	04.04.24 Bidding	01.19.24 Bids & Permits	01.19.2023 Owner Review–Budget
	■	■	■
	□	□	□

Drawing Issued
For Reference Only

SHEET INDEX

Sheet No. Sheet Description

ARCHITECTURAL

■	■	■	A.CVR	Cover Sheet
■	■	■	A.001	Project Data
■	■	■	A.002	Life Safety
■	■		A.003	Specifications
■	■		A.004	Specifications
■	■	■	A.100	Floor Plan
■	■	■	A.120	Finish Floor Plan
■	■	■	A.500	Interior Elevations
■	■	■	A.501	Interior Elevations
■	■	■	A.600	Reflected Ceiling Plan
■	■	■	A.700	Schedules

MECHANICAL / PLUMBING

■	■	■	M.001	INDEX, SYMBOLS, & ABBREVIATIONS
■	■	■	M.002	STANDARD MATERIALS SCHEDULES
■	■	■	M.003	SPECIFICATIONS
■	■	■	M.004	SPECIFICATIONS
■	■	■	M.005	SPECIFICATIONS
■	■	■	M.100	MECHANICAL DEMOLITION PLAN
■	■	■	M.200	PLUMBING PLAN
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■	■	■	M.700	SCHEDULES
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ELECTRICAL

■	■	■	E.001	ELECTRICAL LEGEND, SYMBOLS, & NOTES
■	■	■	E.002	RACEWAY/CONDUCTOR/CABLE APPLICATION SCHEDULE
■	■	■	E.003	ELECTRICAL SPECIFICATIONS
■	■	■	E.100	OVERALL FIRST FLOOR ELECTRICAL PLAN
■	■	■	E.101	PARTIAL FIRST FLOOR POWER PLAN
■	■	■	E.102	PARTIAL FIRST FLOOR LIGHTING PLAN
■	■	■	E.500	ELECTRICAL STANDARD CIRCUITING & CONDUIT SIZING SCHEDULES
■	■	■	E.501	PANEL SCHEDULES

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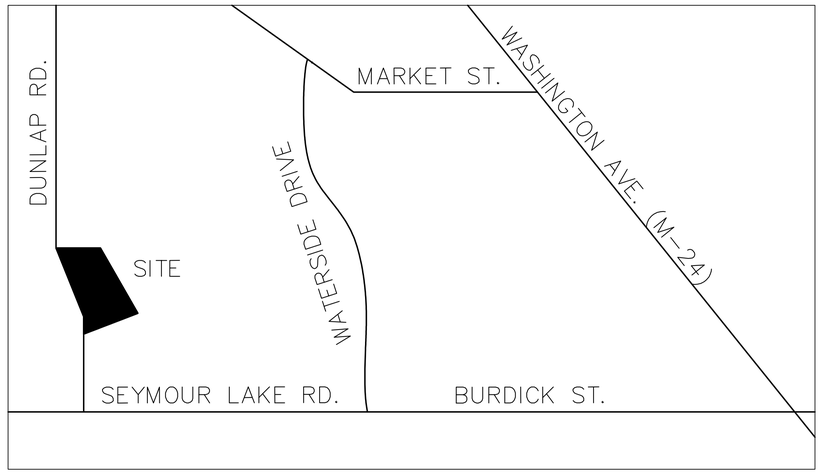
04.04.24
BIDDING



Location Map
No Scale

Project

Oxford Twp. Sub-Station Expansion and Lower Level Build-Out

300 Dunlap St.
Oxford, MI 48371

AKA Architects Inc. Project Number 2321.00

M / E/ P Engineer

Greenpath Design
139 W Liberty Street
Plymouth, MI 48170

voice 248–310–7286

Oxford Twp. Sub-Station 2321.00

AUGER KLEIN ALLER
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MATERIAL KEY

SYMBOL	DESCRIPTION
	BRICK
	CMU LEFT: HOLLOW RIGHT: GROUTED SOLID
	CONCRETE
	FINISHED WOOD
	PLYWOOD
	TILE
	MARBLE
	EARTH
	METAL (in elevation)
	STEEL
	LUMBER / WOOD BLOCK'G Left: Continuos right: discontinuous
	LOOSE OR BATT INSULATION
	RIGID INSULATION
	CARPET
	GYPSUM WALL BOARD OR PLASTER
	GRANULAR OR GRAVEL FILL

PLAN LEGEND

	EXISTING TO REMAIN
	PROPOSED

GENERAL NOTES

1.) ALL APPLICABLE LAWS, ORDINANCES AND REGULATIONS OF ALL AUTHORITIES WITH JURISDICTION OVER THE CONSTRUCTION SHALL APPLY IN THE PERFORMANCE OF ALL WORK ASSOCIATED WITH THIS PROJECT. IN CASE OF CONFLICT, THE MOST STRINGENT CODE SHALL APPLY.

2.) UPON OWNER APPROVAL, THE CONTRACTOR SHALL SECURE AND ASSUME ALL COSTS OF ALL REQUIRED PLAN REVIEW AND BUILDING PERMIT FEES AND BONDS.

3.) CONTRACTORS AND SUBCONTRACTORS SHALL VERIFY SITE CONDITIONS. ANY INCONSISTENCIES BETWEEN DRAWINGS AND FIELD CONDITIONS SHALL BE RESOLVED WITH ARCHITECT PRIOR TO COMMENCEMENT OF THE WORK.

4.) CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY CONDITIONS DISCOVERED WHERE MODIFICATION OF THE INTENT OF THE DESIGN WOULD PRODUCE BENEFICIAL RESULTS.

5.) CONTRACTOR AND SUBCONTRACTORS TO PROVIDE ALL NECESSARY TEMPORARY PROTECTION TO INSURE THE SAFETY OF THE GENERAL PUBLIC DURING CONSTRUCTION.

6.) THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODES AND DESIGN STANDARDS TO SUPPORT IN-PLACE DESIGN LOADS IN A COMPLETED BUILDING STRUCTURE. PROVIDE ADDITIONAL SUPPORTS OR TEMPORARY SHORING/ BRACING FOR THE STRUCTURE AS NEEDED DUE TO THE FORCES IMPOSED DURING HANDLING AND ERECTION.

7.) CONSTRUCTION METHODS, PROCEDURES, AND SEQUENCES ARE THE CONTRACTORS' RESPONSIBILITY, CONTRACTOR SHALL TAKE ALL NECESSARY MEANS TO MAINTAIN AND PROTECT STRUCTURAL INTEGRITY OF CONSTRUCTION AT ALL STAGES.

8.) THE CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO ANY WORK AND SHALL BE RESPONSIBLE FOR ALL WORK AND MATERIALS INCLUDING THOSE FURNISHED BY SUBCONTRACTORS AND OWNERS.

9.) ANY DETAILS OR NOTES REQUIRING FIELD VERIFICATION BY THE CONTRACTOR ARE TO BE DONE DURING THE BID PROCESS. DISCREPANCIES FOUND AFTER THE GENERAL CONTRACTOR IS SELECTED WILL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND CORRECTED AT HIS EXPENSE.

10.) APPROVED PLANS SHALL BE KEPT IN A PLAN BOX AND SHALL NOT BE USED BY WORKMEN. ALL CONSTRUCTION SETS SHALL REFLECT SAME INFORMATION. CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS IN GOOD CONDITION ON THE PREMISES AT ALL TIMES.

11.) CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION, TESTING AND BALANCING OF HVAC SYSTEM. SUPPLY AND RETURN DUCTS SHALL BE DAMPERED IF REQUIRED. PROVIDE FIRE DAMPERS ON ALL RETURN OPENINGS IN RATED CONSTRUCTION, TYPICAL.

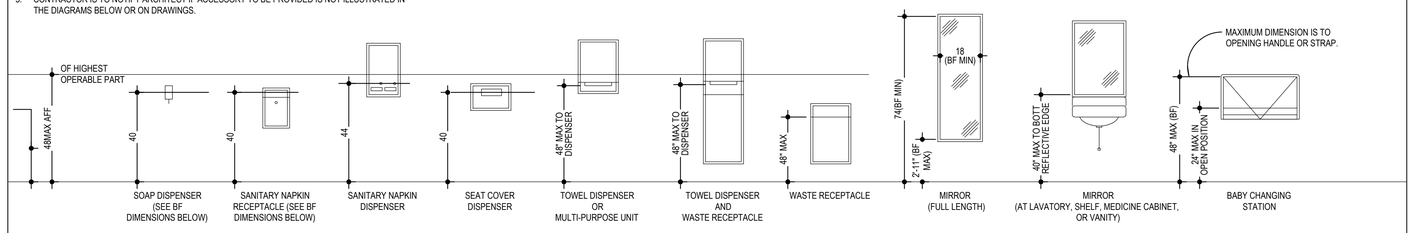
12.) IF ANY GENERAL NOTE CONFLICTS WITH ANY DETAIL OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.

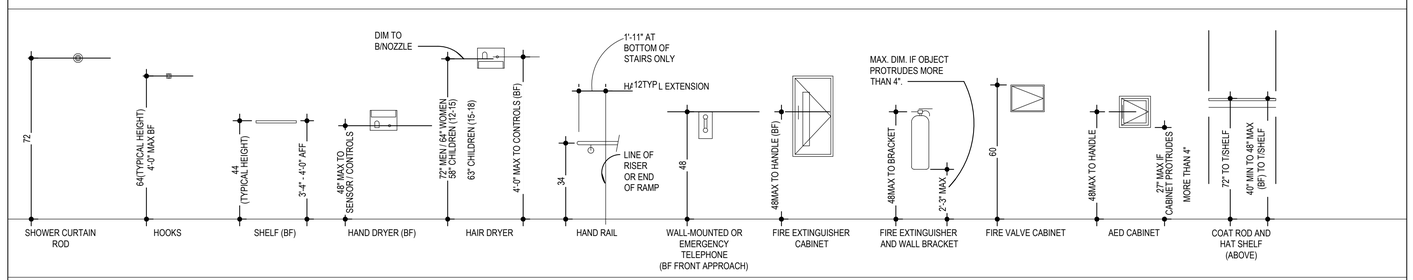
SYMBOLS KEY

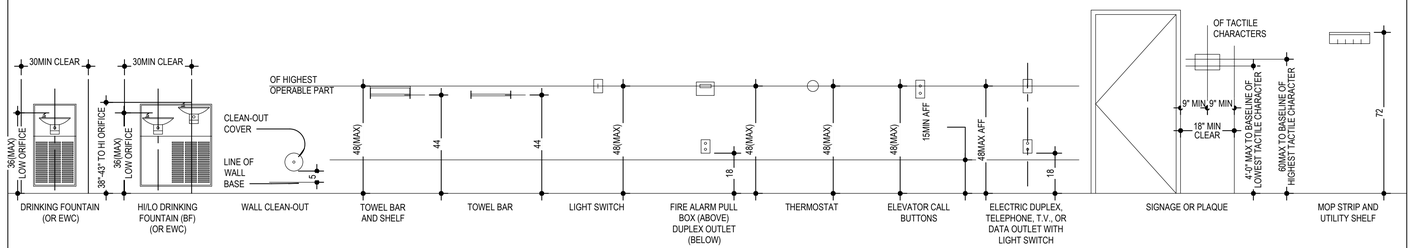
SYMBOL	DESCRIPTION
	PROJECT NORTH ARROW VERIFY ORIENTATION ON PLAN SHEETS
X	EXIST COLUMN CENTER LINES
X	NEW COLUMN CENTER LINES
	WORK POINT
T.O. FIN. FLR. ELEV. = 100'-0"	FLOOR ELEVATION POINT REFERENCE
8'-4" A.F.F.	CEILING HEIGHT TAG
BLDG. SECT. 1 A.301	BUILDING SECTION CUT SYMBOL
1 A.401	DETAIL CUTS
P1	PARTITION TYPE
X A.702 X	INTERIOR ELEVATION
EXIST. RM_NAME 100	EXISTING ROOM NAME
New RM_NAME 100	NEW ROOM NAME/NUMBER
EX	EXIST DOOR TO REMAIN
	ITEMS SCHEDULED FOR DEMO
100	NEW DOOR AND NUMBER
	LEADER LINE
4'-6"	DIMENSION LINE
X	WINDOW TYPE
1	BULLETIN
1	ADDENDUM
P1	WALL FINISH
F1	FLOOR FINISH
B1	BASE FINISH

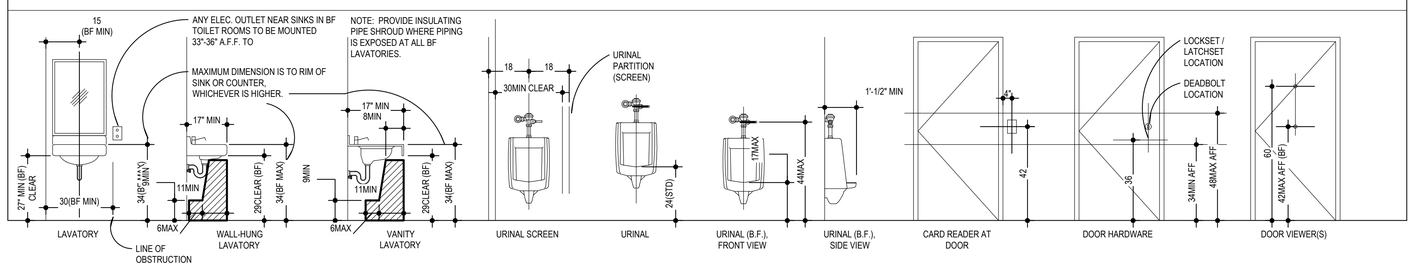
TYPICAL MOUNTING HEIGHT LEGEND

GENERAL NOTES:
1. MOUNTING HEIGHTS SHOWN ARE PROPOSED FOR ALL ACCESSORIES AND FIXTURES REQUIRED UNLESS OTHERWISE NOTED OR DIMENSIONED ON DRAWINGS FOR SPECIFIC CONDITIONS.
2. PROVIDE IN-WALL BLOCKING FOR ALL WALL-MOUNTED COMPONENTS.
3. BF DENOTES BARRIER-FREE REQUIREMENTS.
4. ALL DIMENSIONS FROM FLOOR ARE TAKEN FROM FINISH FLOOR.
5. CONTRACTOR IS TO NOTIFY ARCHITECT IF ACCESSORY TO BE PROVIDED IS NOT ILLUSTRATED IN THE DIAGRAMS BELOW OR ON DRAWINGS.









STANDARD ABBREVIATIONS

ACP -	ACOUSTIC CEILING PANEL	
ADD -	ADDENDUM	
AESS -	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	
AFF -	ABOVE FINISHED FLOOR	
ALT -	ALTERNATE	
ALUM -	ALUMINUM	
ANOD -	ANODIZED	
AP -	ACRYLIC PANELS	
BRD -	BOARD	
BF -	BARRIER FREE	
BLDG -	BUILDING	
BOS -	BOTTOM OF STEEL	
BULL -	BULLETIN	
CB -	CONCRETE BRICK	
CG -	CORNER GUARD	
CJ -	CONTROL JOINTS	
CL -	CENTER LINE	
CLG -	CEILING	
CLO -	CLOSET	
CMU-	CONCRETE MASONRY UNIT	
COL -	COLUMN	
CONC -	CONCRETE	
CONC-S -	CONCRETE – SEALED	
CPT -	CARPET	
CPTB -	CARPET BASE	
CW -	COLD WATER	
DCMU -	DECORATIVE CONCRETE MASONRY UNIT	
DEFS -	DIRECT-APPLIED EXTERIOR FINISH SYSTEM	
DEMO -	DEMOLISH, DEMOLITION	
DF -	DRAPERY FABRIC	
DIA -	DIAMETER	
DIM -	DIMENSION	
DN -	DOWN	
DS -	DOWNSPOUT	
DW -	DISHWASHER	
DWG(S) -	DRAWING(S)	
EA -	EACH	
EIFS-	EXTERIOR INSULATION AND FINISH SYSTEM	
EJ -	EXPANSION JOINT	
EL -	ELEVATION	
EM -	EMERGENCY	
EOS -	EDGE OF SLAB	
EQ -	EQUAL	
EQUIP -	EQUIPMENT	
EWC -	ELECTRIC WATER COOLER	
EX -	EXISTING	
EXIST -	EXISTING	
EXP -	EXPANSION	
FAB -	FABRIC	
FD -	FLOOR DRAIN	
FE -	FIRE EXTINGUISHER	
FEC -	FIRE EXTINGUISHER CABINET	
FHC -	FIRE HOSE CABINET	
FDN -	FOUNDATION	
FRP -	FIBERGLASS REINFORCED PANEL	
FRT -	FIRE RETARDANT TREATED	
FT -	FOOT, FEET	
FWC-	FABRIC WALL COVERING	
FWP-	FABRIC WRAPPED PANEL	
FWTP -	FABRIC WRAPPED TACKABLE PANEL	
GA -	GAUGE	
GALV -	GALVANIZED	
GB -	GYPSUM BOARD	
GFRC -	GLASS FIBER REINFORCED CONCRETE	
GL -	GLASS	
GLBL -	GLASS BLOCK	
GLT -	GLASS TILE	
GMB -	GLASS MARKER BOARD	
HM -	HOLLOW METAL	
HW -	HOT WATER	
HORZ -	HORIZONTALLY	
HPC -	HIGH PERFORMANCE COATING	
HT -	HEIGHT	
IIC -	IMPACT ISOLATION CLASS	
IN -	INCH, INCHES	
INCL -	INCLUDING, INCLUSIVE	
INSUL -	INSULATION	
JC -	JANITOR'S CLOSET	
LAV -	LAVATORY	
LF -	LINEAL FOOT / FEET	
LIN -	LINOLEUM	
LLH -	LONG LEG HORIZONTAL	
LLV -	LONG LEG VERTICAL	
LTS -	LINOLEUM TACKABLE SURFACE	
LVT -	LUXURY VINYL TILE	
MAT -	ENTRANCE MAT	
MAX -	MAXIMUM	
MB -	MARKER BOARD	
MECH -	MECHANICAL	
MFR -	MANUFACTURER	
MIN -	MINIMUM	
MISC -	MISCELLANEOUS	
MJ -	MOVEMENT JOINT	
MO -	MASONRY OPENING	
MTL -	METAL	
MW -	MICROWAVE OVEN	
NAF -	NO ADDITIONAL FINISH	
NIC -	NOT IN CONTRACT	
NTS -	NOT TO SCALE	
OC -	ON CENTER	
OD -	OUTSIDE DIAMETER	
OFCI -	OWNER FURNISHED, CONTRACTOR INSTALLED	
OFOI -	OWNER FURNISHED, OWNER INSTALLED	
OPP -	OPPOSITE	
P -	PAINT	
PFN -	PRE-FINISHED	
PL -	PLASTIC LAMINATE	
PSF -	POUNDS PER SQUARE FOOT	
PSI -	POUNDS PER SQUARE INCH	
PVC -	POLYVINYL CHLORIDE	
QSSM -	QUARTZ SOLID SURFACING MATERIAL	
QT -	QUARRY TILE	
QTB -	QUARRY TILE BASE	
QZ -	QUARTZ, NATURAL STONE	
RB -	RESILIENT BASE	
REF -	REFRIGERATOR	
REINF -	REINFORCED, REINFORCING	
REQD -	REQUIRED	
RES -	RESILIENT FLOORING	
RD -	ROOF DRAIN	
RF -	RUBBER FLOORING	
RO -	ROUGH OPENING	
RP -	RESIN PANEL	
RTR -	RESILIENT TREADS/RISERS	
SF -	SPORT FLOORING	
SIM -	SIMILAR	
SPEC -	SPECIFICATION	
SQFT -	SQUARE FEET	
SS -	STAINLESS STEEL	
SSM -	SOLID SURFACE MATERIAL	
STC -	SOUND TRANSMISSION COEFFICIENT	
ST -	STONE	
STN -	STAIN	
T -	TILE (CERAMIC, PORCELAIN)	
TB -	TILE BASE (CERAMIC, PORCELAIN)	
TBD -	TO BE DETERMINED	
T&G -	TONGUE AND GROOVE	
THK -	THICKNESS	
THOLD -	THRESHOLD	
TOS -	TOP OF STEEL	
TRANS -	TRANSPARENT	
TYP -	TYPICAL	
TZ -	TERRAZZO	
TZT -	TERRAZZO TILE	
UL -	UNDERWRITER'S LABORATORY	
UNO -	UNLESS NOTED OTHERWISE	
UPH -	UPHOLSTERY	
UR -	URINAL	
VCT -	VINYL COMPOSITION TILE	
VERT -	VERTICAL	
VIF -	VERIFY IN FIELD	
WC -	WATER CLOSET	
WD -	WOOD	
WDB -	WOOD BASE	
WDF-	WOOD FLOORING	
WLC-	WALL COVERING	
WPFG -	WATERPROOFING	
WP -	WORK POINT	
WD -	WOOD	

AKA ARCHITECTS 30 YEARS FOUNDED 1994

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303 E. THIRD STREET SUITE 100
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PROJECT
Oxford Township Hall Renovation

300 Dunlap Rd.
Oxford, MI 48371

DATE ISSUED	ISSUED FOR
01.19.24	BIDS & PERMITS
04.04.24	BIDDING

DRAWN AKA
CHECKED SA
APPROVED SA

SHEET
Project Data

scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.001

LIFE SAFETY LEGEND

(XX) → (OCCUPANCY LOAD) → DIRECTION OF EGRESS

COMMON PATH OF TRAVEL (CPT)

EXIT ACCESS TRAVEL DISTANCE

ROLLING MOVABLE GROW TABLES

MECHANICAL UNITS ON THE GROUND

EXIT ACCESS TRAVEL DISTANCE:
OCCUPANCY B – MAX. 300 FT. ALLOWABLE PER MBC TABLE 1017.2
W/ SPRINKLER SYSTEM

COMMON PATH OF EGRESS TRAVEL DISTANCE:
OCCUPANCY B – MAX. 100 FT. ALLOWABLE PER MBC TABLE 1006.2.1
W/ SPRINKLER SYSTEM

NOTE:
SEE ELECTRICAL SHEETS FOR EXIT SIGN LOCATIONS

F.E.C. PROVIDE SIX FIRE EXTINGUISHER CABINETS AS SHOWN ON PLAN. FINAL LOCATION AND QUANTITY TO BE DETERMINED BY THE FIRE MARSHAL (MIN. 2A–10BC)
SURFACE MOUNTED CABINETS AND EXTINGUISHER BY JL INDUSTRIES

OCCUPANT LOAD

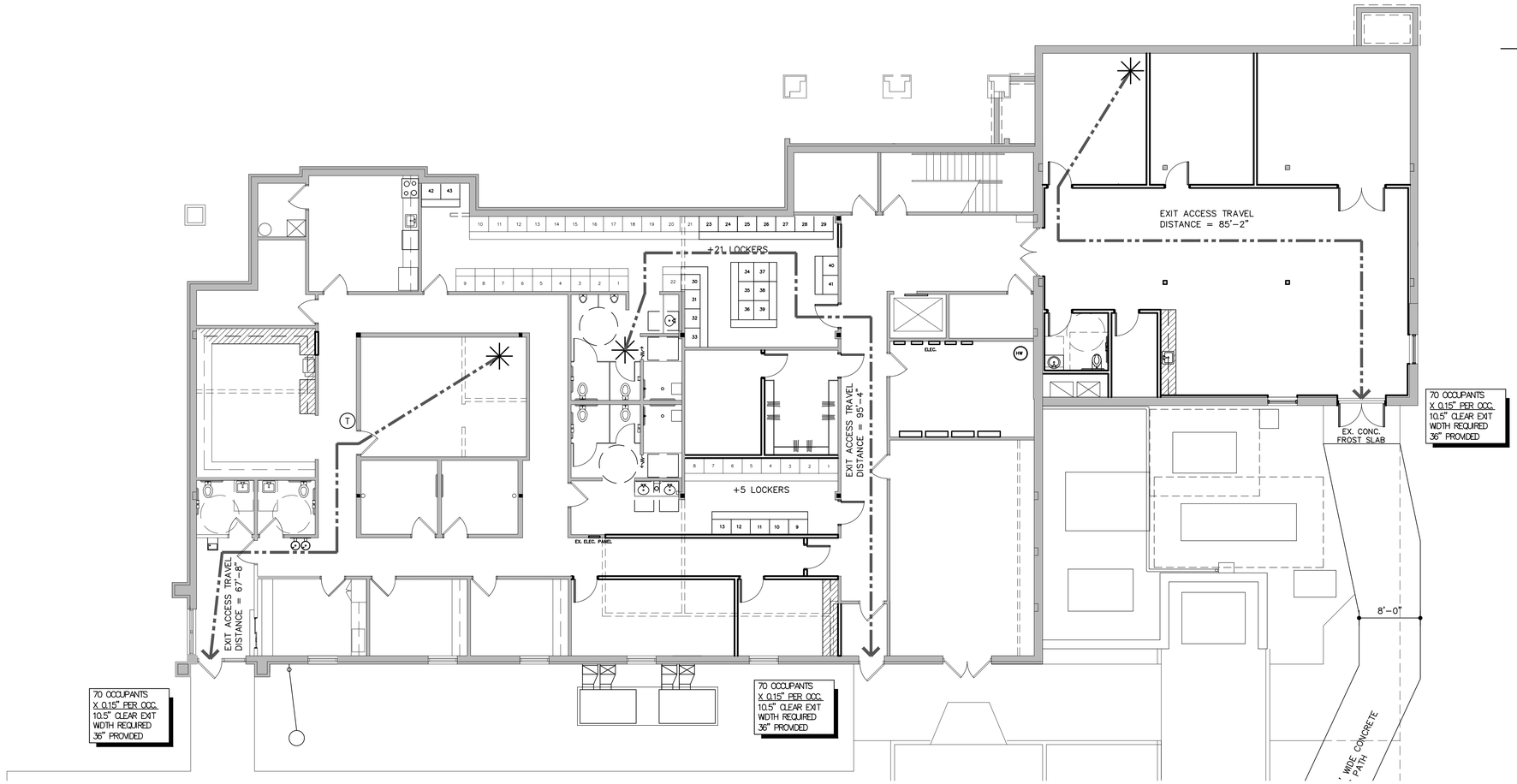
CONSTRUCTION TYPE: 2B

BUILDING TOTAL: 17,869 GROSS SQUARE FEET (GSF)

FUNCTION OF SPACE PER 1004.1.2:
BUSINESS (B) = 100 GROSS
STORAGE (S) = 300 GROSS

USE & OCCUPANCY:

BUSINESS (B) = 3817 SF/100 GROSS	= 39 OCCUPANTS
MENS LOCKER ROOM = 319 SF/15 GROSS	= 21 OCCUPANTS
WOMENS LOCKER ROOM = 102 SF/15 GROSS	= 6 OCCUPANTS
STORAGE (S) = 1191 SF/300 GROSS	= 4 OCCUPANTS
TOTAL OCCUPANT LOAD FOR ENTIRE BUILDING PER MBC:	= 70 OCCUPANTS



1 A.002 Life Safety Plan
SCALE: 1/8" = 1'–0"

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DRAWN	AKA
CHECKED	SA
APPROVED	SA

SHEET
Life Safety Plan

scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.002

DIVISION 1 - GENERAL REQUIREMENTS

1. Scope:

A. Provide tenant build-out to existing sheriff substation and finish previously unfinished areas of lower level Oxford Township ~~courts facility and Facility to remain occupied~~ during construction with minimal disruptions to remain operational. Contractor to notify owner of temporary conflicts with the operation of the facility 1 week prior to the event.Furnish all materials, labor, transportation, fees, permits, etc. as required to complete the Work as shown on the Drawings and as specified herein.

B. The intent of the Drawings and Specifications is to describe the complete Project, including materials, labor, equipment and incidentals necessary for the execution and completion of the Work. The Scope of the Work shall include all items directly called for by the Drawings and Specifications and all work reasonably to be foreseen and/or inferred in order to completely perform the Work and produce the complete Project as intended.

C. Contractor and sub-contractors shall verify site conditions. Any inconsistencies between drawings and conditions shall be resolved with the architect prior to commencement of the work.

D. Contractor shall notify the architect of any conditions discovered where modification of the intent of the design would produce beneficial results.

E. All dimensions are to the face of finish framing of walls or finish face of concrete unless noted otherwise (u.n.o.).

2. Temporary Facilities

A. Fire extinguishers as required by the local fire jurisdiction shall be furnished by the Contractor.

B. Heating, ventilation, water, electricity and toilet services shall be furnished by the contractor as required.

3. Permits

A. All required permits and inspections, unless otherwise noted, shall be obtained and paid for by the Contractor without an increase in the Contract Sum and without an extension of the Contract Time.

B. Plan Check fee and Building Permit fee will be reimbursed at cost by Owner. Reimbursement requests shall be included with final Payment Request and shall be accompanied with a copy of the pertinent receipts.

C. General Conditions : American Institute of Architects Document A-201, "General Conditions of the Contract for Construction" (latest edition) is hereby made a part of the Contract Documents by reference and shall have the same effect as if included herein.

D. The structure is designed to be self-supporting and stable after it is fully completed according to the plans and specifications. It is the contractor's sole responsibility to determine construction/erection procedure and sequence, and to ensure the safety of the structure and its component parts during construction. Temporary bracing, guying and tie downs of the structure during erection shall be the responsibility of the erector and the contractor. The architect / engineer assume no liability for the absence, presence or adequacy of any temporary bracing. Construction shall be braced and protected as required.

E. The architect / engineer assume no liability for the structure during construction. As such, the means and methods of construction are the sole responsibility of the contractors.

4. Tests and Inspections

A. All tests and inspections stipulated in the Specifications and/or Drawings shall be performed by the Owner's Testing Laboratory at the Owner's expense.

B. The Contractor shall cooperate with the Testing Laboratory and notify the Testing Laboratory sufficiently in advance so that the specified samples, tests, etc. can be accomplished.

C. Guarantees: Contractor shall guarantee installation of the Work for a period of one year following the date of Substantial Completion.

5. Cleaning

A. Contractor shall dispose of all debris, rubbish, etc. for the Project site in a lawful manner during the course of construction without an increase in the Contract Sum and without an extension of the Contract time.

B. Upon completion of the Work, the contractor shall clean Project Area, including, but not limited to; adjacent flooring, glass, casework, storefront windows, doors, door frames, plumbing fixtures, light fixtures, adjacent tenant entry / storefront, etc.

6. Submittals

A. Submittals include, but are not limited to, samples, shop drawings, product data, installation instruction for all work to be installed or as requested. Contractor shall not purchase items requiring submittal until submittal has been review and accepted by Architect.

B. Samples, including, but not limited to colors, materials textures, finishes, etc. shall be submitted when specified herein or upon request from the Architect. Quantity of samples shall be determined by Architect.

C. Owner shall select colors, accept samples, etc. prior to the installation of the item.

SECTION 016300: PRODUCT SUBSTITUTIONS

1. Substitutions for items specified herein and on the Drawings shall be allowed. The Owner and Architect shall be the sole judge of equivalent substitute items.
2. Wherever catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with a designated material, product, thing, or service mentioned in these Specifications, the catalog numbers and specific brands are used to establish the standards of quality, utility, appearance, etc. required.
3. When materials are specified by first manufacturer's name and product number followed by a second manufacturer's name and the designation "or equal", the second manufacturer's and the "or equal" manufacturer's product shall be considered a substitution and shall be submitted in accordance with the requirements for substitute items.
4. Substitutions which are equal in quality, utility, and appearance to those specified as judged by the Architect.
5. All substitutions must be accepted by the Architect in writing.
6. Sufficient data, Drawings, samples, literature, modifications required to incorporate the proposed substitution and other detailed information as will demonstrate to the Architect that the proposed substitute is equal in quality, appearance, etc. to the specified shall be submitted to the Architect for review and acceptance or rejection .
7. The Contractor is solely responsible for submitting sufficient information for the Architect to evaluate the proposed substitution. The submission of insufficient information shall be just cause for the rejection of the proposed substitution.
8. The Architect's acceptance of a substitution shall not relieve the Contractor from complying with the requirements of the Drawings and Specifications, and the Contractor shall be responsible, without an increase in the Contract Sum and without an extension of the Contract Time, for any changes resulting for the Contractor's proposed substitutions which affect other parts of the Contractor's own work or the work of others.
9. Failure of the Contractor to submit proposed substitutions for review in the manner described above and a timely manner so as not to cause a delay in the Work shall be sufficient cause for rejection of the proposed substitution by the Architect.
10. Only one proposed substitution (when allowed) will be submitted for each item. If a proposed substitution is judged by the Architect to be unacceptable, the specified item shall be provided; further substitution submissions for the same item will not be allowed.
11. Contractor representation of substitutions:
    A. Request for substitution constitutes a representation that Contractor has investigated proposed product and has determined that it is equal to or superior in all respects to specified product.
    B. Contractor will provide same warranty for substitution as for specified product.
    C. Contractor will coordinate installation of accepted substitute, making such changes be required for Work to be complete in al respects without an increase in the Contract sum and without an extension of the Contract Time.

DIVISION 2 - EXISTING CONDITIONS

SECTION 024100 - SELECTIVE DEMOLITION

1. Selective structure demolition work includes, but is not limited to, the following:
   A. Demolition and removal of selected portions of the existing building.
   B. Patching and repairs.
2. SUBMITTALS
   A. Schedule: Submit schedule indicating proposed methods and sequence of operations for selective structure demolition work to Owner's Representative for review prior to commencement of work.
      1. Provide detailed sequence of demolition and removal work to ensure uninterrupted occupancy of building.
      2. Include coordination for shut-off of utilities, if required.
      3. Proposed dust-control and noise-control measures.
   B. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating all refrigerant that was present was recovered and recovery was performed according to EPA regulations.
      1. Include name and address of technician and date refrigerant was recovered.
   C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction that might be misconstrued as damage caused by selective structure demolition operations.
   D. Landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous waste.
3. QUALITY ASSURANCE
   A. Contractor Qualifications: Engage only subcontractors who can demonstrate not less than fiveyears successful experience in work of similar character.
   B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
   C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
   D. Standards: Comply with ANSI A10.6 and NFPA 241.
4. PROJECT CONDITIONS
   A. Occupancy: The Owner WILL be continuously occupying spaces immediately adjacent to areas of selective structure demolition. Conduct selective structure demolition work in such manner that will minimize need for disruption of normal operations.
   B. Condition of Structures: Owner assumes no responsibility for actual condition of items to be demolished.
   C. Asbestos is NOT expected to be encountered in the course of this Contract. If any materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Architect and the Owner. If asbestos is encountered, it will be removed by Owner prior to the start of Work.
   D. Lead Paint: Lead paint is NOT expected to be encountered in the course of this Contract.
   E. Partial Demolition: Items indicated to be removed, but of salvable value shall be turned over to the Owner.
   F. Storage or sale of removed items or materials on-site is prohibited.
   Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective structure demolition work.
   1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from the building.
   2. Protect from damage existing finish work that is to remain in place and becomes exposed during Contractor is responsible for compliance with all requirements related lead containing paint if encountered.
   3. Protect floors with suitable coverings when necessary.
   4. Construct temporary insulated solid dustproof partitions where required to separate area where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required. Temporary dustproof partitions shall be fire-rated where indicated or required by authorities having jurisdiction.
   5. Remove protections at completion of work.
   H. Damages: Promptly repair damages caused to adjacent facilities by structure demolition work at no cost to Owner.
5. MATERIALS
   A. General: Except as otherwise indicated or approved by Architect, provide materials for selective demolition which will result in equal-or-better work than the work being cut-and-patched in terms of performance characteristics, including visual effect where applicable. Comply with the requirements, and use materials identical to original materials where feasible and where recognized that satisfactory results can be produced

DIVISION 6-WOOD AND PLASTICS

SECTION 062000 - FINISH CARPENTRY

1. Scope: Furnish and install all finish carpentry, millwork and related items including installation of building specialties as shown on the drawings and specified herein. AWI tolerances and standards and tolerances. Fabricate per approval of shop drawings showing verified field dimensions.
2. Materials:
   A. Hardwood: WIC-MM Premium Grade of Species included in building standard.
   B. Solid cores for plastic laminate:
      1. Veneer Plywood Cores: For shelves spanning more than 2'-0" without intermediate supports, closed grain plywood 3/4" thick. At counters to receive sinks use only marine plywood.
      2. Where plywood cores are not required, cores may be medium densities, 40lb Mat formed wood particleboard, per CS236-61.
   C. Interior Trim and Millwork: Furnish and install all interior wood trim as indicated and detailed on the drawings.
      1. Counter Work: Countertops as selected by owner shall be furnished and installed on all interior cabinet work as called for in the drawings, unless noted otherwise.
      2. Mirrors: Furnish and install 1/4" plate glass for mirrors where shown in drawings.
      3. Fasteners: Include fasteners as required.
      4. Nails: Bright Finnish nails for interior, exposed work.
3. Installation.
   A. Installation of Finish carpentry and millwork shall conform to the applicable requirements of the WIC-MM, sections 10,11,12, and 13 for interior work.In general, all work to Receive stain or transparent finish shall conform to "Custom" grade requirements.
   B. Hammer or tool marks or marred surfaces and edges will not be accepted on any exposed finished surfaces and as evidence of inferior workmanship, may be cause for rejection of such work.
   C. All end slices exposed in finish members shall be accurately and neatly itered or scarified. Install members in long lengths as possible.
   D. All work shall be installed to details shown, plumb, level, true to line, and securely anchored. Exterior corner joints shall be mitered. Interior corner joints may be coped. Where molded members adjoin or plain sections, the molded members shall be carefully and accurately scribed to the other members. All exposed edges shall be eased.
   E. Set all nails for putty at exposed finish work.
   F. Finishes as specified under section 09900.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 072100 - THERMAL INSULATION

PART 1 GENERAL

1.01SECTION INCLUDES

A. Board insulation and integral vapor retarder at cavity wall construction and exterior wall behind siding wall finish.

B. Batt insulation in exterior wall construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2019.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2021.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation Over Metal Stud Framed Walls, Continuous: Extruded polystyrene (XPS) board.

B. Insulation in Metal Framed Walls: Batt insulation with separate vapor retarder.

2.02 FOAM BOARD INSULATION MATERIALS

1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

A. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.

1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
3. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.

B. Extruded Polystyrene (XPS) Continuous Insulation (CI) Board: Complies with ASTM C578, and manufactured using carbon black technology.

1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
3. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.6 (0.98), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
4. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
5. Board Thickness: 1-3/4 inch (44.5 mm).
6. Board Edges: Shiplap, at long edges.

C. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.

1. Classifications:
   a. Type II: Faced with either organic felt facers or glass fiber mat facers on both major surfaces of the core foam.
      1) Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of core foam.
      2) Compressive Strength: Classes 1-2-3, Grade 3 - 25 psi (172 kPa), minimum.
      3) Thermal Resistance, R-value (RSI-value): At 1-1/2 inch (38.1 mm) thick; Class 2 - 8.0 (1.41), minimum, at 75 degrees F (24 degrees C).
2. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
3. Board Thickness: 3" & 2.5" inch (76 & 64 mm).
4. Tapered Board: Slope as indicated; minimum thickness 2.5 inch (64 mm); fabricate of fewest layers possible.
5. Board Edges: Square.

2.03 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket complying with ASTM C665, friction fit

1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance eith ASTM E136, except for facing, if any.
4. Thermal Resistance: R-value (RSI-value) R-13 minimum.
5. Thickness: As indicated on drawings.
6. Products:
   a. Certainteed Corporation; www.certainteed.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 BOARD INSTALLATION AT EXTERIOR WALLS

A. Install boards horizontally on walls.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.02 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over face of member

F. Tape seal tears or cuts in vapor retarder.

3.03 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

SECTION 078400 - FIRESTOPPING

PART 1 GENERAL

1.01SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2020.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

C. ITS (DIR) - Directory of Listed Products current edition.

D. FM (AG) - FM Approval Guide current edition.

E. UL 1479 - Standard for Fire Tests of Penetration Firestops Current Edition, Including All Revisions.

F. UL (FRD) - Fire Resistance Directory Current Edition.

1.03SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

1.04QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc- es.org will be considered as constituting an acceptable test report.
3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:

1. 3M Fire Protection Products; [____]: www.3m.com/firestop/#sle.
2. A/D Fire Protection Systems Inc; []: www.adfire.com/#sle.
3. Rectorseal, a CSW Industrials Company; Metacaulk 150+ General Purpose Firestop Sealant: www.metacaulk.com/#sle.
4. Everkem Diversified Products, Inc; Intumescent Fire-Rated Putty Pads: www.everkemproducts.com/#sle.
5. Hilti, Inc; []: www.us.hilti.com/#sle.
6. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com/#sle.
7. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

2.03 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.

