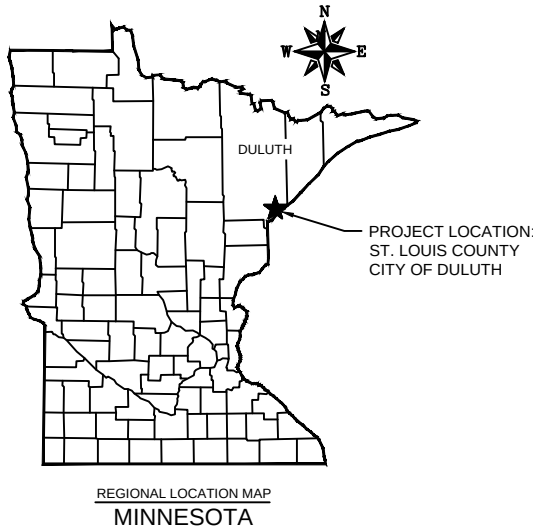


LAKEWOOD WATER TREATMENT PLANT HEATING, VENTILATION,
AND COOLING SYSTEM IMPROVEMENTS-ENGINEERING DIVISION

LOCATION: DULUTH, MN
CONSTRUCTION PLANS FOR: LAKEWOOD WATER TREATMENT PLANT
CITY PROJECT NUMBER: 1340

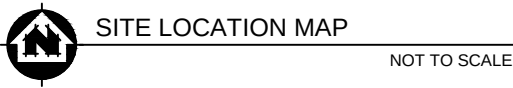


WARNING
LOCATION OF UNDERGROUND UTILITIES
TO BE VERIFIED BY CONTRACTOR
GOPHER STATE ONE CALL
CALL BEFORE DIGGING,
1-800-252-1166
REQUIRED BY LAW

NOTE:

UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR
SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO
CONSTRUCTION.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY
LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE
GUIDELINES OF C/ASCE 38-2, ENTITLED "STANDARD GUIDELINES FOR THE
COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."



GOVERNING SPECIFICATIONS

THE 2014 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION
"STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE 2014 EDITION OF THE
"MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
AVAILABLE AT: <http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2015 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT
STANDARD CONSTRUCTION SPECIFICATIONS

SHEET INDEX

SHEET NO.	DESCRIPTION
G-1-3	GENERAL SHEETS
C-1-2	CIVIL SHEETS
A-1-6	ARCHITECTURAL SHEETS
M-1.0-7.2	MECHANICAL SHEETS
PM-1-4	PROCESS MECHANICAL SHEETS
E-1-29	ELECTRICAL SHEETS
SEE COMPLETE SET LIST ON SHEET G-2	

RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

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

Eric R. Shaffer 3/7/2016 44287
PROJECT ENGINEER: ENGINEER'S NAME DATE LIC NO.



PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 2016	DRAWN BY: INIT	-	-	-	-
F.B.:	CHECKED BY: SRC	-	-	-	-
PLOT DATE: 11/14/17, P:\6105\616\00616097\CADD\Record Drawings\AutoCAD DWG's\G-1 TITLE SHEET.dwg					

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Eric R. Shaffer
MARCH 7, 2016 44287
Date License No.

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TITLE SHEET

LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

FILE NO.
00616097
SHEET
G-1

RECORD DRAWINGS

SHEET INDEX

G - GENERAL

G-1	TITLE SHEET
G-2R	SHEET INDEX <i>MODIFIED</i>
G-3	LEGEND, SYMBOLS, & ABBREVIATIONS

C - CIVIL

C-1	SITE PLAN
C-2	SITE PHOTOS

A-ARCHITECTURAL

A-1	ENLARGED FIRST FLOOR PLAN SOUTH <i>MODIFIED</i>
A-2	ENLARGED FIRST FLOOR PLAN NORTH
A-3	ENLARGED SECOND FLOOR PLAN
A-4	ROOF PLAN
A-5	SECTION AND DETAILS
A-6	DETAILS

M-MECHANICAL

M1.0	MECHANICAL SYMBOLS, & ABBREVIATIONS
M2.1	FIRST FLOOR SOUTH MECHANICAL DEMOLITION
M2.2	FIRST FLOOR NORTH MECHANICAL DEMOLITION
M2.3	SECOND FLOOR SOUTH MECHANICAL DEMOLITION
M2.4	SECOND FLOOR NORTH MECHANICAL DEMOLITION
M2.5	ROOF MECHANICAL DEMOLITION
M3.1	FIRST FLOOR SOUTH HEATING/COOLING PIPING
M3.2	FIRST FLOOR NORTH HEATING/COOLING PIPING
M3.3	SECOND FLOOR SOUTH HEATING/COOLING PIPING
M4.1	FIRST FLOOR SOUTH DUCTWORK <i>MODIFIED</i>
M4.2	FIRST FLOOR NORTH DUCTWORK
M4.3	SECOND FLOOR SOUTH DUCTWORK <i>MODIFIED</i>
M4.4	SECOND FLOOR NORTH DUCTWORK
M4.5	ROOF MECHANICAL PLAN
M5.1	MECHANICAL ROOM PARTIAL PLAN <i>MODIFIED</i>
M5.2	MECHANICAL ROOM PARTIAL PLAN <i>MODIFIED</i>
M5.3	MECHANICAL ROOM PARTIAL PLAN <i>MODIFIED</i>
M5.4	EAST ELEVATION PARTIAL PLAN
M5.5	RAPID MIX ROOM PARTIAL PLAN
M6.1	MECHANICAL DETAILS
M6.2	MECHANICAL DETAILS
M7.1	MECHANICAL EQUIPMENT SCHEDULES
M7.2	MECHANICAL EQUIPMENT SCHEDULES

PM-PROCESS MECHANICAL

PM-1	FIRST FLOOR SOUTH MECHANICAL PLAN DEMOLITION
PM-2	FIRST FLOOR SOUTH MECHANICAL PLAN
PM-3	SAMPLE PUMP PIPING DIAGRAM
PM-4	SAMPLE PUMP PIPING PHOTOS

E - ELECTRICAL

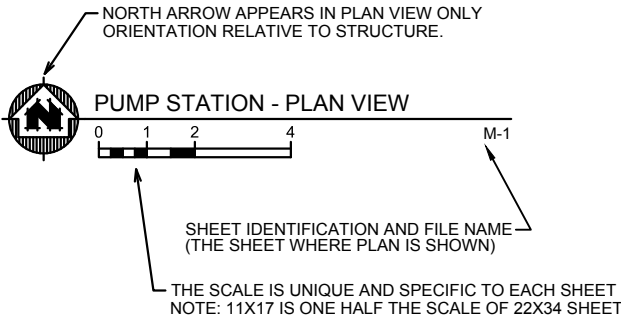
E-1	ELECTRICAL SYMBOLS, & ABBREVIATIONS
E-2	ELECTRICAL SYMBOLS, & ABBREVIATIONS
E-3R	FIRST FLOOR SOUTH ELECTRICAL DEMO
E-4	FIRST FLOOR NORTH ELECTRICAL DEMO
E-5	SECOND FLOOR SOUTH ELECTRICAL DEMO
E-6R	SECOND FLOOR NORTH ELECTRICAL DEMO
E-7R	ROOF ELECTRICAL DEMO
E-8R	FIRST FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN
E-9	FIRST FLOOR NORTH HEATING/COOLING ELECTRICAL PLAN
E-10R	SECOND FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN
E-11	FIRST FLOOR SOUTH DUCTWORK ELECTRICAL PLAN
E-12	FIRST FLOOR NORTH DUCTWORK ELECTRICAL PLAN
E-13	SECOND FLOOR SOUTH DUCTWORK ELECTRICAL PLAN
E-14R	SECOND FLOOR NORTH DUCTWORK ELECTRICAL PLAN
E-15R	ELECTRICAL ROOF PLAN
E-16R	PARTIAL ELECTRICAL PLANS
E-17R	ONE-LINE DIAGRAM
E-18R	ONE-LINE DIAGRAM NO. 2
E-19R	ONE-LINE DIAGRAM FOR POWER SUPPLY
E-20	PROCESS RISER DIAGRAM
E-21	ELECTRICAL PHOTOS
E-22R	ELECTRICAL SCHEDULES NO. 1
E-23R	ELECTRICAL SCHEDULES NO. 2
E-24R	ELECTRICAL SCHEDULES NO. 3
E-25R	ELECTRICAL SCHEDULES NO. 4
E-26R	ELECTRICAL SCHEDULES NO. 5
E-27	ELECTRICAL DETAILS NO. 1
E-28	ELECTRICAL DETAILS NO. 2
E-29	ELECTRICAL DETAILS NO. 3

DISCIPLINE IDENTIFICATION

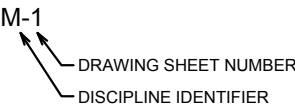
DESIGNATION	DISCIPLINE
G	GENERAL
C	SITE CIVIL
R	REMOVAL/DEMOLITION
S	STRUCTURAL
PM	MECHANICAL
PP	UTILITY PLAN & PROFILE
A	ARCHITECTURAL
M	PLUMBING/HVAC
E	ELECTRICAL

NOTE: FOR CLARITY, IN A FEW LOCATIONS PORTIONS OF WORK FOR A DISCIPLINE MAY BE SHOWN ON SHEET WITH A DIFFERENT DISCIPLINE DESIGNATION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.

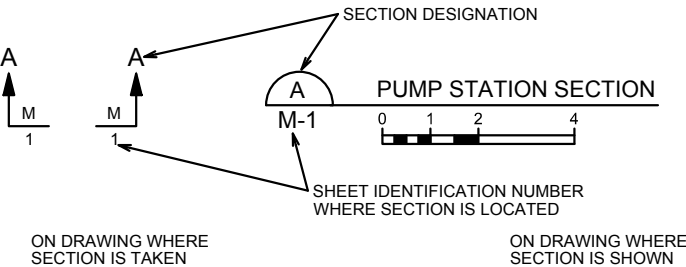
PLAN VIEW LABEL



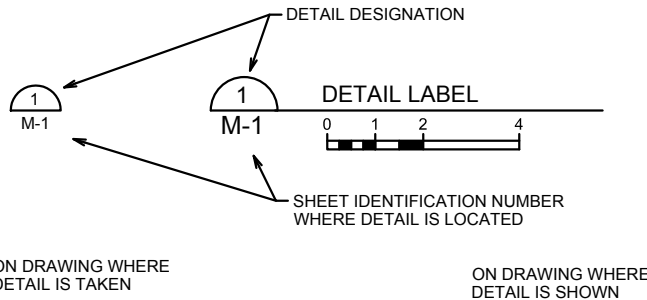
SHEET IDENTIFICATION NUMBERING EXAMPLE



SECTION DESIGNATION



DETAIL DESIGNATION



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

MSA

BY JAS
DATE 01/2017
CRS NO. XXXXX

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	3/25	ADDENDUM #1	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P1610s16100616097/CADD/Record Drawings/AutoCAD DWG's1616097 G-2.dwg	-	-	-	-	-

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Scott R. Chilson

SCOTT R. CHILSON

MARCH 25, 2016

44287

Date

License No.

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

SHEET INDEX

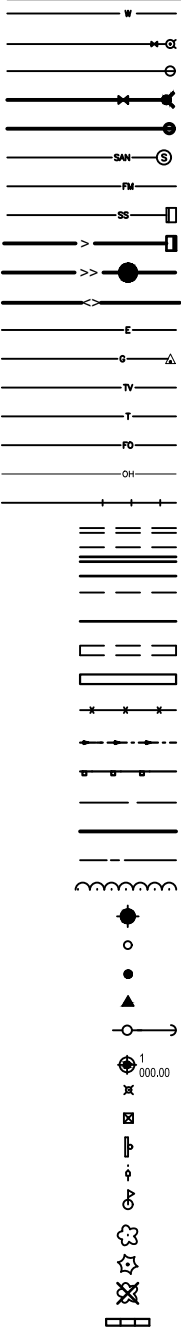
FILE NO.
00616097

SHEET
G-2R

ABBREVIATIONS

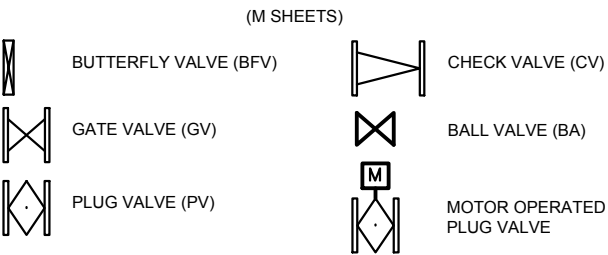
A.B.	ANCHOR BOLT	HVAC	HEATING/VENTILATING/ AIR CONDITIONING
ACOUST	ACOUSTIC(AL)	ID	INSIDE DIAMETER
A/C	AIR CONDITIONER	IE	INVERT ELEVATION
ADJ	ADJACENT	INSUL	INSULATION
A.F.F.	ABOVE FINISH FLOOR	INV	INVERT
ALT	ALTERNATE	JT	JOINT
ALUM	ALUMINUM	LAV	LAVATORY
APPROX	APPROXIMATE(LY)	LP	LOW POINT
AVG	AVERAGE	LR	LONG RADIUS
B/	BOTTOM OF	LWL	LOW WATER LEVEL
BD	BOARD	MATL	MATERIAL
BF	BLIND FLANGE	MAX	MAXIMUM
BFP	BACKFLOW PREVENTER	MECH	MECHANICAL
BIT	BITUMINOUS	MFR	MANUFACTURER
BLDG	BUILDING	MH	MANHOLE
BLK	BLOCK	MJ	MECHANICAL JOINT
BLKG	BLOCKING	MIN	MINIMUM
BM	BEAM	MO	MASONRY OPENING
BRG	BEARING	MR	MOISTURE RESISTANT
BUR	BUILT UP ROOF	MTD	MOUNTED
C.J.	CONTROL JOINT	MTL	METAL
CL	CENTERLINE	N.I.C.	NOT IN CONTRACT
CLG	CEILING	NO. or #	NUMBER
CMU	CONCRETE MASONRY UNIT	NPW	NON-POTABLE WATER
CO	CLEAN OUT	N.T.S.	NOT TO SCALE
COL	COLUMN	O.C.	ON CENTER
CONC	CONCRETE	OD	OUTSIDE DIAMETER
CONT	CONTINUOUS	OPP HD	OPPOSITE HAND
CPVC	CHLORINATED POLYVINYL CHLORIDE	P.C.	PRECAST CONCRETE
DBL	DOUBLE	P&ID	PROCESS AND INSTRUMENTATION DIAGRAM
DEG or °	DEGREE	PDF	POWER DRIVEN FASTENER
DF	DRINKING FOUNTAIN	PCP	PRESTRESSED CONCRETE PIPE
DI	DUCTILE IRON	PLBG	PLUMBING
DIA	DIAMETER	PLWD	PLYWOOD
DIM	DIMENSION	PNT.	PAINT(ED)
DIP	DUCTILE IRON PIPE	PRV	PRESSURE REDUCING VALVE
DN	DOWN	PSF	POUNDS PER SQUARE FOOT
DS	DOWN SPOUT	PSI	POUNDS PER SQUARE INCH
D.T.	DRAIN TILE	PVC	POLYVINYL CHLORIDE
DWG	DRAWING	P.T.	PRESSURE TREATED
E.I.F.S.	EXTERIOR INSULATION FINISH SYSTEM	R.C.P.	REFLECTED CEILING PLAN
EA	EACH WAY	R.D.	ROOF DRAIN
EB	ELBOW	RCP	REINFORCED CONCRETE PIPE
ECC	ECCENTRIC	REDUC	REDUCER
ELEC	ELECTRIC	REINF	REINFORCING OR REINFORCED
EL	ELEVATION	REQ'D	REQUIRED
EQ	EQUAL	RO	ROUGH OPENING
EWC	ELECTRIC WATER COOLER	SG	SLUICE GATE
EXIST	EXISTING	SIM	SIMILAR
EXP	EXPANSION	SM	SHEET METAL
EXT	EXTERIOR	SPECS	SPECIFICATIONS
F.E.	FIRE EXTINGUISHER	SQ	SQUARE
F.D.	FLOOR DRAIN	SQ FT	SQUARE FOOT
FCA	FLANGED COUPLING ADAPTOR	SR	SHORT RADIUS
FIN	FINISH(ED)	SS	SERVICE SINK
FLG	FLANGE	SST	STAINLESS STEEL
FLR	FLOOR	STD	STANDARD
FM	FLOW METER	STL	STEEL
FOC	FACE OF CONCRETE	SUSP	SUSPENDED
FOM	FACE OF MASONRY	T&G	TONGUE & GROOVE
FOS	FACE OF STUD	T/	TOP OF
FT	FOOT OR FEET	T.O.F.	TOP OF FOOTING
FTG	FOOTING	TOC	TOP OF CONCRETE
GALV	GALVANIZED	TOG	TOP OF GRATING
GC	GENERAL CONTRACTOR	TOW	TOP OF WALL
GPM	GALLON PER MINUTE	TYP	TYPICAL
GWB	GYP SUM WALL BOARD	UNEXC	UNEXCAVATED
GYP	GYP SUM	UNO	UNLESS NOTED OTHERWISE
HB	HOSE BIBB	UV	UNIT VENTILATOR
HC	HANDICAP	VERT	VERTICAL
HGT	HEIGHT	WD	WOOD
HM	HOLLOW METAL	WH	WALL HYDRANT
HORIZ	HORIZONTAL	W/	WITH
HTG	HEATING	W/O	WITH OUT
HP	HIGH POINT	WL	WATER LEVEL
HWH	HOT WATER HEATER	WT	WEIGHT
HWL	HIGH WATER LEVEL	WWM	WIRE WELDED MESH
		YR	YEAR

LEGEND



- EXISTING WATER MAIN
- EXISTING GATE VALVE & HYDRANT
- WATER SERVICE & CURB STOP
- PROPOSED WATERMAIN, VALVE, & HYDRANT
- PROPOSED WATER SERVICE & CURB STOP
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING FORCEMAIN
- EXISTING STORM SEWER & INLET
- PROPOSED STORM SEWER & INLET
- PROPOSED SANITARY MANHOLE & SEWER MAIN
- PROPOSED FORCE MAIN
- BURIED ELECTRIC
- BURIED GAS & VALVE
- BURIED CABLE TELEVISION
- BURIED TELEPHONE
- BURIED FIBER OPTICS
- OVERHEAD UTILITY
- RAILROAD TRACKS
- EXISTING CURB & GUTTER
- PROPOSED CURB & GUTTER
- EXISTING SIDEWALK
- PROPOSED SIDEWALK
- EXISTING CULVERT PIPE
- PROPOSED CULVERT PIPE
- FENCE LINE
- DRAINAGE ARROW
- SILT FENCE
- RIGHT-OF-WAY
- BASELINE
- PROPERTY LINE
- TREE LINE
- BENCHMARK
- IRON PIPE
- IRON ROD
- CONTROL POINT
- UTILITY POLE & GUY
- SOIL BORING
- LIGHT POLE
- PEDESTAL
- STREET SIGN
- MAILBOX
- FLAGPOLE
- TREE - DECIDUOUS
- TREE - CONIFEROUS
- TREE TO BE REMOVED
- EROSION BALES

PROCESS VALVE SYMBOLS

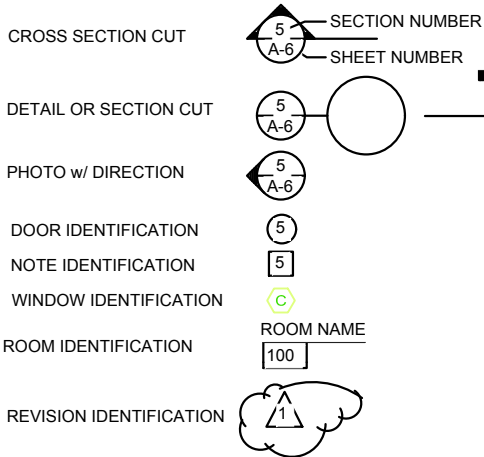


NOTE: UNDERGROUND PIPING IS SHOWN ON THE PLANS WITH FLANGED JOINTS FOR CONVENIENCE ONLY. SEE DIVISON 40- WASTEWATER PROCESS PIPING SYSTEMS OF THE SPECIFICATIONS FOR CORRECT JOINT TYPE.

PIPELINE IDENTIFIERS

AIR	AIR LOW PRESSURE
AL/FE	ALUM OR FERRIC CHEMICAL
ALK	ALKALINITY CHEMICAL
BYP	BYPASS
CHLOR	CHLORINATION CHEMICAL
CA	CAUSTIC SODA CHEMICAL
D	DRAIN
DCT	DECANT
DECHLOR	DECHLORINATION
DS	DIGESTION FLUID
EFFL	EFFLUENT
FEI	FLOW EQUALIZATION INFLUENT
FER	FLOW EQUALIZATION RETURN
FM	FORCEMAIN
G	GAS
HYPH	HYPOCHLORITE
INFL	INFLUENT
ML	MIXED LIQUOR
NG	NATURAL GAS
NPW	NON-POTABLE WATER
OF	OVERFLOW
OXD	OXIDATION DITCH
PLE	PLANT EFFLUENT WATER
POL	POLYMER CHEMICAL
RAS	RETURN ACTIVATED SLUDGE
RYC	RECYCLE
RET	RETURN SIDESTREAM
RW.SAN	RAW WASTEWATER
SAM	SAMPLE
SCE	SECONDARY EFFLUENT
SEL	SELECTOR TANK
SI	SECONDARY INFLUENT
SS	STORM SEWER
TWAS	THICKENED WAS
V	VENT
W	POTABLE WATER
WAS	WASTE ACTIVATED SLUDGE

ARCHITECTURAL SYMBOLS



GENERAL NOTES

- FOR CLARITY, IN A FEW INSTANCES WORK FOR A DISCIPLINE MAY BE SHOWN ON A SHEET WITH A DIFFERENT DISCIPLINE SHEET DESIGNATION. THE GENERAL CONTRACTOR IS REQUIRED TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
- REFER TO ELECTRICAL DRAWINGS AND SCHEDULES FOR WORK REQUIRED FOR ALL ELECTRICAL AND CONTROL DEVICES.

DEMOLITION GENERAL NOTES

- THE GENERAL CONTRACTOR SHALL COORDINATE AND PROVIDE ALL DEMOLITION AND REMOVAL OF DEBRIS NECESSARY TO ACCOMMODATE NEW CONSTRUCTION.
- DEMOLITION PLAN IS PROVIDED AS AN AID IN PLANNING AND DOES NOT RELIVE CONTRACTORS RESPONSIBILITY TO FILED VERIFY THE EXISTING JOB SITE.
- DEMOLITION PLAN SHALL BE USED IN CONJUNCTION WITH THE REMAINDER OF THE SHEETS IN THIS SET.
- REMOVED EXISTING CONCRETE SLABS AS REQUIRED FOR PROCESS MECHANICAL, HVAC, AND ELECTRICAL WORK.
- ALL AREAS, FINISHED, AND ITEMS NOT REQUIRING DEMOLITION MUST BE PROTECTED DURING DEMOLITION AND CONSTRUCTION WORK.
- REFERENCE HVAC AND ELECTRICAL SHEETS FOR ADDITIONAL ITEMS TO BE REMOVED AND OR RELOCATED.
- PRIOR TO START OF DEMOLITION WORK, VERIFY WITH THE OWNER ALL ITEMS TO BE TURNED OVER TO THE OWNER. ALL OTHER ITEMS TO BE REMOVED SHALL BE RESPONSIBILITY OF THE GC.

RECORD DRAWINGS

REVISED TO CONFORM TO CONSTRUCTION RECORDS PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-
PLOT DATE:	11/14/17	P:1610s(61600616097)CADDRecord Drawings\AutoCAD DWG's\G-3 LEGEND, SYMBOLS, & ABBREVIATIONS.dwg	-	-	-	-

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Scott R. Chilson
SCOTT R. CHILSON

MARCH 7, 2016
Date

44287
License No.



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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

LEGEND SYMBOLS & ABBREVIATIONS

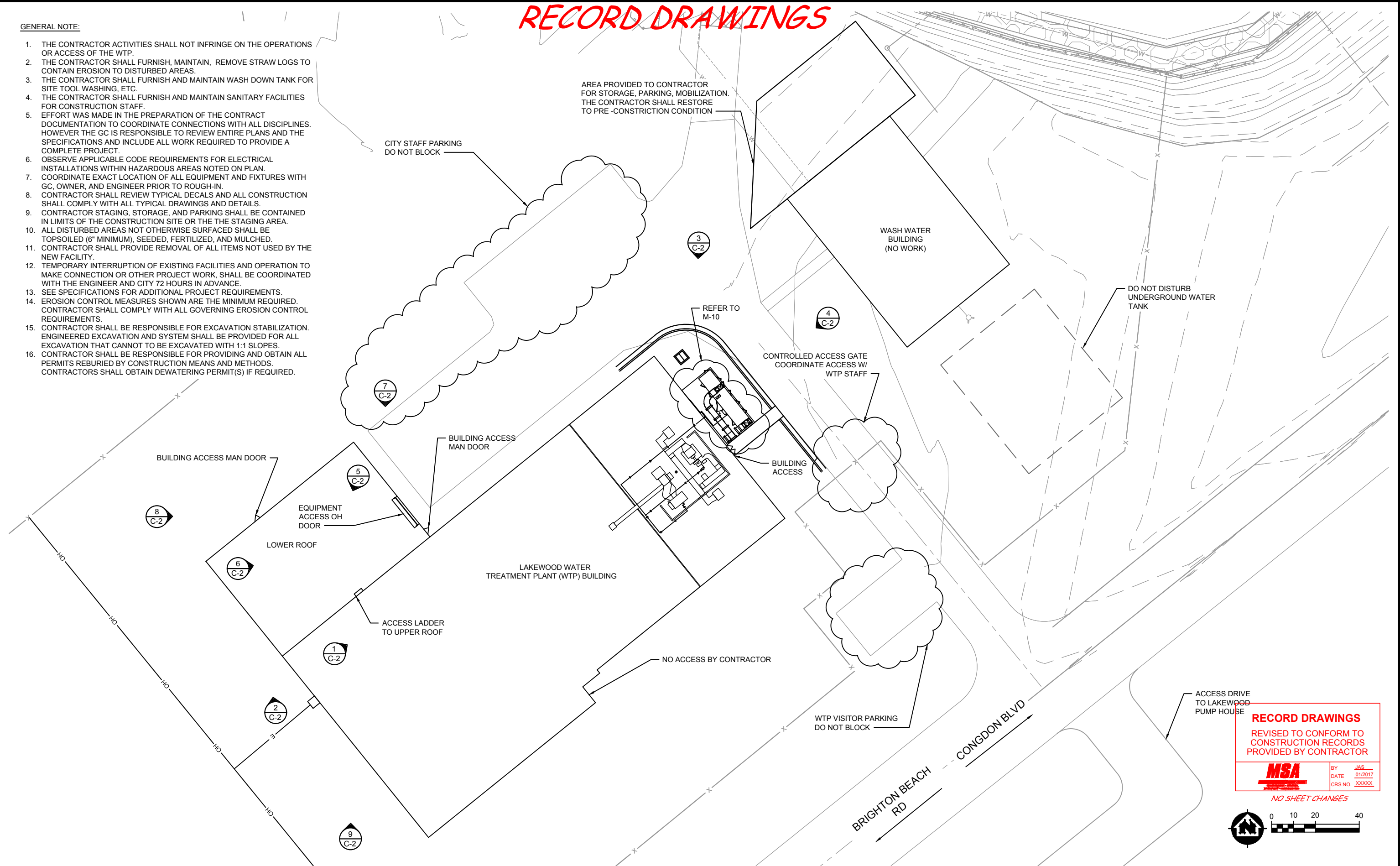
FILE NO.
00616097

SHEET
G-3

GENERAL NOTE:

1. THE CONTRACTOR ACTIVITIES SHALL NOT INFRINGE ON THE OPERATIONS OR ACCESS OF THE WTP.
2. THE CONTRACTOR SHALL FURNISH, MAINTAIN, REMOVE STRAW LOGS TO CONTAIN EROSION TO DISTURBED AREAS.
3. THE CONTRACTOR SHALL FURNISH AND MAINTAIN WASH DOWN TANK FOR SITE TOOL WASHING, ETC.
4. THE CONTRACTOR SHALL FURNISH AND MAINTAIN SANITARY FACILITIES FOR CONSTRUCTION STAFF.
5. EFFORT WAS MADE IN THE PREPARATION OF THE CONTRACT DOCUMENTATION TO COORDINATE CONNECTIONS WITH ALL DISCIPLINES. HOWEVER THE GC IS RESPONSIBLE TO REVIEW ENTIRE PLANS AND THE SPECIFICATIONS AND INCLUDE ALL WORK REQUIRED TO PROVIDE A COMPLETE PROJECT.
6. OBSERVE APPLICABLE CODE REQUIREMENTS FOR ELECTRICAL INSTALLATIONS WITHIN HAZARDOUS AREAS NOTED ON PLAN.
7. COORDINATE EXACT LOCATION OF ALL EQUIPMENT AND FIXTURES WITH GC, OWNER, AND ENGINEER PRIOR TO ROUGH-IN.
8. CONTRACTOR SHALL REVIEW TYPICAL DECALS AND ALL CONSTRUCTION SHALL COMPLY WITH ALL TYPICAL DRAWINGS AND DETAILS.
9. CONTRACTOR STAGING, STORAGE, AND PARKING SHALL BE CONTAINED IN LIMITS OF THE CONSTRUCTION SITE OR THE THE STAGING AREA.
10. ALL DISTURBED AREAS NOT OTHERWISE SURFACED SHALL BE TOPSOILED (6" MINIMUM), SEEDED, FERTILIZED, AND MULCHED.
11. CONTRACTOR SHALL PROVIDE REMOVAL OF ALL ITEMS NOT USED BY THE NEW FACILITY.
12. TEMPORARY INTERRUPTION OF EXISTING FACILITIES AND OPERATION TO MAKE CONNECTION OR OTHER PROJECT WORK, SHALL BE COORDINATED WITH THE ENGINEER AND CITY 72 HOURS IN ADVANCE.
13. SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS.
14. EROSION CONTROL MEASURES SHOWN ARE THE MINIMUM REQUIRED. CONTRACTOR SHALL COMPLY WITH ALL GOVERNING EROSION CONTROL REQUIREMENTS.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR EXCAVATION STABILIZATION. ENGINEERED EXCAVATION AND SYSTEM SHALL BE PROVIDED FOR ALL EXCAVATION THAT CANNOT TO BE EXCAVATED WITH 1:1 SLOPES.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND OBTAIN ALL PERMITS REBURIED BY CONSTRUCTION MEANS AND METHODS. CONTRACTORS SHALL OBTAIN DEWATERING PERMIT(S) IF REQUIRED.

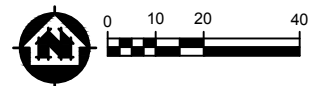
RECORD DRAWINGS



RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

MSA
BY: JAS
DATE: 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



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SCOTT R. CHILSON
MARCH 7, 2016
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

SITE PLAN

FILE NO.
00616097
SHEET
C-1

RECORD DRAWINGS



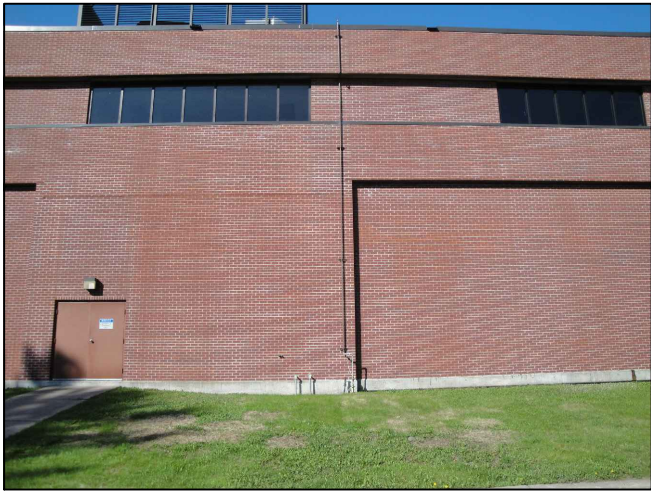
1 WTP UPPER ROOF



2 WTP WEST WALL



3 WTP NE WALL



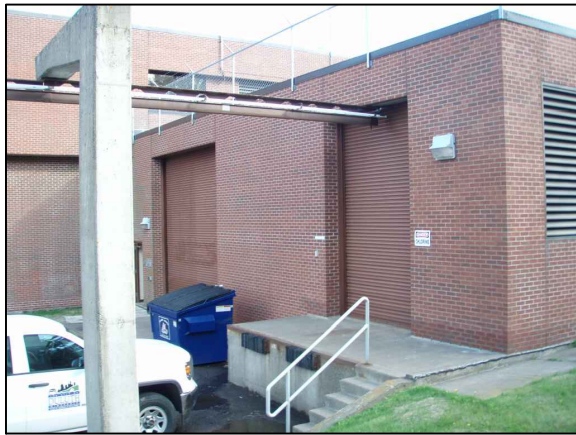
4 WTP EAST EXTERIOR



5 WTP LOWER ROOF



6 WTP LOWER ROOF



7 WTP WEST WALL AND LOADING DOCK



8 WTP NORTH WALL



9 WTP WEST WALL

RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P1610s16100616097CADDRecord Drawings\AutoCAD DWG's1616097 CITE PHOTOS.dwg	-	-	-	-	-

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Scott R. Chilson
SCOTT R. CHILSON
MARCH 7, 2016
Date
44287
License No.

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CITY OF DULUTH
DULUTH, MINNESOTA

SITE PHOTOS

FILE NO.
00616097
SHEET
C-2

DEMOLITION GENERAL NOTES

- A. THE CONTRACTOR SHALL COORDINATE AND PROVIDE ALL DEMOLITION AND REMOVAL OF DEBRIS NECESSARY TO ACCOMMODATE NEW CONSTRUCTION.
- B. DEMOLITION PLAN IS PROVIDED AS AN AID IN PLANNING AND DOES NOT RELIEVE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE EXISTING JOB SITE.
- C. ALL AREAS, FINISHES AND ITEMS NOT REQUIRING DEMOLITION MUST BE PROTECTED DURING DEMOLITION AND CONSTRUCTION WORK.
- D. CONTRACTOR SHALL FIELD VERIFY EXISTING DIMENSIONS, ELEVATIONS, PIPE INVERTS, CONDITIONS, ETC.
- E. PRIOR TO START OF DEMOLITION WORK, VERIFY W/ THE OWNER ALL ITEMS TO BE TURNED OVER TO THE OWNER. DISPOSAL OF ALL OTHER ITEMS TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- F. PROVIDE ALL TEMPORARY SHORING AS REQUIRED TO SUPPORT STRUCTURES AND FINISHES TO REMAIN.
- G. IDENTIFY ALL EXISTING SUPPORT STRUCTURE AND LEAVE INTACT. NOTIFY ENGINEER WITH ANY CONFLICTS TO THE NEW CONSTRUCTION.
- H. CORE DRILL OR SAW-CUT OPENINGS THROUGH EXISTING MASONRY OR CONCRETE TO REMAIN; OTHER METHODS ARE NOT ACCEPTABLE.
- I. EXISTING BRICK REMOVED FOR NEW WORK SHALL BE SALVAGED, CLEANED, AND SAVED FOR REINSTALLATION.

GENERAL NOTES

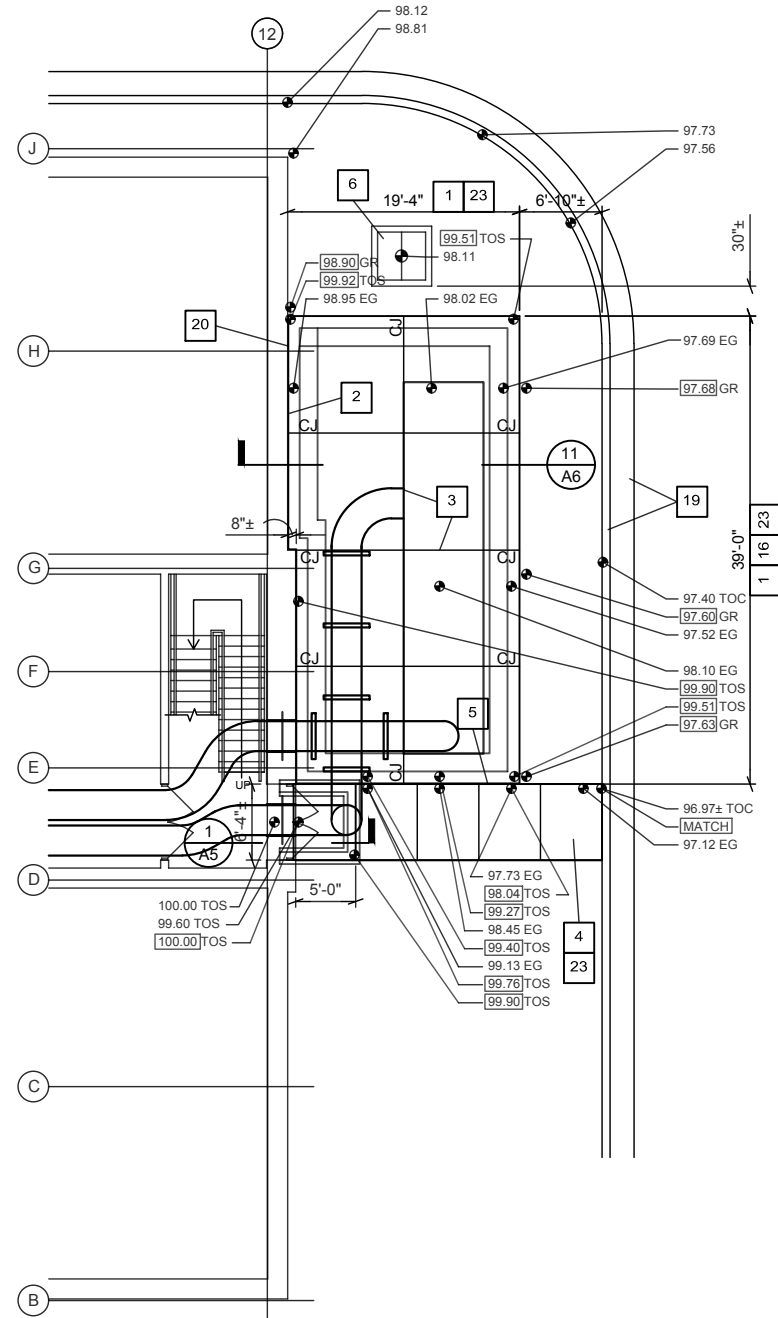
- A. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ENGINEER BEFORE CONTINUING WITH CONSTRUCTION.
- B. ALL DIMENSIONING IS TO FACE OF CONCRETE OR CMU.
- C. ALL ITEMS NOT LABELED AS EXISTING ARE NEW.
- D. OPENINGS FOR DUCTWORK IN WALLS AND FLOORS SHALL BE PROVIDED BY CONTRACTOR. LOCATION AND SIZE OF THESE OPENINGS SHALL BE THE RESPONSIBILITY OF THE HVAC CONTRACTOR.
- E. EXTERIOR WALL AND RELATED EXTERIOR OPENINGS SHALL BE FLASHED AND CAULKED. ALL ROOFING PENETRATIONS SHALL BE FLASHED BY THE ROOFING CONTRACTOR.
- F. ALL NEW INTERIOR EXPOSED ANCHORS AND CONDUIT SHALL BE PAINTED, UNO.
- G. CONTRACTOR SHALL USE SALVAGED BRICK AT NEW EXTERIOR WALL PENETRATIONS.
- H. PATCH HOLES LEFT IN EXISTING WALLS, CEILING, FLOOR, ETC. FROM ITEMS REMOVED W/ MATERIAL TO MATCH EXISTING CONSTRUCTION. TOUCH-UP PAINT.

LEGEND

- SPOT ELEVATION
- 97.56 EXISTING ELEVATION
- 97.60 PROPOSED ELEVATION
- TOC TOP OF CURB
- TOS TOP OF SLAB
- EG EXISTING GRADE
- GR PROPOSED GRADE

PLAN NOTES

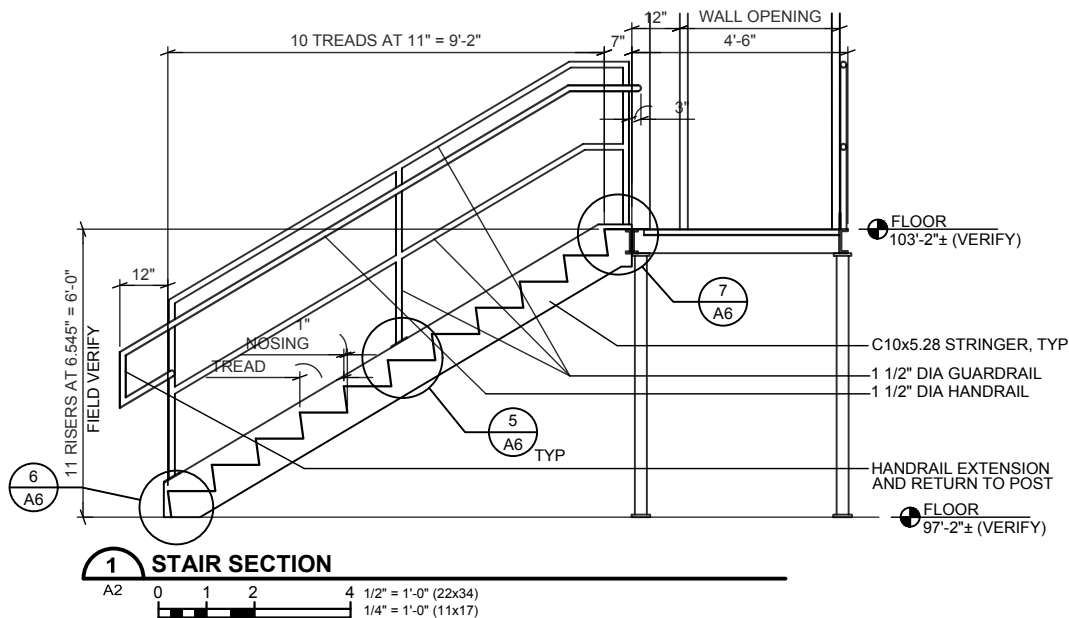
- 1 CONCRETE SLAB w/ THICKENED EDGES AND BROOM FINISH. SEE DETAIL 11/A6 FOR CONSTRUCTION REQUIREMENTS.
- 2 1/2" EXPANSION JOINT MATERIAL w/ REMOVABLE CAP AND SELF-LEVELING SEALANT AT SLAB/ BUILDING JOINT
- 3 SLAB CONTROL/CONSTRUCTION JOINT (CJ) LOCATION, TYP - SEE DETAIL 4/A6
- 4 CONCRETE SIDEWALK BROOM FINISH w/ TOOLED CONTROL JOINTS AS SHOWN - SEE DETAIL 2/A5
- 5 1/2" EXPANSION JOINT MATERIAL w/ REMOVABLE CAP AND SELF-LEVELING SEALANT AT SLAB/ SIDEWALK JOINT, TYP
- 6 EXISTING ELECTRIC VAULT - FIELD VERIFY LOCATION. DO NOT DISTURB.
- 7 DEHUMIDIFIER - VERIFY SIZE w/ EQUIPMENT SUPPLIER
- 8 DISTANCE AS DETERMINED BY HVAC CONTRACTOR
- 9 DUCTWORK HUNG FROM CEILING - SEE HVAC
- 10 DUCTWORK UP THROUGH FLOOR ABOVE - SEE SECOND FLOOR PLAN FOR CONTINUATION
- 11 TOPSOIL AND SEED ALL DISTURBED AREA
- 12 REMOVE EXISTING MASONRY FULL WIDTH ABOVE DOORS, FROM BELOW DUCT TO UNDERSIDE OF EXISTING CONCRETE STRUCTURE ABOVE.
- 13 LINTEL FOR DUCT PENETRATION THROUGH EXTERIOR WALL, TYP - SEE DETAIL 8/A5
- 14 EQUIPMENT BASE SUPPORTS SPACED AT 5'-0" OC MAX - SEE DETAIL 8/A6
- 15 PIPE SUPPORT FOR DUCT, TYP. SPACE AT 5'-0" OC MAX. DO NOT INSTALL AT LOCATIONS WHICH WILL INTERFERE W/ EQUIPMENT ACCESS PANELS - COORDINATE W/ HVAC CONTRACTOR. SEE DETAIL 7/A5.
- 16 LENGTH REQUIRED SHALL BE VERIFIED W/ HVAC CONTRACTOR (BASED REQUIREMENTS LISTED ON FLOOR PLAN)
- 17 PAINT EAST WALL FULL HEIGHT, MATCH EXISTING COLOR
- 18 PAINT CEILING, THIS ROOM - MATCH EXISTING COLOR
- 19 EXISTING CONCRETE CURB AND GUTTER - TO REMAIN
- 20 EXISTING CONCRETE BRICK LEDGE HAS 1" CHAMFER ON OUTSIDE EDGE - FIELD VERIFY. TOP OF SLAB SHALL BE FLUSH W/ BOTTOM OF EXISTING CHAMFER - ADJUST GRADES AS NECESSARY.
- 21 EXISTING GAS LINE TO BE MOVED BY OWNER (NIC)
- 22 EXISTING CONDUIT/JUNCTION BOX TO REMAIN
- 23 COMPACT EXISTING SOILS IN PLACE w/ BACKHOE MOUNTED COMPACTOR BEFORE PLACEMENT OF FILL MATERIALS



RECORD DRAWINGS

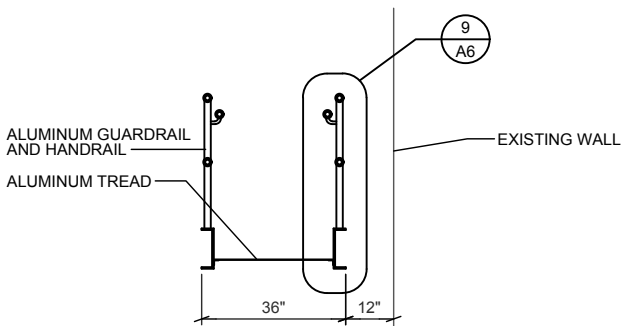
PLAN NOTES

- 1 ALUM TUBE COLUMN w/ BASE PLATE - SEE DETAIL 10/A6
- 2 ALUM STAIR, PLATFORM AND RAILING, TYP
- 3 PAINT EXISTING MASONRY WALLS, FULL HEIGHT, ENTIRE ROOM. MATCH EXISTING COLOR.
- 4 PAINT ENTIRE EXISTING MASONRY AND CONCRETE WALL, FULL HEIGHT. MATCH EXISTING COLOR.
- 5 EXISTING MECHANICAL ROOM 217 ON FLOOR ABOVE IN NORTHWEST CORNER. PREP AND PAINT EXISTING MASONRY WALLS, FULL HEIGHT, ENTIRE ROOM. MATCH EXISTING COLOR.
- 6 SAW-CUT EXISTING MASONRY WALL FOR DUCT PENETRATION. COORDINATE SIZE AND LOCATION w/ HVAC CONTRACTOR. INFILL AROUND DUCT w/ MASONRY. INSTALL BACKER ROD AND SEALANT AROUND DUCT PERIMETER - BOTH SIDES.
- 7 INFILL EXISTING OPENING (60"x24" - VERIFY) w/ MASONRY TO MATCH EXISTING. PAINT. SEE HVAC FOR LOCATION AND SIZE.
- 8 REMOVE EXISTING CONCRETE PAD AT REMOVED HVAC EQUIPMENT - SEE HVAC FOR LOCATION
- 9 3 1/2" HIGH CONCRETE HOUSEKEEPING PAD FOR NEW HVAC EQUIPMENT - SEE HVAC FOR LOCATION AND SIZE



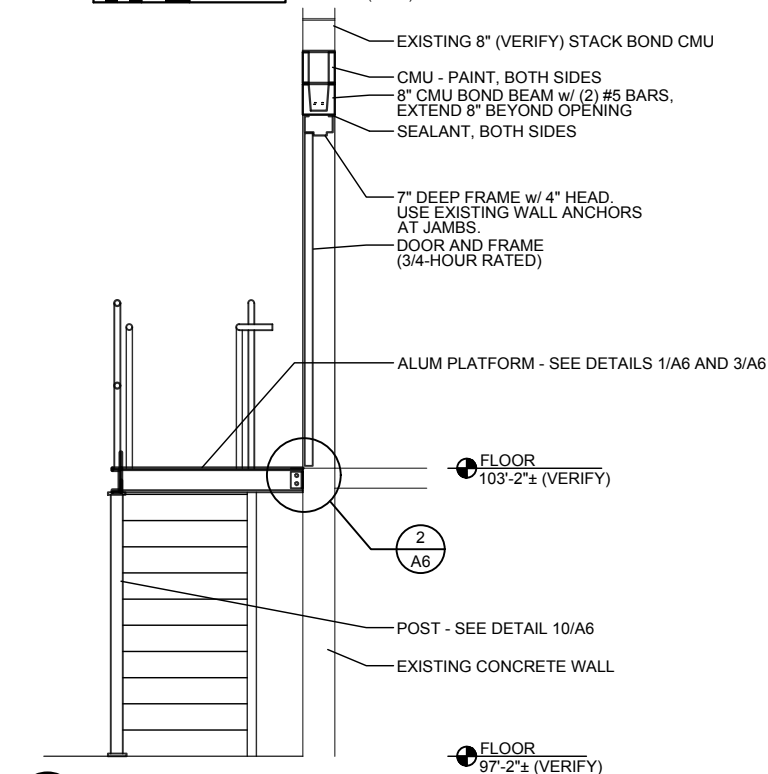
1 STAIR SECTION

A2 0 1 2 4 1/2" = 1'-0" (22x34)
1/4" = 1'-0" (11x17)



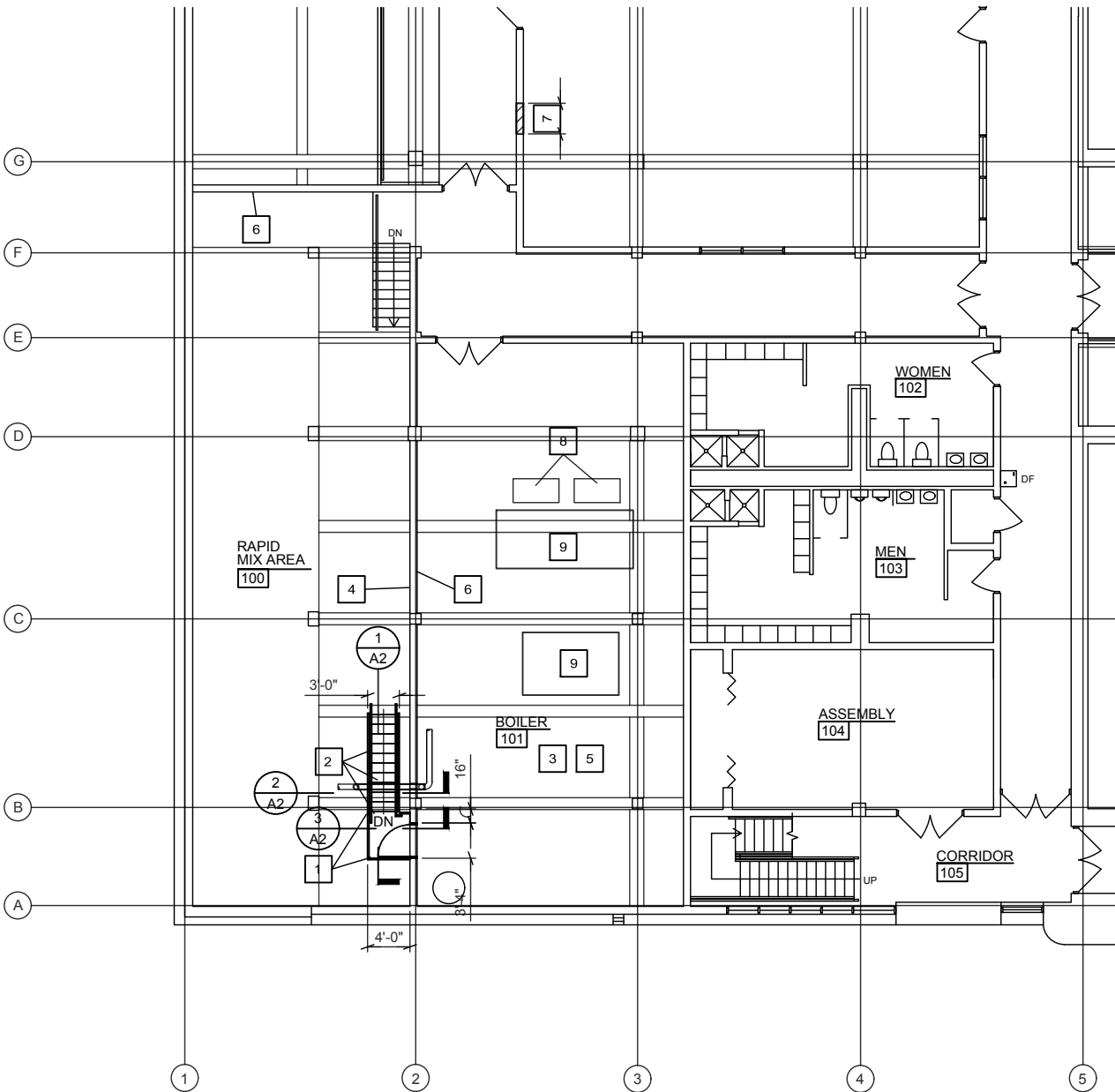
2 STAIR SECTION

A2 0 1 2 4 1/2" = 1'-0" (22x34)
1/4" = 1'-0" (11x17)



3 STAIR PLATFORM SECTION

A2 0 1 2 4 1/2" = 1'-0" (22x34)
1/4" = 1'-0" (11x17)



ENLARGED PARTIAL FIRST FLOOR PLAN

0 4 8 16 1/8" = 1'-0" (22x34)
1/16" = 1'-0" (11x17)

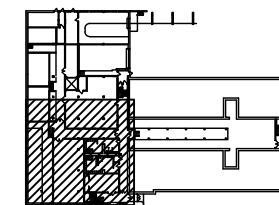
RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS.
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN

PROJECT NO:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:					
		CHECKED BY:					
P:\610s\616\00616097\CADD\Construction Documents							
PLOT DATE:							

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ALLEN J. SZYMANSKI

03/07/16

20405

Date License No.



