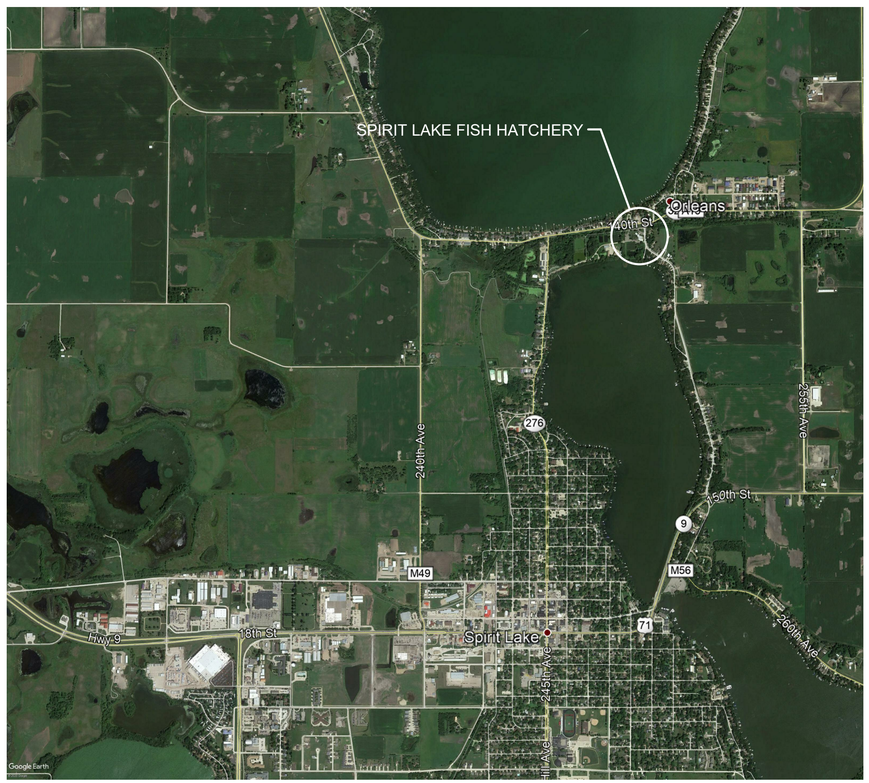

Contract Drawings For

Spirit Lake Fish Hatchery

Upgrade for RAS

Architectural Structural Process Electrical

Project No. 10232924
Spirit Lake, Iowa

Date: August 2020

DNR# 21-01-30-01

ISSUED FOR BID

INDEX OF DRAWINGS	
SHEET #	DESCRIPTION
00 - GENERAL (G)	
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16 - ELECTRICAL (E)	
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E-3	ELECTRICAL DETAILS
E-4	ELECTRICAL DETAILS

AUTHORIZATION TO BID

AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY DATE

ENGINEERING BUREAU CHIEF DATE

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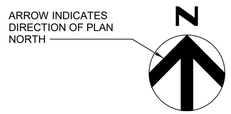
MATERIALS IN PLAN/SECTION

- ACOUSTICAL CEILING TILE (SECTION)
- ASPHALT (PLAN OR SMALL-SCALE SECTION)
- ASPHALT (LARGE-SCALE SECTION)
- BATT INSULATION (SECTION)
- BRICK MASONRY (PLAN AND/OR SECTION)
- CHECKERED PLATE (PLAN)
- CONCRETE (PLAN AND/OR SECTION)
- CONCRETE MASONRY (PLAN AND/OR SECTION)
- DEMOLITION (PLAN AND/OR SECTION)
- EARTH (SECTION)
- FILTER POINT MAT (PLAN)
- FINISHED WOOD (SECTION)
- GLULAM LUMBER (SECTION)
- GRANULAR FILL (SECTION)
- GRATING (SECTION)
- GRATING (PLAN)
- GROUT (SECTION)
- GYPSUM BOARD (SECTION)
- METAL (SECTION)
- ORIENTED STRAND BOARD (SECTION)
- PARTICLE BOARD (SECTION)
- PLYWOOD (LARGE-SCALE SECTION)
- PLYWOOD (SMALL-SCALE SECTION)
- PRECAST CONCRETE (PLAN AND/OR SECTION)
- RIGID INSULATION (SECTION)
- RIPRAP (PLAN AND/OR SECTION)
- SAND (SECTION)
- SOD (SECTION)
- WEEP JOINT MORTAR PROTECTION SYSTEM (SECTION)
- WOOD - CONTINUOUS (SECTION)
- WOOD - BLOCKING (SECTION)

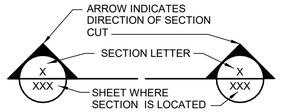
GENERAL SYMBOLOGY



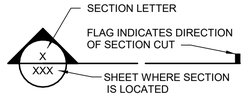
NORTH ARROW

PLAN
1/4" = 1'-0"

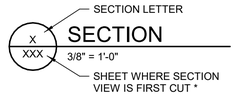
PLAN TITLE



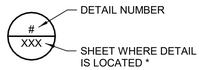
FULL BUILDING SECTION CUT MARKER



SECTION CUT MARKER



SECTION TITLE



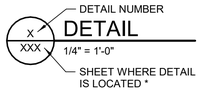
DETAIL MARKER

FOR REFERENCING DETAILS INCLUDED IN DRAWING SET.

XXXXXX

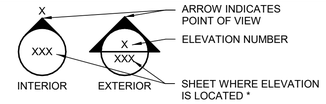
DETAIL MARKER

FOR REFERENCING DETAILS BOUND IN SPECIFICATIONS OR SEPARATE VOLUME.

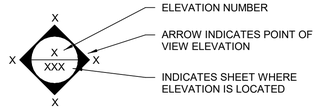


DETAIL TITLE

* EXCEPTIONS WHERE THE SHEET NUMBER IS REPLACED BY A DASH (-).
1) FOR COMMON DETAILS, SECTIONS, ELEVATIONS OR DETAILS THAT ARE CUT OR CALLED OUT ON MULTIPLE SHEETS.
2) SECTIONS, ELEVATIONS OR DETAILS THAT ARE LOCATED ON THE SAME SHEET THEY ARE CUT OR CALLED OUT ON.



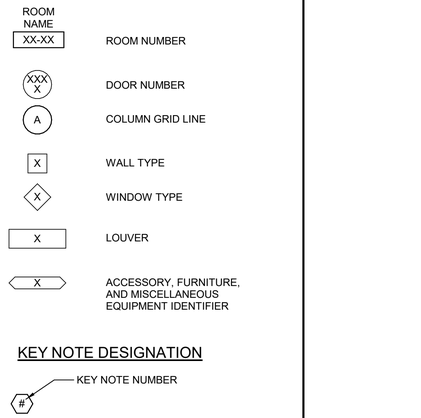
SINGLE ELEVATION OR PHOTO MARKER



MULTIPLE ELEVATION OR PHOTO MARKER

ELEVATION TITLE

ARCHITECTURAL



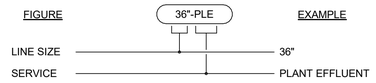
KEY NOTE DESIGNATION

GENERAL LINE SYMBOLOGY

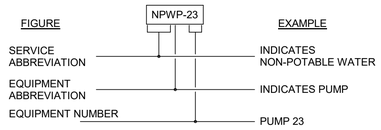
- 4-HOUR FIRE RATED WALL
- 3-HOUR FIRE RATED WALL
- 2-HOUR FIRE RATED WALL
- 1-HOUR FIRE RATED WALL
- COLUMN GRID LINE/CENTERLINE

IDENTIFICATION SYMBOLOGY

PIPING



EQUIPMENT IDENTIFICATION



GENERAL NOTES:

1. THIS IS A STANDARD SHEET SHOWING COMMON SYMBOLOGY. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
P26101
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

GENERAL LEGEND

0 1" 2"

FILENAME: HDRE_ALL_DISCIPLINES.rte
SCALE: NONE
SHEET: G-2

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A/C	AIR CONDITIONING
A/E	ARCHITECT/ENGINEER
A	AMPERE
AB	ANCHOR BOLT
ABAN	ABANDON
ABC	AGGREGATE BASE COURSE
ABT	ABOUT
AC	ALTERNATING CURRENT
ACK	ACKNOWLEDGE
ACP	ACOUSTIC CEILING PANEL, ASPHALTIC CONCRETE PAVEMENT
ACST	ACOUSTIC
AD	ADDENDUM, AREA DRAIN
ADDL	ADDITIONAL
ADH	ADHESIVE
ADJ	ADJUSTABLE, ADJACENT
AF	AMP FRAME, AMP FUSE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AGGR	AGGREGATE
AI	AREA INLET, ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
ALIG	ALIGNMENT
ALT	ALTERNATE, ALTITUDE
ALUM	ALUMINUM
AM	ACOUSTICAL MATERIAL
AMB	AMBIENT
ANC	ANCHOR
AO	ANALOG OUTPUT
AP	ACCESS PANEL
APRX	APPROXIMATE
APVD	APPROVED
ARCH	ARCHITECTURAL
ASSY	ASSEMBLY
AT	ACOUSTICAL TILE, AMP TRIP
ATC	ACOUSTICAL TILE CEILING
ATM	ATMOSPHERE
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AVG	AVERAGE
AWG	AMERICAN WIRE GAGE
AWT	ACOUSTICAL WALL TILE
B TO B	BACK TO BACK
BAL	BALANCE
BBD	BULLETIN BOARD
BC	BASE CABINET, BOTTOM CHORD, BOLT CENTER, BOLT CIRCLE
BD	BOARD
BE	BOTH ENDS, BELL END
BF	BOTH FACES, BOTTOM FACE, BLIND FLANGE, BOARD FEET
BITUM	BITUMINOUS
BKG	BACKING
BL	BASE LINE
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BENCHMARK, BEAM
BOC	BACK OF CURB
BOD	BOTTOM OF DUCT
BOG	BOTTOM OF GRILLE
BOL	BOTTOM OF LOUVER, BOLLARD
BOP	BOTTOM OF PIPE
BOR	BOTTOM OF REGISTER
BOT	BOTTOM
BOU	BOTTOM OF UNIT
BP	BASE PLATE
BRG	BEARING
BRGP	BEARING PLATE
BRKT	BRACKET
BS	BOTH SIDES
BTU	BRITISH THERMAL UNIT
BTW	BETWEEN
BTWLD	BUTT WELD
BU	BELL UP, BUILT-UP
BUR	BUILT-UP ROOFING
BW	BOTH WAYS
BYP	BYPASS
CTOC	CENTER TO CENTER
C&G	CURB AND GUTTER
C	CHANNEL SHAPE, CENTIGRADE, CONDUIT
CAB	CABINET
CAP	CAPACITY
CAT	CATALOG, CATEGORY
CAV	CAVITY
CB	CATCH BASIN
CCB	CONCRETE BLOCK
CCW	COUNTER CLOCKWISE
CDF	CONTROLLED-DENSITY FILL
CE	CONCRETE EDGE
CER	CERAMIC
CF	CUBIC FEET (FOOT)
CFL	COUNTER FLASHING
CHBD	CHALKBOARD
CHD	CHORD
CHFR	CHAMFER
CHH	COMMUNICATION HANDHOLE
CI	CURB INLET
CIP	CAST-IN-PLACE
CIPB	CONCRETE INTERLOCKING PAVER BALLAST
CIRC	CIRCULATION, CIRCULAR
CJ	CONSTRUCTION JOINT
CKT	CIRCUIT
CL	CENTERLINE, CLASS, CLOSE
CLG	CEILING
CLKG	CAULKING
CLR	CLEAR
CMH	COMMUNICATION MANHOLE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT, CONCRETE OPENING
COL	COLUMN
COM	COMMON
COMB	COMBINATION
COMM	COMMUNICATION
COMP	COMPOSITION, COMPRESSIBLE, COMPOSITE
CON	CONCENTRIC
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
COOR	COORDINATE
CORR	CORROSIVE, CORRUGATED
CP	CHECKER PLATE, CONTROL POINT
CPLG	COUPLING
CRL	CORROSION-RESISTANT LINING
CSC	COMPRESSION SLEEVE COUPLING
CSK	COUNTERSINK
CSS	CLINIC SERVICE SINK
CT	CERAMIC TILE
CTJ	CONTRACTION JOINT
CTR	CENTER
CTRL	CONTROL
CVT	CULVERT
CU	COPPER, CUBIC
CW	CLOCKWISE
CY	CUBIC YARD
d	PENNY (NAIL MEASURE)
D	DEEP, DIFFUSER, DRAIN
DB	DUCT BANK, DECIBEL, DRY BULB
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DC	DIRECT CURRENT
DEG	DEGREE
DEG C	DEGREE CENTIGRADE
DEG F	DEGREE FAHRENHEIT
DEMO	DEMOLITION
DEP	DEPRESSED
DEPT	DEPARTMENT
DET	DETAIL
DI	DROP INLET, DUCTILE IRON, DIGITAL INPUT
DIA	DIAMETER
DIAG	DIAGONAL, DIAGRAM
DIFF	DIFFERENTIAL, DIFFERENCE
DIM	DIMENSION
DISCH	DISCHARGE
DIST	DISTANCE, DISTRIBUTION
DIV	DIVISION
DL	DEAD LOAD
DMJ	DOUBLE MECHANICAL JOINT
DMPF	DAMP PROOFING
DN	DOWN
DO	DISSOLVED OXYGEN, DIGITAL OUTPUT, DITTO
DP	DEPTH
DPDT	DOUBLE POLE, DOUBLE THROW
DPST	DOUBLE POLE, SINGLE THROW
DS	DOWN SPOUT
DT	DOUBLE TEE, DRIP TRAP ASSEMBLY
DUP	DUPLICATE
DWG	DRAWING
DWL	DOWEL
DWR	DRAWER
E	EAST
EA	EACH, EXHAUST AIR
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
ED	EQUIPMENT DRAIN
EDB	ELECTRICAL DUCT BANK
EE	EACH END
EF	EACH FACE
EFF	EFFLUENT, EFFICIENCY
EHH	ELECTRICAL HANDHOLE
EIFS	EXTERIOR INSULATION & FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELBOW, ELEVATION
ELEC	ELECTRICAL
EMBD	EMBEDDED
EMER	EMERGENCY
EMH	ELECTRICAL MANHOLE
ENCL	ENCLOSURE
ENGR	ENGINEER
ENTR	ENTRANCE
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ES	EACH SIDE, EQUAL SPACE, EMERGENCY SHOWER
ESEW	EMERGENCY SHOWER AND EYE WASH
EST	ESTIMATE
EW	EACH WAY, EMERGENCY EYE/FACE WASH
EWC	ELECTRIC WATER COOLER
EWEF	EACH WAY, EACH FACE
EWTB	EACH WAY, TOP AND BOTTOM
EXC	EXCAVATION
EXH	EXHAUST
EXP	EXPANSION, EXPOSED
EXST	EXISTING
EXT	EXTERIOR, EXTERNAL, EXTENSION
F TO F	FACE TO FACE
F&B	FACE AND BYPASS
FAB	FABRICATE
FB	FLOOR BEAM
FBD	FIBERBOARD
FBG	FIBERGLASS
FBM	BOARD FOOT MEASURE
FBO	FURNISHED BY OWNER
FC	FLUSHING CONNECTION
FCA	FLANGED COUPLING ADAPTER
FD	FLOOR DRAIN
FDC	FLEXIBLE DUCT CONNECTION
FDR	FEEDER
FDTN	FOUNDATION
FE	FLANGED END
FEC	FIRE EXTINGUISHER CABINET
FES	FLARED END SECTION
FEXT	FIRE EXTINGUISHER
FF	FAR FACE, FACTORY FINISH, FLAT FACE
FG	FINISHED GRADE
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISH
FJT	FLUSH JOINT
FL	FLOW, FLOW LINE
FLEX	FLEXIBLE
FLG	FLANGE
FLOR	FLUORESCENT
FLR	FLOOR
FLS	FLASHING, FLUSH
FN	FENCE
FO	FINISHED OPENING
FOB	FLAT ON BOTTOM
FOC	FACE OF CONCRETE, FACE OF CURB
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FOT	FLAT ON TOP
FPT	FEMALE PIPE THREAD
FR	FRAME
FRP	FIBERGLASS REINFORCED PLASTIC
FRTM	FIRE RETARDANT TREATED MATERIAL
FS	FLOOR SINK, FAR SIDE
FT	FEET, FOOT
FTG	FOOTING, FITTING
FUR	FURRED, FURRING
FURN	FURNITURE, FURNISH
FUT	FUTURE
FV	FACE VELOCITY
FW	FIELD WELD, FIRE WALL
FWD	FORWARD
FWE	FURNISHED WITH EQUIPMENT
FXTR	FIXTURE
G	GRILLE, GROUND
GA	GAGE (METAL THICKNESS)
GAL	GALLON
GALV	GALVANIZED
GB	GRAB BAR, GRADE BREAK
GC	GROOVED COUPLING
GD	GUARD
GEN	GENERAL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFMU	GROUND FACE MASONRY UNIT
GG	GUTTER GRADE
GJ	GROOVED JOINT
GL	GLASS
GLB	GLASS BLOCK, GLULAM BEAM
GND	GROUND
GP	GUY POLE
GR	GRADE
GRTG	GRATING
GSB	GYPSUM SHEATHING BOARD
GT	GREASE TRAP
GVL	GRAVEL
GW	GUY WIRE
GWB	GYPSUM WALLBOARD
GYP	GYPSUM HARDBOARD
H	HIGH
HB	HOSE BIBB
HBD	HARDBOARD
HC	HANDICAPPED, HOLLOW CORE, HORIZONTAL CURVE, HORIZONTAL CENTERLINE
HD	HEAD, HOT DIP
HDR	HEADER
HDW	HARDWARE
HEX	HEXAGONAL
HGR	HANGER
HH	HANDHOLE
HID	HIGH-INTENSITY DISCHARGE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HIGH POINT, HORSEPOWER
HPC	HORIZONTAL POINT OF CURVATURE
HPS	HIGH-PRESSURE SODIUM
HPT	HORIZONTAL POINT OF TANGENCY
HR	HOSE REEL, HOUR
HS	HEADED STUD, HIGH STRENGTH
HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
HTG	HEATING
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWD	HARDWOOD
HWL	HIGH WATER LEVEL
HYD	HYDRAULIC
HZ	HERTZ, CYCLES PER SECOND
ID	INSIDE DIAMETER, INTERIOR DIMENSION
IE	INVERT ELEVATION, FOR EXAMPLE
IF	INSIDE FACE
IH	INTAKE HOOD
IMP	IMPACT
IN	INCH
INC	INCLUDE, INCANDESCENT
INF	INFLUENT
INSTR	INSTRUMENTATION
INSUL	INSULATION
INT	INTERIOR, INTERSECTION
INTR	INTERMEDIATE, INTERIOR
INV	INVERT
IPS	IRON PIPE SIZE
IPT	INTERNAL PIPE THREAD
IR	INSIDE RADIUS, IRON ROD
IRR	IRRIGATION
ISO	ISOMETRIC
JB	JUNCTION BOX
JCT	JUNCTION
JF	JOINT FILLER
JST	JOIST
JT	JOINT
K	KIP
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KD	KNOCK DOWN
KO	KNOCK OUT
KSI	KIPS PER SQUARE INCH
KW	KILOWATT
L	ANGLE, LENGTH, LAVATORY, LINTEL
LAD	LADDER
LAM	LAMINATE
LATL	LATERAL
LB	LAG BOLT, POUND
LCTB	LIQUID CHALK AND TACK BOARD
LDG	LANDING
LDR	LEADER
LE	LIFTING EYE
LF	LINEAR FOOT
LG	LONG
LH	LEFT HAND
LIN	LINEAR
LIQ	LIQUID
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LMLU	LIQUID MARKER LECTURE UNIT
LNG	LONGITUDINAL
LOC	LOCATION
LP	LOW POINT
LPS	LOW-PRESSURE SODIUM
LR	LONG RADIUS
LT	LEFT
LTD	LIMITED
LTG	LIGHTING
LTL	LINTEL
LTNG	LIGHTNING
LV	LOW VOLTAGE
LVL	LAMINATED VENEER LUMBER
LVR	LOUVER
LW	LIGHTWEIGHT
LWC	LIGHTWEIGHT CONCRETE
LWL	LOW WATER LEVEL
MA	MIXED AIR
MACH	MACHINED
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MBR	MEMBER
MC	MECHANICAL CONTRACTOR, MECHANICAL COUPLING, MOMENT CONNECTION
MCB	METAL CORNER BEAD
MCJ	MASONRY CONTROL JOINT
MDMJ	MODIFIED DOUBLE MECHANICAL JOINT
MECH	MECHANICAL
MED	MEDIUM
MFR	MANUFACTURER
MH	MANHOLE, METAL HALIDE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MASONRY LINTEL
MLO	MAIN LUGS ONLY
MMB	MEMBRANE
MO	MASONRY OPENING
MOD	MODULAR, MODIFY
MON	MONUMENT
MPT	MALE PIPE THREAD
MRGWB	MOISTURE-RESISTANT GYPSUM WALLBOARD
MS	MOP SINK
MSL	MEAN SEA LEVEL
MT	MOUNT
MU	MASONRY UNIT
MULL	MULLION
MV	MEDIUM VOLTAGE
MW	MONITORING WELL
N	NORTH, NEUTRAL
NA	NOT APPLICABLE
NAT	NATURAL, NATIONAL
NC	NORMALLY CLOSED
NEG	NEGATIVE
NF	NEAR FACE, NON-FUSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN, NUMBER
NOM	NOMINAL
NPS	NOMINAL PIPE SIZE
NPT	NATIONAL PIPE THREAD
NS	NEAR SIDE
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
O TO O	OUT TO OUT
OA	OUTSIDE AIR, OVERALL
OC	ON CENTER
OCPD	OVER CURRENT PROTECTION DEVICE
OD	OUTSIDE DIAMETER
OED	OPEN END DUCT
OF	OUTSIDE FACE, OFFICE FURNISHING
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OG	ORIGINAL GROUND
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OPT	OPTIONAL
OR	OUTSIDE RADIUS
ORD	OVERFLOW ROOF DRAIN
ORIG	ORIGINAL
OVFL	OVERFLOW
OVHG	OVERHANG
OZ	OUNCE
P	PAINT
PA	PUBLIC ADDRESS
PAR	PARALLEL, PARAPET
PB	PANIC BAR, PULL BOX
PBD	PARTICLE BOARD
PC	POINT OF CURVE, PIECE, PRECAST
PCC	POINT OF COMPOUND CURVATURE
PCF	POUNDS PER CUBIC FOOT
PCT	PERCENT
PE	PLAIN END
PED	PEDESTAL
PEN	PENETRATION
PERF	PERFORATED
PERM	PERMANENT
PERP	PERPENDICULAR
PF	POWER FACTOR
PFMU	PREFACED MASONRY UNIT
PH	PHASE
PI	POINT OF INTERSECTION
PKG	PACKAGE
PL	PLATE, PROPERTY LINE, PRECAST LINTEL
PLAS	PLASTER
PLAT	PLATFORM
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PNEU	PNEUMATIC
POL	POLISH
POS	POSITIVE, POSITION
PP	POLYPROPYLENE, POWER POLE
PRC	POINT OF REVERSE CURVATURE
PREF	PREFINISHED
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARE
PRES	PRESSURE
PRI	PRIMARY
PROP	PROPERTY, PROPOSED
PROT	PROTECTION
PS	PIPE SUPPORT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PST	PRESTRESSED
PT	POINT, POINT OF TANGENCY
PTN	PARTITION
PVC	POLYVINYL CHLORIDE, POINT OF VERTICAL CURVE
PVC-RGS	PVC COATED RGS
PVMT	PAVEMENT
PWD	PLYWOOD
PWJ	PLYWOOD WEB JOIST
PZ	PIEZOMETER
Q	RATE OF FLOW
QT	QUARRY TILE
QTR	QUARTER
QTY	QUANTITY
QUAL	QUALITY
R&R	REMOVE AND REPLACE
R&S	REMOVE AND SALVAGE
R	RADIUS, REGISTER, RISER
RA	RETURN AIR
RB	RESILIENT BASE, ROCK BERM
RCPT	RECEPTACLE
RD	ROOF DRAIN
REC	RECESS
RECD	RECEIVED
RECT	RECTANGULAR
RED	REDUCER
REF	REFERENCE
REINF	REINFORCING
REM	REMOVE
REQD	REQUIRED
RESIL	RESILIENT
RET	RETAINING, RETURN
REV	REVISION, REVERSE
RF	RESILIENT FLOORING
RFG	ROOFING
RFL	REFLECTED, REFLECTOR
RGH	ROUGH
RGS	RIGID GALVANIZED STEEL
RH	RELIEF HOOD, RIGHT HAND, RELATIVE HUMIDITY
RL	REQUIRED LAP
RLFA	RELIEF AIR
RND	ROUND
RNG	RUNNING
RO	ROUGH OPENING
ROW	RIGHT-OF-WAY
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RSP	ROCK SLOPE PROTECTION
RT	RIGHT
RVT	RESILIENT VINYL TILE
RY	READY
S	SOUTH, SINK
SA	SUPPLY AIR
SAMU	SOUND-ABSORBING MASONRY UNIT
SAN	SANITARY
SB	SPLASH BLOCK
SC	SOLID CORE
SCH	SCHEDULE
SCHEM	SCHEMATIC
SCN	SCREEN
SE	STEEL/ALUMINUM EDGE
SEC	SECONDARY, SECONDS
SECT	SECTION
SEP	SEPARATE
SF	SQUARE FOOT, SILT FENCE
SG	SHEET GLASS, SEALANT GROOVE
SH	SHOWER
SHT	SHEET
SHTG	SHEATHING
SIL	SILENCE
SIM	SIMILAR
SJ	SLAB JOINT
SL	SLOPE, STEEL LINTEL
SLTD	SLOTTED
SLV	SLEEVE
SMLS	SEAMLESS
SOG	SLAB ON GRADE
SP	SOUNDPROOF, STANDPIPE
SPA	SPACING
SPEC	SPECIFICATION
SPLY	SUPPLY
SPST	SINGLE POLE SINGLE THROW
SPT	SET POINT
SQ	SQUARE
SR	SHORT RADIUS
SS	SERVICE SINK
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STL	STEEL
STOR	STORAGE
STR	STRUCTURAL, STRAIGHT
SUB	SUBSTITUTE
SUC	SUCTION
SUSP	SUSPENDED
SY	SQUARE YARD
SYM	SYMBOL
SYMM	SYMMETRICAL
SYN	SYNTHETIC
SYS	SYSTEM
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
T	TILE, TREAD
TA	TOILET ACCESSORY, TEMPERED AIR
TAN	TANGENT
TBM	TEMPORARY BENCHMARK
TCE	TEMPORARY CONSTRUCTION EASEMENT
TEF	TROWELED EPOXY FLOORING
TEMP	TEMPORARY, TEMPERATURE
THD	THREAD
THK	THICK
THRESH	THRESHOLD
TKBD	TACK BOARD
TOB	TOP OF BOLT, TOP OF BANK, TOP OF BEAM, TOP OF BERM
TOC	TOP OF CURB, TOP OF CONCRETE
TOD	TOP OF DUCT
TOF	TOP OF FOOTING
TOG	TOP OF GRATING
TOL	TOLERANCE, TOP OF LEDGER
TOM	TOP OF MASONRY
TOP	TOP OF PLATE
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB, TOP OF STEEL, TOE OF SLOPE
TOW	TOP OF WALL
TP	TOILET PARTITION, TELEPHONE POLE, TOE PLATE, TRAP PRIMER
TPD	TOILET PAPER DISPENSER
TPG	TOPPING, THROUGH PLATE GIRDER
TR	TRANSOM
TRANS	TRANSITION
TRD	TRENCH DRAIN
TYP	TYPICAL
U	URINAL
UG	UNDERGROUND
ULT	ULTIMATE
UNFN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY
V	VENT, VELOCITY, VOLT
VA	VOLT AMPERE
VAC	VACUUM
VAR	VARNISH, VARIABLE, VOLT AMPERES REACTIVE
VB	VAPOR BARRIER, VINYL BASE, VALVE BOX
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VCT	VINYL COMPOSITION TILE, VERTICAL CENTERLINE
VEL	VELOCITY
VENT	VENTILATION
VERT	VERTICAL
VERTS	VERTICAL REINFORCING
VG	VERTICAL GRAIN
VIF	VERIFY IN FIELD
VIN	VINYL
VOL	VOLUME
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
VS	VERSUS, VAPOR SEAL
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING
W/	WITH
W/O	WITHOUT
W	WATT, WEST, WIDE, WINDOW, WIRE, WIDE FLANGE BEAM
WB	WOOD BASE
WC	WATER CLOSET, WATER COLUMN
WD	WOOD, WIDTH
WF	WIDE FLANGE, WASH FOUNTAIN
WG	WIRE GLASS, WATER GAGE
WH	WALL HYDRANT, WEEP HOLE
WI	WROUGHT IRON
WL	WATER LEVEL
WLD	WELDED
WM	WIRE MESH
WP	WEATHERPROOF
WS	WATERSTOP, WATER SURFACE
WSCT	WAINSCOT
WT	WEIGHT, WATER TIGHT
WTHP	WATERPROOF, WORKING POINT
WWF	WELDED WIRE FABRIC
XP	EXPLOSION-PROOF
XS	EXTRA STRONG
XSECT	CROSS SECTION
XXS	DOUBLE EXTRA STRONG
YH	YARD HYDRANT
YS	YIELD STRENGTH