1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

SECTION 079200 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.

B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants 2018.

C. ASTM C834 - Standard Specification for Latex Sealants 2017.

D. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete 2020a.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems 2016.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

H. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.

I. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2018.

J. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).

K. SCAQMD 1168 - Adhesive and Sealant Applications 1989 (Amended 2017).

1.03 SUBMITTALS

A. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.
3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.
5. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
6. Sample product warranty.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

H. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

B. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.

1. Adhesion Testing: In accordance with ASTM C794.
2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver to manufacturer sufficient samples for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

C. Field Quality Control Plan:

1. Field testing agency's qualifications.
2. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.

1. ADFAST Corporation; www.adfastcorp.com/#sle.
2. Adhesives Technology Corporation; www.atcepoxy.com/#sle.
3. Bostik Inc; www.bostik-us.com/#sle.
4. Dow; www.dow.com/#sle.
5. Everkem Diversified Products, Inc; www.everkemproducts.com/#sle.
6. Hilti, Inc; www.us.hilti.com/#sle.
7. Master Builders Solutions by BASF; www.master-builders- solutions.basf.us/en-us/#sle.
8. Sherwin-Williams Company; www.sherwin-williams.com/#sle.
9. Sika Corporation; www.usa-sika.com/#sle.
10. Tremco Commercial Sealants & Waterproofing; www.tremcosealants.com/#sle.
11. Substitutions: See Section 016000 - Product Requirements.

B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.

1. Adhesives Technology Corporation; www.atcepoxy.com/#sle.
2. Bostik Inc; www.bostik-us.com/#sle.
3. Dow; [____]: www.dow.com/#sle.
4. Master Builders Solutions by BASF; www.master-builders- solutions.basf.us/en-us/#sle.
5. QUIKRETE Companies; www.quikrete.com/#sle.
6. Sherwin-Williams Company; www.sherwin-williams.com/#sle.
7. Tremco Commercial Sealants & Waterproofing; www.tremcosealants.com/#sle.
8. W.R. Meadows, Inc; www.wrmeadows.com/#sle.
9. Substitutions: See Section 016300 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
   a. Wall expansion and control joints.
   b. Joints between door, window, and other frames and adjacent construction.
   c. Joints between different exposed materials.
   d. Openings below ledge angles in masonry.
   e. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. Other joints indicated below.
3. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.

1. Wall and Ceiling Joints in Wet Areas: Acrylic emulsion latex sealant.
2. Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
3. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew- resistant silicone sealant; white.
5. Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.
6. Other Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.

D. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 016116.

B. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

C. Colors: As selected by Architect from Manufacturer's standard range of colors.

2.04 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus [__] percent, minimum.
2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Color: Match adjacent finished surfaces.

B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.

C. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.

1. Color: White.

D. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: Match adjacent finished surfaces.

E. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.

1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: Match adjacent finished surfaces.

F. Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.

G. Epoxy Sealant: ASTM C881/C881M, Type I and III, Grade 3, Class B and C; two- component.

1. Hardness Range: 65 to 75, Shore D, when tested in accordance with ASTM C661.
2. Color: To be selected by Architect from manufacturer's standard range.

H. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non- bleeding, non-sagging; not intended for exterior use.

1. Color: To be selected by Architect from manufacturer's standard range.

2.05 SELF-LEVELING SEALANTS

A. Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.

1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.

B. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multi- component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.

C. Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.

D. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

1. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
2. Color: To be selected by Architect from manufacturer's standard colors.
3. Joint Width, Minimum: 1/8 inch (3 mm).

2.06 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi- Cellular Polyethylene.
3. Open Cell: 40 to 50 percent larger in diameter than joint width.
4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

DIVISION 8 - OPENINGS

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware.

B. Section 088000 - Glazing: Glass for doors and borrowed lites.

1.03 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

C. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:

1. Ceco Door, an Assa Abloy Group company; www.assaabloydss.com/#sle.
2. Republic Doors, an Allegion brand; www.republicdoor.com/#sle.
3. Steelcraft, an Allegion brand; www.allegion.com/#sle.
4. Substitutions: See Section 016300 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 2 - Heavy-duty.
   b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
2. Door Core Material: Polyisocyanurate, 2 lbs/cu ft minimum density.
   a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with

DIVISION 9 - FINISHES

SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Metal stud wall framing.
C. Gypsum wallboard.
D. Joint treatment and accessories.

1.02 SUBMITTALS

A. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:

1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:

1. ClarkDietrich; www.clarkdietrich.com/#sle.
2. Jaimes Industries; www.jaimesind.com/#sle.
3. SCAFCO Corporation; www.scafco.com/#sle.
4. Supreme Steel Framing System Association; Supreme Stud: www.ssfsa.com//#sle.

Substitutions: See Section 016300 - Product Requirements.

B. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.
C. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. Georgia-Pacific Gypsum; www.gpgypsum.com/#sle.
   2. USG Corporation; www.usg.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.
B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Thickness:
      a. Vertical Surfaces: 5/8 inch (16 mm).
      b. Ceilings: 5/8 inch (16 mm).
   3. Paper-Faced Products:
      a. American Gypsum Company; LightRoc Gypsum Wallboard: www.americangypsum.com/#sle.
      b. CertainTeed Corporation; Type X Drywall: www.certainteed.com/#sle.
      c. Continental Building Products; Regular Drywall: www.continental-bp.com/#sle.
      d. Georgia-Pacific Gypsum; ToughRock: www.gpgypsum.com/#sle.
      e. Substitutions: See Section 016300 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
B. Studs: Space studs at 16 inches on center (at 406 mm on center).
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
C. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water- resistant sealant.
E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Seal joints, cut edges, and holes with water-resistant sealant.
F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
G. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. At exterior soffits, not more than 30 feet (10 meters) apart in both directions.
B. Corner Beads: Install at external corners, using longest practical lengths.

3.06 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   5. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).
C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

SECTION 096500 - RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.
B. Resilient base.
C. Installation accessories.

1.02 REFERENCE STANDARDS

A. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.
B. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.

1.03 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
B. Shop Drawings: Indicate seaming plans and floor patterns.
C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
D. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.
E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

Extra Flooring Material: 45 square feet of each type and color.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
B. Store all materials off of the floor in an acclimatized, weather-tight space.
C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).
D. Protect roll materials from damage by storing on end.
E. Do not double stack pallets.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Tile - Type LVT-1: Solid vinyl with color and pattern throughout thickness.
   1. Manufacturers: Refer to Room Finish Schedule
      a. Substitutions: See Section 016300 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   3. Plank Tile Size: As indicated on drawings.
   4. Pattern: As indicated on drawings.
   5. Color: As indicated on drawings.

2.03 RESILIENT BASE

A. Resilient Base - Type WB-1: ASTM F1861, Type TS rubber, vulcanized thermoset; style as scheduled.
   1. Manufacturers:
      a. Burke Flooring; www.burkeflooring.com/#sle.
      b. Johnsonite, a Tarkett Company; www.johnsonite.com/#sle.
      c. Roppe Corporation; Contours Profiled Wall Base System: www.roppe.com/#sle.
   2. Height: 4 inch (100 mm).
   3. Thickness: 0.125 inch (3.2 mm).
   4. Finish: Satin.
   5. Length: Roll.
   6. Color: As indicated on drawings.

2.04 ACCESSORIES

A. Adhesive for Vinyl Flooring: As recommended by flooring manufacturer.
B. Moldings, Transition and Edge Strips: Same material as flooring.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.
B. Install in accordance with manufacturer's written instructions.
C. Adhesive-Applied Installation:
   1. Place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance with static control flooring manufacturer's instructions. Refer to Section 260526 for grounding and bonding to building grounding system.
   2. Fit joints and butt seams tightly.
   3. Set flooring in place, press with heavy roller to attain full adhesion.

SECTION 099000 - PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Interior painting and coating systems.
C. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Exterior:
         1) Masonry: Concrete masonry units (CMU), cinder or concrete block.
         2) Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
      b. Interior:
         1) Masonry CMU: Concrete, split face, scored, smooth, high density, low density, and fluted.
         2) Metal: Aluminum and galvanized.
         3) Metal, Galvanized: Ceilings and ductwork.
         4) Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
         5) Drywall: Walls, ceilings, gypsum board, and similar items.

1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.
B. SCAQMD 1113 - Architectural Coatings 1977 (Amended 2016).
C. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).
D. SSPC-SP 6 - Commercial Blast Cleaning 2007.
E. SSPC-SP 13 - Surface Preparation of Concrete 1997 (Reaffirmed 2003).

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.
   6. Clean-up information.
C. Samples: Submit four paper draw down samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.

Label each container with color in addition to manufacturer's label.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.05 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.
B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.
B. Comparable Products: Products of approved manufacturers will be considered in accordance with 016000 - Product Requirements, and the following:
   1. Products are approved by manufacturer in writing for application specified.
   2. Products that meet or exceed performance and physical characteristics of basis of design products.

2.02 PAINTINGS AND COATINGS

A. General:
   1. Provide factory-mixed coatings unless otherwise indicated.
   2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.
B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.
C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 PAINT SYSTEMS - EXTERIOR

A. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
   1. Alkyd Systems, Water Based:
      a. Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
      b. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
      c. Low Sheen Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.

2.04 PAINT SYSTEMS - INTERIOR

A. Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal (refer to Section 099600 for high performance coating for steel columns in cultivation rooms).
   1. Alkyd Systems, Water Based:
      a. Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Gloss, B53-1050 Series: www.sherwin-williams.com/#sle.
      b. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
      c. Low Sheen Finish:
         1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Low Sheen, B53-1250 Series: www.sherwin-williams.com/#sle.
E. Drywall: Walls, ceilings, gypsum board, and similar items.
   1. Latex Systems:
      a. Egg-Shell Finish:
         1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.
      b. Flat Finish:
         2) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
         3) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.
D. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk.
E. Masonry: Remove efflorescence and chalk.
F. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.
G. Aluminum: Remove surface contamination and oil; wash with solvent according to SSPC- SP 1.
H. Galvanized Surfaces:
   1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
I. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until coated.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
B. Apply products in accordance with manufacturer's written instructions.
C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.
D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. Clean surfaces immediately of overspray, splatter, and excess material.
C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished coatings from damage until completion of project.
B. Touch-up damaged finishes after Substantial Completion.

AKA ARCHITECTS 30 YEARS
FOUNDED 1994
AUGER KLEIN ALLER
ARCHITECTS INC.
303 E. THIRD STREET SUITE 100
ROCHESTER, MI 48307
248.814.9160
WWW.AKA-ARCHITECTS.NET

PROJECT
Oxford Township Hall Renovation

300 Dunlap Rd
Oxford, MI 48371

DATE ISSUED	ISSUED FOR
01.19.24	BIDS & PERMITS
04.04.24	BIDDING

DRAWN AKA
CHECKED SA
APPROVED SA

SHEET
Specifications

scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.004

GENERAL CONSTRUCTION NOTES

1. ALL DIMENSIONS TO FINISH FACE OF WALL UNLESS NOTED OTHERWISE (U.N.O.)
2. CONTRACTOR SHALL COORD W/ MECH, ELEC, PLUM'G CONTR'S LOCATION OF DUCTS, PIP'G, BOXES, CHASES, CONDUIT, ETC.. ME& P TO BE "DESIG/BUILD". DESIGN–BUILD SUB–CONTRACTORS ARE RESPONSIBLE FOR THE CONSTRUCTION DRAWINGS, SPECIFICATIONS AND OBTAINING PERMITS FOR THEIR SCOPE OF WORK..
3. ALL BLOCK'G & PLYWD. TO BE FIRE RETARDANT–TREATED.
4. ALL FURRED & FRAMED WALLS SHALL HAVE FIRE BLOCK'G AS REQ'D BY CODE.
5. ALL MATERIALS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS, CONTRACTOR IS RESPONSIBLE FOR ALL WARRANTIES, MATERIALS AND METHODS.
6. ALL GYPSUM WALL BOARD (G.W.B.) TO BE 5/8" TYPE "X" U.N.O.
7. ALL NEW PARTITIONS AND WALLS TO MATCH EXISTING. VERIFY THICKNESS OF EXIST PARTITIONS IN FIELD.
8. FINISHES FOR ALL NEW PARTITIONS, FLOORS, DOORS, BASE BRDS, TRIMS, PATCH AND REPAIR WORK TO BE COORDINATED W/ OWNER.
9. ALL INTERIOR FINISHES AND TRIM SHALL BE CLASS A.
10. VERIFY LOCATIONS OF ALL NEW RELOCATED AND EXIST. ELECTRICAL, COMMUNICATION, COMPUTER OUTLETS, THERMOSTATS, CABLE TV OUTLETS AND SWITCHES FOR LIGHTING WITH TENANT. NOTE: INSTALL ALL OUTLETS 18" A.F.F.
11. MAINTAIN CONTINUOUS 2 HOUR SEPARATION BETWEEN FLOORS. ALL EXTERIOR WALLS TO HAVE 5/8" TYPE X GWB. IF EXIST'G 5/8" GWB IS NOT DETERMINED AS TYPE X, REPLACE W/ 5/8" TYPE X GWB.
12. ANY STORAGE ROOM 100 SQUARE FEET OR MORE, OR STORAGE OF COMBUSTIBLE MATERIALS, MUST BE SEPARATED BY MIN 1 HOUR RESISTIVE CONSTRUCTION.
13. ALL GYPSUM WALL BOARD DROPPED CEILING SYSTEMS ARE TO BE SUPPORTED BY 2X WOOD FRAMING SYSTEM. TYP.

ACCESSORY LEGEND

A WALL MOUNTED PAPER TOWEL DISPENSER
B WALL MOUNTED FRAMELESS MIRROR
C 6" STAINLESS STEEL TRASH GROMMET
D WALL MOUNTED SOAP DISPENSER
E ADA GRAB BARS
F TOILET PAPER HOLDER
G FEMININE NAPKIN DISPOSAL

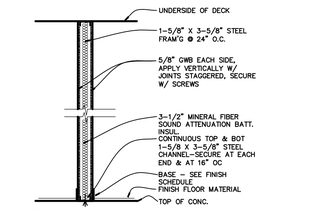
KEYED NOTES

(1) S.S. CORNER GUARD MIN. 6' HIGH FROM F.F.–TYP

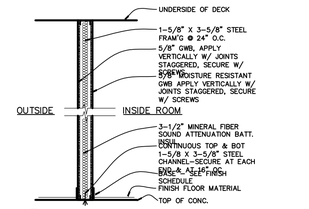
WALL LEGEND

- EXISTING WALL TO REMAIN
- EXISTING WALL TO BE REMOVED
- PROPOSED STUD WALL
- BRICK VENEER
- CONCRETE BLOCK MASONRY FOUNDATION WALL
- POURED CONCRETE FOUNDATION WALL
- 3/4"PLYWOOD BEHIND GWB
- FIRE EXTINGUISHER (F.E.)

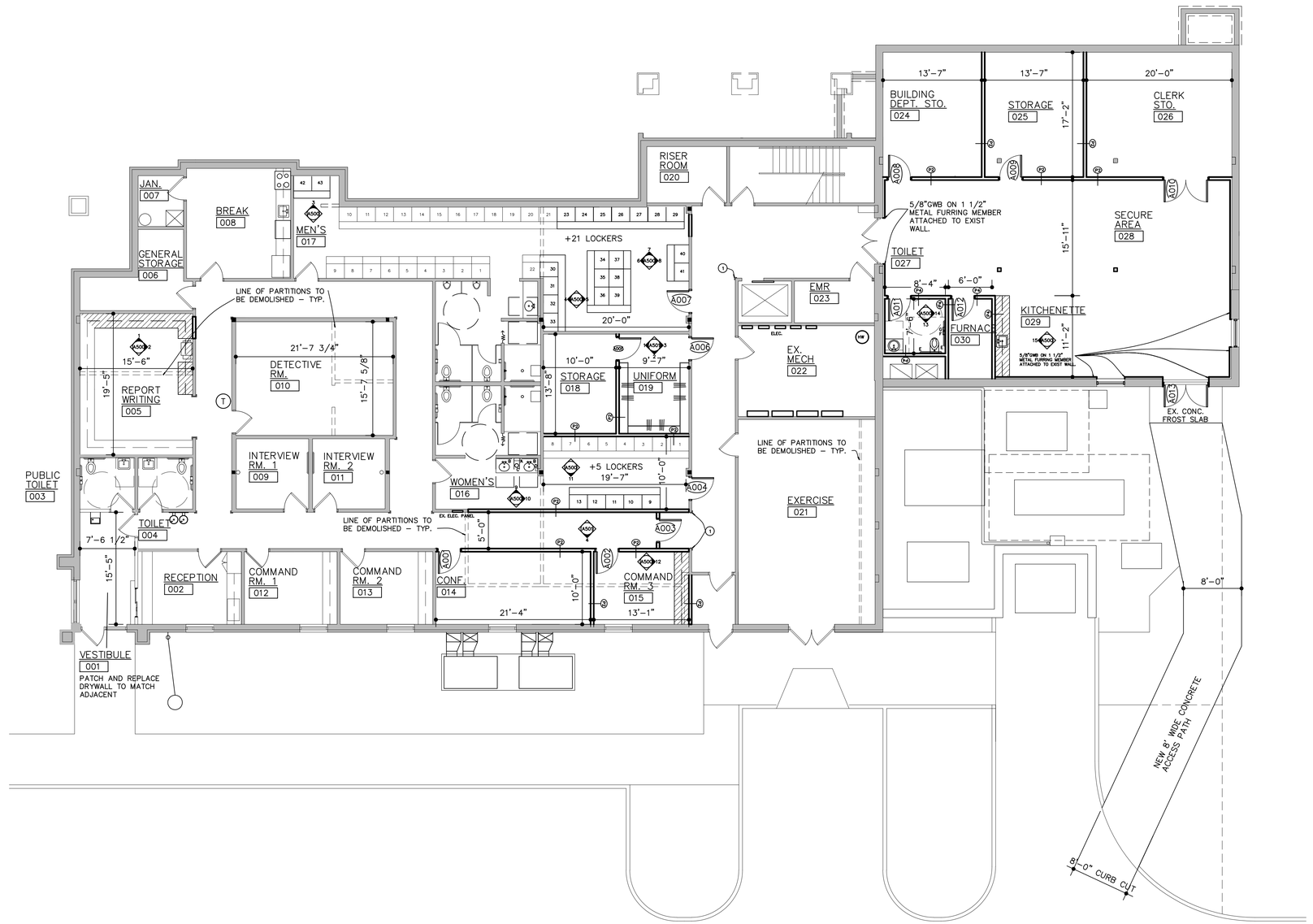
NOTE: PROVIDE CONC. SLAB CONTROL JOINTS TO MATCH EXIST'G @ EXIST'G COLS & COL LINES. SEE DET 1/ SHT S–104.



P–2 SECTION
A–106 SCALE 1/2"=1'–0"



P–4 SECTION
A–106 SCALE 1/2"=1'–0"



1 A.100 Approved Scheme Floor Plan
SCALE: 1/8" = 1'–0"

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PROJECT
Oxford Township Hall Renovation

300 Dunlap Rd
Oxford, MI 48371

DATE ISSUED	ISSUED FOR
06.22.23	CLIENT REVIEW
06.29.23	CLIENT REVIEW
11.03.23	OWNER DD FINAL
11.17.23	OWNER REVIEW
12.21.23	MEP REVIEW
01.19.24	BIDS & PERMITS
04.04.24	BIDDING

DRAWN	AKA
CHECKED	SA
APPROVED	SA

SHEET
Floor Plan

scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.100

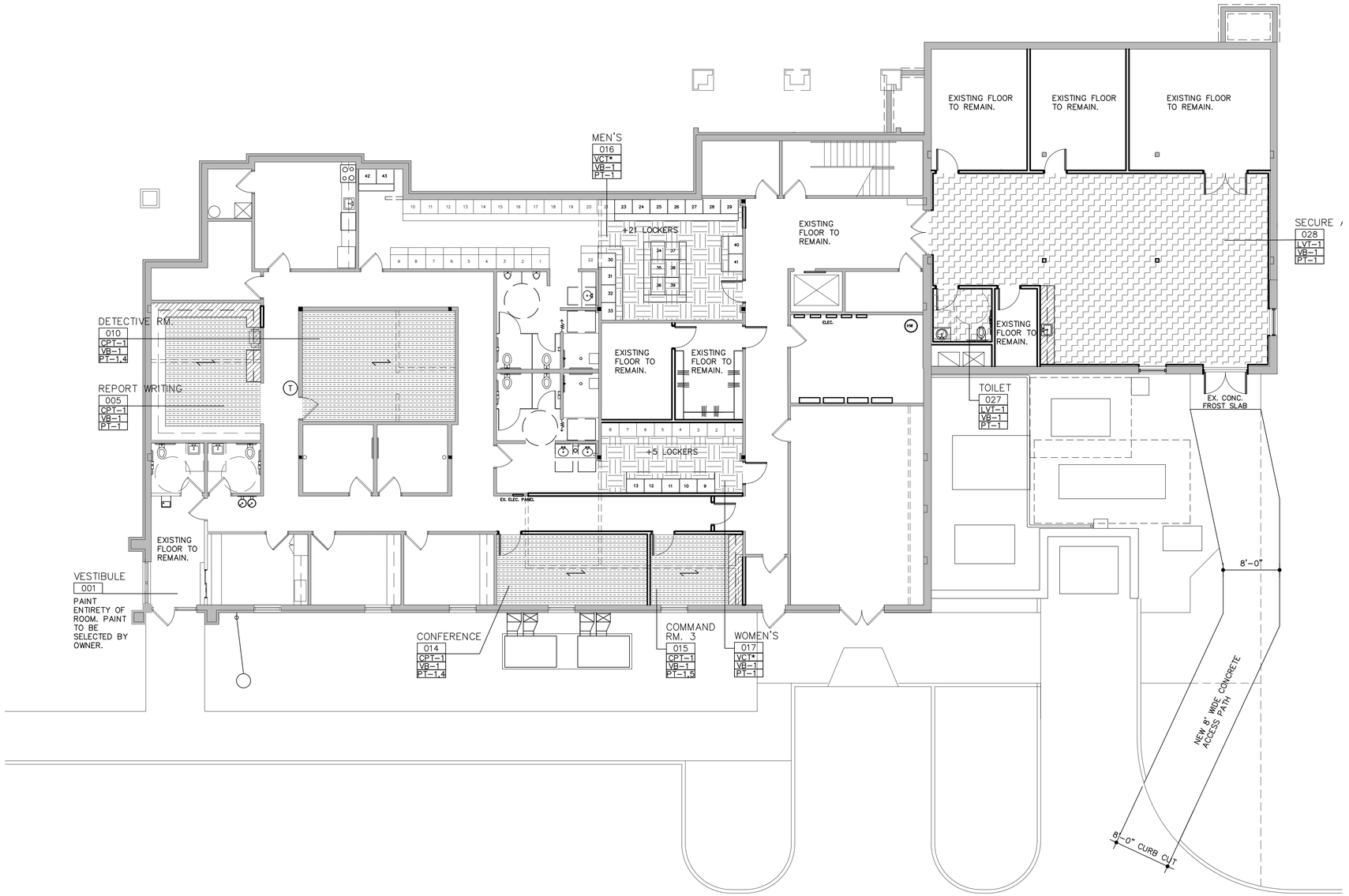
FINISH MATERIALS

CODE	MATERIAL	DESCRIPTION
ACT-1	ACOUST. CLG. TILE	MANUF: ARMSTRONG
		STYLE: OPTIMA OPEN PLAN TEGULAR
		SIZE: 24" X 48"
		GRID FACE: 9/16" INTERLUDE XL DIM.
		GRID COLOR: WHITE
VCT*	VINYL COMPOSITION TILE	MANUF: ECORE
		STYLE: EVERLAST ULTRA
		SIZE: 2' X 2' TILES
		PATTERN: EL99 OMEGA 3
VS-1	VINYL SHEET	MANUF: ECORE
		STYLE: FOREST RX
		SIZE: 6'X30' ROLLS
		PATTERN: TO BE SELECTED BY ARCHITECT
VB-1	VINYL WALL BASE	MANUF: ROPPE
		COLOR: TO BE SELECTED BY ARCHITECT
		SIZE: 4" VINYL BASE
		FINISH: PRE-FIN.
TILE-1	PORCELAIN TILE COVE BASE	MANUFACTURER: CROSSVILE
		SIZE: 6" X 12" COVE BASE
		COLOR: MAIN STREET: CAFE CARAMEL
TILE-2	PORCELAIN WALL TILE	MANUF.: ANATOLIA TILE
		SIZE: 12" X24"
		COLOR: ZERA ANNEX: WALNUT
TILE-3	PORCELAIN TILE WALL TRIM	MANUF.: ANATOLIA TILE
		SIZE: 4" X24" BULL NOSE
		COLOR: ZERA ANNEX: WALNUT
PLAM-1	PLASTIC LAMINATE BASE & WALL CABS	MANUF: FORMICA
		COLOR: JARRAH LEGNO MATTE 8847-58
PLAM-2	PLASTIC LAMINATE HORIZONTAL SURFACES	MANUF: FORMICA
		COLOR: JUTE GAUZE MATTE 7709-58
PT-1	PAINT	MANUF: SHERWIN WILLIAMS
		COLOR: NOMADIC DESERT SW 6107
		FINISH: EGGSHELL
		SUBSTRAIT: GWB
PT-2	PAINT	MANUF: SHERWIN WILLIAMS
		COLOR: CEILING BRIGHT WHITE SW7007
		FINISH: EGGSHELL
		SUBSTRAIT: GWB CEILING
LVT-1	LUXURY VINYL TILE	MANUF: PATCRAFT
		STYLE: 1716V PLANAR
		COLLECTION: SHAPE STUDY
		COLOR: 00555 GRAY PLANAR-V2
		SIZE: 24" X 24"

NOTE: VCT* TO MATCH EXISTING.

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM IDENTIFICATION	FLOOR	BASE	WALLS				CEILING			REMARKS
				NORTH	EAST	SOUTH	WEST	TYPE	HEIGHT	FINISH	
005	REPORT WRITING	CPT-1	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
010	DETECTIVE RM.	CPT-1	VB-1	PT-1	PT-4	PT-1	PT-1	ACT-1	9'-0"	-	
014	CONFERENCE	CPT-1	VB-1	PT-1	PT-1	PT-4	PT-1	ACT-1	9'-0"	-	
015	COMAND RM.3	CPT-1	VB-1	PT-1	PT-1	PT-5	PT-1	ACT-1	9'-0"	-	
016	MEN'S	VCT*	VB-1	PT-1 TILE- 1-2-3	PT-1 TILE- 1-2-3	PT-1 TILE- 1-2-3	PT-1 TILE- 1-2-3	ACT-1/GYP	9'-0"	PT-2	SEE RCP FOR SOFFIT HEIGHT
017	WOMEN'S	VCT*	VB-1	PT-1 TILE- 1-2-3	PT-1 TILE- 1-2-3	PT-1 TILE- 1-2-3	PT-1 TILE- 1-2-3	ACT-1/GYP	9'-0"	PT-2	SEE RCP FOR SOFFIT HEIGHT
018	STORAGE	EXIST.	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
019	UNIFORM RM.	EXIST.	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
024	BLDG. DEPT. STORAGE	EXIST.	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
025	STORAGE	EXIST.	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
026	CLERK STORAGE	EXIST.	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
027	TOILET	LVT-1	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
028	SECURE AREA	LVT-1	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	
029	KITCHENETTE	LVT-1	VB-1	PT-1	PT-1	PT-1	PT-1	ACT-1	9'-0"	-	



1 A.120 Finish Floor Plan
SCALE: 1/8" = 1'-0"

AKA ARCHITECTS 30 YEARS
FOUNDED 1994
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DRAWN	AKA
CHECKED	SA
APPROVED	SA

SHEET
Finish Floor Plan

scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.120

GENERAL CONSTRUCTION NOTES

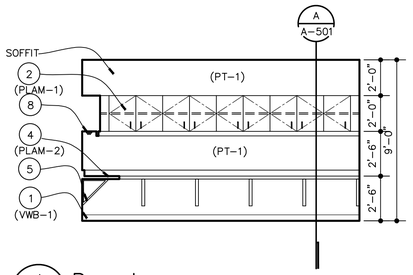
1. ALL DIMENSIONS TO FINISH FACE OF WALL UNLESS NOTED OTHERWISE (U.N.O.)
2. CONTRACTOR SHALL COORD W/ MECH, ELEC, PLUM'G CONTR'S LOCATION OF DUCTS, PIP'G, BOXES, CHASES, CONDUIT, ETC.. ME& P TO BE "DESIG/BUILD". DESIGN–BUILD SUB–CONTRACTORS ARE RESPONSIBLE FOR THE CONSTRUCTION DRAWINGS, SPECIFICATIONS AND OBTAINING PERMITS FOR THEIR SCOPE OF WORK..
3. ALL BLOCK'G & PLYWD. TO BE FIRE RETARDANT–TREATED.
4. ALL FURRED & FRAMED WALLS SHALL HAVE FIRE BLOCK'G AS REQ'D BY CODE.
5. ALL MATERIALS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS, CONTRACTOR IS RESPONSIBLE FOR ALL WARRANTIES, MATERIALS AND METHODS.
6. ALL GYPSUM WALL BOARD (G.W.B.) TO BE 5/8" TYPE "X" U.N.O.
7. ALL NEW PARTITIONS AND WALLS TO MATCH EXISTING. VERIFY THICKNESS OF EXIST PARTITIONS IN FIELD.
8. FINISHES FOR ALL NEW PARTITIONS, FLOORS, DOORS, BASE BRDS, TRIMS, PATCH AND REPAIR WORK TO BE COORDINATED W/ OWNER.
9. ALL INTERIOR FINISHES AND TRIM SHALL BE CLASS A.
10. VERIFY LOCATIONS OF ALL NEW RELOCATED AND EXIST. ELECTRICAL, COMMUNICATION, COMPUTER OUTLETS, THERMOSTATS, CABLE TV OUTLETS AND SWITCHES FOR LIGHTING WITH TENANT. NOTE: INSTALL ALL OUTLETS 18" A.F.F.
11. MAINTAIN CONTINUOUS 2 HOUR SEPARATION BETWEEN FLOORS. ALL EXTERIOR WALLS TO HAVE 5/8" TYPE X GWB. IF EXIST'G 5/8" GWB IS NOT DETERMINED AS TYPE X, REPLACE W/ 5/8" TYPE X GWB.
12. ANY STORAGE ROOM 100 SQUARE FEET OR MORE, OR STORAGE OF COMBUSTIBLE MATERIALS, MUST BE SEPARATED BY MIN 1 HOUR RESISTIVE CONSTRUCTION.
13. ALL GYPSUM WALL BOARD DROPPED CEILING SYSTEMS ARE TO BE SUPPORTED BY 2X WOOD FRAMING SYSTEM. TYP.

ACCESSORY LEGEND

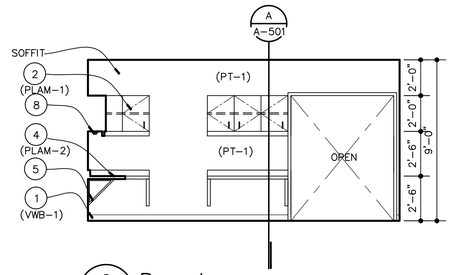
A WALL MOUNTED PAPER TOWEL DISPENSER
B WALL MOUNTED FRAMELESS MIRROR
C 6" STAINLESS STEEL TRASH GROMMET
D WALL MOUNTED SOAP DISPENSER
E ADA GRAB BARS
F TOILET PAPER HOLDER
G FEMININE NAPKIN DISPOSAL

KEYED NOTES

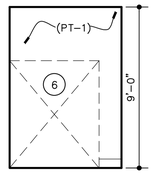
1. 4" VINYL BASE
2. FLUSH FACE P–LAM BASE AND WALL CABS W/ WIRE PULLS –TYP.
3. B. NOSE P–LAM C. TOP W/ 4" B.SPLASH ON 3/4"MARINE PLYWD. –TYP.
4. P–LAM DESK TOP W/ 4" RETURN
5. MLT. DESK SUPPORT 36" O.C. MIN –TYP.
6. LOCKERS PROVIDED BY OWNER
7. 21.25"X17" SS HAND WASH LAV.
8. CONT. UPPER CABINET TASK LIGHT'G –TYP.
9. HOLLOW METAL DOOR AND FRAME–PAINT. REFER TO DOOR SCHEDULE FOR DOOR SPECIFICATION.
10. S.S. CORNER GUARD MIN. 6' HIGH FROM F.F.–TYP



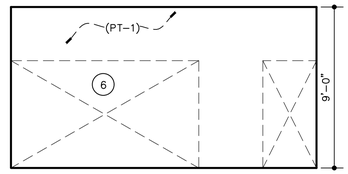
1 A–500 Report
SCALE 1/4"=1'–0"



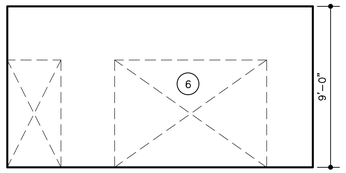
2 A–500 Report
SCALE 1/4"=1'–0"



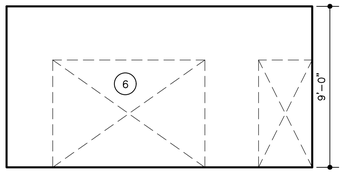
3 A–500 Men's
SCALE 1/4"=1'–0"



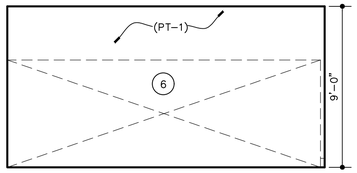
4 A–500 Men's
SCALE 1/4"=1'–0"



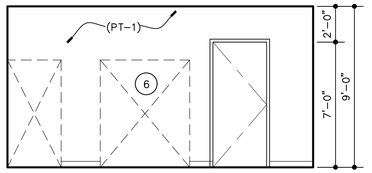
5 A–500 Men's
SCALE 1/4"=1'–0"



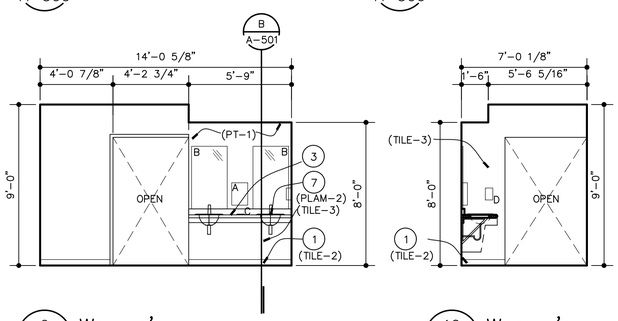
6 A–500 Men's
SCALE 1/4"=1'–0"



7 A–500 Men's
SCALE 1/4"=1'–0"

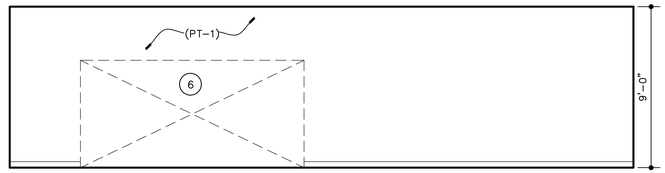


8 A–500 Men's
SCALE 1/4"=1'–0"

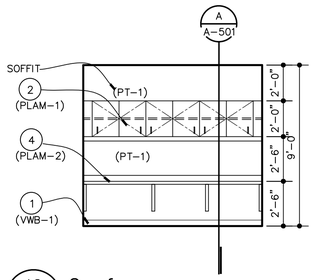


9 A–500 Women's
SCALE 1/4"=1'–0"

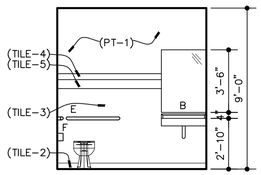
10 A–500 Women's
SCALE 1/4"=1'–0"



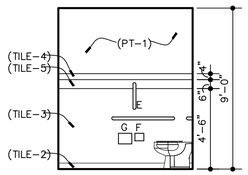
11 A–500 Women's
SCALE 1/4"=1'–0"



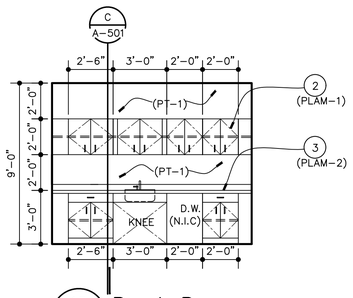
12 A–500 Conference
SCALE 1/4"=1'–0"



13 A–500 Toilet
SCALE 1/4"=1'–0"
NOTE: BOTTOM OF MIRROR MOUNT @ 3'–2" A.F.F.



14 A–500 Toilet
SCALE 1/4"=1'–0"
NOTE: BOTTOM OF MIRROR MOUNT @ 3'–2" A.F.F.



15 A–500 Break Room
SCALE 1/4"=1'–0"

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PROJECT
Oxford Township Hall Renovation

300 Dunlap Rd
Oxford, MI 48371

DATE ISSUED	ISSUED FOR
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01.19.24	BIDS & PERMITS
04.04.24	BIDDING

DRAWN AKA
CHECKED SA
APPROVED SA

SHEET
Interior Elevations

scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.500

GENERAL CONSTRUCTION NOTES

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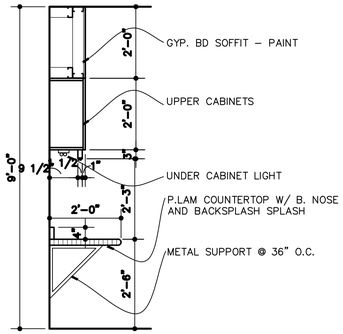
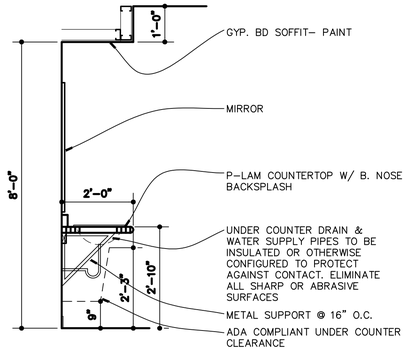
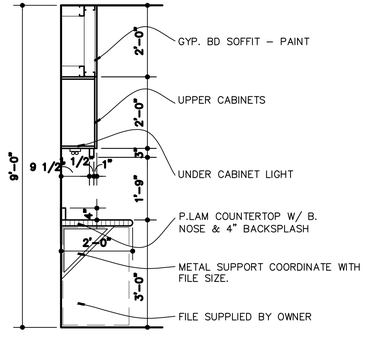


A Section A-501 SCALE: 1/2"=1'-0"



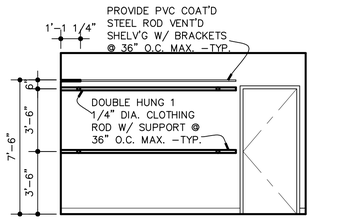
B Section A-501 SCALE: 1/2"=1'-0"



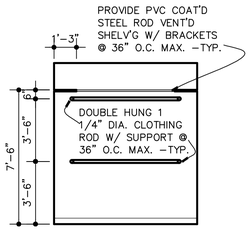
C Section A-501 SCALE: 1/2"=1'-0"

KEYED NOTES

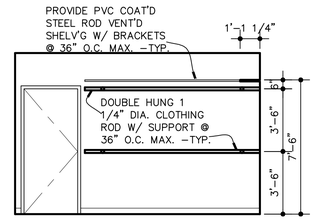
1. 4" VINYL BASE
2. FLUSH FACE P-LAM BASE AND WALL CABS W/ WIRE PULLS –TYP.
3. B. NOSE P-LAM C. TOP W/ 4" B.SPLASH ON 3/4"MARINE PLYWD. –TYP.
4. P-LAM DESK TOP W/ 4" RETURN
5. MLT. DESK SUPPORT 36" O.C. MIN –TYP.
6. LOCKERS PROVIDED BY OWNER
7. 21.25"X17" SS HAND WASH LAV.
8. CONT. UPPER CABINET TASK LIGHT'G –TYP.
9. HOLLOW METAL DOOR AND FRAME-PAINT. REFER TO DOOR SCHEDULE FOR DOOR SPECIFICATION.
10. S.S. CORNER GUARD MIN. 6' HIGH FROM F.F.-TYP



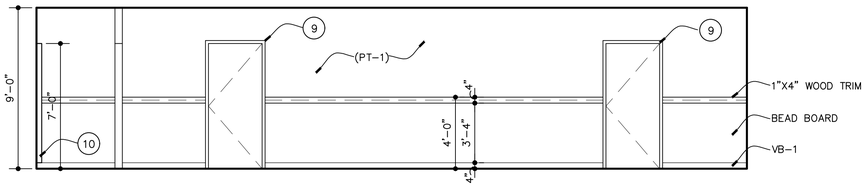
1 Uniform Hang A-501 SCALE 1/4"=1'-0"



2 Uniform Hang A-501 SCALE 1/4"=1'-0"



3 Uniform Hang A-501 SCALE 1/4"=1'-0"



4 Corridor SIMILAR DETAIL THROUGHOUT CORRIDOR. A-502 SCALE 1/4"=1'-0"

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SHEET

Interior Elevations

scale as shown

FILE NUMBER

2321

SHEET NUMBER

A.501

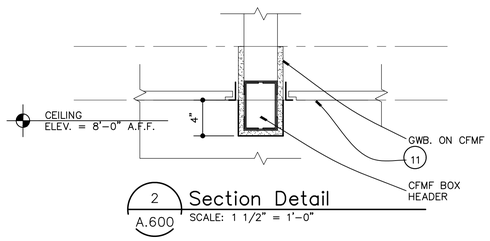
LUMINAIRE SCHEDULE

SYMBOL	MARK	DESCRIPTION	MANUFACTURER(S)	LAMP DESCRIPTION
	A	2' X 4' LAY-IN LED LIGHT FIXTURE/ EMERGENCY/ NIGHT LIGHT	1. LITHONIA 2. LIGHTOLIER 3. METALUX 4. DAY BRITE	
	AA	2' X 4' LAY-IN LED LIGHT FIXTURE/ EMERGENCY/ NIGHT LIGHT	1. LITHONIA 2. LIGHTOLIER 3. METALUX 4. DAY BRITE	
	B	4" x 8' PENDANT MNTD. LED LIGHT FIXTURE/ EMERGENCY LIGHT	1. LITHONIA 2. LIGHTOLIER 3. METALUX 4. DAY BRITE	
	BB	4" x 4' PENDANT MNTD. LED LIGHT FIXTURE/ EMERGENCY LIGHT	1. LITHONIA 2. LIGHTOLIER 3. METALUX 4. DAY BRITE	
	C		1. GOTHAM 2. LIGHTOLIER 3. LSI 4. CAPRI	
	X1		1. LITHONIA LE SERIES 2. LIGHTOLIER 3. OMEGA 4. COOPER	HIGH OUTPUT LED LIGHT PANEL
	X2		1. LITHONIA LE SERIES 2. LIGHTOLIER 3. OMEGA 4. COOPER	HIGH OUTPUT LED LIGHT PANEL

GENERAL NOTES
1. FIRST MANUFACTURER LISTED IS BASIS OF DESIGN, OTHER MANUFACTURERS LISTED ARE APPROVED ALTERNATIVES.

