment shall contain ETL, CETL and ISO-ARI 13256-1 listings and labels prior to leaving the factory. Units meet the efficiency standards of the ASHRAE 90.1-2010 standard. Service and caution area labels shall also be placed on the unit in their appropriate locations.

**Air-to-Refrigerant Coil**

Internally finned, 3/8-inch copper tubes mechanically bonded to a configured aluminum plate fin shall be standard. Coils shall be leak tested at the factory to ensure the pressure integrity. The coil shall be leak tested to 450 psig and pressure tested to 650 psig. The tubes are to be completely evacuated of air and correctly charged with proper volume of refrigerant prior to shipment.

The refrigerant coil distributor assembly shall be of orifice style with round copper distributor tubes. The tubes shall be sized consistently with the capacity of the coil. Suction header shall be fabricated from rounded copper pipe.

A thermostatic expansion valve shall be factory selected and installed for a wide range of control.

**Basic Controls (option)**

The basic control package shall contain a low and high pressure switch, overflow switch and freeze protection along with a compressor lockout relay for control assistance. High voltage power connections shall be made at the equipment's contactor. Each device shall be factory mounted, wired, and tested in the equipment and include freezestat, 50 VA

transformer and compressor contactor.

### **Cabinet**

Unit casing shall be constructed of zinc coated, heavy gauge, galvanized steel.

Service to the refrigerant and controls shall be provided through a single access panel at the front of the equipment. Access to the refrigerant and controls for the larger units shall be provided through the front and side access panels.

All panels shall be insulated with ½-inch thick dual density bonded glass fiber. The exposed side is a high density erosion proof material suitable for use in air streams up to 3600 feet per minute (FPM). The insulation meets the erosion requirements of UL 181. It has a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

Access for inspection and cleaning of the unit drain pan, coils and fan section shall be provided. The unit shall be installed for proper access.

### **Hanging Rod Grommets**

Four rubber grommets are enclosed with every GEH\* unit. These grommets are to be used in conjunction with unit hanging rods to isolate vibration.

### **Compressors**

The unit shall contain a high efficiency rotary or scroll compressor. External vibration isolation shall be provided by rubber mounting devices located underneath the mounting base of the compressor. A second isolation of the refrigeration assembly shall be supported under the compressor mounting base.

Internal thermal overload protection shall be provided. Protection against excessive discharge pressure shall be provided by means of a high pressure switch. A loss of charge shall be provided by a low pressure safety.

### **Deluxe Controls (option)**

The deluxe control packages shall provide a 50 VA transformer (fused) or 75 VA transformer with circuit breaker, low and high pressure switch, condensate overflow and freeze protection. The controller shall include a lockout function, anti-short cycle compressor protection, random start delay, brown-out protection, low pressure time delay, compressor delay on start and an open relay. Hot gas reheat and electric heat shall also be provided. Three LEDs (light emitting diodes) shall also be included for diagnostics of the equipment.

### **Drain Pan**

The condensate pan shall be constructed of corrosion resistant material and insulated to prevent sweating. The bottom of the drain pan shall be sloped on two planes which pitches the condensate to the drain connection. The drain pan shall be flame rated per UL945V-B. A UL508 float switch shall be installed on all units to protect against the overflow of condensate from the drain pan.

### **Economizing Coil (GEH Option)**

The waterside economizing package shall be an external unit accessory pre-piped and pre-wired ready for turn-key installation to the unit. The economizing coil shall be designed to perform with the WSHP at unit measured flow rate of 80.6°F DB/66.2°F WB with 45°F EWT.

All hydronic coils shall be of 5/8 in. copper and aluminum plate fin combination. All coils shall be proof and leak tested from the manufacturer. The proof test shall be performed at 1.5 times the maximum operating pressure and the leak test at the maximum operating pressure.

A dual sloped noncorrosive drain pan shall be easily accessible and cleanable for the hydronic economizing coil.

An electronic two-position, 3-way valve shall meter water flow to the economizing coil during the economizing mode. It shall be factory set to energize the economizing mode at 55°F, while simultaneously halting mechanical operation of the compressor.

Hanging brackets with rubber isolation shall be provided for the horizontal version of the economizing coil option. The bracket design shall be the same throughout the equipment.

### **Electrical**

The unit control box shall contain all necessary devices to allow heating and cooling operation to occur from a remote wall thermostat. These devices shall be as follows:

- 24 Vac energy limiting class II [50 VA (minimum) transformer]
- 24 Vac blower motor relay
- 24 Vac compressor contactor for compressor control
- Field thermostat connections shall be provided for ease of hook-up to a terminal strip located in the unit's control box.
- Lockout function controls cycling of the compressor shall be provided to protect the compressor during adverse operating conditions. The device may be reset by interrupting power to the 24Vac control circuit. Reset may be done either at a remote thermostat or through a momentary main power interruption
- A high pressure switch shall protect the compressor against operation at refrigerant system pressures exceeding 650 psig.
- Factory installed wire harness shall be available for the Basic, Deluxe, ZN524 and UC400 control packages.

Nameplate information shall be provided for the application of either time-delay fuses or HACR circuit breakers for branch circuit protection from the primary source of power.

### **Filters**

Units come standard with a flat filter rack for non-ducted return air applications. One-inch throwaway filters are standard. Two-inch throwaway, two-inch MERV 8 or 13 filters are available as an option. An optional ducted filter box is available as a field installed accessory.

### **Indoor Fan**

The blower shall be a forward-curved style wheel with multiple speed combinations available.



All direct drive motors shall have sealed bearings that do not require field lubrication. The motor has a permanent split capacitor with thermal overload protection. Options of standard static or high static can be selected. The motor contains a quick disconnect plug. They are constructed of corrosion resistant galvanized material. Removal of the motor and fan wheel can be made with the assistance of a factory provided orifice ring device. This device attaches the wheel and motor to the fan housing in a single assembly eliminating the need for access to the set screw on the backside of the fan hub.

The fan shall be placed in a draw-through configuration. They shall be constructed of corrosion resistant galvanized material.

#### **Orifice Ring**

Removal of the motor and fan wheel for the ½-5-ton units shall be made with the assistance of a factory provided orifice ring device. This device shall attach the wheel and motor to the fan housing in one assembly providing single side service access.

#### **Refrigerant Circuits**

The refrigerant circuit shall contain a thermal expansion device. Service pressure ports shall be factory supplied on the high and low pressure sides for easy refrigerant pressure or temperature testing.

#### **Refrigerant Tubing**

The refrigerant tubing shall be of 99% pure copper. This system shall be free from contaminants and conditions such as drilling fragments, dirt and oil. All refrigerant and water lines shall be insulated with an elastomeric insulation that has a 3/8-inch thick wall in the air-side section of the unit.

#### **Sound Attenuation**

Sound attenuation shall be applied as a standard feature in the product design. The sound reduction package shall include vibration isolation to the compressor and water-to-refrigerant coil, unit base stiffeners, insulated metal compressor enclosure, and a second stage of vibration isolation to the compressor and water-to-refrigerant base pan.

#### **Water-to-Refrigerant Heat Exchanger**

The water-to-refrigerant heat exchanger shall be of a high quality co-axial coil for maximum heat transfer. The copper or optional cupro-nickel coil shall be deeply fluted to enhance heat transfer and minimize fouling and scaling. The coil shall have a working pressure of 400 psig. The factory shall provide rubber isolation to the heat exchanging device to enhance sound attenuation.

- D. Accessories:
  - 1. Disconnect Switch: Factory-wired, non-fusible, in housing for thermal overload protected motor or solid-state speed controller.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.

### 3.2 INSTALLATION

- A. Suspended Cabinet Fans: Install flexible connections specified in Section 15820 between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch (25 mm) flex between ductwork and fan while running.
- B. Pipe scroll drains to nearest condensate drain piping.

### 3.3 CLEANING

- A. Section 01700 - Execution Requirements: Requirements for cleaning.
- B. Vacuum clean coils and inside of fan cabinet.

### 3.4 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

### 3.5 PROTECTION OF FINISHED WORK

- A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 15760

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MECHANICAL: DIVISION 15

SECTION 15075: PACKAGED AIR CONDITIONERS

1.0 GENERAL

1.1 SECTION INCLUDES

- A. Packaged roof top air conditioning units.

1.2 SUBMITTALS

- A. Shop Drawings and Product Data: Provide for manufactured products and assemblies required. Indicate water, drain, electrical, and refrigeration rough in connections.
- B. Submit manufacturer's installation instructions.
- C. Operating and Maintenance Instructions: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listing.

1.3 MAINTENANCE

- A. Furnish complete service and maintenance of packaged roof top air conditioning units for one year of service call, provide work order or report, and include description of work performed.
- B. Provide one extra set of filters.

2.0 PRODUCTS

2.1 PACKAGED ROOF TOP AIR CONDITIONING UNITS

- A. Manufacturers:
  - 1. York
  - 2. Carrier.
  - 3. Lennox.
  - 4. McQuay.
- B. Unit: Self-contained, packaged, factory assembled and pre-wired unit, consisting of cabinet and frame, supply fan, heat exchanger and burner, controls, air filters, refrigerant cooling coil and compressor completely contained within cabinet, condenser coil, condenser fan and hail guards.
- C. Cabinet: Galvanized steel with baked enamel finish, access doors or removable access panels with quick fasteners, screwdriver operated flush cam type.

- D. Insulation: One inch thick neoprene coated glass fiber.
- E. Heat Exchangers: Aluminized steel, of welded construction.
- F. Supply Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch motor pulley, and rubber isolated hinge mounted motor or direct drive.
- G. Air Filters: One inch thick glass fiber disposable media in metal frames.
- H. Gas Burner: Atmospheric type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame sensing device, automatic 100 percent shut-off pilot, and high limit control. Temperature sensor sensing bonnet temperatures independent of burner controls, energizes fan.
- I. Evaporator Coil: Copper or aluminum tube fin coil assembly with capillary tubes or thermostatic expansion valves, galvanized drain pan and connection.
- J. Compressor: Hermetic or semi-hermetic compressor, 3600 rpm, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gage ports, and filter drier.
  - 1. Outdoor thermostat shall energize compressor above 57 degrees F ambient.
  - 2. Step Capacity Control: Cycling multi- speed compressors.
- K. Condenser: Copper or aluminum tube aluminum fin coil assembly with sub-cooling rows, direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide refrigerant pressure switches to cycle condenser fans.
- L. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Outside air damper may be gravity balanced.
- M. Damper Operator: 24 volt with gear train sealed in oil.
- O. Mixed Air Controls: Maintain selected supply air temperature and return dampers to minimum position on call for heating and above 75 degrees F (24 degrees C) ambient.
- P. Low Voltage Thermostat: Controls burner operation, heater stages in sequence with delay between stages, compressor and condenser fan, and supply fan with system selector switch (off-heat-auto-cool) and fan control switch (auto-on).

3.0 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Coordinate installation of units with architectural, mechanical, and electrical work.
- C. Provide initial start-up and shut-down during first year of operation, including routine servicing and check-out.
- D. Mount roof mounted units on 4" concrete pad with ½" rebar, 4" o.c. cross.
- E. Supply units fully charged with refrigerant and filled with oil.
- F. Scheduled performance is based on ARI 210/240 test conditions.

