DELTA COLLEGE PLANETARIUM ENTRY DOOR REPLACEMENT

SHEET INDEX	(
NUMBER	TITLE
GENERAL	
TS	TITLE SHEET
ARCHITECTURAL	
A2.0	PARTIAL FLOOR PLAN, ENLARGED PLANS, DOOR & ROOM FINISH SCHEE
A2.1	ENLARGED DEMO PLAN, FLOOR PLAN, ROOF PLAN & DETAILS
A4.0	EXTERIOR ELEVATION, BUILDING SECTIONS & STRUCTURAL NOTES
A5.0	WALL SECTIONS & STRUCTURAL DETAILS
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E0.0	GENERAL NOTES
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E3.0	POWER AND LIGHTING PLANS
E7.0	PANEL SCHEDULES

100 CENTER AVENUE BAY CITY, MI 48708

. DULES _____

	CONTACT INFORMATIO
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EMAIL: ctucker@kibbe.com

CITY OF BAY CITY 301 WASHINGTON AVE., SUITE 211 BAY CITY, MI 48708 (989) 894-8162 KEITH BENNETT

BUILDING OFFICIAL

PROJECT INFORMATION

BUILDING CODE COMPLIANCE

- 2015 MICHIGAN REHABILITATION CODE (MRC) 2015 MICHIGAN BUILDING CODE (MBC)
- 2021 MICHIGAN PLUMBING CODE (MPC)
- 2021 MICHIGAN MECHANICAL CODE (MMC) 2023 NATIONAL ELECTRICAL CODE (NEC)
- 2015 INTERNATIONAL FIRE CODE (IFC)
- 2012 NFPA 101 LIFE SAFETY CODE (LSC)

USE AND OCCUPANCY CLASSIFICATION [CHAPTER 3] GROUP A1 - ASSEMBLY (PLANETARIUM)

BUILDING HEIGHT AND NUMBER OF STORIES [TBL 504.3, 504.4] ALLOWED - 75' / (2) STORIES PROPOSED (EXISTING) / (2) STORIES

- PLANETARIUM DOME 45'-6"
- ELEVATOR TOWER 59'-6"

BUILDING AREA [TBL 506.2] ALLOWABLE TOTAL AREA - 55,250 SF (EQUATION 5-2) ACTUAL AREAS (BY FLOOR)

- 4,492 SFT BASEMENT
- 18,384 SFT FIRST FLOOR 8,971 SFT - SECOND FLOOR

CONSTRUCTION CLASSIFICATION [SEC 602, TBL 601] TYPE 2B - NON-COMBUSTIBLE

FIRE RESISTANCE RATING [TBL 601] • 0 - PRIMARY STRUCTURAL FRAME

- 0 BEARING WALLS
- 0 NON BEARING WALLS & PARTITIONS (INTERIOR) 0 - NON BEARING WALLS & PARTITIONS (EXTERIOR)
- 0 FLOOR CONSTRUCTION

0 - ROOF CONSTRUCTION

EXTERIOR WALLS [SECTION 705] NON-COMBUSTIBLE; TYPE 2B CONSTRUCTION

WALLS AND CEILING FINISHES [SEC 803, TBL 803.11] FLAME SPREAD INDEX - CLASS A(0-25), CLASS B(26-75), CLASS

C(76-200) SMOKE DEVELOPED INDEX - CLASS A(0-450), CLASS B(0-450), CLASS

- C(0-450) CLASS B - INTERIOR EXIT STAIRWAYS, RAMPS, EXIT PASSAGES
- CLASS B CORRIDORS, ENCL. FOR EXIT ACCESS STAIRS, RAMPS
- CLASS C ROOMS AND ENCLOSED SPACES

SYSTEM.

OCCUPANT LOAD [SEC 1004, TBL 1004.1.2]

 EXISTING - NO CHANGE MEANS OF EGRESS SIZING [SEC 1005] OCCUPANT LOAD 250 X .15 = 37.5" MIN WIDTH • REQUIRED EXIT DOORS @ 33"/DR = 2 DOORS PROVIDED - 6

NUMBER OF EXITS AND EXIT ACCESS DOORWAYS [SEC 1006] REQUIRED (2) OCCUPANT LOAD > 1 TO 500

EXIT ACCESS TRAVEL DISTANCE [SEC 1017, TBL 1017.2] USE GROUP A W/ SPRINKLER SYSTEM 250'

CORRIDORS [SEC 1020, TBL 1020.1] OHR RATING W/ SPRINKLER SYSTEM OCCUPANT LOAD > 30

FIRE PROTECTION SYSTEMS [CHAPTER 9] BUILDING IS PROTECTED BY AUTOMATIC SPRINKLER

PORTABLE FIRE EXTINGUISHERS [SEC 906] CLASS A, 75' - TYPE 2A EXTINGUISHERS SEE ALSO IFC SECTION 2311.6

PROJECT NARRATIVE

 THIS PROJECT ESSENTIALLY CONSISTS OF DEMOLITION OF (2) EXISTING REVOLVING DOOR ENTRY ENCLOSURES AND REPLACEMENT W/(2) NEW AIR-LOCK CONVENTIONAL VESTIBULES. INCIDENTAL MECHANICAL HEATING AND ELECTRIC EXITING REWORK. LIMITED STRUCTURAL WORK FOR NEW ENTRY ROOF COVERINGS.

								WILLIAM A. KIBE	ENGINEERS AK
								BAY CITY, MI 48/U8	
	DATE	1.03.25							
	STATUS / REVISIONS	ISSUED FOR BIDS							
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DOOR AN	ID FRA	ME SCI	HEDULE	Ξ								
			DOOR					FRAME				
		SIZE								1		
DOOR NO.	W	HT	THK	TYPE	MTL	FIN	TYPE	MTL	FIN	HDWR	RATING	COMMENTS
100A	3'-0"	7'-0"	1 3/4"	G	AL	PF	2	AL	PF			1, 2, 4
100B	3'-0"	7'-0"	1 3/4"	G	AL	PF	2	AL	PF			1, 2, 4
101A	3'-0"	7'-0"	1 3/4"	G	AL	PF	2	AL	PF			1, 3, 4
101B	3'-0"	7'-0"	1 3/4"	G	AL	PF	2	AL	PF			1, 3, 4

COMMENTS

- PREFINISHED ALUMINUM STOREFRONT SYSTEM, SEE SPECIFICATIONS. INSULATED & TEMPERED GLASS.
- PROVIDE NEW ADA OPERATOR & PUSH BUTTONS, VERIFY & MATCH EX SALVAGED ADA OPERATOR MANUFACTURER.
 SALVAGED ADA OPERATOR TO BE INSTALLED ON THIS DOOR. PROVIDE ALL NEW PUSH

BUTTONS.

ALL NEW DOOR HARDWARE TO MATCH OWNER'S EXISTING SYSTEM. CONTRACTOR TO FIELD VERIFY PRIOR TO SUBMITTING BID. PROVIDE NEW CYLINDERS TO OWNER FOR KEYING. CYLINDER INSTALLATION BY CONTRACTOR AFTER KEYING IS COMPLETED.

		FLC	OR	CEIL	ING		WAL	LS		
ROOM NO.	ROOM NAME	FINISH	BASE	MATERIAL	FINISH	NORTH	EAST	SOUTH	WEST	COMMENTS
100	VEST	CPT	VB	GYP	Р	DW/P	DW/P	DW/P	DW/P	1
101	VEST	CPT	VB	GYP	Р	DW/P	DW/P	DW/P	DW/P	1
102	LOBBY	EX	VB	EX	EX	EX/P	EX/P	EX/P	EX/P	2, 3
103	LOBBY	EX	EX/VB	EX	EX	EX/P	EX/P	EX/P	EX/P	2, 3
104	PLANETARIUM	EX	EX	EX	EX	EX	EX	EX	EX	4

COMMENTS

1. EXPOSED STEEL BEAM TO BE PAINTED TO MATCH CEILING. CLEAN & PREP

1. EXPOSED STELE BEAM TO BE PAINTED TO MATCH CEIEING. CLEAN & PREP AS REQUIRED.
 2. WALL PAINT DESIGNATIONS FOR THIS ROOM PERTAINS TO NEW DRYWALL AT NEW VESTIBULE & ALL TOUCH-UP AS REQUIRED.
 3. NEW VB AT NEW WALLS ONLY, MATCH EX STYLE, PROFILE AND COLOR.
 4. NO WORK IN THIS ROOM.

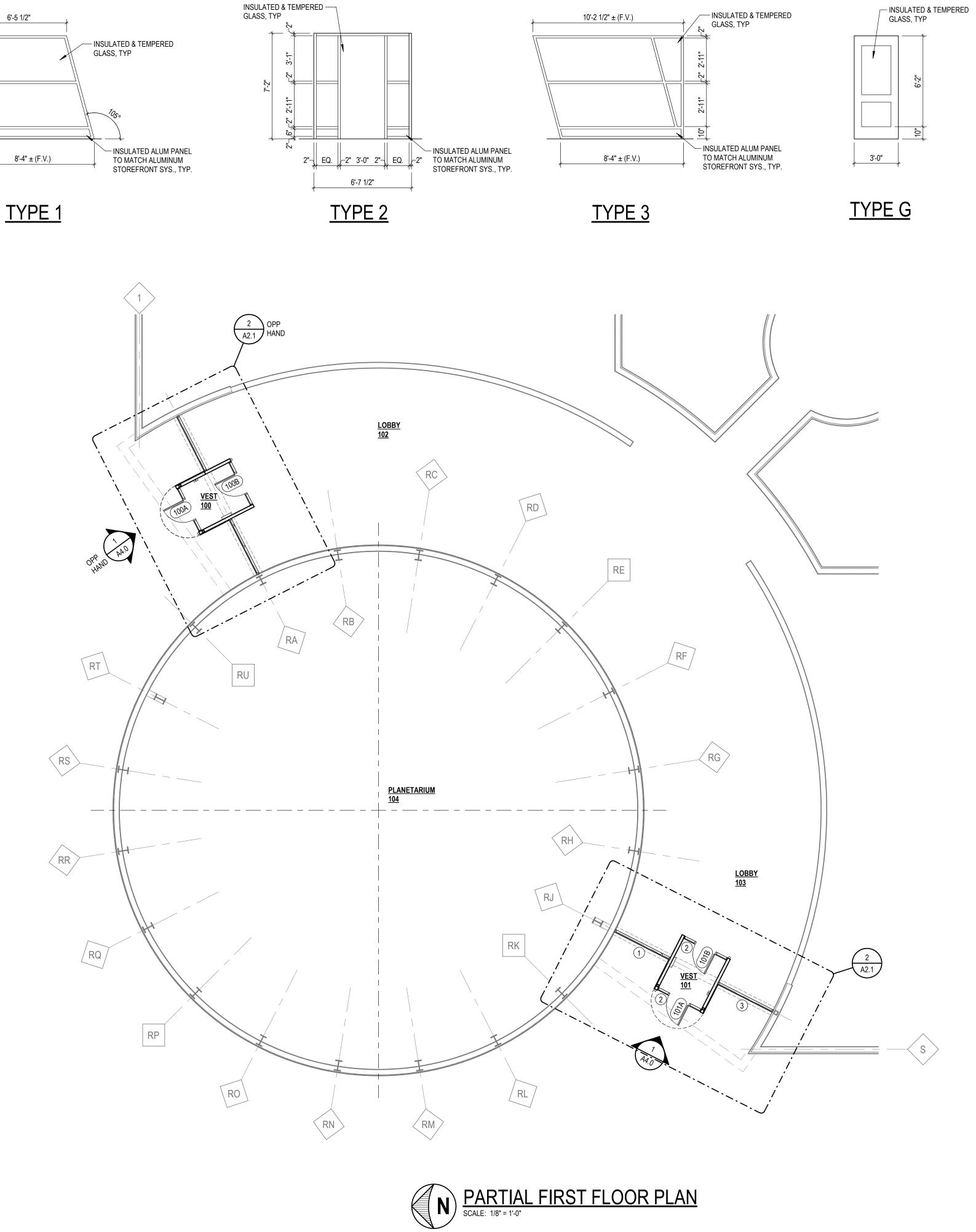
NOTE:

NOTE: FIELD VERIFY ALL DIMENSIONS IN FIELD PRIOR TO ORDERING ANY MATERIALS.

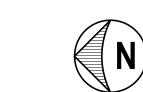
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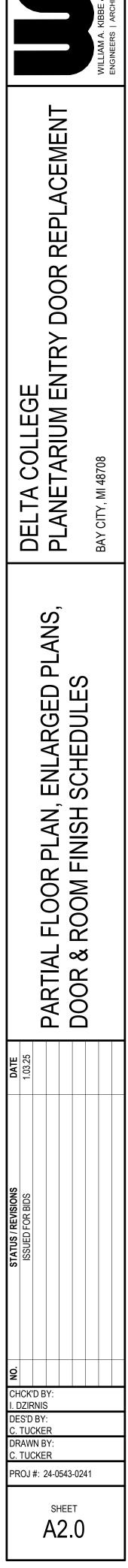
6'-5 1/2"

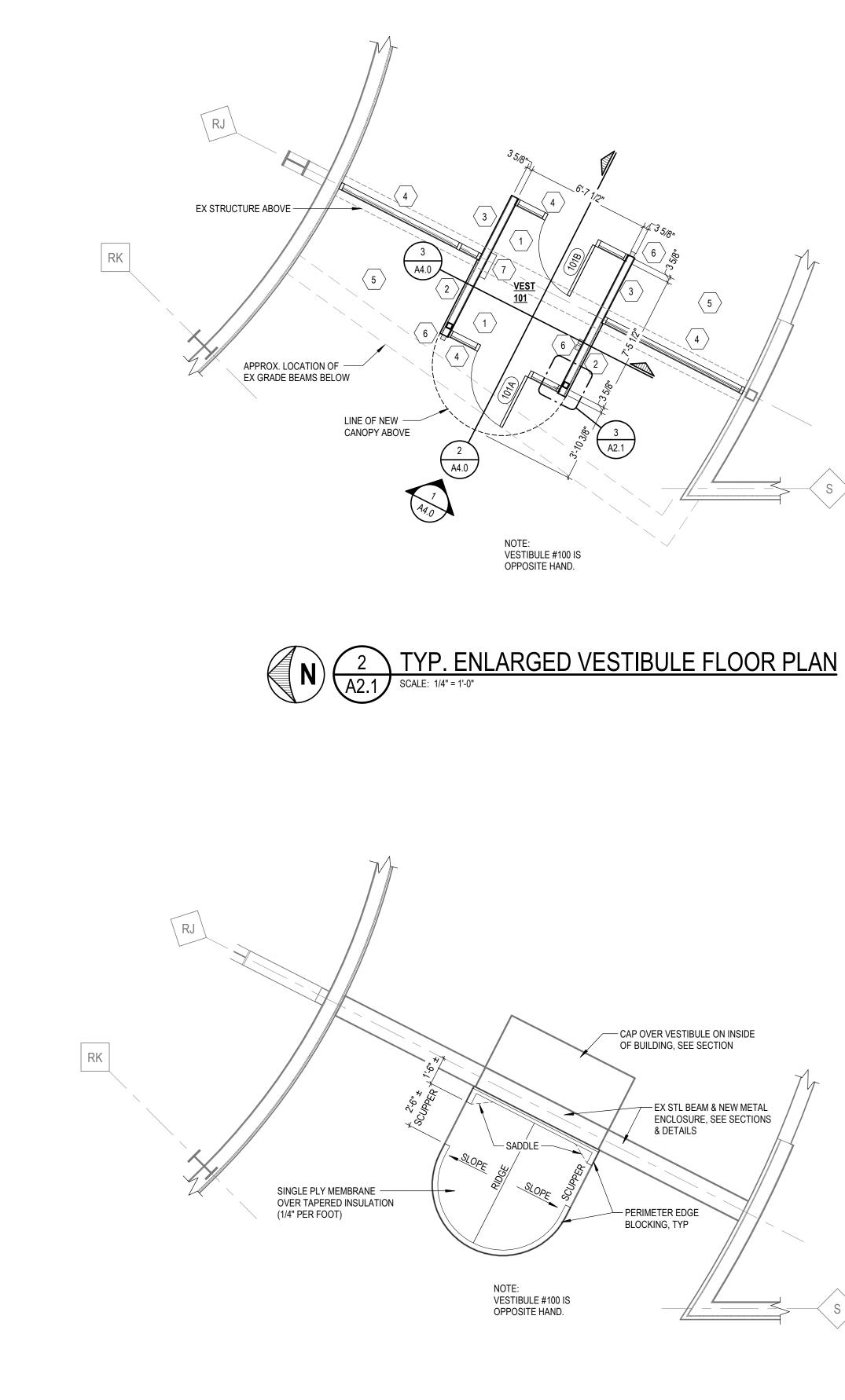
ONLY ONE ENTRANCE MAY BE WORKED ON AT A TIME. THE FIRST ENTRANCE WILL NEED TO BE OPENED FOR USE PRIOR TO STARTING THE SECOND ENTRANCE.