REFLECTED CEILING LEGEND

SYMBOL	DESCRIPTION
	HARD WIRED EXIT SIGN – SINGLE FACED PER CODE SEE ELECTRICAL
	HARD WIRED EXIT SIGN – DOUBLE FACED PER CODE SEE ELECTRICAL
S	SMOKE DETECTOR W/STROBE
	2'X2' LIGHTING AS SPECIFIED
	2'X2' LIGHTING AS SPECIFIED LIGHT FIXTURE W/ NIGHT LIGHT / EMERGENCY LIGHT
	2'X4' LIGHTING AS SPECIFIED LIGHT FIXTURE W/ NIGHT LIGHT / EMERGENCY LIGHT
	RELOCATED AS SPECIFIED STRIP LIGHTS
	RECESSED AS SPECIFIED LIGHT FIXTURE
	SUPPLY AIR DIFFUSER (PLACEMENT TO BE DETERMINED BY D/B MECH. CONTR.)
	RETURN AIR DIFFUSER (PLACEMENT TO BE DETERMINED BY D/B MECH. CONTR.)
F	CEILING EXHAUST FAN
	BATTERY OPERATED EMERGENCY LIGHTING UNIT
	REMOTE EXTERIOR EMERGENCY LIGHTING UNIT
	GWB ON MET FRAM'G AS SPECIFIED



2 A.600 Section Detail
SCALE: 1 1/2" = 1'-0"

GENERAL ELECTRICAL NOTES

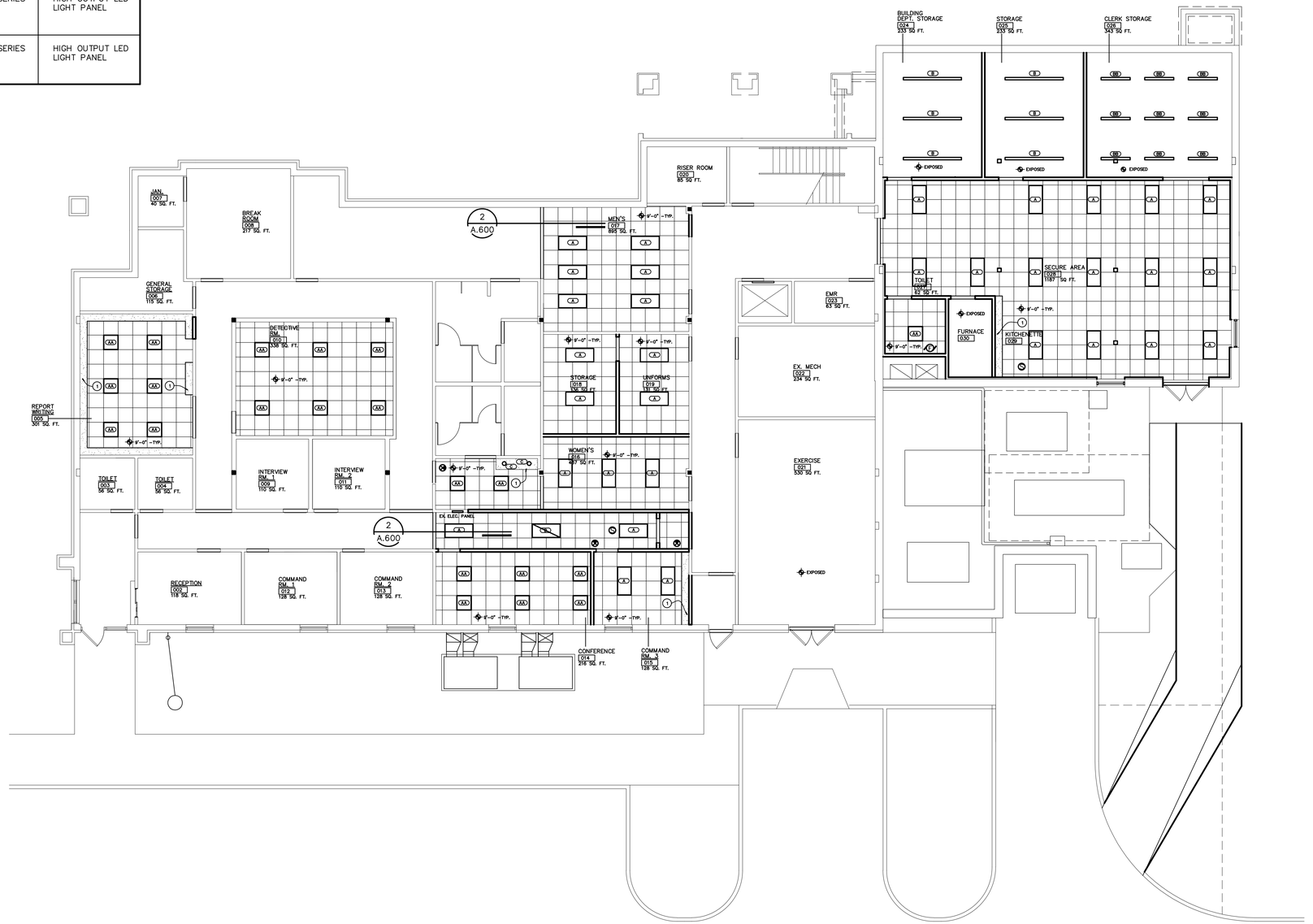
1. ALL ELECTRICAL DEVICES SHOWN ON THIS PLAN SHALL BE NEW UNLESS OTHERWISE NOTED. WITH THE INTENT OF MATCHING EXISTING.
2. ANY 120 VOLT BRANCH CIRCUIT FEEDER LONGER THAN 120'-0" TO LAST DEVICE SHALL BE SIZED TO THE NEXT LARGER STANDARD AWG SIZE. E.C. SHALL FIELD VERIFY ALL LENGTHS OF FEEDERS.
3. ALL RECEPTACLES SHALL BE 20A. RATED.
4. ALL DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE.
5. ALL RECEPTACLES WITHIN 6'-0" OF SINK OR OTHER WATER SUPPLY SHALL BE GFCI TYPE RECEPTACLE.
6. REFER TO ARCHITECTURAL FLOOR PLAN AND ELEVATIONS FOR GNERAL LOCATION OF DEVICES. VERIFY LOCATIONS IN FIELD, INSTALL PER CODE.
7. ALL JUNCTION BOXES SERVING BRANCH CIRCUIT WIRING SHALL BE LABELED WITH CIRCUITS SERVED.
8. ALL 120 VOLT CIRCUITS SHALL UTILIZE A SEPARATE NEUTRAL.
9. ALL CONDUITS SERVING 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE.
10. ALL CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.
11. ALL LIGHT FIXTURES SHALL BE U.L. LABELED.
12. CONTRACTOR SHALL COORD W/ MECH, ELEC, PLUM'G CONTR'S LOCATION OF DUCTS, PIP'G, BOXES, CHASES, CONDUIT, ETC.

GENERAL NOTES

1. REFER TO ROOM FINISH SCHEDULE FOR ALL CEILING HEIGHTS AND FINISHES.
2. ANY ACOUSTICAL CEILINGS NOT DIMENSIONED ARE TO BE EVENLY SPACED FROM PERIMETER WALLS IN ROOM. CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO THE GRID LAYOUT TO AVOID 2" OR LESS CEILING TILES. REVIEW WITH ARCHITECT PRIOR TO INSTALLATION.
3. PAINT ALL EXPOSED MECHANICAL/ELECTRICAL EQUIPMENT IE. DUCTWORK, CONDUIT, ETC.
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHT FIXTURE SCHEDULE.
5. REFER TO THE MECHANICAL DRAWINGS FOR RETURN AIR GRILLES AND SUPPLY AIR DIFFUSER SCHEDULES.
6. PACKAGE, WRAP, & PROTECT ANY EXTRA LIGHT FIXTURES NOT USING. STORE FOR OWNER.

KEYED NOTES

(1) GWB SOFFIT W/ CWB FACE ON 2X4 W/O FRAM'G @ 16" O.C. @ 7'-0" A.F.F. (PROVIDE BCK'G FOR O.H. CABS –TYP.)



1 A600 Reflected Ceiling Plan
SCALE: 1/8" = 1'-0"

AKA ARCHITECTS 30 YEARS FOUNDED 1994
AUGER KLEIN ALLER
ARCHITECTS INC.
303 E. THIRD STREET SUITE 100
ROCHESTER, MI 48307
248.814.9160
WWW.AKA-ARCHITECTS.NET

PROJECT
Oxford Township Hall Renovation

300 Dunlap Rd
Oxford, MI 48371

DATE ISSUED	ISSUED FOR
11.17.23	OWNER REVIEW
12.21.23	MEP REVIEW
01.19.24	BIDS & PERMITS
04.04.24	BIDDING

DRAWN	AKA
CHECKED	SA
APPROVED	SA

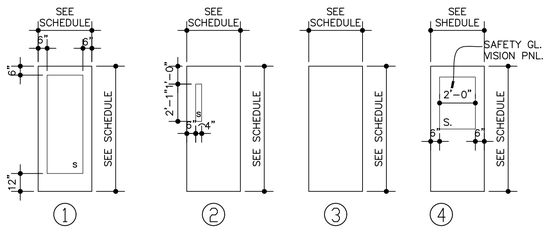
SHEET
Reflected Ceiling Plan

scale as shown

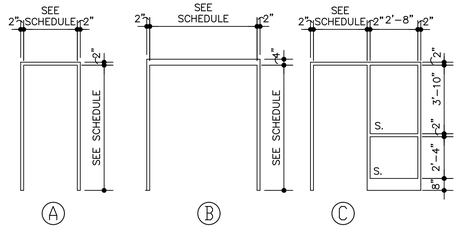
FILE NUMBER
2321

SHEET NUMBER
A600

Door Types



Frame Types



DOOR SCHEDULE

ROOM NUMBER	LOCATION	DOOR						FRAME				DETAILS		U.L. LABEL	HDW SET	REMARKS
		WIDTH	HEIGHT	THK	TYPE	MAT	FIN.	TYPE	MAT	FIN	H	J	T			
A001	CONFERENCE	3'-0"	7'-0"	1 3/4"	4	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	1A	–
A002	COMMAND RM. 3	3'-0"	7'-0"	1 3/4"	4	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	1A	–
A003	COORIDOR	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	1B	–
A004	WOMEN'S	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	5B	–
A005	STORAGE	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	3A	–
A006	UNIFORM	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	3A	–
A007	MEN'S	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	5B	–
A008	BLDG. DEPT. STORAGE	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	3A	–
A009	STORAGE	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	3A	–
A010	CLERK STORAGE	(2) 3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	B	HM	PRE FIN.	–	–	–	–	3A	–
A011	TOILET	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	3A	–
A012	FURNACE	3'-0"	7'-0"	1 3/4"	3	WD.	PRE FIN.	A	HM	PRE FIN.	–	–	–	–	3A	–
A013	SECURE AREA	(2) 3'-0"	7'-0"	1 3/4"	1	GL/ALUM	ANOD	B	ALUM.	ANOD	–	–	–	–	3A	PANIC, CLOSER, HOLD OPEN

NOTE: DOOR HARDWARE TO MATCH EXISTING.

Abbreviations

ALUM	=	ALUMINUM
ANOD	=	ANODIZED
GL	=	GLASS
HM	=	HOLLOW METAL
MET	=	METAL
P-FIN	=	PRE-FINISHED
PT	=	PAINT
WD	=	WOOD
KD	=	KNOCK DOWN METAL
PH	=	PRESSED HARDBOARD

Notes:

1. 1/4" CLEAR GLASS AT ALL INTERIOR LOCATIONS-TYPICAL
2. S = SAFETY GLASS

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.	.
.	.

DRAWN	AKA
CHECKED	SA
APPROVED	SA

SHEET

Door Schedules
scale as shown

FILE NUMBER
2321

SHEET NUMBER
A.700

TEMPERATURE CONTROLS SCHEMATIC SYMBOLS

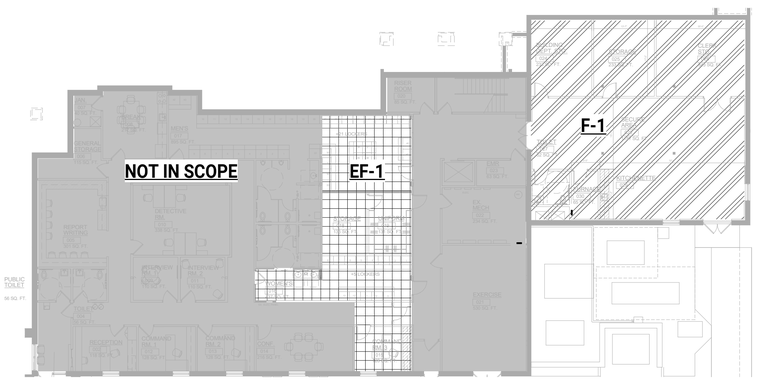
MS	MOTOR STARTER	CONTACTS - NORMALLY CLOSED	
S/S	START/ STOP RELAY	CONTACTS - NORMALLY OPEN	
CS	CURRENT SWITCH	PUSH BUTTONS - NORMALLY CLOSED	
LS	LIMIT SWITCH	PUSH BUTTONS - NORMALLY OPEN	
R	RELAY	SWITCH - NORMALLY CLOSED TIMING CLOSED	
H	HUMIDITY SENSOR, DUCT MOUNTED	SWITCH - NORMALLY OPEN TIMING CLOSED	
T	TEMPERATURE SENSOR - DUCT MOUNTED RIGID ELEMENT	SWITCH - NORMALLY CLOSED TIMING OPEN	
T	TEMPERATURE SENSOR - RIGID ELEMENT WITH THERMAL WELL	SWITCH - NORMALLY OPEN TIMING OPEN	
DD	DUCT SMOKE DETECTOR	SWITCH - NORMALLY OPEN	
FM	FLOW METER	THERMAL OVERLOAD, SINGLE PHASE	
FS	FLOW SWITCH	TRANSFER SWITCH - TEMPERATURE ACTUATED	
M	DAMPER ACTUATOR	SWITCH - LIMIT- NORMALLY OPEN	
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	SWITCH - LIMIT- NORMALLY CLOSED	
DPS	DIFFERENTIAL PRESSURE SENSOR	HAND/OFF/AUTO SWITCH	HAND OFF AUTO
PS	PRESSURE SWITCH		
T	THERMOSTAT OR TEMPERATURE SENSOR	TRANSFORMER	
T/H	TEMPERATURE & HUMIDITY SENSOR	FUSE	
CO2	CARBON DIOXIDE SENSOR	GROUND	
<>	ALARM & STROBE	MOTOR, SINGLE PHASE	
LEL	FLAMMABILITY SENSOR	VARIABLE FREQUENCY CONTROLLER	VFC
O2	OXYGEN SENSOR	ELECTRICALLY COMMUTATED MOTER	ECM
PS	POWER SUPPLY	DAMPER - PARALLEL BLADE	
AI	ANALOG INPUT - SIGNAL - BAS/EMS/DDC	DAMPER - OPPOSED BLADE	
AO	ANALOG OUTPUT - SIGNAL - BAS/EMS/DDC	GUARD FOR STAT OR SENSOR	
DI	DIGITAL INPUT - SIGNAL - BAS/EMS/DDC	CONTROLLER	C
DO	DIGITAL OUTPUT - SIGNAL - BAS/EMS/DDC	EMERGENCY SHUT-OFF SWITCH	SW
AI	ANALOG INPUT - SIGNAL - BAS/EMS/DDC - PACKAGED EQUIPMENT		
AO	ANALOG OUTPUT - SIGNAL - BAS/EMS/DDC - PACKAGED EQUIPMENT		
DI	DIGITAL INPUT - SIGNAL - BAS/EMS/DDC - PACKAGED EQUIPMENT		
DO	DIGITAL OUTPUT - SIGNAL - BAS/EMS/DDC- PACKAGED EQUIPMENT		

ABBREVIATIONS AND DESCRIPTIONS

A	COMPRESSED AIR	LPS	LOW PRESSURE STEAM
ACC	AIR COOLED CONDENSER	LRA	LOCKED ROTOR AMPS
ACCU	AIR COOLED CONDENSING UNIT	LTU	LAB AIR TERMINAL UNIT
AFF	ABOVE FINISHED FLOOR	LWB	LEAVING WET BULB
AHU	AIR HANDLING UNIT	LWT	LEAVING WATER TEMPERATURE
ALT	ALTERNATE		
AMP	AMPERE	MAT	MIXED AIR TEMPERATURE
APD	AIR PRESSURE DROP	MAU	MAKE UP AIR UNIT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS	MAX	MAXIMUM
		MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
AUX	AUXILIARY	MCA	MINIMUM CIRCUIT AMPACITY
AV	ACID VENT	MECH	MECHANICAL
AVTR	ACID VENT THROUGH ROOF	MFR	MANUFACTURER
AW	ACID WASTE	MIN	MINIMUM
		MISC	MISCELLANEOUS
BAS	BUILDING AUTOMATION SYSTEM	MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
BCU	BLOWER COIL UNIT	M/S	MOTOR STARTED
BDD	BACK DRAFT DAMPER	MV	MANUAL AIR VENT
BFP	BACK FLOW PREVENTER		
BHP	BRAKE HORSE POWER	NC	NORAMALLY CLOSED
BOD	BOTTOM OF DUCT	NC	NOISE CRITERIA
BOP	BOTTOM OF PIPE	NFPA	NATIONAL FIRE PROTECTION AGENCY
BTU	BRITISH THERMAL UNIT	NIC	NOT IN CONTRACT
BTUH	BRITISH THERMAL UNIT PER HOUR	NO	NORMALLY OPEN
		NPCW	NON POTABLE COLD WATER
C	COMMON		
CAP	CAPACITY	OA	OUTSIDE AIR
CC	COOLING COIL	OAT	OUTSIDE AIR TEMPERATURE
CD	CONDENSATE DRAIN	OBD	OPPOSED BLADE DAMPER
CFH	CUBIC FEET PER HOUR	OD	OUTSIDE DIAMETER
CFM	CUBIC FEET PER MINUTE	ORC	OVERFLOW ROOF CONDUCTOR
CH	CHILLER	ORD	OVERFLOW ROOF DRAIN
CHW	CHILLED WATER	OS&Y	OUTSIDE SCREW AND YOLK
CHWS	CHILLED WATER SUPPLY	OV	OUTLET VELOCITY
CHWR	CHILLED WATER RETURN		
CNDS	CONDENSATE	PC	PUMPED CONDENSATE
CO	CLEAN OUT	PCR	PROCESS COOLING RETURN
CO2	CARBON DIOXIDE	PCS	PROCESS COOLING SUPPLY
CP	CIRCULATING PUMP	PD	PRESSURE DROP (FEET OF WATER)
CRU	CONDENSATE RETURN UNIT	PH	PERIMETER HEAT
CT	COOLING TOWER	PHR	PERIMETER HEAT RETURN
CUH	CABINET UNIT HEATER	PHS	PERIMETER HEAT SUPPLY
CW	DOMESTIC COLD WATER	PRV	PRESSURE REDUCING VALVE
CWS	CONDENSER WATER SUPPLY	PS	PUMPED STORM
CWR	CONDENSER WATER RETURN	PSI	POUNDS PER SQUARE INCH
		PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
DAT	DISCHARGE AIR TEMPERATURE	PSIG	POUNDS PER SQUARE INCH - GAUGE
DB	DRY BULB	PW	PROCESS WATER
DDC	DIRECT DIGITAL CONTROL	PWR	PROCESS WATER RETURN
DEG	DEGREE	PWS	PROCESS WATER SUPPLY
DFU	DRAINAGE FIXTURE UNIT		
DN	DOWN	RA	RETURN AIR
DNZ	DOWNSPOUT NOZZLE	RAT	RETURN AIR TEMPERATURE
DT	DRAIN TILE	RC	ROOF CONDUCTOR
DWH	DOMESTIC WATER HEATER	RCP	RADIANT CEILING PANEL
DX	DIRECT EXPANSION COOLING	RD	ROOF DRAIN
		RF	RETURN FAN
F	FIRE PROTECTION	RH	RELATIVE HUMIDITY
°F	DEGREES FAHRENHEIT	RH	ROOF HYDRANT
FCU	FAN COIL UNIT	RL	REFRIGERANT LIQUID
FD	FLOOR DRAIN	RLFA	RELIEF AIR
FLA	FULL LOAD AMPS	RPM	REVOLUTIONS PER MINUTE
FP	FIRE PUMP	RS	REFRIGERANT SUCTION
FS	FLOOR SINK	RTU	ROOFTOP UNIT
FT	FEET		
FTR	FINNED TUBE RADIATION	SA	SUPPLY AIR
		SA	SOUND ATTENUATOR
G	NATURAL GAS	SAN	SANITARY WASTE
GA	GAUGE	SF	SUPPLY FAN
GAL	GALLON	SH	SHOWER
GRH	GRAVITY RELIEF HOOD	SK	SINK
GPH	GALLON PER HOUR	SMR	SNOW MELT RETURN
GPM	GALLON PER MINUTE	SMS	SNOW MELT SUPPLY
		SP	STATIC PRESSURE
HB	HOSE BIBB	SPEC	SPECIFICATION
HC	HEATING COIL	SQFT	SQUARE FEET
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE	S/S	START/STOP
HL	HIGH LIMIT	SS	SERVICE SINK
HOA	HAND/OFF/AUTO	ST	STORM
HP	HEAT PUMP	STM	STEAM
HP	HORSEPOWER	SW	SWITCH
HPLR	HEAT PUMP LOOP RETURN		
HPLS	HEAT PUMP LOOP SUPPLY	TC	TEMPERATURE CONTROL
HTG	HEATING	TC	TEMPERING COIL
HUV	HORIZONTAL UNIT VENTILATOR	TCP	TEMPERATURE CONTROL PANEL
HV	HEATING VENTILATION	TD	TRENCH DRAIN
HVAC	HEATING, VENTILATION, AIR CONDITIONING	TEMP	TERMPERATURE
HWH	HOT WATER HEATING	TSP	TOTAL STATIC PRESSURE
HWHR	HOT WATER HEATING RETURN	TU	AIR TERMINAL UNIT
HWHS	HOT WATER HEATING SUPPLY	TYP	TYPICAL
HW	DOMESTIC HOT WATER		
HWR	DOMESTIC HOT WATER RETURN	UH	UNIT HEATER
HX	HEAT EXCHANGER	UL	UNDERWRITER
HZ	HERTZ	UR	URINAL
		UV	UNIT VENTILATOR
ID	INSIDE DIAMETER		
IE	INVERT ELEVATION	V	VENT
IH	INTAKE HOOD	VAC	VACUUM
IN	INCHES	VAV	VARIABLE AIR VOLUME
IW	INDIRECT WASTE	VB	VACUUM BREAKER
		VFC	VARIABLE FREQUENCY CONTROLLER
KW	KILOWATT	VTR	VENT THROUGH ROOF
KWH	KILOWATT HOUR	VUV	VERTICAL UNIT VENTILATOR
LAT	LEAVING AIR TEMPERATURE	W	WASTE
LAV	LAVATORY	WB	WET BULB
LBS	POUNDS	WC	WATER CLOSET
LDB	LEAVING DRY BULB	WC	WATER COLUMN
LL	LOW LIMIT	WH	WALL HYDRANT
LPC	LOW PRESSURE CONDENSATE	WPD	WATER PRESSURE DROP

SYMBOLS AND NOTATION STANDARDS

	DASHED LINES INDICATE PIPING ROUTED BELOW SLAB OR GRADE	FINNED TUBE ELEMENT LENGTH FINNED TUBE ELEMENT HEAT IN MBH GALLONS PER MINUTE FOR ELEMENT	FTR A — X' - X" / X MBH / X GPM
	HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED		
	LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION	SUPPLY DIFFUSER TYPE 1 (SCHEDULED) 8" DIAMETER NECK SIZE TWO DIFFUSERS WITH 100 CFM	S-1 8Ø 100-2
	HEAVY LINE WEIGHT INDICATES NEW WORK		
	MANUAL VOLUME DAMPER	EQUIPMENT TAG	X / X
FD	FIRE DAMPER DYNAMIC; VERTICAL OR HORIZONTAL	CONSTRUCTION NOTES	X
SD	SMOKE DAMPER; VERTICAL OR HORIZONTAL	THERMOSTAT/ TEMPERATURE SENSOR	T
	COMBINATION FIRE & SMOKE DAMPER; HORIZONTAL	NEW CONNECTION	
	COMBINATION FIRE & SMOKE DAMPER; VERTICAL	RETURN/TRANSFER ARROW	
	TRANSITION; SYMMETRIC	SUPPLY ARROW	
	TRANSITION; ASYMMETRIC	BLANK OFF SECTION	
	90 DEG RADIUS ELBOW (R/W = 1.5)	PIPE ENDCAP	
	MITERED ELBOW WITH TURNING VANES	VENT THROUGH ROOF	VTR
	TEE, BOOT ENTRY BRANCH	PIPE ELBOW DOWN	
	TEE, ROUND BRANCH	PIPE ELBOW UP	
	TEE, CONICAL ROUND BRANCH	BACKFLOW PREVENTER	BFP
	CEILING MOUNTED RETURN GRILLE / REGISTER	ISOLATION VALVE	
	CEILING MOUNTED SUPPLY DIFFUSER/GRILLE	BALANCE VALVE	
	CEILING MOUNTED EXHAUST GRILLE/REGISTER	BALANCE VALVE WITH FLOW MEASURING	
24x12	INTERIOR CLEAR DUCTWORK DIMENSIONS; WIDTHxHEIGHT	CONTROL VALVE	
12Ø	INTERIOR CLEAR DUCTWORK DIMENSIONS-ROUND; DIAMETER	BALL VALVE	
24/12 OR 24x12Ø	INTERIOR CLEAR DUCTWORK DIMENSIONS-OVAL; WIDTHxHEIGHT	GAS VALVE (MANUAL)	
	SUPPLY AIR DUCT UP	PIPE CONTINUATION	
	SUPPLY AIR DUCT DOWN	PRESSURE REGULATING VALVE	
	RETURN AIR DUCT UP	OUTSIDE STEM AND YOKE VALVE	
	RETURN AIR DUCT DOWN	OUTSIDE STEM AND YOKE VALVE WITH TAMPER SWITCH	TS
	EXHAUST AIR DUCT UP	CHECK VALVE	
	EXHAUST AIR DUCT DOWN	PIPE FLEXIBLE CONNECTION	
	FLEXIBLE DUCT	PIPE UNION	
	AIR TERMINAL UNIT WITH HOT WATER COIL	CLEAN OUT - PIPE FLANGE	CO
	AIR TERMINAL UNIT WITH ELECTRIC COIL	CLEAN OUT - IN FLOOR	CO
		PUMP	
		HOSE BIBB	HB
		WALL HYDRANT	WH
		WATER METER	M
		FLOOR DRAIN/ SINK	
		FLOW MEASURING DEVICE	
		THERMOMETER	
		PRESSURE GAUGE AND COCK	
		AIR VENT - MANUAL	MV
		AIR VENT - AUTOMATIC	AV
		PRESSURE RELIEF VALVE	
		STRAINER WITH HOSE CONNECTION	
		STRAINER	
		REDUCER - CONCENTRIC	
		REDUCER - ECCENTRIC	
		FUNNEL FLOOR DRAIN - ELEVATION (DETAILS)	
		FLOOR DRAIN -ELEVATION (DETAIL)	
		ACCESS DOOR	
		FLEXIBLE CONNECTOR	
		VARIABLE FREQUENCY CONTROLLER	VFC
		AUTOFLOW VALVE	



N — 1 / M-001 ZONING PLAN
1/16" = 1'-0"

SHEET LIST - MECHANICAL

Sheet Number	Sheet Name
M-001	INDEX, SYMBOLS, & ABBREVIATIONS
M-002	STANDARD MATERIALS SCHEDULES
M-003	SPECIFICATIONS
M-004	SPECIFICATIONS
M-014	MECHANICAL DEMOLITION PLAN
M-211	FIRST FLOOR SANITARY AND VENT PLAN
M-401	FIRST FLOOR MECHANICAL PLAN
M-601	DETAILS AND SCHEDULES

DESIGN CONDITIONS

	OUTSIDE AIR	RETURN AIR
COOLING DB (°F)	90.3	75
COOLING WB (°F)	73.4	--
HEATING DB (°F)	0	72
CLIMATE ZONE		5A

NOTE: DESIGN CONDITIONS BASED ON ASHRAE 2013 CLIMATIC DESIGN INFORMATION

GREENPATH DESIGN

139 WEST LIBERTY STREET
PLYMOUTH, MI 48170

GREENPATH.DESIGN
1.248.310.7286

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PROJECT
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OXFORD, MI 48371

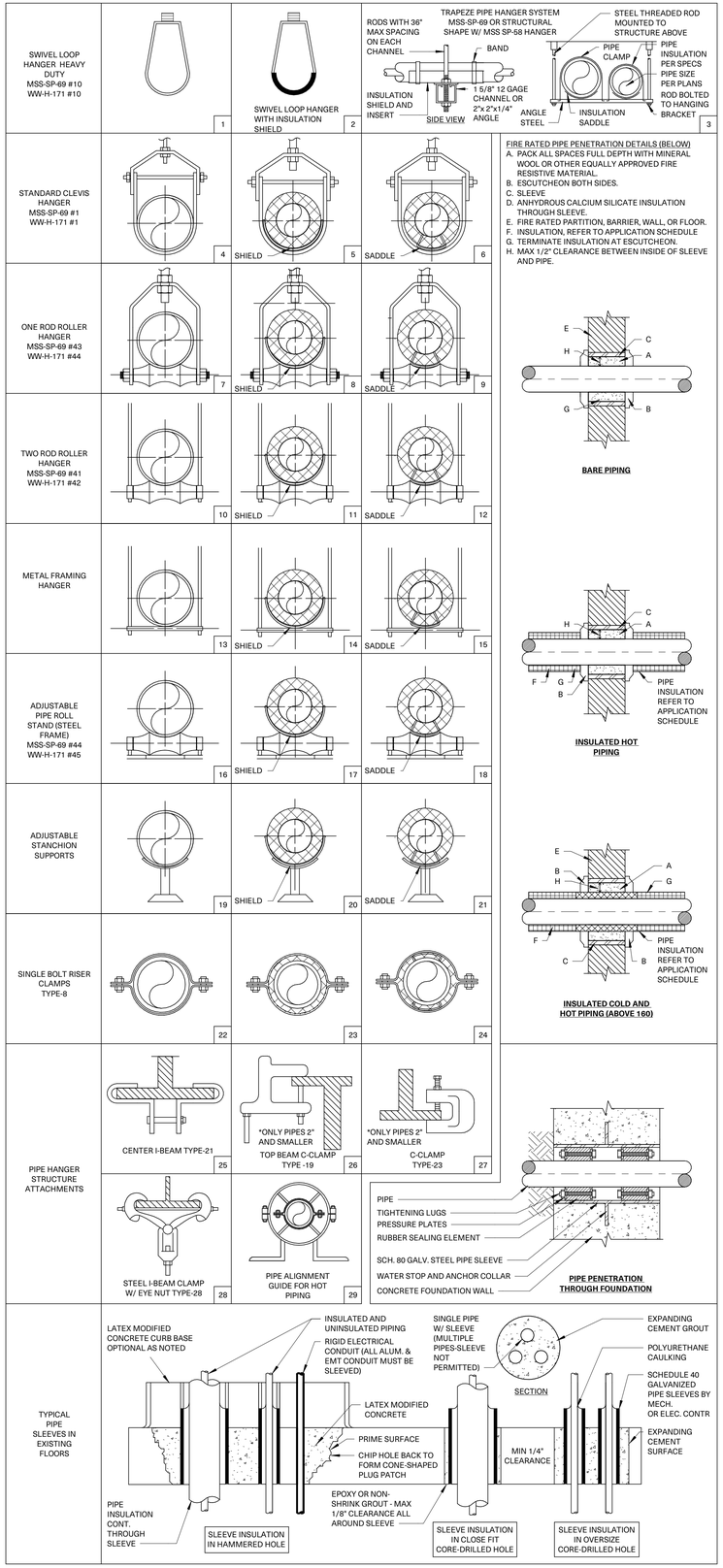
DATE ISSUED	ISSUED FOR

DRAWN ZB
CHECKED KBS
APPROVED KBS

SHEET
INDEX, SYMBOLS, & ABBREVIATIONS

FILE NUMBER
2023-0078

SHEET NUMBER
M-001



FIRE RATED PIPE PENETRATION DETAILS (BELOW)

- A. PACK ALL SPACES FULL DEPTH WITH MINERAL WOOL OR OTHER EQUALLY APPROVED FIRE RESISTIVE MATERIAL.
- B. ESCUTCHEON BOTH SIDES.
- C. SLEEVE
- D. ANHYDROUS CALCIUM SILICATE INSULATION THROUGH SLEEVE.
- E. FIRE RATED PARTITION, BARRIER, WALL, OR FLOOR.
- F. INSULATION, REFER TO APPLICATION SCHEDULE
- G. TERMINATE INSULATION AT ESCUTCHEON.
- H. MAX 1/2" CLEARANCE BETWEEN INSIDE OF SLEEVE AND PIPE.

PIPING APPLICATION SCHEDULE

PIPING SYSTEM	PIPE SYSTEM PRESSURE	SIZE									MATERIAL															PRESSURE CONNECTION									GRAVITY CONNECTION				ISOLATION VALVE					INSULATION															SUPPORT								KEYED NOTES
																																													MATERIAL					THICKNESS, IN						FIELD APPLIED JACKETING				HANGER FIGURE NUMBER			SUPPORT					
		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	COPPER TYPE L	COPPER TYPE K	COPPER DWV	CARBON STEEL SCH. 40	CARBON STEEL SCH. 80	GALVANIZED STEEL (SCH. 40)	POLYPROPYLENE	POLYETHYLENE	PVC SCH. 40	CPVC	HDPE	PEX	NO HUB CISP	STD. BALCK STEEL	CPVC FIRE	SOLDERED	BRAZED	WELDED	FLANGED	THREADED	SOLVENT WELDED	MECHANICALLY JOINT	GROOVED	FUSION	SOLDERED	SOLVENT WELD	CISP HUBLESS	HEAVY DUTY HUBLESS	BALL	BUTTERFLY	HIGH PERF. BUTTERFLY	GAS BALL VALVE	LUBRICATED PLUG	FIBERGLASS	FLEXIBLE ELASTOMERIC	MINERAL WOOL	CALCIUM SILICATE	POLYISOCYANURATE	1/2	3/4	1	1 1/2	2	MINIMUM R-VALUE	PVC	ALUMINUM	SELF ADHESIVE	STAINLESS STEEL	LESS THAN 1/4" MOVEMENT	GREATER THAN 1/4" OF MOVEMENT	VERTICAL	LESS THAN 1/4" MOVEMENT	GREATER THAN 1/4" OF MOVEMENT	MAX SPACING HORIZONTAL, FT	MAX SPACING VERTICAL, FT	ROD DIAMETER	
ABOVEGROUND DOMESTIC WATER	125 PSIG	X	X	X	X						X															X			X										X					X	X						X			3.5	X	X			2/ 5	2/ 5	23	20	17	6	10	3/8	A, E
ABOVEGROUND DOMESTIC WATER	125 PSIG					X	X				X															X			X										X					X	X							X		5	X	X			2/ 5	2/ 5	23	20	17	6	10	3/8	A, E
UNDERGROUND DOMESTIC WATER	125 PSIG	X	X	X	X							X										X										X																			X			3.5					-	-	-	-	-	-	-	-	
ABOVEGROUND SANITARY WASTE & VENT	10 FT HD					X	X												X				X													X	X																						1/ 4	1/ 4	22	19	16	4	10	3/8	D, F, G
ABOVEGROUND SANITARY WASTE & VENT	10 FT HD							X	X										X				X													X	X																						4	7	22	19	16	4	10	1/2	D, F, G
ABOVEGROUND FUEL GAS	125 PSIG	X	X	X	X	X	X																	X				X		X												X																	1/ 4	1/ 4	22	19	16	12	15	3/8	B
ABOVEGROUND COLD CONDENSATE	10 FT HD	X	X	X	X	X	X				X		X						X																X	X								X	XX					XX	X			3.5					2/ 5	2/ 5	23	20	17	4	10	3/8	D
REFRIGERANT LIQUID AND HOT GAS	125 PSIG	X	X	X	X	X	X				X																X																		X						X			3.5					2/ 5	2/ 5	23	20	17	12	10	3/8	H

GENERAL NOTES:

1. EACH ACCEPTABLE MATERIAL IS INDICATED WITH AN "X". IF MORE THAN ONE IS SELECTED, THE CONTRACTOR HAS THE OPTION TO CHOOSE BETWEEN SELECTED MATERIALS.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. EQUIPMENT CONNECTIONS SHALL BE EITHER GROOVED OR FLANGED OR USE UNIONS.
4. EQUIPMENT DRAINS, RELIEF VALVES, AND VENTS SHALL BE THE SAME MATERIAL AS PIPING SYSTEM.
5. DISSIMILAR METAL PIPING JOINTS SHALL USE DIELECTRIC FITTINGS COMPATIBLE WITH BOTH MATERIALS.
6. ALL INSULATING MATERIALS, THICKNESS, AND THERMAL RESISTANCE SHALL COMPLY WITH THE INTERNATIONAL ENERGY CONSERVATION CODE 2015 OR ASHRAE STANDARD 90.1-2013.
7. INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVE BODIES, AND BALANCE VALVES ASSOCIATED WITH PIPING 1 INCH AND SMALLER.
8. INSULATION IS NOT REQUIRED FOR PIPING CONVEYING FLUIDS OPERATING BETWEEN 60°F AND 105°F AND DIRECT BURIED PIPING CONVEYING FLUIDS AT OR BELOW 60°F.
9. PIPE HANGER SPACING IS BASED ON WORST CASE ALLOWED MATERIAL. HANGER SPACING FOR SELECTED MATERIAL SHALL COMPLY WITH CURRENT PLUMBING AND MECHANICAL CODE OR APPROVED BY AHJ.

