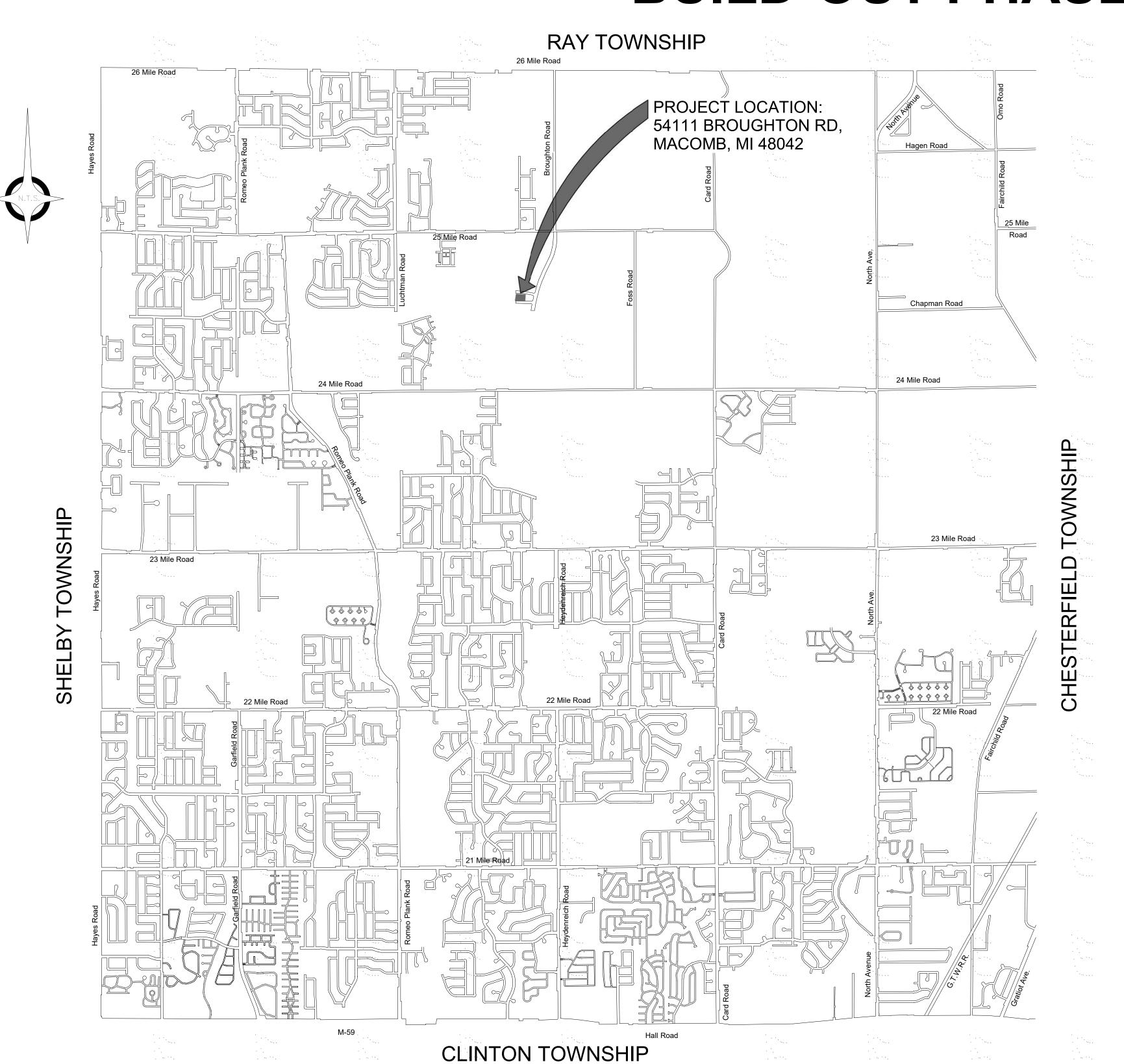


Macomb Township



Macomb County, Michigan MACOMB TOWNSHIP BASEMENT

BUILD-OUT PHASE TWO



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"I HEREBY CERTIFY THESE PLANS HAVE BEEN PREPARED UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH ACT 240, PUBLIC ACTS OF 1937 AS AMENDED- STATE OF MICHIGAN."

SON ARLOW, AIA # 1301054547

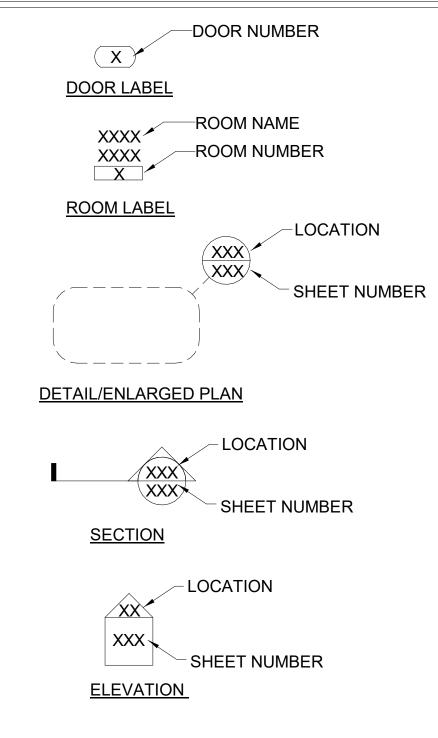
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ABBREVIATIONS

	T ALL ABBREVIATIONS USED. REVIATIONS INCLUDE BUT NOT LIMITED TO TH	112 I 12T	
ADDI A.F.F	ABOVE FINISH FLOOR	LHR	LEFT HAND REVERSE
ACCOM	ACCOMMODATE	MFR	MANUFACTURER
ACCORD	ACCORDANCE	MAX	MAXIMUM
A.C.P.	ACOUSTICAL PANEL	MECH.	MECHANICAL
ACOUS	ACOUSTICAL	MC	MECHANICAL CONTRACT (OR)
AD ALT	ACCESS DOOR	M.P.E.	MECHANICAL, PLUMBING, ELECTRICAL
ALT	ALTERNATE	MET	METAL
ALUM. ARCH	ALUMINUM ARCHITECT	MIN MISC.	MINIMUM MISCELLANEOUS
@	AT	N/A	NOT APPLICABLE
BRG	BEARING	NIC	NOT IN CONTRACT
B PL	BEARING PLATE	NTS	NOT TO SCALE
BIT	BITUMINOUS	NRC	NOISE REDUCTION COEFFICIENT
BLK	BLOCK	NO OR #	NUMBER
BRD	BOARD	OC	ON CENTER
BOTT BRKT	BOTTOM BRACKET	OPP. OD	OPPOSITE OUTSIDE DIAMETER
BLDG	BUILDINGS	OH	OVERHEAD
CAB	CABINET	PLAS.	PLASTIC
CLG.	CEILING	PL	PLATE
CL	CENTER LINE	PLYWD	PLYWOOD
CIRC	CIRCULATION	PO	POLYETHYLENE
CLO	CLOSET	PSI	POUNDS PER SQ. INCH
COL	COMPLITED	PSF	POUNDS PER SQ. FOOT
COMP CONC.	COMPUTER CONCRETE	PVC RWC	POLYVINYL CHLORIDE RAIN WATER CONDUCTOR
CONC. CMU	CONCRETE MASONRY UNIT	RECPT	RECEPTION
CONF.	CONFERENCE	REC	RECESSED
CONST	CONSTRUCTION	REF.	REFLECTED
CONT	CONTINUOUS	REINF	REINFORCING
COORD	COORDINATE	RE-BAR	REINFORCING BARS
CR	COAT RACK	REP	REPRESENTATIVE
CRS	COURSES	REQ	REQUIRED
DEMO DIA	DEMOLISH, DEMOLITION DIAMETER	RF RFM	ROOF FAN RECESSED FLOOR MAT
DIM	DIMENSION	RH	RIGHT HAND
DIV	DIVISION	RHR	RIGHT HAND REVERSE
DR	DOOR	ROW	RIGHT OF WAY
DN	DOWN	RD	ROOF DRAIN
DS	DOWN SPOUT	RM	ROOM
ELEC.	ELECTRICAL WATER COOLER	RO	ROUGH OPENING
EWC EC	ELECTRICAL WATER COOLER ELECTRICAL CONTRACTOR	SCHED. SIM.	SCHEDULE SIMILAR
ELEV.	ELEVATION, ELEVATOR	SPEC	SPECIFICATION
ENG	ENGINEER	SPKLR	SPRINKLER
EQ	EQUAL	SS	STAINLESS STEEL
EXIST.	EXISTING	STD	STANDARD
EXP	EXPANSION, EXPOSED	STL	STEEL
EJ	EXPANSION JOINT	STL JST	STEEL JOIST
EXT EF	EXTERIOR	STL STD	STEEL STUD
EF FWC	EXHAUST FAN FABRIC WALL COVERING	STOR STRUCT.	STORAGE STRUCTURE
F.V.	FIELD VERIFY	STR STL	STRUCTURAL STEEL
F.R.P.	FIBERGLASS REINFORCED PANEL	SUSP.	SUSPENDED
FIN	FINISH	SYS	SYSTEM
FF 	FINISHED FLOOR	TEL	TELEPHONE
FE FF0	FIRE EXTINGUISHER	TEMP.	TEMPERED OLAZED
FEC	FIRE EXTINGUISHER CABINET	T	TEMPERED GLAZED
FLR FD	FLOOR FLOOR DRAIN	T & G TOC	TONGUE AND GROOVE TOP OF CURB
FTG	FOOTING	TOF	TOP OF FOOTER
GA	GAGE, GAUGE	TOS	TOP OF STEEL
GALV	GALVANIZED	TOW	TOP OF WALL
GC	GENERAL CONTRACTOR	TOM	TOP OF MASONRY
GWB	GYPSUM DRYWALL (WALLBOARD)	TYP.	TYPICAL
GWB-X	GWB TYPE-X (FIRE RESISTIVE	UNO	UNLESS NOTED OTHERWISE
LIV/AC	CLASSIFICATION)	UR VB	URINAL
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING	VIF	VAPOR BARRIER VERIFY IN FIELD
HT.	HEIGHT	VERT	VERTICAL
H.M.	HOLLOW METAL STEEL	VCT	VINYL COMPOSITE TILE
HOR	HORIZONTAL	VWB	VINYL WALL BASE
ID	INSIDE DIAMETER	VWC	VINYL WALL COVERING
INS	INCHES	WAIT	WAITING
JT	JOINT	WC	WATER CLOSET
JST	JOIST KIDS DED SOLIABE EQOT	WT	WEIGHT
KSF LAM.	KIPS PER SQUARE FOOT LAMINATE	WWF W/	WELDED WIRE FABRIC WITH
LAIVI. LIN FT	LINEAR FOOT	W/O	WITH OUT
LLV	LONG LEG VERTICAL	WD.	WOOD
LAV	LAVATORY	•	FOOT, FEET
			INIOU INIOUEO

SYMBOL KEY



INCH, INCHES

GENERAL DEMOLITION NOTES

- 1. REMOVE ALL ABANDONED MISC. HARDWARE, ACCESSORIES, SUPPORTS, BRACKETS, ANCHORS ETC. IN AREAS OF DEMOLITION (TYPICAL).
- 2. REMOVE ALL ABANDONED WIRING, CABLES, RACEWAYS, SWITCHES AND OUTLETS AS REQUIRED.
- 3. REMOVE ALL MISC. ATTACHMENTS THAT INTERFERE WITH NEW CONSTRUCTION OR AS SHOWN ON PLANS.
- 4. OWNER HAS FIRST SALVAGE RIGHTS ON ALL ITEMS AND EQUIPMENT, VERIFY SALVAGE OF ITEMS AND EQUIPMENT WITH OWNER.
- 5. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE DEMOLITION AND/OR CONSTRUCTION. CONTRACTOR SHALL COORDINATE DEMOLITION AND CONSTRUCTION TO COMPLETE WORK AS DEFINED ON PLAN, ELEVATIONS AND DETAILS.
- 6. COORDINATE ALL DIMENSIONS WITH PROPOSED CONSTRUCTION.
- 7. CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES DURING DEMOLITION & CONSTRUCTION. (WATER, SEWER, ELECTRICAL, GAS) VERIFY ALL EXISTING LOCATIONS.
- 8. CONTRACTOR SHALL PROTECT ALL BUILDING ELEMENTS DURING CONSTRUCTION, RESTORE AS REQUIRED.
- 9. ELEMENTS LABELED AS EXISTING ARE TO REMAIN UNLESS NOTED OTHERWISE.
- 10. DASHED LINES INDICATE ITEMS TO BE REMOVED AS NOTED.
- 11. RELOCATE ALL EXISTING ELECTRICAL LIGHTING FIXTURES AS INDICATED ON PLAN OR THAT INTERFERE WITH PROPOSED CONSTRUCTION.
- 12.RELOCATE ALL EXISTING OUTLETS, SWITCHES, DEVICES AND COVER PLATES AS SHOWN ON PLANS OR THAT INTERFERE WITH CONSTRUCTION.
- 13.RELOCATE ALL MECHANICAL GRILLES, LOUVERS AND DIFFUSERS AS SHOWN ON PLAN OR THAT INTERFERE WITH PROPOSED CONSTRUCTION.
- 14.COORDINATE AND VERIFY ALL DEMOLITION DIMENSIONS WITH ARCHITECTURAL DIMENSIONS.
- 15. COORDINATE ALL DEMOLITION WITH MECHANICAL AND ELECTRICAL TRADES.
- 16.CONTRACTOR SHALL REMOVE ALL ITEMS (ATTACHED OR OTHERWISE) WHICH REQUIRE REMOVAL OR ARE AFFECTED BY THE PROPOSED NEW CONSTRUCTION. THE CONTRACTOR SHALL FAMILIARIZE WITH THE EXISTING CONDITIONS AND SHALL COMPLETE ALL REQUIRED DEMOLITION (REGARDLESS WEATHER EACH INDIVIDUAL ITEM HAS BEEN IDENTIFIED).
- 17.THE CONTRACTOR SHALL LEVEL / ADJUST SUBFLOOR AND OR CONCRETE FLOOR SLAB AS REQ'D FOR FLOOR FINISH.

GENERAL NOTES

- 1. THE CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS, FEES AND INSPECTIONS. PERMIT FEES WILL BE WAIVED BY THE TOWNSHIP.
- 2. ALL CONTRACTORS SHALL COORDINATE THE LOCATION OF DUCTS, PIPING, BOXES, CHASES, CONDUITS, ETC... WITH THE MECHANICAL, ELECTRICAL AND ALL OTHER TRADES
- 3. SEAL/MORTAR ALL OPENINGS AROUND PIPES, CONDUITS, ETC.... WHICH PASS THROUGH FLOORS AND WALLS.
- 5. CAULK ALL JOINTS BETWEEN DOOR FRAMES, WINDOW FRAMES, MASONRY WALLS AND ALL DISSIMILAR MATERIALS.
- 6. PROVIDE ALL NECESSARY BLOCKING AS REQUIRED TO SUPPORT LIGHTING, SIGNS, BRACKETS, CAGES, ACCESSORIES, ETC....
- 7. ALL DIMENSIONS ARE FROM FACE OF STUD TO FACE OF STUD OR FACE OF BLOCK TO FACE OF BLOCK.
- 8. ALL ITEMS NOTED "BY OWNER" OR "N.I.C." ARE NOT IN CONTRACT.
- 9. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS EXISTING AND PROPOSED ON THE JOB. REPORT ALL DEVIATIONS FROM DRAWINGS PRIOR TO START OF CONSTRUCTION.
- 10.ALL CONTRACTORS SHALL CONSTRUCT THIS PROJECT IN ACCORDANCE WITH ALL STATE, FEDERAL AND LOCAL CODES.
- 11.ALL CONTRACTORS SHALL REPAIR ANY DAMAGES OR DISTURBANCES TO THE EXISTING BUILDING AND SITE. PATCH / REPAIR AND PAINT ANY DISTURBED ELEMENTS FROM DEMOLITION.
- 12.ALL WOOD AND MISC. BLOCKING MUST BE NON-COMBUSTIBLE MATERIAL

SWEEP TO REMOVE ALL DIRT. REMOVE ALL TEMPORARY LABELS.

DURING CONSTRUCTION. MATCH IN KIND AND PREP. FOR FLR. FIN.

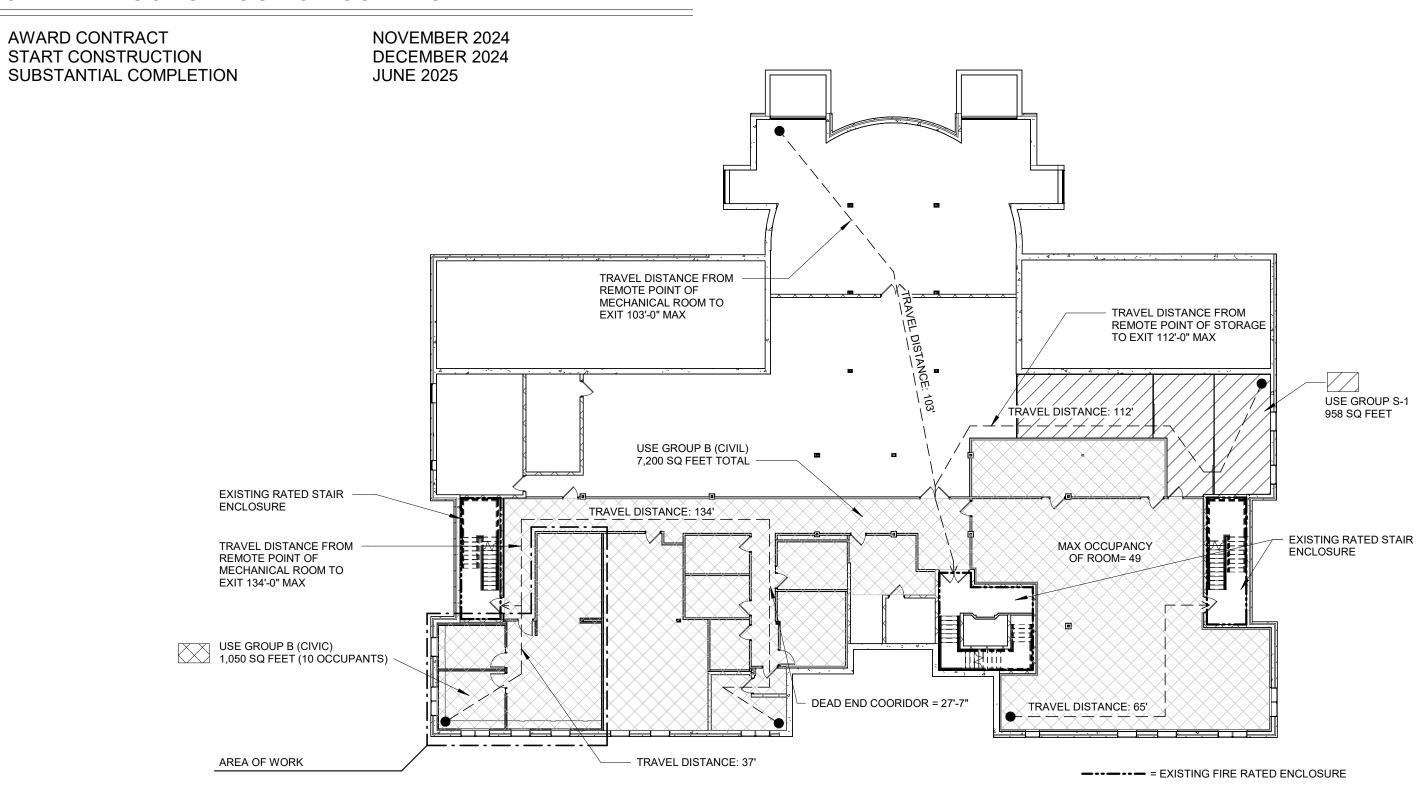
- 13.ALL MATERIALS USED ARE REQUIRED TO BE OF GOOD QUALITY AND MEET OR EXCEED ALL APPLICABLE INDUSTRY STANDARDS.
- 14.ALL WORK IS TO BE DONE WITH THE APPROPRIATE TOOLS AND MATERIALS. THE ARCHITECT HAS THE RIGHT TO REJECT ANY WORK NOT DONE APPROPRIATELY.
- 15.REMOVE ALL TRASH AND DEBRIS FROM THE SITE. WASH ALL SURFACES DUST AND
- 16.REPLACE ALL CONCRETE FLOOR WHICH WAS REMOVED AND OR DAMAGED FOR /
- 17.ALL CONTRACTORS AND SUBCONTRACTORS SHALL PROVIDE ALL WORK SHOWN IN ANY PART OF THE DOCUMENTS, I.E. HAND DRYER SHOWN ON ARCHITECTURAL DRAWINGS

MUST BE WIRED BY THE ELECTRICIAN WHETHER IT IS OR IS NOT SHOWN ON THE

- 18.THE GENERAL CONTRACTOR SHALL PROVIDE A MIN. 2 YEAR (U.N.O.) WARRANTY ON ALL MATERIAL, EQUIPMENT AND WORK PERFORMED.
- 19.THE GENERAL CONTRACTOR SHALL SUBMIT SEALED ENGINEERED FIRE SUPPRESSION SYSTEM DESIGN DRAWINGS AND SPECIFICATIONS AS A DELAYED SUBMITTAL TO AUTHORITIES HAVING JURISDICTION COMPLIANT WITH ALL APPLICABLE CODES AND REQUIREMENTS, INCLUDING, BUT NOT LIMITED TO MICHIGAN BUILDING CODE AND NFPA 13 REQUIREMENTS.
- 20. PROVIDE FIRE DAMPERS FOR DUCTS THAT PENETRATE RATED WALL AND FLOOR ASSEMBLIES

GENERAL CONSTRUCTION SCHEDULE

ELECTRICAL DRAWINGS.





2015 MICHIGAN BUILDING CODE

ALL ITEMS REFERENCE 2015 MICHIGAN BUILDING CODE UNLESS NOTED OTHERWISE

USE GROUP (SECTION 302) (PER EXISTING PLANS)
'A-2' ASSEMBLY (MAIN LEVEL)

'A-2' ASSEMBLY (MAIN LEVEL)
'B' BUSINESS (2ND LEVEL)
'B' BUSINESS (BASEMENT) CIVIC ADMISTRATION AND 'S-1' PAPER AND BOOKS

TYPE OF CONSTRUCTION (SECTION 601) (PER EXISTING PLANS)
TYPE 2-A

BUILDING AREA (503) (SEPERATED USE PER EXISTING PLANS)
ALLOWABLE AREA (TABLE 506.2)

'A-2' ASSEMBLY 46,500 S.F. (MAIN LEVEL)
'B' BUSINESS 112,500 S.F.

TABLE 508.4 (BASEMENT)
B & S-1 = N (NO SEPERATION REQUIRED)

AREA OF BASEMENT = 15,026 S.F. ETR

BUILDING HEIGHT (SECTION 503) ALLOWABLE HEIGHT (TABLE 504.3 AND 504.4) 'A-2' ASSEMBLY 85', 4 STORY

'B' BUSINESS 85', 6 STORY

OCCUPANT LOAD (TABLE 1004.1.2) (BASEMENT)
1ST FLOOR = 225 (PER EXISTING PLANS)
2ND FLOOR = 30 (PER EXISTING PLANS)
BASEMENT = 75 (PER EXISTING PLANS)
B= 7,200 SQ FEET/100 GROSS = 72 ETR

REQUIRED PLUMBING BASEMENT FIXTURES (2018 MICHIGAN PLUBMING CODE TABLE 403.1)
BUSINESS
WC: 1 PER 25 FOR 1ST 50, 1 PER 50 FOR REMAINDER

2 REQUIRED, 2 PROVIDED FOR MEN AND WOMEN

1 AV 1 PER 40 FOR 1ST 80 1 PER 80 FOR REMAINDER

1 REQUIRED, 1 PROVIDED FOR MEN AND WOMEN

1 REQUIRED, 1 PROVIDED

DRINKING FOUNTAIN: 1 PER 100 1 REQUIRED, 1 PROVIDED

COMMON PATH OF TRAVEL (TABLE 1006.2.1)
B & S WITH SUPPRESSION = 100' MAX

NUMBER OF EXITS (TABLE 1006.3.1)
BUSINESS = 2 REQUIRED, 3 PROVIDED

DEAD-END CORRIDORS (SECTION 1020.4) 27' - 7" PROPOSED, MAXIMUM LENGTH (50'-0")

EXIT WIDTH (TABLE 1020.2)
MINIMUM 44" 60" PROVIDE

SQUARE SINK:

NIINIINION 44, 60 PROVIDED

EXIST TRAVEL DISTANCE (TABLE 1017.2)
MAXIMUM 300' (WITH SPRINKLER SYSTEM), 138' PROVIDED

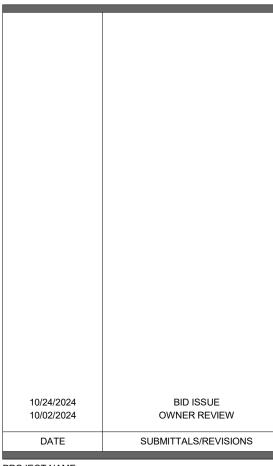
S PER NFPA, EXISTING

ANDERSON, ECKSTEIN AND WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS
51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
Michigan 48315

ENGINEERING STRONG COMMUNITIES

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PROJECT NAME:

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

GENERAL PROJECT INFORMATION

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD

DRAWN BY: CHECKED BY: DATE:
ARD JRA AUGUST 2024

SCALE:

AS NOTED



UTILITY INFORMATION, AS SHOWN, INDICATES
APPROXIMATE LOCATIONS AND TYPES OF EXISTING
FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED
TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO
GUARANTEE IS GIVEN OR IMPLIED AS TO THE
COMPLETENESS OR ACCURACY THEREOF.

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE INCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

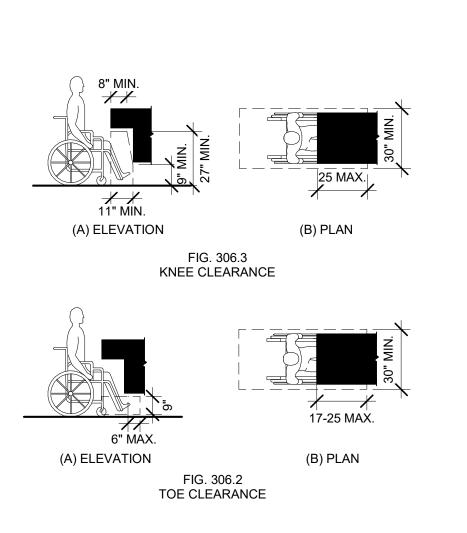
DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

PROJECT NO.

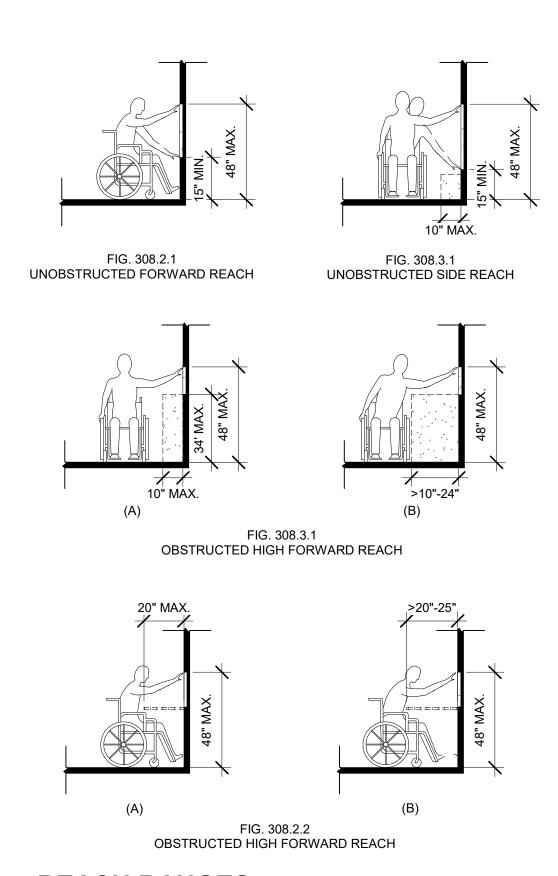
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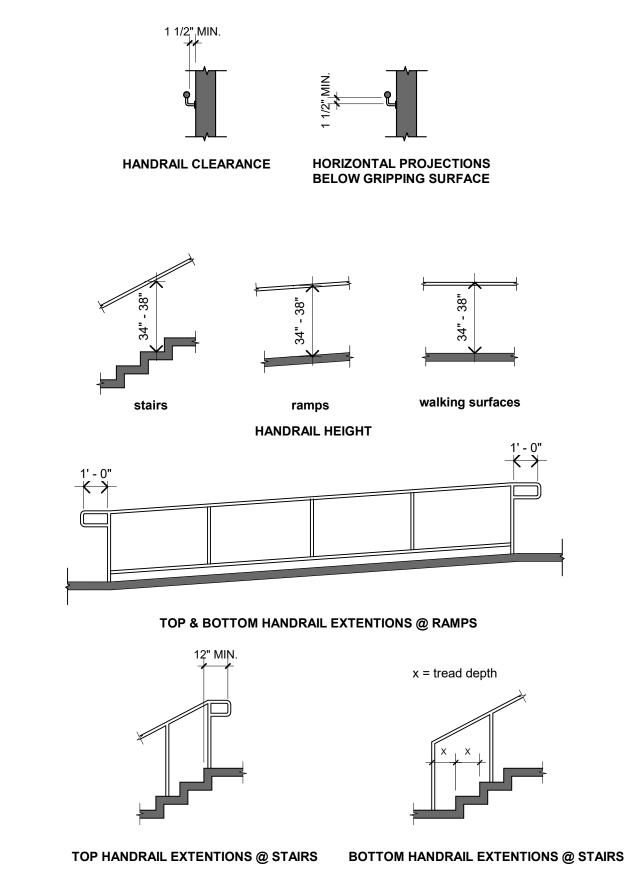
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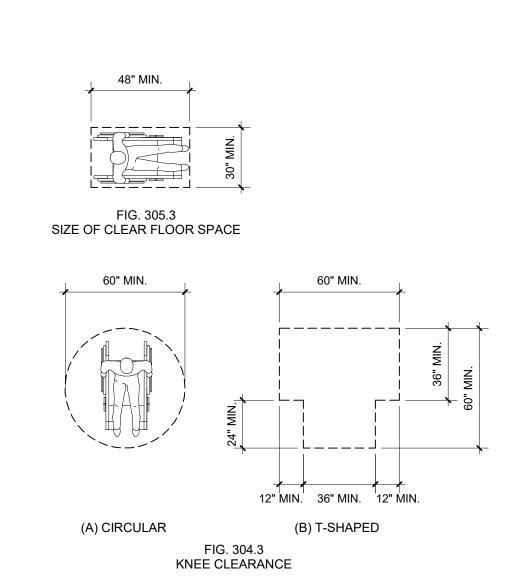
KNEE CLEARANCE



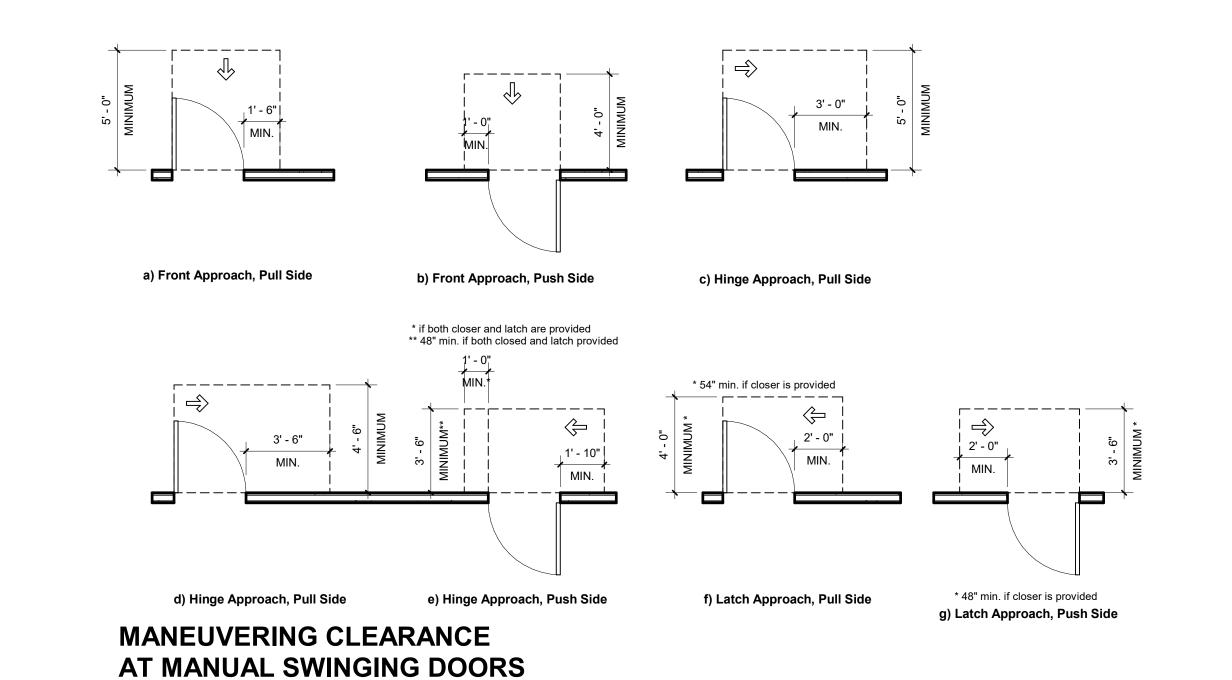
REACH RANGES

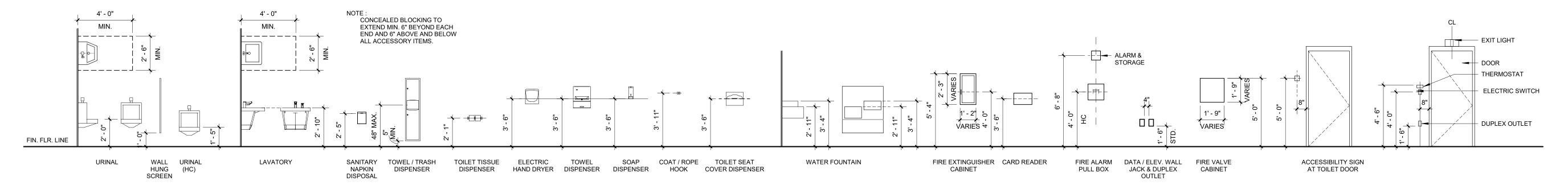


ADA REFERENCE - HANDRAIL DETAILS



TURNING SPACE & CLEARANCE SPACE





GENERAL INFO. - STANDARD MOUNTING HEIGHTS

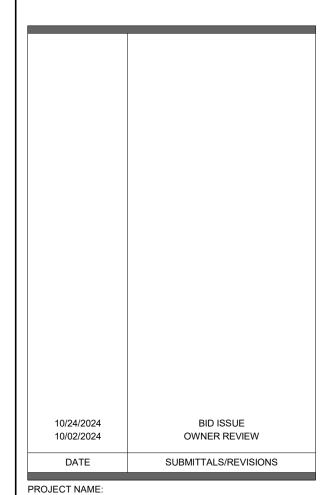


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CIVIL ENGINEERS SURVEYORS ARCHITECTS 51301 Schoenherr Road Phone 586 726 1234 Shelby Township Fax 586 726 8780 Michigan 48315

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MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE:

ADA DETAILS

MACOMB TOWNSHIP

PRELIMINAR	CONSTRU	CTION RECORD					
DRAWN BY:	CHECKED BY:	DATE:					
ARD	OCTOBER 2024						
SCALE:							
	AS NOTED						
AS NOTED							



UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF EXISTING FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE

COMPLETENESS OR ACCURACY THEREOF. PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE INCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH THAT UTILITY).

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

PROJECT NO. 0249-0338



GENERAL TRADES SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

- 1. ALL WORK SHALL COMPLY WITH STATE AND LOCAL BUILDING CODES AS THEY APPLY.
- 2. THE ENTIRE FLOOR SHALL BE ACCESSIBLE TO THE PHYSICALLY HANDICAPPED AND MEET ALL REQUIREMENTS OF A.D.A. & MICHIGAN BARRIER FREE DESIGN CODE.
- 3. ALL PROVISIONS OF "DIVISION 0" BIDDING REQUIREMENTS, CONTRACTS, FORMS AND CONDITIONS OF CONTRACT AND "DIVISION 1" - GENERAL REQUIREMENTS, FORM A PART OF EACH DIVISION GIVEN ON THIS DRAWING SHEET.
- 4. CONTRACTOR IS REQUIRED TO CARRY WORKERS, LIABILITY, AND BUILDERS RISK INSURANCE POLICIES.
- 5. CONTRACTORS AND SUBCONTRACTORS SHALL PROVIDE ALL WORK SHOWN IN ANY PART OF THE DOCUMENTS, I.E. HAND DRYER SHOWN ON ARCHITECTURAL DRAWINGS MUST BE WIRED BY THE ELECTRICIAN WHETHER IT IS OR IS NOT SHOWN ON THE ELECTRICAL DRAWINGS.
- 6. CONTRACTOR SHALL PROVIDE A MIN. 2 YEAR WARRANTY ON ALL MATERIAL, EQUIPMENT AND WORK PERFORMED.
- 7. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS, FEES, AND INSPECTION

DIVISION 5- METALS

- LIGHT GAGE METAL FRAMING

 1. COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE MICHIGAN BUILDING CODE AND THE AMERICAN IRON AND STEEL INSTITUTE, SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS AND THE CENTER FOR COLD-FORMED STEEL STRUCTURES TECHNICAL BULLETIN, VOL. 2 NO.1,1996; AISI SPECIFICATION PROVISIONS FOR SCREW CONNECTIONS.
- 2. COLD FORMED STEEL FRAMING SHOWN ON CONTRACT DRAWINGS ARE BASED ON STEEL CONTRACTOR MUST SUBMIT ENGINEERED PRODUCT INFORMATION SHOWING THAT MANUFACTURER'S SUPPLIED MEMBERS PROVIDE EQUIVALENT STRENGTH AND STIFFNESS.
- 3. INSTALLING CONTRACTOR SHALL SUBMIT SEALED CALCULATIONS AND SHOP DRAWINGS INDICATING CAPACITY OF MEMBER, FRAMING DETAILS, CONNECTIONS, BRACING, BRIDGING AND ALL OTHER ACCESSORIES CONFORMING TO DESIGN CRITERIA. CALCULATIONS AND SHOP DRAWINGS SHALL BE PREPARED BY AN ENGINEER EXPERIENCED IN THE DESIGN OF LIGHT GAGE CONSTRUCTION AND LICENSED IN THE STATE OF MICHIGAN.
- 4. COLD-FORMED METAL FRAMING SHALL BE OF THE SIZE, GAGE AND SECTION PROPERTIES AS REQUIRED FOR THE SPECIFIC LOADING CONDITION AND CONFORM TO ASTM A653. ALL METAL FRAMING 16 GAGE AND HEAVIER SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI. ALL METAL FRAMING 18 GAGE AND LIGHTER SHALL HAVE A MINIMUM YIELD STRENGTH OF 33 KSI. ALL FRAMING SHALL BE HOT-DIPPED GALVANIZED (G-60) IN ACCORDANCE WITH ASTM
- 5. WELDING OF LIGHT GAGE METAL FRAMING SHALL NOT BE PERMITTED.
- 6. ALL METAL FRAMING SHALL BE SAW CUT, SQUARE AND TRUE. CUTTING OF METAL FRAMING WITH A TORCH WILL NOT
- 7. NO SPLICES WILL BE PERMITTED IN ANY FRAMING UNLESS SHOWN OR NOTED ON THE DRAWINGS.
- 8. CONNECTIONS FOR LIGHT GAGE FRAMING SHALL BE AS MANUFACTURED BY THE STEEL NETWORK, INC. OR APPROVED SUBSTITUTE.