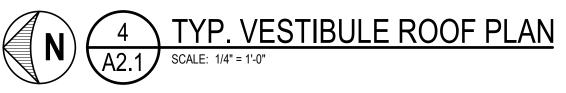


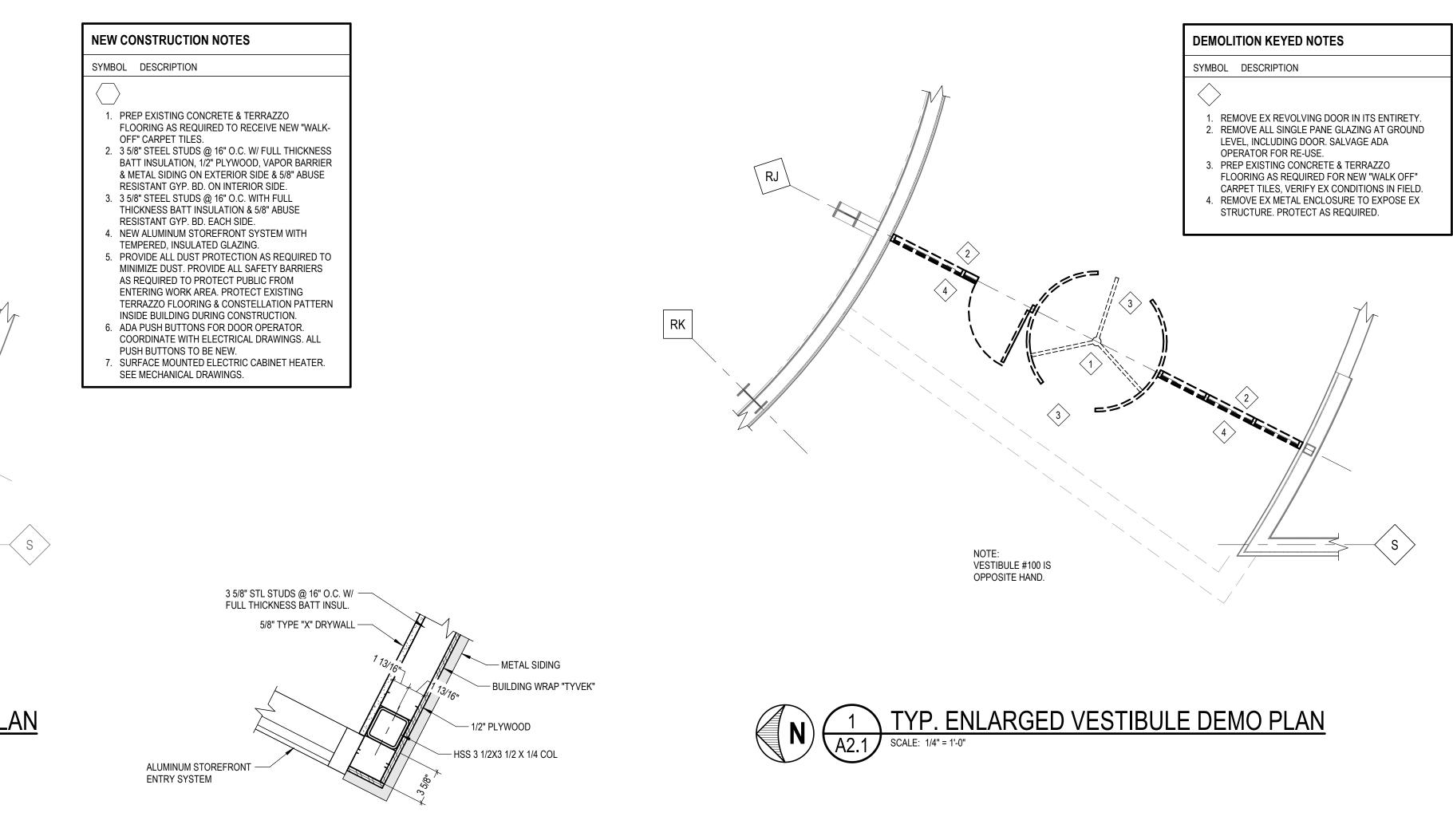
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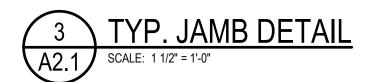








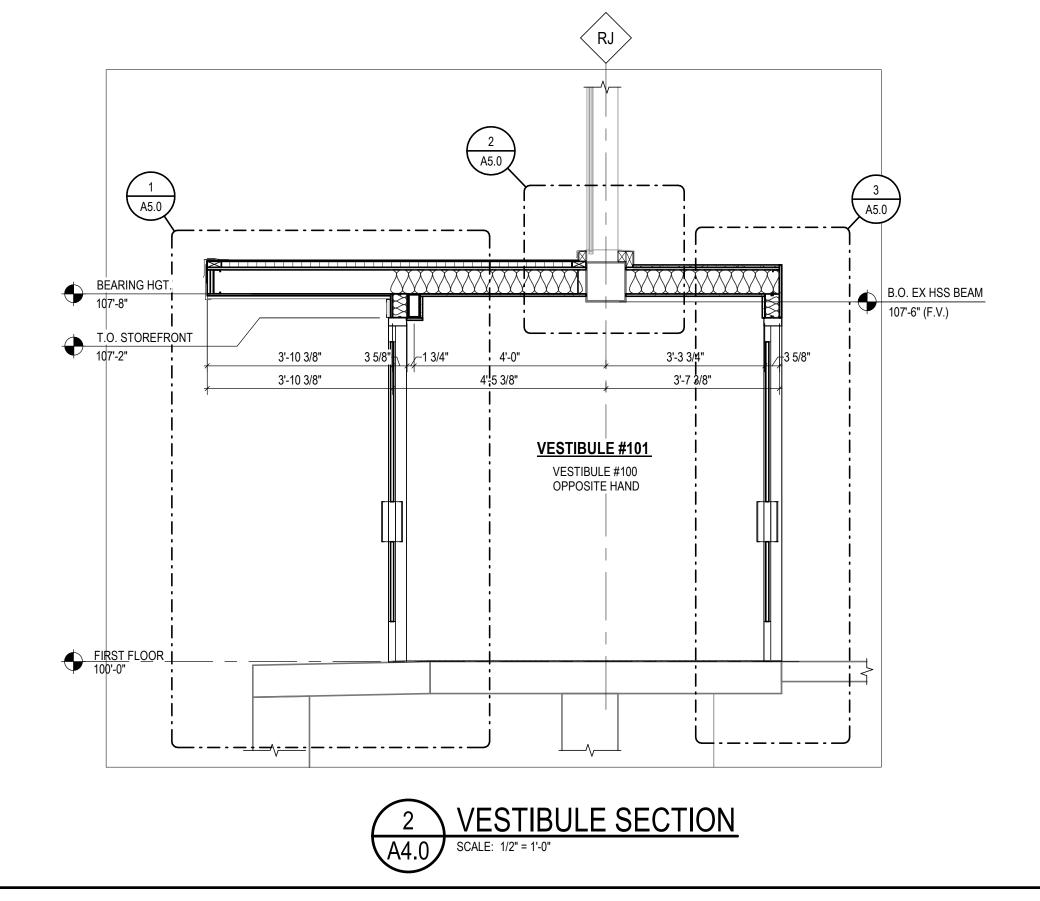


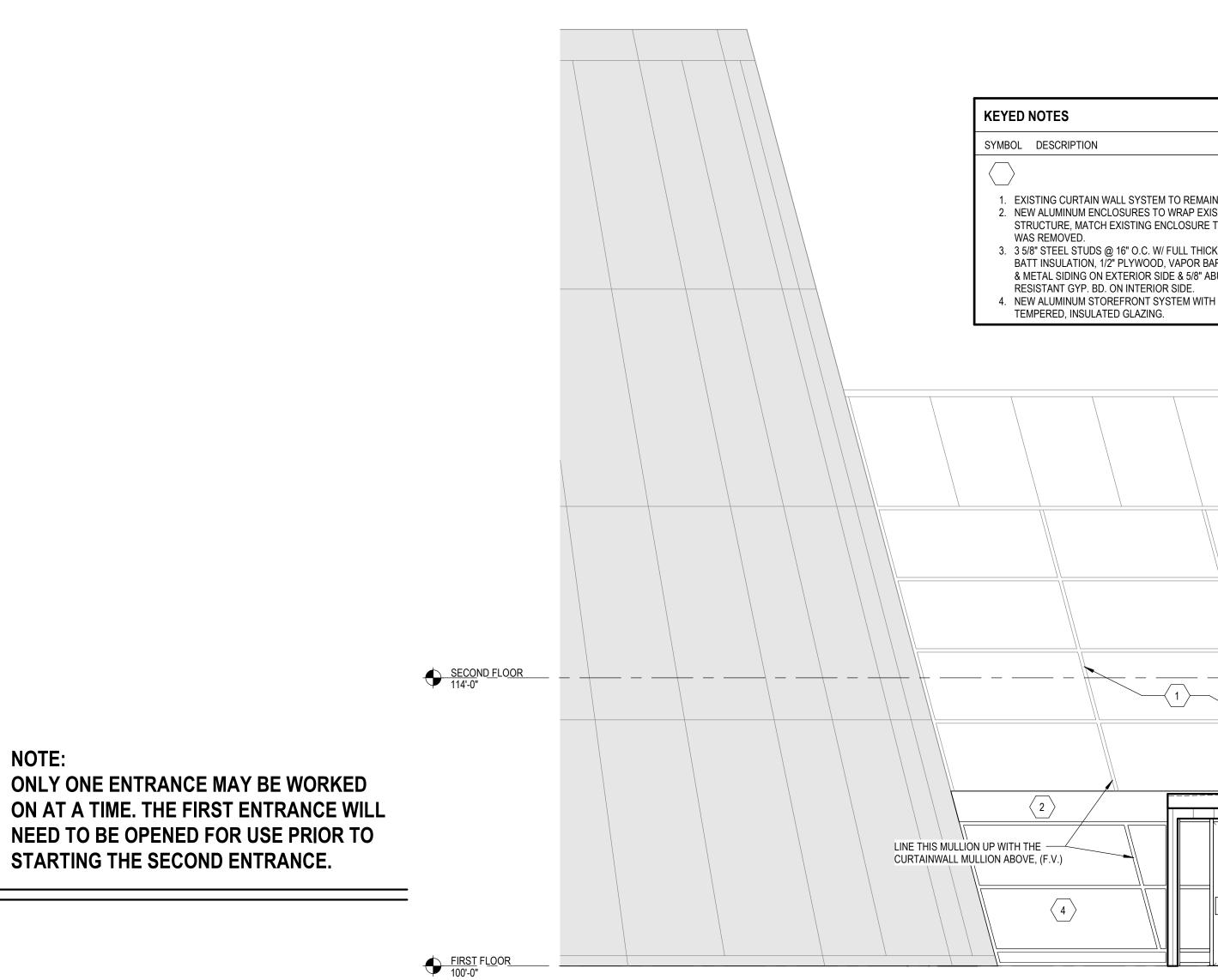


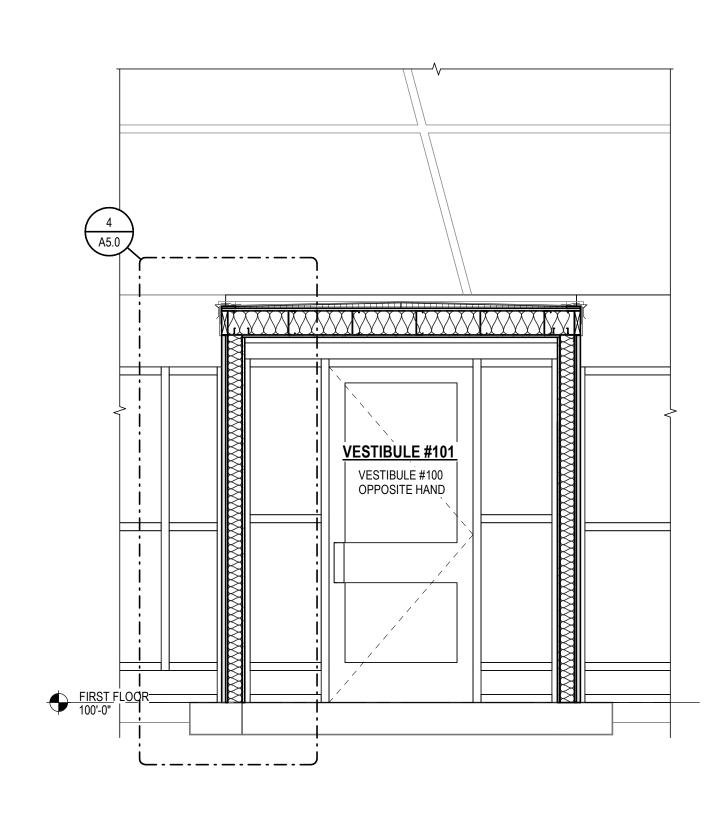
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WILLIAM A. KIBBE & ASSOCIATES, IN ENGINEERS ARCHITECTS SURVEYO
DELTA COLLEGE PLANETARIUM ENTRY DOOR REPLACEMENT BAY CITY, MI 48708
ENLARGED DEMO PLAN, FLOOR PLAN, ROOF PLAN & DETAILS
DATE 1.03.25
STATUS / REVISIONS ISSUED FOR BIDS
Ý
SHEET









VESTIBULE SECTION

3

A4.0 SCALE: 1/2" = 1'-0"

R	OOF DEAD LOADS
•	ROOFING AND INSULATION
•	5/8" PLYWOOD SHEATHING
•	CEILING 5/8" GYPSUM
•	MECHANICAL AND ELECTRICAL
•	MISCELLANEOUS
	TOTAL
D	

MICHIGAN BUILDING CODE 2015 (ASCE 7-10) RISK CATEGORY II

DESIGN CRITERIA

ROOF LIVE LOADSMINIMUM LOAD

SNOW LOADS

- IMPORTANCE FACTOR GROUND SNOW LOAD
- SNOW EXPOSURE FACTOR
- THERMAL FACTOR FLAT USE SNOW
- SNOW DRIFT PER ASCE 7

WIND LOADS

- BASIC WIND SPEED EXPOSURE CATEGORY COMPONENTS AND CLADDING PER ASCE 7
- SEISMIC DESIGN DATA SITE CLASS
- RESPONSE COEFFICIENTS
- SEISMIC DESIGN CATEGORY

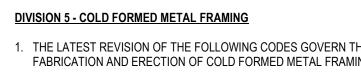
1 TYPICAL ELE 4.0 SCALE: 1/4" = 1'-0"	EVATION
	DIVISION 5 - COLD FORMED METAL FRAMING
	 THE LATEST REVISION OF THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING FABRICATION AND ERECTION OF COLD FORMED METAL FRAMING.
2 PSF 3 PSF 3 PSF 4 PSF <u>3 PSF</u>	 A. AMERICAN IRON AND STEEL INSTITUTE (AISI) AISI S200, NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL FRAMING - GENERAL PROVISIONS. B. AISI S201, NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL FRAMING - PRODUCT DATA. C. AISI S202, CODE OF STANDARD PRACTICE FOR COLD-FORMED STEEL STRUCTURAL FRAMING.
15 PSF 20 PSF	2. COLD FORMED STEEL SHALL CONFORM TO THE FOLLOWING ASTM MATERIAL SPECIFICATIONS:
20 F3F	 A. ASTM A446, Fy = 33 KSI FOR MATERIAL 0.0478 INCH (18 GAGE) OR THINNER. B. ASTM A446, Fy = 50 KSI FOR MATERIAL 0.0598 INCH (16 GAGE) OR THICKER.
$I_s = 1.0$ $P_g = 35 PSF$ $C_e = 1.0$ $C_t = 1.0$	3. ALL COLD FORMED STEEL SHALL HAVE A GALVANIZED COATING CONFORMING TO ASTM A653-G60.
$P_f = 24.5 PSF (TYPICAL ROOF)$	 ALL WELDING SHALL CONFORM TO AWS D1.3 SPECIFICATION FOR WELDING SHEET STEEL STRUCTURES AND AWS D19.0 WELDING ZINC COATED STEEL.
115 MPH (3 SEC GUST) B	 THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING SIZES, DESIGN VALUES, MATERIALS, DIMENSIONS, CONNECTIONS AND CALCULATIONS WHICH HAY BEEN PREPARED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEE
D SD _S = 0.067 SD ₁ = 0.062 A	6. UNLESS SPECIFICALLY NOTED, ALL MATERIAL SHALL BE A MINIMUM 18 GAUGE (MINIMUM 16 GAUGE FOR STUDS SERVING AS BACKUP FOR BRICK VENEER) THICKNESS, AND SHALL MEET THE DEFLECTION REQUIREMENTS OF THE FINISH MATERIAL TO BE ATTACHED TO THE COLD FORMED FRAMING WORK. DEFLECTION OF COLD FORMED STUDS, UNDER WIND LOADS, SERVING AS BACKUP FOR BRICK VENEER SHALL NOT EXCEED SPAN/1,000.
	 ALL STUDS AND JOISTS SHALL BE INSTALLED AT SPACING INDICATED ON THE DRAWINGS, UNLESS NOTED, EACH SIDE OF THE OPENINGS SHALL BE FRAMED WIT DOUBLE STUDS.
	 ALL STUDS AND JOISTS SHALL HAVE A BRIDGING LINE INSTALLED AT A MAXIMUM DISTANCE OF 4'-0" AND 5'-0" RESPECTIVELY.
	9. ALL JOISTS SHALL HAVE WEB STIFFENERS AT REACTION POINTS AND CONCENTRATED LOADS.
	10. STRUCTURAL CONNECTIONS OF COLD FORMED METAL FRAMING MEMBERS SHALL BE MADE PER MANUFACTURER'S RECOMMENDATIONS, ADEQUATE TO CARRY THE IMPOSED LOADS, AND CONFORMING TO THE AISI AND AWS SPECIFICATIONS.

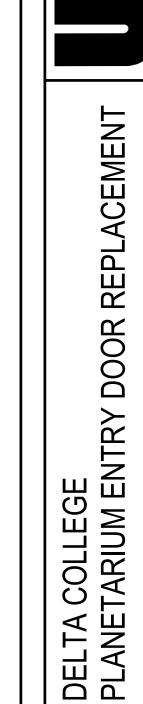
- 50 KSI FOR MATERIAL 0.0598 INCH (16 GAGE) OR THICKER. STEEL SHALL HAVE A GALVANIZED COATING CONFORMING TO CONFORM TO AWS D1.3 SPECIFICATION FOR WELDING SHEET AND AWS D19.0 WELDING ZINC COATED STEEL. SHALL SUBMIT SHOP DRAWINGS SHOWING SIZES, DESIGN , DIMENSIONS, CONNECTIONS AND CALCULATIONS WHICH HAVE NDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER. LY NOTED, ALL MATERIAL SHALL BE A MINIMUM 18 GAUGE E FOR STUDS SERVING AS BACKUP FOR BRICK VENEER) HALL MEET THE DEFLECTION REQUIREMENTS OF THE FINISH TACHED TO THE COLD FORMED FRAMING WORK. DEFLECTION
- TUDS, UNDER WIND LOADS, SERVING AS BACKUP FOR BRICK
- EXCEED SPAN/1,000. ISTS SHALL BE INSTALLED AT SPACING INDICATED ON THE
- S NOTED, EACH SIDE OF THE OPENINGS SHALL BE FRAMED WITH
- ISTS SHALL HAVE A BRIDGING LINE INSTALLED AT A MAXIMUM AND 5'-0" RESPECTIVELY.
- AVE WEB STIFFENERS AT REACTION POINTS AND ADS.
- ECTIONS OF COLD FORMED METAL FRAMING MEMBERS SHALL FACTURER'S RECOMMENDATIONS, ADEQUATE TO CARRY THE ND CONFORMING TO THE AISI AND AWS SPECIFICATIONS.
- 11. NON LOAD BEARING WALLS OR CURTAIN WALLS SHALL BE DESIGNED AND CONNECTED TO ALLOW FOR DEFLECTION OF THE BUILDING STRUCTURE.

- ION OF THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING, ERECTION OF COLD FORMED METAL FRAMING.