GENERAL NOTES:

1. THESE ABBREVIATIONS APPLY TO THE ENTIRE SET OF CONTRACT DRAWINGS.
2. LISTING OF ABBREVIATIONS DOES NOT IMPLY THAT ALL ABBREVIATIONS ARE USED IN THE CONTRACT DRAWINGS.
3. ABBREVIATIONS SHOWN ON THIS SHEET INCLUDE VARIATIONS OF A WORD. FOR EXAMPLE, "MOD" MAY MEAN MODIFY OR MODIFICATION, "INC" MAY MEAN INCLUDED OR INCLUDING, AND "REINF" MAY MEAN REINFORCE OR REINFORCING.
4. SEE INSTRUMENTATION AND GENERAL LEGEND SHEETS FOR PROJECT-SPECIFIC EQUIPMENT AND PIPING SYSTEM ABBREVIATIONS.

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
P26101
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

ABBREVIATIONS

0 1" 2"

FILENAME: HDRE_ALL_DISCIPLINES.rte
SCALE: NONE
SHEET: G-3

PIPING SYMBOLOGY

VALVES

SINGLE LINE	DOUBLE LINE	ISOLATION
		BALL VALVE
		BUTTERFLY VALVE
		DIAPHRAGM VALVE
		GATE VALVE
		GLOBE VALVE
		KNIFE GATE VALVE
		NEEDLE VALVE
		PINCH VALVE
		PLUG VALVE
		THREE-WAY BALL VALVE
		THREE-WAY PLUG VALVE
BBFV	BBFV	BURIED BUTTERFLY VALVE
		CONTROL
		BALL CHECK VALVE
		CHECK VALVE
		DOUBLE-DISK CHECK VALVE
		CONE VALVE
OR	OR	PRESSURE RELIEF VALVE
		PRESSURE-REDUCING VALVE
X	X	AIR RELEASE VACUUM VALVE A = AIR RELEASE VAC = VACUUM
		PRESSURE-REGULATING VALVE
		3-WAY CONTROL VALVE

MISCELLANEOUS

- BACKFLOW PREVENTER
- M — WATER METER
- VARIABLE AREA METER
- UNION
- WYE-STRAINER
- PENETRATION THROUGH STRUCTURE
- FLEXIBLE HOSE OR TUBING
- FLEXIBLE PIPING CONNECTION
- LINE SIZE CHANGE (CONCENTRIC REDUCER)
- LINE SIZE CHANGE (ECCENTRIC REDUCER)
- LINE TURNING DOWN
- LINE TURNING UP
- BLIND FLANGE
- PIPE BREAK

NOTE:
MISCELLANEOUS SYMBOLOGY SHOWN IS FOR SINGLE-LINE PIPING. DOUBLE-LINE PIPING SYMBOLS ARE SIMILAR.

MISCELLANEOUS

- PIPE JOINT (SEE SPECS FOR REQUIREMENTS)
- COMPRESSION SLEEVE TYPE COUPLING
- FLANGED COUPLING ADAPTER (FCA)
- FLEXIBLE CONNECTION
- HARNESSED MECHANICAL COUPLING
- PRESSURE GAGE (W/COCK)
- TRAP
- QUICK DISCONNECT CAM & GROOVE COUPLING
- CAP OR PLUG
- CO — INTERIOR CLEANOUT
- HB-X — HOSE VALVE, HOSE BIBB, OR FLUSHING CONNECTION
- HR-X — HOSE RACK
- FD-X — FLOOR DRAIN

X = TYPE DESIGNATED IN SPECIFICATIONS

- PIPE IN SECTION
- BU — BELL UP (PLAN)
- BU — BELL UP (SECTION OR SCHEMATIC)
- D — DRAIN (SECTION OR SCHEMATIC)
- ATA — AIR TOOL ASSEMBLY
- AVS — AUTOMATIC VALVE STATION
- PRS — PRESSURE-REDUCING STATION
- FREEZE RESISTANT WALL HYDRANT

PLUMBING PIPING LEGEND

- VT — VENT (VT)
- POTABLE WATER, COLD (CW)
- POTABLE WATER, HOT (HW)
- POTABLE WATER HOT RETURN (HWR)
- W — DOMESTIC WATER
- G — GAS
- SAN — SANITARY WASTE
- CW — COLD WATER DOMESTIC
- HW — HOW WATER DOMESTIC
- HWR — HOT WATER RETURN DOMESTIC
- PWC — POTABLE WATER COLD

PROCESS PIPING LEGEND

- AWS — AERATED WATER SUPPLY
- HWS — HEATED WATER SUPPLY
- CWS — CHILLED WATER SUPPLY
- WWN — WELL WATER NON-POTABLE
- DRN — DRAIN (PROCESS)
- DFT — DRAIN AND FISH TRANSFER
- LPA — LOW PRESSURE AIR
- MPA — MEDIUM PRESSURE AIR (FISH FEEDER AIR)
- PRX — HYDROGEN PEROXIDE PIPING

HVAC SYMBOLOGY

- 24x18 — SUPPLY AIR OR OUTSIDE AIR DUCT UP (SECTION CUT, FIRST DIMENSION DUCT WIDTH)
- SUPPLY AIR OR OUTSIDE AIR DUCT DOWN (NO SECTION CUT)
- RETURN AIR DUCT UP (SECTION CUT)
- RETURN AIR DUCT DOWN (NO SECTION CUT)
- EXHAUST AIR DUCT UP (NO SECTION CUT)
- EXHAUST AIR DUCT DOWN (NO SECTION CUT)
- ROUND ELBOW UP
- ROUND ELBOW DOWN
- TRANSITION - DOUBLE SIDED
- TRANSITION - ONE SIDED
- TRANSITION - RECTANGULAR TO ROUND DUCT
- STANDARD BRANCH - FOR SUPPLY AIR W/ EXTRACTOR AND RETURN AIR W/O EXTRACTOR
- ELBOW - W/TURNING VANE (RECTANGULAR)
- ELBOW - W/TURNING VANES (RECTANGULAR), SMOOTH RADIUS
- GOOSENECK HOOD (COWL)
- 18x24 — RECTANGULAR DUCT OR OPENING SIZE FIRST NUMBER INDICATES SIZE OF SIDE SHOWN
- 18"φ — ROUND DUCT SIZE
- R OR D — RECTANGULAR DUCT INCLINE - RISE OR DROP IN RESPECT TO THE AIR FLOW
- (R)OR(D) — ROUND DUCT INCLINE - RISE OR DROP IN RESPECT TO THE AIR FLOW
- 18x24 — HIDDEN DUCT
- T 9'-10" B 9'-0" / 18x10 — DUCT ELEVATION TAG ABOVE FINISH FLOOR
- PRESSURE/TEMPERATURE TEST PLUG (PETE PLUG OR EQUAL)
- SA — SOUND ATTENUATOR
- SD SD — SPLITTER DAMPER
- VD, BDD — VD = VOLUME DAMPER, BDD = BACKDRAFT DAMPER
- M — MOD = MOTOR OPERATED DAMPER
- FIRE DAMPER — FIRE DAMPER
- SMOKE DAMPER — SMOKE DAMPER
- SMOKE AND FIRE DAMPER — SMOKE AND FIRE DAMPER
- ZD = ZONE DAMPER

- FLEXIBLE CONNECTION
- FLEXIBLE DUCT - TWO LINE
- FLEXIBLE DUCT - ONE LINE
- ACOUSTICAL LINING - DUCT DIMENSIONS FOR NET FREE AREA
- SIZE / CFM — SUPPLY AIR REGISTER OR GRILLE - W/ DUCT-MOUNTED EXTRACTOR
- SIZE / CFM — EXHAUST AIR OR RETURN AIR REGISTER OR GRILLE
- SIZE / CFM — EXHAUST AIR OR RETURN AIR REGISTER OR GRILLE
- SIZE / CFM — SUPPLY AIR ASSEMBLY SQUARE DIFFUSER
- SIZE / CFM — SUPPLY AIR ASSEMBLY ROUND DIFFUSER
- WALL LOUVER
- AD PLAN / AD SECTION — ACCESS DOOR
- UC 3/4" — UNDERCUT DOOR 3/4"
- AD — ACCESS DOOR OR ACCESS PANEL IN DUCTWORK
- INTAKE OR RELIEF HOOD
- DOOR GRILLE
- AIR FLOW — BACKDRAFT DAMPER
- EXHAUST ROOF VENTILATOR PROPELLER OR CENTRIFUGAL TYPE
- PROPELLER WALL FAN
- ROOM AIR CONDITIONING UNIT
- INTAKE/EXHAUST LOUVER
- SUPPLY, RETURN OR EXHAUST FAN
- AIR FILTER

HVAC CONTROL SYMBOLOGY

- TC — TEMPERATURE CONTROLLER
- TT — TEMPERATURE TRANSMITTER
- TS — TEMPERATURE SWITCH
- T — THERMOSTAT
- TS — TEMPERATURE SENSOR
- TI — TEMPERATURE INDICATOR
- % — PERCENTAGE TIMER
- RC — RECEIVER CONTROLLER
- HOA — HAND-OFF-AUTO
- MS — MOTOR STARTER
- M — DAMPER ACTUATOR
- PI — PRESSURE INDICATOR
- FRZ — FREEZE STAT
- FS — FIRE STAT
- DPS — DIFFERENTIAL PRESSURE SWITCH
- S — SMOKE DETECTOR
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- ---- D ---- — TIME DELAY
- M — MINIMUM POSITION RELAY
- S — SIGNAL
- AO — ANALOG OUTPUT
- AI — ANALOG INPUT
- DO — DIGITAL OUTPUT
- DI — DIGITAL INPUT
- C — COMMON PORT
- S — SIGNAL PORT
- NO — NORMALLY OPEN
- NC — NORMALLY CLOSED
- BALANCING VALVE
- RHC — RESISTANCE HEATING CONTACTOR
- TA — TEST-AUTO
- TOA — TEST-OFF-AUTO
- ELECTRIC SIGNAL
- PIPING
- BULB-TYPE THERMOSTAT
- D — DIESEL EXHAUST SENSOR
- CO2 — CARBON DIOXIDE SENSOR
- VD — VOLUME DAMPER - MANUAL
- M — VOLUME DAMPER - MOTORIZED

AIR FLOW SCHEMATIC AND TEMPERATURE CONTROL DIAGRAM SYMBOLOGY

- C / C — CHILLED WATER COOLING COIL
- H / C — HOT WATER HEATING COIL
- EP / R — DIRECT EVAPORATIVE COOLER
- D / X — DIRECT EXPANSION COOLING COIL
- EH / C — ELECTRIC HEATING COIL
- VFD — VFD (VARIABLE FREQUENCY DRIVE)
- H / C CAV — CONSTANT AIR VOLUME BOX WITH REHEAT COIL
- H / C VAV — VARIABLE AIR VOLUME BOX WITH REHEAT COIL

MISCELLANEOUS SYMBOLOGY

- MIST ELIMINATOR
- ACTIVATED CARBON OR CHEMICAL FILTER
- CENTRIFUGAL PUMP
- SPRAY NOZZLE/HUMIDIFIER

GENERAL NOTES:

1. THIS IS A STANDARD PROCESS, MECHANICAL AND PLUMBING SYMBOLOGY SHEET. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.
3. SEE INSTRUMENTATION LEGEND AND GENERAL SHEETS FOR PROJECT-SPECIFIC EQUIPMENT SYMBOLS, EQUIPMENT ABBREVIATIONS, AND PIPING SYSTEM ABBREVIATIONS.

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
P26101
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PROCESS, MECHANICAL AND PLUMBING LEGEND

0 1" 2"

FILENAME	HDRE_ALL_DISCIPLINES.rte
SCALE	NONE
SHEET	G-4

ONE-LINE, POWER, AND LIGHTING SYMBOLOGY

X 20A 3P OR X 100AF 80AT 3P — LOW VOLTAGE CIRCUIT BREAKER (CB). RATING AND NO. OF POLES AS SHOWN. WHEN SPECIFIC TYPE, OTHER THAN MCCB, IS REQUIRED, X INDICATES TYPE.

TYPES:
- MCCB - MOLDED CASE
- ICCB - INSULATED CASE
- LVP - LOW VOLTAGE POWER
- MCP - MOTOR CIRCUIT PROTECTOR (RATING PER CONNECTED LOAD)

TRIP UNIT:
- L - LONG TIME PICKUP
- S - SHORT TIME PICKUP
- I - INSTANTANEOUS PICKUP
- G - GROUND FAULT PICKUP
- A - ARC ENERGY REDUCTION MODE

X — INTERLOCK: X - INDICATES TYPE

TYPES:
- E - ELECTRICAL
- M - MECHANICAL
- K - KEY

GFP — GROUND FAULT PROTECTION

52 — MEDIUM VOLTAGE CIRCUIT BREAKER

FUSE, RATING, AND NUMBER OF FUSES AS NOTED

FUSED CUTOUT, CURRENT RATING, FUSE RATING, AND QUANTITY AS NOTED

FUSIBLE SWITCH, CURRENT RATING, FUSE RATING, AND QUANTITY AS NOTED (3 POLE UON)

NON-FUSED SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED (3 POLE UON)

DISCONNECT OR DRAWOUT CONNECTION

A C B & A C B — MAGNETIC MOTOR STARTER AND SEPARATELY MOUNTED COMBINATION MAGNETIC MOTOR STARTER

D C & D C — MOTOR/LOAD CONTROLLER AND SEPARATELY MOUNTED MOTOR/LOAD CONTROLLER WITH SHORT CIRCUIT PROTECTION AND DISCONNECT

MOTOR STARTER AND CONTROLLER SUBSCRIPTS:

A - MAGNETIC STARTER NEMA SIZE

B - STARTER TYPE
- NONE - FULL VOLTAGE NON-REVERSING (FVNR)
- FVR - FULL VOLTAGE REVERSING
- 2S - TWO SPEED
- RVAT - REDUCED VOLTAGE AUTO TRANSFORMER

C - CONTROL DIAGRAM OR CONTROLS SCHEDULE NUMBER (IF REQUIRED)

D - CONTROLLER TYPE
- VFD - VARIABLE FREQUENCY DRIVE
- SS - SOLID STATE
- CONT - CONTACTOR

SEPARATELY MOUNTED COMBINATION MOTOR STARTER OR CONTROLLER; SEE ELECTRICAL ONE - LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION

SEPARATELY MOUNTED MOTOR STARTER OR CONTROLLER; SEE ELECTRICAL ONE-LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION.

X — NON-FUSED SAFETY SWITCH, 30A, 3P, X INDICATES AMP RATING GREATER THAN 30A

X Y — FUSED SAFETY SWITCH, 3P, X INDICATES AMP RATING GREATER THAN 30A, Y INDICATES FUSE SIZE

CB — SEPARATELY MOUNTED CIRCUIT BREAKER; SEE ELECTRICAL ONE - LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION

7 1/2 OR HP — MOTOR WITH DESIGN HORSEPOWER (WHEN INDICATED)

G — GENERATOR

TRANSFER SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED

ATS — ATS - AUTOMATIC; MTS - MANUAL

TRANSFORMER
- △ 3-PHASE, 3-WIRE DELTA CONNECTION
- Y 3-PHASE, 4-WIRE GROUNDED WYE CONNECTION

LP100 208/120V 3Ø, 4W — SWITCHBOARD OR PANELBOARD; NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED

100 KVA — NON-MOTOR LOAD WITH DESIGN KVA, KW, OR AMP

VOLTAGE TRANSFORMER (VT, PT, OR CPT)

CURRENT TRANSFORMER (CT)

WH — UTILITY WATT-HOUR METER PER UTILITY REQUIREMENTS

DMP — DIGITAL METERING PACKAGE

GROUND

LIGHTNING ARRESTER

SPD — LOW VOLTAGE SURGE PROTECTIVE DEVICE

SS — SELECTOR SWITCH

PB — PUSHBUTTON

IC — INSTRUMENTATION / CONTROL DEVICE

SV — SOLENOID VALVE

CONTROL PANEL INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

CONTROL PANEL WITH DISCONNECT SWITCH INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

J OR J — JUNCTION OR PULL BOX

PANELBOARD (250V TO 600V)

PANELBOARD (LESS THAN 250V)

X — ELECTRICAL EQUIPMENT ENCLOSURE: SWITCHBOARD, MOTOR CONTROL CENTER, CONTROL PANEL, TRANSFORMER OR OTHER EQUIPMENT AS INDICATED. ESTIMATED SIZE AS INDICATED. WHEN USED X INDICATES EQUIPMENT TYPE.