DIVISION 8 - OPENINGS :

- . HOLLOW METAL DOOR FRAMES: 18 GA. (MIN.) STEEL WITH ZINC COATING AND FACTORY BAKED ON PRIMER. CONFORM TO REQUIREMENTS OF ANSI À250.8. FABRICATE TO SUIT MASONRY WALL CAUSING (4 IN. HEAD MEMBER) AT MASONRY WALLS, AND WITH HOLES FOR SILENCERS. APPROVED MANUFACTURERS: STEELCRAFT, CURRIES OR APPROVED EQUAL (MUST BE MEMBER OF STEEL DOOR INSTITUTE). COORDINATE DOORS WITH FINISH HARDWARE. SEE SHEET (DOOR SCHEDULE) AND SECTION 08710 - FINISH HARDWARE.
- 2. COORDINATE DOORS WITH FINISHED HARDWARE.
- 3. ALL LOCKS SHALL BE MASTER KEYED AND KEYED ALIKE, AS DIRECTED BY OWNER AND ARCHITECT. COORDINATE WITH EXISTING KEY SYSTEM.
- 4. FINISH HARDWARE. COORDINATE WITH DOORS AND FRAMES. KEYING WITH OWNERS APPROVAL. PROVIDE ALL HARDWARE APPROVED MANUFACTURERS AS FOLLOWS (OR APPROVED EQUAL): CONSULT OWNER / OWNER'S REP. FOR HARDWARE KEYING REQUIREMENTS AND FINISHES.
- 5. INTERIOR GLAZING (NON RATED) 1/4" CLEAR TEMPERED FLOAT GLASS.
- 6. INTERIOR WOOD DOORS: 1 3/4" INCHES THICK, SOLID CORE CONSTRUCTION, WHITE OAK VENEER PLAIN SLICED W/ PAIR MATCHED GRAIN, PRE-FINISHED STAIN (MATCH EXISTING). MATCH EXISTING APPROVED MANUFACTURERS AS FOLLOWS (OR APPROVED EQUAL):
 - ALGOMA HARDWOODS MANSFIELD DOOR SYSTEMS MOHAWK

DOOR HARDWARE

GENERAL NOTES:

- 1. CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS AND NOTIFY ARCHITECT IMMEDIATELY IF THAT WHICH EXISTS DIFFERS FROM THAT WHICH IS SHOWN ON DRAWINGS.
- 2. ALL WORK TO COMPLY WITH CURRENT FEDERAL, STATE AND LOCAL CODES, LAWS AND ORDINANCES. THE REQUIREMENTS OF ICC/ANSI A117.1 AND THE AMERICANS WITH DISABILITIES ACT (ADA) ARE TO BE FULLY SATISFIED. ALL WORK SHALL MEET THE MOST STRINGENT REQUIREMENTS OF BOTH INCLUDING, BUT NOT LIMITED TO CLEARANCES, LIMITATIONS, ACCESSORIES, ETC.
- 3. THESE DRAWINGS ARE PREPARED IN ACCORDANCE WITH THE LIMITED SERVICES FOR WHICH THE ARCHITECT WAS CONTRACTED. THE ARCHITECT MAKES NO REPRESENTATION THAT THE INTERPRETATION OF THESE DOCUMENTS WILL RESULT IN COMPLETE COMPLIANCE WITH THE ADA.
- 4. ALL DOORS REQUIRED TO BE LABELED SHALL BE SET IN LABELED FRAMES AND IDENTIFIED WITH UL LABEL AND BE PROVIDED WITH APPROVED SELF-CLOSING DEVICES AND POSITIVE LATCHING HARDWARE.
- 5. ALL DESIGNATED EXIT DOORS SHALL BE EQUIPPED WITH THE REQUIRED EGRESS HARDWARE.
- 6. FURNISH HARDWARE AS SCHEDULED WITHOUT SUBSTITUTION, NO ALTERNATES WILL BE APPROVED.
- 7. PROVIDE COMBINATED CYLINDERS AND CUT KEYS; KEYED TO OWNERS' MASTER SYSTEM. INCLUDE KEY CONFERENCE AND KEY SYSTEM SCHEDULE. FURNISH A KEYED CYLINDER AND TWO CUT KEYS FOR EACH LOCKING DEVICE SPECIFIED.
- 8. FURNISH AND PROVIDE ALL NECESSARY REINFORCEMENTS, BRACKETS, FASTENERS, SPACERS AND FILLERS TO PROVIDE A COMPLETE FUNCTIONING OPENING.
- 9. PROVIDE COMPLETE SHOP DRAWINGS, SUBMITTALS AND CUT SHEETS COMPLYING WITH DHI PRESCRIBED METHODS AND VERTICAL FORMAT DOUBLE SPACED HARDWARE SCHEDULE.

HARDWARE SET 1 – BID ALTERNATE-RELOCATE EXISTING DOOR AND HARDWARE IN NEW FRAME

HARDWARE SET 2 - OFFICE LOCK [LOCK / UNLOCK]

- 3 EA. BUTT HINGE BB81 4 ½" X 4 ½" NRP
- EA. OFFICE LOCKSET MR 116 BJSJ SF7 1 EA. WALL STOP 1407

32D

HARDWARE SET 3 - RELOCATE EXISTING DOOR AND HARDWARE IN NEW FRAME. ENSURE HARDWARE FUNCTIONS PROPERLY AFTER RELOCATION

DIVISION 9 - FINISHES

- SEALANTS:
 - COLOR: MATCH ADJACENT MATERIAL
- 2. GYPSUM BOARD SHALL BE 5/8" THICK MANUFACTURED BY UNITED STATES GYPSUM COMPANY OR EQUAL. USE WATER RESISTANT GREEN BOARD IN TOILET ROOMS. USE 5/8" TYPE "X" AND C" FIRECODE BOARD WHERE NOTED. A. ABUSE RESISTANCE GYPSUM WALLBOARD (VHI - VERY HIGH IMPACT) ASTM C1278 AND C1629 MANUFACTURED TO PRODUCE GREATER RESISTANCE TO SURFACE IDENTIFICATION AND THROUGH PENETRATION THAN STANDARD GYPSUM PANELS, 5/8" THICK WITH TAPERED EDGES.
 - 1. GOLD BOND HI-IMPACT BRAND XP WALLBOARD; NATIONAL GYPSUM COMPANY. (WITH PROFOAM JOINT TAPE AND PROFOAM READY MIX OR SETTING COMPOUND)
 - FIBEROCK BHI BREAND ABUSE RESISTANT GYPSUM PANELS; UNITED STATES GYPSUM CO. AIR RENEW EXTREME IMPACT - CERTAINTEED
- 3. PAINT FINISHES SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. APPROVED MANUFACTURER'S: PT-1: WALL PAINT: PPG WINDSWEPT BEACH
 - PT-2: CEILING PAINT: SHERWIN WILLIAMS IRON ORE
- USE BENJAMIN MOORE IRON CLAD RETARDO RUST INHIBITIVE PAINT ON ALL STEEL DOORS, FRAMES AND LINTEL
- 4. CARPETING SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS A. SHAWCONTRACT: LANDFORM TILE 5T449 MARBLE 06101
- 5. SPECIALTY SURFACES SOLID POLYMER FABRICATIONS (WINDOW SILLS)
- A. MATERIAL 1/2" HOMOGENEOUS FILLED ACRYILIC; NOT COATED B. LAMINATED OR OF COMPOSITE CONSTRUCTION; MEETINGS ANSI Z124.3 & .6, TYPE SIX, AND FED. SPEC. WW-
- a. MATERIAL SHALL HAVE MINIMUM PHYSICAL AND PERFORMANCE PROPERTIES SPECIFIED UNDER TESTING b. SUPERFICIAL DAMAGE TO DEPTH OF0.010" (.25MM) SHALL BE REPAIRABLE BY SANDING AND POLISIHING
- C. MANUFACTURER a. CORIAN - ANTARCTICA (MATCH EXISTING)
- b. OR EQUAL D. ACCESSORY PRODUCTS
- a. JOINT ADHESIVE: MANUFACTURERS'S STANDARD TWO-PART ADHESIVE KIT TO CREATE INCONSPICUOUS,
- NON-POROUS JOINT, WITH A CHEMICAL BOND. b. SEALANT: MANUFACTURER'S STANDARD MILDEW-RESISTANT, FDA/UL RECOGNIZED SILICONE SEALANT IN COLOR MATCHING OR CLEAR FORMULATIONS
- 6. RESILIENT WALL BASE SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS A. JOHNSONITE 4" MOON ROCK

DIVISION 10 - SPECIALTIES

- 1. FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES:
 - a. JL INDUSTRIES, INC www.jlindustries.com (OR APPROVED EQUAL)
- 2. PLAQUE IDENTIFICATION SIGNS FOR INTERIOR APPLICATION SHALL BE STANDARD 6"x6" SIZE WITH RADIUSED CORNERS; .080" THICK BACK- PLATE LAMINATED TO FACEPLATE SURFACE; BACKPLATE BACKGROUND AS SELECTED BY ARCHITECT. TYPE SPF AS MANUFACTURED BY ASI SIGN SYSTEM OR APPROVED EQUAL.
- CORNER GUARDS A. ACROVYN 4000 MODEL SM-20N AS MANUFACTURED BY CONSTRUCITON SPECAILTIES

DIVISION 21 - FIRE PROTECTION/ALARM

- 1. FIRE PROTECTION AN ALARM SYSTEM DESIGN BUILT BY FIRE SUPPRESSION CONTRACTOR AND ELECTRICIAN
- 2. CONTRACTORS TO SUBMIT A FULL SET OF FIRE SUPPRESSION AND ALARM PLANS TO CITY AND FIRE MARSHAL FOR APPROVAL PRIOR TO CONSTRUCTION



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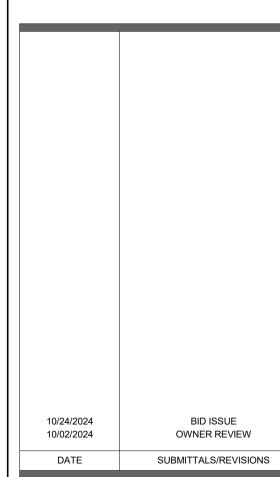
CIVIL ENGINEERS SURVEYORS ARCHITECTS 51301 Schoenherr Road Phone 586 726 1234

Fax 586 726 8780

Michigan 48315 www.aewinc.com

Shelby Township

ENGINEERING STRONG COMMUNITIES



PROJECT NAME:

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE

SHEET TITLE:

SPECIFICATIONS

MACOMB TOWNSHIP

CHECKED BY: OCTOBER 2024 SCALE: AS NOTED



UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF EXISTING

72 hours before you dig.

FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS

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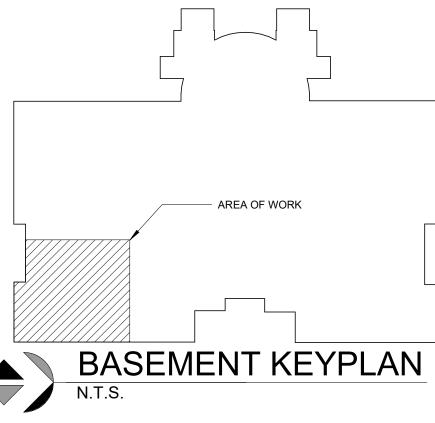
PROJECT NO.

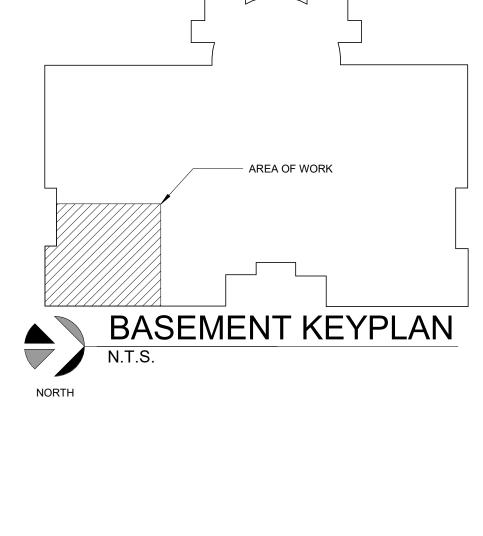
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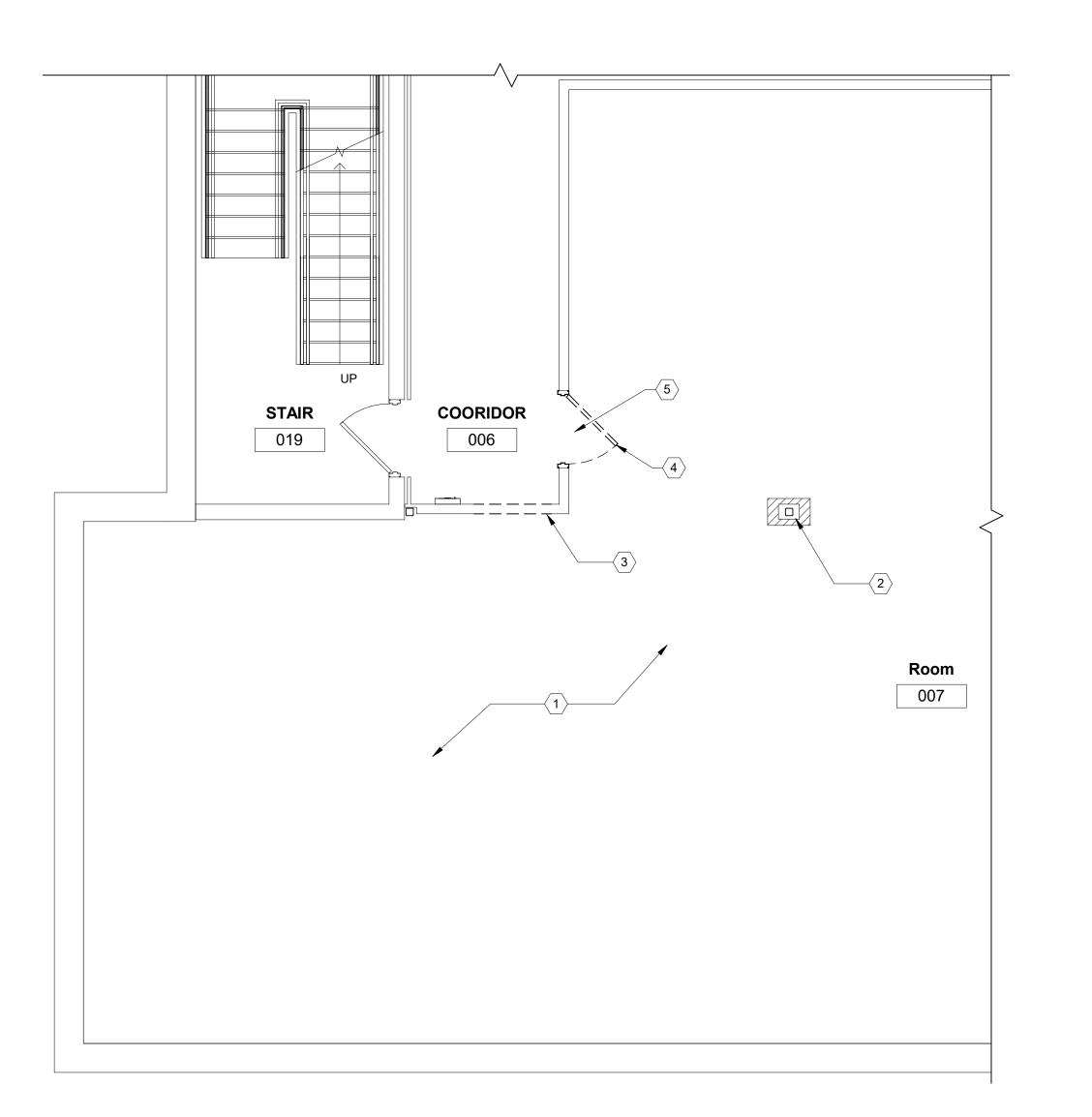
Build Out Phase 2.rvt 10/24/2024 4:27:31 PM

DEMOLITION PLAN KEYNOTES

- 1 PREPARE CONC. FLOOR FOR NEW FLOORING AS NECESSARY
- 2 REMOVE EXISTING COLUMN ENCLOSURES
- REMOVE EXISTING WALL UP TO 7' 2" PREPARE OPENING FOR NEW GYP. BD. FINISH AS NECESSARY
- 4 SALVAGE EXISTING DOOR AND HARDWARE FOR RELOCATION
- 5 REMOVE EXIT SIGN ABOVE DOOR AND PREPARE FOR RELOCATION









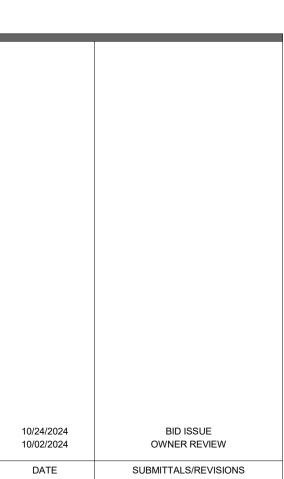


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PROJECT NAME:

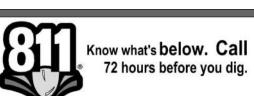
MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE:

ENLARGED BASEMENT DEMOLITION PLAN

MACOMB TOWNSHIP

PRELIMINAR	Y CONSTRU	CTION RECORD					
DRAWN BY:	CHECKED BY:	DATE:					
LJD	JRA	OCTOBER 2024					
SCALE:	•						
	AS NOTED						



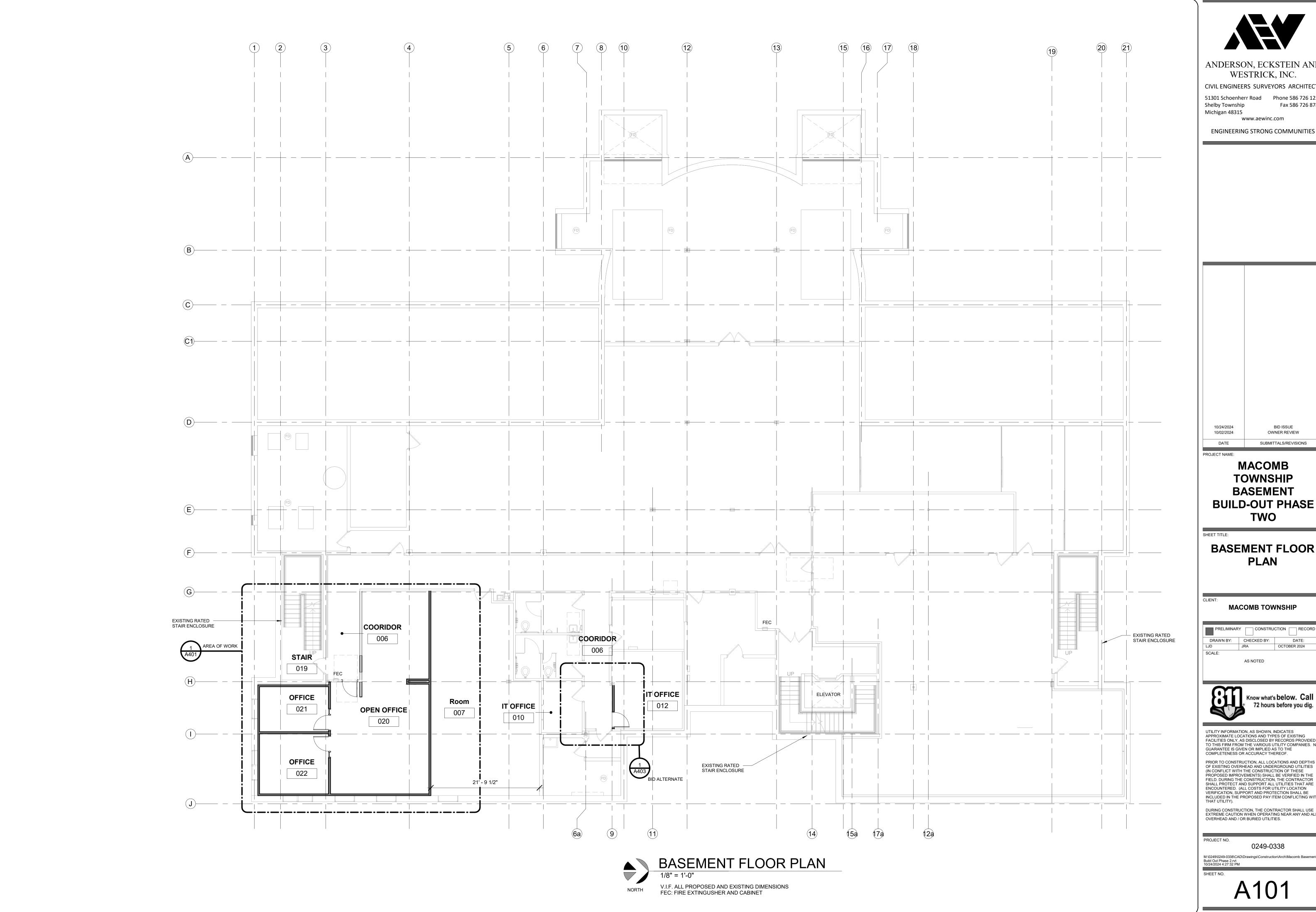
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PROJECT NO.

0249-0338





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10/24/2024 BID ISSUE OWNER REVIEW 10/02/2024 SUBMITTALS/REVISIONS

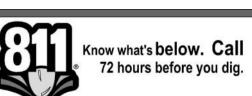
PROJECT NAME:

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

BASEMENT FLOOR PLAN

MACOMB TOWNSHIP

CHECKED BY: DAIL.
OCTOBER 2024 AS NOTED



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PROJECT NO.

0249-0338

CEILING LEGEND EMERGENCY LED LIGHTING LED EXIT SIGN W/ EMERGENCY LIGHTING EXISTING GYP. CEILING EXISTING ACT CEILING EXISTING SUPPLY DIFFUSER

EXISTING RETURN GRILLE

EXISTING LED LIGHTING FIXTURE

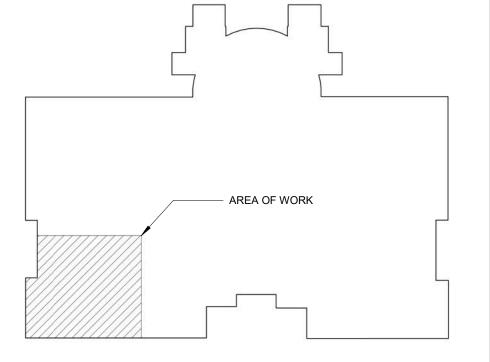
PARTITION TYPES

A 3 5/8" METAL STUD @ 16" O.C. WITH 5/8" GYP. BOTH SIDES AND UNFACED BATT. SOUND INSULATION. RUN TIGHT TO STRUCTURE ABOVE. ALL WALLS TYPE A U.N.O

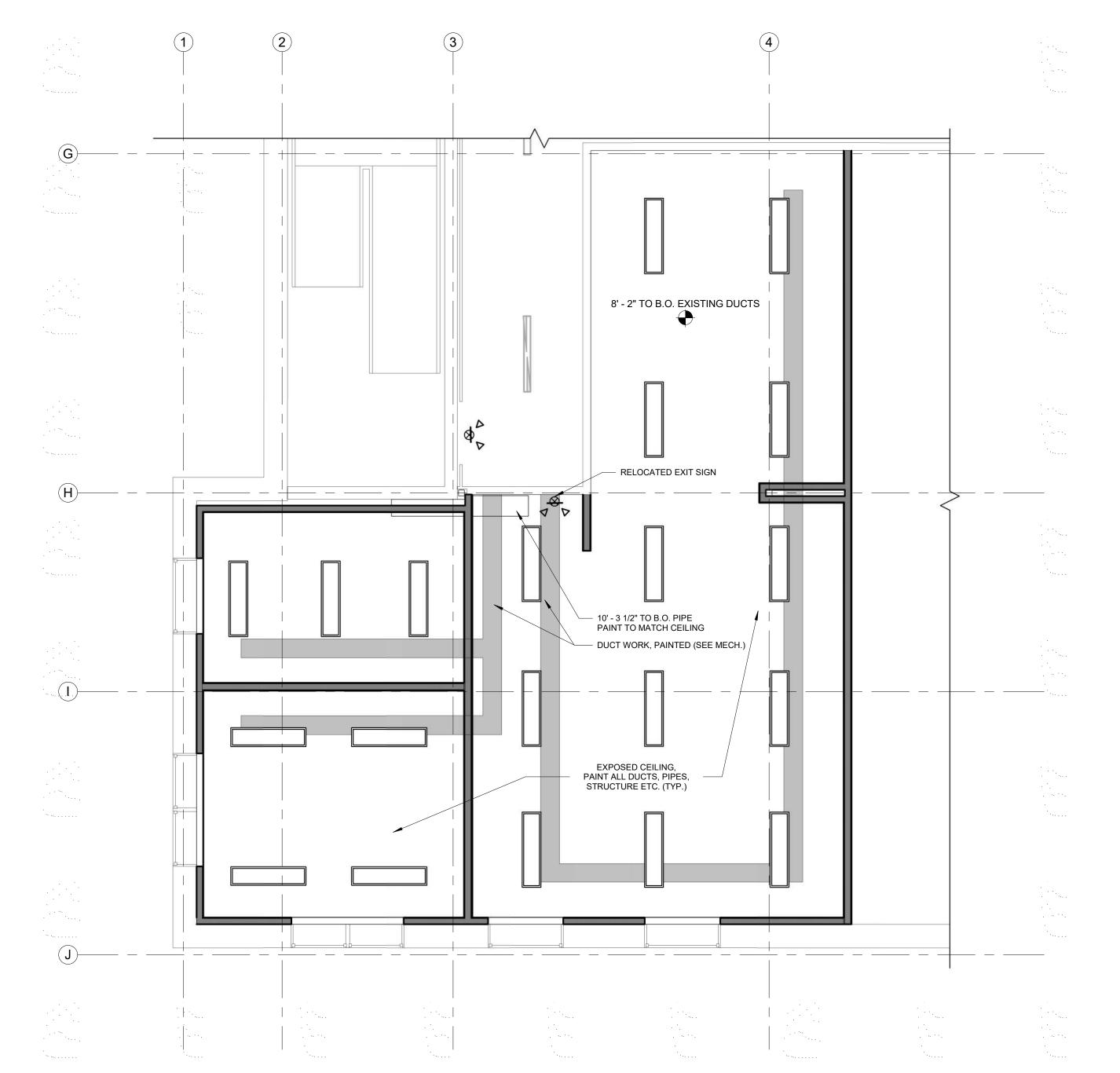
3 5/8" METAL STUD @ 16" O.C. WITH 1 LAYER OF 5/8" GYP. AND UNFACED BATT. SOUND INSULATION. RUN TIGHT TO STRUCTURE ABOVE.

FLOOR PLAN KEYNOTES

- 1) INFILL DOOR WITH METAL STUDS TO MATCH THICKNESS OF EXISTING WALL. GYP. BD. EACH SIDE, PAINTED
- RELOCATED DOOR, UNDER CUT IF REQURED. ENSURE THAT DOOR, FRAME AND HARDWARE ARE IN WORKING ORDER
- (3) CORNER GUARDS

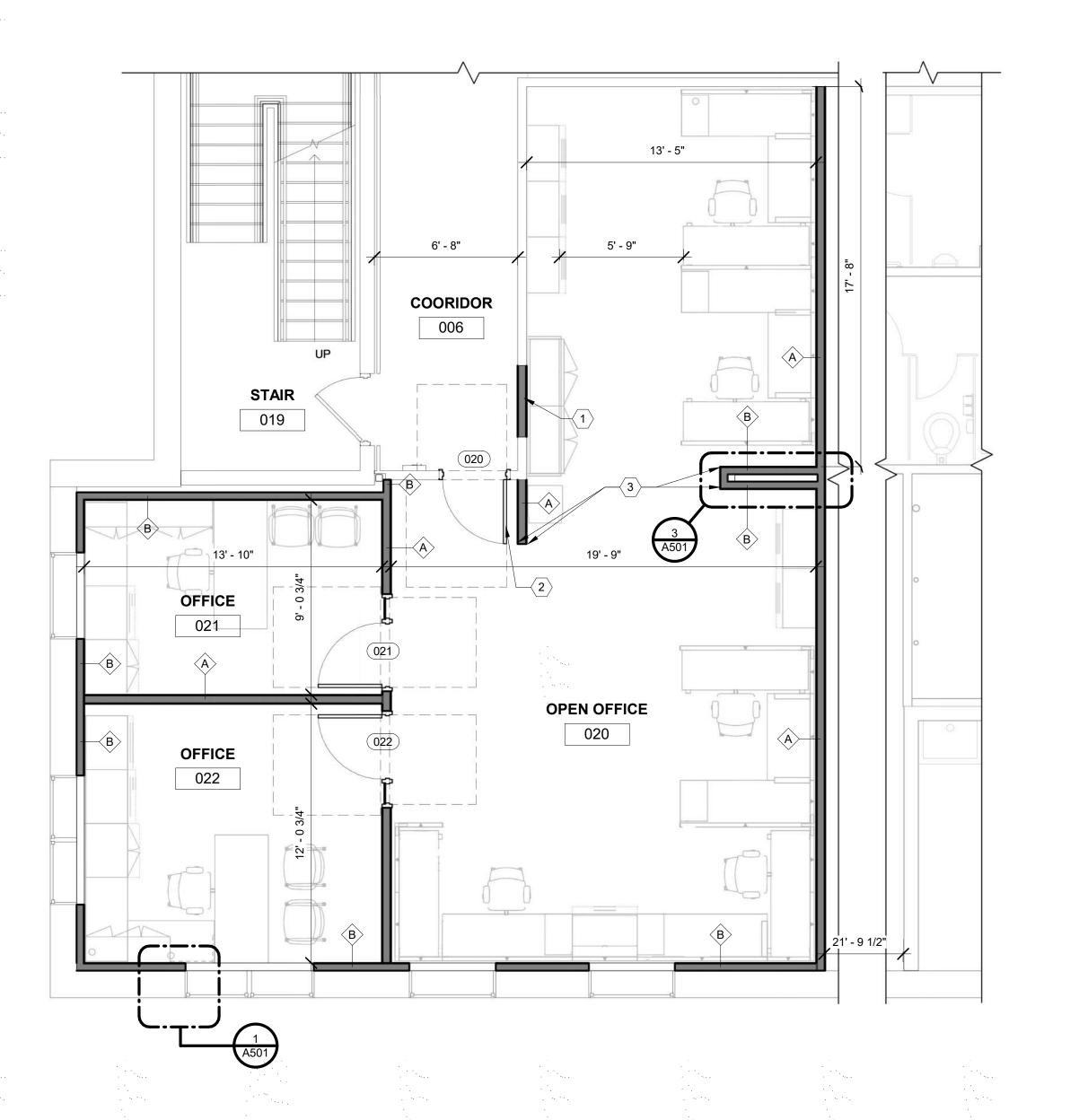






BASEMENT REFLECTED CEILING PLAN

1/4" = 1'-0"



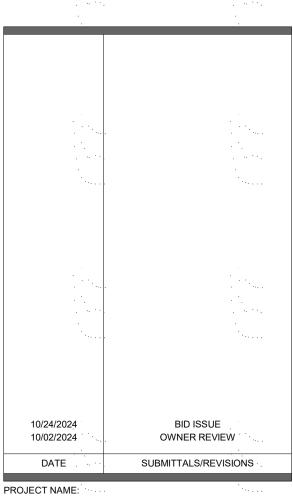




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MACOMB

TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

ENLARGED PLANS

MACOMB TOWNSHIP

AUGUST 2024 AS NOTED

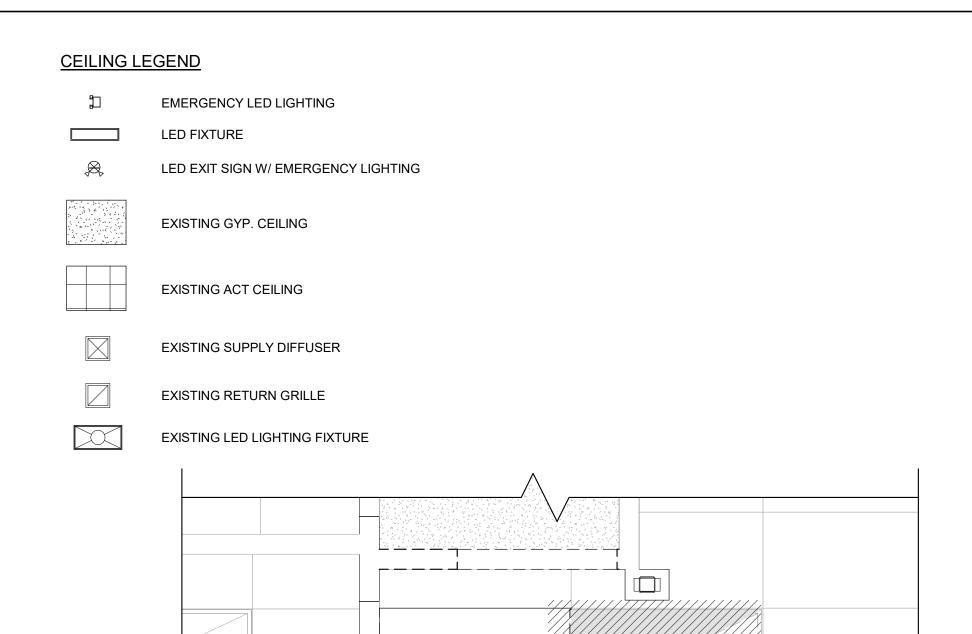


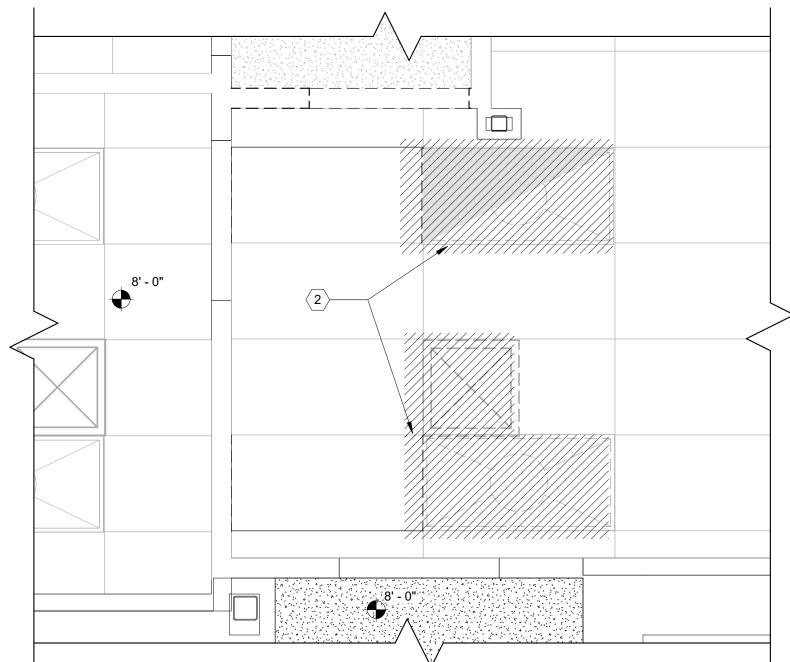
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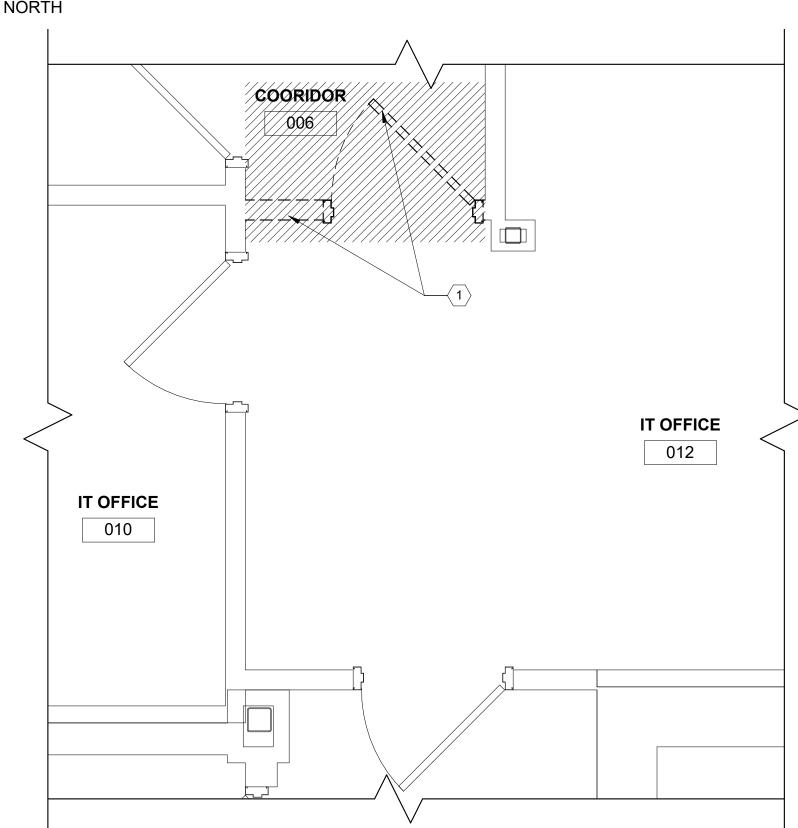
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PROJECT NO. 0249-0338









3 IT OFFICE DEMO PLAN
NORTH

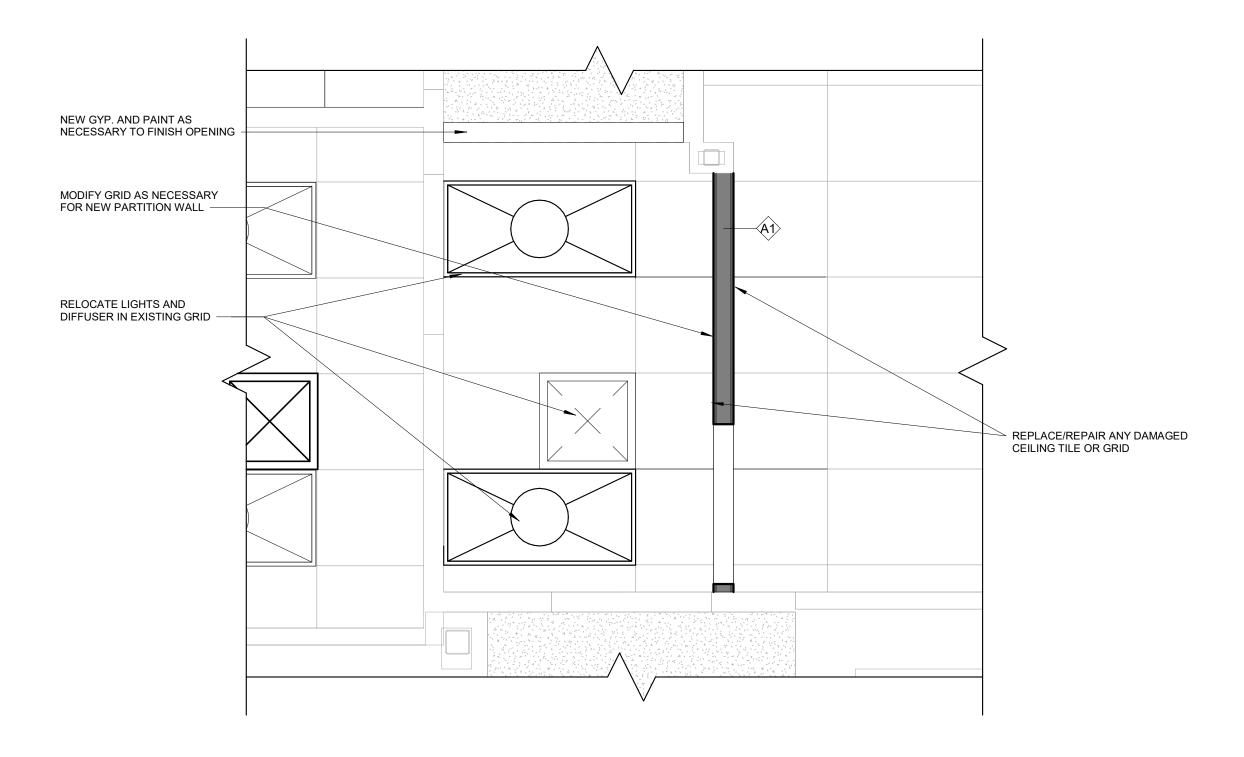
DEMOLITION PLAN KEYNOTES

BID ALTERNATE:

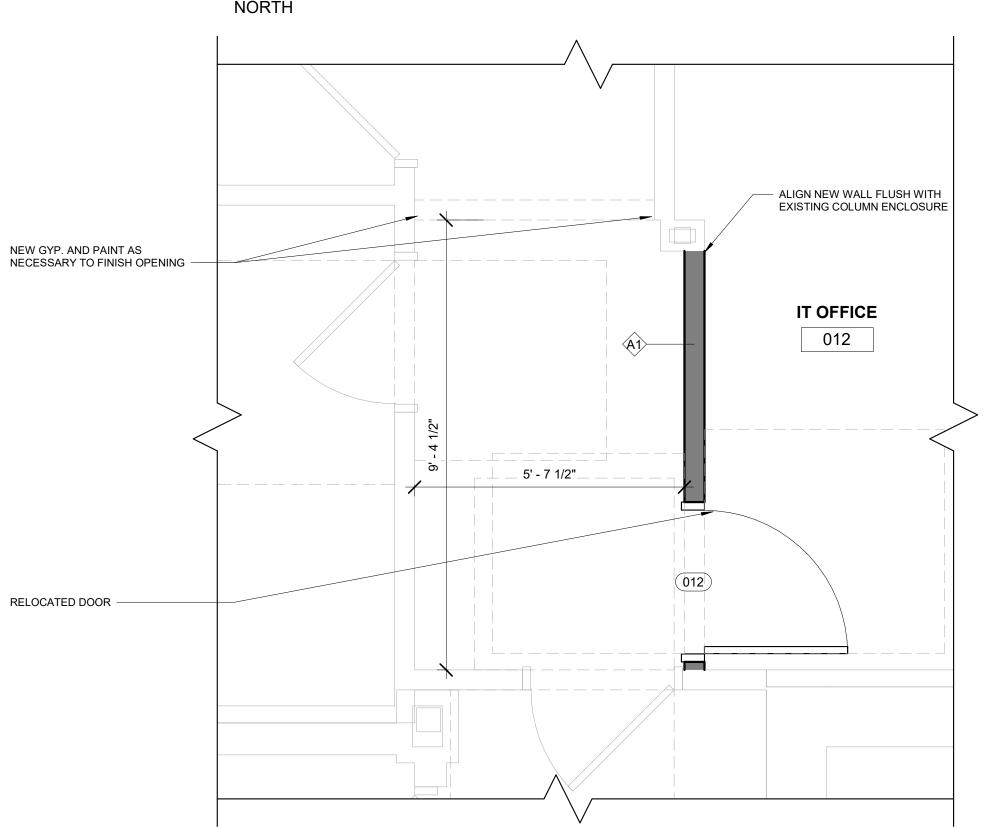
- REMOVE EXISTING WALL UP TO 7' 2", SALVAGE EXISTING DOOR FOR RELOCATION.
- PREPARE OPENING FOR NEW GYP. BD. FINISH AS NECESSARY
- REMOVE EXISTING LIGHTS AND DIFFUSER, SALVAGE FOR REINSTALLATION

PARTITION TYPES

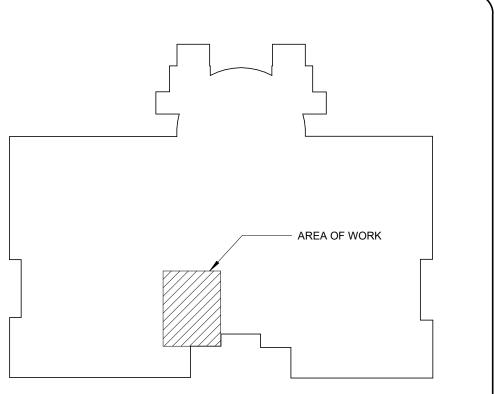
3 5/8" METAL STUD @ 16" O.C. WITH 5/8" GYP. BOTH
SIDES AND UNFACED BATT. SOUND INSULATION. RUN TO 4"
ABOVE EXISTING CEILING



2 IT ROOM REFLECTED CEILING PLAN









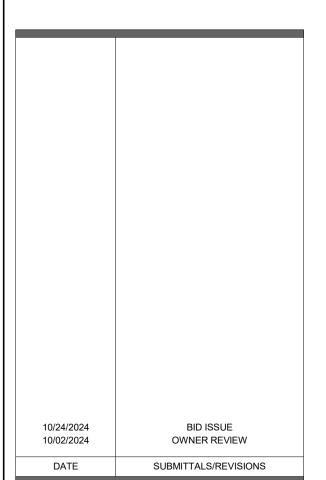


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PROJECT NAME:

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

BID ALTERNATE- IT ROOM ENLARGED PLANS

MACOMB TOWNSHIP

CHECKED BY: AS NOTED



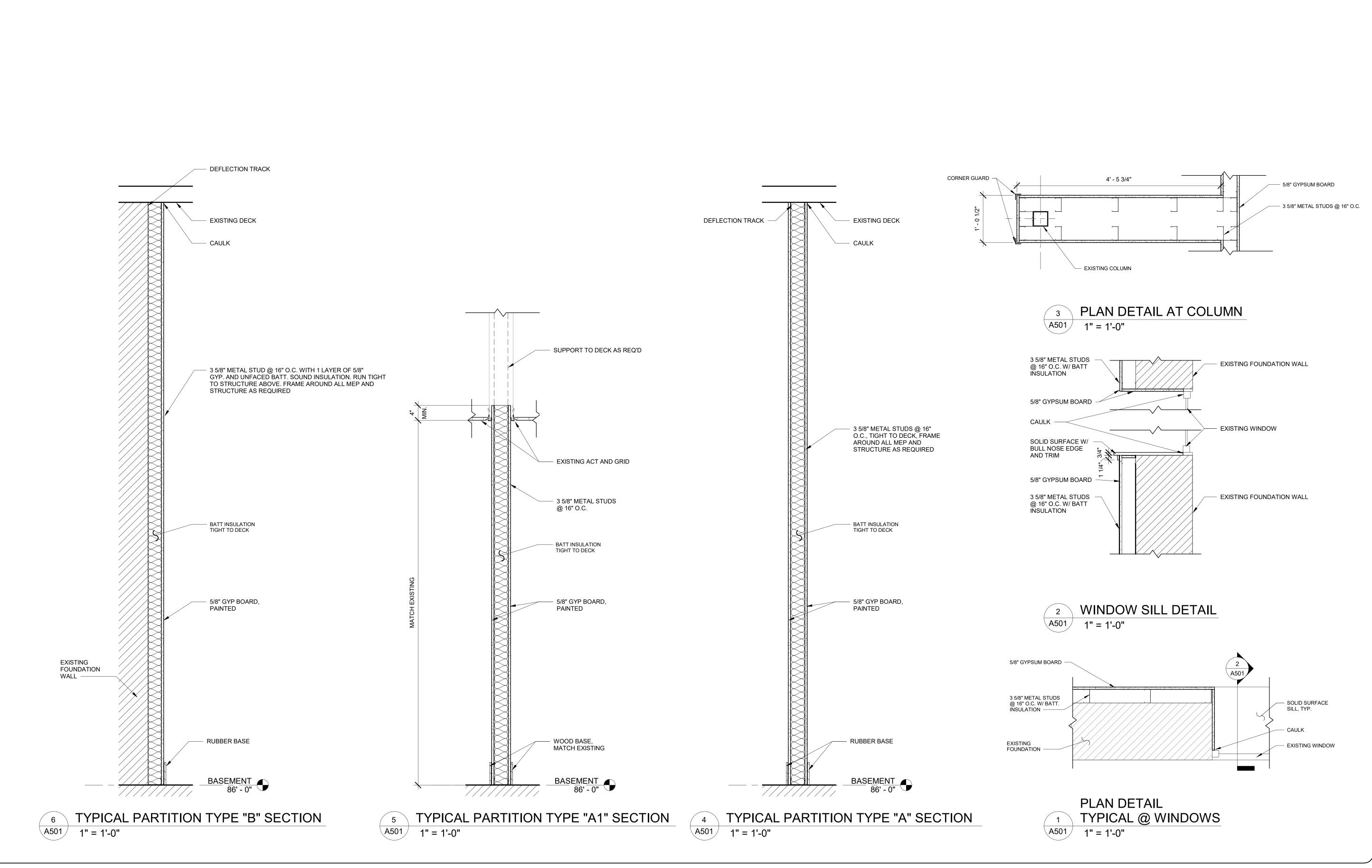
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PROJECT NO. 0249-0338



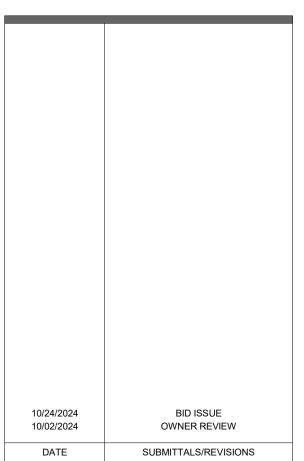


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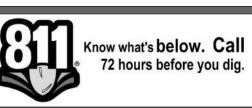
MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE:

ELEVATIONS AND DETAILS

MACOMB TOWNSHIP

DRAWN BY:	DRAWN BY: CHECKED BY:						
LJD	JRA	6/21/24					
SCALE:							
	AS NOTED						



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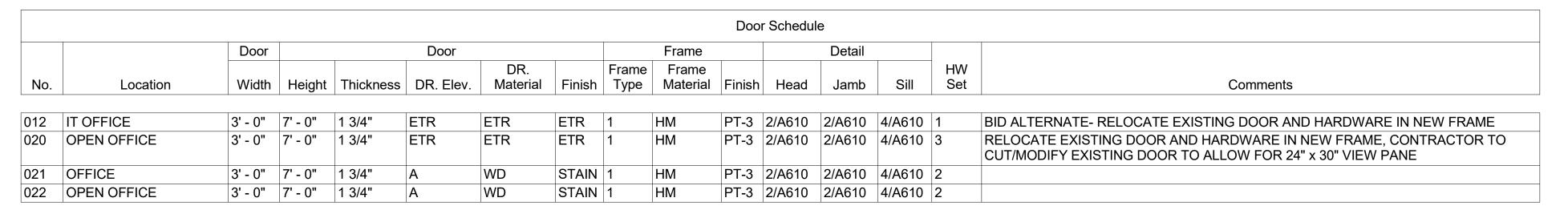
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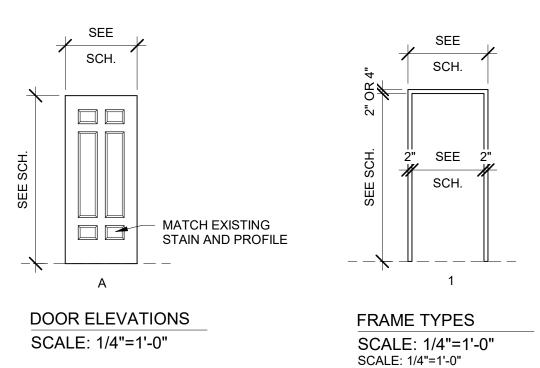
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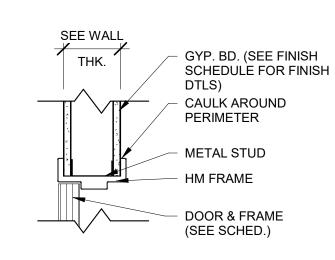
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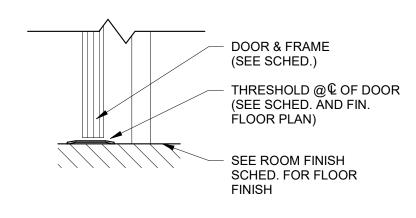
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SHEET NO.





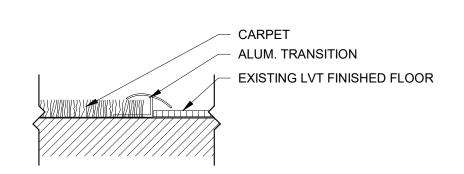






		HM DR FRAME @ MET. STUD
1	1	SILL DETAIL
A	610	1 1/2" = 1'-0"

ROOM FINISH SCHEDULE Floor Base Ceiling Ceiling Finish Finish Finish Height Wall Finish Number Name Comments BID ALT. ONLY. PATCH/ MODIFY IT OFFICE | WD | PT (MATCH EXISTING) | ETR FLOOR AND BASE AS REQ'D (MATCH EXISTING) OPEN OFFICE CPT PT-1/PT-2 **EXPOSED** PT-2 OFFICE RB PT-1/PT-2 **EXPOSED** PT-2 PT-1/PT-2 OFFICE ETR **EXPOSED**

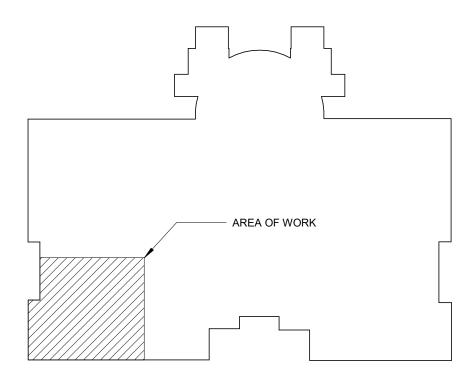


THRESHOLD DETAIL- CARPET TO LVT

6" = 1'-0"

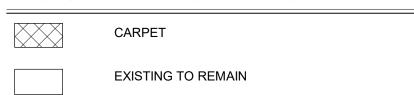
ARRREVIATIONS

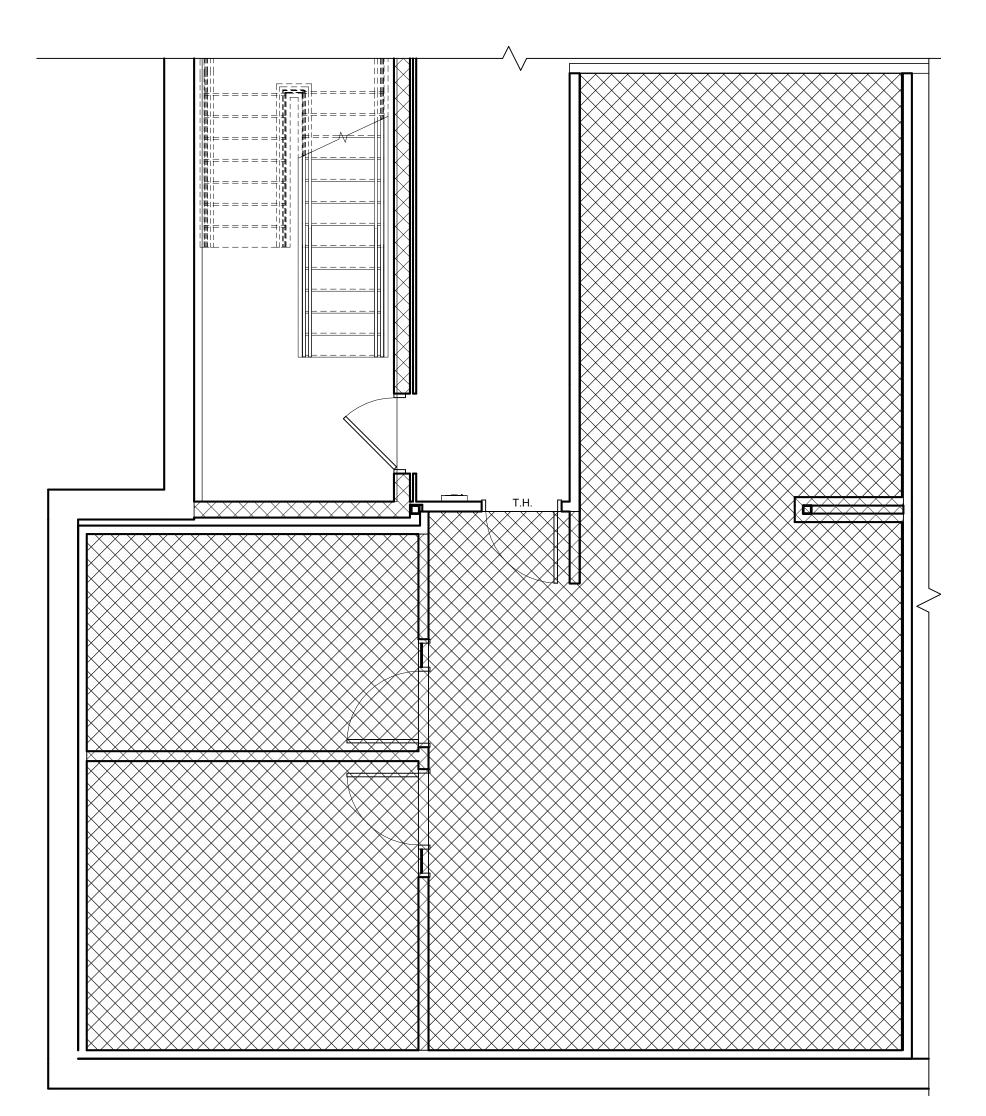
ABBR	EVIATIONS
FLOORING CPT: ETR: TH:	CARPET EXISTING TO REMAIN THRESHOLD
WALLS GYP: PT-1: PT-2 PT-3: ETR:	GYPSUM BOARD PAINTED PAINT PAINT PAINT EXISTING TO REMAIN
CEILING ACT: GYP BD: PT: ETR:	ACOUSTIC CEILING TILE GYPSUM BOARD PAINTED PAINT EXISTING TO REMAIN
BASE ETR: WD: RB:	EXISTING TO REMAIN WOOD PAINTED (MATCH EXISTING) RUBBER BASE
DOORS ETR: WD:	EXISTING TO REMAIN WOOD





ROOM FINISH LEGEND









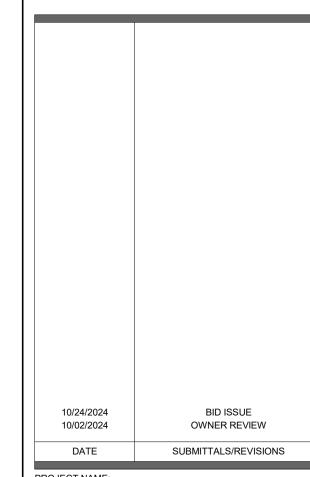
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Shelby Township Fax 586 726 8780
Michigan 48315

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PROJECT NAME:

MACOMB
TOWNSHIP

BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE:

FLOOR FINISH PLAN, DETAILS AND DOOR SCHEDULE

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD

DRAWN BY: CHECKED BY: DATE:

LJD JRA 6/21/24

SCALE:

AS NOTED



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PROJECT NO.

0249-0338

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A610

NOTE: LIST OF ADDITIONAL SYMBOLS & ABBREVIATIONS ASSOCIATED WITH TEMPERATURE CONTROLS ARE IDENTIFIED ON TC DRAWNGS.

MECHANICAL DRAWING INDEX

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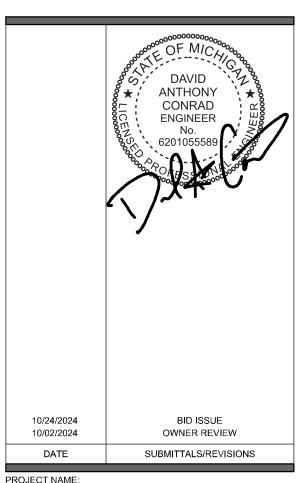
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ENGINEERING STRONG COMMUNITIES



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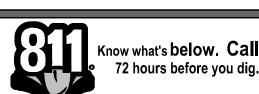


MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE: MECHANICAL STANDARDS AND DRAWING INDEX

MACOMB TOWNSHIP

PRELIMINAR	CONSTRU	CTION RECORD
DRAWN BY:	CHECKED BY:	DATE:
DAW	DAC	10/24/2024
SCALE:		
	NONE	



UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF EXISTING FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF.

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD, DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE NCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

PROJECT NO.

0249-0338

WITH THE LATEST ISSUE OF THE VARIOUS, APPLICABLE STANDARD SPECIFICATIONS. B. PERFORMANCE REQUIREMENTS: SYSTEMS COMPONENTS PRESSURE AND TEMPERATURE RATINGS: NOT LESS THAN INDICATED AND AS REQUIRED FOR SYSTEM PRESSURES AND TEMPERATURES.

C. QUALITY ASSURANCE: 1. SCOPE OF WORK: FURNISH ALL LABOR, MATERIAL, EQUIPMENT, TECHNICAL SUPERVISION, AND INCIDENTAL SERVICES REQUIRED TO COMPLETE, TEST AND LEAVE READY FOR OPERATION THE MECHANICAL SYSTEMS AS

SPECIFIED AND AS INDICATED ON DRAWINGS. 2. ORDINANCES AND CODES: PERFORM ALL WORK IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL ORDINANCES AND REGULATIONS, THE RULES AND REGULATIONS OF ASHRAE, NFPA, SMACNA AND UL,

UNLESS OTHERWISE INDICATED. 3. SOURCE LIMITATIONS: EQUIPMENT OF THE SAME OR SIMILAR SYSTEMS SHALL BE BY THE SAME MANUFACTURER.

4. TESTS AND INSPECTIONS: PERFORM ALL TESTS REQUIRED BY STATE, CITY, COUNTY AND/OR OTHER AGENCIES HAVING JURISDICTION. PROVIDE ALL MATERIALS, EQUIPMENT, ETC., AND LABOR REQUIRED FOR

5. SEQUENCE AND SCHEDULE: WORK SO AS TO AVOID INTERFERENCE WITH THE WORK OF OTHER TRADES. BE RESPONSIBLE FOR REMOVING AND RELOCATING ANY WORK WHICH IN THE OPINION OF THE OWNER'S REPRESENTATIVES CAUSES INTERFERENCE.

6. LABELING REQUIREMENT FOR PACKAGED EQUIPMENT: ELECTRICAL PANELS ON PACKAGED MECHANICAL EQUIPMENT SHALL BEAR UL LABEL OR LABEL OF OTHER NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) (ITSNA, CSA, ETC.).

7. 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

D. CODES, PERMITS AND FEES:

1. UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR MECHANICAL WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES AND REGULATIONS.

2. WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE RULES AND REGULATIONS SET FORTH IN LOCAL AND STATE CODES. PREPARE ANY DETAILED DRAWINGS OR DIAGRAMS WHICH MAY BE REQUIRED BY THE GOVERNING AUTHORITIES. WHERE THE DRAWINGS AND SPECIFICATIONS INDICATE MATERIALS OR CONSTRUCTION IN EXCESS OF CODE REQUIREMENTS, THE DRAWINGS AND SPECIFICATIONS SHALL GOVERN. E. THE DRAWINGS SHOW LOCATION AND GENERAL ARRANGEMENT OF EQUIPMENT, PIPING AND RELATED ITEMS.

FOLLOW DRAWINGS AS CLOSELY AS ELEMENTS OF THE CONSTRUCTION PERMIT.

F. MATERIAL AND EQUIPMENT MANUFACTURERS:

1. EQUIPMENT: ALL ITEMS OF EQUIPMENT SHALL BE FURNISHED COMPLETE WITH ALL ACCESSORIES NORMALLY SUPPLIED WITH THE CATALOG ITEMS LISTED AND ALL OTHER ACCESSORIES NECESSARY FOR COMPLETE AND SATISFACTORY OPERATING SYSTEM. EQUIPMENT AND MATERIALS SHALL BE NEW AND SHALL BE STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF FIRE PROTECTION; PLUMBING; HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT; AND SHALL BE MANUFACTURER'S LATEST DESIGN. 2. 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.

3. INSPECTION OF SITE: VISIT SITE. EXAMINE AND VERIFY CONDITIONS UNDER WHICH WORK MUST BE CONDUCTED BEFORE SUBMITTING PROPOSAL. SUBMITTING OF PROPOSAL IMPLIES THAT CONTRACTOR HAS VISITED SITE AND UNDERSTANDS CONDITIONS UNDER WHICH WORK MUST BE CONDUCTED. NO ADDITIONAL CHARGES WILL BE ALLOWED BECAUSE OF FAILURE TO MAKE THIS EXAMINATION OR TO INCLUDE ALL MATERIALS AND LABOR TO

COMPLETE WORK. H. SUBMITTALS: SUBMIT PROJECT SPECIFIC SUBMITTALS FOR REVIEW.

 DELIVERY, STORAGE, AND HANDLING: STORAGE AND PROTECTION: PROVIDE ADEQUATE WEATHER PROTECTED STORAGE SPACE FOR ALL MECHANICAL EQUIPMENT AND MATERIALS DELIVERIES TO THE JOB SITE. STORAGE LOCATIONS WILL BE DESIGNATED BY THE OWNER'S REPRESENTATIVE. EQUIPMENT STORED IN UNPROTECTED AREAS MUST BE PROVIDED WITH TEMPORARY PROTECTION.

. INSTRUCTION OF OWNER PERSONNEL: BEFORE FINAL INSPECTION, INSTRUCT OWNER'S DESIGNATED PERSONNEL IN OPERATION, ADJUSTMENT, AND MAINTENANCE OF MECHANICAL EQUIPMENT AND SYSTEMS AT AGREED UPON TIMES. A MINIMUM OF 24 HOURS OF FORMAL INSTRUCTION TO OWNER'S PERSONNEL SHALL BE PROVIDED FOR EACH BUILDING. ADDITIONAL HOURS ARE SPECIFIED IN INDIVIDUAL SPECIFICATION SECTIONS.

K. WARRANTY: CONTRACTOR SHALL WARRANTY THAT MECHANICAL INSTALLATION IS FREE FROM DEFECTS AND AGREES TO REPLACE OR REPAIR. TO OWNER'S SATISFACTION. ANY PART OF THIS MECHANICAL INSTALLATION WHICH BECOMES DEFECTIVE WITHIN A PERIOD OF ONE YEAR (UNLESS SPECIFIED OTHERWISE) FROM THE DATE OF SUBSTANTIAL COMPLETION FOLLOWING FINAL ACCEPTANCE, PROVIDED THAT SUCH FAILURE IS DUE TO DEFECTS IN EQUIPMENT, MATERIAL, WORKMANSHIP OR FAILURE TO FOLLOW CONTRACT DOCUMENTS. FILE WITH OWNER ANY AND ALL WARRANTIES FROM EQUIPMENT MANUFACTURERS INCLUDING OPERATING CONDITIONS AND

PERFORMANCE CAPACITIES THEY ARE BASED ON. MECHANICAL DEMOLITION WORK: DEMOLITION OF EXISTING MECHANICAL EQUIPMENT AND MATERIALS SHALL BE DONE BY THE CONTRACTOR UNLESS OTHERWISE INDICATED. INCLUDE ALL ITEMS SUCH AS, BUT NOT LIMITED TO EXISTING PIPING. PUMPS. DUCTWORK. SUPPORTS AND EQUIPMENT WHERE SUCH ITEMS ARE NOT REQUIRED FOR PROPER OPERATION OF MODIFIED SYSTEM. IN GENERAL, DEMOLITION WORK IS INDICATED ON DRAWINGS. HOWEVER, THE CONTRACTOR SHALL VISIT JOB SITE TO DETERMINE FULL EXTENT AND CHARACTER OF THIS

M. WORK IN EXISTING BUILDINGS:

1. OWNER WILL PROVIDE ACCESS TO EXISTING BUILDINGS AS REQUIRED. ACCESS REQUIREMENTS TO OCCUPIED BUILDINGS SHALL BE IDENTIFIED ON THE PROJECT SCHEDULE. CONTRACTOR, ONCE WORK IS STARTED IN EXISTING BUILDING, SHALL COMPLETE SAME WITHOUT INTERRUPTION IN ORDER TO RETURN WORK AREAS AS SOON AS POSSIBLE TO OWNER.

2. ADEQUATELY PROTECT AND PRESERVE ALL EXISTING AND NEWLY INSTALLED WORK. PROMPTLY REPAIR ANY DAMAGE TO SAME AT CONTRACTOR'S EXPENSE.

3. CONSULT WITH OWNER'S REPRESENTATIVE AS TO METHODS OF CARRYING ON WORK SO AS NOT TO INTERFERE WITH OWNER'S OPERATION ANY MORE THAN ABSOLUTELY NECESSARY. ACCORDINGLY, ALL SERVICE LINES SHALL BE KEPT IN OPERATION AS LONG AS POSSIBLE AND THE SERVICES SHALL ONLY BE INTERRUPTED AT SUCH TIME AS WILL BE DESIGNATED BY THE OWNER'S REPRESENTATIVE.

4. PRIOR TO STARTING WORK IN ANY AREA, OBTAIN APPROVAL FOR DOING SO FROM A QUALIFIED REPRESENTATIVE OF THE OWNER WHO IS DESIGNATED AND AUTHORIZED BY THE OWNER TO PERFORM TESTING AND ABATEMENT, IF NECESSARY, OF ALL HAZARDOUS MATERIALS INCLUDING BUT NOT LIMITED TO, ASBESTOS. CONTRACTOR SHALL NOT PERFORM ANY INSPECTION, TESTING, CONTAINMENT, REMOVAL OR OTHER WORK THAT IS RELATED IN ANY WAY WHATSOEVER TO HAZARDOUS MATERIALS UNDER THE CONTRACT

N. TEMPORARY SERVICES: THE EXISTING BUILDING WILL BE OCCUPIED DURING CONSTRUCTION. MAINTAIN MECHANICAL SERVICES AND PROVIDE NECESSARY TEMPORARY CONNECTIONS AND THEIR REMOVAL AT NO ADDITIONAL EXPENSE.

). WORK INVOLVING OTHER TRADES: CERTAIN ITEMS OF EQUIPMENT OR MATERIALS SPECIFIED IN THE MECHANICAL DIVISION MAY HAVE TO BE INSTALLED BY OTHER TRADES DUE TO CODE REQUIREMENTS OR UNION JURISDICTIONAL REQUIREMENTS. IN SUCH INSTANCES, CONTRACTOR SHALL COMPLETE WORK THROUGH AN APPROVED, QUALIFIED SUBCONTRACTOR AND SHALL INCLUDE FULL COST FOR SAME IN PROPOSAL.

P. ACCEPTANCE PROCEDURE: UPON SUCCESSFUL COMPLETION OF START-UP AND RECALIBRATION, BUT PRIOR TO BUILDING ACCEPTANCE, SUBSTANTIAL COMPLETION AND COMMENCEMENT OF WARRANTIES, ARCHITECT/ENGINEER SHALL BE REQUESTED IN WRITING TO OBSERVE THE SATISFACTORY OPERATION OF ALL MECHANICAL SYSTEMS. 1. CONTRACTOR SHALL DEMONSTRATE OPERATION OF EQUIPMENT AND CONTROL SYSTEMS, INCLUDING EACH

INDIVIDUAL COMPONENT, TO OWNER AND ARCHITECT/ENGINEER. 2. AFTER CORRECTING ALL ITEMS APPEARING ON THE PUNCH LIST, MAKE A SECOND WRITTEN REQUEST TO THE OWNER AND ARCHITECT/ENGINEER FOR OBSERVATION AND APPROVAL.

3. AFTER ALL ITEMS ON PUNCH LIST ARE CORRECTED AND FORMAL APPROVAL OF MECHANICAL SYSTEMS IS PROVIDED BY ARCHITECT/ENGINEER, CONTRACTOR SHALL INDICATE TO THE OWNER IN WRITING THE COMMENCEMENT OF THE WARRANTY PERIOD.

<u>200510 - BASIC MECHANICAL MATERIALS AND METHODS</u>

A. PIPE, TUBE, AND FITTINGS: 1. REFER TO INDIVIDUAL PIPING SECTIONS FOR PIPE, TUBE, AND FITTING MATERIALS AND JOINING METHODS.

2. PIPE THREADS: ASME B1.20.1 FOR FACTORY—THREADED PIPE AND PIPE FITTINGS. B. JOINING MATERIALS: 1. REFER TO INDIVIDUAL PIPING SPECIFICATIONS FOR SPECIAL JOINING MATERIALS NOT LISTED BELOW.

2. UNIONS: PIPE SIZE 2 INCHES AND SMALLER: FERROUS PIPE: MALLEABLE IRON GROUND JOINT TYPE UNIONS. UNIONS IN GALVANIZED PIPING SYSTEM SHALL BE GALVANIZED. COPPER TUBE AND PIPE: BRONZE UNIONS WITH SOLDERED JOINTS.

3. FLANGES: PIPE SIZES 2-1/2 INCH AND LARGER: FERROUS PIPE: STANDARD WEIGHT FORGED STEEL WELD

NECK FLANGES. COPPER TUBE AND PIPE: SLIP_ON BRONZE FLANGES. 4. PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM

5. FLANGE BOLTS AND NUTS: ASME B18.2.1, CARBON STEEL, UNLESS OTHERWISE INDICATED. SQUARE HEAD

BOLTS AND NUTS ARE NOT ACCEPTABLE. 6. SOLDER FILLER METALS: ASTM B 32, LEAD-FREE, ANTIMONY-FREE, SILVER-BEARING ALLOYS. INCLUDE

WATER-FLUSHABLE FLUX ACCORDING TO ASTM B 813. 7. BRAZING FILLER METALS: AWS A5.8, BCUP SERIES, COPPER-PHOSPHORUS ALLOYS FOR GENERAL-DUTY BRAZING, UNLESS OTHERWISE INDICATED; AND AWS A5.8, BAG1, SILVER ALLOY FOR REFRIGERANT PIPING,

UNLESS OTHERWISE INDICATED. C. PIPE THREAD COMPOUNDS:

1. PIPE THREAD COMPOUNDS FOR THE FLUID SERVICE COMPATIBLE WITH PIPING MATERIALS PROVIDED.

2. COMPOUNDS FOR POTABLE WATER SERVICE AND SIMILAR APPLICATIONS ACCEPTABLE TO U.S. DEPARTMENT OF AGRICULTURE (USDA) OR FOOD AND DRUG ADMINISTRATION (FDA). COMPOUNDS CONTAINING LEAD ARE PROHIBITED.

3. INORGANIC ZINC-RICH COATINGS OR CORROSION INHIBITED PROPRIETARY COMPOUNDS FOR GALVANIZED CARBON STEEL SYSTEMS TO COAT RAW CARBON STEEL SURFACES, IN LIEU OF SUBSEQUENT PAINTING. MANUFACTURERS: CARBOLINE CARBO-ZINC 12 | TNEMEC; KOPPERS. 4. GRAPHITE AND OIL OR PROPRIETARY CORROSION INHIBITED COMPOUNDS SUITABLE FOR SYSTEM

TEMPERATURES FOR STEAM OR CONDENSATE. MANUFACTURERS: WKM, DIVISION OF COOPER INDUSTRIES, INC., KEY GRAPHITE PASTE | OTHER APPROVED.

JOINTS. MANUFACTURERS: CADILLAC PLASTIC; PERMACEL | OTHER APPROVED.

D. DIELECTRIC FITTINGS: PROVIDE DIELECTRIC FITTINGS AS SCHEDULED ON THE DRAWINGS. 1. DIELECTRIC-FLANGE KITS:

a. MANUFACTURERS: ADVANCE PRODUCTS & SYSTEMS, INC. | CALPICO, INC. | CENTRAL PLASTICS COMPANY | PIPELINE SEAL AND INSULATOR, INC. | WATTS WATER TECHNOLOGIES, INC.; WATTS REGULATOR CO. 2. DIELECTRIC NIPPLE/WATERWAY FITTINGS:

a. MANUFACTURERS: ASC ENGINEERED SOLUTIONS; GRUVLOK MANUFACTURING; DI-LOK NIPPLES | ELSTER GROUP; PERFECTION CORP.; CLEARFLOW | PRECISION PLUMBING PRODUCTS, INC.; CLEARFLOW | SIOUX

CHIEF MANUFACTURING CO., INC. | TYCO FIRE & BUILDING PRODUCTS; GRINNELL MECHANICAL PRODUCTS; FIGURE 407 CLEARFLOW | VICTAULIC CO. OF AMERICA; STYLE 47 CLEARFLOW. E. EPOXY BONDING COMPOUND: TWO-COMPONENT SYSTEM SUITABLE FOR BONDING WET OR DRY CONCRETE TO

EACH OTHER AND TO OTHER MATERIALS. 1. MANUFACTURERS: EUCO 452 #450, EUCLID CHEMICAL CO. | EPOBOND, L & M CONSTRUCTION CHEMICALS

SIKADUR 87, SIKA CORP. F. LEAK DETECTOR SOLUTION: COMMERCIAL LEAK DETECTOR SOLUTION FOR PIPE SYSTEM TESTING.

1. MANUFACTURERS: AMERICAN GAS AND CHEMICALS INC., LEAK TEC | COLE-PARMER INST. CO., LEAK

DETECTOR | GUY SPEAKER CO. INC., SQUIRT 'N BUBBLES. G. PIPE ROOF PENETRATION ENCLOSURES: MINIMUM 18 GAGE WELDED GALVANIZED STEEL CONSTRUCTION INTEGRAL BASE PLATE. BUILT—IN FULLY MITERED CANT. FACTORY INSTALLED INSECT AND DECAY RESISTANT WOOD NAILER. FACTORY INSTALLED 1-1/2 INCH THICK, 3 POUNDS PER CUBIC FOOT DENSITY RIGID INSULATION. EPDM COMPRESSION MOLDED RUBBER CAP FOR SINGLE OR MULTIPLE PIPES AS REQUIRED.

STAINLESS STEEL DRAW-BAND CLAMPS. 1. MANUFACTURERS: PATE COMPANY | PORTALS PLUS, INC. | THYBAR CORPORATION, THYCURB.

<u>200529 - HANGERS AND SUPPORTS</u>

A. PIPE HANGERS, SUPPORTS, AND ACCESSORIES SHALL COMPLY WITH THE FOLLOWING: 1. MSS SP-58, PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN AND MANUFACTURE.

2. MSS SP-69, PIPE HANGERS AND SUPPORTS - SELECTION AND APPLICATION. MSS SP-89, PIPE HANGERS AND SUPPORTS - FABRICATION AND INSTALLATION PRACTICES

B. HANGER ROD MATERIAL: THREADED, HOT ROLLED, STEEL ROD CONFORMING TO ASTM A 36 OR ASTM A 575. C. STEEL PIPE HANGERS AND SUPPORTS: MSS SP-58, TYPES 1 THROUGH 58, FACTORY-FABRICATED COMPONENTS.