END OF SECTION 15780

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MECHANICAL: DIVISION 15  
SECTION 15810: DUCTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes ductwork, duct cleaning, duct sealing, and.

1.2 PERFORMANCE REQUIREMENTS

- A. No variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
1. Catalog data for duct materials, flexible duct/connectors, sealing materials.
  2. Shop drawings indicating duct layout with pressure classification and sizes, fittings, hangers and supports, seam and joint construction, connections to equipment such as coils, etc., for pressure class ducts 2 inches and greater.
  3. Test Reports indicating pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.4 QUALITY ASSURANCE

- A. Construct ductwork in accordance with SMACNA - HVAC Duct Construction Standards - Metal and Flexible, and NFPA 90A.
- B. Fiberboard duct is not acceptable.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum 3 years experience.
- B. Installer: Company specializing in performing work of this section with minimum 3 years experience approved by manufacturer.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealant.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Comply with Section 01630, Product Options and Substitutions.



## 2.2 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653 galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90.
- B. Fasteners: Rivets, bolts, or sheet metal screws.
- C. Hanger Rod: ASTM A36; steel threaded both ends, threaded one end, or continuously threaded. Use galvanized steel or aluminum, 6061-T6, hangers in contact with aluminum duct.
- D. Hanger Straps: ASTM A653 galvanized steel having G90 zinc coating in conformance with ASTM A90.
- E. Structural Steel Members: ASTM A36 steel. Use aluminum, 6061-T6 or galvanized steel members for aluminum ducts.

## 2.3 DUCTWORK FABRICATION

- A. Fabricate ductwork and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Furnish duct material, gages, reinforcing, and sealing for pressure class indicated.
- B. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide single thickness turning vanes constructed and installed in accordance with SMACNA Standards. Vanes are not required in return air sound trap elbows and transfer ducts.
- C. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard.
- D. Provide, at minimum, rectangular 45-degree entry fittings for rectangular ducts and 45-degree wye takeoffs for round ducts.
- E. Duct sizes noted are inside clear dimensions. For lined ducts, maintain duct sizes inside lining.
- F. Increase duct size gradually, not exceeding 15 degree divergence wherever possible. Do not exceed 30-degree divergence upstream of equipment. Do not exceed 45-degree convergence downstream of equipment.

## 2.4 FLEXIBLE DUCTS (INSULATED, LOW PRESSURE)

- A. Manufacturer: Flexmaster, Type 5.
- B. Duct assembly of a trilaminate of aluminum foil, fiberglass, and aluminized polyester, mechanically locked (no adhesives) into an aluminum helix formed on the ducts outside surface, insulation encased in a fire retardant protective barrier, duct UL listed 181 class 1, and complies with NFPA 90A.
  - 1. Pressure Rating: 6 inches w.g. positive, 4 inches w.g. negative through 16 inches diameter, 1 inch w.g. negative for 18 inches and 20 inches diameter.
  - 2. Rated Velocity: 4000 fpm.
  - 3. Temperature Rating: Minus 20 degrees F to plus 250 degrees F.
  - 4. Insulation: Fiberglass, C factor of 0.23 or less.

## 2.5 FLEXIBLE CONNECTIONS (EXPOSED TO SUN AND WEATHER)

- A. Manufacturer: Ventfabrics, Ventlon.

- B. 24 gage metaledge ventlon (glass fiber coated with hypalon), fire retardant, UL Standard 214, and comply with NFPA-90A.
  - 1. Pressure Rating: 10 inches w.g., negative and positive.
  - 2. Temperature Rating: Minus 10 degrees F to plus 275 degrees F.
  - 3. Weight: 26 oz/sq yd plus or minus 2 ounces.

## 2.6 FLEXIBLE CONNECTIONS (INDOOR)

- A. Manufacturer: Ventfabrics, Ventlon.
- B. 24 gage metaledge ventlon (glass fiber coated with hypalon), fire retardant, UL Standard 214, and comply with NFPA-90A.
  - 1. Pressure Rating: 10 inches w.g. negative and positive.
  - 2. Temperature Rating: Minus 20 degrees F to plus 200 degrees F.
  - 3. Weight: 30 oz/sq yd plus or minus 3 ounces.

## 2.7 SPIRAL ROUND AND FLAT OVAL DUCT

- A. Machine made spiral lock-seam duct with light reinforcing corrugations. Fittings: Welded seam construction, manufactured of at least two gages heavier metal than duct.

## 2.8 DUCT LINER

- A. Manufacturer: Certainteed, Tough Gard with Enhanced Surface.
- B. Composed of long textile type glass fibers with thermosetting resin overlaid with a tough and durable fire resistive black composite surface on the air stream. The air stream surface to contain an EPA registered antimicrobial agent to reduce the potential of microbial growth. Flame spread/smoke developed 25/50 maximum meeting NFPA 90A requirements.
  - 1. Thickness: 1 inch.
  - 2. Velocity Rating: 6000 fpm.
  - 3. Temperature Rating: 250 degrees F.
  - 4. Minimum Density: 1 1/2 pcf.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify sizes of equipment connection before fabricating transitions.

### 3.2 INSTALLATION

- A. Install and support ductwork in accordance with SMACNA HVAC Duct Construction Standards-Metal and Flexible.
- B. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- C. Use double nuts and lock washers on threaded rod supports.
- D. Connect flexible ducts to metal ducts with draw bands.
- E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

- F. Provide factory fabricated balancing dampers with indicating type locking quadrant where noted on drawing.
  - 1. Dampers are not required upstream or downstream of VAV boxes serving only one diffuser.
  - 2. Do not use splitter dampers.
  - 3. Locate balancing dampers as far as possible (recommend no closer than 5 feet) from air terminals to avoid excessive noise.
- G. Provide flexible connections with minimum 1-inch slack immediately adjacent to equipment in ducts associated with fans and motorized equipment.
- H. Limit flexible ductwork to diffusers, terminal units, or light troffer boots, to 5 feet in length.
  - 1. Do not install flexible ductwork upstream of VAV boxes.
  - 2. Provide rigid straight ductwork, 2 duct diameters or a minimum of 12 inches, downstream of VAV boxes.
- I. Provide duct access doors for inspection and cleaning upstream of filters, coils, automatic dampers, and equipment as indicated on drawings. Provide minimum 8 X 8 inch size for hand access, 18 X 18 inch size for shoulder access.
- J. Where indicated, weld or braze duct joints and seams in accordance with AWS D9.1.
- K. Repair damaged galvanized ductwork surfaces (welds, scratches, etc.) by applying minimum 2 coats of a zinc base paint.
- L. Paint exposed ductwork in occupied areas to match surroundings. Refer to Section 09900, Painting.
- M. Provide duct drops to diffuser same size as diffuser neck size.
- N. Provide UL/FM approved through-penetration firestop system when penetrating fire-rated barriers (i.e., walls, floors, etc).
- O. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.
- P. Secure duct liner with mechanical fasteners and adhesive per SMACNA duct liner standards and/or manufacturer's installation specifications. Coat all raw exposed edges per manufacturer's instructions.
- Q. Insulate ductwork in accordance with 15080.

### 3.3 CLEANING

- A. After completing system installation and inspection, vacuum ducts to remove dust and debris.

### 3.4 DUCTWORK PRESSURE CLASSIFICATION

- A. Construct each duct system for a minimum pressure classification of 1 inch w.g., and as follows:
  - 1. Supply Ducts: 3-inch w.g. pressure duct from air handling unit to VAV terminal unit.
  - 2. Supply Ducts: 2 inches pressure duct from VAV terminal unit to diffuser.
  - 3. Return Ducts: 2 inches w.g., negative pressure.

4. Exhaust Ducts: 2 inches w.g., negative pressure.

### 3.5 DUCT SEALING

- A. Seal duct seams and joints in accordance to the duct pressure classification as described in SMACNA HVAC Duct Construction Standards-Metal and Flexible.
- B. Do not use pressure-sensitive sealant on ducts with a pressure class of 1 inch w.g. or greater.

### 3.6 DUCT LEAKAGE

- A. Perform leakage tests in accordance with the SMACNA HVAC Duct Leakage Test Manual, using tests forms equivalent to those outlined in manual.
- B. The entire duct system need not to be tested. Tests may be made for only representative sections provided these sections represent at least 25 percent of the total installed duct area for the tested pressure class.
- C. Maximum Allowable Leakage: Comply with the following requirements
  1. Leakage Classification 3 for round and flat oval ducts.
  2. Leakage Classification 12 for rectangular ducts, 2 inches w. g. or less.
  3. Leakage Classification 6 for rectangular ducts, 2-10 inches w.g.
- D. Remake leaking joints and retest to ensure leakage is less than the minimum allowed.

END OF SECTION 15810

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## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Duct access doors.
  - 2. Volume control dampers.
  - 3. Flexible duct connections
  - 4. Duct test holes.
- B. Related Sections:
  - 1. Section 15810 - Ducts: Requirements for duct construction and pressure classifications.

## 1.2 REFERENCES

- A. National Fire Protection Association:
  - 1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
  - 2. NFPA 92A - Recommended Practice for Smoke-Control Systems.
- B. Sheet Metal and Air Conditioning Contractors:
  - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- C. Underwriters Laboratories Inc.:
  - 1. UL 33 - Heat Responsive Links for Fire-Protection Service.
  - 2. UL 555S - Leakage Rated Dampers for Use in Smoke Control Systems.

## 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors, and, duct test holes.
- C. Product Data: Submit data for shop fabricated assemblies including back draft dampers, flexible duct connections, volume control dampers, duct access doors, duct test holes, and, hardware used. Include electrical characteristics and connection requirements.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

## 1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of test holes.

## 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Protect dampers from damage to operating linkages and blades.

### 1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

### 1.8 COORDINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work where appropriate with building control Work.

## PART 2 PRODUCTS

### 2.1 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.
- B. Quadrants:
  - 1. Furnish locking, indicating quadrant regulators on single and multi-blade dampers.
  - 2. On insulated ducts mount quadrant regulators on standoff mounting brackets, bases, or adapters.
  - 3. Where rod lengths exceed 30 inches (750 mm) furnish regulator at both ends.

### 2.2 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.
- B. Connector: Fabric crimped into metal edging strip.
  - 1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric conforming to NFPA 90A, minimum density 30 oz per sq yd.
  - 2. Net Fabric Width: Approximately 2 wide.
  - 3. Metal: 3 inch wide, 24 gage galvanized steel.
- C. Leaded Vinyl Sheet: Minimum 0.55 inch (14 mm) thick, 0.087 lbs. per sq ft (4.2 kg/sq m), 10 dB attenuation in 10 to 10,000 Hz range.

### 2.3 DUCT TEST HOLES

- A. Permanent Test Holes: Factory fabricated airtight flanged fittings with screw cap. Furnish extended neck fittings to clear insulation.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Verify ducts and equipment installation are ready for accessories.
- C. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

### 3.2 INSTALLATION.

- A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 15810 for duct construction and pressure class.
- B. Install duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, and as indicated on Drawings. Install minimum 8 x 8 inch (200 x 200



mm) size for hand access, 18 x 18 inch (450 x 450 mm) size for shoulder access, and as indicated on Drawings

- C. Install permanent duct test holes where required for testing and balancing purposes.

