IOWA CAPITOL COMPLEX

M2 MECHANICAL IMPROVEMENTS

JUNE 2, 2017

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DRAWING INDEX

M0 GENERAL NOTES
M1 TUNNEL PLAN

LICENSED PROFESSIONAL ENGINEER
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I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

21397
CHAD D. BASS, P.E. REG. NO. DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2017.

PAGES OR SHEETS COVERED BY THIS SEAL:

LICENSED PROFESSIONAL ENGINEER
JAMES R. DEEDS IV 17588
IOWA

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MECHANICAL SYMBOLS

	EXHAUST DUCT UP
	EXHAUST DUCT DOWN
	RECTANGULAR TO ROUND DUCT TRANSITION
	90 DEGREE MITERED ELBOW
	90 DEGREE MITERED ELBOW WITH TURNING VANES
	90 DEGREE RADIUS ELBOW
	90 DEGREE RADIUS ELBOW WITH TURNING VANES
	FLEXIBLE CONNECTION
	NEW DUCTWORK
Lbl 1	EQUIPMENT TAG
1	NOTE REFERENCE
	EXISTING DUCTWORK TO REMAIN
	POINT OF CONNECTION OF NEW WORK TO EXISTING OR POINT OF DISCONNECTION OF DEMOLITION WORK

NOTE: NOT ALL SYMBOLS APPLY TO THIS PROJECT.

MECHANICAL ABBREVIATIONS

ABSOR	ABSORPTION	EQUIP	EQUIPMENT	LDBT	LEAVING DRY BULB TEMPERATURE
ACU	AIR CONDITIONING UNIT	EST	EXTERNAL STATIC PRESSURE	LWT	LEAVING WATER TEMPERATURE
AD	ACCESS DOOR OR AREA DRAIN	EWBT	ENTERING WET BULB TEMPERATURE	LWBT	LEAVING WET BULB TEMPERATURE
AFF	ABOVE FINISHED FLOOR	EWC	ELECTRIC WATER COOLER	MB	MOP BASIN
AFG	ABOVE FINISHED GRADE	EWT	ENTERING WATER TEMPERATURE	MBH	1000 BTUH
AHU	AIR HANDLING UNIT	EX	EXISTING	MC	MECHANICAL CONTRACTOR
AV	AIR VENT	EXH	EXHAUST	MECH	MECHANICAL
BOT	BOTTOM	EXP	EXPANSION	MH	MANHOLE
BTU	BRITISH THERMAL UNIT	FAI	FRESH AIR INTAKE	NTS	NOT TO SCALE
BTUH	BTU PER HOUR	FCU	FAN COIL UNIT	OA	OUTSIDE AIR
CA	COMPRESSED AIR	FD	FLOOR DRAIN	OD	OVERFLOW ROOF DRAIN
CB	CATCH BASIN	FLEX	FLEXIBLE	PSI	POUNDS PER SQUARE INCH
CENT	CENTRIFUGAL	FLR	FLOOR	PRV	POWER ROOF VENTILATOR
CFM	CUBIC FEET PER MINUTE	FPM	FEET PER MINUTE	PRV	PRESSURE REDUCING VALVE
CI	CAST IRON	FPS	FEET PER SECOND	PV	PRESSURE VENT
CL	CENTER LINE	FS	FLOOR SINK	PVC	POLYVINYL CHLORIDE
COND	CONDENSATE	FT	FINTUBE	RA	RETURN AIR
CO	CLEAN OUT	FTG	FOOTING	RD	ROOF DRAIN
CONC	CONCRETE	GA	GAGE	RH	RELATIVE HUMIDITY
CONTR	CONTRACTOR	GAL	GALLON	RTU	ROOF TOP UNIT
CP	CONDENSATE PUMP	GALV	GALVANIZED	RV	RELIEF VALVE
CU	COPPER	GC	GENERAL CONTRACTOR	SK	SINK
CUH	CABINET UNIT HEATER	GPH	GALLONS PER HOUR	SA	SUPPLY AIR
CWP	CIRCULATING WATER PUMP	GPM	GALLONS PER MINUTE	SH	SHOWER
DDC	DIRECT DIGITAL CONTROLS	H	WALL HYDRANT	SP	STATIC PRESSURE
DN	DOWN	HR	HOUR	TCC	TEMPERATURE CONTROL CONTRACTOR
DR	DRAIN	HTG	HEATING	TYP	TYPICAL
DS	DOWNSPOUT	HB	HOSE BIBB	UC	UNDER CUT
EA	EXHAUST AIR	ISP	INTERNAL STATIC PRESSURE	UH	UNIT HEATER
EAT	ENTERING AIR TEMPERATURE	JR	JANITOR RECEPTOR	UR	URINAL
EC	ELECTRICAL CONTRACTOR	LAV	LAVATORY	UV	UNIT VENTILATOR
EDBT	ENTERING DRY BULB TEMPERATURE			VTR	VENT THROUGH ROOF
EF	EXHAUST FAN			WC	WATER CLOSET
EJ	EXPANSION JOINT			WH	WATER HEATER