- AND STEEL INSTITUTE (AISI) AISI S200, NORTH AMERICAN

- COLD-FORMED STEEL FRAMING GENERAL PROVISIONS.







SECTIONS

JILDING

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EXTERIOR ELEVATION & STRUCTURAL NOTES

DATE 1.03.25

FOR BIDS

TATUS ISSUEE

CHCK'D BY:

DES'D BY: C. TUCKER

DRAWN BY:

C. TUCKER

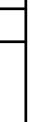
PROJ #: 24-0543-0241

SHEET

A4.0

I. DZIRNIS / E. MANNOR







VESTIBULE #100 IS OPPOSITE HAND.

NOTE:

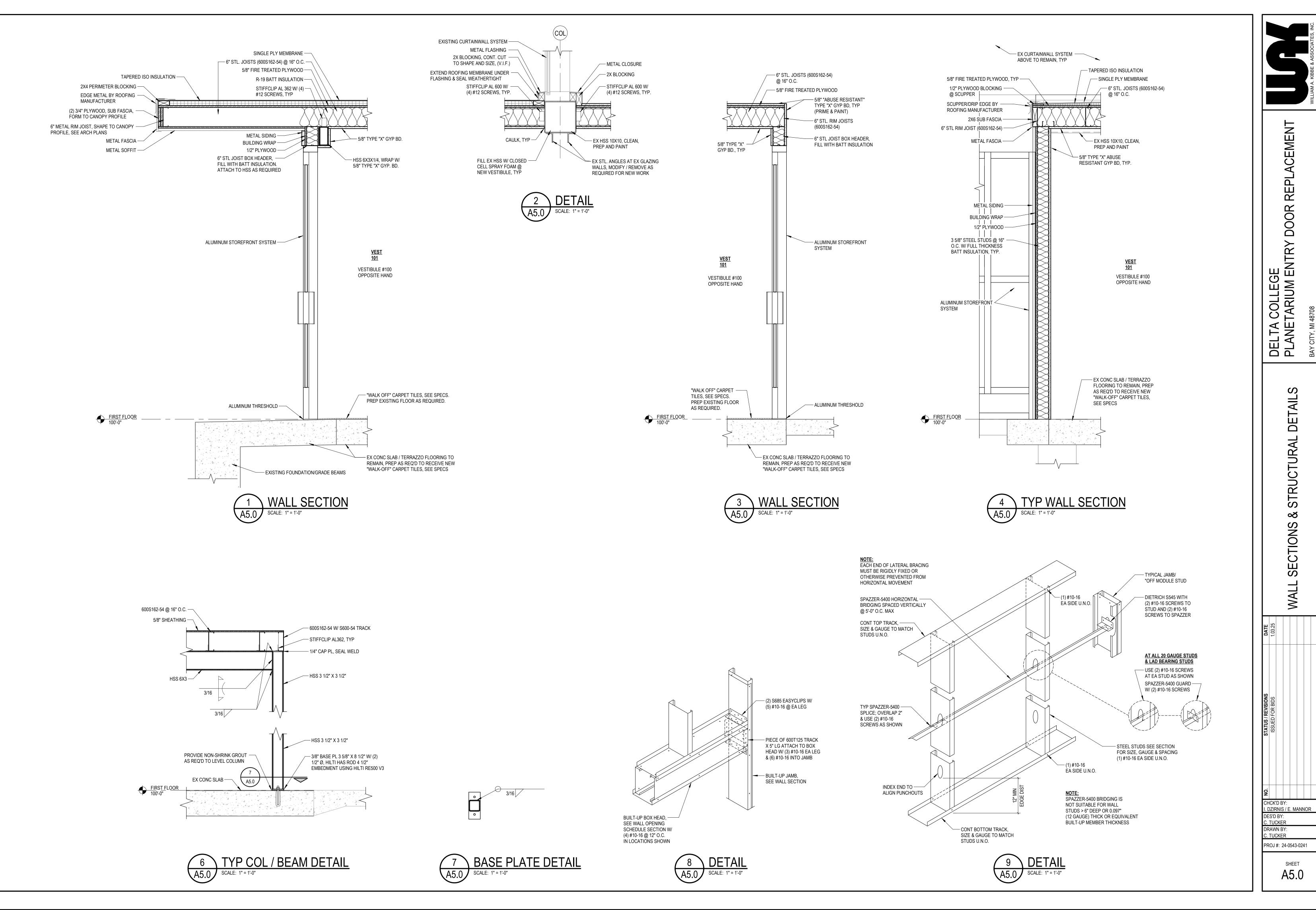
-<u>(1)</u>- $\langle 2 \rangle$ >(3) <4 > $\langle 4 \rangle$

1. EXISTING CURTAIN WALL SYSTEM TO REMAIN. 2. NEW ALUMINUM ENCLOSURES TO WRAP EXISTING STRUCTURE, MATCH EXISTING ENCLOSURE THAT WAS REMOVED. 3. 3 5/8" STEEL STUDS @ 16" O.C. W/ FULL THICKNESS BATT INSULATION, 1/2" PLYWOOD, VAPOR BARRIER & METAL SIDING ON EXTERIOR SIDE & 5/8" ABUSE RESISTANT GYP. BD. ON INTERIOR SIDE.

SYMBOL DESCRIPTION

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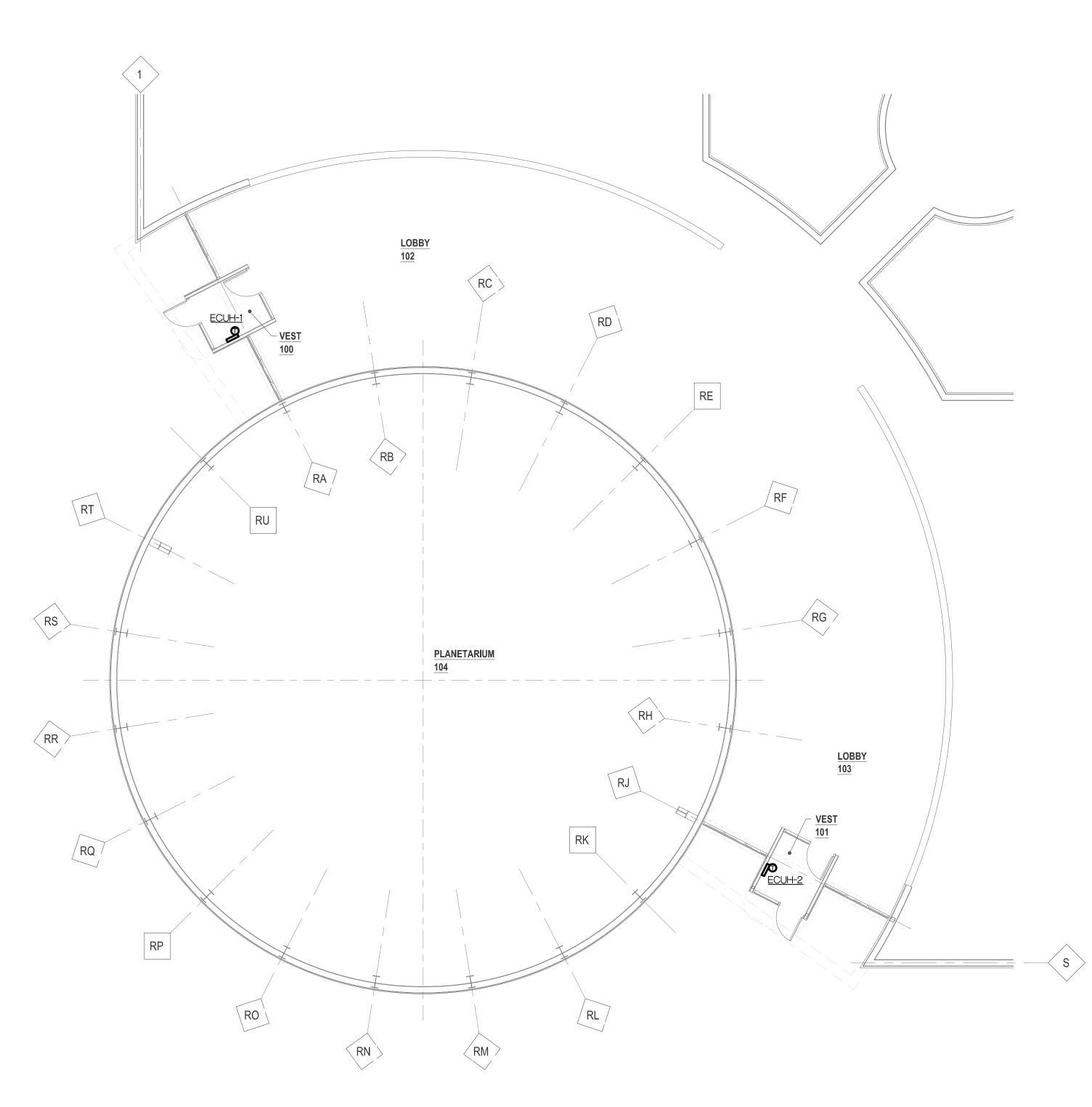
A4.0



		AIR			ELECTRICAL	DATA			HEATER				
MARK	AREA SERVED	FLOW (CFM) @ 70 DEG F	BTUH	WATTS	AMPS	VOLT	PHASE	WIDTH (IN)	HEIGHT (IN)	DEPTH (IN)	MANUFACTURER	MODEL NUMBER	NOTES
ECUH-1	VESTIBULE 100	175	10,200	3000	14.4	208	1	17	21	4	MARKEL	HF3386D-RP	1,2,3,4
ECUH-2	VESTIBULE 101	175	10,200	3000	14.4	208	1	17	21	4	MARKEL	HF3386D-RP	1,2,3,4

. SURFACE MOUNTED.

. PROVIDE SURFACE MOUNTING ADAPTER.

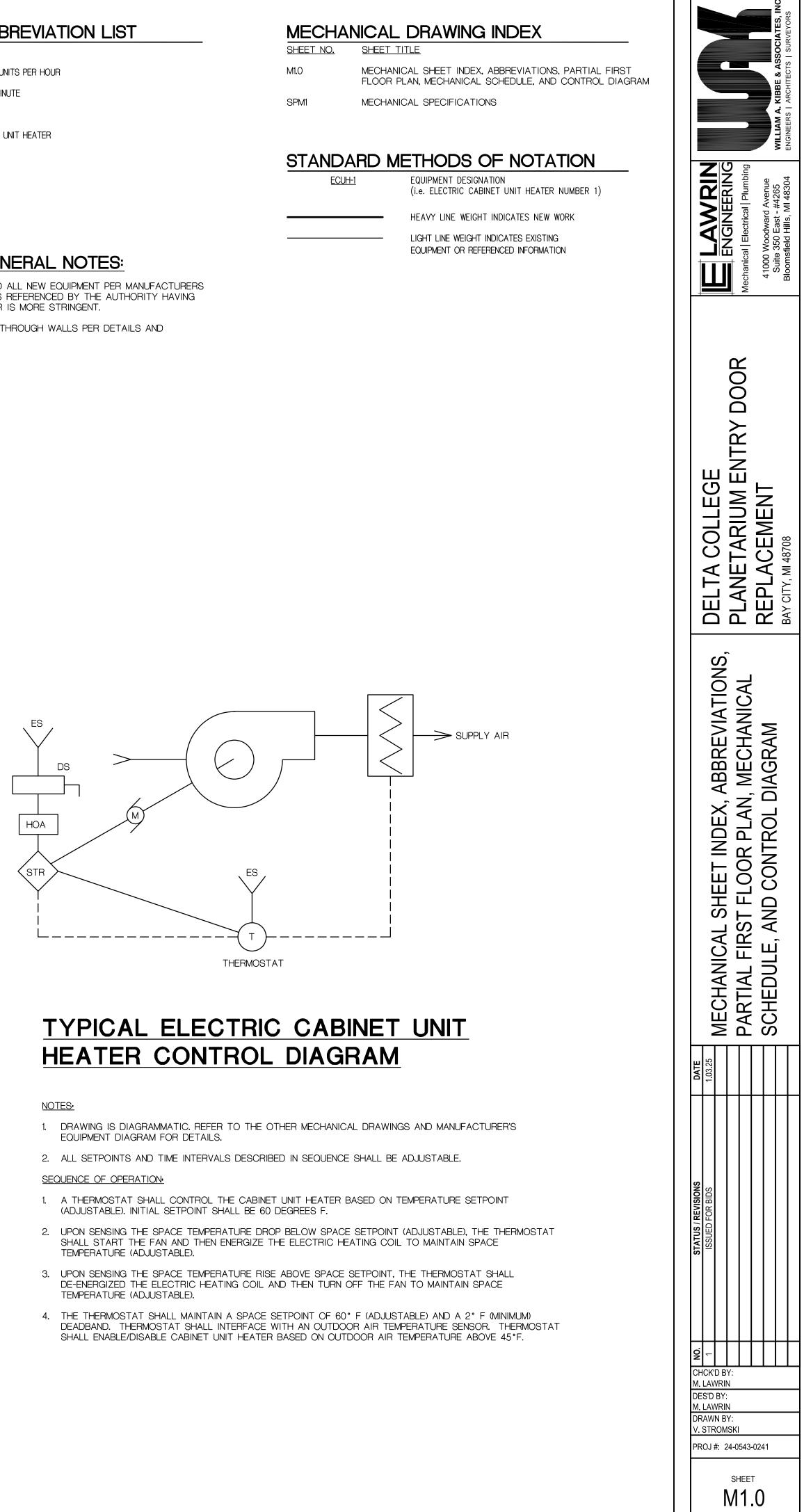


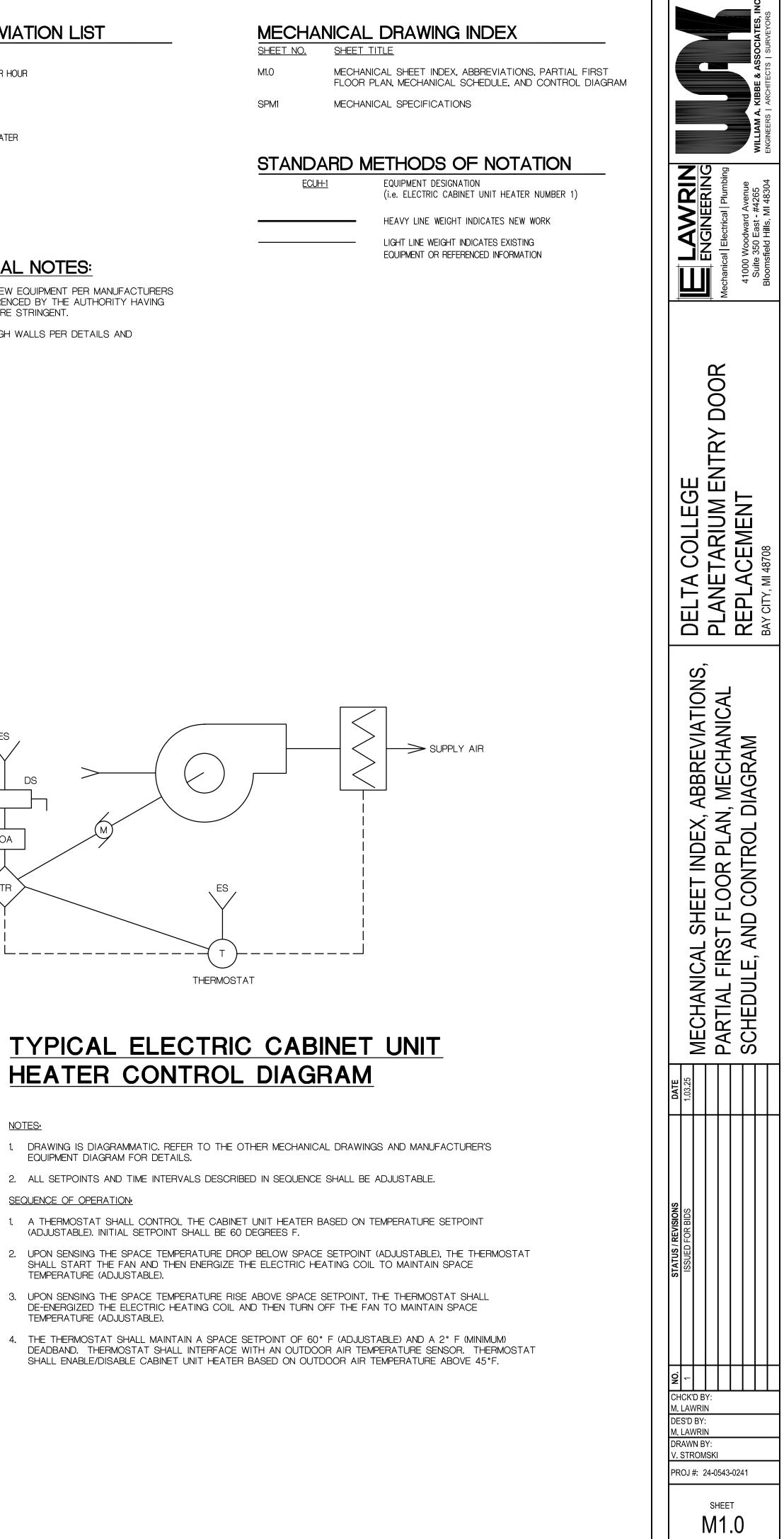
MECHANICAL	ABBREVIATION

ABBREVIATION	DESCRIPTION
BTUH	BRITISH THERMAL UNITS PER HOUR
CFM	CUBIC FEET PER MINUTE
DEG	DEGREE
ECUH	ELECTRIC CABINET UNIT HEATER
F	FAHRENHEIT
IN	INCHES
ТҮР	TYPICAL

MECHANICAL GENERAL NOTES:

- 1. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURERS REQUIREMENTS OR CODES REFERENCED BY THE AUTHORITY HAVING JURISDICTION., WHICHEVER IS MORE STRINGENT.
- 2. SEAL ALL PENETRATIONS THROUGH WALLS PER DETAILS AND SPECIFICATIONS.