END OF SECTION 15820

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## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Roof exhausters.
  - 2. Cabinet and ceiling exhaust fans.
- B. Related Sections:
  - 1. Section 15080 - Mechanical Insulation: Product requirements for power ventilators for placement by this section.
  - 2. Section 15810 - Ducts: Product requirements for hangers for placement by this section.
  - 3. Section 15820 - Duct Accessories: Product requirements for duct accessories for placement by this section.

## 1.2 REFERENCES

- A. American Bearing Manufacturers Association:
  - 1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
  - 2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- B. Air Movement and Control Association International, Inc.:
  - 1. AMCA 99 - Standards Handbook.
  - 2. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
  - 3. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
  - 4. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- C. National Electrical Manufacturers Association:
  - 1. NEMA MG 1 - Motors and Generators.
- D. Underwriters Laboratories Inc.:
  - 1. UL 705 - Power Ventilators.

## 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
  - 1. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.
  - 2. Product Data: Submit data on fans and accessories including fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.
  - 3. Manufacturer's Installation Instructions: Submit fan manufacturer's instructions.
  - 4. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Protect motors, shafts, and bearings from weather and construction dust.

#### 1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

### PART 2 PRODUCTS

#### 2.1 ROOF EXHAUSTERS

##### A. Manufacturers:

1. Cook
2. Greenheck
3. Acme

##### B. Product Requirements:

1. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
2. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
3. Fabrication: Conform to AMCA 99.
4. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.

##### C. Construction:

1. Fan Unit: V-belt or direct driven as indicated on Drawings, with spun aluminum housing; resilient mounted motor; ½ inch (13 mm) mesh, 0.62 inch (0.62 inch (1.6 mm) thick aluminum wire bird screen; square base to suit roof curb with continuous curb gaskets.
2. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

##### D. Accessories:

1. Roof Curb: 8 high. Self-flashing with continuously welded and factory installed nailer strip.
2. Disconnect Switch: Factory-wired, non-fusible, in housing for thermal overload protected motor or solid-state speed controller.
3. Back-draft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, and blades linked.
4. Disconnect Switch: Factory mount disconnect switch in on equipment.

#### 2.2 CABINET AND CEILING EXHAUST FANS

##### A. Manufacturers:

1. Cook
2. Greenheck
3. Acme

- B. Construction:
  - 1. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with 1/2 inch (13 mm) acoustic insulation, resilient mounted motor, gravity back-draft damper in discharge.
  - 2. Disconnect Switch: Cord and plug in housing for thermal overload protected motor and solid-state speed controller.
  - 3. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.
  - 4. Disconnect Switch: Factory mount disconnect switch in on equipment.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Verify roof curbs are installed and dimensions are as instructed by manufacturer.

#### 3.2 INSTALLATION

- A. Secure fans with cadmium plated lag screws to roof curb structure.
- B. Suspended Cabinet Fans: Install flexible connections specified in Section 15820 between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch (25 mm) flex between ductwork and fan while running.
- C. Install backdraft dampers on inlet to exhaust fans ventilators used in relief air applications.
- D. Provide backdraft dampers on outlet from cabinet and ceiling fans and as indicated on Drawings.
- E. Install safety screen where inlet or outlet is exposed.
- F. Pipe scroll drains to nearest floor drain.
- G. Install backdraft dampers on discharge of exhaust fans and as indicated on Drawings.
- H. Provide sheaves required for final air balance.

#### 3.3 CLEANING

- A. Section 01700 - Execution Requirements: Requirements for cleaning.
- B. Vacuum clean coils and inside of fan cabinet.

#### 3.4 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

#### 3.5 PROTECTION OF FINISHED WORK

- A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 15830

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MECHANICAL: DIVISION 1.5

## SECTION 15850: AIR OUTLETS AND INLETS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Diffusers
  - 2. Registers
  - 3. Grilles
  - 4. Louvers
- B. Related Sections:
  - 1. Section 09900 - Paints and Coatings: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.
  - 2. Section 10210 - Wall Louvers: Wall Louvers.
  - 3. Section 15820 - Duct Accessories: Volume dampers for inlets and outlets.

## 1.2 REFERENCES

- A. Air Movement and Control Association International, Inc.:
  - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
  - 1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.
- C. Sheet Metal and Air Conditioning Contractors:
  - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

## 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
- C. MANUFACTURER'S CERTIFICATE: CERTIFY PRODUCTS MEET OR EXCEED SPECIFIED REQUIREMENTS.

## 1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of air outlets and inlets.

## 1.5 QUALITY ASSURANCE

- A. Test and rate diffuser, register, and grille performance in accordance with ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.

## 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.



## PART 2 PRODUCTS

## 2.1 RECTANGULAR CEILING DIFFUSERS

- A. Type: Square, adjustable pattern, stamped, diffuser to discharge air in four-way pattern.
- B. Frame: Surface mount or Inverted T-bar type. In plaster ceilings, furnish plaster frame and ceiling frame.
- C. Fabrication: Steel with baked enamel off-white finish.

## 2.2 CEILING SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, two-way deflection.
- B. Fabrication: Aluminum extrusions with factory off-white enamel finish.
- C. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face. Only supply OBD's in grilles and registers mounted in hard ceilings.

## 2.3 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4." minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, horizontal face.
- B. Frame: 1 inch margin with countersunk screw mounting.
- C. Fabrication: Steel with 20 gage (0.90 mm) minimum frames and 22 gage (0.80 mm) minimum blades, steel and aluminum with 20 gage (0.90 mm) minimum frame, or aluminum extrusions, with factory off-white enamel finish.
- D. Damper: Integral gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

## 2.4 LOUVERS

- A. Product Description: Stationary, drainable.
- B. Type: 6 deep with blades on 45-degree slope, heavy channel frame.
- C. Fabrication: 16 gage (1.50 mm) thick galvanized steel], welded assembly, with factory prime coat finish.
- D. Bird Screen: Bird screen with 1/2 inch (13 mm) square mesh for exhaust and 3/4 inch (19 mm) for intake.
- E. Insect Screen: Aluminum mesh, set in steel frame.

## PART 3 EXECUTION

## 3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Coordination and project conditions.
- B. Verify inlet and outlet locations.
- C. Verify systems are ready for installation.

## 3.2 INSTALLATION

- A. Install diffusers to ductwork with airtight connection.

- B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly. Refer to Section 15820.
- C. Paint visible portion of ductwork behind air outlets and inlets matte black. Refer to Section 09900.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

END OF SECTION 15850

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MECHANICAL: DIVISION 15

## SECTION 15950: TESTING, ADJUSTING, AND BALANCING

## PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Requirements of Contractor and retained TAB Agency.
- B. TAB of air and hydronic systems.
- C. Sound and vibration measurements of equipment operating conditions.

## 1.2 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balance Bureau.
- C. TAB: Testing, Adjusting, and Balancing.

## 1.3 PERFORMED WORK

- A. TAB to be performed by an independent AABC or NEBB-certified TAB Agency, contracted and directed by Owners Representative under a separate contract.

## 1.4 SUBMITTALS

- A. Submit the following in accordance with Section 01330, Submittal Procedures:
  - 1. Qualifications of TAB Agency, per Section 1.6, prior to performing TAB work.
  - 2. Test reports that are signed and stamped by an AABC or NEBB TAB Supervisor on the latest edition of approved AABC or NEBB Report Forms.

## 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the latest edition of AABC or NEBB procedural standards for TAB of environmental systems.
- B. A Santa Fe County representative may witness all or portions of the TAB Agencies Work.

## 1.6 QUALIFICATIONS

- A. TAB Agency: AABC or NEBB-certified company specializing in TAB of systems specified in this section with minimum [3] years experience.
- B. TAB Agency to be independent of any HVAC contractors performing the work (i.e., Mechanical or Controls), and a direct sub to the General Contractor.
- C. Submit list of 3 projects and references of TAB Agency.
- D. Submit AABC or NEBB certification of responsible TAB Agency supervisor.

## PART 2 PRODUCT

## 2.1 INSTRUMENTS

- A. The TAB Agency to furnish instruments required for testing, adjusting, and balancing.
- B. Instruments used for measurements to meet AABC or NEBB-specified accuracy and calibration histories, and be available for spot-checking by Santa Fe County Construction Inspector during testing.

## PART 3 EXECUTION

## 3.1 CONTRACTOR RESPONSIBILITIES

- A. Provide window in project schedule for completion of TAB services prior to final inspection of project.
- B. Have mechanical, controls, structural and related electrical systems complete and operable before notifying Santa Fe County Construction Inspector that project is ready for TAB Agency services and the requirements of 3.1 have been met. Advance written notice of not less than 15 calendar days is required.
- C. Complete operational readiness prior to commencement of TAB services. Verify the following:
  - 1. Doors, windows and ceilings are installed.
  - 2. Systems are started and operating in safe and normal condition.
  - 3. Temperature control systems are installed complete and operating. Testing and programming of all system components and the overall system has been completed and test reports accepted by the Santa Fe County Construction Inspector.
  - 4. Proper thermal overload protection is in place for electrical equipment.
  - 5. Construction filters have been replaced and the final filters are clean and in-place.
  - 6. Duct systems are clean of debris.
  - 7. Fans are rotating correctly.
  - 8. Volume dampers are in place and open.
  - 9. Air coil fins are cleaned and combed.
  - 10. Access doors are closed and duct end caps are in place.
  - 11. Air outlets and inlets are installed and connected.
  - 12. Duct and piping supports are installed.
  - 13. Duct systems are leak and pressure tested and test reports accepted by Santa Fe County Construction Inspector.
  - 14. Hydronic systems are leak tested and test reports accepted by Santa Fe County Construction Inspector.
  - 15. Hydronic systems are flushed, filled and vented.
  - 16. Refrigerant systems are leak tested and test reports accepted by Santa Fe County Construction Inspector.
  - 17. Pumps are rotating correctly.
  - 18. Start-up screens from pump suction diffusers are removed.
  - 19. Proper strainer baskets are clean and in place.
  - 20. Service and balance valves are open.
  - 21. Pressure gauges, temperature gauges, test fittings, etc., are installed.
- D. Put HVAC systems and equipment into full operation and continue operation during times of testing and balancing.
  - 1. Do not operate equipment until properly lubricated and brought into manufacturer's specified operating conditions.
- E. Provide labor and materials to make any change in sheaves, belts, and dampers, required for correct balance as requested by the TAB Agency.
- F. Provide labor, i.e., remove and reinstall ceiling tiles, etc., to access concealed equipment as requested by TAB Agency.
- G. After TAB Agency is notified and TAB work started, should system(s) be found to not be in readiness or a dispute occurs as to readiness of system(s), the Contract Administrator may require a joint inspection be made by representatives of Santa Fe County, the TAB Agency and the Contractor.

1. Should inspection reveal TAB services notification to have been premature, costs of work previously accomplished by TAB Agency to be paid for by the Contractor.
2. Such items as are not ready for TAB services to be completed and placed in operational readiness by Contractor, and TAB services again be scheduled.