HVAC GENERAL NOTES

MECHANICAL CONTRACTOR TO PROVIDE A COMPLETE EXHAUST SYSTEM, INCLUDING EXHAUST DUCTWORK, MECHANICAL EQUIPMENT, SUPPORTS, HANGERS AND ALL APPURTENANCES. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. INSTALL SYSTEM TO MEET ALL CITY AND STATE CODES AND REQUIREMENTS.

DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DUCT SYSTEM. INDICATED DUCT LOCATIONS, CONFIGURATIONS, AND ARRANGEMENTS WERE USED TO SIZE DUCTS AND CALCULATE FRICTION LOSS FOR AIR-HANDLING EQUIPMENT SIZING AND FOR OTHER DESIGN CONSIDERATIONS. INSTALL DUCT SYSTEMS AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE BY ENGINEER PRIOR TO DUCT FABRICATION.

ALL DUCT DIMENSIONS LISTED ARE INTERIOR FREE AREA DUCT DIMENSIONS AND DO NOT INCLUDE INSULATION REQUIREMENTS.

MECHANICAL GENERAL NOTES

COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, ALL PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.

INCORPORATE INTO INSTALLATION MECHANICAL SPECIFICATIONS, DRAWINGS, STATE AND LOCAL CODES, AND OTHER APPLICABLE REQUIREMENTS.

ON COMPLETION OF THE INSTALLATION, MECHANICAL CONTRACTOR SHALL COOPERATE WITH THE OWNER TO PROVIDE ANY NECESSARY ADJUSTING AND BALANCING TO OBTAIN PROPER OPERATION OF ALL EQUIPMENT AND SYSTEMS. CONTRACTOR SHALL PROVIDE ALL FACILITIES AND EQUIPMENT, AND MAKE ALL TESTS, REQUIRED FOR ADJUSTMENTS AND BALANCING TO ESTABLISH THE PROPER PERFORMANCE OF ANY PIECE OF EQUIPMENT.

MECHANICAL WARRANTY NOTES

MECHANICAL CONTRACTOR SHALL WARRANT ALL EQUIPMENT AND INSTALLATION FOR A MINIMUM OF 1 YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION. ALL DEFECTS THAT BECOME APPARENT WITHIN THE WARRANTY PERIOD SHALL BE REPAIRED BY THE MECHANICAL CONTRACTOR AS DIRECTED BY THE ENGINEER THROUGH THE OWNERS REPRESENTATIVE. WARRANTY WILL NOT OBLIGATE THE MECHANICAL CONTRACTOR TO REPAIR DAMAGE RESULTING FROM ACCIDENT OR IMPROPER OPERATION OF CARE ON THE PART OF THE OWNER, AND NOT DUE TO DEFECTIVE MATERIAL OR INSTALLATION. REFER TO SPECIFICATIONS FOR ADDITIONAL DETAILS AND OTHER WARRANTY INFORMATION.