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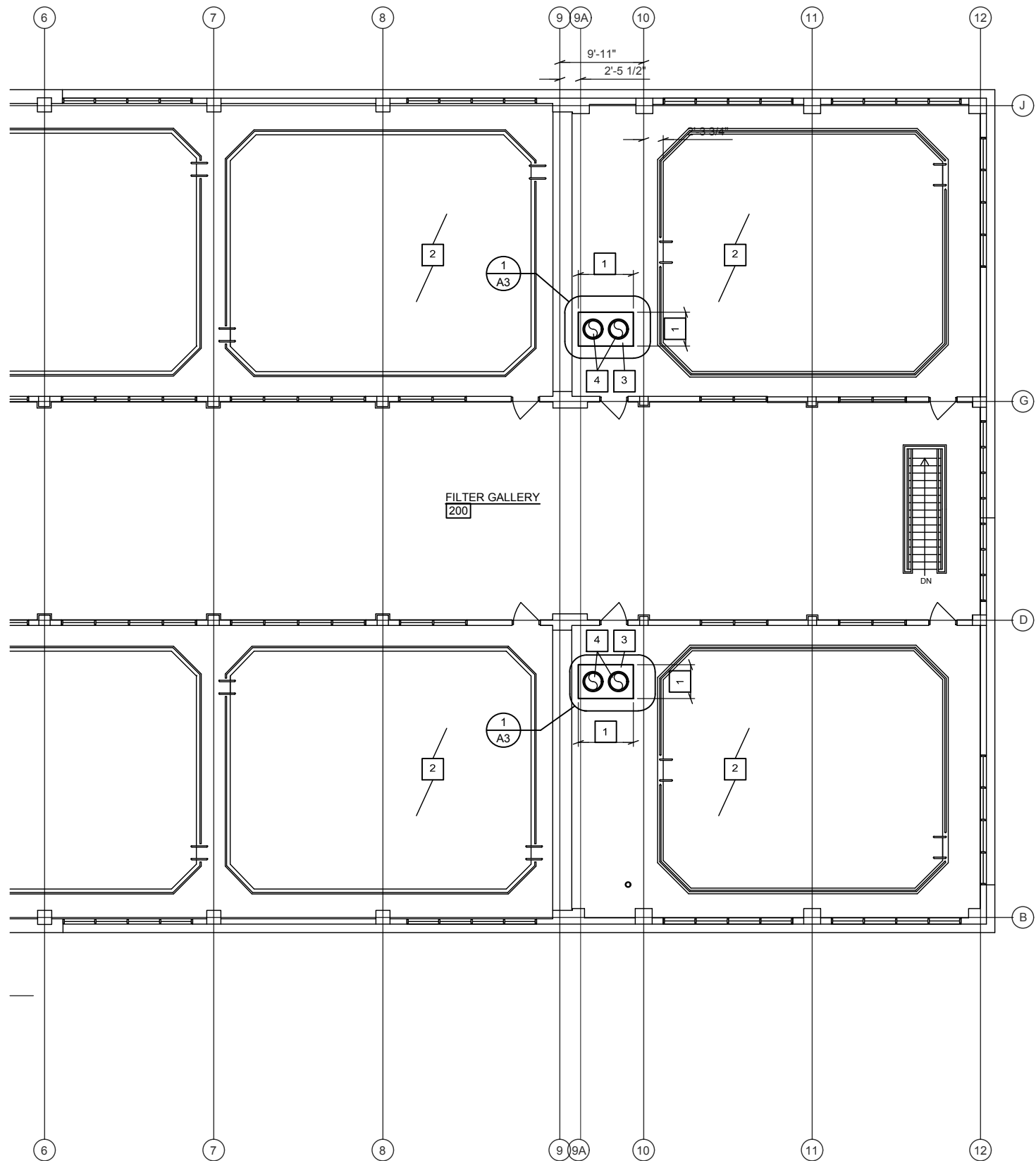
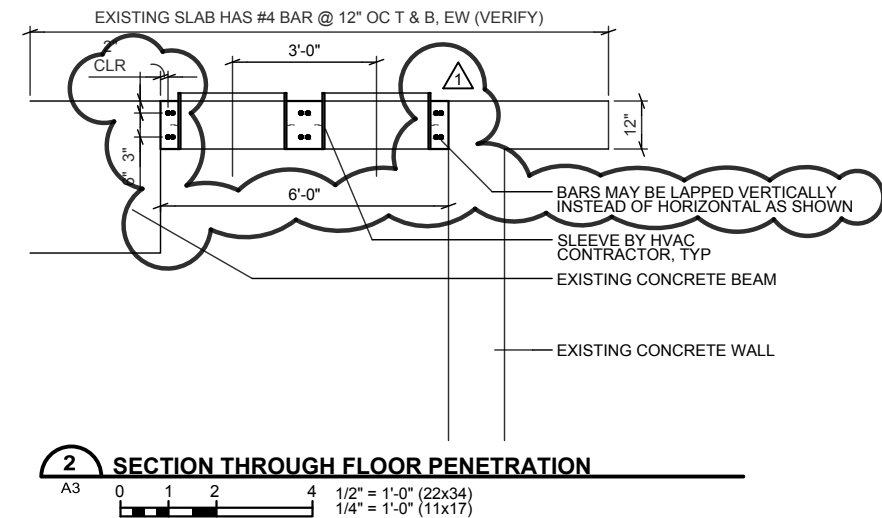
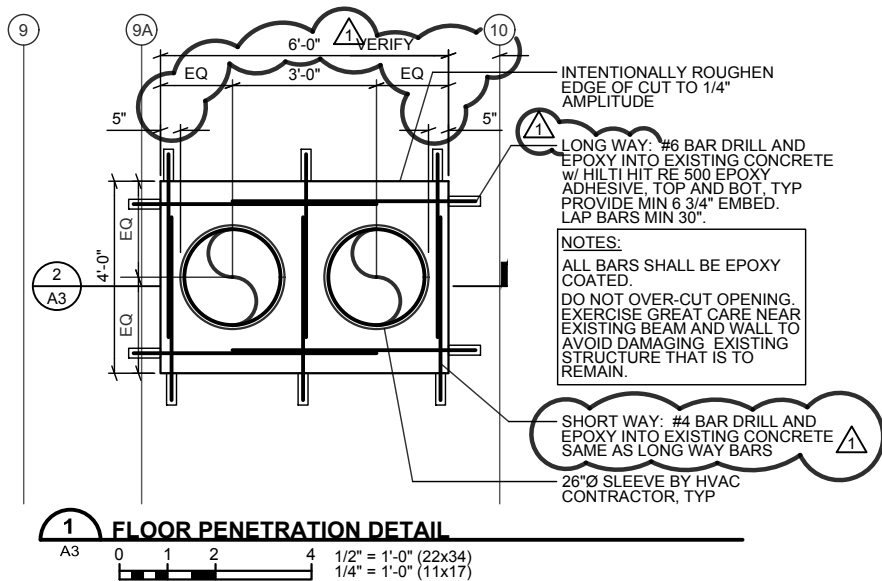
ENLARGED FIRST
FLOOR PLAN

FILE NO:
00616097
SHEET
A-2

RECORD DRAWINGS

PLAN NOTES

- 1 SAW-CUT AND REMOVE EXISTING CONCRETE SLAB IN THIS AREA
- 2 EXISTING TANK w/ GUARDRAIL, TYP
- 3 CONCRETE SLAB INFILL
- 4 SLEEVE IN SLAB FOR DUCT. SEE FIRST FLOOR PLAN FOR LOCATION OF OPENINGS. SEE HVAC FOR DUCT SIZE. VERIFY w/ HVAC.
- 5 3 1/2" HIGH CONCRETE HOUSEKEEPING PAD FOR NEW AIR HANDLING UNIT IN MECHANICAL ROOM - SEE HVAC FOR LOCATION AND SIZE



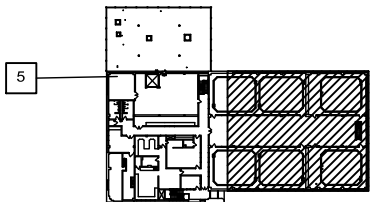
RECORD DRAWINGS

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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN



ENLARGED PARTIAL SECOND FLOOR PLAN

0 4 8 16 1/8" = 1'-0" (22x34)
1/16" = 1'-0" (11x17)

PROJECT NO:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	1	05/18/16		REQUEST FOR INFORMATION #3	CJW
		CHECKED BY:	-	-	-	-	-
		DATE:	-	-	-	-	-
		PLT DATE:	-	-	-	-	-

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03/07/16 20405
Date License No.

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

ENLARGED SECOND
FLOOR PLAN

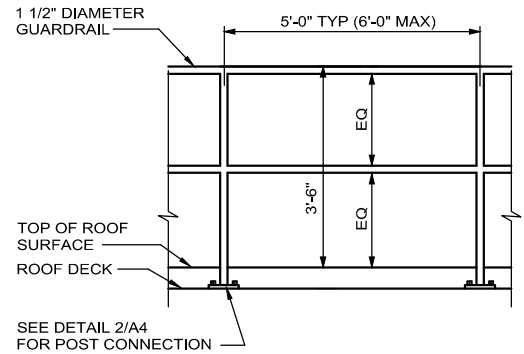
FILE NO:
00616097

SHEET
A-3

RECORD DRAWINGS

PLAN NOTES

- 1
- EXISTING ROOF FAN TO REMAIN
- 2
- ROOF MOUNTED GUARDRAIL - SEE DETAIL 1/A4
- 3
- EXISTING ROOF MEMBRANE AND INSULATION TO BE REMOVED TO PRECAST CONCRETE DECK AT GUARDRAIL MOUNTING LOCATIONS
- 4
- ALIGN CENTER LINES OF NEW GUARDRAIL AND EXISTING FAN
- 5
- EXISTING BUILT UP ROOF w/ PEA GRAVEL



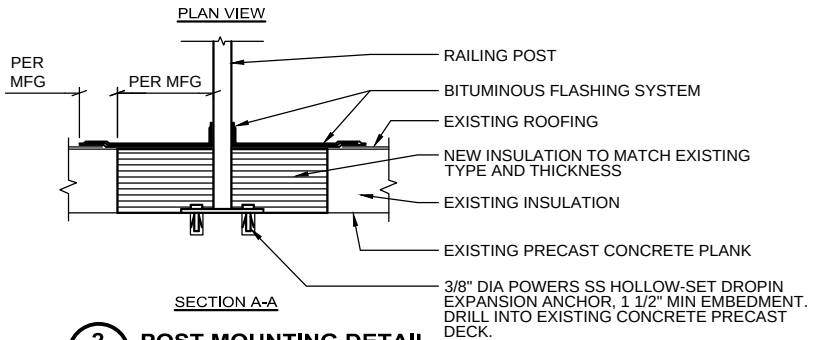
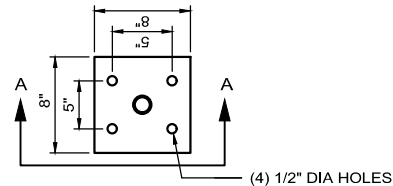
RAILING SHALL BE DESIGNED BY MANUFACTURER TO MEET THE FOLLOWING:

- TOP RAIL: 50 PLF APPLIED IN ANY DIRECTION
- TOP RAIL: A SINGLE CONCENTRATED LOAD OF 200 POUNDS AT ANY POINT
- INTERMEDIATE RAIL: 50 PLF APPLIED IN ANY DIRECTION

CONNECTIONS SHALL BE DESIGNED BY MANUFACTURER.

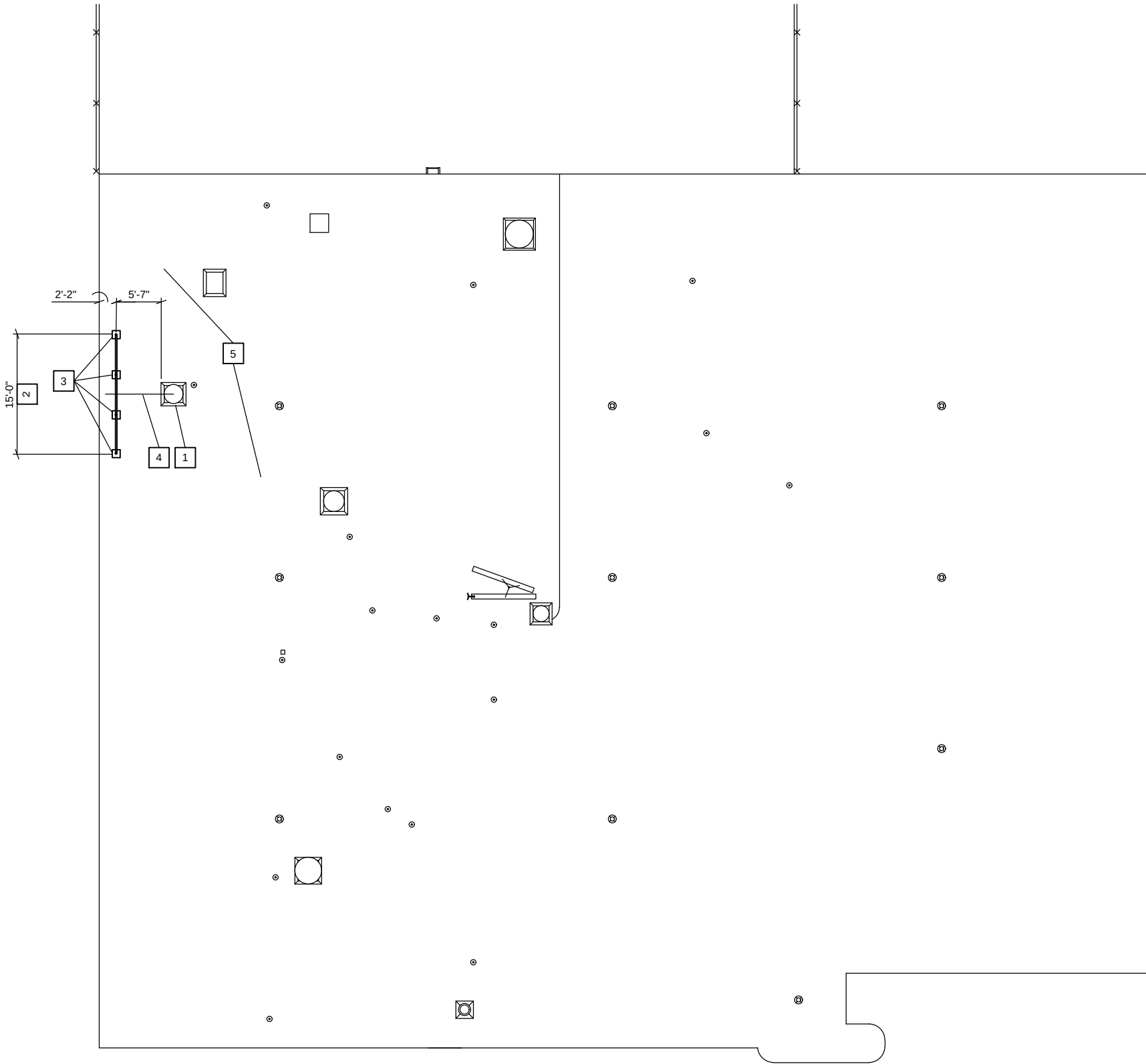
1 ALUMINUM GUARDRAIL DETAIL, TYP

A4 NOT TO SCALE

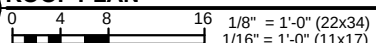


2 POST MOUNTING DETAIL

A4 NOT TO SCALE



ROOF PLAN



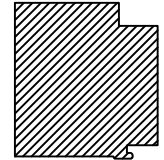
RECORD DRAWINGS

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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN

PROJECT NO:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	-	-	-	-	-
		CHECKED BY:	-	-	-	-	-
PJ/610s/616/00616097/CADD/Construction Documents			-	-	-	-	-
PLOT DATE:			-	-	-	-	-

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ALLEN J. SZYMANSKI

03/07/16

Date

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DULUTH, MINNESOTA

ROOF PLAN

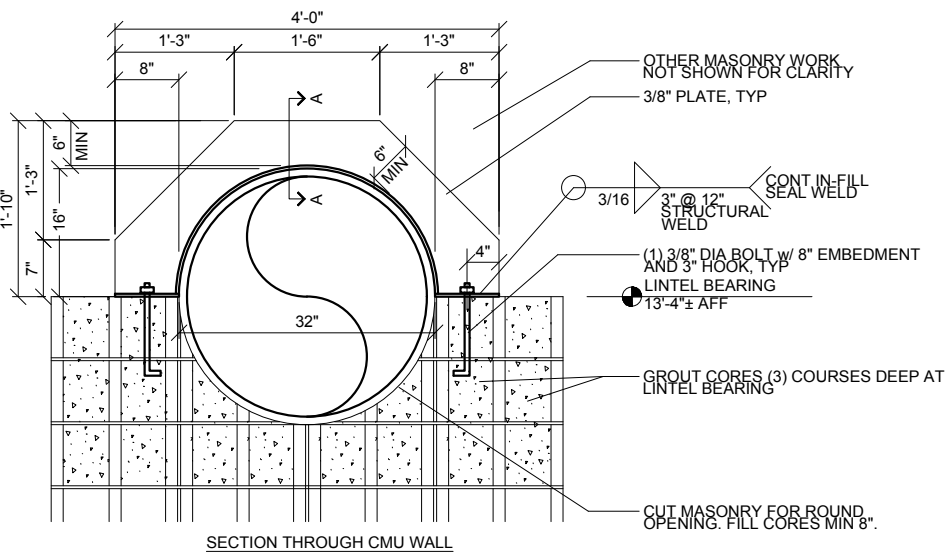
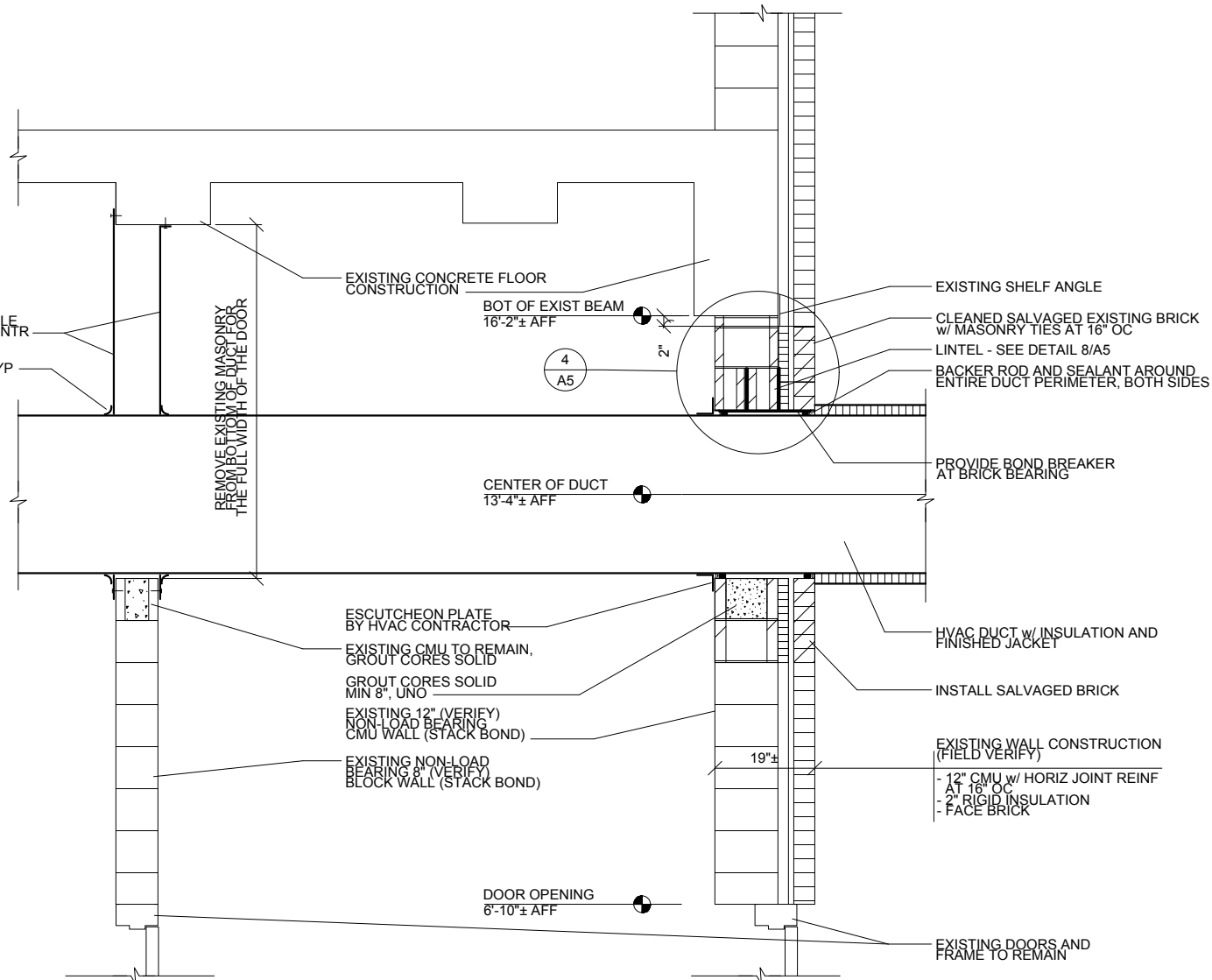
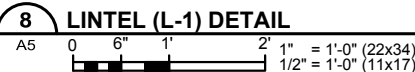
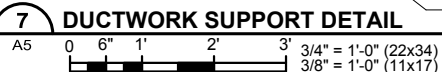
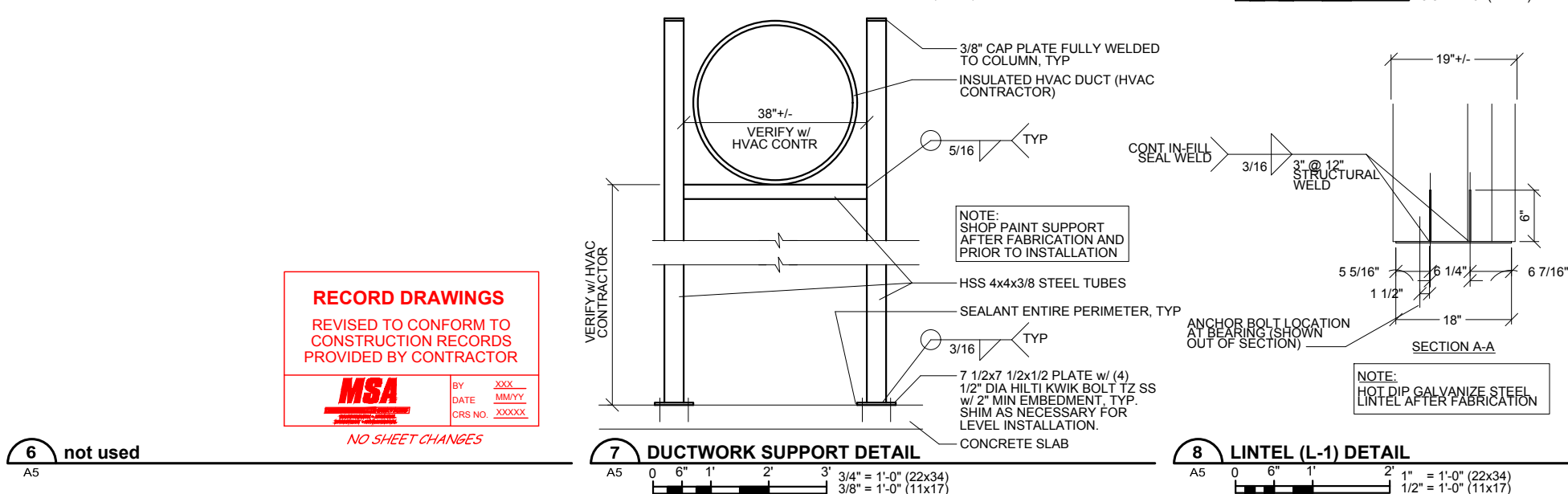
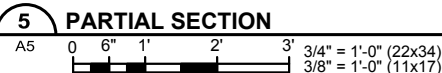
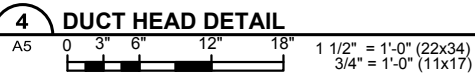
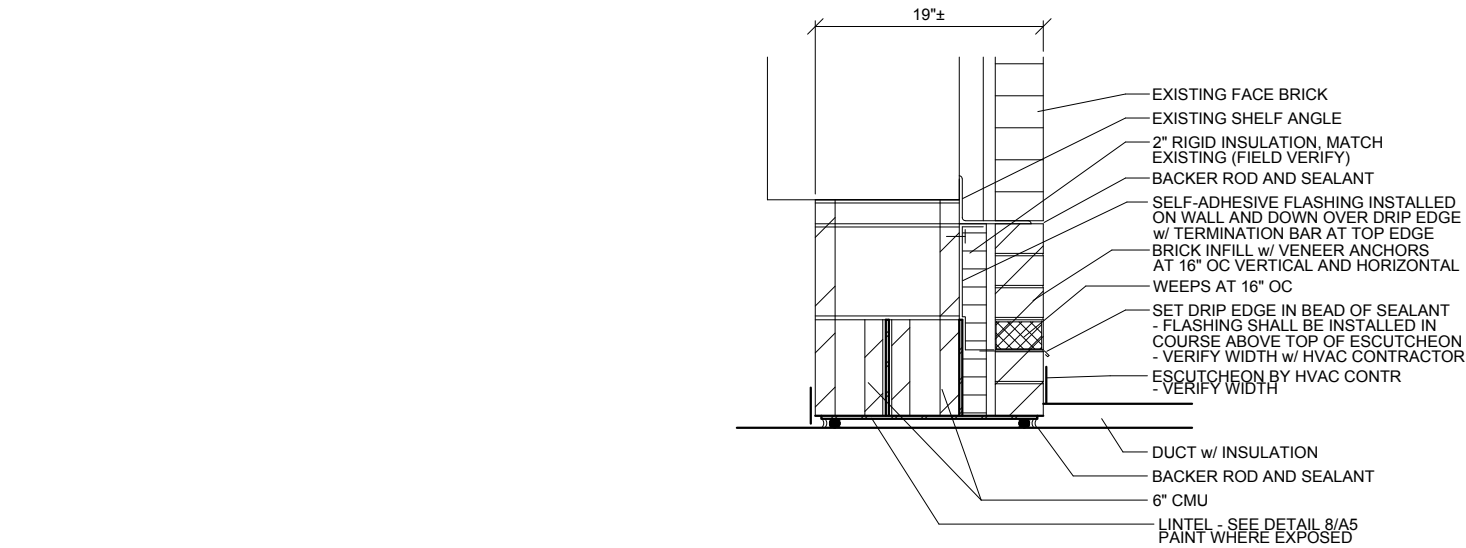
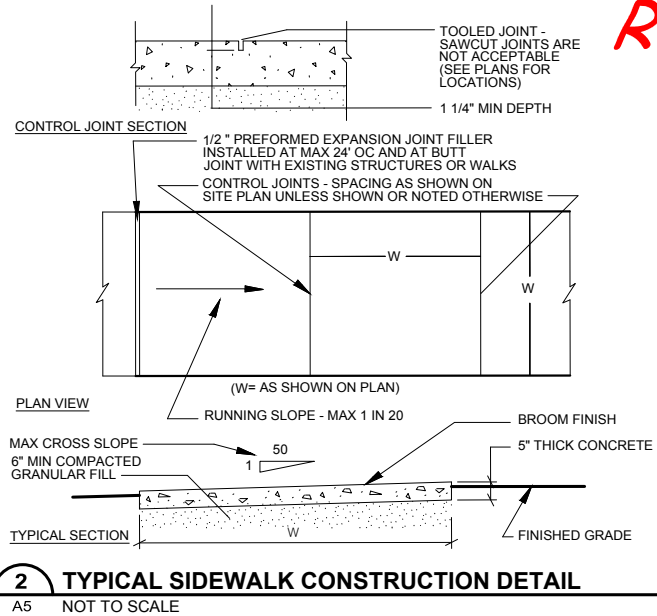
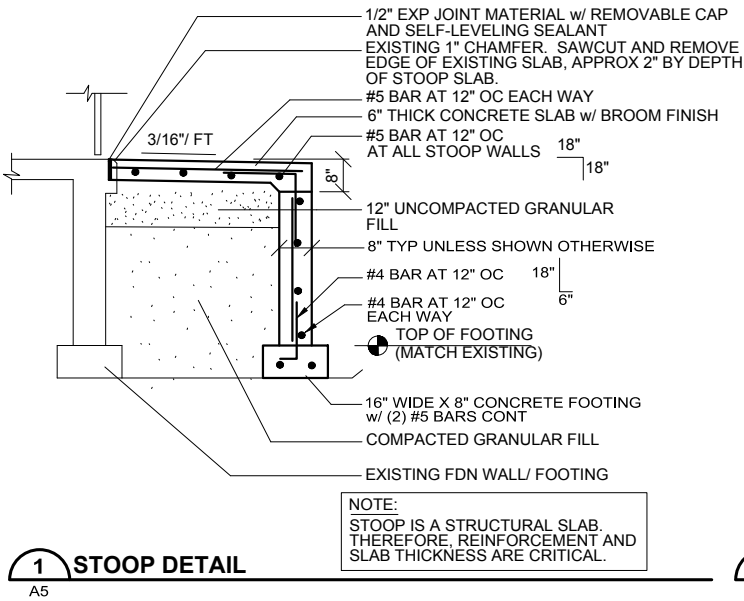
FILE NO.

00616097

SHEET

A-4

RECORD DRAWINGS



RECORD DRAWINGS
REVISED TO CONFORM TO CONSTRUCTION RECORDS PROVIDED BY CONTRACTOR
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BY DATE CRS NO. XXX MM/YY XXXXX
NO SHEET CHANGES

PROJECT NO:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:					
CHECKED BY:							
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PLOT DATE:							

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ENGINEER
Date
03/07/16
20405
License No.

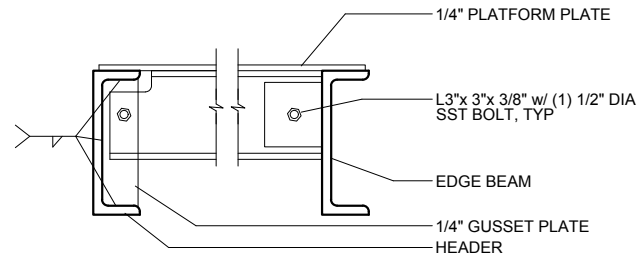
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CITY OF DULUTH
DULUTH, MINNESOTA

SECTION AND DETAILS

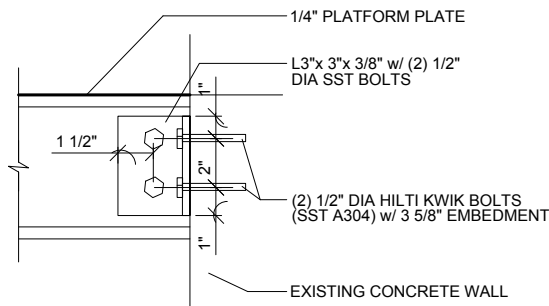
FILE NO.
00616097
SHEET
A-5

RECORD DRAWINGS



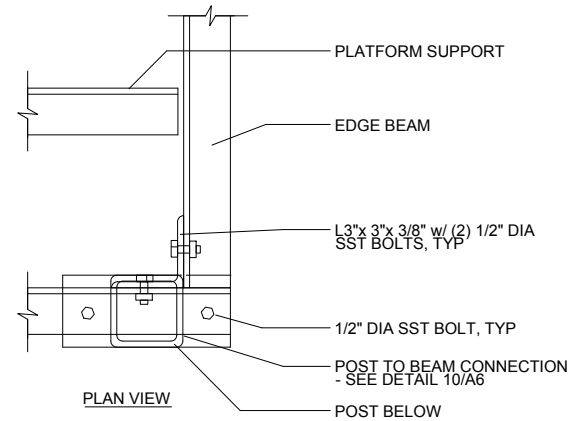
1 PLATFORM SUPPORT SECTION

A6 0 1 1/2" 3" 6" 9" 3" = 1'-0" (22x34)
1 1/2" = 1'-0" (11x17)



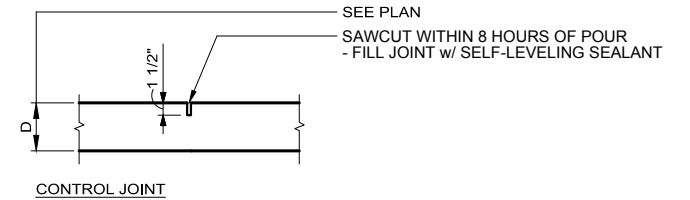
2 HEADER CONNECTION TO WALL

A6 0 1 1/2" 3" 6" 9" 3" = 1'-0" (22x34)
1 1/2" = 1'-0" (11x17)



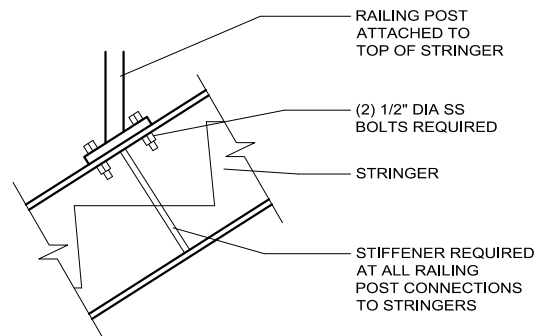
3 PLATFORM FRAME CONNECTION

A6 0 1 1/2" 3" 6" 9" 3" = 1'-0" (22x34)
1 1/2" = 1'-0" (11x17)



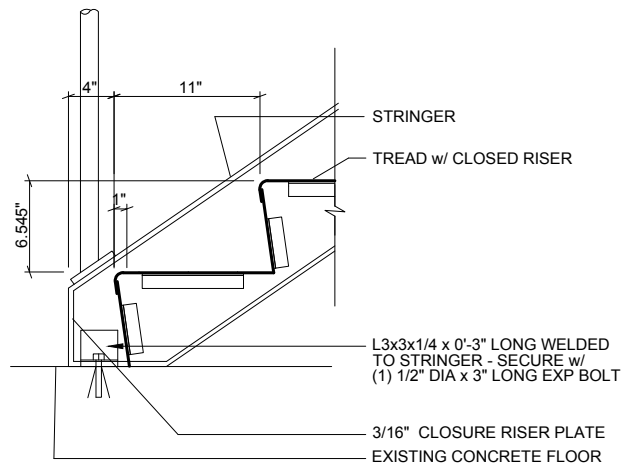
4 TYPICAL SLAB ON GRADE JOINT (CJ) DETAIL

A6 NOT TO SCALE



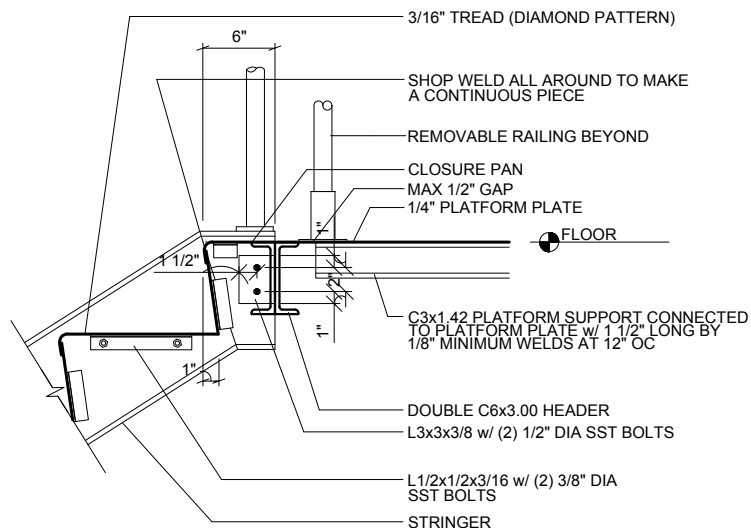
5 RAILING CONNECTION DETAIL

A6 NOT TO SCALE



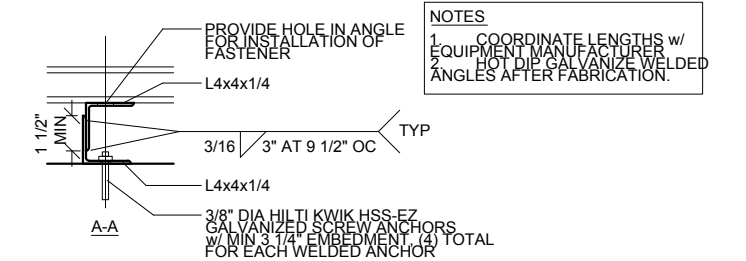
6 BASE OF STAIR STRINGER DETAIL

A6 0 3" 6" 12" 18" 1 1/2" = 1'-0" (22x34)
3/4" = 1'-0" (11x17)



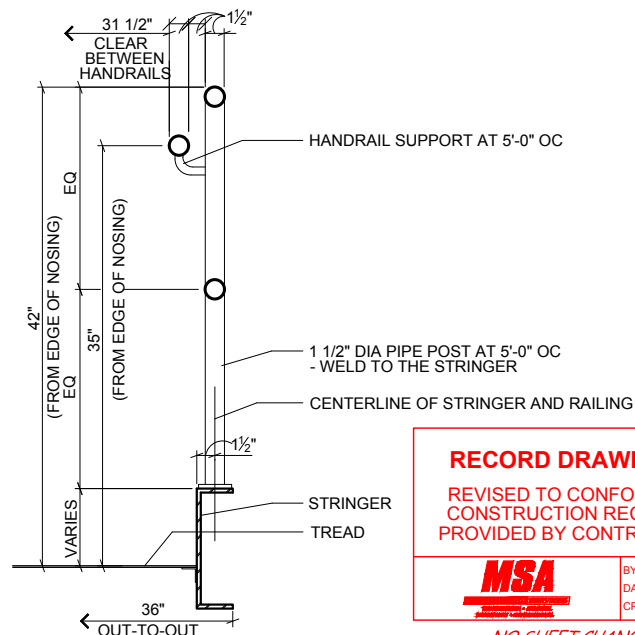
7 TOP OF STAIR STRINGER DETAIL

A6 0 3" 6" 12" 18" 1 1/2" = 1'-0" (22x34)
3/4" = 1'-0" (11x17)



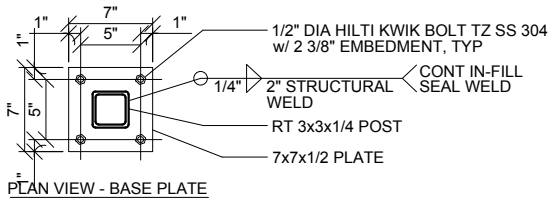
8 EQUIPMENT BASE

A6 0 6" 1' 2' 3' 3/4" = 1'-0" (22x34)
3/8" = 1'-0" (11x17)



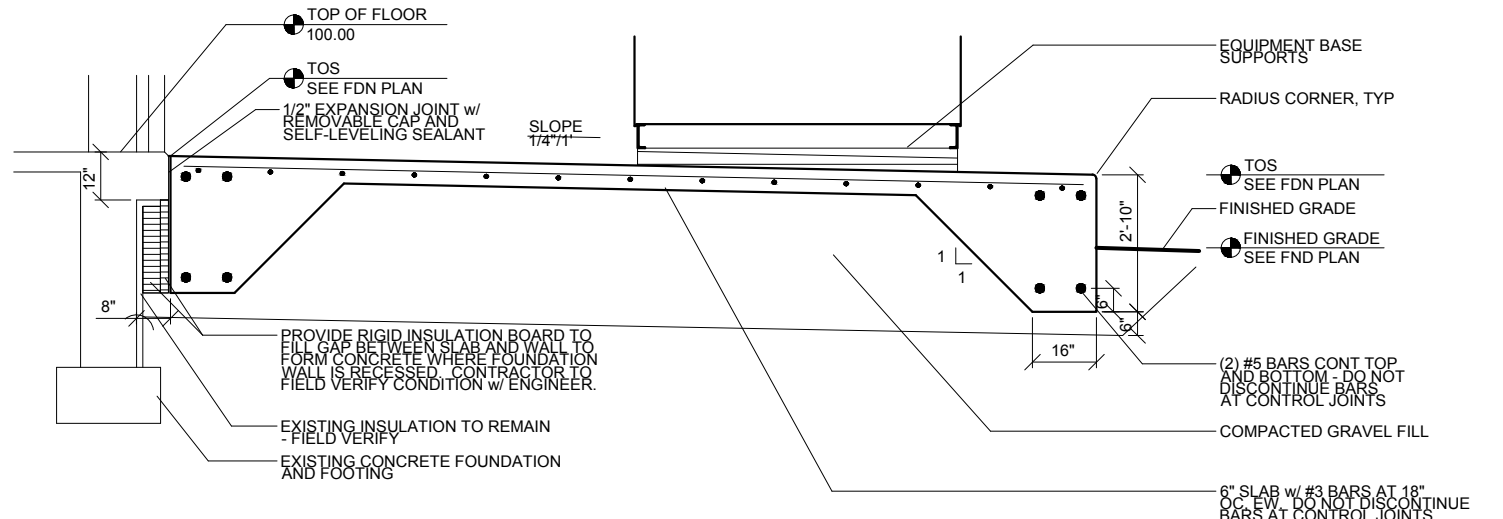
9 STAIR HANDRAIL/ GUARDRAIL SECTION

A6 0 3" 6" 12" 18" 1 1/2" = 1'-0" (22x34)
3/4" = 1'-0" (11x17)



10 STAIR PLATFORM POST DETAIL

A6 0 3" 6" 12" 18" 1 1/2" = 1'-0" (22x34)
3/4" = 1'-0" (11x17)



11 SLAB ON GRADE DETAIL

A6 0 1 2 4 1/2" = 1'-0" (22x34)
1/4" = 1'-0" (11x17)

RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

MSA
BY: XXXX
DATE: MM/YY
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	-	-	-	-	-
CHECKED BY:	-	-	-	-	-	-	-
P:\610s\616\00616097\CADD\Construction Documents	-	-	-	-	-	-	-
PLOT DATE:	-	-	-	-	-	-	-

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ENGINEER
ALLEN J. SZYMANSKI

03/07/16
Date

20405
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CITY OF DULUTH
DULUTH, MINNESOTA

DETAILS
00616097
SHEET
A-6

RECORD DRAWINGS

MECHANICAL ABBREVIATIONS

ABV.	ABOVE
AC	AIR CONDITIONING
ACU-	AIR CONDITIONING UNIT
A.D.	AREA DRAIN
A.F.C.	ABOVE FINISHED CEILING
A.F.F.	ABOVE FINISHED FLOOR
A.L.	ACOUSTICAL LINING
AHU-	AIR HANDLING UNIT
AMU	AIR MEASURING UNIT
A.P.	ACCESS PANEL
APPROX.	APPROXIMATE
AR	ACID RESISTANT
ARCH.	ARCHITECT/ARCHITECTURAL
AS-	AIR SEPARATOR
BD	BLOWDOWN
B.F.F.	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BFW	BOILER FEED WATER
BG	BELOW GRADE
BHP	BRAKE HORSEPOWER
BLW.	BELOW
B.O.D.	BOTTOM OF DUCT ELEVATION A.F.F.
B.O.P.	BOTTOM OF PIPE ELEVATION A.F.F.
BOT.	BOTTOM
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CA	COMPRESSED AIR
CC-	COOLING COIL
CD	CEILING DIFFUSER
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
C.I.	CAST IRON
CG	CEILING GRILLE
CFH	CUBIC FEET PER HOUR
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
C.L.	CENTER LINE
CLG.	CEILING OR COOLING
CMPR.	COMPRESSOR
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
C.O.	CLEAN OUT
CONC.	CONCRETE
COND	CONDENSATE
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUATION
CONTR.	CONTRACTOR
CONV-	CONVECTOR
CP	CONDENSATE PUMP
CU-	CONDENSING UNIT
CUH-	CABINET UNIT HEATER
CW	COLD WATER (DOMESTIC)
D.	DRAIN
D & T	DRIP & TRAP
DEMO.	DEMOLITION
DF	DRINKING FOUNTAIN
DFS	DRY FIRE SPRINKLER
DG	DOOR GRILLE
DIA.	DIAMETER
D.I.	DEIONIZED
DMPR.	DAMPER
DN.	DOWN
E.	EAST
EA.	EACH
EAT	ENTERING AIR TEMPERATURE
EF-	EXHAUST FAN
ELEC.	ELECTRIC
ELEV.	ELEVATION
ENCL.	ENCLOSURE
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
ET-	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH.	EXHAUST
EXP.	EXPANSION
EXIST.	EXISTING
F & T	FLOAT & THERMOSTATIC
F-	PLUMBING FIXTURE
F.A.	FREE AREA
FCO	FLOOR CLEANOUT
F.D.	FLOOR DRAIN
FD/FS	FLOOR DRAIN WITH FUNNEL STRAINER
FD	FIRE DAMPER
FDV	FIRE DEPARTMENT VALVE
F.F.E.	FINISHED FLOOR ELEVATION
FL	FLOOR
FMS	FLOW MEASURING STATION
FPM	FEET PER MINUTE

FR	FLOOR REGISTER
F.S.	FIRE SPRINKLER
FSK	FLOOR SINK
FT.	FOOT OR FEET
FTR-	FIN TUBE RADIATION
FUT.	FUTURE
G	GAS PIPING
GA.	GAUGE/GAGE
GEN'L.	GENERAL
GF-	GAS FURNACE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRD.	GRADE/GROUND
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
GV-	GRAVITY VENT
H.	HIGH
HB	HOSE BIBB
HC	HEATING COIL
HOG	HEAVY DUTY GRILLE
HG	REFRIGERANT HOT GAS
HORIZ.	HORIZONTAL
HPR	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM
HTR.	HEATER
H-STAT	HUMIDISTAT
HW	HOT WATER (DOMESTIC)
HWC	HOT WATER CIRCULATED
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX-	HEAT EXCHANGER OR CONVERTOR
I.D.	INSIDE DIMENSION
I.B.S.	IN BEAM SPACE
I.J.S.	IN JOIST SPACE
INV. ELEV.	INVERT ELEVATION
I.T.S.	IN TRUSS/TEE SPACE
IW	INDIRECT WASTE
L	REFRIGERANT LIQUID
LAT	LEAVING AIR TEMPERATURE
LAV.	LAVATORY
L.D.	LINEAR DIFFUSER
L.F.	LINEAL FEET
LG.	LONG OR LENGTH
LP	LIQUID PROPANE
LPR	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
LSD	LINEAR SLOT DIFFUSER
L.T.	LAUNDRY TUB
MAU-	MAKE-UP AIR UNIT
MAX.	MAXIMUM
MBH	1000 BTU PER HOUR
MFG.	MANUFACTURER
M.H.	MANHOLE
MIN.	MINIMUM
MOT.	MOTORIZED
MS	MOP SINK
N.	NORTH
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NO.	NUMBER
N.T.S.	NOT TO SCALE
O.A.	OUTSIDE AIR
O.D.	OUTSIDE DIMENSION
OFRD	OVERFLOW ROOF DRAIN
OFRWL	OVERFLOW RAINWATER LEADER
OPNG.	OPENING
O.S. & Y.	OUTSIDE SCREW & YOKE
P-	PUMP
ΔP	PRESSURE DIFFERENCE
PCD	PERFORATED CEILING DIFFUSER
PC	PUMPED CONDENSATE
PCW	PROCESSED COLD WATER
PHW	PROCESSED HOT WATER
P.H.	PENTHOUSE
PRV	POWER ROOF VENTILATOR
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	PSI GAUGE
PVC	POLYVINYL CHLORIDE
PW	PUMPED WASTE
RA	RETURN AIR
RAD	RETURN AIR DUCT
RAD.	RADIATOR
RCP	REFLECTED CEILING PLAN
RCP	REINFORCED CONCRETE PIPE
RCVR.	RECEIVER
RCD	ROUND CEILING DIFFUSER
R.D.	ROOF DRAIN
RE-	RETURN EXHAUST FAN
RECIRC.	RECIRCULATING
REQ'D.	REQUIRED
RF	RETURN FAN

RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHW	RECIRCULATING HOT WATER
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
RTU-	ROOFTOP UNIT
RWL	RAINWATER LEADER
S	REFRIGERANT SUCTION
S.	SOUTH
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SAN.	SANITARY
SD	SLOT DIFFUSER
SF-	SUPPLY FAN
SR	SUPPLY REGISTER
SP	STATIC PRESSURE
SPEC.	SPECIFICATION
SQ.	SQUARE
S.S.	STAINLESS STEEL
STD.	STANDARD
STM.	STEAM
STS	STORM SEWER
SYS.	SYSTEM
ΔT	TEMPERATURE DIFFERENCE
TEMP.	TEMPERATURE
TF-	TRANSFER FAN
THRU	THROUGH
T.O.	TAKE-OFF
T.O.D.	TOP OF DUCT ELEVATION A.F.F.
T.O.P.	TOP OF PIPE ELEVATION A.F.F.
T & P	TEMPERATURE AND PRESSURE
T-STAT	THERMOSTAT
TSP	TOTAL STATIC PRESSURE
TW	TEMPERED WATER
TYP.	TYPICAL
U.F.	UNDERFLOOR
UH-	UNIT HEATER
UR	URINAL
V.	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VCP	VITRIFIED CLAY TILE PIPE
VERT.	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
V.S.	VENT STACK
V.T.R.	VENT THRU ROOF
W	WATER SERVICE
W.	WEST
WC	WATER CLOSET
W.C.O.	WALL CLEANOUT
WG	WALL GRILLE
W.H.	WALL HYDRANT
WH-	WATER HEATER
WL-	WALL LOUVER
W.S.	WASTE STACK
WT.	WEIGHT
W/	WITH
W/O	WITHOUT
W-W ENC.	WALL TO WALL ENCLOSURE
WW	WELL WATER

GENERAL SYMBOLS

③	NUMBERED NOTE
103	ROOM NUMBER
△	REVISION (NO.1)
φ	DIAMETER OR ROUND
⊙	AT
<	ANGLE

FIRE SPRINKLER HEAD SYMBOLS

•	UPRIGHT OR PENDENT HEAD
⊙	SEMI-RECESSED PENDENT
○	RECESSED OR CONCEALED HEAD
◀	FREEZEPROOF SIDEWALL HEAD
◀	SIDEWALL HEAD
⊕	PRE-ACTION PENDENT

CONTROL SYMBOLS

①	THERMOSTAT
①	TEMPERATURE OR THERMOSTAT SENSOR
②	HUMIDISTAT OR HUMIDITY SENSOR
③	TEMPERATURE SENSOR
④	CARBON MONOXIDE SENSOR
Ⓢ	TIMER SWITCH
Ⓢ	STATIC PRESSURE SENSOR

PIPING SYMBOLS

—W—	DOMESTIC WATER SERVICE
—F—	FIRE PROTECTION WATER SERVICE
—FS—	FIRE SPRINKLER
—SAN—	SANITARY SEWER
—STS—	STORM SEWER
—WW—	WELL WATER
—AR—	UNDERFLOOR SOIL & WASTE
—AR—	UNDERFLOOR ACID RESISTANT WASTE
—AR—	ABOVE FLOOR WASTE
—CO—	ABOVE FLOOR ACID RESISTANT WASTE
—D—	CONDENSATE DRAIN
—D—	DRAIN
—IW—	INDIRECT WASTE (OPEN WASTE)
—PD—	PUMPED DRAIN
—PW—	PUMPED WASTE
—V—	ABOVE FLOOR VENT
—AR—	ABOVE FLOOR ACID RESISTANT VENT
—IV—	ISLAND VENT
—V—	UNDERFLOOR VENT
—AR—	UNDERFLOOR ACID RESISTANT VENT
—AR—	UNDERFLOOR RAINWATER LINE
—AR—	ABOVE FLOOR RAINWATER LINE
—AR—	UNDERFLOOR OVERFLOW RAINWATER LINE
—AR—	ABOVE FLOOR OVERFLOW RAINWATER LINE
—C—	COLD WATER
—H—	HOT WATER
—NP—	RECIRCULATING HOT WATER
—EW—	NON POTABLE WATER
—TW—	EFFLUENT WATER
—SW—	TEMPERED WATER
—HP—	SOFTENED COLD WATER
—HARD—	HIGH PRESSURE WATER
—DI—	HARD COLD WATER
—140—	DEIONIZED WATER
—180—	140° HOT WATER
—180—	180° HOT WATER

—G—	GAS
—IG—	INTERRUPTABLE GAS
—FG—	FIRM GAS
—CA—	COMPRESSED AIR
—L—	REFRIGERANT LIQUID
—S—	REFRIGERANT SUCTION
—HG—	REFRIGERANT HOT GAS
—HWS—	HEATING WATER SUPPLY
—HWR—	HEATING WATER RETURN
—HRR—	HEATING WATER REVERSE RETURN
—HGS—	HEATING GLYCOL SUPPLY
—HGR—	HEATING GLYCOL RETURN
—CHWS—	CHILLED WATER SUPPLY
—CHWR—	CHILLED WATER RETURN
—PC—	PUMPED CONDENSATE
—STM—	STEAM
—LPR—	LOW PRESSURE CONDENSATE RETURN
—HPS—	HIGH PRESSURE STEAM
—HPR—	HIGH PRESSURE CONDENSATE RETURN
—CS—	CORE WATER RETURN
—CR—	CORE WATER SUPPLY
—CWS—	CONDENSER WATER SUPPLY
—CWR—	CONDENSER WATER RETURN
—CGS—	COOLING GLYCOL SUPPLY
—CGR—	COOLING GLYCOL RETURN
—FOS—	FUEL OIL SUPPLY
—FOR—	FUEL OIL RETURN
—A—	MEDICAL COMPRESSED AIR
—N—	NITROGEN
—O—	OXYGEN
—N ₂ O—	NITROUS OXIDE
—CO ₂ —	CARBON DIOXIDE
—TGE—	TRACE GAS EVACUATION
—VAC—	VACUUM

VALVES, FITTINGS & APPURTENANCES

— —	UNION
— —	SHUT-OFF VALVE
— —	GATE VALVE
— —	OUTSIDE STEM & YOKE VALVE
— —	CHECK VALVE
— —	BALANCING VALVE
— —	STOP & WASTE VALVE
— —	SOLENOID VALVE
— —	2-WAY CONTROL VALVE
— —	3-WAY CONTROL VALVE
— —	THERMOSTATIC MIXING VALVE
— —	GLOBE VALVE
— —	PRESSURE REGULATING VALVE
— —	WATER REGULATING VALVE
— —	GAS PRESSURE REGULATOR
— —	BALL VALVE
— —	BUTTERFLY VALVE
— —	TEMPERATURE & PRESSURE RELIEF VALVE
— —	BACKFLOW PREVENTER
— —	REDUCED PRESSURE BACKFLOW PREVENTER
— —	PIPE ANCHOR
— —	PIPE GUIDE
— —	STEAM TRAP
— —	FLOW MEASURING STATION
— —	STRAINER
— —	FLEXIBLE PIPE CONNECTOR
— —	SHOCK ABSORBER
— —	PRESSURE GAUGE
— —	THERMOMETER
— —	AIR VENT
— —	FLOW ALARM
— —	FLOOR SINK
— —	AREA DRAIN
— —	ROOF DRAIN
— —	FLOOR DRAIN
— —	CEILING/WALL CLEANOUT
— —	FLOOR CLEANOUT
— —	SHOWER HEAD
— —	CAPPED PIPE
— —	DIRECTION OF FLOW
— —	TOP TAKE-OFF
— —	RISER
— —	BOTTOM TAKE-OFF
— —	PIPE DROP
— —	PIPE RISE

DIFFUSER DESIGNATION CODE

24 06	INDICATES NECK SIZE DIAMETER IN INCHES
—	INDICATES SQUARE DIFFUSER SIZE IN INCHES

DUCTWORK SYMBOLS

— —	FIRE DAMPER
— —	COMBINATION SMOKE/FIRE DAMPER
— —	SUPPLY DUCT UP
— —	RETURN OR EXHAUST DUCT UP
— —	SUPPLY DUCT DOWN
— —	RETURN OR EXHAUST DUCT DOWN
— —	MOTORIZED DAMPER
— —	BACKDRAFT DAMPER
— —	OPPOSED BLADE
— —	PARALLEL BLADE
— —	SUPPLY AIR DIFFUSER
— —	RETURN OR EXHAUST AIR GRILLE
— —	ROUND DUCT
— —	RECTANGULAR DUCT (FIRST FIG. IS SIDE SHOWN)
— —	MANUAL BALANCING DAMPER
— —	FLEXIBLE DUCT CONNECTION
— —	ACCESS PANEL (SIZE AS REQUIRED)
— —	SQUARE TURN DUCT ELBOW WITH TURNING VANES
— —	RADIUS DUCT ELBOW WITH RADIUS = 1.5 X WIDTH OF SIDE SHOWN
— —	CONICAL BRANCH TAKE-OFF CONNECTION
— —	45° ENTRY BRANCH TAKE-OFF CONNECTION WITH FILLER PIECES AT CORNERS
— —	RIGID SHEET METAL BRANCH DUCT WITH FLEXIBLE AIR DUCT EXTENSION TO DIFFUSER
— —	TRANSITION (20° MAXIMUM ANGLE)
— —	ACOUSTICALLY LINED DUCT

RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

MSA

BY JAS.
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

NOTE: NOT ALL OF THESE ITEMS
MAY BE USED ON THESE DRAWINGS

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	SRS	-	-	-
F.B.:	A79-164	CHECKED BY:	TAW	-	-	-
PLOT DATE:	11/14/17, P:610616100616097/CADD/Record Drawings/AutoCAD DWG's/M1.0.dwg					

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Thomas A. Wentz

MARCH 7, 2016

18609

Date

License No.

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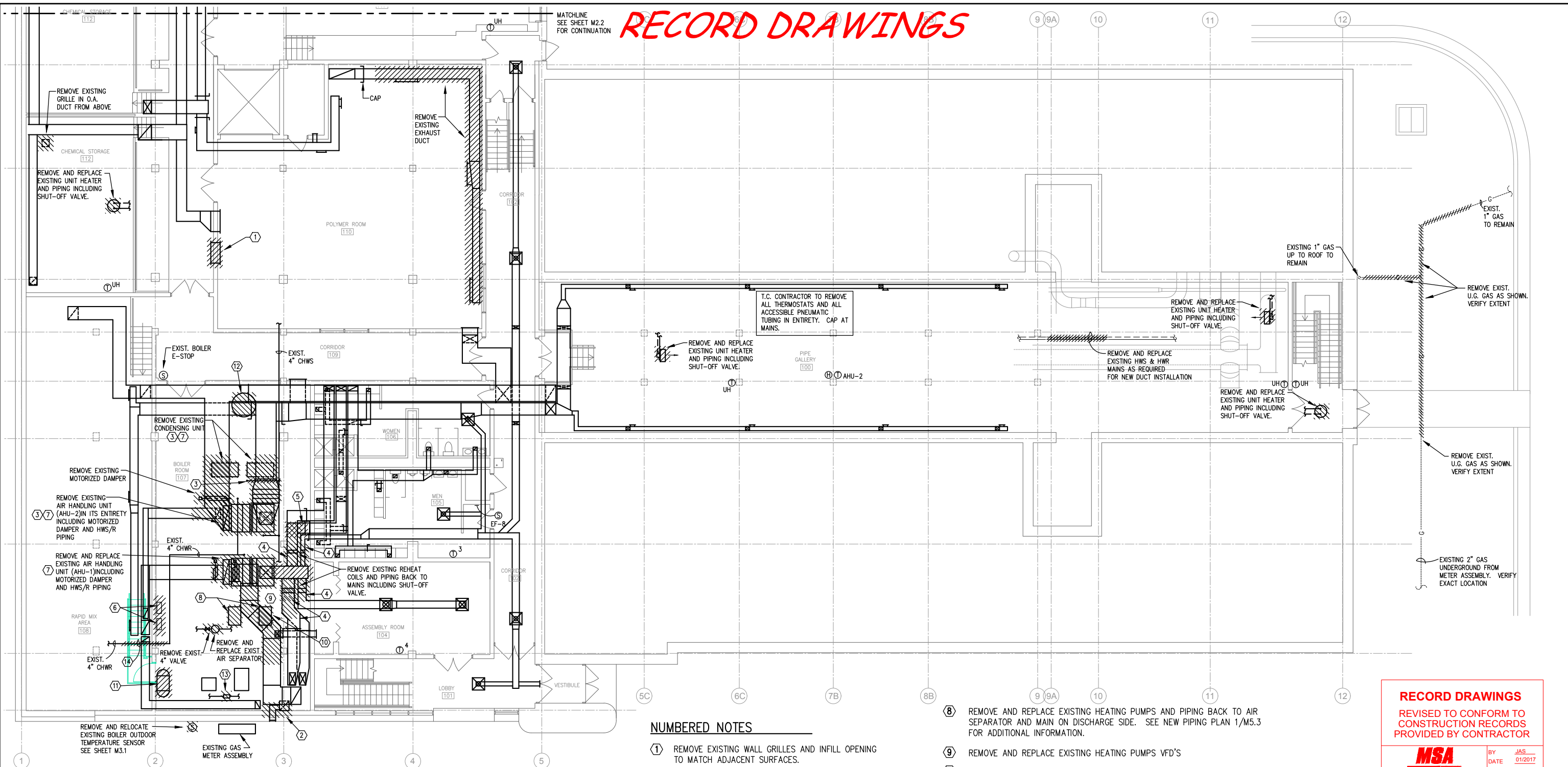
CITY OF DULUTH
DULUTH, MINNESOTA

MECHANICAL SYMBOLS
& ABBREVIATIONS

FILE NO.
00616097

SHEET
M1.0

RECORD DRAWINGS



GENERAL NOTES

- CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING.
- REMOVE ITEMS INDICATED AS HACHURED.
- CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR REMOVAL AND INSTALLATION OF MECHANICAL ITEMS. ALL NEW PATCHING SHALL MATCH EXISTING SURFACES.
- WHERE EQUIPMENT, PIPING AND DUCTWORK IS REMOVED AND NO NEW WORK IS INVOLVED, CAP, PATCH AND FILL ALL HOLES TO MATCH ADJACENT SURFACES. COORDINATE WITH NEW CONSTRUCTION PLANS.
- WHERE EQUIPMENT IS INDICATED TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED PIPING AND CONTROLS.
- WHERE PIPING AND DUCTWORK IS INDICATED TO BE REMOVED OR REPLACED, ALSO REMOVE AND REPLACE ALL ASSOCIATED HANGERS AND SUPPORTS.
- COORDINATE DEMO WORK WITH OTHER TRADES.
- CONTRACTOR TO REMOVE ALL EXISTING CONCRETE HOUSEKEEPING PADS NOT USED FOR NEW EQUIPMENT.