EQUIPMENT TYPES:
- ATS - AUTOMATIC TRANSFER SWITCH
- CP - CONTROL PANEL
- MTS - MANUAL TRANSFER SWITCH
- MCC - MOTOR CONTROL CENTER
- UPS - UNINTERRUPTIBLE POWER SUPPLY
- VFD - VARIABLE FREQUENCY DRIVE
- SB - SWITCHBOARD
- SG - SWITCHGEAR
- T - TRANSFORMER

Z X Y — CEILING/PENDANT/BOLLARD MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED

Z X Y — CEILING/PENDANT/BOLLARD MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED, EMERGENCY (INTERNAL OR EXTERNAL POWER SOURCE AS INDICATED)

Z X Y — WALL MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED

Z X Y — WALL MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED, EMERGENCY (INTERNAL OR EXTERNAL POWER SOURCE AS INDICATED)

Z X Y — WALL MOUNTED FLOOD LUMINAIRE, LAMP TYPE AS SPECIFIED

Z X Y — POLE/STANCHION MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED

Z X Y — POLE/STANCHION MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED, EMERGENCY (INTERNAL OR EXTERNAL POWER SOURCE AS INDICATED

Z X Y — POLE/STANCHION MOUNTED FLOOR LUMINAIRE, LAMP TYPE AS SPECIFIED

Z Z X Y — CEILING/PENDANT MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED

Z X Y — WALL MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED

Z X Y — CEILING/PENDANT MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED, ALL OR PARTIAL EMERGENCY (INTERNAL OR EXTERNAL POWER SOURCE AS INDICATED

Z X Y — WALL MOUNTED LUMINAIRE, LAMP TYPE AS SPECIFIED, ALL OR PARTIAL EMERGENCY (INTERNAL OR EXTERNAL POWER SOURCE AS INDICATED

X Y — EMERGENCY LIGHT, NUMBER OF ATTACHED HEADS AS SHOWN

X Y — EMERGENCY LIGHT, REMOTE MOUNTED HEAD

X Y X Y — DOUBLE-FACED CEILING OR WALL MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

X Y X Y — SINGLE-FACED CEILING OR WALL MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

LIGHTING FIXTURE SUBSCRIPTS:
- X - INDICATES LUMINAIRE TYPE PER LUMINAIRE SCHEDULE
- Y - INDICATES CIRCUIT NUMBER FROM PANELBOARD
- Z - INDICATES CONTROLLING SWITCH (IF REQUIRED)
- NL - NIGHT LIGHT UNSWITCHED

$ Y X — WALL SWITCH

SUBSCRIPTS:
X - INDICATES TYPE
- NONE - SINGLE POLE
- 2 - DOUBLE POLE
- 3 - THREE-WAY
- 4 - FOUR-WAY
- K - KEY SWITCH
- P - PILOT LIGHT
- L - LIGHTED HANDLE
- DM - DIMMING
- MC - MOMENTARY CONTACT
- T - TIMER

Y - INDICATES CONTROLLING SWITCH (IF REQUIRED)

$ Y X — MANUAL MOTOR STARTER

SUBSCRIPTS:
X - INDICATES TYPE
- HP - HORSEPOWER RATED
- TE - HORSEPOWER RATED WITH THERMAL ELEMENT
- FT - HORSEPOWER RATED WITH FUSETRON FUSE

Y - INDICATES SWITCH TYPE
- NONE - TOGGLE SWITCH TYPE
- R - ROTARY SWITCH TYPE

PC — PHOTOCELL

TC — TIME CLOCK

$ OSX OR OSX — LIGHTING CONTROL OCCUPANCY SENSOR, WALL MOUNTED, X INDICATES SPECIFIC TYPE AS SPECIFIED

OSX — LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED, X INDICATES SPECIFIC TYPE AS SPECIFIED

X — ROOM/AREA LIGHTING CONTROL TYPE, SEE LIGHTING CONTROL SCHEDULE FOR REQUIREMENTS

2 a — LOW VOLTAGE DIGITAL WALL SWITCH, NUMBER INDICATES QUANTITY OF PUSH BUTTONS PER SINGLE GANG PLATE, LETTER INDICATES CONTROL ZONE WHEN SHOWN

PLUG-IN RECEPTACLE STRIP, QUANTITY AND SPACING OF RECEPTACLES AS NOTED OR SPECIFIED

X Y — SPECIAL-PURPOSE RECEPTACLE AS DEFINED ON PLANS

X Y OR X Y — TWO RECEPTACLES IN 2-GANG BOX UNDER COMMON COVER PLATE

X Y — DUPLEX RECEPTACLE

X Y — SIMPLEX RECEPTACLE

X Y — RECESSED FLOOR MOUNTED BOX, QUANTITY AND TYPE OF RECEPTACLES AS INDICATED

SUBSCRIPTS:

X - INDICATES TYPE
- GFCI - GROUND FAULT CIRCUIT INTERRUPTER
- IG - ISOLATED GROUND
- TR - TAMPER RESISTANT
- PLH - PLUG LOAD HALF CONTROLLED
- PLD - PLUG LOAD DUAL CONTROLLED
- USB - USB CHARGING STATION
- SPD - SURGE PROTECTIVE DEVICE

Y - INDICATES CIRCUIT NUMBER FROM PANELBOARD

CONDUIT TURNING UP

CONDUIT TURNING DOWN

(#X) — HOMERUN TO SOURCE (E.G. PANELBOARD, MCC) NUMBER IN PARENTHESES REPRESENTS CONDUCTOR SIZE OTHER THAN #12 SINGLE PHASE: 2#12, 1#12G IN 3/4"C THREE PHASE: 3#12, 1#12G IN 3/4"C UNLESS OTHERWISE NOTED, CONDUCTOR SIZE IS FOR ENTIRE CIRCUIT, SOURCE TO LAST DEVICE. ALSO, SEE ONE LINE DIAGRAM FOR CIRCUIT REQUIREMENTS

CONDUIT CONNECTION TO EQUIPMENT

CIRCUIT RUN BETWEEN DEVICES EXPOSED IN NON-ARCHITECTURALLY FINISHED AREAS; CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

CONDUIT RUN BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

(#X) — CIRCUIT HASH MARKS (WHEN INDICATED); LONG, SHORT, SINGLE DOT, AND DOUBLE DOT REPRESENT PHASE, NEUTRAL, EQUIPMENT GROUND, AND ISOLATED EQUIPMENT GROUND, RESPECTIVELY. X REPRESENTS CONDUCTOR SIZE OTHER THAN #12 IN 3/4" CONDUIT.

CIRCUIT CONTINUATION

CONDUIT STUBBED OUT AND CAPPED

CORD AND PLUG CONNECTION

XXX OR XXX — CONDUIT TAG OR CIRCUIT NUMBER - WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE ON THE SHEETS

GROUND CABLE

GROUND ROD

GENERAL NOTES:

1. THIS IS A STANDARD ELECTRICAL SYMBOLOGY SHEET. NOT ALL SYMBOLS MAY BE USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.
3. SEE P&ID LEGEND SHEET FOR PROJECT SPECIFIC EQUIPMENT SYMBOLS, EQUIPMENT ABBREVIATIONS, AND PIPING SYSTEM ABBREVIATIONS.

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER — ANDREW D. KANER — P26130 — IOWA — 08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

ELECTRICAL LEGEND 1

0 1" 2"

FILENAME: HDRE_ALL_DISCIPLINES.rte
SCALE: NONE
SHEET: G-5

COMMUNICATION SYMBOLOGY

- WALL MOUNTED TELEPHONE OUTLET
- WALL MOUNTED DATA OUTLET
- WALL MOUNTED COMBINATION TELEPHONE AND DATA OUTLET
- RECESSED FLOOR MOUNTED TELEPHONE OUTLET
- RECESSED FLOOR MOUNTED DATA OUTLET
- RECESSED FLOOR MOUNTED COMBINATION TELEPHONE AND DATA OUTLET

AUDIO/VISUAL SYMBOLOGY

- TV — TELEVISION OUTLET
- S — CEILING MOUNT SPEAKER
- S X — WALL MOUNT SPEAKER
  SPEAKER SUBSCRIPTS:
  X - INDICATES HEIGHT
- H — HORN TYPE TRANSDUCER
- VC — VOLUME CONTROL
- PAHE — HEAD END EQUIPMENT
- M — FLOOR MOUNTED MICROPHONE JACK
- M — WALL MOUNTED MICROPHONE JACK

SECURITY SYMBOLOGY

- DOOR POSITION SWITCH
- COMBINATION ELECTRIC DOOR STRIKE AND POSITION SWITCH
- R P — PROXIMITY CARD READER
- R K — PROXIMITY CARD READER WITH KEYPAD
- M — DUAL TECHNOLOGY MOTION DETECTOR
- REQUEST TO EXIT MOTION DETECTOR
- REQUEST TO EXIT PUSH BUTTON
- G — GLASS BREAK DETECTOR
- PTZ — CCTV CAMERA PAN/TILT/ZOOM WHEN INDICATED
- SEC — SECURITY EQUIPMENT CABINET
- R — REMOTE KEYPAD/CONTROL STATION

EMERGENCY ALARM SYMBOLOGY

- E — ALARM BELL
- E — ALARM HORN
- E — ALARM FLASHING LIGHT
- E — ALARM BELL AND FLASHING LIGHT COMBINATION UNIT
- E — ALARM HORN AND FLASHING LIGHT COMBINATION UNIT
- E — PUSHBUTTON OR PULLSTATION

SITE SYMBOLOGY

- EXTERIOR PAD MOUNTED TRANSFORMER
- POLE - MOUNTED TRANSFORMER
- X / Y — ELECTRICAL HANDHOLE OR MANHOLE
  X - INDICATES SEQUENCE NUMBER
  Y- MHX OR HHX
- X / Y — POLE/STANCHION MOUNTED FLOOD LUMINAIRE, LAMP TYPE AS SPECIFIED
- X / Y — POLE MOUNTED AREA OR ROADWAY LUMINAIRE, LAMP TYPE AS SPECIFIED
- X / Y — HIGH MAST LIGHTING, NUMBER OF LUMINAIRES AS SPECIFIED
  LIGHTING FIXTURE SUBSCRIPTS:
  X - INDICATES LUMINAIRE TYPE PER LUMINAIRE SCHEDULE
  Y - INDICATES CIRCUIT NUMBER FROM PANELBOARD
- POWER POLE
- DOWNGUY
- E — UNDERGROUND (UNO) ELECTRICAL AND COMMUNICATION SYSTEMS PATHWAY
- OHE — OVERHEAD ELECTRICAL AND COMMUNICATION SYSTEMS PATHWAY

CONTROL SYMBOLOGY

- ELECTRICAL CONNECTION
- OR OR — NO ELECTRICAL CONNECTION
- SV OR — SOLENOID VALVE
- X / Y — CONTROL/RELAY COIL:
  X-INDICATES TYPE
  Y-INDICATES LOOP NUMBER, WHEN USED
  TYPES:
  CR-CONTROL RELAY — TC-TIME CLOCK
  PC-PHOTOCELL — LC-LIGHTING CONTACTOR
  DP-DEFINITE PURPOSE — TR-TIMING RELAY
  M-MOTOR STARTER
- NORMALLY OPEN CONTACT (N.O.)
- NORMALLY CLOSED CONTACT (N.C.)
- NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS ENERGIZED
- NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS ENERGIZED
- NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS DE-ENERGIZED
- NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS DE-ENERGIZED
- NORMALLY OPEN TEMPERATURE SWITCH; CLOSE ON RISING TEMPERATURE
- NORMALLY CLOSED TEMPERATURE SWITCH; OPEN ON RISING TEMPERATURE
- NORMALLY OPEN FLOW SWITCH; CLOSE ON INCREASING FLOW
- NORMALLY CLOSED FLOW SWITCH; OPEN ON INCREASING FLOW
- NORMALLY OPEN LEVEL SWITCH, CLOSE ON RISING LEVEL
- NORMALLY CLOSED LEVEL SWITCH, OPEN ON RISING LEVEL
- NORMALLY OPEN PRESSURE SWITCH, CLOSE ON INCREASING PRESSURE
- NORMALLY CLOSED PRESSURE SWITCH, OPEN ON INCREASING PRESSURE
- NORMALLY OPEN LIMIT SWITCH, CLOSE ON REACHING LIMIT
- NORMALLY CLOSED LIMIT SWITCH, OPEN ON REACHING LIMIT
- MICROPROCESSOR (PLC, RTU, ETC.) OUTPUT
- MICROPROCESSOR (PLC, RTU, ETC.) INPUT
- FIELD WIRING EXTERNAL TO CONTROL PANEL
- OFF / HAND / AUTO — XOO / OOX — 3 POSITION SELECTOR SWITCH, MAINTAINED CONTACTS; UNLESS OTHERWISE NOTED, 2-POSITION SIMILAR
- NORMALLY OPEN PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED
- NORMALLY CLOSED PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

CONTROL SYMBOLOGY

- X — INDICATING LIGHT: X INDICATES LENS COLOR
- X — PUSH TO TEST INDICATING LIGHT: X INDICATES LENS COLOR

  LENS COLORS:

R - RED	Y - YELLOW
G - GREEN	W - WHITE
B - BLUE	A - AMBER

- THERMAL OVERLOAD ELEMENT
- OL / (X) — THERMAL OVERLOAD RELAY CONTACT. WHEN SHOWN X INDICATES QUANTITY.
- CPT — CONTROL POWER TRANSFORMER (CPT)
- RTM — RUN TIME METER

ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER — ANDREW D. KANER — P26139 — IOWA — 08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

ELECTRICAL LEGEND 2

0 — 1" — 2"

FILENAME	HDRE_ALL_DISCIPLINES.rte
SCALE	NONE
SHEET	G-6

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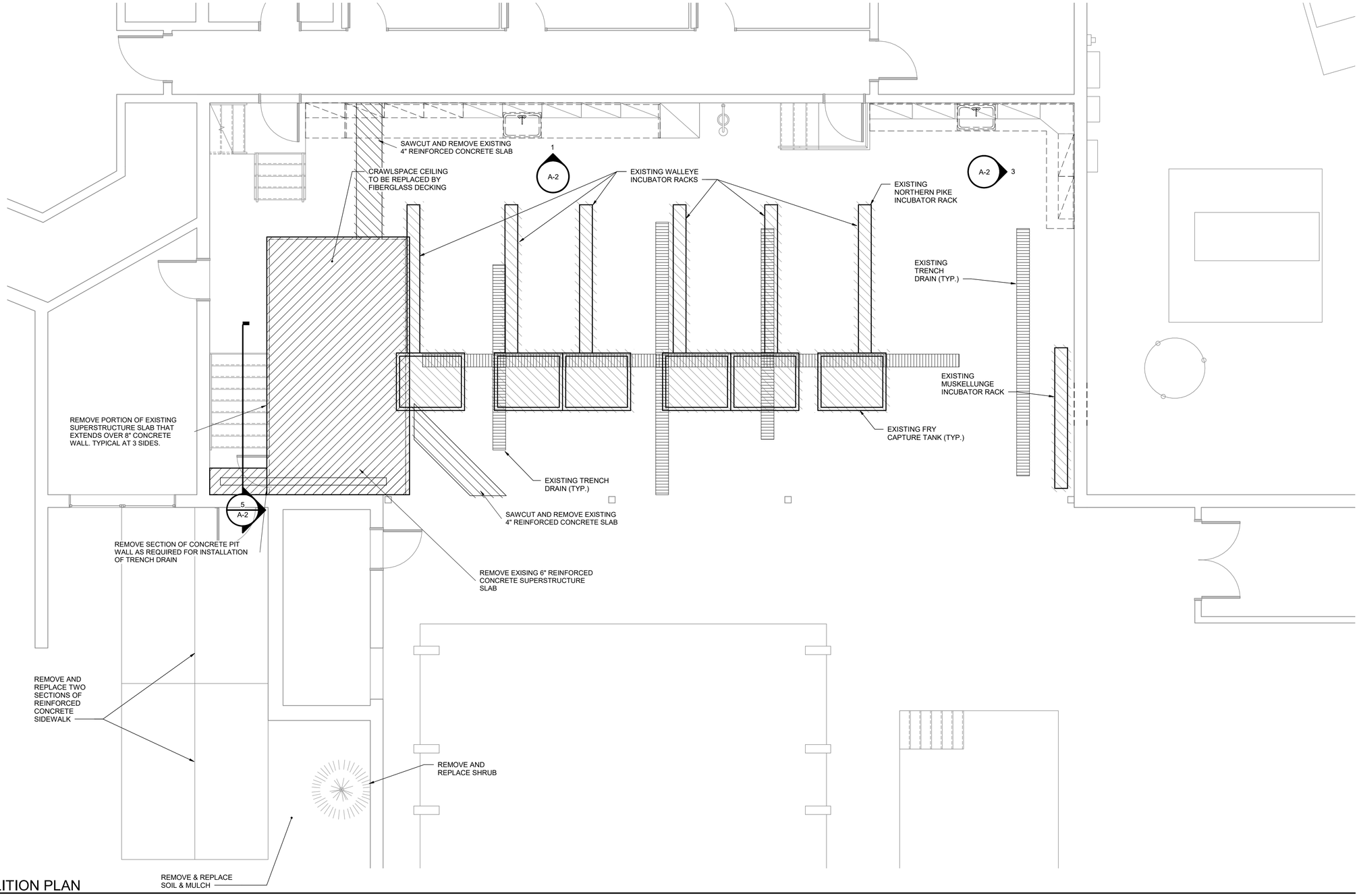

DEMOLITION PLAN

1/4" = 1'-0"

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STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
P26101
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PARTIAL FLOOR PLAN - DEMOLITION

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 1/4" = 1'-0"

SHEET X-1

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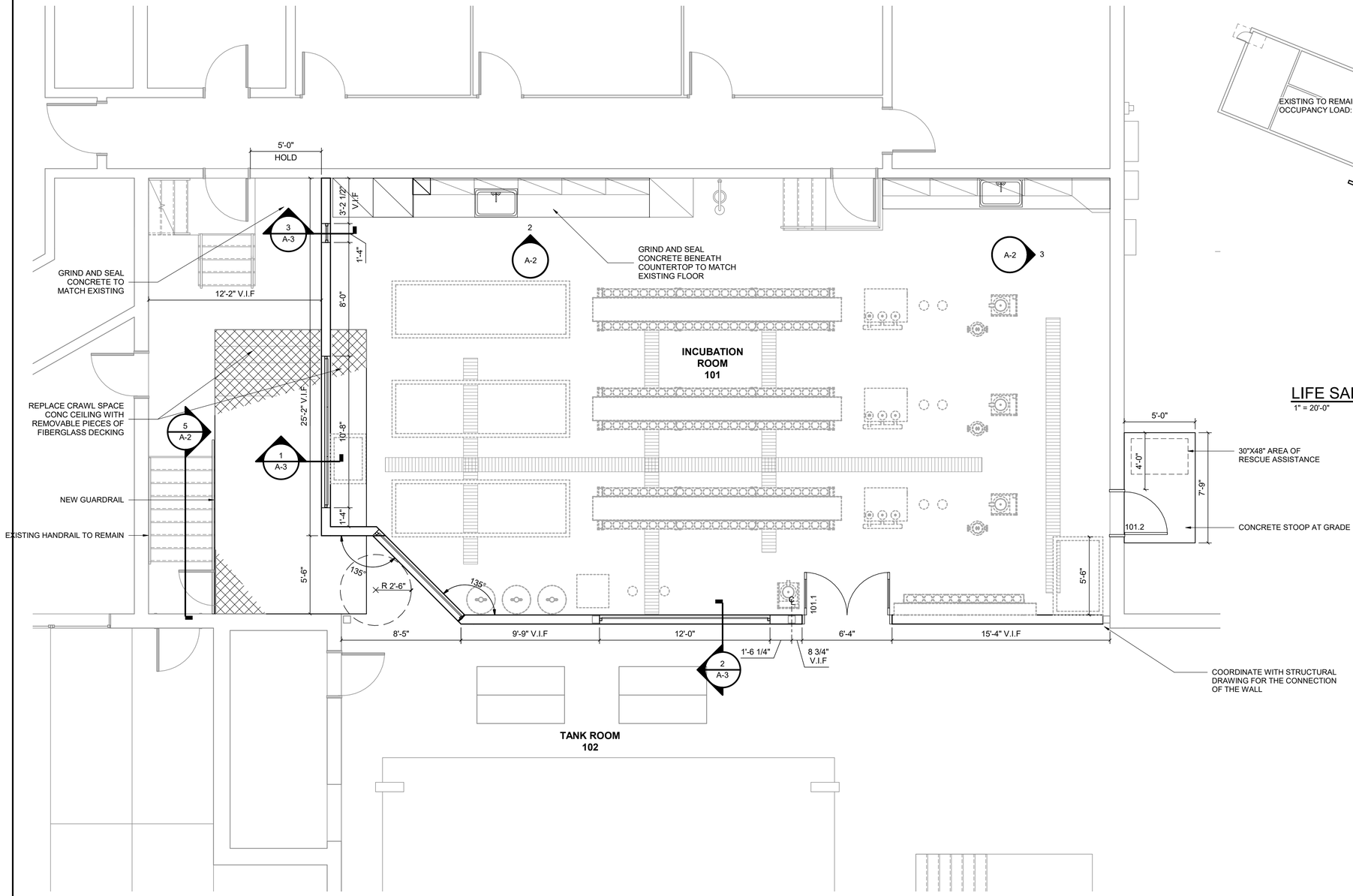
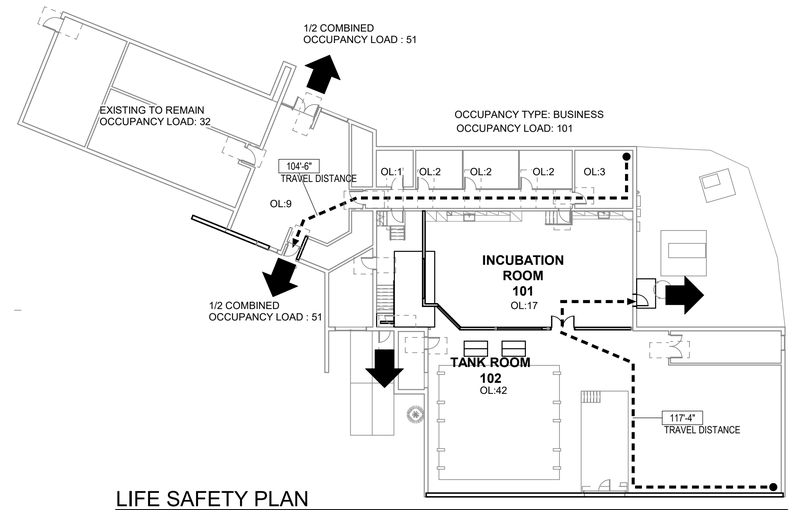


FLOOR PLAN

1/4" = 1'-0"



LIFE SAFETY PLAN

1" = 20'-0"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ARCHITECT
MATTHEW JOHN STOFFEL
07132
IOWA

Spirit Lake Fish Hatchery
Upgrade for RAS

PARTIAL FLOOR PLAN - NEW WORK

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE As indicated

SHEET A-1

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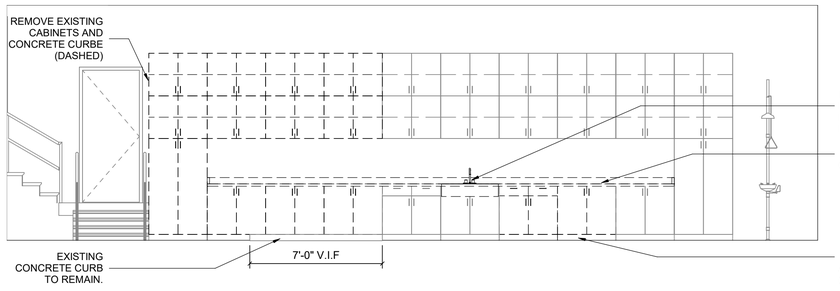
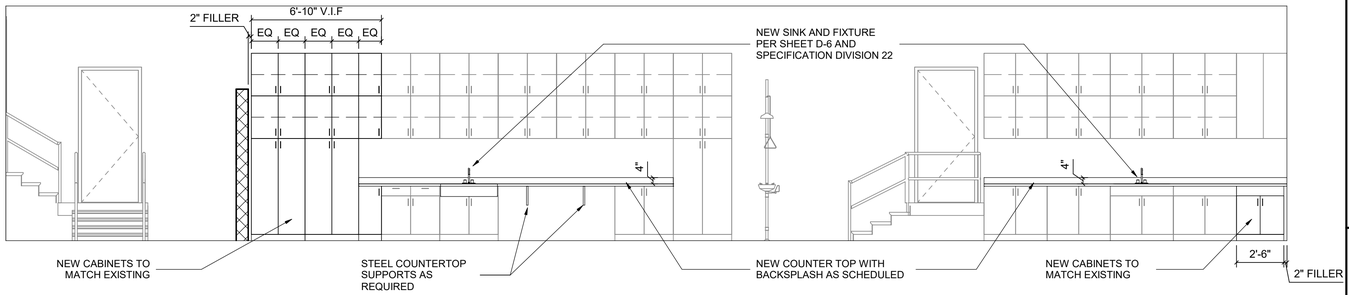


