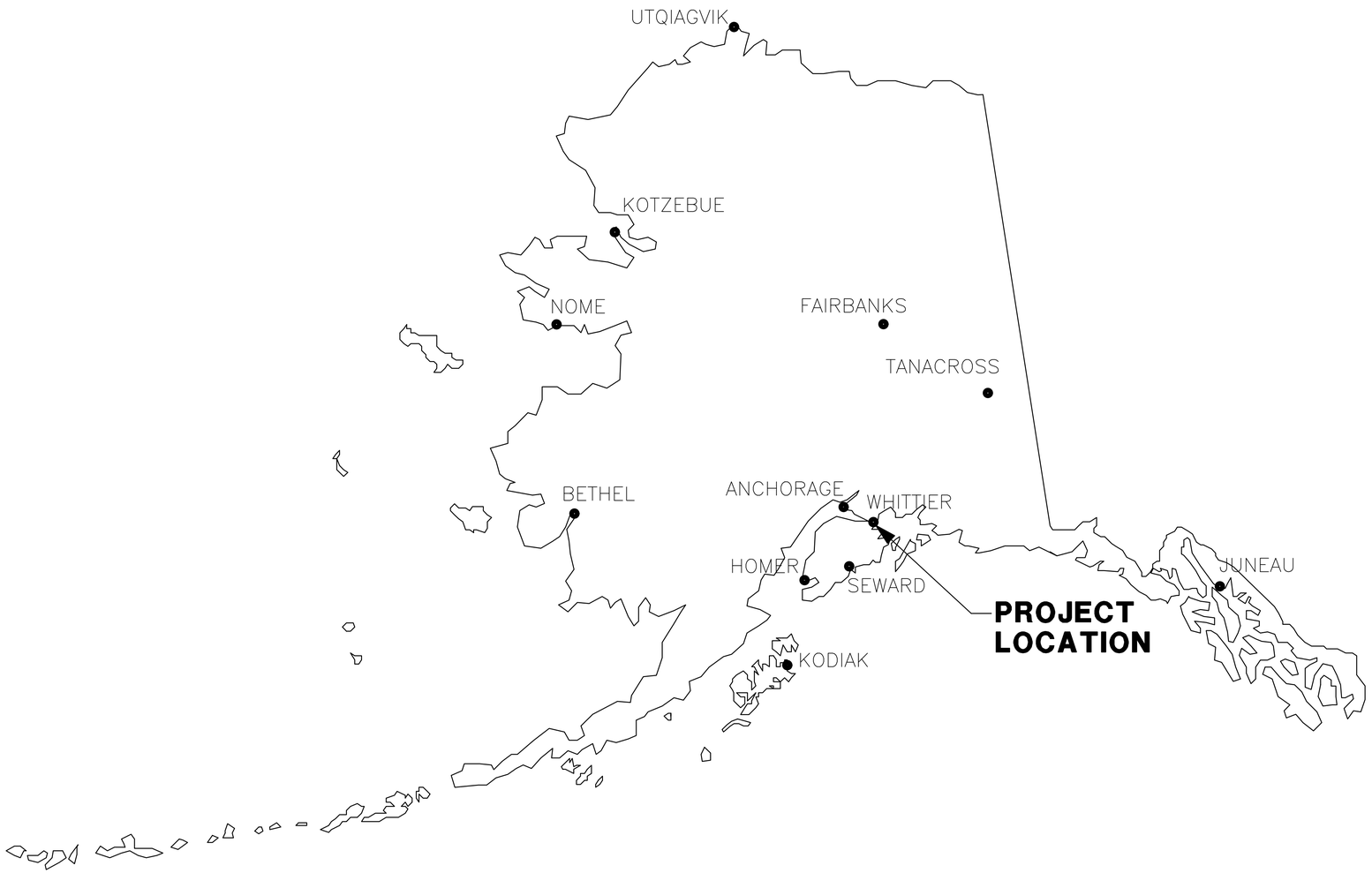
CITY OF WHITTIER, ALASKA

WHITTIER WELL FIELD UPGRADE

DECEMBER 2021

FINAL DESIGN



PREPARED FOR:

CITY OF WHITTIER

PREPARED BY:

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ANCHORAGE, ALASKA 99503
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BETTISWORTH NORTH

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01/04/2022
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FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

SHEET INDEX

REVISION SCHEDULE		
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.

G002

PLOT DATE:1/4/2022

LEGEND

SYMBOL EXISTING	SYMBOL PROPOSED	
○	●	SANITARY SEWER MANHOLE
ⓦ	ⓦ	WATER WELL
Ⓦ		WATER MAIN MANHOLE
⋈	⋈	WATER KEY BOX/VALVE MARKER
		FIRE HYDRANT
		STUBOUT CAPPED OR PLUGGED END
□G.M.		GAS METER
□U.E.		UNDERGROUND ELECTRIC PEDESTAL
Ⓔ		ELECTRICAL MANHOLE/J-BOX
○-○EM		ELECTRIC METER
Ⓔ		ELECTRICAL VAULT
○-○		LUMINAIRE
○		UTILITY POLE
		GUY ANCHOR
		JOINT USE POWER & TELE. POLE
□U.T.		UNDERGROUND TELE. PEDESTAL
□U.C.		UNDERGROUND TV CABLE PEDESTAL
		CENTERLINE
		PROPERTY LINE
		EASEMENT LINE
		UNPAVED (GRAVEL) EDGE OF ROAD/DRIVEWAY
		EDGE OF PAVED ROAD/DRIVEWAY
		STREAM/EDGE OF WATERWAY DRAINAGE SWALE
		DRAINAGE ARROW
		BLUFF AREA/ EARTHWORK SLOPE
		CULVERT
		BOTTOM OF DITCH
		CHAINLINK FENCE
		WOOD FENCE
		VEGETATION, BRUSH & TREELINE
		STREET SIGN
		TEST BORING OR TEST HOLE
		HOUSE OR STRUCTURE

SYMBOL EXISTING	SYMBOL PROPOSED	
(123)	(123)	CONTOUR LINE
SPT EL	SPT EL	SPOT ELEVATION
		APPROX. FILL SLOPE LIMITS
		APPROX. CUT SLOPE LIMITS
E		ELECTRIC LINE
OE		ELECTRIC LINE (OVERHEAD)
OET		ELECTRIC & TELEPHONE (OVERHEAD)
G		NATURAL GAS LINE
S	S	SANITARY SEWER LINE
T		TELEPHONE LINE
OT		TELEPHONE LINE (OVERHEAD)
AW		WATER LINE (ABANDONED
W	W	WATER LINE

PROFILE LEGEND

SYMBOL EXISTING	SYMBOL PROPOSED	
	0.00%	GRADE OF PAVEMENT AT CENTER LINE
		EXISTING GROUND OVER PIPE
		APPROXIMATE EXCAVATION LIMITS
	0.00%	PIPE (PROFILE)
		PIPE (SECTION)
		WATER LEVEL
		SANITARY SEWER MANHOLE & PIPE

