#### PROJECT DIRECTORY:

MECHANICAL/ELECTRICAL BDH Engineering 440 Regency Pkwy; Suite 135 Omaha, NE 68114 402 981 5527

### OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

#### **GENERAL NOTES**

- 1. THE GENERAL CONTRACTOR SHALL VERIFY THE EXISTING/ACTUAL DIMENSIONS AND CONDITIONS SHOWN ON
- 2. THE DRAWINGS MAY SPECIFY DIMENSIONS, ELEVATIONS
- 3. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS.
- 4. PROVIDE ALL SPECIFIED PRODUCTS/MATERIALS UNLESS OTHERWISE NOTED OR APPROVED BY OWNER, ARCHITECT, OR

OMAHA, NE

#### **INDEX OF DRAWINGS**

#### **STANDARD ABBREVIATIONS**

Sheet Number	Sheet Name	
COVER PAGE		
G0.0	COVER SHEET	
Grand total: 1		
	MECHANICAL	
Sheet Number	Sheet Name	
MECHANICAL		
M0.0	MECHANICAL SYMBOLS LEGEND AND GENERAL NOTES	
M0.1	MECHANICAL COM CHECK	
M0.2	NORTH MECHANICAL KEY PLAN	
M0.3	NORTHWEST MECHANICAL KEY PLAN	
M0.4	NORTH MECHANICAL DEMOLITION PLAN	
M0.5	NORTHWEST MECHANICAL DEMOLITION PLAN	
M1.1	NORTH MECHANICAL PLAN	
M1.2	NORTHWEST MECHANICAL PLAN	
M4.1	MECHANICAL SECTIONS	
M7.1	MECHANICAL DETAILS AND SCHEDULES	
Grand total: 10		

**GENERAL** 

ELECTRICAL						
Sheet Number	Sheet Name					
ELECTRICAL						
E0.0	ELECTRICAL SYMBOLS LEGEND AND GENERAL NOTES					
E0.1	ELECTRICAL COM CHECK					
E0.2	NORTH ELECTRICAL KEY					
E0.3	NORTHWEST ELECTRICAL KEY PLAN					
E0.4	NORTH ELECTRICAL DEMOLITION PLAN					
E0.5	NORTHWEST ELECTRICAL DEMOLITION PLAN					
E1.1	NORTH ELECTRICAL PLAN					
E1.2	NORTHWEST ELECTRICAL PLAN					
E6.1	ELECTRCAL DIAGRAMS AND DETAILS					
E7.1	ELECTRICAL SCHEDULES					
Grand total: 10						

\ /C		
	AIR CONDITIONING	JANJANITO
	ARCHITECT/ENGINEER	KITKITCHE
	ADDITIONAL	LAB LABORATOR
	ADJUSTABLE	LAVLAVATOR
	ABOVE FINISHED FLOOR	LVL
4F.S	ABOVE FINISHED SLAB	LWLIGHTWEIGH
ΔI	ALUMINUM	M/R MOISTURE RESISTAN
	AMOUNT	
		MAINTMAINTENANC
	ANODIZED	MAT'LMATERIA
ADDL	ADDITIONAL	MAXMAXIMUI
	ADDENDUM	MDFMEDIUM DENSIT
	ADJUSTABLE	FIBERBOAR
	ABOVE FINISH FLOOR	MECH MECHANICA
AF.S	ABOVE FINISH SLAB	MEZZMEZZANIN
ALT	ALTERNATE	MFGMANUFACTURIN
ARCH	ARCHITECT(URAL)	MFR MANUFACTURE
ΔCT	ACOUSTIC CEILING TILE	MISC MISCELLANEOU
		MULTMULTIPL
₹77°E	AVENUE	
	BELOW FINISH FLOOR	NNORT
3LDG	BUILDING	N/A NOT APPLICABL
3.0.	BOTTOM OF	NICNOT.IN.CONTRAC
	BOTTOM	NOMNOMINA
	BEARING	NTS NOT TO SCAL
	BASEMENT	OFCIOWNER FURNISHED
CIP	CAST IN PLACE	CONTRACTOR INSTALLE
CJ	CONTROL JOINT	CONTRACTOR INSTALLE OFF. OFFIC
٦l	CLEAR	OFOI OWNER FURNISHED
⊃L	OF INC	
JLU	CEILING	OWNER INSTALLE OHOVERHEA
	CLOSET	
CLR	CLEAR	OPP OPPOSIT
CMU	CONCRETE MASONRY UNIT	OPTOPTIONA
	CONCRETE	ORIG ORIGINA
	CONFEDENCE	
	CONFERENCE	PPAIN
	CONTINUOUS	PLAMPLASTIC LAMINAT
COORD	COORDINATE	PLY PLYWOO
CPT	CARPET	POLY POLYSTYREN
	CERAMIC TILE	POLYISO POLYISOCYANURAT
	DBL	PR PAI
JDL	DEMOLICIE	
JEMO	DEMOLISH	PREFAB. PREFABRICATE
DEP.T	DEPARTMENT	PRELIMPRELIMINAR
DF	DRINKING FOUNTAIN	PVC POLYVINYL CHLORID
	DIMENSION	QTYQUANTIT
JIOT	DISTANCE	RE: REFERENC
JIO.I	DISTANCE	NE. NEFERENC
JS	DOWNSPOUT	REQ'D REQUIRE
	DISHWASHER	REVREVERSE/REVISIO
DW.G	DRAWING	ROROUGH OPENING
	DRAWER	SSOUTH/STAI
		SC SOLID COR
<del>-</del>	EAST EACH	SCSULID COR
=A	EACH	SCHEDSCHEDUL
	EXTERIOR INSULATION &	SCWDSOLID.CORE.WOO
	FINISH SYSTEM EXPANSION JOINT	SFSQUARE FEE
=.1	EXPANSION JOINT	SGLSINGL
	ELECTRICAL	SIM SIMILA
	ELEVATOR	ODEO ODEOUEIOATIO
	ELEVATOR	SPEC SPECIFICATIO
	EMERGENCY	SQ SQUAR
ENCL	ENCLOSURE	SSSTAINLESS STEE
ENGR	ENGINEER	STSTREE
=PS	EXPANDED POLYSTYRENE	STDSTANDAR
	EQUAL	STORAG STORAG
_\. -\/T	EXTERIOR	
=X I	EXIERIOR	STRUCT STRUCTURA
		01100
EE	FIRE EXTINGUISHER	SUSPSUSPENDE
EE	FIRE EXTINGUISHER	
E F&E	FIRE EXTINGUISHER FIXTURES FURNITURE & FOUIPMENT	T&B TOP & BOTTOI
E F&E	FIRE EXTINGUISHER FIXTURES FURNITURE & FOUIPMENT	T&B TOP & BOTTOI T&G TONGUE & GROOV
E F&E	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION	T&BTOP.& BOTTOI T&GTONGUE & GROOV TBDTO BE DETERMINE
E F&E FE LG FI	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING	T&B
E F&E FE LG. FI	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR	T&B
E F&E FE LG. FI	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR	T&B
E F&E FE LG FI LR PRG	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FICOR	T&B
E F&E FE LG FI LR PRG	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT	T&B
E F&E LG Fl LR PRG T	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA
FEFEFLFLFLFLFLFLFLFL	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE
FEFEFLFLFLFLFLFLFLFL	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS
FEFEFLFLFLFLFLFLFLFL	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT
FE.F&E.FE.FLG.FLF.FLG.FLF.FLG.FLF.FLG.FLF.FLG.FLF.FLG.FLF.FLG.FLF.FLG.FLG	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VERTICA
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOF T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL
FEFEFEFEFEFEFEFE.	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES
FEFEFEFEFEFEFEFE.	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WIT
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD HARDWOOD	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOF T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WITHOU
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD HARDWOOD HARDWARE	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WITHOU W/R WATER RESISTAN
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD HARDWOOD HARDWARE HOLLOW METAL	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WITHOU W/R WATER RESISTAN WC WATER CLOSE
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD HARDWOOD HARDWARE	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WITHOU W/R WATER RESISTAN WC WATER CLOSE WHSE WAREHOUS
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD HARDWOOD HARDWARE HOLLOW METAL	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WITHOU W/R WATER RESISTAN WC WATER CLOSE
FEFEFEFEFEFEFEFE	FIRE EXTINGUISHER FIXTURES FURNITURE & EQUIPMENT FINISH FLOOR ELEVATION ANGE/FLASHING/FLOORING FLOOR FIREPROOFING FT FOOTING FUTURE FUTURE FIELD VERIFY GALVANIZED GENERAL CONTRACTOR GYPSUM PLASTER GYPSUM WALL BOARD HOLLOW CORE HARDBOARD HARDWOOD HARDWARE HOLLOW METAL HORIZONTAL	T&B TOP & BOTTOI T&G TONGUE & GROOV TBD TO BE DETERMINE TEMP TEMPORAR THRU THROUG TLT TOILET/TOILET ROOI T.O. TOP O TYP TYPICA UNFIN UNFINISHE UNO UNLESS NOTED OTHERWIS UTIL UTILIT VCT VINYL COMPOSITION TIL VERT VESTIBUL W WES W/ WITHOU W/R WATER RESISTAN WC WATER CLOSE WHSE WAREHOUS

& AIR CONDITIONING





Coordinating Professional on the OPS NORTH &

TOWER REPLACEMENT

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

**COVER SHEET** 



COPYRIGHT

This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law

**BID NUMBER 26-004** 

DESIGN PROFESSIONAL'S ELECTRONIC OR DIGITAL SEAL OR SIGNATURE IS EFFECTIVE ONLY AS TO THAT VERSION OF THIS DOCUMENT AS ORIGINALLY PUBLISHED BY DESIGN PROFESSIONAL. DESIGN PROFESSIONAL IS NOT RESPONSIBLE FOR ANY SUBSEQUENT MODIFICATION, CORRUPTION, OR UNAUTHORIZED USE OF SUCH DOCUMENT. TO VERIFY THE VALIDITY OR APPLICABILITY OF THE SEAL OR SIGNATURE CONTACT DESIGN PROFESSIONAL.