KEYED NOTES:

- A. GROOVED FITTINGS SHALL ONLY BE USED IN ACCESSIBLE SPACE(S) (I.E. MECHANICAL ROOMS OR ABOVE LAY-IN CEILINGS).
- B. FUEL GAS PIPING LOCATED WITHIN RETURN AIR PLENUM SHALL BE WELDED. VALVES, FLANGES, AND UNIONS ARE PROHIBITED.
- C. NO JOINTS ALLOWED UNDERGROUND.
- D. PLASTIC PIPE SHALL NOT BE USED IN RETURN AIR PLENUMS. CONTRACTOR SHALL PROVIDE FIRE RATED INSULATION OR GYPSUM ENCLOSURE WHEN ROUTED THROUGH A PLENUM SPACE.
- E. PROVIDE INSULATION JACKETS FOR ALL AREAS SUSCEPTABLE FOR DAMAGE INCLUDING BUT NOT LIMITED TO MECHANICAL ROOMS, EQUIPMENT ROOMS, JANITOR CLOSET, RECIEVING. JACKETS SHALL BE INSTALLED UP TO 10 FEET ABOVE FINISHED FLOOR.
- F. THE MAXIMUM HORIZONTAL SPACING OF PIPE HANGERS SHALL BE INCREASED TO 10 FEET WHERE 10 FOOT LENGTHS ARE INSTALLED.
- G. WASTE PIPING RECIEVING WATER ABOVE 120 DEG SHALL BE METAL.
- H. PROVIDE PROTECTIVE COATING FOR INSULATION LOCATED OUTDOORS.
- I. INSULATE EXTERIOR PIPE & PROVIDE ALUMINUM JACKET.

LOW PRESSURE DUCTWORK JOINT AND SUPPORT SCHEDULE

RECTANGULAR JOINT CONSTRUCTION											RECTANGULAR HANGERS AND SUPPORTS							ROUND HANGERS AND SUPPORTS				
STEEL GAUGE	MINIMUM DUCT SIZE	MAXIMUM DUCT SIZE	PLAIN "S" SLIP	DRIVE SLIP	HEMMED "S" SLIP	FLANGED WITH GASKET	STANDING DRIVE SLIP	STANDING S	STANDING S (BAR REINFORCED)	STANDING S (ANGLE REINFORCED)	MAXIMUM HALF OF DUCT PERIMETER	GALVANIZED SHEET STEEL STRAPS	LOAD RATED CABLE	GALVANIZED THREADED STEEL ROD	MAXIMUM SPACING FT	WIRE/ ROD DIAMETER	STRAP WIDTH AND GAUGE	DIAMETER	MAXIMUM SPACING FT	WIRE DIAMETER	ROD DIAMETER	STRAP WIDTH AND GAUGE
24	4	12	X	X	X		X	X			P/2=30"	X		X	10	10 ga	1' x 22 ga	10	12	12 ga	1/4"	1' x 22 ga
24	13	18	X	X	X		X	X			P/2=72"	X		X	10	3/8"	1' x 18 ga	11-18	12	8 ga	1/4"	1' x 22 ga
24	19	30	X	X	X		X	X			P/2=96"	X		X	10	3/8"	1' x 16 ga	19-24	12	(2) 10 ga	1/4"	1' x 22 ga
22	31	42				X	X	X	X	X	P/2=120"	X		X	10	1/2"	1 1/2' x 16 ga	25-36	12	(2) 8 ga	3/8"	1' x 20 ga
22	43	54				X	X	X	X	X	P/2=168"	X		X	10	1/2"	1 1/2' x 16 ga	37-50	12	-	(2) 3/8"	(2) 1' x 20 ga
20	55	60				X	X	X	X	X	P/2=192"	X		X	10	1/2"	-	51-60	12	-	(2) 3/8"	(2) 1' x 18 ga

GENERAL NOTES:

1. JOINT CONSTRUCTION SHALL COMPLY WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS.
2. "X" NOTES ALLOWED JOINT CONSTRUCTION AND SUPPORT TYPE.
3. HANGERS AND SUPPORTS SHALL COMPLY WITH CHAPTER 5 SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE AND LOCAL CODE AUTHORITY HAVING JURSIDICTION.
4. REFER TO SMACNA FOR JOINT GAUGE, BRACING, TRANVERSE REINFORCEMENT, AND JOINT REINFORCEMENT REQUIREMENTS.
5. ROUND METALLIC DUCTS SHALL BE MECHANICALLY FASTENED WITH A MINIMUM OF THREE (3) SHEET METAL SCREWS OR RIVETS EQUALLY SPACED.

DUCT APPLICATION SCHEDULE

AIR SYSTEMS	DUCT MATERIAL											MAXIMUM AIR VELOCITY, FPM	MAX FRICTION LOSS (IN. WG.)	DESIGN PRESSURE CLASS (IN. WG.)	MAXIMUM ALLOWABLE LEAKAGE (%)	SEAL CLASS	DUCT LOCATION						INSULATION MATERIAL/THICKNESS (INCH)					MINIMUM THERMAL RESISTANCE R-VALUE	FIELD APPLIED JACKET			NOTES
	G90 GALV. SHEET METAL	G90 GALV. SHEET METAL W/ 1" DUCT LINER	ALUMINUM	TYPE 304 STAINLESS STEEL	FABRIC	DOUBLE WALL LINED G90 GALV. W/ SOLID INNER	DOUBLE WALL LINED G90 GALV. W/ PERF. INNER	14 GAUGE CARBON STEEL	PVC COATED G90 GALV SHEET METAL	UL 1978 PRE-FAB ZERO-CLEARANCE GREASE DUCT	RIGID PHENOLIC PRE-INSULATED DUCT						EXPOSED (SERVING SPACE)	EXPOSED (NOT SERVING SPACE)	ABOVE CEILING/ CONCEALED/ OUTSIDE THE SPACE SERVED	MECHANICAL ROOM	NATATORIUM/ HIGH HUMIDITY	OUTDOOR/ ATTIC	FIBERGLASS BLANKET	FIBERGLASS BOARD	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE BLANKET	2-HOUR FIRE BLANKET		ALUMINUM	SELF-ADHERED CLADDING	FULLY ADHERED TPO ROOFING	
LOW PRESSURE SUPPLY		X				X						1000	0.1	+2	5	A		X														
LOW PRESSURE SUPPLY	X											1000	0.1	+2	5	A	X															
LOW PRESSURE SUPPLY	X											1000	0.1	+2	5	A			X	X			1.5	1.5				4.7				
LOW PRESSURE EXHAUST	X											1000	0.1	-2	5	A	X		X	X		X										
LOW PRESSURE RETURN		X				X						1000	0.1	-2	5	A		X														
LOW PRESSURE RETURN	X											1000	0.1	-2	5	A	X		X													RETURN AIR PLENUM; PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET FROM AHU
LOW PRESSURE RETURN	X											1000	0.1	-2	5	A			X	X			1.5	1.5				4.7				DUCTED RETURN; PROVIDE LINED DUCTWORK FOR THE FIRST 15 FEET FROM AHU
AIR TRANSFER DUCT		X									X	500	0.05	+2	5	A			X	X												
LOW PRESSURE OUTSIDE AIR AND MIXED AIR	X											1000	0.1	-2	5	A	X		X	X			1.5	1.5				4.7				
LOW PRESSURE EXHAUST (DAMPER TO EXTERIOR)	X						X					1000	0.1	+/-2	5	A	X		X	X			1.5	1.5				4.7				

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PROJECT
OXFORD TOWNSHIP
HALL RENOVATION

30 DUNLAP RD
OXFORD, MI 48371

DATE ISSUED ISSUED FOR

DRAWN ZB
CHECKED KBS
APPROVED KBS

SHEET
STANDARD
MATERIALS
SCHEDULES

FILE NUMBER
2023-0078

SHEET NUMBER
M-002

SECTION 20 05 00 - MECHANICAL AND PLUMBING GENERAL REQUIREMENTS

1.01 WORK INCLUDED
A. THE WORK INCLUDED BY THIS DIVISION OF THE SPECIFICATIONS INCLUDES FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICES, INCLUDING MINOR ITEMS OMITTED BUT NECESSARY TO CONSTRUCT AND INSTALL THE COMPLETE SYSTEMS DESCRIBED BY THE CONTRACT DOCUMENTS AND SPECIFIED BELOW. "CONTRACTOR" REFERS TO THE MECHANICAL/PLUMBING CONTRACTOR. THE GENERAL CONDITIONS OF THE SPECIFICATIONS APPLY AND ARE INCLUDED IN THIS PART OF THIS SECTION.

1.02 CODES AND REGULATIONS
A. COMPLY WITH STATE AND LOCAL CODES, AND UTILITY COMPANY REGULATIONS. FINAL INTERPRETATIONS WILL BE MADE BY THE LOCAL INSPECTION AUTHORITY. THE CONTRACTOR TO VERIFY THE GOVERNANCE OF THE FOLLOWING CODES, INCLUDING ANY LOCAL AMENDMENTS AND SUPPLEMENTARY CODES SUCH AS THE CODES OF THE NATIONAL FIRE PROTECTION ASSOCIATION:
1. BUILDING CODE: 2015 MICHIGAN BUILDING CODE
2. PLUMBING CODE: 2018 MICHIGAN PLUMBING CODE
3. MECHANICAL CODE: 2015 MICHIGAN MECHANICAL CODE
4. FIRE CODE: 2015 INTERNATIONAL FIRE CODE
5. GAS CODE: 2015 INTERNATIONAL FUEL GAS CODE
6. ENERGY CODE: 90.1-2013 2015 INTERNATIONAL ENERGY CONSERVATION CODE/ ASHRAE
7. ELECTRICAL CODE: 2011 NATIONAL ELECTRICAL CODE

1.03 QUALITY ASSURANCE
A. PERFORM WORK TO AVOID INTERFERENCE WITH THE WORK OF OTHER TRADES. REMOVE AND RELOCATE WORK WHICH IN THE OPINION OF THE OWNER'S REPRESENTATIVES CAUSES INTERFERENCE
B. EQUIPMENT AND MATERIALS SHALL BE NEW, UL-LISTED FOR THE USE INTENDED, AND FREE FROM DAMAGE OR DEFECT. THEY SHALL COMPLY WITH THE LATEST INDUSTRY STANDARDS.
C. PACKAGED EQUIPMENT SHALL BEAR ALL LABELS BY RECOGNIZED NATIONAL TESTING LABORATORY.
D. PERFORM ALL TESTS AND INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
E. ALL EQUIPMENT OR COMPONENTS OF THIS SPECIFICATION SECTION SHALL MEET OR EXCEED THE REQUIREMENTS AND QUALITY OF THE ITEMS HEREIN SPECIFIED, OR AS DENOTED ON THE DRAWINGS.

1.04 CONTRACT DRAWINGS
A. ILLUSTRATE THE GENERAL DESIGN AND EXTENT OF PERFORMANCE REQUIRED. ALL DIMENSIONS AND LOCATIONS SHALL BE TAKEN FROM THE ARCHITECTURAL DRAWINGS. CONSULT WITH ARCHITECTURAL PLANS AND LOCATE ALL CEILING EQUIPMENT WHERE INDICATED ON REFLECTED CEILING PLANS.
B. DEVIATIONS FROM THE DRAWINGS, WITH THE EXCEPTION OF MINOR CHANGES IN ROUTING AND OTHER SUCH INCIDENTAL CHANGES THAT DO NOT AFFECT THE FUNCTIONING OR SERVICEABILITY OF THE SYSTEMS, SHALL NOT BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER.
C. THE ARCHITECTURAL AND STRUCTURAL DRAWINGS TAKE PRECEDENCE IN ALL MATTERS PERTAINING TO THE BUILDING STRUCTURE, MECHANICAL DRAWINGS IN ALL MATTERS PERTAINING TO MECHANICAL TRADES AND ELECTRICAL DRAWINGS IN ALL MATTERS PERTAINING TO ELECTRICAL TRADES. WHERE THERE ARE CONFLICTS OR DIFFERENCES BETWEEN THE DRAWINGS FOR THE VARIOUS TRADES, REPORT SUCH CONFLICTS OR DIFFERENCES TO THE ARCHITECT/ENGINEER FOR RESOLUTION.
D. DRAWINGS ARE NOT INTENDED TO SERVE AS SHOP DRAWINGS. TAKE ALL FIELD MEASUREMENTS REQUIRED TO COMPLETE THE WORK.

1.05 SHOP DRAWINGS
A. SUBMIT PROJECT SPECIFIC SUBMITTALS FOR REVIEW IN COMPLIANCE WITH DIVISION 01.
B. PREPARE SHOP DRAWINGS TO SCALE FOR THE ARCHITECT/ENGINEER FOR REVIEW. EQUIPMENT AND MATERIAL INFORMATION REQUIRED ARE MECHANICAL; FIRE SUPPRESSION; PLUMBING; AND HEATING, VENTILATING AND AIR CONDITIONING SECTIONS.
C. ALL SUBMITTALS SHALL BE SUBMITTED IN GROUPINGS OF SIMILAR AND/OR RELATED ITEMS.
D. SHOP DRAWINGS SHALL BE REVIEWED BY THE MECHANICAL CONTRACTOR FOR COMPLETENESS AND ACCURACY PRIOR TO SUBMITTING TO THE ARCHITECT/ENGINEER FOR REVIEW. THE SHOP DRAWINGS SHALL BE DATED AND SIGNED BY THE MECHANICAL CONTRACTOR PRIOR TO SUBMISSION.
E. SUBMITTAL S MUST BE JOB SPECIFIC AND NOT GENERIC IN NATURE.
F. NO EQUIPMENT SHALL BE SHIPPED FROM STOCK OR FABRICATED UNTIL SHOP DRAWINGS FOR THEM HAVE BEEN REVIEWED BY THE ARCHITECT/ENGINEER.
G. BY THE REVIEW OF SHOP DRAWINGS, THE ARCHITECT/ENGINEER DOES NOT ASSUME RESPONSIBILITY FOR ACTUAL DIMENSIONS OR FOR THE FIT OF COMPLETED WORK IN POSITION, NOR DOES SUCH REVIEW RELIEVE MECHANICAL TRADES OF FULL RESPONSIBILITY FOR THE PROPER AND CORRECT EXECUTION OF THE WORK REQUIRED.
H. CONTRACTOR IS RESPONSIBLE FOR:
a. DIMENSIONS, WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE.
b. FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION.
c. QUANTITIES.
d. COORDINATION OF CONTRACTOR'S WORK WITH ALL OTHER TRADES.
e. SATISFACTORY PERFORMANCE OF CONTRACTOR'S WORK.
f. TEMPORARY ASPECTS OF THE CONSTRUCTION PROCESS.
g. SUBMIT DETAILED SHOP DRAWINGS OF PIPING SYSTEMS SHOWING PIPE ROUTING AND TYPES AND LOCATIONS OF ALL PIPE HANGERS.
I. IF DEVIATIONS (NOT SUBSTITUTIONS) FROM CONTRACT DOCUMENTS ARE DEEMED NECESSARY BY THE CONTRACTOR, DETAILS OF SUCH DEVIATIONS, INCLUDING CHANGES IN RELATED PORTIONS OF THE PROJECT AND THE REASONS THEREFORE, SHALL BE SUBMITTED WITH THE SUBMITTAL FOR APPROVAL.
J. MANUFACTURERS NOT LISTED MAY SUBMIT FOR ACCEPTANCE AS AN "APPROVED EQUAL." REQUESTS FOR AN "EQUIVALENT" MEANS "APPROVED EQUIVALENT". FOUR COPIES OF SUCH SUBMITTALS MUST BE RECEIVED BY THE ENGINEER SEVEN (7) WORKING DAYS PRIOR TO BID DATE.
a. THE TERMS "APPROVED", "APPROVED EQUAL", AND "EQUAL" REFER TO APPROVAL BY THE ARCHITECT OR ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS SHALL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.
b. COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

1.06 WARRANTY
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF MECHANICAL SYSTEMS, EQUIPMENT, AND MATERIALS INSTALLED UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS ONE YEAR . WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN OR MATERIAL. DEFECTIVE EQUIPMENT OR MATERIALS SHALL BE REPAIRED OR REPLACED AT NO EXPENSE TO THE OWNER. PROVIDE FOUR COMPLETE SERVICE AND MAINTENANCE CALLS SPACED AT EQUAL INTERVALS DURING THE WARRANTY PERIOD.
B. WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.
C. AT THE TIME OF FINAL ACCEPTANCE, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1.07 DELIVERY, PRODUCT HANDLING, AND CLEAN UP
A. DELIVER MATERIALS TO THE SITE IN SUCH A MATTER AS TO PROTECT THE MATERIALS FROM SHIPPING AND HANDLING DAMAGE. PROVIDE MATERIALS ON FACTORY PROVIDED SHIPPING SKIDS AND LIFTING LUGS IF REQUIRED FOR HANDLING. MATERIALS DAMAGED BY THE ELEMENTS SHOULD BE PACKAGED IN SUCH A MATTER THAT THEY COULD WITHSTAND SHORT-TERM EXPOSURE TO THE ELEMENTS DURING TRANSPORTATION.
B. STORE MATERIALS IN CLEAN, UNDAMAGED, DRY PLACE AND PROTECT FROM WEATHER AND CONSTRUCTION TRAFFIC. HANDLE CAREFULLY TO AVOID DAMAGE. THE GENERAL CONDITIONS TAKE PRECEDENCE.
C. USE ALL MEANS NECESSARY TO PROTECT EQUIPMENT BEFORE, DURING, AND AFTER INSTALLATION.
D. ALL SCRATCHED, DENTED, AND OTHERWISE DAMAGED UNITS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ARCHITECT/ENGINEER.
E. KEEP JOBSITE CLEAN AND TIDY ALLOWING OTHER TRADES TO CONTINUE WORK.

1.08 OPERATING AND MAINTENANCE DATA
A. PROVIDE THE OWNER WITH OPERATING AND MAINTENANCE INSTRUCTIONS (FOUR COPIES) REQUIRED FOR OPERATION OF ALL MECHANICAL SYSTEMS. BIND THE WRITTEN INSTRUCTIONS IN A NOTEBOOK. THE GENERAL CONDITIONS TAKE PRECEDENCE. THE MANUALS SHALL INCLUDE THE FOLLOWING ITEMS:
1. OPERATING MANUAL AND SPARE PARTS LIST FOR EACH PIECE OF EQUIPMENT.
2. PREVENTIVE MAINTENANCE SCHEDULE FOR LUBRICATING AND CHECKING EACH PIECE OF EQUIPMENT.
3. INSTRUCTIONS ON WHO TO CALL FOR SERVICE DURING THE WARRANTY PERIOD.

1.09 PERMITS
A. THE CONTRACTOR SHALL PAY FOR ALL FEES, TAXES, SECURE PERMITS, LICENSES, AND INSPECTIONS REQUIRED FOR THE PROJECT.
B. RULES OF LOCAL UTILITY COMPANIES SHALL BE COMPLIED WITH. CHECK WITH EACH UTILITY COMPANY SUPPLYING SERVICE TO THE INSTALLATION AND DETERMINE ALL DEVICES INCLUDING, BUT NOT LIMITED TO, ALL VALVES, METER BOXES, AND METERS WHICH WILL BE REQUIRED AND INCLUDE THE COST OF ALL SUCH ITEMS IN PROPOSAL.

1.10 TEMPORARY SERVICES
A. PROVIDE TEMPORARY WATER SERVICE FOR CONSTRUCTION, AS REQUIRED BY THE GENERAL CONTRACTOR.

1.11 COORDINATION
A. COORDINATE OUTLET DEVICE AND EQUIPMENT LOCATIONS WITH THE ARCHITECTURAL PLANS AND WORK OF OTHER TRADES. LOCATE ON HORIZONTAL AND VERTICAL LINES TO AVOID INTERFERENCE AND TO PROVIDE FUNCTIONAL USE OF ALL EQUIPMENT. VERIFY ELECTRICAL POWER CHARACTERISTICS BEFORE ORDERING EQUIPMENT.
B. THE GENERAL GUIDELINE FOR THE DIVISION BETWEEN CONTROL (BY MC) WIRING AND POWER WIRING (BY EC) IS THAT POWER WIRING CARRIES THE CURRENT WHICH ENERGIZES A MOTOR, CONTROL WIRING DOES NOT. CONTROL WIRING MAY BE 120V, WHICH WOULD BE THE RESPONSIBILITY OF THE MC. CONTROL MOTORS ARE WIRED BY THE MC.
C. FURNISH WIRING DIAGRAMS TO THE ELECTRICAL CONTRACTOR AS REQUIRED FOR PROPER EQUIPMENT HOOKUP. COORDINATE WITH THE ELECTRICAL CONTRACTOR THE ACTUAL WIRE SIZING AMPS FOR MECHANICAL EQUIPMENT (FROM THE EQUIPMENT NAMEPLATE) TO ENSURE PROPER INSTALLATION.
D. EXAMINE THE SITE AND BECOME AWARE OF EXISTING CONDITIONS, UTILITIES, AND OTHER ISSUES AFFECTING THE SATISFACTORY COMPLETION OF THE PROJECT.
E. ELECTRICAL WORK PERFORMED BY THIS CONTRACTOR WILL CONFORM TO THE STANDARDS OF DIVISION 26-28. MECHANICAL EQUIPMENT MOTORS AND CONTROLS SHALL BE FURNISHED, SET IN PLACE, AND WIRED ACCORDING WITH THE FOLLOWING SCHEDULE UNLESS OTHERWISE NOTED OR SPECIFIED. MC = DIVISION 21-23 EC = DIVISION 26-28

ITEM	FURN BY	SET BY	POWER WIRING	CONTROL WIRING
COMBINATION STARTERS	MC	EC	EC	MC
EQUIPMENT MOTORS	MC	MC	EC	--
MOTOR STARTERS & O.L. RELAYS	MC	EC	EC	MC
DISCONNECT SWITCHES	EC	EC	EC	MC
THERMAL OVERLOAD HEATERS (1)	EC	EC	EC	--
VARIABLE SPEED DRIVES	MC	EC	EC	MC
CONTROL RELAYS/TRANSFORMERS	MC	MC	EC	MC
TEMPERATURE CONTROL PANELS	MC	MC	EC	MC
TEMP. CONTROLS CONDUIT/WIRING	MC	MC	--	MC
ACTUATOR AND SOLENOID WIRING	MC	MC	--	MC
PUSHBUTTONS & PILOT LIGHTS	MC	MC	--	MC
ROOM THERMOSTATS	MC	MC	--	MC
THERMOSTATS: LINE VOLTAGE	EC	EC	EC	--

1.12 ELECTRICAL
A. LUGS FOR WIRING CONNECTIONS SHALL BE RATED FOR COPPER AND ALUMINUM, NAD SHALL HAVE A MINIMUM RATING OF 75C.
B. ELECTRIC MOTORS SHALL BE RATED FOR THE APPROPRIATE APPLICATION: WET LOCATION (TEFC); SUBMERSIBLE; EXPLOSION PROOF, VFD'S, ETC.
C. ALL LOW VOLTAGE CONTROL WIRING (24 VOLT) SHALL BE IN CONDUIT AND IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODES AND ORDINANCES AND SHALL BE DONE BY THIS HVAC CONTRACTOR.

1.13 DELIVERY, STORAGE, HANDLING
A. PROVIDE NECESSARY HAULING AND HOISTING EQUIPMENT. PROTECT THE MATERIALS OF THIS DIVISION BEFORE, DURING, AND AFTER INSTALLATION.

1.14 AS-BUILT DRAWINGS
A. KEEP A CURRENT SET OF "AS-BUILT" DRAWINGS ON SITE. UPON COMPLETION OF THE WORK, FURNISH ENGINEER WITH A REPRODUCIBLE PRINTS SHOWING THE "AS-BUILT" INSTALLATION.

1.15 PROJECT/SITE CONDITIONS
A. VISIT THE SITE, EXAMINE AND VERIFY THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED BEFORE SUBMITTING PROPOSAL. THE SUBMITTING OF A PROPOSAL IMPLIES THAT THE CONTRACTOR HAS VISITED THE SITE AND UNDERSTANDS THE CONDITIONS UNDER WHICH THE WORK MUST BE CONDUCTED. NO ADDITIONAL CHARGES OR TIME EXTENSIONS WILL BE ALLOWED BECAUSE OF FAILURE TO MAKE THIS EXAMINATION OR TO INCLUDE ALL MATERIALS AND LABOR TO COMPLETE THE WORK.

1.16 PLAN VERIFICATION
A. AFTER COMPLETION OF THE BIDDING AND SELECTION PROCESS, PRIOR TO AWARDING THE CONTRACT, THE CONTRACTOR MUST REVIEW AND VERIFY THE CONTRACT DOCUMENTS IN THEIR ENTIRETY, INCLUDING THOSE OF OTHER TRADES. AT THIS TIME, DISCREPANCIES, CONFLICTS, OMISSIONS, ETC IN THE CONTRACT DOCUMENTS MUST BE DOCUMENTED. ALTERATIONS TO THE CONTRACT WILL BE MADE AT THAT TIME TO INCLUDE SUCH ITEMS, AS WELL OTHER MODIFICATIONS WHICH MIGHT BE MADE BY THE OWNER. AFTER AWARD OF THE CONTRACT, CHANGE ORDERS CAUSED BY DISCREPANCIES, CONFLICTS, OMISSIONS IN THE CONTRACT DOCUMENTS WILL NOT BE ALLOWED.

1.17 INSTRUCTION OF OWNER PERSONNEL
A. AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, PROVIDE THE SERVICES OF A FACTORY TRAINED AND AUTHORIZED REPRESENTATIVE TO TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR THIS PROJECT. PROVIDE TRAINING TO INCLUDE, BUT NOT BE LIMITED TO, AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE BUILDING, START-UP, OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE AND APPROPRIATE OPERATOR INTERVENTION; AND REVIEW OF DATA INCLUDED IN THE OPERATION AND MAINTENANCE MANUALS.
B. SUBMIT A CERTIFICATION LETTER TO THE ARCHITECT STATING THAT THE OWNER'S DESIGNATED REPRESENTATIVE HAS BEEN TRAINED AS SPECIFIED HEREIN. LETTER SHALL INCLUDE DATE, TIME, ATTENDEES AND SUBJECT OF TRAINING. THE CONTRACTOR AND THE OWNER'S REPRESENTATIVE SHALL SIGN THE CERTIFICATION LETTER INDICATING AGREEMENT THAT THE TRAINING HAS BEEN PROVIDED.
C. SCHEDULE OWNER TRAINING WITHIN AT LEAST 7 DAYS ADVANCE NOTICE.
D. PROVIDE TWO (2) COMPLETE SETS OF OPERATING AND MAINTENANCE INSTRUCTION BOOKLETS.

1.18 HVAC USE DURING CONSTRUCTION
A. HVAC EQUIPMENT SHALL NOT BE USED DURING CONSTRUCTION AS A MEANS TO HEAT OR COOL THE SPACE, UNLESS SPECIFIC APPROVAL IS GIVEN BY THE OWNER. IF SUCH EQUIPMENT IS USED, IT MUST BE COMPLETELY CLEANED AND REPAIRED AS NECESSARY. CLEANING INVOLVES REPLACING ALL FILTERS; CLEANING ALL COILS AND HEAT EXCHANGERS; INSPECTING FANS, PLENUMS, AND DUCTWORK AND CLEANING AS DIRECTED BY THE OWNER.
B. IF HVAC EQUIPMENT IS USED DURING THE CONSTRUCTION PERIOD, THIS CONTRACTOR SHALL PROVIDE MINIMUM MERV-8 FILTERS OR FILTRATION MEDIA OVER ANY RETURN AIR GRILLES AND OPEN RETURN AIR DUCT WORK FOR THE DURATION OF THE CONSTRUCTION PERIOD. CONTRACTOR SHALL PROVIDE ONE SET OF FILTERS WHEN THE UNIT IS STARTED AND REPLACE FILTERS AS NEEDED, BUT NOT LESS THAN EVERY FOUR WEEKS.
C. ON THE DAY OF SUBSTANTIAL COMPLETION, THE CONTRACTOR SHALL CLEAN THE UNIT AND PROVIDE A NEW SET OF FILTERS IN THE UNIT.

1.19 REFRIGERANT AND OIL
A. PROVIDE FULL REFRIGERANT AND OIL CHARGE IN NEW AIR CONDITIONING REFRIGERATION SYSTEMS, AND MAINTAIN IT FOR FULL TERM OF THE GUARANTEE.
B. ALL NEW MECHANICAL EQUIPMENT SHALL UTILIZE R-410A.
C. DISPOSE OF RECOVERED REFRIGERANT LEGALLY, IN ACCORDANCE WITH APPLICABLE RULES AND REGULATIONS.

2.01 MATERIALS AND EQUIPMENT
A. PROVIDE NECESSARY EQUIPMENT, PIPING, DUCTWORK, AND ACCESSORIES THAT ARE NOT PROVIDED BY THE EQUIPMENT SUPPLIER OR OWNER TO COMPLETE INSTALLATION OF EQUIPMENT FURNISHED BY OTHERS/ EXISTING EQUIPMENT IN LOCATIONS AS INDICATED ON THE DRAWINGS AND/OR DESCRIBED IN THE GENERAL NOTES TO THIS CONTRACTOR. EQUIPMENT AND ACCESSORIES NOT PROVIDED BY THE EQUIPMENT SUPPLIER MAY INCLUDE CONDENSATE DRAINS, FLUES, VENTS, INTAKES, ASSOCIATED ROOF JACKS AND CAPS TO EXTERIOR, DAMPERS, INLINE FANS, ROOF FANS, CONTROL INTERLOCKS, ETC. AS REQUIRED FOR PROPER OPERATION OF THE COMPLETE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
B. CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECT ROUGH-IN DIMENSIONS AND SHALL VERIFY SAME WITH ARCHITECT AND/OR EQUIPMENT SUPPLIER PRIOR TO SERVICE INSTALLATIONS.
C. IF AN APPROVED MANUFACTURER IS OTHER THAN THE MANUFACTURER USED AS THE BASIS FOR DESIGN, THE EQUIPMENT OR PRODUCT PROVIDED SHALL BE EQUAL IN SIZE, QUALITY, DURABILITY, APPEARANCE, CAPACITY, AND EFFICIENCY THROUGH ALL RANGES OF OPERATION, SHALL CONFORM WITH ARRANGEMENTS AND SPACE LIMITATIONS OF THE EQUIPMENT SHOWN ON THE PLANS AND/OR SPECIFIED, SHALL BE COMPATIBLE WITH THE OTHER COMPONENTS OF THE SYSTEM AND SHALL COMPLY WITH THE REQUIREMENTS FOR ITEMS REQUIRING PRIOR APPROVAL SPECIFIED IN THIS SECTION OF THE SPECIFICATIONS. ALL COSTS TO MAKE THESE ITEMS OF EQUIPMENT COMPLY WITH THESE REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, PIPING, SHEET METAL, ELECTRICAL WORK, AND BUILDING ALTERATIONS SHALL BE INCLUDED IN THE ORIGINAL BID.
D. CHANGES INVOLVING ELECTRICAL WORK: THE DESIGN OF THE MECHANICAL SYSTEMS IS BASED ON THE EQUIPMENT SCHEDULED ON THE DRAWINGS. EQUIPMENT OF HIGHER ELECTRICAL CHARACTERISTICS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING ELECTRICAL SERVICES, CIRCUIT BREAKERS, AND CONDUIT SIZES ARE APPROPRIATELY MODIFIED WITH NO ADDITIONAL COST TO PROJECT. IF MINIMUM ENERGY RATINGS OR EFFIECIENCIES ARE SPECIFIED, EQUIPMENT SHALL COMPLY WITH REQUIREMENTS.
a. WHERE EQUIPMENT CHANGES ARE MADE THAT INVOLVE ADDITIONAL ELECTRICAL WORK (LARGER SIZE MOTOR, ADDITIONAL WIRING OF EQUIPMENT, ETC.) THE MECHANICAL TRADES INVOLVED SHALL COMPENSATE THE ELECTRICAL TRADES FOR THE COST OF THE ADDITIONAL WORK REQUIRED.

SECTION 20 05 10 - MECHANICAL AND PLUMBING BASIC MATERIALS AND METHODS

1.01 GENERAL
A. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
B. COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEM COMPONENTS AND RELATED MATERIALS," FOR PLASTIC, POTABLE DOMESTIC WATER PIPING AND COMPONENTS. INCLUDE MARKING "NSF-PW" ON PIPING.
C. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; SECTIONS 1 THROUGH 9," FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
D. COMPLY WITH NSF 372, "DRINKING WATER SYSTEM COMPONENTS – LEAD CONTENT" FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
E. STEEL SUPPORT WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO AWS D1.1, "STRUCTURAL WELDING CODE--STEEL."
F. STEEL PIPE WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS." COMPLY WITH PROVISIONS IN ASME B31 SERIES, "CODE FOR PRESSURE PIPING." CERTIFY THAT EACH WELDER HAS PASSED AWS QUALIFICATION TESTS FOR WELDING PROCESSES INVOLVED AND THAT CERTIFICATION IS CURRENT.
G. BRAZING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS," OR AWS B2.2, "STANDARD FOR BRAZING PROCEDURE AND PERFORMANCE QUALIFICATION."
H. SOLDERING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO AWS B2.3/2.3M, "SPECIFICATION FOR SOLDERING PROCEDURE AND PERFORMANCE QUALIFICATION."

2.01 JOINING MATERIALS
A. UNIONS: PIPE SIZE 2 INCHES AND SMALLER:
a. FERROUS PIPE: MALLEABLE IRON GROUND JOINT TYPE UNIONS.
b. UNION FOR GALVANIZED PIPING SYSTEMS: SHALL BE GALVANIZED.
c. COPPER TUBE AND PIPE: BRONZE UNIONS WITH SOLDERED JOINTS.
B. FLANGES: PIPE SIZES 2-1/2 INCH AND LARGER:
a. FERROUS PIPE: STANDARD WEIGHT, FORGED STEEL WELD NECK FLANGES.
b. COPPER TUBE AND PIPE: SLIP-ON BRONZE FLANGES.
c. PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM CONTENTS.
C. DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATON BARRIER. PROVIDE NON-CONDUCTNG DIELECTRIC CONNECTONS WHEREVER JOINTNG DISSIMILAR METALS.
D. FLANGE BOLTS AND NUTS: ASME B18.2.1, CARBON STEEL, UNLESS OTHERWISE INDICATED. SQUARE HEAD BOLTS AND NUTS ARE NOT ACCEPTABLE.
E. SOLDER FILLER METALS: ASTM B 32, LEAD-FREE, ANTIMONY-FREE, SILVER-BEARING ALLOYS. INCLUDE WATER-FLUSHABLE FLUX ACCORDING TO ASTM B 813.
F. BRAZING FILLER METALS: ALLOYS MEETING AWS A5.8.
a. USE TYPE BCUP SERIES, SILVER-BEARING, COPPER-PHOSPHORUS ALLOYS FOR JOINING COPPER OR BRONZE SOCKET FITTINGS WITH COPPER PIPE. FLUX IS PROHIBITED UNLESS USED WITH BRONZE FITTINGS.
b. USE TYPE BAG SERIES, CADMIUM-FREE SILVER ALLOYS FOR JOINING COPPER WITH STEEL, STAINLESS STEEL, OR OTHER FERROUS ALLOYS.
G. WELDING FILLER METALS: COMPLY WITH AWS D10.12/D10.12M FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND CHEMICAL ANALYSIS OF STEEL PIPE BEING WELDED.
H. WELDING MATERIALS: COMPLY WITH SECTION II, PART C, OF ASME BOILER AND PRESSURE VESSEL CODE FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND FOR CHEMICAL ANALYSIS OF PIPE BEING WELDED.
I. SOLVENT CEMENTS FOR JOINING PVC PIPING: ASTM D 2564. INCLUDE PRIMER ACCORDING TO ASTM F 656.
J. SOLVENT CEMENTS FOR JOINING CPVC PIPING AND TUBING: ASTM F 493.
K. SOLVENT CEMENTS FOR JOINING ABS PIPING: ASTM D 2235.
L. SOLVENT CEMENTS FOR JOINING PVC TO ABS PIPING TRANSITION: ASTM D 3138.
M. PIPE THREAD COMPOUND FOR NATURAL GAS: USE TETRAFLUOROETHYLENE (TEFLON) TAPE 2 TO 3 MILS THICK
N. PIPE THREAD COMPOUNG FOR STEEL PIPEL INORGANIC ZINC-RICH COATINGS OR CORROSION INHIBITED PROPRIETARY COMPOUND.

2.02 MOTORS AND STARTERS
A. PROVIDE MOTORS AND STARTING EQUIPMENT WHERE NOT FURNISHED WITH THE EQUIPMENT PACKAGE. MOTORS SHALL HAVE COPPER WINDINGS, CLASS B INSULATION, AND STANDARD SQUIRREL CAGE WITH STARTING TORQUE CHARACTERISTICS SUITABLE FOR THE EQUIPMENT SERVED. MOTORS FOR AIR HANDLING EQUIPMENT SHALL BE SELECTED FOR QUIET OPERATION. EACH MOTOR SHALL BE CHECKED FOR PROPER ROTATION AFTER ELECTRICAL CONNECTION HAS BEEN COMPLETED. PROVIDE DRIP-PROOF ENCLOSURE FOR LOCATIONS PROTECTED FROM WEATHER AND NOT IN AIR STREAM OF FAN; AND TOTALLY ENCLOSED FAN-COOLED ENCLOSURE FOR MOTORS EXPOSED TO WEATHER. MOTORS SHALL BE MANUFACTURED BY CENTURY, GENERAL ELECTRIC, WESTINGHOUSE, LOUIS-ALLIS OR APPROVED EQUAL.
B. PROVIDE EVERY MOTOR, EXCEPT FRACTIONAL HORSEPOWER SINGLE PHASE MOTORS WITH AN APPROVED TYPE OF BUILT-IN THERMAL OVERLOAD PROTECTION, WITH A MOTOR STARTER. EACH STARTER SHALL BE PROVIDED WITH OVERLOAD HEATERS SIZED TO THE MOTOR RATING, AND EVERY THREE-PHASE MOTOR STARTER SHALL HAVE OVERLOAD HEATERS IN EACH PHASE. AMBIENT COMPENSATED HEATERS SHALL BE INSTALLED WHEREVER NECESSARY, UNLESS NOTED OTHERWISE. MOTOR STARTERS FURNISHED FROM THE DIVISION 26 CONTRACTOR FOR INSTALLATION AND CONNECTION BY THE DIVISION 16 CONTRACTOR, STARTERS SHALL BE ALLEN-BRADLEY, CLARK, FURNAS, SQUARE D, OR APPROVED EQUAL.