MECHANICAL DEMOLITION NOTES

MECHANICAL DEMOLITION DRAWINGS SHOWING EXISTING CONDITIONS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND ORIGINAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH DO NOT SHOW, AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER SIMILAR TO THOSE ITEMS WHICH DO SHOW. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS.

CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH EXISTING MECHANICAL SYSTEMS WHICH WILL BE AFFECTED BY THE DEMOLITION WORK. CONTRACTOR SHALL OBTAIN PERMISSION FROM OWNER'S REPRESENTATIVE TO SHUT OFF SERVICES OR SYSTEMS WHICH MAY AFFECT OTHER AREAS BEYOND THE LIMITS OF THE IMMEDIATE DEMOLITION AREA. SUCH PERMISSION WILL BE GRANTED ONLY AFTER OWNER'S REPRESENTATIVE IS INFORMED OF THE REASON FOR AND DURATION OF THE SHUTDOWN AND IS SATISFIED THAT THE SHUTDOWN CAN BE MADE WITH AS LITTLE INCONVENIENCE TO OTHER AREAS AS POSSIBLE.

PIPING, HANGERS, DUCTWORK, GRILLES, REGISTERS, DIFFUSERS, ETC., SHOWN TO BE REMOVED ON PLANS SHALL BE DISPOSED OF UNLESS NOTED OTHERWISE. DISPOSAL SHALL BE DONE IN A TIMELY MANNER IN ACCORDANCE WITH THE GENERAL DEMOLITION WORK. COORDINATE WITH THE OWNER AND OTHER CONTRACTORS.

EQUIPMENT AND/OR MATERIALS SCHEDULED FOR ABANDONMENT AND REMOVAL ARE TO BECOME CONTRACTOR'S SALVAGE AND SHALL BE HAULED AWAY FROM THE SITE PROMPTLY.

REMOVE ALL ABANDONED PIPING AND DUCTWORK AND ASSOCIATED SUPPORTS.

GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIR OR REPLACEMENT OF EQUIPMENT FOUND TO BE DAMAGED OR NON-FUNCTIONAL DUE TO CONSTRUCTION PROCESS AFTER SUBSTANTIAL COMPLETION.

MECHANICAL PATCHING NOTES

CONTRACTOR SHALL PROTECT AND REPAIR EXISTING TUNNEL FINISHES FROM WORK PERFORMED. CONTRACTOR SHALL REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION TO MATCH ORIGINAL FINISHES.

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KCL Project Number: 17052

Date: 6/2/2017

100% BID SET

Revisions	Date	No.

CAPITOL COMPLEX M2 IMPROVEMENTS

STATE OF IOWA CAPITOL COMPLEX
DES MOINES, IOWA

Sheet Name: GENERAL NOTES

Scale: NOT TO SCALE

Sheet: M0

CONTROL DIAGRAM SYMBOLS

TS	TEMPERATURE SENSOR (AVERAGING)
N.O.	NORMALLY OPEN (POWERED CLOSED)
N.C.	NORMALLY CLOSED (POWERED OPEN)
TS	TEMPERATURE SENSOR AS INDICATED
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
ADJ	ADJUSTABLE

GENERAL CONTROL NOTES:

BASE BID:

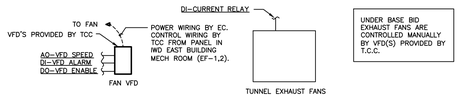
TEMPERATURE CONTROL CONTRACTOR TO PROVIDE ONLY VFDS FOR EF(S).

ALTERNATE #1:

TEMPERATURE CONTROL CONTRACTOR TO PROVIDE A COMPLETE CONTROL SYSTEM EXTENDING FROM EXISTING DDC SYSTEM INCLUDING SENSORS, RELAYS, WIRING, CONDUIT, CONTROLLERS, PANELS, ENCLOSURES AND OTHER COMPONENTS. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. TCC TO INSTALL ALL MFR PROVIDED CONTROLS COMPONENTS FURNISHED LOOSE FROM FACTORY.