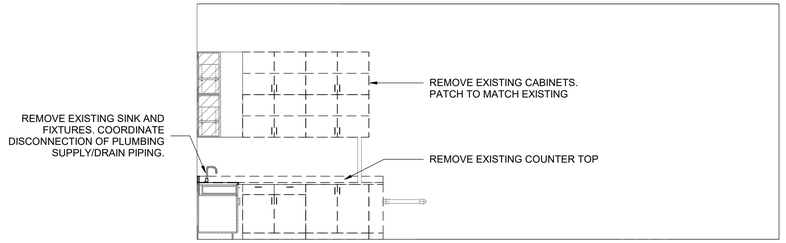
1 PARTIAL NORTH ELEVATION - INCUBATION ROOM 101 - DEMOLITION

1/4" = 1'-0"



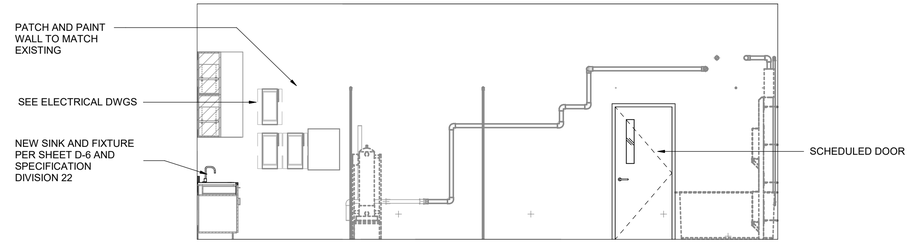
2 NORTH ELEVATION - INCUBATION ROOM 101

1/4" = 1'-0"



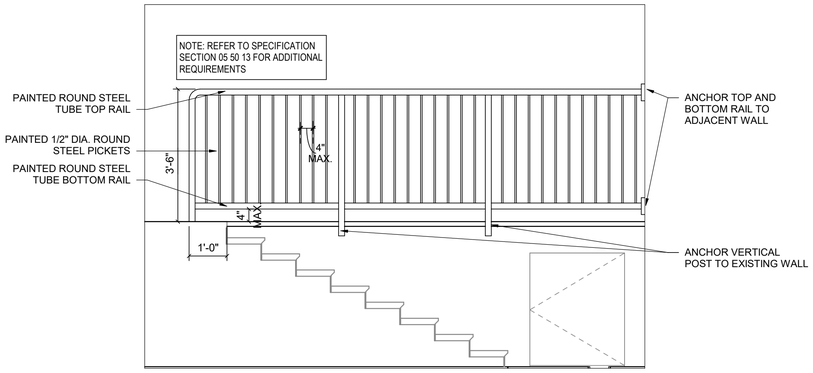
3 EAST ELEVATION - INCUBATION ROOM 101 - DEMOLITION

1/4" = 1'-0"



4 EAST ELEVATION - INCUBATION ROOM 101

1/4" = 1'-0"



5 GUARDRAIL ELEVATION

1/2" = 1'-0"

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PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ARCHITECT
MATTHEW JOHN STOFFEL
07132
IOWA

Spirit Lake Fish Hatchery Upgrade for RAS

ELEVATIONS

0 1" 2"

FILENAME	HDRE_ALL_DISCIPLINES.rte
SCALE	As indicated

SHEET A-2

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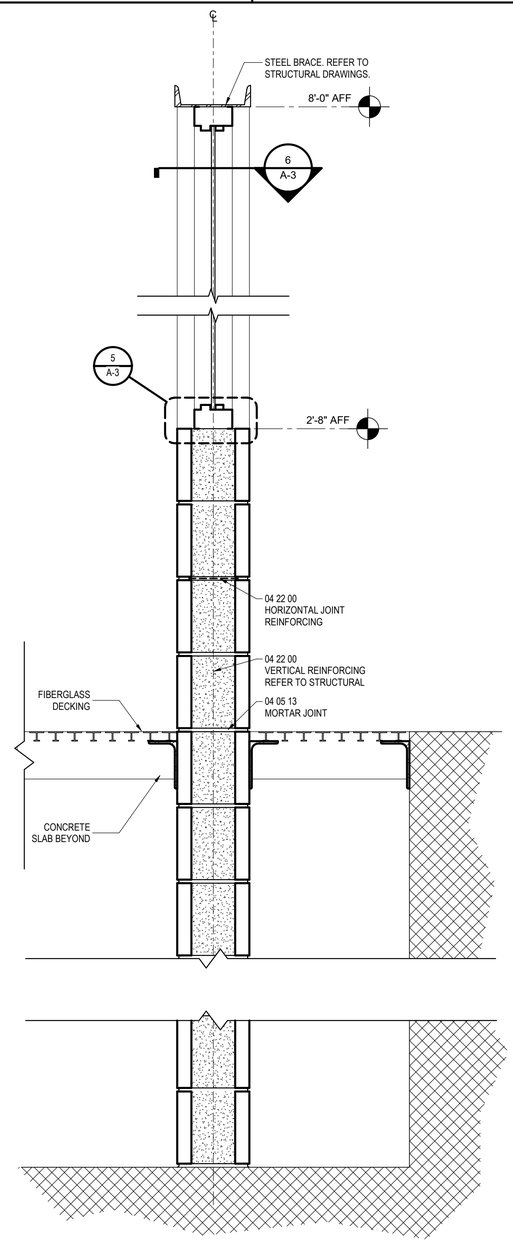
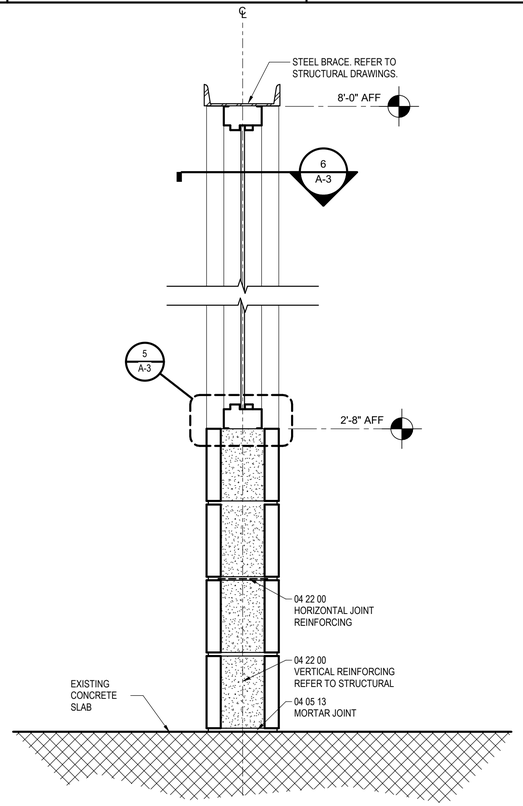
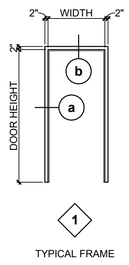


1 WALL SECTION @ PIT
1 1/2" = 1'-0"

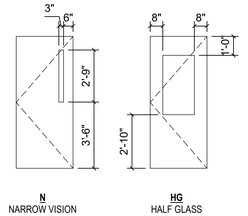


2 WALL SECTION @ CONCRETE SLAB
1 1/2" = 1'-0"



TYPICAL FRAME

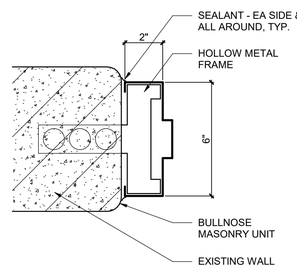
DOOR FRAME TYPE
1/4" = 1'-0"



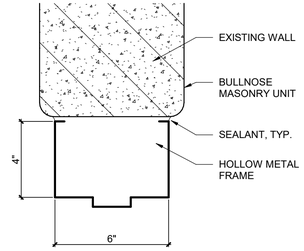
N
NARROW VISION

HG
HALF GLASS

DOOR PANEL TYPE
1/4" = 1'-0"



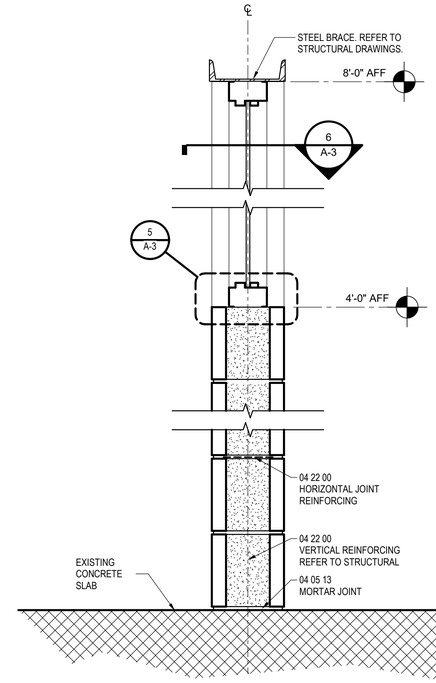
a DOOR JAMB DETAIL
3" = 1'-0"



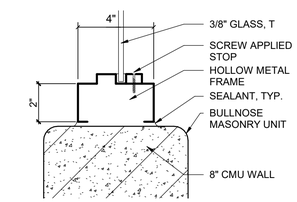
b DOOR HEAD DETAIL
3" = 1'-0"

DOOR AND FRAME SCHEDULE

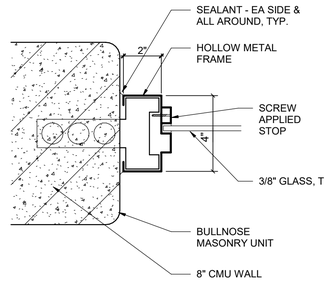
IDENTIFICATION	DIMENSION					PANEL					FRAME							
	WIDTH																	
DOOR NO.	W1	W2	TOTAL	H	T	PANEL COUNT	TYPE	MATERIAL	FINISH	GLAZING	TYPE	MATERIAL	FINISH	SILL HEIGHT	FIRE RATING	STC Rating	OVT Hardware Set	NOTES
101.1	3' -0"	3' -0"	6' - 0"	7' - 10"	0' - 1 3/4"	2	HG	HM	PAINTED	T	1	HM	PAINTED	0"				
101.2	3' -0"		3' - 0"	7' - 0"	0' - 1 3/4"		N	HM	PAINTED	T	1	HM	PAINTED	0"				



3 WALL SECTION @ WINDOW
1 1/2" = 1'-0"



5 WINDOW SILL DETAIL
3" = 1'-0"



6 WINDOW JAMB DETAIL
3" = 1'-0"

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ARCHITECTURAL	M. STOFFEL
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PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ARCHITECT
MATTHEW JOHN STOFFEL
07132
IOWA

Spirit Lake Fish Hatchery Upgrade for RAS

DETAILS

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE As indicated

SHEET A-3

GENERAL

G1. SCOPE
THE NOTES ON THIS SHEET AND THE STANDARD STRUCTURAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT WHETHER SPECIFICALLY CALLED OUT OR NOT, EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY ON STRUCTURAL SHEETS. IF THERE ARE QUESTIONS, THEY SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER AND ANSWERED IN WRITING PRIOR TO CONSTRUCTION.

G2. APPLICABLE SPECIFICATIONS AND CODES
A. INTERNATIONAL BUILDING CODE (IBC) 2015 WITH APPLICABLE EDITIONS OF THE CODE REFERENCED STANDARDS.
B. LOCAL JURISDICTION AMENDMENTS

G3. DESIGN CRITERIA
1. APPLIES TO ALL STRUCTURES (UNO)
A. DEAD LOAD:
1. ACTUAL TRIBUTARY STRUCTURE WEIGHT
B. LIVE LOAD:
1. GRATING: 100 PSF

G4. SAFETY
SAFETY AND STRUCTURE STABILITY DURING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. STRUCTURES HAVE BEEN DESIGNED TO RESIST THE DESIGN LIVE LOADS ONLY AS A COMPLETED STRUCTURE.

G5. OPENINGS
OPENINGS FOR PIPES, DUCTS, CONDUITS, ETC. ARE NOT ALL SHOWN ON THE STRUCTURAL DRAWINGS. COORDINATE AND PROVIDE OPENINGS AS REQUIRED TO ACCOMMODATE ALL WORK SHOWN OR SPECIFIED IN THE CONTRACT DOCUMENTS AND OTHERWISE REQUIRED FOR THE FURNISHING OF A FUNCTIONALLY COMPLETE PROJECT. REINFORCE AROUND OPENINGS PER STANDARD STRUCTURAL DETAILS UNLESS OTHERWISE SHOWN.

G6. STANDARD DETAILS
THE STANDARD DETAILS DEPICT TYPICAL DETAILING TO BE USED ON THIS PROJECT. IF CONDITIONS ARE NOT EXPLICITLY SHOWN ON THE DRAWINGS THEY SHALL BE MADE SIMILAR TO THE STANDARD DETAILS. OBTAIN APPROVAL OF ENGINEER IN WRITING FOR SIMILAR CONDITIONS PRIOR TO CONSTRUCTION.

G7. THE CONTACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION AS REQUIRED TO COORDINATE NEW CONSTRUCTION. SUBMIT REQUIRED CHANGES FOR APPROVAL.

G8. CONTRACTOR TO SUBMIT FOR REVIEW ALL EQUIPMENT SIZES, OPERATING WEIGHTS, VIBRATION FORCES, SUPPORT LOCATIONS, ALONG WITH ANY FLOOR OPENINGS, NOTCHES, AND RECESSES REQUIRED BY SUCH EQUIPMENT. CONCRETE SUPPORT PADS AND/OR FRAMING REQUIRED TO SUPPORT SAID EQUIPMENT SHALL NOT BE FABRICATED AND PLACED UNTIL THE CONCRETE SUPPORT PADS AND/OR FRAMING IS APPROVED TO SUPPORT THE EQUIPMENT.

CONCRETE

C1. DESIGN STRENGTHS:
F'c = 4000 PSI
Fy = 60,000 PSI

C2. CONCRETE COVER
UNLESS OTHERWISE NOTED, PROVIDE CONCRETE COVER FOR REINFORCING AS FOLLOWS:
CONCRETE DEPOSITED AGAINST EARTH: 3"
ALL OTHER: 2"
SEE DRAWINGS FOR EXCEPTIONS

C3. SEE SPECIFICATIONS FOR REINFORCING PLACEMENT REQUIREMENTS.

C4. REFER TO OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION FOR EMBEDDED ITEMS AND PENETRATIONS NOT SHOWN ON STRUCTURAL DRAWINGS. AS REQUIRED TO ACCOMMODATE ALL WORK SHOWN OR SPECIFIED IN THE CONTRACT DOCUMENTS AND OTHERWISE REQUIRED FOR THE FURNISHING OF A FUNCTIONALLY COMPLETE PROJECT. REINFORCE AROUND OPENINGS PER STANDARD STRUCTURAL DETAILS UNLESS OTHERWISE SHOWN.

C5. PROVIDE 3/4" CHAMFERS AT ALL EXPOSED EDGES. NOT ALL CHAMFERS MAY BE SHOWN ON DRAWINGS.

C6. FIELD ADJUST REINFORCING AT OPENINGS AND EMBEDDED ITEMS AS INDICATED.

C7. ANCHOR BOLTS NOT SPECIFIED BY ENGINEER SHALL BE DESIGNED AND CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER, RETAINED BY THE CONTRACTOR, IN ACCORDANCE WITH APPLICABLE PROJECT AND CODE REQUIREMENTS. SUBMIT AS A SHOP DRAWING FOR REVIEW AND APPROVAL BY THE ENGINEER. COORDINATE LOCATION, SIZE AND EMBEDMENT PRIOR TO CASTING CONCRETE.

C8. ABSOLUTELY NO WELDING OF REINFORCING BARS OR TORCHING TO BEND REINFORCING BARS SHALL BE ALLOWED WITHOUT SPECIFIC APPROVAL FROM THE STRUCTURAL ENGINEER.

C9. ALL CAST IN PLACE AND POST-INSTALLED ANCHORS INDICATED IN THE STRUCTURAL DOCUMENTS SHALL COMPLY WITH APPENDIX D OF ACI 318 AND CHAPTER 19 OF THE IBC. ALL EXPANSION AND ADHESIVE ANCHORS SHALL HAVE THE ICC REPORT SHOWING EQUIVALENT LOAD CAPACITY. SUBMIT AND INSTALL PER THE ICC EVALUATION REPORT.

MASONRY

M1. DESIGN STRENGTHS:
F'm= 1500 PSI
Fy = 60,000 PSI

M2. GROUT FOR FILLING MASONRY CAVITIES TO BE COARSE GROUT UNO, MAXIMUM COARSE AGGREGATE SIZE IS 3/8 INCH.

M3. GROUT POURS SHALL NOT EXCEED 4 FEET IN HEIGHT UNLESS CLEANOUTS ARE PROVIDED IN THE BOTTOM COURSE OF THE CELL(S) TO BE GROUTED AND WRITTEN PERMISSION IS OBTAINED FOR HIGH LIFT GROUTING.

M4. RESTRICTED BAR ANCHORAGE:
IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS FAR AS REQUIRED, THE BARS SHALL EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOK. SHOW ON SHOP DRAWINGS AND HIGHLIGHT WITH A BOX TO BRING TO ENGINEER'S ATTENTION.

M5. ANCHOR BOLTS:
ALL EXPANSION AND ADHESIVE ANCHORS SHALL HAVE THE ICC REPORT SHOWING EQUIVALENT LOAD CAPACITY. SUBMIT AND INSTALL PER THE ICC EVALUATION REPORT.

M6. IF BOND BEAMS AT INTERSECTING WALLS ARE SHOWN ON THE DRAWINGS TO MEET AT DIFFERENT ELEVATIONS, EXTEND REIFORCING OF BOTH BOND BEAMS AROUND INTERSECTING CORNER NOT LESS THAN 4 FEET IN EACH DIRECTION.

M7. LINTEL BLOCKS SHALL NOT BE USED AS BOND BEAM BLOCKS EXCEPT AT OPENINGS WHERE BOND BEAMS AND LINTELS COINCIDE.

STEEL

S1. DESIGN STRENGTHS:
WIDE FLANGE Fy=50 KSI
ALL OTHER PLATES AND SHAPES: Fy=36 KSI

S2. DIMENSIONS:
TO CENTERLINES OF COLUMNS AND BEAMS, TOP SURFACES OF BEAMS AND TUBES AND BACKS OF CHANNELS AND ANGLES UNO.

S3. ELEVATIONS:
TOP OF STEEL REFERS TO TOP SURFACE OF MEMBER OR FLANGE UNO.

S4. WHEN FILLET WELD SIZE IS NOT INDICATED, PROVIDE MAXIMUM WELD SIZE BASED ON MATERIAL THICKNESS IN ACCORDANCE WITH AISC SPECIFICATIONS.

S5. ALL BOLTED STRUCTURAL CONNECTIONS ARE BEARING TYPE CONNECTIONS UNLESS OTHERWISE SPECIFIED TO BE SLIP-CRITICAL. PROVIDE LOAD INDICATING WASHERS AT SLIP-CRITICAL CONNECTIONS.

S6. CONFORM TO AISC 360, STEEL CONSTRUCTION MANUAL.

ALUMINUM

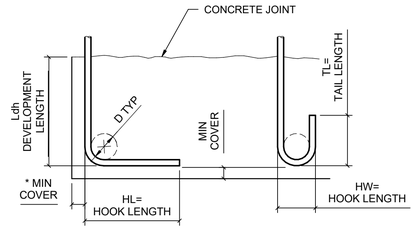
A1. STRUCTURAL ALUMINUM YIELD STRENGTHS
STRUCTURAL ALUMINUM: Fy=35 KSI
STRUCTURAL ALUMINUM IS ALLOY 6061-T6 UNO

A2. DIMENSIONS:
TO CENTERLINES OF COLUMNS AND BEAMS, TOP SURFACES OF BEAMS AND TUBES AND BACKS OF CHANNELS AND ANGLES UNO.

A3. ELEVATIONS:
TOP OF ALUMINUM REFERS TO TOP SURFACE OR FLANGE OF MEMBER UNO.

A4. WHEN FILLET WELD SIZE IS NOT INDICATED, PROVIDE MAXIMUM WELD SIZE FOR THE MATERIAL THICKNESS IN ACCORDANCE WITH THE LATEST EDITION OF THE "ALUMINUM DESIGN MANUAL" BY THE ALUMINUM ASSOCIATION.

A5. ALUMINUM IN CONTACT WITH DISSIMILAR MATERIALS OR CONCRETE:
CONTACT SURFACES SHALL BE PROVIDED WITH GALVANIC SEPERATION PER SPECIFICATIONS.



90 DEG STD HOOK 180 DEG STD HOOK

BAR SIZE GRADE 60	HL	HW	TL	D	f'c=4.0 OR 4.5 KSI Ldh *
#3	6"	3"	3"	2 1/4"	6"
#4	8"	4"	4 1/2"	3"	7"
#5	10"	5"	5"	3 3/4"	9"
#6	1'-0"	6"	6"	4 1/2"	10"
#7	1'-2"	7"	7"	5 1/4"	12"
#8	1'-4"	8"	8"	6"	14"
#9	1'-7"	11 3/4"	10 1/2"	9 1/2"	15"
#10	1'-10"	1'-1 1/4"	11 1/2"	10 3/4"	17"
#11	2'-0"	1'-2 3/4"	1'-1"	12"	19"

* COMPLYING WITH MINIMUM COVER REQUIREMENTS OF ACI 318, 12.5.3. OTHERWISE Ldh MUST BE RE-CALCULATED.

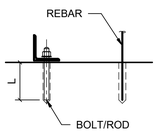
REINFORCING HOOK SCHEDULE

LAP SPLICE AND EMDEDMENT LENGTHS f'c =4.0 ksi fy = 60 ksi f'c =4.5 ksi		
BAR	BARS SPACED GREATER THAN 4"	BARS SPACED LESS THAN OR EQUAL TO 4"
#3	14"	20"
#4	19"	32"
#5	29"	46"
#6	39"	62"
#7	55"	87"
#8	69"	107"
#9	76"	116"
#10	97"	140"
#11	120"	146"

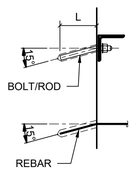
NOTES:

1. PROVIDE MINIMUM LAP SPLICE LENGTHS AND EMBEDMENTS PER TABLE UNLESS NOTED OTHERWISE. EMBEDMENT LENGTH EQUALS THE LAP SPLICE LENGTH UNLESS OTHERWISE NOTED.
2. BAR SPACING AT LAP SPLICE IS THE MINIMUM CLEAR DISTANCE BETWEEN LAPPED BARS PLUS ONE BAR DIAMETER.
3. ALL SPLICES TO BE CONTACT SPLICES AND WIRED TOGETHER UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CONCRETE REINFORCING LAP AND EMBEDMENT SCHEDULE



VERTICAL



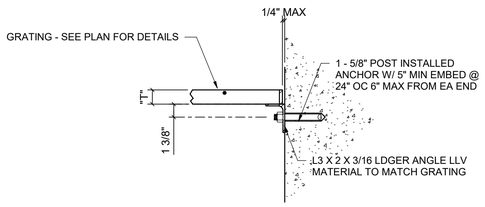
HORIZONTAL

REINFORCING BARS		ANCHOR BOLTS/RODS	
BAR SIZE	EMBED LENGTH (L)	DIA (IN)	EMBED LENGTH (L)
#3	4"	3/8"	5"
#4	5"	1/2"	6"
#5	6"	5/8"	7"
#6	7"	3/4"	8"
#7	8"	7/8"	9"
#8	9"	1"	10"
#9	10"		
#10	12"		

NOTES:

1. ADHESIVE TYPE IS SUBJECT TO APPROVAL OF THE ENGINEER OF RECORD.
2. EMBEDMENT LENGTHS SHOWN ARE MINIMUM UNLESS NOTED OTHERWISE ON DRAWINGS OR AS OTHERWISE REQUIRED BY SPECIFICATIONS.
3. FOR ADDITIONAL REQUIREMENTS, SEE SPECIFICATION SECTION 03 15 19.