2.03 ACCESS PANELS
A. THE MECHANICAL CONTRACTOR SHALL FURNISH AND GENERAL CONTRACTOR SHALL INSTALL ACCESS PANELS WHERE REQUIRED FOR ACCESS TO EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL INCLUDE THE COST OF INSTALLATION IN HIS BID. ACCESS PANELS SHALL BE ADEQUATELY SIZED, OF A TYPE APPROVED BY THE ARCHITECT AND SHALL BE FIRE OR SMOKE-RATED AS REQUIRED. ACCESS PANELS SHALL BE MINIMUM 18"X18".

2.04 STRUCTURAL STEEL
A. STRUCTURAL STEEL USED FOR SUPPORT OF EQUIPMENT, DUCTWORK AND PIPING SHALL BE NEW, CLEAN AND CONFORM TO ASTM DESIGNATION A-36.
B. SUPPORT MECHANICAL COMPONENTS FROM THE BUILDING STRUCTURE. DO NOT SUPPORT MECHANICAL COMPONENTS FROM CEILINGS, OTHER MECHANICAL OR ELECTRICAL COMPONENTS, NOR OTHER NON-STRUCTURAL ELEMENTS.

2.05 PENETRATIONS AND SLEEVES
A. SLEEVE-SEAL SYSTEMS SHALL INCLUDE MODULAR SEALING-ELEMENT DESIGNED FOR FIELD ASSEMBLY FOR FILLING AN ANNULAR SPACE BETWEEN PIPE AND SLEEVE. SEAL SHALL BE DESIGNED FOR HYDROSTATIC PRESSURE OF 20 PSI. SEAL SHALL BE MADE OF EPDM-RUBBER WITH INTERLOCKING LINKS SHAPED TO FIT SURFACE OF PIPE. PRESSURE PLATES SHALL BE MADE OF STAINLESS STEEL WITH STAINLESS STEEL CONNECTING BOLTS AND NUTS. APPROVED MANUFACTURE ARE METRAFLEX, CALPICO, PIPELINE SEAL AND INSULATOR.
B. PIPE SLEEVES SHALL BE STEEL PIPE IN ACCORDANCE WITH ASTM A-53, TYPE E, GRADE B, SCHEDULE 40 WITH PLAIN ENDS AND INTEGRAL WELDED W

SECTION 22 11 19 DOMESTIC WATER PIPING SPECIALTIES

2.01 BACKFLOW PREVENTERS
A. APPROVED MANUFACTURERS: APOLLO VALVES, FEBCO, WATTS, AND ZURN
B. INTERMEDIATE ATMOSPHERIC-VENT BACKFLOW PREVENTERS
a. SHALL COMPLY WITH ASSE 1012 FOR CONTINUOUS-PRESSURE APPLICATIONS. BRONZE BODY WITH UNION SOLDER JOINTS AND SIZES UP TO 3/4 INCH.

2.02 VACUUM BREAKERS
A. APPROVED MANUFACTURERS: APOLLO VALVES, FEBCO, WATTS, AND ZURN
B. ATMOSPHERIC TYPE
a. SHALL COMPLY WITH ASSE 1001 FOR SIZES 1/4 TO 3, AS REQUIRED TO MATCH CONNECTED PIPING. DEVICE SHALL HAVE A BRONZE BODY, INLET AND OUTLET CONNECTION SHALL BE THREADED, AND CHROME PLATED FINISH.

2.03 TEMPERATURE ACTUATED MIXING VALVES (TMV)
A. APPROVED MANUFACTURERS: APOLLO VALVES, BRADLEY, LAWLER, LEONARD, WATTS, AND ZURN
B. WATER TEMPERATURE LIMITING DEVICE (FIXTURE)
a. SHALL COMPLY WITH ASSE 1070 WITH MINIMUM PRESSURE RATING OF 125 PSIG. THERMOSTATICALLY CONTROLLED WITH BRONZE BODY CHROME PLATED. 1/2 INCH UNION OR 3/8 COMPRESSION WITH INTEGRAL CHECK VALVES AND TEMPERATURE ADJUSTMENT.

SECTION 22 13 16 DRAINAGE PIPING

2.01 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS
A. PIPE AND FITTINGS SHALL COMPLY WITH ASTM A 888 OR CISPI 301.
B. CAST-IRON SOIL PIPE, HUBLESS-PIPING COUPLINGS SHALL BE NSF CERTIFIED FOR COMPLIANCE WITH CISPI 310. STAINLESS-STEEL CORRUGATED SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL CENTER PIPE STOP.
C. HEAVY DUTY CAST-IRON SOIL PIPE, HUBLESS-PIPING COUPLINGS SHALL COMPLY WITH ASTM C 1277 AND ASTM C 1540, OR ASTM C 1277 AND FM 1680 CLASS I. STAINLESS-STEEL SHIELD WITH STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE WITH INTEGRAL CENTER PIPE STOP.
D. APPROVED MANUFACTURERS: ANACO-HUSKY, FERGUSON ENTERPRISES, INC., IDEAL-TRIDON., MISSION RUBBER COMPANY, TYLER PIPE, FERNCO INC.

2.02 COPPER PIPE AND FITTINGS
A. DRAIN WASTE AND VENT (DWV) COPPER
a. TUBE SHALL COMPLY WITH ASTM B 306, DRAINAGE TUBE, DRAWN TEMPER.
b. FITTINGS SHALL COMPLY WITH ASME B16.23, CAST COPPER OR ASME B16.29, WROUGHT COPPER, SOLDER-JOINT FITTINGS.
B. HARD COPPER, TYPE L
a. TUBE SHALL BE IN BRAC CORDANCE WITH ASTM B 88, TYPE L (ASTM B 88M, TYPE B), WATER TUBE, DRAWN TEMPER.
b. COPPER PRESSURE FITTINGS SHALL BE IN ACCORDANCE WITH ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT- COPPER, SOLDER-JOINT FITTINGS.
c. BRONZE FLANGES SHALL BE IN ACCORDANCE WITH ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
d. COPPER UNIONS SHALL BE IN ACCORDANCE WITH MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.

2.03 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS
A. SOLID-WALL PVC PIPE SHALL BE SCHEDULE 40, ASTM D 2665, DRAIN, WASTE, AND VENT.
B. PVC SOCKET FITTINGS SHALL BE ASTM D 2665, SOCKET TYPE, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE.

SECTION 22 13 19 DRAINAGE PIPING SPECIALTIES

2.01 CLEANOUTS
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, JAY R. SMITH, ZURN
B. CLEANOUTS SHALL BE THE SAME NOMINAL SIZE AS PIPE THEY SERVE UP TO 4 INCHES. PIPES LARGE THAN 4 INCHES SHALL HAVE A CLEANOUT OF 4 INCHES MINIMUM.
C. BODY SHALL BE HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH OR HUBLESS, CAST-IRON SOIL PIPE TEST TEE AS REQUIRED TO MATCH CONNECTED PIPING. CLOSURE SHALL BE COUNTERSUNK OR RAISED-HEAD, DRILLED-AND-THREADED BRONZE OR BRASS PLUG WITH TAPERED THREADS.
D. CLEANOUTS IN FINISHED FLOOR SHALL HAVE A NICKEL-BRONZE, COPPER ALLOY WITH SCORIATED COVER IN SERVICE AREAS, AND RECESSED COVER TO ACCEPT FLOOR FINISH MATERIAL IN FINISHED FLOOR AREAS.
E. CLEANOUTS IN FINISHED WALL SHALL HAVE A ROUND, CHROME-PLATED BRONZE FLAT, CHROME-PLATED BRASS OR STAINLESS-STEEL COVER PLATE WITH SCREW.
F. A CLEAN-OUT SHALL BE INSTALLED AT THE BASE OF EACH SOIL AND WASTE STACK, AND AT NOT MORE THAN 100'-0" INTERVALS ON HORIZONTAL RUNS AND AS REQUIRED BY CODE.

2.02 FLOOR DRAINS, SINKS, AND TRENCH DRAINS
A. APPROVED MANUFACTURERS: JOSAM, MIFAB, JAY R. SMITH, ZURN
B. REFER TO PLUMBING SCHEDULES.

2.03 AIR ADMITTANCE VALVES
A. APPROVED MANUFACTURERS: OATEY, STUDOR, RECTORSEAL
B. STANDARD ASSE 1051 TYPE A FOR SINGLE FIXTURE OF TYPE B FOR BRANCH PIPING. HOUSING SHALL BE PLASTIC WITH MECHANICAL SEALING DIAPHRAGM THE SAME SIZE AS BRANCH VENT.
C. STANDARD ASSE 1050 TYPE FOR VENT STACKS. HOUSING SHALL BE PLASTIC WITH MECHANICAL SEALING DIAPHRAGM THE SAME SIZE AS VENT STACK.
D. PROVIDE A WHITE PLASTIC WALL BOX WITH GRILLE FOR RECESSED INSTALLATION. SIZE SHALL BE MINIMUM 9 INCHES WIDE BY 9 INCHES TALL BY 4 INCHES DEEP.

SECTION 22 42 00 PLUMBING FIXTURES

1.01 GENERAL
A. OBTAIN PLUMBING FIXTURES, FAUCETS, AND OTHER COMPONENTS OF EACH CATEGORY THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER. IF FIXTURES, FAUCETS, OR OTHER COMPONENTS ARE NOT AVAILABLE FROM A SINGLE MANUFACTURER, OBTAIN SIMILAR PRODUCTS FROM OTHER MANUFACTURERS SPECIFIED FOR THAT CATEGORY.
B. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.
C. FIXTURES WITH ADA NOTED SHALL COMPLY WITH REQUIREMENTS IN ICC A117.1, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES"; PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT"; AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT"; FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
D. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 102-486, "ENERGY POLICY ACT," ABOUT WATER FLOW RATE/CONSUMPTION RATES FOR PLUMBING FIXTURES.
E. COMPLY WITH REQUIREMENTS IN PUBLIC LAW 111-380, "REDUCTION OF LEAD IN DRINKING WATER ACT," ABOUT LEAD CONTENT IN MATERIALS THAT WILL BE IN CONTACT WITH POTABLE WATER FOR HUMAN CONSUMPTION.
F. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS; SECTIONS 1 THROUGH 9," AND NSF 372 DRINKING WATER SYSTEM COMPONENTS – LEAD CONTENT FOR POTABLE DOMESTIC WATER PIPING AND COMPONENTS.
G. SELECT COMBINATIONS OF FIXTURES AND TRIM, FAUCETS, FITTINGS, AND OTHER COMPONENTS THAT ARE COMPATIBLE.
H. COMPLY WITH APPLICABLE ANSI, ASME, ASSE, ASTM, ICC, NSF, AND UL STANDARDS AND OTHER REQUIREMENTS SPECIFIED FOR PLUMBING FIXTURES, TRIM, FITTINGS, COMPONENTS, AND FEATURES.
I. REFER TO PLUMBING FIXTURE SCHEDULES FOR BASIS OF DESIGN AND REQUIREMENTS.

2.01 PLUMBING FIXTURES
A. APPROVED WATER CLOSET MANUFACTURES: AMERICAN STANDARD, KOHLER, SLOAN, AND ZURN
B. APPROVED WATER CLOSET FLUSH VALVE MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, SLOAN, AND ZURN
C. APPROVED TOILET SEAT MANUFACTURES: AMERICAN STANDARD, BEMIS, PROFLO, ZURN, AND KOHLER
D. APPROVED LAVATORY MANUFACTURES: AMERICAN STANDARD, KOHLER, SLOAN, AND ZURN
E. APPROVED LAVATORY FAUCET MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, SLOAN, T&S BRASS AND BRONZE WORKS, AND ZURN
F. APPROVED SINK MANUFACTURES: ELKAY, JUST MFG., KOHLER, AND MOEN,
G. APPROVED SINK FAUCET MANUFACTURES: AMERICAN STANDARD, MOEN, DELTA, SPEAKMAN, KOHLER, CHICAGO FAUCET, T&S BRASS AND BRONZE WORKS, AND ZURN
H. APPROVED SERVICE SINK MANUFACTURES: AMERICAN STANDARD, KOHLER, AND ZURN
I. APPROVED SERVICE SINK FAUCET MANUFACTURES: AMERICAN STANDARD, KOHLER, T&S BRASS AND BRONZE WORKS, AND ZURN
J. APPROVED DISPOSER MANUFACTURES: AMERICAN STANDARD, MAYTAG, IN-SINK-ERATOR, AND MOEN
K. APPROVED FIXTURE SUPPLY MANUFACTURES: ANY APPROVED FIXTURE MANUFACTURE

SECTION 23 05 93-TESTING, ADJUSTING, AND BALANCING

1.01 GENERAL
A. BALANCING SHALL BE DONE BY AN INDEPENDENT FIRM SPECIALIZING SOLELY IN THE DISCIPLINE OF BALANCING AIR AND WATER SYSTEMS, AND A MEMBER OF NEBB., FIRMS DESIRING TO FURNISH SERVICES FOR THIS PROJECT SHALL SUBMIT FOR WRITTEN APPROVAL DURING BIDDING. ALL AIR AND HYDRONIC SYSTEMS SHALL BE BALANCED USING APPLICABLE PROPORTIONATE PROCEDURE.
B. CONTRACTOR SHALL FURNISH SERVICES FOR TWO COMPLETE ADJUSTMENTS OF THE HEATING, AIR CONDITIONING AND AIR DISTRIBUTION SYSTEMS WITH A REPORT FOR EACH VISIT. REPORTS MUST BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.
C. SYSTEM SHALL BE TESTED, ADJUSTED & BALANCED BY 'NEBB' CERTIFIED PERSONNEL.

2.01 TESTING CONDITIONS
A. (AIR) BEFORE ADJUSTMENTS ARE MADE, CHECK THE SYSTEM FOR SUCH ITEMS AS DIRTY FILTERS, DUCT AND DAMPER LEAKAGE, VIBRATIONS, ETC. ALL DIFFUSERS, DUCT SECTIONS, ETC SHALL BE ADJUSTED TO DELIVER DESIGN QUANTITIES WITHIN 5%. AIR QUANTITIES SHALL BE TESTED SIMULATING FILTERS BEING 50% LOADED. ADJUST/REPLACE SHEAVES AND BELTS AS REQUIRED TO ACHIEVE DESIGN AIR QUANTITIES. REPLACE THERMAL MOTOR OVERLOADS AS REQUIRED.
B. MERV-8 FILTERS SHALL BE INSTALLED PRIOR TO TEST AND BALANCE.

2.02 VERIFICATION OF TEMPERATURE CONTROL
A. THE TEST AND BALANCE AGENCY SHALL BE ASSISTED BY THE CONTROL CONTRACTOR IN VERIFYING THE OPERATION AND CALIBRATION OF ALL TEMPERATURE CONTROL SYSTEMS. THE FOLLOWING TESTS SHALL BE CONDUCTED:
a. VERIFY THAT ALL CONTROL COMPONENTS ARE INSTALLED IN ACCORDANCE WITH PROJECT REQUIREMENTS AND ARE FUNCTIONAL, INCLUDING ALL ELECTRICAL INTERLOCKS, DAMPER SEQUENCES, AND FIRE AND SMOKE DETECTORS.
b. VERIFY THAT ALL CONTROLLING INSTRUMENTS ARE CALIBRATED AND SET FOR DESIGN OPERATING CONDITIONS.
c. VERIFY THE ACCURACY OF THE FINAL SETTING BY TAKING TEMPERATURE READINGS. THE READINGS SHALL BE IN A TYPICAL CONDITIONED SPACE FOR EACH SEPARATELY CONTROLLED ZONE.

2.03 REPORT
A. AFTER ALL ADJUSTMENTS ARE MADE, A DETAIL WRITTEN REPORT SHALL BE PREPARED AND SUBMITTED FOR APPROVAL. FINAL ACCEPTANCE OF THE PROJECT WILL NOT BE MADE UNTIL A SATISFACTORY REPORT IS RECEIVED AND FIELD VERIFIED. THE REPORT SHALL DETAIL THE TEST EQUIPMENT AND BALANCE PROCEDURES BEING USED; THE GENERAL STATUS OF THE SYSTEM BEING TESTED INCLUDING EQUIPMENT DETAILS; PROVIDE DATA SHEETS INDICATING THE REQUIRED AND ACTUAL CFM OF ALL OUTLETS AND INLETS.
B. SIX (6) COPIES OF THE TEST AND BALANCE REPORT ARE REQUIRED AND SHALL BE SUBMITTED TO THE ARCHITECT.
C. TEST & BALANCE REPORT TO INCLUDE OUTSIDE AIRFLOW READINGS.
D. THE REPORT SHALL CONTAIN THE FOLLOWING GENERAL DATA IN A FORMAT SELECTED BY THE TEST AND BALANCE AGENCY: PROJECT NUMBER, PROJECT TITLE, PROJECT LOCATION, PROJECT ARCHITECT, PROJECT MECHANICAL ENGINEER, TEST AND BALANCE AGENCY, TEST AND BALANCE ENGINEER, OWNER, MECHANICAL SUBCONTRACTORS, DATES TESTS WERE PERFORMED, CERTIFICATION.
E. THE TEST AND BALANCE REPORT SHALL BE RECORDED ON REPORT FORMS CONFORMING TO THE RECOMMENDED FORMS IN THE A.A.B.C. NATIONAL STANDARDS.
a. PREFACE - A GENERAL DISCUSSION OF THE SYSTEM, ANY ABNORMALITIES AND PROBLEMS ENCOUNTERED (DEFICIENCIES OUTSTANDING LISTED).
b. INSTRUMENTATION LIST - THE LIST OF INSTRUMENTS INCLUDE TYPE, MODEL, MANUFACTURER, SERIAL NUMBER AND CALIBRATION DATE.
c. SYSTEM IDENTIFICATION - IN EACH REPORT, THE VAV BOXES, ZONES, SUPPLY, RETURN, DATA SHEETS, ALONG WITH A DRAWING SHOWING THE ABOVE.
d. AIR HANDLING EQUIPMENT TEST REPORT FORMS - RECORD THE FOLLOWING ON EACH AIR-HANDLING EQUIPMENT TEST FORM:
e. MANUFACTURER, MODEL NUMBER AND SERIAL NUMBER
f. ALL DESIGN AND MANUFACTURER-RATED DATA.
g. TOTAL ACTUAL CFM BY TRAVERSE IF PRACTICAL, IF NOT PRACTICAL, THE SUM OF THE OUTLETS MAY BE USED, OR A COMBINATION OF EACH OF THESE PROCEDURES.
h. SUCTION AND DISCHARGE STATIC PRESSURE OF EACH FAN, AS APPLICABLE.

2.04 ACCEPTANCE OF TEST AND BALANCE REPORT
A. AT THE TIME OF ACCEPTANCE OF THE TEST AND BALANCE REPORT, THE TEST AND BALANCE AGENCY SHALL, IF REQUESTED, RECHECK IN THE PRESENCE OF THE OWNER REPRESENTATIVE, SPECIFIC AND RANDOM SELECTIONS OF DATA RECORDED IN THE CERTIFIED TEST AND BALANCE REPORT.
B. POINTS AND AREAS FOR RECHECK SHALL BE SELECTED BY THE ENGINEER OF RECORD.
C. MEASUREMENTS AND TEST PROCEDURES SHALL BE THE SAME AS THE ORIGINAL TEST AND BALANCE.
D. SELECTIONS FOR RECHECK, SPECIFIC PLUS RANDOM, SHALL NOT NORMALLY EXCEED 15% OF THE TOTAL NUMBER TABULATED IN THE REPORT, EXCEPT WHERE SPECIAL AIR SYSTEMS REQUIRE A COMPLETE RECHECK FOR SAFETY REASONS.
E. IF RANDOM TESTS DEMONSTRATED A MEASURED FLOW DEVIATION OF 15% OR MORE FROM THAT RECORDED, A NEW CERTIFIED TEST AND BALANCE REPORT MUST BE SUBMITTED, AND A NEW INSPECTION TEST MADE, ALL AT NO ADDITIONAL COST TO OWNER.

3.01 AIR SYSTEM PROCEDURES
A. THE TEST AND BALANCE AGENCY SHALL PERFORM THE FOLLOWING TESTING AND BALANCING FUNCTIONS:
1. DESIGN CONDITIONS INCLUDING SUPPLY/ EXHAUST AIRFLOW, MOTOR HP, FAN RPM, OUTLET VELOCITY, STATIC PRESSURE.
2. INSTALLED EQUIPMENT INFORMATION INCLUDING BELT, SHEAVE SIZE, MOTOR, MODEL NUMBERS.
3. FAN SPEEDS - TEST AND ADJUST FAN RPM TO ACHIEVE DESIGN CFM REQUIREMENTS.
4. CURRENT AND VOLTAGE - MEASURE AND RECORD MOTOR CURRENT AND VOLTAGE.
5. PITOT TUBE TRAVERSE - PERFORM A PITOT TUBE TRAVERSE OF MAIN SUPPLY AND RETURN DUCTS TO OBTAIN TOTAL CFM. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE SUMMATION OF THE OUTLETS OR INLETS MAY BE USED. AN EXPLANATION WHY A TRAVERSE WAS NOT MADE MUST APPEAR ON THE APPROPRIATE DATA SHEET.
6. OUTSIDE AIR - TEST AND ADJUST SYSTEM MINIMUM OUTSIDE AIR BY PITOT TUBE TRAVERSE. IF A PITOT TUBE TRAVERSE IS NOT PRACTICAL, THE PERCENTAGE OF OUTSIDE AIR MAY BE DETERMINED BY CALCULATIONS FROM THE RETURN AIR, OUTSIDE AIR, AND MIXED AIR TEMPERATURE. MAKE ALLOWANCES FOR HEAT OF COMPRESSION AND MOTOR HEAT WHERE APPLICABLE.
7. STATIC PRESSURE - TEST AND RECORD SYSTEM STATIC PRESSURES, INCLUDING SUCTION AND DISCHARGE STATIC PRESSURE PROFILE OF EACH FAN.
8. AIR TEMPERATURE - TAKE WET-BULB AND DRY-BULB AIR TEMPERATURES ON THE ENTERING AND LEAVING SIDE OF EACH HEATING COIL.
9. TOLERANCE - TEST AND BALANCE EACH DIFFUSER, GRILLE, AND REGISTER TO WITHIN 10 PERCENT OF DESIGN AND REQUIREMENT.
10. DESCRIPTION - RECORD THE SIZE AND TYPE OF EACH DIFFUSER, GRILLE, AND REGISTER ON AIR OUTLET DATA SHEETS.
11. TERMINAL BOXES - ALL ASSOCIATED TEMPERATURE CONTROLS SHALL BE CHECKED FOR PROPER OPERATION AND CALIBRATION
12. MINIMIZING DRAFTS - ADJUST ALL DIFFUSERS, GRILLES, AND REGISTERS TO MINIMIZE DRAFTS IN ALL AREAS
13. EQUIPMENT SHALL BE BALANCED TO AIRFLOWS WITHIN:
A. TERMINAL DEVICES & BRANCH LINES: ±10% OF DESIGNED LOADS
B. MAIN DUCTS & AHU'S: ± 5% OF DESIGNED LOADS
14. EXHAUST FANS/HOODS
a. MEASURE EXHAUST FAN STATIC PRESSURE, TOTAL CFM. MAKEUP AIR AND FAN RPM.
b. MEASURE MOTOR OPERATING VOLTAGE AND AMPERAGE.
c. MEASURE HOOD AVERAGE FACE VELOCITIES AND ADJUST AS NECESSARY. WHERE POSSIBLE, BALANCE FLOW USING A PITOT TRAVERSE WITHIN HOOD WHERE DUCTS ARE CONNECTED.
d. RECORD THE SPECIFIED AGAINST THE ACTUAL SUPPLIED HORSEPOWER AND ELECTRICAL CHARACTERISTICS OF ALL MOTORS. RECORD, IF SPECIFIED, TO BE SELF OR PERMANENTLY LUBRICATED.

SECTION 23 11 23 - FUEL GAS PIPING

2.01 BLACK STEEL PIPE AND FITTINGS
A. PROVIDE BLACK STEEL PIPE IN ACCORDANCE WITH ASTM A 53/A 53, TYPE E OR S, GRADE B, SCHEDULE 40.
B. PROVIDE MALLEABLE-IRON THREADED FITTINGS ASME B16.3, CLASS 150 OR STEEL THREADED FITTINGS ASME B16.11 FORGED STEEL THREADED FITTINGS.
C. STEEL WELDED FITTING SHALL COMPLY WITH ASME B16.9 AND SHALL BE WROUGHT STEEL OR ASME B16.11 FORGED STEEL.
D. UNIONS SHALL BE ASME B16.39, CLASS 150, MALLEABLE IRON AND HAVE THREADED ENDS.
E. CAST IRON FLANGES AND FLANGED FITTINGS SHALL BE ASME B16.1, CLASS 125 OR STEEL FLANGES AND FLANGED FITTINGS IN ACCORDANCE WITH ASME B16.5. GASKET MATERIAL SHALL BE SUITABLE FOR GAS.

2.02 PIPING SPECIALTIES
A. FLEXIBLE CONNECTORS: ANSI Z21.24, COPPER ALLOY.
B. QUICK-DISCONNECT DEVICES: ANSI Z21.41, CONVENIENCE OUTLETS AND MATCHING PLUG CONNECTOR.
C. Y-PATTERN STRAINERS SHALL BE ASTM A 126, CLASS B, CAST IRON BODY WITH BOLTED COVER AND BOTTOM DRAIN CONNECTION. END CONNECTIONS SHALL BE THREADED ENDS FOR 2 INCH AND SMALLER; FLANGED ENDS FOR 2-1/2 INCH AND LARGER. PERFORATED STAINLESS-STEEL BASKET WITH 50 PERCENT FREE AREA. COLD WORKING PRESSURE OF 125 PSIG
D. WEATHERPROOF VENT CAP: CAST- OR MALLEABLE-IRON INCREASER FITTING WITH CORROSION-RESISTANT WIRE SCREEN, WITH FREE AREA AT LEAST EQUAL TO CROSS-SECTIONAL AREA OF CONNECTING PIPE AND THREADED-END CONNECTION.

2.03 VALVES
A. NATURAL GAS VALVES 3 INCH AND SMALLER
a. BALL VALVES: BRONZE OR BRASS BODY WITH AGA OR CSA STAMP, UL LISTED OR FM APPROVED FOR SERVICE, WITH CHROME-PLATED BRASS BALL AND LEVER HANDLE; 125-PSIG MINIMUM PRESSURE RATING. VALVE SHALL HAVE LOCKING CAPABILITY.
b. APPROVED MANUFACTURERS: APOLLO VALVE; CONBRACO INDUSTRIES, INC., NIBCO INC., WATTS WATER TECHNOLOGIES, INC.; WATTS REGULATOR CO.

2.04 PRESSURE REGULATORS
A. DESCRIPTION: SINGLE STAGE AND SUITABLE FOR FUEL GAS SERVICE. INCLUDE STEEL JACKET AND CORROSION-RESISTANT COMPONENTS, ELEVATION COMPENSATOR, AND ATMOSPHERIC VENT.
B. APPROVED MANUFACTURERS: ELSTER GAS NORTH AMERICA; FISHER CONTROLS INTERNATIONAL, INC.; ITRON GAS.
a. NPS 2 AND SMALLER: THREADED ENDS ACCORDING TO ASME B1.20.1 FOR PIPE THREADS.
b. LINE PRESSURE REGULATORS: ANSI Z21.80/GCA 6.22 OR ANSI B109.4/CGA 6.18, WITH INLET PRESSURE RATING AS SCHEDULED ON THE DRAWINGS.
c. APPLIANCE PRESSURE REGULATORS: ANSI Z21.18. REGULATOR MAY INCLUDE VENT LIMITING DEVICE, INSTEAD OF VENT CONNECTION, IF APPROVED BY AUTHORITIES HAVING JURISDICTION.
C. PRESSURE REGULATOR VENTS: FACTORY- OR FIELD-INSTALLED, CORROSION-RESISTANT SCREEN IN OPENING IF NOT CONNECTED TO VENT PIPING.

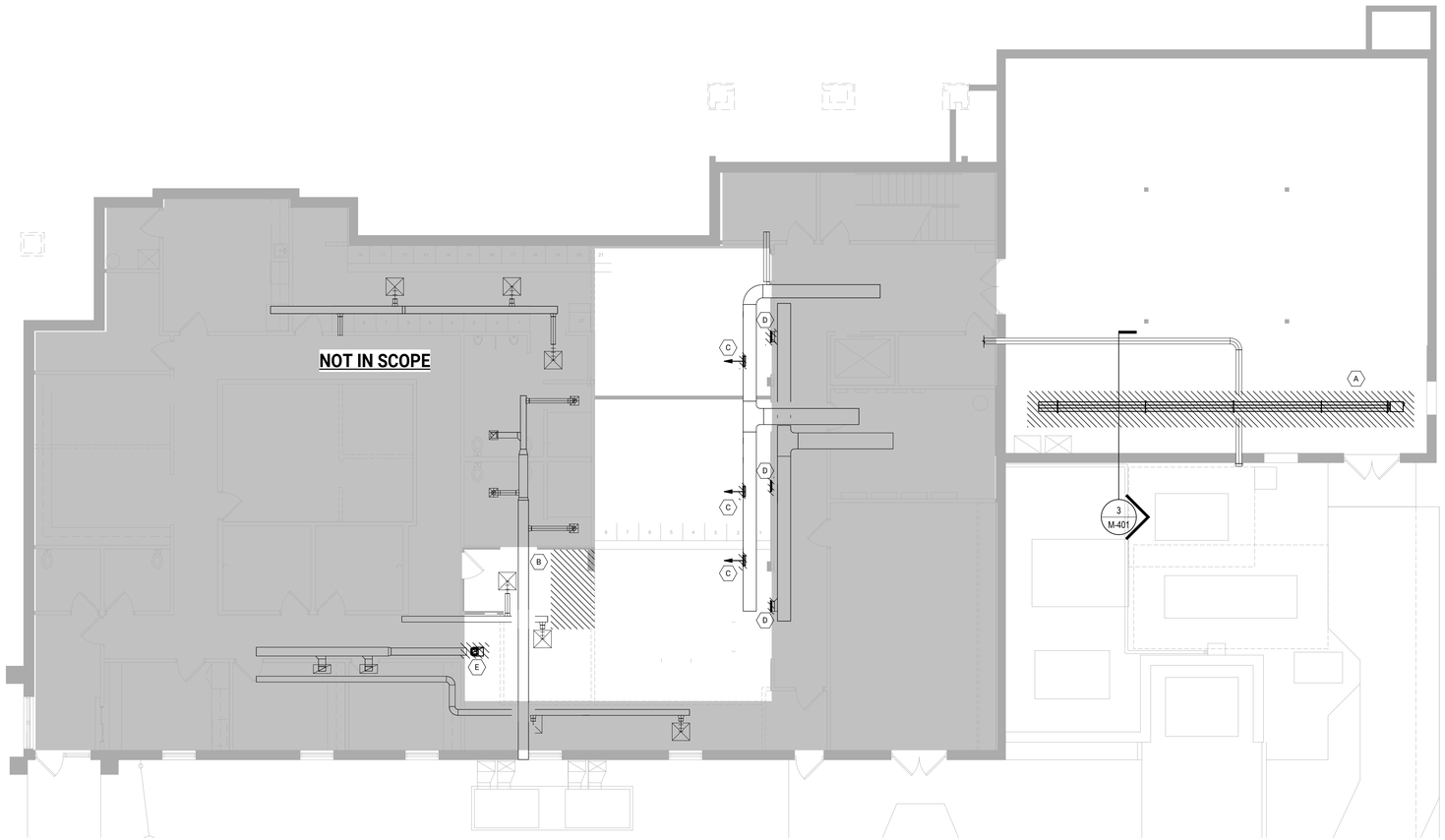
SECTION 23 31 13 - METAL DUCTS

1.01 DUCTWORK
A. GENERAL
1. ALL DUCTWORK SHALL BE CONSTRUCTED STRICTLY ACCORDING TO THE LATEST ASHRAE 90A, SMACNA, AND IMC STANDARDS. DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS; MAINTAIN SIZES INSIDE LINING FOR LINED DUCTS.
2. REFER TO DUCT APPLICATION SCHEDULES FOR MATERIALS, PRESSURE CLASS, SEAL CLASS, AND LOCATIONS.
3. DUCT PRESSURE DEFINITIONS:
A. LOW PRESSURE: UP TO 2 INCH WG AND VELOCITIES LESS THAN 1,500 FPM. CONSTRUCT FOR 2 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.
B. MEDIUM PRESSURE: GREATER THAN 2 INCH WG TO 6 INCH WG AND VELOCITIES GREATER THAN 1,500 FPM AND LESS THAN 2,500 FPM. CONSTRUCT FOR 6 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.
C. HIGH PRESSURE: GREATER THAN 6 INCH WG TO 12 INCH WG AND VELOCITIES GREATER THAN 2,500 FPM. CONSTRUCT FOR 12 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE.

2.01 SHEET METAL
A. MATERIALS
a. GALVANIZED STEEL CONFORMING TO ASTM STANDARDS ASTM A-653/ A 653M. GALVANIZED COATING DESIGNATION G-90 ALL BE G90 WITH FINISHES FOR EXPOSED SURFACES MILL PHOSPHATIZED. REINFORCEMENT SHALL BE CONSTRUCTED OF GALVANIZED STEEL.
b. CARBON-STEEL SHEETS CONFORMING WITH ASTM A 366/A 366A, WITH OILED, MATTE FINISH FOR EXPOSED DUCTWORK.
c. ALUMINUM SHEETS CONFORMING WITH ASTM B 209 (ASTM B 209M) ALLOY 3003, H14 TEMPER; WITH MILL FINISH FOR CONCEALED DUCTS, AND STANDARD, ONE-SIDE BRIGHT FINISH FOR DUCT SURFACES EXPOSED TO VIEW.
d. STAINLESS-STEEL SHEETS CONFORMING WITH ASTM A 480/A 480M, TYPE 304 OR 316, COLD ROLLED, ANNEALED, SHEET. EXPOSED SURFACE FINISH SHALL BE NO. 4.
e. PVC-COATED GALVANIZED STEEL CONFORMING WITH UL 181, CLASS 1 LISTING. LOCK-FORMING-QUALITY, GALVANIZED SHEET STEEL CONFORMING WITH ASTM A 653/A 653M AND HAVING G60 (Z180) COATING DESIGNATION. FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS THICK ON EXPOSED SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL THICK ON INTERIOR AND/OR EXTERIOR SURFACES.
B. DUCT THICKNESS SHALL CONFORM TO THE ABOVE STANDARDS. WHERE THERE IS A DISCREPANCY, THE GREATER THICKNESS SHALL APPLY. REINFORCEMENT, JOINT TYPE, SPACING AND THICKNESS MAY BE VARIED AT THE CONTRACTORS DISCRETION, IN CONFORMANCE WITH THE ABOVE STANDARDS, EXCEPT WHERE SPECIFICALLY NOTED. MINIMUM THICKNESS OF DUCTS SHALL BE 26-GAUGE SHEET METAL.
C. RECTANGULAR DUCTWORK
a. PROVIDE RECTANGULAR DUCTWORK AND HOUSINGS TO SIZES AS SHOWN ON DRAWINGS.
b. PROVIDE RADIUS ELBOWS, TURNS AND OFFSETS WITH A MINIMUM CENTERLINE RADIUS OF 1-1/2 TIMES THE DUCT WIDTH. WHERE SPACE DOES NOT PERMIT FULL RADIUS ELBOWS PROVIDE SHORT RADIUS ELBOWS WITH A MINIMUM OF TWO CONTINUOUS SPLITTER VANES. VANES SHALL BE THE ENTIRE LENGTH OF THE BEND. PROVIDE MITERED ELBOWS WHERE SPACE DOES NOT PERMIT RADIUS ELBOWS WHERE SHOWN ON THE DRAWINGS OR AT THE OPTION OF THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. MITERED ELBOWS LESS THAN 45 DEGREES SHALL NOT REQUIRE TURNING VANES. MITERED ELBOWS 45 DEGREES AND GREATER SHALL HAVE DOUBLE WALL AIRFOIL FORMED TYPE TURNING VANES OF SAME GAUGE AS DUCTWORK RIGIDLY FASTENED WITH GUIDE STRIPS IN DUCTWORK. VANES FOR MITERED ELBOWS SHALL BE PROVIDED IN ALL SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK.
D. ROUND AND FLAT-OVAL DUCTWORK
a. PROVIDE ROUND AND FLAT-OVAL DUCT TO SIZES AS SHOWN ON DRAWINGS.
b. LOW PRESSURE FITTINGS 24" IN DIAMETER AND LESS SHALL BE PREFABRICATED, SPOTWELDED AND INTERNALLY SEALED. CONTINUOUSLY WELD FITTINGS LARGER THAN 24" IN DIAMETER. FITTING GAUGE SHALL BE 22-GAUGE FOR 36" FITTINGS AND UNDER 20-GAUGE FOR LARGER SIZES. 90- DEGREE TEE'S SHALL BE CONICAL-TYPE. SEAL LONGITUDINAL AND TRANSVERSE DUCTWORK JOINTS AIR-TIGHT WITH HEAVY WATER BASED LIQUID SEALANT APPLIED ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PROVIDE GAUGE THICKNESS IN MEDIUM PRESSURE DUCTWORK AS RECOMMENDED BY SMACNA.
c. APPROVED MANUFACTURERS OF ROUND AND FLAT-OVAL SPIRAL LOCK-SEAM DUCTS ARE LINDAB INC., MCGILL AIRFLOW CORP, SEMCO INC, LAPINE METAL PRODUCTS, OR APPROVED EQUAL. ROUND AND FLAT-OVAL SPIRAL LOCK-SEAM SUPPLY AND RETURN DUCTS SHALL BE FABRICATED ACCORDING TO SMACNA STANDARDS BASED ON PRESSURE CLASS. MINIMUM THICKNESS OF DUCT SHALL BE 26 GAUGE SHEET METAL. ROUND AND FLAT-OVAL FITTINGS SHALL BE FACTORY FABRICATED WELDED DESIGN. DUCTS UP TO 20" INCHES IN DIAMETER SHALL HAVE CENTER-BEADED SLIP COUPLING, SEALED BEFORE AND AFTER FASTENING, ATTACHED WITH SHEET METAL SCREWS. DUCTS 21" TO 72" INCHES SHALL HAVE A THREE-PIECE GASKETED FLANGED JOINT CONSISTING OF TWO INTERNAL FLANGES WITH SEALANT AND ONE EXTERNAL CLOSURE BAND WITH GASKET. PREFABRICATED CONNECTION SYSTEM CONSISTING OF FLANGES AND GASKET ARE ACCEPTABLE. APPROVED MANUFACTURERS ARE DUCTMATE INDUSTRIES INC AND LINDAB. ELBOWS, TEES, AND BENDS SHALL HAVE A RADIUS NOT LESS THAN 1-1/2 TIMES THE WIDTH OF THE CENTERLINE. TRANSITIONS IN DUCT SIZE SHALL BE GRADUAL NOT EXCEEDING 15 DEGREES WHERE POSSIBLE. ROUND ELBOWS UP TO 14 INCHES SHALL BE PLEATED AND GORED FOR 16" AND ABOVE. ALL FLAT OVAL ELBOWS SHALL BE GORED. 90 DEGREE TEES, LATERALS, AND CONICAL TEES SHALL BE FABRICATED TO SMACNA.
d. ROUND DUCTWORK EXPOSED TO THE PUBLIC SHALL BE GALVANIZED STEEL, SPIRAL WOUND, MAINTAINING AN ALL CLEAN, SHINY APPEARANCE, AND NOT UTILIZING SEALING MATERIAL. CONCEALED ROUND DUCTWORK MAY SPIRAL WOUND, OR SNAP LOCK TYPE GALVANIZED STEEL DUCTWORK.
E. SEAL DUCTWORK WITH HEAVY LIQUID WATER BASED SEALANT - SEALANTS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS: MILL FINISH ALUMINUM SUBSTRATE WITH GRAY ADHESIVES, MINIMUM 30 MIL THICK, MINIMUM 17 LB/IN PEEL STRENGTH, MAX SMOKE DEVELOPED OF 50 WHEN TESTED IN ACCORDANCE WITH ASTM G-53, VOC CONTENT OF 250 g/L OR LESS, PRESSURE CLASS UP TO 10" W.C. - HARDCAST FLEXGRIP 550, UNITED MCGILL DUCT SEALER, MON-ECO INDUSTRIES ECO DUCT SEAL 44-50 OR EQUIVALENT, OR APPROVED EQUAL APPLIED ACCORDING TO SEALANT MANUFACTURER'S INSTRUCTIONS.
F. LOCATION: SHEET METAL MAY BE USED THROUGHOUT THE PROJECT.
G. SUPPORTS
a. SUPPORT HORIZONTAL RUNS OF DUCT ON CENTERS NOT TO EXCEED 8'-0". DO NOT SUPPORT CEILING GRID, CONDUITS, PIPES, EQUIPMENT, ETC. FROM DUCTWORK. COORDINATE ROUTING OF DUCTWORK WITH OTHER CONTRACTORS SUCH THAT PIPING, ELECTRICAL CONDUIT, AND ASSOCIATED SUPPORTS ARE NOT ROUTED THROUGH THE DUCTWORK.