### 3.2 SANTA FE COUNTY RESPONSIBILITIES

- A. Provide TAB Agency with Contract Drawings, approved submittal data, specifications and supplements required for TAB Agency to accomplish review, inspection and TAB services outlined in this specification.
- B. Notify TAB Agency within 48 hours of receipt of written notification from Contractor that system(s) will be ready for testing, adjusting and balancing.

### 3.3 TAB AGENCY RESPONSIBILITIES

- A. Review, inspect, test, adjust and balance systems, as outlined in this Section.
- B. Promptly report to Santa Fe County Construction Inspector any conditions that prevent system balancing.
- C. Cooperate with Contractor but do not instruct or direct Contractor in any of the work, but make such reports as are necessary directly to Santa Fe County Construction Inspector.
- D. Do not provide any construction labor or materials to modify systems.

### 3.4 TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 10 percent of design flow rates.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design flow rates to space. Adjusts outlets and inlets in space to within plus or minus 10 percent of design flow rates.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design flow rates.

### 3.5 ADJUSTING

- A. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- B. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- C. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

### 3.6 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distributions systems to obtain required or design supply, return and exhaust airflow rates.
- B. Make airflow rate measurements in main ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure airflow rates at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts.
- E. Use volume control devices to regulate airflow rates only to extent adjustments do not create objectionable air motion or sound levels. Effect volume control by using volume dampers located in ducts.
- F. Vary total system airflow rates by adjustment of fan speeds. Vary branch airflow rates by damper regulation

- G. Provide system schematic with design and actual airflow rates recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions. Check dampers for proper operation.
- J. Check leakage across outside air, return air, and exhaust dampers.
- K. At modulating damper locations, take measurements and balance at extreme conditions. Balance variable volume systems at maximum airflow rate, full cooling, and at minimum airflow rate, full heating.
- L. Measure building static pressure and adjust supply, return, and exhaust air systems to obtain required relationship between each to maintain approximately [0.05] inches positive static pressure near building entries.
- M. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.
- N. For variable air volume system powered units set volume controller to airflow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable-air-volume temperature control.
- O. On fan powered VAV boxes, adjust airflow switches for proper operation.

### 3.7 WATER SYSTEM PROCEDURE

- A. Adjust water systems, after air balancing, to obtain design flow rates.
- B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rate for system balance. Where flow-metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in system.
- C. Adjust systems to obtain specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open or in normal position to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts simulate full flow in one part by temporary restriction of flow to other parts.

### 3.8 TEST REPORT FORMS

- A. Final report forms to contain the following minimum data.
- B. Report Forms
  - 1. Title Page:
    - a. Name of Testing, Adjusting, and Balancing Agency
    - b. Address of Testing, Adjusting, and Balancing Agency
    - c. Telephone and facsimile numbers of Testing, Adjusting, and Balancing Agency
    - d. Project name
    - e. Project location



- f. Project Manager
- g. Project Inspector
- h. Project Contractor
- i. Project altitude
- j. Report date
- 2. Summary Comments:
  - a. Design versus final performance
  - b. Notable characteristics of system
  - c. Description of systems operation sequence
  - d. Summary of outdoor and exhaust flows to indicate building pressurization
  - e. Nomenclature used throughout report
  - f. Test conditions
- 3. Instrument List:
  - a. Instrument
  - b. Manufacturer
  - c. Model number
  - d. Serial number
  - e. Range
  - f. Calibration date
- 4. Electric Motors:
  - a. Manufacturer
  - b. Model/Frame
  - c. HP/BHP and kW
  - d. Phase, voltage, amperage; nameplate, actual, no load
  - e. RPM
  - f. Service factor
  - g. Starter size, rating, heater elements
  - h. Sheave Make/Size/Bore
- 5. V-Belt Drive:
  - a. Identification/location
  - b. Required driven RPM
  - c. Driven sheave, diameter and RPM
  - d. Belt, size and quantity
  - e. Motor sheave diameter and RPM
  - f. Center to center distance, maximum, minimum, and actual
- 6. Air Cooled Condenser:
  - a. Identification/number
  - b. Location
  - c. Manufacturer
  - d. Model number
  - e. Serial number
  - f. Entering DB air temperature, design and actual
  - g. Leaving DB air temperature, design and actual
  - h. Number of compressors
- 7. Air Moving Equipment:
  - a. Location
  - b. Manufacturer
  - c. Model number
  - d. Serial number
  - e. Arrangement/Class/Discharge
  - f. Air flow, specified and actual
  - g. Return air flow, specified and actual
  - h. Outside air flow, specified and actual
  - i. Total static pressure (total external), specified and actual
  - j. Inlet pressure

- k. Discharge pressure
- l. Sheave Make/Size/Bore
- m. Number of Belts/Make/Size
- n. Fan RPM
- 8. Return Air/Outside Air Data:
  - a. Identification/location
  - b. Design air flow
  - c. Actual air flow
  - d. Design return air flow
  - e. Actual return air flow
  - f. Design outside air flow
  - g. Actual outside air flow
  - h. Return air temperature
  - i. Outside air temperature
  - j. Required mixed air temperature
  - k. Actual mixed air temperature
  - l. Design outside/return air ratio
  - m. Actual outside/return air ratio
- 9. Exhaust Fan Data:
  - a. Location
  - b. Manufacturer
  - c. Model number
  - d. Serial number
  - e. Air flow, specified and actual
  - f. Total static pressure (total external), specified and actual
  - g. Inlet pressure
  - h. Discharge pressure
  - i. Sheave Make/Size/Bore
  - j. Number of Belts/Make/Size
  - k. Fan RPM
- 10. Duct Traverse:
  - a. System zone/branch
  - b. Duct size
  - c. Area
  - d. Design velocity
  - e. Design air flow
  - f. Test velocity
  - g. Test air flow
  - h. Duct static pressure
  - i. Air temperature
  - j. Air correction factor

END OF SECTION 15950

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ELECTRICAL - DIVISION 16  
SECTION 16010: GENERAL PROVISIONS

1. GENERAL
- 1.1 SCOPE OF WORK
  - A. Conform with applicable provisions of the General Provisions.
- 1.2 REQUIREMENTS
  - A. Furnish all labor, materials, service, equipment and appliances required to complete the installation of the complete electrical system in accordance with the specifications and contract drawings.
- 1.3 REQUIREMENTS OF REGULATORY AGENCIES AND STANDARDS
  - A. Regulatory Agencies: Installation, materials, equipment and workmanship shall conform to the applicable provisions of the **2014** National Electrical Code (NEC), New Mexico State Electrical Code **2014** Edition, the National Electrical Safety Code (NESC), and the terms and the conditions of the authorities having lawful jurisdiction pertaining to the work required. All modifications required by these codes, rules, regulations and authorities shall be made by the Contractor without additional charge to the Owner.
  - B. Underwriter's Laboratories (UL): All materials, appliances, equipment or devices shall conform to the applicable standards of Underwriter's Laboratories, Inc. The label of, or listing by, UL is required.
- 1.4 SUBMITTALS
  - A. Materials List: Within 15 days after award of contract, the Contractor shall submit to the Architect a minimum of 7 (seven) copies of all equipment to be furnished. Where such equipment will be furnished "as specified", a statement to that effect is sufficient. Where substitutions are proposed, the Contractor shall submit for prior approval. Written approval of the Architect must be obtained.
  - B. Samples: If required by the Architect, the Contractor shall submit for inspection samples of both specified and proposed substitute items.
  - C. Shop Drawings: Submit for approval a minimum of seven (7) copies of all shop drawings after the materials list has been approved and prior to ordering. Show complete outlines, dimensions, electrical services, control diagrams, electrical characteristics of special nature or critical to the installation and pertinent data required for installation. Indicate in the transmittal that submittal has been reviewed and accepted and all contract deviations identified.

## MATERIALS

### 2.1 EQUIPMENT REQUIREMENTS

- A. The electrical requirements for equipment specified or indicated on the drawings are based on information available at the time of design. If equipment furnished for installation has electrical requirements other than indicated on the electrical drawings, the Contractor shall make all adjustments to wire and conduit size, controls, over current protection and installation as required to accommodate the equipment supplied, without additional charge to the Owner. The complete responsibility and costs for such adjustments shall be assigned to the respective section of this specification under which the equipment is furnished.

### 2.2 MATERIALS

- A. All similar materials and equipment shall be the product of the same manufacturer.
- B. Where no specific material, apparatus or appliance is mentioned, any first-class product made by a reputable manufacturer may be used, providing it conforms to the contract requirements and meets the approval of the Architect.
- C. Material and equipment shall be the standard products of manufacturers regularly engaged in the productions of such material and shall be the manufacturer's current and standard design.
- D. Altitude: Equipment affected by altitude shall perform satisfactorily for the function intended at an altitude of the project site.

## INSTALLATION

### 3.1 GENERAL

- A. Fabrication, erection and installation of the complete electrical system shall be done in a first class workmanlike manner by qualified personnel experienced in such work and shall proceed in an orderly manner so as not to hold up progress of the project. The Electrical Contractor shall check all areas and surfaces where electrical equipment material is to be installed, removed or relocated and report any unsatisfactory conditions before starting work. Commencement of work signifies this Contractor's acceptance of existing conditions. In the acceptance or rejection of the finished installation, no allowance will be made for lack of skill on the part of workmen.

### 3.2 TEMPORARY POWER AND LIGHTING

- A. Furnish and install all temporary electrical facilities required for construction and safety operations.

### 3.3 PERFORMANCE TESTS

- A. Thoroughly test all fixtures, services and all circuits for proper operating condition and freedom from grounds and short circuits before acceptance is requested. All equipment, appliances, and devices shall be operated under load conditions.

### 3.4 AS-BUILT DRAWINGS

- A. During progress of the work, maintain an accurate record of the installation of the system, locating each circuit precisely by dimension. Upon completion of the installation, transfer all record data to blue line prints of the original drawings.

### 3.5 OPERATING INSTRUCTIONS AND MANUALS

- A. Instructions: Without additional charge to the Owner, furnish competent instruction to the Owner in the care, adjustment and operation of all parts of the electrical equipment and systems.
- B. Manuals: Upon completion of the work, prepare and deliver to the Owner three (3) sets of complete operating and maintenance manuals for the systems and major equipment installed. Include catalog data, shop drawings, wiring diagrams, performance curves and rating data, spare parts lists and manufacturer's operating and maintenance data.
- C. Other: The above requirements are in addition to specific instructions and manuals specified for individual systems or equipment.

### 3.6 DRAWINGS

- A. General: The electrical drawings show the general arrangement of all conduit, equipment, etc. and shall be followed as closely as actual building construction and the work of other trades will permit. Because of the small scale of the electrical drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The contractor shall investigate the structural and finish conditions affecting the work and shall arrange his work accordingly, providing such fittings, elbow, pullboxes, and accessories as may be required to meet such conditions.
- B. Field Measurements: The Contractor shall verify the dimensions governing the electrical work at the building. No extra compensation shall be claimed or allowed on account of differences between actual dimensions and those indicated on the drawings.

### 3.7 LOCATION OF EQUIPMENT AND OUTLETS

- A. The approximate locations of cabinets, panelboards, wiring, power outlets, etc., are indicated on the drawings; however, they are not intended to give complete and accurate information. Determine the exact location after thoroughly examining the general building plans and by actual measurements during construction, subject to the approval of the Architect.