NUMBERED NOTES

- REMOVE EXISTING WALL GRILLES AND INFILL OPENING TO MATCH ADJACENT SURFACES.
- REMOVE EXISTING MECHANICAL ROOM EXHAUST FAN AND LOWER PORTION OF DUCTWORK. LOUVER AND UPPER PORTION OF DUCTWORK TO REMAIN.
- REMOVE ALL COOLING WATER PIPING ASSOCIATED WITH CONDENSER SYSTEM AND AHU-2 BACK TO MAIN AND CAP. VERIFY EXACT PIPING QUANTITY AND LOCATION OF MAINS.
- REMOVE EXISTING DUCTWORK AS REQUIRED TO ACCOMMODATE INSTALLATION OF NEW VAV BOX. VERIFY EXTENT.
- REMOVE EXISTING ZONE #2 DUCTWORK FROM 30x24 PLENUM TO WALL AND CAP. FIRE DAMPER TO BE TRIPPED AND REMAIN.
- REMOVE EXISTING TEMPERATURE CONTROL CABINET IN ENTIRETY.
- COORDINATE CONCRETE HOUSEKEEPING PAD REMOVAL AND REPLACEMENT FOR MECHANICAL EQUIPMENT WITH WORK AS DESCRIBED ON SHEET A2, NUMBERED NOTES 8 & 9.
- REMOVE AND REPLACE EXISTING HEATING PUMPS AND PIPING BACK TO AIR SEPARATOR AND MAIN ON DISCHARGE SIDE. SEE NEW PIPING PLAN 1/M5.3 FOR ADDITIONAL INFORMATION.
- REMOVE AND REPLACE EXISTING HEATING PUMPS VFD'S
- REMOVE AND REPLACE EXISTING HEATING SYSTEM CHEMICAL FEEDER SYSTEM.
- REMOVE EXISTING COMPRESSION TANK AND ASSOCIATED PIPING FROM AIR SEPARATOR AND SUPPORT STAND.
- REMOVE EXISTING ABANDONED WATER HEATER AND BRANCH PIPING BACK TO MAINS AND CAP.
- DISCONNECT EXISTING HEATING SYSTEM MAKE-UP WATER CONNECTION.
- DISCONNECT AND RELOCATE SECTION OF EXISTING 4" CHWR DRAIN PIPING AS REQUIRED FOR NEW DOOR AND STAIR INSTALLATION. PIPING TO BE RECONNECTED. PATCH WALL TO MATCH EXISTING.

RECORD DRAWINGS

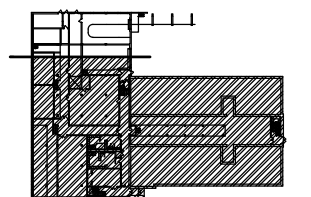
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PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

FIRST FLOOR SOUTH DEMOLITION PLAN



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	SRS			
F.B.:	A79-164	CHECKED BY:	TAW			
PLOT DATE:	11/14/17, P:\610616\00616097\CADD\Record Drawings\AutoCAD DWG's\M2.1.dwg					

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Thomas A. Wentz
THOMAS A. WENTZ

MARCH 7, 2016
Date

18609
License No.



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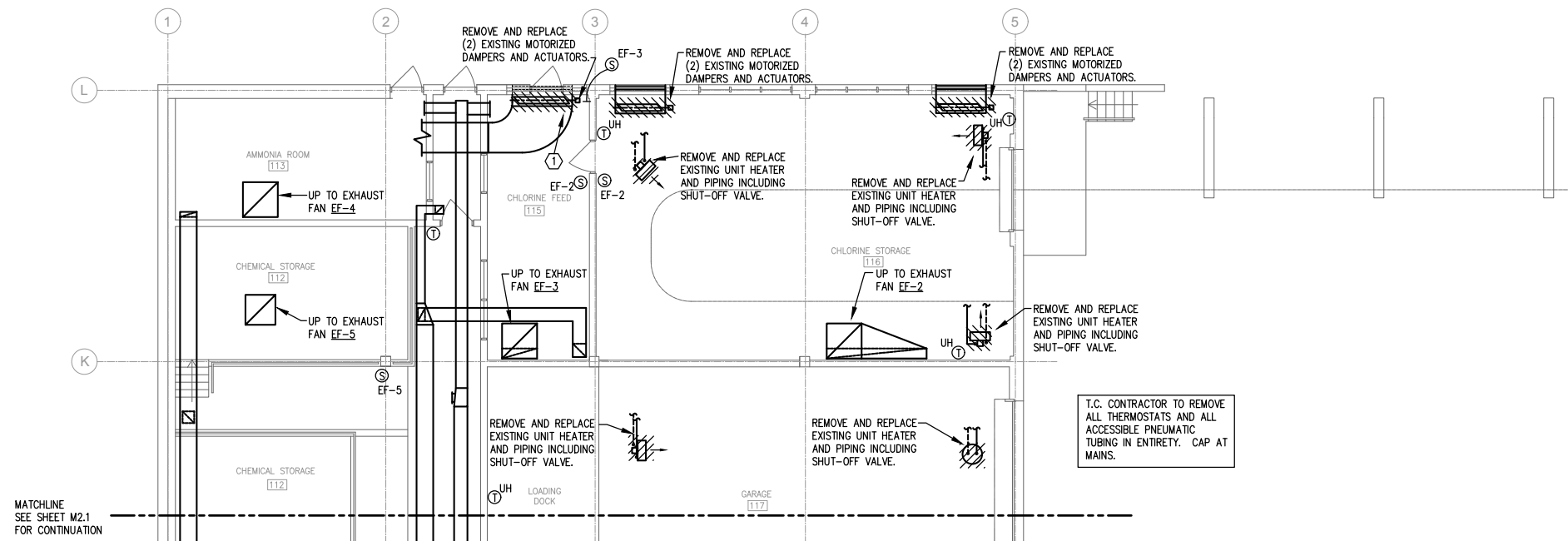
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR SOUTH
MECHANICAL DEMOLITION

FILE NO.
00616097
SHEET
M2.1

RECORD DRAWINGS



GENERAL NOTES

- 1 - CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING.
- 2 - REMOVE ITEMS INDICATED AS HACHURED.
- 3 - CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR REMOVAL AND INSTALLATION OF MECHANICAL ITEMS. ALL NEW PATCHING SHALL MATCH EXISTING SURFACES.
- 4 - WHERE EQUIPMENT, PIPING AND DUCTWORK IS REMOVED AND NO NEW WORK IS INVOLVED, CAP, PATCH AND FILL ALL HOLES TO MATCH ADJACENT SURFACES. COORDINATE WITH NEW CONSTRUCTION PLANS.
- 5 - WHERE EQUIPMENT IS INDICATED TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED PIPING AND CONTROLS.
- 6 - WHERE PIPING AND DUCTWORK IS INDICATED TO BE REMOVED OR REPLACED, ALSO REMOVE AND REPLACE ALL ASSOCIATED HANGERS AND SUPPORTS.
- 7 - COORDINATE DEMO WORK WITH OTHER TRADES.

NUMBERED NOTES

- ① EXISTING MOTORIZED DAMPER SERVING AMMONIA ROOM IS WITHIN DUCTWORK. REMOVE AND REPLACE DUCTWORK AND DAMPER ACCESS DOOR AS REQUIRED.

RECORD DRAWINGS

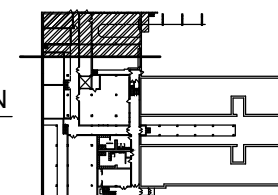
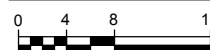
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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

FIRST FLOOR NORTH DEMOLITION PLAN



KEY PLAN - FIRST FLOOR

PROJECT NO.	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	SRS	-	-	-
F.B.:	A79-164	CHECKED BY:	TAW	-	-	-
PLOT DATE:	11/14/17, P:610s616\00616097\CADD\Record Drawings\AutoCAD DWG's\M2.2.dwg					

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Thomas A. Wentz
THOMAS A. WENTZ

MARCH 7, 2016
Date

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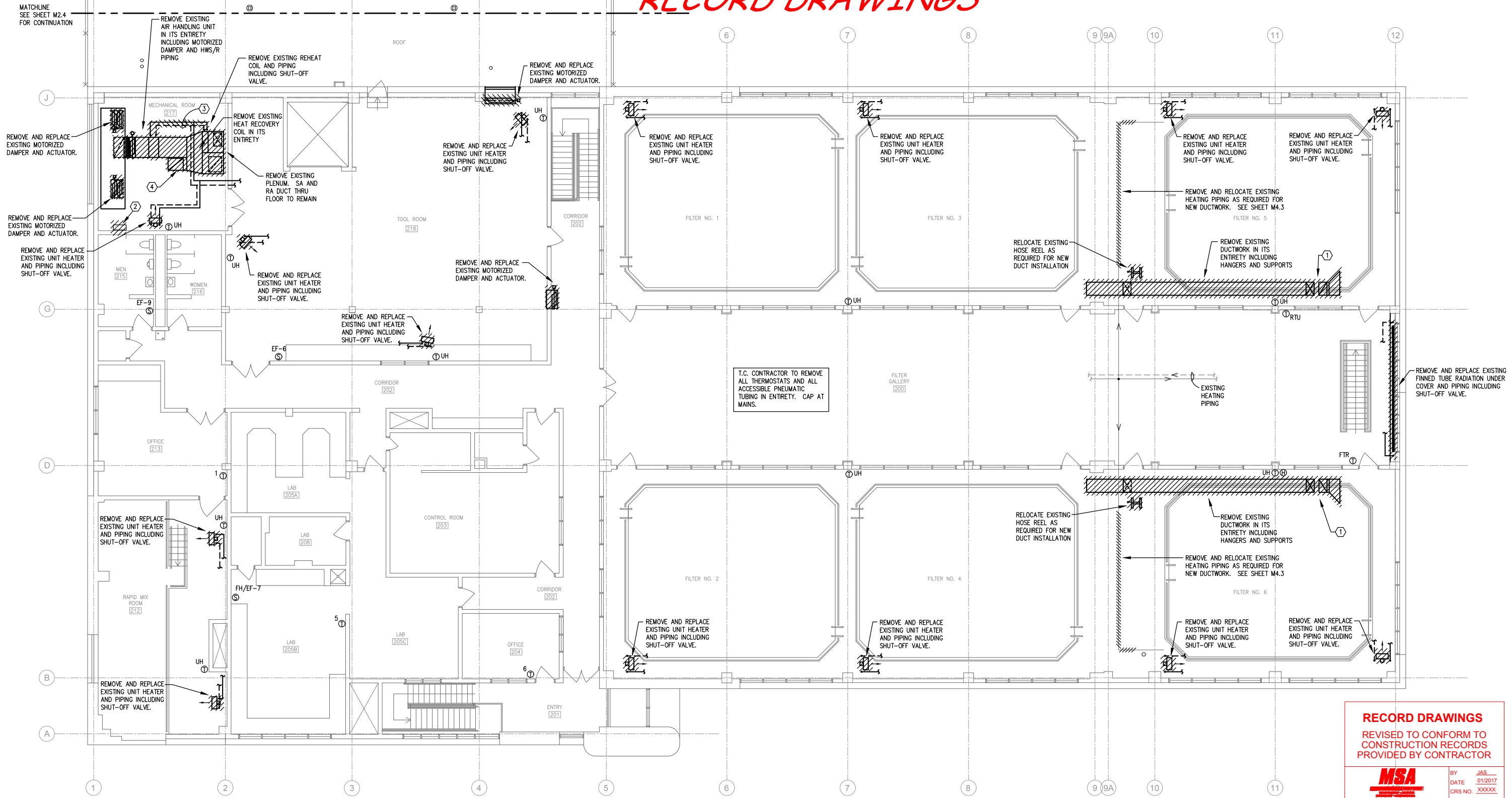
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR NORTH
MECHANICAL DEMOLITION

FILE NO.
00616097
SHEET
M2.2

RECORD DRAWINGS



GENERAL NOTES

- 1 - CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING.
- 2 - REMOVE ITEMS INDICATED AS HACHURED.
- 3 - CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR REMOVAL AND INSTALLATION OF MECHANICAL ITEMS. ALL NEW PATCHING SHALL MATCH EXISTING SURFACES.
- 4 - COORDINATE DEMO WORK WITH OTHER TRADES.
- 5 - WHERE EQUIPMENT, PIPING AND DUCTWORK IS REMOVED AND NO NEW WORK IS INVOLVED, CAP, PATCH AND FILL ALL HOLES TO MATCH ADJACENT SURFACES. COORDINATE WITH NEW CONSTRUCTION PLANS.
- 6 - WHERE EQUIPMENT IS INDICATED TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED PIPING AND CONTROLS.
- 7 - WHERE PIPING AND DUCTWORK IS INDICATED TO BE REMOVED OR REPLACED, ALSO REMOVE AND REPLACE ALL ASSOCIATED HANGERS AND SUPPORTS.

NUMBERED NOTES

- ① PROVIDE PAINTED STEEL PANEL AT ROOF OPENING FROM REMOVED DUCTWORK.
- ② REMOVE EXISTING TEMPERATURE CONTROL CABINET IN ENTIRETY.
- ③ REMOVE EXISTING HWS & HWR PIPING AS REQUIRED FOR NEW AHU SYSTEM.
- ④ REMOVE EXISTING IN-LINE FAN AND DUCTWORK UP THRU ROOF.

RECORD DRAWINGS

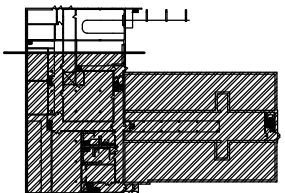
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DATE 01/2017
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NO SHEET CHANGES

SECOND FLOOR SOUTH DEMOLITION PLAN



KEY PLAN - SECOND FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	SRS			
F.B.:	A79-164	CHECKED BY:	TAW			
PLOT DATE:	11/14/17, P:610616100616097\CADD\Record Drawings\AutoCAD DWG's\M2.3.dwg					

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THOMAS A. WENTZ

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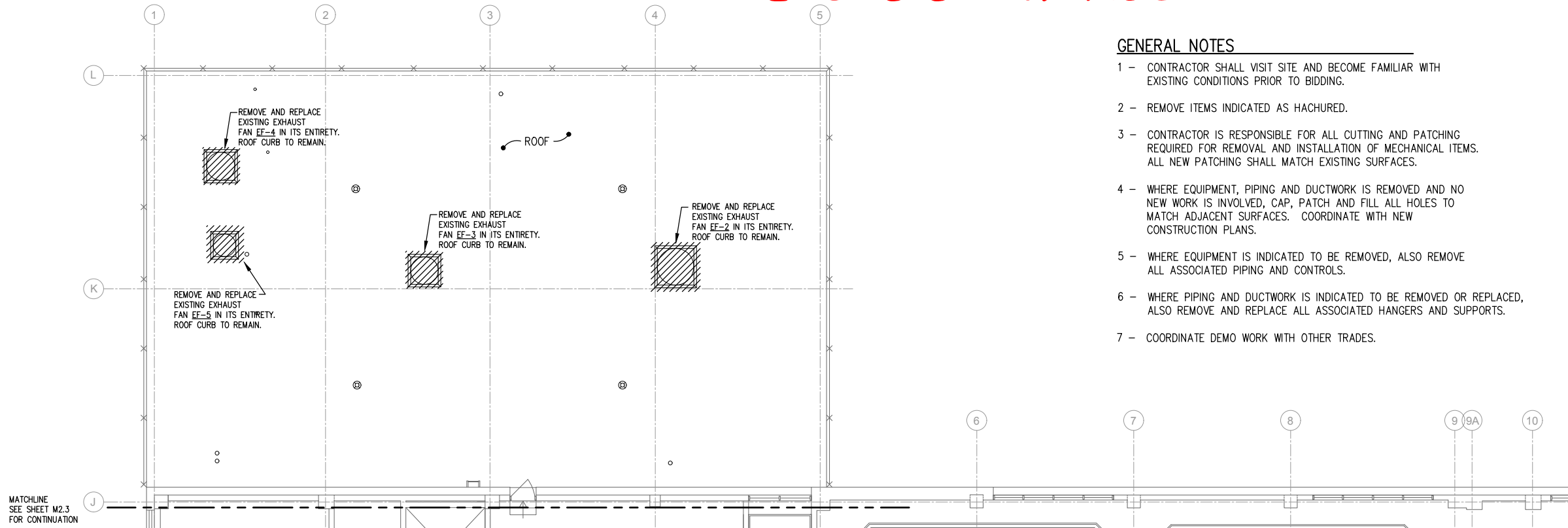
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DULUTH, MINNESOTA

SECOND FLOOR SOUTH
MECHANICAL DEMOLITION

FILE NO.
00616097
SHEET
M2.3

RECORD DRAWINGS



GENERAL NOTES

- 1 - CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING.
- 2 - REMOVE ITEMS INDICATED AS HACHURED.
- 3 - CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR REMOVAL AND INSTALLATION OF MECHANICAL ITEMS. ALL NEW PATCHING SHALL MATCH EXISTING SURFACES.
- 4 - WHERE EQUIPMENT, PIPING AND DUCTWORK IS REMOVED AND NO NEW WORK IS INVOLVED, CAP, PATCH AND FILL ALL HOLES TO MATCH ADJACENT SURFACES. COORDINATE WITH NEW CONSTRUCTION PLANS.
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- 7 - COORDINATE DEMO WORK WITH OTHER TRADES.

RECORD DRAWINGS

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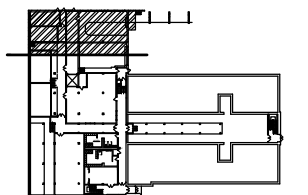


BY JAS
DATE 01/2017
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NO SHEET CHANGES



SECOND FLOOR NORTH DEMOLITION PLAN



KEY PLAN - SECOND FLOOR

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PLOT DATE:	11/14/17, P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG's\M2.4.dwg										

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Thomas A. Wentz
THOMAS A. WENTZ

MARCH 7, 2016
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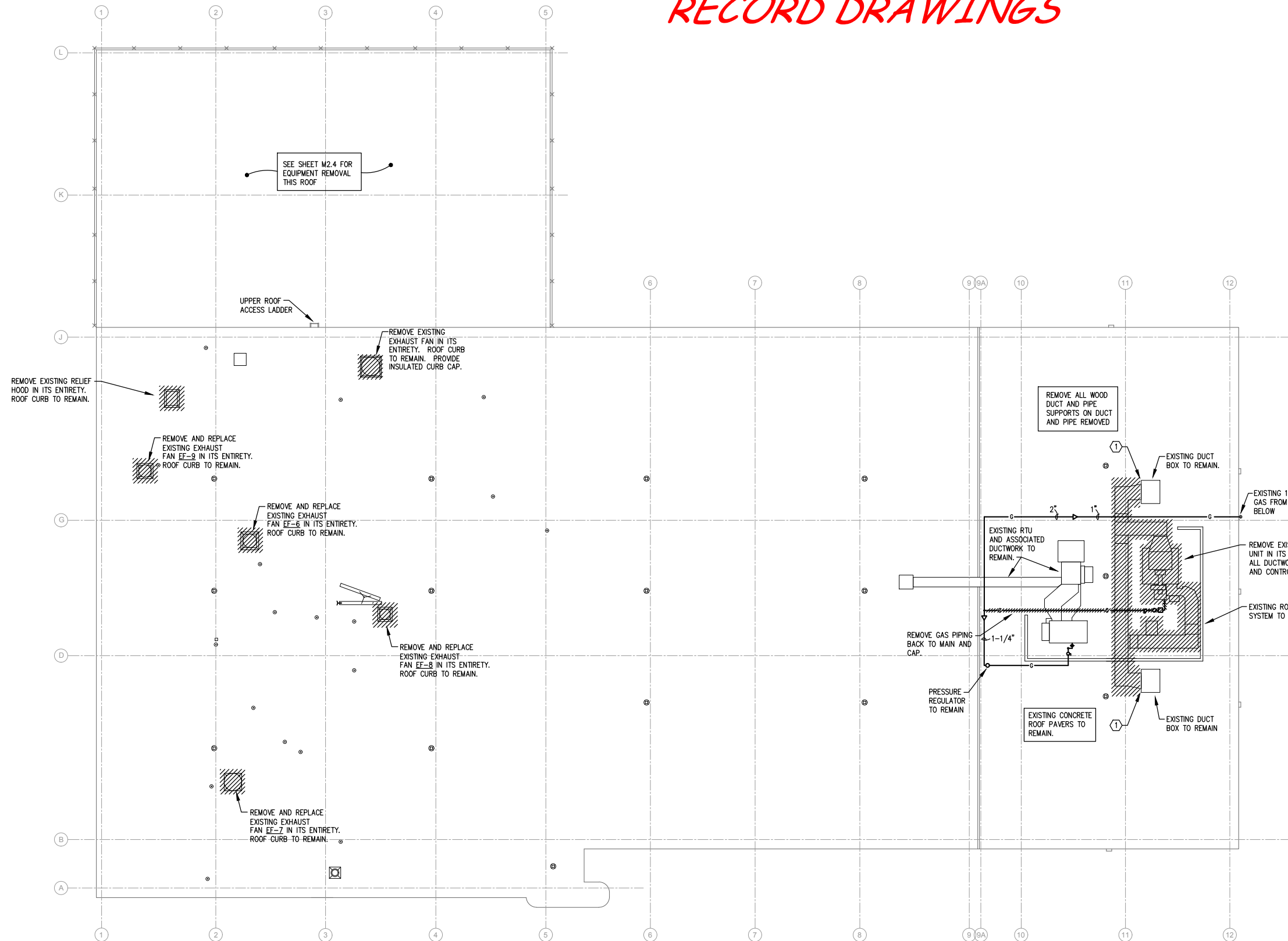
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CITY OF DULUTH
DULUTH, MINNESOTA

SECOND FLOOR NORTH
MECHANICAL DEMOLITION

FILE NO.
00616097
SHEET
M2.4

RECORD DRAWINGS



GENERAL NOTES

- 1 - CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING.
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- 7 - COORDINATE DEMO WORK WITH OTHER TRADES.

NUMBERED NOTES

- ① EXISTING DUCT BOX TO REMAIN. REMOVE DUCTWORK CONNECTING TO SIDE OF BOX, STUFF WITH FIBERGLASS INSULATION AND CAP OPENING IN SIDE OF DUCT BOX. SEAL COMPLETELY WEATHERTIGHT.

RECORD DRAWINGS

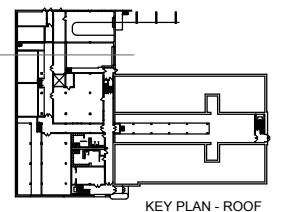
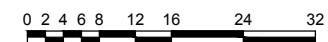
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DATE 01/2017
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NO SHEET CHANGES

ROOF MECHANICAL DEMOLITION PLAN



KEY PLAN - ROOF

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Thomas A. Wentz
THOMAS A. WENTZ

MARCH 7, 2016
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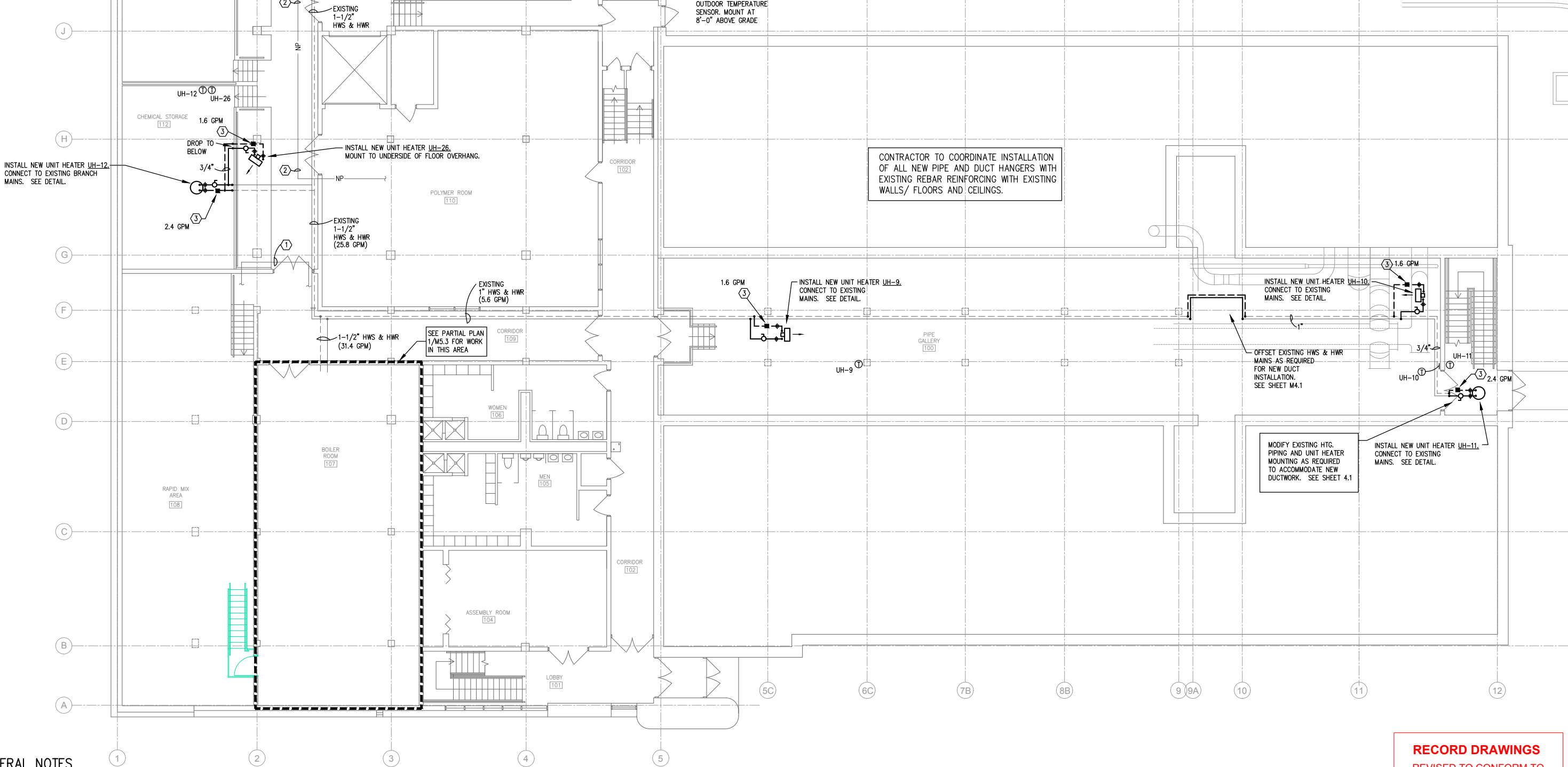
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CITY OF DULUTH
DULUTH, MINNESOTA
ROOF
MECHANICAL DEMOLITION

FILE NO.
00616097
SHEET
M2.5

RECORD DRAWINGS

MATCHLINE
SEE SHEET M3.2
FOR CONTINUATION



GENERAL NOTES

- 1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.
- 2 - SEAL ALL DUCT AND PIPE OPENINGS THRU EXTERIOR WALL WEATHERTIGHT.
- 3 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.
- 4 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING.
- 5 - MOUNT ALL HORIZONTAL HW UNIT HEATERS WITH BOTTOM AT 8 FT. A.F.F. AND ALL VERTICAL HW UNIT HEATERS WITH BOTTOM AT 10 FT. A.F.F.
- 6 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.
- 7 - SEAL ALL PIPING PENETRATIONS OF CHEMICAL ROOM WALLS.

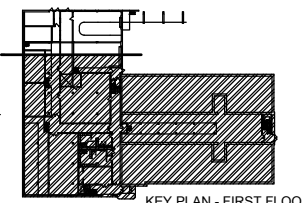
- 8 - ALL EQUIPMENT CONNECTIONS TO BE MADE WITH UNIONS UNLESS NOTED OTHERWISE.
- 9 - PROVIDE ADDITIONAL UNISTRUT PIPING SUPPORT STANDS AS REQUIRED FOR SMALLER PIPING. COORDINATE WITH FIELD ENGINEER. MAINTAIN ACCESS AND SERVICE CLEARANCES.
- 10 - ALL BRANCH HEATING WATER SUPPLY AND RETURN PIPING TO UNIT HEATERS AND CABINET UNIT HEATERS TO BE 3/4" UNLESS NOTED OTHERWISE.
- 11 - PROVIDE MANUAL AIR VENTS IN HEATING WATER SYSTEM AT ALL HIGH POINTS OF RISERS.
- 12 - PROVIDE NEW SHUT-OFF VALVES, BALANCING VALVES AND DRAIN VALVES IN ALL BRANCH PIPING TO UNIT HEATERS AND CABINET UNIT HEATERS.
- 13 - PROVIDE LABOR/MATERIAL FOR INSULATING EQUIVALENT OF 150 L.F. OF ADDITIONAL EXISTING 2" PIPING. PIPING TO BE INSULATED TO BE FIELD LOCATED BY FIELD ENGINEER.

NUMBERED NOTES

- ① INSULATE EXISTING 10" OVERHEAD PROCESS WATER PIPE ON CHEMICAL STORAGE ROOM SIDE OF WALL.
- ② INSULATE EXISTING 2" NON-POTABLE (NP) WATER PIPING IN CHEMICAL STORAGE CORRIDOR.
- ③ INSTALL AUTOMATIC FLOW CONTROL VALVE. FLOW AS INDICATED OR AS SCHEDULED FOR EQUIPMENT SERVED.



FIRST FLOOR SOUTH HEATING/COOLING PLAN



RECORD DRAWINGS
REVISED TO CONFORM TO
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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
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PLOT DATE:	11/14/17, P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG's\M3.1.dwg					

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THOMAS A. WENTZ
MARCH 7, 2016
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CITY OF DULUTH
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FIRST FLOOR SOUTH
HEATING/COOLING PIPING

FILE NO.
00616097
SHEET
M3.1

RECORD DRAWINGS

GENERAL NOTES

- 1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.
- 2 - SEAL ALL DUCT AND PIPE OPENINGS THRU EXTERIOR WALL WEATHERTIGHT.
- 3 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.
- 4 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING.
- 5 - MOUNT ALL HORIZONTAL HW UNIT HEATERS WITH BOTTOM AT 8 FT. A.F.F. AND ALL VERTICAL HW UNIT HEATERS WITH BOTTOM AT 10 FT. A.F.F.
- 6 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.
- 7 - SEAL ALL PIPING PENETRATIONS OF CHEMICAL ROOM WALLS.
- 8 - ALL EQUIPMENT CONNECTIONS TO BE MADE WITH UNIONS UNLESS NOTED OTHERWISE.
- 9 - PROVIDE ADDITIONAL UNISTRUT PIPING SUPPORT STANDS AS REQUIRED FOR SMALLER PIPING. COORDINATE WITH FIELD ENGINEER. MAINTAIN ACCESS AND SERVICE CLEARANCES.
- 10 - ALL BRANCH HEATING WATER SUPPLY AND RETURN PIPING TO UNIT HEATERS AND CABINET UNIT HEATERS TO BE 3/4" UNLESS NOTED OTHERWISE.
- 11 - PROVIDE MANUAL AIR VENTS IN HEATING WATER SYSTEM AT ALL HIGH POINTS OF RISERS.
- 12 - PROVIDE NEW SHUT-OFF VALVES, BALANCING VALVES AND DRAIN VALVES IN ALL BRANCH PIPING TO UNIT HEATERS AND CABINET UNIT HEATERS. MAKE CONNECTION TO EXISTING BRANCH PIPING. VERIFY EXACT CONNECTION SIZE AND LOCATION.

NUMBERED NOTES

- ① INSULATE EXISTING 2" NON-POTABLE (NP) WATER PIPING.
- ② MAKE CONNECTION OF NEW 3/4" HWS & HWR TO EXISTING HWS & HWR MAINS. VERIFY EXACT CONNECTION SIZE AND LOCATION.
- ③ INSTALL AUTOMATIC FLOW CONTROL VALVE. FLOW AS INDICATED OR AS SCHEDULED FOR EQUIPMENT SERVED.

RECORD DRAWINGS

REVISED TO CONFORM TO
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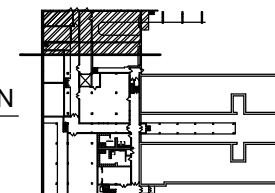


BY JAS
DATE 01/2017
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NO SHEET CHANGES



FIRST FLOOR NORTH HEATING/COOLING PLAN



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.		DATE		REVISION		BY	
PROJECT DATE:	MARCH 2016	DRAWN BY:	SRS								
F.B.:	A79-164	CHECKED BY:	TAW								
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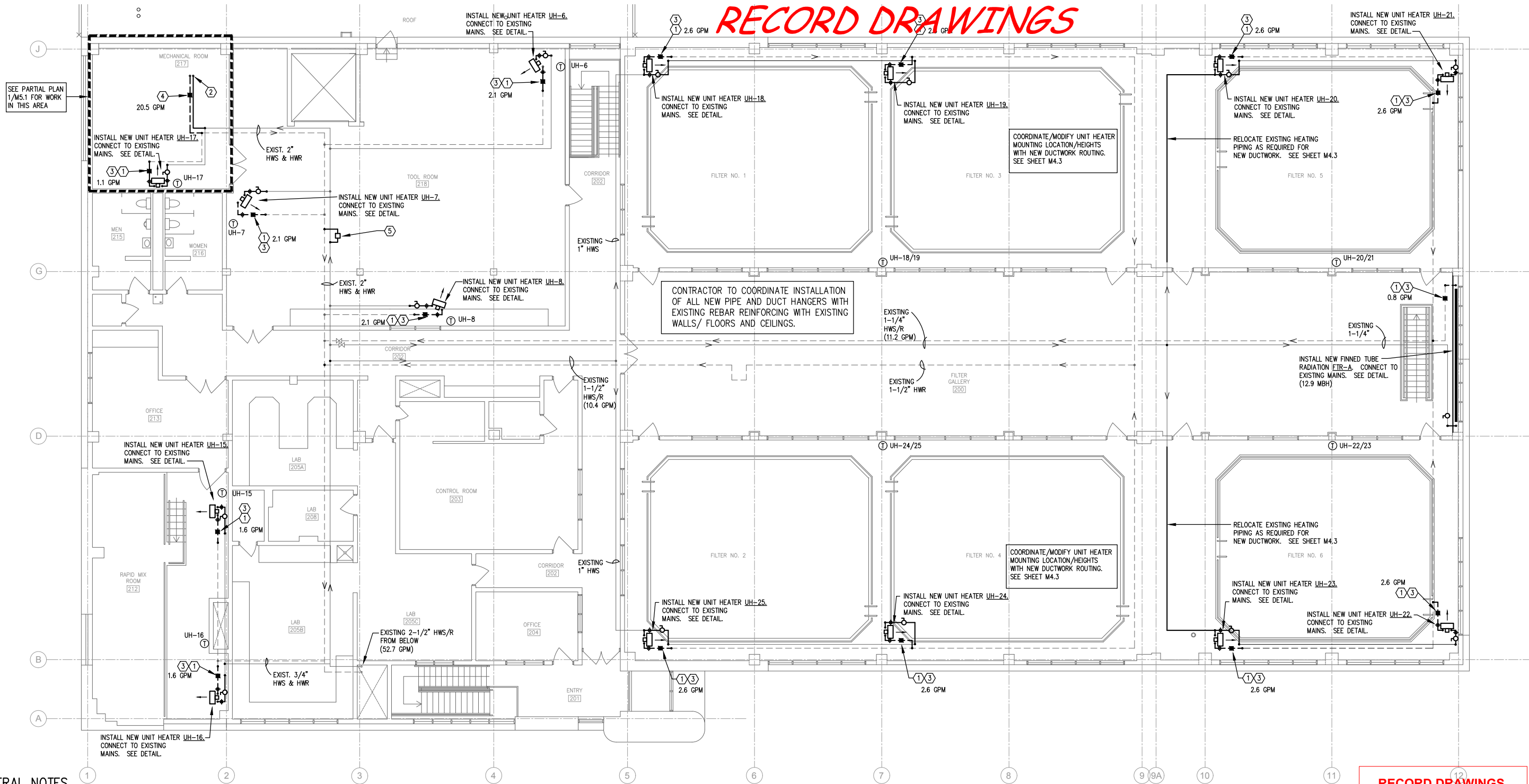
CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR NORTH
HEATING/COOLING PIPING

FILE NO.
00616097

SHEET
M3.2

RECORD DRAWINGS



GENERAL NOTES

- 1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.
- 2 - SEAL ALL DUCT AND PIPE OPENINGS THRU EXTERIOR WALL WEATHERTIGHT.
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- 4 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING.
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- 9 - PROVIDE ADDITIONAL UNISTRUT PIPING SUPPORT STANDS AS REQUIRED FOR SMALLER PIPING. COORDINATE WITH FIELD ENGINEER. MAINTAIN ACCESS AND SERVICE CLEARANCES.
- 10 - ALL BRANCH HEATING WATER SUPPLY AND RETURN PIPING TO UNIT HEATERS AND CABINET UNIT HEATERS TO BE 3/4" UNLESS NOTED OTHERWISE.
- 11 - PROVIDE MANUAL AIR VENTS IN HEATING WATER SYSTEM AT ALL HIGH POINTS OF RISERS.
- 12 - PROVIDE NEW SHUT-OFF VALVES, BALANCING VALVES AND DRAIN VALVES IN ALL BRANCH PIPING TO UNIT HEATERS AND CABINET UNIT HEATERS.
- 13 - PROVIDE LABOR/MATERIAL FOR INSULATING EQUIVALENT OF 150 L.F. OF ADDITIONAL EXISTING 2" PIPING. PIPING TO BE INSULATED TO BE FIELD LOCATED BY FIELD ENGINEER.

NUMBERED NOTES

- ① MAKE CONNECTION OF NEW 3/4" HWS & HWR TO EXISTING HWS & HWR MAINS. VERIFY EXACT CONNECTION SIZE AND LOCATION.
- ② 1-1/2" HWS & HWR TO AHU-3 HEATING COIL. SEE DETAIL.
- ③ INSTALL AUTOMATIC FLOW CONTROL VALVE. FLOW AS INDICATED OR AS SCHEDULED FOR EQUIPMENT SERVED.
- ④ FLOW MEASURING STATION. BALANCE TO FLOW INDICATED.
- ⑤ INSTALL NEW HEATING SYSTEM DIFFERENTIAL PRESSURE SENSOR ACROSS HWS & HWR MAINS.

SECOND FLOOR SOUTH HEATING/COOLING PLAN



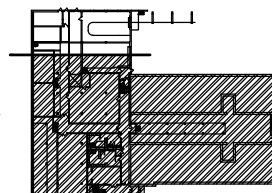
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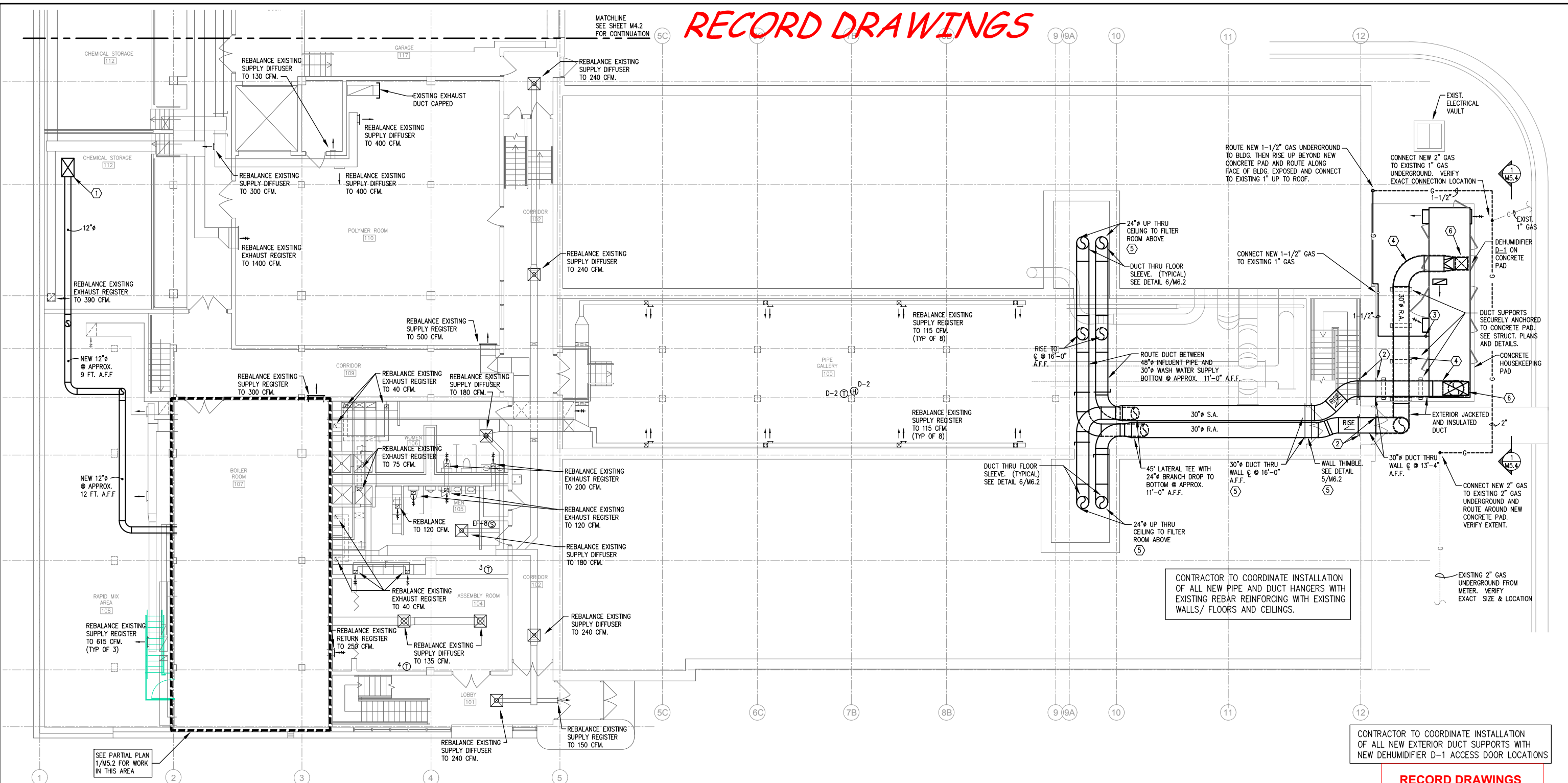


KEY PLAN - SECOND FLOOR

PROJECT NO.: 00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY	I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	THOMAS A. WENTZ	MARCH 7, 2016	18609	Date	License No.	MSA	TRANSPORTATION • MUNICIPAL DEVELOPMENT • ENVIRONMENTAL	332 W. Superior Street, Duluth, MN 55802 218-722-3915 • 1-800-777-7380 Fax: 218-722-4548 Web Address: www.msa-ps.com © MSA Professional Services, Inc.	WENTZ ASSOCIATES INC. CONSULTING ENGINEERS 7225 CHAS LANE EDINA, MINNESOTA 55435 PHONE: 952-931-1180 FAX: 952/931-0119 EMAIL: info@wentzassoc.com	LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS	CITY OF DULUTH DULUTH, MINNESOTA	SECOND FLOOR SOUTH HEATING/COOLING PIPING	FILE NO. 00616097	SHEET M3.3
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RECORD DRAWINGS

MATCHLINE
SEE SHEET M4.2
FOR CONTINUATION



NUMBERED NOTES

- CONNECT NEW 12" REACT. AIR INLET FOR DEHUMIDIFIER D-2 TO EXISTING 36x24 FROM ABOVE. FABRICATE PLENUM BOX AS REQUIRED.
- PROVIDE ESCUTCHEON PLATE AROUND DUCT ON BOTH SIDES AT WALL PENETRATION. ANCHOR TO WALL. SEAL AIRTIGHT AT WALL AND DUCT BOTH SIDES. ESCUTCHEON TO BE TYPE 316 STAINLESS STEEL.
- MAKE 1-1/2" GAS CONNECTION TO EQUIPMENT WITH SHUT-OFF VALVE, DRIP LEG AND PRESSURE REGULATOR.
- EXTERIOR DUCTWORK TO BE INSULATED AND JACKETED WEATHERTIGHT.
- PROVIDE ESCUTCHEON PLATE AROUND DUCT ON BOTH SIDES OF WALL/FLOOR PENETRATIONS. ANCHOR TO WALL/FLOOR. CAULK WEATHERTIGHT AT WALL/FLOOR AND DUCT BOTH SIDES. ESCUTCHEON TO BE ALUMINUM.
- FLEXIBLE DUCT CONNECTION AT UNIT. INSULATION AND JACKET TO COVER FLEX CONNECTION.

GENERAL NOTES

- ALL ROUND EXPOSED DUCTWORK WITHIN FILTER ROOMS TO BE TYPE 3003-H14 ALUMINUM SPIRAL DUCT WITH TYPE 316 STAINLESS-STEEL SUPPORTS AND HANGERS. ISOLATE DISSIMILAR METAL COMPONENTS WITH NEOPRENE SHEETING OR EQUIPMENT.

ALUMINUM



FIRST FLOOR SOUTH DUCTWORK PLAN



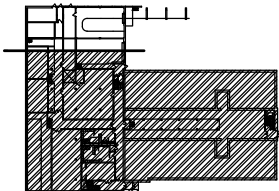
CONTRACTOR TO COORDINATE INSTALLATION OF ALL NEW EXTERIOR DUCT SUPPORTS WITH NEW DEHUMIDIFIER D-1 ACCESS DOOR LOCATIONS

RECORD DRAWINGS

REVISED TO CONFORM TO CONSTRUCTION RECORDS PROVIDED BY CONTRACTOR



BY JAS.
DATE 01/2017
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KEY PLAN - FIRST FLOOR

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THOMAS A. WENTZ

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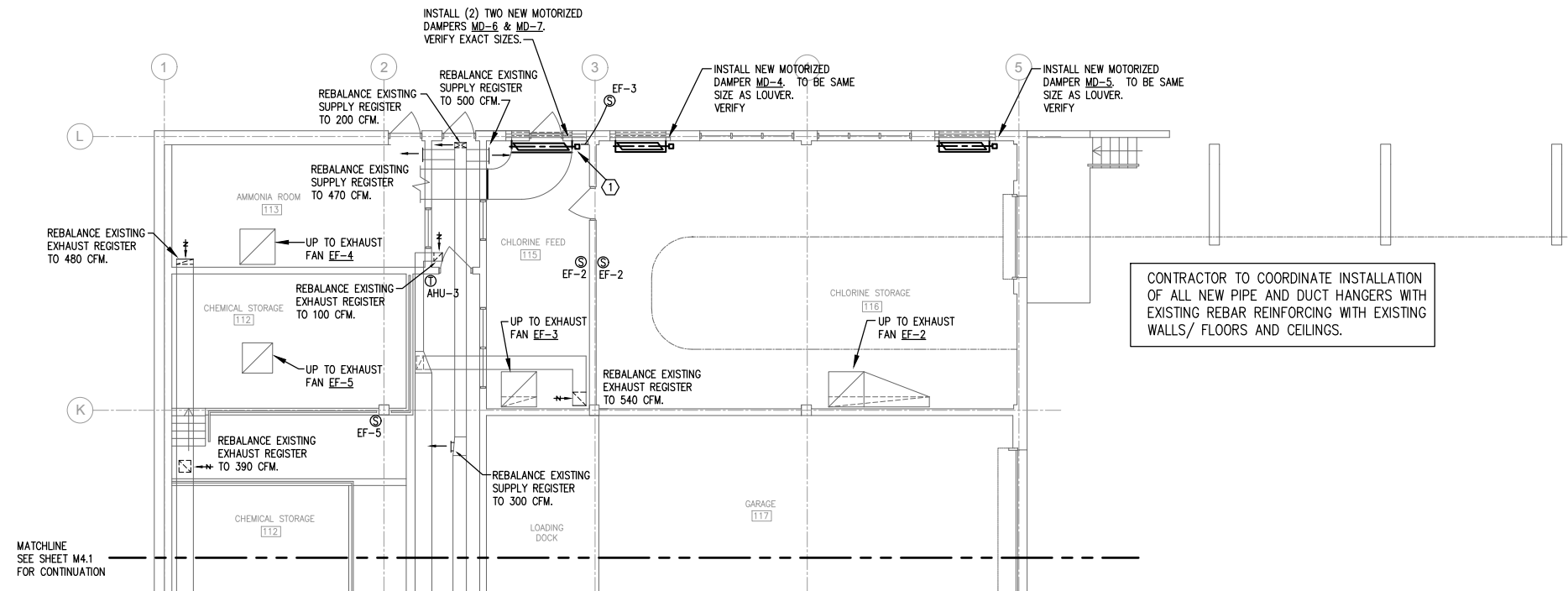
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR SOUTH DUCTWORK PLAN	FILE NO. 00616097
	SHEET M4.1

RECORD DRAWINGS

NUMBERED NOTES

- ① MOTORIZED DAMPER MD-7 LOCATED WITHIN DUCTWORK. REPLACE DUCTWORK AND DAMPER ACCESS DOOR.



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

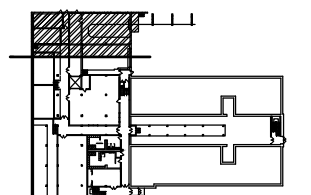


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NO SHEET CHANGES



FIRST FLOOR NORTH DUCTWORK PLAN



KEY PLAN - FIRST FLOOR

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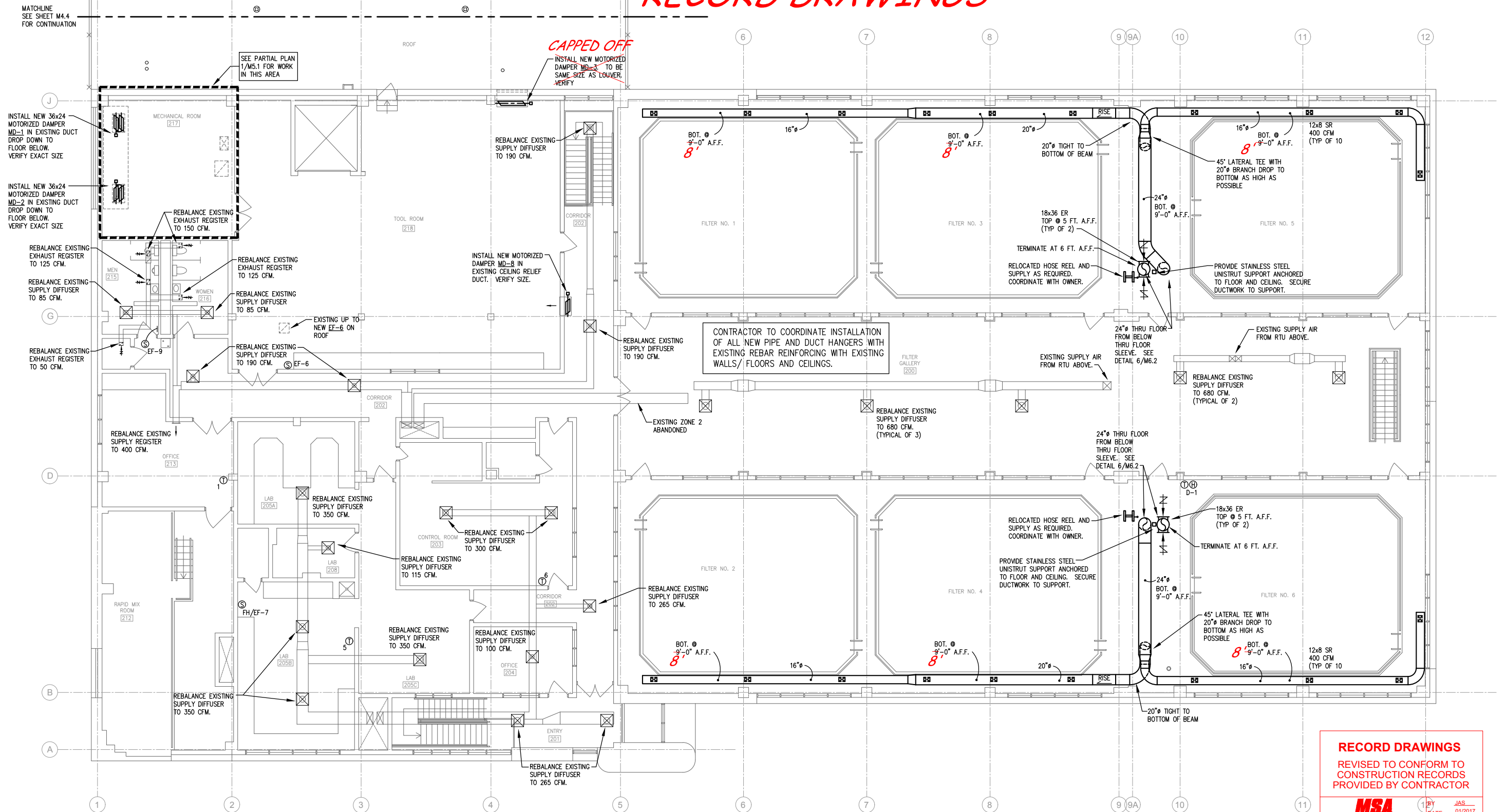
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR NORTH
DUCTWORK PLAN

FILE NO.
00616097
SHEET
M4.2

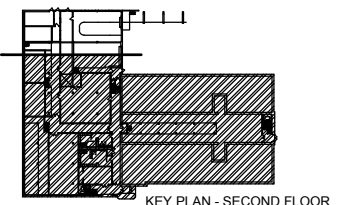
RECORD DRAWINGS



GENERAL NOTES

- ALL ROUND EXPOSED DUCTWORK WITHIN FILTER ROOMS TO BE TYPE 3003-H14 ALUMINUM SPIRAL DUCT WITH TYPE 316 **ALUMINUM** STAINLESS-STEEL SUPPORTS AND HANGERS. ISOLATE DISSIMILAR METAL COMPONENTS WITH NEOPRENE SHEETING OR EQUIPMENT.

ENLARGED SECOND FLOOR PLAN



RECORD DRAWINGS
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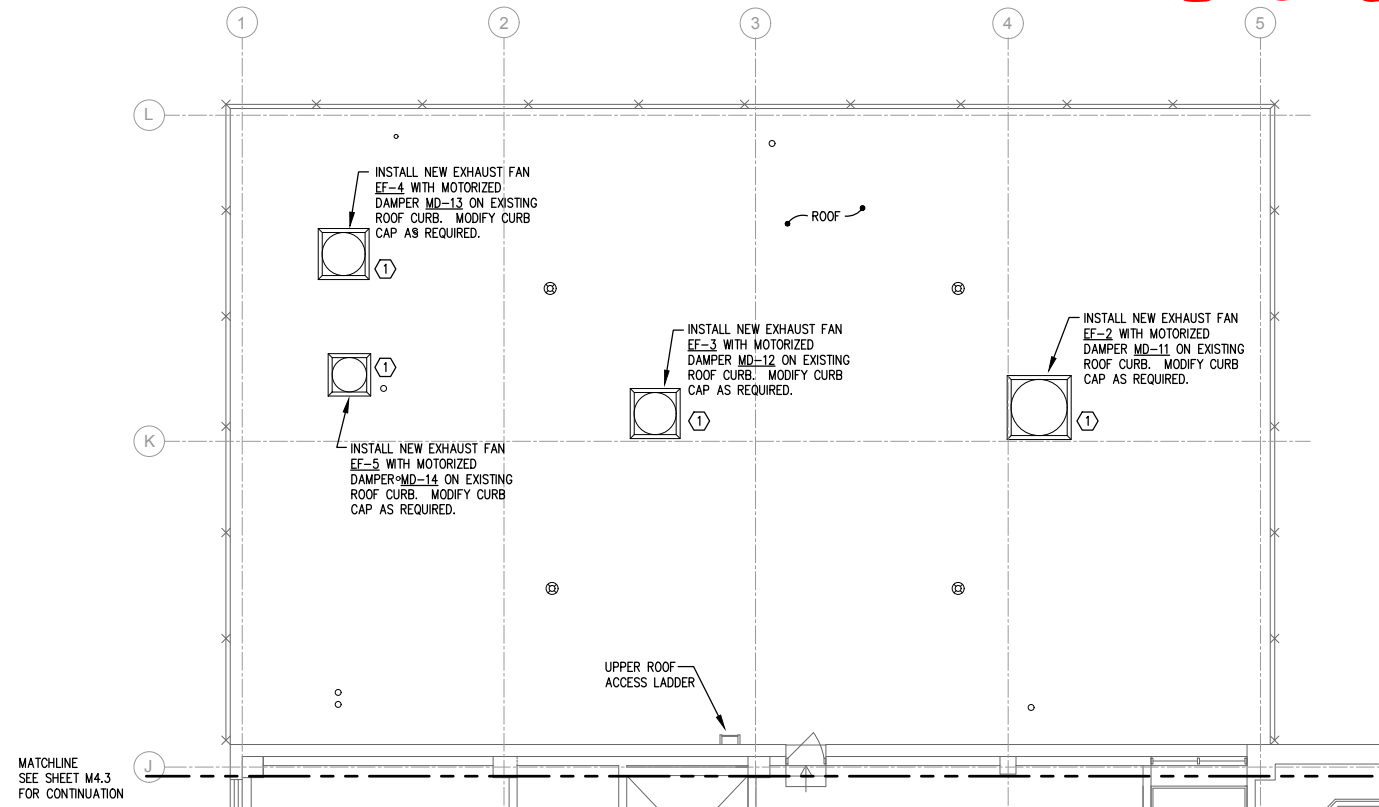


LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

SECOND FLOOR SOUTH
DUCTWORK PLAN

FILE NO.
00616097
SHEET
M4.3

RECORD DRAWINGS



NUMBERED NOTES

- ① PROVIDE CURB ADAPTOR AS REQUIRED FOR NEW EXHAUST FAN. VERIFY EXACT SIZE REQUIRED.