SECTION 23 33 00 - DUCT ACCESSORIES

2.01 BALANCING DAMPERS
A. APPROVED MANUFACTURES: GREENHECK, KRUEGER, NAILOR, RUSKIN, OR APPROVED EQUAL.
B. WHERE SHOWN ON DRAWINGS AND WHEREVER NECESSARY FOR CO



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M-014
MECHANICAL DEMOLITION PLAN
1/8" = 1'-0"

GENERAL MECHANICAL DEMOLITION NOTES

1. ALL DEMOLITION SHALL BE IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE AND ALL LOCAL ORDINANCES.
2. DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION, THE GENERAL CONTRACTOR SHALL MAINTAIN INTEGRITY TO THE STRUCTURE TO BE DEMOLISHED AND ADJACENT AREAS TO REMAIN WITH INTERIOR OR EXTERIOR SHORING, BRACING, OR SUPPORT TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF STRUCTURE. EXISTING STRUCTURE TO REMAIN SHALL BE SAFED OFF AND PROTECTED FROM ELEMENTS AT ALL TIMES.
3. WHERE THE EXISTING WORK IS TO BE CUT, UNDERPINNED, AND/OR SHORED, CONTRACTOR SHALL PROVIDE ALL SHORING, NEEDLING, BRACING, WEDGING, AND DRY PACKING, AND BE RESPONSIBLE FOR THE SAFETY OF THE STRUCTURE DURING THESE OPERATIONS.
4. AREA OF WORK SHALL BE KEPT CLEAN AT ALL TIMES.
5. ANY MATERIALS DEEMED AS HAZARDOUS, SUCH AS BUT NOT LIMITED TO ASBESTOS OR LEAD PAINTS SHALL BE REMOVED AS REQUIRED BY FEDERAL, STATE, OR LOCAL CODES. CONTRACTOR SHALL UTILIZE THE APPROPRIATE TECHNIQUES, PROCEDURES, AND DISPOSAL METHODS AS PER STANDARD PRACTICE AND ALL FEDERAL, STATE, AND LOCAL CODES.
6. CONTRACTOR SHALL REMOVE ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, HANGERS, AND CONTROLS NOT SCHEDULED TO BE REUSED, BACK TO THE EXISTING CURB. CURBS NOT SCHEDULED TO BE REUSED OR ADAPTED FOR NEW UNITS SHALL BE CAPPED AND INSULATED FOR A WEATHERTIGHT SEAL. DO NOT ABANDON. SEAL ALL PENETRATIONS THROUGH WALLS, AND FLOORS AT REMOVED MECHANICAL COMPONENTS.
7. CONTRACTOR SHALL REMOVE ALL PLUMBING FIXTURES, DRAINS, PIPING SYSTEMS, ETC. NOT SCHEDULED FOR REUSE BACK TO NEAREST ACTIVE LINE SCHEDULED FOR REUSE. CAP AND SEAL LINES AT ACTIVE LINES WITH SAME MATERIALS. DO NOT ABANDON COMPONENT IN PLACE. SEAL ALL PENETRATIONS THROUGH WALLS AND FLOORS AT REMOVED PLUMBING SYSTEM COMPONENTS.
8. EXISTING CONCRETE FLOOR SLAB SHALL BE LEVELED, BROOM CLEAN WITH NO REMAINING ADHESIVE RESIDUES, AND SEALED.
9. REMOVAL OF ALL DEMOLITION AND CONSTRUCTION DEBRIS SHALL BE COORDINATED BETWEEN THE GENERAL CONTRACTOR AND THE LANDLORD AND SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES.
10. IN AREA WHERE ELECTRICAL OR MECHANICAL SYSTEMS CONFLICT OR ALTERATIONS TO AN EXISTING SYSTEM IS REQUIRED BY THE GENERAL CONTRACT; NOTIFY AND COORDINATE ALL TRADES SO THAT THE PROPER ARRANGEMENTS AND SCHEDULING CAN BE MADE FOR INSTALLATION, CUTTING, REMOVING, TERMINATING, AND PATCHING OF SURROUNDING SYSTEMS AND MATERIALS CAN BE PROPERLY COMPLETED.
11. CONTRACTOR SHALL FAMILIARIZE WITH EXISTING BUILDING CONDITIONS AND OBSERVE THE SITE, STRUCTURE, AND PHYSICAL SPACE LIMITATIONS AND CHALLENGES TO COMPLETE WORK DESCRIBED ON DOCUMENTS.
12. ANY DEPARTURES FROM DESIGN INTENT ON DOCUMENTS, CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

DEMOLITION NOTES

- A DEMOLISH GAS INFRARED TUBE HEATER, HANGERS AND SUPPORTS COMPLETE. CAP GAS PIPE FOR FUTURE CONNECTION.
- B DEMOLISH LAVATORY. FIELD VERIFY VENT LOCATION AND PREPARE FOR FUTURE CONNECTION.
- C DEMOLISH AND CAP GRILLE ON DUCT.
- D DEMOLISH EXISTING RETURN GRILLE. PREPARE FOR FUTURE CONNECTION.
- E REMOVE, CLEAN AND PREPARE GRILLE FOR INSTALLATION AT LOCATION SHOWN ON M-401.

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PROJECT
OXFORD TOWNSHIP HALL RENOVATION

30 DUNLAP RD
OXFORD, MI 48371

DATE ISSUED	ISSUED FOR

DRAWN	ZB
CHECKED	KBS
APPROVED	KBS

NOT FOR CONSTRUCTION

SHEET
MECHANICAL DEMOLITION PLAN

FILE NUMBER
2023–0078

SHEET NUMBER
M–014

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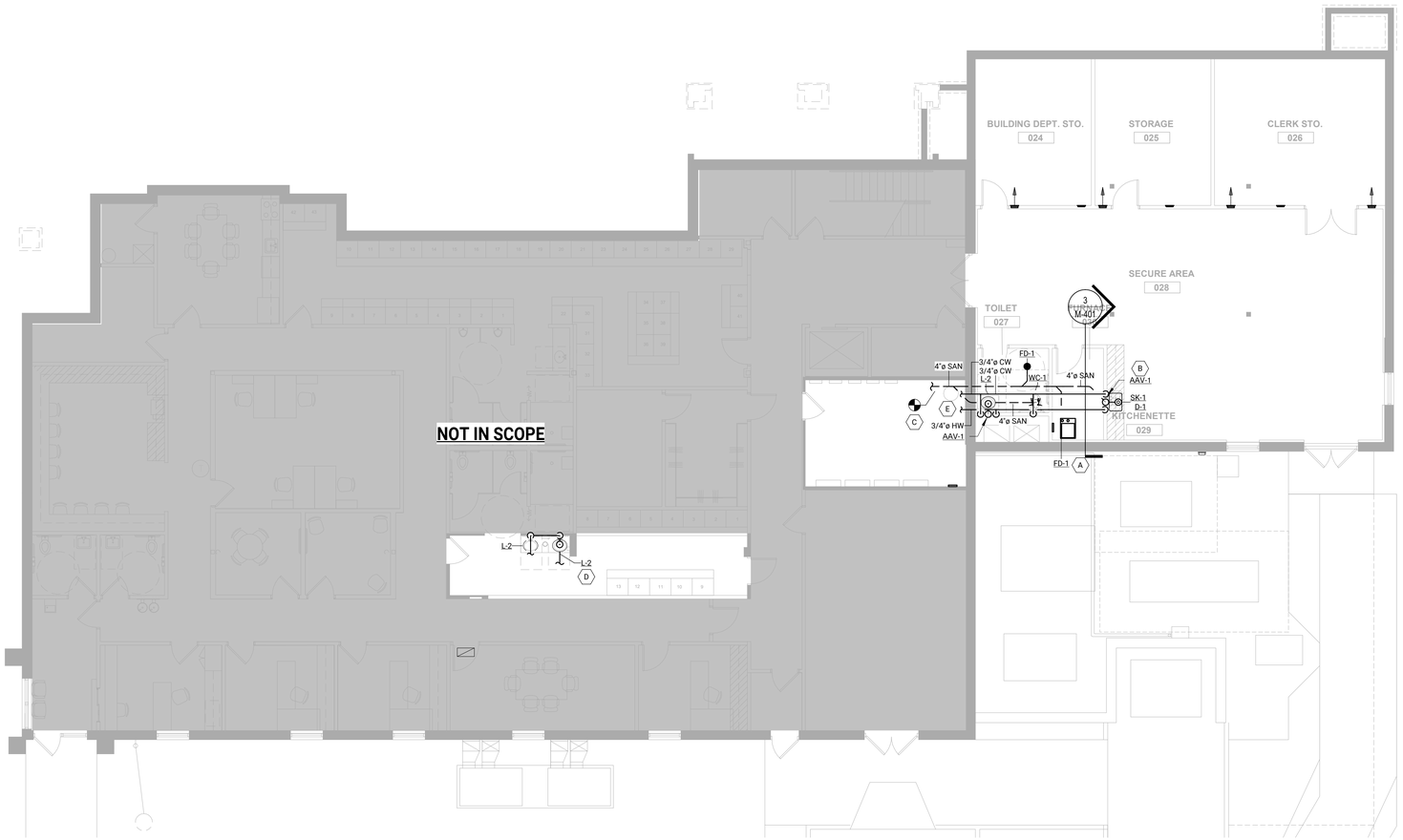

1 PLUMBING PLAN
M-211 1/8" = 1'-0"

PLUMBING GENERAL NOTES

1. THESE DRAWINGS ARE INTENDED TO BE DIAGRAMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM INCLUDING THE STRUCTURE, SHEET METAL, CONDUITS, CABLE TRAY, AND LIGHT FIXTURES.
2. PROVIDE ALL NECESSARY CLEARANCES AROUND MECHANICAL AND ELECTRICAL EQUIPMENT, DEVICES, VALVES, AND ANY COMPONENT REQUIRING MAINTENANCE PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3. COORDINATE ROUTING OF PIPING AND SHEET METAL WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL TRADES TO AVOID INTERFERENCES. PROVIDE ADDITIONAL FITTINGS AND ELBOWS NECESSARY TO AVOID CONFLICTS.
4. ALL SANITARY PIPING BELOW SLAB SHALL BE A MINIMUM OF 4"Ø UNLESS NOTED OR AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
5. ALL SANITARY AND STORM PIPING 2 AND SMALLER SHALL BE SLOPED AT A MINIMUM 1/4" PER FOOT, AND ALL SANITARY AND STORM PIPING 3 AND LARGER SHALL BE SLOPED AT A MINIMUM OF 1/8" PER FOOT, UNLESS OTHERWISE NOTED OR AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
6. INSTALL PIPING SUCH THAT ALL VALVES, STRAINERS, TRAPS, FLANGES, UNIONS, AND PIPE ACCESSORIES ARE ACCESSIBLE.
7. SLEEVE AND FIRE STOP ALL PENETRATION OF RATED WALLS, FLOORS, CEILINGS, ETC. IN ACCORDANCE WITH APPLICABLE UL STANDARDS AND LISTINGS AND LOCAL CODES TO MAINTAIN RATINGS. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLIES.
8. INSTALL WATER HAMMER ARRESTORS, BACKFLOW PREVENTERS, THERMOSTATIC MIXING VALVES, AND TRAP PRIMERS AS REQUIRED BY CODE IN THE DOMESTIC WATER SYSTEM.
9. ALL EQUIPMENT AND FIXTURES SHALL BE INSTALLED COMPLETE INCLUDING ISOLATION VALVES, ANGLE SUPPLIES, STOPS, SUPPORT HARDWARE, P-TRAPS, OFFSETS, MIXING VALVES, ETC.
10. ALL PIPING LOCATED WITHIN RETURN AIR PLENUM SHALL BE PLENUM RATED OR FIRE WRAPPED AS NEEDED. COORDINATE PLENUM LOCATIONS WITH MECHANICAL TRADES.
11. ALL ADA FIXTURES, WHERE DESIGNATED BY THE ARCHITECT SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE "BARRIER-FREE" DESIGN REQUIREMENTS OF THE APPLICABLE LOCAL CODE.
12. CONTRACTOR SHALL VIDEO CAMERA AND SCOPE ALL SANITARY AND STORM PIPING TO CONFIRM INTEGRITY AND IS FREE OF OBSTRUCTIONS AND DEFECTS TO ENSURE PROPER FLOW.

PLUMBING CONSTRUCTION NOTES

- A ROUTE 3/4" CONDENSATE FROM THE FURNACE AND TERMINATE IN FLOOR DRAIN
- B PROVIDE AND INSTALL AIR ADMITANCE VALVE WITH RECESSED BOX AND GRILLE.
- C EXTEND AND CONNECT 4" SANITARY PIPE TO EXISTING SANITARY PIPE.
- D CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING SANITARY PIPE AND EXTEND AND CONNECT 4" SANITARY PIPE. CONTRACTOR TO EXTENED AND CONNECT 1-1/2" VENT PIPE TO EXISTING VENT EXTEND AND CONNECT 1/2" CW AND 1/2" HW PIPE IN AREA TO LAVATORIES.
- E EXTEND AND CONNECT 3/4" CW AND HW PIPE TO EXISTING GAS WATER HEATER.

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PROJECT
OXFORD TOWNSHIP HALL RENOVATION

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OXFORD, MI 48371

DATE ISSUED ISSUED FOR

DRAWN Author
CHECKED Checker
APPROVED Approver

SHEET
FIRST FLOOR SANITARY AND VENT PLAN

FILE NUMBER
2023-0078

SHEET NUMBER
M-211

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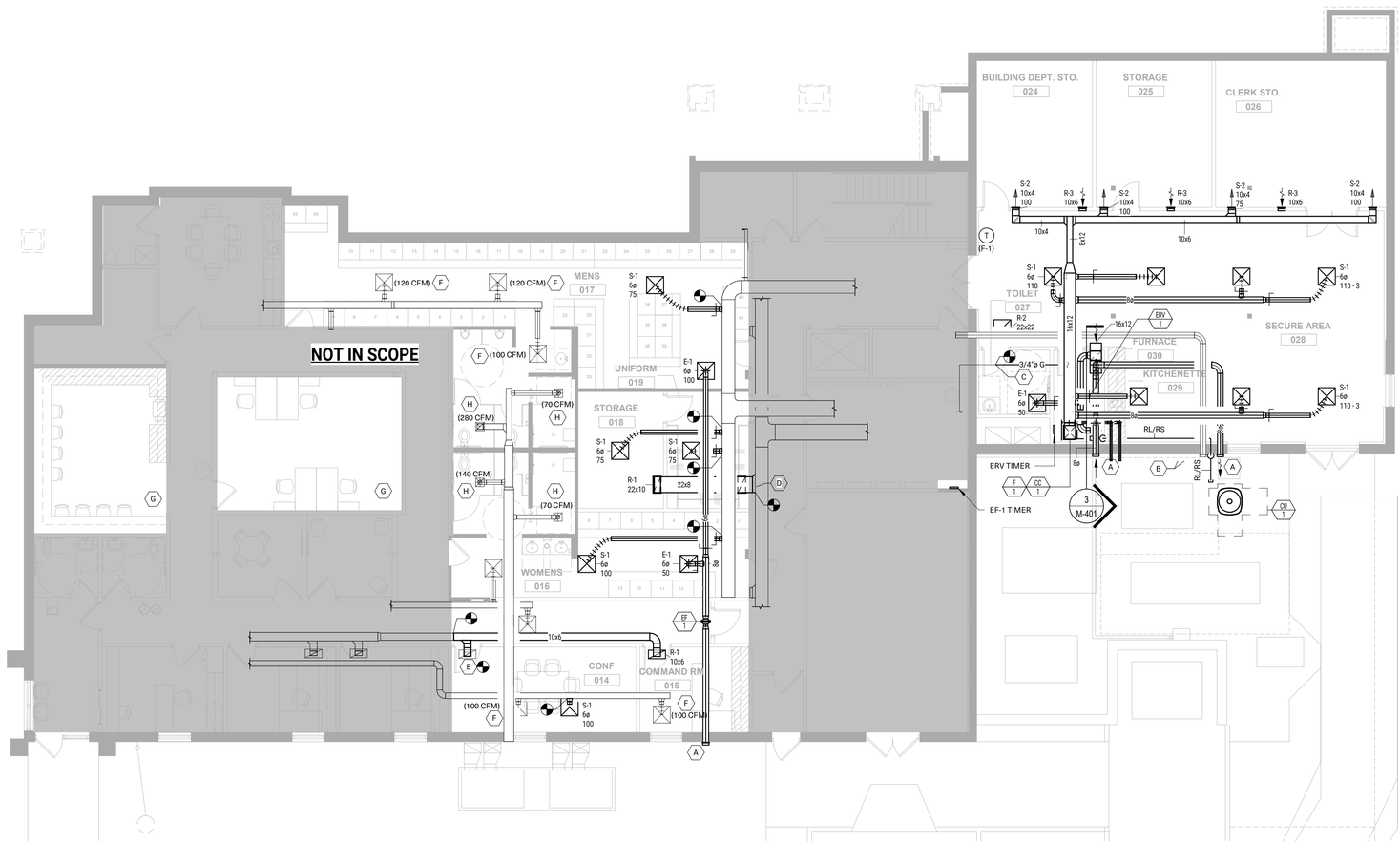
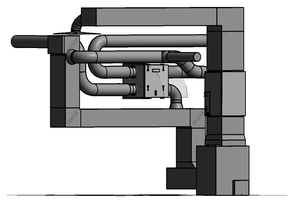
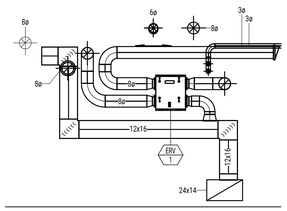


N 1 M-401 MECHANICAL NEW WORK PLAN
1/8" = 1'-0"



N 2 M-401 MECHANICAL ROOM ISOMETRIC



N 3 M-401 MECHANICAL ROOM SECTION
1/4" = 1'-0"

MECHANICAL - GENERAL NOTES

1 THESE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC AND ARE NOT TO BE CONSIDERED FABRICATION OR SHOP DRAWINGS. COORDINATE PIPING AND DUCTWORK AMONGST OTHER TRADES AS REQUIRED
2 PROVIDE ALL NECESSARY CLEARANCES AROUND MECHANICAL AND ELECTRICAL EQUIPMENT, DEVICES, VALVES, AND ANY COMPONENT REQUIRING MAINTENANCE PER MANUFACTURER RECOMMENDATIONS AND CODE REQUIREMENTS.
3 COORDINATE ROUTING OF PIPING AND SHEET METAL WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL TRADES TO AVOID INTERFERENCES. PROVIDE ADDITIONAL FITTINGS, OFFSETS, AND ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR OTHER FIELD CONDITIONS AND ARE NECESSARY TO AVOID CONFLICTS.
4 MOUNT THERMOSTATS 48" ABOVE FINISH FLOOR UNLESS NOTED OTHERWISE.
5 PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.
6 PROVIDE ACCESS DOORS IN HARD CEILINGS FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.
7 DUCTWORK AND PIPING SHALL NOT BE LOCATED OVER ANY ELECTRICAL EQUIPMENT OR PANELS. PROVIDE REQUIRED N.E.C. CLEARANCE IN FRONT AND ABOVE ELECTRICAL EQUIPMENT.
8 CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL FOR THE PROPER INSTALLATION AND SUPPORT OF MECHANICAL SYSTEMS.
9 CONTRACTOR SHALL VERIFY THERE ARE NO COMBUSTIBLES IN ANY RETURN AIR PLENUM. IF COMBUSTIBLES ARE PRESENT CONTRACTOR SHALL COORDINATE WITH ARCHITECT/ENGINEER FOR COURSE OF ACTION. DUCTED RETURN SYSTEM OR ELIMINATE COMBUSTIBLES WITH FIREPROOF, WRAP, OR BY OTHER MEANS.
10 ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURE RECOMMENDATIONS AND REQUIREMENTS.
11 MECHANICAL AIR HANDLING EQUIPMENT SHALL HAVE DUCT DETECTOR IN RETURN AND/OR SUPPLY DUCT. SMOKE DETECTION WILL SHUT OFF HVAC UNIT UPON ACTIVATION. THE ACTIVATION OF THE SMOKE DETECTOR SHALL ACTIVATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION OR TIE INTO FIRE ALARM PANEL IF ONE EXISTS. SMOKE DETECTION DEVICES THAT ARE NOT VISIBLE SHALL BE PROVIDED WITH A REMOTE INDICATION DEVICE PER CODE.

MECHANICAL CONSTRUCTION NOTES

A PROVIDE A GREENHECK WC-8 WALL CAP WITH INSECT SCREEN AND BACKDRAFT DAMPER.
B ROUTE 2" FURNACE INTAKE AND FLUE THRU WALL AND TERMINATE PER MANUFACTURES REQUIREMENTS.
C EXTEND AND CONNECT 3/4" GAS PIPE PREVIOUSLY SERVING THE GAS TUBE HEATER (125 CFH) TO NEW FURNACE (70 CFH).
D CONTRACTOR TO FIELD VERIFY RETURN DUCT. IF PLENUM RETURN, CONTRACTOR TO STUB 22x8 DUCT INTO PLENUM. IF DUCTED RETURN, CONTRACTOR TO CONNECT 22x8 RETURN DUCT TO EXISTING RETURN DUCT LOCATED IN HALLWAY AS SHOWN ON PLANS.
E MOVE EXISTING RETURN GRILLE TO LOCATION SHOWN.
F BALANCE EXISTING DIFFUSER TO CFM INDICATED.
G RELOCATE DIFFUSERS AND ASSOCIATED DUCTWORK AS REQUIRED.
H EXISTING CEILING EXHAUST FAN. CFM SHOWN FOR REFERENCE ONLY.

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SHEET
FIRST FLOOR MECHANICAL PLAN

FILE NUMBER
2023-0078

SHEET NUMBER
M-401

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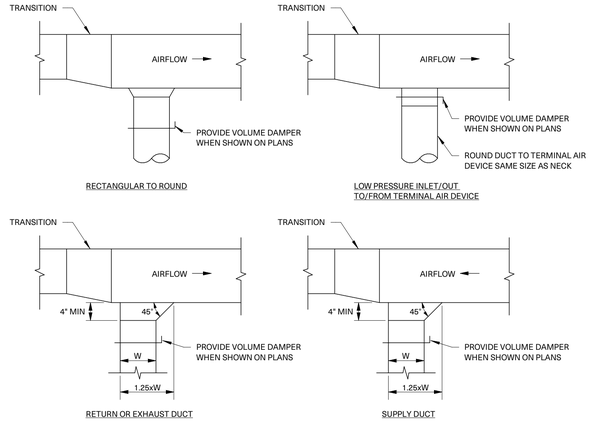
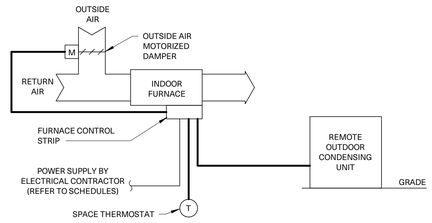


RECTANGULAR BRANCH DUCT DETAILS

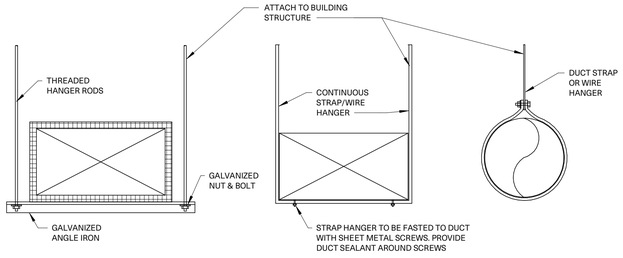
NO SCALE



SPLIT SYSTEM FURNACE AND AIR CONDITIONER FIELD WIRING & CONTROL

NOTES:
1. TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE COMPONENTS AND WIRING INDICATED WITH HEAVY LINE WEIGHT. COORDINATE WITH PURCHASED MANUFACTURE FOR EXACT WIRING REQUIREMENTS.
2. CONTRACTOR SHALL PROVIDE FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE REMOTE CONDENSER. REFER TO MECH FLOOR PLANS FOR LOCATION OF UNITS.
3. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.

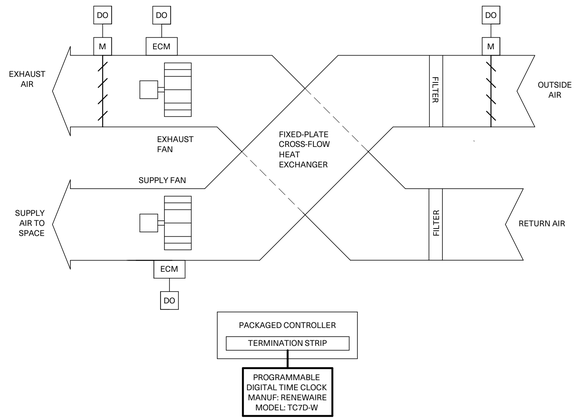
SEQUENCE OF OPERATION:
1. SUPPLY FAN OPERATION SHALL BE BASED ON MAIN THERMOSTAT TIME SCHEDULE AND RUN CONTINUOUSLY IN "AUTO" MODE.
2. GAS FURNACE SHALL CYCLE UPON CALL FOR HEATING AND DELIVER HEATED AIR UNTIL SPACE TEMPERATURE IS SATISFIED. WHEN SPACE TEMEPRATURE IS SATISFIED, GAS FURNACE SHALL SHUTOFF.
3. OUTDOOR CONDENSING UNIT SHALL BE ENERGIZED UPON CALL FOR COOLING. THE SYSTEM SHALL DELIVER COOL AIR UNTIL THE SPACE TEMPERATURE IS SATISFIED. WHEN SPACE TEMPERATURE IS SATISFIED, OUTDOOR CONDENSING UNIT SHALL TURN OFF.
4. WHEN SPACE IS OCCUPIED AND SUPPLY FAN IS ENERGIZED, THE OUTSIDE AIR DAMPER SHALL OPEN. WHEN THE SPACE IS UNOCCUPIED AND SUPPLY FAN IS OFF, THE OUTSIDE AIR DAMPER SHALL BE CLOSED.



NOTES:
1. ALL HANGER STRAPS AND HANGER RODS SHALL BE FIRMLY SUPPORTED FROM THE STRUCTURAL STEEL.
2. REFER TO LOW PRESSURE DUCTWORK JOINT AND SUPPORT SCHEDULE FOR HANGER AND SUPPORT GAUGES, SPACING, STRAP SIZES, ETC.

DUCT SUPPORT DETAIL

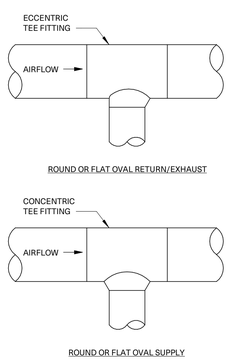
NO SCALE



ERV CONTROL & FIELD WIRING

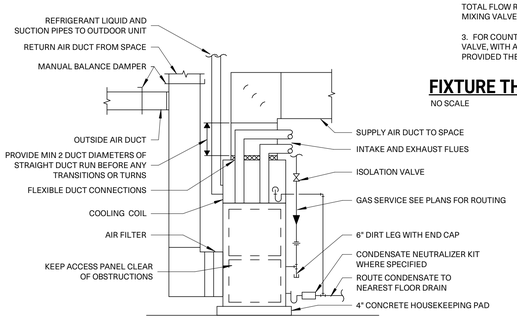
GENERAL NOTES:
1. TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE COMPONENTS AND WIRING INDICATED WITH HEAVY LINE WEIGHT. COORDINATE WITH PURCHASED MANUFACTURE FOR EXACT WIRING REQUIREMENTS.
2. ERV SHALL INCLUDE PACKAGED CONTROLS. THE PACKAGED ERV CONTROLS SHALL AT A MINIMUM MEET ALL REQUIREMENTS LISTED IN THE SEQUENCE OF OPERATION.
3. ERV CONTROLLER SHALL BE FACTORY PROGRAMMED, MOUNTED AND TESTED. CONTROLLER SHALL HAVE A LCD READOUT FOR CHANGING SET POINTS AND MONITORING UNIT OPERATION.
4. REFER TO FLOOR PLANS FOR QUANTITIES AND LOCATIONS OF DEVICES.

ERV SEQUENCE OF OPERATION:
1. ERV SHALL HAVE START/STOP CAPABILITY FROM THE PROGRAMMABLE DIGITAL TIME CLOCK.
2. ERV TO OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE AND UNOCCUPIED CYCLE MODE.
3. WHEN THE ERV IS ACTIVATED FOR OCCUPIED MODE, CONTROLS SHALL ACTIVATE THE SUPPLY AND EXHAUST FANS.
4. DURING UNOCCUPIED MODE, THE SUPPLY AND EXHAUST FAN SHALL REMAIN OFF.



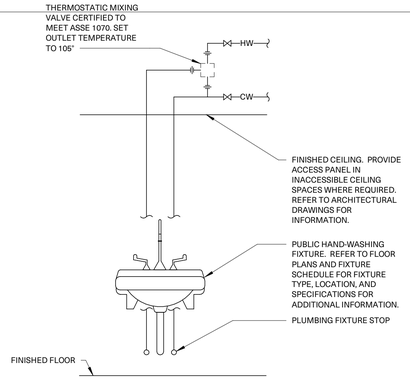
ROUND BRANCH DUCT DETAILS

NO SCALE



HIGH EFFICIENCY GAS FURNACE AND COOLING COIL DIAGRAM AND INSTALLATION DETAIL

NO SCALE



GENERAL NOTES:
1. THIS PIPING ARRANGEMENT IS FOR A SINGLE HAND-WASHING FIXTURE WITH MIXING VALVE ABOVE CEILING.

2. FOR A SINGLE MIXING VALVE TO SERVE MULTIPLE HAND-WASHING FIXTURES, REFER TO FLOOR PLANS FOR PIPING SIZING AND ARRANGEMENT. MIXING VALVE SHALL BE SIZED AND RATED FOR THE TOTAL FLOW RATE REQUIRED BY THE NUMBER OF FIXTURES CONNECTED TO THAT PARTICULAR MIXING VALVE.

3. FOR COUNTERTOP FIXTURES WITH CASEWORK BELOW, IT IS ACCEPTABLE TO LOCATE THE MIXING VALVE, WITH ASSOCIATED UNIONS AND SHUT-OFF VALVES, IN THE CASEWORK BELOW FIXTURE, PROVIDED THE OWNER AND AUTHORITIES HAVING JURISDICTION ALLOW THIS LOCATION.

FIXTURE THERMOSTATIC MIXING VALVE PIPING SCHEMATIC

NO SCALE

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT ID	FACE SIZE IN.	NECK SIZE IN.	MOUNTING STYLE	CONSTRUCTION	OPTIONS/ ACCESSORIES	FINISH	MANUFACTURER	MODEL NUMBER	NOTES
E-1	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	PDDR	
R-1	24x12	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	PDDR	
R-2	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	PDDR	
R-3	NECK + 1-3/4"	SEE PLANS	SURFACE	STEEL	--	ARCH TO SELECT	PRICE	530	
S-1	24x24	SEE PLANS	LAY-IN	STEEL	--	ARCH TO SELECT	PRICE	SPD	
S-2	NECK + 1-3/4"	SEE PLANS	SURFACE	STEEL	--	ARCH TO SELECT	PRICE	520	

FAN SCHEDULE

UNIT ID	UNIT TAG	AREA/ SYSTEM SERVED	AIRFLOW CFM	EXTERNAL STATIC PRESSURE IN.WG.	RPM	TYPE	DRIVE TYPE	MOTOR WATTS	MOTOR RPM	ELECTRICAL VOLTAGE	ELECTRICAL PHASE	CONTROL TYPE	MANUFACTURER	MODEL NUMBER	NOTES
EF	1	LOCKER ROOM	150	0.50	1877	INLINE	DIRECT	74	1877	120	1	ECM	FANTECH	FG 6M EC	PROVIDE TIMER

CODE MINIMUM SYSTEM VENTILATION RESULTS

AIR HANDLING SYSTEM	SYSTEM VENTILATION EFFICIENCY, Ev	MAX AIRFLOW, CFM	MAX OUTSIDE AIRFLOW, CFM	MAX OUTSIDE AIRFLOW FRACTION, %	MIN AIRFLOW, CFM	MIN OUTSIDE AIRFLOW, CFM	MIN OUTSIDE AIRFLOW FRACTION, %	OCCUPANT DIVERSITY	SYSTEM PRIMARY AIRFLOW, Vps	SYSTEM UNCORRECTED OUTDOOR AIRFLOW, Vou	AVERAGE OUTDOOR AIR FRACTION, Xs	OUTDOOR AIR INTAKE AIRFLOW (MULTI-ZONE), Vot	OUTDOOR AIR INTAKE AIRFLOW (100% OA), Vot
F-1	0.82	1190	248	21	1190	248	21	100	1190	202	0.17	248	253

CODE MINIMUM VENTILATION SCHEDULE

ROOM NO.	ROOM NAME	AREA SQ.FT.	MINIMUM ZONE PRIMARY AIR AT FULL OCCUPANCY Voz	OCCUPANT DENSITY PEOPLE/1000 sq/ft	PEOPLE OA RATE CFM/PERSON Rp	TOTAL PEOPLE Pz	AREA OA RATE CFM/sq/ft Ra	AIR DISTRIBUTION EFFECTIVENESS Ez	BREATHING ZONE OUTDOOR AIRFLOW Voz	OUTSIDE AIR FRACTION AT MINIMUM SA Zpz	ZONE OUTDOOR AIRFLOW Voz	SYSTEM
024	BUILDING DEPT. STO.	229 SF	100	0	0.0	0	0.12	0.8	28	0.35	35	F-1
025	STORAGE	233 SF	100	0	0.0	0	0.12	0.8	28	0.35	35	F-1
026	CLERK STO.	339 SF	150	0	0.0	0	0.12	0.8	41	0.35	52	F-1
027	TOILET	63 SF	0	0	0.0	0	0.00	0.8	0	0.00	0	F-1
028	SECURE AREA	1043 SF	750	5	5.0	6	0.06	0.8	102	0.17	128	F-1
029	KITCHENETTE	74 SF	75	0	0.0	0	0.00	0.8	0	0.00	0	F-1
030	FURNACE	64 SF	65	0	0.0	0	0.06	0.8	4	0.08	5	F-1

ENERGY RECOVERY UNIT SCHEDULE - PRE-CONDITIONER

UNIT ID	UNIT TAG	AREA/ SYSTEM SERVED	SUPPLY FAN AIRFLOW CFM	SUPPLY FAN MINIMUM OUTSIDE AIRFLOW CFM	SUPPLY FAN ESP IN.WG.	SUPPLY FAN FILTER TYPE	SUPPLY FAN CONFIGURATION	EXHAUST FAN AIRFLOW CFM	EXHAUST FAN ESP IN.WG.	EXHAUST FAN FILTER TYPE	ENERGY RECOVERY WHEEL SUMMER PERFORMANCE OAT DB/WB °F	SUMMER PERFORMANCE EAT DB/WB °F	SUMMER PERFORMANCE RAT DB/WB °F	WINTER PERFORMANCE OAT DB °F	WINTER PERFORMANCE EAT DB °F	WINTER PERFORMANCE RAT DB °F	DIMENSIONS, INCHES LENGTH	DIMENSIONS, INCHES WIDTH	DIMENSIONS, INCHES HEIGHT	WEIGHT LBS.	ELECTRICAL VOLTAGE	ELECTRICAL PHASE	ELECTRICAL MCA	ELECTRICAL MOP	MANUFACTURER	MODEL NUMBER	NOTES
ERV	1	SECURE STORAGE	250	250	0.6	1" MERV 8 PLEATED	VERTICAL	250	0.6	1" MERV 8 PLEATED	90/73	80/63	70/60	0	47	70	2'-0"	2'-0"	1'-10"	55	120	1	10	10	RENEWAIRE	EV PREMIUM L	PROVIDE TIMER AND BACKDRAFT DAMPERS FOR INTAKE AND OUTLET.

GAS FIRED FURNACE SCHEDULE

UNIT ID	UNIT TAG	AREA/ SYSTEM SERVED	FAN AIRFLOW CFM	FAN ESP IN.WG.	MINIMUM OUTSIDE AIRFLOW CFM	MINIMUM SEER	HEATING INPUT CAPACITY MBH	HEATING OUTPUT CAPACITY MBH	HEATING EAT DB °F	HEATING LAT DB °F	DIMENSIONS, IN. LENGTH	DIMENSIONS, IN. WIDTH	DIMENSIONS, IN. HEIGHT	WEIGHT LBS.	ELECTRICAL VOLTAGE	ELECTRICAL PHASE	ELECTRICAL FLA	ELECTRICAL MOP	MANUFACTURER	MODEL NUMBER	NOTES
F	1	SECURE STORAGE	1200	1	250	14	60	58	60	100	2'-6"	1'-6"	2'-11"	140	115	1	11	15	CARRIER	59TP6B060V17--14	PROVIDE THERMOSTAT AND VENT KIT

CONDENSING UNIT SCHEDULE (OUTDOOR)

UNIT ID	UNIT TAG	AREA/ SYSTEM SERVED	PERFORMANCE AIR AIRFLOW CFM	PERFORMANCE AIR AMBIENT AIR DB	PERFORMANCE NOMINAL SIZE TONS	PERFORMANCE REFRIGERANT TYPE	PERFORMANCE MINIMUM SEER	SOUND POWER LEVEL dB	DIMENSIONS, INCHES LENGTH	DIMENSIONS, INCHES WIDTH	DIMENSIONS, INCHES HEIGHT	WEIGHT LBS.	ELECTRICAL VOLTAGE	ELECTRICAL PHASE	ELECTRICAL MCA	ELECTRICAL MOP	MANUFACTURER	MODEL NUMBER	NOTES
CU	1	OFFICE	1200	95	3	R-410a	13.4	75	2'-8"	2'-8"	2'-2"	150	208/220	1	17	25	CARRIER	24SCA436N003	PROVIDE REFRIGERANT LINESET AND CONDENSER PAD

PLUMBING FIXTURE SCHEDULE - FLOOR DRAINS/ FLOOR SINKS/ TRENCH DRAINS

UNIT ID	CONNECTION SIZE IN INCHES CW	HW	SAN	VENT	DESCRIPTION	BODY MATERIAL	TOP SHAPE	CONNECTION MATERIAL	OUTLET FITTING	COATING	ACCESSORIES	MANUFACTURER/ MODEL NUMBER	NOTES
FD-1	-	-	3	-	ROUND ADJUSTABLE FLOOR DRAIN WITH NICKEL BRONZE STRAINER	PVC	ROUND	PVC	SOLVENT	NO	-	ZURN EZ-PV3	PROVIDE A BARRIER TRAP PROTECTION DEVICE IN ACCORDANCE WITH ASSE 1072.