PARTIAL FIRST FLOOR PLAN SCALE: 1/8" = 1'-0"

MECHANICAL SPECIFICATIONS GENERAL:

- OBTAIN AND PAY FOR ALL PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES REQUIRED AND INSURE THAT THE ENTIRE MECHANICAL INSTALLATION CONFORMS TO CODES AND REGULATIONS REQUIRED BY AUTHORITY OR AGENCY HAVING JURISDICTION OVER THE INSTALLATION, ALTERATION OR CONSTRUCTION OF WORK INCLUDED.
- 2. ALL MECHANICAL WORK AND MATERIALS SHALL COMPLY WITH, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING
 - MICHIGAN MINIMUM DESIGN STANDARDS FOR HEALTH CARE FACILITIES MICHIGAN BUILDING CODE (MBC)
 - MICHIGAN MECHANICAL CODE (MMC) MICHIGAN PLUMBING CODE (MPC)
 - AMERICANS WITH DISABILITIES ACT (ADA) STATE OF MICHIGAN DLEG BUREAU OF FIRE SERVICES
 - LOCAL CODES, ORDINANCES AND REGULATIONS
 - ASHRAE STANDARD 15 ASHRAE STANDARD 62.1
 - AHSRAE STANDARD 90.1
 - ASHRAE STANDARD 55 ALL OTHER APPLICABLE ASHRAE STANDARDS
 - NFPA 13
 - NFPA 90A ALL OTHER APPLICABLE NFPA STANDARDS
- 3. INSTALL EQUIPMENT AND MATERIALS IN COMPLIANCE WITH THE FOLLOWING AND PROVIDE EQUIPMENT AND MATERIALS THAT CONFORM TO THE APPLICABLE STANDARDS OF THE FOLLOWING ORGANIZATIONS
 - AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) UNDERWRITERS LABORATORIES (UL) MET LABORATORIES (MET)
- 4. PRIOR TO SUBMITTING THE BID, REQUEST CLARIFICATION, IN WRITING, OF ANY AMBIGUITIES, QUESTIONS, UNCERTAINTIES, ETC. REQUESTS SHALL BE MADE IN WRITING A MINIMUM OF TEN (10) DAYS BEFORE THE BID DUE DATE. NO ALLOWANCES OR EXTRA CONSIDERATION IN BEHALF OF THE CONTRACTOR WILL SUBSEQUENTLY BE ALLOWED BECAUSE OF ERROR OR FAILURE ON THE PART OF THE CONTRACTOR TO CONFORM TO THE REQUIREMENTS DESCRIBED HEREIN AND TO UNDERSTAND THE EXISTING CONDITIONS.
- MECHANICAL WORK, SHALL BE PERFORMED IN A SEQUENCE AS REQUIRED TO ACCOMMODATE CONSTRUCTION PHASING REQUIREMENTS. CONTRACTOR SHALL REVIEW PROJECT PHASING REQUIREMENTS AND ARRANGE ACCORDINGLY. ALL COSTS RELATED TO CONSTRUCTION PHASING REQUIREMENTS SHALL BE INCLUDED IN THE BID.
- ANY DISRUPTIVE WORK SHALL BE COMPLETED DURING NON-PUBLIC HOURS 6. AS COORDINATED WITH THE OWNER.
- 7. ALL MATERIALS AND EQUIPMENT SHALL BE APPLIED, INSTALLED, WIRED AND CONNECTED IN ACCORDANCE WITH ITS UL LISTING.
- ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. WHERE INSTRUCTIONS ARE NOT PROVIDED WITH THE EQUIPMENT, INCLUDING OWNER FURNISHED EQUIPMENT, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING THE INSTRUCTIONS PRIOR TO INSTALLATION.
- 9. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND OPERATION OF THE HVAC SYSTEMS.
- 10. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATION AND ARRANGEMENT OF ALL THE EQUIPMENT. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER NECESSARY WORK WILL PERMIT.
- 11. THE MECHANICAL CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH APPLICABLE CODES, APPLICABLE STANDARDS, AND THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 12. THE MECHANICAL CONTRACTOR SHALL VISIT THE JOB SITE TO INTERPRET THE DRAWINGS AND DETERMINE THE FULL EXTENT OF THE WORK REQUIRED.
- 13. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING REQUIRED FOR THE SYSTEMS INDICATED. ALL WIRING AND CONDUIT SHALL BE IN COMPLIANCE WITH THE ELECTRICAL REQUIREMENTS OF THE PROJECT.
- 14. ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR MECHANICAL WORK SHALL BE SECURED AND PAID FOR BY THE MECHANICAL CONTRACTOR. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES, AND REGULATIONS.
- 15. ALL CUTTING, PATCHING AND REPAIR WORK SHALL BE DONE BY THE TRADES WHO INSTALLED THE WORK AND PAID FOR BY THE TRADES FOR WHOM THE WORK IS DONE.
- 16. MECHANICAL CONTRACTOR SHALL PROVIDE COMPLETE OPERATING AND MAINTENANCE MANUALS TO THE OWNER COVERING ALL MECHANICAL EQUIPMENT HEREIN SPECIFIED, TOGETHER WITH PARTS LISTS.
- 17. SHOP DRAWINGS
 - A. NO APPARATUS OR EQUIPMENT SHALL BE SHIPPED FROM STOCK OR FABRICATED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND STAMPED REVIEW COMPLETED.
- B. SUBMIT FOR APPROVAL, SHOP DRAWINGS FOR ALL EQUIPMENT LISTED BELOW. WHERE ITEMS ARE REFERRED TO BY SYMBOL NUMBERS ON THE DRAWINGS AND SPECIFICATIONS, ALL SUBMITTALS SHALL BEAR THE SAME SYMBOL NUMBERS. ALL DRAWING SHALL CONTAIN THE PROJECT NAME AND PROJECT NUMBER. NO LOOSE SHEETS SHALL BE SUBMITTED UNLESS A COVER SHEET IS ATTACHED.
 - I. ELECTRIC CABINET UNIT HEATER
- ELECTRIC CABINET UNIT HEATERS
- 1. MANUFACTURERS
 - A. MANUFACTURERS, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING.
 - BERKO, MARLEY ENGINEERED PRODUCTS
 - INDEECO
 - MARKEL QMARK, MARLEY ENGINEERED PRODUCTS
 - STERLING.
 - TRANE INC. RITTLING.
 - VULCAN

- 2. DESCRIPTION
- A. FACTORY-ASSEMBLED AND -TESTED UNIT COMPLYING
- B. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORI LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TES AND MARKED FOR INTENDED LOCATION AND APPLICAT
- C. COMPLY WITH UL 2021.
- 3. PERFORMANCE REQUIREMENTS
 - A. ASHRAE/IESNA 90.1 COMPLIANCE: APPLICABLE REQUIRE ASHRAE/IESNA 90.1, SECTION 6 - "HEATING, VENTILATING AIR-CONDITIONING."
- 4. CABINETS
 - A. MATERIAL. STEEL WITH BAKED-ENAMEL FINISH WITH STANDARD PAINT, IN COLOR SELECTED BY ARCHITEC
 - VERTICAL UNIT, EXPOSED FRONT PANELS. MINIMI GALVANIZED SHEET STEEL, REMOVABLE PANELS CHANNEL-FORMED EDGES SECURED WITH TAMPER
 - FASTENERS. RECESSED FLANGES. STEEL, FINISHED TO MATC BASE: MINIMUM 18-GA.STEEL SUB-BASE, FINISHED 3. CABINET, 6 INCHES HIGH WITH LEVELING BOLTS.
- 5. FILTERS
 - A. MINIMUM ARRESTANCE: ACCORDING TO ASHRAE 52.1 EFFICIENCY REPORTING VALUE (MERV) ACCORDING TO
 - 1. PLEATED: 90 PERCENT ARRESTANCE AND MERV
- 6. COILS
 - A. ELECTRIC-RESISTANCE HEATING COIL: NICKEL-CHROM WIRE, FREE FROM EXPANSION NOISE AND HUM, MOUNTE INSERTS IN GALVANIZED-STEEL HOUSING, WITH FUSES FOR OVERCURRENT PROTECTION AND LIMIT CONTROLS HIGH-TEMPERATURE PROTECTION. TERMINATE ELEMEN STAINLESS-STEEL MACHINE-STAKED TERMINALS SECUR STAINLESS-STEEL HARDWARE.
- CONTROLS 7.
- A. FAN AND MOTOR BOARD, REMOVABLE.
 - FAN: FORWARD CURVED, DOUBLE WIDTH, CENTR CONNECTED TO MOTOR, THERMOPLASTIC OR PA WHEELS AND ALUMINUM, PAINTED-STEEL, OR GAL'
- FAN SCROLLS. MOTOR: PERMANENTLY LUBRICATED, MULTISPEEL
- MOUNTED ON MOTOR BOARD. З. WIRING TERMINATIONS: CONNECT MOTOR TO CH WITH PLUG CONNECTION.
- B. BASIC UNIT CONTROLS
- 1. CONTROL VOLTAGE TRANSFORMER.
- C. UNIT-MOUNTED THERMOSTAT
- D. ELECTRICAL CONNECTION FACTORY-WIRED MOTORS FOR A SINGLE FIELD CONNECTION.
- 8. EXAMINATION
 - EXAMINE AREAS TO RECEIVE CABINET UNIT HEATERS WITH REQUIREMENTS FOR INSTALLATION TOLERANCES CONDITIONS AFFECTING PERFORMANCE OF THE WORK.
 - B. EXAMINE ROUGHING-IN FOR ELECTRICAL CONNECTIONS ACTUAL LOCATIONS BEFORE UNIT-HEATER INSTALLAT
- C. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFA CONDITIONS HAVE BEEN CORRECTED.
- 9. INSTALLATION
 - A. INSTALL WALL BOXES IN FINISHED WALL ASSEMBLY, SE WEATHERPROOF.
 - B. INSTALL CABINET UNIT HEATERS TO COMPLY WITH NFPA 90A.
 - C. INSTALL NEW FILTERS IN EACH FAN-COIL UNIT WITHIN TWO WEEKS OF
 - SUBSTANTIAL COMPLETION.
- 10. CONNECTIONS
- A. COMPLY WITH SAFETY REQUIREMENTS IN UL 1995.
- B. GROUND EQUIPMENT ACCORDING TO ELECTRICAL SPECIFICATIONS.
- C. CONNECT WIRING ACCORDING TO ELECTRICAL SPECIFICATIONS.
- 11. FIELD QUALITY CONTROL
 - A. PERFORM THE FOLLOWING TESTS AND INSPECTIONS.
 - OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION
 - AND UNIT OPERATION. 2. OPERATE ELECTRIC HEATING ELEMENTS THROUGH EACH STAGE
 - TO VERIFY PROPER OPERATION AND ELECTRICAL CONNECTIONS. 3. TEST AND ADJUST CONTROLS AND SAFETY DEVICES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.
 - B. UNITS WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.
 - C. PREPARE TEST AND INSPECTION REPORTS.

	12.	ADJUSTING					
IG WITH AHRI 440. RIES: LISTED AND		A. PRIOR TO SUBSTANTIAL COMPLETION, CLEAN UNIT'S EXPOSED SURFACES AND VACUUM CLEAN INTERNAL COMPONENTS INCLUDING FAN WHEEL, COIL SECTIONS, AND FILTERS.					
ESTING AGENCY. ATION.		B. ADJUST INITIAL TEMPERATURE SET POINTS.					
	13.	INSTALLATION					
IREMENTS IN		A. LOCATE CABINET UNIT HEATERS AS INDICATED, COORDINATE WITH OTHER TRADES TO ASSURE CORRECT RECESS SIZE OF RECESSED CABINET UNIT HEATERS.					
FING, AND	14.	ELECTRICAL WIRING					
H MANUFACTURER'S CT.		A. GENERAL: INSTALL ELECTRICAL DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY-MOUNTED. FURNISH COPY OF MANUFACTURER'S WIRING DIAGRAM SUBMITTAL TO ELECTRICAL INSTALLER.					
IMUM 16-GA.	15.	DEMONSTRATION					
S WITH PERPROOF CAM ICH CABINET.		A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN CABINET UNIT HEATERS.					
ED TO MATCH S.	GUARANTEE						
.1 AND A MINIMUM FO ASHRAE 52.2. RV 7.	1.	THIS CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE, IN WRITING, ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER AND SHALL PROVIDE FREE SERVICE FOR REPAIR OF ALL EQUIPMENT INVOLVED IN THIS CONTRACT DURING THE GUARANTEE PERIOD. ALL EQUIPMENT WARRANTEES SHALL ALSO BE PROVIDED TO THE OWNER.					
OMIUM HEATING NTED IN CERAMIC ES IN TERMINAL BOX OLS FOR IENTS IN SURED WITH	2.	THE GUARANTEE SHALL INCLUDE RESTORATION TO ITS ORIGINAL CONDITION. AT NO COST TO THE OWNER, ALL ADJACENT WORK THAT MUST BE DISTURBED IN FULFILLING THE GUARANTEE ALL SUCH REPAIRS AND/OR REPLACEMENT SHALL BE MADE WITHOUT DELAY AND AT THE CONVENIENCE OF THE OWNER.					
TRIFUGAL, DIRECTLY							
PAINTED-STEEL ALVANIZED-STEEL							
ED, RESILIENTLY							
CHASSIS WIRING							
RS AND CONTROLS							
S FOR COMPLIANCE ES AND OTHER RK.							
NS TO VERIFY ATION.							
SFACTORY							
SEAL AND							

			2	ug di la constanta di la consta				ENGINEERS ARCHITECTS SURVEYORS				
				Mechanical Electrical Plumbing		41000 Woodward Avenue	Sulte 350 East - #4265 Disconstant Hills MI 49204					
MECHANICAL SPECIFICATIONS REPLACEMENT BAY CITY, MI 48708												
DATE	1.03.25											
STATUS / REVISIONS	ISSUED FOR BIDS											
NO.	¢	D B VRII BY	N									

SYMBOL LEGEND

SYMBOL	DESCRIPTION		
H	DUPLEX RECEPTACLE, 18" A.F.F. TO TOP	R	LUMINAIRE: WALL MOUNTED W/ TYPE
₽ ₽	DUPLEX RECEPTACLE, 16 A.F.F. TO TOP	_ ¤ _	LUMINAIRE: WALL MOUNTED W/ TYPE
ě	DUPLEX RECEPTACLE, CEILING MOUNTED	N X	TO SCHEDULE
) Še	DUPLEX RECEPTACLE GFI, CEILING MOUNTED	A	LUMINAIRE: SURFACE OR RECESSED W/ TYPE, REFER TO SCHEDULE
	DUPLEX RECEPTACLE USB, 18" A.F.F. TO TOP	Δ	LUMINAIRE: ON EMERGENCY, LIFE SAFETY, OR LOCAL LIGHTING
⊖=	DUPLEX RECEPTACLE, 6" ABOVE COUNTER	A	CIRCUIT W/ TYPE, REFER TO SCHEDULE
₽ E	DUPLEX RECEPTACLE GFI, 6" ABOVE COUNTER		EXIT SIGN: CEILING MOUNTED W/ TYPE, SEE SCHEDULE
\ominus	DUPLEX RECEPTACLE, FLOOR MOUNTED	\bigotimes	EXIT SIGN: WALL MOUNTED W/ TYPE, SEE SCHEDULE
Е	DUPLEX RECEPTACLE GFI , FLOOR MOUNTED		EM LIGHTS: WALL MOUNTED UNO, REFER TO SCHEDULE
Ø	SPECIALTY OUTLET, SEE DRAWINGS W/ MTG HT		REMOTE HEADS: WALL MOUNTED, REFER TO SCHEDULE
\	QUAD RECEPTACLE, 18" A.F.F. TO TOP	\geq	TV CONNECTION: 96" TO TOP, COAX CONNECTION, UNO
₽₽	QUAD RECEPTACLE GFI, 18" A.F.F. TO TOP		VOICE/ DATA OUTLET: 18" TO TOP, UNO
$\overset{\circ}{\oplus}$	QUAD RECEPTACLE, CEILING MOUNTED	0	VOICE/ DATA OUTLET: CEILING MOUNTED, UNO
₩ E	QUAD RECEPTACLE GFI, CEILING MOUNTED		VOICE/ DATA/ TV OUTLET: FLOOR MOUNTED, UNO
\$ _M	MOTOR SWITCH		TELEPHONE: 18" TO TOP, UNO
	OVERHEAD DOOR 3-BUTTON SWITCH, OPEN- CLOSE-STOP		DATA/ TELEPHONE: 18" TO TOP, UNO
PP	POWER POLE	Р	FIRE: MANUAL PULL STATION, WALL MOUNTED, 48" AFF TO TOP UNO
JB	JUNCTION BOX		FIRE: AUDIBLE AND VISUAL ANNUNCIATION, WALL MOUNTED, 8'-0" AFF TO TOP UNO
FF	FURNITURE FEED	##CD	FIRE: VISUAL ANNUNCIATION, WALL MOUNTED, 8'-0" AFF TO TOP
<i>\$</i>		, ## <u>CD</u>	UNO
	NON-FUSED DISCONNECT		FIRE: AUDIBLE ANNUNCIATION, WALL MOUNTED, 8'-0" AFF TO TOP UNO
42 42	COMBINATION MOTOR STARTER/ DISCONNECT	(AV) #CD	FIRE: AUDIBLE AND VISUAL ANNUNCIATION, CEILING MOUNTED
	MANUAL MOTOR STARTER	\frown	
	MOTOR STARTER	(V) #CD	FIRE: VISUAL ANNUNCIATION, CEILING MOUNTED
	SURFACE MOUNTED PANEL BOARD	A	FIRE: AUDIBLE ANNUNCIATION, CEILING MOUNTED
	RECESSED PANEL BOARD	SD	FIRE: SMOKE DETECTOR, CEILING
		HD	FIRE: HEAT DETECTOR, CEILING
\$	SWITCH, SINGLE POLE, 48" A.F.F. TO TOP UNO	\$/H	FIRE: SMOKE AND HEAT DETECTOR
\$ ₃	SWITCH, 3-POLE, 48" A.F.F. TO TOP UNO	DSD	FIRE: DUCT SMOKE DETECTOR, CEILING, PROVIDED / INSTALLED BY EC, MOUNTED BY MC, UNO
\$ ₄	SWITCH, 4-POLE, 48" A.F.F. TO TOP UNO	RT	FIRE ALARM: REMOTE TEST STATION
\$ _D	SWITCH, WALL BOX DIMMER, 48" A.F.F. TO TOP UNO	TS	FIRE: TAMPER SWITCH
\$ _{LV}	SWITCH, LOW VOLTAGE, 48" A.F.F. TO TOP UNO (VERIFY W/ FIXTURE)	FS	FIRE: FLOW SWITCH
\$ _{LVD}	W/ FIXTURE) SWITCH, LOW VOLTAGE DIMMER, 48" A.F.F. TO TOP UNO	DH	FIRE: MAGNETIC DOOR HOLD
۲LVD	(VERIFY W/ FIXTURE)	FR	FIRE: DOOR LOCK RELEASE
\$ _F	SWITCH, FUSED: 125V, SINGLE POLE, DUAL ELEMENT PLUG FUSE	PS	FIRE: PRESSURE SWITCH
\$ _K	SWITCH, KEYED, 48" A.F.F. TO TOP UNO		
\$ _P	SWITCH, PILOT LIGHT, 48" A.F.F. TO TOP UNO		HOME RUN W/ DIRECTION
\$ _T	SWITCH, TIMER, 48" A.F.F. TO TOP	——E——	ELECTRICAL CIRCUIT
\$ _{OS}	SWITCH, MULTI-TECH OCCUPANCY SENSOR, WALL		UNDERGROUND ELECTRICAL W/ INCDICATOR
03	SWITCH, MULTI-TECH OCCUPANCY SENSOR, CEILING	Ţ	SITE: LIGHT, POLE, AND BASE
Ø	SWITCH, EXTERIOR PHOTOCELL		
P	POWER PACK FOR OCCUPANCY SENSORS	XF	TRANSFORMER W/ LABEL
\odot	CONTROLS: SPEAKER (SEE SCHEDULE)	•	DEVICE OR EQUIPMENT CONNECTION
DO	CONTROLS: ADA DOOR CONTROL OPENER, COORDINATE WITH DOOR REQUIREMENTS		
ADA	CONTROLS: ADA DOOR CONTROL OPENER, COORDINATE WITH SECURITY, AUTO AND MANUAL CONTROL		
\square	SECURITY: PAN - TILT - ZOOM CAMERA		
	SECURITY: PUSH BUTTON		
CR	SECURITY: CARD READER		
DC	SECURITY: DOOR CONTACT		