ADHESIVE ANCHOR DETAIL AND SCHEDULE

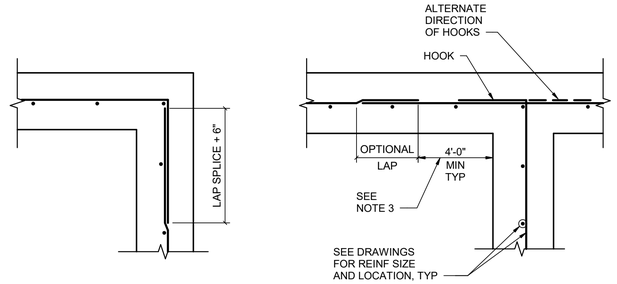


ONLY TO BE USED AT CONT WALL ABOVE GRAING OR AT PRE-EXISTING CONCRETE CONSTRUCTION

NOTES:

1. GRATING SIZE PER CONTRACT DOCUMENTS.
2. ANGLES MOUNTED ON MSONRY SHALL HAVE CELLS GROUTED SOLID TO ACCEPT POST-INSTALLED ANCHORS
3. ATTACH GRATING TO ALL SUPPORT ANGLES WITH BOLTED LIPS, SPACED AT 2'-0" MAX CENTERS
4. PROVIDE DISSIMILAR MATERIAL PROTECTION FOR ALUMINUM IN CONTACT WITH CONCRETE PER SPECIFICATION.

GRATING AND SUPPORT



NOTES:

1. ALL HOOKS SHALL BE STD 90 DEGREE HOOKS.
2. SEE DRAWINGS FOR ADDITIONAL HORIZONTAL BARS. STAGGER BETWEEN TYPICAL REINF SPACING, EXTEND TO 1/5 OF DISTANCE TO NEAREST ADJACENT WALL IN EACH DIRECTION, UNO.
3. OPTIONAL LAP LOCATION. APPLIES TO BOTH DOUBLE AND SINGLE LAYER CONDITIONS TYP.

WALL REINFORCEMENT AT CORNERS AND INTERSECTIONS

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
BRUCE A. BRADLEY
P26147
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE As indicated
SHEET S-1

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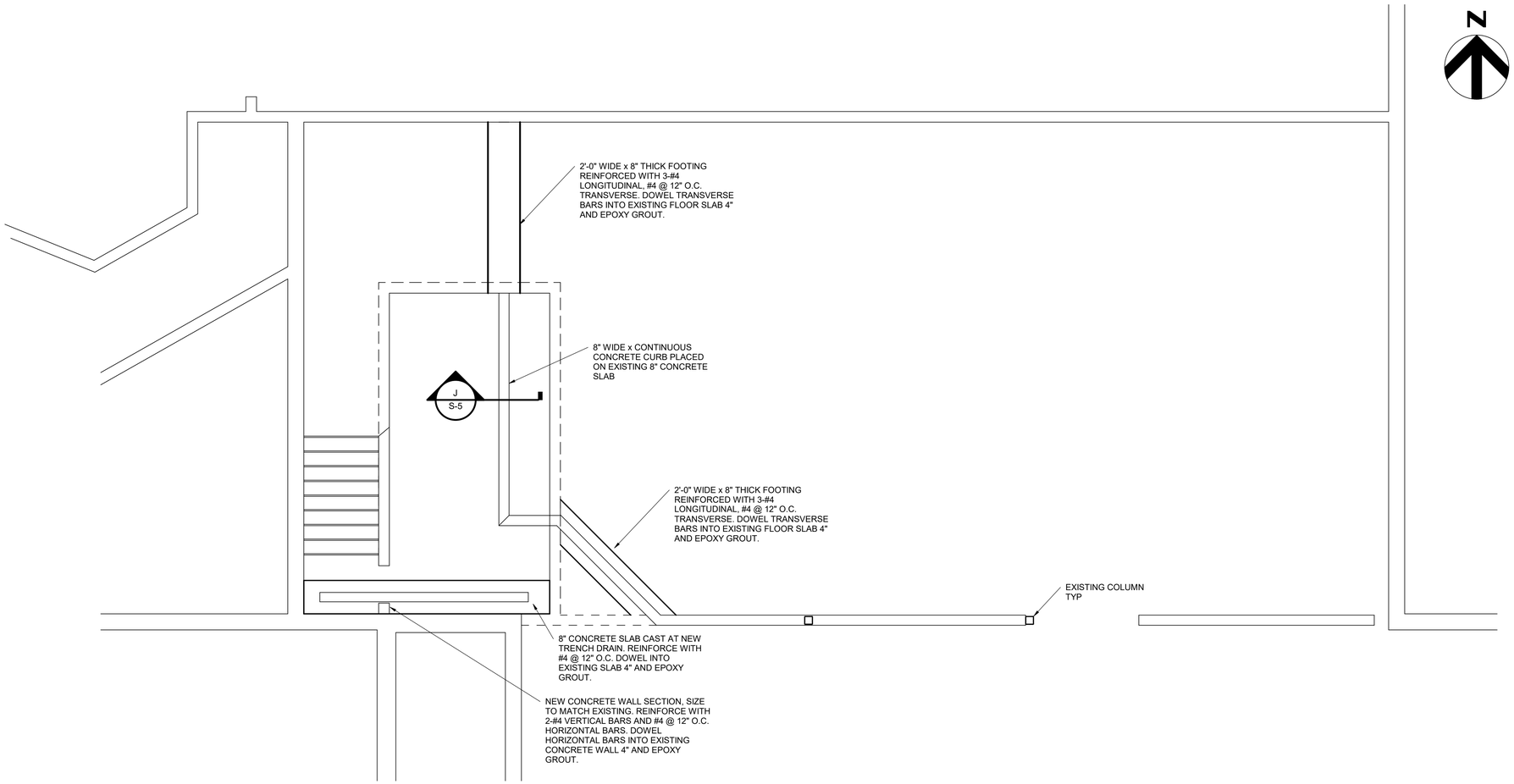

SLAB PLAN

1/4" = 1'-0"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
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P26147
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PIT LEVEL PLAN

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 1/4" = 1'-0"

SHEET S-2

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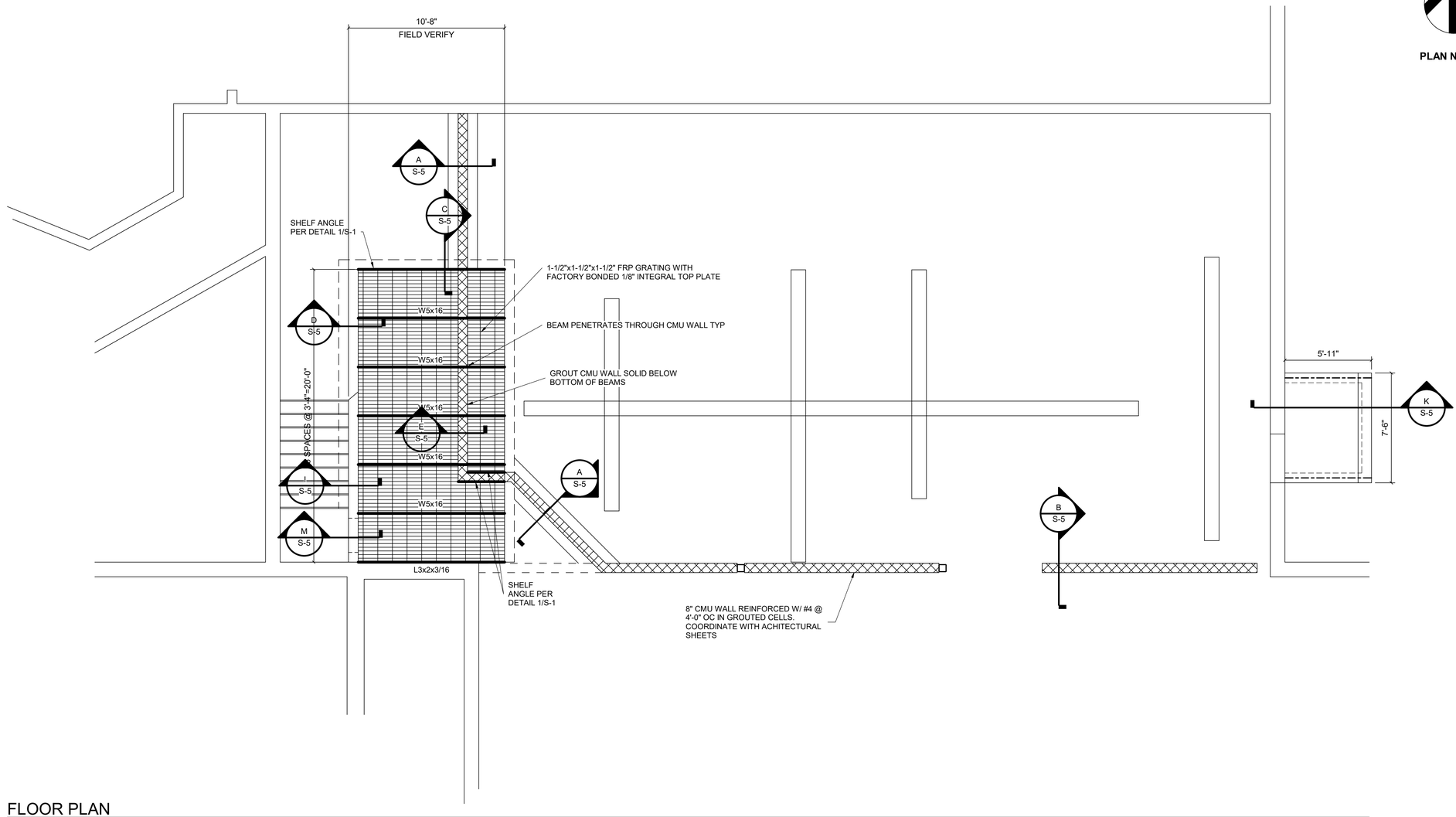

FLOOR PLAN

1/4" = 1'-0"

PLAN NORTH

TRUE NORTH

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

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Spirit Lake Fish Hatchery
Upgrade for RAS

STRUCTURAL FLOOR PLAN

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 1/4" = 1'-0"

SHEET **S-3**

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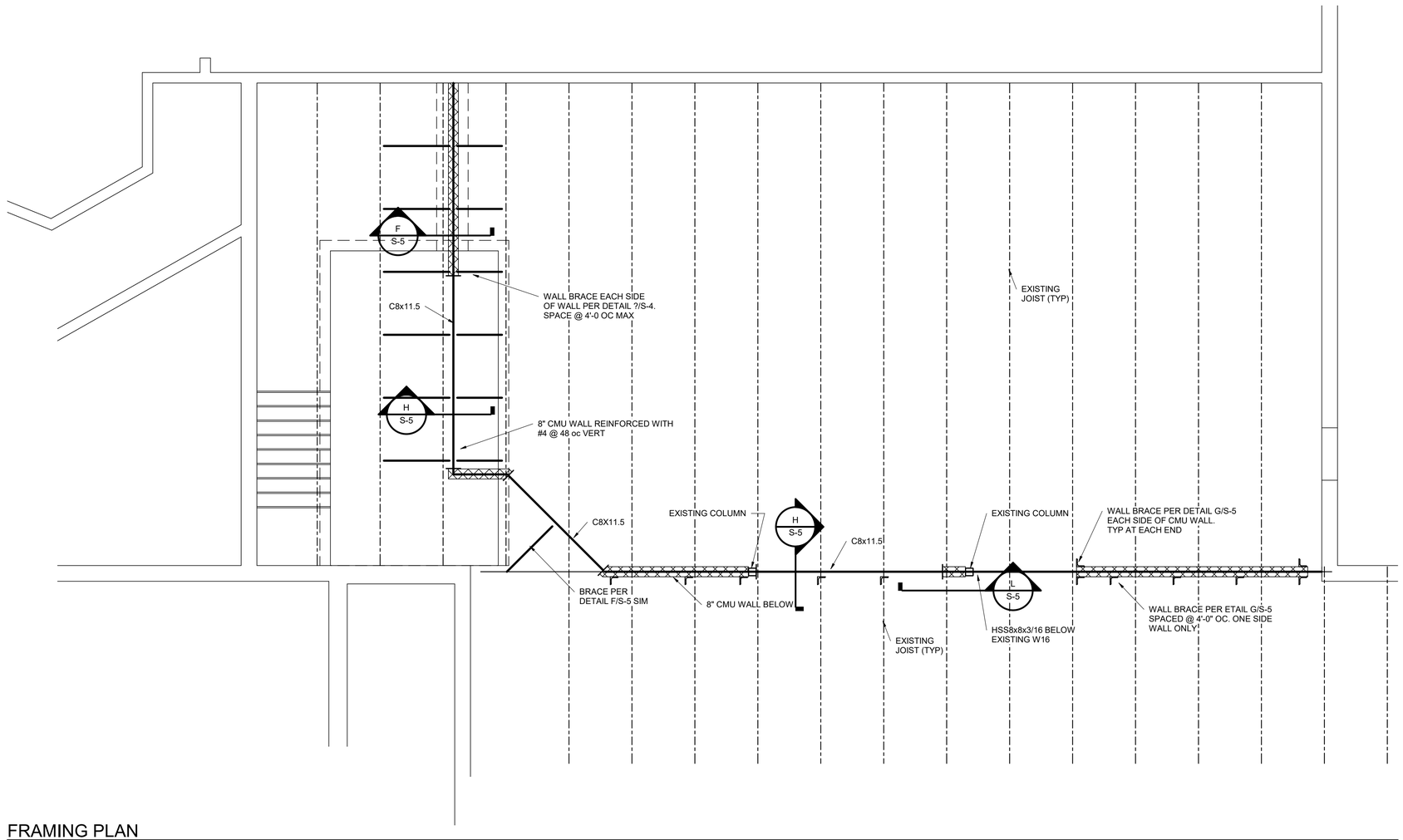

FRAMING PLAN

1/4" = 1'-0"

PLAN NORTH

TRUE NORTH

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

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Spirit Lake Fish Hatchery Upgrade for RAS

STRUCTURAL FRAMING PLAN

0 1" 2"

FILENAME	HDRE_ALL_DISCIPLINES.rte
SCALE	1/4" = 1'-0"

SHEET S-4

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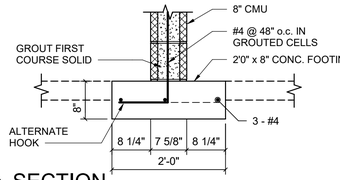
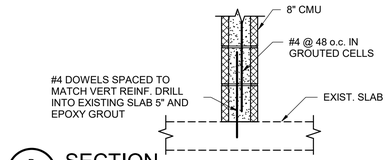
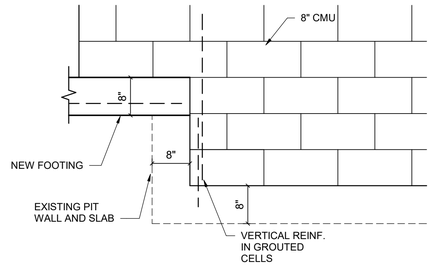


A S-3 SECTION
3/4" = 1'-0"



B S-3 SECTION
3/4" = 1'-0"



C S-3 SECTION
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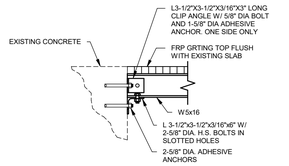

D S-3 SECTION
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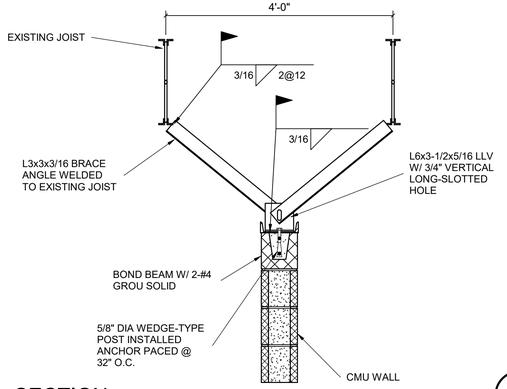

F S-4 SECTION
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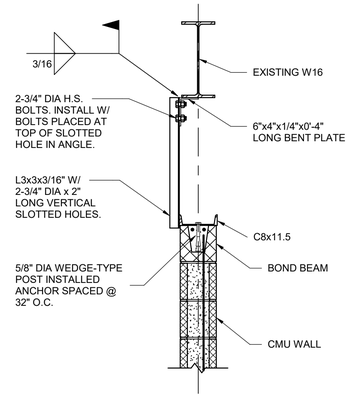
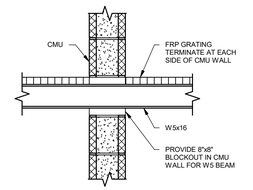


NOTES:
1. SPACE BRACES @ 4'-0" O.C.
2. PLACE BRACE AT ENDS OF CMU WALL SEGMENTS

G S-3 SECTION
3/4" = 1'-0"



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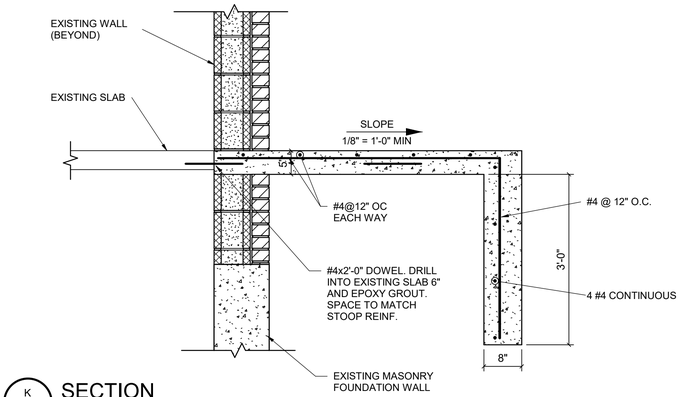

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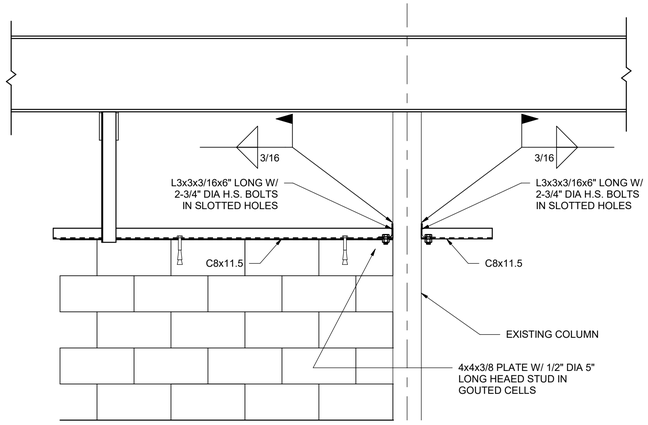

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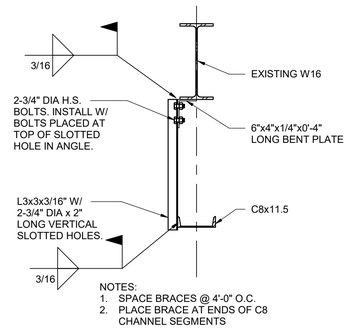

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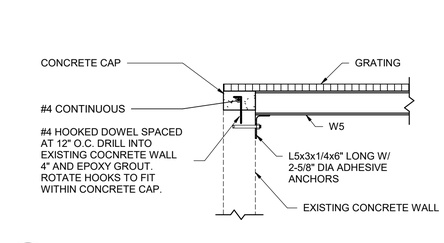

I S-3 SECTION
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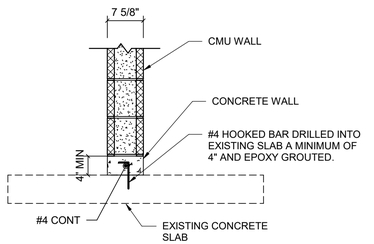

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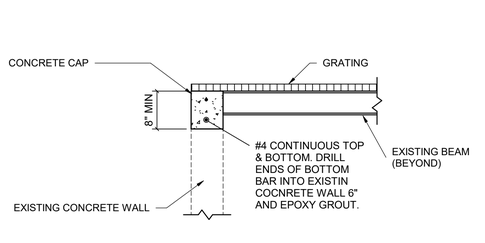

M S-3 SECTION
3/4" = 1'-0"

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

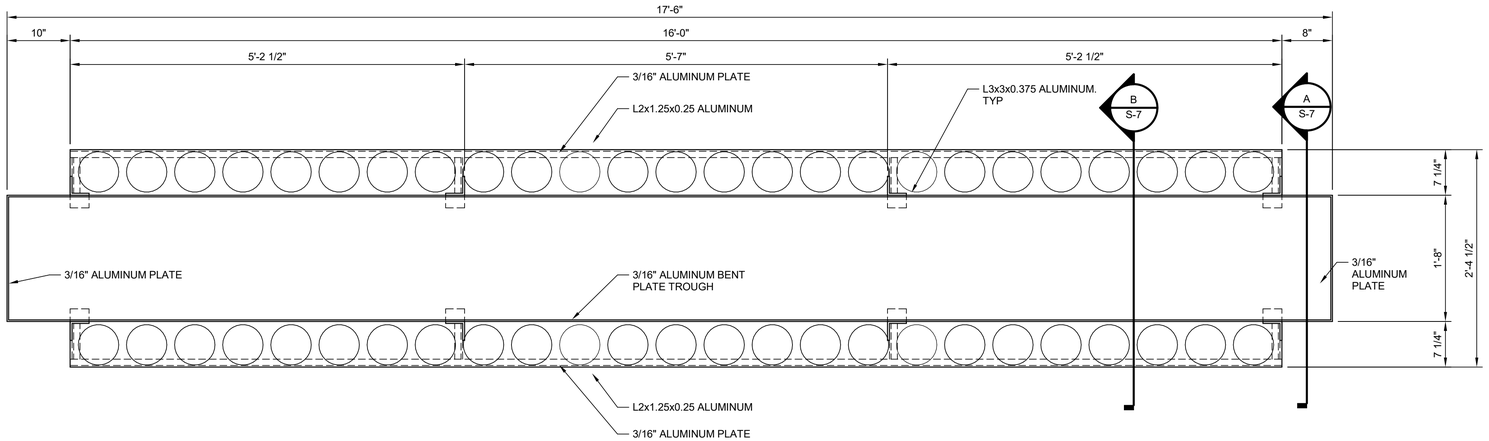
LICENSED PROFESSIONAL ENGINEER
BRUCE A. BRADLEY
P26147
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