PLUMBING FIXTURE SCHEDULE - WATER CLOSET/ URINAL

UNIT ID	CONNECTION SIZE IN INCHES CW	HW	SAN	VENT	WATER CLOSET/ URINAL MATERIAL	COLOR	MOUNTING	BOWL TYPE	INSTALLED RIM HEIGHT IN.	SUPPLY LOCATION	MANUFACTURER/ MODEL NUMBER	FLUSH VALVE FLOW RATE GPF	FLUSH VALVE DESCRIPTION	FLUSH VALVE MANUFACTURER/ MODEL NUMBER	TOILET SEAT MANUFACTURER/ MODEL NUMBER	NOTES
WC-1	3/4	-	3	2	VITREOUS CHINA	WHITE	FLOOR	ELONGATED	17"	BACK LEFT	ZURN 75551-K	1.6	MANUAL	ZURN 75551-K	PROFLO PFTSCOF A2000WH	

PLUMBING FIXTURE SCHEDULE - LAVATORY/ SINK

UNIT ID	CONNECTION SIZE IN INCHES CW	HW	SAN	VENT	LAVATORY/ SINK FIXTURE MATERIAL	MOUNTING	COLOR	NUMBER OF BOWLS	BOWL DIMENSIONS L"xW"xD"	OVERALL DIMENSIONS L"xW"xD"	MANUFACTURER/ MODEL NUMBER	FLOW RATE GPM	FAUCET DESCRIPTION	FAUCET MANUFACTURER/ MODEL NUMBER	NOTES
SK-1	1/2	1/2	1 1/2	1 1/2	STAINLESS STEEL	UNDERMOUNT	--	1	21" x 15-3/4" x 4-3/8"	23-1/2" x 18-1/4" x 5-7/8"	ELKAY ELUHAD211545PD	1.5	POLISHED CHROME SINGLE HOLE MOUNT GOOSENECK WITH SPRAY FAUCET, SWIVEL AND PULL DOWN SPRAY	ELKAY LKAV3031	DRAIN SHALL BE ELKAY PERFECT DRAIN LK99 CHROME PLATED BRASS BODY STRAINER AND TAILPIECE. P-TRAP ASSEMBLY SHALL BE CAST BRASS WITH CLEANOUT, WATER STOPS. PROVIDE PROFLO INSULATION KIT FOR WASTE AND SUPPLY ASSEMBLIES.
L-1	1/2	1/2	1 1/2	1 1/2	VITREOUS CHINA	WALL	WHITE	1	16-1/2"x10-1/4"x6-3/8"	20"x18"	ZURN Z5344	0.5	POLISHED CHROME BATTERY SENSOR FAUCET	ZURN Z6915-XL	DRAIN SHALL BE PROFLO FLAT PERFORATED GRID STRAINER WITH ADA COMPLIANT 1-1/4" OFFSET TAILPIECE. P-TRAP ASSEMBLY SHALL BE CAST BRASS CHROME PROFLO 1-1/2" WITH CLEAN OUT. PROVIDE PROFLO ADA COMPLIANT INSULATION KIT FOR WASTE AND SUPPLY ASSEMBLIES.

DX COOLING COIL SCHEDULE

UNIT ID	UNIT TAG	AREA/ SYSTEM SERVED	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	AIR AIRFLOW CFM	AIR EAT DB °F	AIR EAT WB °F	AIR LAT DB °F	AIR LAT WB °F	AIR MAXIMUM AIR PRESSURE DROP IN.WC.	REFRIGERANT TYPE	MANUFACTURER	MODEL NUMBER	NOTES
CC	1	F-1	34	24	1200	80	67	61	59	0.25	R-410a	CARRIER	CVPVP3617AMC	

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LIGHTING SYMBOL LEGEND

(NOT ALL SYMBOLS USED)

XXX	LIGHT FIXTURE TYPE, REFER TO LIGHT FIXTURE SCHEDULE
	SURFACE OR PENDANT LIGHT FIXTURE, CHEVRON INDICATED WALL WASH AIMING, SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	RECESSED LIGHT FIXTURE, CHEVRON INDICATED WALL WASH AIMING, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	SURFACE OR PENDANT LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	RECESSED LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	RECESSED ARCHITECTURAL LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE, HALF-SHADING INDICATES EMERGENCY EGRESS LIGHT FIXTURE
	EXIT SIGN, PROVIDE ARROWS/CHEVRONS AS INDICATED ON PLANS, SHADED AREA INDICATES FACE, FOOT ON SYMBOL INDICATES WALL MOUNTED, LIGHT HEADS INDICATE COMBINATION EXIT/BATTERY POWERED EMERGENCY LIGHTING UNIT
	BATTERY POWERED EMERGENCY LIGHTING UNIT, LIGHT HEADS ON SIDES OF UNIT INDICATES CEILING MOUNTED
$Xa	SINGLE POLE SWITCH - 20A, 125/277V UON, -'a' INDICATES WHICH FIXTURES/DEVICES ARE CONTROLLED VIA SWITCH -'X' DENOTES TYPE: BLANK - SINGLE POLE 2 - DOUBLE POLE 3 - THREE WAY 4 - FOUR WAY D - DIMMER K - KEY OPERATED I - ILLUMINATED (ILLUMINATED IN 'OFF' POSITION) P - WITH PILOT LIGHT (LIGHT ON IN 'ON' POSITION) T - TIME SWITCH L - LOW VOLTAGE C - MOMENTARY CONTACT O - WALL BOX OCCUPANCY SENSOR - PASSIVE INFRARED V - WALL BOX VACANCY SENSOR - PASSIVE INFRARED
OS Xa VS Xa OS Xa VS Xa	OCCUPANCY/VACANCY SENSOR, FOOT ON SYMBOL INDICATES WALL MOUNTED, -'a' INDICATES WHICH FIXTURES ARE CONTROLLED VIA SENSOR -'X' DENOTES TYPE: A - 180° DUAL TECHNOLOGY OCCUPANCY SENSOR B - 360° DUAL TECHNOLOGY OCCUPANCY SENSOR C - 180° PASSIVE INFRARED OCCUPANCY SENSOR D - 360° ULTRASONIC OCCUPANCY SENSOR

ONE-LINE DIAGRAM SYMBOL LEGEND

(NOT ALL SYMBOLS USED)

	TERMINAL		DELTA
	TERMINATOR		WYE - SOLIDLY GROUNDED
	STRESS CONE CABLE TERMINATION		GROUND
	STAB	G	ENGINE GENERATOR
	STATIONARY CIRCUIT BREAKER	ST	SHUNT TRIP
	DRAWOUT CIRCUIT BREAKER	A	AMMETER
	STATIONARY SWITCH	M	UTILITY METER
	FUSE	V	VOLT METER
	MOTOR STARTER WITH OVERLOAD	EMU	ELECTRONIC MONITORING UNIT
	THERMAL OVERLOAD RELAY	PM	POWER MONITORING UNIT
	NORMALLY OPEN CONTACTS	K	KEYED INTERLOCK
	NORMALLY CLOSED CONTACTS	SPD	SURGE PROTECTION DEVICE
	GROUND	MH	MANHOLE
	LIGHTNING ARRESTOR	HH	HANDHOLE
	CURRENT TRANSFORMER	XXXX	TRANSFORMER
	POTENTIAL TRANSFORMER	XX-XX	PANELBOARD, 'XX-XX' INDICATES PANELBOARD DESIGNATION
	TRANSFER SWITCH		

NOTE:
1. REFER TO POWER SYMBOLS SCHEDULE FOR MORE SYMBOL DESCRIPTIONS THAT MAY BE SHOWN ON THE ONE LINE DIAGRAM.

DATA SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
W	TELEPHONE OUTLET, FLUSH MOUNTED, MH=5'-0" AFF UNO
#	TELEPHONE AND DATA OUTLET, FLUSH MOUNTED, # = QUANTITY OF CABLES, MH=1'-4" AFF UNO
TV	CABLE TELEVISION OUTLET, FLUSH MOUNTED, MH=7'-0" AFF UNO
WAP	WIRELESS ACCESS POINT, CEILING MOUNTED

ELECTRICAL DEMOLITION LEGEND

TAG	SYMBOLOGY	DESCRIPTION
(EX)		EXISTING DEVICE TO REMAIN.
(ED)		EXISTING DEVICE TO BE DEMOLISHED.
(ER)		EXISTING DEVICE TO BE RELOCATED.
(EL)		EXISTING DEVICE SHOWN IN NEW LOCATION TO BE REINSTALLED.
(EN)		EXISTING DEVICE TO BE REPLACED WITH NEW DEVICE IN SAME LOCATION.

POWER SYMBOL LEGEND

(NOT ALL SYMBOLS USED)

	SIMPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	DUPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	DUPLEX RECEPTACLE - NEMA 5-20R, GROUND FAULT INTERRUPTING, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	DUPLEX RECEPTACLE - NEMA 5-20R, TAMPER RESISTANT, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	SPLIT-WIRED DUPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	COMBINATION DUPLEX RECEPTACLE (NEMA 5-20R)/USB (TYPE A, 2.0), TWO CHARGING USB PORTS, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER
	QUADPLEX RECEPTACLE - NEMA 5-20R, HORIZONTAL LINE INDICATES MOUNTED AFC UON, SHADING INDICATES CIRCUITED TO GENERATOR/UPS POWER (ALL OTHER NEMA 5-20R QUAD RECEPTACLE SYMBOLS FOLLOW SAME STACKED DUPLEX PATTERN)
	SPECIAL RECEPTACLE -'X' DENOTES TYPE: A - (NEMA L5-30R) 125V, 30A, SINGLE PHASE, TWIST-LOCK RECEPTACLE 2 POLE, 3 WIRE B - (NEMA L6-20R) 250V, 20A, SINGLE PHASE, TWIST-LOCK RECEPTACLE 2 POLE, 3 WIRE C - (NEMA L6-30R) 250V, 30A, SINGLE PHASE, TWIST-LOCK RECEPTACLE, 2 POLE, 3 WIRE D - (NEMA L15-20R) 250V, 20A, THREE PHASE, TWIST-LOCK RECEPTACLE 3 POLE, 4 WIRE E - (NEMA L15-30R) 250V, 30A, THREE PHASE, TWIST-LOCK RECEPTACLE, 3 POLE, 4 WIRE F - (NEMA L21-30R) 208Y/120V, 30A, THREE PHASE, TWIST-LOCK RECEPTACLE 4 POLE, 5 WIRE G - (NEMA 14-30R) 125/ 250V SINGLE PHASE RECEPTACLE 3 POLE, 4 WIRE H - (NEMA 14-50R) 125/ 250V SINGLE PHASE RECEPTACLE 3 POLE, 4 WIRE
J J J	JUNCTION BOX, LEG INDICATES WALL/EQUIPMENT MOUNTING IS REQUIRED, SQUARE INDICATES FLOOR MOUNTED
SM	MANUAL MOTOR STARTER/DISCONNECT SWITCH WITH THERMAL OVERLOAD PROTECTION
	ENCLOSED DISCONNECT SWITCH, SHADING INDICATES SWITCH IS FUSIBLE
	SWITCHBOARD SECTION. SOLID FILL INDICATES 480V LINE TO LINE, NO FILL INDICATES 208V OR 240V LINE TO LINE. DASHED LINE INDICATES NEC WORKING SPACE.
	SURFACE MOUNTED PANELBOARD. SOLID FILL INDICATES 480V LINE TO LINE, NO FILL INDICATES 208V OR 240V LINE TO LINE. INSTALL DOOR HINGE ON THE SIDE SHOWN ON SYMBOL. DASHED LINE INDICATES NEC WORKING SPACE. HALF-TONE LINE INDICATES WALL.
	FLUSH/RECESSED MOUNTED PANELBOARD. SOLID FILL INDICATES 480V LINE TO LINE, NO FILL INDICATES 208V OR 240V LINE TO LINE. INSTALL DOOR HINGE ON THE SIDE SHOWN ON SYMBOL. DASHED LINE INDICATES NEC WORKING SPACE. HALF-TONE LINE INDICATES WALL.
RP1	PANEL TAG, i.e. CIRCUITS WITHIN AREA WHERE TAG IS LOCATED ON PLAN ARE CIRCUITED TO PANEL 'RP1' UON
WSHP-2 MECH	MECHANICAL EQUIPMENT CONNECTION TAG. DESIGNATION ON TOP INDICATES EQUIPMENT IDENTIFIER AND DESIGNATION ON BOTTOM INDICATES ASSOCIATED EQUIPMENT CONNECTION SCHEDULE AS FOLLOWS: MECH = MECHANICAL, KTCH = KITCHEN, PUMP = PUMP, HEAT = HEATER, FAN = FAN. REFER TO ELECTRICAL SCHEDULES SHEETS FOR ADDITIONAL INFORMATION.

FIRE ALARM SYMBOL SCHEDULE

(NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
FAP	FIRE ALARM PANEL, MH=6'-0" AFF TO TOP OF PANEL UNO
FAPS	FIRE ALARM POWER SUPPLY, MH=6'-0" AFF TO TOP OF PANEL UNO
FAA	FIRE ALARM ANNUNCIATOR, MH=5'-0" AFF TO TOP OF PANEL UNO
F	FIRE ALARM MANUAL STATION, MH=4'-0" AFF UNO
2	FIRE ALARM SMOKE DETECTOR, CEILING MOUNTED
2	FIRE ALARM ADDRESSABLE DUCT TYPE SMOKE DETECTOR, MOUNTED ON DUCT
	FIRE ALARM SPEAKER/HORN WITH STROBE, MH=6'-8" AFF UNO
	FIRE ALARM SPEAKER/HORN WITH STROBE, CEILING MOUNTED
	FIRE ALARM STROBE, MH=6'-8" AFF UNO
	FIRE ALARM STROBE, CEILING MOUNTED
	MAGNETIC DOOR HOLDER, MH=6'-6" AFF UNO
FS	FIRE SUPPRESSION WATER FLOW/PRESSURE SWITCH, INSTALLED BY FSC WIRED BY FAC
TS	FIRE SUPPRESSION TAMPER/TROUBLE/SUPERVISORY SWITCH, INSTALLED BY FSC WIRED BY FAC

ELECTRICAL GENERAL NOTES

1. PRIOR TO BID, THE CONTRACTOR SHALL VISIT SITE TO SURVEY EXISTING CONDITIONS AFFECTING WORK. INCLUDE NECESSARY MATERIALS AND LABOR TO ACCOMPLISH THE ELECTRICAL WORK, INCLUDING RELOCATION OF EXISTING EQUIPMENT TO ALLOW FOR NEW CONSTRUCTION. ANY CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER AND RESOLVED PRIOR TO BID. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES.
2. THESE DRAWINGS ARE A PART OF A COMPLETE SET OF ARCHITECTURAL/ENGINEERING DRAWINGS. DRAWINGS SHOWING ELECTRICAL WORK ARE DIAGRAMATIC.
REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR GUIDANCE AND COORDINATION WITH DIMENSIONS, CEILINGS, DOOR SWINGS, ELEVATIONS, CASEWORK, FINISHES, STRUCTURAL CONCRETE, FRAMING, DUCTWORK, AND PIPING.
3. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH THE NEC AND LOCAL ORDINANCES INCLUDING ALL REQUIREMENTS OF APPLICABLE CODES. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS.
4. PROVIDE EXPANSION JOINT FITTINGS ON ALL CONDUITS THAT CROSS EXPANSION JOINTS OR CONDUITS THAT PENETRATE WALLS WITH SEISMIC BRACING. SEE ARCHITECTURAL DRAWINGS.
5. VERIFY LOCATION OF ALL FLOOR OUTLETS WITH ARCHITECT PRIOR TO ROUGH-IN.
6. ALL WALL OUTLETS NOT PROVIDED WITH A DEVICE BY THIS CONTRACTOR SHALL BE PROVIDED WITH BLANK WALL PLATES.
7. MULTI-WIRE BRANCH CIRCUITS ARE PROHIBITED UNLESS SPECIFICALLY NOTED OTHERWISE.
8. TYPE "ENT" ELECTRICAL NON-METALLIC TUBING SHALL NOT USED.
9. PROVIDE ACCESS PANELS IN GYPBOARD CEILINGS WHERE ACCESS TO JUNCTION BOXES IS REQUIRED.
10. PROVIDE A MINIMUM OF (1) 3/4"C. WITH PULLSTRING AND NYLON END BUSHING STUBBED TO ABOVE ACCESSIBLE CEILING FOR ALL WALL MOUNTED AUXILIARY DEVICE, JUNCTION BOXES INCLUDING, BUT NOT LIMITED TO CARD READERS, PUSH PLATES, ETC, UON.
11. VERIFY ALL DOOR SWINGS W/ ARCHITECT PRIOR TO ROUGH-IN OF WALL MOUNTED LIGHTING CONTROLS, ACCESS CONTROLS, DOOR OPERATORS, ETC.
12. PROVIDE ADDITIONAL STEEL SUPPORTS FOR MOTOR CONTROLLERS, FIXTURES, RACEWAYS, CABINETS, BOXES, AND THE LIKE WHRE THE BUILDING, EQUIPMENT, OR STRUCTURE IS NOT SUITABLE FOR MOUNTING DIRECTLY THEREON.
13. ELECTRICAL WORK EMBEDDED IN CONCRETE OR OTHERWISE PERMANENTLY CONCEALED SHALL NOT BE COVERED UNTIL INSPECTED BY THE OWNER'S REPRESENATIVE.
14. ALL PENETRATIONS THROUGH FIRE RESISTANT WALLS AND OTHER SUCH RATED ASSEMBLIES SHALL BE FIRESTOPPED TO MAINTAIN ITS RATING.
15. DIVISION 22 AND 23 EQUIPMENT CIRCUITING, DISCONNECT, AND OVERCURRENT PROTECTION CHARACTERISTICS ARE BASED ON THE BASIS OF DESIGN EQUIPMENT SPECIFICATION. CONTRACTOR SHALL BEAR ALL COSTS OF ELECTRICAL CHANGES RESULTING FROM PROVIDING EQUIPMENT FROM AN ALTERNATE MANUFACTURER.

ELECTRICAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL REMOVE THE EXISTING ELECTRICAL WORK NECESSARY TO PROVIDE THE INTENDED ARRANGEMENT OF WALLS AND CELINGS, AND SHALL RECONNECT ALL CIRCUITS INTERRUPTED BY THIS DEMOLITION WHERE THOSE CIRCUITS ARE UTILIZED BEYOND THE DEMOLITION, WHETHER SUCH CIRCUITS ARE INDICATED OR NOT.
2. WHERE AN ELECTRICAL DEVICE THAT IS TO BE REMOVED IS AN "END OF LINE" OR A SINGLE DEVICE, THE CONDUCTORS SHALL BE DISCONNECTED AT THE NEXT UPSTREAM DEVICE TO REMAIN OR AT ITS RELATED PANELBOARD. ALL NON-FUNCTIONAL CONDUCTORS INCLUDING POWER AND TELECOMMUNICATION CABLES SHALL BE REMOVED.
3. DEMOLITION: ACCURACY OF ORIGINAL PLANS HAS NOT BEEN VERIFIED. THE CONTRACTORS SHALL MAINTAIN CIRCUIT CONTINUITY OF ALL EXISTING FIXTURES AND DEVICES THAT ARE TO REMAIN.
4. EXISTING CIRCUITS, IF INDICATED, ARE DIAGRAMMATIC ONLY. VERIFY EXACT CONDUIT LOCATION AND ROUTING OF EXISTING CONDUIT RUNS AND NUMBER OF CONDUCTORS. AND PROVIDE ADDITIONAL CONDUITS / CONDUCTORS AS NECESSARY TO ACCOMPLISH THE DESIGN INTENT.
5. CIRCUIT BREAKERS ADDED TO THE EXISTING PANELBOARDS SHALL MATCH THE EXISTING BREAKER TYPE, MANUFACTURER, AND AIC RATING. PROVIDE NEW TYPE WRITTEN, UPDATED DIRECTORIES IN THE EXISTING PANELBOARDS TO REFLECT CHANGES MADE BY THIS RENOVATION.
6. ALL ADDITIONS TO SYSTEMS SHALL MATCH THE MANUFACTURER'S EXISTING SYSTEMS PRESENTLY INSTALLED IN THE FACILITY UNLESS OTHERWISE NOTED.
7. EXISTING SYSTEMS SHALL REMAIN UNLESS NOTED FOR REMOVAL OR RELOCATION. ALL SYSTEMS SHALL BE CHECKED TO ENSURE THEY ARE IN PROPER WORKING ORDER BEFORE ANY DEMOLITION IS STARTED. SYSTEMS NOT FOUND TO BE IN SATISFACTORY WORKING CONDITION SHALL BE REPORTED TO THE OWNER IN WRITING PRIOR TO THE START OF ANY DEMOLITION WORK. ALL SYSTEMS SHALL BE CHECKED TO ENSURE THAT THEY ARE WORKING PROPERLY AFTER THE DEMOLITION WORK IS FINISHED AND AFTER THE NEW ELECTRICAL INSTALLATION IS COMPLETE.
8. DEMOLITION, WHERE INDICATED ON PLAN, IS BASED ON EXISTING DRAWINGS AND LIMITED FIELD INVESTIGATION OF EXISTING CONDITIONS. SELECT DEMOLITION MAY BE REQUIRED FOR NEW CONSTRUCTION AND MAY NOT BE DELINEATED ON THIS DRAWING. CAREFULLY COORDINATE DEMOLITION WITH NEW CONSTRUCTION PLANS OF ALL DISCIPLINES TO VERIFY ACTUAL EXTENT OF DEMOLITION. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND FULLY UNDERSTAND THE EXTENT OF DEMOLITION WORK.
9. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
10. QUANTITY AND LOCATION OF EXISTING DEVICES SHOWN ON PLANS ARE APPROXIMATE. FIELD VERIFY DEVICES AND LOCATIONS.
11. ITEMS SHOWN HEAVY LINE WEIGHT DASHED LINES, HATCHED AND/OR NOTED SHALL BE DEMOLISHED AND ALL ASSOCIATED DEVICES, CONDUIT, AND WIRING SHALL BE REMOVED BACK TO THE NEAREST ACTIVE JUNCTION BOX OR SOURCE UNLESS NOTED OTHERWISE. SEE DEMOLITION LEGEND FOR ADDITIONAL INFORMATION.
12. ALL EXISTING EQUIPMENT MAY NOT BE INDICATED. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO BIDDING. EXISTING ITEMS NOT SHOWN HATCHED SHALL REMAIN IN OPERATION. REVISE THE EXISTING CIRCUITRY TO MAINTAIN OPERATION OF ITEMS TO REMAIN.
13. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES, AND EQUIPMENT THAT ARE OUTSIDE AREA OF RENOVATION. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
14. RECYCLE OR DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL ASSOCIATED COSTS IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING LEED REQUIREMENTS, TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
15. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE" AND PLACE IN THE "OFF" POSITION.
16. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
17. OFFER OWNERS REPRESENTATIVE FIRST RIGHT OF REFUSAL OF ALL EQUIPMENT REMOVED FROM SPACE.
18. PROVIDE CODE-COMPLIANT SUPPORT TO EXISTING-TO-REMAIN UNSUPPORTED CONDUITS AND BOXES WHERE CEILINGS ARE TO BE REMOVED. RE-ROUTE BRANCH CIRCUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.

ELECTRICAL ABBREVIATIONS

ABBREVIATION	DESCRIPTION
(ED)	EXISTING TO BE DEMOLISHED
(EL)	EXISTING DEVICE SHOWN IN NEW LOCATION TO BE REINSTALLED
(EN)	EXISTING TO BE REPLACED WITH NEW.
(ER)	EXISTING TO BE RELOCATED
(EX)	EXISTING TO rEMAIN
AFC, AC	ABOVE FINISHED CABINET/COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CM	COFFEE MAKER
CT	CURRENT TRANSFORMER
CU	COPPER
DW	DISHWASHER
EG	EQUIPMENT GROUND
EM	EMERGENCY
FLA	FULL LOAD AMPS
FWE	FURNISHED WITH EQUIPMENT
G, GND	GROUND
GD	GARBAGE DISPOSAL
GFI, GFCI	GROUND FAULT INTERRUPTER
H	HORIZONTAL, HORIZONTALLY MOUNTED
KVA	KILOVOLT-AMPERES
LTS	LIGHTS
MCA	MAXIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT - FIXTURE CONTROLLED AT BRANCH CIRCUIT BREAKER ONLY
NTS	NOT TO SCALE
OC	ON CENTER
P	POLE
PH	PHASE
RECEPT, RCPT	RECEPTACLE
REF	REFRIGERATOR
SWBD	SWITCHBOARD
TYP	TYPICAL
UNO,UON	UNLESS NOTED OTHERWISE
W	WATTS, WIRE
WP	WEATHERPROOF WHILE IN USE COVER

ELECTRICAL INDEX OF DRAWINGS

NOT FOR CONSTRUCTION

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PROJECT
OXFORD TOWNSHIP HALL RENOVATION

30 DUNLAP RD
OXFORD, MI 48371

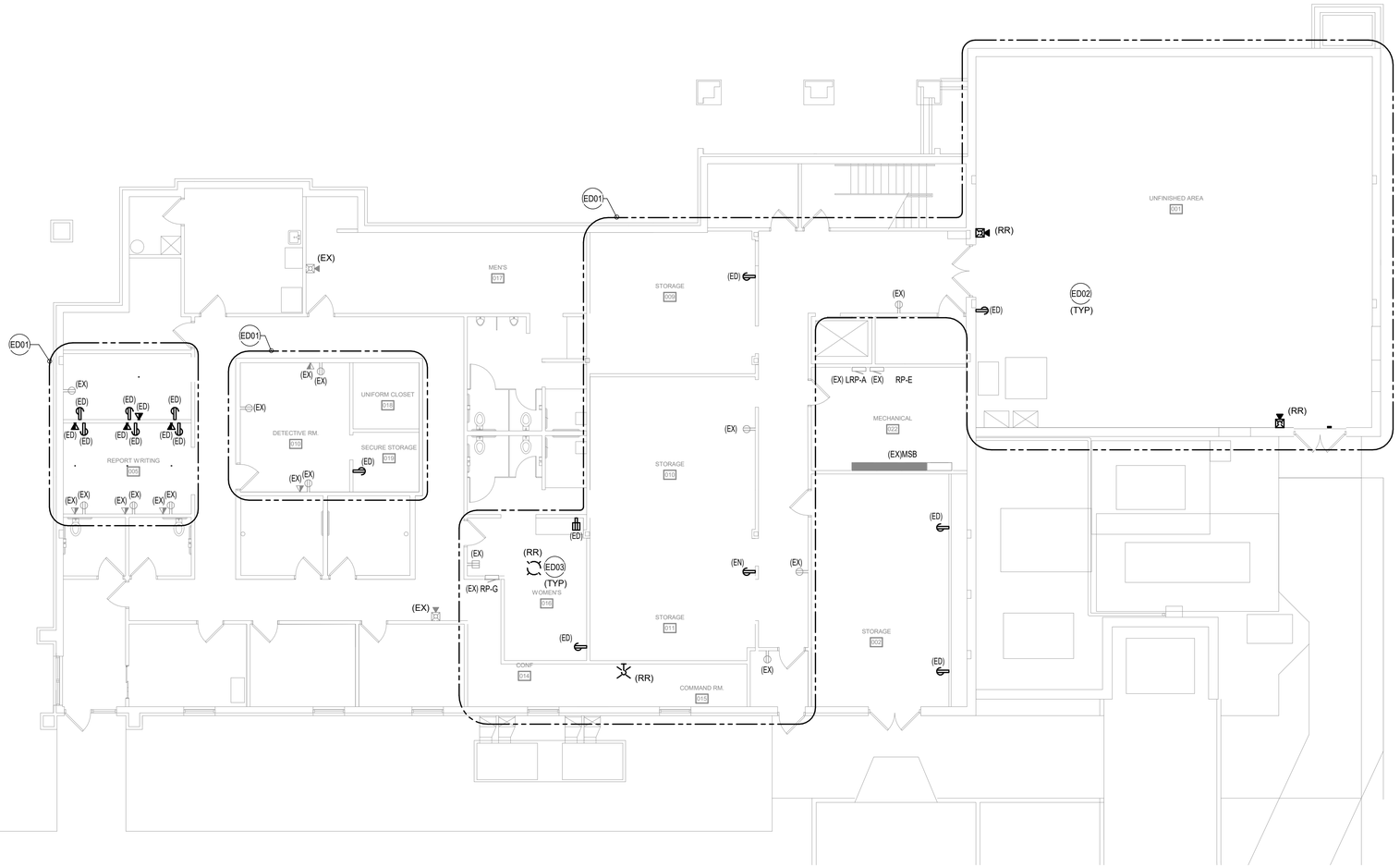
DATE ISSUED	ISSUED FOR
	-

DRAWN JLB
CHECKED JLB

SHEET
ELECTRICAL SYMBOLS, & NOTES

FILE NUMBER
2023-0078

SHEET NUMBER
E.000



1 FIRST FLOOR PLAN OVERALL - DEMOLITION
ED.100 1/8" = 1'-0"

PLAN NOTES

ED01 REMOVE EXISTING LIGHT FIXTURES AND LIGHTING CONTROLS IN THIS AREA. EXISTING LIGHTING CIRCUITS TO REMAIN TO SERVE NEW LIGHTING VIA NEW CONTROLS. REUSE OF EXISTING LIGHTING CONTROLS JUNCTION BOXES WHERE PRACTICAL IS ACCEPTABLE.

ED02 REMOVE CONDUIT, WIRING, AND ASSOCIATED ELECTRICAL ITEMS FROM MECHANICAL EQUIPMENT IN SPACE BEING DEMOLISHED. REMOVE CONDUIT AND WIRING BACK TO SOURCE.

ED03 REMOVE AND RELOCATED '(ER)' EXISTING FIRE ALARM NOTIFICIATION APPLIANCE. TEST DEVICE FOR FUNCTIONALITY. REPAIR OR REPLACE WHERE DAMAGED. REFER TO POWER PLAN FOR NEW DEVICE LOCAITON.

GENERAL NOTES - LIGHTING

A. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES UNLESS NOTED OTHERWISE.

B. REFER TO THE LUMINAIRE SCHEDULE LOCATED ON THE ELECTRICAL GENERAL INFORMATION DRAWING.

C. ELECTRICAL DEVICES INDICATED ON THIS PLAN SHALL BE NEW UNLESS NOTED OTHERWISE.

D. LIGHT SWITCHES SHALL BE GROUPED UNDER ONE COMMON FACEPLATE WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION.

E. EXISTING LIGHTING INDICATED TO REMAIN SHALL BE RELAMPED AND CLEANED. REPAIR EXISTING FIXTURES THAT ARE MALFUNCTIONING WHERE FEASIBLE. OTHERWISE REPLACE WITH NEW. REVISE CIRCUITING AS INDICATED.

F. SINGLE PHASE 20A LIGHTING BRANCH CIRCUIT WIRING ASSOCIATED WITH NEW LIGHTING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

G. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

H. REUSE OF EXISTING LEFT IN PLACE BRANCH CIRCUIT CONDUIT ASSOCIATED WITH THE LIGHTING FIXTURES REMOVED DURING DEMOLITION IS ACCEPTABLE TO REFEED NEW LIGHTING FIXTURES UNLESS NOTED OTHERWISE. REWORK THE EXISTING CIRCUIT TO PROVIDE LIGHTING CONTROL AS INDICATED ON THIS DRAWING, UNLESS NOTED OTHERWISE. PROVIDE NEW WIRING BACK TO SOURCE OR NEAREST UPSTREAM TO REMAIN DEVICE.

I. EXISTING LIGHTING INDICATED AS TO REMAIN AND LOCATED IN AREAS WHERE THE CEILING IS BEING MODIFIED SHALL BE TEMPORARILY SUPPORTED AND REINSTALLED UPON COMPLETION OF CEILING REVISIONS. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS AND ARCHITECTURAL TRADE.

J. NIGHT LIGHT AND EXIT SIGNS SHALL BE UNCONTROLLED AND CONNECTED AHEAD OF THE LOCAL LIGHTING CONTROLS.

K. CONDUITS INSTALLED IN FINISHED AREAS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

L. EXIT SIGN FIXTURES ARE TYPE 'X1' UNLESS NOTED OTHERWISE.

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DATE ISSUED ISSUED FOR

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SHEET
LOWER LEVEL ELECTRICAL DEMOLITION PLAN

FILE NUMBER
2023-0078

SHEET NUMBER
ED.100

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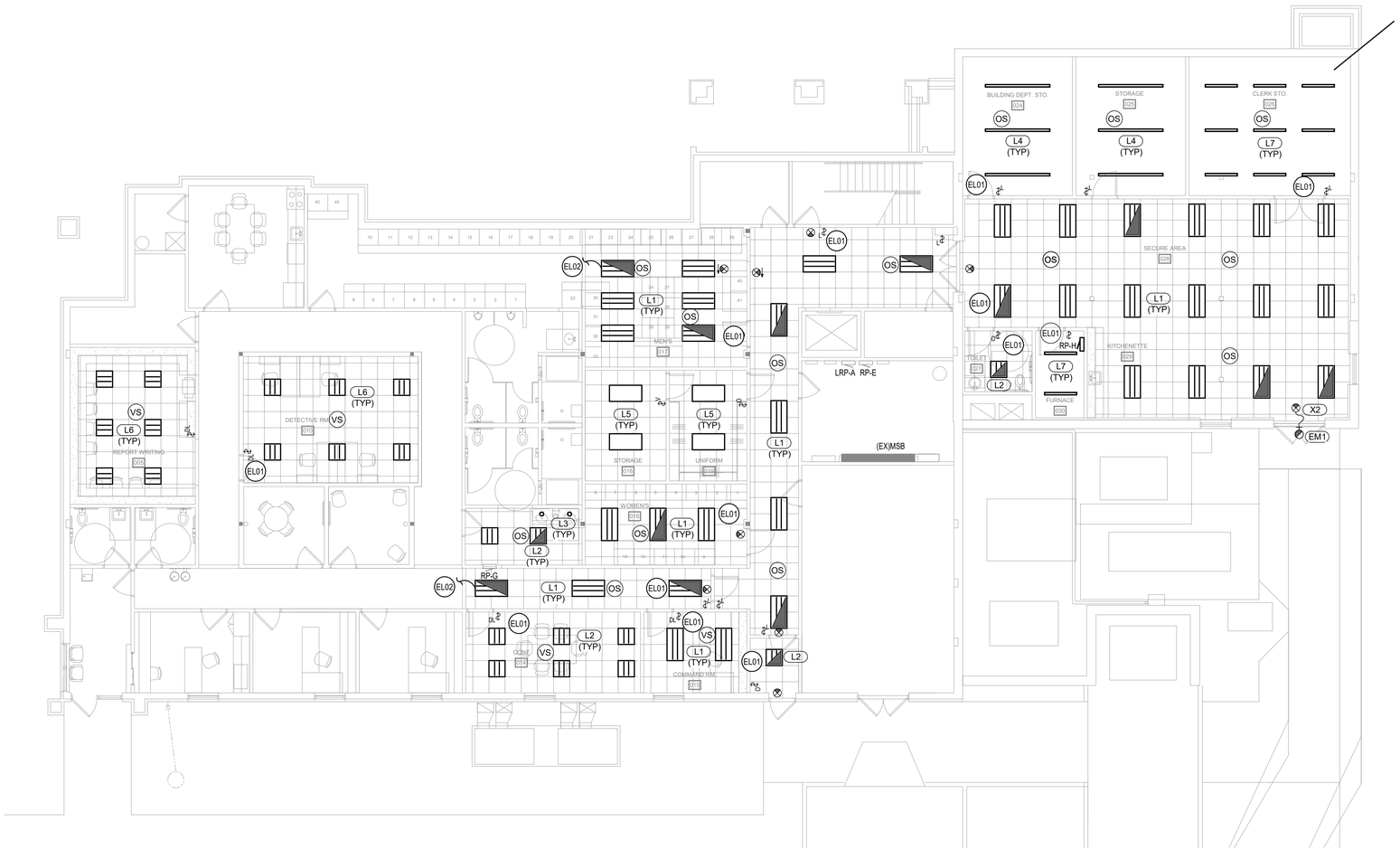

N 1 E.200 FIRST FLOOR PLAN OVERALL - LIGHTING
1/8" = 1'-0"

GENERAL NOTES - LIGHTING

A. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES UNLESS NOTED OTHERWISE.

B. REFER TO THE LUMINAIRE SCHEDULE LOCATED ON THE ELECTRICAL GENERAL INFORMATION DRAWING.

C. ELECTRICAL DEVICES INDICATED ON THIS PLAN SHALL BE NEW UNLESS NOTED OTHERWISE.

D. LIGHT SWITCHES SHALL BE GROUPED UNDER ONE COMMON FACEPLATE WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION.

E. EXISTING LIGHTING INDICATED TO REMAIN SHALL BE RELAMPED AND CLEANED. REPAIR EXISTING FIXTURES THAT ARE MALFUNCTIONING WHERE FEASIBLE. OTHERWISE REPLACE WITH NEW. REVISE CIRCUITING AS INDICATED.

F. SINGLE PHASE 20A LIGHTING BRANCH CIRCUIT WIRING ASSOCIATED WITH NEW LIGHTING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

G. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

H. REUSE OF EXISTING LEFT IN PLACE BRANCH CIRCUIT CONDUIT ASSOCIATED WITH THE LIGHTING FIXTURES REMOVED DURING DEMOLITION IS ACCEPTABLE TO REFEED NEW LIGHTING FIXTURES UNLESS NOTED OTHERWISE. REWORK THE EXISTING CIRCUIT TO PROVIDE LIGHTING CONTROL AS INDICATED ON THIS DRAWING, UNLESS NOTED OTHERWISE. PROVIDE NEW WIRING BACK TO SOURCE OR NEAREST UPSTREAM TO REMAIN DEVICE.

I. EXISTING LIGHTING INDICATED AS TO REMAIN AND LOCATED IN AREAS WHERE THE CEILING IS BEING MODIFIED SHALL BE TEMPORARILY SUPPORTED AND REINSTALLED UPON COMPLETION OF CEILING REVISIONS. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS AND ARCHITECTURAL TRADE.

J. NIGHT LIGHT AND EXIT SIGNS SHALL BE UNCONTROLLED AND CONNECTED AHEAD OF THE LOCAL LIGHTING CONTROLS.

K. CONDUITS INSTALLED IN FINISHED AREAS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

L. EXIT SIGN FIXTURES ARE TYPE 'X1' UNLESS NOTED OTHERWISE.

PLAN NOTES

EL01 CONNECT NEW LIGHT FIXTURES IN AREA TO EXISTING LIGHTING CIRCUIT LEFT OVER FROM DEMOLITION VIA NEW CONTROLS INDICATED. LIMIT 20A, 120V BRANCH CIRCUIT CONNECTED LOAD TO 1920VA.

EL02 CONNECT NEW LOW VOLTAGE LIGHTING DEVICES INDICATED ON PLAN TO EXISTING LOW VOLTAGE LIGHT SYSTEM SERVING ADJOINED SPACE. NEW AND EXISTING TO REMAIN LIGHT FIXTURES IN SPACE SHALL BE SWITCHED VIA EXISTING AND NEW CONTROLS COOPERATIVELY.