ABBREVIATIONS

A.C. A.F.F. ALT AL AWG AMP OR A ATS BLDG BMS CKT CB C CLG CP CU D DS DWG EA EMT EX EXT FIN. FLR. FACP	ABOVE COUNTER ABOVE FINISHED FLOOR ALTERNATE ALUMINUM AMERICAN WIRE GAUGE AMPERES AUTOMATIC TRANSFER BUILDING BUILDING MANAGEMENT SYSTEM CIRCUIT CIRCUIT BREAKER CONDUIT CEILING CONTROL PANEL COPPER DATA DISCONNECT SWITCH DRAWING(S) EACH ELECTRICAL METALLIC TUBING EXISTING EXTERNAL FINISH FLOOR FIRE ALARM CONTROL PANEL	FT GRC GND GFCI HH HOA IU IMC JB KVA KVAR LC MCB MDP MLO MSB MH MFR MCC MTD NEC NEMA
FACP FF	FIRE ALARM CONTROL PANEL FURNITURE FEED	NEMA

FOOT, FEET GALVANIZED RIGID CONDUIT GROUND GROUND FAULT CIRCUIT INTERUPPTER GROUND FAULT PROTECTION HAND HOLE HAND-OFF-AUTO SELECTOR SWITCH INDOOR UNIT INTERMEDIATE METAL CONDUIT JUNCTION BOX KILO VOLT-AMPERES KILO VOLT-AMPERES REACTIVE LIGHTING CONTRACTOR MAIN CIRCUIT BREAKER MAIN DISTRIBUTOR PANEL MAIN LUGS ONLY MAIN SWITCH BOARD MAN HOLE MANUFACTURER'S MOTOR CONTROL CENTER MOUNTED NATIONAL ELECTRIC CODE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION

NIGHT LIGHT NORMALLY CLOSED CONTACT NORMALLY OPEN CONTACT NOT TO SCALE OUTDOOR UNIT OUTSIDE DIAMETER OVERLOADS-THERMAL PANEL W/ INDICATION PHASE PHASE PHOTO-SWITCH POLE PROGRAMMABLE LOGIC CONTROLLER PULL BOX PUSH-TO-TEST RIGID METAL COUNT SPECIFICATION SWITCH SWITCHING DUTY TELEPHONE TYPICAL UNDERWRITERS LABORATORY

UNLESS NOTED OTHERWISE

VARIABLE FREQUENCY DRIVE

VARIABLE FREQUENCY CONTROLLER

N.L.

NC

NO

OU

0.D.

PNL

PH

PC

PLC

PB

PTT

RMC

SW

SWD

TEL

TYP

U.N.O.

VFC

VFD

UL

SPEC

N.T.S.

WP W/ XF/ XFMR

XXAF

XXAS

VOLT WATT WEATHER PROOF WIRE WITH TRANSFORMER

XX AMPERE FUSE XX AMPERE SWITCH X POLES

CIRCUIT COND	UIT & CONDUC	TOR SCHI	EDULE
FUSE/CIRCUIT BREAKER - AMP/POLE	PHASE/NEUTRAL (NOTE 3)	GROUND	CONDUIT
15A/1P & 20A/1P	2 - 12 AWG	1 - 12 AWG	3/4"
15A/2P & 20A/2P	2 OR 3 - 12 AWG	1 - 12 AWG	3/4"
15A/3P & 20A/3P	3 OR 4 - 12 AWG	1 - 12 AWG	3/4"
25A/1P & 30A/1P	2 - 10 AWG	1 - 10 AWG	3/4"
25A/2P & 30A/2P	2 OR 3 - 10 AWG	1 - 10 AWG	3/4"
25A/3P & 30A/3P	3 OR 4 - 10 AWG	1 - 10 AWG	3/4"
35A/1P & 40A/1P	2 - 8 AWG	1 - 10 AWG	3/4"
35A/2P & 40A/2P	2 OR 3 - 8 AWG	1 - 10 AWG	3/4"
35A/3P & 40A/3P	3 OR 4 - 8 AWG	1 - 10 AWG	3/4"
40A/1P & 45A/1P	2 - 8 AWG	1 - 10 AWG	3/4"
40A/2P & 45A/2P	2 OR 3 - 8 AWG	1 - 10 AWG	3/4"
40A/3P & 45A/3P	3 OR 4 - 8 AWG	1 - 10 AWG	3/4"
60A/1P	2 - 6 AWG	1 - 10 AWG	3/4"
60A/2P	2 OR 3 - 6 AWG	1 - 10 AWG	3/4"
60A/3P	3 OR 4 - 6 AWG	1 - 10 AWG	1"
70A/1P	2 - 4 AWG	1 - 8 AWG	1"
70A/2P	2 OR 3 - 4 AWG	1 - 8 AWG	1"
70A/3P	3 OR 4 - 4 AWG	1 - 8 AWG	1 1/4"
80A/2P	2 OR 3 - 4 AWG	1 - 8 AWG	1"
80A/3P	3 OR 4 - 4 AWG	1 - 8 AWG	1 1/4"
90A/2P	2 OR 3 - 3 AWG	1 - 8 AWG	1 1/4"
90A/3P	3 OR 4 - 3 AWG	1 - 8 AWG	1 1/4"
100A/2P	2 OR 3 - 3 AWG	1 - 8 AWG	1 1/4"
100A/3P	3 OR 4 - 3 AWG	1 - 8 AWG	1 1/4"
110A/2P	2 OR 3 - 2 AWG	1 - 6 AWG	1 1/4"
110A/3P	3 OR 4 - 2 AWG	1 - 6 AWG	1 1/4"
125A/2P	2 OR 3 - 1 AWG	1 - 6 AWG	1 1/4"
125A/3P	3 OR 4 - 1 AWG	1 - 6 AWG	1 1/2"
150A/2P	2 OR 3 - 1/0 AWG	1 - 6 AWG	1 1/2"
150A/3P	3 OR 4 - 1/0 AWG	1 - 6 AWG	2"
175A/2P	2 OR 3 - 2/0 AWG	1 - 6 AWG	2"
175A/3P	3 OR 4 - 2/0 AWG	1 - 6 AWG	2"
200A/2P	2 OR 3 - 3/0 AWG	1 - 6 AWG	2"
200A/3P	3 OR 4 - 3/0 AWG	1 - 6 AWG	2"
225A/2P	2 OR 3 - 4/0 AWG	1 - 4 AWG	2"
225A/3P	3 OR 4 - 4/0 AWG	1 - 4 AWG	2 1/2"
250A/2P 250A/3P	2 OR 3 - 250 MCM 3 OR 4 - 250 MCM	1 - 4 AWG	2 1/2" 3"
300A/2P	2 OR 3 - 350 MCM	1 - 4 AWG	3"
300A/3P	3 OR 4 - 350 MCM	1 - 4 AWG	3"
350A/3P	2 OR 3 - 500 MCM	1 - 3 AWG	3 3 1/2"
350A/2F 350A/3P	3 OR 4 - 500 MCM	1 - 3 AWG	3 1/2"
400A/2P	2 OR 3 - 500 MCM	1 - 3 AWG	3 1/2"
400A/2P 400A/3P	3 OR 4 - 500 MCM	1 - 3 AWG	3 1/2"
NOTES:		1 0/100	
1. PROVIDE CIRCUIT CONDUCTOR AND	CONDUIT SIZES INDICATED ABOVE UNLES		

1. PROVIDE CIRCUIT CONDUCTOR AND CONDUIT SIZES INDICATED ABOVE UNLESS OTHERWISE NOTED. CONDUCTOR SIZING BASED UPON 75C THWN INSULATED COPPER CONDUCTORS 3. FOR TWO AND THREE POLE CIRCUITS PROVIDE NEUTRAL CONDUCTOR IF REQUIRED BY EQUIPMENT SERVED.

GENERAL NOTES

<u> </u>	
1.	ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST ACCEPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND ALL STATE AND LOCAL CODES.
2.	COORDINATE THE INSTALLATION OF ALL EQUIPMENT REQUIRING

- ELECTRICAL CONNECTIONS WITH ARCHITECTURAL AND MECHANICAL PLANS, SPECIFICATIONS AND EQUIPMENT DRAWINGS. PROVIDE ALL NECESSARY EQUIPMENT POWER AND CONTROL CONNECTIONS NOT PROVIDED BY OTHERS WHETHER INDICATED ON THE DRAWINGS OR NOT.
- 3. UNLESS OTHERWISE NOTED, WHERE ELECTRICAL DEMOLITION WORK IS SHOWN, REMOVE ALL CONDUCTOR AND EXPOSED CONDUITS FROM EQUIPMENT OR OUTLET LOCATION BACK TO THE POWER SOURCE(S) FOR THE CIRCUIT.
- 4. SEAL ALL WALL AND FLOOR PENETRATIONS TO MAINTAIN RATING.
- 5. BACK-TO-BACK OR THROUGH THE WALL BOXES SHALL NOT BE USED.
- 6. ALL LOW VOLTAGE CONDUCTORS SHALL BE STRANDED COPPER. 7. SPLICE CABLES OR CONDUCTORS IN OUTLET BOXES, DEVICE BOXES,
- PULL BOXES, JUNCTION BOXES. DO NOT SPLICE CABLES OR CONDUCTORS IN CONDUIT BODIES.
- 8. RECEPTACLES INDICATED AS GROUND FAULT CIRCUIT INTERRUPTER (GFI) TYPE MUST BE GFI RECEPTACLE, NO FEED THROUGH.
- 9. BRANCH CIRCUITS FROM CIRCUIT BREAKER TYPE DISTRIBUTION EQUIPMENT WHICH SUPPLY MOTOR LOADS THAT ARE LESS THAN 6.0 AMP SHALL BE PROTECTED BY A 15 AMP CIRCUIT BREAKER.
- 10. FINAL CONNECTIONS TO ITEMS SUBJECT TO VIBRATION SHALL BE MADE WITH LIQUID TIGHT FLEXIBLE METAL CONDUIT. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL NOT BE USED AS A GROUNDING CONDUCTOR. PROVIDE A SEPARATE GREEN GROUNDING CONDUCTOR.
- 11. IN THE EVENT OF CONFLICTS BETWEEN THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS OR WITHIN THE DRAWINGS OR SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL BE ASSUMED TO BE CORRECT. REFER UNCERTAINTIES IN REQUIREMENTS TO THE ENGINEER FOR CLARIFICATION.
- 12. ALL BELOW GRADE LOCATIONS WITHIN BUILDINGS ARE DAMP LOCATIONS UNLESS OTHERWISE NOTED.
- 13. 120V AC CONTROL WIRING ASSOCIATED WITH MOTOR CONTROL CIRCUITS MAY BE RUN IN THE SAME RACEWAY WITH MOTOR POWER WIRING FOR CONSTANT SPEED MOTORS LESS THAN 30HP. FOR MOTORS 30HP AND GREATER OR FOR MOTORS POWERED FROM VARIABLE FREQUENCY CONTROLLERS, SEPARATE RACEWAYS SHALL BE USED FOR POWER AND CONTROL CONDUCTORS.
- 14. 120/240V CIRCUIT WIRING FOR ANY ROOM OR AREA MAY BE GROUPED INTO RACEWAYS AS REQUIRED UNLESS SEPARATE RACEWAYS ARE REQUIRED BY THE NEC. COMPLY WITH NEC REQUIREMENTS FOR CONDUCTOR DERATING.
- 15. CONDUIT PENETRATIONS OF FLOORS, LOWER LEVEL EXTERIOR WALLS OR WETWELL WALLS SHALL BE SLEEVED AND SEALED WITH LINKSEAL. SEE DETAILS ON MECHANICAL DRAWINGS.
- 16. IF COMPLIANCE WITH TWO OR MORE DIFFERING STANDARDS, REQUIREMENTS, DRAWINGS OR SPECIFICATIONS, OR ANY COMBINATION THEREOF, IS SPECIFIED AND THESE ESTABLISH DIFFERENT OR CONFLICTING REQUIREMENTS FOR MINIMUM QUANTITIES OR QUALITY LEVELS, COMPLY WITH THE MOST STRINGENT REQUIREMENT, THE MOST STRINGENT REQUIREMENT WILL BE THE BETTER QUALITY OR GREATER QUANTITY OF WORK, AND WILL TYPICALLY BE THE MORE EXPENSIVE OPTION, REFER UNCERTAINTIES AND REQUIREMENTS THAT ARE DIFFERENT, BUT APPARENTLY EQUAL, TO ENGINEER FOR A DECISION BEFORE PROCEEDING.
- 17. THE QUANTITY OR QUALITY LEVEL SHOWN OR SPECIFIED SHALL BE THE MINIMUM PROVIDED OR PERFORMED. THE ACTUAL INSTALLATION MAY COMPLY EXACTLY WITH THE MINIMUM QUANTITY OR QUALITY SPECIFIED, OR IT MAY EXCEED THE MINIMUM WITHIN REASONABLE LIMITS. TO COMPLY WITH THESE REQUIREMENTS. INDICATED NUMERIC VALUES ARE MINIMUM OR MAXIMUM, AS APPROPRIATE, FOR THE CONTEXT OF REQUIREMENTS. REFER UNCERTAINTIES TO ENGINEER FOR A DECISION BEFORE PROCEEDING.
- 18. DESIGN DOCUMENTS MUST BE REPRODUCED IN THEIR ENTIRETY, INCLUDING ALL PLANS, SPECIFICATIONS, AND FRONT END DOCUMENTS.
- 19. ONLY COMPLETE DOCUMENT SETS ARE TO BE DISTRIBUTED TO SUBCONTRACTORS AND SUPPLIERS OF THE CONTRACTOR DURING BIDDING OR CONSTRUCTION.
- 20. FAILURE TO REVIEW AND COMPLY WITH A FULL SET OF CONTRACT DOCUMENTS WILL NOT BE ACCEPTED AS A VALID REASON FOR FAILURE TO MEET THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS.
- 21. ALL ABOVE CEILING SYSTEMS AND COMPONENTS (INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, ETC.) SHALL BE COORDINATED SUCH THAT THE SYSTEMS ARE PROPERLY INTEGRATED IN THE SPACE PROVIDED ABOVE CEILING AT THE CEILING HEIGHTS NOTED. IT IS THE RESPONSIBILITY OF EACH CONTRACTOR TO COORDINATE PATHWAYS WITHIN THE SPACE PROVIDED. CEILING HEIGHTS WILL NOT BE MODIFIED.
- 22. EQUIPMENT SHALL BE MOUNTED 6'-0" AWAY FROM HEAT PRODUCING EQUIPMENT. U.N.O.

GENERAL DEMOLITION NOTES

- 1. NOTES AND GRAPHIC REPRESENTATION SHALL NOTE LIMIT THE EXTENT OF DEMOLITION REQUIRED. ELECTRICAL CONTRACTOR TO PERFORM ALL DEMOLITION REQUIRED TO ACHIEVE THE FINAL DESIGN INTENT AS REQUIRED BY THE CONTRACT DOCUMENTS. EXTENT OF DEMOLITION WORK SHALL INCLUDE, BUT NOT LIMITED TO, REMOVAL OF LIGHT FIXTURES, WIRING DEVICES. CONNECTIONS TO EQUIPMENT, DISTRIBUTION PANELS, AND ALL ASSOCIATED RACEWAY AND WIRING. EXTENT OF DEMOLITION SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. 2. EQUIPMENT AND WIRING TO BE REMOVED SHALL BE DE-
- ENERGIZED PRIOR TO ANY DEMOLITION WORK. 3. ALL WORK REQUIRED TO REMAIN IN SERVICE, BUT INTERFERES WITH RENOVATIONS, SHALL BE RELOCATED AND RECONNECTED
- USING MATERIALS AND STANDARDS OF THIS CONTRACT. 4. ELECTRICAL CONTRACTOR SHALL TRACE AND RELOCATE ALL EXISTING FEEDERS AND BRANCH CIRCUITS PASSING THROUGH THE DEMOLITION AREA THAT SERVE EXISTING SPACES TO RFMAIN
- 5. ELECTRICAL CONTRACTOR SHALL MAINTAIN CONTINUITY OF CIRCUITS FOR EXISTING EQUIPMENT AND DEVICES THAT ARE TO REMAIN. WHEN DEVICES ARE REMOVED AND NOT THE CIRCUIT DEAD END, EXTEND CIRCUIT AS REQUIRED TO MAINTAIN INTEGRITY OF ORIGINAL CIRCUIT.
- 6. ELECTRICAL EQUIPMENT INDICATED TO BE REMOVED SHALL GET FIRST REFUSAL FROM OWNER AND IS THEN RESPONSIBILITY OF ELECTRICAL CONTRACTOR FOR PROPER DISPOSAL. EQUIPMENT TO BE RE-INSTALLED OR TURNED OVER TO OWNER SHALL BE PLACED IN A MUTUALLY ACCEPTABLE LOCATION.
- 7. FEEDERS AND BRANCH CIRCUITS TO BE REMOVED: CONDUIT AND SUPPORTS SHALL BE REMOVED TO THE PANEL OF ORIGIN. WIRING SHALL BE REMOVED TO THE PANEL OF ORIGIN. WHERE EMPTY CONDUITS REMAIN, INSTALL PULLSTRING AND IDENTIFY BOTH ENDS.
- 8. FEEDERS AND BRANCH CIRCUITS TO BE RE-USED: REMOVE CONDUIT AND WIRING TO LOCATIONS WHICH AVOID CONFLICT WITH NEW WORK. INSTALL JUNCTIONS BOX, TAPE OFF CONDUCTORS AND IDENTIFY WITH PANEL AND CIRCUIT NUMBER. 9. PROVIDE BLANK COVER PLATES AT OPEN BOXES WHERE
- EXISTING RECEPTACLES OR ELECTRICAL DEVICES ARE REMOVED AND NOT INDICATED TO BE REPLACED. 10. UPDATE ALL PANEL SCHEDULES TO REFLECT EQUIPMENT AND
- CIRCUIT CHANGES OR REMOVALS. 11. FIRE ALARM SYSTEM SHALL REMAIN IN OPERATION DURING BOTH DEMOLITION AND CONSTRUCTION STAGES OF THIS PROJECT.