MULTIPLE STRUCTURE NAME SECTIONS AND DETAILS

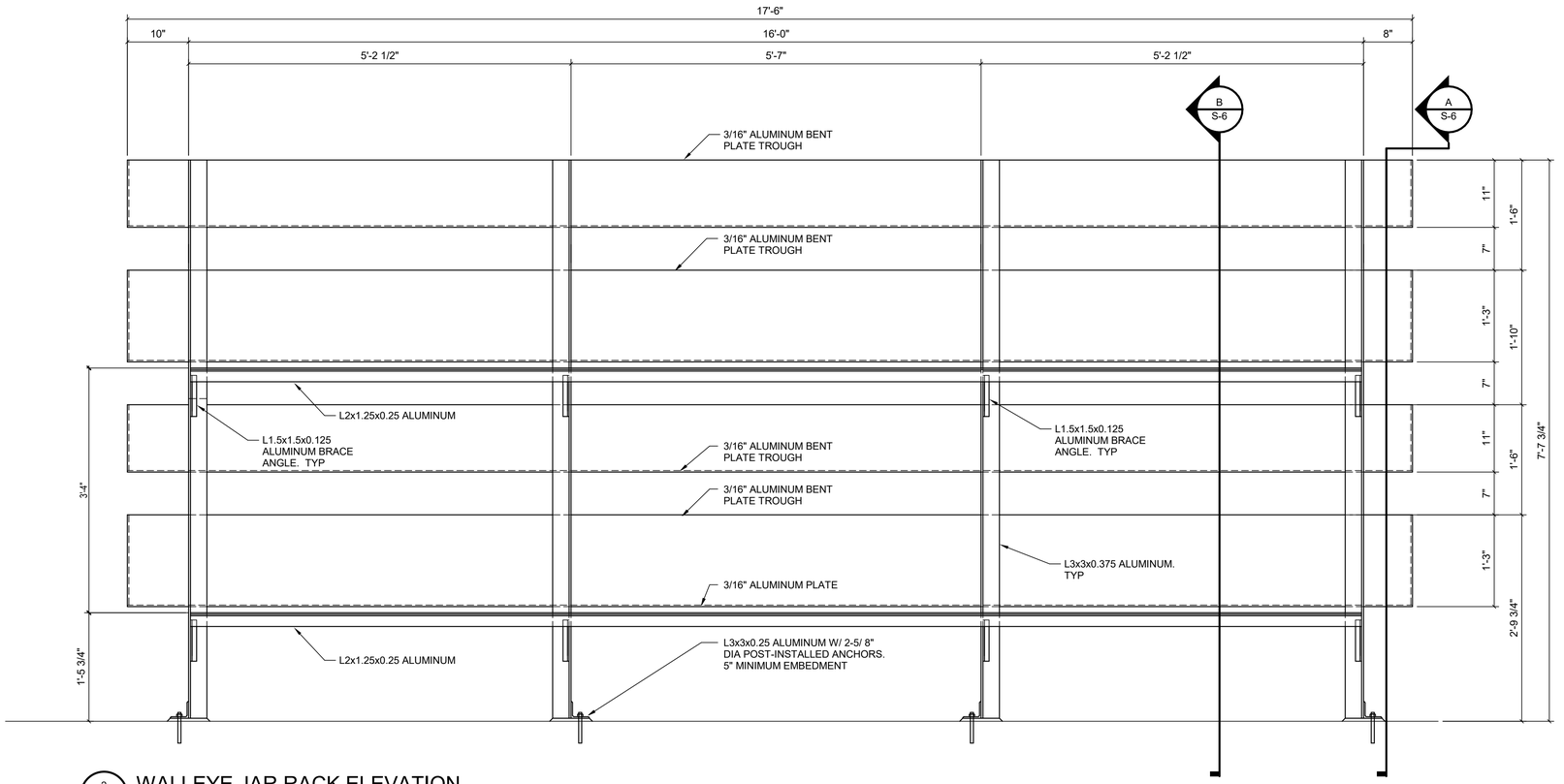
0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE 3/4" = 1'-0"
SHEET S-5



1 WALLEYE JAR RACK PLAN

1" = 1'-0"



2 WALLEYE JAR RACK ELEVATION

1" = 1'-0"

PLAN NORTH

TRUE NORTH

GENERAL NOTES:

1. SEE SHEET D-4 FOR PIPING.

ISSUE	DATE	DESCRIPTION
	08/21/2020	100% SUBMITTAL

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
BRUCE A. BRADLEY
P0614
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

WALLEYE JAR RACK PLAN & ELEVATION

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 1" = 1'-0"

SHEET S-6

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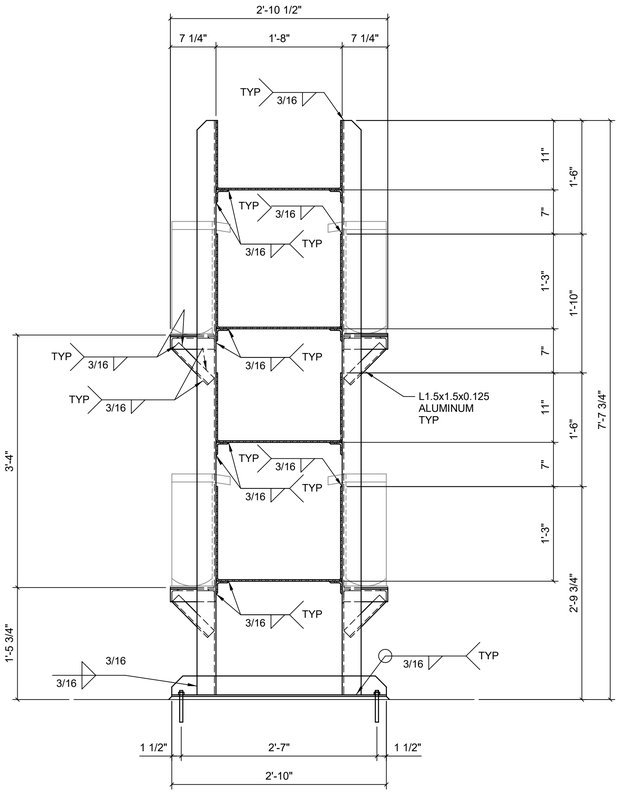
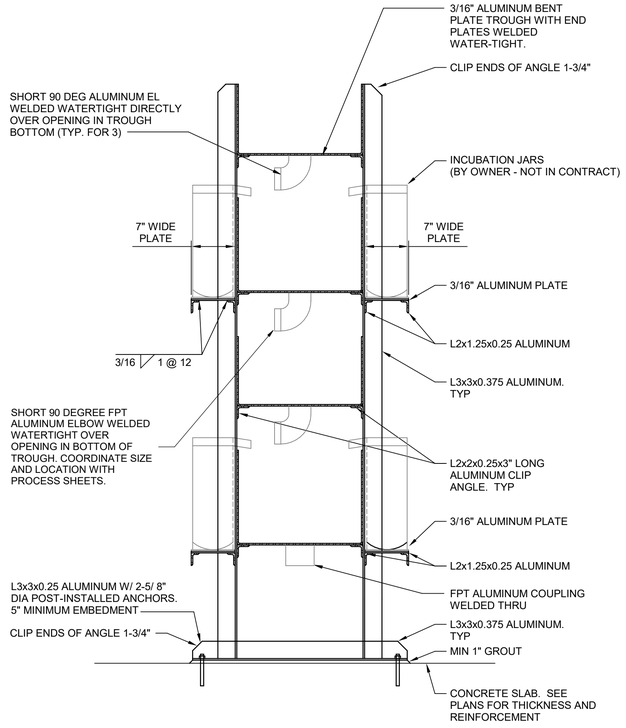


A S-6 WALLEYE JAR RACK SECTION A
1" = 1'-0"



B S-6 WALLEYE JAR RACK SECTION B
1" = 1'-0"

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

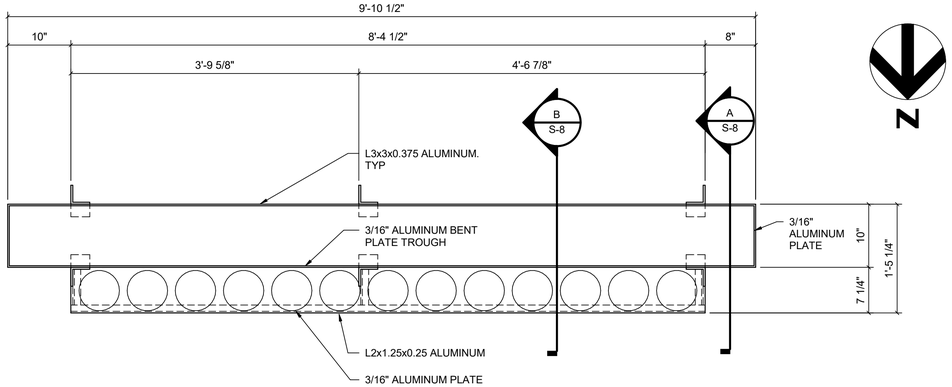
LICENSED PROFESSIONAL ENGINEER
BRUCE A. BRADLEY
P26147
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

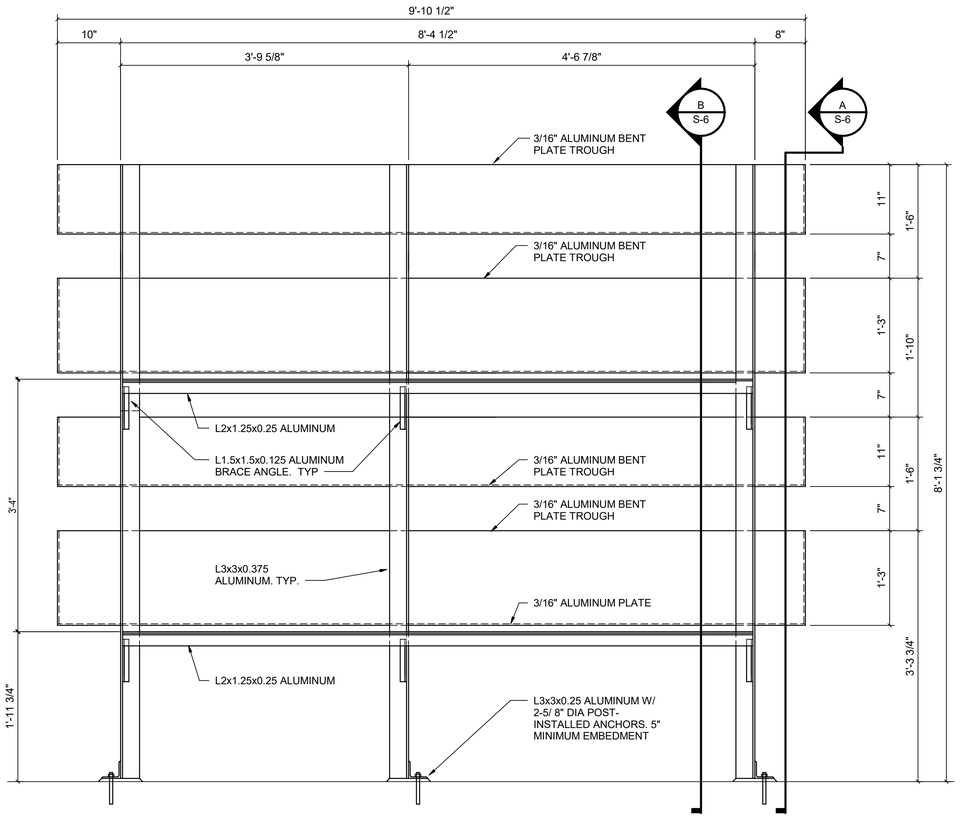
WALLEYE JAR RACKS SECTIONS & DETAILS

0 1" 2"

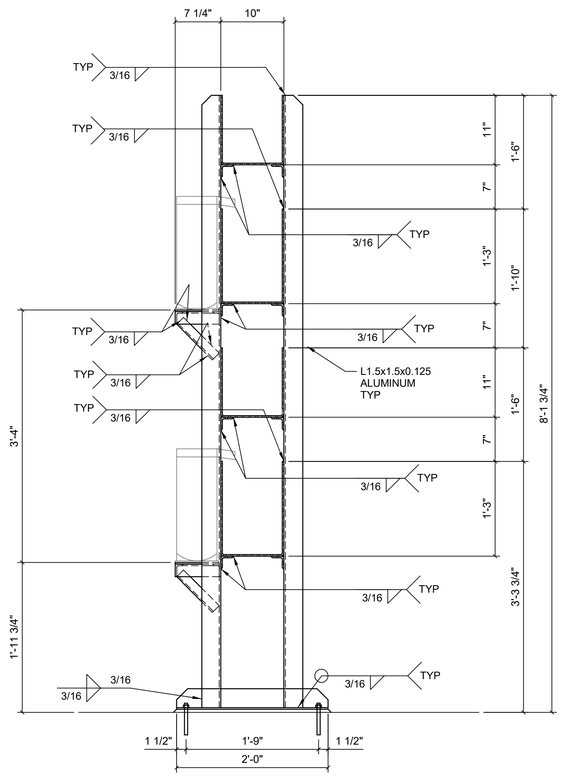
FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE 1" = 1'-0"
SHEET S-7



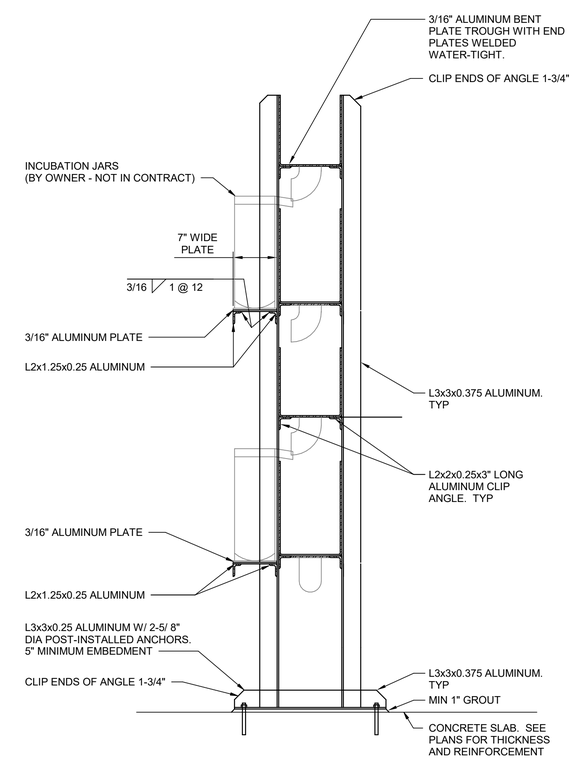
1 ESOCID JAR RACK PLAN
1" = 1'-0"



2 ESOCID JAR RACK ELEVATION
1" = 1'-0"



A S-8 SOCID JAR RACK SECTION
1" = 1'-0"



B S-8 SOCID JAR RACK SECTION
1" = 1'-0"

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

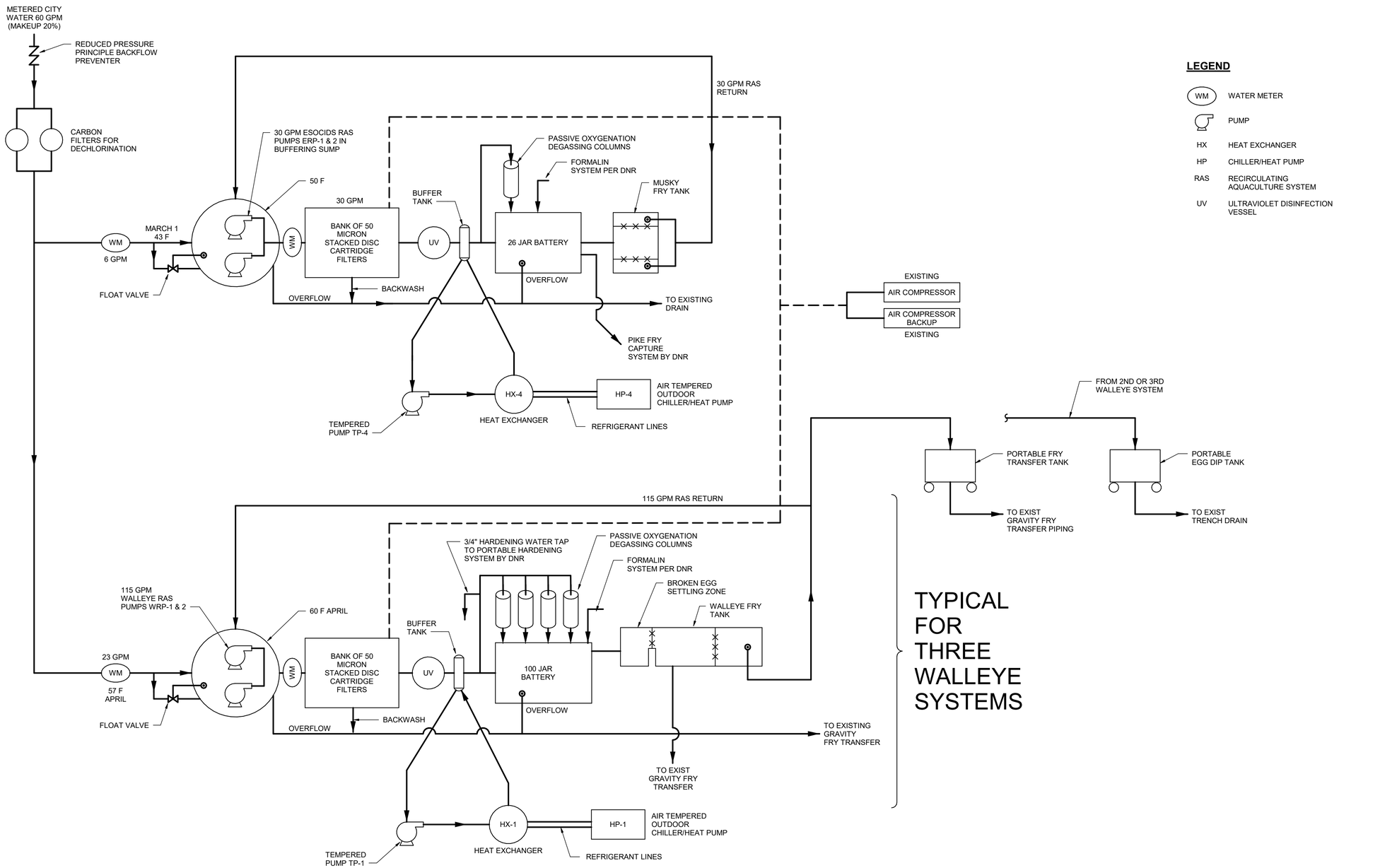
LICENSED PROFESSIONAL ENGINEER
BRUCE A. BRADLEY
P16147
IOWA
08/21/2020

Spirit Lake Fish Hatchery
Upgrade for RAS

ESOCID JAR RACK PLANS & SECTIONS

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE 1" = 1'-0"
SHEET S-8



ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
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IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PROCESS FLOW DIAGRAM

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 12" = 1'-0"

SHEET D-1

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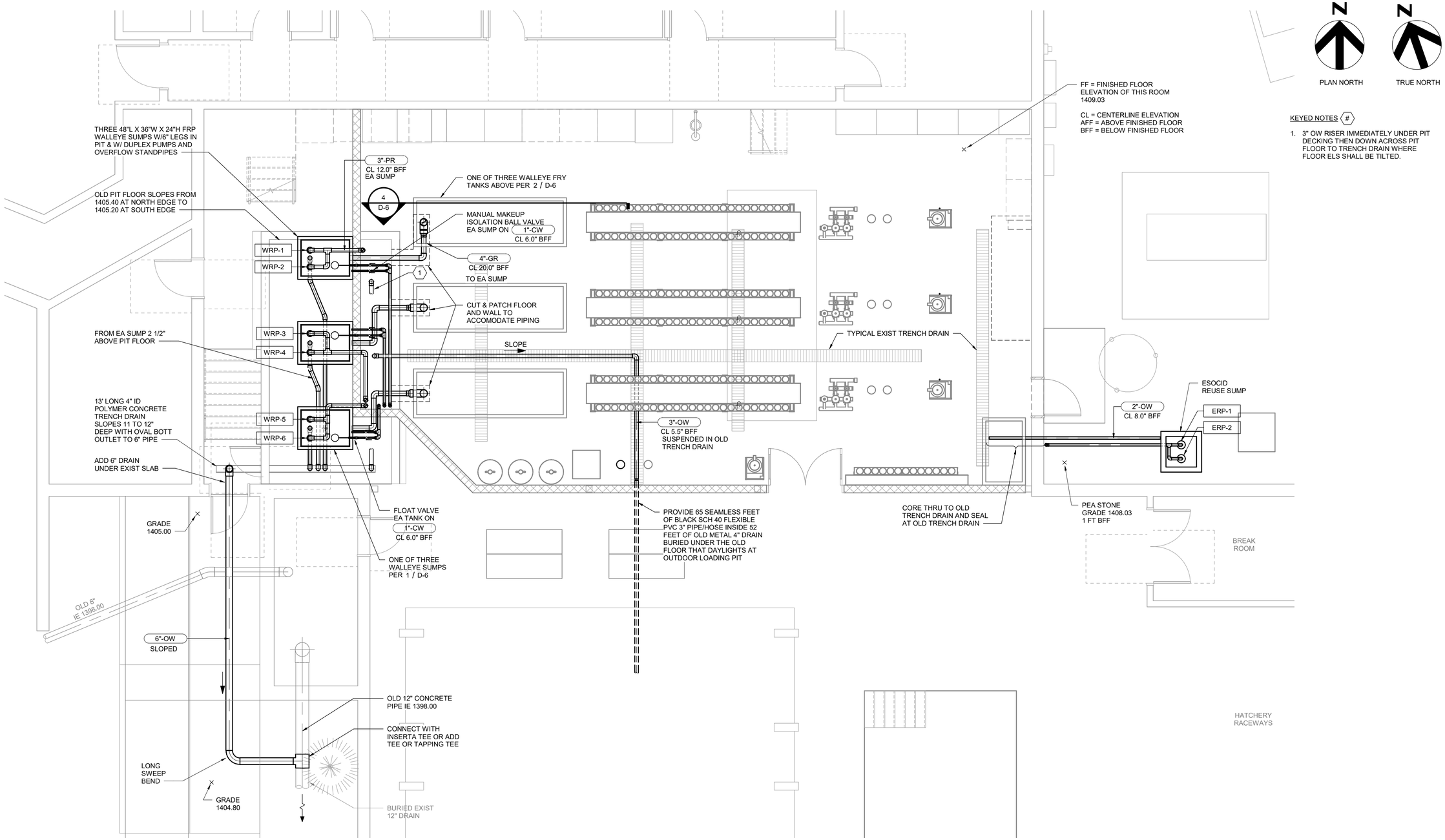

BELOW FLOOR PLAN

1/4" = 1'-0"

0 2'-0" 4'-0" 8'-0"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
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IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PROCESS PLAN BELOW FLOOR

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 1/4" = 1'-0"

SHEET D-2

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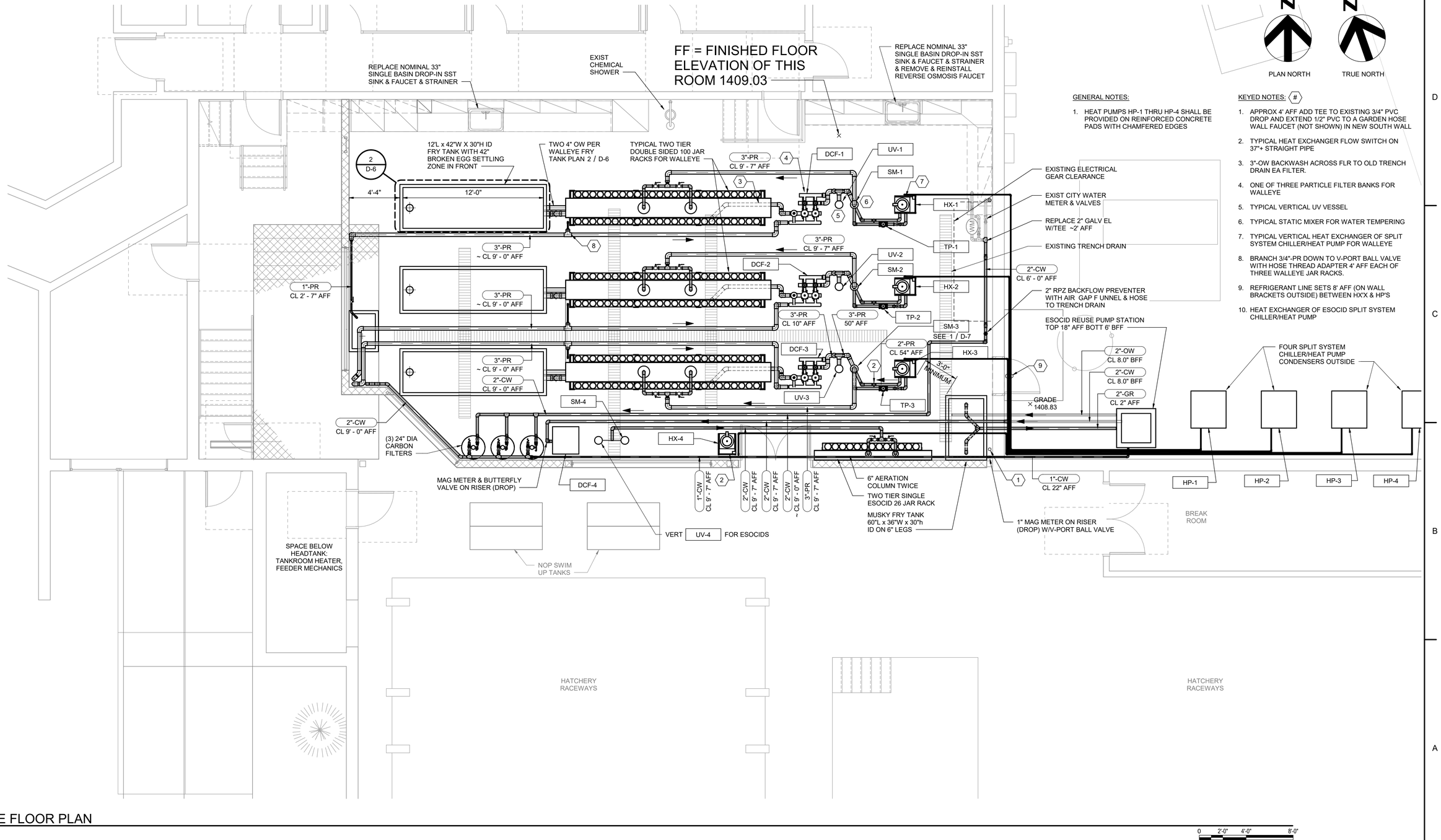