1. MANUFACTURERS: ASC ENGINEERED SOLUTIONS | B-LINE BY EATON | CARPENTER & PATERSON, INC. | HILTI USA | NVENT ELECTRIC PLC | PHD MANUFACTURING, INC.

D. TRAPEZE PIPE HANGERS: MSS SP-69, TYPE 59, SHOP- OR FIELD-FABRICATED PIPE-SUPPORT ASSEMBLY MADE FROM STRUCTURAL-STEEL SHAPES WITH MSS SP-58 HANGER RODS, NUTS, SADDLES, AND U-BOLTS. E. METAL FRAMING SYSTEMS: DESCRIPTION: MFMA-3, SHOP- OR FIELD-FABRICATED PIPE-SUPPORT ASSEMBLY MADE OF STEEL CHANNELS AND OTHER COMPONENTS.

1. MANUFACTURERS: B—LINE BY EATON | HILTI USA | POWER—STRUT A PART OF ATKORE INTERNATIONAL | UNISTRUT A PART OF ATKORE INTERNATIONAL. F. THERMAL—HANGER SHIELD INSERTS: DESCRIPTION: INSULATION INSERT ENCASED IN 360 DEGREE SHEET METAL

1. MANUFACTURERS: AMERICAN MECHANICAL INSULATION SALES INC. (AMIS) | B-LINE BY EATON | NVENT ELECTRIC PLC | PIPE SHIELDS, INC. | RILCO MANUFACTURING COMPANY, INC. | VALUE ENGINEERED

PRODUCTS. G. EQUIPMENT SUPPORTS: WELDED, SHOP- OR FIELD-FABRICATED EQUIPMENT SUPPORT MADE FROM STRUCTURAL-STEEL SHAPES.

H. MISCELLANEOUS MATERIALS: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.

<u>200553 - MECHANICAL IDENTIFICATION</u> A. MANUFACTURERS: SETON | BRADY | EMED | CRAFTMARK | BRIMAR INDUSTRIES, INC. | MARKING SERVICES INC. | 230593 - TESTING, ADJUSTING, AND BALANCING

(MSI) I KOLBI PIPE MARKER CO. B. EQUIPMENT NAMEPLATES: METAL, WITH DATA ENGRAVED OR STAMPED, FOR PERMANENT ATTACHMENT ON

1. LOCATION: ACCESSIBLE AND VISIBLE 2. FASTENERS: AS REQUIRED TO MOUNT ON EQUIPMENT.

C. EQUIPMENT MARKERS: ENGRAVED, COLOR-CODED LAMINATED PLASTIC. INCLUDE CONTACT-TYPE, PERMANENT

1. SIZE: 2-1/2 BY 4 INCHES FOR CONTROL DEVICES, DAMPERS, AND VALVES; 4-1/2 BY 6 INCHES FOR EQUIPMENT.

D. PIPE MARKERS: 1. GENERAL REQUIREMENTS FOR MANUFACTURED PIPE LABELS: PREPRINTED, COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION.

2. PRETENSIONED PIPE LABELS: PRECOILED, SEMIRIGID PLASTIC FORMED TO COVER FULL CIRCUMFERENCE OF PIPE AND TO ATTACH TO PIPE WITHOUT FASTENERS OR ADHESIVE.

3. SELF-ADHESIVE PIPE LABELS: PRINTED PLASTIC WITH CONTACT-TYPE, PERMANENT-ADHESIVE BACKING. 4. PIPE LABEL CONTENTS: INCLUDE IDENTIFICATION OF PIPING SERVICE USING SAME DESIGNATIONS OR

ABBREVIATIONS AS USED ON DRAWINGS, PIPE SIZE, AND AN ARROW INDICATING FLOW DIRECTION. a. FLOW-DIRECTION ARROWS: INTEGRAL WITH PIPING SYSTEM SERVICE LETTERING TO ACCOMMODATE BOTH DIRECTIONS, OR AS SEPARATE UNIT ON EACH PIPE LABEL TO INDICATE FLOW DIRECTION. b. LETTERING SIZE: AT LEAST 1-1/2 INCHES HIGH.

. DUCT LABELS DUCT MARKERS: VINYL, 2-INCH MINIMUM CHARACTER HEIGHT, WITH PERMANENT PRESSURE SENSITIVE ADHESIVE. INCLUDE DIRECTION AND QUANTITY OF AIRFLOW, AIR HANDLING UNIT OR FAN NUMBER, AND DUCT

SERVICE (SUCH AS SUPPLY, RETURN, AND EXHAUST) a. ADHESIVE: CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE. 2. DUCT MARKERS: ENGRAVED, COLOR-CODED LAMINATED PLASTIC. INCLUDE DIRECTION AND QUANTITY OF AIRFLOW, AIR HANDLING UNIT OR FAN NUMBER, AND DUCT SERVICE (SUCH AS SUPPLY, RETURN, AND

a. FASTENERS: STAINLESS-STEEL RIVETS OR SELF-TAPPING SCREWS. 200700 - MECHANICAL INSULATION

EXHAUST). INCLUDE CONTACT-TYPE, PERMANENT ADHESIVE

A. ACCEPTABLE PIPE, DUCT, AND EQUIPMENT INSULATION MATERIALS AND THICKNESSES ARE SCHEDULED ON THE DRAWINGS. WHERE NOT SCHEDULED, THE FOLLOWING APPLY:

1. INDOOR PIPING: a. HOT SERVICE DRAINS, ALL PIPE SIZES: GLASS-FIBER OR MINERAL WOOL, PREFORMED PIPE INSULATION, TYPE I OR II: 1 INCH THICK.

b. HOT SERVICE VENTS, ALL PIPE SIZES: GLASS-FIBER OR MINERAL WOOL, PREFORMED PIPE INSULATION, TYPE I OR II: 1 INCH THICK.

c. EXISTING PLASTIC WATER PIPING WITHIN RETURN AIR PLENUM SPACE: ALL PIPE SIZES: INSULATION SHALL BE:

1) FIRE-RATED PLENUM WRAP: 1/2 INCH THICK. B. FIELD-APPLIED JACKETING SYSTEMS DESCRIPTION:

C. PIPE INSULATION MATERIALS:

1. ACCEPTABLE JACKETING MATERIALS ARE SCHEDULED ON THE DRAWINGS. WHERE NOT SCHEDULED, THE FOLLOWING APPLY: a. STEAM CONDENSATE PIPING WITHIN AIR HANDLING UNITS: ALUMINUM, STUCCO EMBOSSED: 0.016 INCH

THICK. b. PIPING WITHIN ENERGY RECOVERY UNITS: TYPE 304 STAINLESS STEEL, SMOOTH: 0.010 INCH THICK. SEAMS AND JOINTS CALKED WITH CHEMICALLY RESISTANT SEALER.

1. FLEXIBLE ELASTOMERIC: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIALS. a. PRODUCTS: AEROFLEX USA, INC.; AEROCEL TUBE AND SHEET | ARMACELL LLC; AP ARMAFLEX | IK INSULATION GROUP; K-FLEX; INSUL-TUBE AND INSUL-SHEET.

2. GLASS-FIBER, PREFORMED PIPE INSULATION: TYPE I, 850 DEG F MATERIALS: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 547, TYPE I, GRADE A, WITH FACTORY-APPLIED ASJ OR a. PRODUCTS: JOHNS MANVILLE; MICRO-LOK | KNAUF INSULATION; 1000 PIPE INSULATION | MANSON

INSULATION INC.; ALLEY-K | OWENS CORNING; FIBERGLAS PIPE INSULATION. D. DUCTWORK INSULATION MATERIALS: 1. BLANKET INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553,

TYPE II AND ASTM C 1290, TYPE III WITH FACTORY-APPLIED FSK JACKET. a. PRODUCTS: CERTAINTEED CORP.; DUCT WRAP | JOHNS MANVILLE; MICROLITE | KNAUF INSULATION; DUCT

WRAP | MANSON INSULATION INC.; ALLEY WRAP FSK | OWENS CORNING; ALL-SERVICE DUCT WRAP.

2. BOARD INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 612, TYPE IA OR TYPE IB. FOR DUCT AND PLENUM APPLICATIONS, PROVIDE INSULATION WITH FACTORY-APPLIED FSK JACKET. FOR EQUIPMENT APPLICATIONS, PROVIDE INSULATION WITH FACTORY-APPLIED ASJ.

a. PRODUCTS: CERTAINTEED CORP.; COMMERCIAL BOARD | FIBREX INSULATIONS INC.; FBX | JOHNS MANVILLE: 800 SERIES SPIN-GLAS | KNAUF INSULATION; INSULATION BOARD | MANSON INSULATION INC.; AK BOARD | OWENS CORNING; FIBERGLAS 700 SERIES.

INSULATING CEMENTS, ADHESIVES, TAPES, AND SEALANTS: USE MANUFACTURER RECOMMENDED PRODUCTS. F. MASTICS: MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES;

5. USE TETRAFLUOROETHYLENE (TEFLON) TAPE 2 TO 3 MILS THICK FOR NATURAL GAS SYSTEM THREADED G. FIELD—APPLIED JACKETS: FIELD—APPLIED JACKETS SHALL COMPLY WITH ASTM C 921, TYPE I, UNLESS OTHERWISE INDICATED. 1. PVC JACKET: HIGH-IMPACT-RESISTANT, UV-RESISTANT PVC COMPLYING WITH ASTM D 1784,

CLASS 16354-C; THICKNESS AS SPECIFIED; ROLL STOCK READY FOR SHOP OR FIELD CUTTING AND a. PRODUCTS: JOHNS MANVILLE; ZESTON AND CEEL-CO | P.I.C. PLASTICS, INC.; FG SERIES | PROTO PVC

CORPORATION; LOSMOKE | SPEEDLINE CORPORATION; SMOKESAFE. PVC FITTING COVERS: HIGH-IMPACT-RESISTANT, UV-RESISTANT PVC COMPLYING WITH ASTM D 1784. CLASS 16354-C, AND INCLUDING FLEXIBLE GLASS FIBER INSULATION INSERTS.

a. PRODUCTS: JOHNS MANVILLE; ZESTON AND CEEL-CO | P.I.C. PLASTICS, INC.; FG SERIES | PROTO PVC CORPORATION; LOSMOKE | SPEEDLINE CORPORATION; SMOKESAFE. 3. ALUMINUM JACKET: COMPLY WITH ASTM B 209, ALLOY 3003, 3005, 3105 OR 5005, TEMPER H-14. SHEET

AND ROLL STOCK READY FOR SHOP OR FIELD SIZING OR FACTORY CUT AND ROLLED TO SIZE. a. PRODUCTS: PABCO-CHILDERS METALS; ITW INSULATION SYSTEMS; METAL JACKETING SYSTEMS | RPR PRODUCTS, INC.; INSUL-MATE.

230523 — GENERAL-DUTY VALVES FOR HVAC

COMPLY WITH MIL-C-19565C, TYPE II.

A. ASME COMPLIANCE: ASME B31.9 FOR BUILDING SERVICES PIPING VALVES. B. ASME COMPLIANCE FOR FERROUS VALVES: ASME B16.10 AND ASME B16.34 FOR DIMENSION AND DESIGN

ISOLATION VALVES ARE SCHEDULED ON THE DRAWINGS. FOR OTHER GENERAL HVAC VALVE APPLICATIONS, USE THE FOLLOWING:

1. THROTTLING SERVICE: BALL, BUTTERFLY, OR GLOBE VALVES. TWO-PIECE, REGULAR PORT BRONZE BALL VALVES WITH STAINLESS-STEEL TRIM: TYPE 316 STAINLESS-STEEL BALL AND STEM, REINFORCED TFE SEATS, BLOW-OUT-PROOF STEM, WITH ADJUSTABLE STEM PACKING, SOLDERED OR THREADED ENDS; AND 150 PSIG SWP AND 600-PSIG CWP RATINGS.

1. MANUFACTURERS: APOLLO VALVES; BY CONBRACO INDUSTRIES, INC.; SERIES 70-140 | CRANE CO.; CRANE VALVES | HAMMOND VALVE | MILWAUKEE VALVE COMPANY; MODEL BA100S | NIBCO INC.; MODELS S-580-70-66 OR T-580-70-66 | WATTS WATER TECHNOLOGIES, INC.

TWO-PIECE, FULL-PORT, BRONZE BALL VALVES WITH STAINLESS-STEEL TRIM: TYPE 316 STAINLESS-STEEL BALL AND STEM. REINFORCED TFE SEATS, BLOW-OUT-PROOF STEM, WITH ADJUSTABLE STEM PACKING, SOLDERED OR THREADED ENDS; 150 PSIG SWP AND 600-PSIG CWP RATINGS. 1. MANUFACTURERS: APOLLO VALVES; BY CONBRACO INDUSTRIES, INC.; SERIES 77C-140 | CRANE CO.; CRANE

VALVES | HAMMOND VALVE | MILWAUKEE VALVE COMPANY | NIBCO INC.; MODELS S-585-70-66 OR T-585-70-66 | WATTS WATER TECHNOLOGIES, INC. BRONZE CHECK VALVES: MSS SP-80, CLASS 150, BRONZE, SWING CHECK VALVES WITH BRONZE DISC: ASTM B-62 BRONZE BODY AND SEAT WITH REGRINDING-TYPE BRONZE DISC, Y-PATTERN DESIGN, SOLDERED OR

THREADED END CONNECTIONS, AND HAVING 300 PSIG CWP RATING. 1. MANUFACTURERS: APOLLO VALVES; BY CONBRACO INDUSTRIES, INC. | CRANE CO.; CRANE VALVES | CRANE CO.; STOCKHAM DIV. | HAMMOND VALVE | MILWAUKEE VALVE COMPANY; MODEL 515 | NIBCO INC.; MODELS

S-433-B OR T-433-B | WATTS WATER TECHNOLOGIES. G. DRAIN VALVES: BALL-VALVE-TYPE, HOSE-END DRAIN VALVES:

1. BRONZE BALL VALVE AS SPECIFIED IN THIS SECTION. 2. OUTLET: THREADED, SHORT NIPPLE WITH GARDEN-HOSE THREAD COMPLYING WITH ASME B1.20.7 AND CAP

INSTALL VALVES WITH UNIONS OR FLANGES AT EACH PIECE OF EQUIPMENT ARRANGED TO ALLOW SERVICE, MAINTENANCE, AND EQUIPMENT REMOVAL WITHOUT SYSTEM SHUTDOWN. LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY

J. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE CENTER OF PIPE. BUTTERFLY VALVES SHALL BE INSTALLED WITH STEM HORIZONTAL TO ALLOW SUPPORT FOR THE DISC AND THE CLEANING ACTION OF THE

K. INSTALL VALVES IN POSITION TO ALLOW FULL STEM MOVEMENT.

L. INSTALL CHECK VALVES FOR PROPER DIRECTION OF FLOW AND AS FOLLOWS:

A. GENERAL PROCEDURES FOR TESTING AND BALANCING:

1. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS" AND THIS SECTION.

2. MARK EQUIPMENT AND BALANCING DEVICE SETTINGS WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS.

B. GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS: 1. PREPARE TEST REPORTS FOR BOTH FANS AND OUTLETS. OBTAIN MANUFACTURER'S OUTLET FACTORS AND RECOMMENDED TESTING PROCEDURES. CROSSCHECK THE SUMMATION OF REQUIRED OUTLET VOLUMES WITH REQUIRED FAN VOLUMES.

2. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS' "AS-BUILT" DUCT LAYOUTS, OR USE REDUCED SCALE CONTRACT DOCUMENTS WITH NOTATIONS. 3. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.

4. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRFLOW MEASUREMENTS. 5. CUT INSULATION, AND DRILL DUCTS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY TO ALLOW ADEQUATE PERFORMANCE OF PROCEDURES. AFTER TESTING AND BALANCING, CLOSE PROBE HOLES WITH NEAT PATCHES, NEOPRENE PLUGS, THREADED PLUGS, OR THREADED TWIST-ON METAL CAPS, AND PATCH INSULATION WITH NEW MATERIALS IDENTICAL TO THOSE REMOVED. RESTORE VAPOR

BARRIER AND FINISH ACCORDING TO INSULATION SPECIFICATIONS FOR THIS PROJECT. 6. CHECK AIR FLOW WITHIN INTAKE PLENUMS AND MIXING BOXES OF AIR HANDLING UNITS FOR UNEVEN FLOW AND TEMPERATURE STRATIFICATION AND PREPARE A REPORT WITH PROFILE ELEVATIONS (TEMPERATURE AND VELOCITY) ON EACH COIL OR FILTER FACE FOR ARCHITECT.

7. LOCATE START-STOP AND DISCONNECT SWITCHES, ELECTRICAL INTERLOCKS, AND MOTOR STARTERS. 8. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION. 9. CHECK DAMPERS FOR PROPER POSITION TO ACHIEVE DESIRED AIRFLOW PATH.

10. CHECK FOR AIRFLOW BLOCKAGES. 11. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING. 12. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS.

13. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.

C. GENERAL PROCEDURES FOR HYDRONIC SYSTEMS: 1. PREPARE TEST REPORTS WITH PERTINENT DESIGN DATA AND NUMBER IN SEQUENCE STARTING AT PUMP TO END OF SYSTEM. CHECK THE SUM OF BRANCH-CIRCUIT FLOWS AGAINST APPROVED PUMP FLOW RATE.

2. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS' "AS-BUILT" PIPING LAYOUTS, OR USE REDUCED SCALE CONTRACT DOCUMENTS WITH NOTATIONS.

3. PREPARE HYDRONIC SYSTEMS FOR TESTING AND BALANCING ACCORDING TO THE FOLLOWING, IN ADDITION TO THE GENERAL PREPARATION PROCEDURES SPECIFIED ABOVE: a. OPEN ALL MANUAL VALVES FOR MAXIMUM FLOW.

b. CHECK EXPANSION TANK LIQUID LEVEL. c. CHECK MAKEUP-WATER-STATION PRESSURE GAGE FOR ADEQUATE PRESSURE FOR HIGHEST VENT. d. CHECK FLOW-CONTROL VALVES FOR SPECIFIED SEQUENCE OF OPERATION AND SET AT INDICATED FLOW.

e. SET SYSTEM CONTROLS SO AUTOMATIC VALVES ARE WIDE OPEN TO HEAT EXCHANGERS. f. SET DIFFERENTIAL-PRESSURE CONTROL VALVES AT THE SPECIFIED DIFFERENTIAL PRESSURE. DO NOT SET AT FULLY CLOSED POSITION WHEN PUMP IS POSITIVE—DISPLACEMENT TYPE UNLESS SEVERAL TERMINAL

VALVES ARE KEPT OPEN. g. CHECK PUMP-MOTOR LOAD. IF MOTOR IS OVERLOADED, THROTTLE MAIN FLOW-BALANCING DEVICE SO MOTOR NAMEPLATE RATING IS NOT EXCEEDED.

D. TOLERANCES: 1. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:

a. AIR HANDLING EQUIPMENT AND OUTLETS: PLUS OR MINUS 5 PERCENT. WHERE TERMINAL UNITS SERVE 6 OR MORE OUTLETS WITHIN A COMMON ROOM, INDIVIDUAL OUTLETS MAY VARY UP TO PLUS OR MINUS 10 PERCENT OF DESIGN FLOW RATES IF OVERALL ROOM SUPPLY IS WITHIN PLUS OR MINUS 5 PERCENT.

b. HEATING-WATER FLOW RATE: 0 TO MINUS 10 PERCENT. <u>230933 - TEMPERATURE CONTROLS</u>

A. TEMPERATURE CONTROL BUILDING AUTOMATION SYSTEM CONSISTING OF DIRECT DIGITAL CONTROL (DDC) CONTROLLERS, CONTROL VALVES, CONTROL DAMPERS, SENSORS, TRANSDUCERS, RELAYS, SWITCHES, DATA COMMUNICATION NETWORK, ALL ASSOCIATED CONTROL WIRING AND RACEWAY SYSTEMS, BAS/DDC SYSTEM PROGRAMMING, DATABASE AND GRAPHIC DISPLAY GENERATION AT THE NEW/EXISTING REMOTE OPERATOR

INTERFACE. B. THERMOSTAT CONTROL WHERE INDICATED. C. CONTROL SEQUENCES FOR HVAC SYSTEMS, SUBSYSTEMS, AND EQUIPMENT ARE INDICATED ON PROJECT

D. INSTALLER QUALIFICATIONS: AN EXPERIENCED INSTALLER WHO IS [AN AUTHORIZED REPRESENTATIVE] [A CERTIFIED INSTALLER] [AN APPROVED INSTALLER] OF THE AUTOMATIC CONTROL SYSTEM MANUFACTURER FOR BOTH INSTALLATION AND MAINTENANCE OF UNITS REQUIRED FOR THIS PROJECT.

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

F. COMPLY WITH NFPA 90A, "INSTALLATION OF AIR CONDITIONING AND VENTILATION SYSTEMS."

G. THE EXUSTUBG BUILDING AUTOMATION SYSTEM (BAS) IS FULLY INTEGRATED, PROVIDING A DISTRIBUTED DATA PROCESSING SYSTEM. NEW WORK SHALL PROVIDE DIRECT DIGITAL CONTROL (DDC) FOR THE CONTROL AND MONITORING OF HEATING. VENTILATING. AND AIR CONDITIONING (HVAC) EQUIPMENT AND OTHER RELATED SYSTEMS. MICROPROCESSOR BASED DDC CONTROLLERS SHALL BE DIRECTLY CONNECTED TO HVAC EQUIPMENT SENSORS AND ACTUATORS. THE EXISTING DATA COMMUNICATION NETWORK SHALL ALLOW DATA EXCHANGE BETWEEN THE DDC CONTROLLERS AND THE EXISTING BUILDING NETWORK SUPERVISORY CONTROLLER. THE EXISTING BUILDING NETWORK SUPERVISORY CONTROLLER THROUGH WEB-BROWSER SHALL SERVE AS THE PRIMARY OPERATOR INTERFACE FOR THE BAS. APPROVED BAS MANUFACTURER - SYSTEM / INSTALLER (LOCATION):

1. AUTOMATED LOGIC / METRO CONTROLS, INC. (CLINTON TWP, MI).

H. DIRECT DIGITAL CONTROL (DDC) CONTROLLERS: MODULAR IN DESIGN AND CONSISTING OF STAND-ALONE MICROPROCESSOR BOARD WITH ROM AND FULLY CUSTOM PROGRAMMABLE RAM, EPROM, AND/OR EEPROM MEMORY, INTEGRAL INTERFACE EQUIPMENT AND POWER SURGE PROTECTION. CONTROLLERS SHALL BE CONNECTED DIRECTLY TO SENSORS, CONTROLLED DEVICES AND THE COMMUNICATION NETWORK.

I. DDC AIR TERMINAL UNIT CONTROLLERS: MICROPROCESSOR BASED CONTROLLERS CAPABLE OF STAND-ALONE OPERATION FOR CONTROL OF PRESSURE INDEPENDENT AIR TERMINAL UNITS. CONTROLLERS SHALL BE NETWORKED TOGETHER AND CONNECTED TO THE BUILDING'S BAS/DDC NETWORK. CONTROLLERS SHALL HAVE SEPARATE ADJUSTABLE MINIMUM AND MAXIMUM AIRFLOW SETPOINTS. PROVIDE ELECTRONIC TYPE AIR TERMINAL UNIT DAMPER OPERATORS COMPATIBLE WITH THE CONTROLLER AND THE AIR TERMINAL UNITS PROVIDED. EACH CONTROLLER SHALL HAVE AN INTERNAL DIFFERENTIAL PRESSURE TRANSDUCER CAPABLE OF UTILIZING THE TOTAL AND STATIC PRESSURE SIGNALS FROM THE AIR TERMINAL UNIT'S VELOCITY SENSOR FURNISHED BY AIR TERMINAL UNIT MANUFACTURER. EACH CONTROLLER SHALL HAVE ELECTRONIC OUTPUTS COMPATIBLE WITH THE ELECTRONICALLY OPERATED AIR TERMINAL UNIT TEMPERING COIL CONTROL VALVE AND PERIMETER RADIATION CONTROL VALVE WHERE APPLICABLE. TC CONTRACTOR SHALL PROVIDE 24 VAC POWER REQUIREMENTS INCLUDING TRANSFORMERS. ROOM TEMPERATURE SENSORS FOR THE DDC AIR TERMINAL UNIT CONTROLLERS SHALL INCLUDE [+/- TEMPERATURE SETPOINT ADJUSTMENT,] [LCD DISPLAY OF SPACE TEMPERATURE,] [OCCUPANCY OVERRIDE SWITCH,] AND COMMUNICATION PORT FOR LOCAL SERVICE TOOL INTERFACE.

. DATA COMMUNICATION NETWORK SHALL BE PROVIDED TO ALLOW DATA TRANSMISSION BETWEEN ALL DDC CONTROLLERS AND BETWEEN THE DDC CONTROLLERS AND THE [BUILDING NETWORK SUPERVISORY CONTROLLER]

[NEW/EXISTING OPERATOR WORKSTATION].

K. PRESSURE INDEPENDENT CONTROL VALVES (2-WAY): UP TO 2 INCHES - CHARACTERIZED BALL VALVE WITH INTEGRAL PRESSURE COMPENSATING CARTRIDGE WHICH MAINTAINS A CONSTANT PRESSURE DROP ACROSS VALVE SEAT, BRONZE BODY WITH SCREWED ENDS, STAINLESS STEEL OR CHROME PLATED BRASS BALL CHARACTERIZING DISC, STAINLESS STEEL OR BRASS STEM, AND RESILIENT REINFORCED TEFLON SEATS. OVER 2 INCHES - CONTROL VALVE WITH INTEGRAL PRESSURE COMPENSATING SPRING AND DIAPHRAGM WHICH MAINTAINS A CONSTANT PRESSURE DROP ACROSS THE VALVE SEAT, IRON BODY WITH FLANGED ENDS STAINLESS STEEL TRIM. CONTROL VALVES SHALL ACCURATELY CONTROL FLOW FROM 0 TO 100% OF THE FULL RATED FLOW. FLOW THROUGH THE CONTROL VALVE SHALL NOT VARY MORE THAN $\pm -5\%$ DUE TO SYSTEM PRESSURE FLUCTUATIONS WHEN THE PRESSURE DROP ACROSS THE VALVE IS WITHIN THE RANGE OF 5 PSID TO 35 PSID. ASSEMBLY BODY SHALL BE EQUIPPED WITH UPSTREAM AND DOWNSTREAM P/T PORTS MANUFACTURERS: BELIMO, BRAY/DELTA CONTROL PRODUCTS, DANFOSS NEXUS VALVE, FLOWCON INTERNATIONAL, GRISWOLD, HONEYWELL, JOHNSON CONTROLS.

L. ELECTRICAL REQUIREMENTS FOR CONTROLS WORK:

INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. 2. ELECTRICAL ACCESSORIES SUCH AS RELAYS, SWITCHES, CONTACTORS AND CONTROL TRANSFORMERS SHALL

MEET THE REQUIREMENTS OF THE DIVISION 26 SPECIFICATIONS OF RESPECTIVE PROJECT. 3. ELECTRICAL WIRING AND CONDUIT SHALL MEET THE REQUIREMENTS OF THE DIVISION 26 SPECIFICATIONS. ALL CONTROL WIRING IN MECHANICAL ROOMS AND ANY OTHER EXPOSED AREAS SHALL BE RUN IN CONDUIT LOW VOLTAGE TEMPERATURE CONTROL WIRING IN CONCEALED ACCESSIBLE LOCATIONS (I.E. ABOVE LAY-IN CEILINGS), AS WELL AS LOW VOLTAGE TEMPERATURE CONTROL WIRING WITHIN PARTITIONS, MAY BE RUN USING PLENUM RATED CABLE, NEATLY TIE-WRAPPED AND FASTENED TO THE BUILDING STRUCTURE (NOT TO CEILING OR CEILING SUPPORT WIRES).

4. CONDUITS CARRYING CONTROL WIRING SHALL BE SIZED FOR A MAXIMUM FILL OF 40% OF CAPACITY. 5. WHERE RACEWAY IS REQUIRED, TWO SEPARATE RACEWAY SYSTEMS SHALL BE PROVIDED; ONE FOR A.C. WIRING AND THE OTHER FOR D.C. WIRING.

6. DATA TRANSMISSION CABLING AND EQUIPMENT GROUNDING PROCEDURES SHALL MEET THE LATEST FCC GUIDELINES FOR ELECTROMAGNETIC FIELD GENERATION. . ALL CONTROL WIRING SIZES AND TYPES SHALL MEET OR EXCEED THE EQUIPMENT MANUFACTURER'S

RECOMMENDATIONS. M. INSTALLATION - CONTROL SYSTEMS:

1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. 2. CHECK AND VERIFY LOCATION OF TEMPERATURE SENSORS, THERMOSTATS AND OTHER EXPOSED CONTROL SENSORS WITH PLANS AND ROOM DETAILS BEFORE INSTALLATION. LOCATE ROOM TEMPERATURE SENSORS AND THERMOSTATS 48 INCHES ABOVE FLOOR UNLESS NOTED OTHERWISE.

3. LOCATE ALL CONTROL COMPONENTS AND ACCESSORIES SUCH THAT THEY ARE FASILY ACCESSIBLE FOR ADJUSTMENT, SERVICE AND REPLACEMENT. 4. LOCATE, SUPPORT AND INSTALL ALL CONTROL COMPONENTS AND ACCESSORIES SO THAT THEY WILL NOT BE

SUBJECT TO VIBRATION, EXCESSIVE TEMPERATURES, DIRT, MOISTURE OR OTHER HARMFUL CONDITIONS

WET ENVIRONMENT, SPRAY LABEL WITH CLEAR ENAMEL FOR WATERPROOFING. ALL CONTROL PANELS AND

AUXILIARY ENCLOSURES SHALL BE SUPPLIED WITH ENGRAVED PLASTIC NAMEPLATE PERMANENTLY ATTACHED

BEYOND THEIR RATED LIMITATIONS. 5. PROVIDE ALL NECESSARY RELAYS, SWITCHES, LINKAGES, CONTROL DEVICES, ACCESSORIES AND CONNECTIONS AS REQUIRED FOR A COMPLETE AND OPERATIONAL CONTROL SYSTEM AS SPECIFIED HEREIN AND SHOWN. 6. IDENTIFICATION AND MARKING: .ALL SENSORS, RELAYS, SWITCHES, ETC. SHALL BE MARKED WITH THE SAME IDENTIFICATION NUMBER AS USED ON THE AS-BUILT SHOP DRAWINGS. USE BROTHER P-TOUCH LABEL MAKER OR SIMILAR WITH BLACK TEXT ON CLEAR OR WHITE SUPER ADHESIVE TAPE. IF LABEL APPLIED IN

IDENTIFYING IT AS CONTROL PANEL NUMBER, SYSTEM SERVED, AREA SERVED, FED FROM LIGHTING PANEL NUMBER, CIRCUIT NUMBER, ETC I. GRAPHIC DISPLAY GENERATION. PROVIDE THE FOLLOWING GRAPHIC DISPLAYS AS A MINIMUM AT THE OPERATOR

WORKSTATIONS, ARRANGED IN LOGICAL PENETRATION PATHS. 1. FLOOR PLANS FOR EACH FLOOR WITHIN BUILDING, WITH DISPLAY OF PRESENT VALUES OF SPACE CONDITIONS SENSED BY CONNECTED SPACE SENSORS, DISPLAY OF THE NAME OF THE AIR HANDLER ASSOCIATED WITH EACH SPACE SENSOR, DISPLAY OF THE ROOM NUMBER IN WHICH THE SENSOR IS LOCATED AND COLOR CODING TO INDICATE WHETHER THE SENSED SPACE CONDITION IS WITHIN THE ACCEPTABLE RANGE, IS TOO HIGH, OR IS TOO LOW. TC CONTRACTOR SHALL CONFIRM OWNER DESIRED ROOM NAMES PRIOR TO GRAPHICS GENERATION WHICH MAY DIFFER FROM THE ROOM NAMES INDICATED ON

CONSTRUCTION DOCUMENTS. 2. SCHEMATIC DIAGRAM FOR EACH HVAC SYSTEM. EACH SYSTEM SCHEMATIC DISPLAY SHALL INCLUDE AT LEAST THE FOLLOWING: a. SCHEMATIC ARRANGEMENT OF DUCTWORK, FANS, DAMPERS, COILS, VALVES, PIPING, PUMPS, EQUIPMENT

b. SYSTEM NAME.

c. AREA SERVED d. PRESENT VALUE OR STATUS OF ALL INPUTS, ALONG WITH PRESENT SETPOINT.

e. PRESENT PERCENT OPEN FOR EACH DAMPER, VALVE, ETC. BASED ON COMMANDED POSITION.

ASSOCIATED SPACE CONDITIONS AND SETPOINTS, WHERE APPLICABLE.

4. SEQUENCE OF OPERATION IN WRITTEN (TEXT) FORMAT FOR EACH HVAC SYSTEM.

6. SYSTEM MANAGEMENT GRAPHIC FOR EACH NETWORK DEVICE AND/OR DDC CONTROLLER.

f. RESET SCHEDULE PARAMETERS FOR ALL POINTS, WHERE APPLICABLE. g. PRESENT OCCUPANCY MODE.

5. OVERALL BAS SYSTEM SCHEMATIC.

h. PRESENT ECONOMIZER MODE, WHERE APPLICABLE. i. PRESENT OUTSIDE AIR TEMPERATURE.

k. STATUS OF APPLICATION PROGRAMS (E.G., WARM-UP, OCCUPIED MODE, UNOCCUPIED MODE, STANDBY MODE, ETC.). I. COLOR CODING TO INDICATE NORMAL AND ABNORMAL VALUES, ALARMS, ETC.

3. MANUAL OVERRIDE CAPABILITY FOR EACH ON/OFF OR OPEN/CLOSED CONTROLLED DIGITAL OUTPUT (FOR FANS, PUMPS, 2-POSITION DAMPERS AND VALVES, ETC.) AND EACH MODULATING ANALOG OUTPUT (FOR DAMPERS, VALVES, VFD SPEED MODULATION TYPE POINTS, ETC) SHALL BE PROVIDED. GRAPHIC DISPLAY OF OUTPUT POINT AUTO OR MANUAL OVERRIDE STATUS SHALL BE PROVIDED.

AND TRAINING TO THE OWNER ON THE OPERATION OF THE CONTROL SYSTEMS FOR THE INITIAL INSTALLATION. INSTRUCTION AND TRAINING SHALL BE PERFORMED BY A COMPETENT CONTRACTOR REPRESENTATIVE FAMILIAR WITH THE CONTROL SYSTEMS OPERATION, MAINTENANCE AND CALIBRATION

P. CALIBRATION AND START-UP: AFTER INSTALLATION AND CONNECTION OF CONTROL COMPONENTS. TEST,

BALANCE AND PERFORMANCE. MAKE SYSTEMS READY FOR ENVIRONMENTAL EQUIPMENT ACCEPTANCE TESTS

ADJUST AND RE-ADJUST AS REQUIRED ALL CONTROL COMPONENTS IN TERMS OF FUNCTION, DESIGN, SYSTEMS

O. OWNER INSTRUCTION AND TRAINING: PROVIDE A MINIMUM OF FORTY (40) HOURS OF ON-SITE INSTRUCTION

ANDERSON, ECKSTEIN AND WESTRICK, INC

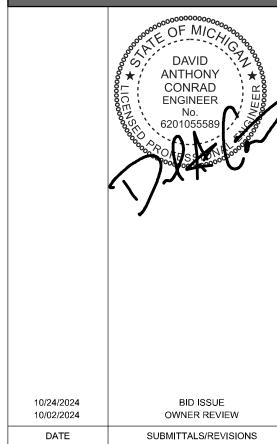
CIVIL ENGINEERS SURVEYORS ARCHITECTS Phone 586 726 1234 51301 Schoenherr Road

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ENGINEERING STRONG COMMUNITIES



5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024.0259



MACOMB **TOWNSHIP** BASEMENT **BUILD-OUT PHASE**

PROJECT NAME

SPECIFICATIONS

SHEET TITLE: MECHANICAL

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD CHECKED BY: NONE

> Know what's below. Call 72 hours before you dig.

FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED O THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO UARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTH OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE

PPROXIMATE LOCATIONS AND TYPES OF EXISTING

UTILITY INFORMATION, AS SHOWN, INDICATES

HALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE NCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH DURING CONSTRUCTION, THE CONTRACTOR SHALL USE

EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL

0249-0338

FIELD, DURING THE CONSTRUCTION, THE CONTRACTO

OVERHEAD AND / OR BURIED UTILITIES.

K. MANUFACTURERS: APOLLO VALVES; CONBRACO INDUSTRIES, INC. | KECKLEY COMPANY | METRAFLEX COMPANY | MUELLER STEAM SPECIALTY; A WATTS BRAND | NIBCO, INC. | SURE FLOW EQUIPMENT INC. | TITAN FLOW CONTROL. INC. | WATTS | YARWAY: EMERSON AUTOMATION SOLUTIONS | ASC ENGINEERED SOLUTIONS: GRUVLOK MANUFACTURING (FOR GROOVED PIPING) | VICTAULIC COMPANY (FOR GROOVED PIPING).

Q. ACCEPTANCE PROCEDURE: UPON SUCCESSFUL COMPLETION OF START-UP AND RECALIBRATION AS INDICATED

IN THIS SECTION, THE ARCHITECT SHALL BE REQUESTED IN WRITING TO INSPECT THE SATISFACTORY OPERATION

.. HANGER, SUPPORT, AND ANCHOR DEVICES ARE SPECIFIED IN "HANGERS AND SUPPORTS." COMPLY WITH THE D. FLEXIBLE CONNECTORS: FOLLOWING REQUIREMENTS FOR MAXIMUM SPACING OF SUPPORTS.

M. INSTALL THE FOLLOWING PIPE ATTACHMENTS: 1. ADJUSTABLE STEEL CLEVIS HANGERS FOR INDIVIDUAL HORIZONTAL PIPING LESS THAN 20 FEET LONG. 2. ADJUSTABLE ROLLER HANGERS AND SPRING HANGERS FOR INDIVIDUAL HORIZONTAL PIPING 20 FEET OR

3. PIPE ROLLER: MSS SP-58, TYPE 44 FOR MULTIPLE HORIZONTAL PIPING 20 FEET OR LONGER, SUPPORTED

ON A TRAPEZE. 4. SPRING HANGERS TO SUPPORT VERTICAL RUNS.

5. PROVIDE COPPER-CLAD HANGERS AND SUPPORTS FOR HANGERS AND SUPPORTS IN DIRECT CONTACT WITH COPPER PIPE.

N. INSTALL HANGERS FOR STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES: 1. NPS 3/4: MAXIMUM SPAN, 7 FEET; MINIMUM ROD SIZE, 1/4 INCH. 2. NPS 1: MAXIMUM SPAN, 7 FEET; MINIMUM ROD SIZE, 1/4 INCH.

3. NPS 1-1/2: MAXIMUM SPAN, 9 FEET; MINIMUM ROD SIZE, 3/8 INCH. 4. NPS 2: MAXIMUM SPAN, 10 FEET; MINIMUM ROD SIZE, 3/8 INCH. O. INSTALL HANGERS FOR DRAWN-TEMPER COPPER PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM

ROD SIZES: 1. NPS 3/4: MAXIMUM SPAN, 5 FEET; MINIMUM ROD SIZE, 1/4 INCH. 2. NPS 1: MAXIMUM SPAN, 6 FEET; MINIMUM ROD SIZE, 1/4 INCH.