LIGHTING NOTES AND CONTROL SEQUENCE

- APPROVAL
- B. CONDUCT PRE-INSTALLATION MEETING WITH THE SUPPLIER, PROGRAMMER, INSTALLER, AND OWNER TO REVIEW THE SYSTEM.
- C. PERFORM POST VISIT FOR PROGRAMMING. TRAINING AGENDA SHOULD BE PROVIDED BEFORE THE CLASS. TRAINING SHOULD INCLUDE: 1. HOW TO OPERATE AND ADJUST THE SYSTEM.
- 2. HOW TO MAINTAIN THE SYSTEM.

SEE THE FOLLOWING LIGHTING CONTROL SEQUENCE FOR PROPOSED SPACES:

VESTIBULES AND MAIN ENTRANCE EXTERIOR / EGRESS LIGHTING: SUPPLIED FROM A REMOTE EMERGENCY INVERTER LOCATED NEAR THE TIMECLOCKS.

LIGHTING F	LIGHTING FIXTURE SCHEDULE												
		LAMP				BASIS OF DESIGN							
TYPE NAME	TYPE	VA	VOLT	DESCRIPTION	MANUFACTURER	CAT. NO.	COMMENTS						
A	LED	17.5 VA	277 V	6" CLYD. WALL SCONCE, 1500 LUMENS, DN LT, 80 CRI, 4000K, WET, MATTE WH.	LITHONIA	LDN6CYL4015L06ARLSSMVOLTGZ10WMWLDWHG							
В	LED	6.0 VA	277 V	4" RND, OPEN DN LT, 597 LUMENS, 80 CRI, 4000K, IC, WET, CLEAR, WH TRIM	LITHONIA	LDN415LM40KLOARTRWLSSMVOLTUGZ-WL							
С	LED	2.3 VA	277 V	EXIT LIGHT, RED, BRUSHED ALUMINUM FACE, DIE CAST AL HOUSING	LITHONIA	SIGNATURE TLE1R							

KEYED DEMOLITION NOTES

REMOVE (4) EXISTING ADA DOOR

OPERATORS AND GIVE TO OWNER FOR USE

AS SPARES ELSEWHERE IN THE BUILDING.

UTILIZE EXISTING ELECTRICAL BOX AS A

JUNCTION BOX TO EXTEND WIRING FOR

REMOVE (2) EXISTING EXIT LIGHTS AND

DISCARD, REMOVE WIRING BACK TO

ACCOMODATIONS TO EXTEND WIRING

REMOVE (2) EXTERIOR WALL SCONCES

OVER HANDICAP DOORS. REMOVE WIRING

BACK TO NEAREST JUNCTION BOX MAKE

FROM THIS LOCATION TO NEW EXTERIOR

ACCOMODATIONS TO EXTEND WIRING

WALL SCONCES AND SOFFIT LIGHTS.

FROM THIS LOCATION TO NEW EXIT LIGHT

NEAREST JUNCTION BOX. MAKE

INSTALLATIONS.

NEW INSTALLATION. INSTALL BLANK COVER

SYMBOL DESCRIPTION

A. LIGHTING CONTROLS SHALL MEET THE 2015 MICHIGAN ENERGY CODE. LIGHTING CONTROL PERFORMANCE CRITERIA TO BE VERIFIED BY A THIRD PARTY FOR PROPER OPERATION, CALIBRATION, ADJUSTMENT, PROGRAMMING, AND

D. PROVIDE 4 HOUR TRAINING SESSION FOR THE LIGHTING CONTROLS BY A MANUFACTURER AUTHORIZED PERSON.

E. PROVIDE TWO FOLLOW UP VISITS TO REVIEW OPERATION OF THE SYSTEM AND MAKE ADJUSTMENTS FOR THE OWNER. SCHEDULE FOR 30 DAYS AND 6 MONTHS AFTER OCCUPANCY. SCHEDULE DATES WITH OWNER AT PROJECT CLOSEOUT.

• LIGHTING SHALL BE AUTO ON TO 100% LIGHT OUTPUT. VESTIBULES AND MAIN ENTRANCE EXTERIOR / EGRESS LIGHTING WILL BE CONTROLLED BY AN ASTROLGICAL TIMECLOCK WITH PHOTOCELL OVERIDE FOR CLOUDY DAYS AND A MANUAL OVERIDE "ON" SWITCH LOCATED ON VESTIBULE WALL INSIDE THE ATRIUM. THE TIMECLOCK HAS ITS OWN CAPACITOR BACKUP FOR 100 HOURS. THE VESTIBULE AND MAIN ENTRANCE EXTERIOR EGRESS LIGHTING WILL BE

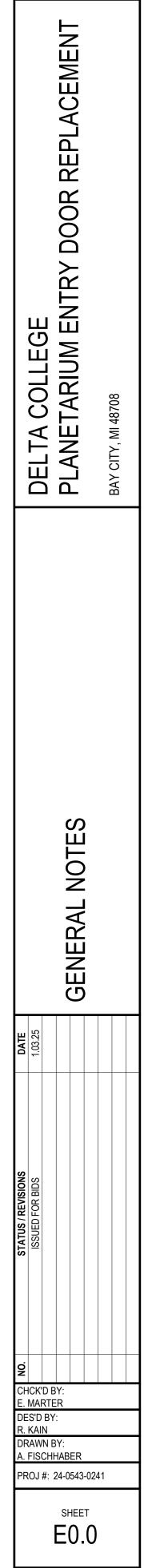
KEYED CONSTRUCTION NOTES

SYMBOL DESCRIPTION

INSTALL (8) NEW ADA DOOR OPERATORS. (4) AT EACH VESITIBULE LOCATION. TIE INTO EXISTING SALVAGED ADA DOOR OPERATOR CIRCUIT

- INSTALL (4) NEW EXIT LIGHTS. (2) CENTERED ON THE INTERIOR VESTIBULE FACIA. (1) AT EACH VESTIBULE LOCATION. AND (2) INSIDE THE VESTIBULE NEXT TO THE EXTERIOR DOOR. (1) AT EACH VESTIBULE LOCATION. TIE INTO EXISTING SALVAGED EXIT LIGHT CIRCUIT EL-2.
- **INSTALL (4) NEW EXTERIOR WALL** SCONCES. (2) AT EACH VESTIBULE LOCATION, CENTERED OVER THE MIDDLE WINDOW ON EACH SIDE OF THE VESTIBULE. TIE INTO EXISTING EXTERIOR LIGHTING CIRCUIT CIRCUIT EL-4.
- INSTALL (12) NEW RECESSED LED FIXTURES IN VESTIBULE CEILINGS. (6) AT EACH VESTIBULE LOCATION. TIE INTO EXISTING LOBBY LIGHTING CIRCUIT CIRCUIT EL-12.
- INSTALL (2) JUNCTION / PULL BOXES INSIDE MAIN BUILDING, (1) FOR EACH VESTIBULE LOCATION AS SHOWN ON DRAWINGS. CONTRACTOR TO FIELD SIZE.
- PROVIDE 208V, 2 POLE FEED TO (2) ELECTRIC HEATERS. (1) IN EACH VESTIBULE. PROVIDE SEPERATE INSULATED EQUIPMENT GROUNDING CONDUCTOR.





DIVISION 26000 - ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.
- 1.2 SUBMITTALS
- A. PRODUCT DATA FOR 1. WIRING DEVICES
- 2. LIGHTING FIXTURES
- 3. POWER DISTRIBUTION EQUIPMENT 4. LIGHTING CONTROLS
- 1.3 QUALITY ASSURANCE
- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION. AND MARKED FOR INTENDED USE. B. COMPLY WITH UL 467 FOR GROUNDING AND BONDING MATERIALS AND EQUIPMENT.
- C. COMPLY WITH NFPA 70
- D. COMPLY WITH NECA 1, INCLUDING THE MOUNTING HEIGHTS LISTED IN THAT STANDARD, UNLESS OTHERWISE NOTED. E. COMPLY WITH APPLICABLE PORTIONS OF NECA1, NEMA PB 1.1, AND NEMA PB 2.1 FOR INSTALLATION OF ENCLOSED SWITCHES AND
- CIRCUIT BREAKERS F. SOURCE LIMITATIONS: OBTAIN EACH TYPE OF PRODUCT, EQUIPMENT, AND WIRING DEVICES AND ASSOCIATED WALL PLATE THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER. SO FAR AS THEY ARE AVAILABLE, OBTAIN ALL PRODUCTS, EQUIPMENT, AND WIRING DEVICES AND ASSOCIATED WALL PLATES FROM A SINGLE MANUFACTURER AND ONE SOURCE.

1.4 COORDINATION

- A. COORDINATE ARRANGEMENT, MOUNTING, AND SUPPORT OF ELECTRICAL EQUIPMENT:
- 1. TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS THAT REDUCE HEADROOM ARE INDICATED. 2. TO PROVIDE FOR EASE OF DISCONNECTING THE EQUIPMENT WITH MINIMUM INTERFERENCE TO OTHER INSTALLATIONS. TO ALLOW RIGHT OF WAY FOR PIPING AND CONDUIT INSTALLED AT REQUIRED SLOPE.
- 4. SO CONNECTING RACEWAYS, CABLES, WIREWAYS, CABLE TRAYS, AND BUSWAYS WILL BE CLEAR OF OBSTRUCTIONS AND OF THE WORKING AND ACCESS SPACE OF OTHER EQUIPMENT.
- 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. RECEPTACLES FOR OWNER-FURNISHED EQUIPMENT: MATCH PLUG CONFIGURATIONS.

PART 2 - PRODUCTS

2.1 GROUNDING PRODUCTS

- A. BONDING CONDUCTOR: NO. 6 AWG INSULATED COPPER, STRANDED CONDUCTOR.
- B. WELDED CONNECTORS: EXOTHERMIC-WELDING KITS OF TYPES RECOMMENDED BY KIT MANUFACTURER FOR MATERIALS BEING JOINED AND INSTALLATION CONDITIONS.
- C. GROUND RODS: COPPER-CLAD STEEL 3/4 INCH BY 10 FEET

2.2 RACEWAYS AND WIREWAYS A. RACEWAY MATERIALS:

- 1. RIGID STEEL CONDUIT (RMC): ANSI C80.1.
- 2. EMT: ANSI C80.3. 3. LFMC: FLEXIBLE STEEL CONDUIT WITH PVC JACKET.
- 4. FITTINGS FOR CONDUIT (INCLUDING ALL TYPES AND FLEXIBLE AND LIQUIDTIGHT), EMT, AND CABLE. NEMA FB 1: LISTED FOR TYPE AND SIZE RACEWAY WITH WHICH USED, AND FOR APPLICATION AND ENVIRONMENT IN WHICH INSTALLED.
- 5. SURFACE RACEWAY: WIREMOLD SERIES 500/700 ONE PIECE RACEWAY 6. METAL WIREWAYS DESCRIPTION: SHEET METAL SIZED AND SHAPED AS INDICATED, NEMA 250, TYPE 1 OR 3R, UNLESS OTHERWISE
- INDICATED. WIREWAY COVERS: SCREW-COVER TYPE OR AS INDICATED. 7. SHEET METAL OUTLET AND DEVICE BOXES: NEMA OS 1.
- 8. SMALL SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1.
- 9. CABINETS: A. NEMA 250, TYPE 1, GALVANIZED-STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE. B. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE.

2.3 CABLES AND WIRING MATERIALS

- A. CONDUCTOR INSULATION: COMPLY WITH NEMA WC 70 FOR TYPES THW AND THHN-THWN. B. MULTICONDUCTOR CABLE: COMPLY WITH NEMA WC 70 FOR METAL-CLAD CABLE, TYPE MC WITH GROUND WIRE.
- C. FEEDERS: COPPER, STRANDED
- D. BRANCH CIRCUITS: COPPER, STRANDED, MINIMUM 12 AWG.

C. KEY LATCH TO MATCH PANELBOARDS.

- E. EXPOSED OR CONCEALED FEEDERS AND BRANCH CIRCUITS: TYPE THHN-THWN, SINGLE CONDUCTORS IN RACEWAY.
- F. CLASS 1 CONTROL CIRCUITS: TYPE THHN-THWN, IN RACEWAY. G. CLASS 2 CONTROL CIRCUITS: TYPE THHN-THWN, IN RACEWAY, OR POWER-LIMITED CABLE, CONCEALED IN BUILDING FINISHES.

2.4 IDENTIFICATION MATERIALS

- A. COLOR-CODING CONDUCTOR TAPE: COLORED, SELF-ADHESIVE VINYL-TAPE NOT LESS THAN 3 MILS THICK BY 1 TO 2 INCHES WIDE. B. MARKER TAPES: VINYL OR VINYL-CLOTH, SELF-ADHESIVE WRAPAROUND TYPE, WITH CIRCUIT IDENTIFICATION LEGEND MACHINE PRINTED BY THERMAL TRANSFER OR EQUIVALENT PROCESS.
- C. SELF-ADHESIVE, ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL. ADHESIVE BACKED, WITH WHITE LETTERS ON A DARK-GRAY BACKGROUND. MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH.

2.5 WIRING DEVICES

- A. PROVIDE PRODUCTS BY ONE OF THE FOLLOWING MANUFACTURERS 1. COOPER WIRING DEVICES: A DIVISION OF COOPER INDUSTRIES, INC.
- 2. HUBBELL INCORPORATED: WIRING DEVICE-KELLEMS.
- 3. LEVITON MFG. COMPANY, INC.
- 4. PASS & SEYMOUR/LEGRAND: WIRING DEVICES & ACCESSORIES.
- B. GFCI DUPLEX RECEPTACLES: STRAIGHT BLADE, FEED-THROUGH TYPE. COMPLY WITH NEMA WD 1, NEMA WD 6, UL 498, AND UL 943,
- CLASS A, AND INCLUDE INDICATOR LIGHT THAT IS LIGHTED WHEN DEVICE IS TRIPPED. C. SNAP SWITCHES: COMPLY WITH NEMA WD 1 AND UL 20, 120/277V, 20A.
- D. WALL PLATES: SINGLE AND COMBINATION TYPES TO MATCH CORRESPONDING WIRING DEVICES.
- 1. PLATE-SECURING SCREWS: METAL WITH HEAD COLOR TO MATCH PLATE FINISH.
- 2. MATERIAL: SMOOTH, HIGH-IMPACT THERMOPLASTIC. 3. WET OR DAMP-LOCATION, WEATHERPROOF COVER PLATES: NEMA 250, COMPLYING WITH TYPE 3R WEATHER-RESISTANT, DIE-CAST ALUMINUM WITH LOCKABLE COVER.

2.6 POWER DISTRIBUTION FOUIPMENT

- A. PROVIDE PRODUCTS BY ONE OF THE FOLLOWING MANUFACTURERS:
- 1. SQUARE-D/GROUP SCHNEIDER COMPANY 2. EATON CORPORATION - CUTLER HAMMER
- B. FUSIBLE SWITCH, 600A AND SMALLER: NEMA KS 1, TYPE HD, WITH CLIPS OR BOLT PADS TO ACCOMMODATE SPECIFIED FUSES.
- LOCKABLE HANDLE WITH CAPABILITY TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH COVER IN CLOSED POSITION.
- C. MANUAL MOTOR CONTROLLER: NEMA ICS 2, GENERAL PURPOSE, CLASS A, WITH "QUICK-MAKE, QUICK-BREAK" TOGGLE OR PUSHBUTTON ACTION, AND MARKED TO SHOW WHETHER UNIT IS "OFF", "ON", OR "TRIPPED."
- 1. OVERLOAD RELAY: AMBIENT-COMPENSATED TYPE WITH INVERSE-TIME CURRENT CHARACTERISTICS AND NEMA ICS 2, CLASS 10 TRIPPING CHARACTERISTICS. RELAYS SHALL HAVE HEATERS AND SENSORS IN EACH PHASE, MATCHED TO NAMEPLATE, FULL-LOAD CURRENT OF SPECIFIC MOTOR TO WHICH THEY CONNECT AND SHALL HAVE APPROPRIATE ADJUSTMENT FOR DUTY CYCLE. D. PANELBOARDS:
- 1. COMPLY WITH NEMA PB 1 AND NFPA 70
- 2. RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION:
- A. INDOOR DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1 B. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R
- C. WET OR DAMP INDOOR LOCATIONS: NEMA 250, TYPE 4
- D. INDOOR LOCATIONS SUBJECT TO DUST, FALLING DIRT, AND DRIPPING NONCORROSIVE LIQUIDS: NEMA 250, TYPE 12
- INCOMING MAIN LOCATIONS: CONVERTIBLE BETWEEN TOP AND BOTTOM. 4. PHASE, NEUTRAL, AND GROUND BUSES: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
- 5. CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL AND SIZES.
- A. MATERIAL: HARD-DRAWN COPPER, 98 PERCENT CONDUCTIVITY.
- B. MAIN AND NEUTRAL LUGS: MECHANICAL TYPE, WITH A LUG ON THE NEUTRAL BAR FOR EACH POLE IN THE PANELBOARD. C. GROUND LUGS AND BUS-CONFIGURED TERMINATORS: MECHANICAL TYPE, WITH A LUG ON THE BAR FOR EACH POLE IN THE PANELBOARD.
- D. FEED-THROUGH LUGS: MECHANICAL TYPE, SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT OPPOSITE END OF BUS FROM INCOMING LUGS OR MAIN DEVICE.
- E. SUBFEED (DOUBLE) LUGS: MECHANICAL TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE.
- E. TRANSFORMERS: . COMPLY WITH 10 CFR 431 (DOE 2016) EFFICIENCY LEVELS.
- 2. MARKED AS COMPLIANT WITH DOE 2016 EFFICIENCY LEVELS BY AN NRTL.
- 3. COIL MATERIAL: COPPER. 4. ENCLOSURE: VENTILATED, NEMA 250, TYPE 2: CORE AND COIL SHALL BE ENCAPSULATED WITHIN RESIN COMPOUND.
- 5. TAPS FOR TRANSFORMERS: TWO 2.5 PERCENT TAPS ABOVE AND TWO 2.5 PERCENT TAPS BELOW NORMAL FULL CAPACITY.
- 6. INSULATION CLASS: 220 DEG C, UL-COMPONENT-RECOGNIZED INSULATION SYSTEM WITH A MAXIMUM OF 115 DEG C RISE ABOVE 40 DEG C AMBIENT TEMPERATURE 7. GROUNDING: PROVIDE GROUND-BAR KIT OR A GROUND BAR INSTALLED ON THE INSIDE OF THE TRANSFORMER ENCLOSURE.