DIAGRAMS ARE SCHEMATIC. PROVIDE ADDITIONAL POINTS WHERE REQUIRED TO MEET SEQUENCE OF CONTROL. REFER TO DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL DETAIL.

UNLESS STATED OTHER, ELECTRICAL CONTRACTOR IS TO PROVIDE ALL LINE VOLTAGE POWER AND CONDUIT FOR CONTROL SYSTEM AND ALL CODE REQUIRED HARD WIRED POINTS FOR INTERACTION WITH FIRE ALARM SHUTDOWN. COORDINATE WITH EC ON REQUIRED POWER REQUIREMENTS AND LOCATIONS.



CONTROL SEQUENCE

EXHAUST FANS SHALL BE CONTROLLED THRU THE DDC SYSTEM. FAN STATUS SHALL BE MONITORED THRU A CURRENT RELAY. FAN TO OPERATE BASED ON TIME OF DAY SCHEDULE. FANS SHALL BE DISABLED DUE TO A FIRE ALARM IN THE TUNNEL.

ALARMS
AN ALARM SHALL BE GENERATED AT THE DDC IF FAN STATUS IS NOT PROVED.

TRENDS
ALL POINTS SHALL BE HISTORICALLY TRENDED. TREND POINTS AT 15 MIN. INTERVALS OVER A MINIMUM 90 DAY PERIOD OF TIME.

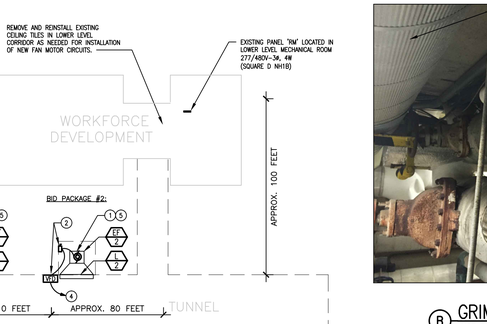
(C) EXHAUST FAN CONTROL (EF) – (ALT. #1 ONLY)
NOT TO SCALE

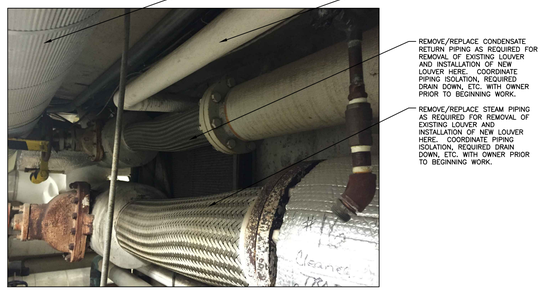
EXHAUST FAN SCHEDULE		
REFERENCE	EF-1,2	EF-3
MANUFACTURER	GREENHECK	GREENHECK
MODEL #	CSW-18-BI-41-4-100-I-30	CSW-18-BI-41-4-100-I-30
TYPE	F.C. CENTRIFUGAL UTITLY TYPE	F.C. CENTRIFUGAL UTITLY TYPE
SERVES	MULTIPLE TUNNELS	GRIMES TUNNEL
CFM	5,000	5,000
ESP (IN. W.C.)	0.75	0.75
FAN RPM	1585	1585
BELT/DIRECT	DIRECT	DIRECT
SPEED CONTROL (YES/NO)	NO	NO
SONES	35.0	35.0
DAMPER TYPE	NONE	NONE
BHP	2.1	2.1
MOTOR HP	3.0	3.0
VOLTAGE/PH	208/3	480/3
NOTES	1,2,3	1,2,3

NOTES:
1. FAN SHALL BE CONTROLLED BY VFD PROVIDED BY T.C.C. REFER TO EXHAUST FAN CONTROL DETAIL.
2. DISCONNECT PROVIDED BY FAN MFR.
3. FAN MOTOR SHALL BE PREMIUM EFFICIENCY AND MEET NEMA TABLE 12-12 REQUIREMENTS.