### PLUMBING AND MECHANICAL SYMBOLS LEGEND (AS APPLICABLE)

SYMBOL	DESCRIPTION	PIPIN	G AND SPECIALTIES  DESCRIPTION	SYMBOL	DESCRIPTION
	REFRIGERANT DISCHARGE	==PGR==	PROPYLENE GLYCOL RETURN	——————————————————————————————————————	INLINE PUMP
	REFRIGERANT LIQUID	PGS	PROPYLENE GLYCOL SUPPLY	√MV	
== RS ===	REFRIGERANT SUCTION	FOR	FUEL OIL RETURN	MV	AIR VENT - MANUAL
—CD—	COIL CONDENSATE DRAIN	FOS	FUEL OIL SUPPLY	A	AIR VENT - AUTOMATIC
= LPS (XX) ===	LOW PRESSURE STEAM (PRESSURE)	FOV	FUEL OIL VENT	FS	FLOW SWITCH
= MPS (XX)===	MEDIUM PRESSURE STEAM (PRESSURE)	CR	CONDENSER WATER RETURN		Lew switch
, ,	HIGH PRESSURE STEAM (PRESSURE)	== cs ==	CONDENSER WATER SUPPLY	PS PS	PRESSURE SWITCH
=LPC ==	LOW PRESSURE CONDENSATE	==HPWR==	HEAT PUMP WATER RETURN	$$ $\bigcirc_{\overline{AS-}}$	AIR SEPARATOR
	MEDIUM PRESSURE CONDENSATE	= HPWS=	HEAT PUMP WATER SUPPLY		THERMOMETER
==HPC=== ===PC====	HIGH PRESSURE CONDENSATE PUMPED CONDENSATE	—— <u>D</u> —— R	PITCH OF PIPE, RISE (R) OR DROP (D)	Ĭ — τw	
	MAKE-UP WATER	<del></del>	PIPE ANCHOR - MAIN	TW	THERMOMETER WELL
=HCR=	HOT/CHILLED WATER RETURN	—×—	PIPE ANCHOR - INTERMEDIATE	-	BALL JOINT
=HCS=	HOT/CHILLED WATER SUPPLY	Н	HANGER - ROD	  PSD —	PUMP SUCTION DIFFUSER
—HWR—	HEATING WATER RETURN		HANCED CDDING		FLOAT THERMOSTATIC TRAP
—HWS—	HEATING WATER SUPPLY	——————————————————————————————————————	HANGER - SPRING		FLOWMETER - ORIFICE
==CWR===	CHILLED WATER RETURN	_=_	ALIGNMENT GUIDE		FLOWMETER - VENTURI
=CWS=	CHILLED WATER SUPPLY		FLEX CONNECTOR	<u>Q</u>	DUPLEX STRAINER
==EGR===	ETHYLENE GLYCOL RETURN		EXPANSION - LOOP	O	DOI LEX OTTO MINER
==EGS===	ETHYLENE GLYCOL SUPPLY		EXPANSION - JOINT		
			DUCTWORK		
CT. RND. OVAL					
	SUPPLY (SA), OUTSIDE (OA), VENTILATION (VA) AIR DUCT (UP/DOWN/SECTION)	$R \longrightarrow R$	ELEVATION CHANGE (RISE OR DROP)		FIRE DAMPER (IN HORIZONTAL DUCT)
	RETURN (RA) AIR DUCT (UP/DOWN/SECTION)		HIGH EFF. TAKE OFF FITTING WITH VOLUME DAMPER	•	SMOKE DAMPER (IN HORIZONTAL DUCT)
	EXHAUST (EA) AIR DUCT (UP/DOWN/SECTION)	BD	BACKDRAFT DAMPER	FD <b>←</b>	FIRE DAMPER (IN VERTICAL DUCT)
	RECTANGLE DUCT (WIDTH/HEIGHT/SYSTEM)		TURNING VANES	SD ♦—	SMOKE DAMPER (IN VERTICAL DUCT)
	·		VOLUME CONTROL DAMPER	FSD▶⊳	FIRE/SMOKE DAMPER (IN HORIZONTAL DU
	ROUND DUCT (DIAMETER/SYSTEM)	IVD	VOLUME CONTROL DAMPER  VOLUME CONTROL DAMPER	FSD ♦♦	FIRE/SMOKE DAMPER (IN VERTICAL DUCT
	FLAT OVAL DUCT (WIDTH/HEIGHT/SYSTEM)	<i>p</i> & <i>p</i> &	OPPOSED BLADE DAMPER	□AD \	DUCT ACCESS PANEL
++++++++	FLEXIBLE DUCTWORK	p p p p p p	PARALLEL BLADE DAMPER		RELIEF PANEL
			TAVALLE BLADE DAIVII EIX		DUCT END CAP
			H.V.A.C.		
	SUPPLY DIFFUSER				THERMOSTAT
	SUPPLY DIFFUSER		VAV TERMINAL UNIT	① <sub>G</sub>	THERMOSTAT WITH GUARD
	SUPPLY REGISTER	[-T	FAN POWERED VAV TERMINAL UNIT	® XX-X	TEMPERATURE SENSOR -
#	SUPPLY SLOT DIFFUSER	L		Ŭ	XX-X DENOTES SERVED
	SOFFET SLOT DITT USER	П	SIDE WALL DIFFUSER	©co	CARBON MONOXIDE SENSOR
	RETURN REGISTER		DOLIND DIFF. 1955	©CO2	CARBON DIOXIDE SENSOR
	RETURN GRILLE		ROUND DIFFUSER	<b>S</b> NOX	NITROGEN DIOXIDE SENSOR
			EXTERIOR LOUVER	® <sub>H</sub>	HUMIDITY SENSOR
	EXHAUST REGISTER	7 >		® <sub>P</sub>	PRESSURE SENSOR
	EXHAUST GRILLE	<u>X</u> CFM	SUPPLY IDENTIFICATION TAG X DENOTES TYPE	$\$_{G}$	TEMPERATURE SENSOR WITH GUAR
		X	RETURN/ EXHAUST/LOUVER IDENTIFICATION TAG	$\oplus$	HUMIDISTAT
	DUAL DUCT TERMINAL UNIT	CFINI	X DENOTES TYPE	Ho	EMERGENCY SHUTDOWN SWITCH
		<u>M</u> -	MOTORIZED ACTUATOR	·	
		<u> </u>	PNEUMATIC ACTUATOR		
			FITTINGS		
SINGLE DOUBLE LINE LINE				SINGLE DOU	
LINE LINE		SINGLE DOUBL LINE LINE		LINE LIN	<b>\</b> _
	ELBOW	LINE LINE		LINE LIN	
+ ¬	ELBOW LONG RADIUS ELBOW	LINE LINE	ELBOW - DOUBLE BRANCH -		REDUCER - CONCENTRIC
+ ±	LONG RADIUS ELBOW	LINE LINE	ELBOW - DOUBLE BRANCH - ELBOW - SIDE OUTLET UP		REDUCER - CONCENTRIC REDUCER - ECCENTRIC
+	LONG RADIUS ELBOW SHORT RADIUS ELBOW	LINE LINE  †  †  †  †  †  †  †  †  †  †  †  †  †	ELBOW - DOUBLE BRANCH -		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION
+ ±	LONG RADIUS ELBOW	LINE LINE	ELBOW - DOUBLE BRANCH - ELBOW - SIDE OUTLET UP		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION
+	LONG RADIUS ELBOW SHORT RADIUS ELBOW	LINE LINE  †  †  †  †  †  †  †  †  †  †  †  †  †	ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION
+ + + sr = sr + + + + + + + + + + + + + + + + + +	LONG RADIUS ELBOW SHORT RADIUS ELBOW 45° ELBOW	LINE LINE  THE STATE OF THE STA	ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION  STRAINER
サナ	LONG RADIUS ELBOW SHORT RADIUS ELBOW 45° ELBOW TEE CROSS	LINE LINE  THE STATE OF THE STA	ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION  STRAINER
サナ	LONG RADIUS ELBOW  SHORT RADIUS ELBOW  45° ELBOW  TEE  CROSS		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION  STRAINER
「	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION  STRAINER  STRAINER WITH BALL VALVE DRAIN
+ + + + + + + + + + + + + + + + + + +	LONG RADIUS ELBOW  SHORT RADIUS ELBOW  45° ELBOW  TEE  CROSS		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION  STRAINER  STRAINER WITH BALL VALVE DRAIN  STRAINER WITH COUPLER
FF SR & 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  STRAINER  STRAINER WITH BALL VALVE DRAIL  STRAINER WITH COUPLER  BUSHING
「	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  STRAINER  STRAINER WITH BALL VALVE DRAIL  STRAINER WITH COUPLER  BUSHING
FF SR & 4 4 4 7 1	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  STRAINER  STRAINER WITH BALL VALVE DRAIN  STRAINER WITH COUPLER  BUSHING
「	LONG RADIUS ELBOW  SHORT RADIUS ELBOW  45° ELBOW  TEE  CROSS  LATERAL  TEE - SINGLE SWEEP		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION FLANGED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE
「	LONG RADIUS ELBOW  SHORT RADIUS ELBOW  45° ELBOW  TEE  CROSS  LATERAL  TEE - SINGLE SWEEP		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET DOWN  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET DOWN  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION  THREADED CONNECTION  FLANGED CONNECTION  STRAINER  STRAINER WITH BALL VALVE DRAIN  STRAINER WITH COUPLER  BUSHING  FLOW DIRECTION
F F SR	LONG RADIUS ELBOW  SHORT RADIUS ELBOW  45° ELBOW  TEE  CROSS  LATERAL  TEE - SINGLE SWEEP		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  SWING GATE CHECK VALVE (ARROW IND. FLOW)		REDUCER - CONCENTRIC  REDUCER - ECCENTRIC  CAPPED CONNECTION THREADED CONNECTION  FLANGED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIL STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE
FF SR & 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	LONG RADIUS ELBOW  SHORT RADIUS ELBOW  45° ELBOW  TEE  CROSS  LATERAL  TEE - SINGLE SWEEP  GATE VALVE  ANGLE GATE VALVE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET DOWN  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET DOWN  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)	PRV-X PRV-X PRV-X	REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE  BALL VALVE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  SWING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.
「	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  SWING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE	PRV-X PRV-X PRV-X	REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.
FF SR & 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.
FF 8	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET UP TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  SWING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE  2-WAY ELECTROMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY. DOUBLE CHK VALVE BACKFLOW ASSY. DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE
「	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET UP TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) SWING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE 3-WAY ELECTROMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM VALVE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE  2-WAY ELECTROMOTOR VALVE  2-WAY MANUAL VALVE  3-WAY ELECTROMOTOR VALVE  3-WAY ELECTROMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE  2-WAY ELECTROMOTOR VALVE  2-WAY MANUAL VALVE  3-WAY ELECTROMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY MANUAL VALVE  3-WAY MANUAL VALVE  3-WAY MANUAL VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM VALVE DIAPHRAGM ACTUATED VALVE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  SWING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE  2-WAY ELECTROMOTOR VALVE  2-WAY MANUAL VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE PRESSURE REDUCING PILOT VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE		ELBOW - DOUBLE BRANCH  ELBOW - SIDE OUTLET UP  ELBOW - SIDE OUTLET DOWN  ELBOW - OUTLET DOWN  ELBOW - OUTLET UP  TEE - OUTLET DOWN  TEE - OUTLET UP  TEE - SIDE OUTLET DOWN  TEE - SIDE OUTLET UP  SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW)  SPRING GATE CHECK VALVE (ARROW IND. FLOW)  ANGLE STOP/CHECK VALVE  2-WAY ELECTROMOTOR VALVE  2-WAY MANUAL VALVE  3-WAY ELECTROMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY MANUAL VALVE  3-WAY MANUAL VALVE  3-WAY MANUAL VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY. DOUBLE CHK VALVE BACKFLOW ASSY. DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA GLOBE VALVE WITH GLOBE VALVE BY-PA
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE HOSE GATE VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) SWING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE 3-WAY BLECTROMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY MANUAL VALVE SAFETY PRESSURE RELIEF VALVE PRESSURE RELIEF VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA GLOBE VALVE WITH GLOBE VALVE BY-PA SPRINKLER - CONCEALED
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS  LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE DIAPHRAGM VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE HOSE GATE VALVE HOSE GLOBE VALVE HOSE ANGLE VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET DOWN TEE - OUTLET DOWN TEE - OUTLET DOWN TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) SWING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE SAFETY PRESSURE RELIEF VALVE PRESSURE RELIEF VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY. DOUBLE CHK VALVE BACKFLOW ASSY. DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA SPRINKLER - CONCEALED SPRINKLER - RECESSED
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE HOSE GATE VALVE HOSE GLOBE VALVE HOSE ANGLE VALVE SOLENOID VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) SWING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE  2-WAY ELECTROMOTOR VALVE  2-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  3-WAY AIRMOTOR VALVE  TEMPERATURE MIXING VALVE  AUTO FLOW VALVE  FLOAT VALVE		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA GLOBE VALVE WITH GLOBE VALVE BY-PA SPRINKLER - CONCEALED SPRINKLER - RECESSED SPRINKLER - RECESSED
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS  LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE DIAPHRAGM VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE HOSE GATE VALVE HOSE GLOBE VALVE HOSE ANGLE VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE 3-WAY ELECTROMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE TEMPERATURE MIXING VALVE  ELOCK SHIELD		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA SPRINKLER - CONCEALED SPRINKLER - RECESSED SPRINKLER - SIDEWALL SPRINKLER - UPRIGHT
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE HOSE GATE VALVE HOSE GLOBE VALVE HOSE ANGLE VALVE SOLENOID VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) SWING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY MANUAL VALVE 3-WAY MANUAL VALVE TEMPERATURE MIXING VALVE AUTO FLOW VALVE FLOAT VALVE LOCK SHIELD CIRCUIT SETTER		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA GLOBE VALVE WITH GLOBE VALVE BY-PA SPRINKLER - CONCEALED SPRINKLER - RECESSED SPRINKLER - SIDEWALL
	LONG RADIUS ELBOW SHORT RADIUS ELBOW  45° ELBOW  TEE CROSS LATERAL TEE - SINGLE SWEEP  GATE VALVE ANGLE GATE VALVE BALL VALVE LOCKABLE BALL VALVE BUTTERFLY VALVE GLOBE VALVE ANGLE GLOBE VALVE PLUG VALVE DIAPHRAGM ACTUATED VALVE VALVE IN VERTICAL LINE HOSE GATE VALVE HOSE GLOBE VALVE HOSE ANGLE VALVE SOLENOID VALVE		ELBOW - DOUBLE BRANCH ELBOW - SIDE OUTLET UP ELBOW - SIDE OUTLET DOWN ELBOW - OUTLET DOWN ELBOW - OUTLET UP TEE - OUTLET DOWN TEE - OUTLET UP TEE - SIDE OUTLET DOWN TEE - SIDE OUTLET UP SIAMESE CONNECTION  VALVES  STOP/CHECK GATE VALVE (ARROW IND. FLOW) SPRING GATE CHECK VALVE (ARROW IND. FLOW) ANGLE STOP/CHECK VALVE 2-WAY ELECTROMOTOR VALVE 2-WAY AIRMOTOR VALVE 3-WAY ELECTROMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE 3-WAY AIRMOTOR VALVE TEMPERATURE MIXING VALVE  ELOCK SHIELD		REDUCER - CONCENTRIC REDUCER - ECCENTRIC CAPPED CONNECTION THREADED CONNECTION THREADED CONNECTION STRAINER STRAINER WITH BALL VALVE DRAIN STRAINER WITH COUPLER BUSHING FLOW DIRECTION  MULTIPURPOSE VALVE PRESSURE REDUCING VALVE REDUCED PRESS. BACKFLOW ASSY.  DOUBLE CHK VALVE BACKFLOW ASSY.  DOUBLE DETECTOR CHECK VALVE OUTSIDE STEM & YOKE VALVE QUICK CLOSING FUSIBLE LINK VALVE QUICK OPENING VALVE PRESSURE GAUGE & BALL VALVE GATE VALVE WITH GLOBE VALVE BY-PA GLOBE VALVE WITH GLOBE VALVE BY-PA SPRINKLER - CONCEALED SPRINKLER - SIDEWALL SPRINKLER - UPRIGHT

			PLUMBING		
	PIPE REMOVAL	==NPCW=	NON-POTABLE COLD WATER	— P —	TRAP PRIMER
DCW	DOMESTIC COLD WATER	=NPHW $=$	NON-POTABLE HOT WATER	—— НВ	HOSE BIBB
DHW	DOMESTIC HOT WATER	=NPSW $=$	NON-POTABLE SOFT WATER	——WH	WALL HYDRANT
==RHW==	DOMESTIC HOT WATER RECIRC.	= PD $=$	PUMPED DISCHARGE	$\longrightarrow$ RH	ROOF HYDRANT
==DSW==	DOMESTIC SOFT WATER	— G (XX)—	NATURAL GAS (PSIG)	<u>C</u> O	CLEAN OUT
SAN	SANITARY	= PG (XX) $=$	PROPANE GAS (PSIG)	FCO	FLOOR CLEAN OUT
st	STORM	v	VENT	⊙ FD	FLOOR DRAIN
so	STORM OVERFLOW	=== AW ===	ACID WASTE		VENT THRU ROOF (X DENOTES IDENTIFICATION)
=== GW ===	GREASE WASTE	=== AV ====	ACID VENT	(o) RD	ROOF DRAIN
CA	COMPRESSED AIR	osw	OIL/SAND	(o) ORD	OVERFLOW ROOF DRAIN
PA	PROCESSED AIR	=== IR ===	IRRIGATION	⇒ DSN	DOWNSPOUT NOZZLE
		М	ISCELLANEOUS		
XX X	EQUIPMENT IDENTIFICATION TAG (ELECTRICAL CONNECTION REQUIRED)	•	NEW CONNECTION POINT	WC	WATER CLOSET
	DETAIL REFERENCE		POINT OF DISCONNECT	UR	URINAL
XXX	SHEET REFERENCE	OA	OUTSIDE AIR	L	LAVATORY
		VA	VENTILATION AIR	S	SINK
$\begin{array}{c c} X & X \\ XX & XX \end{array}$	SECTION CUT REFERENCE SHEET REFERENCE	EA	EXHAUST AIR	DF	DRINKING FOUNTAIN
701 701		RA RA	RELIEF OR RETURN AIR	EWC	ELECTRIC WATER COOLER
	ELECTRICAL PANEL - SHOWN FOR COORDINATION PURPOSES ONLY	SA	SUPPLY AIR	SS	SERVICE SINK
	ELECTRICAL PANEL - SHOWN FOR	MA	MIXED AIR	SH	SHOWER
	COORDINATION PURPOSES ONLY	RF	RELIEF OR RETURN FAN	DWH	DOMESTIC WATER HEATER
	ELECTRICAL PANEL - SHOWN FOR COORDINATION PURPOSES ONLY	EF	EXHAUST FAN	MSB	MOP SINK BASIN
	ELECTRICAL TRANSFORMER - SHOWN	DCE	DUST COLLECTION EXHAUST	<b>(</b> E)	DASHED DARK LINEWORK = DEMOLITION
T	FOR COORDINATION PURPOSES ONLY	(TYP)	TYPICAL	(E)	LIGHT LINEWORK = EXISTING DARK LINEWORK = NEW

NOTICE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SHOP AND OTHER APPROPRIATE DRAWINGS OR AT SITE. LAY OUT AND COORDINATE ALL WORK PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, AND CODES. VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCES FOR ALL TRADES. THIS NOTICE APPLIES TO ALL MECHANICAL / PLUMBING PLANS.

	MECHANICAL
Sheet Number	Sheet Name
MECHANICAL	
M0.0	MECHANICAL SYMBOLS LEGEND AND GENERAL NOTES
M0.1	MECHANICAL COM CHECK
M0.2	NORTH MECHANICAL KEY PLAN
M0.3	NORTHWEST MECHANICAL KEY PLAN
M0.4	NORTH MECHANICAL DEMOLITION PLAN
M0.5	NORTHWEST MECHANICAL DEMOLITION PLAN
M1.1	NORTH MECHANICAL PLAN
M1.2	NORTHWEST MECHANICAL PLAN
M4.1	MECHANICAL SECTIONS
M7.1	MECHANICAL DETAILS AND SCHEDULES
Grand total: 10	

### GENERAL MECHANICAL / PLUMBING DEMOLITION NOTES

\_\_\_\_\_\_

APPLY TO ALL MECHANICAL AND PLUMBING SHEETS

- 1. ALL EXISTING ITEMS AND ASSOCIATED PIPING, ACCESSORIES, SUPPORTS AND HANGERS INDICATED BY BOLD, DASHED, HEAVY LINES OR IDENTIFIED BY NOTES, SHALL BE COMPLETELY REMOVED. PRIOR TO PROPER DISPOSAL OF REMOVED ITEMS, OWNER SHALL HAVE FIRST RIGHT OF REFUSAL.
- 2. DRAWINGS INDICATE APPROXIMATE ROUTING OF PIPING, DUCTWORK AND MAJOR COMPONENTS AND DO NOT INCLUDE ALL OFFSETS, FITTINGS, VALVES, ETC. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE AND ROUTING PRIOR TO REMOVAL OR RELOCATION. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REMOVAL OF MISCELLANEOUS MECHANICAL ITEMS LOCATED ON OR IN ANY WALLS TO BE REMOVED.

EXISTING INSULATION DAMAGED DURING DEMOLITION / CONSTRUCTION ACTIVITIES SHALL

- BE REPAIRED WITH SIMILAR MATERIALS.

  4. ALL OPENINGS THROUGH WALLS AND FLOOR SLABS NOT BEING REUSED SHALL BE
- PATCHED WITH LIKE MATERIALS AND PAINTED TO MATCH EXISTING.

  5. ALL OPENINGS THROUGH ROOF NOT BEING REUSED SHALL BE PATCHED WITH LIKE
- 5. ALL OPENINGS THROUGH ROOF NOT BEING REUSED SHALL BE PATCHED WITH LIKE MATERIALS AND SEALED WATERTIGHT.
- CONTRACTOR SHALL REMOVE ALL MATERIALS AS REQUIRED AND SHALL GIVE OWNER THE OPPORTUNITY TO INSPECT SUCH MATERIALS FOR POTENTIAL SALVAGE. CONTRACTOR SHALL REMOVE FROM THE SITE ALL MATERIALS DEEMED "NON-SALVAGEABLE" BY THE OWNER. CONTRACTOR SHALL TURN OVER TO OWNER ALL MATERIALS DEEMED "SALVAGEABLE" BY THE OWNER.