COMMON ABBREVIATIONS

ABBR.	DESCRIPTION
AC	ASPHALT CONCRETE
APPROX, APPX	APPROXIMATE
BM	BENCH MARK
BOP	BEGINNING OF PROJECT
C&G	CURB AND GUTTER
CB	CATCH BASIN
CBMH	CATCH BASIN MANHOLE
C/L, CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CONST	CONSTRUCTION
CPEP	CORRUGATED POLYETHYLENE PIPE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
D.W.	DETECTABLE WARNING
E	EAST
ELEC	ELECTRIC / ELECTRICAL
ELEV, EL	ELEVATION
EOP	END OF PROJECT / EDGE OF PAVEMENT
EX, EXIST	EXISTING
F&I	FURNISH AND INSTALL
FG	FINISHED GRADE
GB	GRADE BREAK
JB	JUNCTION BOX
LC	LOAD CENTER
IAW	IN ACCORDANCE WITH
IE	INVERT ELEVATION
INTX	INTERSECTION
INV	INVERT
LF	LINEAR FOOT
LT, L	LEFT
LUM	LUMINAIRE
MAX	MAXIMUM
MH	MANHOLE
MIN.	MINIMUM
MON	MONUMENT
MSL	MEAN SEA LEVEL
N	NORTH
N/A	NOT APPLICABLE
N.I.C.	NOT IN CONTRACT
NTS	NOT TO SCALE
NWT	NO WATER TABLE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OH	OVERHEAD
PC	POINT OF CURVATURE
PCC	PORTLAND CONCRETE CEMENT
PCC	POINT OF CONTINUOUS CURVATURE
PI	POINT OF INTERSECTION
PL, P/L	PROPERTY LINE
PCMP	PRECOATED CORRUGATED METAL PIPE
PCPEP	PERFORATED CORRUGATED POLYETHYLENE PIPE
PT	POINT OF TANGENCY
PUE	PUBLIC USE EASEMENT
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENT
ROW, R/W	RIGHT OF WAY
RT, R	RIGHT
R.W.	RETAINING WALL
S	SOUTH
SEC COR	SECTION CORNER
SCH/SCHD	SCHEDULE
SI	STREET INTERSECTION
SS	SANITARY SEWER, STAINLESS STEEL
ST	STREET
STA	STATION / STATIONING
STD	STANDARD
STRUCT	STRUCTURE
S/W	SIDEWALK
TBC	TOP BACK OF CURB
TBM	TEMPORARY BENCH MARK
TCP	TEMPORARY CONSTRUCTION PERMIT
TELE	TELEPHONE
TH	TEST HOLE
(TYP.)	TYPICAL
UG	UNDERGROUND
UTIL	UTILITY
V	VOLT
VB	VALVE BOX
VC	VERTICAL CURVE
W	WEST

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FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

NOTES, ABBREVIATIONS, AND LEGEND

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.

G003

PLOT DATE:1/4/2022

GENERAL NOTES

1. CAUTION! UNDERGROUND UTILITIES EXIST WITHIN THE PROJECT AREA. CONTRACTOR SHALL CALL FOR UTILITY LOCATES PRIOR TO BEGINNING CONSTRUCTION. CALL 907–240–2019 TO CONTACT CITY OF WHITTIER PUBLIC WORKS DEPARTMENT FOR CITY UTILITIES LOCATES.
2. ALL CONSTRUCTION SHALL BE INSTALLED AS SPECIFIED IN THE 2015 EDITION OF THE MUNICIPALITY OF ANCHORAGE (MOA) STANDARD SPECIFICATIONS (HEREINAFTER REFERRED TO AS MASS); THE MOST RECENT VERSION OF THE AWWU DESIGN AND CONSTRUCTION PRACTICES MANUAL (DCPM); AND THE SPECIAL PROVISIONS.
3. THE LOCATIONS OF THE EXISTING FEATURES AND UTILITIES SHOWN IN THESE DRAWINGS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR SHALL VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES ENCOUNTERED AND RECORD THEIR LOCATION ON THE CONTRACT RECORD DRAWINGS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER. CONTRACTOR SHALL ADJUST ALIGNMENT OR GRADE OF PROPOSED PIPING AS NECESSARY TO AVOID CONFLICTS WITH EXISTING UTILITIES.
5. ALL WORK IN CLOSE PROXIMITY TO EXISTING OVERHEAD AND UNDERGROUND TELEPHONE AND ELECTRIC UTILITIES SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL STATUTES, CODES AND GUIDELINES AND THE CLEARANCE REQUIREMENTS OF THE SERVING UTILITY.
6. ALL WORK SHALL BE PERFORMED WITHIN PUBLIC RIGHT–OF–WAY, PUBLIC USE EASEMENT, UTILITY EASEMENT, OR TEMPORARY CONSTRUCTION EASEMENT AREAS.
7. ALL WORK AND EQUIPMENT REQUIRED FOR REMOVING ANY LITTER OR DEBRIS WITHIN THE PROJECT LIMITS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE PAYMENT WILL BE MADE.
8. THE LOCATIONS OF VEGETATION AND BRUSH SHOWN IN THESE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL PROVIDE ALL CLEARING AND GRUBBING NECESSARY TO CONSTRUCT THE IMPROVEMENTS AS SHOWN ON THE DRAWINGS.
9. ALL ORGANIC MATERIAL SHALL BE REMOVED FROM THE SUBGRADE TO A DEPTH TO BE DETERMINED BY THE ENGINEER. NO ORGANIC MATERIAL OR OTHER DELETERIOUS MATERIAL SHALL BE UTILIZED FOR BACKFILL.
10. NO DUMPSITE IS PROVIDED. CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL MATERIALS REMOVED/DEMOLISHED.
11. CONTRACTOR SHALL PROVIDE RECORD DRAWINGS IN ACCORDANCE WITH THE REQUIREMENTS OF MASS AND THE MOST RECENT VERSION OF AWWU DESIGN AND CONSTRUCTION PRACTICES MANUAL. CONTRACTOR SHALL SUBMIT ALL FIELD SURVEY BOOKS (SURVEY LINE AND GRADE BOOKS) WITH THE RECORD DRAWINGS PRIOR TO CONTRACT FINAL PAYMENT.
12. CONTRACTOR SHALL RESTORE ALL PROPERTY (INCLUDING, BUT NOT LIMITED TO, DRAINAGE SWALES, STRUCTURES, BASKETBALL COURT, CITY PARK) DISTURBED BY CONSTRUCTION TO PRE–CONSTRUCTION CONDITIONS, UNLESS OTHERWISE DIRECTED BY ENGINEER. RESTORING DISTURBED PROPERTY SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE PAYMENT SHALL BE MADE.
13. MAINTAIN A MINIMUM OF 10 FEET HORIZONTAL AND 18 INCHES VERTICAL SEPARATION BETWEEN WATER AND SANITARY OR STORM SEWER MAINS AND SERVICES. WHERE WATER AND SEWER MAINS CROSS, SEWER MAIN JOINTS SHALL BE AT LEAST 9 FEET FROM WATER MAIN JOINTS.
14. SHRINK WRAP ALL WATER PIPE JOINTS WITHIN 10 FEET HORIZONTAL OF SANITARY AND STORM SEWER CROSSINGS WITH CANUSAWRAP. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
15. IF ANY SANITARY OR STORM SEWER PIPE JOINTS ARE EXPOSED DURING EXCAVATION OF WATER MAIN, SHRINK WRAP SANITARY AND STORM SEWER PIPE JOINTS WITH CANUSAWRAP. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
16. MAINTAIN A MINIMUM OF 36 INCHES OF VERTICAL SEPARATION BETWEEN ANY STORM SEWER (STORM DRAIN OR FOOTING DRAIN) AND WATERLINE (MAINS OR SERVICES) OR SANITARY SEWER (MAINS OR SERVICES). IF 36 INCHES CANNOT BE MAINTAINED, PROVIDE A MINIMUM R–20 INSULATION. IF 18 INCHES CANNOT BE MAINTAINED, RELOCATE WATER MAIN.
17. CONSTRUCT WATER MAIN SO THAT JOINTS ARE EQUIDISTANT FROM EXISTING SANITARY SEWER AND EXISTING STORM SEWER PIPES.
18. IN CASE OF CONFLICT BETWEEN STATIONING OR DIMENSIONED LOCATION OF PIPE OR FITTINGS, USE DIMENSIONED LOCATIONS RELATIVE TO THE CENTERLINE AND PROPERTY LINE. THE DIMENSIONED LOCATIONS SHALL GOVERN.
19. ALL WATER PIPE INSULATION SHALL BE RIGID BOARD, HIGH DENSITY EXTRUDED POLYSTYRENE MIN. 60 P.S.I., FOR UNDERGROUND INSTALLATIONS EQUIVALENT TO R–20.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS AS NECESSARY TO COMPLY WITH FEDERAL, STATE, AND MUNICIPAL LAWS THAT PROHIBIT UNPERMITTED DISCHARGE OF POLLUTANTS, INCLUDING SEDIMENTS, THAT ARE A RESULT OF EROSION AND OTHER CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONDUCT ALL WORK SO SEDIMENT IS NOT TRANSPORTED ONTO THE ROADWAY OR ADJACENT PROPERTY. AT A MINIMUM, THE CONTRACTOR SHALL SWEEP UP ANY SEDIMENT TRACKED ONTO PAVED SURFACES IN PUBLIC RIGHT–OF–WAY WITHIN 24 HOURS OF THE TRACKING TO MINIMIZE THE WASH–OFF OF SEDIMENT INTO THE STORM DRAINS OR WATERWAYS.
21. WATER RESULTING FROM THE CONTRACTOR'S DEWATERING EFFORT MAY NOT BY PUMPED OR OTHERWISE DIVERTED INTO EXISTING STORM DRAINS UNLESS REQUIRED PERMITS, INCLUDING, BUT NOT LIMITED TO, THE ALASKA DEPARTMENT OF ENVIRONMENT CONSERVATION ARE OBTAINED BY THE CONTRACTOR. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR BE ALLOWED TO DIVERT WATER FROM EXCAVATION ONTO ROADWAYS. THE CONTRACTOR SHALL PROVIDE DISPOSAL SITE FOR EXCESS WATER AND SHALL BE RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL PROVIDE COPIES OF PERMITS AND APPROVALS TO THE ENGINEER PRIOR TO BEGINNING DEWATERING.
22. "BOP" IS DEFINED AS THE OUTSIDE BOTTOM OF PIPE. INVERT "INV" IS DEFINED AS THE INSIDE BOTTOM OF PIPE.
23. ALL WATER STATIONING IS PIPE STATIONING.
24. ALL NUTS, BOLTS AND WASHERS USED TO CONSTRUCT VALVES SHALL BE STAINLESS STEEL (TYPE 316).
25. DAMAGE TO SEWER SERVICE CONNECTIONS MADE DURING WATERLINE CONSTRUCTION SHALL BE REPAIRED USING APPROVED MATERIALS WITH APPROVED COUPLINGS, AT CONTRACTOR'S EXPENSE.
26. CONTRACTOR SHALL INSTALL RESTRAINED FITTINGS ON ALL MECHANICAL JOINTS.
27. ANY EXISTING SURVEY MONUMENTATION DISTURBED BY CONTRACTOR OPERATIONS SHALL BE REPLACED AT CONTRACTOR'S EXPENSE BY SURVEYOR LICENSED TO PRACTICE IN THE STATE OF ALASKA.