### 3.8 ELECTRICAL INSTALLATIONS

- A. Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:
1. Coordinate electrical systems, equipment, and materials installation with other building components.
  2. Verify all dimensions by field measurements.
  3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
  4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
  5. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
  6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
  7. Coordinate connection of electrical systems with existing utilities and services. Comply with other governing regulations.
  8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
  9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
  10. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
  11. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified in other sections of these specifications.

12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.9 WARRANTY

- A. Deliver originals of all guarantees and warranties on this portion of the work to the Owner. Warrant all equipment, materials and workmanship for one year in accordance with the terms of this Contract.

END OF SECTION 16010



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ELECTRICAL - DIVISION 16  
SECTION 16110: RACEWAYS, BOXES AND FITTINGS

1. GENERAL
- 1.1 CONFORMANCE
  - A. Conform with applicable provisions of the General Conditions, Special Provisions and General Requirements.
- 1.2 RELATED WORK IN OTHER SECTIONS
  - A. Section 16010, General Provisions; Section 16450, Grounding.

## MATERIAL

- 2.1 CONDUITS
  - A. Steel Conduit: Rigid, threaded, thick wall, zinc coated on the outside and either zinc coated or coated with an approved corrosion resistant coating on the inside.
  - B. Electrical Metallic Tubing (EMT): Mild steel, zinc coated on the outside and either zinc coated or coated with an approved corrosion resistant coating on the inside. Maximum, size 2 inch electrical trade size unless noted on the drawings or specifically approved.
  - C. Intermediate Metal Conduit (IMC): Rigid, threaded, lightweight steel, zinc-coated on the outside and either zinc-coated or coated with an approved corrosion resistant coating on the inside.
  - D. Flexible Conduit: Commercial greenfield, galvanized steel, with a separate grounding bond wire installed in the conduit in addition to other wires.
  - E. Liquid Tight Flexible Conduit: Flexible galvanized steel tubing with extruded liquid tight PVC outer jacket and a continuous copper bonding conductor wound spirally between the convolutions. Where a separate grounding conductor is installed in the conduit, bonding conductor in the convolutions may be omitted.
  - F. Plastic coated rigid steel conduit shall be hot galvanized steel conduit with a coating of polyvinyl chloride, minimum 15 mills (0.015), on the exterior surfaces, shall have an approved corrosion resistant coat inside and shall be Pittsburgh, J & L, Republic or approved equal.
  - G. Rigid Non-Metallic Conduit: Schedule 40, high impact PVC with 7,000 psi tensile strength at 73.4 F., 11,000 psi flexural strength, 8,600 psi compression strength, approved for 90 C. conductors. Carlon, Triangle, or approved equal.
  - H. Aluminum Conduit: Rigid, threaded, thick wall type, approved for the application.

- I. Conduit Size: Minimum conduit size 1/2 inch except where specifically approved for equipment connections. Sizes not noted on drawings shall be as required by the NEC. All home runs to panel shall be 3/4 inch minimum. Conduits for #12 THHN wire shall be sized the same as for #12 TW wire.

## 2.2 CONDUIT FITTINGS

- A. Connectors and Couplings: Compression type threadless fittings for rigid steel conduit or IMC not permitted. Set screw type fittings for rigid aluminum conduit not permitted. EMT couplings and connectors either steel or malleable iron only. "Concrete Tight" or "Rain Tight" and either the gland and ring compression type or the stainless steel multiple point locking type. Connectors to have insulated throats. EMT fittings using set screws or indentations as a means of attachment are not permitted.
- B. Bushings: Insulated type, designed to prevent abrasion of wires without impairing the continuity of the conduit grounding system, for rigid steel conduit, IMC and rigid aluminum conduit larger than 1/2 inch size and connectors for EMT.
- C. Rigid Steel Conduit, IMC and EMT Fittings: Iron or steel only.
- D. Liquid Tight Flexible Conduit Fittings: With threaded grounding cone, a steel, nylon or equal plastic compression ring and a gland for tightening. Either steel or malleable iron only with insulated throats and male thread and locknut or male bushing with or without "O" ring seat. Each connector shall provide a low resistance ground connection between the flexible conduit and the outlet box, conduit or other equipment to which it is connected.
- E. Rigid Aluminum Conduit Fittings: Malleable iron, steel or aluminum alloy. Ferrous fittings zinc coated or cadmium plated. Aluminum alloy fittings shall conform with the characteristics defined by UL for aluminum rigid metallic conduit and shall not contain more than 0.04 percent copper.
- F. Flexible Conduit Fittings (Commercial Greenfield): Either steel or malleable iron only, with insulated throats.
- G. Fittings for PVC Coated Rigid Steel Conduit: Ells and couplings used with PVC coated rigid steel conduit shall have a factory applied coating of polyvinyl chloride, minimum 15 mills (0.015) on exterior surfaces and shall have a PVC sleeve extruded a minimum of 2" from one end of the fitting.

## 2.3 OUTLET BOXES

- A. Construction: Zinc coated or cadmium plated steel boxes of a class to satisfy the condition at each outlet except where unilet on conduit bodies are required. Knockout type with knockouts removed only where necessary to accommodate the conduit entering. Square cornered, straight sided gang boxes, 4 inch octagon concrete rings and 4 inch octagon hung ceiling boxes with bars may be folded type, one piece deep drawn type for all other boxes.
- B. Size: To accommodate the required number and sizes of conduits, wires and splices in accordance

with NEC requirements, but not smaller than size shown or specified. Standard concrete type boxes not to exceed 6 inches deep except where necessary to permit entrance of conduits into side of boxes without interference with reinforcing bars. Special purpose boxes shall be sized for the device or application indicated.

#### 2.4 PULLBOXES

- A. Minimum NEC requirements unless larger box is noted. As specified for outlet boxes with blank cover for pullboxes with internal volume not more than 150 cubic inches. As specified for cabinets for pullboxes with internal volume over 150 cubic inches, except covers to have same thickness as box with corrosion resistant screw or bolt attachment.

### INSTALLATION

#### 3.1 CONDUIT INSTALLATIONS

- A. Conduit Systems: Rigid Steel conduit, IMC, EMT, or Rigid Non-Metallic conduit unless noted. Install steel conduits for underground runs, runs in concrete feeder circuits and where required by the NEC for mechanical protection, etc. Use flexible conduit only for motor or equipment connections and then only to the extent of minimum lengths required for connections. Install flexible conduit connections at all resilient mounted equipment. Provide liquid tight flexible conduit in exterior, wet or damp locations and for connections to the pipe mechanical system. Aluminum conduit may be used only in dry locations above ground in sizes two inch or larger for power and communications systems. Conduit and tubing shall be kept at least 6 inches from paralleled runs or hot water or steam pipes.
- B. Conduit Installation: Install concealed conduit and EMT in as direct lines as possible. Install exposed conduits and EMT parallel to or at right angles to the lines of the building. Right angle bends in exposed conduit and EMT runs shall be made with standard elbows, screw jointed conduit fittings or conduit bent to radius no less than those of standard elbows.
- C. Concealed Conduits: Install conduit systems concealed where possible unless otherwise noted. Conduit systems may be exposed in unfinished utility areas, ceiling cavities and where specifically approved by the Architect.
- D. Conduit Bends: In any conduit or EMT run, the number of quarter bends or equivalent between terminations at cabinets or boxes shall not exceed four bends for conduits up to 1 1/4 inch, three bends for 1 1/2 to 2 1/2 inch conduits and two bends for 3 to 4 inch conduits. Conduit runs between cabinets or boxes shall not exceed 200 feet for straight runs nor 100 feet for runs with maximum number of bends. Bends in telephone feeder conduits shall be long radius.

#### 3.2 CONDUIT SUPPORTS

- A. Supports: Provide supports for horizontal conduits and EMT not more than 8 feet apart with not less than two supports for each 10 foot straight length and one support near each elbow or bend including runs above suspended ceilings and within 3 feet of all junction boxes, switches, fittings, etc.

- B. Strap: Install one hole pipe straps on conduits 1 1/2 inch or smaller. Install individual pipe hangers for conduits larger than 1 1/2 inch. Spring steel fasteners with hanger rods may be used in dry locations in lieu of pipe straps.
- C. Trapezes: Install multiple (trapeze) pipe hangers where two or more horizontal conduits or EMT run parallel and at the same elevation. Secure each conduit or EMT to the horizontal hanger member by a U-bolt, one hole strap or other specially designed and approved fastener.
- D. Hanger Rods: Install 1/4 inch diameter or larger galvanized steel rods for trapezes, spring steel fasteners, clips or clamps. Wire or perforated strapping shall not be used for the support of any conduit or EMT.
- E. Fastening: Fasten pipe straps and hanger rods to concrete by means of inserts or expansion bolts to brickwork by means of expansion bolts and to hollow masonry by means of toggle bolts. Wooden plugs and shields shall not be used. Power driven fasteners may be used to attach pipe straps and hanger rods to concrete only where approved by the Architect.
- F. All conduits not embedded in concrete shall be firmly secured by means of pipe clamps, hangers, etc., equal to Caddy fasteners of ERICO Products, Inc. Wire wrapped around conduits and supporting members will not be accepted.

### 3.3 OUTLET BOXES

- A. Outlet boxes, covers and fittings, according to the particular use for which they are required, shall be provided in the locations marked on the drawings by symbols, and/or for use to facilitate the installation of the electrical systems. When necessary, outlets shall be relocated so that where fixtures of other fittings are installed they will be symmetrically located according to the room layout and will not interfere with other work or equipment required by the drawings and these specifications.
- B. Installation: Unless otherwise specified or shown on the drawings, outlet boxes shall be flush mounted and the front edges of the boxes or plaster covers shall be flush with the finished wall or ceiling line or if installed in walls and ceilings of incombustible construction, not more than 1/4 inch back of same. Mount boxes with the long axes of devices vertical, unless otherwise specified. Boxes in plastered walls and ceilings shall be provided with plastic covers. A multiple of box extensions and/or covers will not be permitted. Install in a rigid and satisfactory manner with suitable metal bar hangers, box cleats, adjustable box hangers, etc. Use wood screws on wood, expansion shields on masonry and machine screws on steel work.

### 3.5 FIXTURE CONNECTIONS

- A. Recessed or surface light fixtures in lay-in or accessible ceilings shall be connected with minimum 1/2 inch flexible metallic conduit, 4 to 6 feet long with grounding provisions.

END OF SECTION 16110

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ELECTRICAL - DIVISION 16  
SECTION 16120: LOW VOLTAGE CONDUCTORS

1. GENERAL
- 1.1 CONFORMANCE
  - A. Conform with applicable provisions of the General Conditions, Special Provisions, and General Requirements.
- 1.2 RELATED WORK IN OTHER SECTIONS
  - A. Section 16010, General Provisions; Section 16450, Grounding.