#### GENERAL MECHANICAL NOTES

#### APPLY TO ALL MECHANICAL SHEETS

- A. LIGHT LINE WEIGHT INDICATES EXISTING ITEMS AND ASSOCIATED MATERIALS TO REMAIN.
   BOLD LINE WEIGHT INDICATES NEW WORK TO BE INSTALLED UNDER THIS CONTRACT.
   B. ROUTING INDICATED ON DRAWINGS IS APPROXIMATE AND DOES NOT INCLUDE ALL
   OFFSETS, FITTINGS, VALVES, ETC. CONTRACTOR TO FIELD VERIFY DUCT SIZE AND SERVICE
   PRIOR TO FINAL CONNECTION. COORDINATE LOCATION OF HVAC WORK WITH LIGHTING,
   STRUCTURAL MEMBERS, PIPING SYSTEMS, ETC. PROVIDE OFFSETS AND CLEARANCES OR
   RELOCATE HVAC WORK AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL OTHER
- C. HVAC WORK SHALL NOT BE LOCATED OVER ELECTRICAL, DATA, OR COMMUNICATION EQUIPMENT ROOMS. HVAC WORK SHALL NOT BE LOCATED ABOVE ELECTRICAL / DATA / COMMUNICATION EQUIPMENT OR PANELS.
- D. SUPPORT ALL DUCTWORK, PIPING, EQUIPMENT, ETC. FROM BUILDING STRUCTURE. HOLD PIPING TIGHT TO BOTTOM OF STRUCTURAL MEMBERS OR RUN THROUGH JOIST WEBS IF POSSIBLE. DO NOT USE WIRE OR PERFORATED METAL TO SUPPORT PIPING. DO NOT SUPPORT PIPING FROM OTHER PIPING, DUCTWORK AND/OR ELECTRICAL CONDUITS. DO NOT SUPPORT FROM BOTTOM OF CHORD OF BAR JOIST OR FROM METAL ROOF DECK.
- TO ACCOMMODATE DUCT LINER AS REQUIRED.

  F. ELBOWS SHALL BE CONSTRUCTED WITH CENTERLINE RADIUS OF NOT LESS THAN 1-1/2
  TIMES THE WIDTH OF DUCT. WHERE SPACE CONDITIONS DO NOT PERMIT THIS RADIUS OR

ALL DUCT SIZES SHOWN ARE CLEAR AIRWAY DIMENSIONS. INCREASE SHEET METAL SIZE

- TIMES THE WIDTH OF DUCT. WHERE SPACE CONDITIONS DO NOT PERMIT THIS RADIUS OR WHERE INDICATED ON DRAWINGS SQUARE ELBOWS WITH TURNING VANES SHALL BE USED.

  G. SIZE TRANSITIONS WITH A MINIMUM SLOPE OF 1:4.

  H. PROVIDE DRAW BANDS AND SEAL END OF DUCT INSULATION ON ALL FLEXIBLE
- CONNECTIONS. MAXIMUM LENGTH OF FLEXIBLE DUCTS SHALL BE THREE FEET.

  I. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SEALING PENETRATIONS THROUGH A FIRE RATED, SMOKE RATED OR COMBINATION FIRE & SMOKE RATED SEPARATIONS. SEE SPECIFICATIONS FOR FIRE & SMOKE RATED SEALANTS. SEE ARCHITECTURAL PLANS FOR RATED SEPARATIONS.
- J. COORDINATE ALL GRILLE, REGISTER AND DIFFUSER LOCATIONS WITH REFLECTED CEILING PLAN, LIGHT FIXTURES, SPRINKLER HEADS, COMMUNICATION/SOUND DEVICES AND FIRE ALARM DEVICES.
   K. INSTALL ESCUTCHEON PLATES ON ALL WALL PENETRATIONS SERVING ROUND DUCT WALL
- PENETRATIONS. FABRICATE ESCUTCHEON PLATES TO TRIM THE OPENING IN THE WALL.

  L. INSTALL WALL ANGLE FOR ALL RECTANGULAR DUCT PENETRATIONS THROUGH WALLS.

  M. FOR EXPOSED DUCTWORK THOROUGHLY CLEAN, REMOVE ALL SHIPPING LABELS AND OTHER IDENTIFICATION TAGS. DUCTWORK DESIGNATED TO BE PAINTED SHALL HAVE PHOSPHATIZED FINISH. PROVIDE MILL-PHOSPHATIZED FINISH FOR EXPOSED NOT DESIGNATED TO BE PAINTED. COORDINATE WITH ARCHITECTURAL DRAWINGS DUCTWORK
- DESIGNATED FOR PAINTING AND EXPOSED DUCTWORK REQUIREMENTS.

  PROVIDE DUCT MOUNTED ACCESS DOOR AT FIRE DAMPER, SMOKE DAMPER OR COMBINATION FIRE/SMOKE DAMPERS TO ALLOW FOR MAINTENANCE AND VISUAL
- INSPECTION PER NFPA REQUIREMENTS.

  O. VOLUME DAMPERS ABOVE INACCESSIBLE CEILINGS SHALL HAVE EXTENSION RODS AND
- ESCUTCHEON PLATES.

  P. LOCATE AND INSTALL EQUIPMENT TO PROVIDE ALL CODE AND MANUFACTURER'S RECOMMENDED CLEARANCES. KEEP HVAC PIPING, DUCTWORK, ETC. OUT OF CLEARANCE
- Q. ALL OPENINGS IN WALLS AND FLOORS FOR PIPING SHALL BE CORE DRILLED OR SAW CUT, UNLESS OTHERWISE NOTED.
   R. ALL HVAC PIPING WORK SHALL BE LOCATED ABOVE CEILINGS, IN A PIPE CHASE, OR OTHER CONCEALED LOCATIONS, UNLESS OTHERWISE NOTED. LOCATE AND ARRANGE VALVES,

DRAIN FITTINGS, ETC. TO BE ACCESSIBLE THROUGH LAY-IN CEILINGS, ACCESS PANELS OR

- ACCESS DOORS. PROVIDE ACCESS PANEL OR ACCESS DOOR FOR ALL VALVES, DRAIN FITTINGS, ETC. AT NON-ACCESSIBLE LOCATIONS.

  INSTALL SECTIONAL VALVES ON EACH BRANCH AND/OR RISER SERVING TWO OR MORE HYDRONIC TERMINALS OR FOLIDMENT CONNECTIONS. INSTALL VALVES ADJACENT TO
- HYDRONIC TERMINALS OR EQUIPMENT CONNECTIONS. INSTALL VALVES ADJACENT TO MAIN.

  T. INSTALL SHUTOFF VALVES ON INLET AND OUTLET OF EACH MECHANICAL EQUIPMENT ITEM
- AND/OR EACH HYDRONIC TERMINAL.

  U. SLOPE HVAC PIPING TO DRAIN VALVES. PROVIDE MANUAL AIR VENTS AT HIGH POINTS AND AT TOP OF RISERS.

  V. SEAL ALL HVAC PENETRATIONS. SEAL PENETRATIONS THROUGH RATED WALLS, FLOORS
- OR CEILINGS WITH MATERIALS APPROPRIATE FOR RATING.
  W. PIPING IN EXTERIOR WALLS SHALL BE LOCATED ON THE INTERIOR SIDE OF BUILDING
- V. PIPING IN EXTERIOR WALLS SHALL BE LOCATED ON THE INTERIOR SIDE OF BUIL INSULATION AND VAPOR BARRIER.
- COORDINATE INSTALLATION OF BUILDING INSULATION TO RUN CONTINUOUS BETWEEN PIPING AND EXTERIOR WALL SURFACE.

  PVC PIPING SHALL NOT BE INSTALLED IN ANY RETURN AIR PLENUM UNLESS THE PIPING IS
- INSTALLED IN A PRE-APPROVED RATED ASSEMBLY.

  Z. COORDINATE DUCTWORK WITH STRUCTURAL CROSS BRACING. PROVIDE TOP AND BOTTOM BRIDGING BETWEEN JOISTS WHERE DUCTWORK IS TO BE INSTALLED BETWEEN THE JOISTS. COORDINATE WITH ALL TRADES.

#### GENERAL PLUMBING NOTES

APPLY TO ALL PLUMBING SHEETS

- A. LIGHT LINE WEIGHT INDICATES EXISTING ITEMS AND ASSOCIATED MATERIALS TO REMAIN.
   BOLD LINE WEIGHT INDICATES NEW WORK TO BE INSTALLED UNDER THIS CONTRACT.
   B. ROUTING INDICATED ON DRAWINGS IS APPROXIMATE AND DOES NOT INCLUDE ALL OFFSETS,
   FITTINGS, VALVES, ETC. CONTRACTOR TO FIELD VERIFY PIPE SIZE AND SERVICE PRIOR TO
   FINAL CONNECTION. COORDINATE LOCATION OF PLUMBING PIPING WORK WITH LIGHTING,
   STRUCTURAL MEMBERS, HVAC, PIPING SYSTEMS, ETC. PROVIDE OFFSETS AND CLEARANCES
   OR RELOCATE PLUMBING WORK AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL
- OTHER TRADES.

  C. PLUMBING WORK SHALL NOT BE LOCATED OVER ELECTRICAL, DATA OR COMMUNICATION EQUIPMENT ROOMS. PLUMBING WORK SHALL NOT BE LOCATED ABOVE ELECTRICAL / DATA / COMMUNICATION EQUIPMENT OR PANELS.
- D. SUPPORT ALL PLUMBING PIPING, EQUIPMENT, ETC. FROM BUILDING STRUCTURE. HOLD PIPING TIGHT TO BOTTOM OF STRUCTURAL MEMBERS OR RUN THROUGH JOIST WEBS IF POSSIBLE. DO NOT USE WIRE OR PERFORATED METAL TO SUPPORT PIPING. DO NOT SUPPORT PIPING FROM OTHER PIPING, DUCTWORK AND/OR ELECTRICAL CONDUITS. DO NOT SUPPORT FROM BOTTOM OF CHORD OF BAR JOIST OR FROM METAL ROOF DECK.
- E. ROUTE ABOVE GRADE DRAINAGE PIPING AS HIGH AS POSSIBLE AND COORDINATE WITH OTHER TRADES.
- F. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SEALING PENETRATIONS THROUGH A FIRE RATED, SMOKE RATED OR COMBINATION FIRE & SMOKE RATED SEPARATIONS. SEE SPECIFICATIONS FOR FIRE & SMOKE RATED SEALANTS. SEE ARCHITECTURAL PLANS FOR RATED SEPARATIONS.
- G. INSTALL ESCUTCHEON PLATES ON ALL WALL AND FLOOR PENETRATIONS SERVING EXPOSED PLUMBING PIPING WALL PENETRATIONS.
- H. ALL OPENINGS IN WALLS AND FLOORS FOR PIPING SHALL BE CORE DRILLED OR SAW CUT, UNLESS OTHERWISE NOTED.
- I. LOCATE AND INSTALL EQUIPMENT TO PROVIDE ALL CODE AND MANUFACTURER'S RECOMMENDED CLEARANCES. KEEP HVAC PIPING, DUCTWORK, ETC. OUT OF CLEARANCE AREAS.
- J. ALL PLUMBING PIPING WORK SHALL BE LOCATED ABOVE CEILINGS, IN A PIPE CHASE, OR OTHER CONCEALED LOCATIONS, UNLESS OTHERWISE NOTED. LOCATE AND ARRANGE VALVES, DRAIN FITTINGS, ETC. TO BE ACCESSIBLE THROUGH LAY-IN CEILINGS, ACCESS PANELS OR ACCESS DOORS. PROVIDE ACCESS PANEL OR ACCESS DOOR FOR ALL VALVES, DRAIN FITTINGS, ETC. AT NON-ACCESSIBLE LOCATIONS.
- K. INSTALL SECTIONAL VALVES ON EACH BRANCH AND/OR RISER SERVING TWO OR MORE PLUMBING FIXTURES OR EQUIPMENT CONNECTIONS. INSTALL VALVES ADJACENT TO MAIN.
- L. INSTALL SHUTOFF VALVES ON INLET AND OUTLET OF PLUMBING EQUIPMENT.

  M. INSTALL STOPS AT EACH PLUMBING FIXTURE EXCEPT AT FLUSHOMETER LOCATIONS.

  N. SEAL ALL PLUMBING PIPING PENETRATIONS. SEAL PENETRATIONS THROUGH RATED WALLS,
- FLOORS OR CEILINGS WITH MATERIALS APPROPRIATE FOR RATING.

  O. PIPING IN EXTERIOR WALLS SHALL BE LOCATED ON THE INTERIOR SIDE OF BUILDING
- INSULATION AND VAPOR BARRIER.

  P. COORDINATE INSTALLATION OF BUILDING INSULATION TO RUN CONTINUOUS BETWEEN PIPING AND EXTERIOR WALL SURFACE.
- Q. COORDINATE EXACT LOCATION OF FLOOR DRAINS AND FLOOR SINKS. TOP OF GRATE SHALL BE 1/8" BELOW FINISHED FLOOR ELEVATION.
   R. COMPLY WITH LOCAL UTILITY COMPANY RULES AND REGULATIONS FOR ALL GAS METER
- INSTALLATIONS. COORDINATE EXACT LOCATION OF GAS CONNECTIONS WITH EQUIPMENT SUPPLIED.

  S. COPPER PIPING LOCATED ABOVE GRADE SHALL BE TYPE "L"; COPPER PIPING LOCATED
- BELOW GRADE SHALL BE TYPE "K" AND RUN CONTINUOUS WITHOUT JOINTS BELOW GRADE. TYPE "M" COPPER SHALL NOT BE USED ON PRESSURIZED PIPING SYSTEMS.

  T. DRAINAGE PIPING 3 INCHES AND SMALLER SHALL SLOPE NO LESS THAN 1/4 INCH PER FOOT. DRAINAGE PIPING 4 INCHES AND LARGER SHALL SLOPE NO LESS THAN 1/8 INCH PER FOOT.
- U. INSTALL WALL CLEAN OUTS (<u>WCO</u>) WHEN LOCATED BEHIND A WATER CLOSET AT 30" A.F.F. OR AT 42" A.F.F. ABOVE CABINETRY ON ALL SANITARY & STORM STACKS.
   V. COORDINATE EXACT STORM PIPE CONNECTIONS WITH STORM DRAIN LOCATIONS SHOWN ON
- ARCHITECTURAL ROOF PLAN.

  W. INSTALL VENT-THRU-ROOF (VTR) A MINIMUM OF 10'-0" AWAY FROM ANY OUTSIDE AIR INTAKE.

  X. REMOVE, REPAIR AND REPLACE WALLS, FLOORS, ROOFS AND CEILINGS TO MATCH EXISTING,
- WHERE NECESSARY FOR PIPING AND FIXTURE REMOVAL & INSTALLATION.

  Y. KITCHEN EQUIPMENT FURNISHED BY KITCHEN EQUIPMENT CONTRACTOR PLUMBING CONTRACTOR SHALL ROUGH-IN AND MAKE FINAL CONNECTIONS TO UTILITIES REQUIRED AND PROVIDE PIPING, STOPS, WATER HAMMER ARRESTERS, TRAPS AND FITTINGS FOR EQUIPMENT TO BE IN OPERATIONAL ORDER. COORDINATE WITH KITCHEN EQUIPMENT SUPPLIER FOR CONNECTIONS AND LOCATIONS. SEE KITCHEN EQUIPMENT CONNECTION SCHEDULE FOR RESPONSIBILITY OF WHO FURNISHES VACUUM BREAKERS AND PRESSURE
- REDUCING VALVES.

  PVC PIPING SHALL NOT BE INSTALLED IN ANY RETURN AIR PLENUM UNLESS THE PIPING IS INSTALLED IN A PRE-APPROVED RATED ASSEMBLY.
- PROVIDE ACCESSIBLE SHUTOFF VALVE INSIDE THE BUILDING FOR EACH WALL HYDRANT.
  CONTRACTOR SHALL COORDINATE ALL CONNECTIONS OF PLUMBING SYSTEMS WITH EXTERIOR SITE UTILITIES AND SERVICES PRIOR TO INSTALLING ANY PIPING ON THE INTERIOR CONTRACTOR SHALL CONFIRM THAT ALL INTERIOR PIPE INVERTS AND PIPE INVERTS AT THE 5' LINE MATCH EXTERIOR PIPE INVERTS, PRIOR TO INSTALLING ANY INTERIOR PIPING BELOW

### OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

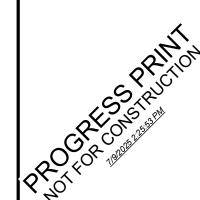
MECHANICAL SYMBOLS LEGEND AND GENERAL NOTES



BDH Engineering 440 Regency Parkwa Suite 135 Omaha, NE 68114 bdhengineer.com

COPYRIGHT BDH#: 25023

This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.