4. NPS 2: MAXIMUM SPAN, 8 FEET; MINIMUM ROD SIZE, 3/8 INCH. P. SUPPORT VERTICAL RUNS AT ROOF, AT EACH FLOOR, AND AT 10-FOOT INTERVALS BETWEEN FLOORS. Q. PERFORM THE FOLLOWING TESTS ON HYDRONIC PIPING: 1. USE AMBIENT TEMPERATURE WATER AS A TESTING MEDIUM UNLESS THERE IS RISK OF DAMAGE DUE TO

FREEZING. ANOTHER LIQUID THAT IS SAFE FOR WORKERS AND COMPATIBLE WITH PIPING MAY BE USED. 2. WHILE FILLING SYSTEM, USE VENTS INSTALLED AT HIGH POINTS OF SYSTEM TO RELEASE AIR. USE DRAINS INSTALLED AT LOW POINTS FOR COMPLETE DRAINING OF TEST LIQUID. 3. ISOLATE EXPANSION TANKS AND DETERMINE THAT HYDRONIC SYSTEM IS FULL OF WATER.

4. SUBJECT PIPING SYSTEM TO HYDROSTATIC TEST PRESSURE THAT IS NOT LESS THAN 1.5 TIMES THE SYSTEM'S WORKING PRESSURE. TEST PRESSURE SHALL NOT EXCEED MAXIMUM PRESSURE FOR ANY VESSEL PUMP, VALVE, OR OTHER COMPONENT IN SYSTEM UNDER TEST. VERIFY THAT STRESS DUE TO PRESSURE AT BOTTOM OF VERTICAL RUNS DOES NOT EXCEED 90 PERCENT OF SPECIFIED MINIMUM YIELD STRENGTH OR 1.7 TIMES "SE" VALUE IN APPENDIX A IN ASME B31.9, "BUILDING SERVICES PIPING." 5. AFTER HYDROSTATIC TEST PRESSURE HAS BEEN APPLIED FOR AT LEAST 10 MINUTES, EXAMINE PIPING. JOINTS, AND CONNECTIONS FOR LEAKAGE. ELIMINATE LEAKS BY TIGHTENING, REPAIRING, OR REPLACING

COMPONENTS, AND REPEAT HYDROSTATIC TEST UNTIL THERE ARE NO LEAKS.

PREPARE WRITTEN REPORT OF TESTING. R. PERFORM THE FOLLOWING BEFORE OPERATING THE SYSTEM: 1. OPEN MANUAL VALVES FULLY.

3. NPS 1-1/2: MAXIMUM SPAN, 8 FEET; MINIMUM ROD SIZE, 3/8 INCH.

2. INSPECT PUMPS FOR PROPER ROTATION. 3. REMOVE DISPOSAL FINE-MESH STRAINERS IN PUMP SUCTION DIFFUSERS. 4. SET MAKEUP PRESSURE-REDUCING VALVES FOR REQUIRED SYSTEM PRESSURE. 5. INSPECT AIR VENTS AT HIGH POINTS OF SYSTEM AND DETERMINE IF ALL ARE INSTALLED AND OPERATING FREELY (AUTOMATIC TYPE), OR BLEED AIR COMPLETELY (MANUAL TYPE).

6. SET TEMPERATURE CONTROLS SO ALL COILS ARE CALLING FOR FULL FLOW. 7. INSPECT AND SET OPERATING TEMPERATURES OF HYDRONIC EQUIPMENT, SUCH AS BOILERS, CHILLERS, COOLING TOWERS, TO SPECIFIED VALUES.

8. VERIFY LUBRICATION OF MOTORS AND BEARINGS.

<u> 233113 – METAL DUCTS</u> A. SHEET METAL MATERIALS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS——METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS, UNLESS

OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS. 1. GALVANIZED SHEET STEEL: LOCK-FORMING QUALITY; COMPLYING WITH ASTM A 653/A 653M AND HAVING G90 COATING DESIGNATION; DUCTS SHALL HAVE MILL-PHOSPHATIZED FINISH FOR SURFACES EXPOSED TO VIEW.

2. STAINLESS STEEL: ASTM A 480/A 480M, TYPE 316. 3. REINFORCEMENT SHAPES AND PLATES: GALVANIZED—STEEL REINFORCEMENT WHERE INSTALLED ON GALVANIZED SHEET METAL DUCTS.

B. SEALANT MATERIALS: 1. JOINT AND SEAM SEALANTS, GENERAL: THE TERM "SEALANT" IS NOT LIMITED SOLELY TO MATERIALS OF MASTIC NATURE BUT ALSO INCLUDES TWO-PART ADHESIVE/OPEN-WEAVE FABRIC STRIP SYSTEMS, AND ELASTOMERIC SEALANT TAPE.

ELASTOMERIC SEALANT TAPE: 3 INCHES WIDE; MODIFIED BUTYL ADHESIVE BACKED. a. MANUFACTURERS: HARDCAST; FOIL—GRIP 1402 AND FOIL—GRIP 1402—181BFX.

3. WATER-BASED JOINT AND SEAM SEALANT: FLEXIBLE, MASTIC SEALANT, RESISTANT TO UV LIGHT WHEN CURED, UL 723 LISTED, AND COMPLYING WITH NFPA REQUIREMENTS FOR CLASS 1 DUCTS.

a. Manufacturers: Hardcast; Flex-Grip 550 and Versa-Grip 181 | Polymer adhesives; No. 11 | UNITED MCGILL. 4. FLANGED JOINT MASTIC: ONE-PART. ACID-CURING. ELASTOMERIC JOINT SEALANT COMPLYING WITH

ASTM C 920, TYPE S, GRADE NS, CLASS 25, USE O. 5. GASKETS: CHLOROPRENE ELASTOMER, 40 DUROMETER, 1/8 INCH THICK, FULL FACE, ONE PIECE VULCANIZED

OR DOVETAILED AT JOINTS. C. HANGERS AND SUPPORTS: 1. BUILDING ATTACHMENTS: CONCRETE INSERTS, OR STRUCTURAL-STEEL FASTENERS APPROPRIATE FOR

CONSTRUCTION MATERIALS TO WHICH HANGERS ARE BEING ATTACHED. 2. HANGER MATERIALS: GALVANIZED SHEET STEEL OR THREADED STEEL ROD. 3. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS; COMPATIBLE WITH DUCT MATERIALS. ATTACHMENTS FOR STAINLESS STEEL AND PVC-COATED DUCT SHALL BE STAINLESS

4. TRAPEZE AND RISER SUPPORTS: STEEL SHAPES COMPLYING WITH ASTM A 36/A 36M. 5. LOAD RATED CABLE SUSPENSION SYSTEM: TESTED TO FIVE TIMES THE SAFE WORKING LOADS AND VERIFIED

BY THE SMACNA TESTING AND RESEARCH INSTITUTE. a. MANUFACTURERS: DUCTMATE INDUSTRIES, INC., CLUTCHER AND EZ-LOCK | DURO DYNE CORP., DYNA-TITE SYSTEM | GRIPPLE INC., HANG-FAST SYSTEM.

6. WELDED SUPPORTS: STRUCTURAL STEEL SHAPES WITH ZINC RICH PAINT. EQUIVALENT, PROPRIETARY DESIGN ROLLED STEEL STRUCTURAL SUPPORT SYSTEMS MAY BE USED IN LIEU OF MILL ROLLED STRUCTURAL STEEL.

D. RECTANGULAR DUCT FABRICATION: FABRICATE DUCTS, ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER CONSTRUCTION ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS——METAL AND FLEXIBLE" AND COMPLYING WITH REQUIREMENTS FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, TIE-ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.

ROUND AND FLAT-OVAL DUCT AND FITTING FABRICATION: 1. DIAMETER AS APPLIED TO FLAT-OVAL DUCTS IN THIS ARTICLE IS THE DIAMETER OF A ROUND DUCT WITH A CIRCUMFERENCE EQUAL TO THE PERIMETER OF A GIVEN SIZE OF FLAT-OVAL DUCT.

2. ROUND, SPIRAL LOCK-SEAM DUCTS: FABRICATE SUPPLY DUCTS OF GALVANIZED STEEL ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS——METAL AND FLEXIBLE."

3. FLAT-OVAL, SPIRAL LOCK-SEAM DUCTS: FABRICATE SUPPLY DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS——METAL AND FLEXIBLE."

CLASS 1.

CONTROLS."

A. QUALITY ASSURANCE: COMPLY WITH NFPA 90A, "INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS." AND NFPA 90B. "INSTALLATION OF WARM AIR HEATING AND AIR CONDITIONING SYSTEMS."

B. MANUAL VOLUME DAMPERS (LOW PRESSURE): 1. FACTORY FABRICATED. WITH REQUIRED HARDWARE AND ACCESSORIES. STIFFEN DAMPER BLADES FOR STABILITY. INCLUDE LOCKING DEVICE TO HOLD SINGLE-BLADE DAMPERS IN A FIXED POSITION WITHOUT VIBRATION. CLOSE DUCT PENETRATIONS FOR DAMPER COMPONENTS TO SEAL DUCT CONSISTENT WITH

PRESSURE CLASS. 2. DAMPER HARDWARE: ZINC-PLATED, DIE-CAST CORE WITH DIAL AND HANDLE MADE OF 3/32-INCH- THICK ZINC-PLATED STEEL, AND A 3/4-INCH HEXAGON LOCKING NUT. INCLUDE CENTER HOLE TO SUIT DAMPER

OPERATING-ROD SIZE. INCLUDE ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING. 3. MANUFACTURERS: AMERICAN WARMING AND VENTILATING | ARROW UNITED INDUSTRIES | GREENHECK KRUEGER | LOUVERS AND DAMPERS | NAILOR INDUSTRIES INC. | RUSKIN COMPANY | VENT PRODUCTS

COMPANY, INC. | YOUNG REGULATOR COMPANY. C. MANUAL VOLUME DAMPERS (MEDIUM OR HIGH PRESSURE):

1. FACTORY FABRICATED, WITH REQUIRED HARDWARE AND ACCESSORIES. STIFFEN DAMPER BLADES FOR STABILITY. INCLUDE LOCKING DEVICE TO HOLD SINGLE-BLADE DAMPERS IN A FIXED POSITION WITHOUT VIBRATION. CLOSE DUCT PENETRATIONS FOR DAMPER COMPONENTS TO SEAL DUCT CONSISTENT WITH PRESSURE CLASS.

2. DAMPER HARDWARE: ZINC-PLATED, DIE-CAST CORE WITH DIAL AND HANDLE MADE OF 3/32-INCH- THICK ZINC-PLATED STEEL. AND A 3/4-INCH HEXAGON LOCKING NUT. INCLUDE CENTER HOLE TO SUIT DAMPER OPERATING-ROD SIZE. INCLUDE ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.

3. MANUFACTURERS: AMERICAN WARMING AND VENTILATING | GREENHECK | LOUVERS AND DAMPERS | NAILOR

INDUSTRIES INC. | RUSKIN COMPANY | VENT PRODUCTS COMPANY, INC. 1. FLAME-RETARDANT OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181,

2. METAL-EDGED CONNECTORS: FACTORY FABRICATED WITH A FABRIC STRIP ATTACHED TO TWO STRIPS OF GALVANIZED SHEET STEEL, STAINLESS STEEL OR ALUMINUM SHEETS. SELECT METAL COMPATIBLE WITH 3. INDOOR SYSTEM, FLEXIBLE CONNECTOR FABRIC: GLASS FABRIC DOUBLE COATED WITH NEOPRENE.

4. OUTDOOR SYSTEM, FLEXIBLE CONNECTOR FABRIC: GLASS FABRIC DOUBLE COATED WITH WEATHERPROOF, SYNTHETIC RUBBER RESISTANT TO UV RAYS AND OZONE. 5. HIGH-TEMPERATURE SYSTEM, FLEXIBLE CONNECTORS: GLASS FABRIC COATED WITH SILICONE RUBBER.

6. HIGH-CORROSIVE-ENVIRONMENT SYSTEM, FLEXIBLE CONNECTORS: GLASS FABRIC WITH CHEMICAL-RESISTANT 7. MANUFACTURERS: ADSCO MANUFACTURING LLC. | DURO DYNE CORP. | SENIOR FLEXONICS PATHWAY.

VENTFABRICS, INC. E. DUCT ACCESSORY HARDWARE: ADHESIVES: HIGH STRENGTH, QUICK SETTING, NEOPRENE BASED, WATERPROOF, AND RESISTANT TO GASOLINE AND GREASE.

233600 - AIR TERMINAL UNITS A. DESIGN REQUIREMENTS: REFER TO SCHEDULES FOR BASIS OF DESIGN AND CAPACITIES. 1. MANUFACTURERS: ANEMOSTAT | KRUEGER | NAILOR INDUSTRIES | PRICE INDUSTRIES | TITUS | TUTTLE &. BAIL FY.

B. SINGLE-DUCT AIR TERMINAL UNITS (HOT WATER COILS): 1. CONFIGURATION: VARIABLE AND CONSTANT VOLUME, MEDIUM PRESSURE TERMINAL UNITS WITH CASING, 100 PERCENT TIGHT SHUTOFF VOLUME REGULATOR WITH VELOCITY SENSOR, AND SOUND ATTENUATING THERMAL

INSULATION. 2. CASING: CONSTRUCTED OF 0.034-INCH MILL GALVANIZED STEEL OR 0.032-INCH ALUMINUM. 3. VOLUME DAMPER: GALVANIZED STEEL WITH PERIPHERAL GASKET AND SELF-LUBRICATING BEARINGS.

5. HOT-WATER HEATING COIL: COPPER TUBE, MECHANICALLY EXPANDED INTO ALUMINUM-PLATE FINS; LEAK TESTED UNDERWATER TO 200 PSIG; AND FACTORY INSTALLED 6. VOLUME DAMPER: GALVANIZED STEEL WITH PERIPHERAL GASKET AND SELF-LUBRICATING BEARINGS. a. MAXIMUM DAMPER LEAKAGE: AHRI 880 RATED, 2 PERCENT OF NOMINAL AIRFLOW AT 3-INCH WG INLET

4. ATTENUATOR SECTION: 0.034-INCH MILL GALVANIZED STEEL OR 0.032-INCH ALUMINUM SHEET METAL.

STATIC PRESSURE. 7. VELOCITY SENSOR: MULTIPOINT AVERAGING ARRAY. SENSOR LOCATED IN AIR INLET. 8. FACTORY-MOUNTED AND -WIRED CONTROLS: ELECTRICAL COMPONENTS SHALL BE MOUNTED IN CONTROL BOX WITH REMOVABLE COVER. INCORPORATE SINGLE-POINT ELECTRICAL CONNECTION TO POWER SOURCE. a. CONTROL TRANSFORMER: FACTORY MOUNTED FOR CONTROL VOLTAGE ON ELECTRIC AND ELECTRONIC

b. WIRING TERMINATIONS: FAN AND CONTROLS TO TERMINAL STRIP, AND TERMINAL LUGS SHALL MATCH QUANTITIES, SIZES, AND MATERIALS OF BRANCH-CIRCUIT CONDUCTORS. ENCLOSE TERMINAL LUGS IN TERMINAL BOX THAT IS SIZED ACCORDING TO NFPA 70.

CONTROL UNITS WITH TERMINAL STRIP IN CONTROL BOX FOR FIELD WIRING OF THERMOSTAT AND POWER

9. CONTROL PANEL ENCLOSURE: NEMA 250, TYPE 1, WITH ACCESS PANEL SEALED FROM AIRFLOW AND MOUNTED ON SIDE OF UNIT. 10. DDC CONTROLS: SINGLE-PACKAGE UNITARY CONTROLLER AND ACTUATOR SPECIFIED IN "TEMPERATURE

11. CONTROL SEQUENCE: REFER TO TEMPERATURE CONTROL DIAGRAMS ON DRAWINGS.

233713 - DIFFUSERS, REGISTERS, AND GRILLES A. AIR DIFFUSION DEVICES ARE SCHEDULED ON THE DRAWINGS.

1. MANUFACTURERS: KREUGER NAILOR INDUSTRIES | PRICE INDUSTRIES | TITUS | TUTTLE & BAILEY.

2. PROVIDE PLASTER FRAMES FOR UNITS INSTALLED IN PLASTER CEILINGS. 3. PROVIDE GASKETS FOR SUPPLY TERMINAL AIR DEVICES MOUNTED IN FINISHED SURFACES.

4. AIR DIFFUSION DEVICE FACE AND VISIBLE TRIM: STANDARD OFF WHITE BAKED ENAMEL FINISH UNLESS NOTED OTHERWISE.

5. AIR DIFFUSION DEVICE INTERIOR SURFACES, INCLUDING BLANK-OFFS: BLACK MATTE FINISH.

WESTRICK, INC CIVIL ENGINEERS SURVEYORS ARCHITECTS

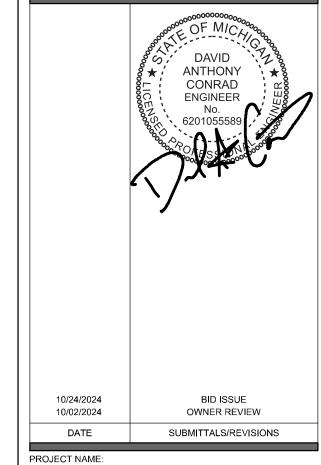
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51301 Schoenherr Road Phone 586 726 1234 Shelby Township Fax 586 726 8780 Michigan 48315 www.aewinc.com

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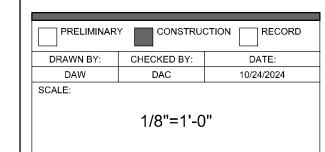
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MACOMB **TOWNSHIP BASEMENT BUILD-OUT PHASE TWO**

SHEET TITLE: MECHANICAL **SPECIFICATIONS**

MACOMB TOWNSHIP



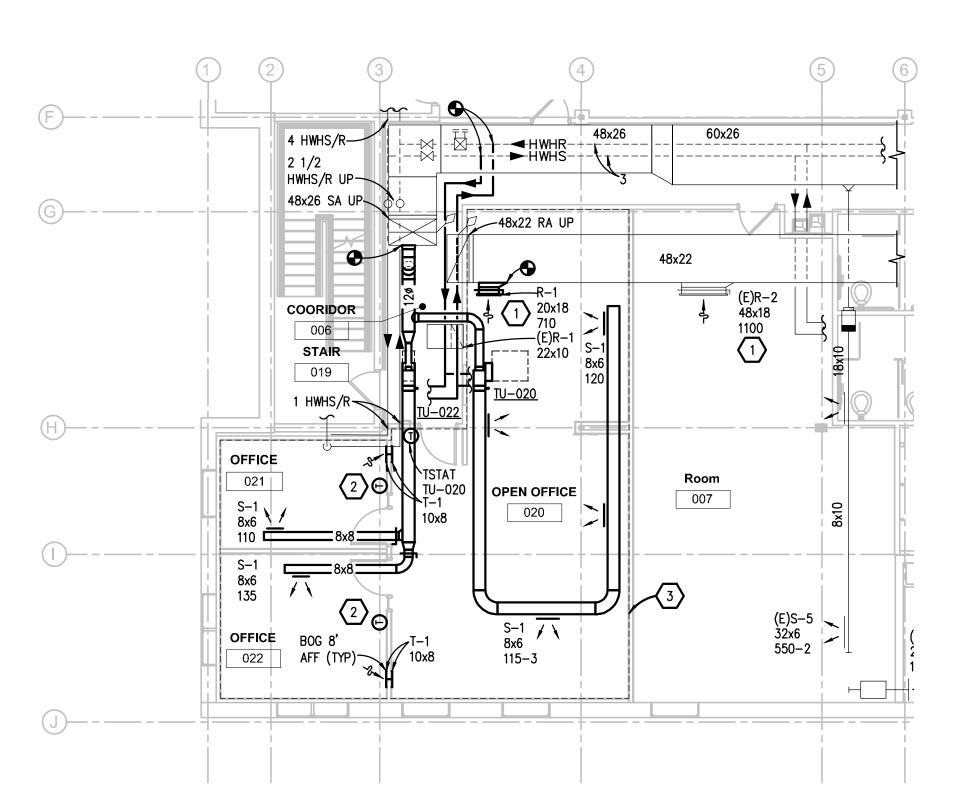


UTILITY INFORMATION, AS SHOWN, INDICATES PPROXIMATE LOCATIONS AND TYPES OF EXISTING FACILITIES ONLY AS DISCLOSED BY RECORDS PROVIDED. TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO SUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD, DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE NCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

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SHEET METAL GENERAL NOTES:

- 1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- 3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
- 4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- 5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- 6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.
- 7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

HVAC PIPING GENERAL NOTES:

- 1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
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- 5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- 6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
- 7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL
- 8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
- 9. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

***** CONSTRUCTION KEY NOTES:

- 1. BALANCE TO CFM INDICATED.
- 2. TU-022 TO BE CONTROLLED BY AVERAGE OF TSTATS IN OFFICES 021 AND 022.
- 3. SHEET METAL IN AREA INDICATED TO BE PAINTED BLACK.



ANDERSON, ECKSTEIN AND WESTRICK, INC.

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Associates

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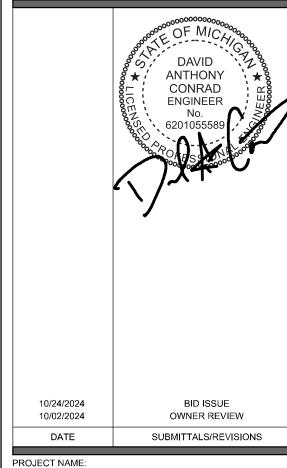
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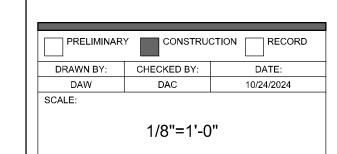


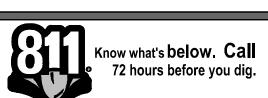
MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE

SHEET TITLE: MECHANICAL
NEW WORK PLAN

TWO

MACOMB TOWNSHIP





UTILITY INFORMATION, AS SHOWN, INDICATES
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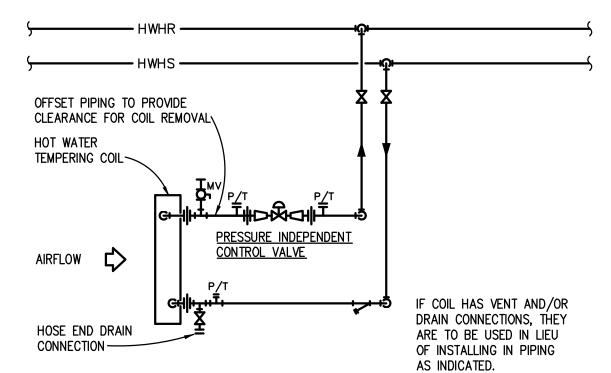
DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

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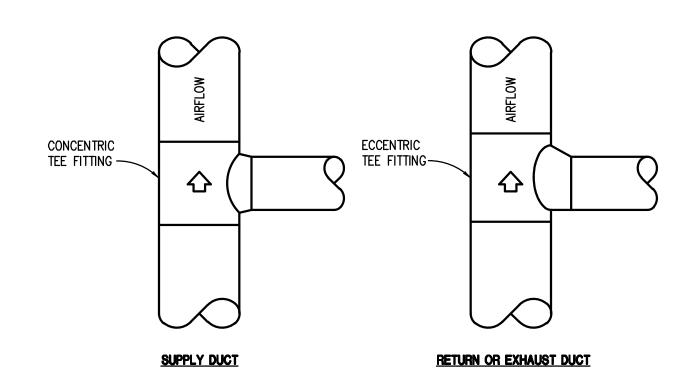
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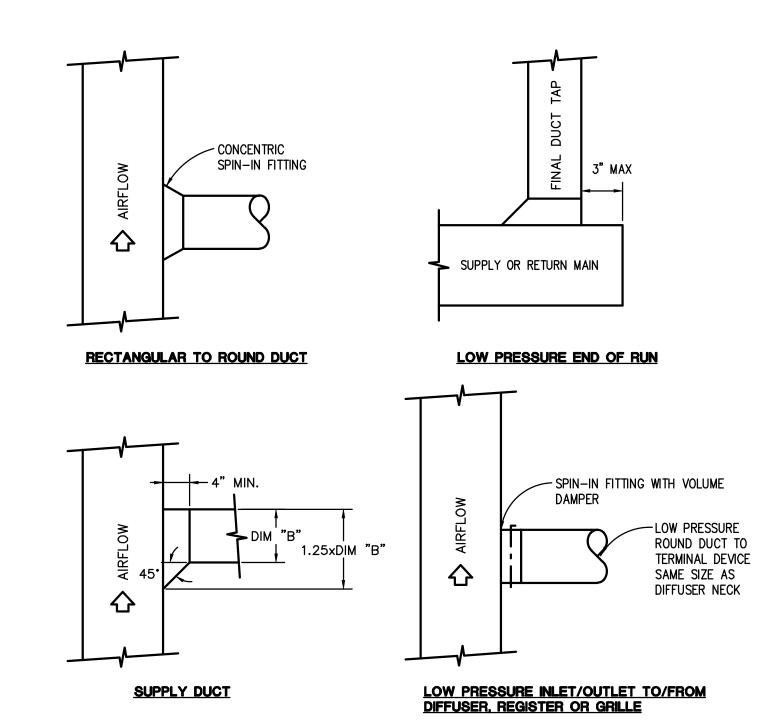
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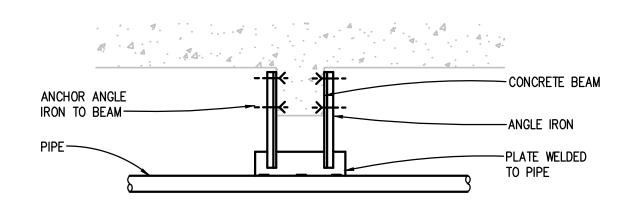
HOT WATER TEMPERING COIL WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM



SPIRAL DUCT BRANCH TAKE-OFF DETAILS NO SCALE (ROUND AND FLAT OVAL SIMILAR)



RECTANGULAR DUCT BRANCH TAKE-OFF DETAILS NO SCALE



PIPE ANCHOR TO BEAM DETAIL

MEDIUM PRESSURE ROUND

UNIT INLET UNLESS NOTED

OTHERWISE ON PLANS

PROVIDE MINIMUM 3

DIAMETERS OF STRAIGHT

RIGID DUCT (UNIT INLET SIZE)

AT INLET OF TERMINAL UNIT

AIR TERMINAL UNIT CONTROLLER -

DUCT, SAME SIZE AS TERMINAL

AIR TERMINAL

SUPPLY TU CONFIGURATION

TERMINAL UNIT SECTION

AIR TERMINAL UNIT (TU) DETAIL
NO SCALE

PROVIDE CLEARANCE FOR FULL HEIGHT OF

AIR TERMINAL UNIT TO ALLOW SERVICE ACCESS

FROM BELOW -

CEILING <

ACCESS DOOR PROVIDED

TERMINAL TEMPERING COIL

WHERE INDICATED ON PLANS

LOW PRESSURE RECTANGULAR

UNIT OUTLET UNLESS NOTED

OTHERWISE ON PLANS

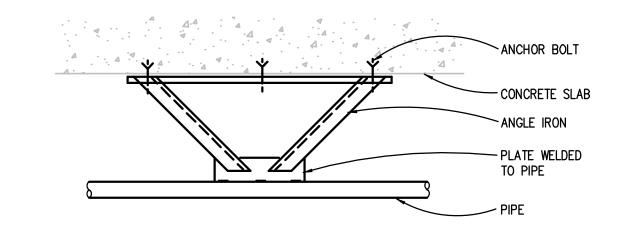
PROVIDE MINIMUM 30" WIDE (OR THE WIDTH OF THE CONTROL PANEL) AND MINIMUM 36" IN FRONT OF THE TERMINAL UNIT CONTROL PANEL (CONTRACTOR SHALL VERIFY CORRECT TERMINAL

UNIT CONTROLLER LOCATION IN FIELD)

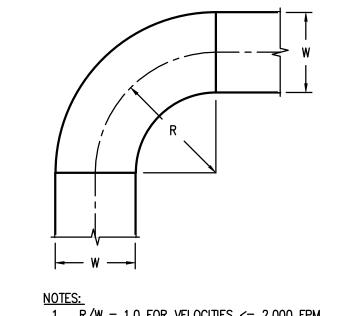
4'-0" MIN.

DUCT. SAME SIZE AS TERMINAL

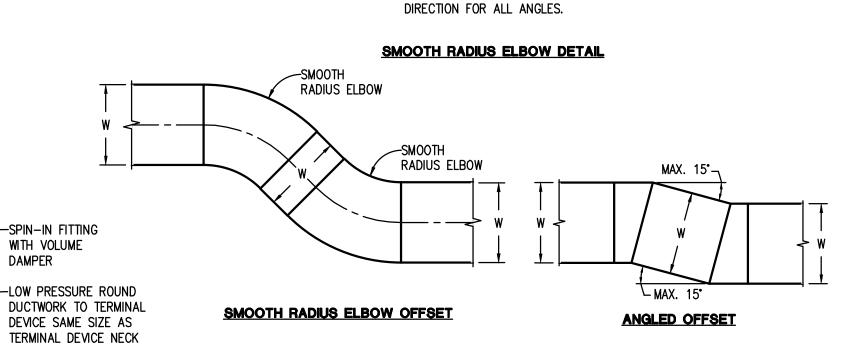
BY AIR TERMINAL UNIT

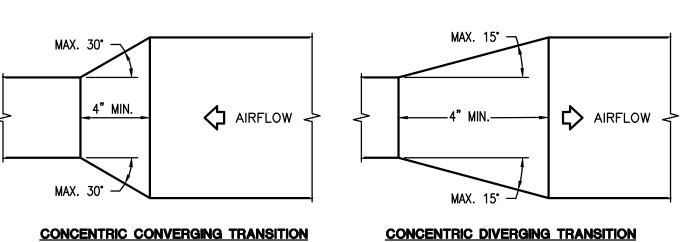


PIPE ANCHOR TO SLAB DETAIL



1. R/W = 1.0 FOR VELOCITIES $\leq 2,000$ FPM UNLESS OTHERWISE INDICATED, R/W = 1.5FOR VELOCITIES > 2,000 FPM UNLESS OTHERWISE INDICATED. 2. ALL CHANGES IN DIRECTION SHALL BE SMOOTH RADIUS ELBOW UNLESS OTHERWISE INDICATED. 3. THIS DETAIL APPLIES TO CHANGES IN





AIRFLOW -

AIRFLOW-**ECCENTRIC CONVERGING TRANSITION ECCENTRIC DIVERGING TRANSITION**

-AIR TERMINAL UNIT CONTROLLER

-AIR TERMINAL UNIT

WITH VOLUME

DAMPER

DUCT TRANSITION AND OFFSET DETAILS



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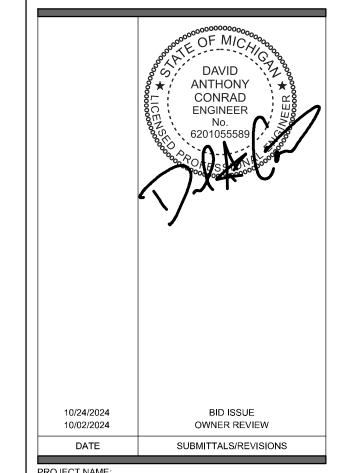
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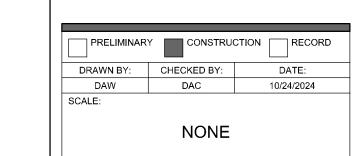
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MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE: MECHANICAL **DETAILS**

MACOMB TOWNSHIP





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- 1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
- 3. 1 X 4 (4 X 1 REVERSE COATED) PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON INTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON EXTERIOR SURFACES.
- 4. 4 X 4 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND 4 MILS (0.10 MM) THICK ON OPPOSITE SURFACES.

DUCT SYSTEM INSULATION A	\PP	LIC	AT	'IOI	N S	SCH	HEC	UL	E.	
	IN	INSULATION MATERIAL & THICKNESS (INCHES)						API	ELD PLIED	
						KET			CKET ERIAL	
	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
DUCT SYSTEMS LOCATED INDOORS										
UPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A, B
XHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING XTERIOR, EXCEPT AS NOTED BELOW		1.5								

PLENUMS, DUCTS, AND DUCT ACCESSORIES NOT REQUIRING INSULATION:

- DOUBLE-WALL METAL DUCTS WITH INSULATION OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 2013
- METAL DUCTS WITH DUCT LINER OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 2013
- FABRIC SUPPLY DUCTS FACTORY-INSULATED FLEXIBLE DUCTS
- FACTORY-INSULATED PLENUMS AND CASINGS
- FLEXIBLE CONNECTORS VIBRATION-CONTROL DEVICES
- FACTORY-INSULATED ACCESS PANELS AND DOORS

GENERAL NOTES

- 1. 'X' OR THICKNESS IN INCHES INDICATE ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
- 2. REFER TO METAL DUCT SECTION OF SPECIFICATIONS FOR DUCT LINING AND DOUBLE-WALL INSULATED DUCT. 3. REFER TO HVAC CASINGS SECTION OF SPECIFICATIONS FOR DOUBLE-WALL INSULATED PLENUMS.

<u>KEYED NOTES</u>

A. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS. B. EXPOSED SUPPLY DUCTWORK LOCATED IN A CONDITIONED SPACE SERVED BY THE SAME AIR HANDLING SYSTEM IS NOT REQUIRED TO BE INSULATED.

ABOVE	3R(OUI	ND	Н١	/A(C F	PIPI	NG	i &	V	ALV	/E	ΑP	PL	IC <i>F</i>	λTΙ	ON	S	CHI	EDULE
			M	IATERI	AL.						CONNE	ECTION				ISC	DLATIO	N VAL	/ES	
PIPE SIZE (INCHES)	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	САТЕ	KEYED NOTES
HEATING HOT WA	HEATING HOT WATER SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP., 125 PSIG AT 200 DEG F																			
UP TO 2				х							х					х				
UP TO 2		х						х	Х					х	Х	х				
CENERAL NOTES		•	•		•					•			•			•	•			

<u>GENERAL NOTES</u>

- 1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE 2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE
- CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.
 - a. NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION. b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
- 3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
- 4. HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING
- 5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

ABOVEGROUND HVAC PIPE &					RY	INS	SUI	_A ⁻	ΓΙΟ	N A	AP	PLI	CA	TION
	SCI		DUL	<u>.E</u>										
	IN	ISULAT		ATERIAL INCHES		IICKNES	SS	FIEL	D-APF	PLIED J	IACKET	MATE	RIAL	
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	DVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER														
NPS 1-1/4 AND SMALLER		1.5						Х		Х				A
NPS 1-1/2 AND LARGER		2						Х		Х				Α

UNLESS OTHERWISE INDICATED OR SCHEDULED, THE FOLLOWING DO NOT REQUIRE INSULATION: DIRECT BURIED COOLING SYSTEM PIPING

PIPING THAT CONVEYS FLUIDS HAVING DESIGN OPERATING TEMPERATURE RANGE BETWEEN 60 DEG F. AND 105 DEG F., INCLUSIVE.

GENERAL NOTES

- 1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM
- THOSE INDICATED SELECTIONS. 2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.
- 3. FOR PIPING NPS 1-1/4 AND SMALLER WITHIN PARTITIONS IN CONDITIONED SPACES INSULATION MAY BE REDUCED BY ONE-INCH THICKNESS, BUT NOT TO LESS THAN ONE-INCH
- 4. FOR PIPING NPS 1 AND SMALLER, INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVES, AND BALANCING VALVES.

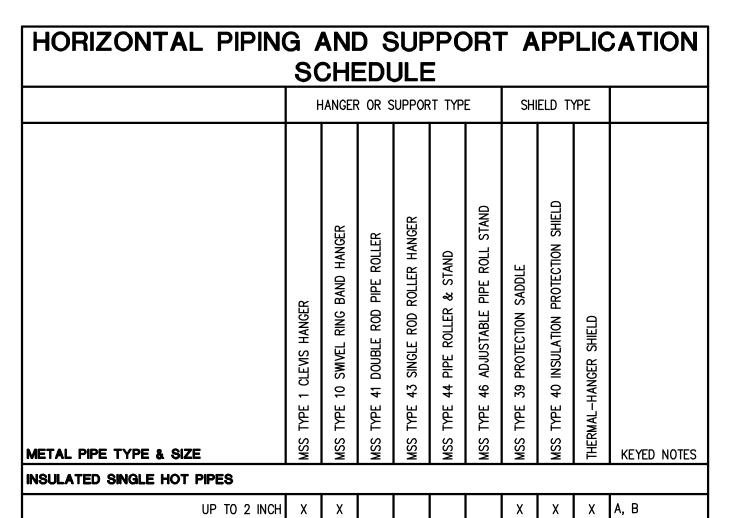
<u>KEYED NOTES</u>

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.

SCHEDULES GENERAL NOTES:

TYPICAL FOR ALL SCHEDULE SHEETS:

- 1. REFER TO ELECTRICAL STANDARD SCHEDULES, ONE LINE DIAGRAM AND PANEL SCHEDULES FOR ADDITIONAL ELECTRICAL INFORMATION
- 2. PROVIDE THE FOLLOWING FACTORY-WIRED ELECTRICAL OPTIONS/ACCESSORIES WHERE INDICATED IN SCHEDULE:
 - A NON-FUSED DISCONNECT SWITCH
 - B UNIT SHALL BE SINGLE POINT ELECTRICAL CONNECTION WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND
 - CONTROLS
 - C SERVICE RECEPTACLE
 - D FUSED DISCONNECT SWITCH E - COMBINATION STARTER
 - F UNIT SHALL HAVE (2) SINGLE POINT CONNECTIONS WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS. (1) CONNECTION SHALL BE FOR CONDENSING SECTION AND (1) CONNECTION SHALL BE FOR THE REMAINDER OF THE UNIT.
- 3. FOR MODULATION/CONTROL TYPE COLUMN, "VFC" INDICATES VARIABLE FREQUENCY CONTROLLERS, "AUTO" INDICATES AUTOMATIC OPERATION (CONTROLLED BY TEMPERATURE CONTROLS OR SELF CONTAINED CONTROLS), "MANUAL" INDICATES HAND OPERATION.
- 4. IF VARIABLE FREQUENCY CONTROLLERS ARE INDICATED TO BE PROVIDED AND ARE NOT INSTALLED INTEGRAL TO THE UNIT, VARIABLE FREQUENCY CONTROLLERS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR (UNLESS OTHERWISE NOTED) AND INSTALLED BY THE ELECTRICAL CONTRACTOR INCLUDING THE LINE SIDE AND LOAD SIDE WIRING TO THE MOTOR AND INCLUDING MISCELLANEOUS STEEL REQUIRED FOR THE SUPPORT AND MOUNTING OF THE VFC. REFER TO FLOOR PLANS FOR LOCATION.
- 5. WHERE EQUIPMENT IS INDICATED TO HAVE A SINGLE POINT ELECTRICAL CONNECTION, THAT EQUIPMENT SHALL COME COMPLETE WITH FACTORY INSTALLED STARTERS, MOTOR OVERLOAD PROTECTION, CONTACTORS, FUSING AND ALL NECESSARY INTERNAL WIRING AND CONTROLS. PROVIDE A FACTORY MOUNTED UNIT DISCONNECTING MEANS WHERE THE ELECTRICAL CONTRACTOR SHALL MAKE SINGLE POINT CONNECTION. INSTALL PACKAGED EQUIPMENT SUCH THAT THE ELECTRICAL CONNECTION AND CONTROLS ARE ACCESSIBLE AND HAVE CLEARANCES MEETING THE NATIONAL ELECTRICAL CODE.
- 6. WHERE PACKAGED EQUIPMENT IS PROVIDED, NAMEPLATE MUST INDICATE MAXIMUM OVERCURRENT PROTECTION BY HACR RATED CIRCUIT BREAKERS OR FUSES. IF FUSE PROTECTION ONLY IS INDICATED, PROVIDE A FUSIBLE DISCONNECT AND FUSES WITH THE UNIT.
- 7. WHERE EQUIPMENT IS DESIGNATED BY MANUFACTURER AND MODEL NUMBER, THIS IS THE BASIS OF DESIGN. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT BY OTHER SPECIFIED MANUFACTURERS OR PROPOSED ALTERNATE EQUIPMENT BY THE BASIS OF DESIGN MANUFACTURER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REVISIONS TO ELECTRICAL REQUIREMENTS, STRUCTURAL LOADING, OR ARCHITECTURAL APPURTENANCES AND SHALL INCLUDE THE COST OF SUCH REVISIONS IN HIS BID.
- WHERE EQUIPMENT IS SCHEDULED TO INCLUDE A SERVICE RECEPTACLE, PROVIDE A FACTORY MOUNTED SERVICE RECEPTACLE WITH APPROPRIATE FUSES AND TRANSFORMERS CONNECTED ON THE LINE SIDE OF THE UNIT DISCONNECT. PROVIDE A NAMEPLATE ON THE DISCONNECT SWITCH INDICATING THE PRESENCE OF LIVE POWER TO THE SERVICE RECEPTACLE WHEN THE UNIT DISCONNECT IS IN THE OFF
- 9. SIZE ALL EQUIPMENT FEEDERS BASED ON THE LISTED MOP (MAXIMUM OVERCURRENT PROTECTION). REFER TO THE FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE ON THE ELECTRICAL STANDARD SCHEDULES SHEET.