#### MATERIALS

- 2.1 WIRES AND CABLES (600 VOLTS)
  - A. Type: Conform to the applicable UL and IPCEA Standards for the use intended. Copper conductors with 600 volts insulation unless otherwise specified or noted on the drawings. Stranded conductors for No. 8 or larger where elsewhere specified or noted on the drawings.
  - B. Insulation: Type THHN insulation, 75 degrees C, for all conductors otherwise specified or noted on the drawings. 90 degrees C minimum insulation within fixture wireways of fluorescent fixtures. All control conductors shall be THHN stranded or MTW.
  - C. Size: No. 14 minimum for controls and No. 12 minimum for lighting and convenience outlets, etc. unless otherwise specified or noted on the drawings. Not less than NEC requirements for the system to be installed. If the equipment to be installed required larger conductor and conduit sizes than indicated on the drawings, the required changes shall be made without additional charge to the Owner.
  - D. Color Coding: Phase, neutral, and ground conductors color-coded in accordance with NEC. Connect all conductors of the same color to the same phase conductor. Color coding shall be A-black, B-red, C-blue, N-white, for 120/208 volts with green for all ground conductors. Conductors No. 14, 12 and 10 shall be solid color compounded for entire length.
- 2.2 CONNECTORS AND LUGS
  - A. For Copper Conductors No. 6 and Smaller: 3M Scotch-Lok or T & B Sta-Kon compression or indent type connectors with integral or separate insulating caps.
  - B. For Copper Conductors Larger than No. 6: Solderless, indent, hex screw or bolt type pressure conductors, properly taped or insulated.

## 2.3 TAPE

- A. Plastic tape: 8.5 mils minimum thickness, 1,000,000 megohms minimum insulation resistance, oil resistant vinyl backing, oil resistant acrylic adhesive, incapable of supporting combustion per ASTM D-568 Test Method B.

## INSTALLATION

### 3.1 SPLICES

- A. (480 Volts and Under): Conductor lengths shall be continuous from termination to termination without splices unless approved by the Owner.

### 3.2 PULL WIRES

- A. In each empty conduit, except underground conduits, install a No. 14 galvanized steel pull wire or a plastic line having a tensile strength of not less than 200 pounds. In each empty underground conduit install a No. 10 AWG bare, hard drawn copper or copper clad pull wire or a plastic line having a tensile strength of no less than 200 pounds.

### 3.3 IN RACEWAYS

- A. Install conductors in rigid conduit. EMT or flexible metallic conduit, unless otherwise specified or noted on the drawings.

### 3.4 CABLE BENDS

- A. Radius of ends not less than 10 times the outer diameter of the cable.

### 3.5 BUNDLING

- A. Conductors No. 10 and smaller shall be neatly and securely bundled and conductors larger than No. 10 shall be neatly and securely cabled in individual circuits, utilizing marlin twine, two ply lacing or nylon straps.

### 3.6 CONDUCTOR PULL

- A. Conductors shall not be pulled into conduits until after all plastering or concrete work is completed and all conduits in which moisture has collected have been swabbed out.

### 3.7 CONNECTORS AND LUGS

- A. Install with manufacturer's recommended tools and with the type and quantity of deformations



recommended by manufacturer.

3.8 LABELING

- A. All conductors and neutrals shall be tagged in every junction box and cabinet with wrap around, stick-on labels or pre-marked nylon clip sleeves identifying panel and circuit number.

END OF SECTION 16120

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ELECTRICAL - DIVISION 16  
SECTION 16140: WIRING DEVICES AND PLATES

1. GENERAL

1.1 RELATED WORK IN OTHER SECTIONS

- A. Section 16010 General Provisions; Section 16450, Grounding.

MATERIAL

2.1 SNAP SWITCHES

- A. Unless otherwise specified, each snap switch (flush tumbler-toggle) shall be of the A.C. General use type for mounting in a single gang spacing, fully rated 20 amperes minimum at 120/277 volts, conforming to minimum requirements of the latest revision of the Underwriter's Laboratories, Inc., UL 20 Fifth Edition Standard Snap Switches and further requirements herein specified. Specification grade, heavy duty, single pole, 3-way or 4-way, of the maintained, momentary or lock type as indicated on the drawings. Ivory color handles unless otherwise indicated on the drawings. Silver or silver alloy contacts. A.C. 120/277 volt general use snap switches shall be capable of withstanding tests as outlined in NEMA Publications and shall be as follows unless otherwise noted.

<u>20A 120/277 AC</u>	<u>HUBBELL</u>
1P	1221-G (Grey)
3-WAY	1223-G (Grey)
4-WAY	1224-G (Grey)

2.2 RECEPTACLES

- A. General: Configuration and requirements for all connector or outlet receptacles shall be in accordance with NEMA Publications. Fire resistant, non-absorptive, hot welded, phenolic composition or equal bodies and bases with metal plaster ears (integral with the supporting member). Single or duplex as shown or noted on drawings. Ivory color unless otherwise noted on the drawings. Double grip contacts for each prong.
- B. Grounding Type: All receptacles shall be grounding type with a green colored hexagonal equipment ground screw of adequate size to accommodate an insulated grounding jumper (based on Table 250-95 of the NEC with minimum size No. 14 AWG). Grounding terminals of all receptacles shall be internally connected to the receptacle mounting yoke.
- C. Unless otherwise noted, receptacle shall be as follows:

<u>DEVICE</u>	<u>HUBBELL</u>
20A-125V AC 2P 3W	5362-G (Grey)
15A-125V AC 2P 3W	5262-G (Grey)

- D. Special: Receptacles for special applications shall be as indicated on the drawings.

### 2.3 DEVICE PLATES

- A. General: Provide plates for each switch, receptacle, signal and telephone outlet and special purpose outlet. Plates shall be stainless steel unless otherwise noted. Do not use sectional gang plates.
- B. Exposed: Plates for exposed screw jointed fittings shall match the fittings with edges of plates flush with edges of fittings. Heavy cadmium plates, steel with gasket. Plates for cast type boxes at locations subject to set or rain conditions shall be of the cast, vapor tight type. Provides hinged covers for devices.
- C. Communications: Plates for telephone and signal outlets shall each have a 3/8 inch bushed opening in the center. Wall plates for push button and buzzer outlets shall have openings to suit the push buttons and buzzers.

## INSTALLATION

### 3.1 DEVICE PLATES

- A. Install with alignment tolerance of one-sixteenth inch and all edges in continuous contact with wall surfaces.

END OF SECTION 16140

1. GENERAL

1.1 RELATED WORK IN OTHER SECTIONS

- A. Section 16010, General Electrical Requirements; Section 16450, Grounding.

1.2 SUBMITTALS

- A. Submit complete shop drawings with outline dimensions, descriptive literature and complete descriptions of the frame size, trip setting, class and interrupting rating of all overcurrent devices. Identify available space.

MATERIAL

2.1 GENERAL

- A. Dead front, safety type with voltage ratings as scheduled. Panelboards shall be of the type required for the short circuit and duty ratings indicated on the drawings or specified. All panelboards shall have a neutral bus and a ground bus. Panelboards shall be circuit breaker as scheduled, unless otherwise noted.
- B. Panels shall be Square "D" – No Exceptions.

2.2 CABINETS

- A. Each panelboard shall be enclosed in a single sheet metal cabinet with front doors, catches, locks, etc.
- B. Door-In-Door: Both surface and flush panels shall be door-in-door. The door over the interior of the panel shall be provided with hinges and combined lock and latch. The outside door over the panel gutters shall have a hinge on one side and machine screws into threaded holes in the panelboard cabinet on the other three sides. In order to insure the rigidity of the outside door, surface type panels shall have a 1/2 inch deep lip bent over all around with the corners welded and ground; or, in the case of flush panels a steel angle frame equivalent in strength to the bent-over lip, shall be welded to the inside of the door. The outside door shall be of such size as to allow a minimum of 2 3/4 inches opening to all four sides of the wiring gutter. All locks shall be keyed alike.

2.3 BRANCH CIRCUIT PANELS

- A. All branch circuit panels for lighting and single phase loads shall be "Quick-lag" circuit breakers with 10,000 amps interrupting capacity, main lugs or main breaker as indicated on the drawings,

"Door-In-Door" cover. Circuit breakers providing motor short circuit protection shall have trip elements sized to meet NEC requirements or equipment manufacturer's recommendations, whichever are smaller.

- B. Breakers: Molded case as scheduled or required. Provide quick make and quick break toggle mechanism, inverse time trip characteristics and trip free operation on overload or short circuit. Automatic tripping shall be indicated by a handle position between the manual OFF and ON position. Provide trip ratings as indicated in the panelboard schedules. Adjustable magnetic trip devices shall be set at the factory to the low trip setting. Provide breaker frame sizes as required for the continuous rating or the interrupting capacity, whichever is larger.
- C. Bolted Type: Circuit breaker current carrying connections to the bus shall be of the bolted type, factory assembled. Stab in type not permitted. Provide bus bars for three phase panelboards of the sequence phased type connection and arranged for 3 phase, 4 wire mains, unless otherwise indicated on the drawings.
- D. Space Only: Where "space only" is noted on the drawings, provide necessary connectors, mounting brackets, etc., for the future insertion of an overcurrent device. Spaces shall be sized for 100 amp straps minimum. The word "space" is intended to mean a space for a future branch circuit breaker, and will include connection straps rated at 100 amperes, minimum, holding brackets, and an identifying numbering unit, so that all that is necessary to convert it to an active circuit is installation of the circuit breaker.
- E. Directories: Provide typewritten circuit descriptions referencing permanent room numbering assigned in lieu of the room numbering shown on the drawings.
- F. Labels:
  - 1. Labels for identifying the breaker shall be engraved laminated plastic strips attached by screws or phenolic buttons or small window frame type.
  - 2. Labels for identifying the panel shall be engraved laminated plastic attached by screws. The nameplate shall identify the panel by name or designation, the voltage system, number of phases, number of wires, and the location of the overcurrent protective device (e.g. "PANEL LW - 120/208V, 3PH, 4W FED FROM MDS-2". Lettering shall be minimum 2" high white letters on black background.
- G. Skirts: Where noted on the drawings panelboards shall be skirted with complete metal enclosures and barriers separating the panel interior.

## 2.4 BUS BARS

- A. All bus bars shall be copper. Use of aluminum bus bars will not be permitted.

## 2.5 SPARE CONDUITS

- A. Provide a minimum of five (5) 1" C stubbed from each branch circuit lighting and appliance panel to the closest accessible lay-in ceiling area, for future branch circuit wiring. The total number of spare conduits shall be determined by one (1) 1" C for every three (3) spare 20A/1P circuit breaker in the panel. All spare conduits shall be stubbed, capped, and labeled as "spare conduit". Refer to the plans for additional spare conduits.

## INSTALLATION

### 3.1 CIRCUIT NUMBERING

- A. Circuit numbering shown on the drawings is based on pole position in the panelboard and not consecutive numbering.

### 3.2 PHASE ROTATION

- A. Phase A, left bus; phase B, center bus; phase C, right bus (front viewing).

### 3.3 CABLE TIE-WRAPPING AND TRAINING

- A. All branch circuit conductors within the panelboard shall be neatly tie-wrapped and trained - no exceptions. Utilize nylon cable wraps and group branch circuit conductors towards the rear of the panel interior. Other means of tie-wrapping branch circuit conductors will not be accepted (wire, string, or conductors).
- B. Label all branch circuits at the point of entry into the panelboard. Labels shall be nylon clip-on sleeve and shall identify the branch circuit conductor by the panelboard circuit number.