2.7 LIGHTING FIXTURES

A. SEE LIGHTING FIXTURE SCHEDULE ON THE DRAWINGS FOR PRODUCT SPECIFICATIONS.

2.8 LIGHTING CONTROLS

A. SEE REQUIREMENTS OF THE DRAWINGS FOR BASIS OF DESIGN. ALTERNATES MUST BE REVIEWED FOR APPROVAL DURING BIDDING. SEE REQUIREMENTS OF THE DRAWINGS.

PART 3 - EXECUTION

- 3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION INTERFERENCE WITH OTHER ITEMS IN THE VICINITY.
- 3.2 GROUNDING APPLICATIONS
- OR AS APPROVED BY AUTHORITY HAVING JURISDICTION.
- UNLESS OTHERWISE INDICATED.
- 3.3 APPLICATION OF IDENTIFICATION SYSTEMS
- CIRCUIT NUMBER
- 1. LABELING INSTRUCTIONS:
- 2. EQUIPMENT TO BE LABELED:
- B. ACCESS DOORS AND PANELS FOR CONCEALED ELECTRICAL ITEMS.
- C. TRANSFORMERS. D. DISCONNECT SWITCHES.
- E. ENCLOSED CIRCUIT BREAKERS. F. MOTOR STARTERS.
- G. PUSH-BUTTON STATIONS
- H. CONTACTORS.
- J. LIGHTING CONTROL EQUIPMENT
- OPERATION AND MAINTENANCE OF EQUIPMENT.
- MANUFACTURER OF IDENTIFICATION DEVICE.
- SERVICE, FEEDER, AND BRANCH-CIRCUIT CONDUCTORS.

A. PHASE A: BROWN

B. PHASE B: ORANGE

A. PHASE A: BLACK B. PHASE B: RED

C. PHASE C: BLUE

A. PHASE A: BLACK

DRIVEN EQUIPMENT): LFMC.

3.6 WIRING DEVICE INSTALLATION

J. RECEPTACLE ORIENTATION:

3.7 PANELBOARD INSTALLATION

3.8 LIGHTING CONTROLS

3.9 FIELD QUALITY CONTROL

NEW UNITS AND RETEST

B. PHASE B: RED

VALUES

C. PHASE C: YELLOW

A. EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS OF BOTH ELECTRICAL EQUIPMENT AND OTHER NEARBY INSTALLATIONS. CONNECT IN SUCH A WAY AS TO FACILITATE FUTURE DISCONNECTING WITH MINIMUM

B. RIGHT OF WAY: GIVE TO PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.

A. INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS AND BRANCH CIRCUITS. INSULATION SHALL BE RATED AT 600V B. CONDUCTORS: INSTALL SOLID CONDUCTOR FOR NO. 10 AWG AND SMALLER, AND STRANDED CONDUCTORS FOR NO. 8 AWG AND LARGER,

C. METAL POLES FOR SIGNS SUPPORTING OUTDOOR LIGHTING FIXTURES: INSTALL GROUNDING ELECTRODE AND A SEPARATE INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ADDITION TO GROUNDING CONDUCTOR INSTALLED WITH BRANCH-CIRCUIT CONDUCTORS.

A. BRANCH-CIRCUIT CONDUCTOR IDENTIFICATION: WHERE THERE ARE CONDUCTORS FOR MORE THAN THREE BRANCH CIRCUITS IN SAME JUNCTION OR PULL BOX, USE COLOR-CODING CONDUCTOR TAPE. IDENTIFY EACH UNDERGROUND CONDUCTOR ACCORDING TO SOURCE AND

B. EQUIPMENT IDENTIFICATION LABELS: ON EACH UNIT OF EQUIPMENT, INSTALL UNIQUE DESIGNATION LABEL THAT IS CONSISTENT WITH WIRING DIAGRAMS, SCHEDULES, AND OPERATION AND MAINTENANCE MANUAL. APPLY LABELS TO DISCONNECT SWITCHES AND PROTECTION EQUIPMENT, CENTRAL OR SYSTEM. SYSTEMS INCLUDE POWER, LIGHTING, CONTROL, COMMUNICATION, SIGNAL, MONITORING, AND ALARM SYSTEMS UNLESS EQUIPMENT IS PROVIDED WITH ITS OWN IDENTIFICATION.

A. INDOOR EQUIPMENT: ADHESIVE FIELD LABEL. UNLESS OTHERWISE INDICATED, PROVIDE A SINGLE LINE OF TEXT WITH 1/2-INCH-HIGH LETTERS ON 1-1/2-INCH-HIGH LABEL. WHERE 2 LINES OF TEXT ARE REQUIRED, USE LABELS 2 INCHES HIGH.

A. PANELBOARDS, ELECTRICAL CABINETS, AND ENCLOSURES.

I. REMOTE-CONTROLLED SWITCHES, DIMMER MODULES, AND CONTROL DEVICES.

C. VERIFY IDENTITY OF EACH ITEM BEFORE INSTALLING IDENTIFICATION PRODUCTS. D. LOCATION: INSTALL IDENTIFICATION MATERIALS AND DEVICES AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH

 APPLY IDENTIFICATION DEVICES TO SURFACES THAT REQUIRE FINISH AFTER COMPLETING FINISH WORK. F. SELF-ADHESIVE IDENTIFICATION PRODUCTS: CLEAN SURFACES BEFORE APPLICATION, USING MATERIALS AND METHODS RECOMMENDED BY

G. SYSTEM IDENTIFICATION COLOR BANDING FOR RACEWAYS AND CABLES: EACH COLOR BAND SHALL COMPLETELY ENCIRCLE CABLE OR CONDUIT PLACE ADJACENT BANDS OF TWO-COLOR MARKINGS IN CONTACT, SIDE BY SIDE. LOCATE BANDS AT CHANGES IN DIRECTION, AT PENETRATIONS OF WALLS AND FLOORS, AT 50-FOOT MAXIMUM INTERVALS IN STRAIGHT RUNS, AND AT 25-FOOT MAXIMUM INTERVALS IN CONGESTED AREAS. H. COLOR-CODING FOR PHASE AND VOLTAGE LEVEL IDENTIFICATION, 600V AND LESS: USE THE COLORS LISTED BELOW FOR UNGROUNDED

1. COLOR SHALL BE FIELD APPLIED FOR CONDUCTORS OVER NO. 10 AWG. 2. COLORS FOR 480/277V CIRCUITS:

COLORS FOR 120/208V CIRCUITS:

4. COLORS FOR 120/240V CIRCUITS:

5. 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.

3.4 INSTALLATION OF POWER CONDUCTORS AND CABLES

A. CONCEAL CABLES IN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED. B. USE MANUFACTURER-APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY. COMPOUND USED MUST NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM PULLING TENSIONS AND SIDEWALL PRESSURE

C. USING PULLING MEANS, INCLUDING FISH TABLE, CABLE, ROPE, AND BASKET-WEAVE WIRE/CABLE GRIPS, THAT WILL NOT DAMAGE CABLES OR

D. WIRING AT OUTLETS: INSTALL CONDUCTOR AT EACH OUTLET, WITH AT LEAST 12 INCHES OF SLACK.

3.5 RACEWAY INSTALLATION AND APPLICATION

A. COMPLY WITH NECA 1 FOR INSTALLATION REQUIREMENTS APPLICABLE TO PRODUCTS SPECIFIED IN PART 2 EXCEPT WHERE REQUIREMENTS ON DRAWINGS OR IN THIS ARTICLE ARE STRICTER.

B. SUPPORT RACEWAYS PER NEC - NFPA-70. C. COMPLY WITH THE FOLLOWING INDOOR APPLICATIONS. UNLESS OTHERWISE INDICATED:

1. EXPOSED ON ACOUSTICAL BLOCK: METAL WIREMOLD. 2. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT ABOVE 48".

3. CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT.

4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-

DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT. D. MINIMUM RACEWAY SIZE: 3/4-INCH TRADE SIZE.

E. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION. 1. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS, UNLESS OTHERWISE INDICATED.

F. COMPLETE RACEWAY INSTALLATION BEFORE STARTING CONDUCTOR INSTALLATION.

G. ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE THE FINISHED SLAB. H. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR COMMUNICATIONS CONDUITS, FOR WHICH FEWER BENDS ARE ALLOWED.

. CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED. I. RACEWAYS EMBEDDED IN SLABS: NOT ALLOWED.

K. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF RACEWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS. L. RACEWAY TERMINATIONS AT LOCATIONS SUBJECT TO MOISTURE OR VIBRATION: USE INSULATING BUSHINGS TO PROTECT CONDUCTORS,

INCLUDING CONDUCTORS SMALLER THAN NO. 4 AWG. M. INSTALL PULL WIRES IN EMPTY RACEWAYS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES OF SLACK AT EACH END OF PULL WIRE. N. FLEXIBLE CONDUIT CONNECTIONS: USE MAXIMUM OF 72 INCHES OF FLEXIBLE CONDUIT FOR RECESSED AND SEMI-RECESSED LIGHTING

FIXTURES, EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR TRANSFORMERS AND MOTORS. 1. USE LFMC IN DAMP OR WET LOCATIONS SUBJECT TO SEVERE PHYSICAL DAMAGE.

A. REPLACE ALL DEVICES THAT HAVE BEEN IN TEMPORARY USE DURING CONSTRUCTION OR THAT SHOW SIGNS THAT THEY WERE INSTALLED BEFORE BUILDING FINISHING OPERATIONS WERE COMPLETE.

B. KEEP EACH WIRING DEVICE IN ITS PACKAGE OR OTHERWISE PROTECTED UNTIL IT IS TIME TO CONNECT CONDUCTORS C. DO NOT REMOVE SURFACE PROTECTION, SUCH AS PLASTIC FILM AND SMUDGE COVERS, UNTIL THE LAST POSSIBLE MOMENT. D. CONNECT DEVICES TO BRANCH CIRCUITS USING PIGTAILS THAT ARE NOT LESS THAN 6 INCHES IN LENGTH. E. WHEN THERE IS A CHOICE, USE SIDE WIRING WITH BINDING-HEAD SCREW TERMINALS. WRAP SOLID CONDUCTOR TIGHTLY CLOCKWISE, 2/3 TO 3/4

OF THE WAY AROUND TERMINAL SCREW. F. USE A TORQUE SCREWDRIVER WHEN A TORQUE IS RECOMMENDED OR REQUIRED BY THE MANUFACTURER. G. WHEN CONDUCTORS LARGER THAN NO. 12 AWG ARE INSTALLED ON 15-A OR 20-A CIRCUITS, SPLICE NO. 12 PIGTAILS FOR DEVICE CONNECTIONS. H. TIGHTEN UNUSED TERMINAL SCREWS ON THE DEVICE.

I. WHEN MOUNTING INTO METAL BOXES, REMOVE THE FIBER OR PLASTIC WASHERS USED TO HOLD DEVICE MOUNTING SCREWS IN YOKES, ALLOWING METAL-TO-METAL CONTACT.

1. INSTALL GROUND PIN OF VERTICALLY MOUNTED RECEPTACLES UP, AND ON HORIZONTALLY MOUNTED RECEPTACLES TO THE RIGHT. K. DEVICE PLATES: DO NOT USE OVERSIZED OR EXTRA-DEEP PLATES. REPAIR WALL FINISHES AND REMOUNT OUTLET BOXES WHEN STANDARD DEVICE PLATES DO NOT FIT FLUSH OR DO NOT COVER ROUGH WALL OPENING. L. ARRANGEMENT OF DEVICES: UNLESS OTHERWISE INDICATED, MOUNT FLUSH, WITH LONG DIMENSION VERTICAL AND WITH GROUNDING TERMINAL OF RECEPTACLES ON TOP. GROUP ADJACENT SWITCHES UNDER SINGLE, MULTIGANG WALL PLATES.

A. INSTALL PANELBOARDS AND ACCESSORIES ACCORDING TO NEMA PB 1.1. B. MOUNT TOP OF TRIM 74 INCHES ABOVE FINISHED FLOOR, UNLESS OTHERWISE INDICATED.

C. MOUNT PLUMB AND RIGID WITHOUT DISTORTION OF BOX. MOUNT RECESSED PANELBOARDS WITH FRONTS UNIFORMLY FLUSH WITH WALL FINISH. D. INSTALL FILLER PLATES IN UNUSED SPACES. E. ARRANGE CONDUCTORS IN GUTTERS INTO GROUPS AND BUNDLE AND WRAP WITH WIRE TIES AFTER COMPLETING LOAD BALANCING.

A. CONDUCT PRE-INSTALLATION MEETING WITH THE SUPPLIER, PROGRAMMER, INSTALLER, AND OWNER TO REVIEW THE SYSTEM. B. PERFORM POST VISIT FOR PROGRAMMING

A. PREPARE FOR ACCEPTANCE TESTS AS FOLLOWS:

1. TEST INSULATION RESISTANCE FOR EACH PANELBOARD BUS, COMPONENT, CONNECTING SUPPLY, FEEDER, AND CONTROL CIRCUIT. 2. TEST CONTINUITY OF EACH CIRCUIT

B. PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS: 1. CORRECT MALFUNCTIONING UNITS ON-SITE, WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE; OTHERWISE, REPLACE WITH

C. PROVIDE OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT. INCLUDE WARRANTY AND REPLACEMENT PART LIST.

DIVISION 284621.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SUBMITTALS

- A. DELEGATED-DESIGN SUBMITTAL: FOR NOTIFICATION APPLIANCES AND SMOKE AND HEAT DETECTORS, IN ADDITION TO SUBMITTALS LISTED ABOVE, INDICATE COMPLIANCE WITH PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA, INCLUDING ANALYSIS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.
- 1. DRAWINGS SHOWING THE LOCATION OF EACH NOTIFICATION APPLIANCE AND SMOKE AND HEAT DETECTOR, RATINGS OF EACH, AND INSTALLATION DETAILS AS NEEDED TO COMPLY WITH LISTING CONDITIONS OF THE DEVICE.
- 2. DESIGN CALCULATIONS: CALCULATE REQUIREMENTS FOR SELECTING THE SPACING AND SENSITIVITY OF DETECTION, COMPLYING WITH NFPA 72. CALCULATE SPACING
- AND INTENSITIES FOR STROBE SIGNALS AND SOUND-PRESSURE LEVELS FOR AUDIBLE APPLIANCES. 3. INDICATE AUDIBLE APPLIANCES REQUIRED TO PRODUCT SQUARE WAVE SIGNAL PER NFPA 72.

1.3 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: PERSONNEL SHALL BE TRAINED AND CERTIFIED BY MANUFACTURER FOR INSTALLATION OF UNITS REQUIRED FOR THIS PROJECT. B. INSTALLER QUALIFICATIONS: INSTALLATION SHALL BE BY PERSONNEL CERTIFIED BY NICET AS FIRE-ALARM LEVEL III TECHNICIAN C. NFPA CERTIFICATION: OBTAIN CERTIFICATION ACCORDING TO NFPA 72 BY A UL-LISTED ALARM COMPANY.

PART 2 - PRODUCTS

2.1 FIRE-ALARM CONTROL UNIT

- INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
- 1. FIRE-LITE ALARMS, INC.; A HONEYWELL INTERNATIONAL COMPANY 2. NOTIFIER
- 3. SIEMENS INDUSTRY, INC.; FIRE SAFETY DIVISION
- 4. SIMPLEX GRINELL LP

5. UNITED TECHNOLOGIES CORPORATION (UTC CLIMATE, CONTROLS & SECURITY - EDWARDS)

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION A. COMPLY WITH NFPA 72, NFPA 101, AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION FOR INSTALLATION AND TESTING OF FIRE-ALARM EQUIPMENT. INSTALL ALL ELECTRICAL WIRING TO COMPLY WITH REQUIREMENTS IN NFPA 70 INCLUDING, BUT NOT LIMITED TO, ARTICLE 760, "FIRE ALARM SYSTEMS."

3.2 FIELD QUALITY CONTROL

- A. PERFORM THE FOLLOWING TESTS AND INSPECTIONS: 1. VISUAL INSPECTION: CONDUCT VISUAL INSPECTION PRIOR TO TESTING.
 - a. INSPECTION SHALL BE BASED ON COMPLETED RECORDING DRAWINGS AND SYSTEM DOCUMENTATION THAT IS REQUIRED BY NFPA 72 IN ITS "COMPLETION DOCUMENTS PREPARATION" TABLE IN THE "DOCUMENTATION" SECTIONS OF THE "FUNDAMENTALS" CHAPTER.
 - b. COMPLY WITH THE "VISUAL INSPECTION FREQUENCIES" TABLE IN THE "INSPECTION" SECTION OF THE "INSPECTION, TESTING, AND MAINTENANCE" CHAPTER IN
- NFPA 72; RETAIN THE "INITIAL/REACCEPTANCE" COLUMN AND LIST ONLY THE INSTALLED COMPONENTS. 2. SYSTEM TESTING: COMPLY WITH THE "TEST METHODS" TABLE IN THE "TESTING" SECTION OF THE "INSPECTION, TESTING AND MAINTENANCE" CHAPTER IN NFPA 72
- 3. TEST AUDIBLE APPLIANCES FOR THE PUBLIC OPERATING MODE ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. PERFORM THE TEST USING A PORTABLE
- SOUND-LEVEL METER COMPLYING WITH TYPE 2 REQUIREMENTS IN ANSI S1.4. TEST AUDIBLE APPLIANCES FOR THE PRIVATE OPERATING MODE ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS
- 5. TEST VISIBLE APPLIANCES FOR THE PUBLIC OPERATING MODE ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. 6. FACTORY-AUTHORIZED SERVICE REPRESENTATIVE SHALL PREPARE THE "FIRE ALARM SYSTEM RECORD OF COMPLETION" IN THE "DOCUMENTATION" SECTION OF THE "FUNDAMENTALS" CHAPTER IN NFPA 72 AND THE "INSPECTION AND TESTING FORM" IN THE "RECORDS" SECTION OF THE "INSPECTION, TESTING AND MAINTENANCE" CHAPTER IN NFPA 72.