GENERAL NOTES

- 1. "X" INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT
- IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS.
- HANGERS AND SUPPORTS USED FOR FIRE PROTECTION SERVICES SHALL BE UL LISTED OR FMG APPROVED. 4. HANGER ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC COATED, FELT
- LINED. OR USE MANUFACTURED COPPER TUBE ISOLATORS.
- REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR HANGER SPACING. 6. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING U-BOLTS OR STRUT CLAMPS
- AND THERMAL HANGER SHIELDS. REFER TO KEYED NOTE A. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD HANGER ELEMENTS
- INDICATED FOR SINGLE COLD PIPES.
- 8. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING ROLLER ELEMENTS AND
- THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEYED NOTES B AND C. 9. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD ROLLER HANGERS INDICATED AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEY NOTES B AND C.

10. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR ADDITIONAL SYSTEM SPECIFIC HANGER APPLICATIONS.

KEYED NOTES

A. USE THERMAL HANGER SHIELD ON TRAPEZE SUPPORTED INSULATED PIPE TO PREVENT CRUSHING OF INSULATION. B. USE TYPE 39 PROTECTION SADDLES IF INSULATION WITHOUT VAPOR BARRIER IS INDICATED. FILL INTERIOR VOIDS WITH INSULATION MATCHING ADJOINING INSULATION.

ANDERSON, ECKSTEIN AND WESTRICK, INC

CIVIL ENGINEERS SURVEYORS ARCHITECTS

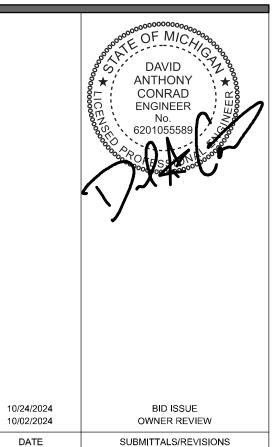
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ENGINEERING STRONG COMMUNITIES



5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024.0259



PROJECT NAME

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE

SHEET TITLE: MECHANICAL **SCHEDULES**

MAAOOMAD TOMMIOLUD

	IVIA	COMB LOW	WNSHIP							
	PRELIMINARY CONSTRUCTION RECO									
1	DRAWN BY:	CHECKED BY:	DATE:							
1	DAW	DAC	10/24/2024							
1	SCALE:									
		NONE								



UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF EXISTING FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED. TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE

COMPLETENESS OR ACCURACY THEREOF. PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE

PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE NCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

0249-0338

	AIR TERMINAL TYPE														
DUCT CONNECTIONS DISCHARGE SOUND POWER/RADIATED SOUND POWER – dB DIMENSIONS MODEL NUMBER															
INLET SIZE INCHES	OUTLET SIZE INCHES	125 Hz	250 Hz	500 Hz	1000 Hz	2000 HZ	4000 HZ	LENGTH INCHES	HEIGHT INCHES	TOMBLIN					
6ø	12x8	73/66	69/63	62/52	56/42	53/40	49/36	25-1/	8	SDV	A				
8ø	12x10	72/68	70/59	66/53	63/47	57/46	53/46	25–1/8	10	SDV	В				

GENERAL NOTES:
1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED. 2. MAXIMUM SOUND POWER LEVEL BASED ON 2" PRESSURE DROP ACROSS UNIT WITH NO ALLOWANCE FOR EXTERNAL ATTENUATION.

KEYED NOTES: A. BASED ON 350 CFM B. BASED ON 650 CFM

AIR TERMINAL UNIT WITH HOT WATER COIL SCHEDULE																			
UNIT IDENTIFICATION	inlet size	AREA SERVED	UNIT SERVED			AIR FLOW								HEATING	COIL (NOTE 3)				KEYED NOTES
			FROM	COOLING MAX	COOLING MIN.	HEATING MIN.	HEATING MAX	MAXIMUM A.P.D.	CAPACITY	APACITY NUMBER AIR WATER MBH ROWS									
				CFM	CFM	CFM	CFM	W/COIL IN. W.G.	MDIT	KO W S	E.D.B *F	L.D.B. F	FLOW GPM	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	CONTROL VALVE TYPE	
TU-020	8	OPEN OFFICE	AHU-1	465	145	145	195	0.25	7.4	1	55	89.5	0.58	180	154	0.50	15.0	2-WAY	
TU-022	6	OFFICES	AHU-1	245	80	80	190	0.25	7.1	1	55	89.2	0.74	180	160	0.50	15.0	2-WAY	

GENERAL NOTES:

1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.

2. MAXIMUM PRESSURE DROP SCHEDULED SHALL BE THE MAXIMUM ALLOWABLE STATIC PRESSURE FOR BOX AND COIL. AT THE MAXIMUM CFM.

3. HEATING COIL SELECTION BASED ON HEATING MAXIMUM AIR FLOW.

	GRILLE, REGISTER, AND DIFFUSER SCHEDULE														
UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES						
S–1	GRILLE	D+1-3/4	SEE PLAN	DUCT MOUNTED	OPPOSED BLADE DAMPER	STEEL	BLACK	500							
R-1	GRILLE	D+1-3/4	SEE PLAN	DUCT MOUNTED		STEEL	BLACK	500							
T–1	GRILLE	D+1-3/4	SEE PLAN	SURFACE MOUNT		STEEL	WHITE	500							

GENERAL NOTES:

1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.



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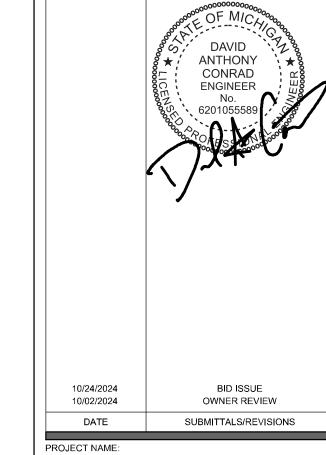
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MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE: MECHANICAL SCHEDULES

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD DRAWN BY: CHECKED BY: DAC NONE



UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATION, AS SHOWN, INDICATES
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DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

PROJECT NO.

0249-0338

SCHEMATIC SYMBOLS (CONT.)

DESCRIPTION

TIMER SWITCH

TRANSFORMER

VELOCITY SENSOR

VIBRATION SWITCH

COIL - RELAY

GROUND

MOTOR, SINGLE PHASE

HAND/OFF/AUTO

SWITCH - LIMIT, NO

TRANSFORMER

<u>DESCRIPTION</u>

ABBREVIATIONS

<u>ABBREVIATION</u>

WIRING SYMBOLS

TEMPERATURE SENSOR - RIGID ELEMENT IN WELL

TEMP SENSOR - DUCT MOUNTED RIGID ELEMENT

TEMPERATURE SENSOR - STRAP ON BULB

THERMOSTAT OR TEMPERATURE SENSOR

(AS DEFINED ON TC DRAWINGS)

VALVE - 2 WAY CONTROL VALVE

VALVE - 3 WAY CONTROL VALVE

VARIABLE FREQUENCY CONTROLLER

COIL - MOTOR STARTER CONTACTOR

CONTACT - INSTANT OPERATING, NO

CONTACT - INSTANT OPERATING, NC

SWITCH - 3 POSITION SELECTOR

SWITCH - FLOW (AIR, WATER, ETC.), NO

SWITCH - PRESSURE & VACUUM, NC

THERMAL OVERLOAD, SINGLE PHASE

WIRE TERMINATION AT DEVICE

WIRE TO WIRE TERMINATION

BUILDING AUTOMATION SYSTEM

DIRECT DIGITAL CONTROL

TEMPERATURE CONTROLS

NORMALLY OPEN

L _ _ _ _ _ _ _

NORMALLY CLOSED

WIRING NOT CONNECTED

SWITCH - TEMPERATURE ACTUATED, NO

THERMAL OVERLOAD CONTACTS-3 PHASE

PUSH BUTTON - MOMENTARY, NC (MUSHROOM HEAD)

TEMP SENSOR - DUCT MOUNTED AVG ELEMENT

CARBON DIOXIDE SENSOR - WALL MOUNTED CO2 CARBON DIOXIDE SENSOR - DUCT MOUNTED CURRENT SWITCH

СТ CURRENT TRANSDUCER DAMPER - OPPOSED BLADE \\\ DAMPER - PARALLEL BLADE ////

DAMPER MOTOR DPS DIFFERENTIAL PRESSURE SWITCH

ELECTRONICALLY COMMUTATED MOTOR

FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE

DIFFERENTIAL PRESSURE TRANSMITTER

FM FLOW METER FS _____ FLOW SWITCH

FZ FREEZESTAT GUARD FOR STAT OR SENSOR

HUMIDIFIER HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS) HUMIDITY SENSOR, DUCT MOUNTED

LEVEL SWITCH OR TRANSMITTER LS

- — — — — LINE — INSTRUMENT AIR (PNEUMATIC) MOTOR STARTER

LINE - ELECTRIC

OCCUPANCY SENSOR PRESSURE TRANSMITTER

RELAY, ELECTRIC SELECTOR SWITCH, (N=NUMBER OF POSITIONS)

SIGNAL - DDC/BAS, ANALOG INPUT SIGNAL - DDC/BAS, ANALOG OUTPUT SIGNAL - DDC/BAS, DIGITAL INPUT

SIGNAL - DDC/BAS, DIGITAL OUTPUT SIGNAL - PACKAGED EQUIPMENT, ANALOG INPUT

SIGNAL - PACKAGED EQUIPMENT, ANALOG OUTPUT SIGNAL - PACKAGED EQUIPMENT, DIGITAL INPUT

\DO\ SIGNAL - PACKAGED EQUIPMENT, DIGITAL OUTPUT SMOKE DETECTOR - DUCT MOUNTED s/s

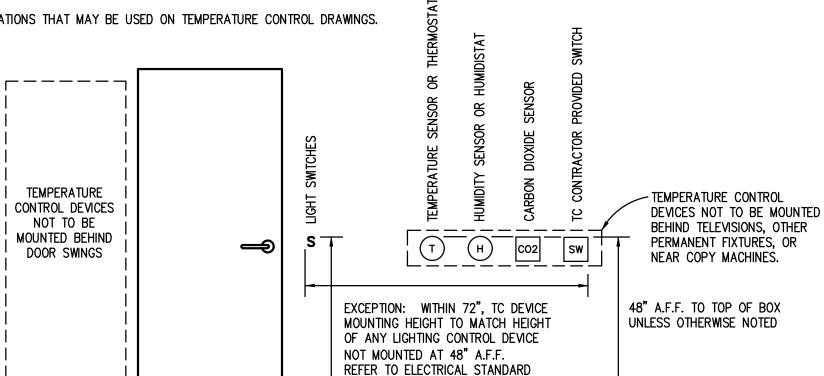
START/STOP RELAY STATIC PRESSURE TRANSMITTER STATIC PRESSURE SENSOR OR PROBE

NOTES:

SPT

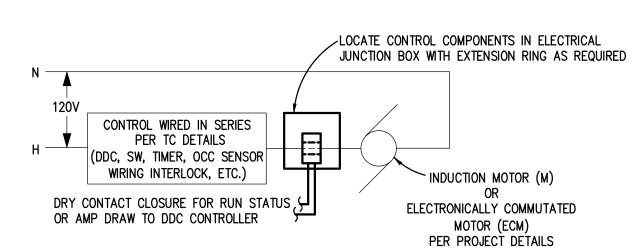
SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

2. REFER TO MECHANICAL STANDARDS ON DRAWING MO.1 FOR ADDITIONAL SYMBOLS & ABBREVIATIONS THAT MAY BE USED ON TEMPERATURE CONTROL DRAWINGS.

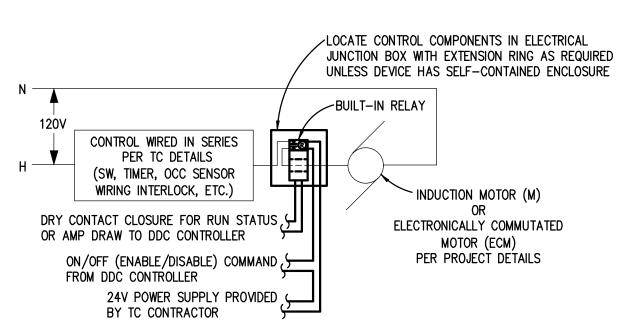


TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL NO SCALE

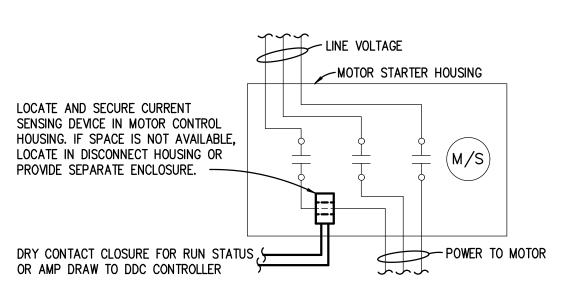
MOUNTING HEIGHTS



1-PHASE POWER APPLICATION - DDC MONITORING



1-PHASE POWER APPLICATION - COMBO DDC MONITORING & CONTROL



3-PHASE POWER APPLICATION - DDC MONITORING

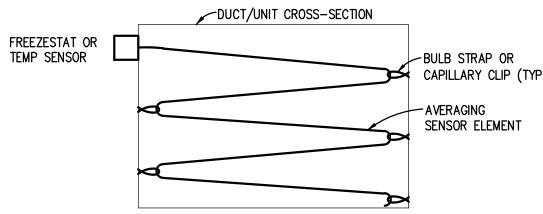
CURRENT SWITCH INSTALLATION DETAILS

TYPICAL NOTES:

- CURRENT SWITCH (CS) OR CURRENT TRANSDUCER (CT) AMP MONITORING AS APPLICABLE PER CONTROL DETAILS SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION. APPROPRIATE TIME DELAY FOR STATUS FEEDBACK UPON DDC START AND STOP COMMANDS SHALL BE INCLUDED WITH THE DDC LOGIC TO AVOID NUISANCE OPERATIONAL ALARMS.
- REVIEW EQUIPMENT SHOP DRAWINGS TO DETERMINE POTENTIAL AMPERAGE RANGE OF FAN OR PUMP OPERATION FOR AMPERAGE TRIP SETTING REQUIREMENTS PRIOR TO SELECTING APPROPRIATE CURRENT SWITCH (MINIMUM SPEED AMPERAGE FOR FPTU WITH ECM CAN BE VERY LOW).
- FOR ECM CURRENT SWITCH APPLICATIONS: PROVIDE CURRENT SWITCH RATED FOR ECM OPERATION WITH AMPERAGE TRIP SETTING HIGHER THAN TRICKLE/IDLE/STANDBY AMPERAGE ASSOCIATED WITH ECM WHEN OFF AND AMPERAGE TRIP SETTING LOWER THAN THE MINIMUM SPEED OPERATION OF FAN OR PUMP AS SET BY THE TAB CONTRACTOR.
- FOR INDUCTION MOTOR CURRENT SWITCH APPLICATIONS (AS APPLICABLE): AMPERAGE TRIP SETTING SHALL BE ADJUSTABLE TO ACCOMMODATE VFC MINIMUM SPEED SETTING, TO DETECT FAN BELT LOSS, OR TO DETECT PUMP COUPLING DETACHMENT.
- WHEN FAN OR PUMP IS ON AND NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR OPERATOR INFORMATION FROM BUILDING AUTOMATION SYSTEM

SUN SHIELD ~ OUTSIDE AIR TEMP SENSOR OUTSIDE AIR HUMIDITY SENSOR -

- 2. CALCULATE OA ENTHALPY OR DEW POINT TEMPERATURE AS REQUIRED PER SEQUENCE
- TO CONTROLLERS REQUIRING INFORMATION FOR DDC PROGRAMMING LOGIC.

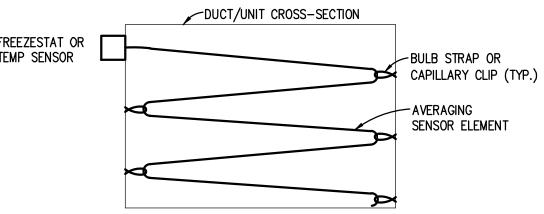


- 3. PROVIDE REQUIRED CAPILLARY STRAP OR CLIPS TO SUPPORT SENSOR TO PREVENT

OA SENSOR INSTALLATION DETAIL

NOTES:

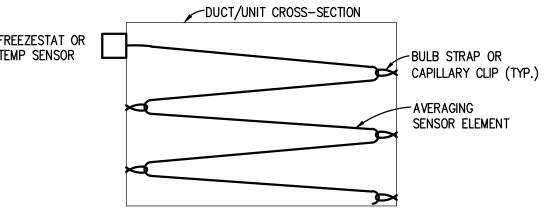
- 1. TC CONTRACTOR HAS THE OPTION OF USING EXISTING OA TEMP AND HUMIDITY SENSORS AS AVAILABLE FOR BUILDING.
- OF OPERATION REQUIREMENTS.



VIBRATION FROM AIR MOVEMENT.

NO SCALE

- 3. BROADCAST OUTSIDE AIR TEMPERATURE, HUMIDITY, AND CALCULATED OA ENTHALPY OR DEWPOINT TEMPERATURE, AS REQUIRED, THROUGH BAS COMMUNICATION NETWORK



NOTES:

- 1. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT. OF CROSS—SECTIONAL AREA.
- 2. AVERAGING DDC SENSOR LENGTH SHALL BE SUFFICIENT TO COVER AND SENSE THE CROSS-SECTIONAL AREA.
- 4. PROVIDE PROTECTION AT EACH CAPILLARY STRAP OR CLIP TO PREVENT ABRASION TO

AVERAGING ELEMENT INSTALLATION DETAIL

ON/OFF ACTIVE COMMAND STATUS

FOLLOWING POINT DATA AS AVAILABLE:

BACnet-MS/TP OPEN PROTOCOL INTERFACE TO - BAS COMMUNICATING BUT NOT LIMITED TO THE

- ON/OFF RUN STATUS COMMON ALARM STATUS
- REMOTE VFC (ALARM) RESET
- CURRENT OPERATING FREQUENCY (Hz)
 DC LINK VOLTAGE RUNTIME HOURS
- RUNTIME HOURS RESET
- MOTOR VOLTAGE
- MOTOR AMPS MOTOR TORQUE
- POWER (KW) ACCUMULATED KWH
- CURRENT SPEED COMMAND (0-100%)
 ACCUMULATED KWH RESET
 - MOTOR THERMAL (0-100%)
 - INVERTER THERMAL (0-100%) HEAT SINK TEMPERATURE

VFC BACnet INTERFACE & MONITORING REQUIREMENTS

TYPICAL FOR NEW FAN & PUMP VFCs

<u>NOTE:</u>

VARIABLE

FREQUENCY

CONTROLLER

TC CONTRACTOR SHALL COORDINATE BACnet-MS/TP OPEN PROTOCOL WIRE TERMINATION REQUIREMENTS AND POINT INTEGRATION CAPABILITIES WITH VFC SUPPLIER/MANUFACTURER AND PROVIDE APPROPRIATE BAS COMPONENTS FOR COMMUNICATION INTERFACE TO BAS.

TC GENERAL NOTES

PROVIDED BY OTHER TRADES.

- 1. THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL TEMPERATURE CONTROL (TC)
- 2. "PROVIDE" IS DEFINED AS "FURNISH AND INSTALL"
- 3. TEMPERATURE CONTROLS CONTRACTOR (TC CONTRACTOR) SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
- 4. FOR TEMPERATURE CONTROL DRAWINGS ONLY: ALL DETAILED INFORMATION IDENTIFIED WITH HEAVY LINE WEIGHT SHALL BE PROVIDED BY TC CONTRACTOR. ALL OTHER INFORMATION IDENTIFIED WITH LIGHT LINE WEIGHT SHALL BE PROVIDED BY OTHER
- 5. ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION.
- 6. TC CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
- 7. ALL TC PROVIDED COMPONENTS AND ALL TC CONTRACTOR INSTALLED WIRING SHALL BE LABELED PER SPECIFICATIONS. 8. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE
- EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS. 9. VARIABLE FREQUENCY CONTROLLER, FAN AND PUMP MOTOR STARTERS, STARTER WIRING, CONTROL VOLTAGE TRANSFORMERS AND ASSOCIATED POWER WIRING SHALL BE
- 10. DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. ELECTRICAL SHALL PROVIDE FIRE ALARM SYSTEM CONTROL MODULES FOR REQUIRED SAFETIES TO MOTOR STARTERS OR VFC'S AS INDICATED. CONTROL MODULES SHALL BE LOCATED NEAR RESPECTIVE MOTOR STARTERS OR VFCs. TC CONTRACTOR SHALL PROVIDE INTERLOCK WIRING FROM
- CONTROL MODULES TO MOTOR STARTERS OR VFCs. 11. ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR UNLESS OTHERWISE NOTED. TC CONTRACTOR SHALL COORDINATE WITH VFC AND MOTOR STARTER SUPPLIERS TO DETERMINE EXACT WRING REQUIREMENTS AND TERMINATION
- 12. ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
- 13. ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS. WHERE RACEWAY IS REQUIRED, TWO SEPARATE ELECTRICAL RACEWAY SYSTEMS SHALL BE PROVIDED: ONE FOR 120V WIRING AND THE OTHER FOR 24V WIRING.
- 14. TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL PANEL SCHEDULES FOR SPARE CIRCUITS OR CIRCUITS DEDICATED TO TEMPERATURE CONTROLS. COORDINATE CIRCUIT USE WITH ELECTRICAL CONTRACTOR.
- 15. TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
- 16. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES. PROVIDE WALL MOUNTED DEVICE GUARDS WHERE INDICATED ON TC DETAILS OR AT SPECIFIC LOCATIONS INDICATED ON MECHANICAL FLOOR PLANS.
- 17. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANELS FOR REQUIRED PANEL MOUNTED EQUIPMENT SUCH AS RELAYS, TRANSDUCERS, CONTROL TRANSFORMERS, ETC. AUXILIARY PANELS SHALL BE LOCATED NEXT TO ASSOCIATED DDC PANEL. DEPENDING ON WIRE QUANTITY OR COMPLEXITY, PROVIDE CONDUITS BETWEEN PANELS OR WIRING THROUGH WITH CONDUIT STUBS ABOVE ALL ASSOCIATED PANELS.
- 18. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSED IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
- 19. CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL
- 20. FREEZESTATS SHALL BE MOUNTED ON UPSTREAM FACE OF COOLING COILS. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT OF CROSS SECTIONAL AREA.
- 21. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT
- THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE. 22. ALL CONTROL VALVES, CONTROL DAMPERS AND ASSOCIATED CONTROL ACTUATORS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR UNLESS OTHERWISE NOTED. DAMPER SIZE AND LOCATIONS ARE INDICATED ON MECHANICAL

FLOOR PLAN DRAWINGS.

- 23. ALL CONTROL VALVES AND DAMPERS FURNISHED BY THE TC CONTRACTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL
- 24. DAMPER ACTUATORS SHALL BE INSTALLED BY TC CONTRACTOR WHEN FURNISHED BY TC CONTRACTOR.
- 25. ALL INSTRUMENTATION TUBING REQUIRED FOR DPS AND DPT COMPONENT INSTALLATIONS SHALL BE PROVIDED BY TC CONTRACTOR.
- 26. TC CONTRACTOR SHALL FIELD MOUNT ALL REQUIRED "SHIPPED LOOSE" PACKAGED CONTROL COMPONENTS FURNISHED BY EQUIPMENT SUPPLIERS WHERE INDICATED. ALL REQUIRED 24V AND 120V FIELD WIRING SHALL BE PROVIDED BY TC CONTRACTOR UNLESS NOTED OTHERWISE. TC CONTRACTOR SHALL COORDINATE SPECIFIC SYSTEM WIRING REQUIREMENTS WITH PACKAGED EQUIPMENT SUPPLIERS.

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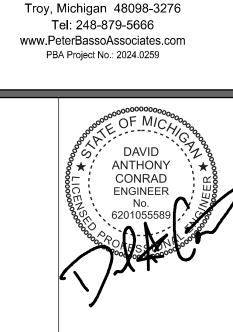
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Michigan 48315



5145 Livernois, Suite 100



10/24/2024 BID ISSUE 10/02/2024 OWNER REVIEW

SUBMITTALS/REVISIONS

PROJECT NAME **MACOMB TOWNSHIP**

BASEMENT BUILD-OUT PHASE

TWO

TEMPERATURE **CONTROL STANDARDS** AND GENERAL NOTES

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD DATE: DRAWN BY: CHECKED BY: DAC SCALE: NONE



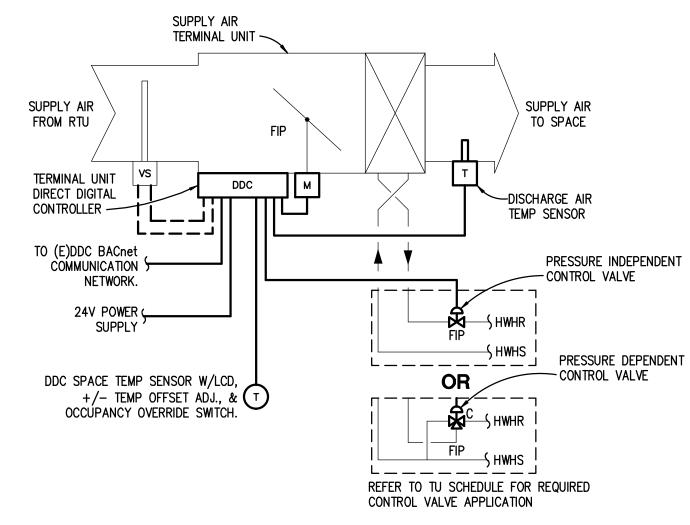
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SUPPLY AIR TERMINAL UNIT CONTROL

TYPICAL (EXCEPT WHERE NOTED)

<u>NOTI</u>

- 1. REFER TO MECHANICAL FLOOR PLANS FOR UNIT QUANTITIES & LOCATIONS AND SPACE TEMP SENSOR.
- TC CONTRACTOR SHALL PROVIDED A FULLY PROGRAMMABLE DDC TERMINAL UNIT (TU)
 CONTROLLER THAT IS CAPABLE OF ACCOMPLISHING THE INDICATED SEQUENCE OF
 OPERATION, INCLUDING CONTROL DEVICES AND WIRING SHOWN IN HEAVY LINE WEIGHT.
- 3. TERMINAL UNIT MANUFACTURER SHALL PROVIDE TERMINAL UNIT, TU DAMPER, TU AIRFLOW SENSOR, AND HW TEMPERING COIL.
- 4. TC CONTRACTOR SHALL FURNISH & INSTALL BACNET MS/TP OPEN PROTOCOL COMMUNICATION WIRING TO EACH TU CONTROLLER AND EXTEND TO THE (E)BUILDING SUPERVISORY CONTROLLER.
- 5. TC CONTRACTOR SHALL PROVIDE 24V POWER SUPPLY TO TU CONTROLLER. 24V TRANSFORMERS REQUIRED FOR TU CONTROLLERS SHALL BE LOCATED IN MECHANICAL OR ELECTRICAL ROOMS COORDINATE LOCATIONS. MAXIMUM TRANSFORMER SIZE SHALL BE 100VA. PROVIDE ENCLOSURE(S) FOR TRANSFORMERS.
- 6. REFER TO MECHANICAL DETAILS TC CONTRACTOR SHALL FURNISH 2—WAY PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVES OR 3—WAY PRESSURE DEPENDENT CONTROL VALVES FOR TEMPERING COILS. SELECT CONTROL VALVE TO ACHIEVE THE SCHEDULED FLOW RATES AND PRESSURE DROPS.
- 7. TC CONTRACTOR SHALL ADD TERMINAL UNIT TO THE EXISTING BAS GRAPHICS.

SEQUENCES OF OPERATION

SUPPLY AIR VAV TU WITH HWH HEATING COIL:

NOTE: ALL SETPOINTS, DEADBANDS, AND TIME DELAYS DESCRIBED IN THE SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

- 1. THE SUPPLY AIR TERMINAL UNIT'S HEATING MINIMUM AND MAXIMUM AIRFLOW SETTINGS AND COOLING MINIMUM AND MAXIMUM AIRFLOW SETTINGS SHALL BE AS INDICATED ON THE SCHEDULES. WHERE HEATING AND COOLING MINIMUM AND MAXIMUM AIRFLOW SETTINGS ARE THE SAME, TU SHALL CONTROL FOR CONSTANT AIR VOLUME (CAV).
- 2. TU CONTROLLER SHALL USE TU DISCHARGE AIR TEMP (DAT) SENSOR TO PROVIDE HIGH LIMIT OVERRIDE CONTROL WITH 90°F SETPOINT.
- 3. WHEN SPACE TEMPERATURE RISES ABOVE THE COOLING SETPOINT, THE SUPPLY AIR TERMINAL UNIT CONTROLLER SHALL KEEP THE HW TEMPERING COIL VALVE CLOSED AND MODULATE THE SUPPLY AIRFLOW BETWEEN ITS COOLING MINIMUM AND MAXIMUM SETPOINTS TO MAINTAIN SPACE TEMPERATURE.
- 4. WHEN SPACE TEMPERATURE FALLS BELOW HEATING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL FIRST MODULATE TU DAMPER TOWARDS ITS MINIMUM AIRFLOW SETPOINTS. WHEN AIRFLOW IS AT MIN, CONTROLLER SHALL MODULATE HW TEMPERING COIL VALVE TO ACHIEVE SPACE TEMPERATURE SETPOINT. IF THE SPACE TEMP IS BELOW SETPOINT WITH DAT AT HIGH LIMIT SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS HEATING MINIMUM AND MAXIMUM SETPOINTS WITH DAT MAINTAINED AT HIGH LIMIT SETPOINT BY HWH CONTROL VALVE MODULATION TO MAINTAIN SPACE SETPOINT.
- 5. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

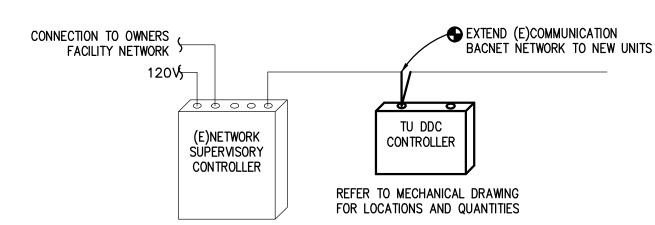
HEATING UNOCCUPIED SETPOINT = 62°F

HEATING OCCUPIED SETPOINT = 72°F

COOLING OCCUPIED SETPOINT = 75°F

COOLING UNOCCUPIED SETPOINT = 82°F

- 6. DURING BUILDING UNOCCUPANCY, RESPECTIVE AHU SHALL CYCLE AS REQUIRED TO MAINTAIN BUILDING SETBACK AND SETUP SPACE TEMP SETPOINTS.
- 7. WHEN RESPECTIVE AHU IS DEACTIVATED, TU DAMPERS SHALL REMAIN IN MINIMUM POSITION AND TU TEMPERING COIL VALVE SHALL REMAIN CLOSED.
- 8. THE DDC TU CONTROLLER SHALL RECALIBRATE THE AIRFLOW SENSOR ONCE A WEEK MINIMUM. THE RECALIBRATION PROCESS SHALL BE STAGGERED AMONGST THE TERMINAL UNITS SO THE DUCT STATIC PRESSURE DOES NOT EXCEED LIMITS.
- 9. SUPPLY TU CONTROL OUTPUT SIGNALS FOR TU DAMPER AND TEMPERING COIL VALVE SHALL BE DISPLAYED WITH BAS GRAPHICS.



DDC SYSTEM ARCHITECTURE

NOTES:

1. THE BUILDING AUTOMATION SYSTEM AND BACNET NETWORK ARE EXISTING. NEW DDC SYSTEM CONTROLLERS SHALL BE COMPATIBLE WITH AND CONNECTED TO THE EXISTING BACNET MS/TP NETWORK. TC CONTRACTOR SHALL UPGRADE THE EXISTING NETWORK SUPERVISOR AND FRONT-END BAS HARDWARE/SOFTWARE AS NECESSARY TO ACCOMMODATE NEW WORK.

- 2. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH SYSTEM.
- 3. TC CONTRACTOR SHALL DETERMINE DDC PANEL QUANTITIES BASED ON POINT DENSITIES AND AVAILABLE MOUNTING SPACE. UNLESS SPECIFICALLY NOTED IN DESIGN DRAWINGS, TC CONTRACTOR SHALL LOCATE DDC PANELS AND COORDINATE WITH OTHER TRADES.
- 4. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM SPARE CIRCUITS WHERE IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELEC CONTRACTOR. REFER TO ELECTRICAL DRAWINGS FOR PANEL LOCATIONS.
- 5. TC CONTRACTOR SHALL PROVIDE 24V TRANSFORMERS REQUIRED FOR CONTROLS AND SHALL BE LOCATED IN MECHANICAL OR ELECTRICAL ROOMS COORDINATE LOCATIONS.

 MAXIMUM TRANSFORMER SIZE SHALL BE 100 VA. PROVIDE ENCLOSURE(S) FOR
- TRANSFORMERS.

 6. TC CONTRACTOR SHALL PROVIDE INTEGRATION OF ALL NEW DDC SYSTEM CONTROLLERS TO THE (E)BAS AND GRAPHICS FOR EACH MECHANICAL SYSTEM, OR WHEN REQUIRED,
- 7. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANEL FOR GAUGES, TRANSMITTERS, RELAYS, POWER TRANSFORMERS, ETC.



WESTRICK, INC.

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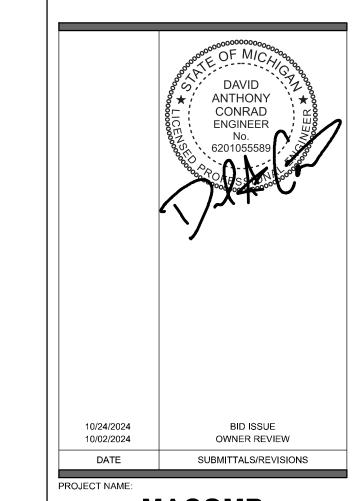
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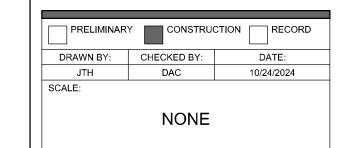


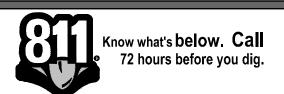
MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE:

TEMPERATURE CONTROLS

MACOMB TOWNSHIP





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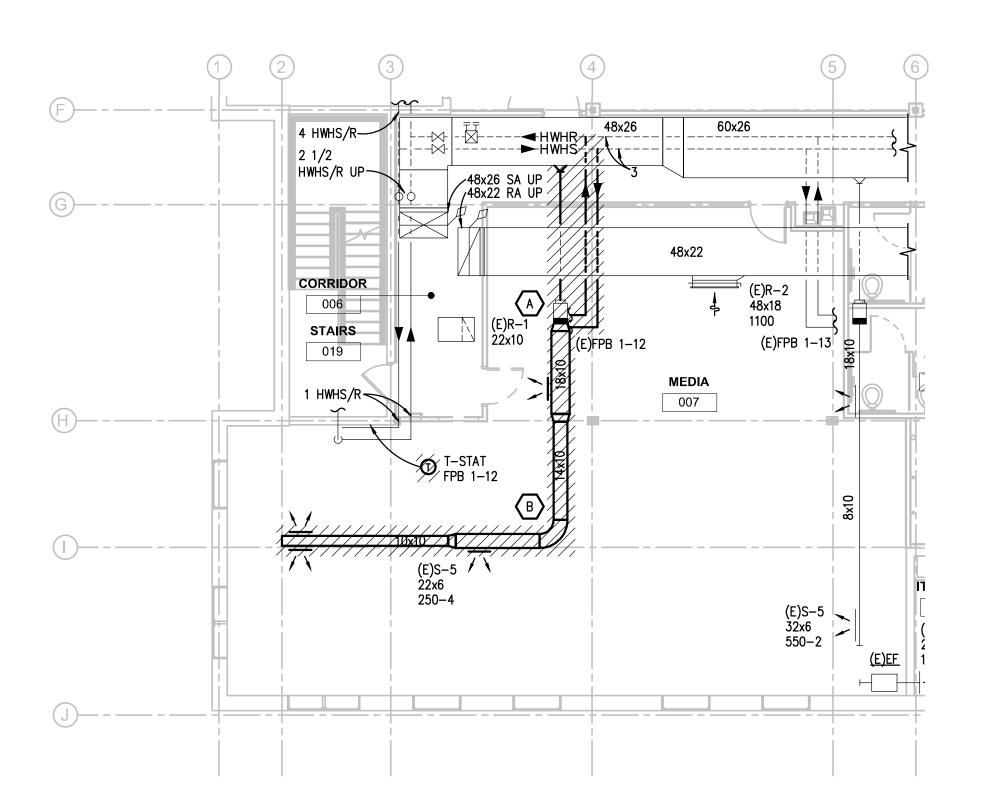
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M802



MECHANICAL DEMOLITION PLAN
SCALE: 1/8" - 1' - 0"

MECHANICAL DEMOLITION GENERAL NOTES:

- 1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
- 2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
- 3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
- 4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

DEMOLITION KEY NOTES:

- A. REMOVE EXISTING FAN POWERED BOX AND ALL ASSOCIATED PIPING, ACCESSORIES, AND TEMPERATURE CONTROLS.
- B. REMOVE SHEET METAL IN AREA INDICATED.