GENERAL NOTES

- 1 - COORDINATE ALL ROOFING WORK WITH ROOFING SUB-CONTRACTOR.

RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

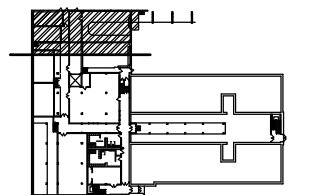


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NO SHEET CHANGES



SECOND FLOOR NORTH DUCTWORK PLAN



KEY PLAN - SECOND FLOOR

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SECOND FLOOR NORTH
DUCTWORK PLAN

FILE NO.
00616097
SHEET
M4.4

MECHANICAL ROOF PLAN

SEE SHEET M4.4 FOR NEW EQUIPMENT THIS ROOF

UPPER ROOF ACCESS LADDER

INSTALL NEW EXHAUST FAN EF-1 ON EXISTING ROOF CURB. MODIFY CURB CAP AS REQUIRED.

INSTALL NEW EXHAUST FAN EF-9 ON EXISTING ROOF CURB. MODIFY CURB CAP AS REQUIRED.

NEW PROTECTIVE RAILING. SEE STRUCTURAL FOR DETAILS

INSTALL NEW EXHAUST FAN EF-6 WITH MOTORIZED DAMPER MD-15 ON EXISTING ROOF CURB. MODIFY CURB CAP AS REQUIRED.

INSTALL NEW EXHAUST FAN EF-8 ON EXISTING ROOF CURB. MODIFY CURB CAP AS REQUIRED.

INSTALL NEW EXHAUST FAN EF-7 WITH MOTORIZED DAMPER MD-16 ON EXISTING ROOF CURB. MODIFY CURB CAP AS REQUIRED.

EXISTING BOILER STACK

EXISTING ROOFTOP UNIT AND DUCTWORK TO REMAIN

EXIST. 2"

EXIST. 1" GAS FROM BELOW

EXIST. 1"

EXISTING ROOFTOP UNIT

EXISTING REGULATOR

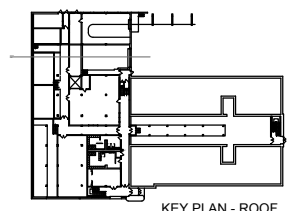
EXISTING DUCT BOX TO REMAIN

EXISTING R SYSTEM TO

1 - CONTRACTOR TO VERIFY EXACT SIZE OF EXISTING ROOF CURBS AND PROVIDE CURB TRANSITIONS AS REQUIRED FOR NEW FANS.

NO SHEET CHANGES

Day	Number of People
Monday	12
Tuesday	16
Wednesday	8
Thursday	4
Friday	2
Saturday	24
Sunday	32



KEY PLAN - ROOF

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THOMAS A. WENTZ Date License No.



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CITY OF DULUTH
DULUTH, MINNESOTA

ROOF
MECHANICAL PLAN

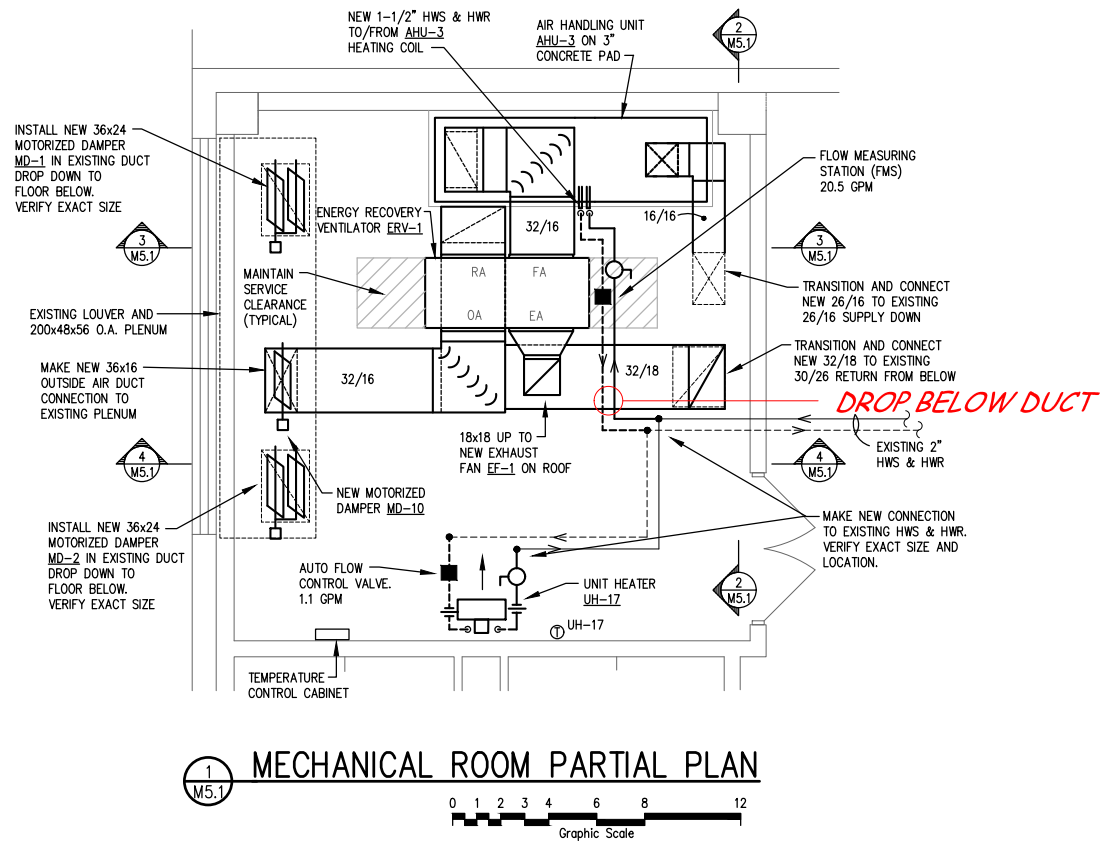
FILE NO.
00616097

SHEET
M4.5

RECORD DRAWINGS

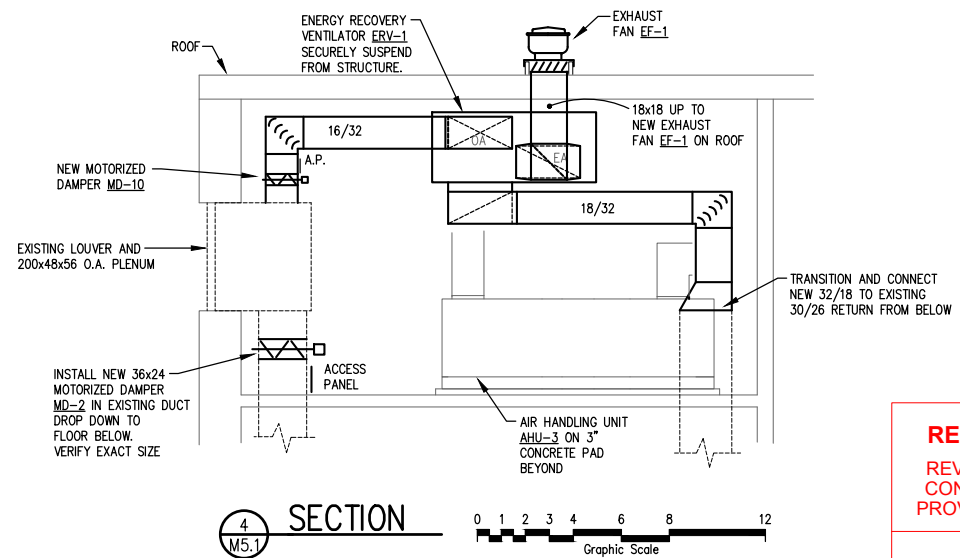
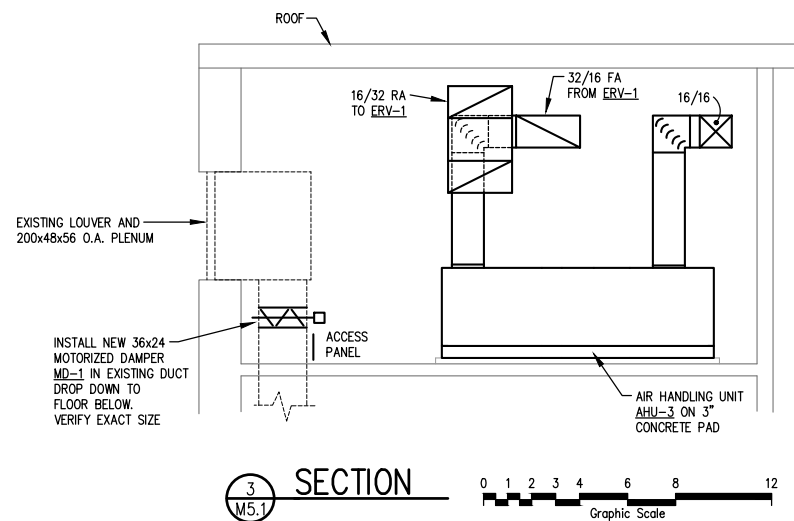
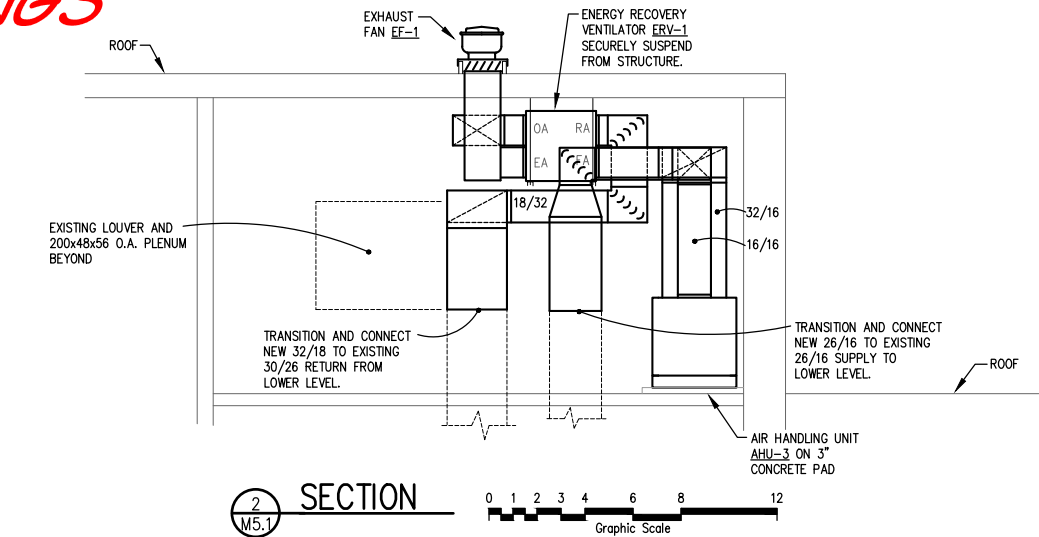
COORDINATE CONCRETE HOUSEKEEPING PAD REMOVAL AND REPLACEMENT WITH WORK AS DESCRIBED ON SHEET A2, NUMBERED NOTES 8 & 9

CONTRACTOR TO COORDINATE INSTALLATION OF ALL NEW PIPE AND DUCT HANGERS WITH EXISTING REBAR REINFORCING WITH EXISTING WALLS/ FLOORS AND CEILINGS.



GENERAL NOTES

- 1 - PROVIDE PROTECTIVE CLOSED CELL BUMPER GUARDS ON EDGES OF ALL DUCTWORK BELOW 7'-0" A.F.F.
- 2 - VERIFY EXACT SIZE OF ALL NEW MOTORIZED DAMPERS INSTALLED IN EXISTING DUCTWORK AND LOUVERS.
- 3 - CONTRACTOR TO PROVIDE NEW 3" CONCRETE PAD FOR AHU-3.



RECORD DRAWINGS
REVISED TO CONFORM TO
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BY JAS
DATE 01/2017
CRS NO. XXXXX

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THOMAS A. WENTZ

MARCH 7, 2016
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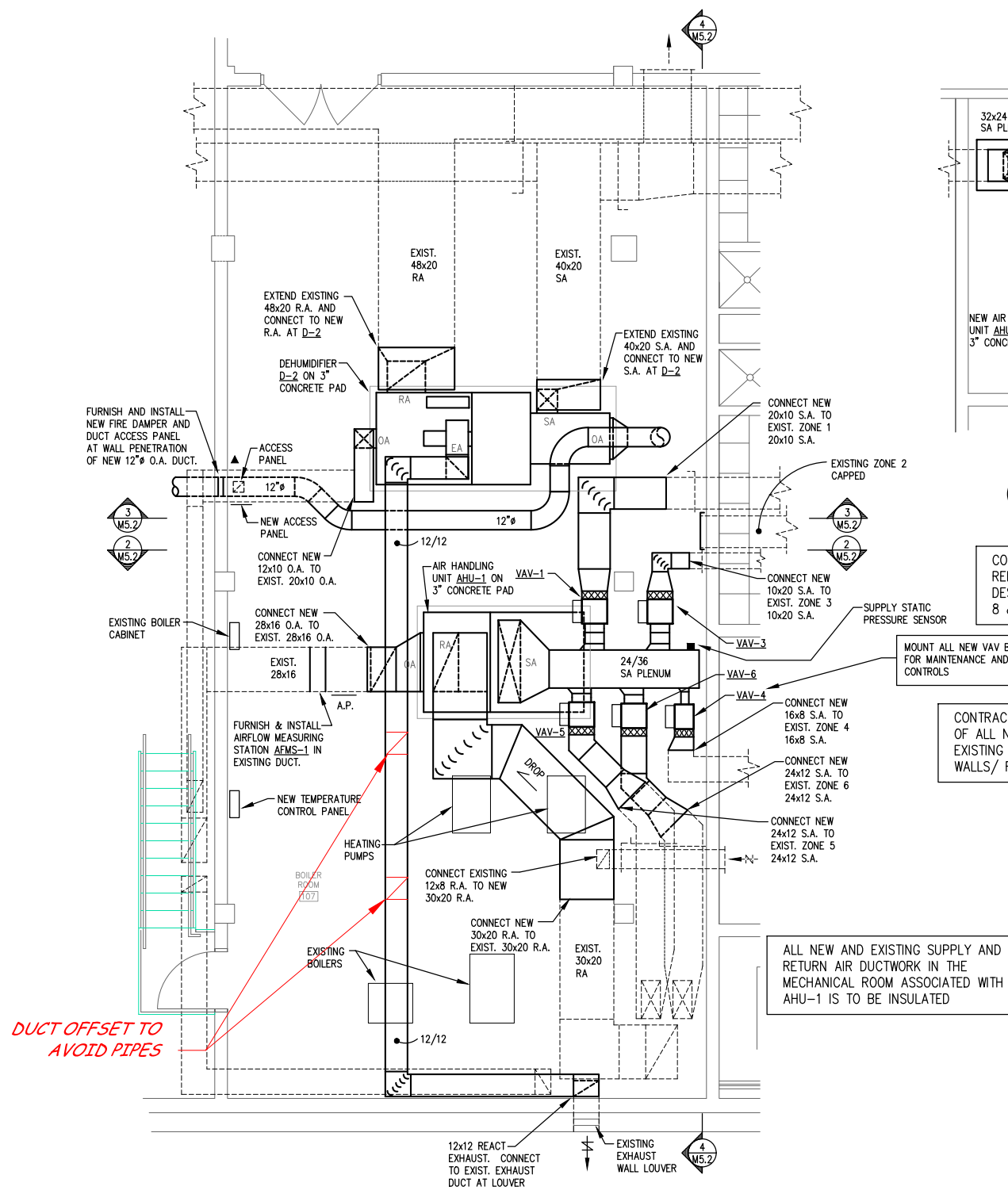


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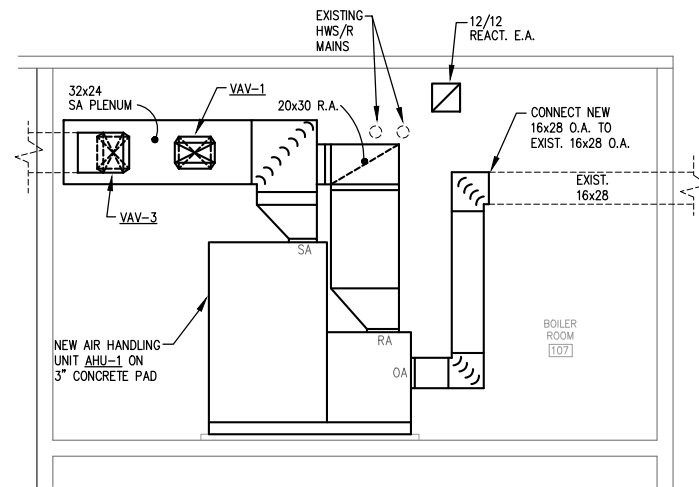
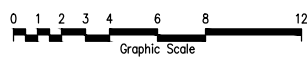
MECHANICAL ROOM
PARTIAL PLAN

FILE NO.
00616097
SHEET
M5.1

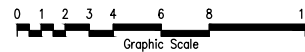
RECORD DRAWINGS



1 LOWER LEVEL BOILER ROOM PARTIAL PLAN



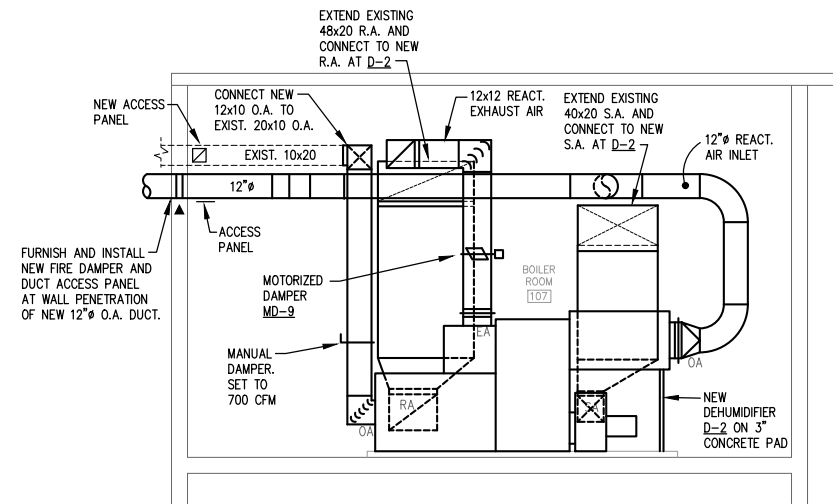
SECTION 2



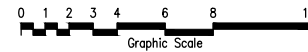
COORDINATE CONCRETE HOUSEKEEPING PAD
REMOVAL AND REPLACEMENT WITH WORK AS
DESCRIBED ON SHEET A2, NUMBERED NOTES
8 & 9

CONTRACTOR TO COORDINATE INSTALLATION
OF ALL NEW PIPE AND DUCT HANGERS WITH
EXISTING REBAR REINFORCING WITH EXISTING
WALLS/ FLOORS AND CEILINGS.

ALL NEW AND EXISTING SUPPLY AND RETURN AIR DUCTWORK IN THE MECHANICAL ROOM ASSOCIATED WITH AHU-1 IS TO BE INSULATED

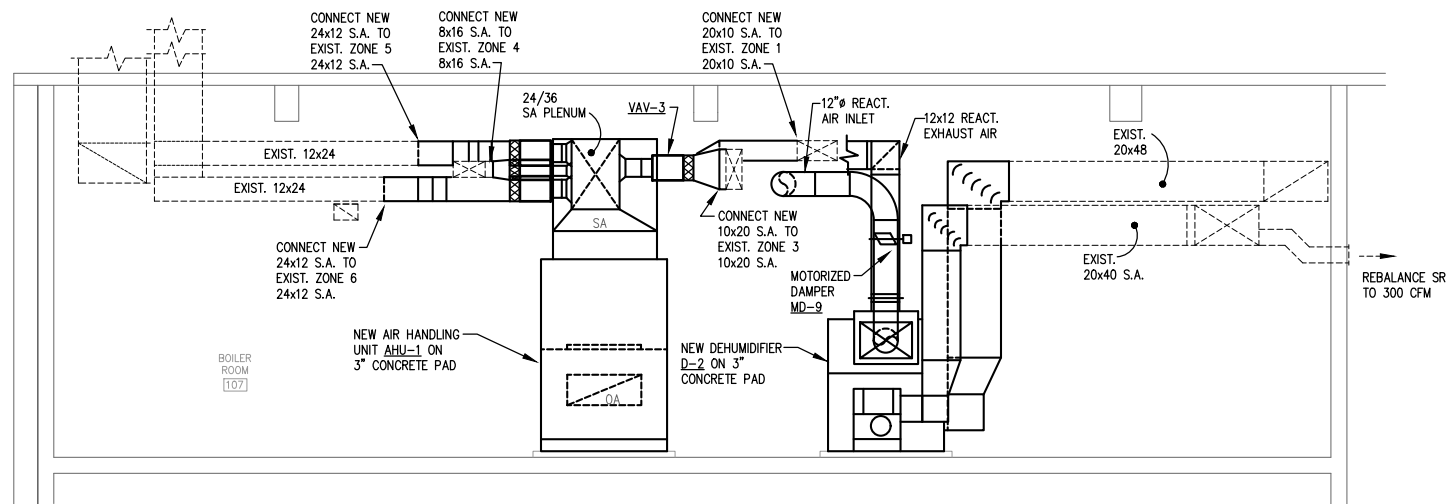


3 SECTION

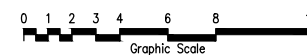


GENERAL NOTES

- 1 - PROVIDE PROTECTIVE CLOSED CELL BUMPER GUARDS ON EDGES OF ALL DUCTWORK BELOW 7'-0" A.F.F.
- 2 - ALL NEW DUCT CONNECTIONS TO NEW EQUIPMENT TO BE MADE WITH FLEXIBLE DUCT CONNECTIONS.
- 3 - CONTRACTOR TO PROVIDE NEW 3" CONCRETE PAD FOR ALL NEW EQUIPMENT. VERIFY EXACT SIZE REQUIRED.



4 LOWER LEVEL BOILER ROOM SECTION



RECORD DRAWINGS

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BY	<u>JAS</u>
DATE	<u>01/2017</u>
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MARCH 7, 2016
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

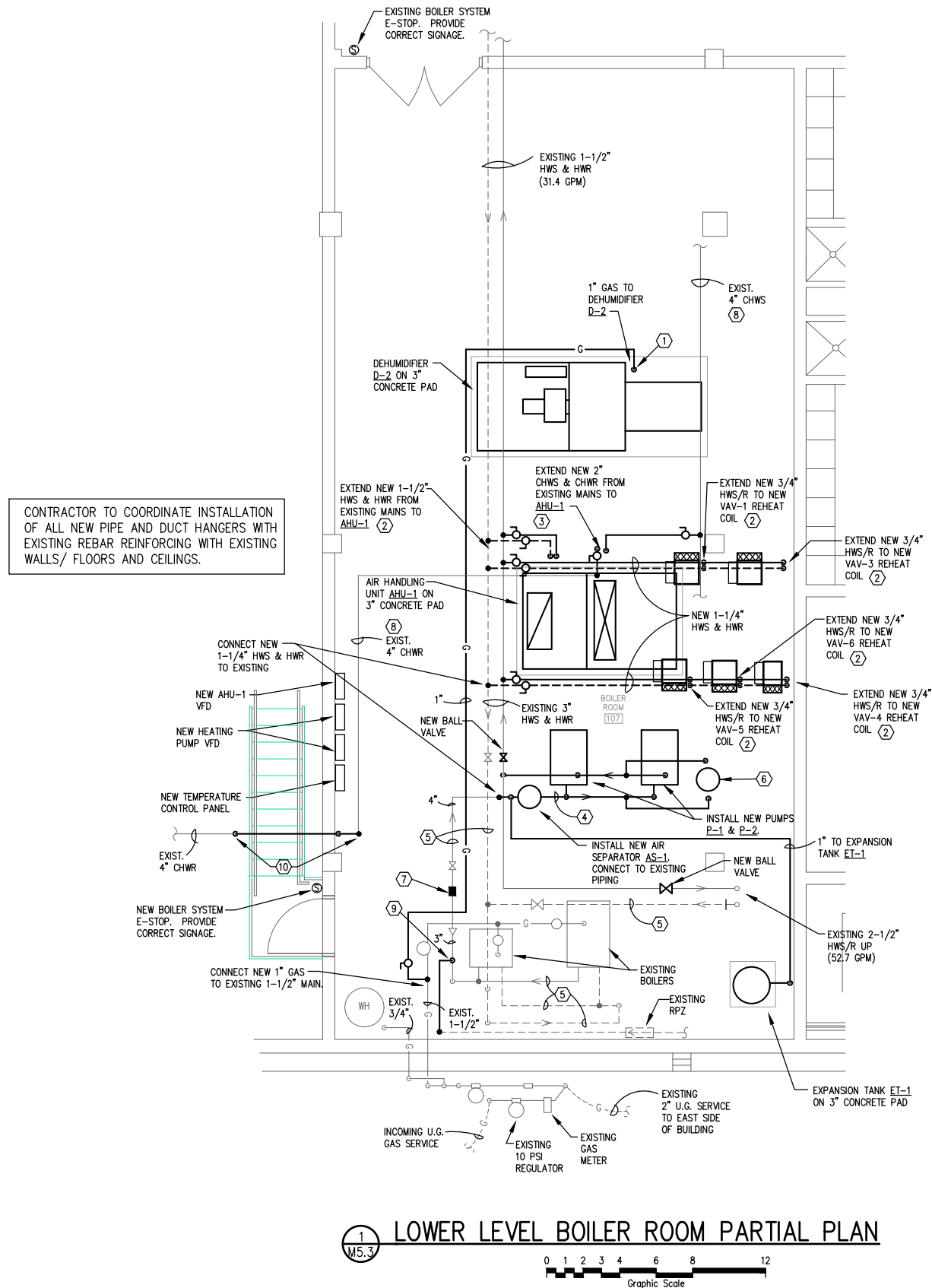
MECHANICAL ROOM
PARTIAL PLAN

FILE NO.

00616097

SHEET
M5.2

RECORD DRAWINGS

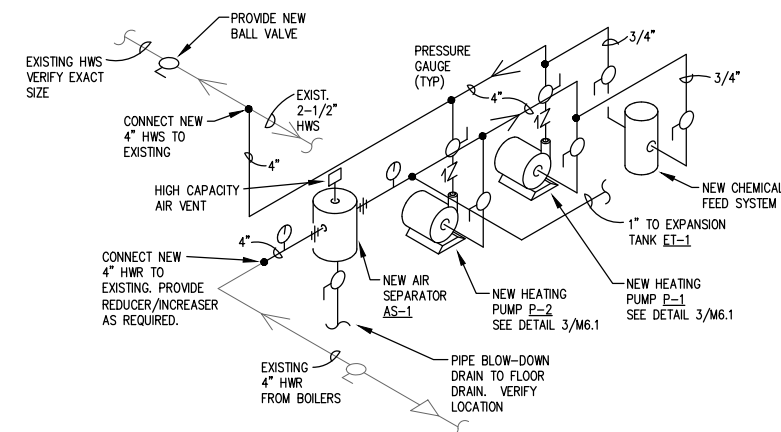


NUMBERED NOTES

- 1 MAKE 1" GAS CONNECTION TO MAKE-UP AIR UNIT WITH SHUT-OFF VALVE, GAS PRESSURE REGULATOR AND DIRT LEG.
- 2 REFER TO COIL PIPING DIAGRAM DETAIL 5/M6.1. PROVIDE AUTO-FLOW CONTROL VALVE FOR EACH HEATING COIL. REFER TO EQUIPMENT SCHEDULES FOR FLOW RATES.
- 3 REFER TO COIL PIPING DIAGRAM DETAIL 4/M6.1. PROVIDE AUTO-FLOW CONTROL VALVE FOR EACH COOLING COIL. REFER TO EQUIPMENT SCHEDULES FOR FLOW RATES. - GALVANIZED PIPE
- 4 FURNISH AND INSTALL NEW HEATING PIPING FROM NEW AIR SEPARATOR TO NEW PUMPS AND FROM NEW PUMPS TO EXISTING HWS MAIN.
- 5 INSULATE ALL EXISTING UNINSULATED HEATING PIPING IN VICINITY OF BOILERS. APPROX. 100 LINEAR FEET OF 3" PIPE. VERIFY EXACT PIPE SIZE AND LENGTH.
- 6 FURNISH AND INSTALL NEW CHEMICAL FEEDER SYSTEM FOR HEATING SYSTEM.
- 7 INSTALL NEW HEATING SYSTEM FLOW METER IN EXISTING 3" HWS PIPE.
- 8 INSULATE EXISTING CHWS & CHWR PIPING WITHIN BOILER ROOM
- 9 MAKE CONNECTION OF 3/4" HEATING SYSTEM MAKE-UP WATER TO EXISTING 3" HEATING WATER MAIN. VERIFY CONNECTIONS.
- 10 CONNECT TO EXISTING 4" CHWR AND ROUTE THRU WALL AT 8 FT. A.F.F. TO PROVIDE REQUIRED CLEARANCE BETWEEN NEW PIPE AND NEW STAIRS. EXTEND NEW PIPE BEYOND NEW STAIRS AND RECONNECT INTO TOP OF EXISTING 4" CHWR PIPE. VERIFY EXTENT OF WORK. - GALVANIZED PIPE

GENERAL NOTES

- 1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.
- 2 - SEAL ALL DUCT AND PIPE OPENINGS THRU EXTERIOR WALL WEATHERTIGHT.
- 3 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.
- 4 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING.
- 5 - ALL EQUIPMENT CONNECTIONS TO BE MADE WITH UNIONS UNLESS NOTED OTHERWISE.
- 6 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.
- 7 - PROVIDE MANUAL AIR VENTS IN HEATING WATER SYSTEM AT ALL HIGH POINTS OF RISERS.
- 8 - PROVIDE NEW SHUT-OFF VALVES, BALANCING VALVES AND DRAIN VALVES IN ALL BRANCH PIPING TO VAVS
- 9 - PROVIDE ADDITIONAL UNISTRUT PIPING SUPPORT STANDS AS REQUIRED FOR SMALLER PIPING. COORDINATE WITH FIELD ENGINEER. MAINTAIN ACCESS AND SERVICE CLEARANCES.
- 10 - ALL BRANCH HEATING WATER SUPPLY AND RETURN PIPING TO VAVS TO BE 3/4" UNLESS NOTED OTHERWISE.
- 11 - PROVIDE LABOR/MATERIAL FOR INSULATING EQUIVALENT OF 150 L.F. OF ADDITIONAL EXISTING 2" PIPING. PIPING TO BE INSULATED TO BE FIELD LOCATED BY FIELD ENGINEER.
- 12 - PROVIDE/MODIFY CONCRETE HOUSEKEEPING PADS FOR ALL NEW EQUIPMENT. VERIFY EXACT SIZES REQUIRED.



2 M5.3 HEATING PUMP PIPING DIAGRAM
NO SCALE

RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

PROJECT NO.	00616097	SCALE	AS SHOWN	NO.		DATE		REVISION		BY	
PROJECT DATE:	MARCH 2016	DRAWN BY:	SRS								
F.B.:	A79-164	CHECKED BY:	TAW								
PLOT DATE:	11/14/17, P:610s16100616097/CADD/Record Drawings/AutoCAD DWG's/M5.3.dwg										

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THOMAS A. WENTZ

MARCH 7, 2016

18609

Date

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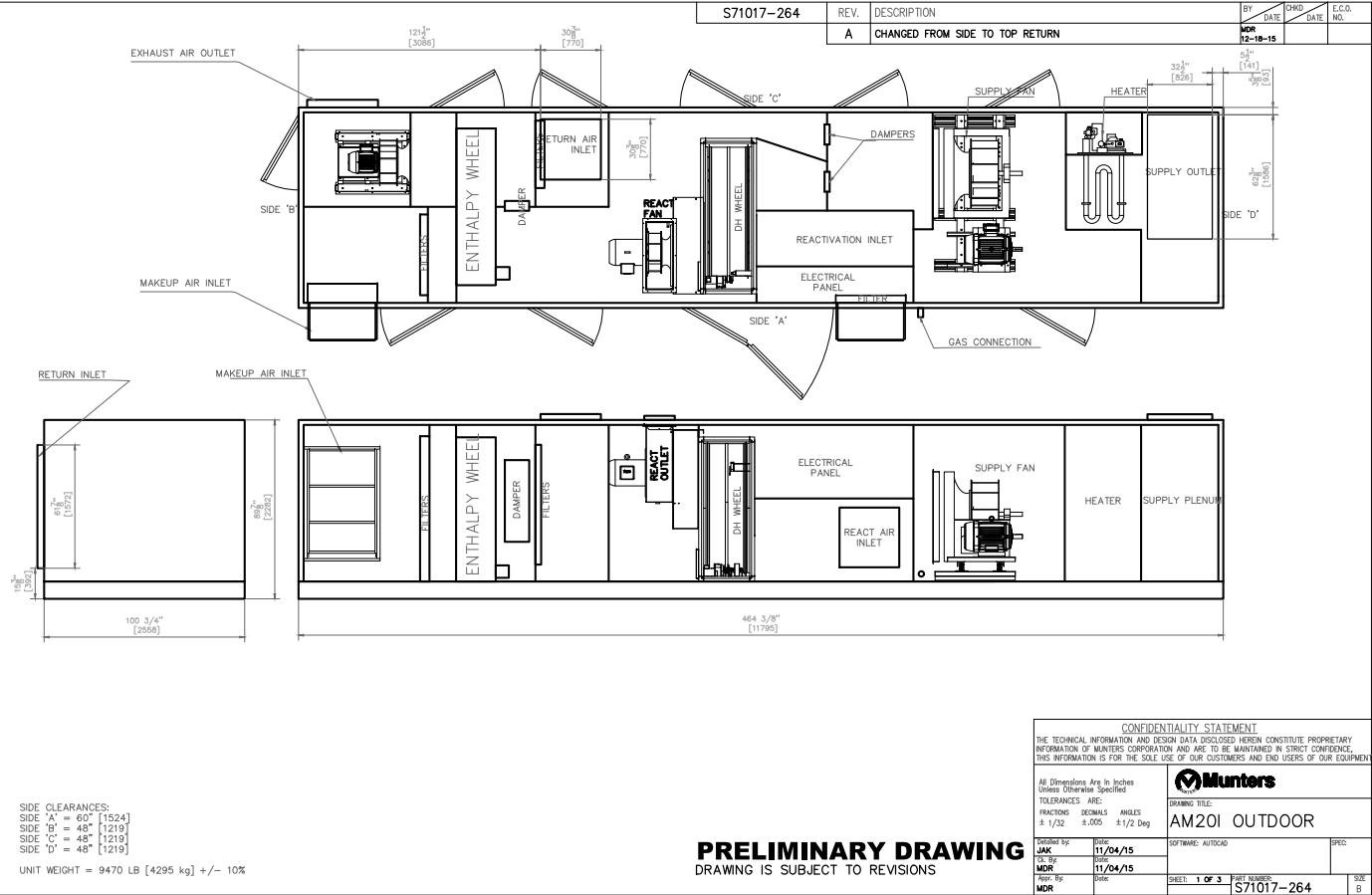
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

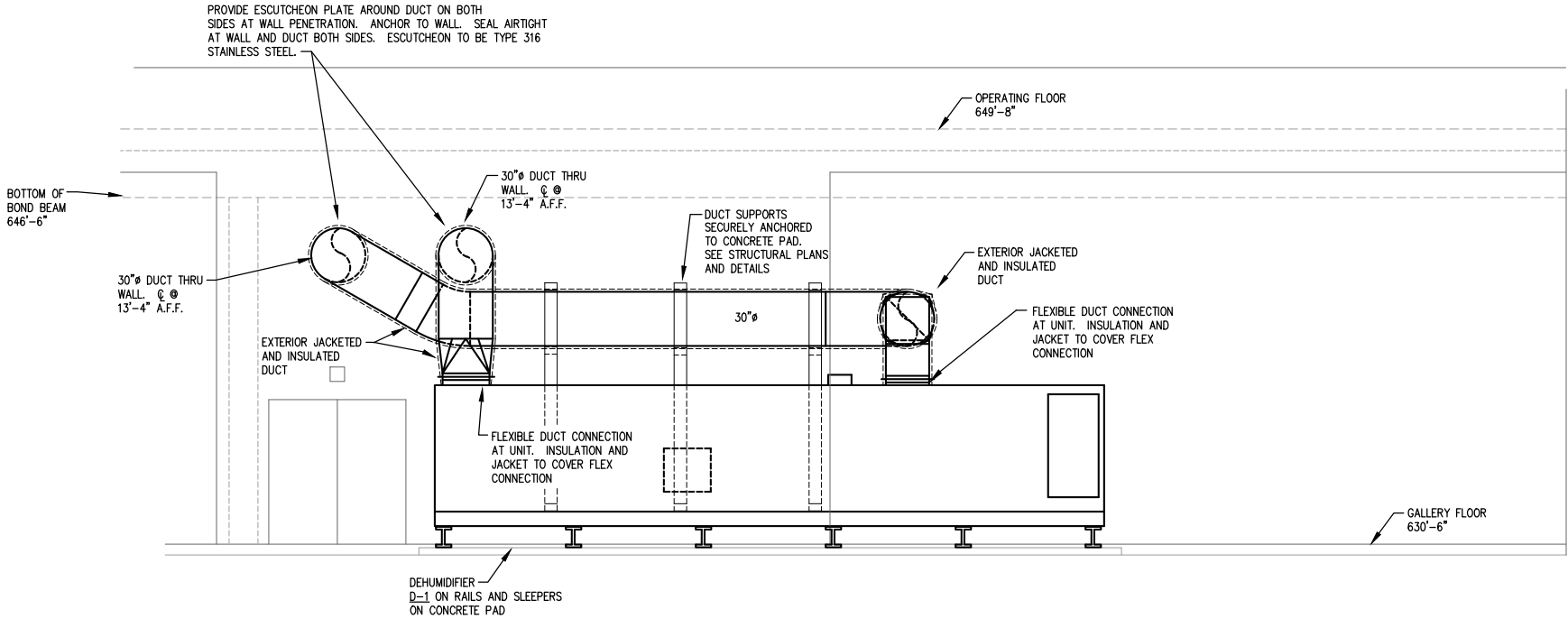
MECHANICAL ROOM
PARTIAL PLAN

FILE NO.
00616097
SHEET
M5.3

RECORD DRAWINGS

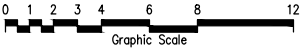


2 DEHUMIDIFIER D-1 BASIS OF DESIGN
M5.4 NO SCALE



CONTRACTOR TO COORDINATE INSTALLATION OF ALL NEW EXTERIOR DUCT SUPPORTS WITH NEW DEHUMIDIFIER D-1 ACCESS DOOR LOCATIONS

1 EAST ELEVATION PLAN
M5.4



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CONSTRUCTION RECORDS
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NO SHEET CHANGES

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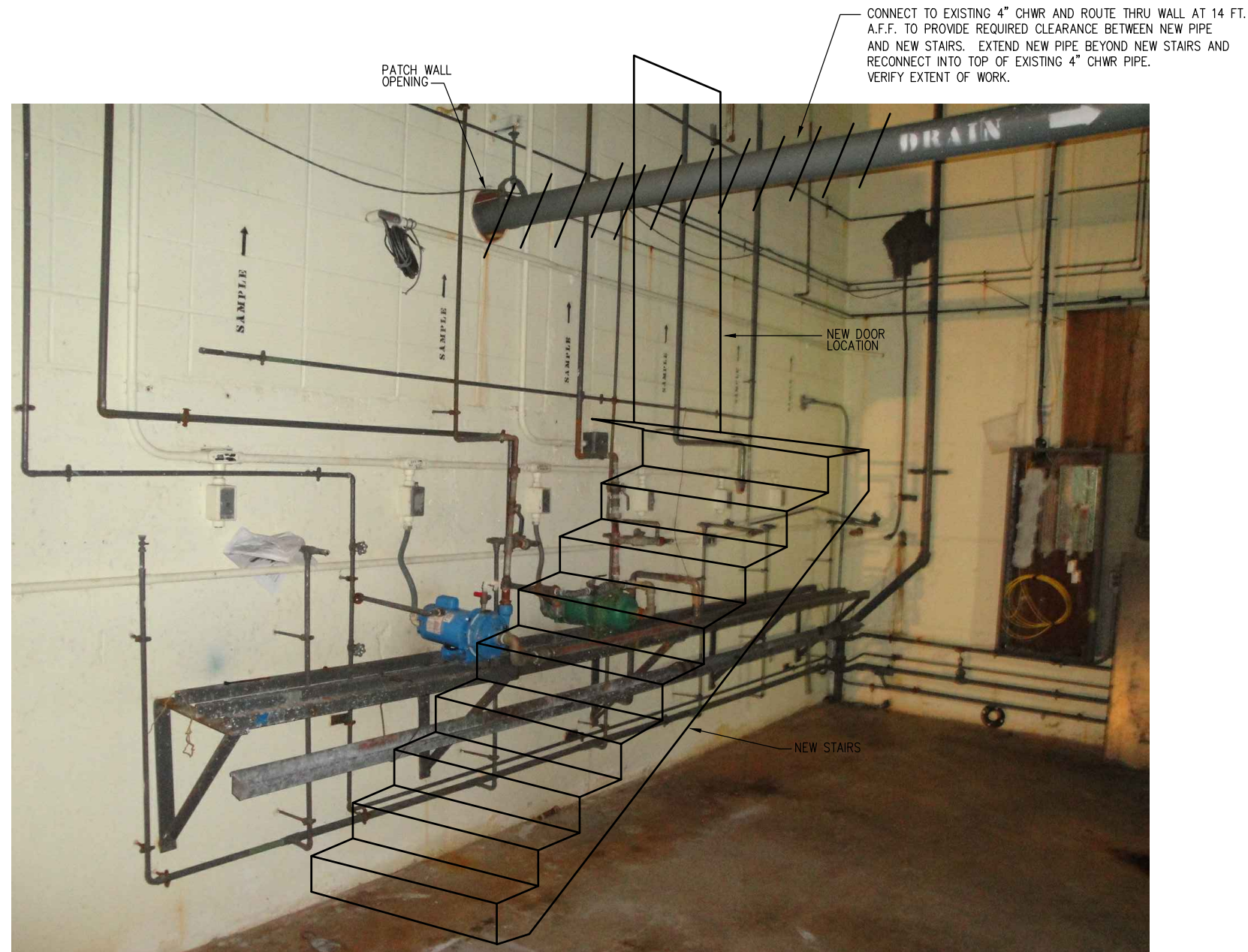
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

EAST ELEVATION
PARTIAL PLAN

FILE NO.
00616097
SHEET
M5.4

RECORD DRAWINGS



DEMOLITION NOTES

- 1 - CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BIDDING.
- 2 - REMOVE ITEMS INDICATED AS HACHURED.
- 3 - CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR REMOVAL AND INSTALLATION OF MECHANICAL ITEMS. ALL NEW PATCHING SHALL MATCH EXISTING SURFACES.
- 4 - WHERE EQUIPMENT AND PIPING IS REMOVED AND NO NEW WORK IS INVOLVED, CAP, PATCH AND FILL ALL HOLES TO MATCH ADJACENT SURFACES. COORDINATE WITH NEW CONSTRUCTION PLANS.
- 5 - WHERE EQUIPMENT IS INDICATED TO BE REMOVED, ALSO REMOVE ALL ASSOCIATED PIPING AND CONTROLS.
- 6 - WHERE PIPING IS INDICATED TO BE REMOVED OR REPLACED, ALSO REMOVE AND REPLACE ALL ASSOCIATED HANGERS AND SUPPORTS.
- 7 - COORDINATE DEMO WORK WITH OTHER TRADES.

GENERAL NOTES

- 1 - REMOVE AND RELOCATE EXISTING SAMPLE PUMPS, ASSOCIATED PIPING AND SUPPORTS AS REQUIRED FOR INSTALLATION OF NEW DOOR AND STAIRS.
- 2 - SAMPLE PUMPS AND PIPING CAN BE RELOCATED TO NORTH BEYOND LOCATION OF NEW STAIRS. VERIFY.
- 3 - EXTEND PIPING AS REQUIRED TO NEW LOCATION.
VERIFY.
- 4 - PERMANENTLY REMOVE AND DISCARD ALL NON-FUNCTIONING PIPING.
VERIFY WITH FIELD ENGINEER AND CITY'S REPRESENTATIVE.
- 5 - SEE SHEET A2 FOR ADDITIONAL INFORMATION ON NEW DOOR AND STAIRS INSTALLATION.

ALL WORK ASSOCIATED WITH SAMPLE PUMPS AND PIPING
IS DEFINED ON DRAWINGS PM1-PM4 AND CLARIFIED IN
ADDENDUM #4.

1
M5.5

EXISTING RAPID MIX ROOM SAMPLE PUMPS AND PIPING

NO SCALE

NO SCALE

RECORD DRAWINGS

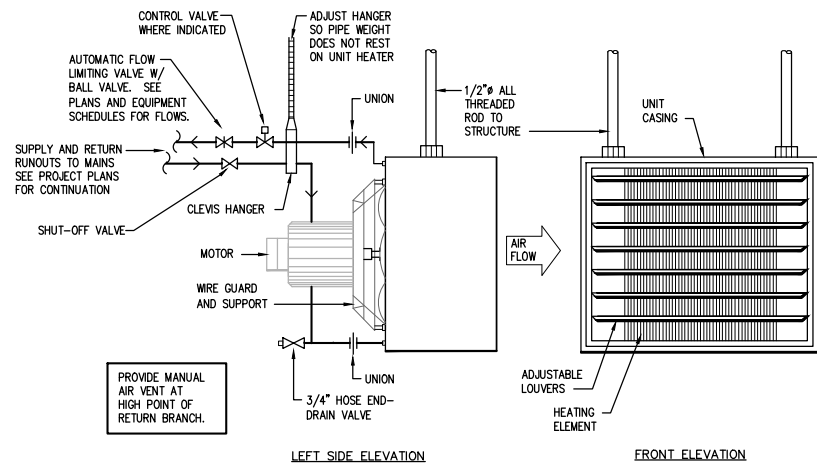
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BY	<u>JAS</u>
DATE	<u>01/2017</u>
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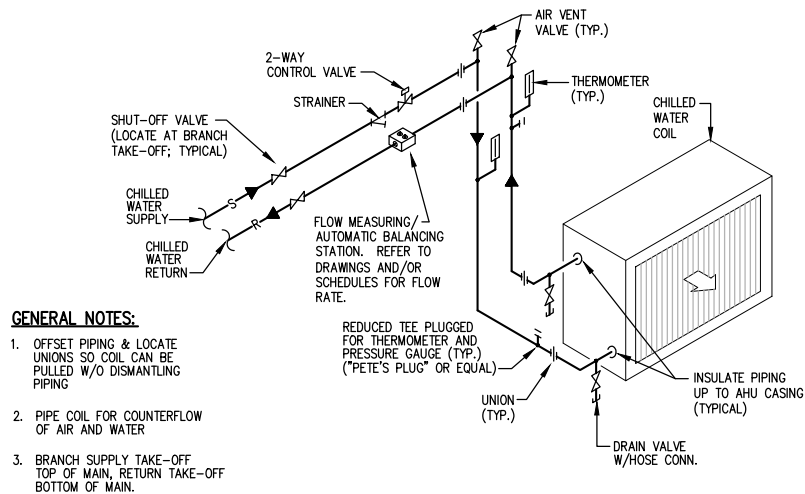
NO SHEET CHANGES

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PROJECT DATE: MARCH 2016	DRAWN BY: SRS	-	-	-							
F.B.: A79-164	CHECKED BY: TAW	-	-	-							
PLOT DATE: 11/14/17, P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG\M5.5.dwg											

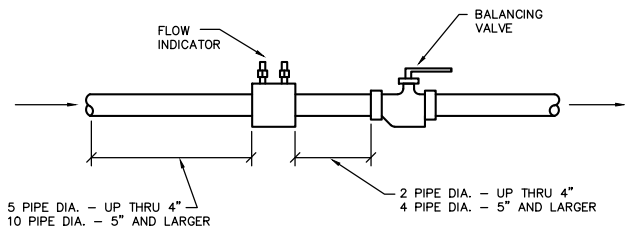
RECORD DRAWINGS



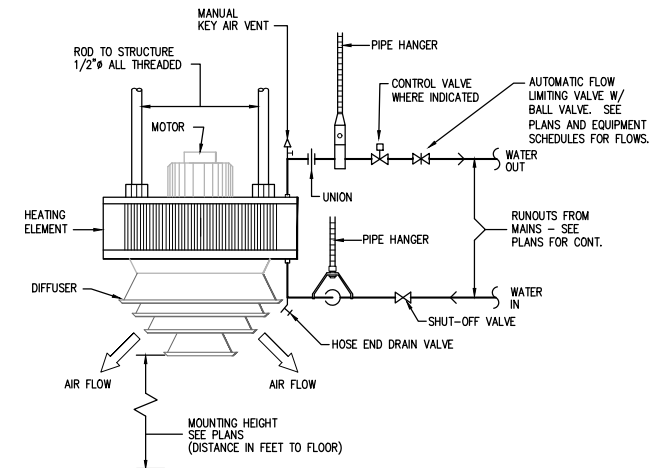
1 HORIZONTAL H.W. UNIT HEATER CONNECTIONS
M6.1 NO SCALE



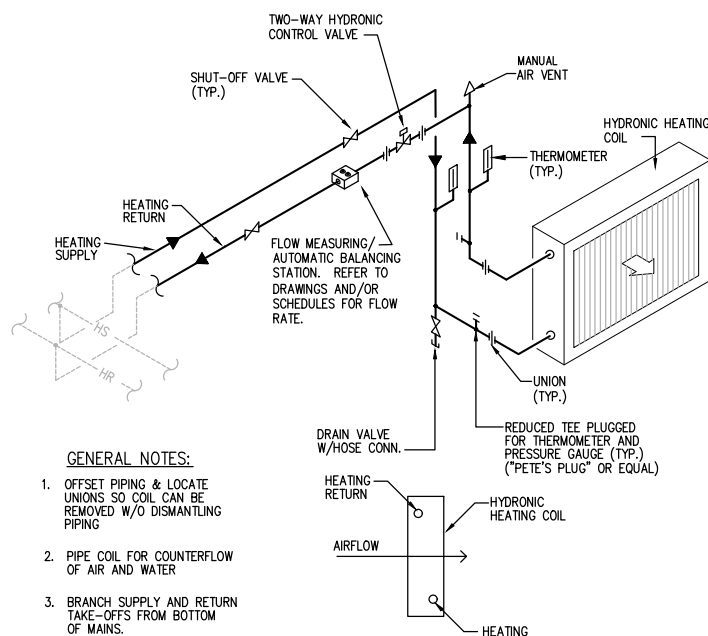
4 CHILLED WATER COIL PIPING (AHU-1)
M6.1 NO SCALE



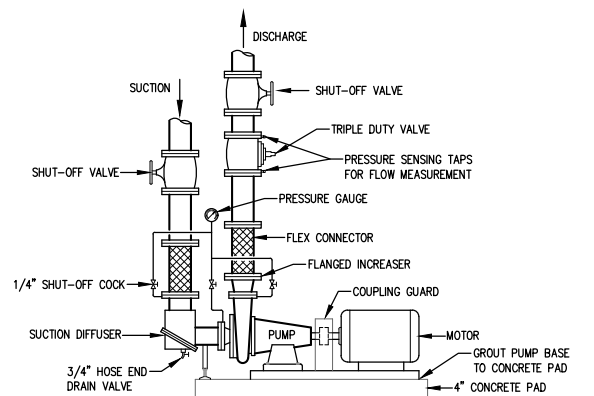
7 FLOW MEASURING STATION
M6.1 NO SCALE



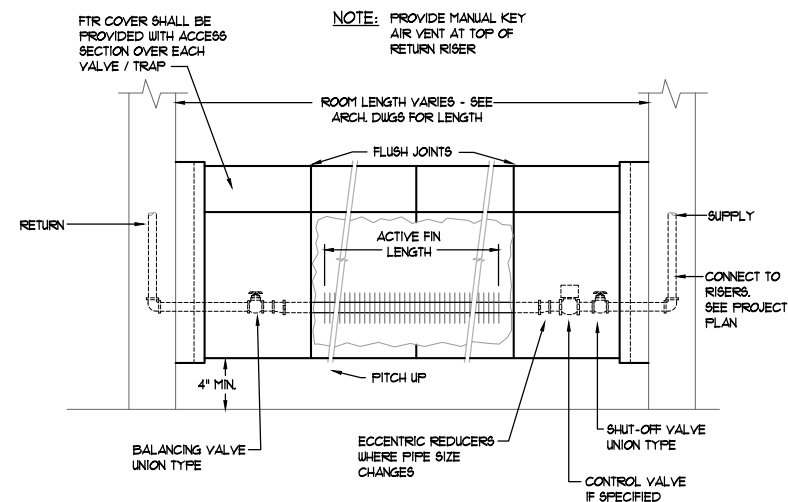
2 VERTICAL H.W. UNIT HEATER CONNECTIONS
M6.1 NO SCALE



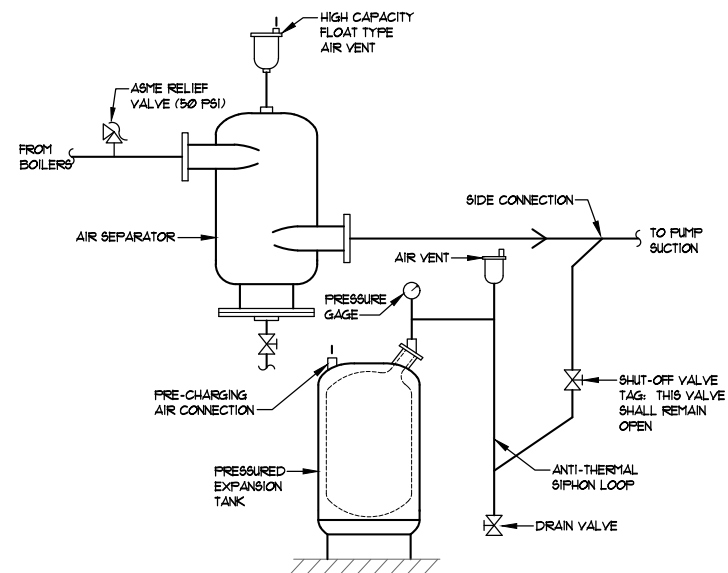
5 HYDRONIC HEATING COIL PIPING (AHU-1 & 3)(VAV REHEAT COILS)
M6.1 NO SCALE



3 BASE MOUNTED SINGLE SUCTION PUMP
M6.1 NO SCALE



6 TYPICAL ONE ROW ELEMENT FIN TUBE H.W. RADIATION
M6.1 NO SCALE



8 EXPANSION TANK & AIR SEPARATOR PIPING
M6.1 NO SCALE

RECORD DRAWINGS
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Thomas A. Wentz
THOMAS A. WENTZ

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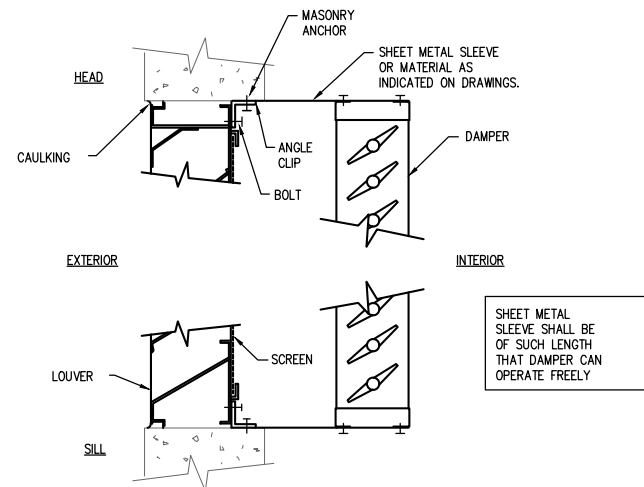
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