3.3 DEMONSTRATION

A. TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN FIRE-ALARM SYSTEM.

CHCK'D BY:

DES'D BY: r. Kain

DRAWN BY:

. FISCHHABER

PROJ #: 24-0543-0241

SHEET

E. MARTER

A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK



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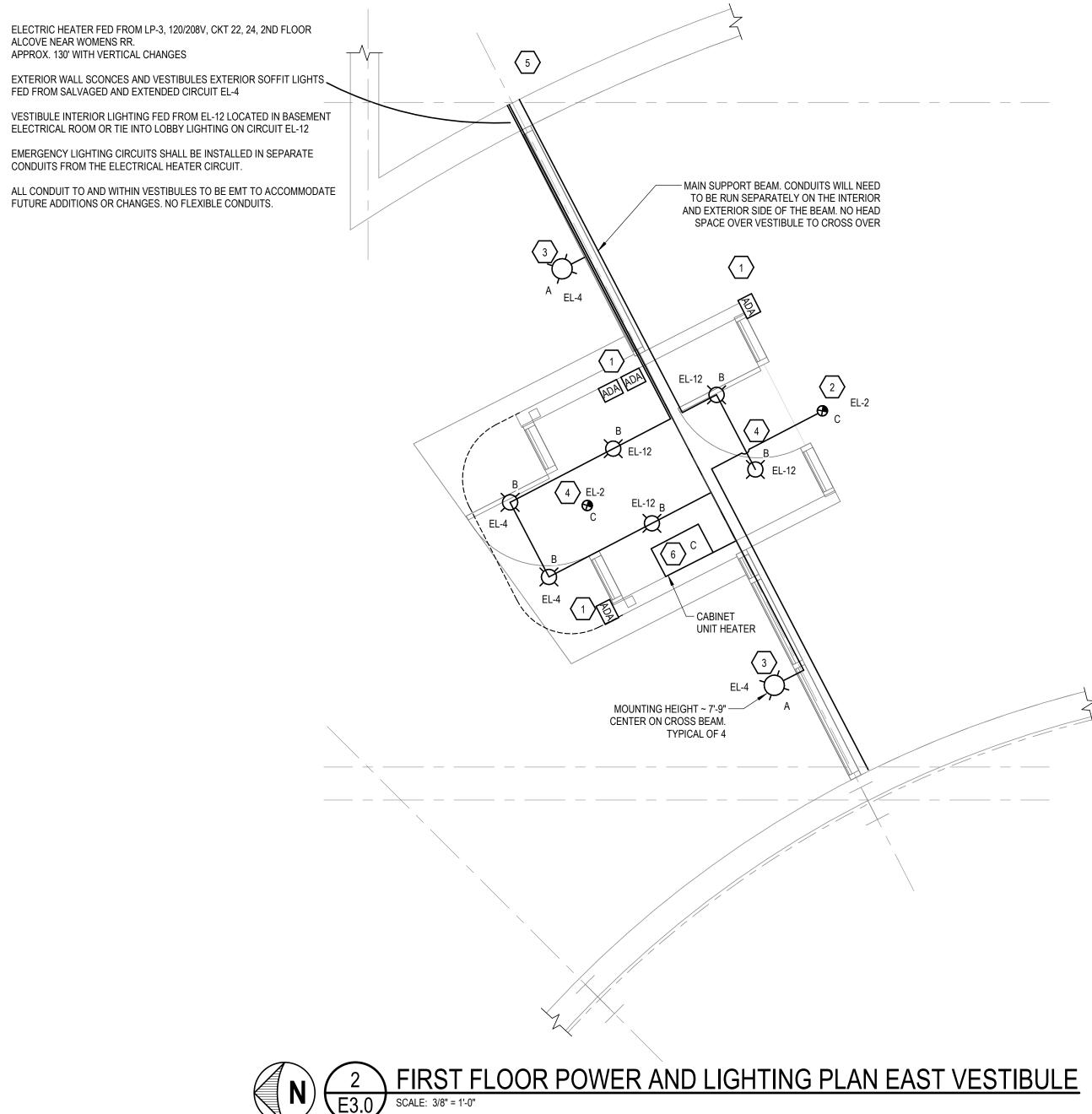
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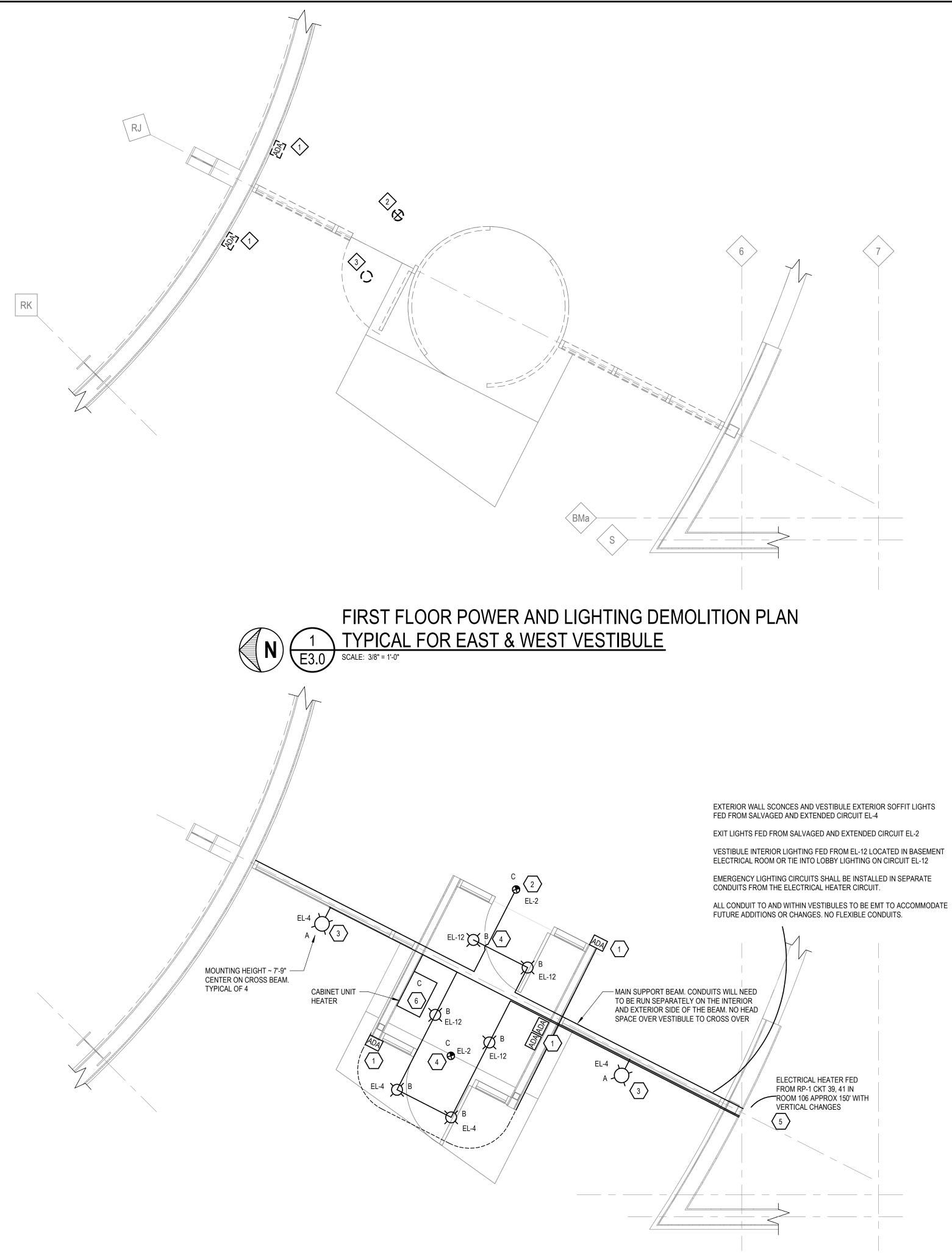
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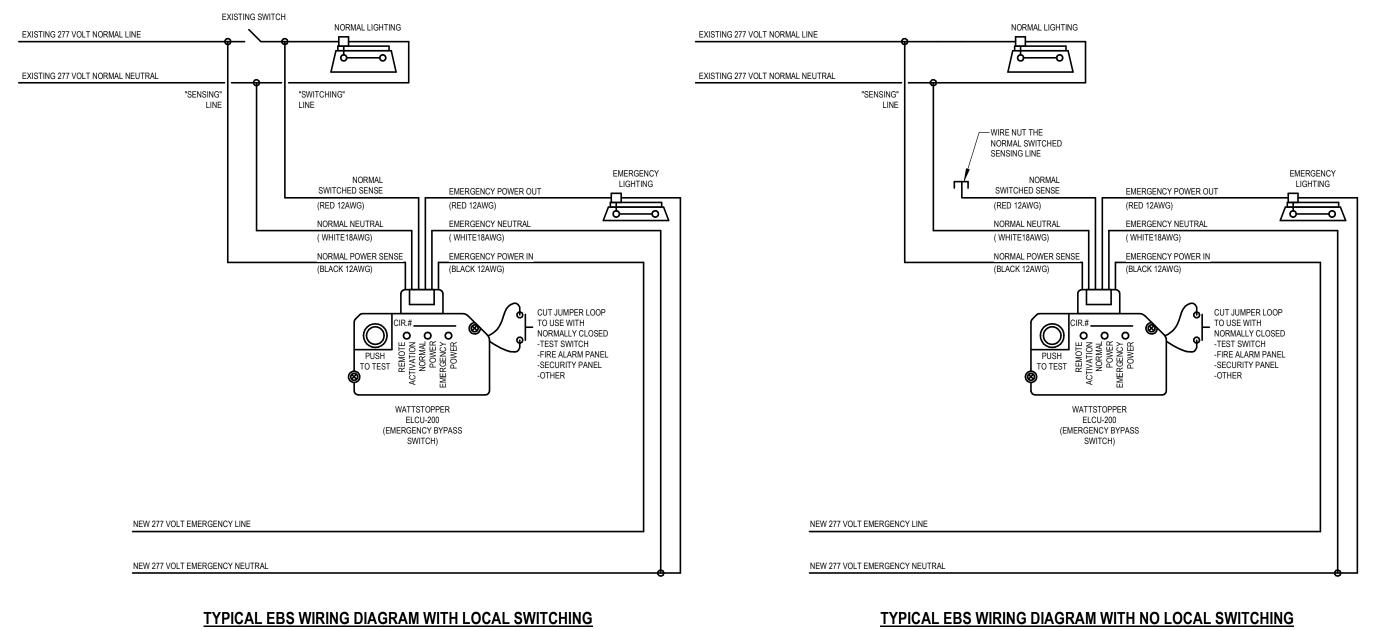


FIRST FLOOR POWER AND LIGHTING PLAN WEST VESTIBULE

		WILLIAM A. KIBBE & ASSOCIATES, INC. ENGINEERS ARCHITECTS SURVEYORS
DELTA COLLEGE		BAY CITY, MI 48708
	POWER AND LIGHTING PLANS	
DATE 1.03.25		
STATUS / REVISIONS ISSUED FOR BIDS		
CHCK'D BY: E. MARTER DES'D BY: R. KAIN DRAWN BY: A. FISCHHAE PROJ #: 24-0		241
	HEET 3.0)

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29,232.
28,951.
81

LOAD CLASSIFCATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	
Lighting	0	125%		тс
Motor	3222	125% LG + REMAIN	3516	то
Receptacle	13550	100% 10kva + 50%	11775	1
Electric Heat	3000	100%	3000	
A/C	9460	125% LG + REMAIN	10660	E
		I		



BRANCH PANEL: PANELBOARD LP-3

LOCATION: SECOND FLOOR ALCOVE NEAR WOMENS RR SUPPLY FROM: DP-1 MOUNTING: Surface

VOLTS: 120/208V PHASES: 3 WIRES: 4

ENCLOSURE: NEMA 1, Square D NQOD

NOTES:

Equipment

СКТ	CIRCUIT DESCRIPTION	TRIP	POLES		Α		В		C	POLES	TRIP	CIRCUIT DESCRIPTION	СКТ
1	16 LOBBY TRACK LIGHTS SOUTH	20	1	2210	100					1	20	SPARE?	2
3	16 LOBBY TRACK LIGHTS SOUTH	20	1			2210	0			1	20	SPARE?	4
5	16 LOBBY TRACK LIGHTS EAST	20	1					2210	800	1	20	LIGHTS RM. 122 MIDDLE ROW	6
7	16 LOBBY TRACK LIGHTS EAST	20	1	2210	800					1	20	LIGHTS RM. 122 MIDDLE ROW	8
9	LIGHTS RM. 122 S. ROW		1			800	780			1	20	EXT. GROUND LIGHT N. AROUND DOME	10
11	LIGHTS RM. 122 S. ROW	20	1					800	780	1	20	EXT. GROUND LIGHT W. AROUND DOME	12
13	OUTSIDE SIDGN - NW CORNER	20	1	1920	800					1	20	LIGHTS RM. 122 N ROW & EAST EM LIGHT	14
15	EXT. GROUND LTS AROUND ELEVATOR	20	1			650	800			1	20	LIGHTS RM. 122 N ROW	16
17	EXT. GROUND LTS AROUND ELEVATOR	60	2					780	440	1	20	LTS S. HALL, GARAGE DR, OUTDR SOFFIT	18
19	SPARE		2	0	0					1	20	SPARE	20
21	DRINKING FOUNTAION	20	1			600	1500			2	20	HEATER EAST ENTRANCE VESTIBULE	22
23	DRINKING FOUNTAION	20	1					600	1500	2	20	HEATER EAST ENTRAINCE VESTIBULE	24
25	SPARE	20	2	0	0					1	20	SPARE	26
27	BLANK	20	2			0	0			1	20	SPARE	28
29	BLANK	20	1					0	0	1	20	BLANK	30
31	BLANK	20	1	0	0					1	20	BLANK	32
33	BLANK	20	1			0	0			1	20	BLANK	34
35	BLANK	20	1					0	0	1	20	BLANK	36
37	BLANK			0	0					2	20	BLANK	38
39	BLANK	20	2			0	0			2	20	BLANK	40
41	BLANK	20	2					0	0	1	20	BLANK	42
		тс	TAL LOAD:	80	040	73	40	79	10				
		то	TAL AMPS:	6	57	6	51	6	6]			

LOAD CLASSIFCATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Lighting	19090	125%	23862.5	TOTAL CONN LOAD VA:	23,290.0
Drinking Fountains	1200	125% LG + REMAIN	1350	TOTAL EST DEMAND VA:	28,212.5
Receptacle	0	100% 10kva + 50%	0	TOTAL CONN AMPS:	65
Electric Heat	3000	100%	3000	EST DEMAND AMPS:	78

	LOCATION: BASEMENT ELECTRICAL ROOM 003, S		VOLTS: 277/480V							ING: 10,0	00		
	SUPPLY FROM: ATS-EL		PHASES: 3						MAINS T	YPE: BRA	NCH MOUNTED MAIN WITHIN PANEL		
	MOUNTING: Surface			WIRES: 4						MAINS RAT	'ING: 40A		
	ENCLOSURE: NEMA 1, Square D NF												
OTES:	<i>·</i> · ·												
			I	-		r		ſ		· · · · · ·		1	
СКТ	CIRCUIT DESCRIPTION	TRIP	POLES		4	E E	3		C	POLES	TRIP	CIRCUIT DESCRIPTION	СКТ
1	BRANCH MOUNTED MAIN CIRCUIT BREAKER	_		MAIN	29.0					1	20	EXIT LIGHTS	2
3	BRANCH MOUNTED MAIN CIRCUIT BREAKER	40	3			MAIN	553.0			1	20	OUTSIDE LIGHTS	4
5	BRANCH MOUNTED MAIN CIRCUIT BREAKER							MAIN	520.0	1	20	PASSAGE/BALCONY LIGHTS	6
7	FIRE ALARM PANEL	25	1	120.0	364.0					1	20	RESTROOM LIGHTS	8
9	PREPARED SACE					0	771.0			1	20	THEATER LIGHTS	10
11	PREPARED SACE							0	356.0	1	20	LOBBY LIGHTS	12
13	PREPARED SACE				710.0					1	20	BASEMENT LIGHTS	14
15	PREPARED SACE					0	360.0			1	20	CIRCLE STARIS	16
17	PREPARED SACE							0	421.0	1	20	STAIR 075E, 175D, 275D	18
19	PREPARED SACE			0	284.0					1	20	STAIR 175F, 275F	20
21	TRANSFORMER T-EL ROOF					867.0	120.0			1	20	CORIDOOR 175E, 275E	22
23	TRANSFORMER T-EL ROOF	30	3					867.0	120.0	1	20	CORIDOOR 175C, 275C	24
25	TRANSFORMER T-EL ROOF			867.0	0							PREPARED SPACE	26
27	TVSS		2			0.2	0					PREPARED SPACE	28
29	TVSS		2					0.2	0			PREPARED SPACE	30
		тс	DTAL LOAD:	237	4.0	267	/1.2	228	34.2			•	
		тс	TAL AMPS:		9	1	0		8				
EGEND:				•		•		•		•			
								1					
	SSIFCATION			CONNEC			FACTOR		D DEMAND			PANEL TOTALS	
Lighting				7209.0 125%				9011.3 TOTAL CO				TOTAL CONN LOAD VA:	7,32

120.4

A.I.C RATING: 10,000A MAINS TYPE: MLO MAINS RATING: 225

DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
125%	9011.3	TOTAL CONN LOAD VA:	7,329.4
125% LG + REMAIN	150.4	TOTAL EST DEMAND VA:	9,161.7
		TOTAL CONN AMPS:	8.8
		EST DEMAND AMPS:	11.0

		WILLIAM A. KIBBE & ASSOCIATES, IN ENGINEERS ARCHITECTS SURVEYOF		
ļщť		BAY CITY, MI 48708		
PANEL SCHEDULES				
DATE 1.03.25				
STATUS / REVISIONS ISSUED FOR BIDS				
Q Image: Check'd BY: E. MARTER DES'D BY: R. KAIN DRAWN BY: A. FISCHHABER PROJ #: 24-0543-0241				
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