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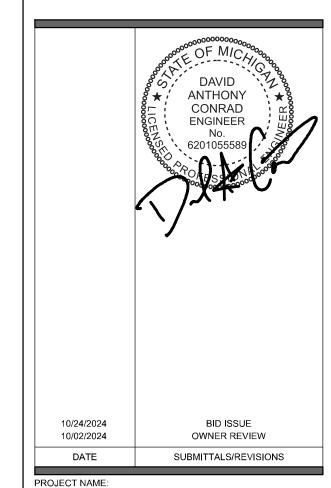
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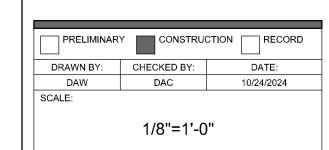
MACOMB TOWNSHIP BASEMENT

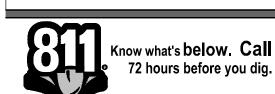
BUILD-OUT PHASE TWO

SHEET TITLE: MECHANICAL

DEMOLITION PLAN

MACOMB TOWNSHIP





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MD101

ELECTRICAL DRAWING INDEX

SHEET NO. SHEET TITLE E001 ELECTRICAL STANDARDS AND DRAWING INDEX E002 ELECTRICAL STANDARD SCHEDULES E003 **ELECTRICAL SPECIFICATIONS** ED101 ELECTRICAL DEMOLITION PLAN E201 LIGHTING NEW WORK PLAN E301 POWER AND AUXILIARY SYSTEMS NEW WORK PLAN

ELECTRICAL DETAILS AND DIAGRAMS

E701

- ELECTRICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	<u>DESCRIPTION</u>	ABBREVIATION	DESCRIPTION
Α	AMPERES	JB	JUNCTION BOX	Р	POLE
AER	ARC ENERGY REDUCTION			PB	PUSHBUTTON STATION
AF	AMPERES FRAME (BREAKER RATING)	KA	THOUSAND AMP	PH	PHASE
AFCI	ARC FAULT CIRCUIT INTERRUPTER	KV	KILOVOLT	PT	POTENTIAL TRANSFORMER
A.F.F.	ABOVE FINISH FLOOR	KVA	KILOVOLT – AMPERES	PDP	POWER DISTRIBUTION PANEL
AIC	AMPS INTERRUPTING CAPACITY	KW	KILOWATT	RECEPT.	RECEPTACLE
AL	AUDIENCE LEFT	KWH	KILOWATT - HOURS	RDP	RECEPTACLE DISTRIBUTION PANE
ALCR	AUTOMATIC LOAD CONTROL RELAY	LA	LIGHTNING ARRESTOR	RP	RECEPTACLE PANEL
AR	AUDIENCE RIGHT	LP	LIGHTING PANEL	RSC	RIGID STEEL CONDUIT
AT	AMPERES TRIP (BREAKER SETTING)	LDP	LIGHTING PANEL		
ATS	AUTOMATIC TRANSFER SWITCH			SCCR	SHORT CIRCUIT CURRENT RATING
AUX	AUXILIARY	MAX	MAXIMUM	SCHED	SCHEDULE
BCELTS	BRANCH CIRCUIT EMERGENCY	MCA	MINIMUM CIRCUIT AMPACITY	SPD	SURGE PROTECTION DEVICE
DOLLIG	LIGHTING TRANSFER SWITCH	MCB	MAIN CIRCUIT BREAKER	ST	SHUNT TRIP
BKR	BREAKER	MCC	MOTOR CONTROL CENTER	SW	SWITCH
BPS	BOLTED PRESSURE SWITCH	MDP	MAIN DISTRIBUTION PANEL	SWBD	SWITCHBOARD
		MECH	MECHANICAL	SWGR	SWITCHGEAR
C	CONDUIT	MIN	MINIMUM	TB	TERMINAL BOX
CB	CIRCUIT BREAKER	MISC.	MISCELLANEOUS	TELECOM	TELECOMMUNICATIONS
CFCI	CONTRACTOR FURNISHED,	MLO	MAIN LUGS ONLY	TR	TAMPER RESISTANT
OLIT	CONTRACTOR INSTALLED	MOP	MAXIMUM OVERCURRENT PROTECTION	TTB	TELEPHONE TERMINAL BACKBOAF
CKT	CIRCUIT	MTD	MOUNTED	TYP	TYPICAL
CT	CURRENT TRANSFORMER	MTG	MOUNTING		
DEMO	DEMOLITION	MTR	MOTOR	U.O.N.	UNLESS OTHERWISE NOTED
DIM	DIMENSION	N	NEUTRAL	US	UPSTAGE
DISC	DISCONNECT	NC	NORMALLY CLOSED	٧	VOLTS
DP	DISTRIBUTION PANEL	NEC	NATIONAL ELECTRICAL CODE	W	WIRE OR WATTS
DS	DOWNSTAGE	NF	NON-FUSIBLE	WAP	WIRELESS ACCESS POINT
DWG	DRAWING	NIC	NOT IN CONTRACT	WG	WIRE GUARD
EBU	EMERGENCY BATTERY UNIT	NL	NIGHT LIGHT	WP	WEATHERPROOF
EC	ELECTRICAL CONTRACTOR	NO	NORMALLY OPEN	WR	WEATHER RESISTANT
ECM	ELECTRONICALLY COMMUTATED MOTOR	NTS	NOT TO SCALE	WIX	WEATHER RESISTANT
ELEC	ELECTRICAL COMMOTATED MOTOR	1413	NOT TO SCALE	XFMR	TRANSFORMER
EM/ EMERG	EMERGENCY	OC	ON CENTER	XP	EXPLOSION PROOF
EMT	ELECTRICAL METALLIC TUBING	OFCI	OWNER FURNISHED,	(E)	EXISTING
EO EO	ELECTRICAL METALLIC TOBING ELECTRICALLY OPERATED		CONTRACTOR INSTALLED		
EPO	EMERGENCY POWER OFF	OFOI	OWNER FURNISHED,	(R)	RELOCATED
			OWNER INSTALLED		
EWC	ELECTRIC WATER COOLER EXISTING				
EXIST		STA	ANDARD METHOL	OS OF	NOTATION
FA	FIRE ALARM	<u> </u>			110111

-CONSTRUCTION KEY NOTE (NUMBER) OR

DEMOLITION KEY NOTE (LETTER)

(i.e. EXHAUST FAN NUMBER 1)

-FOOD SERVICE EQUIPMENT TAG

-SHEET ON WHICH SECTION IS DRAWN

SHEET ON WHICH ENLARGED PLAN IS DRAWN

-EQUIPMENT DESIGNATION,

-SECTION NUMBER

— PLAN NUMBER

- AREA OF ENLARGEMENT

-SECTION OR PLAN NUMBER

-SHEET ON WHICH SECTION IS CUT

(ENLARGED PARTIAL PLAN SIMILAR)

HEAVY LINE WEIGHT INDICATES NEW WORK

LIGHT LINE WEIGHT INDICATES EXISTING

EQUIPMENT OR REFERENCED INFORMATION

THIN GRAY LINE INDICATES CEILING GRID

DASHED LINES INDICATE CONDUIT ROUTED

TO BE DISCONNECTED AND REMOVED.

IN OR BELOW SLAB OR GRADE

CIRCUIT HOMERUN

IN USE

GRAY LINE INDICATES BACKGROUND INFORMATION

HATCH MARKS INDICATE EQUIPMENT OR MATERIALS

DUCT BANK - CONCRETE ENCASED / DIRECT BURIED

SPARE



Shelby Township

Michigan 48315

Peter Basso Associates 5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com

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LINDSEY STEFANIAK **ENGINEER** 620106318 10/24/2024 BID ISSUE 10/02/2024 OWNER REVIEW SUBMITTALS/REVISIONS

PROJECT NAME **MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO**

SHEET TITLE: ELECTRICAL STANDARDS AND DRAWING INDEX

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD DRAWN BY: CHECKED BY: LSS **SCALE** NONE



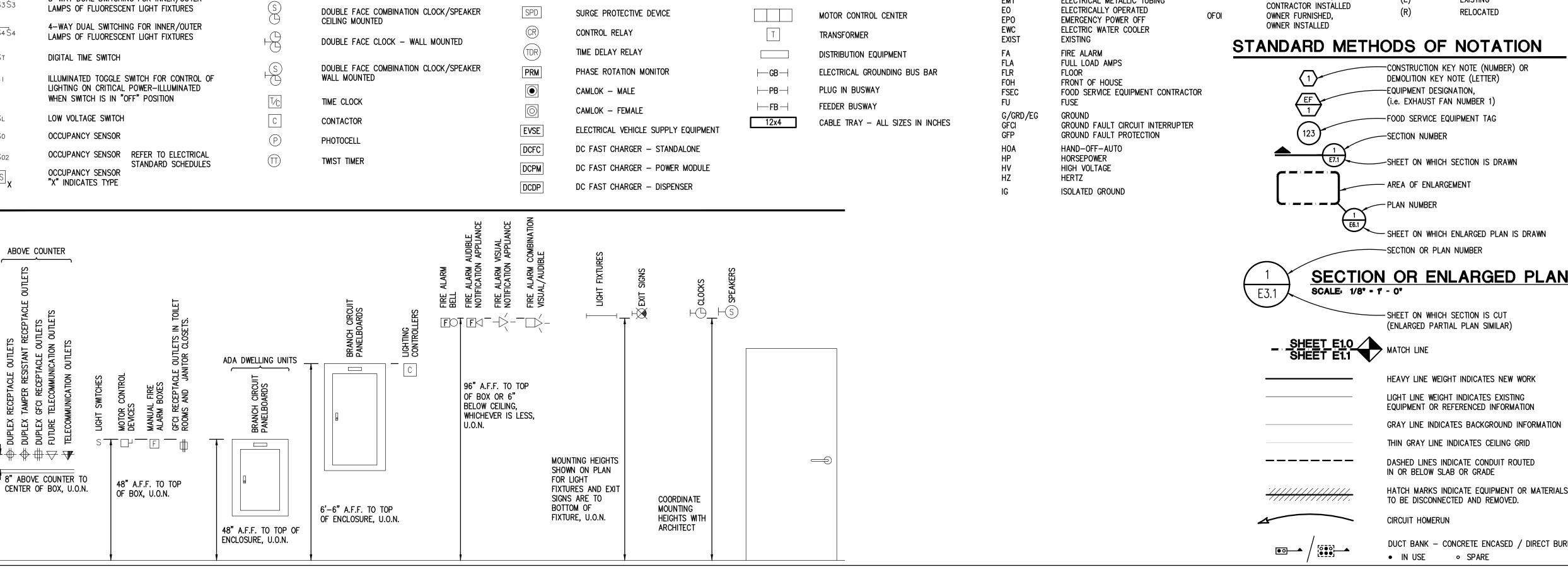
UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF EXISTING FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE

COMPLETENESS OR ACCURACY THEREOF. PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE

FIELD, DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE NCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

PROJECT NO. 0249-0338



	COPPER CONDUCTORS														
OVERCURRENT	WIRE (AWG O	SIZE R KCMIL)		CONDUIT SIZE											
DEVICE RATING (AMPERES)	PHASE & NEUTRAL	GROUND	SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G, 2PH, 1G)	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)									
15-20	12	12	3/4"	3/4"	3/4"	3/4"									
25-30	10	10	3/4"	3/4"	3/4"	3/4"									
35-40	8	10	3/4"	3/4"	3/4"	3/4"									
45-50	8 (6)	10	3/4"	3/4"	3/4"	3/4"	1								
60	6 (4)	10	3/4" (1")	3/4" (1")	3/4" (1")	1" (1 1/4")	1								
70	4	8	1"	1 1/4"	1 1/4"	1 1/4"									
80	4 (3)	8	1"	1 1/4"	1 1/4"	1 1/4"	1								
90–100	3 (2)	8	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1								
110	2 (1)	6	-	1 1/4"	1 1/4"	1 1/4" (1 1/2")	1								
125	1 (1/0)	6	-	1 1/4" (1 1/2")	1 1/4" (1 1/2")	1 1/2"	1								
150	1/0	6	-	1 1/2"	1 1/2"	1 1/2"									
175	2/0	6	-	2"	2"	2"									
200	3/0	6	-	2"	2"	2 1/2"									
225	4/0	4	-	2"	2"	2 1/2"									
250	250	4	-	2 1/2"	2 1/2"	2 1/2"									
300	350	4	-	2 1/2"	2 1/2"	3"									
350	500	3	-	3"	3"	3"									
400	500	3	_	3"	3"	3"									

GENERAL NOTES:

1. CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE.

2. CONTRACTOR MAY COMBINE 20A CIRCUITS AS NOTED IN SPECIFICATION.

3. CONDUCTORS ARE BASED ON THHN/THWN-2 UP TO AND INCLUDING #4/0. LARGER THAN #4/0 ARE BASED ON TYPE XHHW.
4. CONDUIT SIZES ARE VALID FOR EMT OR RSC. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR OTHER TYPES OF CONDUIT.

5. SIZE OF DISCONNECT SWITCH LOCATED AT EQUIPMENT SHALL BE SIZED BASED UPON OVERCURRENT PROTECTION OF THAT DEVICE.
6. OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLING DIFFERENT SIZE/QUANTITY OF CONDUCTORS TO OBTAIN AN EQUIVALENT AMPACITY.

KEYED NOTES:

1. CONDUCTORS ARE BASED ON 90°C, 600V INSULATED WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C. FOR TERMINATION RATED AT 60°C, USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.

			EX	IST	ING	PAI	NELE	BOA	RD	LP-	вв			
#	LOAD TYPE	DESCRIPTION	CB TYPE	СВ	VA	ØA	ØB	ØС	VA	СВ	CB TYPE	DESCRIPTION	LOAD TYPE	
1	L	(E) LIGHTING VOTING 016, OFFICE 017		20	1558	1958			400	20	GFCI	(E) BASEMENT DRINKING FOUNTAIN	R	2
3		SPARE		20			900		900	20		(E) OUTLETS MEDIA & CORRIDOR	R	4
5	R	(E) OUTLETS OFFICE 017		20	1080			2230	1150	20		(E) HAND DRYER TOILET 008	NC	6
7	R	(E) WALL OUTLETS VOTING 016		20	1080	2230			1150	20		(E) HAND DRYER TOILET 009	NC	8
9		(E) WALL OUTLETS VOTING 016		20	900		1980		1080	20		(E) OUTLETS TOILETS & IT OFFICE	R	10
11		(E) CEILING OUTLETS VOTING 016		20	1080			1980	900	20		(E) OUTLETS IT OPEN OFFICE & STORAGE	R	12
13		(E) CEILING OUTLETS VOTING 016		20	900	1900			1000	20		BASEMENT OPEN OFFICE PRINTER	R	14
15		(E) CEILING OUTLETS VOTING 016		20	900	***************************************	1700		800	20		2 WKST - BSMT OPEN OFFICE	R	16
17		BSMT OPEN OFFICE RECEPTS		20	360			1160	800	20		2 WKST - BSMT OPEN OFFICE	R	18
19		SPARE		20		400			400	20		1 WKST - BSMT OPEN OFFICE	R	20
21		SPARE		20			360		360	20		BSMT OFFICE 021 RECEPTS	R	22
23		SPARE		20				360	360	20		BSMT OFFICE 022 RECEPTS	R	24
25		SPACE										SPACE		26
27		SPACE										SPACE		28
29		SPACE										SPACE		30
31		SPACE										SPACE		32
33		SPACE				***************************************						SPACE		34
35		SPACE							1			SPACE		36
37		SPACE										SPACE		38
39		SPACE										SPACE		40
41		SPACE										SPACE		42
	VOLTAG	BOARD INFORMATION SE:208Y/120 MPACITY: 225A		1 CIRCUI UOUS LO		ØA CTED LO	4940 ØB <u>\D</u>			CALCULA LOAD	ATED_	FEEDER AND OVERCURRENT SIZING NOTES:		
ĺ	MAIN T			IC HEAT				-	100%		-	125%		-
		M A.I.C.:		ONTINUO		(NC)	2300	-	100%	2300	-			-
	MOUNT		KITCHE	N LOAD	(K)			-	100%		- -	100%		- -
		1		ACLE BA			10000	_	100%	10000	_	100%		_
		FEED-THROUGH LUGS		ACLE DE		DAD (R)	3300	_	50%	1650	_	100%1650_		_
		DOUBLE LUGS		G LOAD	` '		<u>1558</u>	_	100%	1558	_	125%1948		_
		INTEGRAL SPD		NAL TRA		TING LOA	D		125%			100%		_
	<u>PANELE</u>	BOARD LOCATION		, REMAI				•	100%		-	100%		-
		BASEMENT 21 by Peter Basso Associates, Inc	NOTE: D		ID SIZING	INFORMATIO	N IS	TOT	AL(KVA): (AMPS):			AL (AMPS): 44		- - -

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

RACEWAY / CONDUCTOR / CAR	3LE	: <i>F</i>	۱P	PL	.IC	;A	TI	10	1	SC	CH	E)U	LE	Ξ
	WIRE	COPPER, TYPE THHN/THWN-2	RACEWAY	ELECTRICAL METALLIC TUBING (EMT)	INTERMEDIATE METAL CONDUIT (IMC)	RIGID STEEL CONDUIT (RSC)	PVC COATED RIGID STEEL CONDUIT	RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-40	FLEXIBLE METAL CONDUIT (FMC)	LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	SURFACE RACEWAY	CABLE / CORD	METAL CLAD TYPE CABLE WITH INSULATED GROUND WIRE (TYPE MC)	TWO HOUR FIRE RATED MINERAL INSULATED CABLE (TYPE MI) (KEYED NOTE 1)	POWER LIMITED CABLE
BRANCH CIRCUITS - INTERIOR			_									_			
CONCEALED, ACCESSIBLE CEILINGS		Χ		Х	Х								Х		
CONCEALED, INACCESSIBLE CEILINGS		Х		X	Х										
CONCEALED IN GYPSUM BOARD PARTITION WALLS		Х		X	Х				Х				Х		
CONCEALED IN CMU WALLS		Х		X	Х										
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE		X			Х	X	Х								
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE		X		X	Х						Х			Х	<u> </u>
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	_	X		X	X				<u> </u>					Щ	<u> </u>
EXPOSED, FINISHED SPACES		X						_		_	Х			igspace	ـــــــ
BELOW SLAB ON GRADE		X						X						<u> </u>	igspace
EMBEDDED IN ELEVATED CONCRETE SLAB		X						X	<u> </u>	<u> </u>				\vdash	₩
DAMP AND WET LOCATIONS		Х]		X	X	Х	Х		Х					
SPECIAL APPLICATIONS	_		,									1			
CLASS 1 CONTROL CIRCUITS		X		X	X	X	ļ	ऻ		_	_			$ldsymbol{ldsymbol{ldsymbol{eta}}}$	₩
CLASS 2 CONTROL CIRCUITS	4	X		X	X	X		<u> </u>						<u> </u>	X
CLASS 3 CONTROL CIRCUITS		X		X	Х	Х									Х

1. TRANSITION FROM PVC/HDPE AND PROVIDE RIGID STEEL OR RTRC SWEEPS WHERE CONDUITS PENETRATE WALLS, CONCRETE SLABS, CONCRETE BASES, AND ASPHALT.

2. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON MC/AC CABLE INSTALLATION.
3. EMT SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AREAS SUBJECT TO DAMAGE BELOW 10' AFF.

EMI SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AN
 INSTALL SURFACE RACEWAYS ONLY WHERE INDICATED ON DRAWINGS.

FINISH TO BE APPROVED BY INTERIOR DESIGNER, ARCHITECT OR CLIENT.
 ALL LUMINAIRES TO BE AS SPECIFIED OR EQUAL APPROVED BY PBA.

KEYED NOTES:

1. SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS BASED ON UL TESTING AND RATING.

	LUMINAIRE SCHEDULE													
TYPE	DESCRIPTION	MANUFACTURER(S)	WATTAGE	VOLTAGE	LIGHT CHARACTERISTICS	CONTROLS	MODEL NUMBER							
L1	4FT LINEAR PENDANT	PEERLESS	43.39/4FT		80CRI 3500K 300LM/900LM IN/DI DUAL CIRCUIT	0-10V DIM 1%	PRM2ID LBC 4FT MSL4 80CRI 35K 300LMF 900LMF SMBR INTG MIN1 ZT MVOLT DCT F2 48A C202 SCEP BLK							
GENERAL NOTES: 1. WATTAGE LISTED IS FROM THE BASIS OF DESIGN MANUFACTURER.														

BRANCH CKT	WIRE SIZE (AWG)	M	IAXIMUM BRAN	ICH CIRCUIT LI	ENGTH (IN FEE	T)
RATING (A)		120V	208V	240V	277V	480V
20A	12	83	143	165	191	331
	10	128	222	256	295	511
	8	201	348	402	464	804
	6	313	542	625	721	1250
30A	10	85	148	170	197	341
	8	134	232	268	309	536
	6	208	361	417	481	833
	4	313	542	625	721	1250

GENERAL NOTES:

1. THE ABOVE TABLE VALUES ARE BASED ON COPPER CONDUCTORS, IN STEEL CONDUIT, WITH A LOAD POWER

- FACTOR OF 0.85 PER NEC CHAPTER 9, TABLE 9.

 2. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
- 3. CONDUCTOR SIZES ARE BASED ON MAXIMUM OF 9 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT.

 4. LIMITS FOR CONDUCTOR LENGTHS SHOWN ARE BASED ON A MAXIMUM BRANCH CIRCUIT LOADING OF 64% OF THE BRANCH BREAKER RATING AND A MAXIMUM OF 3 PERCENT VOLTAGE DROP TO COMPLY WITH ASHRAE 90.1 AND THE NEC. FOR CIRCUITS LOADED GREATER THAN 64% OF BRANCH BREAKER RATING, THE CONTRACTOR SHALL PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

ANDERSON, ECKSTEIN AND WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS

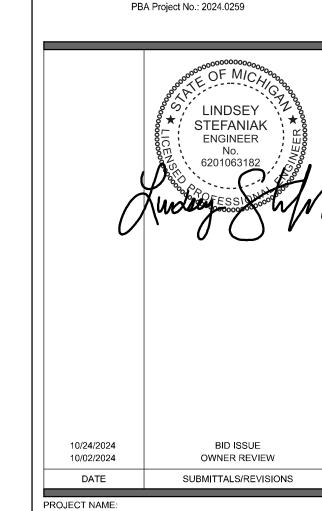
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ENGINEERING STRONG COMMUNITIES





MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE: ELECTRICAL
STANDARD
SCHEDULES

MACOMB TOWNSHIP

PRELIMINAR'	CONSTRU	CTION RECORD
DRAWN BY:	CHECKED BY:	DATE:
CAD	LSS	10/24/2024
SCALE:		
	NONE	



UTILITY INFORMATION, AS SHOWN, INDICATES
APPROXIMATE LOCATIONS AND TYPES OF EXISTING
FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED
TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO
GUARANTEE IS GIVEN OR IMPLIED AS TO THE
COMPLETENESS OR ACCURACY THEREOF.

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE INCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

PROJECT NO.

0249-0338

g:\2024\2024-0259-00\CAD\2024-0259-E0-IND.

EET NO.

- A. SCOPE OF WORK: ALL MATERIAL SHALL BE NEW UNLESS OTHERWISE INDICATED. FURNISH ALL LABOR, EQUIPMENT, TECHNICAL SUPERVISION, AND INCIDENTAL SERVICES REQUIRED TO COMPLETE, TEST, AND LEAVE
- READY FOR OPERATION THE ELECTRICAL SYSTEMS AS SPECIFIED AND AS INDICATED ON DRAWINGS. B. ORDINANCES AND CODES: PERFORM ALL WORK IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL ORDINANCES AND REGULATIONS, THE RULES AND REGULATIONS OF NFPA, NECA, AND UL, UNLESS OTHERWISE INDICATED.
- C. UNLESS OTHERWISE INDICATED, ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR ELECTRICAL WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES AND REGULATIONS.
- D. THE DRAWINGS SHOW THE LOCATION AND GENERAL ARRANGEMENT OF EQUIPMENT, ELECTRICAL SYSTEMS AND RELATED ITEMS. THEY SHALL BE FOLLOWED AS CLOSELY AS ELEMENTS OF THE CONSTRUCTION WILL PERMIT.
- E. EXAMINE THE DRAWINGS OF OTHER TRADES AND VERIFY THE CONDITIONS GOVERNING THE WORK ON THE JOB SITE. ARRANGE WORK ACCORDINGLY, PROVIDING SUCH FITTINGS, CONDUIT, JUNCTION BOXES AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS.
- F. COORDINATE ARRANGEMENT, MOUNTING AND SUPPORT OF ELECTRICAL EQUIPMENT WITH OTHER TRADES. G. 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 WILL BE ALLOWED BECAUSE OF FAILURE TO MAKE THIS EXAMINATION OR TO INCLUDE ALL MATERIALS AND LABOR TO COMPLETE THE WORK.
- H. BIDS SHALL BE BASED UPON MANUFACTURED EQUIPMENT SPECIFIED. VOLUNTARY ALTERNATES MAY BE SUBMITTED FOR CONSIDERATION, WITH LISTED ADDITION OR DEDUCTION TO THE BID. WARRANTY: CONTRACTOR SHALL WARRANTY THAT THE ELECTRICAL INSTALLATION IS FREE FROM DEFECTS AND AGREES TO REPLACE OR REPAIR, TO THE OWNER'S SATISFACTION, ANY PART OF THIS ELECTRICAL INSTALLATION WHICH BECOMES DEFECTIVE WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION FOLLOWING FINAL ACCEPTANCE, PROVIDED THAT SUCH FAILURE IS DUE TO DEFECTS IN THE
- EQUIPMENT, MATERIAL, WORKMANSHIP OR FAILURE TO FOLLOW THE CONTRACT DOCUMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TEMPORARY SERVICES INCLUDING EQUIPMENT AND INSTALLATION REQUIRED TO MAINTAIN OPERATION AS A RESULT OF ANY EQUIPMENT FAILURE OR DEFECT DURING WARRANTY
- K. FILE WITH THE OWNER ANY AND ALL WARRANTIES FROM THE EQUIPMENT MANUFACTURERS INCLUDING THE OPERATING CONDITIONS AND PERFORMANCE CAPACITIES THEY ARE BASED ON.
- L. CONSULT WITH THE OWNER'S REPRESENTATIVE AS TO THE METHODS OF CARRYING ON THE WORK SO AS NOT TO INTERFERE WITH THE OWNER'S OPERATION ANY MORE THAN ABSOLUTELY NECESSARY. ACCORDINGLY, ALL SERVICE LINES SHALL BE KEPT IN OPERATION AS LONG AS POSSIBLE AND THE SERVICES SHALL ONLY BE INTERRUPTED AT SUCH TIME AS WILL BE DESIGNATED BY THE OWNER'S REPRESENTATIVE.
- M. ALL CUTTING. PATCHING AND REPAIR WORK SHALL BE PERFORMED BY THE CONTRACTOR THROUGH APPROVED. QUALIFIED SUBCONTRACTORS. CONTRACTOR SHALL INCLUDE FULL COST OF SAME IN BID.
- N. INSPECT THE INSTALLATION OF ALL EQUIPMENT PER THE MANUFACTURER'S RECOMMENDATION AND APPLICABLE
- O. PROVIDE UL APPROVED FIRE-STOPPING SYSTEM FOR ALL PENETRATIONS PASSING THROUGH FIRE RATED
- ASSEMBLIES. P. COMPLY WITH NECA 1
- Q. PROVIDE COMPLETE OPERATION AND MAINTENANCE INSTRUCTIONAL MANUALS COVERING ALL ELECTRICAL EQUIPMENT HEREIN SPECIFIED, TOGETHER WITH PARTS LISTS.
- R. CONTRACTOR SHALL SUBMIT TO THE ARCHITECT/ENGINEER, RECORD DRAWINGS ON ELECTRONIC MEDIA OR MYLAR WHICH HAVE BEEN NEATLY MARKED TO REPRESENT AS-BUILT CONDITIONS FOR ALL NEW ELECTRICAL
- S. SUBMIT FOR REVIEW SHOP DRAWINGS FOR ELECTRICAL SYSTEMS OR EQUIPMENT LISTED BELOW:
- 1. WIRING DEVICES
- 2. LIGHTING FIXTURES
- LIGHTING CONTROL DEVICES 4. FIRE ALARM DEVICES

DEMOLITION WORK

- A. ALL DEMOLITION OF EXISTING ELECTRICAL EQUIPMENT AND MATERIALS WILL BE DONE BY THIS CONTRACTOR UNLESS OTHERWISE INDICATED. INCLUDE ALL ITEMS RELATED TO THE EXISTING SYSTEMS THAT ARE BEING REMOVED SUCH AS, BUT NOT LIMITED TO, ELECTRICAL EQUIPMENT, CABINETS, DEVICES, LIGHTING FIXTURES, CONDUIT, FITTINGS, BOXES, WIRING, AND SUPPORTS. NO ABANDONED COMPONENTS OF THE ELECTRICAL SYSTEMS INDICATED TO BE REMOVED SHALL REMAIN. WHERE ELECTRICALLY POWERED EQUIPMENT IS INCLUDED IN THE DEMOLITION SCOPE OF OTHER TRADES, DISCONNECT ELECTRICAL WIRING CONNECTIONS AND REMOVE CIRCUIT WIRING COMPLETE.
- B. IN GENERAL, DEMOLITION WORK IS INDICATED ON THE DRAWINGS. HOWEVER, THE CONTRACTOR SHALL VISIT THE
- JOB SITE TO DETERMINE THE FULL EXTENT AND SCOPE OF THIS WORK. C. UNLESS SPECIFICALLY NOTED TO THE CONTRARY. REMOVED MATERIALS SHALL NOT BE REUSED IN THE WORK. SALVAGED MATERIALS THAT ARE TO BE REUSED SHALL BE STORED SAFE AGAINST DAMAGE AND TURNED OVER TO THE APPROPRIATE TRADE FOR REUSE. SALVAGED MATERIALS OF VALUE THAT ARE NOT TO BE REUSED SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS SUCH OWNERSHIP IS WAIVED. ITEMS ON WHICH THE OWNER WAIVES OWNERSHIP SHALL BECOME THE PROPERTY OF THE CONTRACTOR, WHO SHALL REMOVE AND LEGALLY DISPOSE OF SAME, AWAY FROM THE PREMISES.
- D. WHERE EQUIPMENT OR FIXTURES ARE REMOVED AND WALLS REMAIN, OUTLETS SHALL BE PROPERLY BLANKED OFF, CONDUITS CAPPED, AND CONDUCTORS REMOVED BACK TO SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE. AFTER ALTERATIONS ARE DONE, THE ENTIRE INSTALLATION SHALL PRESENT A "FINISHED" LOOK. AS APPROVED BY THE ARCHITECT/ENGINEER. THE ORIGINAL FUNCTION OF THE PRESENT ELECTRICAL WORK TO BE MODIFIED SHALL NOT BE CHANGED UNLESS REQUIRED BY THE SPECIFIC REVISIONS TO THE SYSTEM AS SPECIFIED OR AS INDICATED.
- REROUTE SIGNAL WIRES, LIGHTING AND POWER WIRING AS REQUIRED TO MAINTAIN SERVICE. WHERE WALLS AND CEILINGS ARE TO BE REMOVED AS SHOWN ON THE DRAWINGS, THE CONDUIT IS TO BE CUT OFF BY THE ELECTRICAL TRADES SO THAT THE ABANDONED CONDUIT IN THESE WALLS AND CEILINGS MAY BE REMOVED WITH THE WALLS AND CEILINGS BY THE ARCHITECTURAL TRADES. ALL DEAD-END CONDUIT RUNS SHALL BE PLUGGED AT THE REMAINING LINE OUTLET BOXES OR AT THE PANELS.
- . WHERE NEW WALLS AND/OR FLOORS ARE INSTALLED WHICH INTERFERE WITH EXISTING OUTLETS, DEVICES, ETC., THE ELECTRICAL TRADES SHALL ADJUST, EXTEND AND RECONNECT SUCH ITEMS AS REQUIRED TO MAINTAIN CONTINUITY OF SAME.
- G. ALL ELECTRICAL WORK IN ALTERED AND UNALTERED AREAS SHALL BE RUN CONCEALED WHEREVER POSSIBLE. USE OF SURFACE RACEWAY OR EXPOSED CONDUITS WILL BE PERMITTED ONLY WHERE APPROVED BY THE ARCHITECT/ENGINEER.
- H. EXISTING LIGHTING SHALL BE REUSED WHERE INDICATED ON PLANS. REUSED FIXTURES SHALL BE DETERGENT CLEANED, RELAMPED AND RECONDITIONED SUITABLE FOR SATISFACTORY OPERATION AND APPEARANCE.

260519 - CONDUCTORS AND CABLES

- A. CONDUCTOR MATERIAL: COPPER COMPLYING WITH NEMA WC 70; STRANDED CONDUCTOR.
- B. CONDUCTOR INSULATION TYPES: TYPE THHN-THWN, XHHW-2, SO, COMPLYING WITH NEMA WC 70. C. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.
- D. USE CONDUCTOR NOT SMALLER THAN 12 AWG FOR POWER AND LIGHTING CIRCUITS. UNLESS INDICATED OTHERWISE, ALL CIRCUITS SHALL BE 2#12, 1#12G, 3/4"C.
- E. USE CONDUCTOR NOT SMALLER THAN 14 AWG FOR CONTROL CIRCUITS, PROVIDED BY ELECTRICAL CONTRACTOR. F. SUPPORT COMMUNICATION CABLES ABOVE ACCESSIBLE CEILING, USING SPRING METAL CLIPS OR PLASTIC CABLE TIES TO SUPPORT CABLES FROM STRUCTURE.
- G. USE "STA-KON" CONNECTORS TO TERMINATE STRANDED CONDUCTORS #10 AWG AND SMALLER TO SCREW TERMINALS.
- H. CONDUCTOR AND INSULATION APPLICATIONS:
- 1. REFER TO APPLICATION SCHEDULE INCLUDED ON THE DRAWINGS.

260526 - GROUNDING AND BONDING

- A. EQUIPMENT GROUNDING: COMPLY WITH NFPA 70, ARTICLE 250, FOR TYPES, SIZES, AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS, UNLESS SPECIFIC TYPES, LARGER SIZES, OR MORE CONDUCTORS THAN REQUIRED BY NFPA 70 ARE INDICATED.
- B. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN EACH RACEWAY.
- 1. WHERE EXISTING BRANCH CIRCUITS ARE USING CONDUIT AS EQUIPMENT GROUNDING CONDUCTOR AND ARE EXTENDED, PROVIDE GROUNDING BUSHING ON EXISTING CONDUIT AND PROVIDE NEW EQUIPMENT GROUNDING CONDUCTOR WITH NEW BRANCH CIRCUIT.

260533 - RACEWAYS AND BOXES

- A. SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP-ON COVERS. FINISH WITH MANUFACTURER'S STANDARD PRIME COATING. WIREMOLD OR EQUAL. SIZE/TYPE AS SHOWN ON DRAWINGS. B. MINIMUM RACEWAY SIZE: 3/4-INCH TRADE SIZE.
- C. INSTALL CONDUIT IN ACCORDANCE WITH NECA "NATIONAL ELECTRICAL INSTALLATION STANDARDS".
- D. ROUTE CONDUITS IN FINISHED AREAS WITH EXPOSED CEILINGS AT UNDERSIDE OF STRUCTURAL DECK OR AS HIGH AS POSSIBLE. WHERE STEEL METAL DECK ON STEEL JOIST CONSTRUCTION, ROUTE CONDUITS ABOVE JOISTS. DO NOT SECURE CONDUIT TO BOTTOM OF JOISTS.
- E. RACEWAY APPLICATIONS: REFER TO RACEWAY APPLICATIONS SCHEDULE INCLUDED ON THE DRAWINGS. F. FITTINGS FOR EMT: STEEL, COMPRESSION OR SET SCREW TYPE.
- G. INSTALL SURFACE RACEWAYS ONLY WHERE INDICATED ON DRAWINGS.
- H. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED. I. COMMUNICATIONS AND SIGNAL CABLING SYSTEMS RACEWAYS: ALL BENDS WILL BE LONG, SWEEPING BENDS WITH A RADIUS NOT LESS THAN:
- 1. SIX TIMES THE INTERNAL DIAMETER OF CONDUITS 2 INCHES OR SMALLER.
- 2. TEN TIMES THE INTERNAL DIAMETER OF CONDUITS LARGER THAN 2 INCHES.

3. TEN TIMES THE INTERNAL DIAMETER OF CONDUITS FOR FIBER CABLING.

260553 - ELECTRICAL IDENTIFICATION

- A. COMPLY WITH ANSI A13.1, ANSI C2, NFPA 70, AND 29 CFR 1910.145.
- B. COORDINATE IDENTIFICATION NAMES, ABBREVIATIONS, COLORS, AND OTHER FEATURES WITH REQUIREMENTS IN THE CONTRACT DOCUMENTS, SHOP DRAWINGS, MANUFACTURER'S WIRING DIAGRAMS, AND THE OPERATION AND MAINTENANCE MANUAL, AND WITH THOSE REQUIRED BY CODES, STANDARDS, AND 29 CFR 1910.145. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT.
- C. COORDINATE INSTALLATION OF IDENTIFYING DEVICES WITH COMPLETION OF COVERING AND PAINTING OF SURFACES WHERE DEVICES ARE TO BE APPLIED, WITH LOCATION OF ACCESS PANELS AND DOORS.
- D. WIRING DEVICES: USE ADHESIVE LABEL WITH BLACK FILLED LETTERING ON THE REAR OF THE FACEPLATE AND DURABLE WIRE MARKERS OR TAGS INSIDE OUTLET BOXES. LABELS SHALL BE CLEAR POLYESTER WITH BLACK LETTER, FONT SIZE OF 7. IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH SERVED.
- E. USE THE COLORS LISTED BELOW FOR UNGROUNDED SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS. 1. COLOR SHALL BE FACTORY APPLIED OR, FOR SIZES LARGER THAN NO. 10 AWG IF AUTHORITIES HAVING JURISDICTION PERMIT, FIELD APPLIED.
- 2. COLORS FOR 208/120-V CIRCUITS:
- b. PHASE B: RED.

a. PHASE A: BLACK.

- c. PHASE C: BLUE. d. NEUTRAL: WHITE
- 3. FIELD-APPLIED, COLOR-CODING CONDUCTOR TAPE: APPLY IN HALF-LAPPED TURNS FOR A MINIMUM DISTANCE OF 6 INCHES FROM TERMINAL POINTS AND IN BOXES WHERE SPLICES OR TAPS ARE MADE. APPLY LAST TWO TURNS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING. LOCATE BANDS TO AVOID OBSCURING FACTORY CABLE MARKINGS.
- . ACCESSIBLE RACEWAYS AND CABLES OF AUXILIARY SYSTEMS: IDENTIFY THE FOLLOWING SYSTEMS WITH COLOR-CODED, SELF-ADHESIVE VINYL TAPE APPLIED IN BANDS: 1. FIRE ALARM SYSTEM: RED.
- 2. SECURITY SYSTEM: BLUE AND YELLOW.
- 3. TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.
- 4. CONTROL WIRING: GREEN AND RED.