### 3.4 CLEANING

- A. All panel interiors shall be cleaned of dirt and debris prior to energizing the panels.
- B. Clean all exposed panel surfaces of dirt and paint. Touch-up all scratches with matching paint.

END OF SECTION 16160



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ELECTRICAL - DIVISION 16  
SECTION 16175: SURGE PROTECTIVE DEVICES (SPD)

1. GENERAL

1.1 RELATED WORK IN OTHER SECTIONS

- A. Section 16010, General Electrical Provisions; Section 16450, Grounding and Bonding for Electrical Systems.

1.2 DESCRIPTION

- A. This section describes the material and installation requirements for surge protective devices (SPD) for the protection of all AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.

1.3 REFERENCES

- A. ANSI/IEEE C62.41.1 – 2002, IEEE Guide for Surge Voltages in Low Voltage (1000 V and Less) AC Power Circuits and ANSI/IEEE C62.41.2 – 2002, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000 V and Less) AC Power Circuits.
- B. ANSI/IEEE C62.45 – 2002, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and Less AC Power).
- C. FIBS PUB 94 (1983) - Guide on Electrical Power for ADP Installation
- D. NEC - ARTICLE 285.
- E. NFPA-20, NFPA-70, NFPA-75, NFPA-78
- F. UL 1283 - Electromagnetic Interference Filters.
- G. UL 1449 Third Edition, or most recent edition – Surge Protection Devices.

1.4 SUBMITTALS

- A. Shop drawings, product data and manufacturer's installation instruction for non-approved manufacturers shall be submitted for review ten days prior to the bid date. Approved manufacturers shall provide the same required documentation at the shop drawing approval stage.
- B. The submittal shall include the following:
1. Dimensional drawing of each suppressor type indicating the following:

## a.) Service Entrance SPD

- 1.) Copper bus bars (electrical grade copper 1.5" wide x 0.25" thick)
- 2.) Diagnostic monitoring package.
- 3.) Line to neutral, and neutral to ground suppression paths.

## b.) Panelboard SPD

- 1.) Line to neutral, line to ground, and neutral to ground suppression paths.
2. UL Standard 1449 . Third Edition, or most recent edition, Listing, Standard for Safety, Surge Protection Devices, documentation verifying:
  1. Short Circuit Current Rating (SCCR)
  2. Voltage Protection Ratings (VPRs) for all modes
  3. Maximum Continuous Operating Voltage rating (MCOV)
  4. I-nominal rating (In)
  5. Type 1 Device Listing
3. UL Standard 1283 Listing, Electromagnetic Interference Filters, documentation.
4. Spectrum analysis of SPD based on MIL-STD-22A test procedures between 50kHz and 200kHz.
5. Endurance Testing: Capable of protecting against and surviving 5000 ANSI/IEEE C62.41 C-High transients without failure or degradation of UL 1449 Voltage Protection Rating by more than 10%.
6. A document of specification compliance shall be included outlining the prospective manufacturers compliance or deviation from each point ;in the specification. Should deviations be noted, a comprehensive clarification shall be provided outlining the reason for deviation.

## MATERIAL

## 2.1 SURGE PROTECTION DEVICES (SPD)

- A. Main Distribution Panelboard SPD Protection: Provide at each main distribution panelboard, where indicated on the plans or as otherwise noted on the plans a main distribution panelboard SPD. The SPD shall have the following characteristics:
  1. Shall be UL Listed to UL 1449, Standard for Safety, Transient Voltage Surge Suppressors, UL 1283, Electromagnetic Interference Filters and CSA Certified to CSA C22.2.

2. Shall be tested with Category C3 high exposure waveform (20kV-1.2/50us, 10kA-8/20us) per ANSI/IEEE C62.41 - 1991.
3. Shall be modular in design. Each suppression element shall be a user replaceable surge current diversion module (MOV based). Each surge current diversion module shall be fused with user replaceable 200kAIC rated fuses. Each surge current diversion module shall include solid state status indicator lights.
4. Shall provide redundant surge current diversion modules between each phase conductor and the neutral conductor, and between the neutral conductor and ground. Each mode of protection shall utilize two current sharing surge current diversion modules in parallel.
5. Shall incorporate copper bus bars for the surge current path. Small gauge round wiring or plug-in connections shall be used in the path for surge current diversion. Surge current diversion modules shall use bolted connections to the bus bars for reliable low impedance connections.
6. Shall meet or exceed the following criteria:
  - a.) Maximum surge current capability (single pulse rated) shall be 240kA per phase, in accordance with NEMA LS 1 Standard.
  - b.) Endurance Testing: Capable of protecting against and surviving 4000 ANSI/IEEE C62.41 Category C3 transients without failure or degradation of UL 1449 Suppression Voltage Rating by more than 10%.
  - c.) UL 1449 Suppression Voltage Ratings shall not exceed 400V (L-N) and (N-G).
  - d.) The ANSI/IEEE C62.41-1991 Category C3 let through voltages shall not exceed 470V (L-N) and (N-G).
  - e.) Shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
  - f.) Shall have a minimum EMI/EFI filtering of -50dB at 100kHz with an insertion ratio of 50:1 using MIL STD.220A methodology, in accordance with NEMA LS 1 Standard.
  - g.) Shall be equipped with onboard visual and audible diagnostic monitoring. Red and green indicator lights shall provide full time visual diagnostic monitoring of the operational status of each phase as well as each surge current diversion module. Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm

on/off switch shall be provided to silence the alarm. An alarm push to test switch shall be provided. The SPD diagnostic monitoring devices shall be mounted on the front to for the SPD enclosure. The diagnostic monitoring circuits shall continually monitor the operational status of the surge current diversional modules. No other test equipment shall be required for SPD monitoring or testing before or after installation.

- h.) Shall have a response time no greater than one nanosecond for any of the individual protection modes.
- i.) Shall have a warranty for a period of five (5) years, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.
- j.) Shall be equipped with a transient event surge counter, an internal UL listed disconnect and a Form C dry contact for remote annunciation.

A. Panelboard SPD Protection: Provide at each sub panel, where indicated on the plans or as otherwise noted on the plans an integrally mounted SPD device, Square “D” Model IMA, similar and equal. The panelboard SPD shall have the following characteristics:

1. Shall be UL listed to UL 1449 Third Edition, Standard for Safety, Surge Protection Devices, UL 1283, Electromagnetic Interference Filters and CSA Certified to CSA C22.2.
2. The mounting position of the SPD shall permit a straight and short lead length connection between the SPD and the point of connection to the panelboard.
3. Shall provide suppression components between each phase conductor and neutral, between each phase conductor and ground and between the neutral conductor and ground.
4. All encapsulated SPD's, whether modular or chase nipple units, shall utilize an encapsulant that is UL listed and holds a 94-V2 fire retardant rating. No encapsulant compounds that incorporate epoxy shall be allowed.
5. Shall meet or exceed the following criteria:
  - a.) Maximum surge current capability shall be: 50kA per mode/100kA per phase.
  - b.) SPD shall be UL labeled with 20kA I nominal (In), which is verifiable at “UL.com”.
  - c.) The UL 1449 Third Edition, or most recent edition, Voltage Protection Rating (VPR) shall not exceed:

MODES	L-N	L-G	N-G	L-L
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480Y/277V, 3 $\phi$ , 4W	1200	1200V	1200V	2000V
208Y/120V, 3 $\phi$ , 4W	700V	700V	700V	1200V
480V $\Delta$ , 3 $\phi$ , 3W	N/A	1800V	N/A	1800V
240V $\Delta$ , 3 $\phi$ , 3W	N/A	1000V	N/A	1000V
120/240V, 1 $\phi$ , 3W	700V	700V	700V	1200V

- d.) Shall be made of solid state components and operate bidirectionally.
- e.) Shall have a response time no greater than one nanosecond for any of the individual protection modes.
- f.) Shall have designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
- g.) Shall have a visible indication of proper SPD connection and operation. Visual indication shall be by means of solid state status indicator lights on the front of the SPD.
- h.) Shall have a warranty for a period of five years, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.
- i.) SPD shall be UL labeled Type 1, intended for use without need for external or supplemental overcurrent controls. Every suppression component of every mode, including N-G, shall be protected by internal overcurrent and thermal over temperature controls. SPD's relying upon exterior or supplementary installed safety disconnects do not meet the intent of this specification.
- j.) SPD shall be UL labeled with 200kA Short Circuit Current Rating (SCCR).

## INSTALLATION

### 3.1 INSTALLATION

- A. Install SPD in location as indicated on the drawings and elsewhere as required by the manufacturer. The SPD main panelboard protection device shall be mounted within 18" to the panel being protected, minimizing the lead length between the SPD and panelboard circuit breaker to 24" or less. All conductors (phase, neutral, and ground) shall be kept as straight as possible.
- B. Install SPD equipment per the manufacturers recommendations and wiring diagrams.

END OF SECTION 16175

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ELECTRICAL - DIVISION 16  
SECTION 16195: ELECTRICAL IDENTIFICATION

1. GENERAL
- 1.1 RELATED WORK IN OTHER SECTIONS
  - A. Section 16010, General Provisions; Section 16450, Grounding.
- 1.2 CONFORMANCE
  - A. Conform with applicable provisions of the General Conditions and Supplementary Conditions and Division 1 specifications sections.
- 1.3 SUMMARY
  - A. This Section includes identification of electrical materials, equipment, and installations. It includes requirements for electrical identification components including but not limited to the following:
    1. Identification labeling for raceways, cables, and conductors.
    2. Equipment labels and signs.
  - B. Related Sections: The following Sections contain requirements that relate to this Section:
    1. Division 9 Section "Painting" for related identification requirements.
    2. Division 16 Section "Wires and Cables" for requirements for color coding of conductors for phase identification.
    3. Refer to other Division 16 sections for additional specific electrical identification associated with specific items.
- 1.4 SUBMITTALS
  - A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
  - B. Product Data for each type of product specified.
  - C. Schedule of identification nomenclature to be used for identification signs and labels.
  - D. Samples of each color, lettering style, and other graphic representation required for identification materials; samples of labels and signs.
- 1.5 QUALITY ASSURANCE
  - A. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

## MATERIAL

### 2.1 ELECTRICAL IDENTIFICATION PRODUCTS

- A. Adhesive Marking Labels for Raceway: Pre-printed, flexible, self-adhesive labels with legend indicating voltage and service (Emergency power system, Lighting, Power, Light, HVAC, Communications, Control, Fire, Security, CCTV, Telephone).
- B. Label Size as follows:
  - 1. Raceways 1-Inch and Smaller: 1-1/8 inches high by 4 inches long.
  - 2. Raceways Larger than 1-Inch: 1-1/8 inches high by 8 inches long.
- C. Color: Black legend on orange background.
- D. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape not less than 3 mils thick by 1 inch to 2 inches in width.
- E. Pretensioned Flexible Wraparound Colored Plastic Sleeves for Raceway and Cable Identification: Flexible acrylic bands sized to suit the raceway diameter and arranged to stay in place by pre-tensioned gripping action when coiled around the raceway or cable.
- F. Plasticized Card Stock Tags: Vinyl cloth with preprinted and field-printed legends to suit the application. Orange background, except as otherwise indicated, with Eyelet for fastener.
- G. Engraved, Plastic-Laminated Labels, Signs, and Instruction Plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8-inch thick for larger sizes. Engraved legend in white letters on black face and punched for mechanical fasteners.
- H. Fasteners for Plastic-Laminated nameplates: Self-tapping stainless steel screws or number 10/32 stainless steel machine screws with nuts and flat and lock washers.
- I. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking nylon cable ties, 0.18-inch minimum width, 50-lb minimum tensile strength, and suitable for a temperature range from minus 50 deg F to 350 deg F. Provide ties in specified colors when used for color coding.