PROJECT:

OJECT: 2502 TE: 07/09/202

MO.0

## OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTH MECHANICAL KEY PLAN





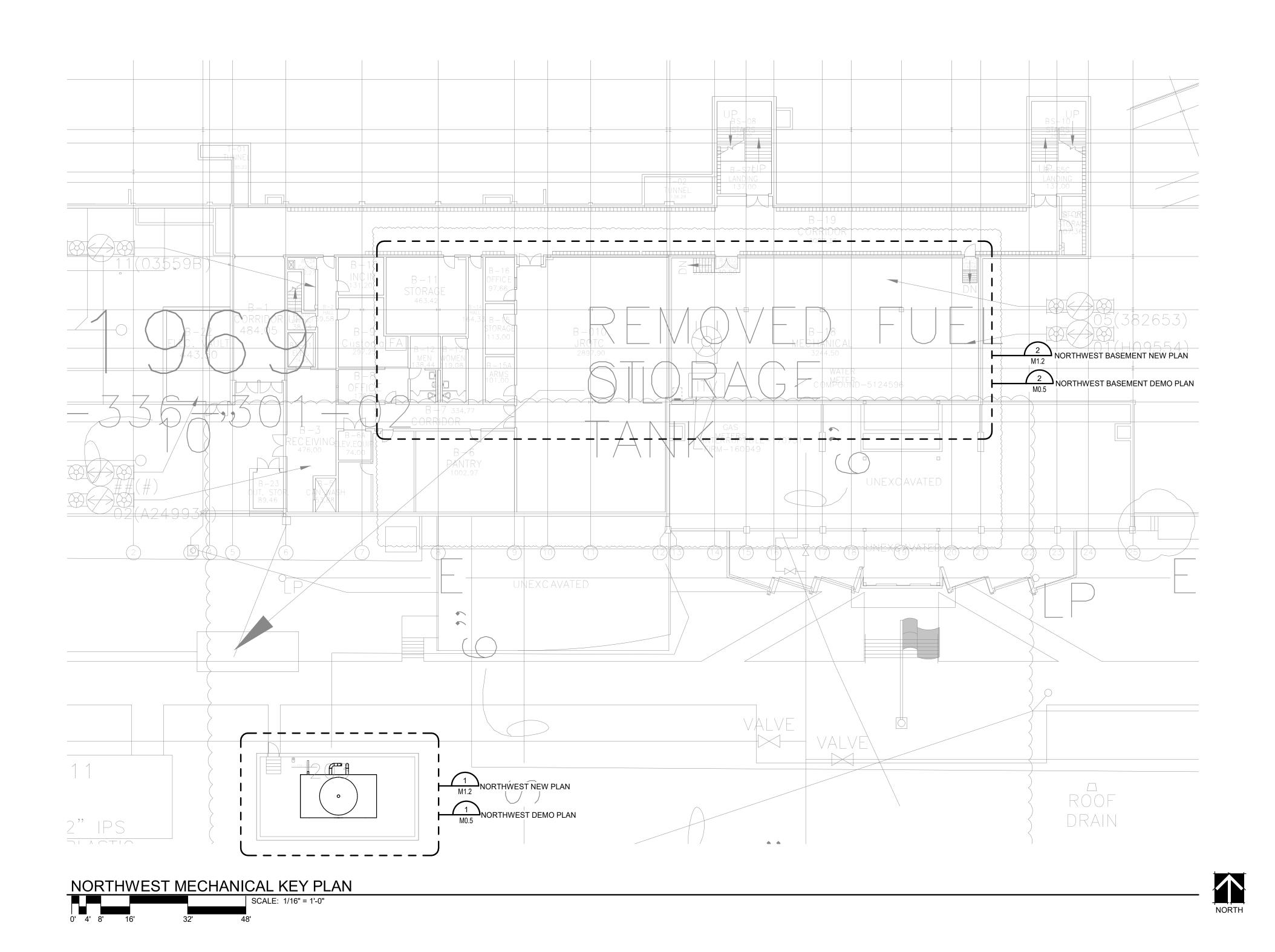
PROJECT:

MO.2

25023

NORTH MECHANICAL KEY PLAN

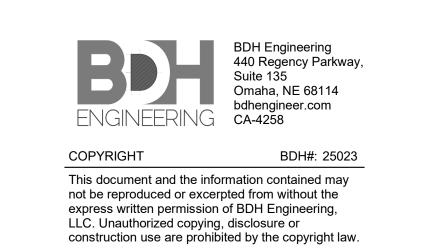
| SCALE: 1/16" = 1'| 0' 4' 8' 16' 32' 48'



## OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST MECHANICAL KEY PLAN



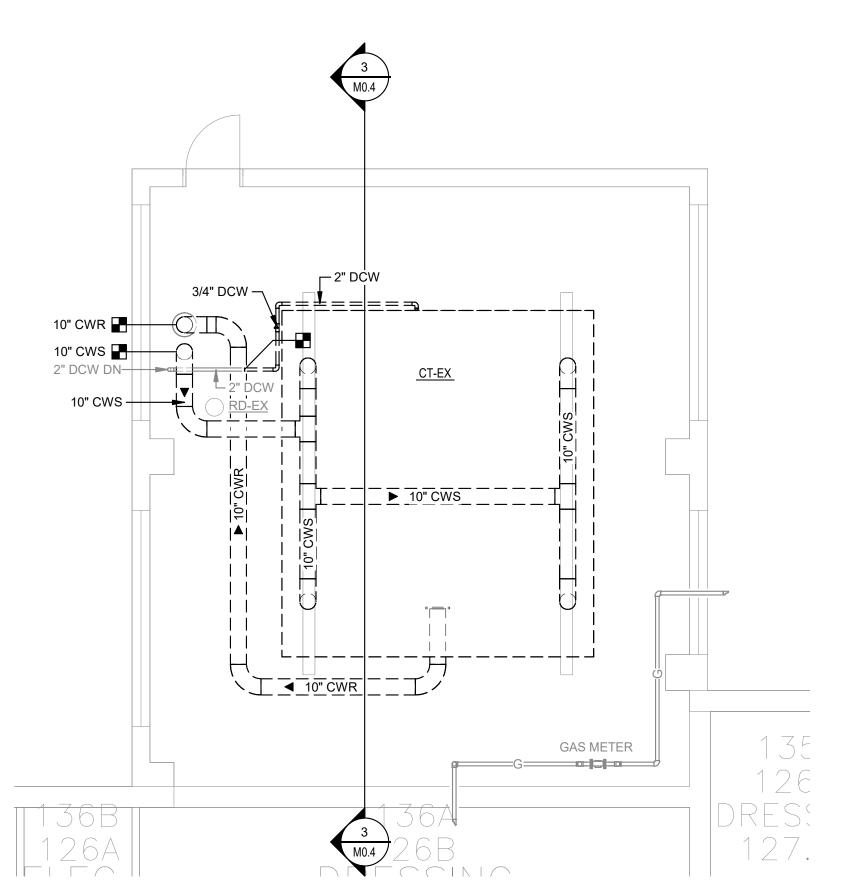


PROJECT:

CT: 25023 07/09/2025

M0.3







**KEYNOTES** 

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

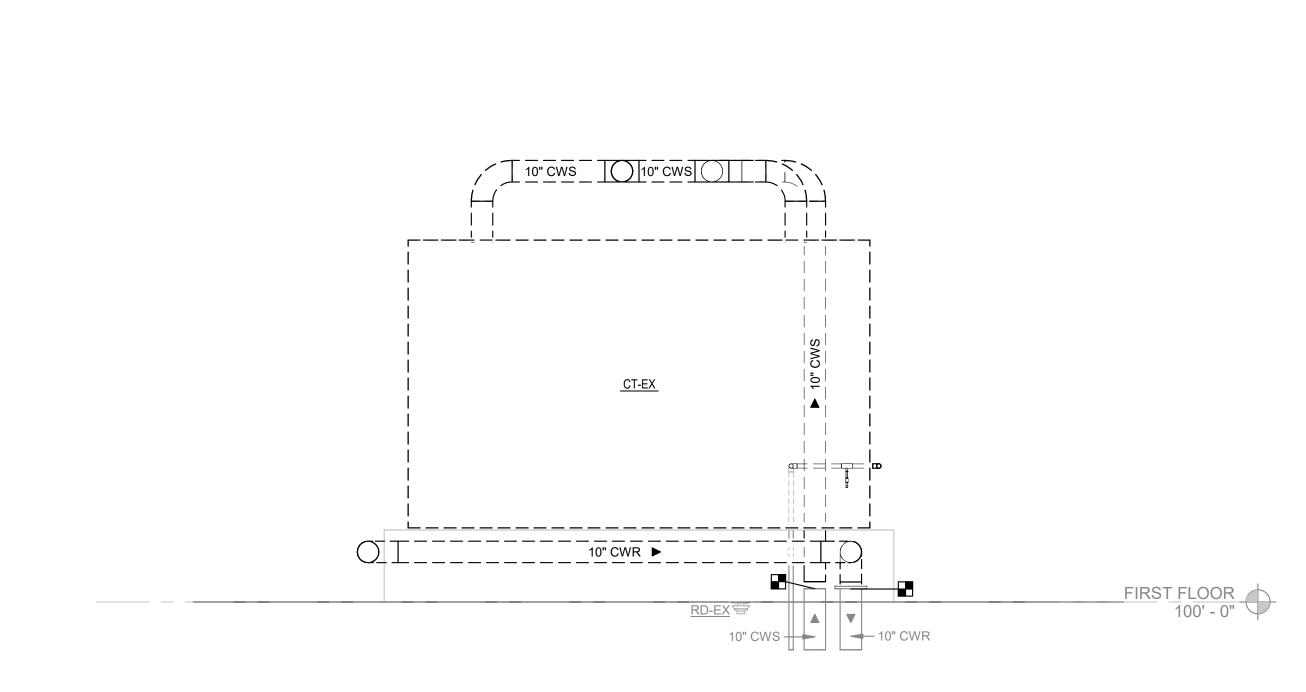
OMAHA, NE

NORTH MECHANICAL **DEMOLITION PLAN** 



COPYRIGHT BDH#: 25023 This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

25023



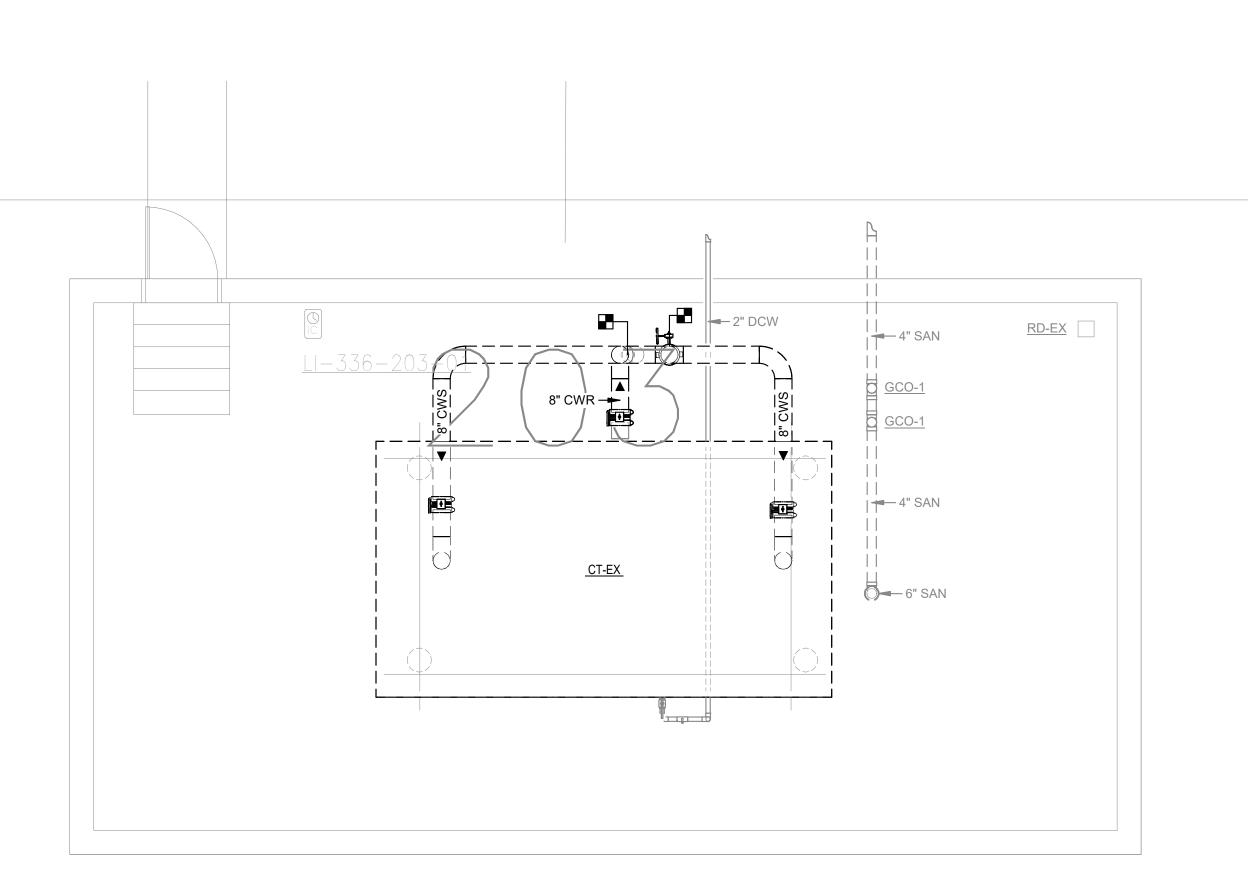
3 SECTION AT PIPING DEMOLITION

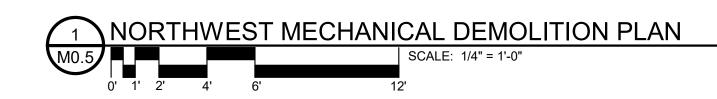
M0.4 | SCALE: 1/4" = 1'-0"

NORTH MECHANICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"







NORTHWEST BASEMENT MECHANICAL DEMOLITION PLAN

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

16' 24'



#### MECHANICAL DEMOLITION NOTES:

SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND GENERAL PLUMBING DEMOLITION NOTES.

KEYNOTES

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST MECHANICAL DEMOLITION PLAN



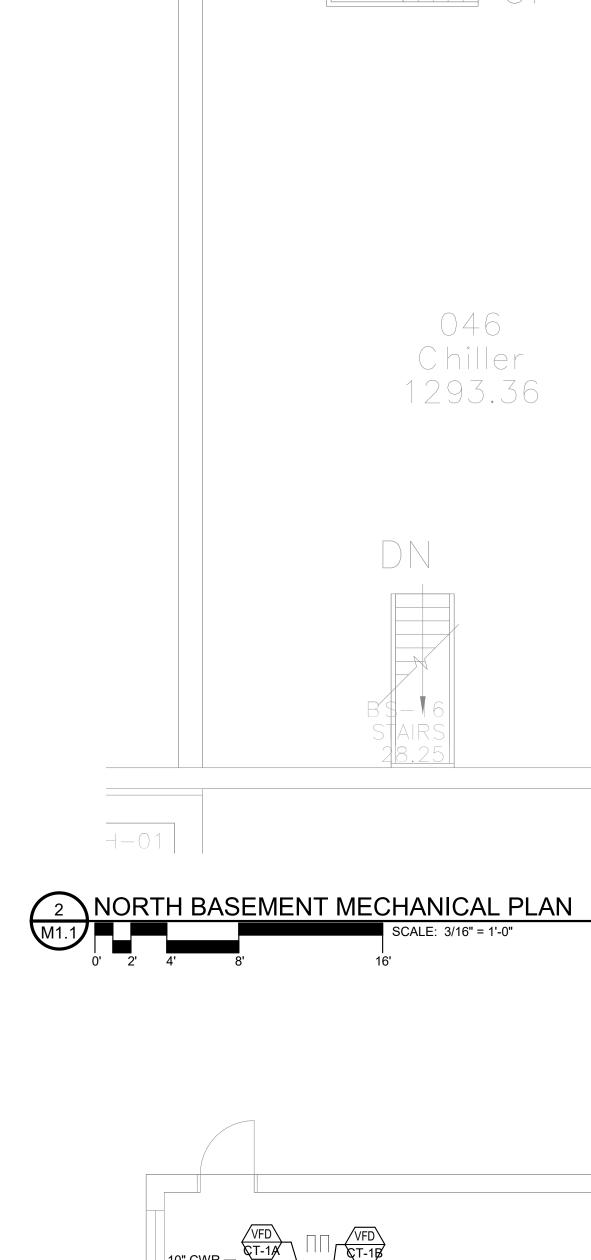
COPYRIGHT BDH#: 25023

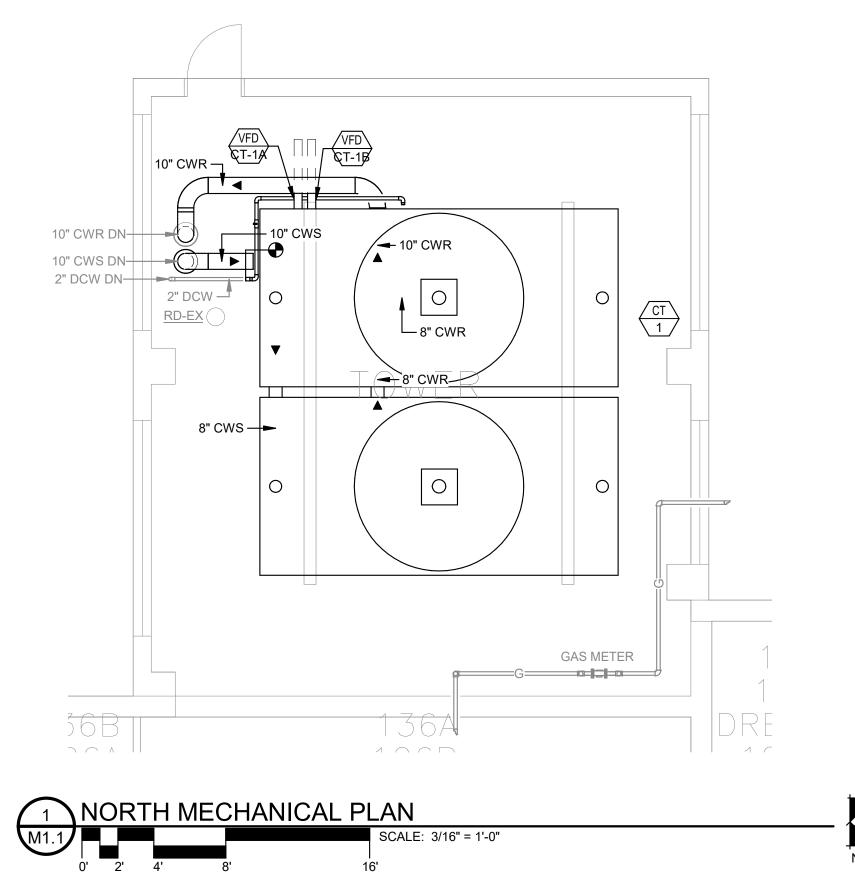
This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.