WATER NOTES

1. CITY OF WHITTIER AND EXISTING CUSTOMERS SHALL BE NOTIFIED SEVENTY–TWO (72) HOURS IN ADVANCE OF WATER SERVICE INTERRUPTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE TEMPORARY WATER SERVICE TO THE EXISTING CUSTOMERS IF THE OUTAGE EXCEEDS 6–HOURS OR IF DEEMED NECESSARY BY THE ENGINEER.
2. ALL WATER MAINS SHALL BE DUCTILE IRON PIPE, CLASS 52 AS SHOWN IN THE PLANS, CONFORMING TO THE REQUIREMENTS OF MASS SECTION 60.02 FURNISH AND INSTALL PIPE.
3. ALL FITTINGS AND VALVES SHALL HAVE MECHANICAL JOINT CONNECTIONS UNLESS OTHERWISE SHOWN ON THE PLANS. INSTALL THRUST BLOCKS AT ALL FITTINGS.
4. ALL MECHANICAL JOINTS SHALL BE RESTRAINED BY EBAA IRON MEGALUG SERIES 1100 OR APPROVED EQUAL.
5. ALL WATER MAIN JOINTS SHALL BE RESTRAINED. U.S. PIPE FIELD LOK GASKET SYSTEM OR EQUAL.
6. NO PIPE LENGTH LESS THAN 8 FEET SHALL BE INCORPORATED IN THE WATER SYSTEM EXCEPT FOR THOSE NECESSARY FOR VALVE LOCATIONS.
7. ALL WATER MAIN TRENCH BACKFILL MATERIALS AND BEDDING SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY.
8. ALL WATER MAINS AND SERVICES SHALL HAVE A MINIMUM OF 7 FEET OF COVER AT ALL POINTS, UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING WATER MAINS. INFORMATION HAS BEEN COMPILED FROM AS–BUILTS AND MAY VARY.
10. ALL PIPE BEDDING FOR DUCTILE IRON PIPE SHALL BE CLASS 'E' PER THE SPECIFICATIONS.
11. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN 8–MIL V–BIO ENHANCED POLYETHYLENE ENCASEMENT PER MASS SECTION 60.02 FURNISH AND INSTALL PIPE.
12. MAXIMUM DEFLECTION OF PIPE PER JOINT SHALL NOT EXCEED 80% OF THE MANUFACTURERS RECOMMENDED DEFLECTION (4 DEGREES) FOR DIP.

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PROJECT No. 20403.14

GENERAL AND WATER NOTES

REVISION SCHEDULE

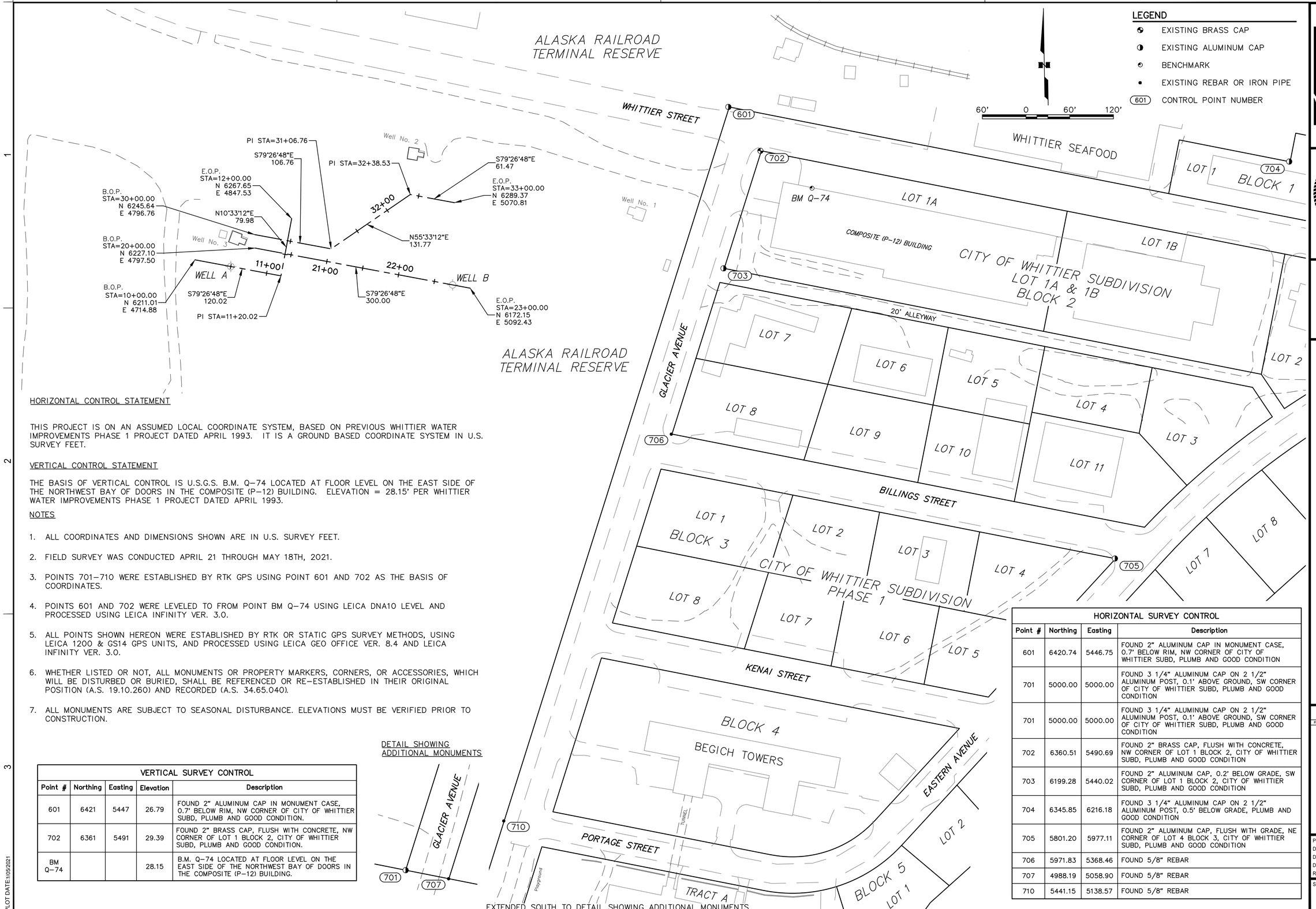
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.

G004

PLOT DATE:1/4/2022



HORIZONTAL CONTROL STATEMENT

THIS PROJECT IS ON AN ASSUMED LOCAL COORDINATE SYSTEM, BASED ON PREVIOUS WHITTIER WATER IMPROVEMENTS PHASE 1 PROJECT DATED APRIL 1993. IT IS A GROUND BASED COORDINATE SYSTEM IN U.S. SURVEY FEET.