ABOVE FLOOR PLAN

1/4" = 1'-0"

0 2'-0" 4'-0" 8'-0"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

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TROY A. TALSMA
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08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PROCESS PLAN ABOVE FLOOR

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte

SCALE 1/4" = 1'-0"

SHEET D-3

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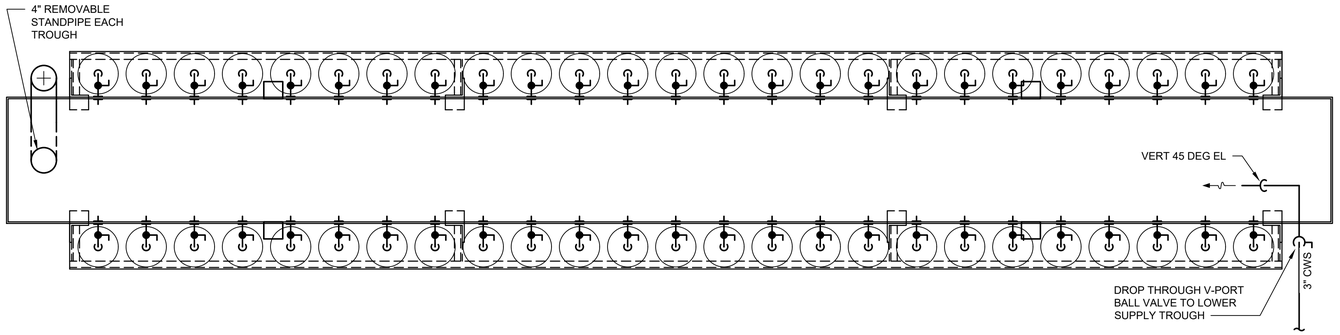
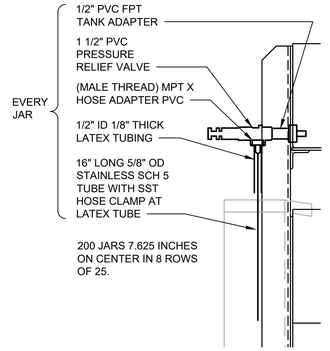


1 - JAR RACK PIPING PLAN

APPROX SCALE: 1" = 1'-0"

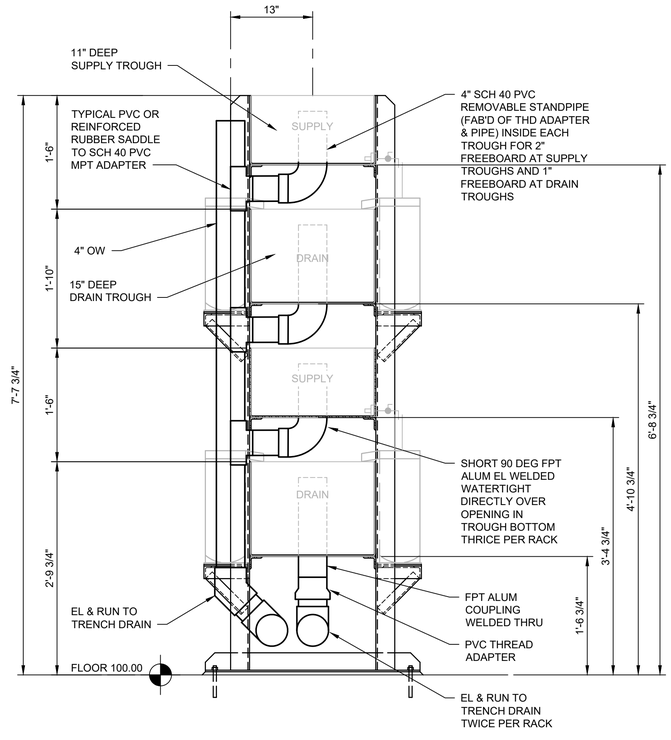
6" 0 6" 12"



2 - JAR PIPING

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

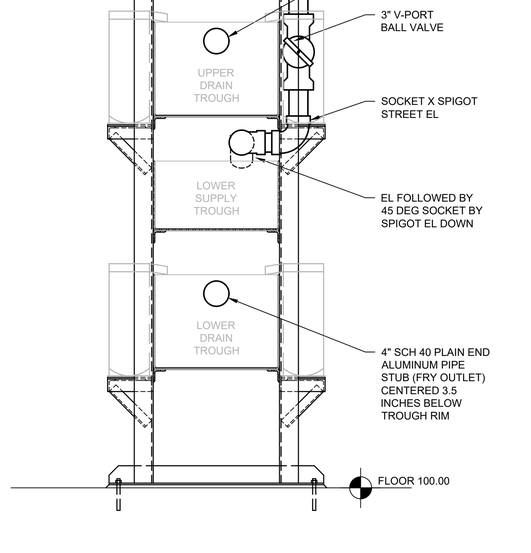
4" 0 4" 8"



A - JAR RACK PIPING EAST END

SCALE: 1" = 1'-0"

6" 0 6" 12"



B - JAR RACK PIPING WEST END

SCALE: 1" = 1'-0"

6" 0 6" 12"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
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08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

WALLEYE JAR RACK PIPING

0 1" 2"

FILENAME D-4.DWG

SCALE AS NOTED

SHEET D-4

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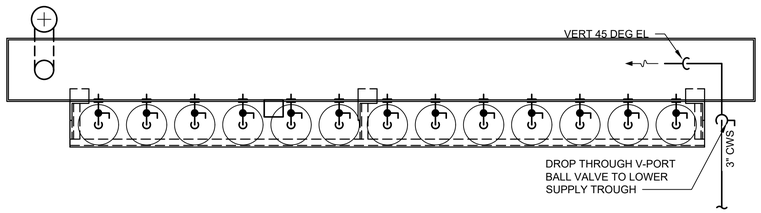
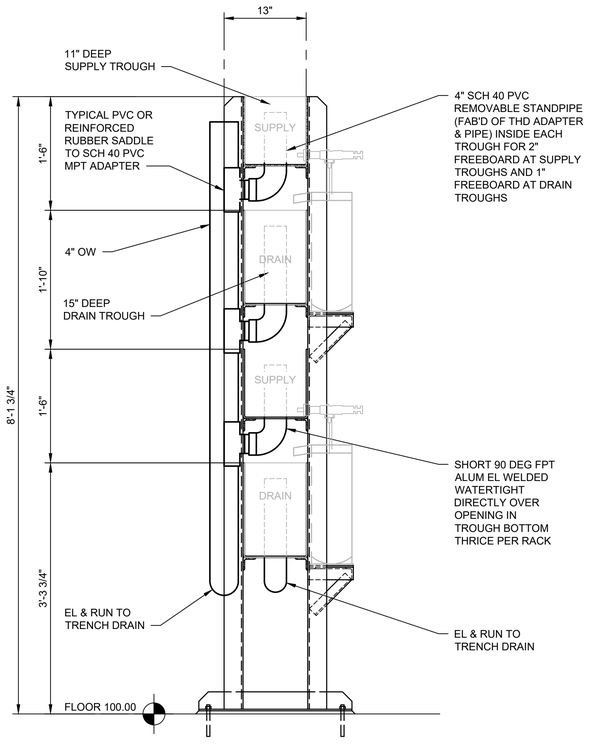


1 - ESOCID JAR RACK PIPING PLAN

APPROX SCALE: 1" = 1'-0"

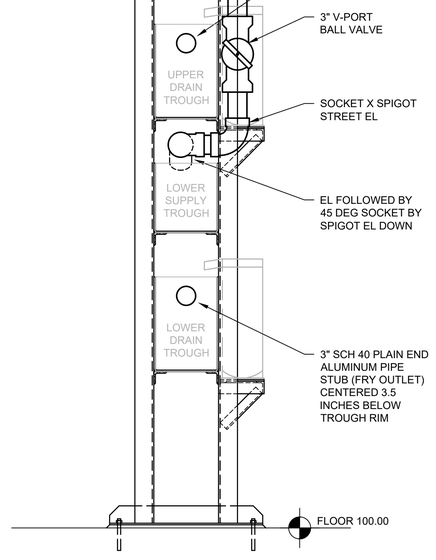
6" 0 6" 12"



A - ESOCID JAR RACK PIPING EAST END

SCALE: 1" = 1'-0"

6" 0 6" 12"



B - ESOCID JAR RACK PIPING WEST END

SCALE: 1" = 1'-0"

6" 0 6" 12"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

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08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

ESOCID JAR RACK PIPING

0 1" 2"

FILENAME D-5.DWG
SCALE AS NOTED

SHEET D-5

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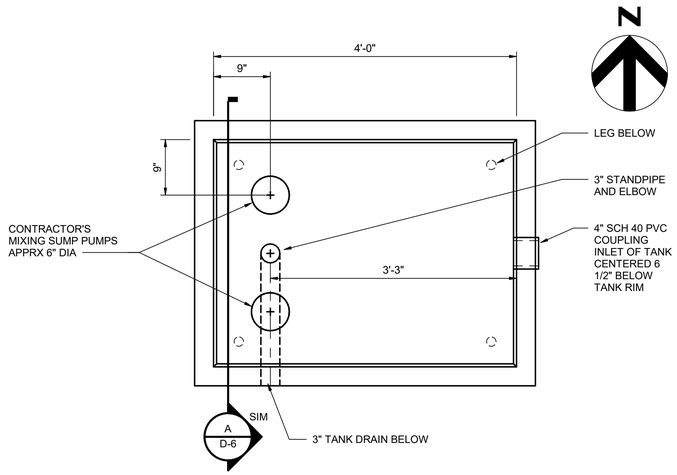
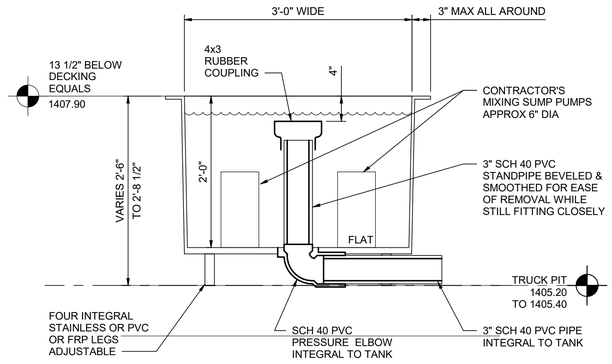


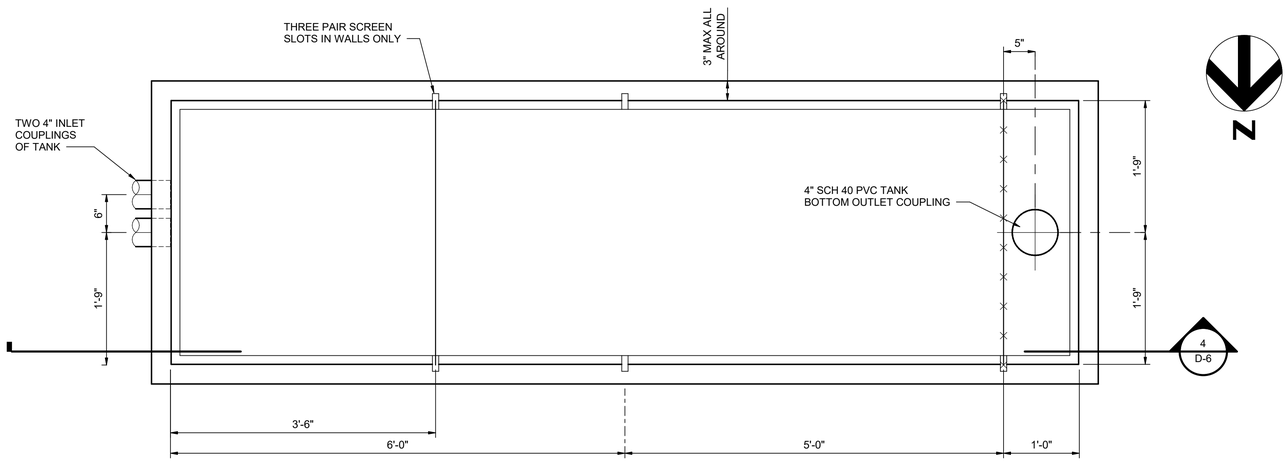
1 - WALLEYE SUMP PLAN

1" = 1'-0"



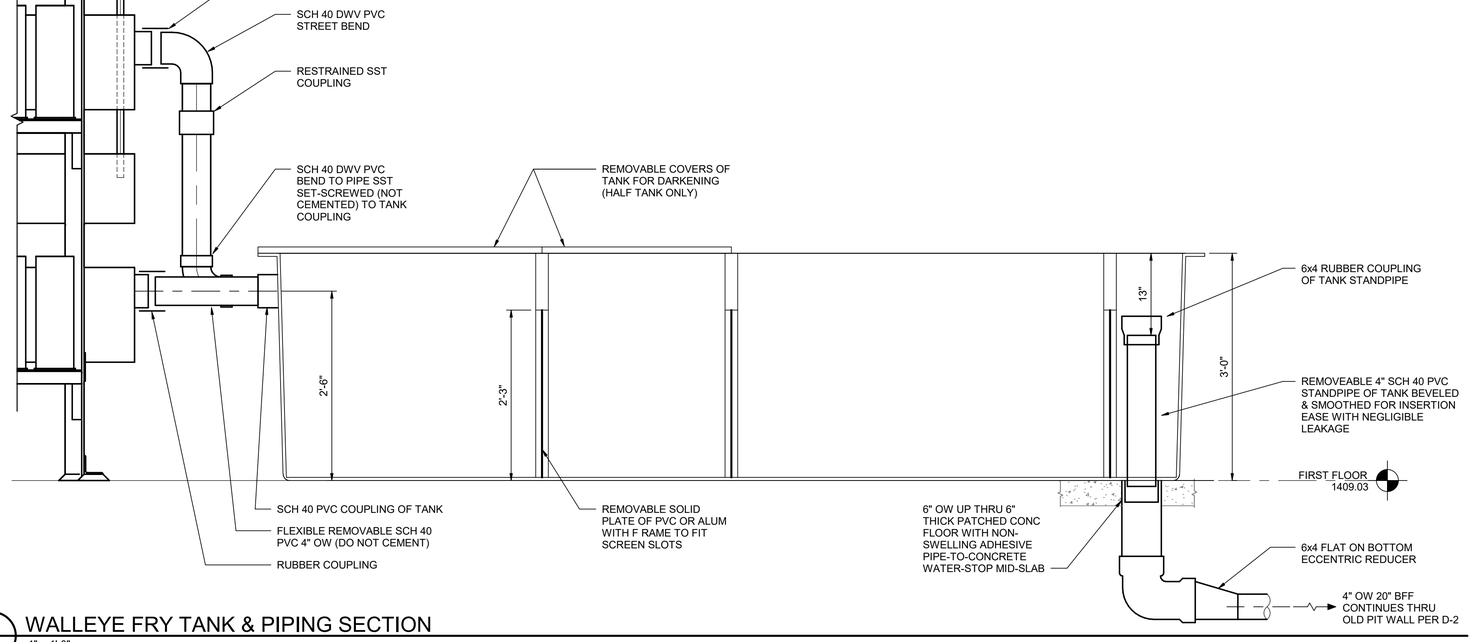
A - WALLEYE SUMP WIDTH SECTION

1" = 1'-0"



2 - WALLEYE FRY TANK PLAN

1" = 1'-0"



4 - WALLEYE FRY TANK & PIPING SECTION

1" = 1'-0"

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
P26101
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08/21/2020

Spirit Lake Fish Hatchery
Upgrade for RAS

AQUACULTURE TANKS

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE 1" = 1'-0"
SHEET D-6

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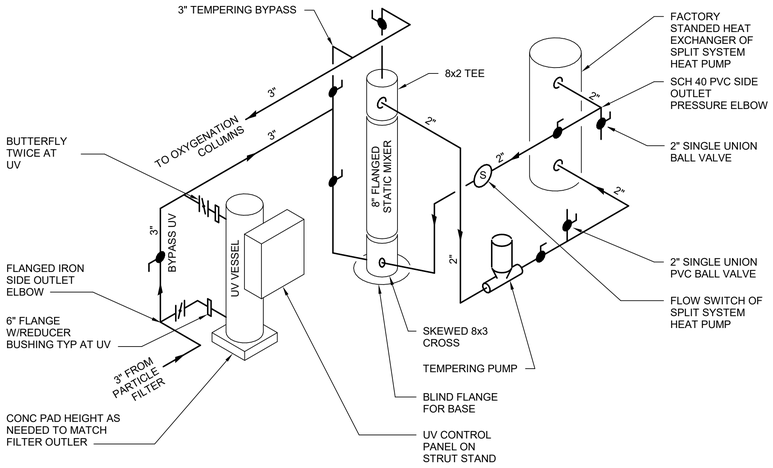
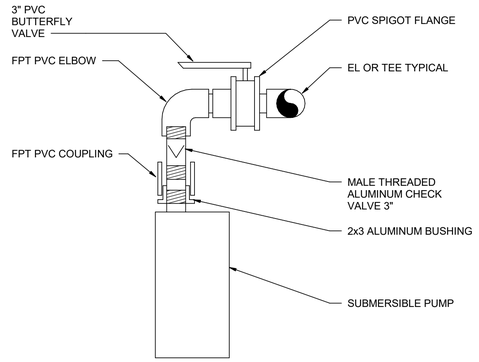
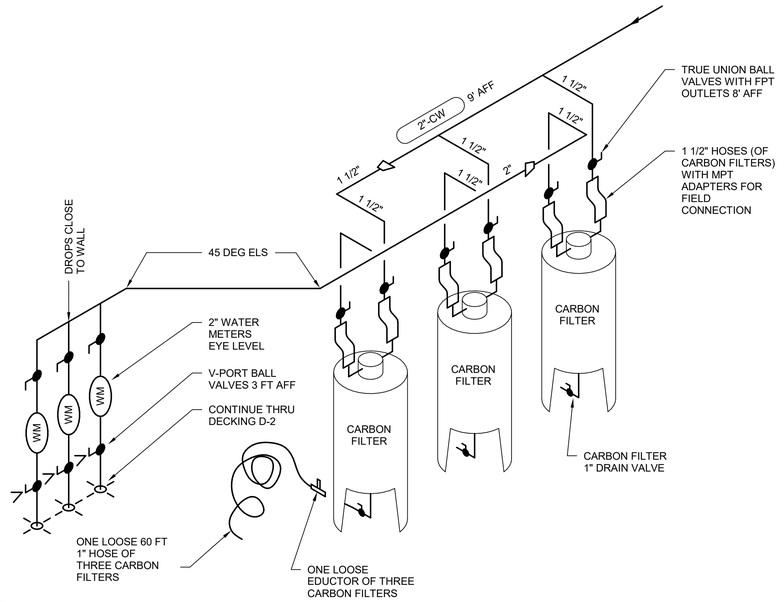


1 WALLEYE UV & TEMPERING WATER ISOMETRIC
NOT TO SCALE



2 WALLEYE REUSE PUMP DETAIL
NOT TO SCALE



3 CARBON FILTERS ISOMETRIC
NOT TO SCALE

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8/21/2020 11:25:15 AM

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
TROY A. TALSMA
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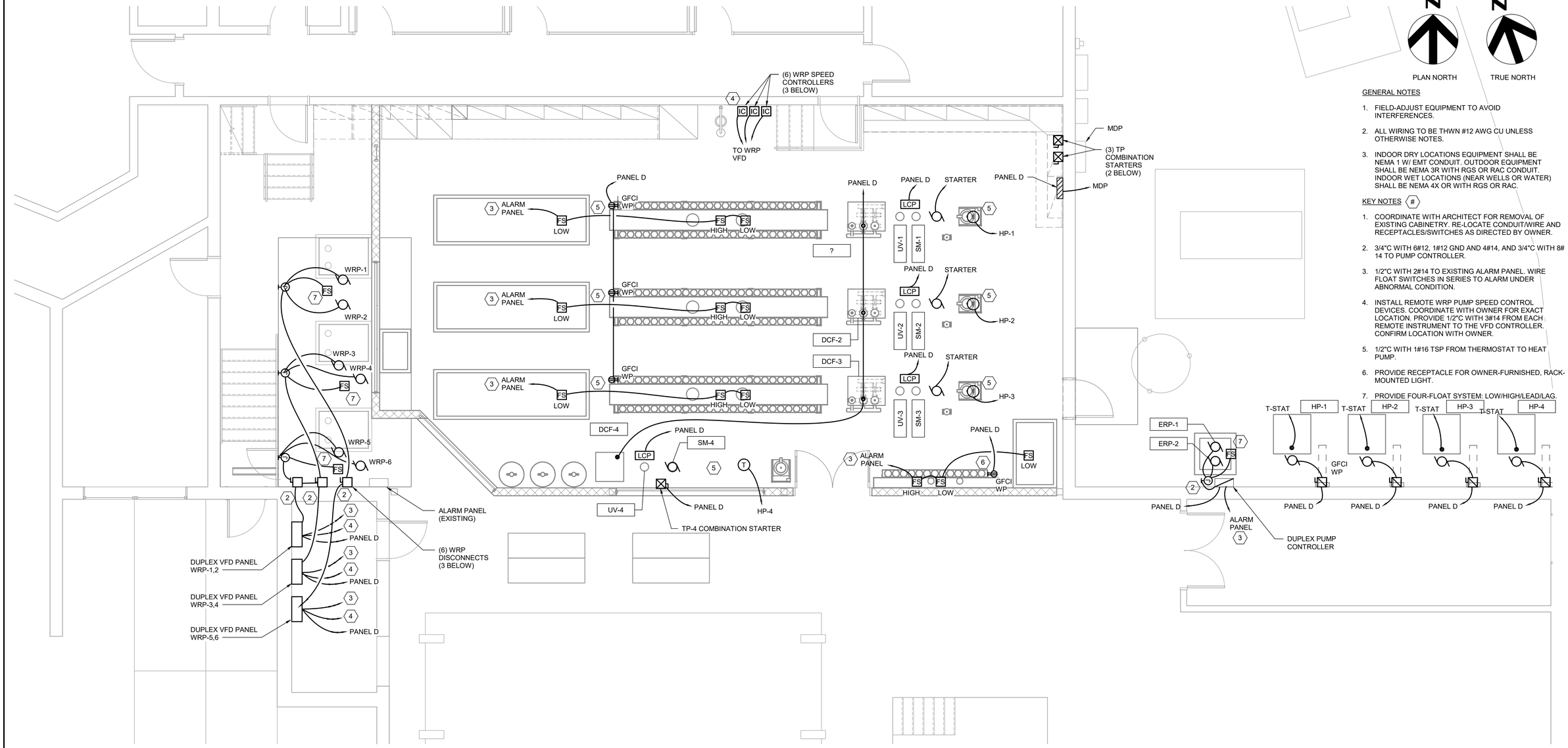
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

PROCESS EQUIPMENT DETAILS

0 1" 2"

FILENAME	HDRE_ALL_DISCIPLINES.rte
SCALE	12" = 1'-0"
SHEET	D-7



GENERAL NOTES

1. FIELD-ADJUST EQUIPMENT TO AVOID INTERFERENCES.
2. ALL WIRING TO BE THWN #12 AWG CU UNLESS OTHERWISE NOTES.
3. INDOOR DRY LOCATIONS EQUIPMENT SHALL BE NEMA 1 W/ EMT CONDUIT. OUTDOOR EQUIPMENT SHALL BE NEMA 3R WITH RGS OR RAC CONDUIT. INDOOR WET LOCATIONS (NEAR WELLS OR WATER) SHALL BE NEMA 4X OR WITH RGS OR RAC.