LIGHTING FIXTURE SCHEDULE

TYPE	MFR	MODEL	CCT	LAMP	LUMENS	MOUNTING	VOLTAGE	WATTS	COMMENTS	NOTES
EM1	LITHONIA	ELA T SD QWP L0309	3500 K	LED	900 lm	WALL	120 V	3 W	REMOTE WEATHERPROOF DUAL HEAD EMERGENCY LIGHT WITH GRAY FINISH.	
L1	LITHONIA	2FSL4 48L GZ10 LP835	3500 K	LED	4800 lm	RECESSED	120 V	40 W	2' x 4' RECESSED LED LUMINAIRE SUITABLE FOR LAY-IN CEILINGS. STEEL HOUSING FINISHED IN WHITE. FROSTED SATIN WHITE LENS. LUMINAIRE COMPLETE WITH INTEGRAL 0-10V DIMMING DRIVER DOWN TO 10%.	
L2	LITHONIA	2FSL2 40L GZ10 LP835	3500 K	LED	4000 lm	RECESSED	120 V	34 W	2' x 2' RECESSED LED LUMINAIRE SUITABLE FOR LAY-IN CEILINGS. STEEL HOUSING BAKED WHITE ENAMEL FINISH. FROSTED WHITE SATIN LENS. LUMINAIRE COMPLETE WITH INTEGRAL 0-10V DIMMING DRIVER DOWN TO 10%.	
L3	LITHONIA	LDN6 35/20 LO6AR LSS MVOLT GZ10	3500 K	LED	2000 lm	RECESSED	120 V	23 W	LED RECESSED OPEN DOWNLIGHT, 6" DIAMETER APERTURE, STEEL HOUSING, CLEAR SEMI-SPECULAR REFLECTOR, 0-10V DRIVER DIMS TO 10%.	
L4	METALUX	8TSNX-52SL-LW-UNV-L835-CD-1-AYC-CHAIN/SET -U	3500 K	LED	5200 lm	RECESSED	120 V	51 W	3" X 8'-0" LINEAR PENDANT LED LUMINAIRE. ALUMINUM HOUSING AND FINISH. FLUSH FROSTED WHITE SATIN ACRYLIC LENS WITH 80CRI. LUMINAIRE COMPLETE WITH 0-10V DIMMING DRIVER DOWN TO 10%.	
L5	LITHONIA	EPANL 2X4 4000LM 80CRI 35K MIN10 ZT MVOLT	3500 K	LED	4000 lm	RECESSED	120 V	34 W	LED EDGE-LIT FLAT PANEL, RECESSED, 2X4 LAY-IN, ALUMINUM FRAME, SATIN WHITE LENS, 80 CRI, 0-10V DIMMING, DIMS TO 10%.	
L6	LITHONIA	2FSL2 40L EZ1 LP835 GLR	3500 K	LED	4000 lm	RECESSED	120 V	34 W	2' x 2' RECESSED LED LUMINAIRE SUITABLE FOR LAY-IN CEILINGS. STEEL HOUSING BAKED WHITE ENAMEL FINISH. FROSTED WHITE SATIN LENS. LUMINAIRE COMPLETE WITH INTEGRAL 0-10V DIMMING DRIVER DOWN TO 10%.	
L7	METALUX	4SNX-45SL-LW-UNV-L835-CD-1-AYC-CHAIN/SET-U	3500 K	LED	4500 lm	RECESSED	120 V	40 W	3" X 4'-0" LINEAR PENDANT LED LUMINAIRE. ALUMINUM HOUSING AND FINISH. FLUSH FROSTED WHITE SATIN ACRYLIC LENS WITH 80CRI. LUMINAIRE COMPLETE WITH 0-10V DIMMING DRIVER DOWN TO 10%.	
X1	LITHONIA	LQM S W 3 R MVOLT EL N SD	3500 K	RED LED	300 lm	SURFACE	120 V	3 W	WHITE THERMOPLASTIC SIGN WITH SELF DIAGNOSTICS AND 90-MINUTE EMERGENCY BATTERY	
X2	LITHONIA	LQHM R HO RO SD	3500 K	RED LED	300 lm	SURFACE	120 V	3 W	WHITE THERMOPLASTIC SIGN WITH SELF DIAGNOSTICS AND 90-MINUTE HIGH-OUTPUT EMERGENCY BATTERY	

GENERAL NOTES - LUMINAIRE SCHEDULE

A. MANUFACTURER CATALOG NUMBERS ARE SHOWN FOR GENERAL DESCRIPTIVE PURPOSES AND TO ESTABLISH STANDARD OF QUALITY ONLY. CONTRACTOR SHALL PROVIDE LUMINAIRES COMPLETE WITH ALL OPTIONS AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION. ALL PRODUCTS SHALL BE UL LISTED.

B. PROVIDE PROPER REFLECTOR ASSEMBLY SPECIFIED AND AS RECOMMENDED BY LUMINAIRE MANUFACTURER.

C. PROVIDE LUMINAIRES WITH JOINING PLATES, END CAPS, CANOPIES, MOUNTING HARDWARE, ETC., AS REQUIRED FOR COMPLETE INSTALLATION.

D. EXIT LIGHTS SHALL BE PROVIDED WITH COLOR OF LETTERS REQUIRED BY LOCAL CODE AUTHORITY. FURNISH WITH CHEVRON DIRECTIONAL INDICATORS AS INDICATED AND REQUIRED.

E. VERIFY CONSTRUCTION OF CEILINGS BEING INSTALLED AND PROVIDE THE LUMINAIRES SPECIFIED IN APPROPRIATE CONFIGURATION WITH ALL HARDWARE AND ACCESSORIES REQUIRED FOR COMPATIBLE INSTALLATION.

F. PROVIDE DEVICES FOR SECURING LAY-IN TYPE LUMINAIRES TO CEILING GRID TO COMPLY WITH ARTICLE 410 OF THE NATIONAL ELECTRICAL CODE.

I. FURNISH LUMINAIRES IN MECHANICAL SPACES COMPLETE WITH PENDANT STEMS OR CHAIN HANGERS AS REQUIRED TO MOUNT BELOW PIPING, DUCT, CONDUIT, ETC., MAINTAIN MINIMUM 7'-6"H. UNIFORM MOUNTING HEIGHT FOR ALL LUMINAIRES THROUGHOUT EACH AREA.

K. BATTERY EMERGENCY UNITS SHALL BE U.L. 924 LISTED AND PRODUCE 90 MINUTES MINIMUM ILLUMINATION.

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LOWER LEVEL LIGHTING PLAN

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2023-0078

SHEET NUMBER
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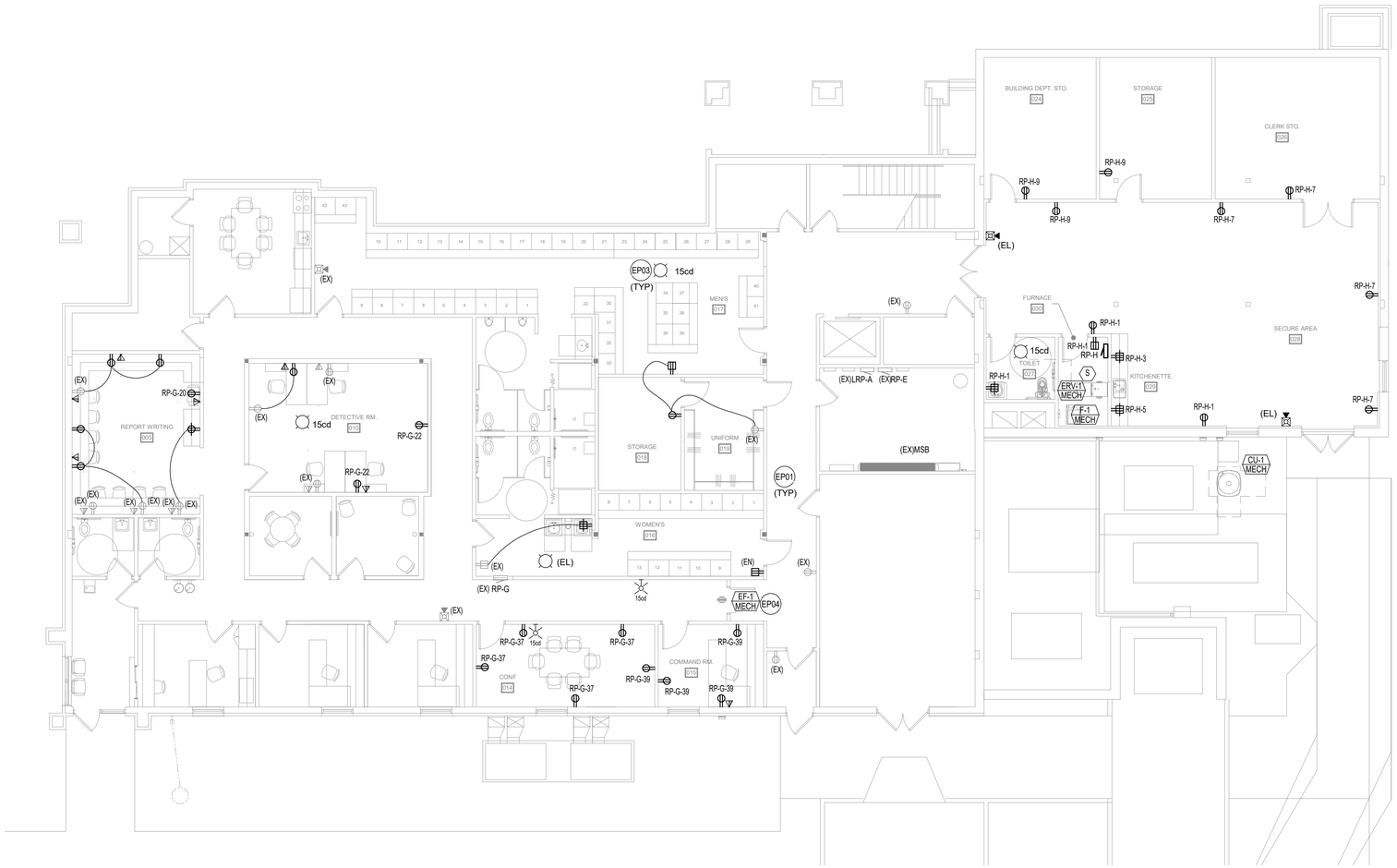

1 FIRST FLOOR PLAN OVERALL - POWER
E.300 1/8" = 1'-0"

GENERAL NOTES - POWER

A. REFER TO ARCHITECTURAL FLOOR PLAN AND ELEVATIONS FOR EXACT LOCATION OF DEVICES WHERE INDICATED.

B. RECEPTACLE OUTLETS SHALL BE RATED 20A U.O.N..

C. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE U.O.N..

D. PROVIDE GFCI PROTECTION WHERE REQUIRED BY THE NEC WHETHER INDICATED OR NOT.

E. BRANCH CIRCUIT JUNCTION BOXES SHALL BE LABELED WITH THE CIRCUITS ENCLOSED.

F. SINGLE PHASE 20A BRANCH CIRCUIT WIRING SHALL BE 2#12, 1#12GND IN 3/4"C UNLESS NOTED OTHERWISE.

G. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

H. CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

PLAN NOTES

EP01 EXISTING FIRE ALARM NOTIFICATION DEVICES (NOT INDICATED ON PLAN) IN EXISTING CORRIDOR ARE TO REMAIN.

EP03 CONNECT NEW FIRE ALARM NOTIFICATION APPLIANCE TO EXISTING SYSTEM. CALCULATE FIRE ALARM SYSTME EMRGENCY BATTERY CAPOACITY AND PROVIDE NEW WHERE REQUIRED. RECERTIFY SYSTEM UPON COMPLETION OF INSTALLATION.

EP04 CONNECT NEW EXHAUST FAN 'EF-1' TO EXISTING 120V GENERAL USE RECEPTACLE CIRCUIT SERVING AREA VIA CONTROLS INDICATED ON MECHANICAL PLANS.

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

MARK	FLA	MCA	MOCP	VOLTAGE	PHASE	CIRCUIT	DISCONNECT SIZE/TYPE	NOTES
CU-1	13.6 A	17.0 A	25 A	208 V	1	RP-H-6,8	30A, 240V 3P HEAVY-DUTY NON-FUSED DISCONNECT SWITCH	
EF-1	0.6 A	1.0 A	20 A	120 V	1		30A, 12V, 2P TOGGLE TYPE DISCONNECT SWITCH	REFER TO PLAN NOTE 'EP04' ON POWER PLAN FOR CIRCUITING INFORMATION.
ERV-1	8.0 A	10.0 A	10 A	120 V	1	RP-H-2	30A, 12V, 2P TOGGLE TYPE DISCONNECT SWITCH	
F-1	11.0 A	13.8 A	15 A	120 V	1	RP-H-4	30A, 12V, 2P TOGGLE TYPE DISCONNECT SWITCH	

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PANELBOARD: RP-H

MAINS: 225 A
LOCATION: FURNACE 030
FED FROM: (EX)MSB
LUG TYPE: MLO
VOLTAGE: 208Y/120V 3Ø 4W.
ENCLOSURE: NEMA 1
MOUNTING: SURFACE
AIC RATING: 10,000 AMPS SYMM.

LOAD DESCRIPTION	BKR	P	CKT	A		B		C		CKT	P	BKR	LOAD DESCRIPTION
RECEPTS - TLT 027, FURNACE 028, SECURE AREA 030	20	1	1	0.7	1.0					2	1	10	ERV-1
RECEPT - KITCHENETTE 029	20	1	3			0.2	1.3			4	1	15	F-1
RECEPT - KITCHENETTE 029	20	1	5					0.2	1.4	6	2	25	CU-1
RECEPTS - SECURE AREA 030	20	1	7	0.7	1.4					8			
RECEPTS - STORAGE 024-026, SECURE AREA 030	20	1	9			0.5	0.0			10	1	20	SPARE (LOD)
SPARE (LOD)	20	1	11					0.0	0.0	12	1	20	SPARE (LOD)
SPARE (LOD)	20	1	13	0.0	0.0					14	1	20	SPARE (LOD)
SPARE (LOD)	20	1	15			0.0	0.0			16	1	20	SPARE (LOD)
SPARE (LOD)	20	1	17					0.0	0.0	18	1	20	SPARE (LOD)
SPARE (LOD)	20	1	19	0.0	0.0					20	1	20	SPARE (LOD)
SPARE (LOD)	20	1	21			0.0	0.0			22	1	20	SPARE (LOD)
SPARE (LOD)	20	1	23					0.0	0.0	24	1	20	SPARE (LOD)
SPACE	--	1	25	--	--					26	1	--	SPACE
SPACE	--	1	27			--	--			28	1	--	SPACE
SPACE	--	1	29					--	--	30	1	--	SPACE
SPACE	--	1	31	--	--					32	1	--	SPACE
SPACE	--	1	33			--	--			34	1	--	SPACE
SPACE	--	1	35					--	--	36	1	--	SPACE
SPACE	--	1	37	--	--					38	1	--	SPACE
SPACE	--	1	39			--	--			40	1	--	SPACE
SPACE	--	1	41					--	--	42	1	--	SPACE
TOTAL CONNECTED kVA:				3.8		2.0		1.6					
TOTAL CONNECTED AMPS:				32.4 A		17.6 A		13.3 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Receptacle	2.3 kVA	100.00%	2.3 kVA		
Mechanical	5.1 kVA	100.00%	5.1 kVA	**CONNECTED LOAD:**	7.4 kVA
				DEMAND LOAD:	7.4 kVA
				CONNECTED CURRENT:	20.7 A
				DEMAND CURRENT:	20.7 A
				20% SPARE CAPACITY:	4 A
				TOTAL DEMAND + SPARE:	25 A

NOTES:
(LOD) LOCK ON/OFF DEVICE - WHERE NEW ARE INDICATE, LOCK SPARE CIRCUIT BREALKER IN THE "OFF" POSITION.

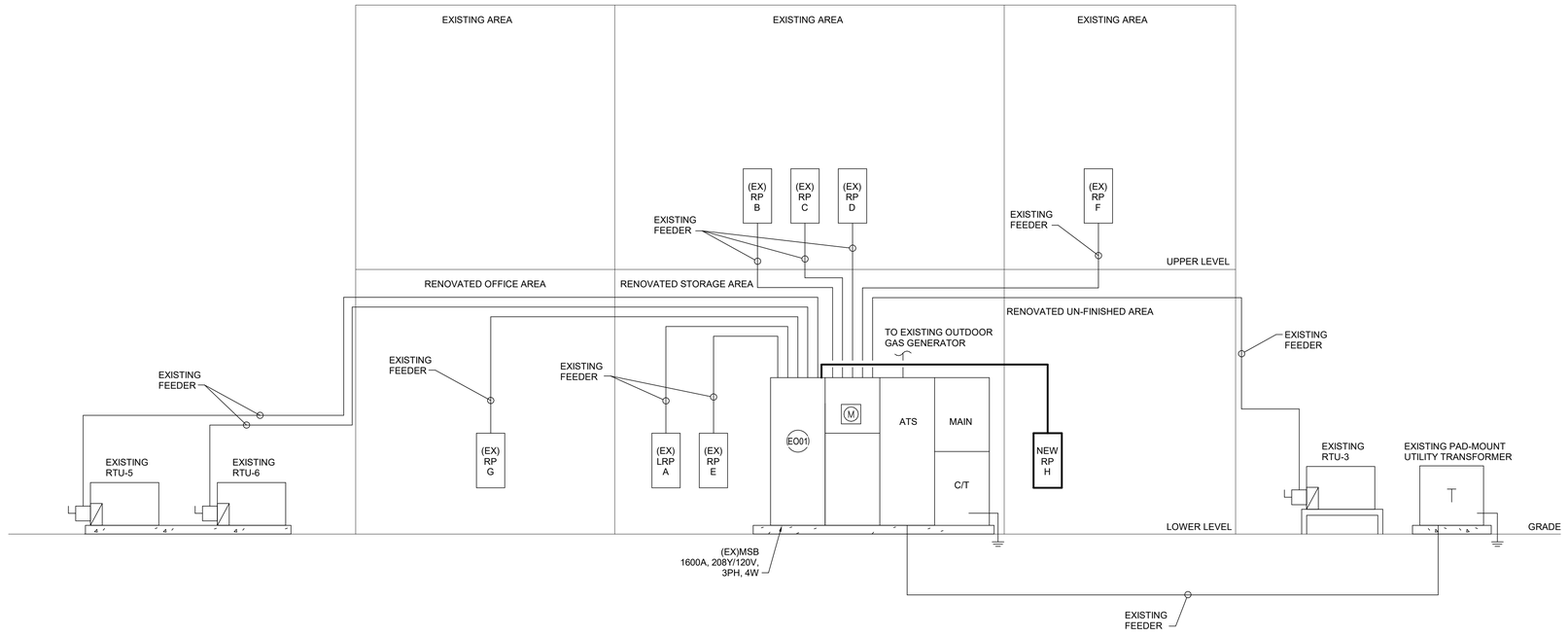
EX. PANELBOARD: RP-G

MAINS: 225 A
FED FROM: (EX)MSB
VOLTAGE: 208Y/120V 3Ø 4W.
ENCLOSURE: NEMA 1
MOUNTING: RECESSED
AIC RATING: 10,000 AMPS SYMM.

LOAD DESCRIPTION	BKR	P	CKT	A		B		C		CKT	P	BKR	LOAD DESCRIPTION
EAST HALL LTS/EM (LOD)	20	1	1	0.3	0.3					2	1	20	**WEST HALL LTS/EM (LOD)**
SHOWER RM LTS/EM (LOD)	20	1	3			0.3	0.4			4	1	20	EAST OFFICE LTS
SOUTH OFFICES LTS	20	1	5					0.4	0.2	6	1	20	**DETECTIVE RM LTS**
DOOR CONTROL	20	1	7	0.5	0.3					8	1	20	INTERVIEW LTS
MICROWAVE	20	1	9			1.1	0.5			10	1	20	KITCHEN
HALL OUTLETS	20	1	11					0.7	0.5	12	1	20	DRINKING FOUNTAIN
COMMAND RM 2 OUTLETS	20	1	13	0.5	0.5					14	1	20	**REPORT WRITING OUTLETS**
COMMAND RM 1 OUTLETS	20	1	15			0.5	0.5			16	1	20	**REPORT WRITING OUTLETS**
RECEPTION OUTLETS	20	1	17					0.9	0.5	18	1	20	**REPORT WRITING OUTLETS**
GENERAL STORAGE OUTLETS	20	1	19	0.2	1.5					20	1	20	**COPIER**
RANGE	50	2	21			4.0	0.4			22	1	20	**RECEPTS - DETECTIVE RM**
			23					4.0	0.0	24	1	20	**SPARE (LOD)**
REFRIGERATOR OUTLET	20	1	25	0.8	0.4					26	1	20	MENS LOCKER ROM OUTLETS
DISPOSAL	20	1	27			1.1	0.5			28	1	20	**WOMENS LOCKER RM OUTLETS**
KITCHEN	20	1	29					0.7	0.4	30	1	20	TOILET RM OUTLETS
FIRE ALARM NAC PANEL (LOD)	20	1	31	0.5	0.4					32	1	20	**DETECTIVE RM OUTLETS**
CIRC PUMP	20	1	33			0.2	0.2			34	1	20	WATER HEATER OUTLET
CAR PORT OUTLET	20	1	35					0.2	0.0	36	1	20	**SPARE (LOD)**
RECEPTS - CONF RM 014	20	1	37	0.7	1.5					38			
RECEPTS - CONF RM 014, COMMAND RM 015	20	1	39			0.7	1.5			40	3	20	VESTIBULE CEILING HEATER
SPARE (LOD)	20	1	41					0.0	1.5	42			
TOTAL CONNECTED kVA:				8.3		12.0		10.0					
TOTAL CONNECTED AMPS:				68.9 A		102.1 A		85.8 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
Receptacle	3.3 kVA	100.00%	3.3 kVA		
Spare	27.0 kVA	100.00%	27.0 kVA	**CONNECTED LOAD:**	30.3 kVA
				DEMAND LOAD:	30.3 kVA
				CONNECTED CURRENT:	84.0 A
				DEMAND CURRENT:	84.0 A

NOTES:
(LOD) LOCK ON/OFF DEVICE - WHERE NEW ARE INDICATE, LOCK SPARE CIRCUIT BREALKER IN THE "OFF" POSITION.



1 E.701 ELECTRICAL ONE-LINE DIAGRAM
N.T.S.

GENERAL NOTES - ONE LINE

A. DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE U.O.N..

B. JUNCTION AND PULL BOXES SHALL BE LABELED WITH THE CIRCUITS ENCLOSED.

C. PROVIDE CIRCUIT DIRECTORIES IN ALL ELECTRICAL PANELS AND NAMEPLATES ON SWITCHBOARDS PER THE SPECIFICATIONS.

D. EXISTING EQUIPMENT/DEVICES NOT SPECIFICALLY INDICATED TO BE DEMOLISHED SHALL REMAIN OPERATIONAL. REVISE EXISTING CIRCUITING TO MAINTAIN OPERATION TO SUCH EQUIPMENT/DEVICES AS REQUIRED.

E. CONDUITS IN FINISHED AREAS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

F. PROVIDE ARC FLASH CALCULATIONS AND LABELS FOR ALL SWITCHBOARDS, PANELBOARDS, MOTOR CONTROLLERS, AND CONTROL PANELS PER SECTION 110.16 OF THE NEC AND NFPA 70E. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

G. ELECTRICAL EQUIPMENT MOUNTED ON THE FLOOR SHALL BE MOUNTED ON A 4" CONCRETE HOUSEKEEPING PAD.

H. PROVIDE ARC FAULT CIRCUIT INTERRUPTER TYPE CIRCUIT BREAKERS IN DWELLING AND DORMITORY UNITS AND FOR ALL BRANCH CIRCUITS INDICATED IN SECTION 210.12 OF THE NEC.

I. REFER TO THE FEEDER SCHEDULE LOCATED ON DRAWING E.801.

J. FAULT CURRENT VALUES, WHERE INDICATED, ARE ESTIMATES BASED ON AVAILABLE INFORMATION AND ESTIMATED FEEDER LENGTHS AT THE TIME OF DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR COLLECTING UPDATED AVAILABLE FAULT CURRENT FROM THE LOCAL UTILITY, MOTOR SIZES FOR NEW MECHANICAL AND PLUMBING EQUIPMENT, AND FIELD MEASUREMENTS TO PERFORM THE SHORT CIRCUIT CALCULATIONS REQUIRED PER THE ELECTRICAL SPECIFICATIONS. ELECTRICAL EQUIPMENT SHALL HAVE RATINGS GREATER THAN THE AVAILABLE FAULT CURRENT DETERMINED BY THE CONTRACTORS STUDY.

GENERAL NOTES - PANEL SCHEDULES

A. PROVIDE CIRCUIT DIRECTORIES IN ALL ELECTRICAL PANELS AND NAMEPLATES ON SWITCHBOARDS PER THE SPECIFICATIONS.

B. PROVIDE ARC FLASH CALCULATIONS AND LABELS FOR ALL SWITCHBOARDS, PANELBOARDS, MOTOR CONTROLLERS, AND CONTROL PANELS PER SECTION 110.16 OF THE NEC AND NFPA 70E. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

C. NEW WORK IN EXISTING PANELS IS NOTED IN BOLD TEXT.

PLAN NOTES

EO01 FEED NEW PANEL 'RP-H' FROM EXISTING 200A SWITCH IN MAIN SWITCHBOARD 'MSB'. PROVIDE NEW 150A FUSES IN SWITCH.

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ELECTRICAL ONE LINE DIAGRAM

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SHEET NUMBER
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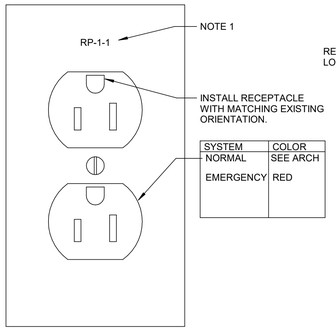
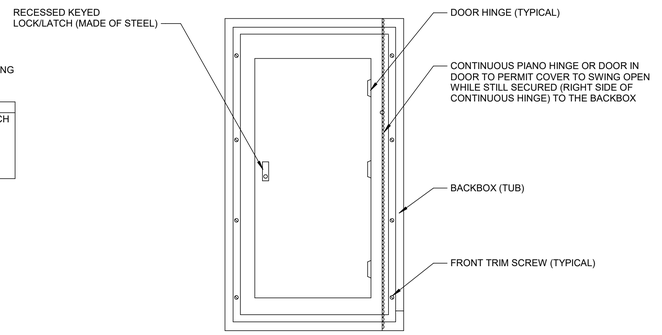


NOTE:

1. REFER TO ELECTRICAL SPECIFICATIONS FOR CIRCUIT IDENTIFICATION REQUIREMENTS.

RECEPTACLE FACEPLATE

SCALE: NOT TO SCALE



PANELBOARD PIANO HINGE FRONT COVER

SCALE: NOT TO SCALE

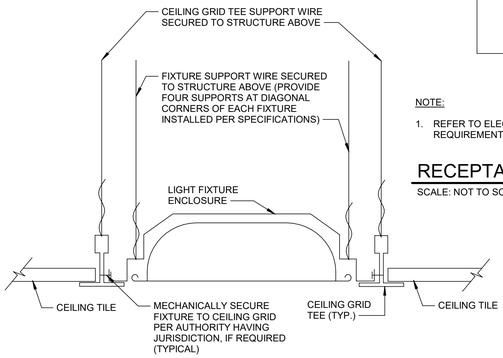
COPPER FEEDER & BRANCH CIRCUIT SIZING SCHEDULE

(NOTES 1,2,10,11,12)

OVERCURRENT DEVICE RATING	SETS PER PHASE	AWG OR KCMIL		CONDUIT SIZE	
		PHASE & NEUTRAL	EG	3 WIRE (3W) (3PH)	4 WIRE (4W) (3PH & 1N)
20A	1	12	12	3/4"	3/4"
30A	1	10	10	3/4"	3/4"
40A	1	8	10	3/4"	3/4"
50A	1	6	10	3/4"	1"
60A	1	4	10	1"	1-1/4"
70A	1	4	8	1"	1-1/4"
100A	1	2	8	1-1/4"	1-1/4"
110A	1	2	6	1-1/4"	1-1/4"
125A	1	1	6	1-1/4"	1-1/2"
150A	1	1/0	6	1-1/2"	1-1/2"
175A	1	2/0	6	1-1/2"	2"
200A	1	3/0	6	2"	2"
225A	1	4/0	4	2"	3"
250A	1	250	4	2"	3"
300A	1	350	4	3"	3"
400A	1	500	2	3"	3"
450A	2	4/0	2	2"	3"
500A	2	250	2	2"	3"
600A	2	350	1	3"	3"
800A	2	500	1/0	3"	3"
1000A	3	500	2/0	3"	3"
1200A	3	600	3/0	3"	4"
1600A	4	600	4/0	3"	4"
2000A	5	600	250	3"	4"

SHEET NOTES

1. AMPACITIES BASED ON THHN/THWN, 90°., 600V., INSULATED, COPPER. WIRE APPLIED AT 60° TERMINATIONS FOR CIRCUITS RATED 110A AND DOWN AND APPLIED AT 75° TERMINTATIONS FOR CIRCUITS RATED ABOVE 110A PER NEC 110.14(C)(1).
2. BASED ON WIRE OUTSIDE DIAMETERS AND NON-RIGID METALLIC CONDUIT INSIDE DIAMETERS AS PROVIDED IN THE NEC. REFER TO NEC FOR CONDUIT TYPES MORE RESTRICTIVE THAN NON-RIGID METALLIC. CONDUCTOR AND CONDUIT SIZES INDICATED ARE MINIMUM REQUIREMENTS. FOLLOW NEC REQUIRMENTS FOR DERATING AND PROVIDE LARGER CONDUCTORS AND CONDUIT WHERE APPLICABLE.
3. BASED ON MOTOR FULL LOAD AMPERES AS PROVIDED BY THE NEC.
4. BASED ON MOTOR RUNNING OVERLOAD PROTECTION PROVIDED BY THERMAL OVERLOAD RELAYS.
5. MOTOR STARTING TYPE BASED ON 3 PHASE, FULL VOLTAGE NON-REVERSING EXCEPT FOR MOTORS SIZED 75HP OR GREATER WHICH ARE BASED ON 3 PHASE, PART WINDING REDUCED VOLTAGE STARTING.
6. TRANSFORMER CIRCUITS BASED ON 480V-208Y/120V, 3 PHASE, 4 WIRE, DRY TYPE. REFER TO CIRCUIT SIZING SCHEDULES ON THIS SHEET FOR PRIMARY/SECONDARY PHASE/NEUTRAL/SUPPLY SIDE BONDING JUMPER CONDUCTOR REQUIREMENTS ASSOCIATED WITH CIRCUIT SIZES NOTED IN THIS TABLE UON.
7. CIRCUIT MAXIMUM DISTANCE IS BASED ON NEC CHAPTER 9, TABLE 8 CONDUCTOR PROPERTIES FOR COATED COPPER AT 75 DEGREES CELSIUS. REFER TO NEXT LARGER OVERCURRENT DEVICE RATING IN THIS TABLE FOR OVERCURRENT DEVICES WITH RATINGS NOT INDICATED.
8. MAXIMUM CIRCUIT LOAD FOR DISTANCE IS BASED ON NEC 220-10.
9. REFER TO CIRCUIT SIZING SCHEDULE ON THIS SHEET FOR UPSIZING CONDUIT AND WIRING. E.G. SHALL BE INCREASED IN SIZE PROPORTIONATELY PER THE NEC. ONLY CONDUCTORS AND CONDUIT SHALL BE INCREASED IN SIZE. OVERCURRENT PROTECTION DEVICE SHALL REMAIN AS SPECIFIED.
10. CONDUCTORS SHALL BE STRANDED. COPPER CONDUCTORS ARE REQUIRED.
11. WHERE OVERCURRENT DEVICE REQUIRED IS NOT LISTED IN TABLE, USE CONDUIT AND WIRE REQUIREMENTS LISTED FOR NEXT LARGER LISTED OVERCURRENT DEVICE.
12. TABLE IS NOT APPLICABLE FOR SERVICE ENTRANCE FEEDERS. REFER TO ELECTRICAL PLANS AND DIAGRAMS FOR SERVICE ENTRANCE FEEDER REQUIREMENTS.
13. REFER TO CIRCUIT SIZING SCHEDULE ON THIS SHEET FOR CONDUIT AND WIRING REQUIREMENTS ASSOCIATED WITH CIRCUIT SIZES NOTED IN THIS TABLE.
14. NON-FUSED LOCAL DISCONNECT SWITCH SIZE SHALL HAVE AN AMPERE RATING NO LESS THAN THE CIRCUIT SIZE INDICATED IN THIS TABLE. WHERE THE CIRCUIT SIZE IS NOT INDICATED, THE AMPERE RATING SHALL BE NO LESS THAN THE RATING OF THE PHASE CONDUCTORS PER THE NEC.



RECESSED GRID TROFFER LIGHT FIXTURE INSTALLATION

SCALE: NOT TO SCALE

CIRCUIT LENGTH TABLE. 120V 1PH

(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE					ONE WAY CIRCUIT LENGTH
		20A	30A	40A	50A	70A	
20A	4	215'	360'	555'	880'	-	
	8	105'	180'	275'	440'	700'	
	12	70'	120'	185'	295'	465'	
	16	50'	90'	140'	220'	350'	
30A	24	-	60'	90'	145'	230'	
40A	32	-	-	70'	110'	175'	
50A	40	-	-	-	85'	140'	
60A	48	-	-	-	-	115'	

CIRCUIT LENGTH TABLE. 208V 1PH

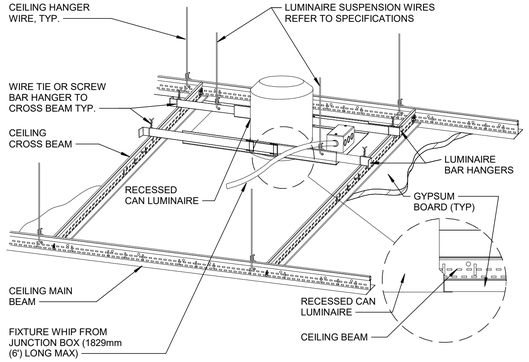
(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE					ONE WAY CIRCUIT LENGTH
		20A	30A	40A	50A	70A	
20A	4	375'	625'	965'	-	-	
	8	185'	310'	480'	765'	-	
	12	125'	205'	320'	510'	810'	
	16	90'	155'	240'	380'	605'	
30A	24	-	100'	160'	255'	405'	
40A	32	-	-	120'	190'	300'	
50A	40	-	-	-	150'	240'	
60A	48	-	-	-	-	200'	

CIRCUIT LENGTH TABLE. 208V 3PH

(NOTES 7,8,9)

OVERCURRENT DEVICE RATING	MAX. CIRCUIT LOAD (AMPS)	CIRCUIT SIZE					ONE WAY CIRCUIT LENGTH
		20A	30A	40A	50A	70A	
20A	4	435'	720'	1115'	-	-	
	8	215'	360'	555'	880'	-	
	12	145'	240'	370'	590'	935'	
	16	105'	180'	275'	440'	700'	
30A	24	-	120'	185'	295'	465'	
40A	32	-	-	135'	220'	350'	
50A	40	-	-	-	175'	275'	
60A	48	-	-	-	-	230'	

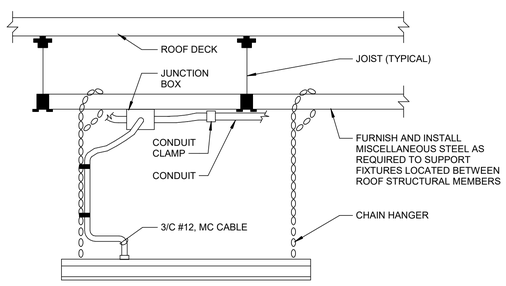


NOTE:

1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S MOUNTING INSTRUCTIONS AND USING THE RECOMMENDED MOUNTING HARDWARE.

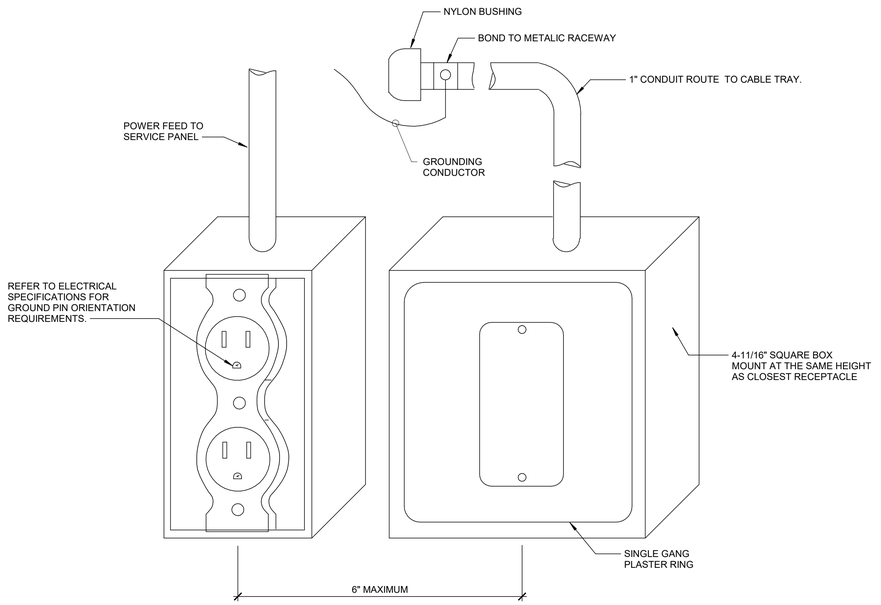
GYPBOARD CEILING DOWNLIGHT INSTALLATION

SCALE: NOT TO SCALE



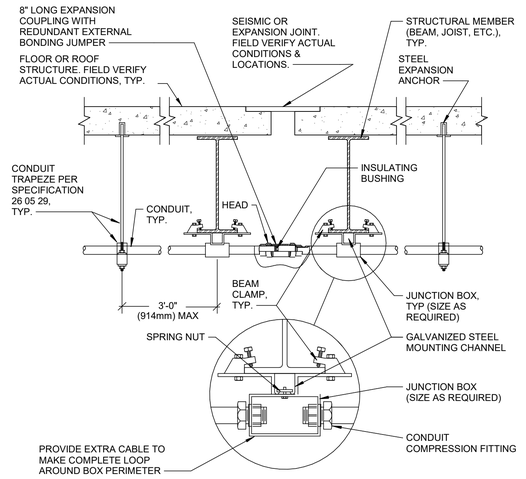
CHAIN HUNG LINEAR INDUSTRIAL LIGHT FIXTURE INSTALLATION

SCALE: NOT TO SCALE



ELECTRICAL/COMMUNICATION BACKBOX

SCALE: NOT TO SCALE



NOTES:

1. DETAIL IS APPLICABLE ONLY TO CONDUIT SMALLER THAN 3" (75mm).
2. CUT ENDS OF GALVANIZED MATERIALS TO BE PAINTED WITH ZINC-RICH PAINT AFTER INSTALLATION.

CONDUIT COUPLING EXPANSION JOINT CROSSING

SCALE: NOT TO SCALE

GREENPATH DESIGN

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PROJECT

OXFORD TOWNSHIP HALL RENOVATION

30 DUNLAP RD
OXFORD, MI 48371

DATE ISSUED	ISSUED FOR

DRAWN: JLB
CHECKED: JLB

SHEET

ELECTRICAL DETAILS AND CIRCUITING SCHEDULES

PROJECT NUMBER

2023-0078

SHEET NUMBER

E.801

NOT FOR CONSTRUCTION

1/25/2024 10:44:55 AM

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