## INSTALLATION

### 3.1 INSTALLATION

- A. Lettering and Graphics: Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering, and colors as approved in submittals and as required by code.
- B. Install identification devices in accordance with manufacturer's written instructions and requirements of NEC.
- C. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- D. Identify Raceways of Certain Systems with Color Banding: Band exposed or accessible raceways of the following systems for identification. Bands shall be pretensioned, snap-around colored plastic sleeves, colored adhesive marking tape, or a combination of the two. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side. Install bands at changes in direction, at penetrations of walls and floors, and at 40-foot maximum intervals in straight runs. Apply the following colors:
  - 1. Fire Alarm System: Red
  - 2. Security Alarm System: Blue and Yellow
  - 3. Mechanical and Electrical Supervisory System: Green and Blue
  - 4. Data/Communication System: Green and Yellow
  - 5. Telecommunications: Orange and Yellow
  - 6. 120/208V Power System: Black
  - 7. 120/208V Emergency Power System: Black and Orange
- E. Identify Junction, Pull, and Connection Boxes: Code-required caution sign for boxes shall be pressure-sensitive, self-adhesive label indicating system voltage in black, preprinted on orange background. Install on outside of box cover. Also label box covers with identity of contained circuits. Use pressure-sensitive plastic labels at exposed locations and similar labels or plasticized card stock tags at concealed boxes.
- F. Use conductors with color factory-applied the entire length of the conductors except as follows:
  - 1. The following field-applied color-coding methods may be used in lieu of factory-coded wire for sizes larger than No. 10 AWG.
    - (a) Apply colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply the last two laps of tape with no tension to prevent possible unwinding. Use 1-inch-wide tape in colors as specified. Do not obliterate cable identification markings by taping. Tape locations may be adjusted slightly to prevent such obliteration.
    - (b) In lieu of pressure-sensitive tape, colored cable ties may be used for color identification. Apply three ties of specified color to each wire at each terminal or splice point starting 3 inches from the terminal and spaced 3 inches apart. Apply with a special tool or pliers, tighten for snug fit, and cut off excess length.

- G. Power Circuit Identification: Securely fasten identifying metal tags or aluminum wraparound marker bands to cables, feeders, and power circuits in pull boxes, junction boxes, and switchboard rooms with 1/4-inch steel letter and number stamps with legend to correspond with designations on Drawings. If metal tags are provided, attach them with approximately 55-lb test monofilament line or one-piece self-locking nylon cable ties.
- H. Tag or label conductors as follows:
1. Future Connections: Tag or label conductors indicated to be for future connection or connection under another contract with identification indicating source (device to panelboard) and circuit numbers. Submit as-built record drawings for distribution to site administrator, Mr. Ron Gallegos, authorized APS representative and FC&P manager.
  2. Multiple Circuits: Where multiple branch circuits or control wiring or telecommunications/signal conductors are present in the same box or enclosure (except for three-circuit, four-wire home runs), label each conductor or cable. Provide legend indicating source, voltage, circuit number, and phase for branch circuit wiring. Phase and voltage of branch circuit wiring may be indicated by mean of coded color of conductor insulation. For control and communications/signal wiring, use color coding or wire/cable marking tape at terminations and at intermediate locations where conductors appear in wiring boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tapes.
  3. Match identification markings with designations used in panelboards shop drawings, Contract Documents, and similar previously established identification schemes for the facility's electrical installations.
  4. Install equipment/system circuit/device identification .
  5. Apply equipment identification labels of engraved plastic-laminate on each major unit of electrical equipment in building, including central or master unit of each electrical system. This includes communication/signal/alarm systems, unless unit is specified with its own self-explanatory identification. Except as otherwise indicated, provide single line of text, with 2-inch-high lettering on 1-1/2-inch-high label (2-inch-high where two lines are required), white lettering in black field. Text shall match terminology and numbering of the Contract Documents and shop drawings. Apply labels for each unit of the following categories of electrical equipment.
    - (a) Panelboards, electrical cabinets, and enclosures.
    - (b) Access doors and panels for concealed electrical items.
    - (c) Electrical switchgear and switchboards.
    - (d) Motor starters.
    - (e) Pushbutton stations.
    - (f) Contactors.
    - (g) Remote-controlled switches.

- (h) Dimmers.
  - (i) Control devices.
  - (j) Fire alarm control panel.
  - (k) Security alarm control panel.
- 
- I. Apply circuit/control/item designation labels of engraved plastic laminate for disconnect switches, breakers, pushbuttons, pilot lights, and similar items for power distribution and control components above, except panelboards and alarm/signal components, where labeling is specified elsewhere. For panelboards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker.
  - J. Install labels at locations indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.

END OF SECTION 16195

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ELECTRICAL - DIVISION 16  
SECTION 16450: GROUNDING

1. GENERAL

1.1 RELATED WORK IN OTHER SECTIONS

- A. Section 16010, General Provisions; Section 16110, Raceways, Boxes and Fittings; Section 16120, Low Voltage Conductors; Section 16140, Wiring Devices and Plates; Section 16160, Panelboards.

MATERIALS

2.1 GROUNDING SYSTEM

- A. Materials, equipment and devices related to the grounding system are specified under other sections of these specifications.

INSTALLATION

3.1 GENERAL

- A. Install an equipment grounding system.

3.2 EQUIPMENT GROUNDING SYSTEM

- A. General: Provide a complete equipment grounding system in accordance with the minimum code requirements and as further indicated on the drawings or specified. The equipment ground (green conductor) consists of metallic conditions to ground of non-current carrying metal parts of the wiring system or apparatus connected to the system. The primary purpose of equipment grounding is to provide greater safety by limiting the electrical potential between non-current carrying parts of the system to provide a low impedance path to ground for possible ground fault currents.
- B. Common Ground Point: Establish one common ground point as specified elsewhere in this section of the specifications for interconnection of the equipment grounding system and the service grounding electrode conductor.
- C. Conduits: Where metallic conduits terminate without mechanical connection to a metallic housing of electrical equipment by means of lock nut and bushings, provide ground bushing connected with a bare copper conductor to the ground bar in the electrical equipment. Metallic conduits containing ground wiring shall be bonded to the ground wire at both conduit entrance and exit. Install grounding conductor in each non metallic conduit or duct except those used for telephone, sound, or low-voltage signals and in all flexible conduit that does not have a built-in ground conductor. Bond the conductor at both ends to the equipment grounding system.



- D. Branch Circuits: Provide a separate green insulated equipment grounding conductor for single phase branch circuits where indicated on the drawings. Install the required grounding conductor in the common conduit or raceway with the related phase and/or neutral conductors and connect to the box or cabinet grounding terminal.
- E. Devices: Install a minimum No. 12 green insulated equipment bonding conductor from a grounding terminal in the respective outlet or junction box to the green ground terminal of all receptacles and through flexible conduit to all light fixture housings.
- F. Motors: Install a separate green insulated equipment bonding conductor from the equipment ground bar in the motor control center of separate starter through the conduit and flexible conduit to the ground terminal in the connection box mounted on the motor. Install the grounding conductor in the common conduit or raceway with the related motor circuit conductors.

### 3.3 GROUND CONNECTIONS

- A. Clean surfaces thoroughly before applying ground lugs or clamps. If surface is coated the coating must be removed down to the bare metal. After the coating has been removed, apply a non-corrosive approved compound to cleaned surface and install lugs or clamps. Where galvanizing is removed from metal, it shall be painted or touched up with "Galvanox", or equal.

END OF SECTION 16450

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ELECTRICAL - DIVISION 16  
SECTION 16510: LIGHTING EQUIPMENT

1. GENERAL

1.1 RELATED WORK IN OTHER SECTIONS

- A. Section 16010, General Electrical Requirements; Section 16450, Grounding.

1.2 SUBMITTALS

- A. Submit for approval complete shop drawings, catalog cuts, special installation instructions, photometric data and descriptive literature. When fixtures are proposed for substitution and prior approval has not been issued, the submittal for approval shall include catalog cuts of both the specified and proposed fixtures.

MATERIALS

2.1 GENERAL

- A. Furnish all lighting fixtures throughout the type indicated on the drawings, complete with lamps, sockets, wiring, fitters, hangers, plaster rings, canopies, etc., as required.

2.2 FINISH

- A. Bonderized or equal treatment on all steel parts prior to applying finish. Metal parts shall be aluminum, brass, copper, bronze, or steel, with baked white enamel finish unless otherwise noted on the drawings.

2.3 CEILING TRIM

- A. Furnish proper ceiling frames for the ceiling material in which recessed fixtures are to be installed.

INSTALLATION

3.1 SUPPORTS

- A. Support ceiling fixtures by anchorage to the ceiling only where the ceiling is concrete or masonry units. For ceilings of other construction, anchor ceiling fixtures to metal supports provided for that purpose of suitable strength and stability, adequately attached to and supported by joists, trusses, or other structural members, unless other methods of support are specifically approved by the Architect. Lay-in fixtures shall be supported independently of the ceiling support system.

3.2 CEILING TRIM AND MEANS OF SUPPORT

- A. The ceiling trim and means of support of recessed fixtures shall be coordinated with the type of the ceiling to be installed to insure proper installation.

### 3.3 CLEAN-UP

- A. At final inspection all fixtures and lighting equipment shall be in first class operating order, in perfect condition as to finish and free from defects, completely lamped, clean and free from dust, plaster or paint spots and complete with the required glassware, reflectors, side panels, louvers or other components necessary to complete the fixtures.

### 3.4 CEILING TRIM

- A. Furnish proper ceiling frames for the ceiling material in which recessed fixtures are to be installed; verify prior to ordering. Rims of all fixtures that overlap ceiling shall be installed tight and snug against the ceiling surfaces so that no light leakage occurs around the rim. If unevenness of surface of fixture allows light to show, then this contractor shall provide soft sponge filler or gasket on all fixtures requiring this treatment.

### 3.4 FLUSH AND RECESSED FIXTURES

- A. Special attention is directed to the special provisions for flush and recessed fixtures in the National Electrical Code. All recessed fixtures shall have top connections to the outlet boxes installed in accordance with the code. Connections to lay-in fixtures shall be made with flexible connections 4'-0" minimum length.

### 3.5 LAY-IN FIXTURES

- A. All lay-in fixtures shall be adequately supported to structure and not to ceiling alone.

### 3.6 TOP PLATES

- A. All surface mounted fixtures shall be furnished with top plated whenever applicable.

### 3.7 CEILING FIRE RATING

- A. All fixtures to be installed in a fire-resistive ceiling which shall be of a type suitable for such installation to ensure the maintenance of the ceiling fire rating or the fixtures shall be tented per UBC.

END OF SECTION 16510