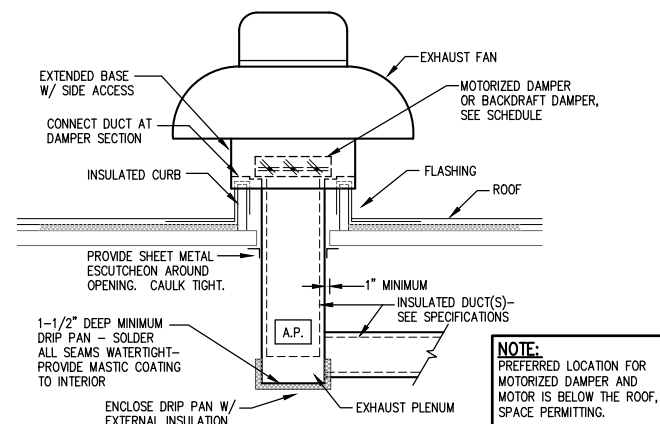
MECHANICAL
DETAILS

FILE NO.
00616097
SHEET
M6.1

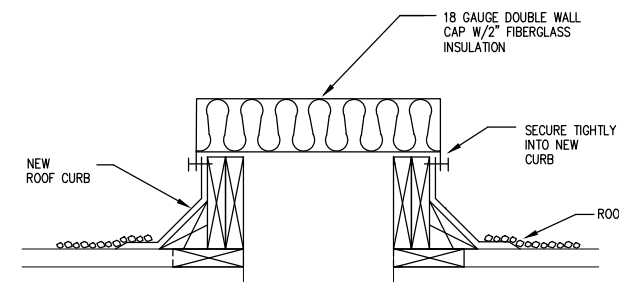
RECORD DRAWINGS



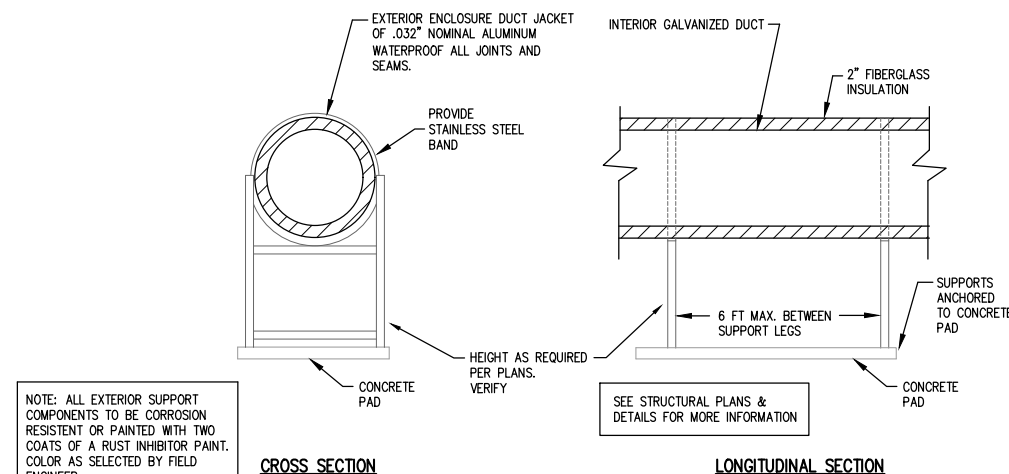
1 LOUVER INSTALLATION
M6.2 NO SCALE



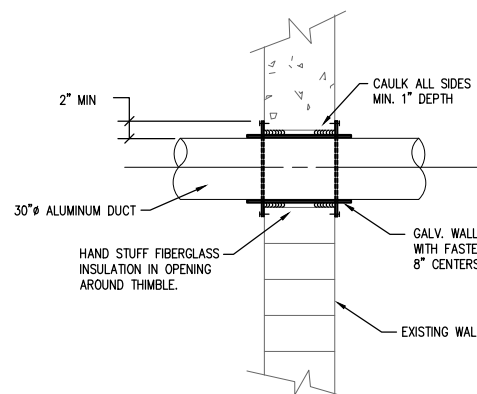
2 ROOF MOUNTED EXHAUST FAN
M6.2 NO SCALE



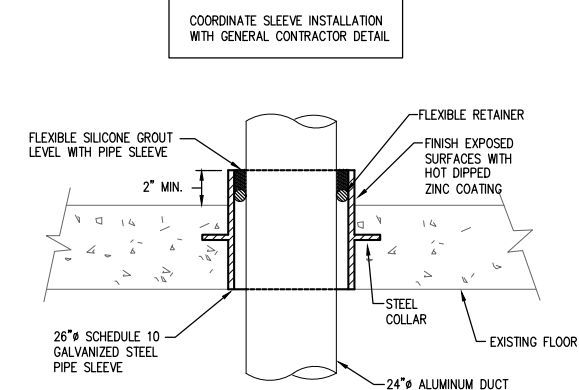
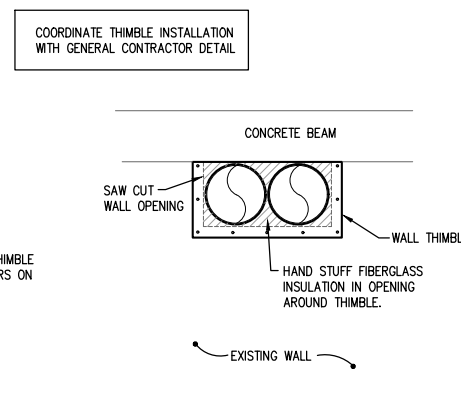
3 ROOF OPENING CAP
M6.2 NO SCALE



4 EXTERIOR DUCT SECTIONS
6.2 NO SCALE



5 PIPE PENETRATION WALL THIMBLE DETAIL
6.2 NO SCALE



6 GALLERY DUCT FLOOR SLEEVE DETAIL
6.2 NO SCALE

RECORD DRAWINGS
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PROJECT DATE: MARCH 2016	DRAWN BY: SRS	-	-	-	-
F.B.: A79-164	CHECKED BY: TAW	-	-	-	-
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LAKESWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

MECHANICAL
DETAILS

FILE NO.
00616097

SHEET
M6.2

RECORD DRAWINGS

EXHAUST FANS

FAN NO.	LOCATION	SERVICE	MODEL NO. *	FAN TYPE	CAPACITY CFM	S.P. "W.G.	ROOF/WALL OPENING SQ. IN.	TIP SPEED FPM	EST. FAN RPM	SONES	DRIVE	MOTOR			ELECTRICAL CHARACTERISTICS	ACCESSORIES	INTER-LOCK WITH	REMARKS
												TYPE	H.P.	R.P.M.				
EF-1	ROOF	ERV-1 EXHAUST	GB-180-15	PRV	3300	1.25	EXISTING	5884	1215	15.8	BELT	ODP	1-1/2	1750	460/60/3	BACKDRAFT DAMPERS, CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS	AHU-3	
EF-2	ROOF	CHLORINE STORAGE	GB-480-30	PRV	18,000	0.375	EXISTING	4498	356	15.8	BELT	ODP	3	1750	460/60/3	CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS. HERESITE COATED	MD-4, MD-5, MD-14	
EF-3	ROOF	CHLORINE FEED	GB-220-7	PRV	4100	0.375	EXISTING	4032	642	12.1	BELT	ODP	3/4	1750	460/60/3	CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS. HERESITE COATED	MD-6, MD-15	
EF-4	ROOF	AMMONIA STORAGE	GB-220-7	PRV	4500	0.375	EXISTING	4288	682	14.2	BELT	ODP	3/4	1750	460/60/3	CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS. HERESITE COATED	MD-7, MD-16	
EF-5	ROOF	CHEMICAL STORAGE	GB-200-5	PRV	3250	0.375	EXISTING	4152	742	9.8	BELT	ODP	1/2	1750	115/60/1	CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS. HERESITE COATED	MD-17	
EF-6	ROOF	SHOP	G-143-VG-5	PRV	2000	0.25	EXISTING	4555	1190	11.3	DIRECT	ECM	1/2	1190	115/60/1	CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS	MD-3, MD-18	
EF-7	ROOF	LAB HOOD	CUE-095-VG-6	UPBLAST	700	0.50	EXISTING	4666	1639	8.9	DIRECT	ECM	1/6	1639	115/60/1	CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS	FUME HOOD	
EF-8	ROOF	LOWER LEVEL TOILETS	G-123-VG-4	PRV	1190	0.375	EXISTING	4093	1197	9.0	DIRECT	ECM	1/4	1197	115/60/1	BACKDRAFT DAMPERS, CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS		
EF-9	ROOF	UPPER LEVEL TOILETS	G-090-VG-6	PRV	600	0.25	EXISTING	4277	1502	7.0	DIRECT	ECM	1/6	1502	115/60/1	BACKDRAFT DAMPERS, CURB ADAPTOR, EXTENDED BASE W/ SIDE ACCESS		

* BASED ON: GREENHECK

ENERGY RECOVERY VENTILATORS

UNIT NO.	LOCATION	SERVING	TYPE	MODEL NO. *	OUTSIDE AIR TEMP., °F.			RETURN AIR TEMP., °F.			% EFFECTIVENESS			PRESSURE DROP "W.G.	NO. OF MOTORS	H.P. EACH	BLOWER DRIVE	ELECTRICAL		FILTER TYPE	REMARKS
					ENT.	LVG.	CFM	ENT.	LVG.	CFM	SENSIBLE	WINTER ENTHALPIC	SUMMER ENTHALPIC					VOLTAGE	MCA		
ERV-1	MECH ROOM	AHU-3	STATIC PLATE	CA4XIN	-30	40.8	2700	70.0	-	3300	77	76	62	1.0	-	-	-	-	-	2" 30% T.A.	

* BASED ON: RENEWAIRE

AIR HANDLING UNITS – MODULAR

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	TYPE	CFM	ESP "W.G.	HEATING					COOLING COIL								MOTOR					CABINET STYLE	FILTER TYPE	CONTROL VALVE (HTG)			ACCESSORIES	UNIT SECTIONS				
							TOTAL MBH	EWT F.	LWT F.	GPM	PRESS DROP FT.	FACE VEL.	ENT. F. D.B.	AIR F. W.B.	LVG. F. D.B.	F. W.B.	ENT. F.	LVG. F.	GPM	PRESS DROP FT.	COOLING TOTAL MBH	SENS. MBH	ROWS	HP			TYPE	RPM	ELECTRICAL			MIN. CIRC. AMPACITY	TYPE	ACTUATOR	SIZE IN.
AHU-1	L.L. MECH ROOM	ADMIN	XT1-45x60	CONST. AIR VOL	5900	1.25	276.0	160	130	19	5.1	500	82	67	56	55	50	60	45	11.0	220.0	172.8	6	7-1/2	INV. DUTY PREM EFF	1840	460/60/3	.	HORIZ. W/ VERTICAL FAN	T.A.	MODUL	ELECTRIC	.	PLENUM FAN	OA/RA DAMPERS-MIX BOX-FILTERS-HEATING COIL-COOLING COIL-VERTICAL. FAN
AHU-3	U.L. MECH ROOM	CHEM STG	XT1-39x42	CONST. AIR VOL	2700	1.50	300.0	160	130	20.5	8.7	-	-	-	-	-	-	-	-	-	-	-	-	2	ODP PREM. EFF.	1750	460/60/3	3.3	HORIZ. W/ TOP INLET-TOP DISCH.	T.A.	MODUL	ELECTRIC	-		FAN-HTG. COIL-INTERNAL FACE & BYPASS-FILTER/MIX BOX

* BASED ON: JOHNSON CONTROLS

DESICCANT DEHUMIDIFIER/VENTILATION UNIT

UNIT NO.	SERVICE	MODEL NO.	SUPPLY FAN				EXHAUST FAN				VENTILATION				REGEN FAN				ENERGY RECOVERY HEAT EXCHANGER, SUMMER				ENERGY RECOVERY HEAT EXCHANGER, WINTER				
			NOM. CFM	STATIC "W.G.	PRESS. "W.G.	MOTOR TYPE	NOM. CFM	STATIC "W.G.	PRESS. "W.G.	MOTOR TYPE	NOM. CFM	STATIC "W.G.	PRESS. "W.G.	MOTOR TYPE	NOM. CFM	STATIC "W.G.	PRESS. "W.G.	MOTOR TYPE	SUPPLY E.A.T (db/gr. °F.)	L.A.T (db/gr. °F.)	EXHAUST E.A.T (db/gr. °F.)	L.A.T (db/gr. °F.)	SUPPLY E.A.T (db., °F.)	L.A.T (db., °F.)	EXHAUST E.A.T (db., °F.)	L.A.T (db., °F.)	
						H.P.	R.P.M.				H.P.	R.P.M.															
D-1	UL FILTER ROOMS	AM20	8000	5.60	1.5	BAF	15	1750	8000	2.25	1.0	BAF	3	1750	4000	1300	.	-	80/133	70/63	65/29	78/98	2	49.8	65	18	
D-2	LL PIPE GALLERY	HCD-4500-DGA-SMFB	4500	.	1.0	TEFC	10	3450	-	-	-	-	-	-	700	888	.	0.75	TEFC	3	3450	-	-	-	-	-	

* BASED ON: MUNTERS

DESICCANT WHEEL PROCESS								REACTIVATION HEATER				POST HEATING SECTION						FILTERS		UNIT ELECTRICAL DATA				CONTROLS	EST. WEIGHT LB.	REMARKS
E.A.T (db/gr, F.)	L.A.T (db/gr, F.)	CFM	BY-PASS CFM	REGEN E.A.T (db/gr, F.)	L.A.T (db/gr, F.)	CFM	CAPACITY LBS./HR	GAS	INLET PRESS. PSI	INPUT MBH	GAS	INLET PRESS. PSI	INPUT MBH	OUTPUT MBH	ENT. AIR, F.	LVG. AIR, F.	TYPE	ASHRAE EFF. %	VOLTS/ HZ/PHASE	FLA (AMPS)	MCA (AMPS)	MAX FUSE (AMPS)				
68/46	100/13	5000	3000	250/162	130/286	1300	180	NAT	2 PSI	400	NAT	2	400	320	57	94	2" T.A.	30%	460/60/3	29.3	33.8	.	SEE SPECS.	.		
67/45	113/5	4500	1544	80/133	134/304	888	75	NAT	CONTR. TO CONFIRM	212	—	—	—	—	—	—	2" T.A.	30%	460/60/3	19.9	—	—	SEE SPECS.	2300		

RECORD DRAWINGS

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BY JAS
DATE 01/2017
CRS NO. XXXXXX

NO SHEET CHANGES

AIR FLOW MEASURING STATIONS

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	NO. OF PROBES	AIR FLOW CFM	DUCT SIZE		ELECTRICAL	ACCESSORIES	REMARKS
						WIDTH INCHES	HEIGHT INCHES			
AFMS-1	BOILER ROOM	AHU-1 O.A.	IAQ-TEK	1	1860/2560	28	16	24 VAC	TRANSDUCER AND MONITOR	.

* BASED ON: ACCUTROL

VAV CONTROL UNITS

UNIT NO.	LOCATION	MODEL NO. *	SIZE	AIR VOLUME CFM		HEATING COIL				MIN. INLET STATIC PRESS. @ MAX. CFM "W.G.	NOM. INLET SIZE IN.	NO. OF OUTLETS	NOM. OUTLET H. X W. IN.	ACTUATOR TYPE	AHU SYSTEM NO.	REMARKS
				MAX.	MIN.	EWTF.	LWT F.	EAT F.	MBH							
VAV-1	L.L. MECH RM	SDR-WC	12	1330	665	160	130	55	45	2	5.0	4.0	0.40	12	1	15x16 DDC 1
NOT USED																
VAV-3	L.L. MECH RM	SDR-WC	12	1470	1190	160	130	55	70	2	5.0	4.0	0.40	12	1	15x16 DDC 1
VAV-4	L.L. MECH RM	SDR-WC	5	250	125	160	130	55	2	1	1.0	1.0	0.16	5	1	10x10 DDC 1
VAV-5	L.L. MECH RM	SDR-WC	12	1515	750	160	130	55	34	2	0.4	1.0	0.40	12	1	15x16 DDC 1
VAV-6	L.L. MECH RM	SDR-WC	12	1500	750	160	130	55	56	2	5.0	4.0	0.40	12	1	15x16 DDC 1

* BASED ON: ENVIRO-TECH

MOTORIZED DAMPERS

DAMPER NO.	LOCATION	SERVING	DESIGN CFM	SIZE		BLADE TYPE	ACTUATOR TYPE	CONTROL		REMARKS
				WIDTH INCHES	HEIGHT INCHES			ACTION	POS.	
MD-1	UL MECH ROOM	O.A.	.	36	24	OPPOSED	120V	2-POS	N.C.	
MD-2	UL MECH ROOM	O.A. D-2	890	36	24	OPPOSED	120V	2-POS	N.C.	INTERLOCK W/ D-2
MD-3	N WALL	TOOL ROOM	2000	64	60	OPPOSED	120V	2-POS	N.C.	
MD-4	N WALL	CHLORINE STORAGE	9000	72	96	OPPOSED	120V	2-POS	N.C.	MULTIPLE ACTUATORS, NEMA 4X
MD-5	N WALL	CHLORINE STORAGE	9000	72	96	OPPOSED	120V	2-POS	N.C.	MULTIPLE ACTUATORS, NEMA 4X
MD-6	N WALL	CHLORINE FEED	4100	96	36	OPPOSED	120V	2-POS	N.C.	NEMA 4X ACTUATORS
MD-7	N WALL	AMMONIA STORAGE	4500	96	36	OPPOSED	120V	2-POS	N.C.	NEMA 4X ACTUATORS
MD-8	CORRIDOR/202	AHU-1 RELIEF	.	30	30	OPPOSED	24V	MOD.	N.C.	
MD-9	LL MECH ROOM	D-2 E.A.	890	12	12	OPPOSED	120V	2-POS	N.C.	INTERLOCK W/ D-2
MD-10	UL MECH ROOM	ERV-1 O.A.	3000	32	16	OPPOSED	120V	2-POS	N.C.	INTERLOCK W/ AHU-3
MD-11	ROOF	EF-2	18,000	48	48	OPPOSED	120V	2-POS	N.C.	
MD-12	ROOF	EF-3	4100	24	24	OPPOSED	120V	2-POS	N.C.	
MD-13	ROOF	EF-4	4500	24	24	OPPOSED	120V	2-POS	N.C.	
MD-14	ROOF	EF-5	3250	18	18	OPPOSED	120V	2-POS	N.C.	
MD-15	ROOF	EF-6	2000	16	16	OPPOSED	120V	2-POS	N.C.	
MD-16	ROOF	EF-7	700	10	10	OPPOSED	120V	2-POS	N.C.	

* BASED ON: RUSKIN CD50

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PLOT DATE:	11/14/17, P:610616100616097\CADD\Record Drawings\AutoCAD DWG's\M7.1.dwg					

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Thomas A. Wentz
THOMAS A. WENTZ

MARCH 7, 2016
Date

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CITY OF DULUTH
DULUTH, MINNESOTA

MECHANICAL
EQUIPMENT SCHEDULES

FILE NO.
00616097

SHEET
M7.1

RECORD DRAWINGS

PUMPS

PUMP NO.	LOCATION	SERVICE	MODEL NO. *	TYPE	FLUID	DESIGN GPM	DESIGN HEAD FT.	SUCTION SIZE IN.	DISCH. SIZE IN.	MOTOR				REMARKS
										TYPE	H.P.	R.P.M.	ELECTRICAL CHARACTERISTICS	
P-1	BOILER ROOM	HTG SYSTEM	2 BD	BASE MTD. 1510	WATER	117	52	2-1/2	2	INV DUTY	3	1750	208/60/3	
P-2	BOILER ROOM	HTG SYSTEM	2 BD	BASE MTD. 1510	WATER	117	52	2-1/2	2	INV DUTY	3	1750	208/60/3	

* BASED ON: BELL & GOSSETT

FINNED TUBE RADIATION

TYPE	MODEL NO. *	ENCLOSURE			ELEMENTS						MATERIAL		ENT. AIR F.	WATER AVG. TEMP. F.	TEMP. DROP F.	HEATING OUTPUT BTU/HR./FT.	TOP OF COVER MOUNTING HT., IN.	ACCESSORIES	REMARKS
		STYLE	HT. IN.	W. IN.	ROWS HIGH	ROWS WIDE	TUBE IN.	FINS IN.	THICK.	PER FT.	TUBE	FINS							
'A'	JVA-S-C3/4-35	SLOPED TOP	14	4-3/8	1	1	3/4	3-1/4 SQ.	0.02	50	CU	AL	60	145	30	612	18		

* BASED ON: STERLING

HOT WATER UNIT HEATERS

UNIT NO.	LOCATION	MODEL NO. *	UNIT TYPE	FAN TYPE	CFM	AIR ENT. F.	WATER			HEATING CAPACITY MBH	MOTOR			CONTROLS	REMARKS
							ENT. F.	LVG. F.	GPM		H.P.	RPM	ELECTRICAL CHARACTERISTICS		
UH-1	CHLORINE STORAGE	HS-72	HORIZ	PROPELLER	1100	60	160	130	3.1	33.5	1/20	1000	115/60/1	REMOTE T-STAT	HERESITE COATED
UH-2	CHLORINE STORAGE	HS-72	HORIZ	PROPELLER	1100	60	160	130	3.1	33.5	1/20	1000	115/60/1	REMOTE T-STAT	HERESITE COATED
UH-3	CHLORINE STORAGE	HS-72	HORIZ	PROPELLER	1100	60	160	130	3.1	33.5	1/20	1000	115/60/1	REMOTE T-STAT	HERESITE COATED
UH-4	GARAGE	HS-72	HORIZ	PROPELLER	1100	60	160	130	3.1	33.5	1/20	1000	115/60/1	REMOTE T-STAT	
UH-5	GARAGE	VS-104	VERT	PROPELLER	1528	60	160	130	4.1	43.7	1/8	1070	115/60/1	REMOTE T-STAT	
UH-6	TOOL ROOM	HS-48	HORIZ	PROPELLER	750	60	160	130	2.1	22.3	1/20	1000	115/60/1	REMOTE T-STAT	
UH-7	TOOL ROOM	HS-48	HORIZ	PROPELLER	750	60	160	130	2.1	22.3	1/20	1000	115/60/1	REMOTE T-STAT	
UH-8	TOOL ROOM	HS-48	HORIZ	PROPELLER	750	60	160	130	2.1	22.3	1/20	1000	115/60/1	REMOTE T-STAT	
UH-9	PIPE GALLERY	HS-36	HORIZ	PROPELLER	550	60	160	130	1.6	16.7	25W	1550	115/60/1	REMOTE T-STAT	
UH-10	PIPE GALLERY	HS-36	HORIZ	PROPELLER	550	60	160	130	1.6	16.7	25W	1550	115/60/1	REMOTE T-STAT	
UH-11	E. ENTRY	VS-62	VERT	PROPELLER	989	60	160	130	2.4	25.3	1/20	1550	115/60/1	REMOTE T-STAT	
UH-12	CHEMICAL STORAGE	VS-62	VERT	PROPELLER	989	60	160	130	2.4	25.3	1/20	1550	115/60/1	REMOTE T-STAT	HERESITE COATED
UH-13	CHLORINE FEED	VS-62	VERT	PROPELLER	989	60	160	130	2.4	25.3	1/20	1550	115/60/1	REMOTE T-STAT	HERESITE COATED
UH-14	AMMONIA ROOM	VS-77	VERT	PROPELLER	1200	60	160	130	2.9	31.0	1/20	1550	115/60/1	REMOTE T-STAT	HERESITE COATED
UH-15	RAPID MIX ROOM	HS-36	HORIZ	PROPELLER	550	60	160	130	1.6	16.7	25W	1550	115/60/1	REMOTE T-STAT	
UH-16	RAPID MIX ROOM	HS-36	HORIZ	PROPELLER	550	60	160	130	1.6	16.7	25W	1550	115/60/1	REMOTE T-STAT	
UH-17	2ND FL MECH ROOM	HS-24	HORIZ	PROPELLER	450	60	160	130	1.1	11.1	16W	1550	115/60/1	REMOTE T-STAT	
UH-18	N. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-19	N. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-20	N. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-21	N. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-22	S. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-23	S. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-24	S. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-25	S. FILTER GALLERY	HS-60	HORIZ	PROPELLER	900	60	160	130	2.6	27.9	1/20	1550	115/60/1	REMOTE T-STAT	
UH-26	CHEMICAL STORAGE	HS-36	HORIZ	PROPELLER	550	60	160	130	1.6	16.7	25W	1550	115/60/1	REMOTE T-STAT	HERESITE COATED

* BASED ON: STERLING

AIR SEPARATORS

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	CAPACITY GPM	HEIGHT IN.	DIA. IN.	PIPE CONNECTION SIZE IN.	DRAIN SIZE IN.	AIR OUTLET SIZE IN.	REMARKS
AS-1	BOILER ROOM	HTG SYSTEM	CRS-4F	245	29	8	4	4	1/2	W/ STRAINER AND MANUAL BLOWDOWN VALVE

* BASED ON: BELL & GOSSETT

EXPANSION TANKS

TANK NO.	LOCATION	SERVICE	MODEL NO. *	TYPE	CAPACITY GALLONS	ACCEPTANCE VOLUME GALLONS	SIZE		WORKING PRESSURE PSIG	STAMP	TAPPINGS		ACCESSORIES	REMARKS
							DIA. IN.	HEIGHT OR LENGTH IN.			SYSTEM IN.	CHARGING IN.		
ET-1	BOILER ROOM	HTG SYSTEM	B-400	VERT	106	106	24	64	125	ASME	1	0.302	HIGH CAPACITY AIR VENT	

* BASED ON: BELL & GOSSETT

RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

MECHANICAL
EQUIPMENT SCHEDULES

FILE NO.
00616097

SHEET
M7.2

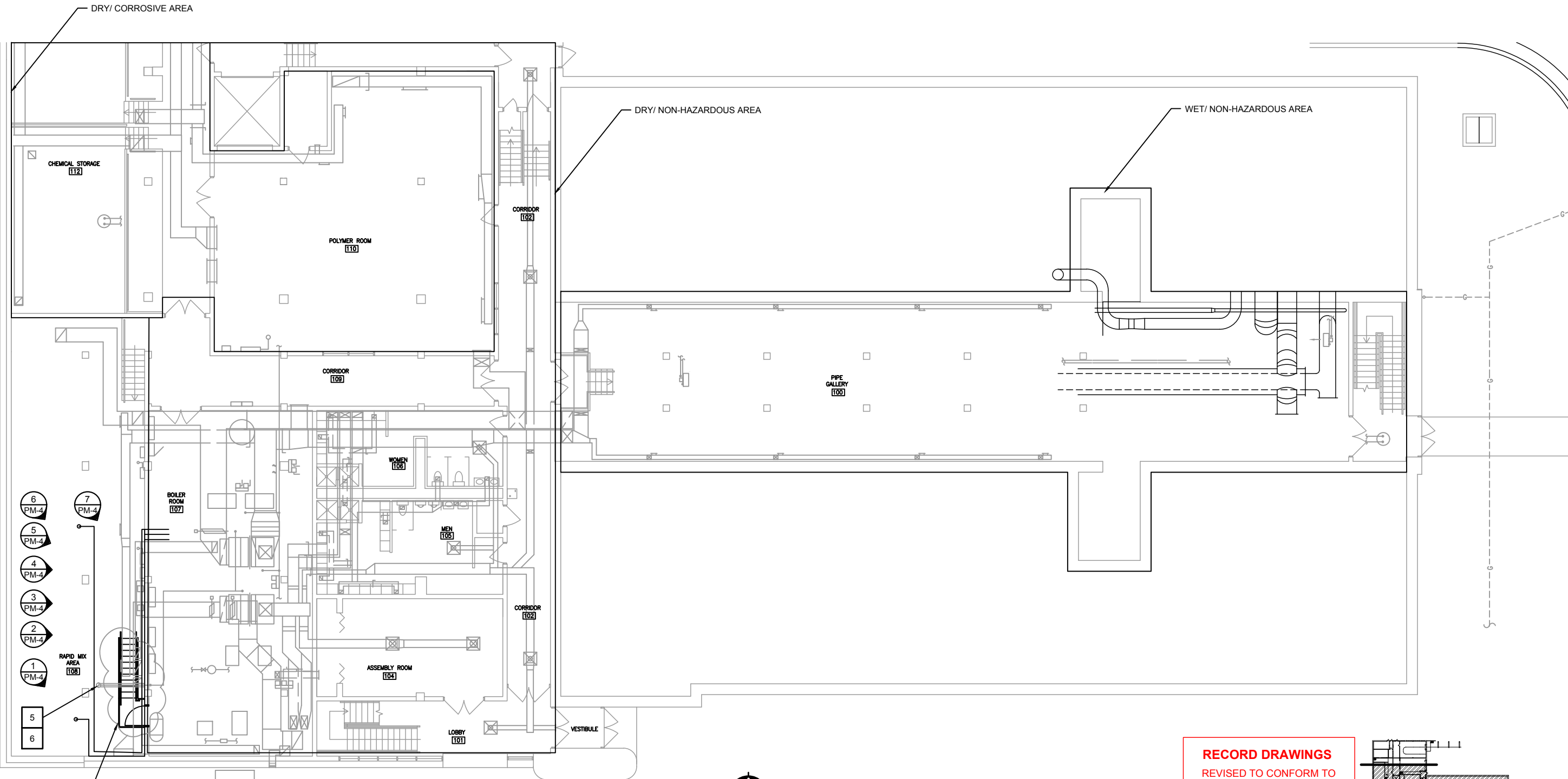
KEY NOTES:

XXX

RECORD DRAWINGS

- 1 RELOCATE EXISTING SAMPLE PUMP(S): SP-1, SP2
- 2 RELOCATED AND RECONFIGURE SAMPLE PIPING TO ACCOMMODATE THE NEW DOOR AND ACCESS STAIRS
- 3 RELOCATE SP-1. CONNECT (TYP). RELOCATE ELECTRICAL CONNECTIONS
- 4 RELOCATE SP-2. CONNECT (TYP). RELOCATE ELECTRICAL CONNECTIONS

- 5 RELOCATE EXISTING 8" DIP DRAIN LINE VERTICALLY TO ACCOMMODATE NEW BOILER ROOM ACCESS (2) NEW FLANGED ADAPTOR, (3) 90° FLxFL BENDS. NEW 8" DIP, NEW CORROSION RESISTANT HANGERS AND SUPPORTS. PIPING SHALL BE PAINTED AND LABELED.
- 6 OFFSET AND SUPPORT EXISTING 8" DIP DRAIN LINE. RECONENCT TO EXISTING PIPE. (COMPLETE)



FIRST FLOOR SOUTH MECHANICAL PLAN

0 4 8 16
SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)

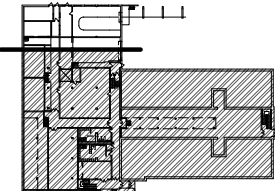
RECORD DRAWINGS

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NO SHEET CHANGES



KEY PLAN - FIRST FLOOR

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Date MARCH 7, 2016
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MECHANICAL FLOOR PLAN REMOVAL

FILE NO.
00616097
SHEET
PM-1

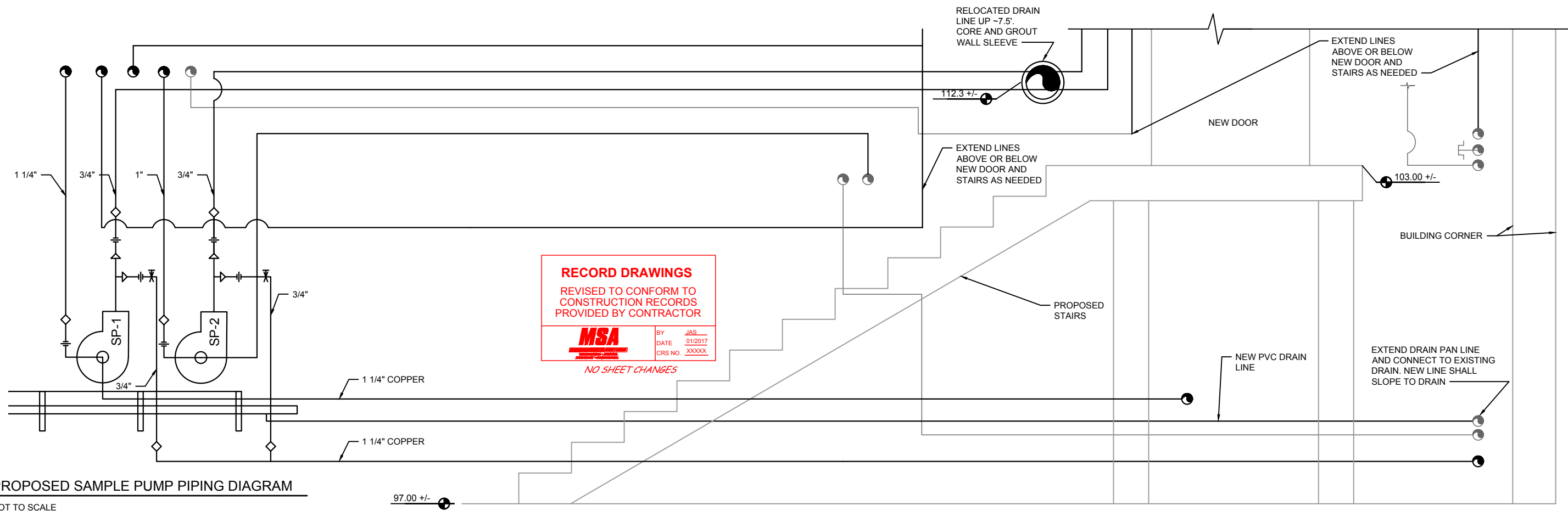
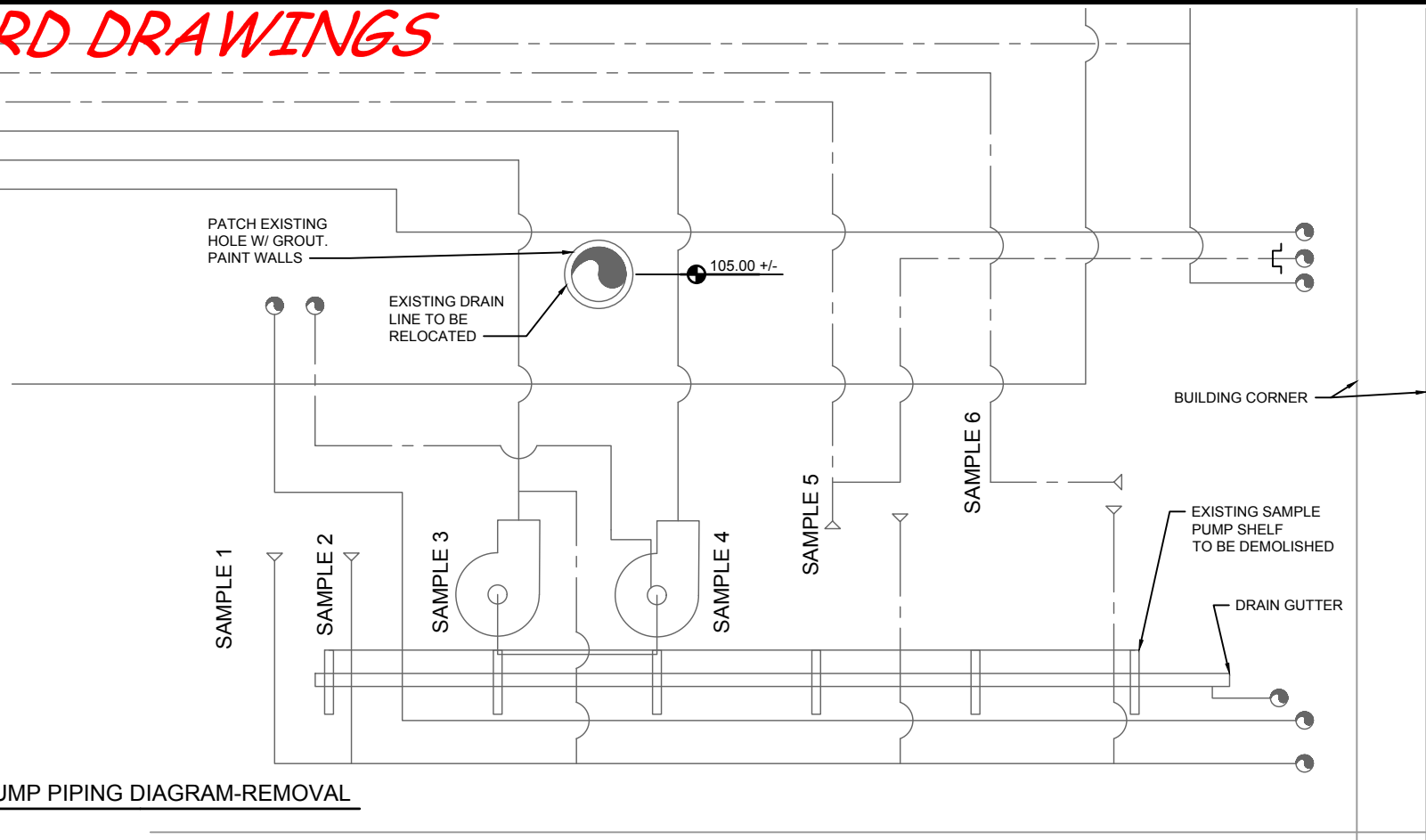
RECORD DRAWINGS

GENERAL NOTES:

1. DIAGRAM ARE IN INTENT. THE CONTRACTOR SHALL VERIFY ACTUAL PIPING AND RELOCATE ALL PIPING AND EQUIPMENT AS REQUIRED FOR CONSTRUCTION OF NEW DOOR AND STAIRS.
2. NEW SAMPLING PIPING SHALL BE COPPER.
3. NEW SAMPLING PIPING SHALL NOT BE INSULATED.

SYMBOLS

- PLUG
- CHECK VALVE
- UNION
- NEEDLE VALVE
- BALL VALVE



RECORD DRAWINGS

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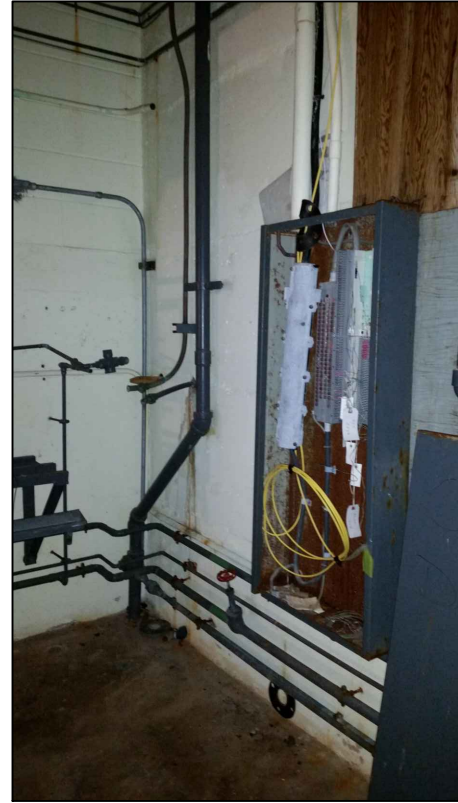
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SAMPLE PUMP PIPING DIAGRAM

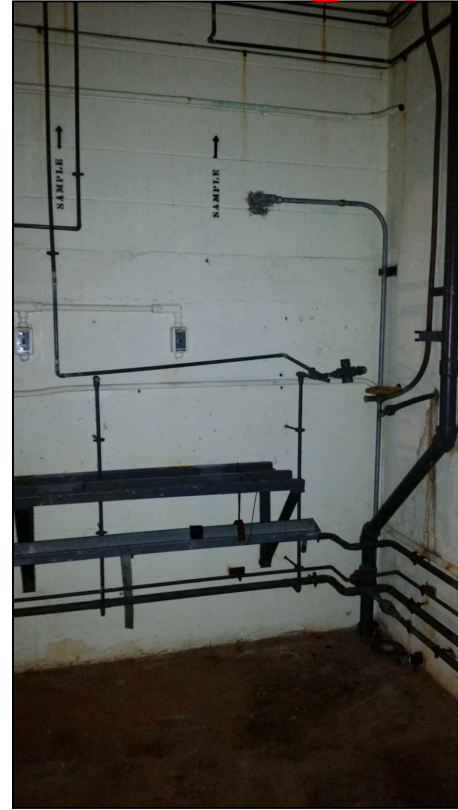
FILE NO.
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SHEET
PM-3

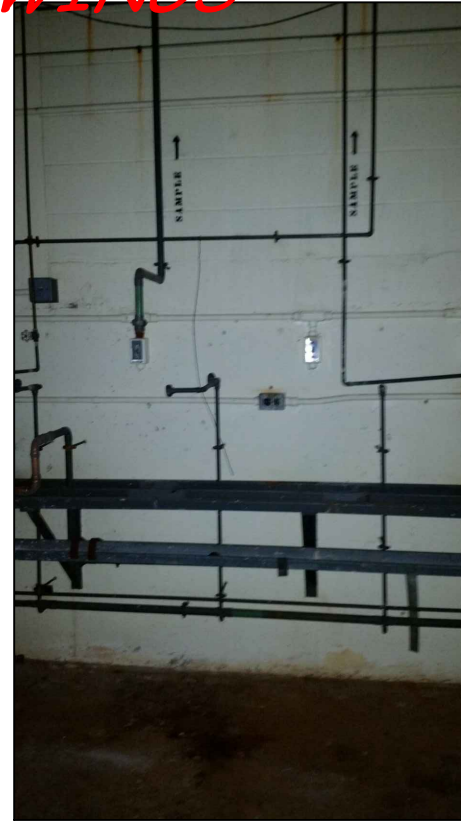
RECORD DRAWINGS



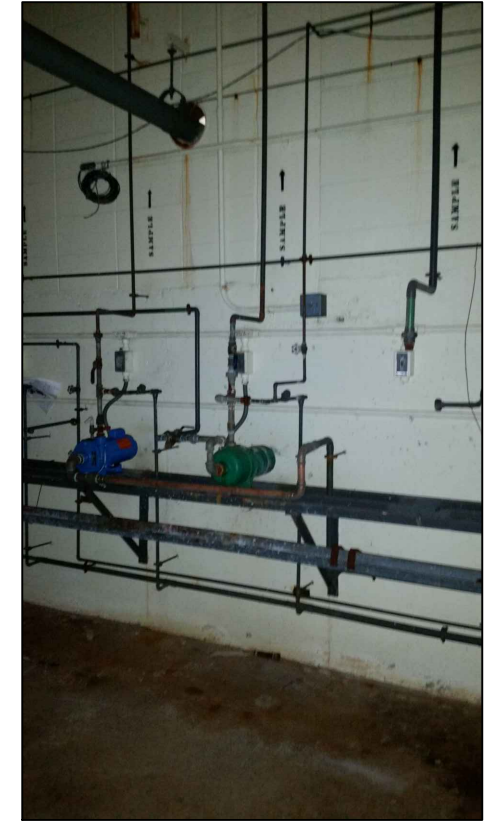
1 SAMPLE PUMP PIPING



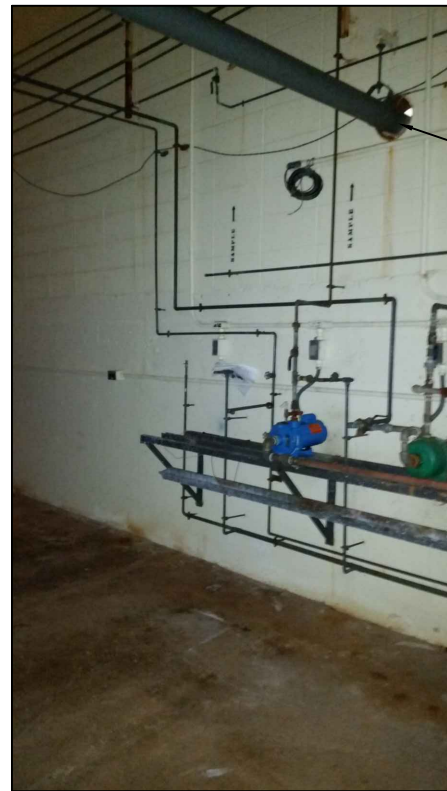
2 SAMPLE PUMP PIPING



3 SAMPLE PUMP PIPING



4 SAMPLE PUMP PIPING



5 SAMPLE PUMP PIPING



6 SAMPLE PUMP PIPING



7 SAMPLE PUMP PIPING

OFFSET 4" DIP DRAIN TO ACCOMMODATE NEW BOILER ROOM ACCESS

RECONFIGURE SAMPLE PIPING
AND SAMPLE PUMPS AS REQ'D

RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

MSA
BY: JAS
DATE: 01/2017
CRS NO: XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
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SAMPLE PUMP PIPING PHOTOS

FILE NO.
00616097
SHEET
PM-4

ABBREVIATIONS (NOT ALL NECESSARILY USED HEREIN)

AE	ARCHITECT / ENGINEER	FAS	FIRE ALARM SYSTEM	NPT	NATIONAL PIPE THREAD
A	AMPERES (AMPS)	FCO	FLOOR CLEANOUT	NTS	NOT TO SCALE
AC	ABOVE COUNTER APPROX 44" AFF	FD	FLOOR DRAIN	OA	OUTSIDE AIR
ACCU	AIR-COOLED CONDENSING UNIT	FD	FIRE DAMPER	OC	ON CENTER
AD	AIR DEVICE	FLA	FULL LOAD AMPS	PC	PHOTO CELL
ADA	AMERICAN W/ DISABILITIES ACT	FLEX	FLEXIBLE	PLBG	PLUMBING
ADJ	USER-ADJUSTABLE	FLUOR	FLUORESCENT	PR	PUMPED CONDENSATE RETURN
AFF	ABOVE FINISH FLOOR	FP	FIRE PROTECTION	PREP	PREPARATION
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	FPM	FEET PER MINUTE	PSI	POUNDS PER SQUARE INCH
AHU	AIR HANDLING UNIT	FPT	FEMALE PIPE THREAD	PSIG	POUNDS PER SQUARE INCH, GAUGE
AL	ALUMINUM	GA	GALVANIZED	PVC	POLYVINYL CHLORIDE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	GALV	GALVANIZED	QTY	QUANTITY
APPROX	APPROXIMATELY	GC	GENERAL CONTRACTOR	RA	RETURN AIR
ARCH	ARCHITECT / ARCHITECTURAL	GFI	GROUND FAULT CIRCUIT INTERRUPTED	REC	RECEPTACLE, RECOMMENDATION
ARI	AMERICAN REFRIGERATION INSTITUTE	GSHP	GROUND SOURCE HEAT PUMP	REFR	REFRIGERATION/REFRIGERANT
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS	GWB	GYPNUM WALL BOARD ("SHEET ROCK")	RHG	REFRIGERANT HOT GAS LINE
BF	BACKFLOW PREVENTER	HACR	HEATING, AIR-CONDITIONING, REFRIGERATION	RL	REFRIGERANT LIQUID LINE
BLDG	BUILDING	HB	HOSE BIB	RLA	RUNNING LOAD AMPS
BOB	BOTTOM OF BEAM	HID	HIGH INTENSITY DISCHARGE	RS	REFRIGERANT SUCTION LINE
BOC	BOTTOM OF CONDUIT	HOA	HAND/OFF/AUTO	S	SINK
BOD	BOTTOM OF DUCT	HP	HORSEPOWER	SF	SQUARE FEET
BOP	BOTTOM OF PIPE	HPS	HIGH PRESSURE SODIUM	SA	SUPPLY AIR
BSMT	BASEMENT	HTW	HIGH TEMP WATER	SAN	SANITARY
BTU	BRITISH THERMAL UNIT	HWR	HOT WATER RECIRCULATION (DOMESTIC)	SAT	SUSPENDED ACOUSTIC TILE
C	CONDUIT	HWS	HEATING HOT WATER SUPPLY	SEER	SEASONAL ENERGY EFFICIENCY RATIO
COND	CONDUIT, CONDENSATE	IAC	ILLINOIS ACCESSIBILITY CODE	SO	SCREENED OPENING
CAP	CAPACITY	IG	ISOLATED GROUND	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
CB	CIRCUIT BREAKER	INTL	INTERLOCK/INTERLOCKED	SPEC	PROJECT SPECIFICATIONS
CFM	CUBIC FEET PER MINUTE	JBOX	JUNCTION BOX	SS	SERVICE SINK
CHS, R	CHILLED WATER SUPPLY, RETURN	KTR	CONTRACTOR	STM	STORM
CKT	CIRCUIT	KVA	KILO VOLT AMPERES	STRUCT	STRUCTURAL
CLG	CEILING	L	LAVATORY	T&P	TEMPERATURE & PRESSURE
CO	CLEAN OUT	LED	LIGHT EMITTING DIODE	TAB	TEST & BALANCE
CONT	CONTINUATION	LF	LINEAR FEET	TRANS	TRANSITION
CU	COPPER	LCR	LOW PRESSURE CONDENSATE RETURN	TXV	THERMAL EXPANSION VALVE
CR	CONDENSER RETURN	MAX	MAXIMUM	TYP	TYPICAL
CS	CONDENSER SUPPLY	MBH	THOUSAND BTU PER HOUR	UC	UNDER COUNTER
D	CONDENSATE DRAIN	MCA	MINIMUM CIRCUIT AMPACITY	UL	UNDERWRITERS LABORATORIES
DC	DIRECT CURRENT	MECH	MECHANICAL	UON	UNLESS OTHERWISE NOTED
DCW	DEMOLITION	MFR	MANUFACTURER	V	VENT, VOLTS
DEMO	DEMOLITION	MH	METAL HALIDE	VAC	VOLTS ALTERNATING CURRENT
DHW	DOMESTIC HOT WATER	MIN	MINIMUM	VERT	VERTICAL
DIA	DIAMETER	MOCP	MAXIMUM OVERCURRENT PROTECTION	VD	VOLUME DAMPER (MANUAL, LOCKING TYPE)
DWH	DOMESTIC WATER HEATER	MOD	MOTOR OPERATED DAMPER	VR	VACUUM (CONDENSATE) RETURN
ELEC	ELECTRICAL, ELECTRICIAN	MS	MOP SINK	VTR	VENT THRU ROOF
EF	EXHAUST FAN	NAIMA	NORTH AMERICAN INSULATION MFR'S ASSOCIATION	W	WATTS
ESP	EXTERNAL STATIC PRESSURE	NC	NORMALLY CLOSED	W/	WITH
EM	LIGHTING FIXTURE W/INTEGRAL EMERGENCY BATTERY OPERATION	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION	W/O	WITHOUT
ETC	ETCETERA	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION	WC	WATER COLUMN
EWB	ELECTRIC WALL HEATER	NIC	NOT IN CONTRACT	WCO	WALL CLEAN OUT
EXH	EXHAUST	NL	NIGHT LIGHT FIXTURE	WH	WALL HYDRANT
FACP	FIRE ALARM CONTROL PANEL	NO	NORMALLY OPEN	WP	WEATHERPROOF
				YCO	YARD CLEAN OUT

RECORD DRAWINGS

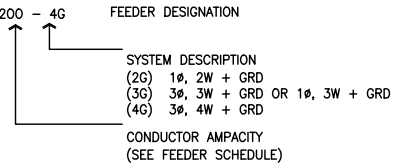
GENERAL NOTES

- THIS DRAWING IS A STANDARD LEGEND. SYMBOLS SHOWN MAY NOT ALL APPEAR ON DRAWINGS FOR THIS PROJECT.
- ALL CONTACTS ARE SHOWN IN THE DE-ENERGIZED (SHELF) POSITION. BI-STABLE RELAYS ARE SHOWN IN THE RESET POSITION.
- ONE-LINE DIAGRAMS FOR POWER SWITCHGEAR, USE ANSI STANDARD SYMBOLS AND ABBREVIATIONS.
- SEE INSTRUMENTATION DRAWINGS FOR INSTRUMENTATION SYMBOLS AND DETAILS.
- OTHER ABBREVIATIONS PER ANSI Z32.13 AND ISA S5.1
- ELEVATIONS ADJACENT TO SYMBOLS ARE BASED ON STATION DATUM. HEIGHTS ADJACENT TO SYMBOLS (+4.0) ARE REFERENCED TO FINISHED FLOOR GRADE.
- THE LETTERS "GFI" ADJACENT TO A RECEPTACLE INDICATES A GROUND FAULT INTERRUPTER FEED-THROUGH RECEPTACLE ASSEMBLY. THE LETTERS ADJACENT TO A PANELBOARD CIRCUIT BREAKER INDICATES A GROUND FAULT CIRCUIT BREAKER. THE LETTERS "IG" INDICATE AN ISOLATED GROUND RECEPTACLE. PROVIDE SEPARATE GROUND WIRE.
- SEE SPECIFICATIONS AND SCHEDULES FOR COMPONENT REQUIREMENTS FOR MOTOR CONTROLLERS AND FOR CONTACTORS.
- DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE ONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM ENGINEER PRIOR TO PROCEEDING WITH WORK.
- EFFORT WAS MADE IN THE PREPARATION OF THE CONTRACT DOCUMENTATION TO COORDINATE CONNECTIONS WITH ALL DISCIPLINES, HOWEVER THE EC IS RESPONSIBLE TO REVIEW ENTIRE PLANS AND THE SPECIFICATIONS AND INCLUDE ALL WORK REQUIRED TO PROVIDE A COMPLETE PROJECT.
- SIZE HOMERUN WIRING PER ONE-LINE DIAGRAM AND NEC GUIDELINES.
- REFER TO INSTRUMENTATION DEVICE SCHEDULE ON SCHEDULE SHEET FOR CONNECTION REQUIREMENTS OF INSTRUMENTATION AND CONTROL DEVICES, EQUIPMENT, ETC.
- OBSERVE APPLICABLE CODE REQUIREMENTS FOR ELECTRICAL INSTALLATIONS WITHIN HAZARDOUS AREAS NOTED ON PLAN.
- MINIMUM CONDUIT SIZE 3/4", UNLESS OTHERWISE NOTED.
- ALL BRANCH CIRCUIT HOMERUNS TO BE (2)#12 & #12G IN 3/4"C MINIMUM UNLESS OTHERWISE NOTED OR REQUIRED. MOTOR WIRING AS INDICATED ON ONE-LINE DIAGRAM.
- ALL DEVICE/SIGNAL CIRCUIT HOMERUNS TO BE (2)#14 & IN 3/4"C MINIMUM.
- PROVIDE ALL MOTOR AND SIGNAL CIRCUIT HOMERUNS RELATED TO PROCESS EQUIPMENT.
- COORDINATE EXACT LOCATION OF ALL EQUIPMENT AND FIXTURES WITH GC, OWNER, AND ENGINEER PRIOR TO ROUGH-IN.
- EC SHALL MODIFY WIRE AND CIRCUIT SIZES BASED ON ACTUAL EQUIPMENT SUPPLIED.
- CONTRACTOR SHALL REVIEW TYPICAL DETAILS AND ALL CONSTRUCTION SHALL COMPLY WITH ALL TYPICAL DRAWINGS AND DETAILS.
- FUTURE EQUIPMENT AND DEVICES SHALL BE ROUGH IN CONDUIT FOR CONTROL AND POWER CABLES TO BOXES. ROUGH-IN CONDUIT AND MAKE PROVISION FOR FUTURE WIRING AND CABLING FOR POWER AND CONTROL. (TYP.)
- DISCONNECTS RELATED TO PROCESS CONNECTIONS SHALL BE PROVIDED AND INSTALLED BY THE EC.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING AND LABELING ALL COMMUNICATIONS SYSTEM CABLING.
- THE CONTRACTOR SHALL REVIEW AND FOLLOW GUIDELINES OF THE TYPICAL DETAILS.
- CONSTRUCTION AND DEMOLISHION SHALL BE COMPLETE AND COORDINATE WITH ALL OTHER TRADES.
- EC SHALL REVIEW CONTRACT DOCUMENT AND PROVIDE ALL WORK, MATERIALS, AND EQUIPMENT FOR A COMPLETE AND OPERABLE PROJECT.
- EXTERIOR RECEPTACLES SHALL BE METALLIC INSERVICE WEATHER PROOF COVERS AND GFI REC.
- PROVIDE CONCRETE HOUSEKEEP PAD FOR ALL FLOOR MOUNTED EQUIPMENT.
- ALL EXTERIOR RACEWAYS THAT EXTEND FROM BELOW GRADE TO ABOVE GRADE SHALL BE INSTALLED WITH EXPANSION COLLAR SLEEVES.
- EXTERIOR PEDISTALS SHALL BE INSTALLED TO A FROST PROTECTED STRUCTURE OR BE PROVIDED WITH MFR RECOMMENDED GROUND RATED GREEN TREAT FOUNDATION.
- COORDINATE ACTUAL LOCATIONS OF ALL EQUIPMENT WITH GC, OWENER, AUTHORITY WITH JURISDICTION, OTHER TRADES, AND ENGINEER PRIOR TO ROUGH-IN. ACTUAL LAYOUT MAY VARY. ALL CHANGES SHALL BE JUSTIFIED AND COORDINATED.
- OBSERVE ENVIRONMENT AND AREA CLASIFICATIONS AS REQUIRED. FOLLOW ALL APPLICABLE CODES.
- SERVICE SHALL BE INSTALL COMPLETE AND IN COMPLIANCE TO THE UTILITY APPROVED REQUIREMENTS. ONLY DIRECTLY FROM THE UTILITY MAYBE APPLIED TO THE UTILITY ALLOWANCE. ALL OTHER WORK, LABOR, MATERIALS SHALL BE INCLUSIVE TO THE CONTRACT.
- WORK INCLUDED SHALL INCLUDE ALL DECOMMISSIONING, REMOVAL, AND DISPOSAL AS REQUIRED TO PROVIDE COMPLETE AND OPERABLE SYSTEM AS SHOWN HEREIN.
- ALL WALL SLEEVES SHALL BE LOCATED PER ACTUAL EQUIPMENT AND COORDINATED W/ GC, AND BUILDING MANUFACTURER.