LOUVER SCHEDULE		
REFERENCE	L-1,2	L-3
MANUFACTURER	GREENHECK	GREENHECK
MODEL	ESD-403	ESD-403
APPLICATION	INTAKE FOR EF	INTAKE FOR EF
MATERIAL	ALUMINUM	ALUMINUM
SIZE (W X L X D) (IN.)	48 X 24 X 4	33 X 33 X 4
CFM	5,000	5,000
FREE AREA (SQ. FT.)	3.8	3.5
PRESSURE DROP (IN. W.C.)	0.3	0.35
FREE AREA VELOCITY (FPM)	1321	1431
BLADE DIRECTION	HORIZONTAL	HORIZONTAL
INSTALLATION	BLOCK WALL	BLOCK WALL
DRAINABLE	YES	YES
NOTES	1,2,3	1,2,3

NOTES:
1. PROVIDE COLOR CHARTS FOR COLOR SELECTION.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
3. PROVIDE LOUVER ABOVE, EQUIVALENT BY NCA, UNITED ENERTECH OR ENGINEER PRE-APPROVED EQUAL.





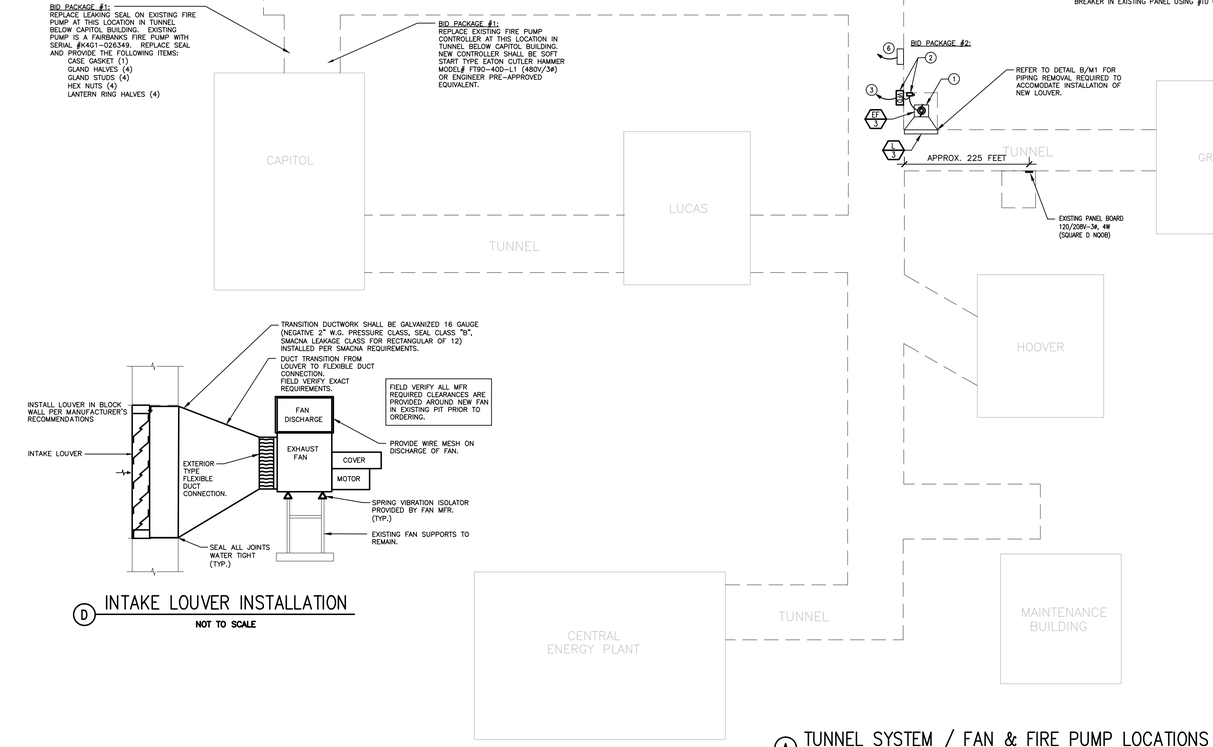
(B) GRIMES TUNNEL LOUVER – DETAILS
NOT TO SCALE