VERTICAL CONTROL STATEMENT

THE BASIS OF VERTICAL CONTROL IS U.S.G.S. B.M. Q–74 LOCATED AT FLOOR LEVEL ON THE EAST SIDE OF THE NORTHWEST BAY OF DOORS IN THE COMPOSITE (P–12) BUILDING. ELEVATION = 28.15' PER WHITTIER WATER IMPROVEMENTS PHASE 1 PROJECT DATED APRIL 1993.

NOTES

1. ALL COORDINATES AND DIMENSIONS SHOWN ARE IN U.S. SURVEY FEET.
2. FIELD SURVEY WAS CONDUCTED APRIL 21 THROUGH MAY 18TH, 2021.
3. POINTS 701–710 WERE ESTABLISHED BY RTK GPS USING POINT 601 AND 702 AS THE BASIS OF COORDINATES.
4. POINTS 601 AND 702 WERE LEVELED TO FROM POINT BM Q–74 USING LEICA DNA10 LEVEL AND PROCESSED USING LEICA INFINITY VER. 3.0.
5. ALL POINTS SHOWN HEREON WERE ESTABLISHED BY RTK OR STATIC GPS SURVEY METHODS, USING LEICA 1200 & GS14 GPS UNITS, AND PROCESSED USING LEICA GEO OFFICE VER. 8.4 AND LEICA INFINITY VER. 3.0.
6. WHETHER LISTED OR NOT, ALL MONUMENTS OR PROPERTY MARKERS, CORNERS, OR ACCESSORIES, WHICH WILL BE DISTURBED OR BURIED, SHALL BE REFERENCED OR RE–ESTABLISHED IN THEIR ORIGINAL POSITION (A.S. 19.10.260) AND RECORDED (A.S. 34.65.040).
7. ALL MONUMENTS ARE SUBJECT TO SEASONAL DISTURBANCE. ELEVATIONS MUST BE VERIFIED PRIOR TO CONSTRUCTION.

VERTICAL SURVEY CONTROL

Point #	Northing	Easting	Elevation	Description
601	6421	5447	26.79	FOUND 2" ALUMINUM CAP IN MONUMENT CASE, 0.7' BELOW RIM, NW CORNER OF CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION.
702	6361	5491	29.39	FOUND 2" BRASS CAP, FLUSH WITH CONCRETE, NW CORNER OF LOT 1 BLOCK 2, CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION.
BM Q–74			28.15	B.M. Q–74 LOCATED AT FLOOR LEVEL ON THE EAST SIDE OF THE NORTHWEST BAY OF DOORS IN THE COMPOSITE (P–12) BUILDING.

DETAIL SHOWING ADDITIONAL MONUMENTS

EXTENDED SOUTH TO DETAIL SHOWING ADDITIONAL MONUMENTS

HORIZONTAL SURVEY CONTROL

Point #	Northing	Easting	Description
601	6420.74	5446.75	FOUND 2" ALUMINUM CAP IN MONUMENT CASE, 0.7' BELOW RIM, NW CORNER OF CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION
701	5000.00	5000.00	FOUND 3 1/4" ALUMINUM CAP ON 2 1/2" ALUMINUM POST, 0.1' ABOVE GROUND, SW CORNER OF CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION
701	5000.00	5000.00	FOUND 3 1/4" ALUMINUM CAP ON 2 1/2" ALUMINUM POST, 0.1' ABOVE GROUND, SW CORNER OF CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION
702	6360.51	5490.69	FOUND 2" BRASS CAP, FLUSH WITH CONCRETE, NW CORNER OF LOT 1 BLOCK 2, CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION
703	6199.28	5440.02	FOUND 2" ALUMINUM CAP, 0.2' BELOW GRADE, SW CORNER OF LOT 1 BLOCK 2, CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION
704	6345.85	6216.18	FOUND 3 1/4" ALUMINUM CAP ON 2 1/2" ALUMINUM POST, 0.5' BELOW GRADE, PLUMB AND GOOD CONDITION
705	5801.20	5977.11	FOUND 2" ALUMINUM CAP, FLUSH WITH GRADE, NE CORNER OF LOT 4 BLOCK 3, CITY OF WHITTIER SUBD, PLUMB AND GOOD CONDITION
706	5971.83	5368.46	FOUND 5/8" REBAR
707	4988.19	5058.90	FOUND 5/8" REBAR
710	5441.15	5138.57	FOUND 5/8" REBAR

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REGISTERED PROFESSIONAL LAND SURVEYOR

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER ALASKA
PROJECT No. 20403.14

SURVEY CONTROL

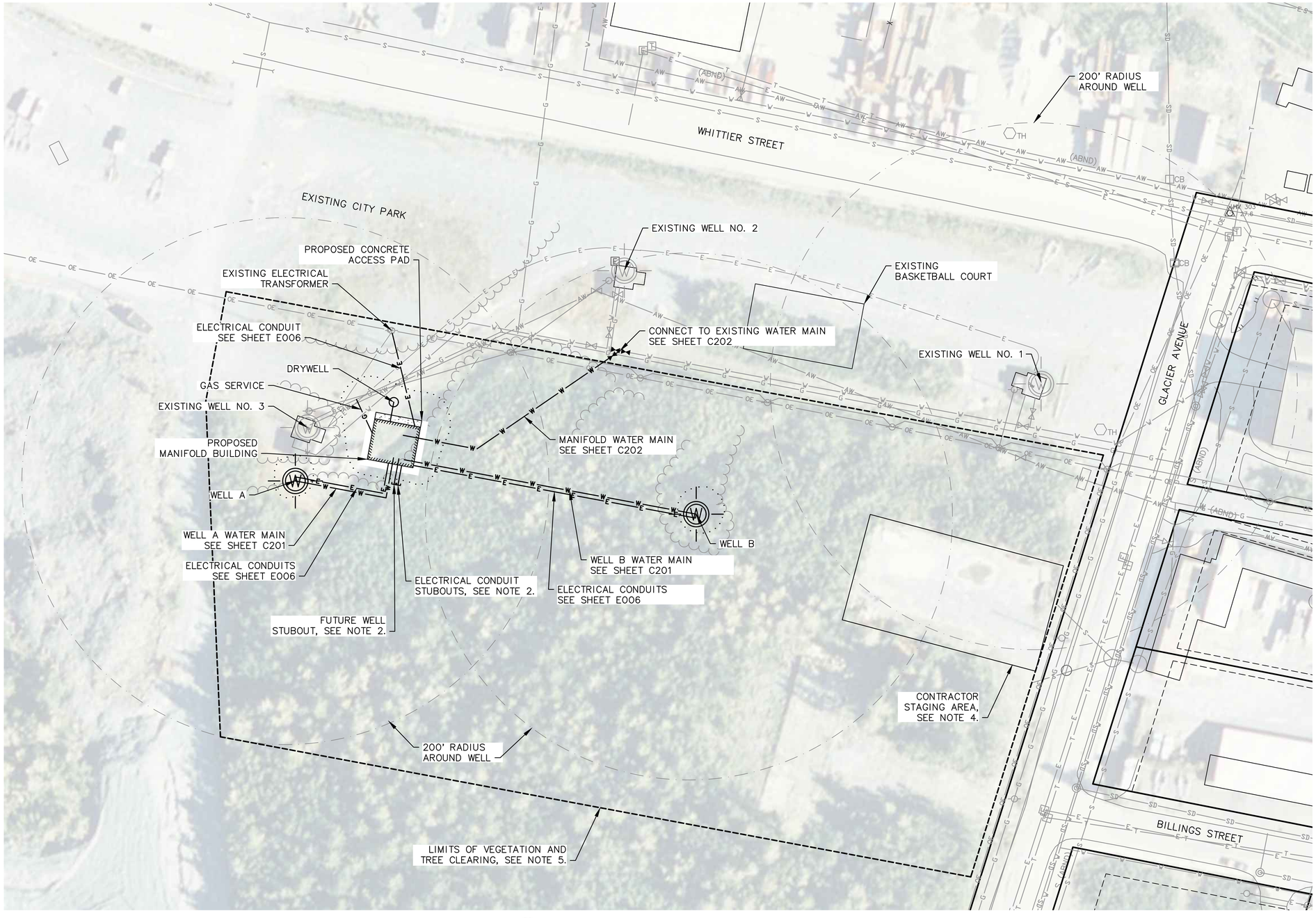
REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	SB
DESIGNED	AJR
REVIEWED	AJR