<u>260923 - LIGHTING CONTROL DEVICES</u>

- G. INDOOR PHOTOELECTRIC CONTROL: SOLID-STATE, LIGHT-LEVEL SENSOR UNIT UTILIZING AN INTERNAL PHOTOCONDUCTIVE CELL TO DETECT CHANGES IN LIGHTING LEVELS AND CAPABLE OF CONTROLLING ANY LIGHTING SOURCE WITH CONTROL UNIT. CONTROL UNIT INPUT POWER SHALL BE FROM UNSWITCHED LEG OF LIGHTING CIRCUIT IT IS CONTROLLING. WATTSTOPPER LS-100 OR EQUAL.
- H. INSTALL LIGHTING CONTROL DEVICES AS INDICATED ON PLAN. INSTALL AT ACCESSIBLE LOCATIONS.
- COORDINATE OCCUPANCY SENSOR LOCATIONS, COVERAGES AND REQUIRED QUANTITIES WITH MANUFACTURER'S RECOMMENDATIONS. COVERAGE AREAS INDICATED ON THE DRAWINGS ARE FOR MINOR MOTION (6 TO 8 INCHES OF HAND MOVEMENT). PROVIDE ADDITIONAL OCCUPANCY SENSORS AND CONTROL UNITS AS REQUIRED TO ACHIEVE COMPLETE MINOR MOTION COVERAGE OF THE SPACE INDICATED.
- J. OCCUPANCY SENSOR ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING SENSORS TO SUIT ACTUAL OCCUPIED CONDITIONS. PROVIDE UP TO TWO VISITS TO SITE OUTSIDE NORMAL OCCUPANCY HOURS FOR THIS PURPOSE.
- K. OCCUPANCY SENSOR: WALL SWITCH PASSIVE INFRARED OCCUPANCY SENSOR: WATTSTOPPER PW-100 OR EQUAL.
- 2. DUAL LEVEL SWITCHING PASSIVE INFRARED OCCUPANCY SENSOR: WATTSTOPPER PW-200 OR EQUAL
- 3. 360° CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR: WATTSTOPPER DT 300 OR EQUAL. 4. 110° WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR: WATTSTOPPER DT-200 OR EQUAL.
- 5. 360° CEILING MOUNTED ULTRASONIC OCCUPANCY SENSORS: WATTSTOPPER "WT" SERIES OR EQUAL
- 6. 360° CEILING MOUNTED PASSIVE INFRARED OCCUPANCY SENSOR. WATTSTOPPER CI-200 OR EQUAL. L. OCCUPANCY SENSOR CONTROL UNITS:
- 1. DESCRIPTION: TRANSFORMER AND RELAY COMBINED IN SINGLE UNIT TO PROVIDE 24DC POWER TO SENSORS AND PROVIDE 20A CONTACT(S) FOR CONTROL OF LIGHTING LOADS AT 120 OR 277V. CONTROL UNIT INPUT POWER SHALL BE FROM UNSWITCHED LEG OF LIGHTING CIRCUIT IT IS CONTROLLING.
- a. CONTROL UNITS SHALL BE PROVIDED AS REQUIRED TO POWER CEILING MOUNTED OCCUPANCY SENSORS, CONTROL LIGHTING LOADS AND PROVIDE A MINIMUM OF ONE AUXILIARY CONTACT.
- b. OCCUPANCY SENSOR CONTROL UNITS SHALL MOUNT EXTERNAL TO 4"SQ JUNCTION BOX IN THE CEILING SPACE. ALL WIRING BETWEEN CONTROL UNIT AND OCCUPANCY SENSOR SHALL BE PLENUM RATED. c. LOCATE CONTROL UNIT IN ACCESSIBLE LOCATION IN GYP-BOARD CEILINGS, ADJACENT TO RETURN AIR
- GRILLES, OR PROVIDE ACCESS PANEL. d. ADDITIONAL AUXILIARY RELAY MODULES SHALL BE PROVIDED AS REQUIRED TO PROVIDE CONTROL OF ALL
- LIGHTING CIRCUITS AND ADDITIONAL AUXILIARY CONTACTS AS REQUIRED. e. IT IS ACCEPTABLE TO PROVIDE CONTROLS AND AUXILIARY CONTACTS AS REQUIRED INTEGRAL TO THE
- CEILING SENSOR, PROVIDED ALL REQUIRED CONTACTS ARE PROVIDED. . MAXIMUM OF 3 SENSORS PER POWER PACK. VERIFY EXACT QUANTITIES REQUIRED WITH MANUFACTURER.

262726 - WIRING DEVICES

F. DIMMERS:

- A. GENERAL WIRING DEVICE REQUIREMENTS: COMPLY WITH NFPA 70, NEMA WD 1, NEMA WD 6, AND UL498. B. WIRING DEVICE AND WALL SWITCH COLOR AS SELECTED BY ARCHITECT UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70.
- C. STANDARD GRADE RECEPTACLES 1. DUPLEX RECEPTACLE, NEMA 5-20R: HEAVY-DUTY GRADE. HUBBELL 5352 OR EQUAL BY EATON/ARROW
- HART, LEVITON, OR LEGRAND PASS & SEYMOUR. 2. DUPLEX RECEPTACLE, NEMA 5-20R: COMMERICAL GRADE. HUBBELL BR20 OR EQUAL BY EATON/ARROW HART, LEVITON, OR LEGRAND PASS & SEYMOUR.
- D. INSTALL RECEPTACLES FLUSH, WITH LONG DIMENSION VERTICAL, AND WITH GROUNDING TERMINAL ON TOP. E. LED DIMMER SWITCHES: LUTRON OR EQUAL, COMPATIBLE WITH LED DIMMING DRIVER SPECIFIED.
- 1. CONTROL: CONTINUOUSLY ADJUSTABLE SLIDER WITH PRE-SET; SINGLE-POLE OR THREE-WAY SWITCHING TO SUIT CONNECTIONS. 2. INSTALL WALL DIMMERS TO ACHIEVE FULL RATING SPECIFIED AND INDICATED AFTER DERATING FOR GANGING
- ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. 3. INSTALL UNSHARED NEUTRAL CONDUCTORS ON LINE AND LOAD SIDE OF DIMMERS ACCORDING TO MANUFACTURERS' WRITTEN INSTRUCTIONS.
- G. WHERE MULTIPLE SWITCHES, DIMMERS, AND/OR OCCUPANCY SENSORS ARE ADJACENT TO EACH OTHER, PROVIDE A SINGLE COVER PLATE. H. WALL PLATES:
- 1. PROVIDE SATIN-FINISHED STAINLESS-STEEL WALL PLATES IN FINISHED AREAS.
- I. CONNECT WIRING DEVICE GROUNDING TERMINAL TO OUTLET BOX WITH BONDING JUMPER. USE OF QUICK GROUND STRAP OR SCREW IS NOT ACCEPTABLE.

<u>265119 – LED INTERIOR LIGHTING</u>

- A. PROVIDE LUMINAIRES (LIGHTING FIXTURES) AS INDICATED ON DRAWINGS.
- B. PROVIDE DRIVERS AS AN INTEGRATED COMPONENT OF THE LUMINAIRE OR AS AN EXTERNAL COMPONENT OF AN ASSEMBLY OF LUMINARIES. C. INSTALL FIXTURES LEVEL, PLUMB, AND SQUARE WITH CEILINGS AND WALLS UNLESS OTHERWISE INDICATED.
- D. INSTALL SURFACE MOUNTED LUMINAIRES AND EXIT SIGNS PLUMB AND ADJUST TO ALIGN WITH BUILDING LINES AND WITH EACH OTHER. SECURE TO PROHIBIT MOVEMENT. E. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED
- TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.
- F. MAKE WIRING CONNECTIONS TO BRANCH CIRCUIT USING BUILDING WIRE WITH INSULATION SUITABLE FOR TEMPERATURE CONDITIONS WITHIN LUMINAIRE. G. BOND PRODUCTS AND METAL ACCESSORIES TO BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR.
- H. CONNECT LUMINAIRES TO BRANCH CIRCUIT OUTLET BOXES PROVIDED UNDER RACEWAYS AND BOXES SECTION USING 1/2" FLEXIBLE CONDUIT.
- I. CLEAN ELECTRICAL PARTS TO REMOVE CONDUCTIVE AND DELETERIOUS MATERIALS.
- J. REMOVE DIRT AND DEBRIS FROM ENCLOSURES AND LENSES.
- K. CLEAN PHOTOMETRIC CONTROL SURFACES AS RECOMMENDED BY MANUFACTURER. L. CLEAN FINISHES AND TOUCH UP DAMAGE.
- M. EMERGENCY AUTOMATIC LOAD CONTROL RELAY (ALCR): LOCAL RELAY TO PROVIDE REQUIRED FUNCTIONALITY TO ALLOW ANY STANDARD LIGHTING CONTROL DEVICE TO CONTROL EMERGENCY LIGHTING IN CONJUNCTION WITH NORMAL LIGHTING IN ANY AREA OF THE BUILDING. THE ALCR SHALL ALLOW CONTROL OF EMERGENCY LIGHTING FIXTURES IN TANDEM WITH NORMAL LIGHTING IN AN AREA WHILE ENSURING THAT EMERGENCY LIGHTING WILL TURN ON IMMEDIATELY TO FULL BRIGHTNESS UPON LOSS OF NORMAL POWER SUPPLYING THE CONTROL DEVICE. EMERGENCY LIGHTING OPERATION SHALL BE INDEPENDENT FOR EACH CONTROLLED AREA AND SHALL NOT REQUIRE A GENERALIZED POWER FAILURE FOR PROPER OPERATION. DEVICE SHALL BE INSTALLED INTEGRAL TO LUMINAIRE OR MOUNTED REMOTELY AS APPLICATION REQUIRED. U.L. 924 LISTED, INTEGRAL TEST SWITCH AND INDICATING LAMPS TO INDICATE STATUS: BODINE BLCD SERIES OR EQUAL BY LVS OR NINE-24.

270500 - TELECOMMUNICATIONS

A. ALL INSTALLATIONS, EQUIPMENT AND MATERIALS SHALL BE PROVIDED IN COMPLIANCE WITH THE CURRENT LAWS AND REGULATIONS OF STATE, COUNTY AND CITY FIRE MARSHALLS, BUILDING INDUSTRY CONSULTING SERVICES INTERNATIONAL (BICSI), NEC, THE INTERNATIONAL BUILDING CODE (IBC), COMMUNICATIONS STANDARDS PUBLISHED BY TIA/EIA, AND ALL OTHER APPLICABLE CODES.

- B. THE CONTRACTOR SHALL INSURE THAT THE MANUFACTURER PULLING TENSIONS AND MINIMUM BENDING RADIUS
- OF THE CABLES BEING INSTALLED ARE NOT EXCEEDED AT ANY TIME DURING INSTALLATION. C. 3/4" CONDUIT SHALL BE RUN TO THE CLOSEST CABLE TRAY IN THE DIRECTION OF THE IDF ROOM, FOR
- DEVICES WITH MORE THAN 3 CABLES, UTILIZE (1) 1" CONDUIT.
- D. ENSURE THAT THE HORIZONTAL CABLE BEND RADIUS IS NO LESS THAN FOUR (4) TIMES THE CABLE DIAMETER.
- E. THE AMOUNT OF UNTWISTING MUST NOT EXCEED 13mm (0.5 INCHES) FOR ALL CATSE CABLES. F. ENSURE THAT THERE IS A MINIMUM OF 10' OF SLACK AT THE IDF.
- G. ENSURE THAT THERE IS A MINIMUM OF 12" OF SLACK AT THE WORK AREA OUTLET.
- H. IDENTIFY CABLES AT EACH END WITH PERMANENT ALPHANUMERIC LABELS PER OWNER STANDARDS. I. WHERE CABLE TRAY IS NOT ACCESSIBLE, SUPPORT THE CABLING SYSTEM USING J-HOOKS.
- J. TELECOMMUNICATIONS JACKS SHALL MEET OWNER'S STANDARDS.
- K. COLOR CODING SHALL MEET OWNER'S STANDARDS. L. ALL ELECTRONICS HARDWARE WILL BE DESIGNED AND PROVIDED BY THE OWNER.

<u> 283100 – FIRE ALARM</u>

- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS; PROVIDE DEVICES COMPATIBALE WITH EXISTING FIRE ALARM SYSTEM IN THE BUILDING.
- B. PERFORMANCE REQUIREMENTS:
- 1. DESIGN AND INSTALLATION OF NEW DEVICES ONTO AN EXISTING FIRE ALARM SYSTEM. THE COMPLETE FUNCTIONAL SYSTEM SHALL MEET THE REQUIREMENTS OF THIS SPECIFICATION, APPLICABLE CODES, AND AHJ REQUIREMENTS.
- 2. COMPLY WITH NFPA 72.
- 3. PROVIDE DEVICE LOCATIONS AND RATINGS AS REQUIRED TO MEET THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION (AHJ) AND ALL APPLICABLE CODES.
- 4. FIRE ALARM SYSTEM VENDOR SHALL PROVIDE SOUND PRESSURE LEVEL CALCULATIONS DEMONSTRATING COMPLIANCE WITH NFPA 72 AND ESTABLISH QUANTITIES AND TAP SETTINGS OF AUDIBLE DEVICES. 5. NO ADDITIONAL CHARGE FOR FIRE ALARM DEVICES WILL BE ALLOWED UNLESS SPACE DEFINITION, USE OR
- CONSTRUCTION IS SUBSTANTIALLY REVISED. . NOTIFICATION APPLIANCES: EQUIPPED FOR MOUNTING AS INDICATED AND WITH SCREW TERMINALS FOR SYSTEM CONNECTIONS.
- 1. COMBINATION DEVICES: FACTORY—INTEGRATED AUDIBLE AND VISIBLE DEVICES IN A SINGLE—MOUNTING ASSEMBLY.
- CHIMES, LOW-LEVEL OUTPUT: VIBRATING TYPE, 75-DBA MINIMUM RATED OUTPUT. 3. CHIMES. HIGH-LEVEL OUTPUT: VIBRATING TYPE. 81-DBA MINIMUM RATED OUTPUT. HORNS: ELECTRIC-VIBRATING-POLARIZED TYPE, 24-V DC; WITH PROVISION FOR HOUSING THE OPERATING
- MECHANISM BEHIND A GRILLE 4. HORNS SHALL PRODUCE A SOUND-PRESSURE LEVEL OF 90 DBA, MEASURED 10 FEET (3 M) FROM THE
- 5. VISIBLE ALARM DEVICES: XENON STROBE LIGHTS LISTED UNDER UL 1971, WITH CLEAR OR NOMINAL WHITE POLYCARBONATE LENS MOUNTED ON AN ALUMINUM FACEPLATE. THE WORD "FIRE" IS ENGRAVED IN MINIMUM 1-INCH- (25-MM-) HIGH LETTERS ON THE LENS.
- a. RATED LIGHT OUTPUT: 15, 30, 60, 75, 110, 135, 185 CANDELA AS REQUIRED TO MEET NFPA 72 REQUIREMENTS.
- 1) STROBE LEADS: FACTORY CONNECTED TO SCREW TERMINALS.
- VOICE/TONE SPEAKERS:
- a. UL 1480 LISTED.
- b. HIGH-RANGE UNITS: RATED 2 TO 15 W.

APPLIANCES: PROVIDE WHITE FINISH.

REPORT RESULTS IN WRITING

- c. LOW-RANGE UNITS: RATED 1 TO 2 W. d. MOUNTING: FLUSH, SEMIRECESSED, OR SURFACE MOUNTED; BIDIRECTIONAL AS INDICATED.
- e. MATCHING TRANSFORMERS: TAP RANGE MATCHED TO THE ACOUSTICAL ENVIRONMENT OF THE SPEAKER
- 7. AUDIBLE ALARM-INDICATING DEVICES: INSTALL AT 96" AFF OR 6 INCHES (150 MM) BELOW THE CEILING, WHICHEVER IS LESS. INSTALL BELLS AND HORNS ON FLUSH-MOUNTED BACK BOXES WITH THE DEVICE-OPERATING MECHANISM CONCEALED BEHIND A GRILLE.
- 8. VISIBLE ALARM-INDICATING DEVICES: INSTALL AT 96" AFF OR 6 INCHES (150 MM) BELOW THE CEILING, WHICHEVER IS LESS. 9. FINISHES: WALL MOUNTED APPLIANCES: PROVIDE RED FINISH WITH WHITE LETTERING. CEILING MOUNTED
- WRE AND CABLE: WIRE AND CABLE FOR FIRE ALARM SYSTEMS SHALL BE UL LISTED AND LABELED AS COMPLYING WITH NFPA 70, ARTICLE 760. 1. FIRE ALARM WIRE AND CABLE SHALL BE AS SPECIFIED BY THE SYSTEM MANUFACTURER INCLUDING CONDUCTOR GAGE, CONDUCTOR QUANTITY, CONDUCTOR TWISTS AND SHIELDING REQUIRED TO MEET NFPA
- CLASS AND STYLE PERFORMANCE SPECIFIED. NON-POWER-LIMITED CIRCUITS: SOLID-COPPER CONDUCTORS WITH 600-V RATED. 75 DEG C. COLOR-CODED. INSULATION. LOW—VOLTAGE CIRCUITS: NO. 16 AWG, MINIMUM. LINE—VOLTAGE CIRCUITS: NO. 12 AWG,
- 3. INSTALL WIRING ACCORDING TO NECA 1 AND TIA/EIA 568-A.

OPERATION BY USING THE MATRIX-STYLE FORM IN APPENDIX A IN NFPA 7.

BE INSTALLED IN A DEDICATED RACEWAY SYSTEM IN AREAS OF EXPOSED CONSTRUCTION. SUBMIT FIRE ALARM DRAWINGS AND DOCUMENTATION TO THE AUTHORITIES HAVING JURISDICTION AND THE ARCHITECT/ENGINEER. INSTALLER QUALIFICATIONS: PERSONNEL CERTIFIED BY NICET AS FIRE ALARM LEVEL II.

. INTERRUPTION OF EXISTING FIRE ALARM SERVICE: DO NOT INTERRUPT FIRE ALARM SERVICE TO FACILITIES

OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY

4. FIRE ALARM CIRCUITS AND EQUIPMENT CONTROL WIRING ASSOCIATED WITH THE FIRE ALARM SYSTEM SHALL

- AFTER ARRANGING TO PROVIDE TEMPORARY GUARD SERVICE ACCORDING TO REQUIREMENTS INDICATED. NOTIFY ARCHITECT. OWNER OR CONSTRUCTION MANAGER NO FEWER THAN SEVEN DAYS IN ADVANCE OF PROPOSED INTERRUPTION OF FIRE ALARM SERVICE. DO NOT PROCEED WITH INTERRUPTION OF FIRE ALARM SERVICE
- WITHOUT OWNER'S WRITTEN PERMISSION. H. FIRE ALARM SYSTEM AND COMPONENTS SHALL OPERATE AS AN EXTENSION OF AN EXISTING SYSTEM. ALL NEW DEVICES SHALL BE SUITABLE AND LISTED WITH EXISTING FIRE ALARM CONTROL PANEL
- CONNECTING TO EXISTING EQUIPMENT: VERIFY THAT EXISTING FIRE ALARM SYSTEM IS OPERATIONAL BEFORE MAKING CHANGES OR CONNECTIONS. J. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO INSPECT TEST, AND ADJUST FIELD-ASSEMBLED COMPONENTS AND EQUIPMENT INSTALLATION. INCLUDING CONNECTIONS. AND TO ASSIST IN FIELD TESTING.

TEST AND INSPECTION RECORDS: PREPARE ACCORDING TO NFPA 72, INCLUDING DEMONSTRATION OF SEQUENCES OF



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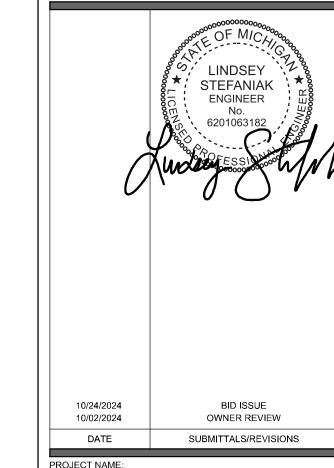
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5145 Livernois, Suite 100 Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024.0259



MACOMB TOWNSHIF BASEMEN¹ **BUILD-OUT PHASE**

SPECIFICATIONS

SHEET TITLE: ELECTRICAL

MACOMB TOWNSHIP PRELIMINARY CONSTRUCTION RECORD DRAWN BY: CHECKED BY: LSS NONE



TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO SUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD, DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION

VERIFICATION, SUPPORT AND PROTECTION SHALL BE

NCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

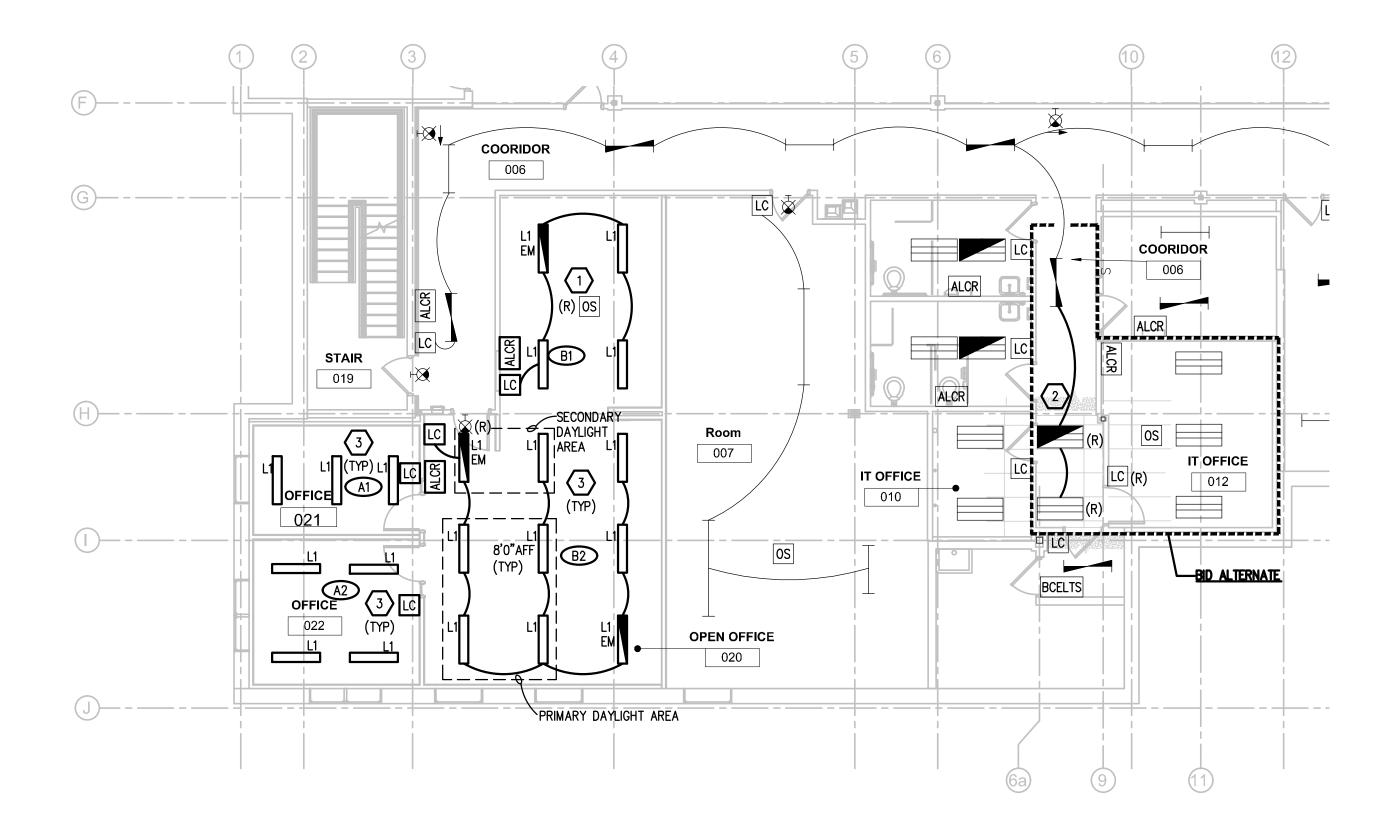
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PPROXIMATE LOCATIONS AND TYPES OF EXISTING

FACILITIES ONLY AS DISCLOSED BY RECORDS PROVIDED.

UTILITY INFORMATION, AS SHOWN, INDICATES

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.





ELECTRICAL GENERAL NOTES:

- 1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- 3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- 4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS
- 5. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
- 6. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
- 7. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE—TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

EXAMPLE 2 CONSTRUCTION KEY NOTES:

- VERIFY EXISTING OCCUPANCY SENSOR HAS THE ABILITY TO CONTROL THE LIGHTS AS INDICATED IN THE LIGHTING CONTROL SCHEDULE AND REUSE/REPROGRAM. IF NOT, TURN OVER TO OWNER.
- ADJUST CONTROL CIRCUITING TO EXISTING 2X4 LIGHTS ARE CONTROLLED WITH CORRIDOR LIGHTS AS SHOWN.
- 3. CIRCUIT NEW LIGHT FIXTURES TO EXISTING NORMAL BRANCH CIRCUIT IN SPACE, WHICH WE HAVE DOCUMENTED AS LPBA-5. CIRCUIT EMERGENCY LIGHT FIXTURES TO EITHER AN EXISTING ALCR IN THE SPACE IF APPLICABLE OR PROVIDE A NEW ALCR CIRCUITED TO EMB-1.



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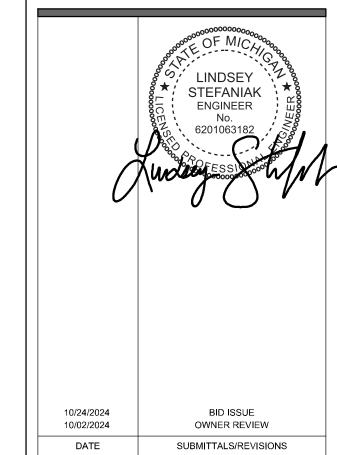
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PBA Project No.: 2024.0259



PROJECT NAME:

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE: LIGHTING
NEW WORK
PLAN

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD

DRAWN BY: CHECKED BY: DATE:

CAD LSS 10/24/2024

SCALE:

1/8"=1'-0"



UTILITY INFORMATION, AS SHOWN, INDICATES
APPROXIMATE LOCATIONS AND TYPES OF EXISTING
FACILITIES ONLY, AS DISCLOSED BY RECORDS PROVIDED
TO THIS FIRM FROM THE VARIOUS UTILITY COMPANIES. NO
GUARANTEE IS GIVEN OR IMPLIED AS TO THE
COMPLETENESS OR ACCURACY THEREOF.

PRIOR TO CONSTRUCTION, ALL LOCATIONS AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF THESE PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. DURING THE CONSTRUCTION, THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL UTILITIES THAT ARE ENCOUNTERED. (ALL COSTS FOR UTILITY LOCATION VERIFICATION, SUPPORT AND PROTECTION SHALL BE INCLUDED IN THE PROPOSED PAY ITEM CONFLICTING WITH

DURING CONSTRUCTION, THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR ANY AND ALL OVERHEAD AND / OR BURIED UTILITIES.

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POWER AND AUXILIARY SYSTEMS NEW WORK PLAN SCALE: 1/8" - 1' - 0"

ELECTRICAL GENERAL NOTES:

- 1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- 2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- 3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- 4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- 5. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
- 6. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
- 7. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. RE—TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT COMPLETION OF PROJECT.

CONSTRUCTION KEY NOTES:

- COORDINATE QUANTITY AND TYPE OF CABLES AND JACKS FOR TELECOM OUTLETS WITH THE OWNER. ALL CABLES TO RUN TO BASEMENT IT CLOSET.
- PROVIDE HARDWIRED CONNECTION TO SYSTEMS FURNITURE. COORDINATE WITH FURNITURE VENDOR.



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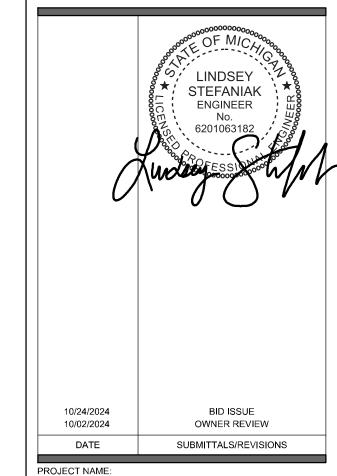
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MACOMB
TOWNSHIP
BASEMENT
BUILD-OUT PHASE

TWO

SHEET TITLE: POWER AND
AUXILIARY SYSTEMS
NEW WORK PLAN

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD

DRAWN BY: CHECKED BY: DATE:
CAD LSS 10/24/2024

SCALE:

1/8"=1'-0"



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O IFOT NO

0249-0338

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	INTERIOR LIGHTING CONTROL SCHEDULE																	
PLAN	ROOM TYPE		LOCAL CONTROL		CONTROL	SENSOR TYPE	TURN ON LIGHTING	BI-LEVEL CONTROL		DAYLIG		PARTI		NO DETECTION	TIME-CLOCK	RECEPTACLE	EMERGENCY LIGHTING	NOTES
REFERENCE	1.00m + 11 Z	SWITCH TYPE	SWITCH CONTROL	SCENE CONTROL	ON / OFF	OLINGON THE	10 %	b. EEVEE GOIVINGE	SIDE LIGHT	TOP LIGHT	MAINTAIN FC LEVEL	REDUCE TO (%)	AT(MIN)	FULL OFF (MIN)	SCHEDULE	CONTROL	CIRCUIT CONTROL	110125
A1	OFFICE (ENCLOSED AND ≤ 250 SQFT)	LOW VOLTAGE	ON-OFF-DIM	N/A	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	N/A	N/A	N/A	N/A	N/A	20	N/A	N/A	N/A	PROVIDE TWO ZONES OF CONTROL, ONE FOR UPLIGHT PORTION OF LIGHT AND ONE FOR DOWNLIGHT PORTION OF LIGHT
A2	OFFICE (ENCLOSED AND ≤ 250 SQFT)	LOW VOLTAGE	ON-OFF-DIM	N/A	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	YES	N/A	50	N/A	N/A	20	N/A	N/A	N/A	PROVIDE TWO ZONES OF CONTROL, ONE FOR UPLIGHT PORTION OF LIGHT AND ONE FOR DOWNLIGHT PORTION OF LIGHT. ENTIRE ROOM IS PRIMARY DAYLIGHT AREA.
B1	OFFICE (OPEN PLAN)	LOW VOLTAGE	ON-OFF-DIM	N/A	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	N/A	N/A	N/A	N/A	N/A	20	N/A	N/A	ALCR	PROVIDE TWO ZONES OF CONTROL, ONE FOR UPLIGHT PORTION OF LIGHT AND ONE FOR DOWNLIGHT PORTION OF LIGHT
B2	OFFICE (OPEN PLAN)	LOW VOLTAGE	ON-OFF-DIM	N/A	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	YES	N/A	45	N/A	N/A	20	N/A	N/A	ALCR	PROVIDE TWO ZONES OF CONTROL, ONE FOR UPLIGHT PORTION OF LIGHT AND ONE FOR DOWNLIGHT PORTION OF LIGHT

OUTER LAMPS

LIGHTING

LOAD

→ AUXILIARY

CONTACT

1. REFER TO PLANS FOR LOCATION OF LOCAL CONTROL.

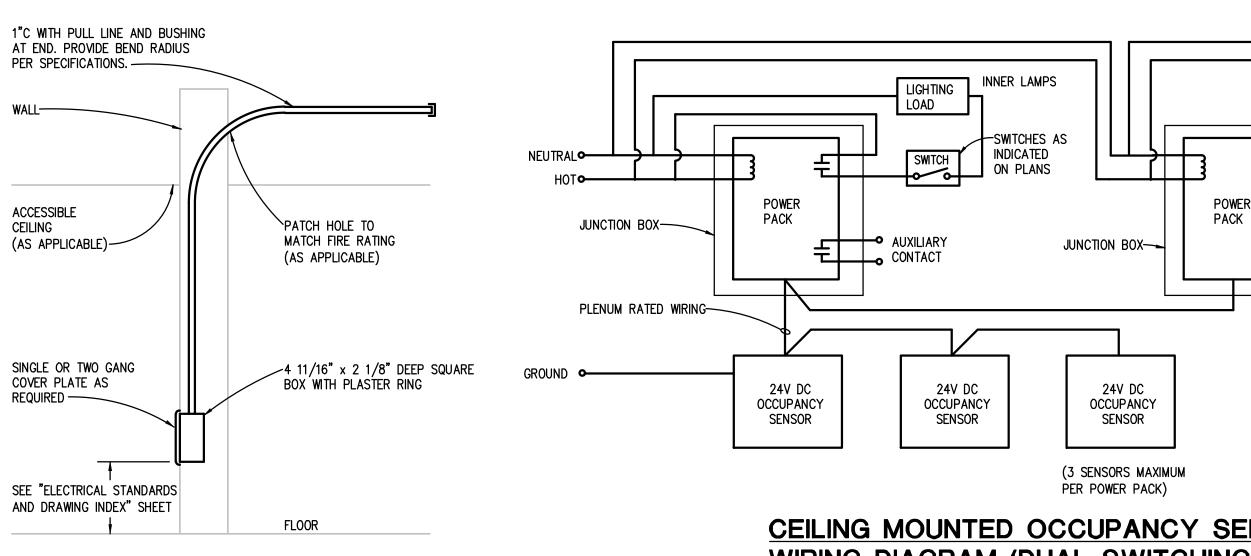
2. REFER TO PLANS FOR PRIMARY AND SECONDARY DAYLIGHT ZONES.

3. PROVIDE EMERGENCY LIGHTING CIRCUIT CONTROL (BCELTS OR ALCR) PER SWITCHING CIRCUIT AS REQUIRED.

4. CONTRACTOR SHALL PROVIDE FLOOR PLAN INDICATING SENSOR AND EQUIPMENT LOCATIONS OF CHOSEN CONTROL SYSTEM. 5. REFER TO LUMINAIRE SCHEDULE FOR FIXTURE CHARACTERISTICS.

6. PROVIDE WIRING CONTROL DIAGRAM FOR APPLICABLE CONTROL SYSTEM(S).

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TELECOMMUNICATION OUTLET DETAIL NO SCALE

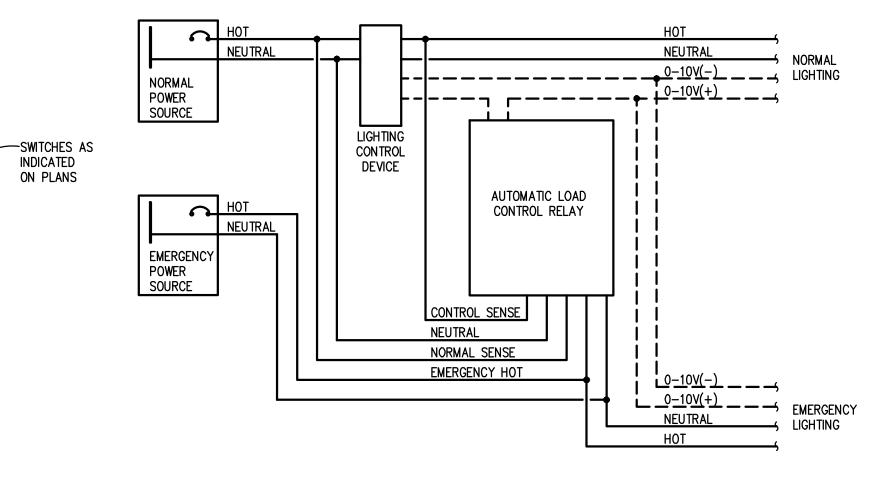
NOTES:

1. IF CEILING IN ROOM IS NOT ACCESSIBLE, ROUTE CONDUIT TO NEAREST ACCESSIBLE CEILING IN DIRECTION OF AND WITH PATHWAY OR ACCESS TO TELECOMMUNICATION ROOM.

CEILING MOUNTED OCCUPANCY SENSOR WIRING DIAGRAM (DUAL SWITCHING) NO SCALE

NOTES:

- REFER TO SPECIFICATION FOR ACCEPTED MANUFACTURERS. PROVIDE POWER PACKS AND SLAVE PACKS AS REQUIRED FOR SWITCHING AS INDICATED
- ON PLAN. REVISE DETAIL AS REQUIRED BY MANUFACTURER.
- MOUNTING LOCATION PER MANUFACTURER'S RECOMMENDATION. 4. PLACE CEILING MOUNTED OCCUPANCY SENSORS IN A FULL CEILING TILE, WHERE
- APPLICABLE.
- ADJUST SENSITIVITY LEVELS PER THE OWNER REQUIREMENTS.
- PROVIDE FACTORY SUPPORT FOR AIMING/ADJUSTING OF SENSORS. SENSOR ADJUSTMENT: BEFORE MAKING ADJUSTMENTS, MAKE SURE ROOM FURNITURE IS INSTALLED, LIGHTING CIRCUITS ARE TURNED ON, AND THE HVAC SYSTEMS ARE IN THE ON POSITION. VAV SYSTEMS SHOULD BE SET TO THEIR HIGHEST AIRFLOW. SET THE LOGIC CONFIGURATION DIP SWITCHES TO "EITHER". EITHER REQUIRES MOTION DETECTION BY ONLY ONE TECHNOLOGY. SET THE TIME DELAY PER OWNERS DIRECTION.



AUTOMATIC LOAD CONTROL RELAY FOR 0-10V DIMMING

NO SCALE

- BASIS OF DESIGN IS LVS CONTROLS EPC-2-D. REFER TO SPECIFICATIONS FOR APPROVED
- MANUFACTURERS. ADJUST WIRING AS NECESSARY FOR OTHER APPROVED MANUFACTURERS. 2. PROVIDE ONE AUTOMATIC LOAD CONTROL RELAY FOR EACH CONTROL CIRCUIT.



ANDERSON, ECKSTEIN AND WESTRICK, INC.

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Michigan 48315 www.aewinc.com

ENGINEERING STRONG COMMUNITIES



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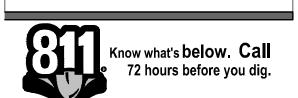
10/24/2024 BID ISSUE 10/02/2024 OWNER REVIEW SUBMITTALS/REVISIONS PROJECT NAME:

MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO

SHEET TITLE: ELECTRICAL **DETAILS AND** DIAGRAMS

MACOMB TOWNSHIP

PRELIMINARY CONSTRUCTION RECORD DRAWN BY: CHECKED BY: LSS NONE



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ELECTRICAL DEMOLITION GENERAL NOTES:

- 1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
- 2. 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.
- 3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
- 4. COORDINATE WITH NEW WORK PLANS FOR EXTENT OF DEMOLITION WORK.
- 5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
- 6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
- 7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
- 8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
- 9. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
- 10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
- 11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.

DEMOLITION KEY NOTES:

- A. RELOCATE DEVICE. REFER TO NEW WORK PLANS.
- B. REMOVE BACK TO SOURCE ANY ELECTRICAL CONNECTIONS ASSOCIATED WITH THE EXISTING FPB THAT IS TO BE REMOVED. REFER TO MECHANICAL PLANS.



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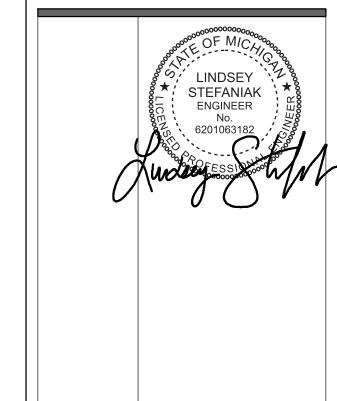
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Troy, Michigan 48098-3276 Tel: 248-879-5666 www.PeterBassoAssociates.com PBA Project No.: 2024 0259



10/24/2024 10/02/2024

PROJECT NAME: **MACOMB TOWNSHIP BASEMENT BUILD-OUT PHASE TWO**

BID ISSUE

SUBMITTALS/REVISIONS

OWNER REVIEW

SHEET TITLE: ELECTRICAL DEMOLITION PLAN

MACOMB TOWNSHIP

CHECKED BY: 1/8"=1'-0"



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