PROJECT:

M0.5





#### **MECHANICAL PIPING NOTES:**

- SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND GENERAL MECHANICAL NOTES.
- B. BRANCH PIPE SIZES SHALL BE 3/4" FROM MAIN TO FIXTURES UNLESS OTHERWISE NOTED. SEE DETAIL X.X FOR ADDITIONAL INFORMATION.
- C. SUPPORT PIPING FROM STRUCTURE AS REQUIRED. SEE PIPE SUPPORT DETAIL FOR ADDITIONAL INFORMATION.

**KEYNOTES** 

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTH MECHANICAL PLAN



COPYRIGHT

BDH#: 25023

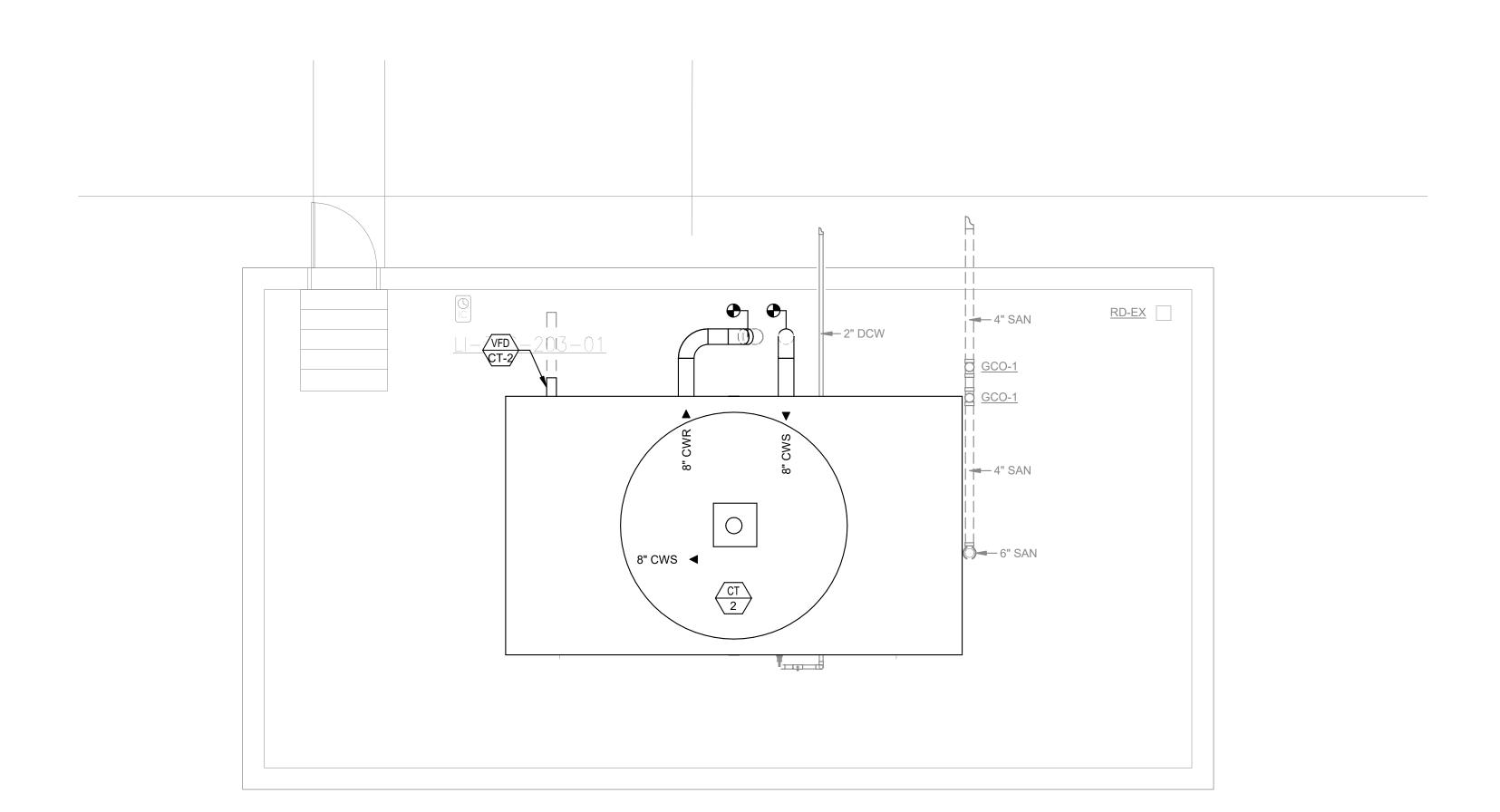
This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

CALLONS OF THE CALLON

PROJECT:











#### **MECHANICAL PIPING NOTES:**

- SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND
- GENERAL MECHANICAL NOTES.
  BRANCH PIPE SIZES SHALL BE 3/4" FROM MAIN TO FIXTURES
  UNLESS OTHERWISE NOTED. SEE DETAIL X.X FOR ADDITIONAL INFORMATION.
- SUPPORT PIPING FROM STRUCTURE AS REQUIRED. SEE PIPE SUPPORT DETAIL FOR ADDITIONAL INFORMATION.

**KEYNOTES** 

**OPS NORTH &** NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST MECHANICAL PLAN



COPYRIGHT BDH#: 25023 This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

	COOLING TOWER																								
				0.4540151/	AMBIENT	MAX			PRESS	INLET		OUTLET			FAN DATA				ELE	CTRICAL	BASIN HEAT	OPERATING			
MARK	SERVES	TOWER CONFIGURATION		(TONS)	TEMP DB/WB (°F)	FLOWRATE (GPM)	EWT (° F)	LWT (°F)		CONNECTION (IN)	INECTION   INLE   CONNECTION		UNICHT (IN) CONNECTION	NO.	TYPE	FAN SPEED (RPM)	AIRFLOW (CFM)	НР	V	PH	SCCR (A)	CAPACITY	WEIGHT (LBS)	MANUFACTURER & MODEL NO.	REMARKS
CT-1	NORTH	CROSSFLOW	2	1000	95/78	2400	95/78	85	10	(2) @ 8"	воттом	(2) @ 8"	2	GEAR	330	102,030	15 EA.	480	3	5000	18 KW PER CELL	19,180 EACH	MARLEY NC8405PAN	1-9	
CT-2	NORTH WEST	CROSSFLOW	1	700	95/78	1700	95/78	85	10	10"	воттом	10"	1	GEAR	347	165,300	40	480	3	5000	24 KW	24,420	MARLEY NC8407TAN	1-9	

#### REMARKS:

- 1. 301L STAINLESS STEEL COLLECTION AND DISTRIBUTION BASINS, GALVANIZED STEEL STRUCTURE AND CASING, GEAR DRIVE WITH MOTOR MOUNTED OUTSIDE THE AIRSTREAM, EXTENDED LUBE LINE, ENHANCED ACCOUSTICAL PERFORMANCE QUIET FAN
- 2. 15 MIL PVC FILL WITH INTEGRAL LOUVERS AND DRIFT ELIMINATORS, GALVANIZED AIR INLET SCREENS, ONE 8" BOTTOM HOT WATER INLETS WITH INTEGRAL PVC PIPING FOR BALANCED DISTRIBUTION PER CELL, FLOAT TYPE MAKEUP VALVE
- 3. ACCESS DOOR PLATFORM ON BOTH CASED FACES, FAN DECK LADDER WITH SAFETY CAGE ON BOTH CASED FACES, LADDER EXTENTIONS TO GRADE, FAN DECK GUARDRAIL, FIBERGLASS VELOCITY RECOVERY STACK, AND STAINLESS STEEL PLENUM WALKWAY
- 4. REMOTE VARIABLE FREQUENCY DRIVE WITH DISCONNECT, SHAFT GROUNDING RING, AND EXTERNALLY MOUNTED MANUAL RESET VIBRATION SWITCH
  5. 8" DEPRESSED SIDE SUMP OUTLET WITH TRASH SCREEN AND ANTI VORTEX PLATE PER CELL, OUTLET ON BOTTOM OF TOWER. STEEL SUMP SIDE OUTLET WITH SCREEN.
- 6. TOWER TO INCLUDE SINGLE POINT POWER CONTROL PANEL FOR FAN AND HEATER POWER. VFD TO BE MOUNTED REMOTE TO PANEL.
- 7. CTI CERTIFIED PER STD-201
- 8. ALTERNATE TOWER MANUFACTURERS ARE ALLOWED. CONTRACTOR RESPONSIBLE FOR ANY MODIFICATIONS FOR ALTERNATE TOWER SELECTIONS.
- 9. 5-YEAR WHOLE UNIT PARTS ONLY WARRANTY

VARIABLE FREQUENCY DRIVE SCHEDULE								
			MOTOR OIZE	El	LECTRICA	٩L	MANUEACTURER & MORE	
MARK SERVES	LOCATED	MOTOR SIZE (HP)	Α	v	PH	MANUFACTURER & MODEL NO.	REMARKS	
VFD-CT-1A	COOLING TOWER CT-1	ON TOWER	15	21.0	480.0	3	YASKAWA	1
VFD-CT-1B	COOLING TOWER CT-1	ON TOWER	15	21.0	480.0	3	YASKAWA	1
VFD-CT-2	COOLING TOWER CT-2	ON TOWER	40	52.0	480.0	3	YASKAWA	1

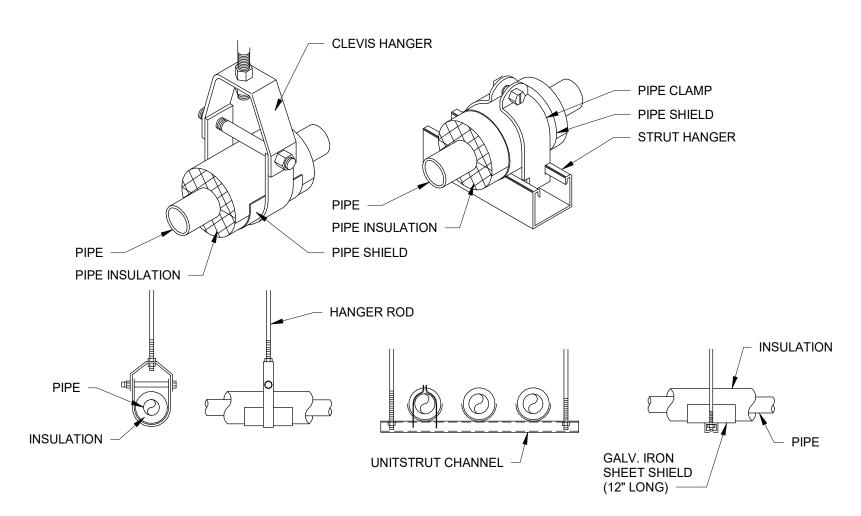
#### REMARKS:

1. VFD TO BE RATED FOR OUTDOOR OPERATION.

		PIPING APPLIC	ATION SCHEDULE			
SYSTEM DESCRIPTION	OVOTEM DECODIDATION OF MATERIAL		JOINTS	INSULATION	NOTES	
STSTEM DESCRIPTION	SIZE	MATERIAL	JOHATO	TYPE	THICKNESS	NOTES
DOMESTIC COLD WATER - OUTDOOR W/ HEAT TRACE	ALL	COPPER (TYPE L)	SOLDER	FIBERGLASS WITH ALUMINUM JACKET	1"	A
CONDENSER WATER OUTDOOR W/ HEAT TRACE	ALL	CPVC	SOLVENT	FIBERGLASS WITH ALUMINUM JACKET	1"	А

#### NOTES:

A) PROVIDE ALUMINUM JACKETED INSULATION WHEN LOCATED OUTDOORS



#### NOTES:

- 1. ATTACH SUPPORTS FOR ALL PIPING SUSPENDED FROM THE
- STEEL STRUCTURE TO THE TOP CORD OF JOISTS OF BEAMS.

  2. PROVIDE COPPER OR PLASTIC COATED HANGERS FOR NON-INSULATED COPPER PIPE.
- INSULATED COPPER PIPE.

  3. PROVIDE AND INSTALL B-LINE OR ACCEPTABLE INSULATED GALVANIZED STEEL JACKET AND HANGER, STRUT MOUNTED CLAMP AND PIPE SUPPORT LOCATIONS.



## OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

MECHANICAL DETAILS AND SCHEDULES



This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.