SHEET NO.
V001

PLOT DATE:1/05/2021



1 SITE PLAN

NOTES:

1. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL SHEETS FOR MANIFOLD BUILDING.
2. STUBOUTS FOR FUTURE WELL MINIMUM 15' FROM OUTSIDE EDGE OF MANIFOLD BUILDING FOUNDATION.
3. FOR INSTALLATION OF NEW LEVEL MONITOR AT RESERVOIR, REFER TO INSTRUMENTATION AND CONTROLS SHEETS.
4. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING DEBRIS FROM STAGING AREA. DEBRIS INCLUDES CONCRETE RUBBLE, SCRAP STEEL, AND OTHER MATERIALS. DEBRIS DOES NOT INCLUDE HAZARDOUS WASTE.
5. LIMITS OF VEGETATION AND TREE CLEARING TO BE FLAGGED BY CONTRACTOR AND APPROVED BY ENGINEER. CHIP ALL BRUSH AND TREES ONSITE AND THEN GRADE SITE SMOOTH.

40' 0 40' 80'

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECC262-AK

STATE OF ALASKA
49TH
Pete Bellezza
CE-8970
12/04/2020
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

SITE PLAN

REVISION SCHEDULE

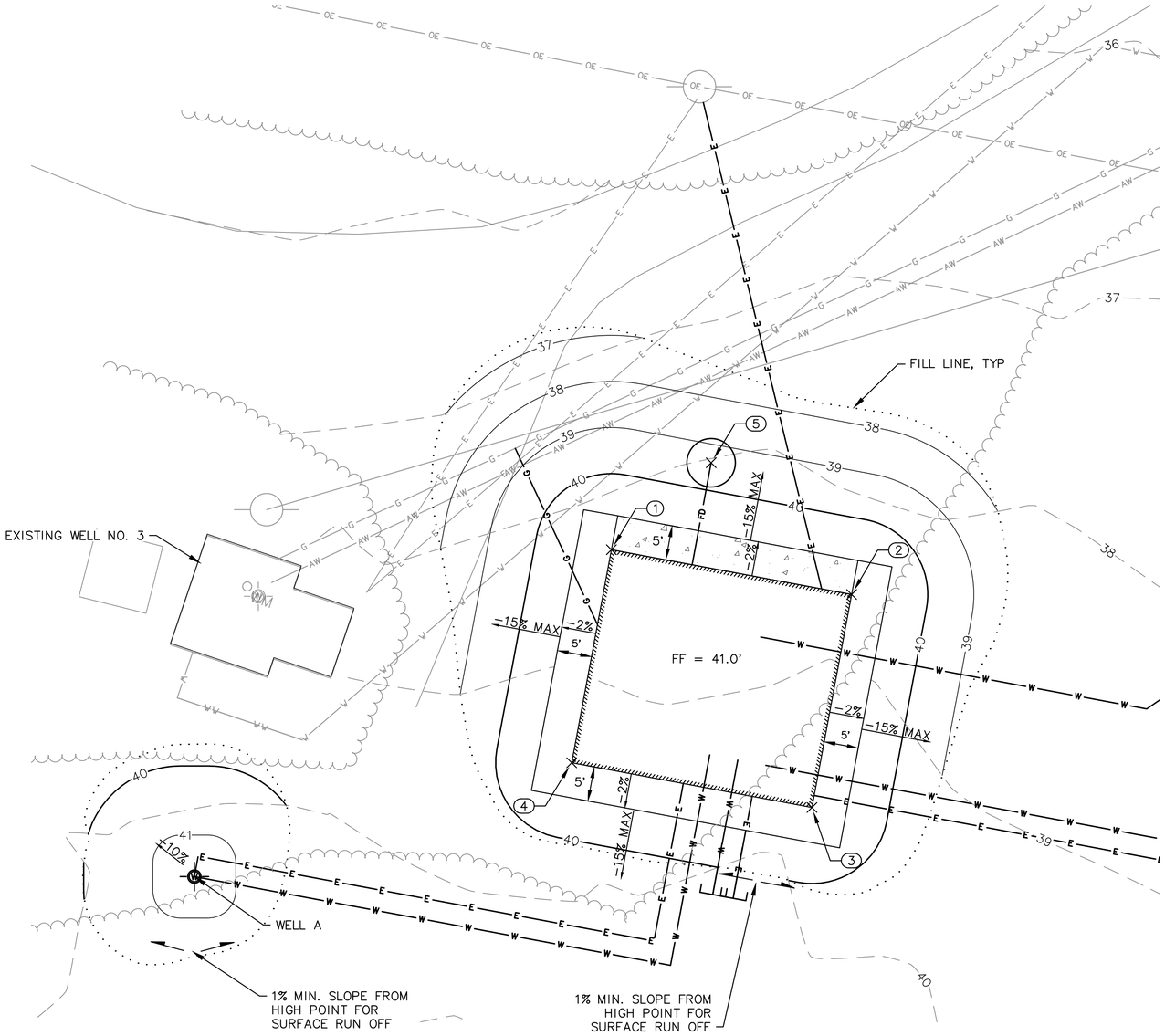
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.
C101

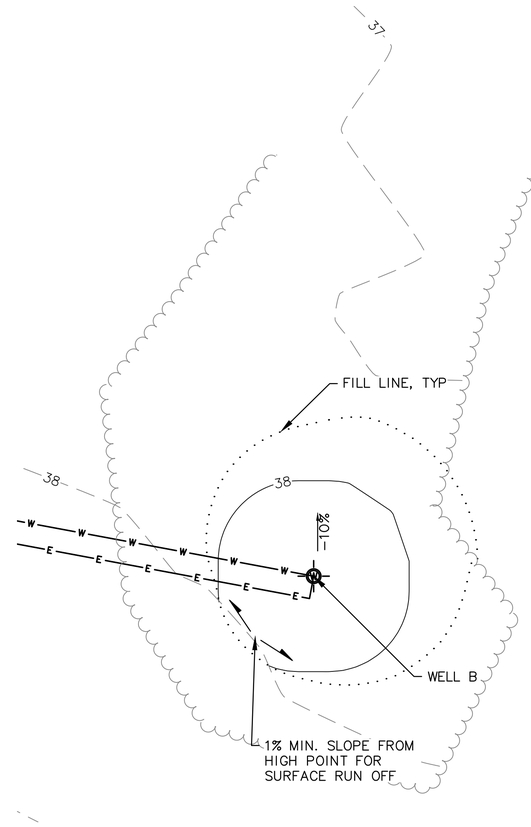
PLOT DATE:1/4/2022

POINT TABLE			
POINT NO	NORTHING	EASTING	DESCRIPTION
1	6249.11	4824.33	NW BLDG CORNER
2	6242.64	4859.06	NE BLDG CORNER
3	6211.84	4853.32	SE BLDG CORNER
4	6218.31	4818.59	SW BLDG CORNER
5	6261.69	4838.75	DRY WELL CENTER



1 **GRADING PLAN - MANIFOLD BUILDING & WELL A**

10' 0 10' 20'



2 **GRADING PLAN - WELL B**

10' 0 10' 20'

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REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

GRADING PLAN

REVISION SCHEDULE

#	DESCRIPTION	DATE

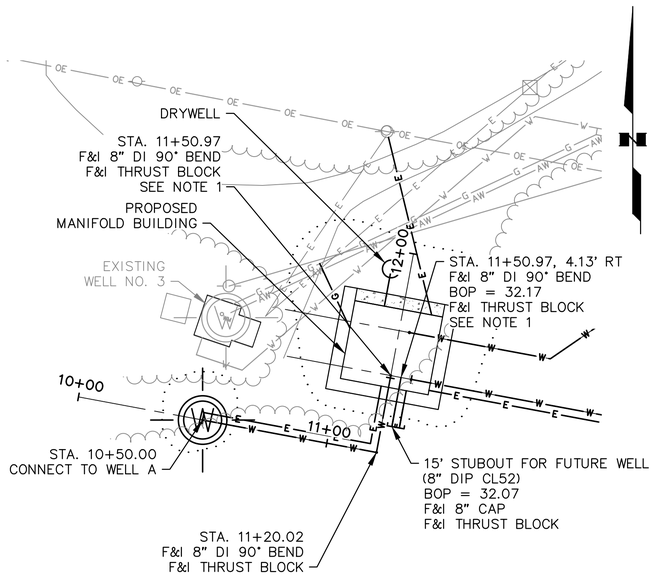
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.
C102