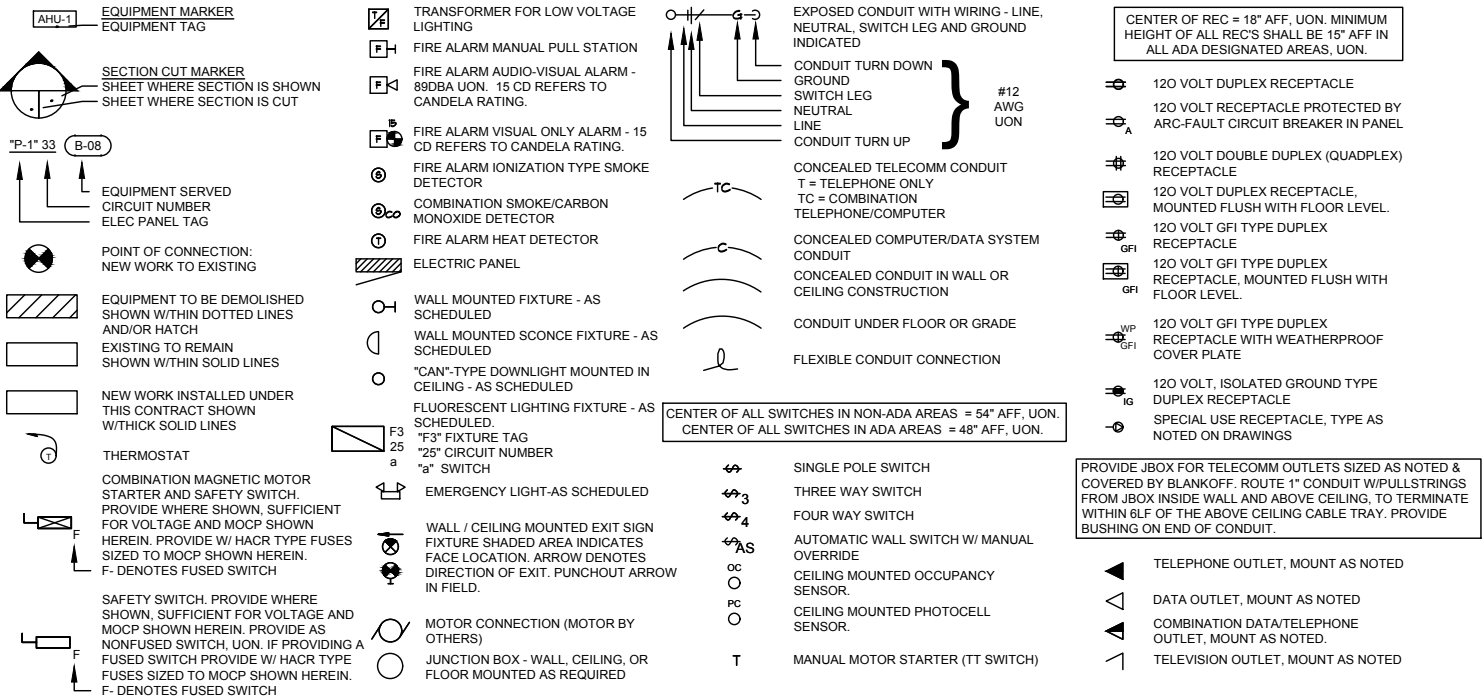
FEEDER SCHEDULE (600 V)				
FEEDER AMPACITY	CONDUCTOR SIZE (kcmil)		CONDUIT SIZE	
	Ø & N	GRD	3Ø & GRD.	3Ø & N & GRD.
20	#12	#12	3/4"	3/4"
30	#10	#10	3/4"	3/4"
40	#8	#10	3/4"	1"
50	#6	#10	1"	1"
70	#4	#8	1-1/4"	1-1/4"
80	#3	#8	1-1/4"	1-1/4"
100	#1	#8	1-1/2"	2"
110	#2	#6	1-1/4"	1-1/2"
125	#1	#6	1-1/2"	2"
150	#1/0	#6	1-1/2"	2"
175	#2/0	#6	2"	2"
200	#3/0	#6	2"	2-1/2"
225	#4/0	#4	2"	2-1/2"
250	#250	#4	2-1/2"	3"
300	#350	#4	3"	3"
350	#500	#3	3"	3-1/2"
380	#500	#3	3"	3-1/2"
400	(2) # 3/0	(2) # 3	(2) 2"	(2) 2-1/2"
450	(2) # 4/0	(2) # 2	(2) 2"	(2) 2-1/2"
500	(2) # 250	(2) # 2	(2) 2-1/2"	(2) 3"
600	(2) # 350	(2) # 1	(2) 3"	(2) 3"
700	(2) # 500	(2) # 1/0	(2) 3"	(2) 3-1/2"
800	(2) # 600	(2) # 1/0	(2) 3-1/2"	(2) 4"
1000	(3) # 400	(3) # 2/0	(3) 3"	(3) 3-1/2"
1200	(3) # 600	(3) # 3/0	(3) 3-1/2"	(3) 4"
1600	(4) # 600	(4) # 4/0	(4) 3-1/2"	(4) 4"
2000	(5) # 600	(5) # 250	(5) 3-1/2"	(5) 4"

GENERAL NOTES:

- THE ABOVE FEEDER SCHEDULE IS A SCHEDULE OF TYPICAL FEEDERS AND SOME SIZES MAY NOT BE UTILIZED.
- ALL CONDUCTOR AMPACITIES ARE BASED ON TABLE 310-16 OF THE NEC FOR COPPER CONDUCTOR TYPE THW/THWN.
- FEEDER SIZES SHOWN ON THE RISER DIAGRAM INDICATE FEEDER AMPACITIES AND DO NOT NECESSARILY CORRESPOND TO CIRCUIT BREAKER AMPACITIES. CERTAIN FEEDERS MAY BE SIZED FOR THE DERATION FACTORS REQUIRED BY CODE AND/OR ARE OVERSIZED FOR VOLTAGE DROP.
- WHERE MULTIPLE CONDUITS ARE INDICATED FOR A SINGLE FEEDER EACH CONDUIT SHALL CONTAIN AN AØ, BØ, CØ, GROUND CONDUCTOR, AND NEUTRAL CONDUCTOR.



SYMBOLS (NOT ALL NECESSARILY USED HEREIN)



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SCOTT R. CHILSON

MARCH 7, 2016

44287

Date

License No.

MSA

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH

DULUTH, MINNESOTA

ELECTRICAL SYMBOLS & ABBREVIATIONS

FILE NO.

00616097

SHEET

E-1

INSTRUMENT SOCIETY OF AMERICA INSTRUMENT IDENTIFICATION					
	FIRST LETTER(S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSOUT FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO(FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE				
N	TORQUE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		
P	PRESSURE (OR VACUUM)		POINT, TEST CONNECTION		
Q	QUANTITY	INTEGRATE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION				
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE	Y AXIS	RELAY OR COMPUTE		
Z	POSITION, DIMENSION	Z AXIS	DRIVE ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT		

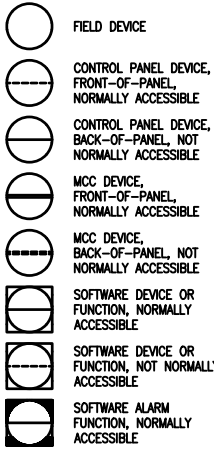


P&ID SYMBOLS (TYPICAL)

A: DESCRIPTION, TOP LINE
B: DESCRIPTION, BOTTOM LINE
TRS: FIRST LETTER(S) AND SUCCEEDING LETTERS OF INSTRUMENT IDENTIFICATION, REFER TO ISA TABLE
W: UNIT PROCESS NUMBER
X: LOOP NUMBER
Y: UNIT NUMBER, USED FOR MULTIPLE SETS WITH THE SAME X-Y DESIGNATION
Z: SET NUMBER, USED FOR MULTIPLE SETS OF UNITS WITH THE SAME W-X-Y DESIGNATION

N: NUMBER OF UNITS
C: INSTALLATION REQUIREMENT:
e.p.: CLASS I, DIVISION 1 HAZARDOUS LOCATION
i.s.: INTRINSICALLY SAFE, INSTALLED IN CLASS I, DIVISION 1 HAZARDOUS LOCATION

Q: PROVISION REQUIREMENT:
*: EXISTING, RE-USED EQUIPMENT
*: EQUIPMENT SPECIFIED UNDER DIVISION OTHER THAN 26
*: FUTURE EQUIPMENT
*: EQUIPMENT SPECIFIED UNDER DIVISION 26



PROGRAMMABLE LOGIC CONTROLLER
INPUT/OUTPUT POINT WHERE Y=QUANTITY AND XX
DI: DIGITAL INPUT
DO: DIGITAL OUTPUT
AI: ANALOG INPUT
AO: ANALOG OUTPUT
NETWORK (DEVICENET, ETC)
CONTROL SYSTEM
INPUT/OUTPUT POINT WHERE Y=QUANTITY AND XX
DI: DIGITAL INPUT
DO: DIGITAL OUTPUT
AI: ANALOG INPUT
AO: ANALOG OUTPUT



FULL VOLTAGE MOTOR CONTROLLER, XX INDICATES LOCATION

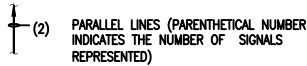
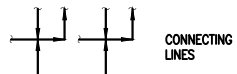
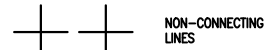


MOTOR CONTROLLER, XX INDICATES TYPE OF CONTROLLER AND YY INDICATES LOCATION

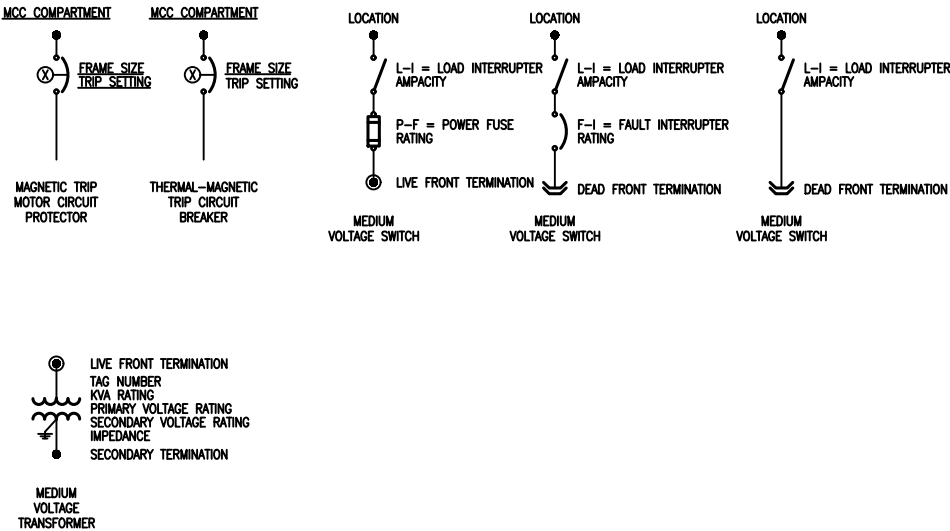
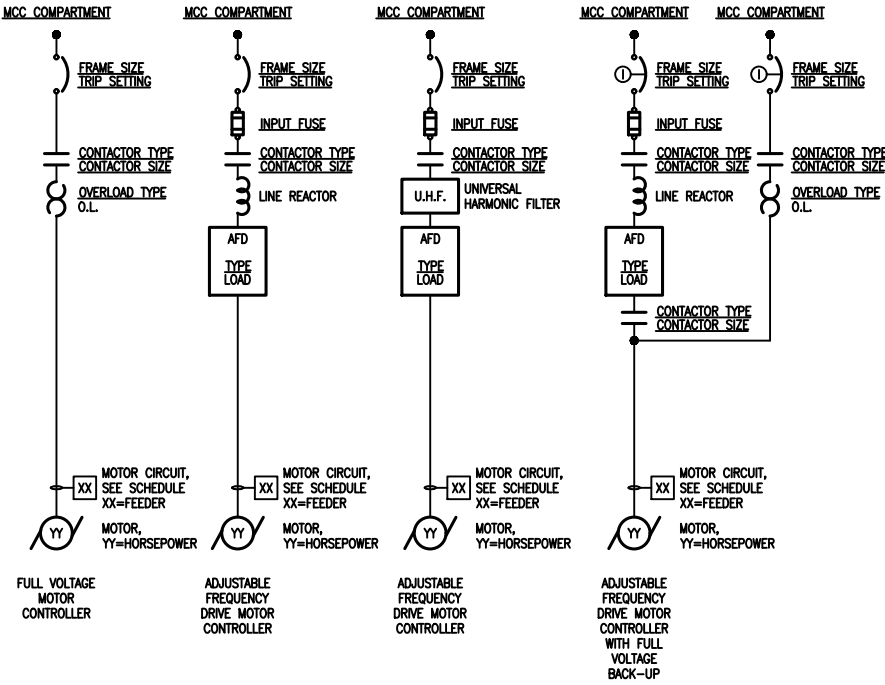
LINETYPE LEGEND

Ax = 2C#16 SHIELDED, TWISTED PAIR CABLE
Dx = #14 THHN WIRE (x = NUMBER OF WIRES)
Mx = 1" CONDUIT FOR CABLE SUPPLIED BY MANUFACTURER BY MFG. (x=NUMBER OF CONDUITS)
Ex = 3/4" CONDUIT AND CAT5e(x) CABLE(S) (x = NUMBER OF CABLES)
FO = CONDUIT AND FIBER OPTIC CABLE

----- SOFTWARE SIGNAL/FUNCTION
----- A ----- ANALOG SIGNAL, 4-20mADC OR PULSE FREQUENCY
----- PF ----- PULSE FREQUENCY
----- DISCRETE SIGNAL, DRY CONTACT
----- M ----- MANUFACTURER'S SIGNAL
----- PNEUMATIC SIGNAL
----- MAJOR PROCESS
----- MINOR PROCESS



MOTOR CONTROL CENTER (MCC) SYMBOLS



PROCESS NOTES:

1. SIZE CONDUIT PER NEC. MINIMUM SIZE 3/4".
2. PROVIDE SEPARATE CONDUITS FOR THE FOLLOWING:
a. 4-20mADC
b. 120 VOLT CONTROL
c. 120 VOLT POWER
d. 480 VOLT POWER
e. LOW VOLTAGE INSTRUMENTATION
f. COMMUNICATION
3. REFER TO SPECIFICATION 16900 FOR DETAILS ON VARIOUS LOOP FUNCTIONS AS WELL AS DETAILS REGARDING OPERATOR INTERFACE FUNCTIONS.
4. REFER TO DIVISION 11000, 13000, 15000 FOR ADDITIONAL DETAILS REGARDING INSTRUMENTATION AND CONTROL EQUIPMENT FURNISHED UNDER THOSE SPECIFICATIONS.
5. (1) 1-1/2"C REFERS TO NUMBER OF WIRES AND SIZE OF WIRE REQUIRED, WHERE AS:
(1) = ONE WIRE
1-1/2"C = THE SIZE OF WIRE REQUIRED

WIRING & CONDUIT (TYPICAL)

1. (X) #12 & #12G
REFERS TO NUMBER OF WIRE(S) AND SIZE OF WIRE(S) REQUIRED, WHERE AS:
(1) = ONE WIRE
#12 = THE SIZE OF WIRE REQUIRED
G = GROUND WIRE
2. (X) 1-1/2"C
REFERS TO NUMBER OF CONDUIT(S) AND SIZE OF CONDUIT(S) REQUIRED, WHERE AS:
(1) = ONE CONDUIT
1-1/2"C = THE SIZE OF CONDUIT REQUIRED

* REFER TO DRAWINGS FOR REQD WIRE AND CONDUIT SIZES AND AMOUNTS

RECORD DRAWINGS

REVISED TO CONFORM TO CONSTRUCTION RECORDS PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT			
F.B.:		CHECKED BY:	SRC			
PLOT DATE:	11/14/17	P1610s16100616097/CADD/Record Drawings/AutoCAD DWG's/E-2 ELECTRICAL SYMBOLS, & ABBREVIATIONS 2.dwg				

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SCOTT R. CHILSON
MARCH 7, 2016
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Date License No.



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CITY OF DULUTH
DULUTH, MINNESOTA

ELECTRICAL SYMBOLS & ABBREVIATIONS 2

FILE NO.
00616097
SHEET
E-2

GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

- 1 DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
- 2 EXISTING ELECTRICAL TO REMAIN
- 3 EXISTING EF
- 4 EXISTING VFD
- 5 EXISTING CIRCULATING PUMP AND OLD BOILER, VFD. DISCONNECTS, MC, ETC TO BE DEMOLISHED
- 6 EXISTING TEMPERATURE ALARM CONTROL PANEL

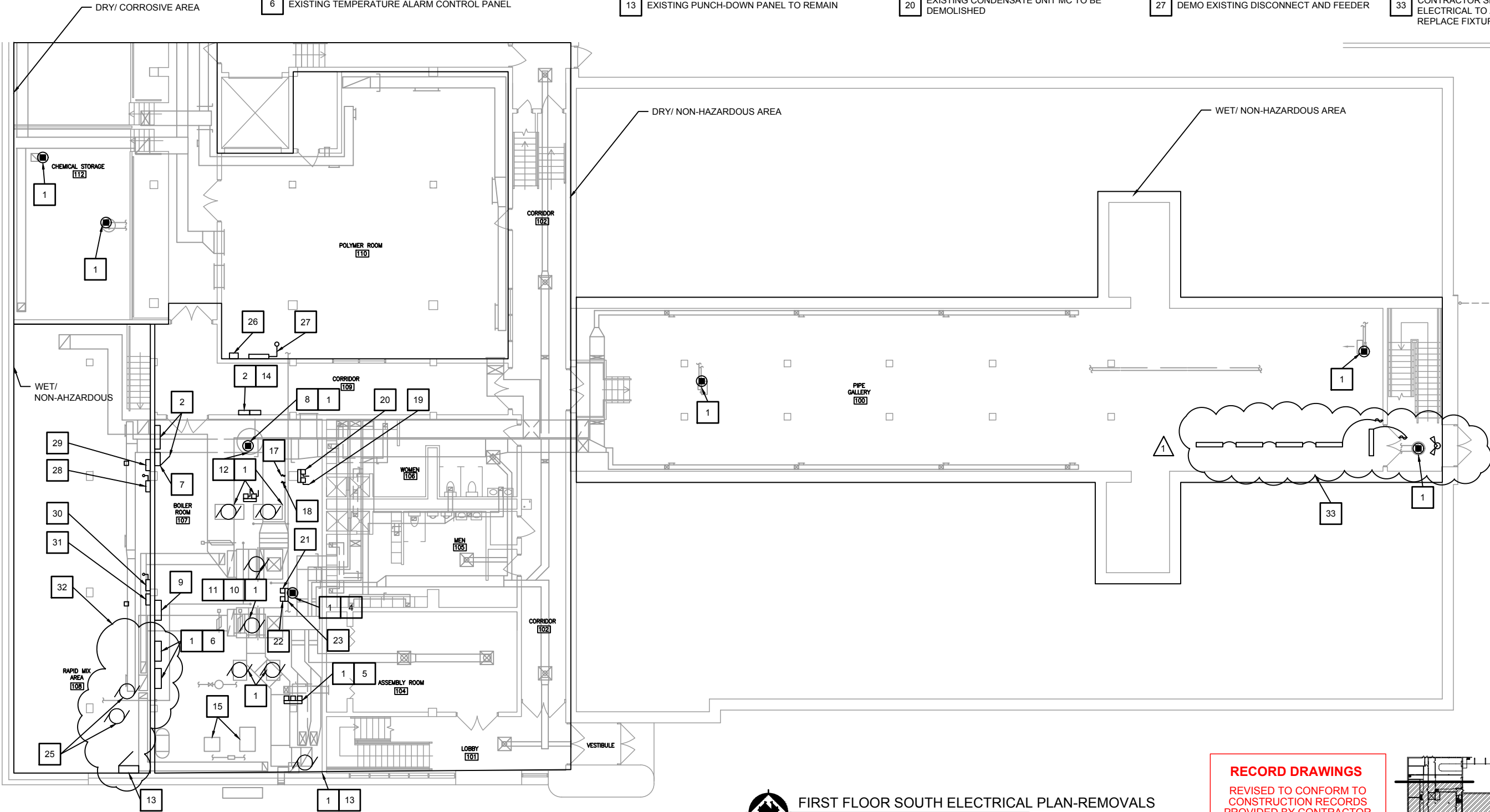
- 7 EXISTING LP - 4. REFER TO E-19
- 8 EXISTING WATER HEATER
- 9 EXISTING STORAGE CABINET TO BE DEMOLISHED
- 10 EXISTING AIR HANDLER TO BE DEMOLISHED
- 11 DISCONNECT ALL DEVICES
- 12 DEMO EXISTING CONDENSATION PUMP AND DEVICES
- 13 EXISTING PUNCH-DOWN PANEL TO REMAIN

- 14 LP - 3A & 3B
- 15 EXISTING BOILER TO REMIAN
- 16 RELOCATE EXISTING LIGHT FIXTURES AS REQUIRED FOR NEW DUCT WORK
- 17 EXISTING VACUUM PUMP DISCONNECT TO BE DEMOLISHED
- 18 EXISTING AIR DRYER DISCONNECT TO BE DEMOLISHED
- 19 EXISTING CONDENSATE UNIT MC TO BE DEMOLISHED
- 20 EXISTING CONDENSATE UNIT MC TO BE DEMOLISHED

- 21 EXISTING AC DISCONNECT TO BE DEMOLISHED
- 22 EXISTING AHU2 DISCONNECT / MC TO BE DEMOLISHED
- 23 EXISTING AHU1 DISCONNECT / MC TO BE DEMOLISHED
- 24 EXISTING VFD TO BE DEMOLISHED
- 25 EXISTING SAMPLE PUMP TO BE RELOCATED REFER TO PM DRAWINGS
- 26 DEMO EXISTING XFMR-L3
- 27 DEMO EXISTING DISCONNECT AND FEEDER

- 28 DEMO EXISTING XFMR-L4
- 29 DEMO EXISTING L4 DISCONNECT
- 30 DEMO EXISTING XFMR-L-3
- 31 DEMO EXISTING L3 DISCONNECT AND FEEDER
- 32 IDENTIFY, DISCONNECT AND RELOCATE EXISTING ELECTRICAL FOR CONSTRUCTION NEW ACCESS DOOR AND STAIRS. REFER TO ARCH DRAWINGS.
- 33 CONTRACTOR SHALL RELOCATE EXISTING ELECTRICAL TO ACCOMMODATE NEW HVAC. REPLACE FIXTURES AS SCHEDULED.

RECORD DRAWINGS



FIRST FLOOR SOUTH ELECTRICAL PLAN-REMOVALS

0 4 8 16
SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)

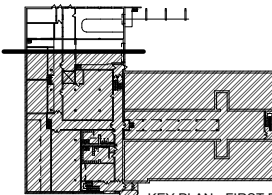
RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	
F.B.:		CHECKED BY:	SRC		ADDENDUM #1	
PLOT DATE:	11/14/17					

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DULUTH, MINNESOTA

FIRST FLOOR SOUTH ELECTRICAL
PLAN - REMOVAL

FILE NO.
00616097
SHEET
E-3R

GENERAL NOTES:

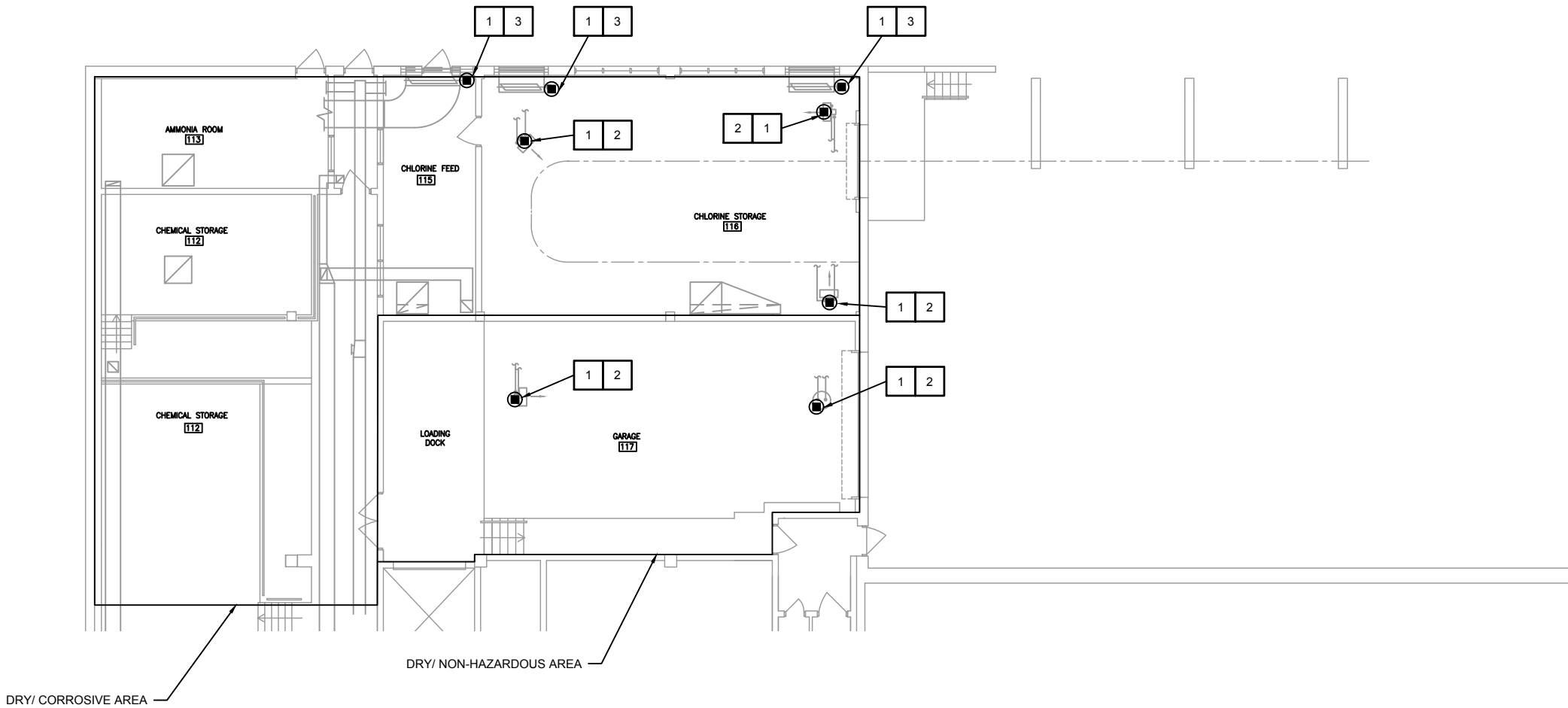
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS

KEY NOTES:

XXX

- | | |
|---|--|
| 1 | DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS |
| 2 | DEMO EXISTING UNIT HEATER |
| 3 | EXISTING DAMPERS & ACTUATORS |



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

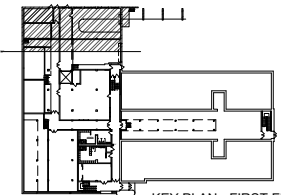
NO SHEET CHANGES



FIRST FLOOR NORTH ELECTRICAL PLAN - REMOVALS

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-
PLOT DATE:	11/14/17, P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG's\616097 ELECTRICAL FLOOR PLAN NORTH.dwg	-	-	-	-	-

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Scott R. Chilson
SCOTT R. CHILSON
MARCH 7, 2016
Date
44287
License No.



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CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR NORTH ELECTRICAL
PLAN - REMOVALS

FILE NO.
00616097
SHEET
E-4

GENERAL NOTES:

1. REFER TO AND COORDINATE WITH M-DRAWINGS.
2. DEMO ALL INSTRUMENTATION, CONNECTIONS, AND EQUIPMENT AS REQUIRED FOR PROJECT COMPLETION.
3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

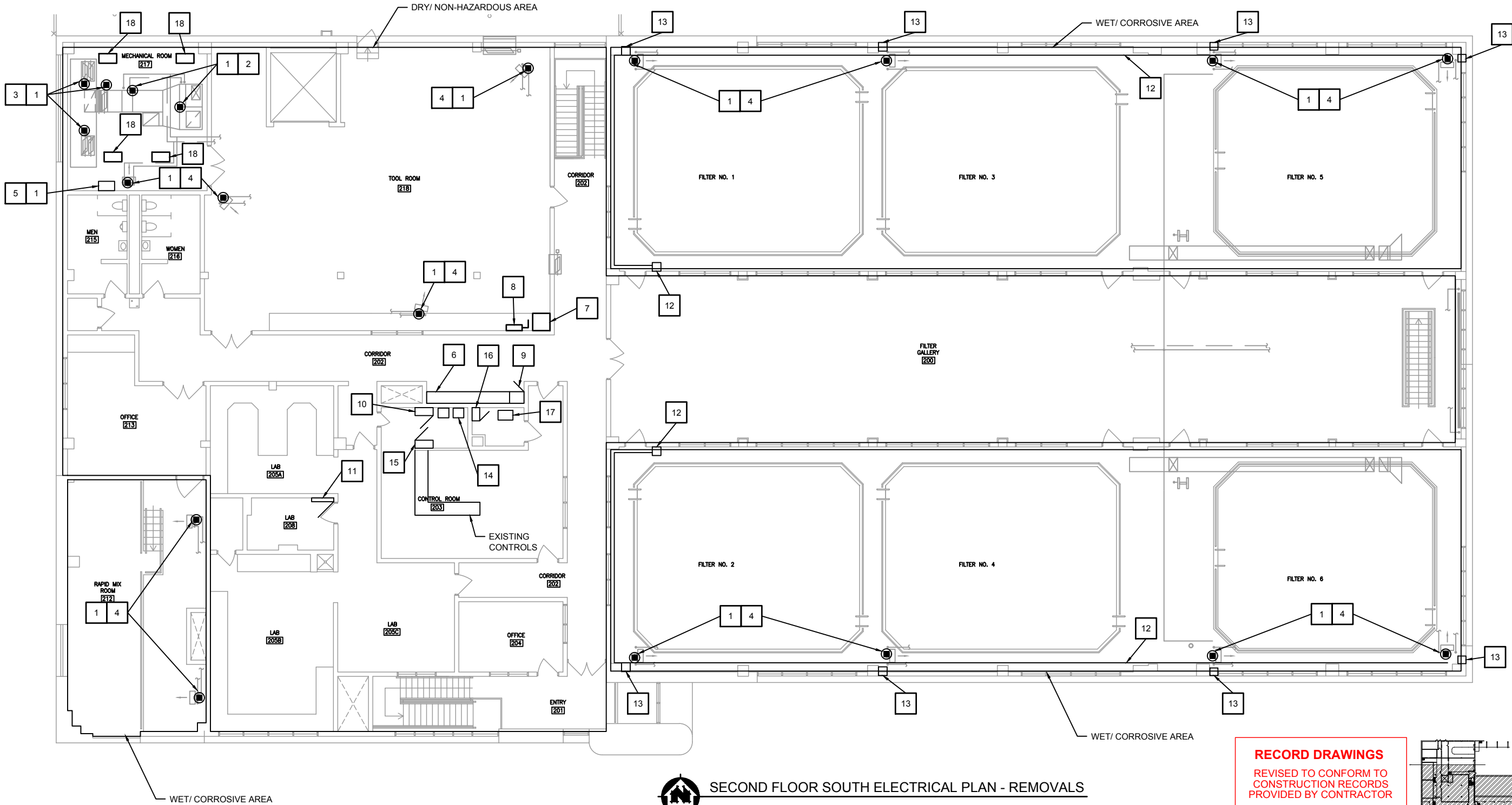
RECORD DRAWINGS

- 1 DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
- 2 DEMO POWER EXISTING REHEAT AND AIR HANDLING UNIT
- 3 DEMO POWER EXISTING ACTUATORS
- 4 DEMO POWER TO UNIT HEATER AND EQUIPMENT, DISCONNECTS AND FEEDERS
- 5 DEMO TEMP CONTROL PANEL

- 6 EXISTING MCC TO REMAIN BUT TO BE MODIFIED. REFER TO ONE LINE DIAGRAMS
- 7 XFMR-L2 TO REMIAN
- 8 DISCONNECT FOR LP-L2
- 9 LP-L2 TO REMAIN TO BE MODIFIED AS REQ'D
- 10 DEMO DC, FEEDERS AND BRANCH CIRCUITS

- 11 LP-L TO BE REFD TO REMAIN REFER TO E-19
- 12 DEMO FEEDER AND CONDUIT
- 13 DEMO DISCONNECT
- 14 DEMO BATTERY CHANGER FEEDERS, AND BRANCH CIRCUITS
- 15 SCADA CONTROL PANEL TO REMAIN

- 16 DATA/COMM SERVICE AND SWITCH TO REMAIN. CONNECT HVAC PDC TO THE SWITCH COORDINATE W/ CITY IT DEPARTMENT
- 17 EXISTING SERVER TO REMAIN
- 18 DEMO/REPLACE LIGHT FIXTURES



SECOND FLOOR SOUTH ELECTRICAL PLAN - REMOVALS

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)

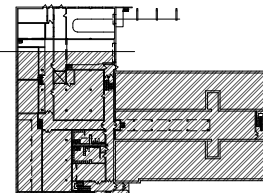
RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN - SECOND FLOOR

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.		DATE		REVISION		BY	
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT								
F.B.:		CHECKED BY:	SRC								
PLOT DATE:	11/14/17	P1610s16100616097/CADD/Record Drawings/AutoCAD DWG's161097 ELECTRICAL PLAN 3.dwg									

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DULUTH, MINNESOTA

SECOND FLOOR SOUTH ELECTRICAL
PLAN - REMOVALS

FILE NO.
00616097
SHEET
E-5

GENERAL NOTES:

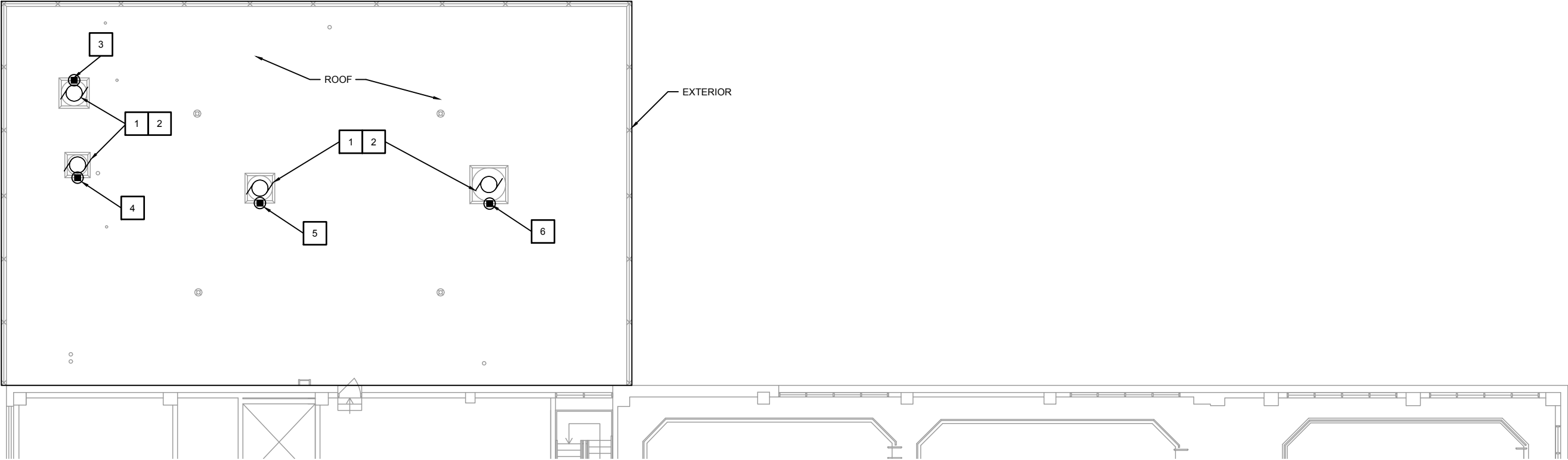
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS

KEY NOTES:

XXX

- 1 DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
- 2 DEMO / REPLACE EXISTING EF
- 3 DEMO / REPLACE MD-13
- 4 DEMO / REPLACE MD-14
- 5 DEMO / REPLACE MD-12
- 6 DEMO / REPLACE MD-11



SECOND FLOOR NORTH ELECTRICAL PLAN - REMOVALS

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)

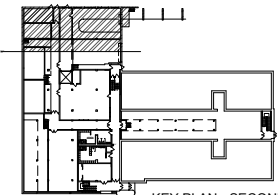
RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN - SECOND FLOOR

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P:	1610s16100616097/CADD/Record Drawings/AutoCAD DWG's161097 E-6R.dwg	-	-	-	-

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SCOTT R. CHILSON
MARCH 25, 2016
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CITY OF DULUTH
DULUTH, MINNESOTA

SECOND FLOOR NORTH ELECTRICAL
PLAN - REMOVALS

FILE NO.
00616097
SHEET
E-6R

GENERAL NOTES:

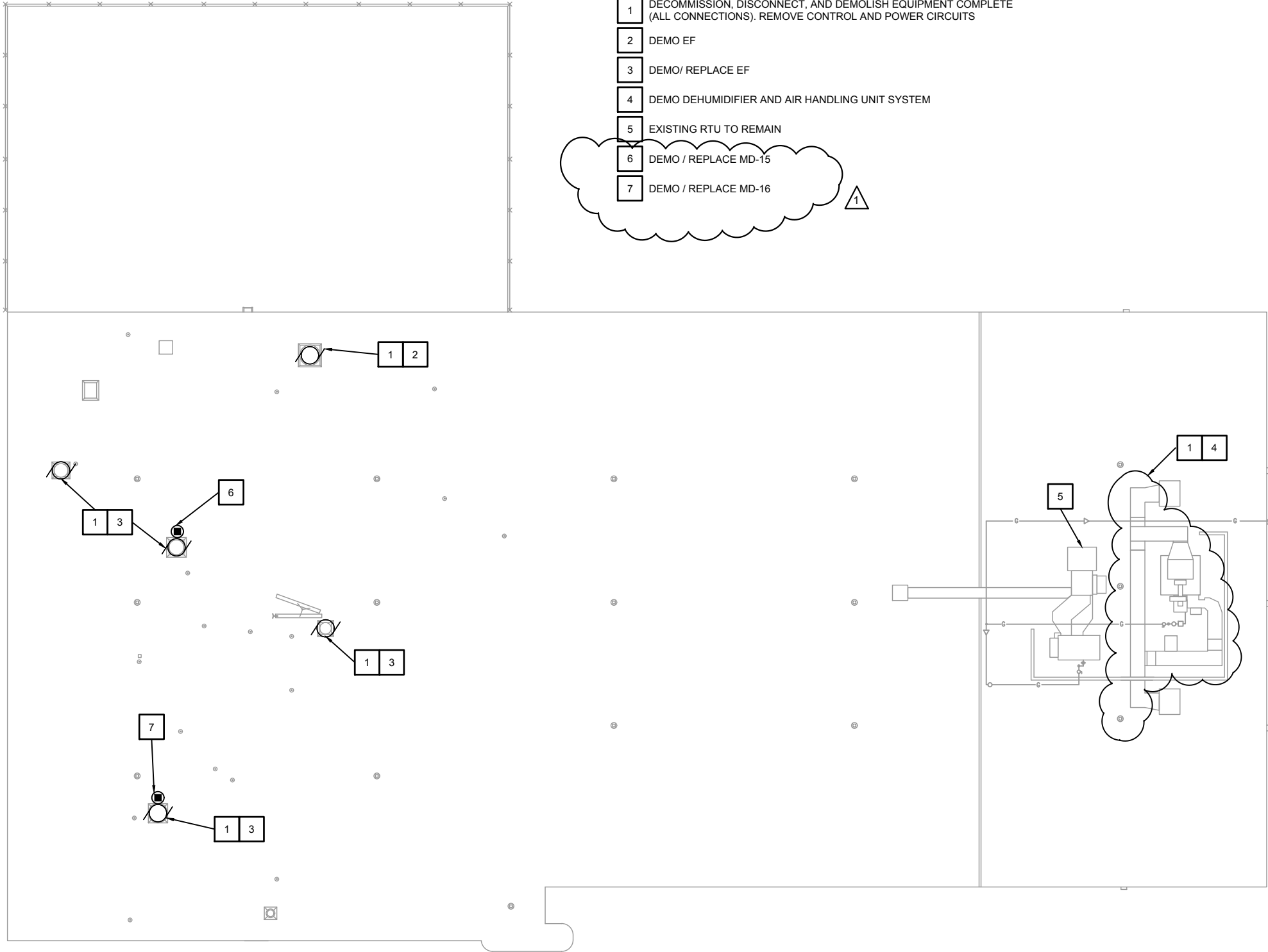
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS

KEY NOTES:

XXX

- 1 DECOMMISSION, DISCONNECT, AND DEMOLISH EQUIPMENT COMPLETE (ALL CONNECTIONS). REMOVE CONTROL AND POWER CIRCUITS
- 2 DEMO EF
- 3 DEMO/ REPLACE EF
- 4 DEMO DEHUMIDIFIER AND AIR HANDLING UNIT SYSTEM
- 5 EXISTING RTU TO REMAIN
- 6 DEMO / REPLACE MD-15
- 7 DEMO / REPLACE MD-16



ROOF ELECTRICAL PLAN - REMOVALS

0 5 10 20

SCALE: 3/32 " = 1'-0" (22x34)
SCALE: 3/64 " = 1'-0" (11x17)

RECORD DRAWINGS

REVISED TO CONFORM TO
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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P:	1610s	16100616097	CADD	Record Drawings	AutoCAD DWG's

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MARCH 25, 2016
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DULUTH, MINNESOTA

ROOF ELECTRICAL PLAN - REMOVALS

FILE NO.
00616097
SHEET
E-7R

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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

RECORD DRAWINGS

- 1 CONNECT POWER UH-12, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 2 CONNECT POWER UH-26, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 3 CONNECT POWER UH-9, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 4 CONNECT POWER UH-10, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 5 CONNECT POWER UH-11, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH

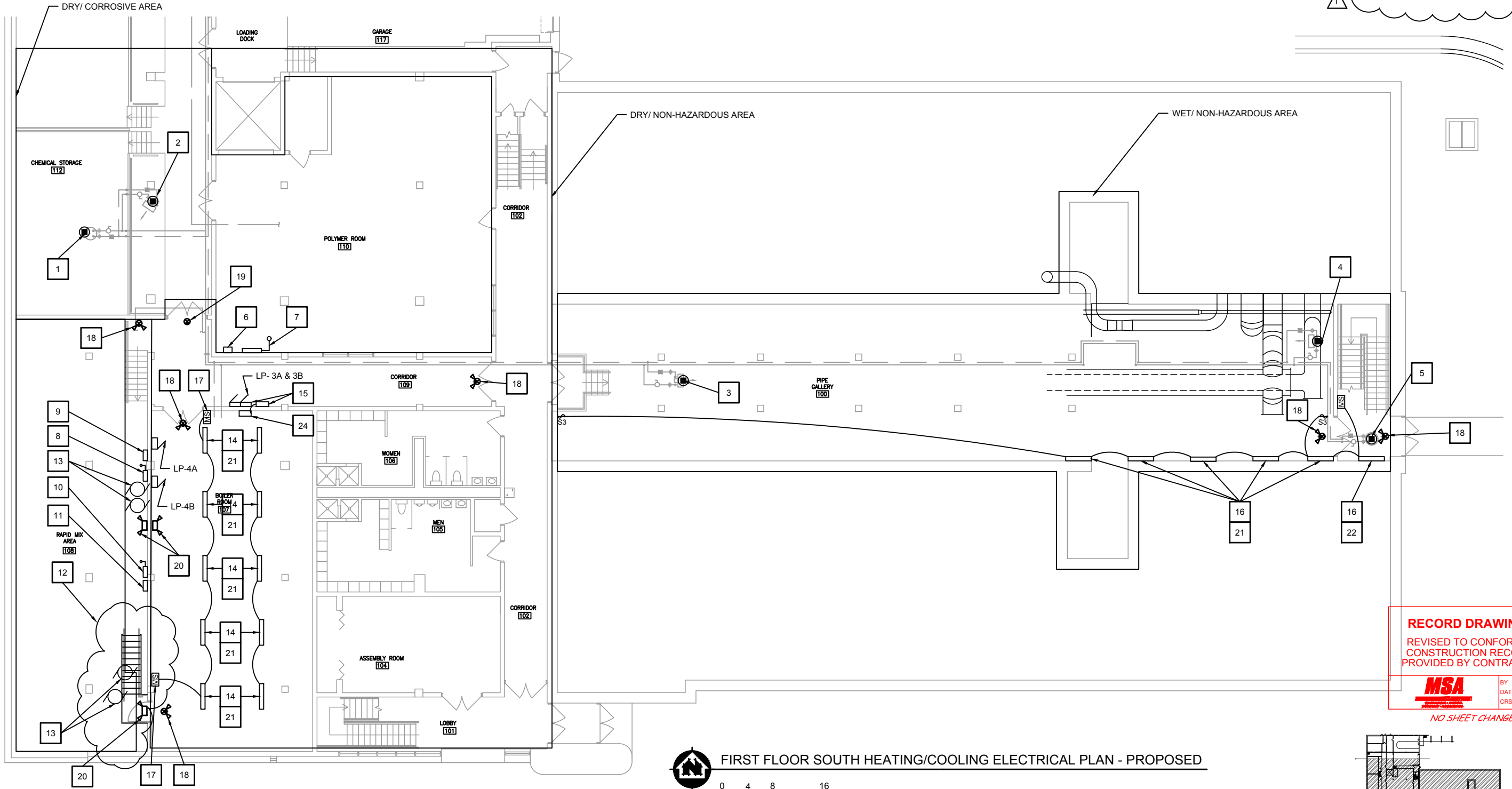
- 6 EXISTING XFMR LP-1A&1B DISCONNECT TO BE DEMOLISHED
- 7 EXISTING XFMR LP-1A&1B TO BE DEMOLISHED
- 8 DEMOLISH XFMR-L4
- 9 DEMOLISH L4 DISCONNECT
- 10 DEMOLISH XFMR-LP/L

- 11 DEMOLISH LP-LP/L DISCONNECT
- 12 IDENTIFY, DISCONNECT AND RELOCATE EXISTING ELECTRICAL FOR CONSTRUCTION NEW ACCESS DOOR AND STAIRS. REFER TO ARCH DRAWINGS.
- 13 EXISTING SAMPLE PUMP AND ELECTRICAL TO BE RELOCATED REFER TO PM DRAWINGS
- 14 NEW STRUT MOUNTED FIXTURE. MOUNT 8'-10" AFF.

- 15 REFEED LP-3A/3B
- 16 NEW WALL MOUNTED FIXTURE REFEED INTO EXISTING CIRCUITS
- 17 NEW MOTION CONTROL SENSOR
- 18 NEW BATTERY BU EXIT AND SPOTS
- 19 NEW BATTERY BU EXIT SIGN

- 20 EM1 - REFER TO SCHEDULE
- 21 V1 - REFER TO SCHEDULE
- 22 V2 - REFER TO SCHEDULE
- 23 NEW LP-3A/B DISCONNECT REFER TO E-19
- 24 FURNISH AND INSTALL XFMR-L3A AND DISCONNECT

1



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

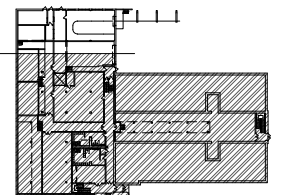
NO SHEET CHANGES



FIRST FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	1	DATE	3/25
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	REVISION	ADDENDUM #1		
F.B.:		CHECKED BY:	SRC				
PLOT DATE: 11/14/17, P:\610s\61600616097\CADD\Record Drawings\AutoCAD DWG's\616097 E-8R.dwg							

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Scott R. Chilson
SCOTT R. CHILSON
Date MARCH 25, 2016 License No. 44287



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CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR SOUTH HEATING AND COOLING
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-8R

GENERAL NOTES:

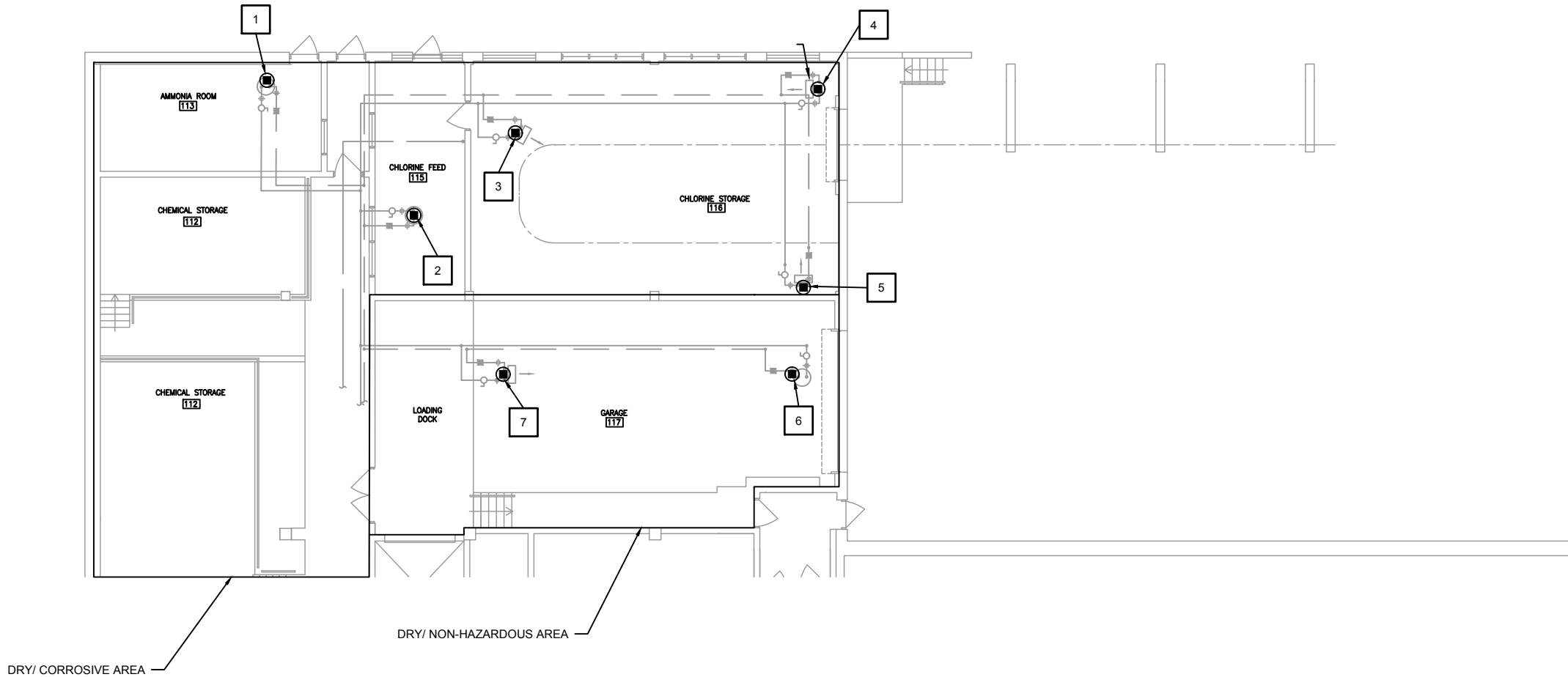
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS

KEY NOTES:

XXX

- 1 CONNECT POWER UH-14, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 2 CONNECT POWER UH-13, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 3 CONNECT POWER UH-1, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 4 CONNECT POWER UH-2, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 5 CONNECT POWER UH-3, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 6 CONNECT POWER UH-5, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 7 CONNECT POWER UH-4, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH



FIRST FLOOR NORTH HEATING/COOLING ELECTRICAL PLAN - PROPOSED



SCALE: 1/8 " = 1'-0" (22x34)
SCALE: 1/16 " = 1'-0" (11x17)

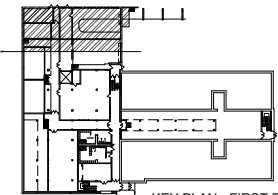
RECORD DRAWINGS

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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-
PLOT DATE:	11/14/17, P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG's\616097 ELECTRICAL PLAN 7.dwg	-	-	-	-	-

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FIRST FLOOR NORTH HEATING AND COOLING
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-9

GENERAL NOTES:

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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

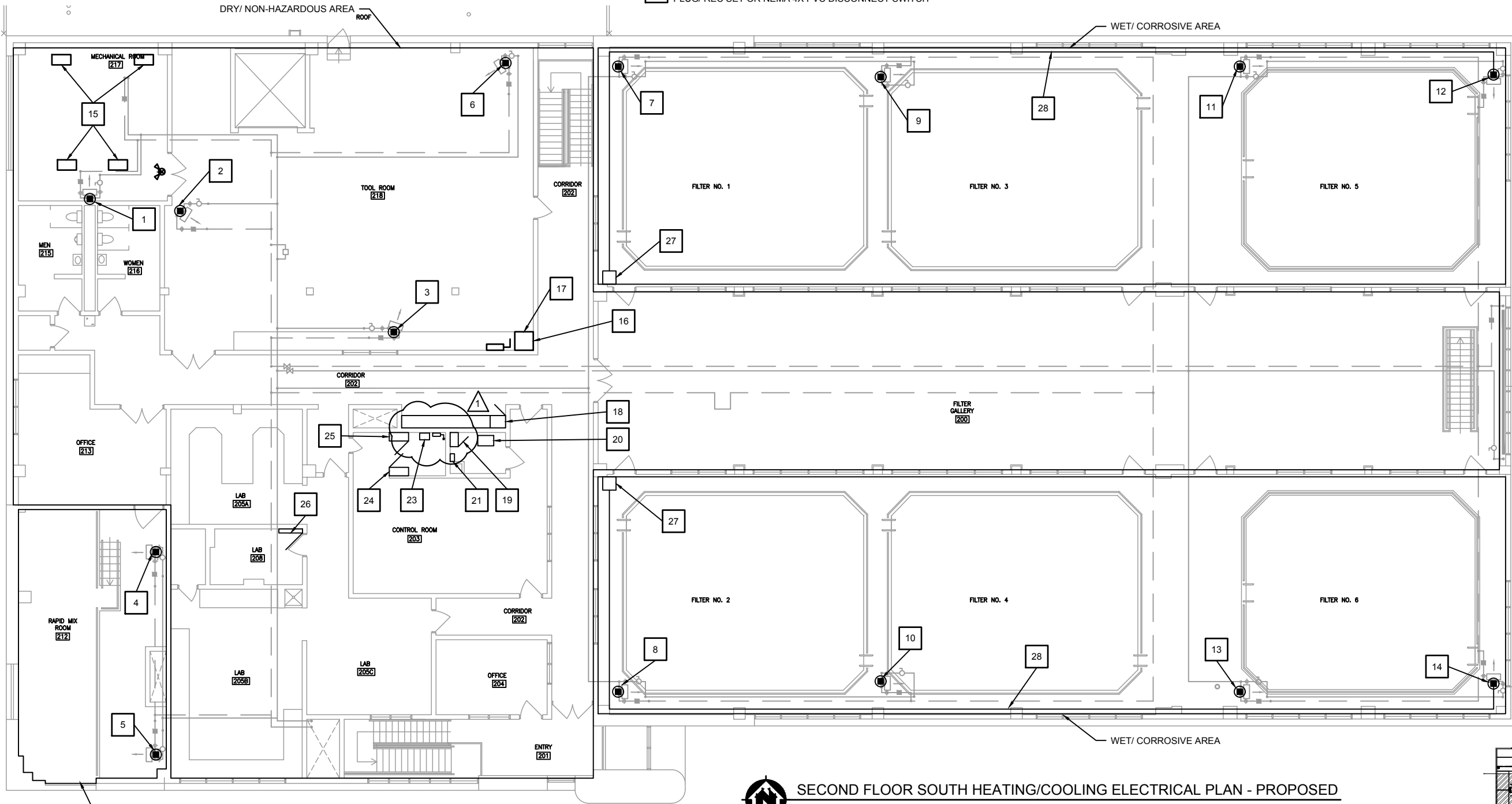
- 1 CONNECT POWER UH-17, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 2 CONNECT POWER UH-7, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 3 CONNECT POWER UH-8, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 4 CONNECT POWER UH-15, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 5 CONNECT POWER UH-16, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 6 CONNECT POWER UH-6, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH

- 7 CONNECT POWER UH-18, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 8 CONNECT POWER UH-25, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 9 CONNECT POWER UH-19, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 10 CONNECT POWER UH-24, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 11 CONNECT POWER UH-20, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 12 CONNECT POWER UH-21, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 13 CONNECT POWER UH-23, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 14 CONNECT POWER UH-22, FURNISH WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH

- 15 NEW LIGHT FIXTURE (TYP)-V1 FIXTURES
- 16 EXISTING XFMR-LP/L2 TO REMAIN
- 17 EXISTING XFMR-LP/L2 DISCONNECT TO REMAIN
- 18 LP-L2 TO REAMIN-PROVIDE NEW BRANCH FEEDER TO MASTER PPC CONTROLLER AND SERVER
- 19 EXISTING DATA/ COMM SERVICE AND SWITCH -CONNECT NETWORK MASTER PPC CONTROLS
- 20 EXISTING SERVER TO REMAIN
- 21 NEW MASTER PPC CONTROLLER AND NEW SERVER. (FURNISH AND INSTALL NETWORK DATA/COMM/PWR LOOP TO AL HVAC CONTROL DEVICES AND EQUIPMENT PER MC

- 22 NOT USED (REFER TO E-8R)
- 23 NEW XFMR-LP-L HOMERUN FROM PP1 FEED ENCLOSED CB DISCONNECT, TO HOMERUN FEED TO LP-L1
- 24 EXISTING SCADA CONTROL PANEL TO REMAIN
- 25 FURNISH, INSTALL, AND CONNECT PP1
- 26 EXISTING LP-L1 TO BE REFD FROM NEW ENCLOSED CB DISCONNECT AND XFMR-LP-L1
- 27 NEW NEMA 4X PVC BOX, EXTEND UH POWER CIRCUIT
- 28 NEW 3/4" PVC UH FEEDER CIRCUIT

RECORD DRAWINGS



RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

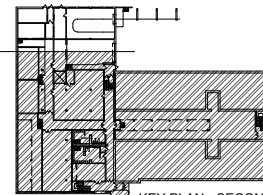
MSA
BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES



SECOND FLOOR SOUTH HEATING/COOLING ELECTRICAL PLAN - PROPOSED

0 4 8 16
SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)