KEY NOTES (#)

1. COORDINATE WITH ARCHITECT FOR REMOVAL OF EXISTING CABINETRY. RE-LOCATE CONDUIT/WIRE AND RECEPTACLES/SWITCHES AS DIRECTED BY OWNER.
2. 3/4"C WITH 6#12, 1#12 GND AND 4#14, AND 3/4"C WITH 8# 14 TO PUMP CONTROLLER.
3. 1/2"C WITH 2#14 TO EXISTING ALARM PANEL. WIRE FLOAT SWITCHES IN SERIES TO ALARM UNDER ABNORMAL CONDITION.
4. INSTALL REMOTE WRP PUMP SPEED CONTROL DEVICES. COORDINATE WITH OWNER FOR EXACT LOCATION. PROVIDE 1/2"C WITH 3#14 FROM EACH REMOTE INSTRUMENT TO THE VFD CONTROLLER. CONFIRM LOCATION WITH OWNER.
5. 1/2"C WITH 1#16 TSP FROM THERMOSTAT TO HEAT PUMP.
6. PROVIDE RECEPTACLE FOR OWNER-FURNISHED, RACK-MOUNTED LIGHT.
7. PROVIDE FOUR-FLOAT SYSTEM: LOW/HIGH/LEAD/LAG.

POWER PLAN

1/4" = 1'-0"

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ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
ANDREW D KANER
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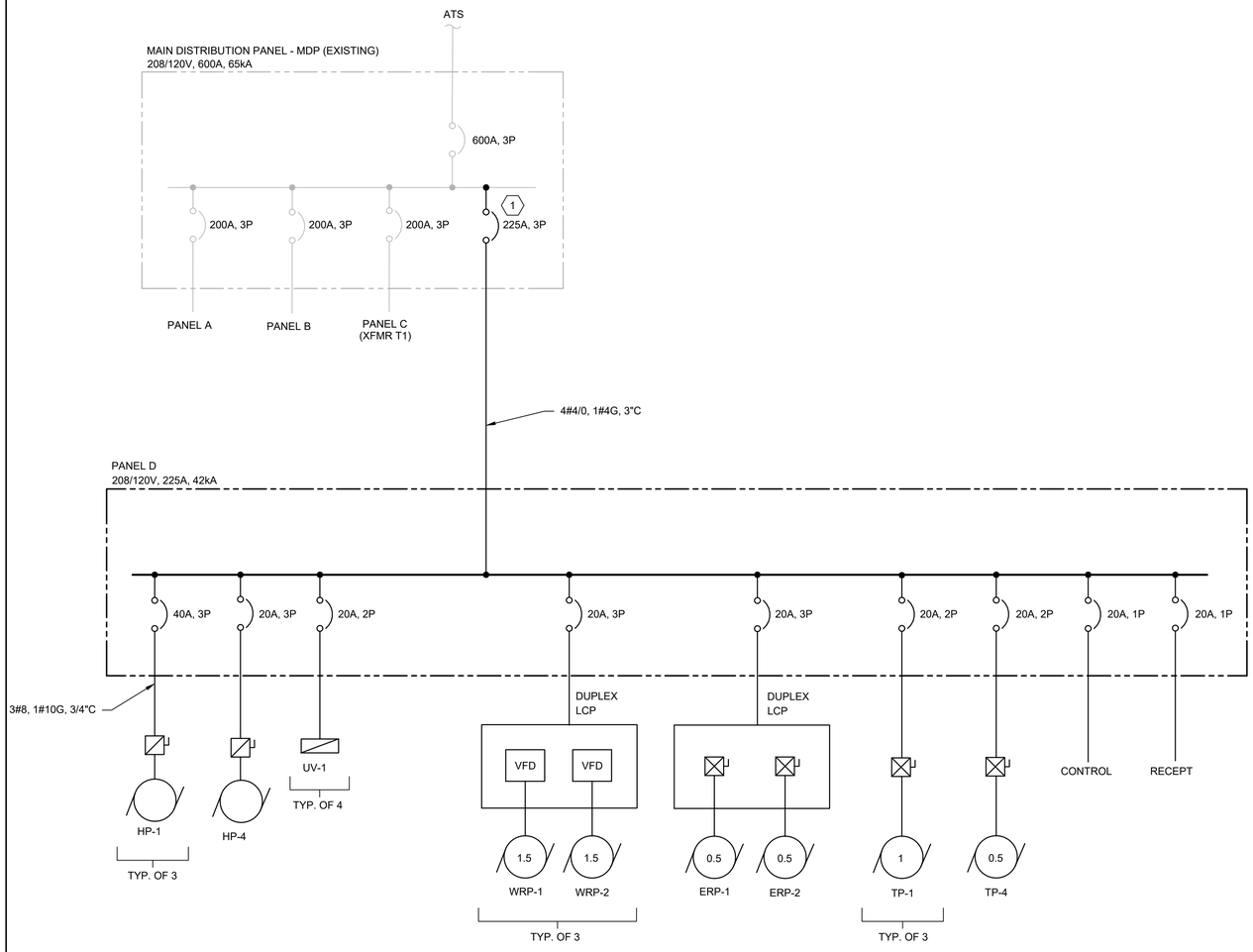
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

MULTIPLE STRUCTURE NAME POWER PLAN

0 1" 2"

FILENAME HDRE_ALL_DISCIPLINES.rte
SCALE 1/4" = 1'-0"
SHEET E-1



1 ONE LINE DIAGRAM
NOT TO SCALE

MAIN ELECTRICAL DISTRIBUTION PANEL - MDP

LOAD DESCRIPTION	CIRCUIT BREAKER			FEEDER TO LOAD	
	AMP	POLE	SCCR	WIRE SIZE	CONDUIT SIZE
PANEL A	200	3	65K	*	*
PANEL D	225	3	65K	*	*
PANEL B	200	3	65K	*	*
PANEL C VIA TRANSFORMER T1	200	3	65K	*	*
SPACE	200	3	65K		
SPACE	200	3	65K		
*REFER TO ONE-LINE DIAGRAM					
VOLTS/PHASE/WIRE CONNECT.	120/208V-3PHASE-4W				
BUS RATING	600A				
MAIN BREAKER RATING	600A				
SHORT CIRCUIT CURRENT RATING	65,000A				

PANELBOARD NO: D

VOLTAGE:	208Y/120	BUS RATING (A):	225	ENCLOSURE:	NEMA 1
PHASE:	3	MAIN OC DEVICE:	MLO	MOUNTING:	SURFACE
WIRE:	4+GND	INTERRUPTING RATING (KA):	42		
200% NEUTRAL:	NO	SERVICE ENTRANCE LABEL:	NO	INTEGRAL SPD:	YES

CKT NO.	DESCRIPTION	CONNECTED LOAD (VA) LTS	REC	MECH	MISC	OCP AMPS	P		OCP AMPS	P	CONNECTED LOAD (VA) LTS	REC	MECH	MISC	DESCRIPTION	CKT NO.
1				2,300				A	20	2				250	UV-1	2
3	HP-1			2,300		40	3	B						250		4
5				2,300				C	20	2				250	UV-2	6
7				2,300				A						250		8
9	HP-2			2,300		40	3	B	20	2				250	UV-3	10
11				2,300				C						250		12
13				2,300				A	20	2				250	UV-4	14
15	HP-3			2,300		40	3	B						250		16
17				2,300				C						1,584		18
19				1,485				A	20	3				1,584	WRP-1,2 CONTROLLER	20
21	HP-4			1,485		20	3	B						1,584		22
23				1,485				C						1,584		24
25	DCF-1 CNTRL POWER					20	1	A	20	3				1,584	WRP-3,4 CONTROLLER	26
27	DCF-2 CNTRL POWER					20	1	B						1,584		28
29	DCF-3 CNTRL POWER					20	1	C						1,584		30
31	DCF-4 CNTRL POWER					20	1	A	20	3				1,584	WRP-5,6 CONTROLLER	32
33	TP-1			915		20	2	B						1,584		34
35				915				C						576		36
37	TP-2			915		20	2	A	20	3				576	ERP-1,2 CONTROLLER	38
39				915				B						576		40
41	TP-3			915		20	2	C				720			RECEPT	42
43				915				A				180			EXTERIOR RECEPT	44
45	TP-4			915		20	2	B	20	1					SPARE	46
47				915				C	20	1					SPARE	48
49								A	20	1					SPARE	50
51	SPARE					20	3	B	20	1					SPARE	52
53								C							SPACE ONLY	54
55	SPACE ONLY							A							SPACE ONLY	56
57	SPACE ONLY							B							SPACE ONLY	58
59	SPACE ONLY							C							SPACE ONLY	60

LOAD SUMMARY

	LTS	REC	MECH	MISC	SPARE	TOTAL				PHASE BALANCE	
CONNECTED LOAD (KVA)	0.0	0.9	48.5	2.0	---	51.4		208	LINE-TO-LINE VOLTS	PHASE A (KVA)	16
DEMAND FACTOR	1.25	1.00	1.00	1.00	20%	---		143	CONNECTED AMPS	PHASE B (KVA)	17
DESIGN LOAD (KVA)	0.0	0.9	48.5	2.0	10.3	61.6		171	DESIGN AMPS	PHASE C (KVA)	18

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STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
ANDREW D. KANER
P26139
IOWA
08/21/2020

Spirit Lake Fish Hatchery
Upgrade for RAS

ELECTRICAL DETAILS

0 1" 2"

FILENAME E-2.DWG
SCALE AS NOTED

SHEET E-2

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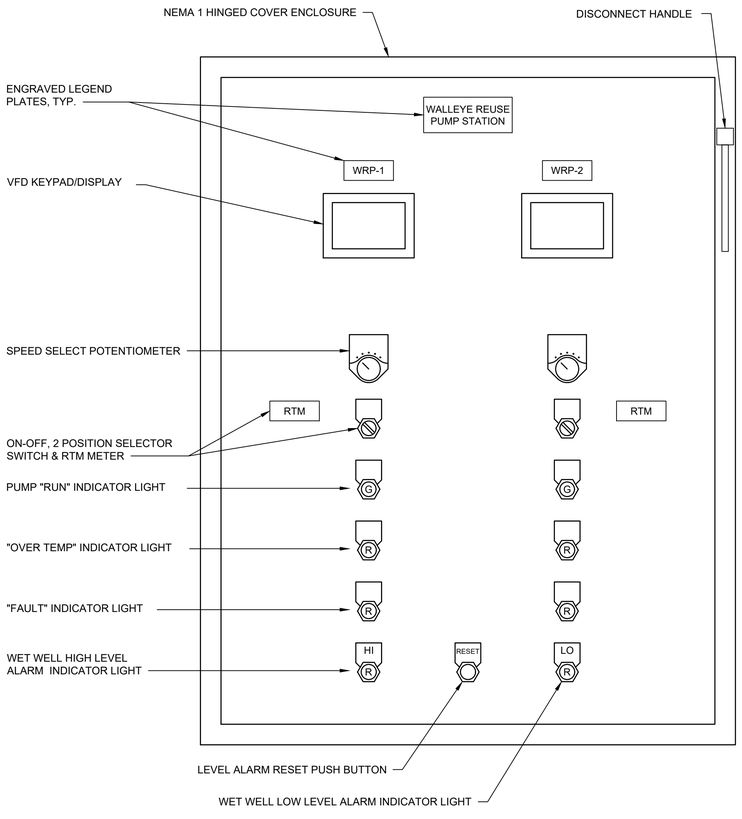

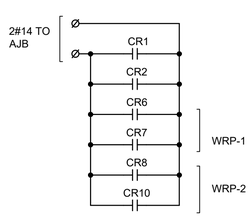

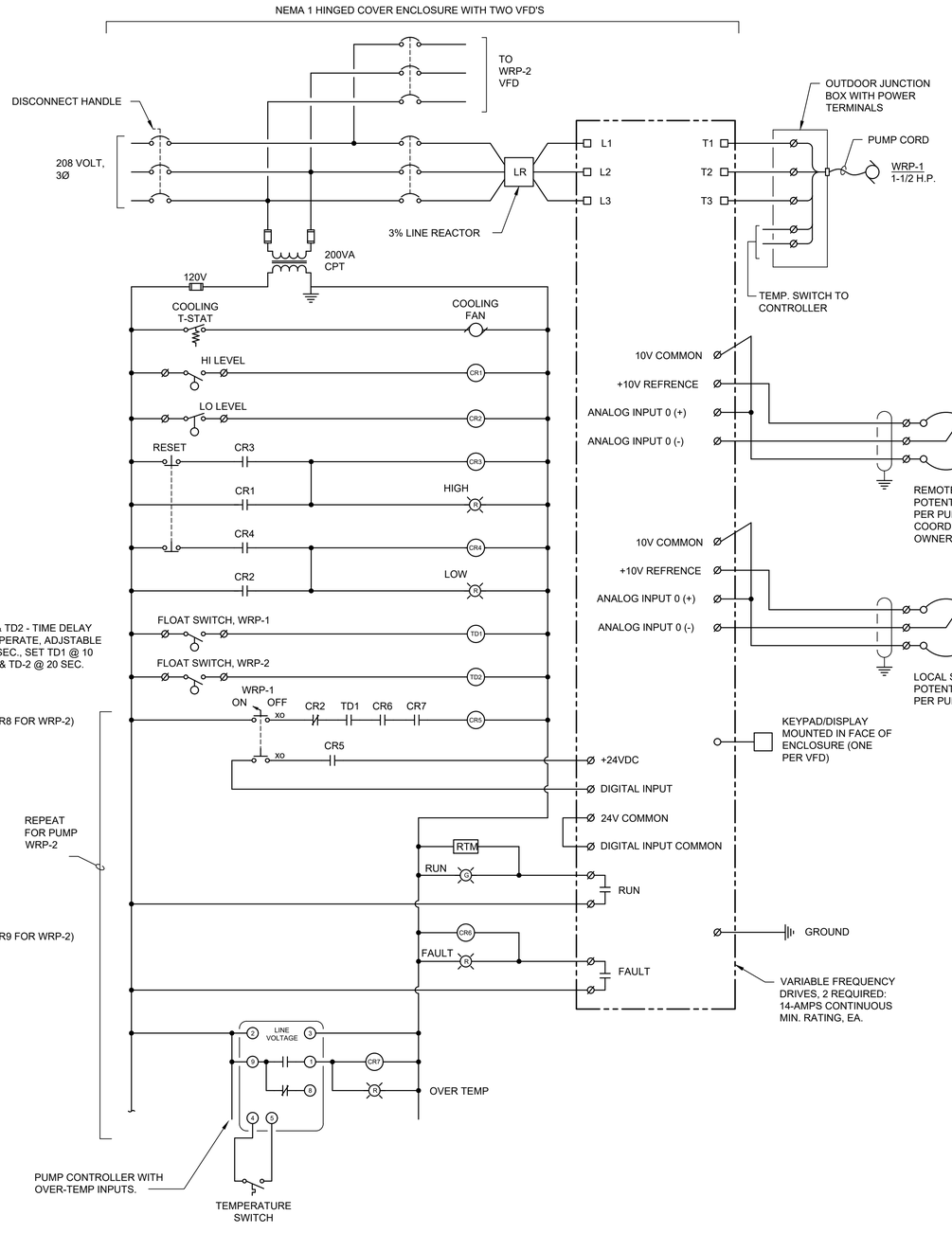

2 - WRP - WALLEYE REUSE PUMP STATION CONTROL PANEL
NOT TO SCALE

1 - WRP - WALLEYE REUSE PUMP CONTROL PANEL - WIRING DIAGRAM
NOT TO SCALE

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
ANDREW D. KANER
P26139
IOWA
08/21/2020

Spirit Lake Fish Hatchery
Upgrade for RAS

ELECTRICAL DETAILS

0 1" 2"

FILENAME E-3.DWG
SCALE AS NOTED
SHEET E-3

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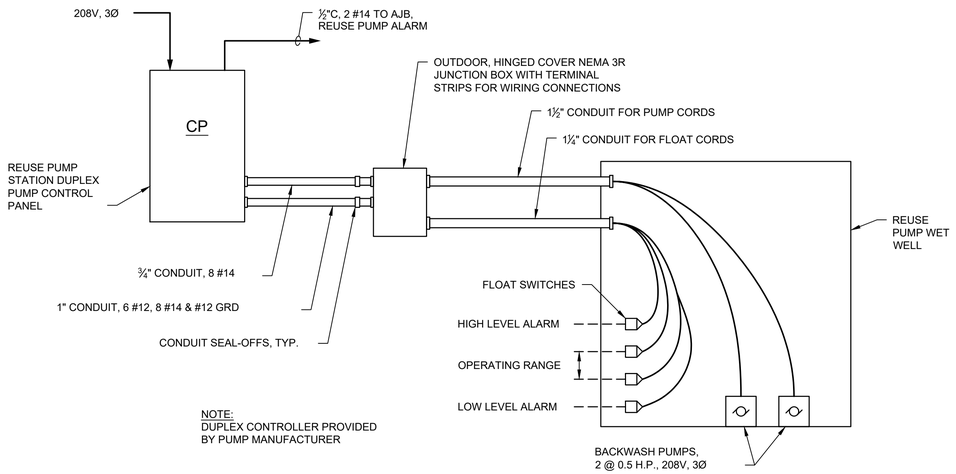
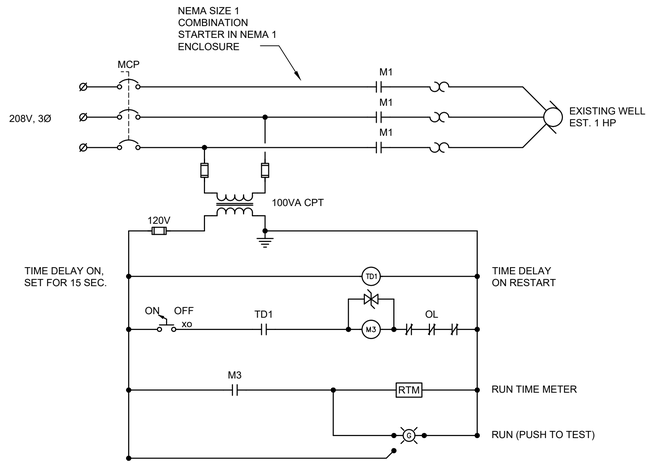


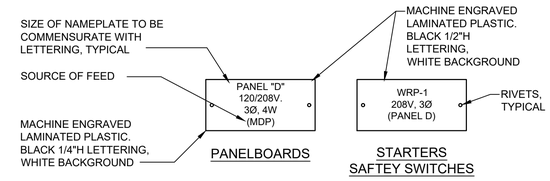
1 - ESOCID REUSE PUMP STATION - BLOCK DIAGRAM

NOT TO SCALE



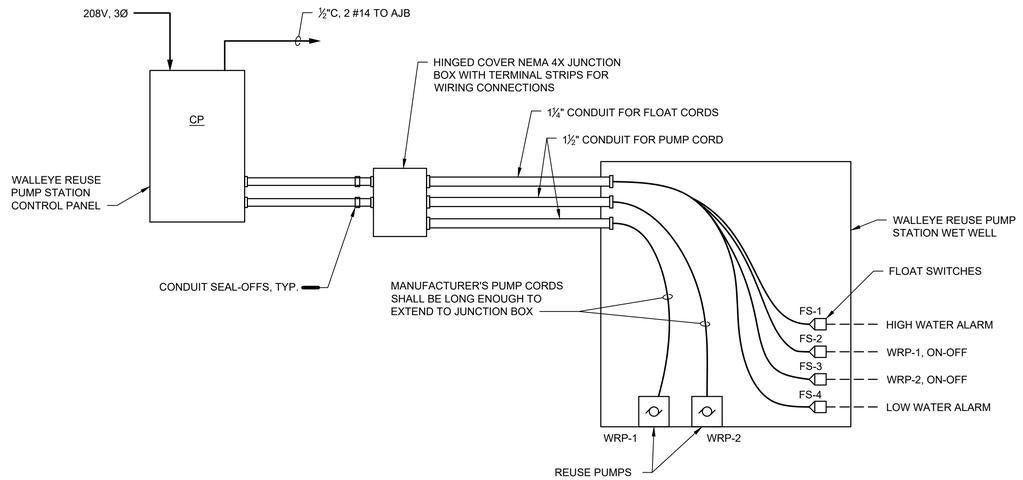
3 - TP-1 WIRING DIAGRAM TEMPERED WATER PUMP

NOT TO SCALE



5 - NAME PLATES DETAIL

NOT TO SCALE



2 - WALLEYE REUSE PUMP STATION - BLOCK DIAGRAM

NOT TO SCALE

OTHER WRP PUMP STATIONS ARE SIMILAR

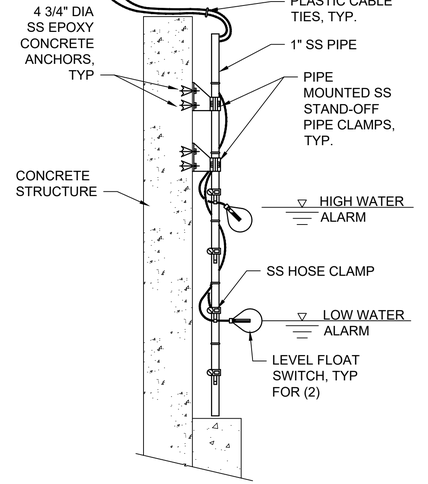
FROM ALARM JUNCTION BOX: 16#14

ALARM PANEL TERMINALS

TERMINALS	DESCRIPTION
1a - 1b	EXISTING
2a - 2b	EXISTING
3a - 3b	EXISTING
4a - 4b	WALLEYE REUSE PUMP STATION (WRP-1,2) - ALARM
5a - 5b	WALLEYE REUSE PUMP STATION (WRP-3,4) - ALARM
6a - 6b	WALLEYE REUSE PUMP STATION (WRP-5,6) - ALARM
7a - 7b	ESOCID REUSE PUMP STATION (ERP-1,2) - ALARM
8a - 8b	WALLEYE JAR RACK 1 - LEVEL ALARM
9a - 9b	WALLEYE JAR RACK 2 - LEVEL ALARM
10a - 10b	WALLEYE JAR RACK 3 - LEVEL ALARM
11a - 11b	ESOCID JAR RACK 1 - LEVEL ALARM
12a - 12b	

4 - HATCHERY ALARM DETAIL

NOT TO SCALE



6 - LEVEL SWITCH MOUNTING BRACKET

NOT TO SCALE

ISSUE	DATE	DESCRIPTION
A	08/21/2020	ISSUED FOR BID

PROJECT MANAGER	M. COCHRAN
ARCHITECTURAL	M. STOFFEL
STRUCTURAL	B. BRADLEY
PROCESS	T. TALSMA
ELECTRICAL	A. KANER
PROJECT NUMBER	10232924

LICENSED PROFESSIONAL ENGINEER
ANDREW D. KANER
P26130
IOWA
08/21/2020

Spirit Lake Fish Hatchery Upgrade for RAS

ELECTRICAL DETAILS

0 1" 2"

FILENAME E-4.DWG

SCALE AS NOTED

SHEET E-4

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