PLOT DATE:1/4/2022

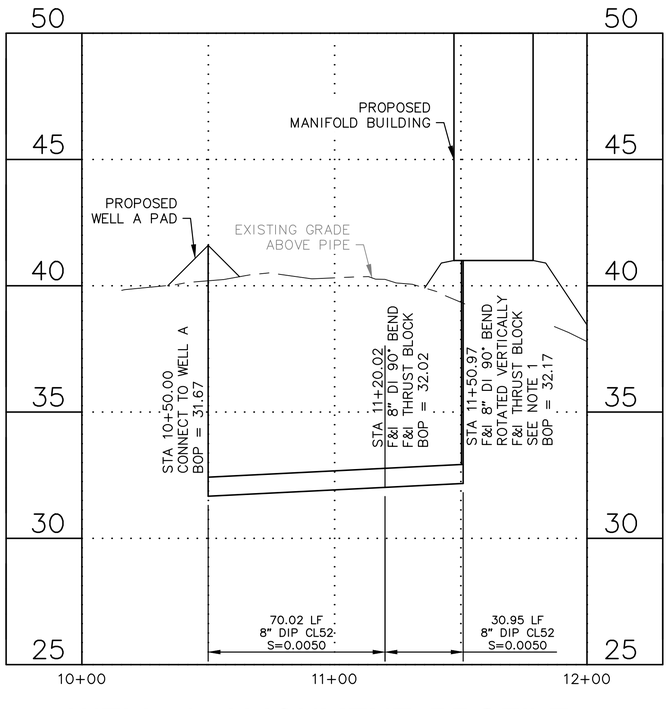
NOTES

1. EXTEND PIPE VERTICALLY FOR CONNECTION TO MANIFOLD BUILDING PIPING, SEE SHEET C205, DETAIL 1. SEE MECHANICAL SHEETS FOR BUILDING PIPING ELEVATION.
2. CAUTION!!! THE LOCATION OF EXISTING UTILITY CROSSINGS SHOWN IN PROFILE ARE APPROXIMATE.

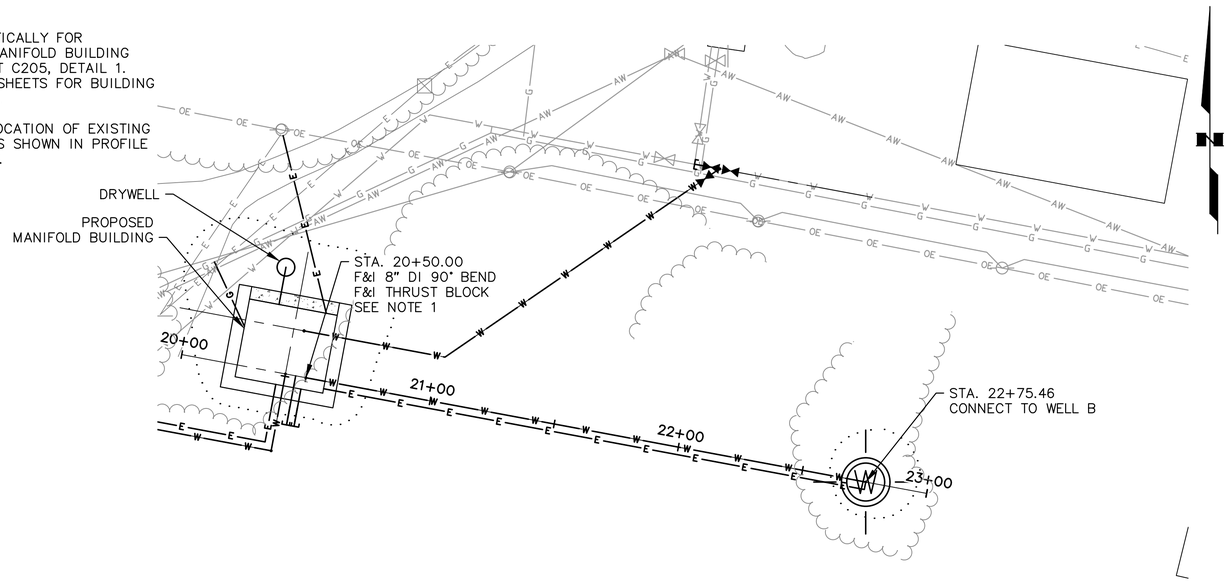


WELL A ALIGNMENT PLAN

30' 0 30' 60'

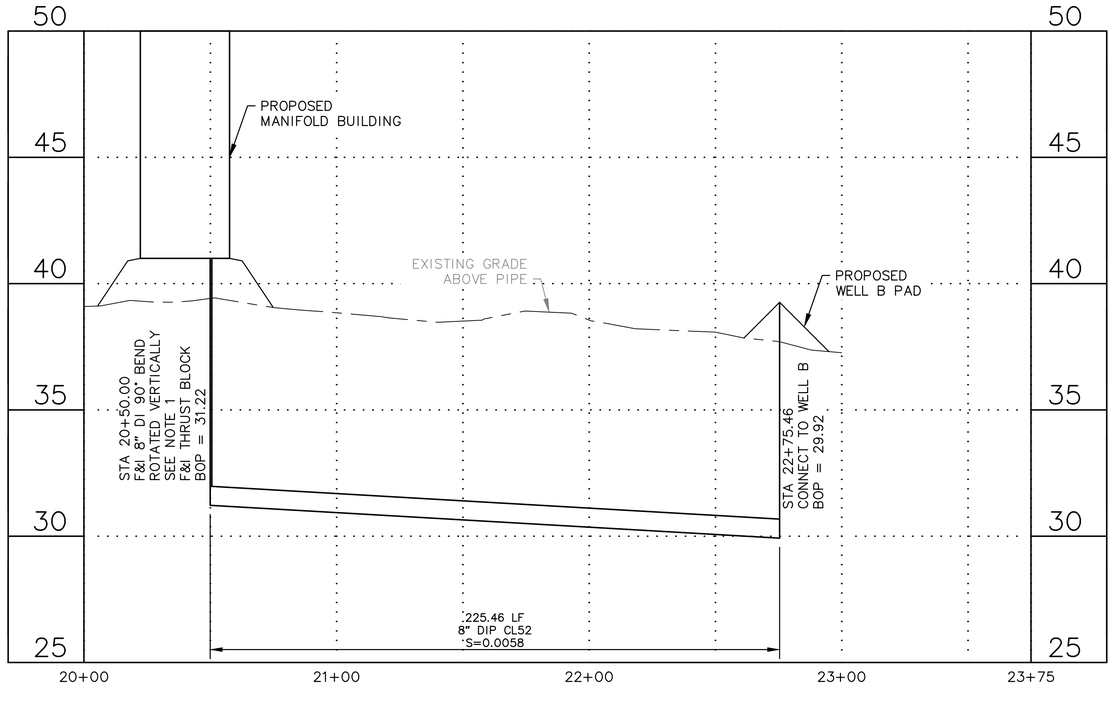


WELL A ALIGNMENT PROFILE



WELL B ALIGNMENT PLAN

30' 0 30' 60'



WELL B ALIGNMENT PROFILE

CRW ENGINEERING GROUP, LLC
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#AECC3252-AK

STATE OF ALASKA
49 TH
Pete Bellezza
CE-8970
12/04/2020
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