KEY PLAN - SECOND FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	
F.B.:		CHECKED BY:	SRC			
PLOT DATE:	11/14/17	P:\610s\61600616097\CADD\Record Drawings\AutoCAD DWG's\616097 E-10R.dwg				

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CITY OF DULUTH
DULUTH, MINNESOTA

SECOND FLOOR SOUTH HEATING AND COOLING
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-10R

GENERAL NOTES:

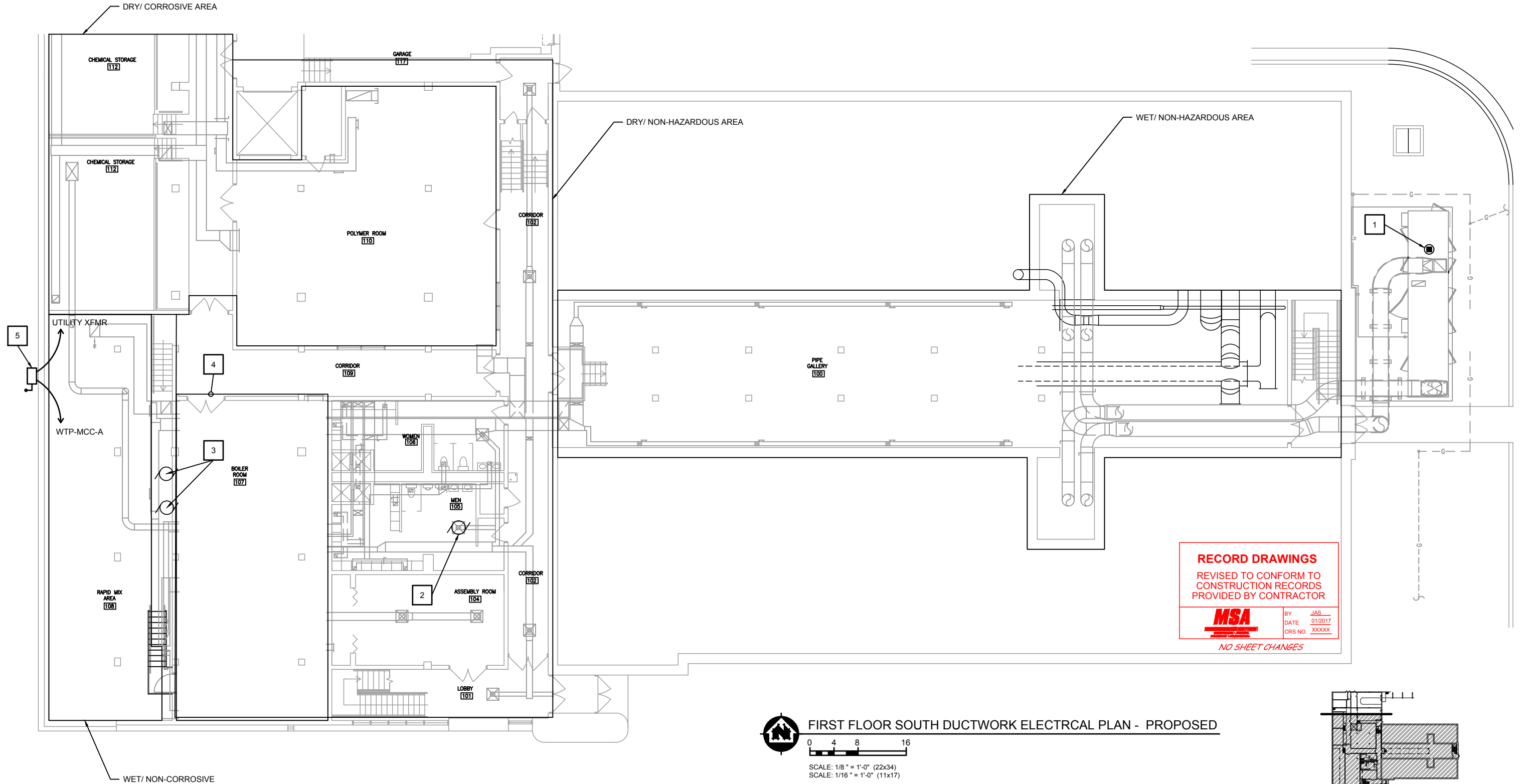
1. REFER TO AND COORDINATE WITH M-DRAWINGS.
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3. INTENT DIVISION OF DEMOLITION: IT IS THE INTENT OF THE EC SHALL DECOMMISSION, DISCONNECT, AND DEMOLISH ALL EQUIPMENT DEVICES, MATERIAL, ETC RELATED TO ALL POWER CONNECTIONS. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR DEMO OF EQUIPMENT, MATERIALS, DEVICES, CONTROL, ETC.
4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

RECORD DRAWINGS

- 1 D-1, FURNISH AND CONNECT WITH DISCONNECT. EACH MOTOR AND CONNECTION HALL HAVE DISCONNECT PLUG SET
- 2 EF-8, FURNISH AND CONNECT WITH DISCONNECT RATED PLUG/ REC SET OR NEMA 4X PVC DISCONNECT SWITCH
- 3 RELOCATE AND CONNECT SAMPLE PUMPS(TYP) REFER TO 2/E-16
- 4 FURNISH NEW CONDUIT AND FEEDER IN THIS SPACE
- 5 FURNISH AND INSTALL NEW WTP-MDS-1. REFER TO ONE-LINE



PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT			
F.B.:		CHECKED BY:	SRC			
PLOT DATE:	11/14/17, P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG's\E-11 ELECTRICAL PLAN 9.dwg					

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SCOTT R. CHILSON

MARCH 7, 2016

44287

Date

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

FIRST FLOOR SOUTH DUCTWORK
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097

SHEET
E-11

GENERAL NOTES:

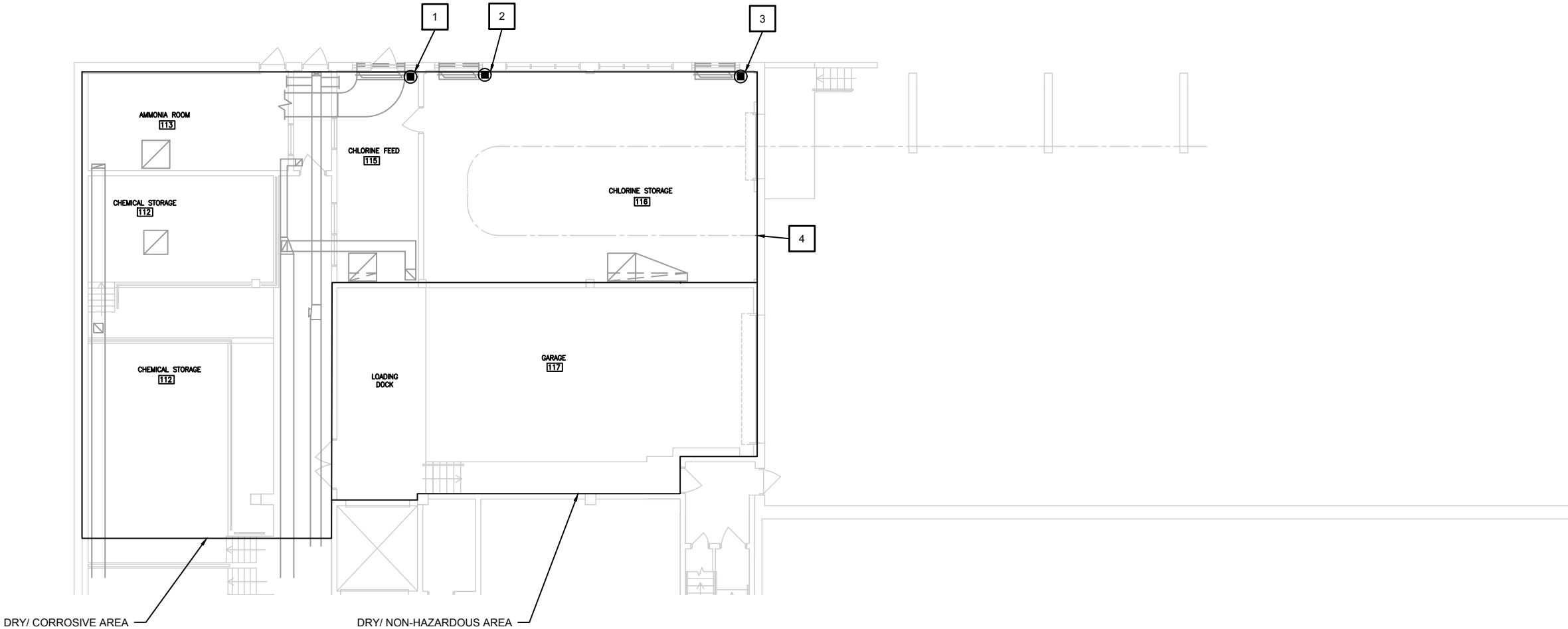
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

RECORD DRAWINGS

- 1 CONNECT POWER MD-4, FURNISH WITH DISCONNECT RATED PLUG/ REC SET
- 2 CONNECT POWER MD-5, FURNISH WITH DISCONNECT RATED PLUG/ REC SET
- 3 CONNECT POWER MD-6 & MD-7, FURNISH WITH DISCONNECT RATED PLUG/ REC SET
- 4 FURNISH NEW CONDUIT AND FEEDERS IN THE CORROSIVE AREA



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

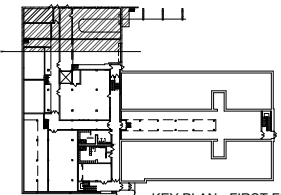
NO SHEET CHANGES



FIRST FLOOR NORTH DUCTWORK ELECTRICAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)



KEY PLAN - FIRST FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-
PLOT DATE:	11/14/17	P:\610s\616\00616097\CADD\Record Drawings\AutoCAD DWG's\616097 ELECTRICAL PLAN 10.dwg	-	-	-	-

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Scott R. Chilson
SCOTT R. CHILSON
MARCH 7, 2016
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FIRST FLOOR NORTH DUCTWORK
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-12

GENERAL NOTES:

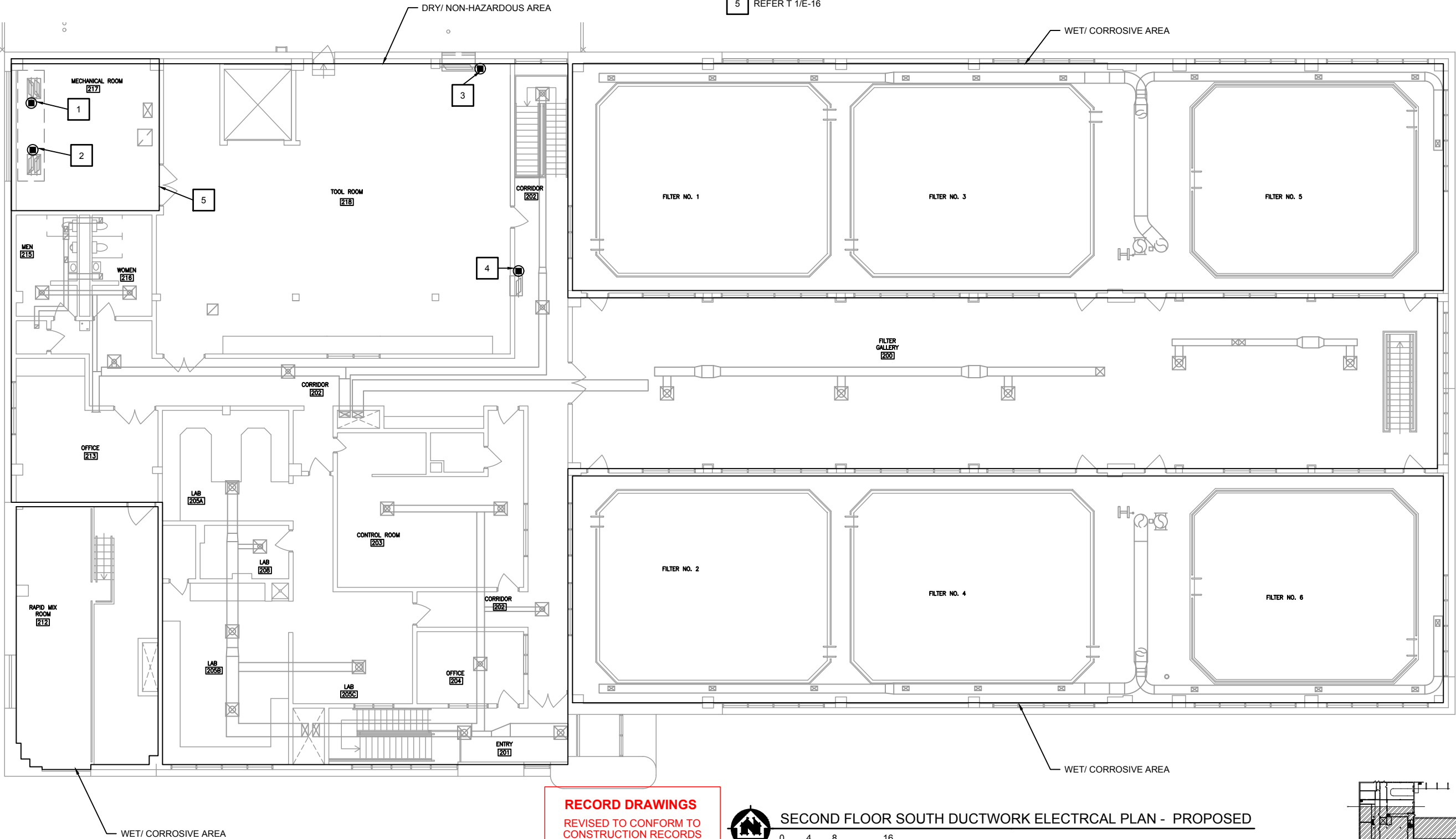
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS

KEY NOTES:

XXX

- 1 CONNECT POWER MD-1, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 2 CONNECT POWER MD-2, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 3 CONNECT POWER MD-3, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 4 CONNECT POWER MD-8, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 5 REFER T 1/E-16



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

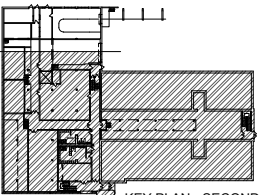
NO SHEET CHANGES



SECOND FLOOR SOUTH DUCTWORK ELECTRICAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)



KEY PLAN - SECOND FLOOR

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
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F.B.:		CHECKED BY:	SRC				
PLOT DATE:	11/14/17, P:\610s\61600616097\CADD\Record Drawings\AutoCAD DWG's\616097 ELECTRICAL PLAN 11.dwg						

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CITY OF DULUTH
DULUTH, MINNESOTA

SECOND FLOOR SOUTH DUCTWORK
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-13

GENERAL NOTES:

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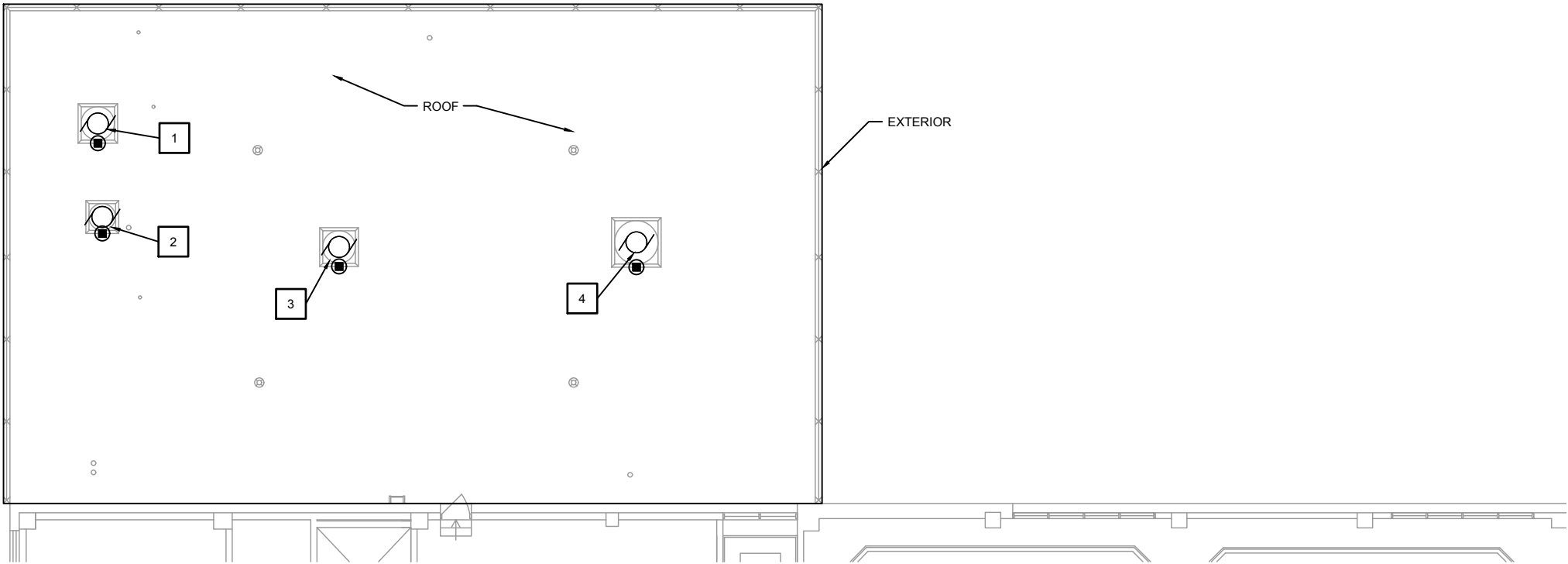
RECORD DRAWINGS

KEY NOTES:

XXX

- 1 CONNECT POWER EF-4 & MD-13, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)
- 2 CONNECT POWER EF-5 & MD-14, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)
- 3 CONNECT POWER EF-3 & MD-12, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)
- 4 CONNECT POWER EF-2 & MD-11, FURNISH WITH DISCONNECT RATED PLUG/ REC SETS (TYP)

1



RECORD DRAWINGS

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CONSTRUCTION RECORDS
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BY JAS
DATE 01/2017
CRS NO. XXXXX

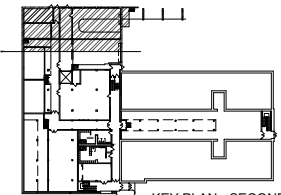
NO SHEET CHANGES



SECOND FLOOR SOUTH DUCTWORK ELECTRICAL PLAN - PROPOSED

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)



KEY PLAN - SECOND FLOOR

PROJECT NO.:	00616097	SCALE: AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	
F.B.:		CHECKED BY:	SRC	-	-	
PLOT DATE:	11/14/17					

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SCOTT R. CHILSON
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CITY OF DULUTH
DULUTH, MINNESOTA

SECOND FLOOR NORTH DUCTWORK
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-14R

GENERAL NOTES:

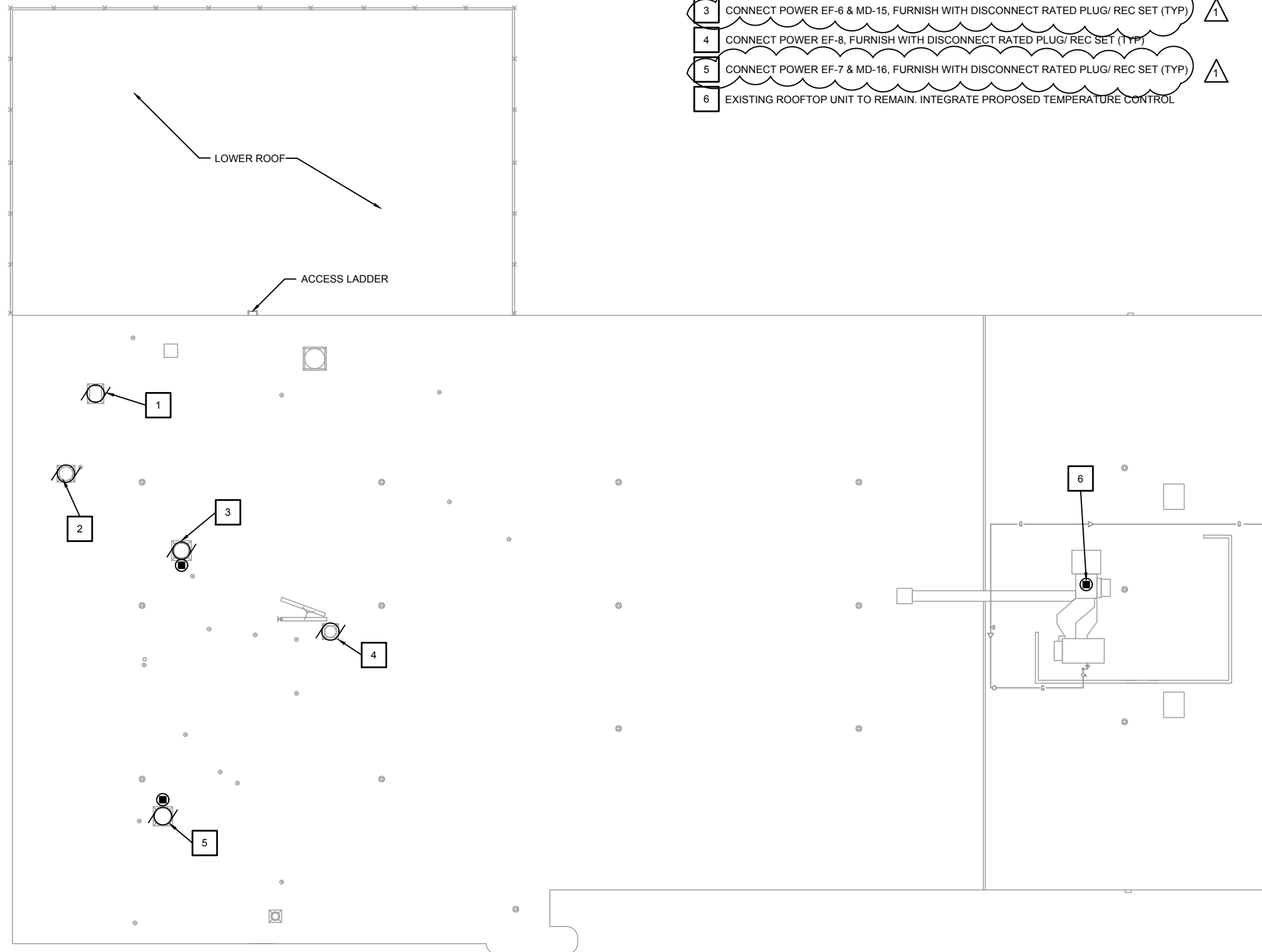
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS

KEY NOTES:

XXX

- 1 CONNECT POWER EF-1, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 2 CONNECT POWER EF-9, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 3 CONNECT POWER EF-6 & MD-15, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 4 CONNECT POWER EF-8, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 5 CONNECT POWER EF-7 & MD-16, FURNISH WITH DISCONNECT RATED PLUG/ REC SET (TYP)
- 6 EXISTING ROOFTOP UNIT TO REMAIN. INTEGRATE PROPOSED TEMPERATURE CONTROL



ROOF DUCTWORK ELECTRICAL PLAN- PROPOSED

0 4 8 16

SCALE: 1/8" = 1'-0" (22x34)
SCALE: 1/16" = 1'-0" (11x17)

RECORD DRAWINGS

REVISED TO CONFORM TO
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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	1	DATE	3/25	REVISION		BY	
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25			ADDENDUM #1			
F.B.:		CHECKED BY:	SRC								
PLOT DATE:	11/14/17	P:\610s\61600616097\CADD\Record Drawings\AutoCAD DWG's\616097 E-15R.dwg									

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CITY OF DULUTH
DULUTH, MINNESOTA

ROOF DUCTWORK
ELECTRICAL PLAN - PROPOSED

FILE NO.
00616097
SHEET
E-15R

GENERAL NOTES:

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4. REFER TO SCHEDULES FOR WORK.

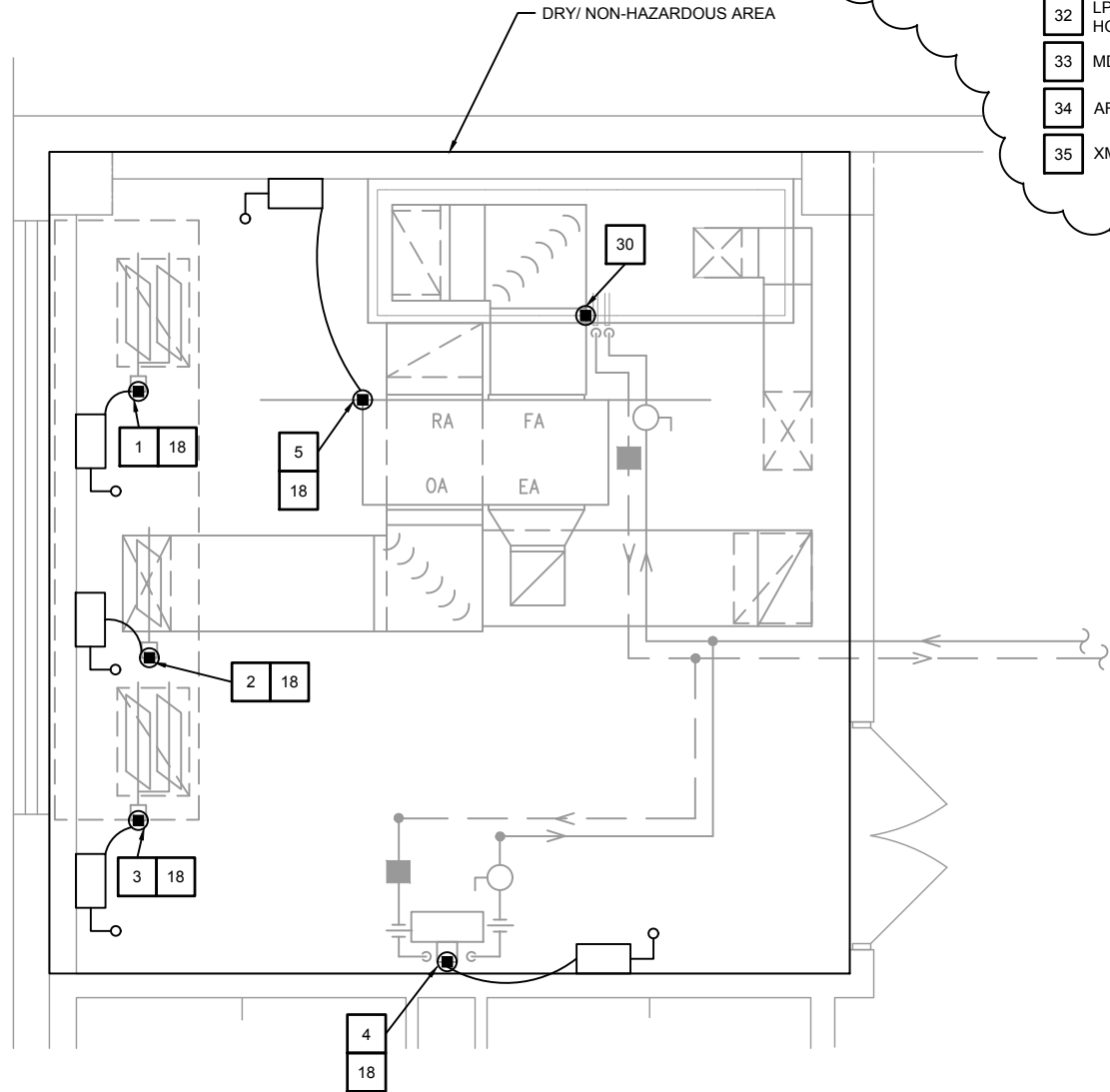
KEY NOTES:

XXX

1	MD-1	9	VAV-4
2	MD-10	10	VAV-6
3	MD-2	11	AHU-1
4	UH-17	12	H-1 OR P-1
5	ENV-1	13	H-2 OR P-2
6	D-2	14	B-1 EXISTING TO REMAIN. CONNECT SIGNALS FOR AUTOMATIC CONTROL
7	VAV-1	15	B-2 EXISTING TO REMAIN. CONNECT SIGNALS FOR AUTOMATIC CONTROL
8	VAV-2	16	VAV-5

17	TEMPERATURE CONTROL CABINET	25	AHU-VFD
18	DISCONNECTS SHALL BE DISCONNECT RATED PLUG/ REC SET. WALL DISCONNECT ARE SHOW FOR CLARITY ONLY	26	P-VDF-1
19	LP-1A	27	P-VFD-2
20	LP-1B	28	EXISTING BOILER E-STOP
21	LP-4A	29	FURNISH AND INSTALL NEW BOILER E-STOP
22	LP-4B	30	AHU-3
23	SAMPLE PUMP 1 SP-1	31	XFMR-LP-L4B WALL MOUNT ABOVE LP-L4B
24	SAMPLE PUMP 2 SP-2	32	LP-L3 ENCLOSED CB DISCONNECT HOMERUN TO XFMR-LP-L3
		33	MD-9
		34	AFMS-1
		35	XMFR-LP-L3

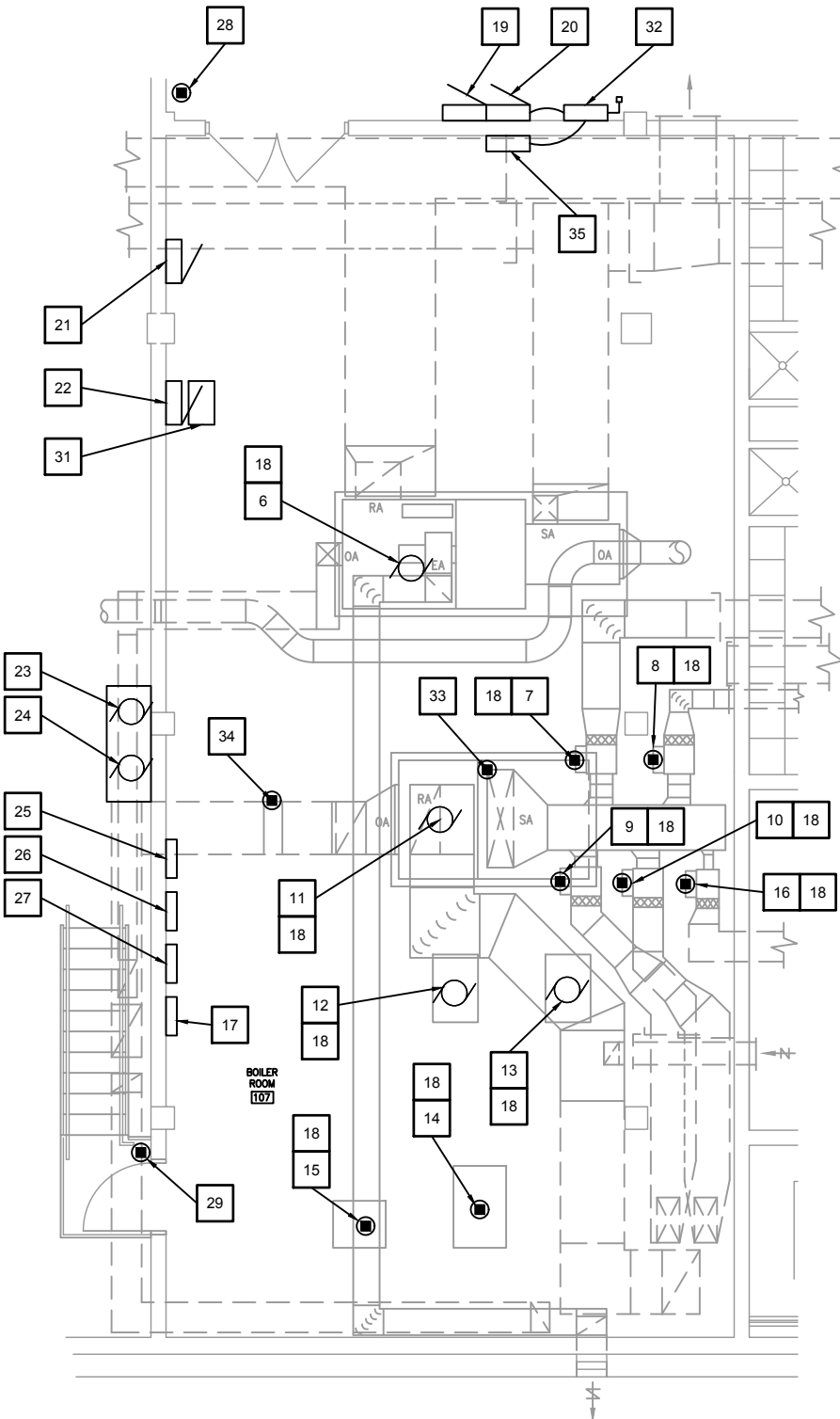
RECORD DRAWINGS



1 UPPER MECHANICAL ROOM ENLARGED PLAN
E-16



SCALE: 3/8" = 1'-0" (22x34)
SCALE: 3/16" = 1'-0" (11x17)



2 LOWER LEVEL BOILER ROOM ENLARGED PLAN - PROPOSED
E-16



SCALE: 3/8" = 1'-0" (22x34)
SCALE: 3/16" = 1'-0" (11x17)

RECORD DRAWINGS

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DATE 01/2017
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PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	
F.B.:		CHECKED BY:	SRC				
PLOT DATE:	11/14/17						

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SCOTT R. CHILSON
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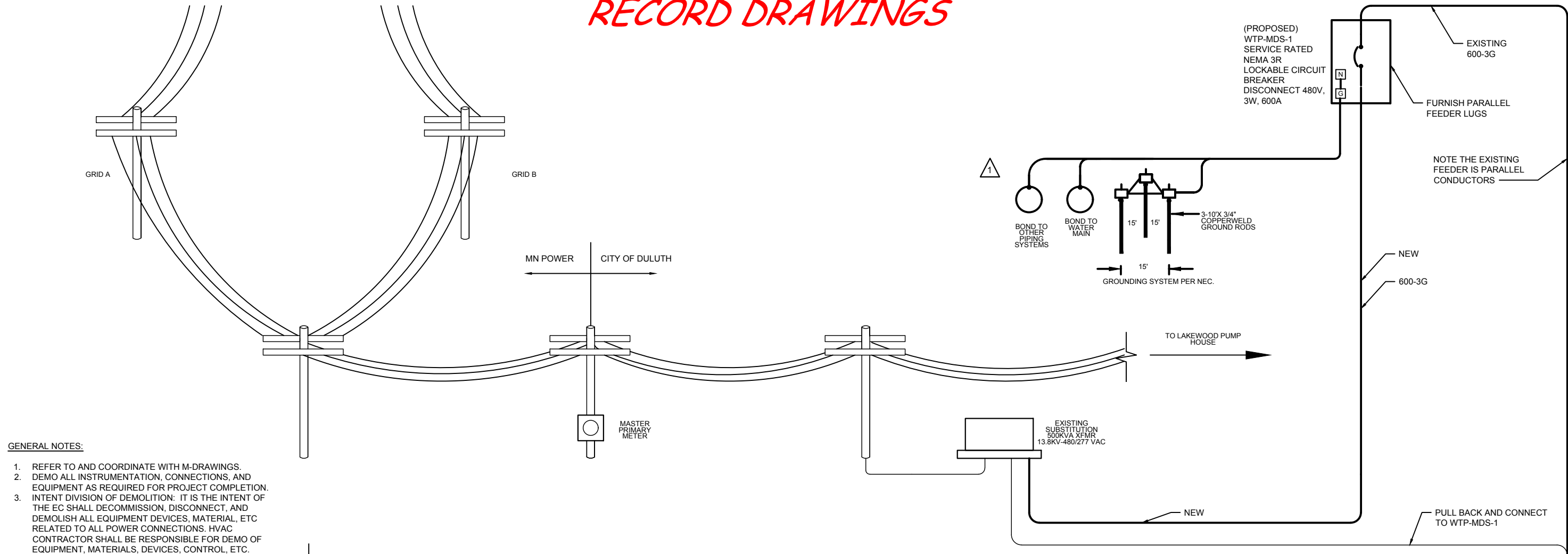
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ELECTRICAL PLANS ENLARGED

FILE NO.
00616097
SHEET
E-16R

RECORD DRAWINGS



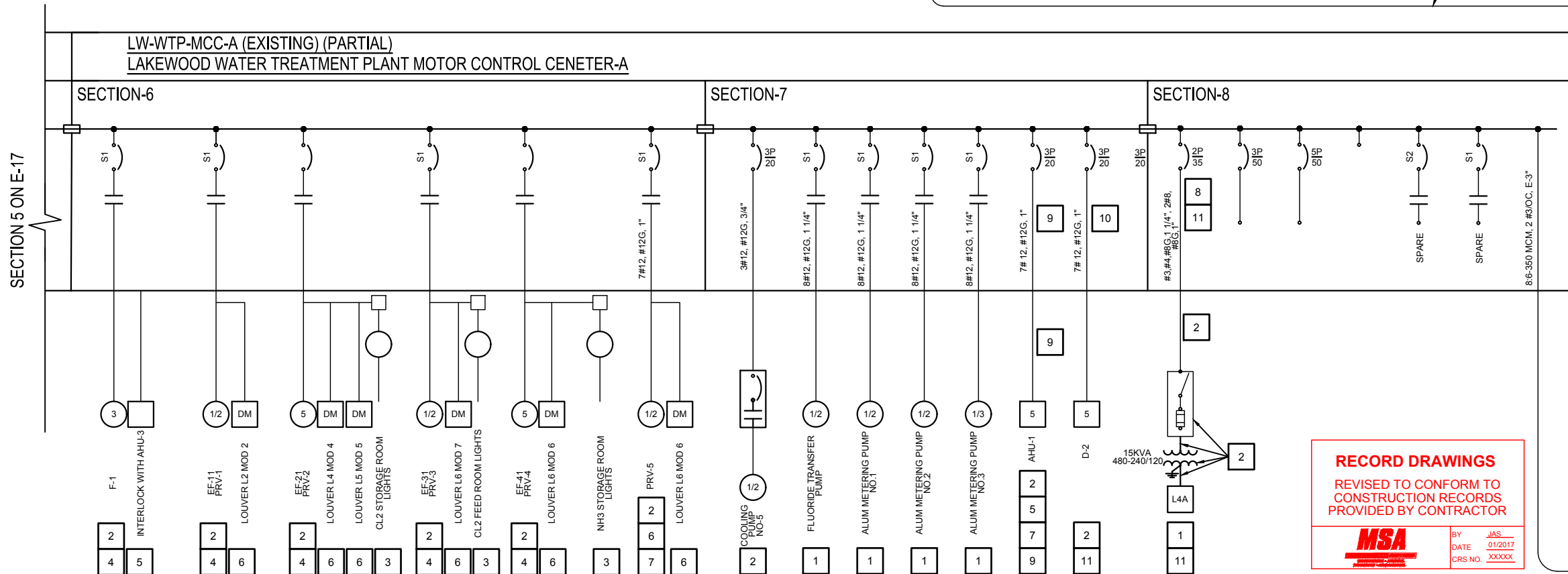
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4. EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

KEY NOTES:

XXX

1. EXISTING EQUIPMENT, DEVICES, AND MATERIALS TO REMAIN.
2. DECOMMISSION, DISCONNECT, AND DEMOLISH EXISTING EQUIPMENT, DEVICES, AND CONNECTION MATERIALS COMPLETE. REUSE OF EXISTING CIRCUITS SHALL BE ALLOWED WHEN THE EXISTING CIRCUITS DERIVE FROM AND TERMINATE IN CORRECT LOCATIONS. OTHERWISE THE EXISTING CONTROL, FEEDERS, CIRCUIT, ETC. SHALL BE REMOVED AND REPLACED.
3. REFEED AND FURNISH NEW INTERLOCK CONTROL FOR EXISTING LIGHTING.
4. REUSE EXISTING MOTOR CONTROL AND FEEDER.
5. CONTROL BY MC.
6. REFEED FROM LB-LP4B, FURNISH CONTROL AND INTERLOCKS PER MC.
7. FURNISH AND INSTALL NEW FEEDER, MOTOR CONTROL, AND CONNECTIONS AS SCHEDULED.
8. REPLACE AND UPGRADE MCC BUCKET TO PROVIDE NEW 300/3P CB DISCONNECT BUCKET CIRCUIT BREAKER AND FEEDER. REFER TO E-19.
9. FURNISH AND INSTALL NEW EQUIPMENT, MATERIALS, DEVICES, WIRING, ETC. (COMPLETE).
10. DECOMMISSION FEEDER BUCKET
11. REFEED AS SHOWN ON E-19



RECORD DRAWINGS

REVISED TO CONFORM TO
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BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	1	DATE	3/25
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25		
F.B.:		CHECKED BY:	SRC				
PLOT DATE:	11/14/17	P:	1610s16100616097/CADD/Record Drawings/AutoCAD DWG's161097 E-17R.dwg				

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MARCH 25, 2016

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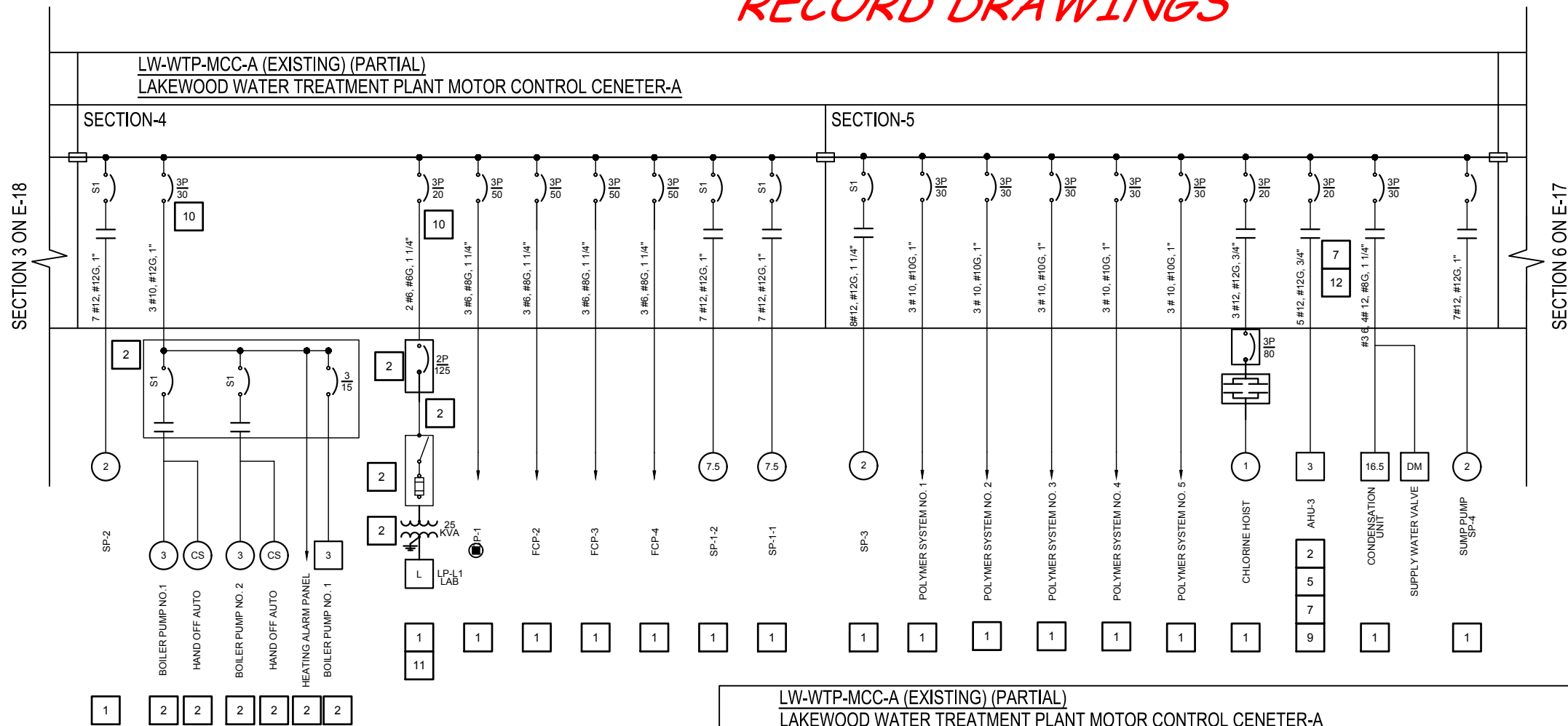
CITY OF DULUTH
DULUTH, MINNESOTA

EXISTING ONE-LINE DIAGRAM NO.1

FILE NO.
00616097

SHEET
E-17R

RECORD DRAWINGS



KEY NOTES:

XXX

GENERAL NOTES:

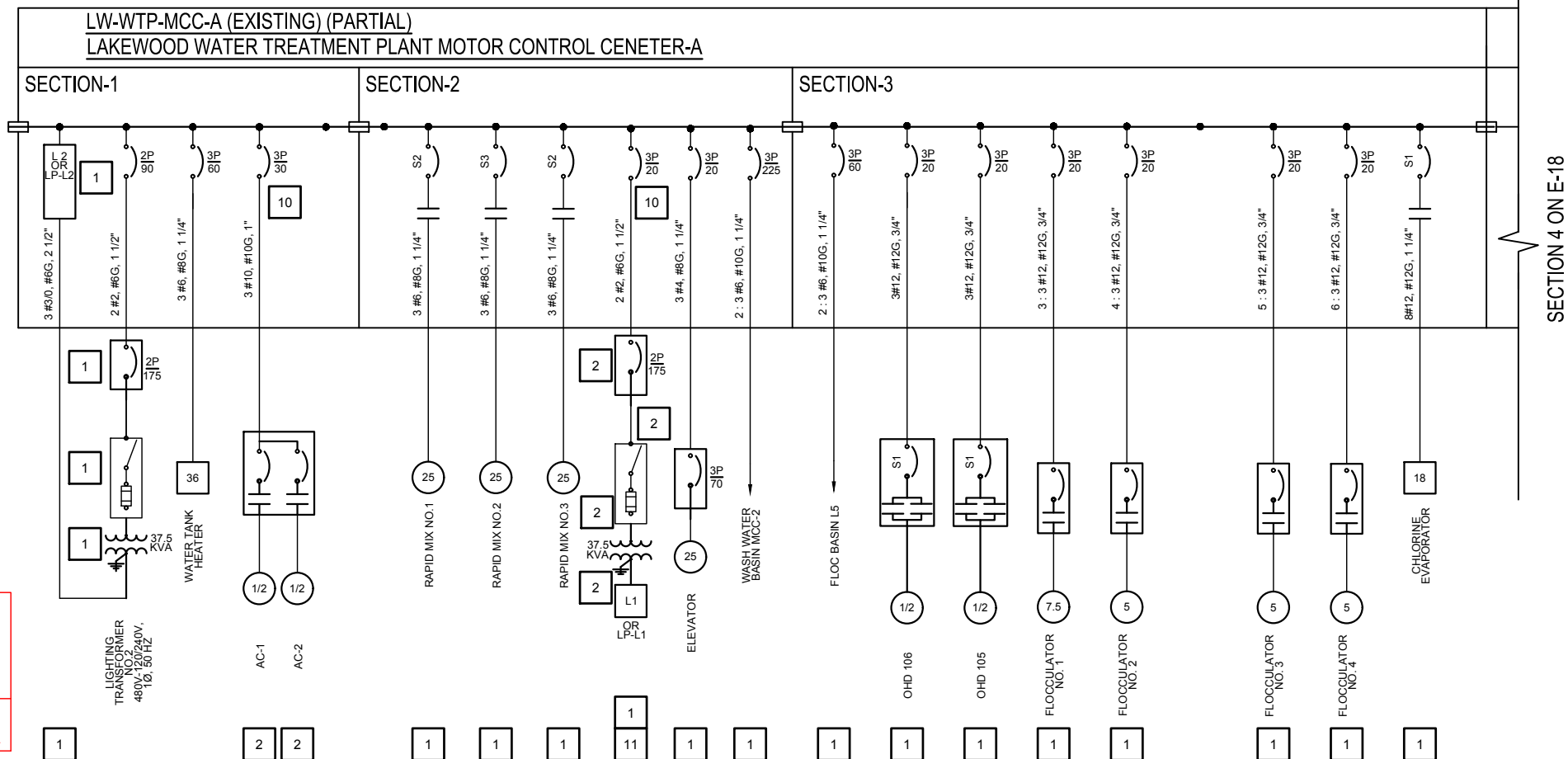
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- REFEED AND FURNISH NEW INTERLOCK CONTROL FOR EXISTING LIGHTING.
- REUSE EXISTING MOTOR CONTROL AND FEEDER.
- CONTROL BY MC.
- REFEED FROM LB-LP4B, FURNISH CONTROL AND INTERLOCKS PER MC.
- FURNISH AND INSTALL NEW FEEDER, MOTOR CONTROL, AND CONNECTIONS AS SCHEDULED.
- REPLACE OR UPGRADE EXISTING MCC BUCKET TO PROVIDE NEW 50/3P CIRCUIT BREAKER AND FEEDER. REFER TO E-19.
- FURNISH AND INSTALL NEW EQUIPMENT, MATERIALS, DEVICES, WIRING, ETC. (COMPLETE).
- DECOMMISSION FEEDER BUCKET.
- REFEED AS SHOWN ON E-19.
- REMOVE EXISTING STARTER AND FEED NEW AHU-3

- REFER TO AND COORDINATE WITH M-DRAWINGS.
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- EC SHALL SUPPORT DISCONNECTING ALL EQUIPMENT SHOWN AND REQUIRED TO COMPLETE PROJECT.

RECORD DRAWINGS
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BY JAS
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NO SHEET CHANGES



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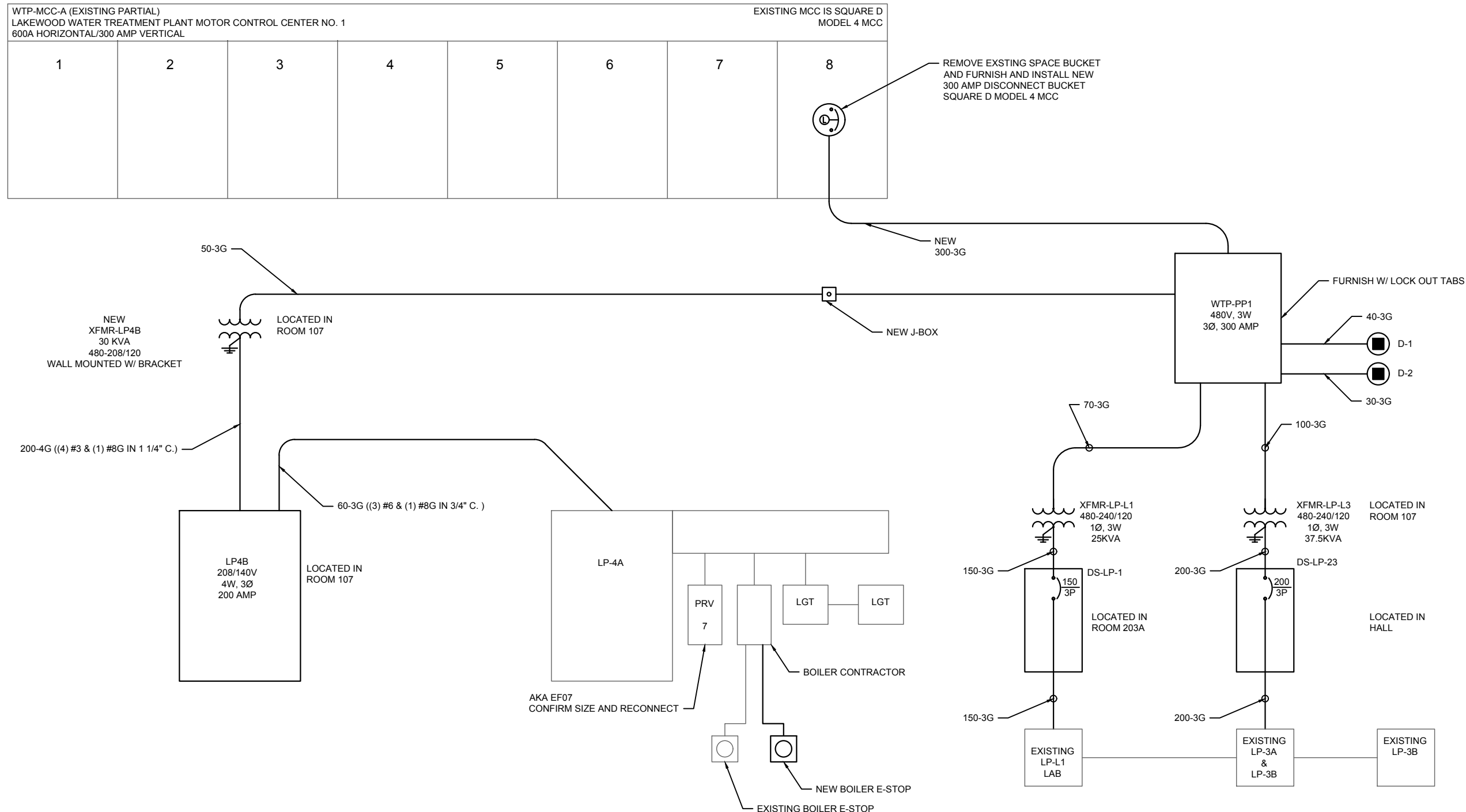
LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

EXISTING ONE-LINE DIAGRAM NO.2

FILE NO.
00616097
SHEET
E-18R

RECORD DRAWINGS

GENERAL NOTE:
1. REFER TO SCHEDULES AND SPECIFICATION FOR ADDITIONAL INFORMATION .



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P:	1610s	61600616097	CADD	Record Drawings	AutoCAD DWG's

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON

SCOTT R. CHILSON

MARCH 25, 2016

44287

Date

License No.