PROJECT:
DATE: 07



			ELECTRICAL SYN		EGEND
	SWIT	CHING			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
\$ a	SINGLE POLE SWITCH - LETTER INDICATES SWITCH LEG	\$ M	MOMENTARY CONTACT SWITCH	HD R/T	HEAT DETECTOR
\$2 \$3	DOUBLE POLE SWITCH THREE-WAY SWITCH	\$к \$₽	KEY OPERATED SWITCH PILOT LIGHT SWITCH	(HD) <sub>F</sub>	HEAT DETECTOR
\$3 \$4	FOUR-WAY SWITCH	Фг \$т	TIMER SWITCH	HDEV	HEAT DETECTOR
<b>\$</b> D	DIMMER SWITCH	<b>\$</b> s	SENSOR SWITCH - WALL MOUNTED: SEE LIGHTING CONTROL SCHEME NARRATIVE FOR TYPE	SD SD	SMOKE DETECTO
\$н	HORSEPOWER RATED SWITCH	<b>♦</b> S,#	SENSOR - CEILING MOUNTED: SEE LIGHTING NUMBER INDICATES ZONE OF		SMOKE DETECTO
\$ F \$ TF	FUSED SWITCH THERMAL ELEMENT		CONTROL SCHEME NARRATIVE FOR TYPE  SENSOR - WALL MOUNTED: SEE LIGHTING  LUMINAIRES TO BE  CONTROLLED BY SENSOR(S).	SD DM	
	LIGHTING CONTROL STATION - LETTER INDICATES TYPE	→ S,#	CONTROL SCHEME NARRATIVE FOR TYPE  NO NUMBER INDICATES ALL ROOM LUMINAIRES TO BE	SD EV	SMOKE DETECTO
		<>DS,#	DAYLIGHTING SENSOR - CEILING MOUNTED CONTROLLED BY SENSOR(S).	F	FIRE ALARM MAN
	LIGH	HTING		F	FIRE ALARM HOR
LAREL INFOR	LETTER INDICATES LUMINAIRE MARK, NUMBER INDICATES				FIRE ALARM VISU
LABEL INFOR	A, # ZONE IDENTIFIER, NO NUMBER INDICATES SINGLE ZONE				FIRE ALARM COM
	LUMINAIRE	Ю	WALL MOUNTED LUMINAIRE		FIRE ALARM SPEA
	LUMINAIRE - LAMPS SWITCHED SEPARATE	$\bowtie$	WALL MOUNTED LUMINAIRE - NIGHT LIGHT		FIRE ALARM COM
	LUMINAIRE WITH AUXILIARY LIGHT	H	WALL MOUNTED LUMINAIRE - EMERGENCY		FIRE ALARIM BELL
	LUMINAIRE - EMERGENCY	$\bowtie \otimes$	EXIT SIGN - WALL/CEILING MOUNTED  EXIT SIGN/EMERGENCY LUMINAIRE COMBINATION		
	LUMINAIRE - NIGHT LIGHT		WALL/CEILING MOUNTED		PUSHBUTTON ST
	WALL MOUNTED LUMINAIRE		PHOTOCELL, DAYLIGHT SENSOR		PUSHBUTTON ST
	WALL MOUNTED LUMINAIRE - EMERGENCY	<b>⊶</b> □	EXTERIOR LUMINAIRE - POLE MOUNTED		DOOR MONITOR S
	WALL MOUNTED LUMINAIRE - NIGHT LIGHT STRIP LUMINAIRE	• <b>·</b>	EXTERIOR LUMINAIRE - POLE MOUNTED  EXTERIOR LUMINAIRE - POLE MOUNTED		DOOR SWITCH
	STRIP LUMINAIRE - EMERGENCY	<ul><li>©</li></ul>	EXTERIOR LUMINAIRE - POLE MOUNTED		DOOR BELL CHIM
	STRIP LUMINAIRE - NIGHT LIGHT	₫]→	FLOOD LIGHT LUMINAIRE		DOOR CONTACT
	LUMINAIRE		EMERGENCY BATTERY PACK		
	LUMINAIRE - NIGHT LIGHT		EMERGENCY LUMINAIRE REMOTE HEADS		
•	LUMINAIRE - EMERGENCY	$\nabla \nabla \nabla$	TRACK LUMINAIRE	E	NURSE CALL DON
	POWER	DEVICES		N	NURSE CALL DON
	SINGLE RECEPTACLE		LIGHTING & APPLIANCE PANELBOARD	HE	EMERGENCY CAL
$\begin{array}{ccc} & & & & \\ & & & & \\ & & & & \\ & & & & $	DUPLEX RECEPTACLE		POWER DISTRIBUTION EQUIPMENT		CODE BLUE STAT
	FOUR-PLEX RECEPTACLE - TWO DUPLEX RECEPTACLES	T	TRANSFORMER	HN	SINGLE BED NUR
	RANGE RECEPTACLE		ENCLOSED CIRCUIT BREAKER		
$  \hspace{.08cm}   \hspace{.08cm} \otimes \hspace{.08cm}  $	SPECIAL RECEPTACLE		CABINET (TYPE INDICATED)		
⊕ G ⊕ G	DUPLEX RECEPTACLE - GROUND-FAULT CIRCUIT-INTERRUPTER	$\bowtie$	MOTOR STARTER, LIGHTING CONTACTOR		~~~~~
⊕ıG	DUPLEX RECEPTACLE - ISOLATED GROUND  DUPLEX RECEPTACLE -		SAFETY SWITCH	\ \ <b>\</b>	
₩R	WEATHER-RESISTANT GROUND-FAULT CIRCUIT-INTERRUPTER	⊠ <sub>1</sub> ∕0∕	COMBINATION MOTOR STARTER & SAFETY SWITCH MOTOR	<b>\</b>	GENER
	DUPLEX RECEPTACLE - ON APPLIANCE CIRCUIT  DUPLEX RECEPTACLE - TAMPER-RESISTANT	(J)—6 •	CORD DROP (J-BOX AT CEILING)	\ \ <b>\</b>	APPLY TO ALL
	DUPLEX RECEPTACLE - ARC-FAULT RATED		CORD DROP (SPECIAL RECEPTACLE AT CEILING)	<b>\</b>	A. COMPLETE
— ⊕м	DUPLEX RECEPTACLE - MOUNTED IN MILLWORK		MULTI-OUTLET ASSEMBLY	\ \ <b>\</b>	LUMINAIRE
⊕в	DUPLEX RECEPTACLE - MOUNTED BELOW COUNTER		FLUSH FLOOR BOX	\ \ <b>\</b>	OR IDENTIF AMOUNT O
	DUPLEX RECEPTACLE - CEILING MOUNTED	•	FLUSH POKE-THRU		DETERMIN
	DUPLEX RECEPTACLE - BOTTOM HALF SWITCHED  SPLIT-WIRE RECEPTACLE	× -	DAMPER	(	B. COORDINA
J	JUNCTION BOX	S	SOLENOID		REPRESEN OCCUPIED
				<b>\</b>	PRIOR APP
	RACE	EWAYS		}	C. REMOVE A EXISTING (
	HOME RUN TO PANEL UNSWITCHED LIGHTING CIRCUIT		TELEPHONE CONDUIT CONDUIT UP	. ح	WHERE SP EXISTING (
	MASTER SATELLITE FIXTURE CONNECTION		CONDUIT DOWN	. ح	
E	EMERGENCY CIRCUIT		CONDUIT SEAL	_ {	D. REMOVE E AS COMPLI
NL C	NIGHT LIGHTING CIRCUIT		CABLE TRAY	_ {	OWNER'S F
S	SOUND SYSTEM RACEWAY	L #"	CONDUIT SLEEVE (NUMBER INDICATES SIZE)	\ \ <b>\</b>	LOCATION. OF LAMPS
	MISCELI	LANEOUS		_ {	E. REMOVE E
$\langle \overline{XX} \rangle$	EQUIPMENT IDENTIFICATION TAG	WP	WEATHER-PROOF	_ {	WIREWAY,
		WG	WIRE GUARD	_ {	PENETRAT SHOWN RE
XXX	DETAIL REFERENCE SHEET REFERENCE	XP	EXPLOSION PROOF	<b>                                     </b>	NON-ACCE
FACP	FIRE ALARM CONTROL PANEL	30/3/10/3R	RATED AMPACITY/NO. POLES/FUSING REQ'D/NEMA ENCL. NO.	<b>,</b>   <b>&gt;</b>	LOCAL INS FLOOR OR
FAAP	FIRE ALARM ANNUNCIATOR PANEL	⊬₽x	PROJECTOR INPUT STATION - LETTER INDICATES TYPE	\ \ <b>\</b>	F. COORDINA
HOA	HAND-OFF-AUTO		PROJECTOR CONTROL STATION  LIGHT LINEWORK = EXISTING	\ \ <b>\</b>	
CCT. PART. CCT.	CIRCUIT  PARTIAL CIRCUIT		DARK/DASHED LINEWORK = DEMOLITION	\ \ <b>\</b>	G. REMOVE E COORDINA
NF	NON-FUSED		DARK LINEWORK = NEW	\ \ <b>\</b>	OCONDII W
		NICATIONS			mm
■W	TELEPHONE OUTLET - WALL MOUNTED		TELEPHONE CABINET		
#	TELEPHONE OUTLET BOX	H©	CLOCK HANGER OUTLET		
	DATA OUTLET BOX NUMBER BY SYMBOL INDICATES QUANTITY OF JACKS. ZERO	HC	CLOCK - WALL MOUNTED		
#	PHONE OUTLET BOX - CEILING MOUNTED   INDICATES EMPTY OUTLET BOX , BLANK PLATE AND CONDUIT.	C 2	CLOCK - CEILING MOUNTED (DOUBLE FACE)		
#	DATA OUTLET BOX - CEILING MOUNTED	CS	CLASSROOM CLOCK & SPEAKER		
₩AP	WIRELESS ACCESS POINT - CEILING MOUNTED	PO	PROGRAM BELL		
	COMBINATION TELEPHONE/DATA OUTLET BOX - ONE JACK EACH DATA OUTLET BOX - BLANK PLATE, 1" CONDUIT	<del></del>	INTERCOM CALL SWITCH		
M #	MICROPHONE OUTLET (NUMBER INDICATES QUANTITY)	<b>—</b> X	INTERCOM ADMINISTRATION STATION (LETTER INDICATES TYPE)		
	MICROPHONE OUTLET - WALL MOUNTED (NUMBER INDICATES QUANTITY)	—Dx	INTERCOM CLASSROOM/STAFF STATION (LETTER INDICATES TYPE)		
L #	LINE INPUT OUTLET (NUMBER INDICATES QUANTITY)	—⊗x	AUDIO/VISUAL AUXILIARY OUTLET (LETTER INDICATES TYPE)		
	LINE INPUT OUTLET - WALL MOUNTED (NUMBER INDICATES QUANTITY)	(A)	T.V. ANTENNA OUTLET		
	INTERCOM/PAGING SPEAKER - CEILING MOUNTED	HV LW	INTERCOM/PAGING VOLUME CONTROL		
	INTERCOM/PAGING SPEAKER - WALL MOUNTED	<b>├</b> ♥	SOUND SYSTEM VOLUME CONTROL		
	INTERCOM/PAGING SPEAKER HORN - WALL MOUNTED	₹ ◊	GROUND BAR NOTE: SYMBOLS SHOWN "STACKED" ON THE ELOOR PLANS		
S	SOUND SYSTEM SPEAKER - CEILING MOUNTED		NOTE: SYMBOLS SHOWN "STACKED" ON THE FLOOR PLANS INDICATE THAT THE DEVICES ARE TO BE LOCATED IN THE SAME		
	SOUND SYSTEM SPEAKER - WALL MOUNTED		OUTLET BOX AND FACEPLATE. (I.E. $\sqrt{\frac{1}{2}}$ 1)		
			·		

FIRE ALARM DESCRIPTION FIRE ALARM HORN - CEILING MOUNTED FIRE ALARM VISUAL SIGNAL - CEILING MOUNTED FIRE ALARM COMBINATION HORN/VISUAL - CEILING MOUNTED HEAT DETECTOR - FIXED TEMPERATURE (CONNECTED TO ELEVATOR RECALL) FIRE ALARM SPEAKER - CEILING MOUNTED

FIRE ALARM COMBINATION SPEAKER/VISUAL - CEILING MOUNTED FLOW SWITCH

MOTION DETECTOR

ELECTRIC STRIKE

CARD READER

DOUBLE BED NURSE CALL STATION (2 CORD SETS)

KEYPAD

TAMPER SWITCH FIRE ALARM MANUAL STATION DUCT DETECTOR REMOTE ALARM INDICATOR FAN SHUT-DOWN RELAY MAGNETIC DOOR HOLDER

FIRE ALARM HORN - WALL MOUNTED FIRE ALARM VISUAL SIGNAL - WALL MOUNTED FIRE ALARM COMBINATION HORN/VISUAL - WALL MOUNTED SMOKE BEAM DETECTOR FIRE ALARM SPEAKER - WALL MOUNTED SMOKE BEAM REFLECTOR FIRE ALARM COMBINATION SPEAKER/VISUAL - WALL MOUNTED FIRE ALARM BELL - WALL MOUNTED

**SECURITY** PUSHBUTTON STATION PUSHBUTTON STATION, 'P' INDICATES PILOT ES DOOR MONITOR SWITCH CR DOOR SWITCH DOOR BELL CHIME/BUZZER

POWER SUPPLY DOOR CONTACT SECURITY CAMERA **NURSE CALL** 

NURSE CALL DOME LIGHT EMERGENCY/NORMAL CALLS NURSE CALL ANNUNCIATOR & POWER SUPPLY EMERGENCY CALL SWITCH NURSE CALL DUTY STATION CODE BLUE STATION NURSE CALL STAFF STATION SINGLE BED NURSE CALL STATION (1 CORD SET)

DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SHOP AND OTHER APPROPRIATE DRAWINGS OR AT SITE. LAY OUT AND COORDINATE ALL WORK PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, AND CODES. VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCES FOR ALL TRADES. THIS NOTICE APPLIES TO ALL ELECTRICAL PLANS.

<b>Sheet Number</b>	Sheet Number Sheet Name									
ELECTRICAL										
E0.0	ELECTRICAL SYMBOLS LEGEND AND GENERAL NOTES									
E0.1	ELECTRICAL COM CHECK									
<b>=</b> 0.2	NORTH ELECTRICAL KEY									
E0.3	NORTHWEST ELECTRICAL KEY PLAN									
<b>E</b> 0.4	NORTH ELECTRICAL DEMOLITION PLAN									
E0.5	NORTHWEST ELECTRICAL DEMOLITION PLAN									
<b>Ξ1.1</b>	NORTH ELECTRICAL PLAN									
1.2	NORTHWEST ELECTRICAL PLAN									
<b>E</b> 6.1	ELECTRCAL DIAGRAMS AND DETAILS									
<b>E</b> 7.1	ELECTRICAL SCHEDULES									

#### GENERAL ELECTRICAL DEMOLITION NOTES

APPLY TO ALL ELECTRICAL SHEETS

NURSE CALL DOME LIGHT EMERGENCY CALLS ONLY

SMOKE DETECTOR

HEAT DETECTOR - COMBINATION

**HEAT DETECTOR - FIXED TEMPERATURE** 

SMOKE DETECTOR - DUCT MOUNTED

SMOKE DETECTOR (CONNECTED TO ELEVATOR RECALL)

A. COMPLETELY REMOVE ALL ELECTRICAL WIRING, CONDUIT, SWITCHES, DISCONNECTS, LUMINAIRES, AND ASSOCIATED ANCILLARY EQUIPMENT INDICATED BY BOLD, DASHED LINES OR IDENTIFIED BY NOTES. ITEMS INDICATED FOR REMOVAL ARE ONLY SUGGESTIVE OF THE AMOUNT OF DEMOLITION WORK INVOLVED. PERFORM A SITE INVESTIGATION TO AID IN DETERMINING THE COMPLETE EXTENT OF DEMOLITION WORK.

- B. COORDINATE AND SCHEDULE ALL NECESSARY POWER OUTAGES WITH THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH SUCH WORK SO OPERATIONS IN ADJACENT OCCUPIED PORTIONS OF THE BUILDING ARE NOT INTERRUPTED OR RESTRICTED WITHOUT PRIOR APPROVAL.
- C. REMOVE ALL EXISTING BRANCH CIRCUITS INDICATED AS COMPLETELY AS POSSIBLE. REMOVE EXISTING CONDUCTORS COMPLETELY FROM THEIR RACEWAYS AND DO NOT REUSE EXCEPT WHERE SPECIFICALLY INDICATED. WHERE AN EXISTING DEVICE IS REMOVED FROM AN EXISTING CIRCUIT, PROVIDE NEW WIRING AND MAINTAIN CONTINUITY OF EXISTING CIRCUIT.
- D. REMOVE EXISTING LUMINAIRES, LAMPS, BALLASTS, AND RELATED COMPONENTS INDICATED AS COMPLETELY AS POSSIBLE. DELIVER EQUIPMENT CONSIDERED SALVAGEABLE BY THE OWNER'S REPRESENTATIVE AND NOT SHOWN FOR REUSE TO THE OWNER'S STORAGE LOCATION. REMOVE NON-SALVAGEABLE EQUIPMENT FROM THE SITE. PROPERLY DISPOSE OF LAMPS AND BALLASTS CONSIDERED HAZARDOUS WASTE.
- E. REMOVE EXISTING SURFACE MOUNTED BOXES, CONDUIT, SURFACE METAL RACEWAY. WIREWAY, ETC. INDICATED AS COMPLETELY AS POSSIBLE. PATCH ABANDONED PENETRATIONS FROM REMOVED FASTENERS. ABANDON IN PLACE NON-ACCESSIBLE BOXES SHOWN REMOVED AND COVER WITH STAINLESS STEEL COVER PLATES. ABANDON IN PLACE NON-ACCESSIBLE CONDUIT SHOWN REMOVED AND CAP OFF IN A SUITABLE MANNER PER LOCAL INSPECTOR'S REQUIREMENTS. CHISEL RACEWAYS STUBBED FROM A CONCRETE FLOOR OR WALL 2 INCHES BELOW ADJACENT SURFACE, GROUT, AND SCREED.
- F. COORDINATE REUSED EXISTING BOX AND CONDUIT LOCATIONS WITH NEW WORK LOCATIONS.

G. REMOVE ELECTRICAL WORK AT ALL MECHANICAL EQUIPMENT SHOWN REMOVED. COORDINATE EQUIPMENT REMOVAL LOCATIONS WITH MECHANICAL DRAWINGS.