WELL A AND B PLAN AND PROFILE

REVISION SCHEDULE

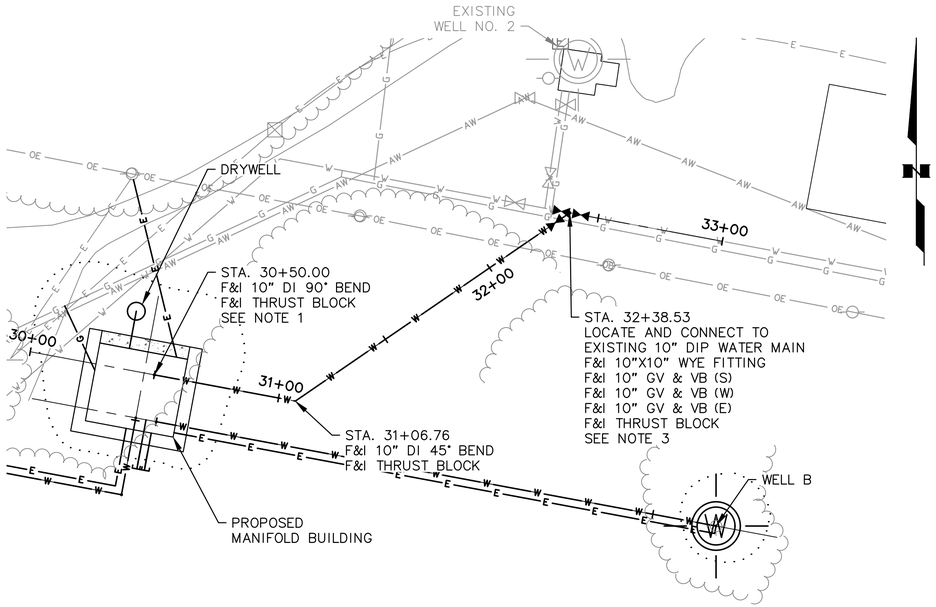
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	CMK
DESIGNED	WVS
REVIEWED	PB

SHEET NO.

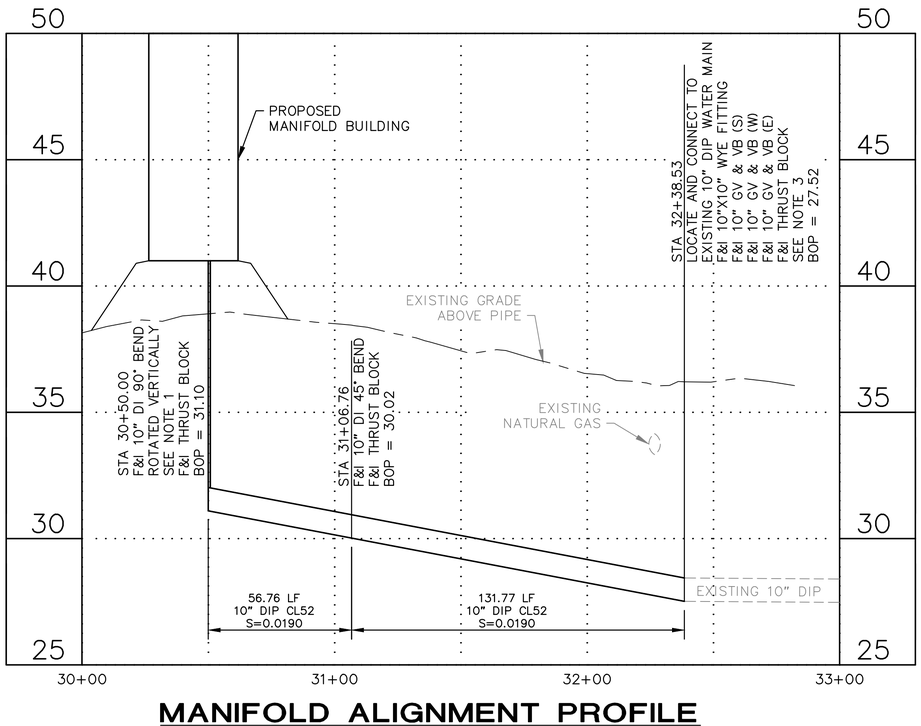
C201

PLOT DATE:1/4/2022



MANIFOLD ALIGNMENT PLAN

30' 0 30' 60'



MANIFOLD ALIGNMENT PROFILE

NOTES

1. EXTEND PIPE VERTICALLY FOR CONNECTION TO MANIFOLD BUILDING PIPING, SEE SHEET C205, DETAIL 1. SEE MECHANICAL SHEETS FOR BUILDING PIPING ELEVATION.
2. CAUTION!!! THE LOCATION OF EXISTING UTILITY CROSSINGS SHOWN IN PROFILE ARE APPROXIMATE.
3. DISCONNECTION OF WELL NO. 2 AND NO. 3 TO OCCUR AFTER COMMISSIONING PROPOSED FACILITIES IAW SHEET C301.

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Pete Bellezza
Pete Bellezza
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04/04/2022
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD PLAN AND PROFILE

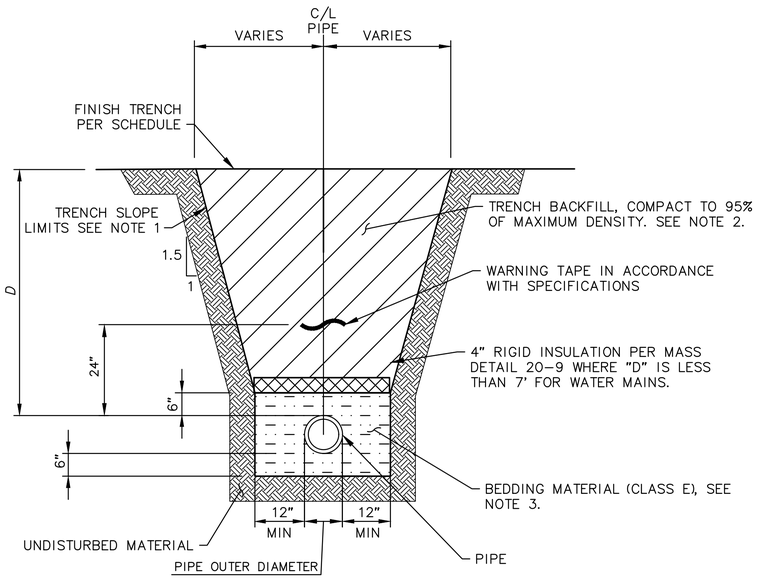
REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	CMK
DESIGNED	WVS
REVIEWED	PB