GENERAL NOTES

1. COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, ALL PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
2. PROVIDE A COMPLETE MECHANICAL EXHAUST SYSTEM INCLUDING SENSORS, RELAYS, WIRING, CONDUIT, CONTROLLERS, TRANSFORMERS, AND OTHER COMPONENTS. INSTALL ALL EQUIPMENT PER MFR RECOMMENDATIONS.
3. DIAGRAMS ARE SCHEMATIC. PROVIDE ADDITIONAL CONTROL POINTS/WIRING WHERE REQUIRED TO MEET OPERATION.
4. INCLUDE IN BID ALL NECESSARY PIPE MODIFICATIONS TO INSTALL LOUVERS, INCLUDING REINSULATING PIPING. MATCH EXISTING INSULATION THICKNESS AND TYPE.
5. FIELD VERIFY ALL EXISTING LOUVER OPENING DIMENSIONS PRIOR TO ORDERING.
6. EF-3 (GRIMES BUILDING) TO BE INSTALLED DURING SUMMER (OFF-SEASON FOR STEAM SYSTEM) AS PIPING MODIFICATIONS WILL BE REQUIRED FOR FLANGES TO BE CUT IN.

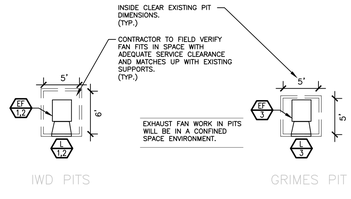
KEYED NOTES

1. REMOVE EXISTING EXHAUST FAN LOCATED IN PIT AND ALL APPURTENANCES INCLUDING TRANSITION SHROUD EXTENDING TO EXISTING LOUVER IN THE TUNNEL. REMOVE EXISTING INTAKE LOUVER FOR EXHAUST FAN LOCATED IN TUNNEL. PREPARE OPENING FOR NEW LOUVER. THIS WORK SHALL BE PROVIDED AS PART OF BID PACKAGE #2.
2. REMOVE EXISTING ELECTRICAL DISCONNECT SWITCH AND MOTOR STARTER. INSTALL NEW 30A/3P NEMA 3R NON-FUSED DISCONNECT SWITCH IN PIT AND VFD IN TUNNEL.
3. CONNECT TO NEW 20A/3P CIRCUIT BREAKER IN EXISTING PANELBOARD USING #8 CONDUCTORS IN 3/4" CONDUIT. REMOVE ABANDONED BREAKERS TO MAKE SPACE FOR NEW BREAKERS.
4. CONNECT TO NEW 15A/3P CIRCUIT BREAKER IN EXISTING PANEL 'RM' USING #10 CONDUCTORS IN 3/4" CONDUIT. REMOVE ABANDONED BREAKERS TO MAKE SPACE FOR NEW BREAKERS.
5. PROVIDE NEW CONDUIT AND EXTEND CONTROL WIRING FROM THE IWD EAST BUILDING BASEMENT MECHANICAL ROOM TO NEW EXHAUST FAN IN TUNNEL. (ALT. #1 ONLY)
6. PROVIDE NEW DDC CONTROL PANEL FOR EF-3 CONTROLS. CONNECT TO EXISTING SPARE 20A/1P CIRCUIT BREAKER IN EXISTING PANEL USING #10 CONDUCTORS IN 3/4" CONDUIT. (ALT. #1 ONLY)



(A) TUNNEL SYSTEM / FAN & FIRE PUMP LOCATIONS
NOT TO SCALE

(D) INTAKE LOUVER INSTALLATION
NOT TO SCALE



(N) (E) EXHAUST FAN PIT PLANS
SCALE: 1/8" = 1'-0"

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CAPITOL COMPLEX M2 IMPROVEMENTS
STATE OF IOWA CAPITOL COMPLEX
DES MOINES, IOWA

Sheet Name: TUNNEL PLAN
Scale: NOT TO SCALE
Sheet: M1