#### **GENERAL ELECTRICAL NOTES**

APPLY TO ALL ELECTRICAL SHEETS

DRAWINGS

- A. MOUNTING HEIGHTS INDICATED ARE TO CENTER OF ROUGH-IN ABOVE FINISHED FLOOR
- B. INSTALL ALL CONDUCTORS IN CONTINUOUS RACEWAY. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTOR.
- C. PROVIDE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT PHASE CONDUCTOR. EXCEPTION: WHERE AN EQUIPMENT MANUFACTURER REQUIRES A MULTIWIRE BRANCH CIRCUIT FOR ONLY ONE UTILIZATION EQUIPMENT AND WHERE ALL UNGROUNDED CONDUCTORS OF THAT CIRCUIT ARE OPENED SIMULTANEOUSLY BY THE BRANCH CIRCUIT OVERCURRENT DEVICE.
- D. CONCEAL ALL CONDUITS IN NEW WALLS, EXISTING STUD WALLS, OR ABOVE SUSPENDED
- E. WHERE CONDUIT CANNOT BE CONCEALED IN EXISTING WALL OR CEILING CAVITIES, INSTALL CONDUCTORS IN SURFACE METAL RACEWAYS; SURFACE CONDUIT OR METAL SURFACE RACEWAY AT ENGINEER'S DISCRETION.
- F. PAINT SURFACE CONDUIT IN FINISHED AREAS, WHEN ALLOWED, TO MATCH SURROUNDING SURFACES. COORDINATE FINISHES WITH ARCHITECT.
- G. METAL SURFACE RACEWAYS SHALL BE WIREMOLD #V500, #V700, OR #V2400 SERIES WITH FACTORY IVORY FINISH OR APPROVED EQUIVALENT. METAL SURFACE RACEWAYS FOR TELEVISION CABLE SHALL BE WIREMOLD #V700 OR LARGER. METAL SURFACE RACEWAYS FOR TELECOMMUNICATIONS CABLES SHALL BE #V2400 OR LARGER. COMPLY WITH EIA/TIA STANDARDS FOR CABLE BENDING RADIUS.
- H. INSTALL EXPOSED OR CONCEALED RACEWAY NEAR METAL CORRUGATED SHEET ROOF DECKING SO NEAREST OUTER RACEWAY SURFACE IS NOT LESS THAN 6 INCHES FROM THE NEAREST SURFACE OF THE ROOF DECKING. EXCEPTION: RIGID METAL CONDUIT AND INTERMEDIATE METAL CONDUIT SHALL NOT BE REQUIRED TO MAINTAIN THIS CLEARANCE.
- . PATCH, PAINT, REPAIR OR REPLACE ALL WALLS, CEILINGS, OR OTHER BUILDING ELEMENTS DISTURBED DURING INSTALLATION OF ELECTRICAL WORK.
- USE ROOM NUMBERS ASSIGNED BY OWNER AND NOT ROOM NUMBERS LISTED ON DRAWINGS FOR LABELING OF PANELBOARD DIRECTORIES, FIRE ALARM PANEL PROGRAMMING, ETC. INCLUDE A DESCRIPTION OF LOAD SUCH AS LIGHTS, RECEPTACLES, MECHANICAL UNIT LOCATIONS, ETC. ON TYPED PANELBOARD DIRECTORIES.
- K. LOCATIONS AND QUANTITIES OF OCCUPANCY SENSORS ON THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE ONLY THE ROOM/AREA CONTROLLED BY THE SENSORS. PROVIDE ADDITIONAL SENSORS AND RELATED EQUIPMENT FOR COMPLETE COVERAGE AND SWITCHING ARRANGEMENTS INDICATED.
- L. REFER TO MECHANICAL/ELECTRICAL COORDINATION SCHEDULE SHEET M FOR ADDITIONAL REQUIREMENTS ON DISCONNECTS, MOTOR STARTERS, ETC.
- M. CONNECT SMOKE AND FIRE/SMOKE DAMPERS TO 120V POWER AND CONTROL WITH FIRE ALARM SYSTEM. VERIFY EXACT QUANTITY AND LOCATION OF DAMPERS WITH MECHANICAL DRAWINGS.
- N. CONNECT ALL FIRE SPRINKLER SYSTEM FLOW, TAMPER, AND SITE PIV SWITCHES TO THE FIRE ALARM SYSTEM. COORDINATE EXACT LOCATION AND QUANTITY OF DEVICES WITH FIRE PROTECTION DRAWINGS AND FIRE SPRINKLER INSTALLER.
- O. COORDINATE LOCATION OF RECESSED LUMINAIRES, SPEAKERS, ETC. WITH FIRE RATED CEILINGS. PROVIDE ENCLOSURES TO MAINTAIN THE FIRE INTEGRITY RATING OF THE CEILING. COORDINATE EXACT LOCATIONS OF FIRE RATED CEILINGS WITH ARCHITECTURAL
- P. PROVIDE MULTIPLE WIRING CONNECTIONS AT EMERGENCY LUMINAIRES WITH GENERATOR TRANSFER DEVICE (GTD) SUCH AS: NORMAL POWER UNSWITCHED FOR SENSING, NORMAL POWER SWITCHED, AND EMERGENCY POWER UNSWITCHED. UPON NORMAL POWER FAILURE, FORCE THE EMERGENCY LUMINAIRE TO FULL ILLUMINATION VIA THE GTD UNSWITCHED EMERGENCY POWER CIRCUIT.
- Q. IN AREAS WITH PRECAST PANELS, COORDINATE INSTALLATION OF FLUSH MOUNTED DEVICE BOXES AND CONCEALED CONDUITS WITH PRECAST PANEL SUPPLIER SO ALL CONDUIT, BOXES, ETC. ARE CAST WITHIN EACH WALL SECTION. FURNISH CONDUIT AND BOXES TO PRECAST SUPPLIER FOR EMBEDMENT INTO WALLS.

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

Date 1

Questions

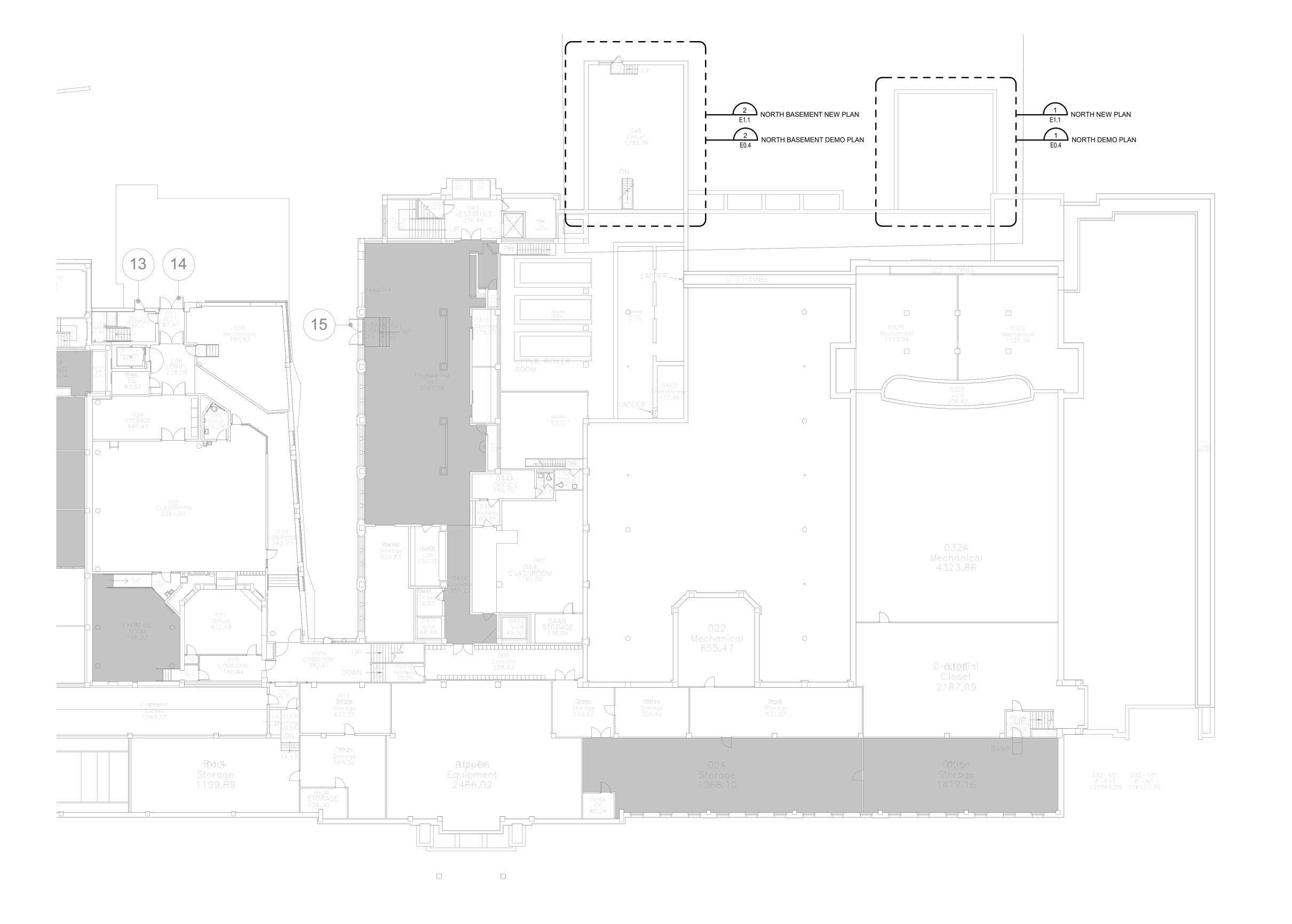
OMAHA, NE

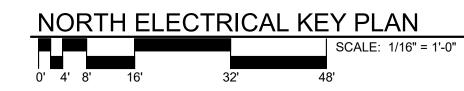
**ELECTRICAL SYMBOLS** LEGEND AND GENERAL NOTES



COPYRIGHT BDH#: 25023 This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or

construction use are prohibited by the copyright law.

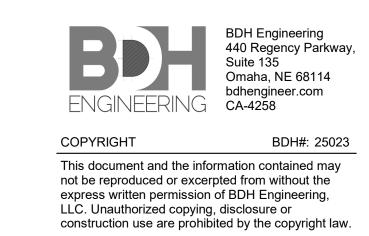




# OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTH ELECTRICAL KEY



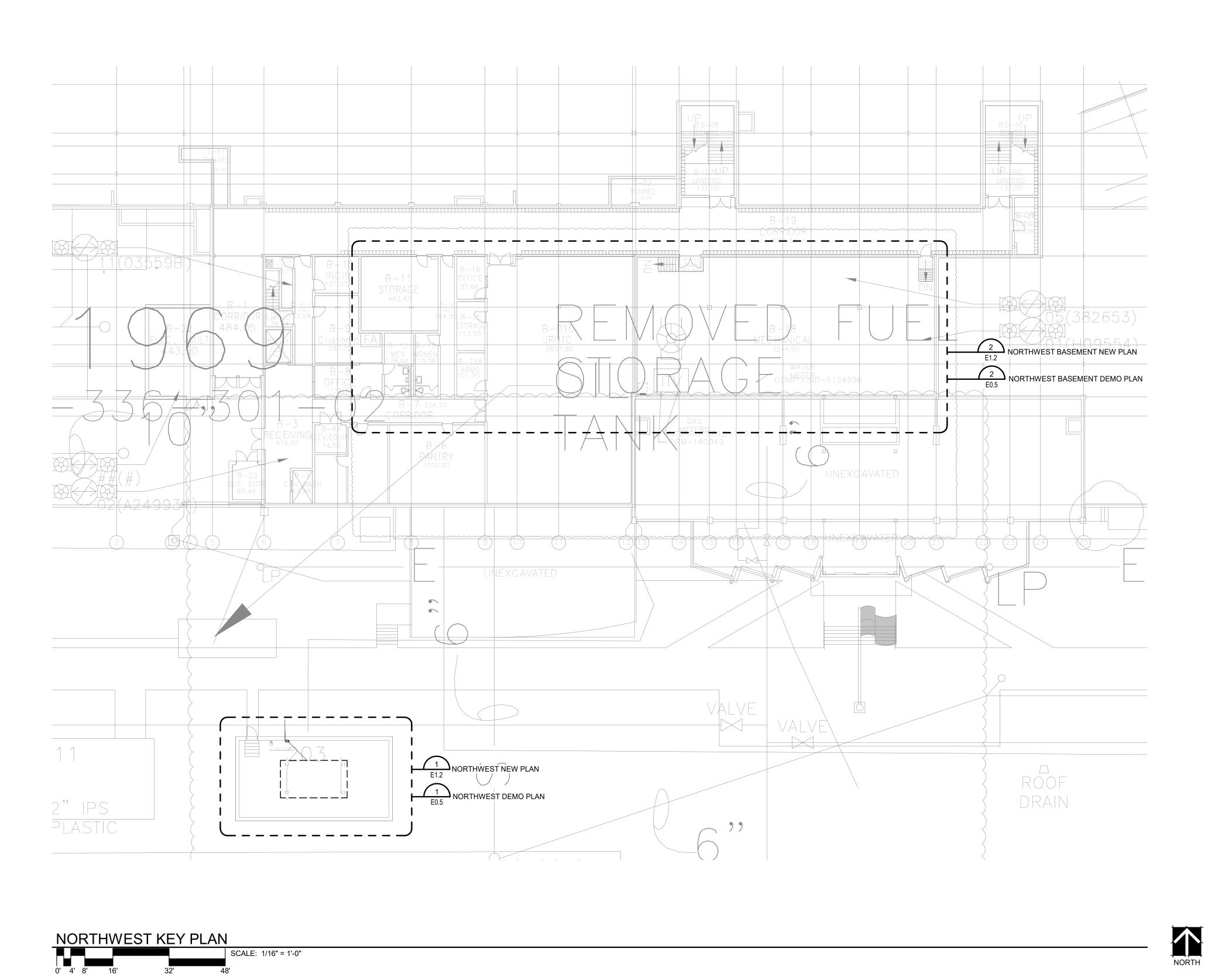


PROJECT:

DATE:

0





### OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

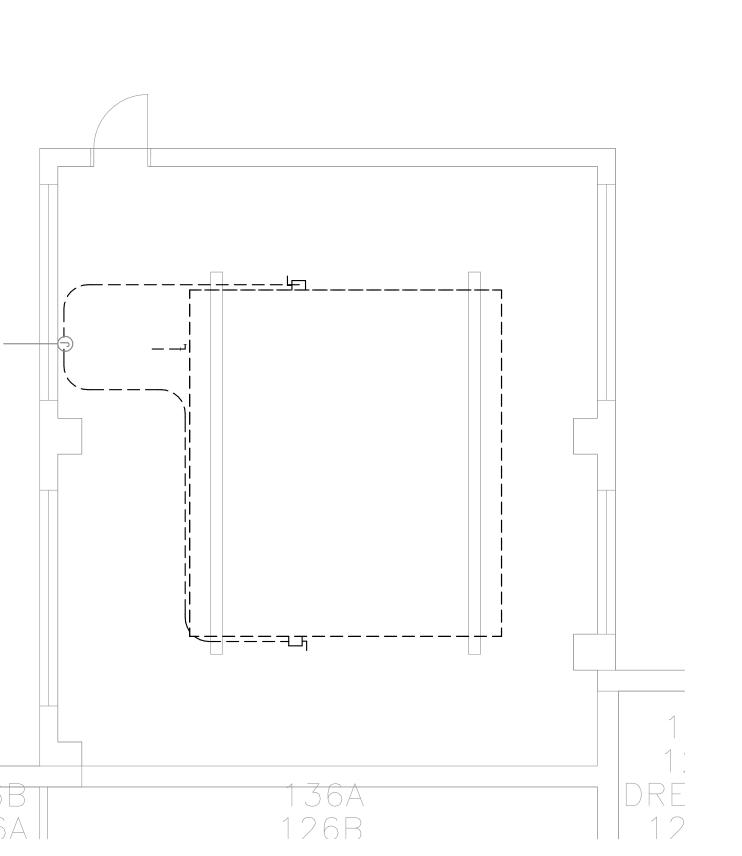
NORTHWEST ELECTRICAL **KEY PLAN** 





NORTH BASEMENT ELECTRICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"



NORTH ELECTRICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

16'

046

OPS NORTH &

NORTHWEST COOLING

TOWER REPLACEMENT

**ELECTRICAL DEMOLITION NOTES:** 

SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL DEMOLITION NOTES.