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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

ONE-LINE DIAGRAM FOR POWER SUPPLY

FILE NO.
00616097

SHEET
E-19R

RECORD DRAWINGS



1 EXISTING TEMPERATURE CONTROL PANEL NO.2 TO BE DEMOLISHED



2 EXISTING CONDENSATE PUMPS TO BE DEMOLISHED



3 ELECTRICAL CONNECTION TO EXISTING ROOFTOP UNIT TO REMAIN



4 EXISTING ROOFTOP DEHUMIDIFIER TO BE REMOVED



5 HEAT PUMPS AND MISC EQUIPMENT TO BE DEMOLISHED



6 ROOFTOP ELECTRICAL CONNECTIONS TO BE ABANDONED

RECORD DRAWINGS

REVISED TO CONFORM TO
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PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P:	1610s16100616097/CADD/Record Drawings/AutoCAD DWG's161097 PROCESS RISER DIAGRAM.dwg	-	-	-	-

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Scott R. Chilson
SCOTT R. CHILSON
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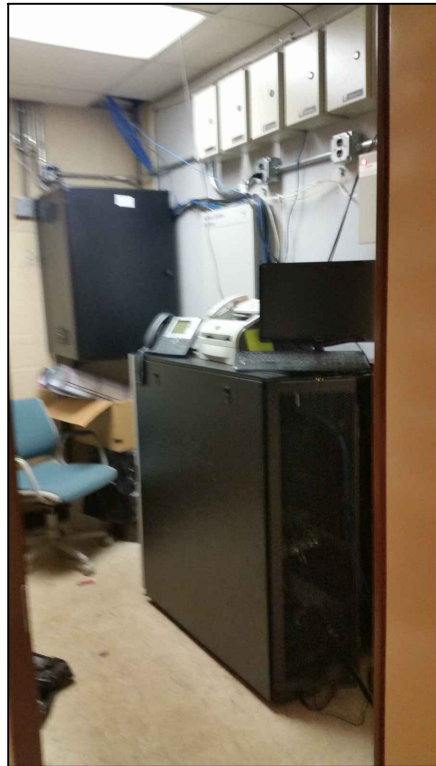
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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

PROCESS RISER DIAGRAM

FILE NO.
00616097
SHEET
E-20

RECORD DRAWINGS



1 DATA ROOM



2 EXISTING BOILERS AND WATER HEATER TO REMAIN



3 EXISTING HVAC PANELS TO BE REMOVED AND REPLACED

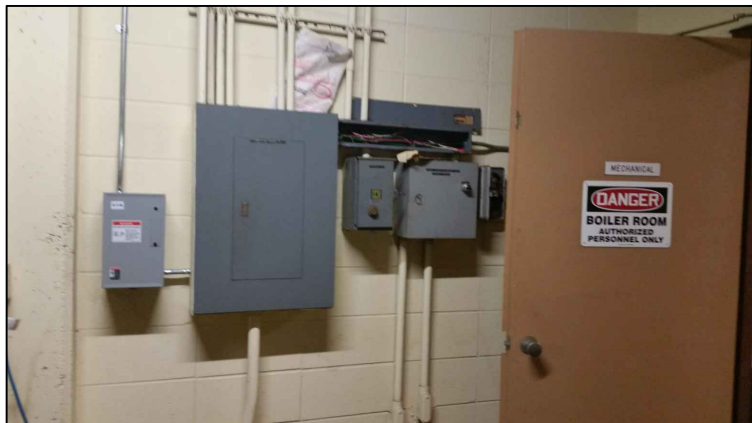
RECORD DRAWINGS

REVISED TO CONFORM TO
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NO SHEET CHANGES



4 EXISTING LP-L4A AND EQUIPMENT



5 EXISTING WTP-MCC-A TO REMAIN



6 EXISTING WTP-MCC-A TO REMAIN



7 EXISTING WTP-MCC-A TO REMAIN

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P1610s16100616097/CADD/Record Drawings/AutoCAD DWG's1616097 ELECTRICAL PHOTOS.dwg	-	-	-	-	-

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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS
CITY OF DULUTH
DULUTH, MINNESOTA

ELECTRICAL PHOTOS

FILE NO.
00616097
SHEET
E-21

RECORD DRAWINGS

SINGLE PHASE PANEL SCHEDULE										PANEL ID/TAG: LP-L2 (EXISTING)																			
TYPE: LIGHTING AND APPLIANCE PANEL (EXISTING TO REMAIN/MODIFY AS REQUIRED)										BUS CONSTRUCTION: CU										BUS AMPACITY: 225A									
VOLTAGE: 240 WYE /120V										GROUND BUS: YES										MAIN CIRCUIT BREAKER: NONE									
PHASE/WIRE: 1P-3W										ISOLATED GROUND BUS: YES										SUB-FEED LUGS: NA									
MOUNT: SURFACE																				INTERRUPTING CAPACITY: 10 KAIC									
LOADS SERVED					DESCRIPTION	LOAD AMP	BKR SIZE	BKR POLE	A		B		BKR POLE	BKR SIZE	LOAD AMP	DESCRIPTION	LOADS SERVED												
LGT	REC	MECH	OTHER	AMP					AMP	POLE	SIZE	LGT					REC	MECH	OTHER										
1					RM 200 LIGHTS	20	1	1	0.0	0.0	2	1	20		219 LIGHTS								2						
3					RM 200 LIGHTS	20	1	3	0.0	0.0	4	1	20		219 LIGHTS								4						
5					RM 200 LIGHTS	20	1	5	0.0	0.0	6	1	20		219 LIGHTS								6						
7					219,214,215,216 LIGHTS	20	1	7	0.0	0.0	8	1	20		219 LIGHTS								8						
9					200,201,202,215,216 LIGHTS	20	1	9	0.0	0.0	10	1	20		203,211 LIGHTS								10						
11					201,202 LIGHTS	20	1	11	0.0	0.0	12	1	20		218 LIGHTS								12						
13					204,203,217 LIGHTS	20	1	13	0.0	0.0	14	1	20		218 LIGHTS								14						
15					205,206 LIGHTS	20	1	15	0.0	0.0	16	1	20		219,207,208 LIGHTS								16						
17					206 LIGHTS	20	1	17	0.0	0.0	18	1	20		209 LIGHTS								18						
19					212,213 LIGHTS 209 CLOCK	20	1	19	0.0	0.0	20	1	20		BATTERY CHARGER								20						
21					INTERCOM	20	1	21	0.0	0.0	22	1	20		SPACE								22						
23					219,200 REC	20	1	23	0.0	0.0	24	1	20		200,219 REC								24						
25					203,205 REC	20	1	25	0.0	0.0	26	1	20		201,204,205 REC								26						
27					212 REC	20	1	27	0.0	0.0	28	1	20		202,213,212 REC								28						
29					202,216 REC	20	1	29	0.0	0.0	30	1	20		202,215,216,218 REC								30						
31					217,216 REC	20	1	31	0.0	0.0	32	1	20		205 REC								32						
33					SPACE	20	1	33	0.0	0.0	34	1	20		203 REC AND ELEVATOR LIGHT								34						
35					FILTER CONSOL NO.1	30	2	35	0.0	0.0	36	2	30		FILTER CONSOL NO.3								36						
37						30	2	37	0.0	0.0	38	2	30										38						
39					FILTER CONSOL NO.2	30	2	39	0.0	0.0	40	2	30		FILTER CONSOL NO.3								40						
41						30	2	41	0.0	0.0	42	2	30										42						
0 0 0 0					:LOADS BY TYPE											LOADS BY TYPE: 0 0 0 0													
TOTAL AMPS / PHASE:						0.0 0.0										TOTAL LOADS BY TYPE: 0 0 0 0													
KVA / PHASE:						0.0 0.0										TOTAL CONNECTED KVA: 0.0													

- GENERAL PANEL CONSTRUCTION NOTES:
- ALL WORK BY THIS CONTRACTOR TO COMPLY WITH ALL LOCAL, STATE AND NATIONAL ELECTRICAL CODES.
 - THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH OTHER TRADES TO AVOID CONFLICTS AND TO VERIFY ALL EQUIPMENT CONNECTION REQUIREMENTS.
 - THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM PER CONTRACT DOCUMENTS AND ENSURING THAT THE SYSTEM IS OPERATIONAL UPON JOB COMPLETION.
 - THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE ELECTRICAL SYSTEM FOR ALL OWNER-FURNISHED APPLIANCES IN ACCORDANCE WITH NEC ARTICLE 422 AND 440.22.
 - THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL BRANCH CIRCUIT WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THESE PROJECT DOCUMENTS
 - PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN CONTROL PANELS AND MOTORS. I
 - MOTORS CONNECTED TO EMERGENCY SYSTEMS CIRCUITRY SHALL HAVE CIRCUITRY INSTALLED IN SEPARATE RACEWAY PER NEC ARTICLE 700.
 - PROVIDE SEPARATE GREEN GROUND FOR EACH MOTOR AND EQUIPMENT CONNECTION ROUTED BACK TO INTEGRAL GROUND BUS OF ASSOCIATED PANELBOARD OR MOTOR CONTROL CENTER. GROUND CONDUCTOR SIZES PER NEC ARTICLE 250.122.
 - ALL HEATING, AIR CONDITIONING AND REFRIGERATION EQUIPMENT INSTALLED ON THE EXTERIOR OF THE BUILDING OR ROOF TOP SHALL HAVE A 15 AMP, 125V WEATHER-RESISTANT GFCI RECEPTACLE SURFACE MOUNTED IN WEATHERPROOF ENCLOSURE, MOUNTED ADJACENT TO EQUIPMENT.
 - THIS CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS INCLUDING VOLTAGE, HORSEPOWER, STARTER TYPE, AND DISCONNECTING MEANS FOR MOTORS AND EQUIPMENT PRIOR TO ORDERING CIRCUIT BREAKERS, DISCONNECT SWITCHES, AND STARTERS
 - REFER TO ONE-LINE AND P&ID'S FOR ADDITIONAL INFORMATION AND DETAIL.
 - REFER TO FEEDER SCHEDULE FOR ADDITIONAL INFORMATION AND DETAIL.

PANEL NOTES:
* NA

SINGLE PHASE PANEL SCHEDULE										PANEL ID/TAG: LP-L4A (EXISTING)																					
TYPE: LIGHTING AND APPLIANCE PANEL (EXISTING TO REMAIN/MODIFY AS REQUIRED)										BUS CONSTRUCTION: CU										BUS AMPACITY: NA											
VOLTAGE: 240 WYE /120V (to be refed with 208/120)										GROUND BUS: YES										MAIN CIRCUIT BREAKER: NONE											
PHASE/WIRE: 1P-3W										ISOLATED GROUND BUS: YES										SUB-FEED LUGS: YES											
MOUNT: SURFACE																				INTERRUPTING CAPACITY: 10 KAIC											
LOADS SERVED				DESCRIPTION				LOAD	BKR	BKR	A	B		BKR	BKR	LOAD	DESCRIPTION				LOADS SERVED										
LGT	REC	MECH	OTHER					AMP	SIZE	POLE	AMP	AMP		POLE	SIZE	AMP	LGT	REC	MECH	OTHER	LGT	REC	MECH	OTHER							
1					#4 ZONE HEATERS (*)			4	20	1	1	6.0	0.0	2	1	20	2	LOWER GALLERY REC						2							
3					#3 ZONE HEATERS (*)			4	20	1	3	0.0	6.0	4	1	20	2	LOWER GALLERY LIGHTS						4							
5					LIGHTS FILTER NO.5			4	20	1	5	8.0	0.0	6	1	20	4	LOWER GALLERY UNIT HEATERS (*)						6							
7					2ND FLOOR GALLERY LIGHTS			2	20	1	7	0.0	3.0	8	1	20	1	STAIRS LIGHTS						8							
9					LIGHTS 2ND FLOOR GALLERY			2	20	1	9	5.0	0.0	10	1	20	3	2ND FLOOR GALLERY REC						10							
11					SPARE			20	1	11	0.0	2.0	12	1	20	2	FILTER NO.6 LIGHTS							12							
13					SPARE			20	1	13	4.0	0.0	14	1	20	4	#2 ZONE HEATERS (*)							14							
15					SPARE			20	2	15	0.0	4.0	16	1	20	4	#1 ZONE HEATERS (*)							16							
17								17	0.0	4.0	0.0	18	2	20	4	SPARE								18							
19					SPACE			19	0.0	12.0	0.0	20	2	20	12	ENTRY GATE								20							
21					SPACE			21	12.0	0.0	0.0	22	2	1	12									22							
23					SPACE			23	0.0	0.0	0.0	24				SPACE								24							
25					SPACE			25	0.0	0.0	0.0	26				SPACE								26							
27					SPACE			27	0.0	0.0	0.0	28				SPACE								28							
29					SPACE			29	0.0	0.0	0.0	30				SPACE								30							
31					SPACE			31	0.0	0.0	0.0	32				SPACE								32							
33					SPACE			33	0.0	0.0	0.0	34				SPACE								34							
35					SPACE			35	0.0	0.0	0.0	36				SPACE								36							
37					SPACE			37	0.0	0.0	0.0	38				SPACE								38							
39					SPACE			39	0.0	0.0	0.0	40				SPACE								40							
41					SPACE			41	0.0	0.0	0.0	42				SPACE								42							
0				0	:LOADS BY TYPE																										
TOTAL AMPS / PHASE:										35.0		27.0		LOADS BY TYPE:										0		0		0		0	
KVA / PHASE:										4.9		3.7		TOTAL LOADS BY TYPE:										0		0		0		0	
														TOTAL CONNECTED KVA: 8.6																	

- GENERAL PANEL CONSTRUCTION NOTES:
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 - PROVIDE ALL POWER WIRING INCLUDING ALL CIRCUITRY CARRYING ELECTRICAL ENERGY FROM PANELBOARD OR OTHER SOURCE THROUGH STARTERS AND DISCONNECTS TO MOTORS, PACKAGED EQUIPMENT, OR PACKAGED CONTROL PANELS. PROVIDE ALL WIRING BETWEEN

RECORD DRAWINGS

LUMINAIRE SCHEDULE

ABBREVIATIONS	DW = DRY WALL	P = PENDANT	S = SURFACE
	ES = EXPOSED STRUCTURE	PL = PLASTER	W = WALL MOUNTED
	LG = LAY-IN GRID	R = RECESSED	V = VARIES

DES.	LAMP DATA		DESCRIPTION	LUMINAIRE		VOLT	BALLAST/ DRIVER CODE	MOUNT	CATELOG SERIAL #	CEILING TYPE	LUMINAIRE DEPTH	OPTIONS/ ACCESSORIES CODE #	ACCEPTABLE MANUFACTURERS	SEE NOTE #
	NO.	TYPE		MANUFACTURE	CATELOG SERIES									
V1	1	LED	ROUGH SERVICE FIXTURE	PHILLIPS	LED	MVOLT	GZ10	V	FLUXSTREAM EX 4' 3/800Lm 4000K (LF-4-EZ-38-40-U-LAG-FH360-UNV)	V	~3"	FH360-UNV	OR EQUAL	10-17-A
V2	2	LED	ROUGH SERVICE FIXTURE	LITHONIA	VAP LED	MVOLT	GZ10	V	VAP-4000L-FST-WD-MVOLT-GZ10-40K-80CRI-SF-BSL722-CS89-QMB-MS10NWL-VAPQMB	V	~4"	VAPQMB	OR EQUAL	10-17-A
EXIT	3	LED	EXIT WITH DUAL EM LAMPS	LITHONIA	LHQM LED	MVOLT	NA	V	LHQM-LED-WHITE-R-HO-SD	V	~9"		OR EQUAL	16-A
EM1	2	LED	EMERGENCY LIGHTNG UNIT	LITHONIA	EU2-LED-M12	MVOLT	NA	V	EU2-LED-M12-784231874493-120/277-1.8	V	~4"			

OPTIONS/ACCESSORIES CODE LISTING:

1	SEMI-SPECULAR REFLECTOR	11	WET LOCATION CONSTRUCTION	21	FURNISH WITH PHOTO CELL
2	LOW IRIDESCENT REFLECTOR	12	STAINLESS STEEL TRIM & DOOR FRAME	22	FURNISH TRIM SUITABLE FOR USE WITH NARROW TEE CEILING GRID
3	FLAT ALUMINUM DOOR FRAME	13	WHITE MILLIGOVE BAFFLE	23	CUSTOM PAINTED FINISH - COLOR AS SELECTED BY ARCHITECT
4	REGRESSED ALUMINUM DOOR FRAME	14	BLACK MILLIGROVE BAFFLE		
5	FLAT STEEL DOOR FRAME	15	FURNISH WITH SLOPE ADAPTER - VERIFY SLOPE		
6	SINGLE GASKET DOOR FRAME	16	FURNISH WITH AUXILIARY EMERGENCY BATTERY PACK		
7	DOUBLE GASKET DOOR FRAME	17	FURNISH WITH WIRE GUARD		
8	TRIPLE-GASKET DOOR FRAME, LENS, & BODY	18	FURNISH CHAIN MOUNTING ACCESSORIES		
9	ANTI-MICROBIAL PROTECTION PAINTED FINISH	19	FURNISH WITH RIGID PENDANT STEMS		
10	DAMP LOCATION CONSTRUCTION	20	FURNISH WITH SWIVEL CANOPY		

BALLAST CODE LISTING: (SEE SPECIFICATION SECTIONS FOR ADDITIONAL INFORMATION)

- | | |
|---|--|
| A | LED DRIVER, FIXED (NON-DIMMED). LED DRIVER MAY BE DIMMABLE, BUT DIMMING IS NOT REQUIRED FOR THIS FIXTURE. |
| B | LED DRIVER, STEP-DIM. |
| C | LED DRIVER, DIMMABLE TO 5%. |
| D | LED DRIVER, DIMMABLE TO 1%. |
| E | T8 PROGRAMMED START, NORMAL BALLAST FACTOR 0.87, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| F | T8 PROGRAMMED START, LOW BALLAST FACTOR 0.77, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| G | T8 PROGRAMMED START, LOW BALLAST FACTOR 0.71, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| H | T8 PROGRAMMED START, HIGH BALLAST FACTOR 1.2, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| I | T8 PROGRAMMED START, STEP-DIM, BALLAST FACTOR 0.87/0.37, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| J | T8 INSTANT START, NORMAL BALLAST FACTOR 0.87, <10% THD, SYLVANIA QUICKTRONIC HIGH EFFICIENCY SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| K | T5HO PROGRAMMED START, 1.0 BALLAST FACTOR, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| L | T5HO PROGRAMMED START, 1.0 BALLAST FACTOR, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| M | T5 PROGRAMMED START, 1.0 BALLAST FACTOR, <10% THD, SYLVANIA QUICKTRONIC PROFESSIONAL SERIES, OR EQUAL BY ADVANCE OR UNIVERSAL. |
| N | H.I.D. LOW FREQUENCY ELECTRONIC UNIVERSAL VOLTAGE, ADVANCE e-VISION, OR EQUAL BY SYLVANIA OR UNIVERSAL. |
| O | CERAMIC METAL HALIDE (T-6) BALLASTS SHALL BE ADVANCE E-VISION SERIES OR APPROVED EQUAL. |
| P | PULSE START BALLAST AS MANUFACTURED BY SYLVANIA, UNIVERSAL, OR ADVANCE. |
| Q | PULSE START BALLAST AS MANUFACTURED BY SYLVANIA, UNIVERSAL, OR ADVANCE. |

GENERAL LUMINAIRE SCHEDULE NOTES:

- SEE SPECIFICATION SECTION FOR ADDITIONAL INFORMATION REGARDING LUMINAIRE AND INSTALLATION REQUIREMENTS. PROVIDE OPTIONS AND ACCESSORIES REFERENCED BY THE COLUMN TITLED "OPTIONS/ACCESSORIES". MANUFACTURES LISTED AS ACCEPTABLE SHALL MEET ALL REQUIREMENTS AND FEATURES INDICATED. ACCEPTABLE MANUFACTUREERS MUST MEET THE PHOTOMETRIC PERFORMANCE OF THE LISTED UNIT.
- MANUFACTURE NAMES AND CATELOG NUMBERS ARE USED FOR QUALITY AND PERFORMANCE ONLY. LUMINARES AND OTHER ELECTRICAL DEVICES MANUFACTUREED BY OTHERS SHALL BE EQUALLY ACCEPTABLE PROVIDED THEY MEET OR EXCEED IN PERFORMANCE AND QUALITY AS SPECIFIED.
- ALL FLUORESCENT LAMP/BALLAST LAMP/BALLASTS WIRED TO THE DIMMING SYSTEM SHALL BE BURNED-IN FOR A MINIMUM OF 100 HOURS PRIOR TO DIMMING SYSTEM SET-UP/PROGRAMMING
- EACH FLUORESCENT LUMINAIRE SHALL BE SUPPLIED WITH QUICK DISCONNECTING MEANS FOR ALL BALLASTS AS REQUIRED BY NEX 410.73. PROVIDE THOMAS AND BETTS LD2 OR LD3 OR EQUAL.
- ALL SELECTION ARE BEST ATTEMPT TO IDENTIFY THE CORRECT ITEM. THE SUPPLIER SHALL COORDINATE AND CONFIRM ALL SELECTION AND APPLCIAITONS BASED ON THE INTENT OF THE CONTRACT.

RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

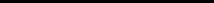
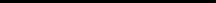


BY	<u>JAS</u>
DATE	<u>01/2017</u>
CRS NO.	<u>XXXXX</u>

NO SHEET CHANGES

LUMINAIRE SCHEDULE NOTES:

1

PROJECT NO.: 00616097		SCALE: AS SHOWN		NO. 1		DATE 3/25		REVISION		BY		I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  SCOTT R. CHILSON MARCH 25, 2016 Date 44287 License No.		 TRANSPORTATION • MUNICIPAL DEVELOPMENT • ENVIRONMENTAL 332 W. Superior Street Duluth, MN 55802 218-722-3915 1-800-777-7380 Fax: 218-722-4548 Web Address: www.msa-ps.com © MSA Professional Services, Inc.		LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS CITY OF DULUTH DULUTH, MINNESOTA		ELECTRICAL SCHEDULES NO.3		FILE NO. 00616097	
PROJECT DATE: MARCH 2016		DRAWN BY: INIT				ADDENDUM #1															
F.B.:		CHECKED BY: SRC																			
PLOT DATE: 11/14/17 P:\616097\61600616097\CADD\Record Drawings\AutoCAD DWG's\616097 E-24R.dwg														SHEET E-24R							

MOTOR AND WIRING COMPARISON SCHEDULE										
TAG NUMBER	EQUIPEMENT/DEVICE/MOTOR DESCRIPTION	PROPOSED				EXISTING				NOTES
		LOAD		POWER		(HP)	(AMPS)	POWER		
		(HP)	(AMPS)	(VOLTS)	(PHASE)			(VOLTS)	(PHASE)	
SMP-1	SAMPLER PUMP NO.1	~1	16	120	1	~1	L4	120	1	1,2
SMP-2	SAMPLER PUMP NO.2	~1	16	120	1	~1	L4	120	1	1,2
EF-1	EXHAUST FAN NO.1	1.5	3	480	3	0.5	MCC-A	480	3	1,2
EF-2	EXHAUST FAN NO.2	3	4.8	480	3	5	MCC-A	480	3	1,2
EF-3	EXHAUST FAN NO.3	0.75	1.6	480	3	0.5	MCC-A	480	3	1,2
EF-4	EXHAUST FAN NO.4	0.75	1.6	480	3	0.75	MCC-A	480	3	1,2
EF-5	EXHAUST FAN NO.5	0.5	9.8	120	1	0.5	MCC-A	480	3	1,2
EF-6	EXHAUST FAN NO.6	0.5	9.8	120	1	TBD	L4	120	1	1,2
EF-7	EXHAUST FAN NO.7	0.02	4.4	120	1	TBD	L4	120	1	1,2
EF-8	EXHAUST FAN NO.8	0.25	5.8	120	1	TBD	L4	120	1	1,2
EF-9	EXHAUST FAN NO.9	0.02	4.4	120	1	TBD	L4	120	1	1,2
AHU-1	AIR HANDLING UNIT NO.1	7.5	11	480	3	5	MCC-A	480	3	1,2
AHU-2	AIR HANDLING UNIT NO.2	3	4.8	480	3	5	MCC-A	480	3	1
AHU-3	AIR HANDLING UNIT NO.3	2	3.3	480	3	3	MCC-A	480	3	1,2
D-1	DESICCANT DEHUMIDIFIER NO.1	COMBINED	30	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (SUPPLY FAN)	15	21	480	3	NA	NA	NA	NA	1,3
D-2	DESICCANT DEHUMIDIFIER NO.1 (EXHAUST FAN)	3	4.8	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (REGENERATION FAN)	3	4.8	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.2	COMBINED	20	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (SUPPLY FAN)	10	14	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (EXHAUST FAN)	NA	NA	480	3	NA	NA	NA	NA	1,3
	DESICCANT DEHUMIDIFIER NO.1 (REGENERATION FAN)	3	4.8	480	3	NA	NA	NA	NA	1,3
MD-1	MOTORIZED DAMPER NO.1	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-2	MOTORIZED DAMPER NO.2	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-3	MOTORIZED DAMPER NO.3	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-4	MOTORIZED DAMPER NO.4	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-5	MOTORIZED DAMPER NO.5	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-6	MOTORIZED DAMPER NO.6	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-7	MOTORIZED DAMPER NO.7	0.1	2.6	120	1	TBD	MCC-A	480	TBD	1,2
MD-8	MOTORIZED DAMPER NO.8	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-9	MOTORIZED DAMPER NO.9	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-10	MOTORIZED DAMPER NO.10	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-11	MOTORIZED DAMPER NO.11	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-12	MOTORIZED DAMPER NO.12	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-13	MOTORIZED DAMPER NO.13	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-14	MOTORIZED DAMPER NO.14	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-15	MOTORIZED DAMPER NO.15	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
MD-16	MOTORIZED DAMPER NO.16	0.1	2.6	120	1	TBD	TBD	TBD	TBD	1,2
P-1 = H-1	HEATING SYSTEM PUMP NO.1	3	4.8	208	3	3	MCC-A	480	3	1,2
P-VFD-1	HEATING SYSTEM PUMP NO.1 VFD CONTROL PANEL	3+	~15	208	3	3	MCC-A	480	3	1,2
P-2	HEATING SYSTEM PUMP NO.2	3	4.8	208	3	3	MCC-A	480	3	1,2
P-VFD-2 = H-2	HEATING SYSTEM PUMP NO.2 VFD CONTROL PANEL	3+	~15	208	3	3	MCC-A	480	3	1,2
UH-1	UNIT HEATER NO.1	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-2	UNIT HEATER NO.2	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-3	UNIT HEATER NO.3	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-4	UNIT HEATER NO.4	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-5	UNIT HEATER NO.5	1/20	2	120	1	TBD	LP-L4A	120	1	1,2
UH-6	UNIT HEATER NO.6	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-7	UNIT HEATER NO.7	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-8	UNIT HEATER NO.8	1/20	0.8	120	1	TBD	LP-L4A	120	1	1,2
UH-9	UNIT HEATER NO.9	TBD	0.26	120	1	TBD	LP-L4A	120	1	1,2
UH-10	UNIT HEATER NO.10	TBD	0.26	120	1	TBD	TBD	TBD	TBD	1,2
UH-11	UNIT HEATER NO.11	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-12	UNIT HEATER NO.12	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-13	UNIT HEATER NO.13	1/20	0.8	120	1	TBD	MCC-A	480	3	1,2
UH-14	UNIT HEATER NO.14	1/20	0.8	120	1	TBD	MCC-A	480	3	1,2
UH-15	UNIT HEATER NO.15	TBD	0.26	120	1	TBD	LP-L4A	120	1	1,2
UH-16	UNIT HEATER NO.16	TBD	0.26	120	1	TBD	LP-L4A	120	1	1,2
UH-17	UNIT HEATER NO.17	TBD	0.16	120	1	TBD	LP-L4A	120	1	1,2
UH-18	UNIT HEATER NO.18	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-19	UNIT HEATER NO.19	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-20	UNIT HEATER NO.20	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-21	UNIT HEATER NO.21	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-22	UNIT HEATER NO.22	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-23	UNIT HEATER NO.23	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-24	UNIT HEATER NO.24	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-25	UNIT HEATER NO.25	1/20	0.8	120	1	TBD	TBD	TBD	TBD	1,2
UH-26	UNIT HEATER NO.26	TBD	0.26	120	1	TBD	TBD	TBD	TBD	1,2
LW-XFMR-L4B	L4B TRANSFORMER	30 Kva	36	480	3	5 kVA	21	240	1	1,4
LP-L4B	LIGHTING AND APPLIANCE PANEL L4B	NA	NA	208/120	3	TBD	TBD	TBD	TBD	1,3
LP-L4A	LIGHTING AND APPLIANCE PANEL L4A	NA	NA	208/120	1	TBD	TBD	240/120	1	1,3
HVAC-TCP-1	HVAC TEMPERATURE CONTROL PANEL	NA	13.3	120	1	TBD	L4	120		1,3
NOTE(S): (INFORMATION PROVIDED IS THE BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL PROVIDE PRECONSTRUCTION INSPECTION TO VERIFY ALL CONNECTIONS ARE CONSISTANT AND RELATIVELY SIMILAR FOR THE PROPOSED APPLICATION.)										
(THE CONTRACTOR SHALL NOTE THAT SOME DEVICES ARE FEED AC, BUT HAVE LOCAL DC XFMR'S.)										
1. CONTRACTOR SHALL FIELD VERIFY ALL EXSITNG CONNECTION AND WIRING. ANY DESCRCANCS FROM THE INFOMATION PROVIDED SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO CONSTRUQITON.										
2. WHEN PROPOSED EQUIPMENT POWER REQUIREMENTS ARE DIFFERENT THAN THE EXSITNG, THEN: DEMOLISH EXSITNG AND FURNISH AND INSTALL NEW RACEWAY AND POWER CIRCUIT FROM NEAREST POWER DISTRIBUITON PANEL.										
3. FURNISH AND INSTALL NEW RACEWAY AND POWER CIRCUIT FROM NEAREST POWER DISTRIBUTION PANEL.										
4. FURNISH NEW CB BUCKET AND FEEDER IN EXSING RACEWAY FROM WTP-MCC-A.										

CONDUIT & BOX SCHEDULE									
Area Classification	Voltage	Type	Installation	Use Conduit	Use Box	Supports	Hardware	Location	
Exterior/ Non-Hazardous	ALL	ALL	Exposed	GRS	REFER TO SPEC.	CB	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Exterior/ Non-Hazardous	ALL	ALL	Underground	PVC	REFER TO SPEC.	PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Non-Hazardous	ALL	ALL	Exposed	EMT	REFER TO SPEC.	GS	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Non-Hazardous	ALL	ALL	Concealed	EMT	REFER TO SPEC.	GS	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Non-Hazardous	ALL	ALL	Exposed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Non-Hazardous	ALL	ALL	Concealed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Corrosive	ALL	ALL	Exposed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Dry / Corrosive	ALL	ALL	Concealed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Corrosive	ALL	ALL	Exposed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
Interior/ Wet / Corrosive	ALL	ALL	Concealed	PGRS/PVC	REFER TO SPEC.	PGRS CAST/PVC	PGRS/ GAL / PVC	PGRS/ GAL / PVC	AS REQUIRED
CONDUIT & BOX SCHEDULE									
NOTES:									
1 All conduit and raceways shall be concealed when possible.									
2 No substitutions shall be allowed unless written permission to the contrary has been obtained from engineer.									
3 Transition to exposed conduit shall comply with specified requirements for exposed conduit, regardless of whether transition is rigid or flexible. Embedded transitions shall be rigid material.									
4 All junction boxes not located in associated area shall be enamel coated galvanized steel or brushed aluminum.									
5 CONTRACTOR shall furnish and install wire gutters as required.									
6 CONTRACTOR shall only use flex conduit in equipment connections. Use on fixtures and I&C devices shall not be permitted.									
7 CONTRACTOR shall only use flex conduit in equipment connections. Use on fixtures and I&C devices shall not be permitted.									
8 AFD motor feeders shall be installed in PGRS conduit or insulated AFD Motor cables installed in PVC.									
9 Exposed conduit located in finished areas of the facility shall be painted.									
10 CONTRACTOR shall be advised Stainless Steel is not advised for the construction of this project on the interior of this facility. CONTRACTOR shall furnish and install painted/coated galvanized steel hardware and related materials to match conduit.									
11 Painting of New Electrical Materials. Refer to schedule.									
ABBREVIATIONS:									
Conduit					Supports & Hardware				
PVC:	Schedule 40 Rigid PVC								
GRS:	Galvanized Rigid Steel				GS	Galvanized Steel			
PGRS:	PVC-Coated GRS				SS	Stainless Steel			
EMT:	Electrical Metallic Tubing				PVC40	SCH 40 PVC			
HDPE:	High Density Polyethylene				PVC80	SCH 80 PVC			
					ZPS	Zinc Plated Steel			
Boxes					PCS	PVC Coated Steel			
SB:	Steel Box				S	Steel			
CB:	Cast Box				AL	Aluminum			
PCB:	PVC-Coated Cast Box								

RECORD DRAWINGS

RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P:	1610s	61600616097	CADD	Record Drawings	AutoCAD DWG's

I HEREBY CERTIFY THAT THIS PLAN, REPORT, OR SPECIFICATION WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SCOTT R. CHILSON

MARCH 25, 2016

Date

44287

License No.



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LAKEWOOD WTP HVAC SYSTEM IMPROVEMENTS

CITY OF DULUTH
DULUTH, MINNESOTA

ELECTRICAL SCHEDULES NO.4

FILE NO.

00616097

SHEET

E-25R

RECORD DRAWINGS

RECORD DRAWINGS

TAG NUMBER		EQUIPMENT/DEVICE/MOTOR DESCRIPTION	STATUS EXISTING / PROPOSED / REPLACE / RELOCATE	EQUIPMENT/DEVICE DISGNATOR (MOTOR / PANEL / DISCONNECT / OTHER)	LOCATION	LOAD			POWER		BREAKER		WIRING		MOTOR CONTROLLER		LOCAL EQUIPMENT DISCONNECT		FIRST SIGNAL CONDUIT		SECOND SIGNAL CONDUIT		POWER CONDUIT		NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
						(KVA)	(HP)	(AMPS)	(VOLTS)	(PHASE)	(SIZE)	(POLE)	(AMP-#G)	TYPE	SIZE	BY	(TYPE)	(SIZE)	(#USED)	(BY)	DESTINATION	TYPE	WIRING	DESTINATION		TYPE	WIRING	DESTINATION	TYPE	WIRING	DESTINATION	TYPE	WIRING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
SMP-1			RELOCATE	MOTOR	106	NA	~1	16	120	1	EXISTING	NA	10-43	EXISTING	EXISTING	MC	NFMP	30	NA	EC	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	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RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



MSA
 METAL SKRAPER
 METAL SKRAPER
 METAL SKRAPER

BY	JAS
DATE	01/201
CRS NO.	XXXXX

NO SHEET CHANGES

PROJECT NO:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	1	3/25	ADDENDUM #1	-
F.B.:		CHECKED BY:	SRC				-
PLOT DATE:	11/14/17, P:\610s\6100616097\CADD\Record Drawings\AutoCAD DWG's\616097-E-26R.dwg						-

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SCOTT R. CHILSON

MARCH 25, 2016

Date

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FILE NO:

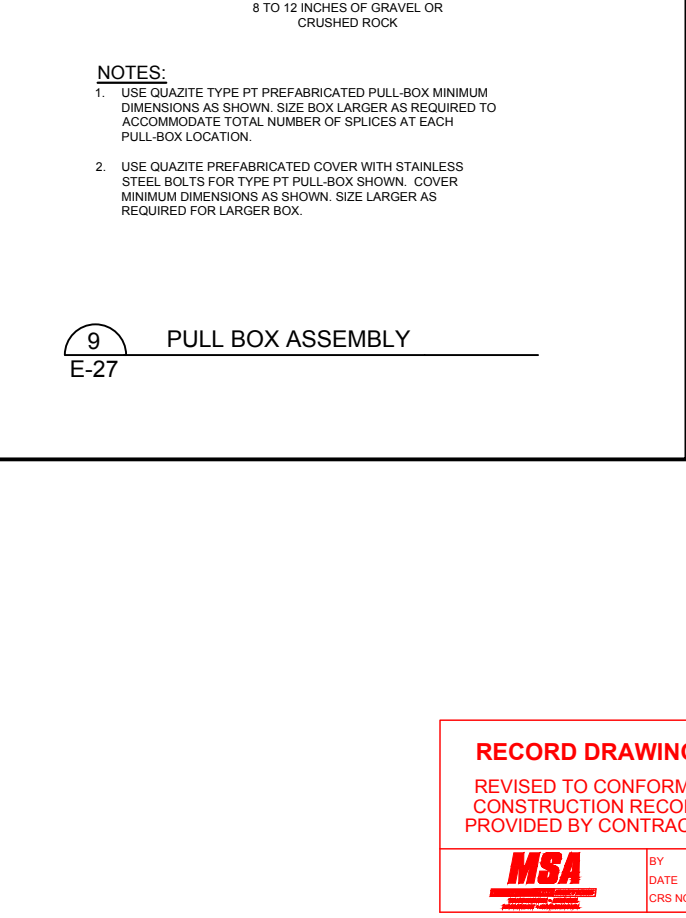
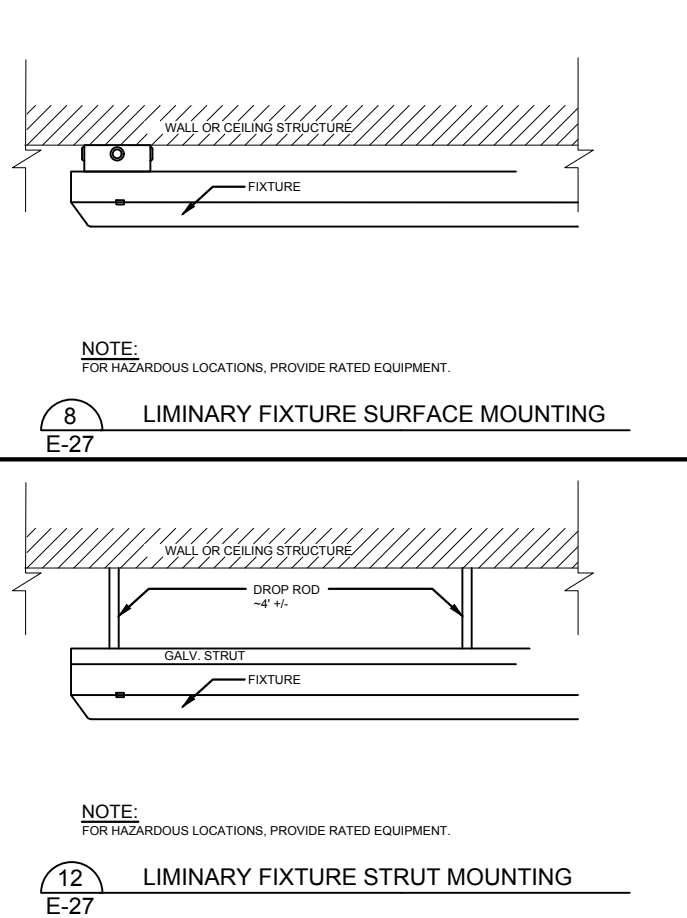
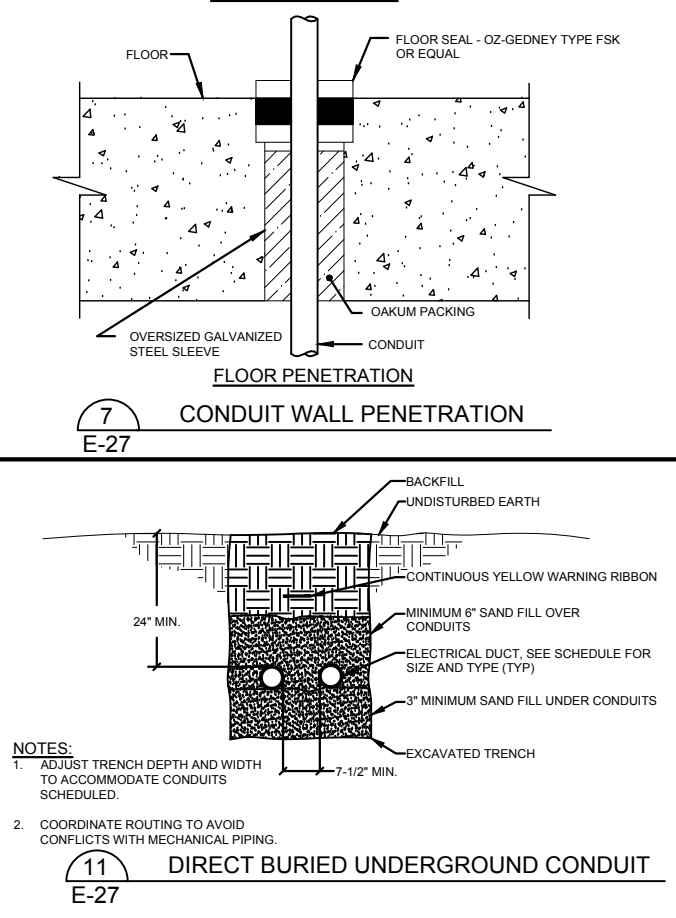
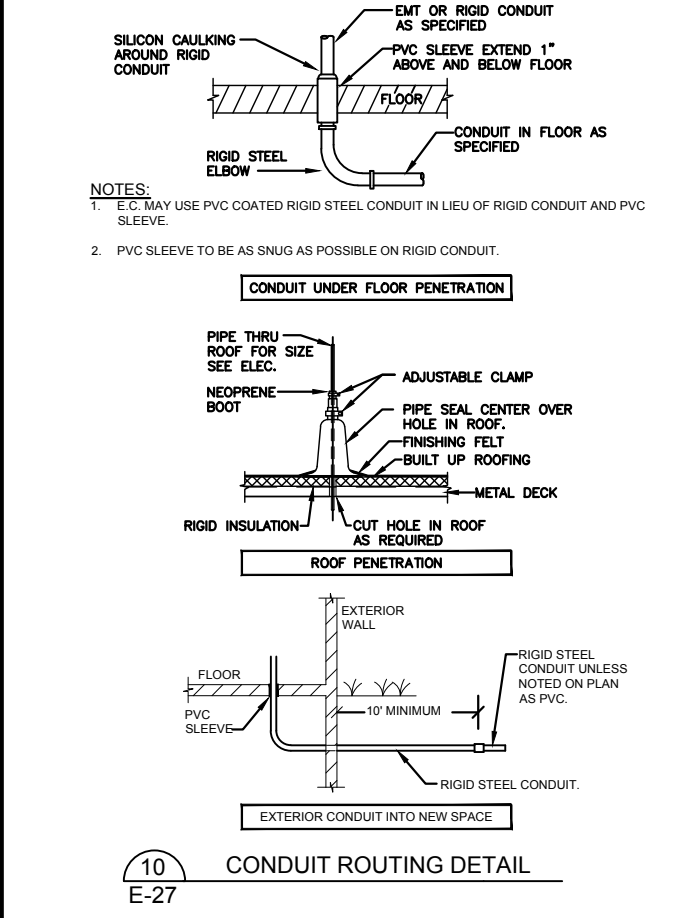
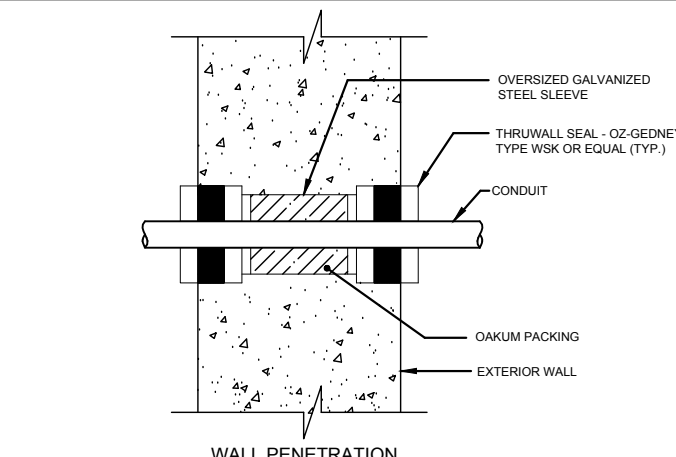
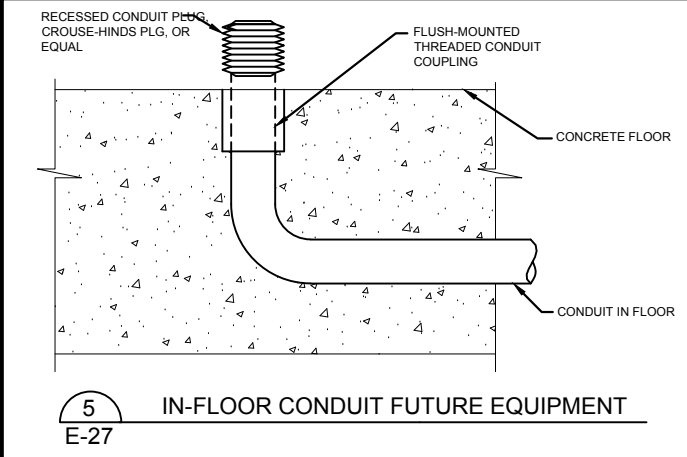
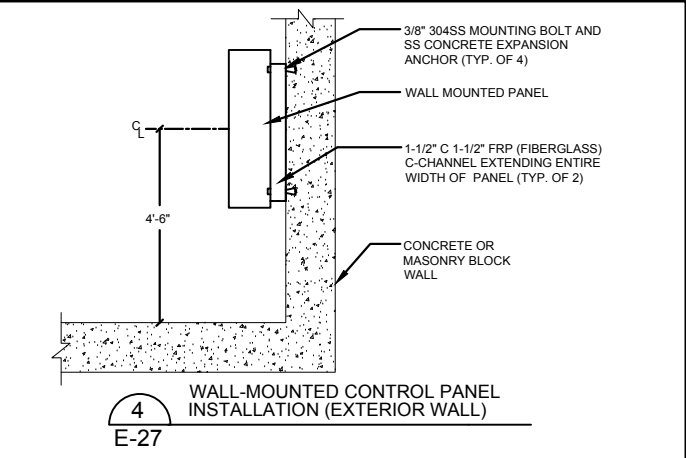
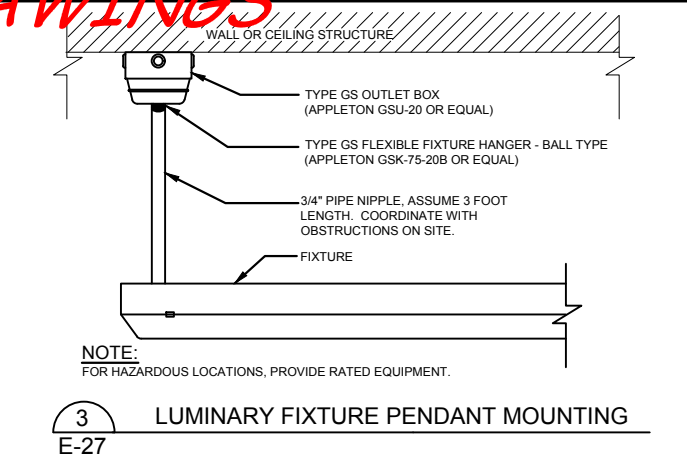
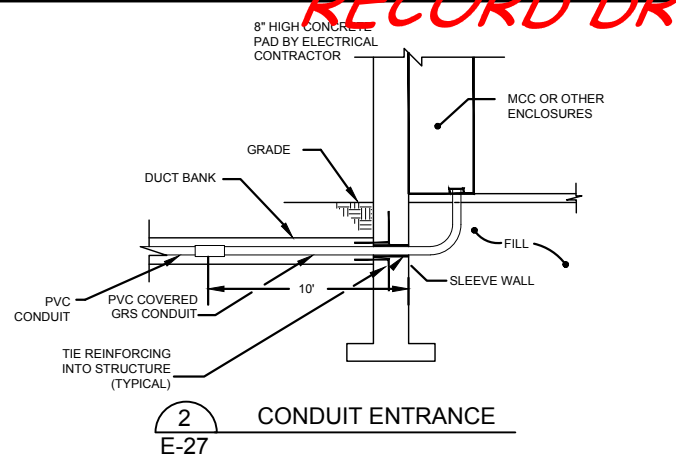
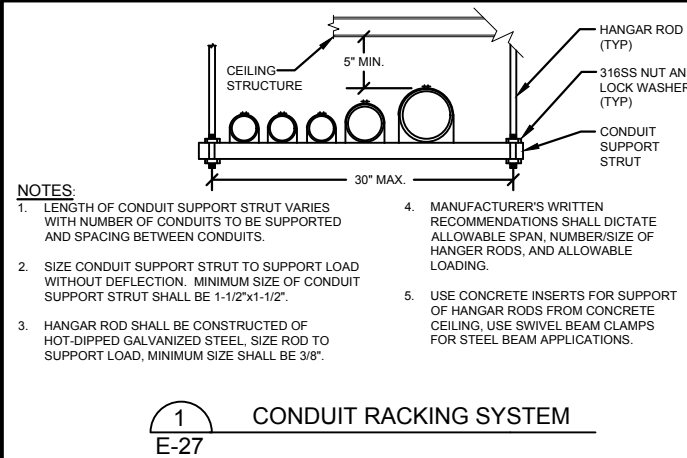
00616097

SHEET

E-26R

ELECTRICAL SCHEDULES NO.5

RECORD DRAWINGS



RECORD DRAWINGS

REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR



BY JAS
DATE 01/2017
CRS NO. XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT				
F.B.:		CHECKED BY:	SRC				
PLOT DATE:	11/14/17	P:1610s16100616097/CADD/Record Drawings/AutoCAD DWG's161097 ELECTRICAL DETAILS.dwg					

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SCOTT R. CHILSON
MARCH 7, 2016
Date

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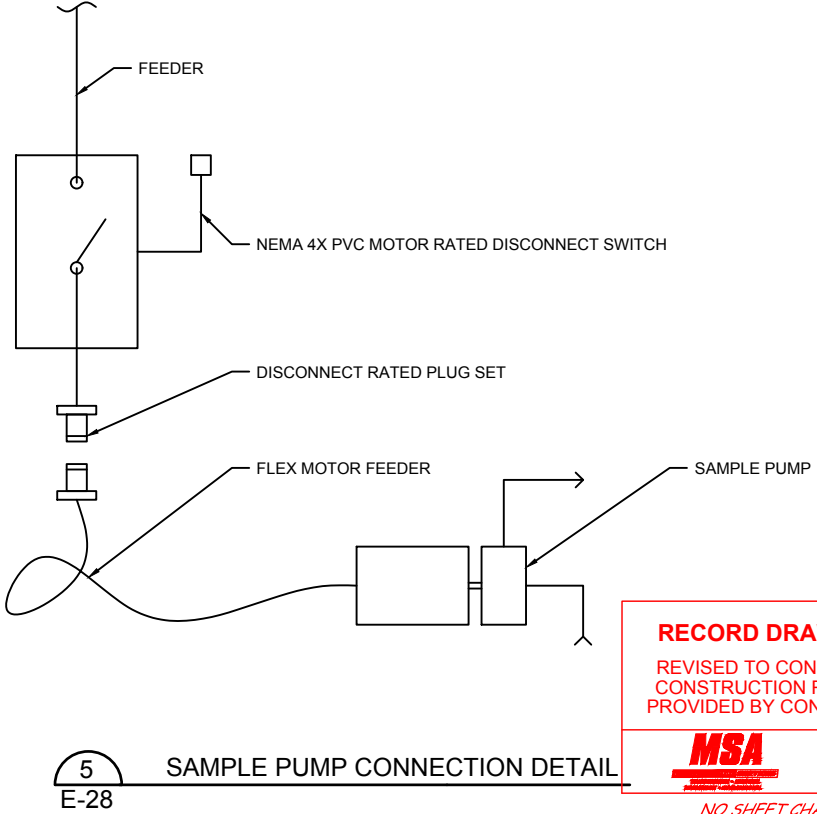
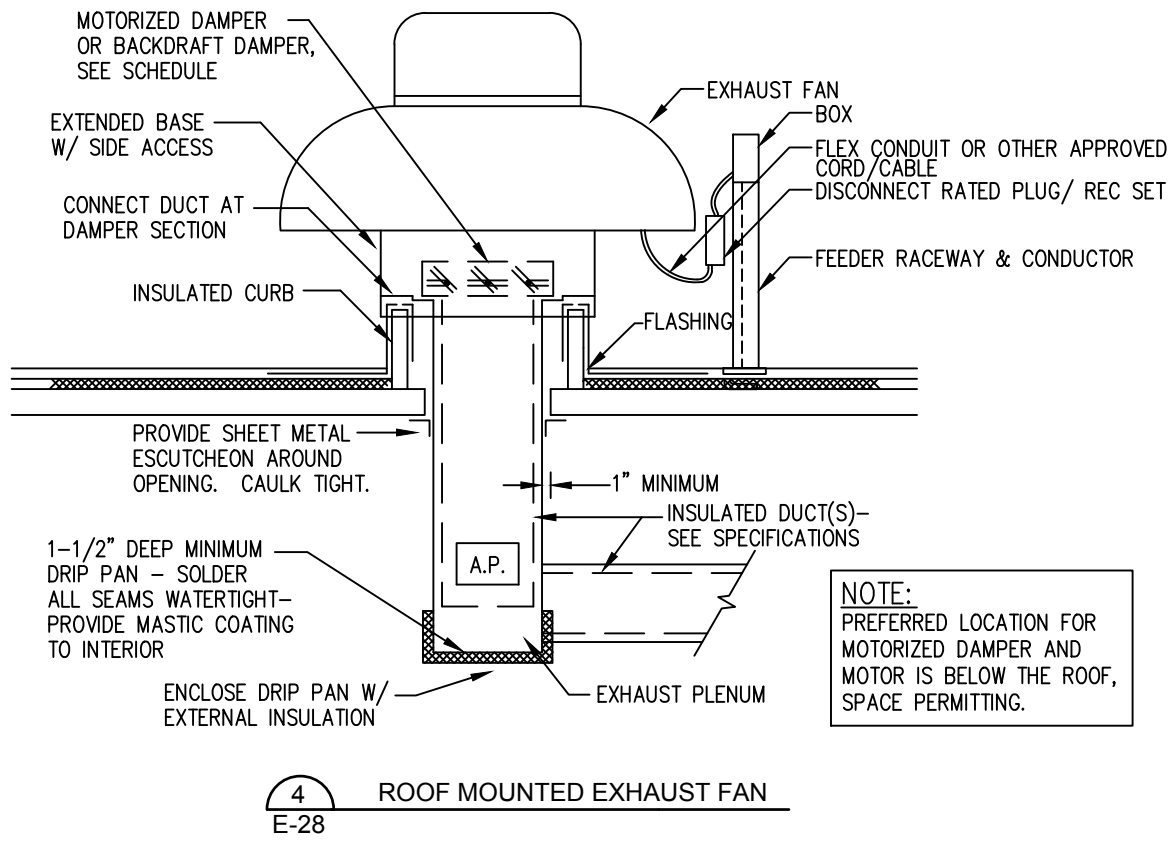
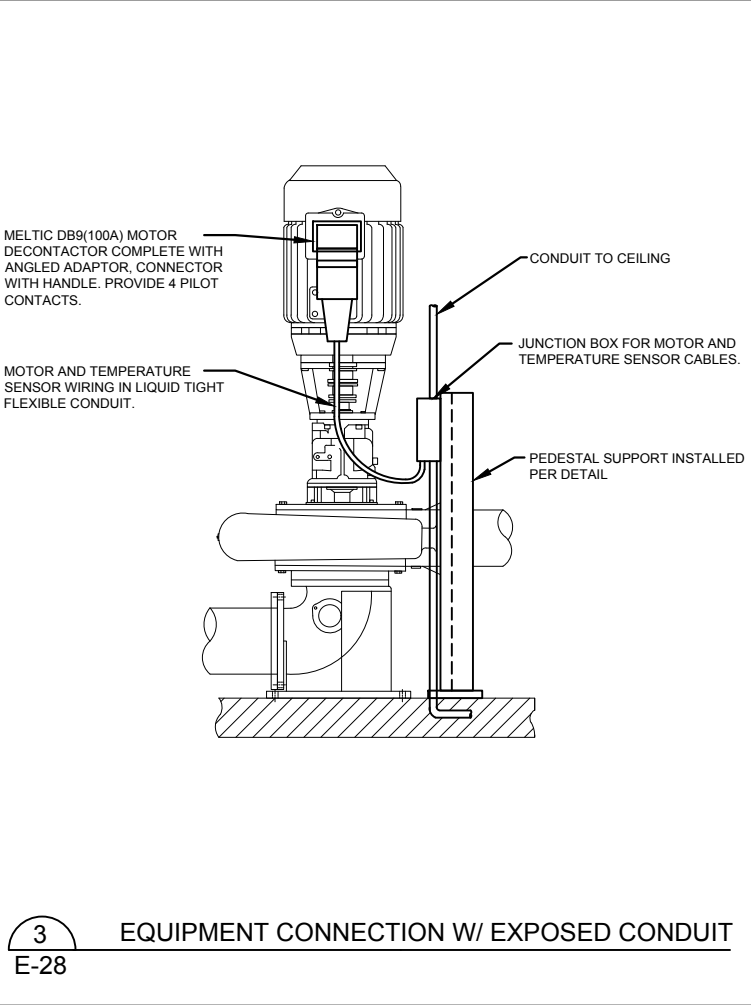
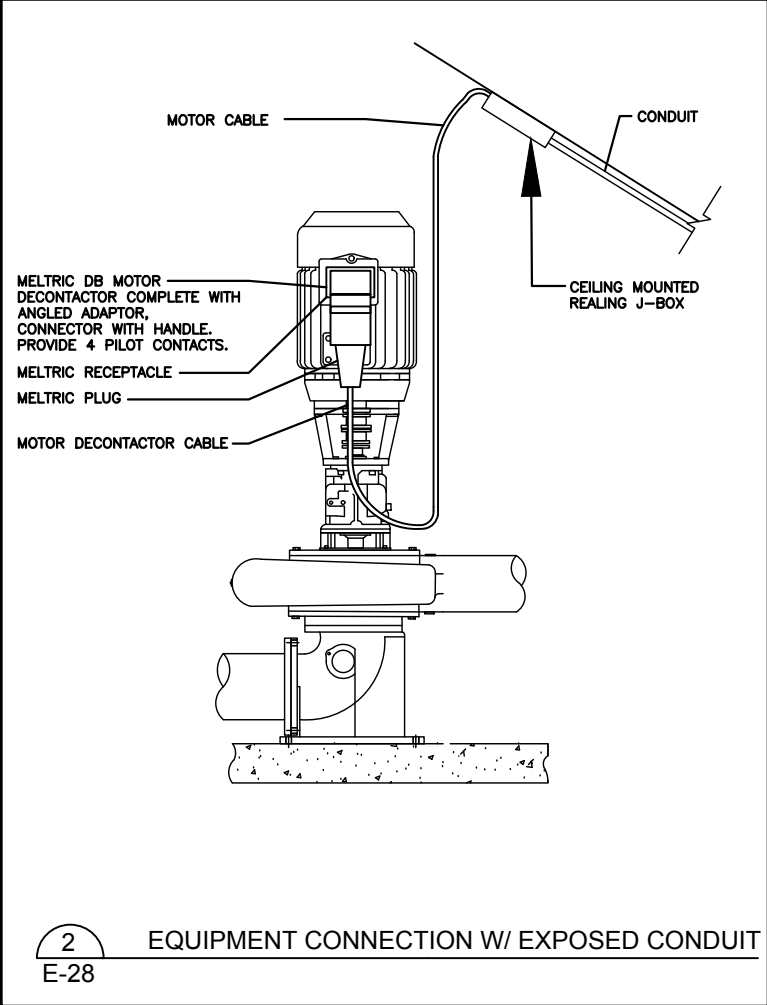
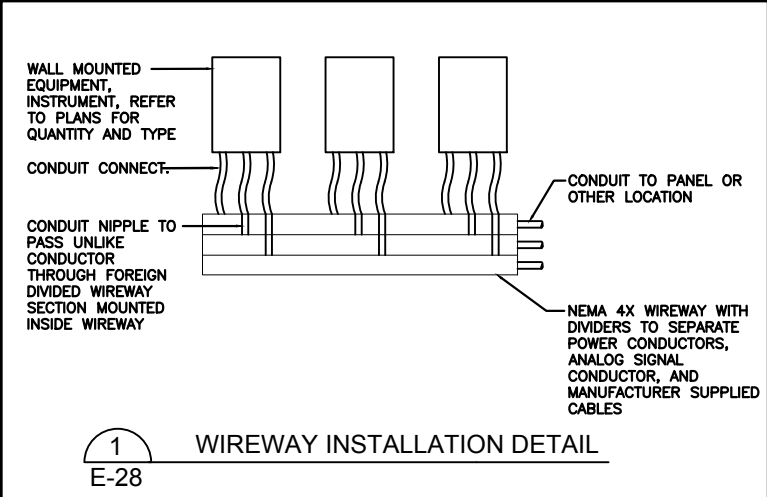
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ELECTRICAL DETAILS

FILE NO.
00616097
SHEET
E-27

RECORD DRAWINGS



NOTE:
PREFERRED LOCATION FOR
MOTORIZED DAMPER AND
MOTOR IS BELOW THE ROOF,
SPACE PERMITTING.

RECORD DRAWINGS
REVISED TO CONFORM TO
CONSTRUCTION RECORDS
PROVIDED BY CONTRACTOR

MSA
BY: JAS
DATE: 01/2017
CRS NO: XXXXX

NO SHEET CHANGES

PROJECT NO.:	00616097	SCALE:	AS SHOWN	NO.	DATE	REVISION	BY
PROJECT DATE:	MARCH 2016	DRAWN BY:	INIT	-	-	-	-
F.B.:	-	CHECKED BY:	SRC	-	-	-	-
PLOT DATE:	11/14/17	P1610s16100616097/CADD/Record Drawings/AutoCAD DWG's161097 ELECTRICAL DETAILS NO. 2.dwg	-	-	-	-	-

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ELECTRICAL DETAILS NO.2

FILE NO.
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SHEET
E-28

RECORD DRAWINGS