**KEYNOTES** 

OMAHA, NE

NORTH ELECTRICAL **DEMOLITION PLAN** 

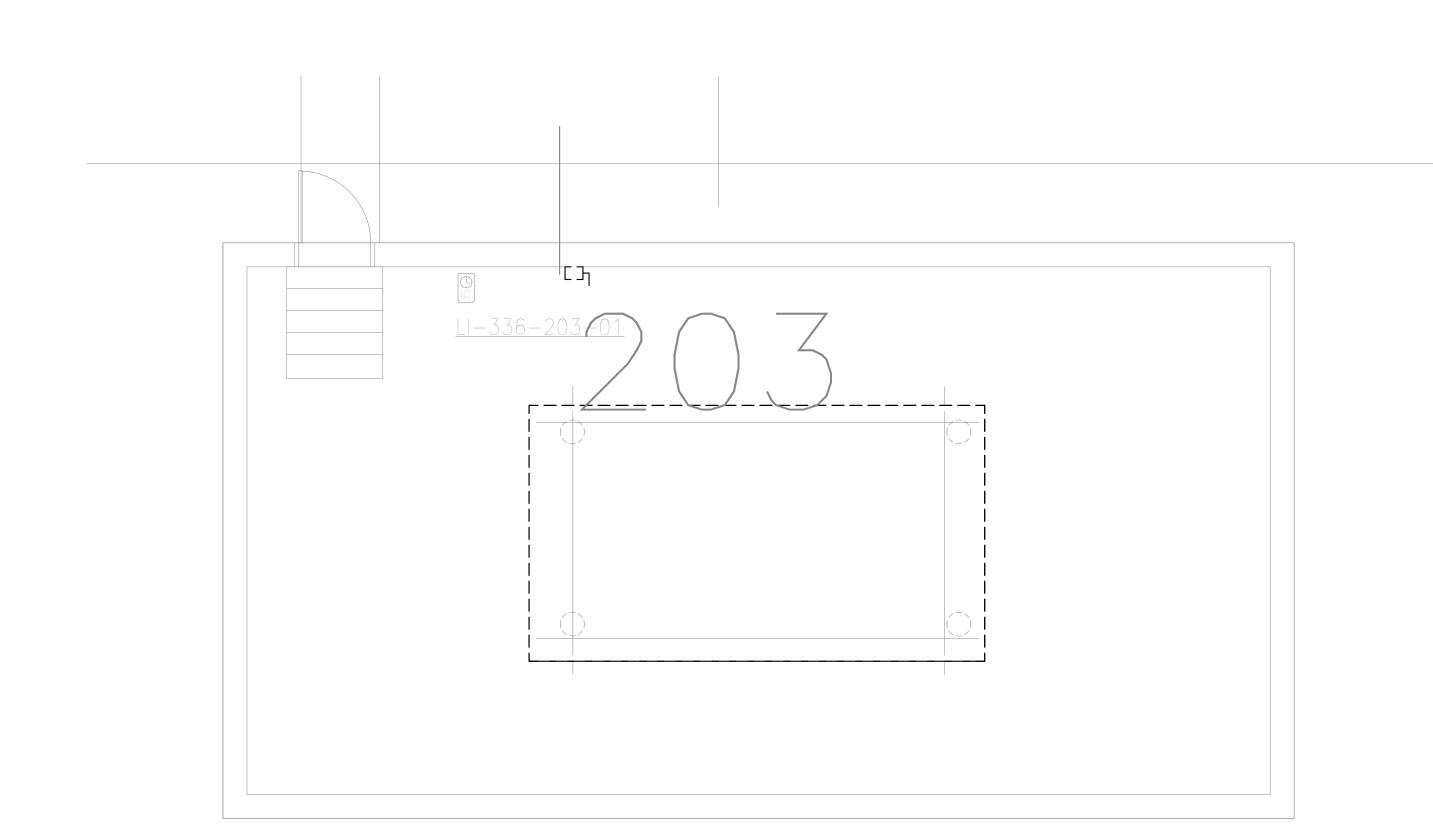
BDH Engineering
440 Regency Parkway,
Suite 135
Omaha, NE 68114
bdhengineer.com
CA-4258

COPYRIGHT This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

NORTHWEST BASEMENT ELECTRICAL DEMOLITION PLAN

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









#### **ELECTRICAL DEMOLITION NOTES:**

SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL DEMOLITION NOTES.

**KEYNOTES** 

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST ELECTRICAL DEMOLITION PLAN



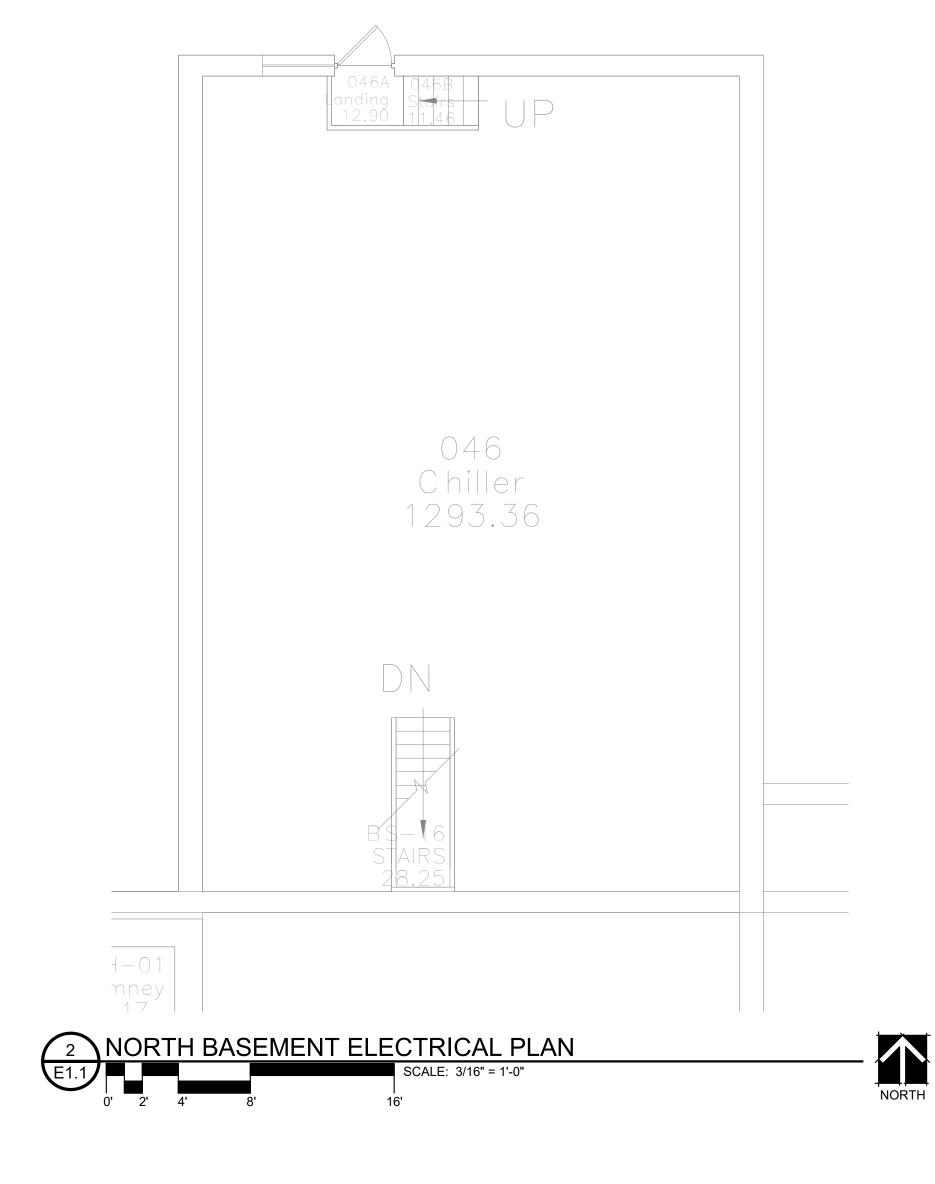
COPYRIGHT BDH#: 25023

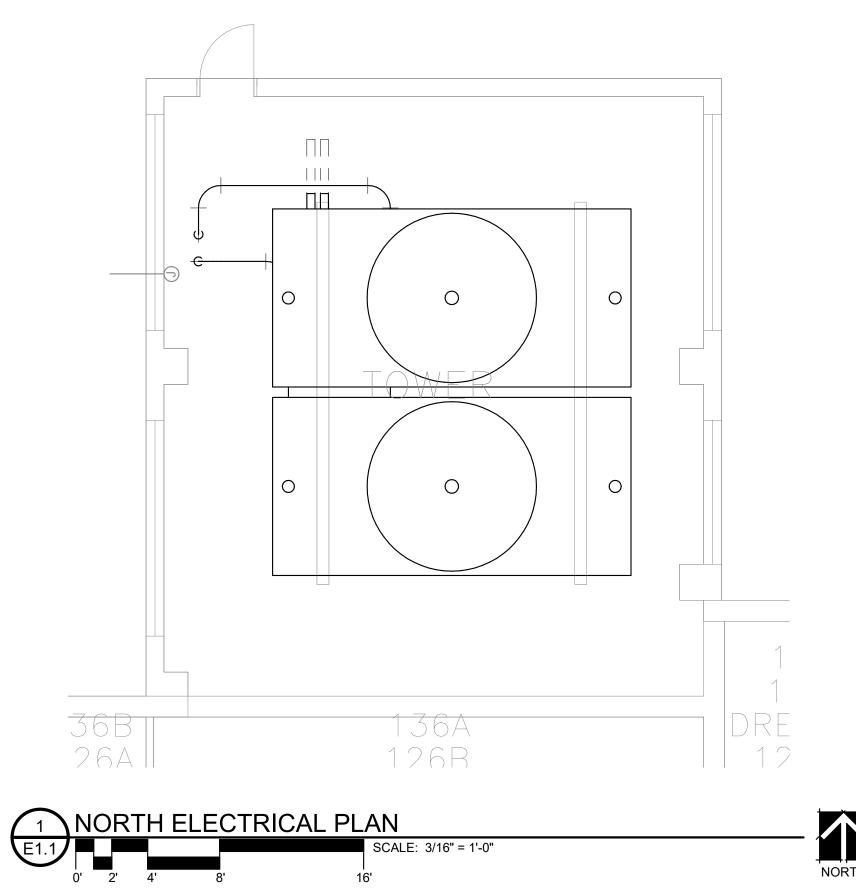
This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

CRION DE CONTROL DE CO

PROJECT:

E0.5





#### **ELECTRICAL POWER NOTES:**

SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL NOTES.
SEE MECHANICAL AND ELECTRICAL SCHEDULE ON M7.1 FOR ADDITIONAL INFORMATION ON MECHANICAL EQUIPMENT REQUIRING POWER.

**KEYNOTES** 

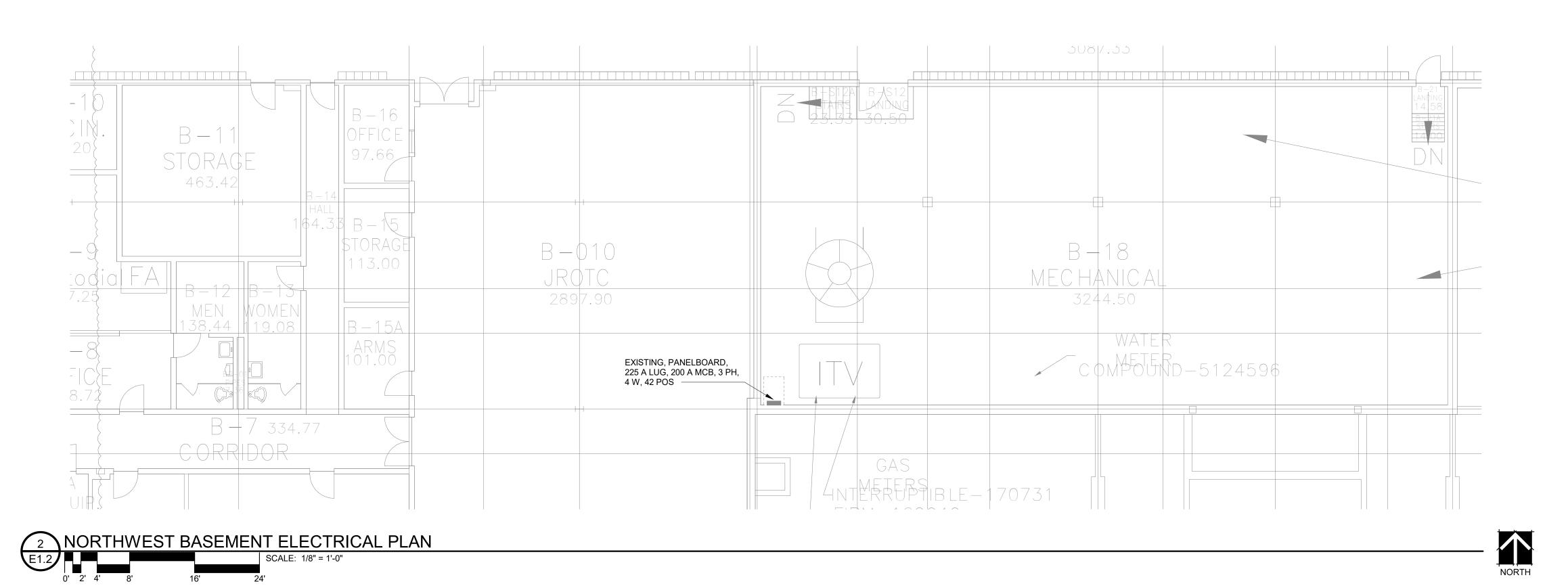
OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

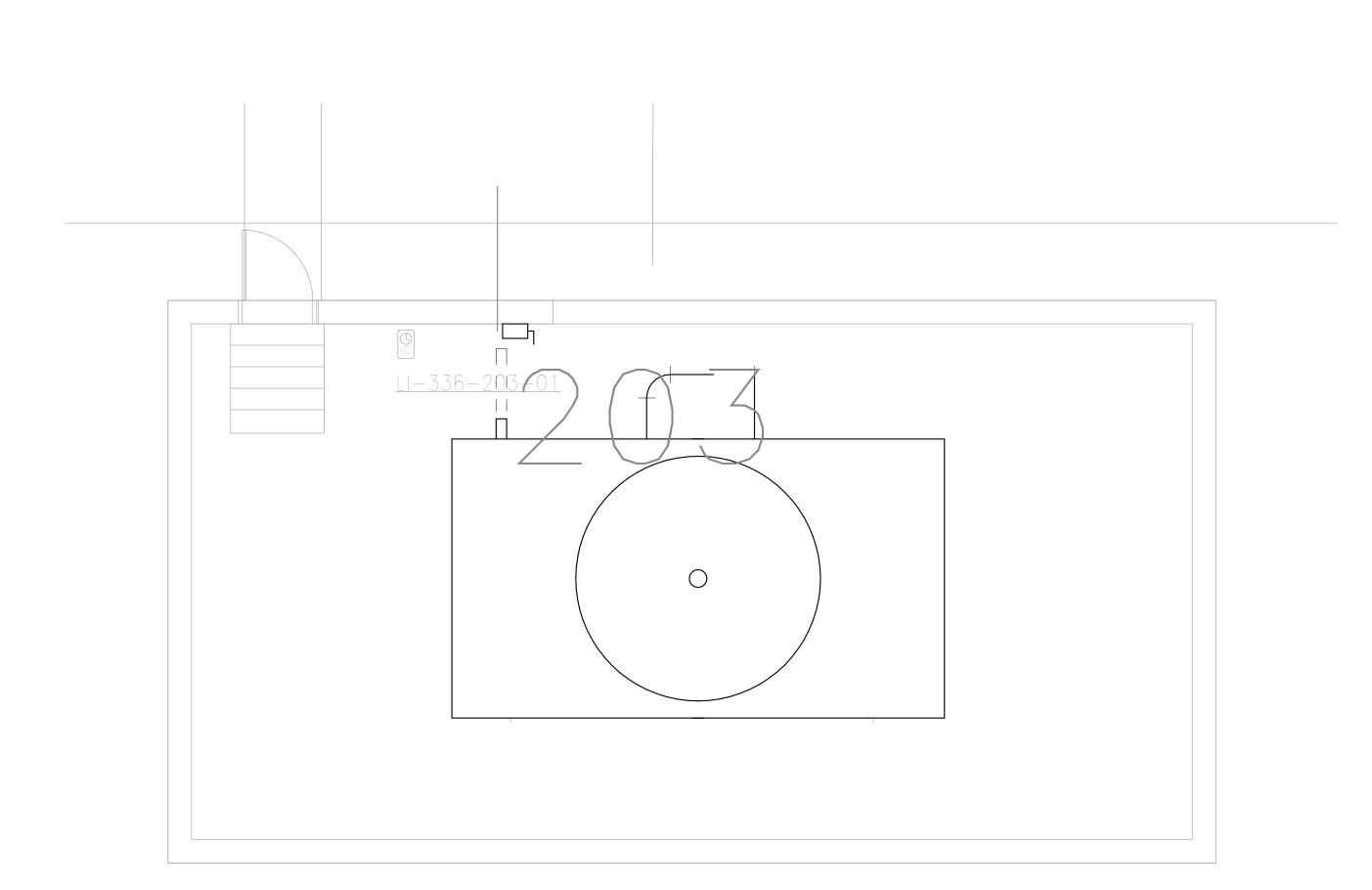
OMAHA, NE

NORTH ELECTRICAL PLAN



This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.







#### **ELECTRICAL POWER NOTES:**

REQUIRING POWER.

A. SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL NOTES.
 B. SEE MECHANICAL AND ELECTRICAL SCHEDULE ON M7.1 FOR ADDITIONAL INFORMATION ON MECHANICAL EQUIPMENT

**KEYNOTES** 

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST ELECTRICAL PLAN



COPYRIGHT

BDH#: 25023

This document and the information contained may not be reproduced or excerpted from without the express written permission of BDH Engineering, LLC. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

OROR OPERATE TO SECOND SECOND

PROJECT: 2

E1.2