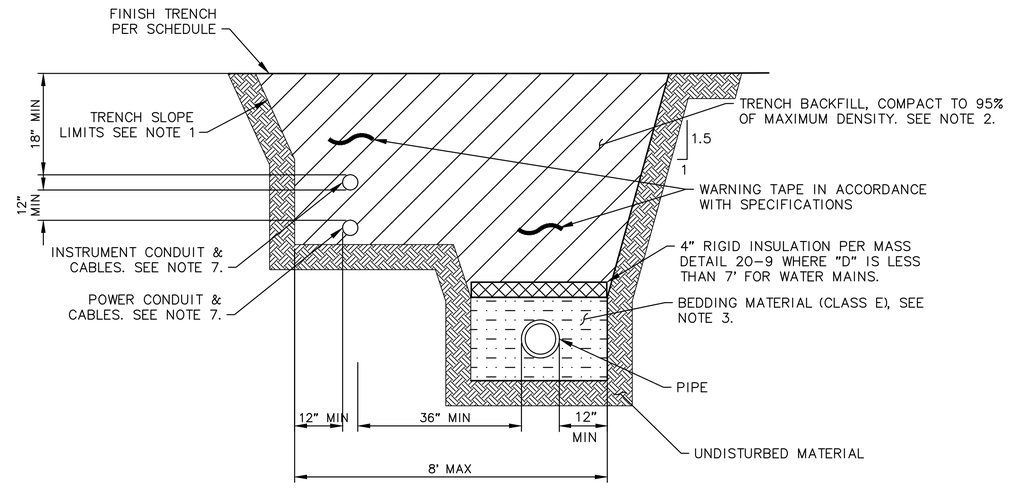
SHEET NO.
C202

PLOT DATE:1/4/2022



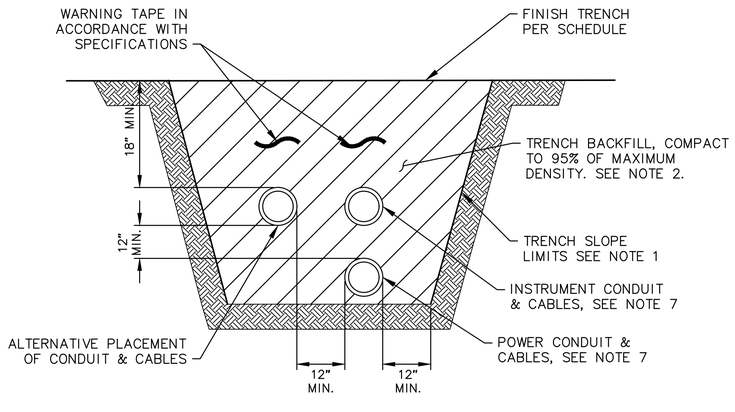
1 **TYPICAL PIPE TRENCH**

SCALE: NTS



2 **TYPICAL PIPE AND ELECTRICAL TRENCH**

SCALE: NTS



3 **TYPICAL ELECTRICAL TRENCH**

SCALE: NTS

TRENCH SECTIONS NOTES

1. TRENCH EXCAVATION AND SHORING SHALL COMPLY WITH ALL LOCAL, STATE, AND OSHA REGULATIONS AND REQUIREMENTS. INDICATED TRENCH WALL SLOPES AND DIMENSIONS ARE FOR PAY QUANTITY DETERMINATIONS ONLY.
2. TRENCH BACKFILL SHALL BE NATIVE MATERIAL AS APPROVED BY THE ENGINEER OR IMPORTED TYPE II CLASSIFIED FILL. ROADWAYS AND ROADWAY PRISMS SHALL HAVE 8" MAXIMUM ROCK SIZE.
3. BEDDING MATERIAL (CLASS E) COMPACTED TO 95% OF MODIFIED PROCTOR (ASTM D1557) MAXIMUM DRY DENSITY, PER MANUFACTURER RECOMMENDATIONS OR GOVERNING UTILITY ENTITY REQUIREMENTS.
4. WHERE OTHER UTILITIES ARE ENCOUNTERED, PROVIDE BEDDING MATERIAL AS SHOWN IN DETAIL 1.
5. REFER TO SHEET E006 FOR ELECTRICAL AND INSTRUMENT CONDUIT SIZES. INSTALL PER NEC REQUIREMENTS.

TRENCH FINISH SCHEDULE

1. BUILDING AND WELL PAD: FINISH WITH NATIVE MATERIAL, GRADED SMOOTH.
2. OTHER: FINISH WITH NATIVE MATERIAL, GRADED SMOOTH.

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Pete Bellezza
CE-8970
12/04/2021
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

CIVIL DETAILS - TRENCH

REVISION SCHEDULE

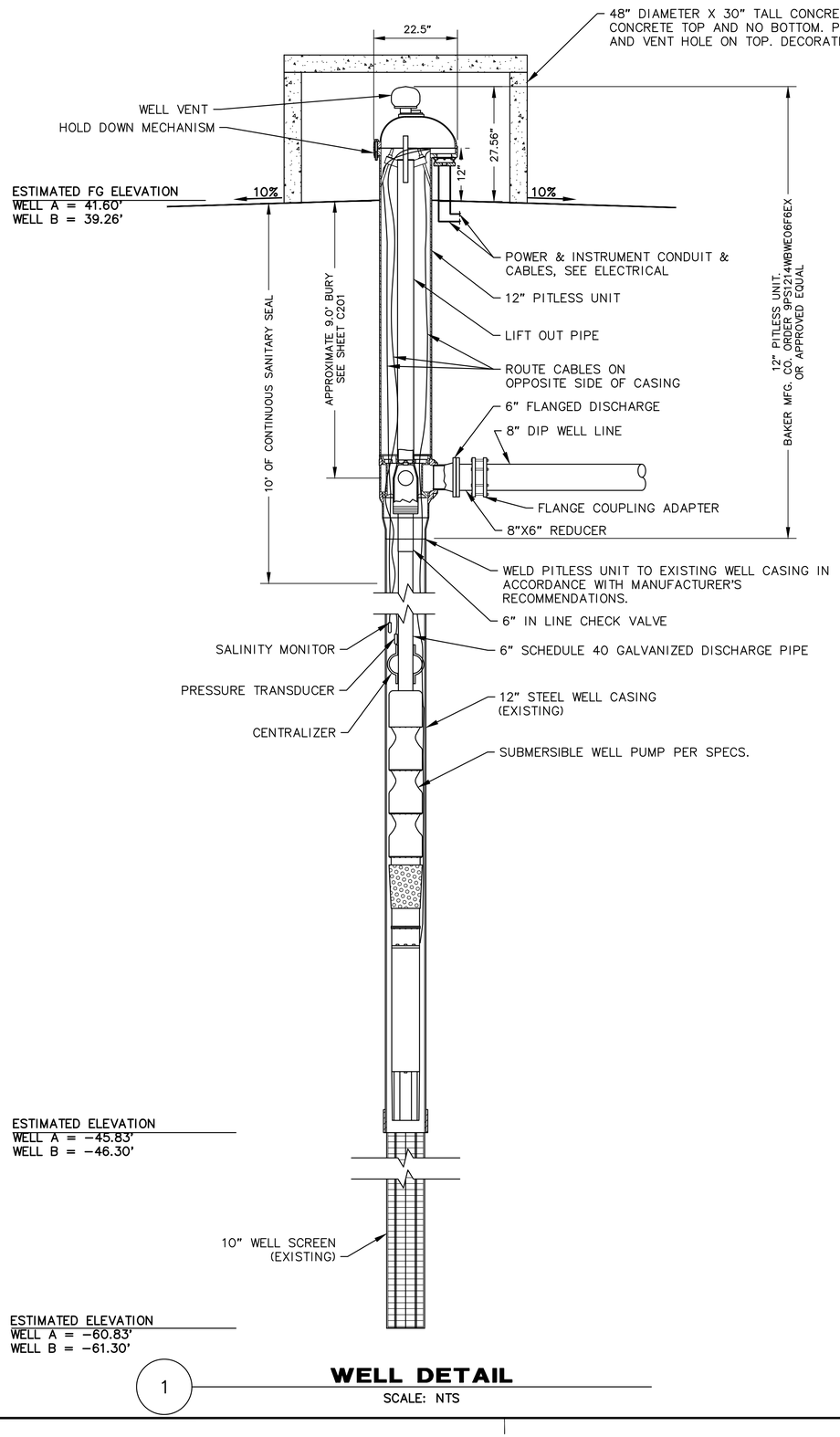
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

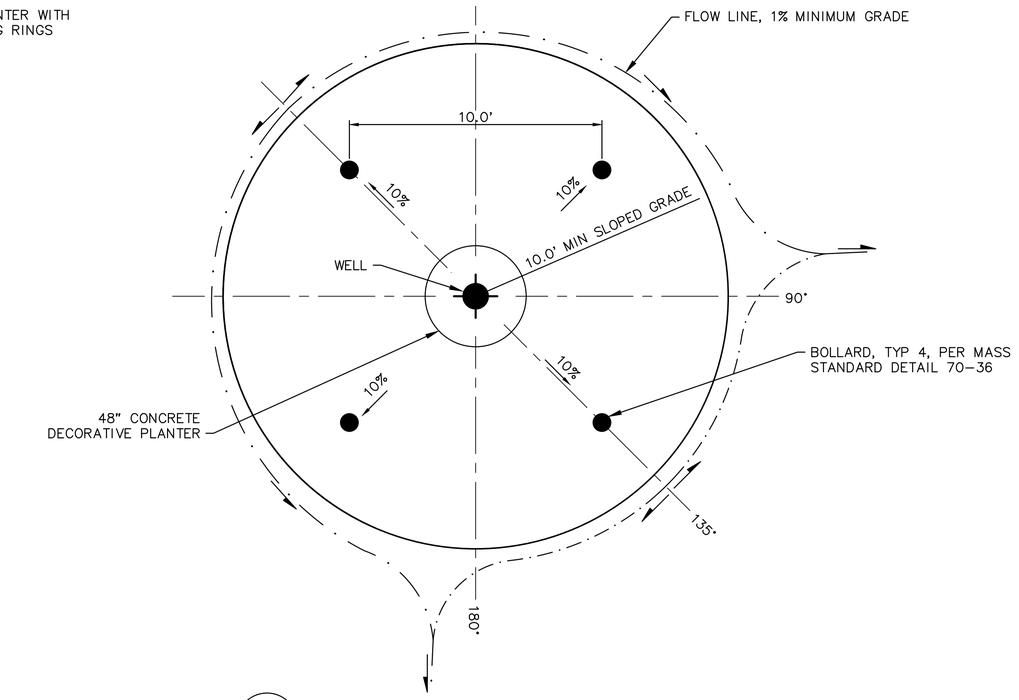
SHEET NO.

C203

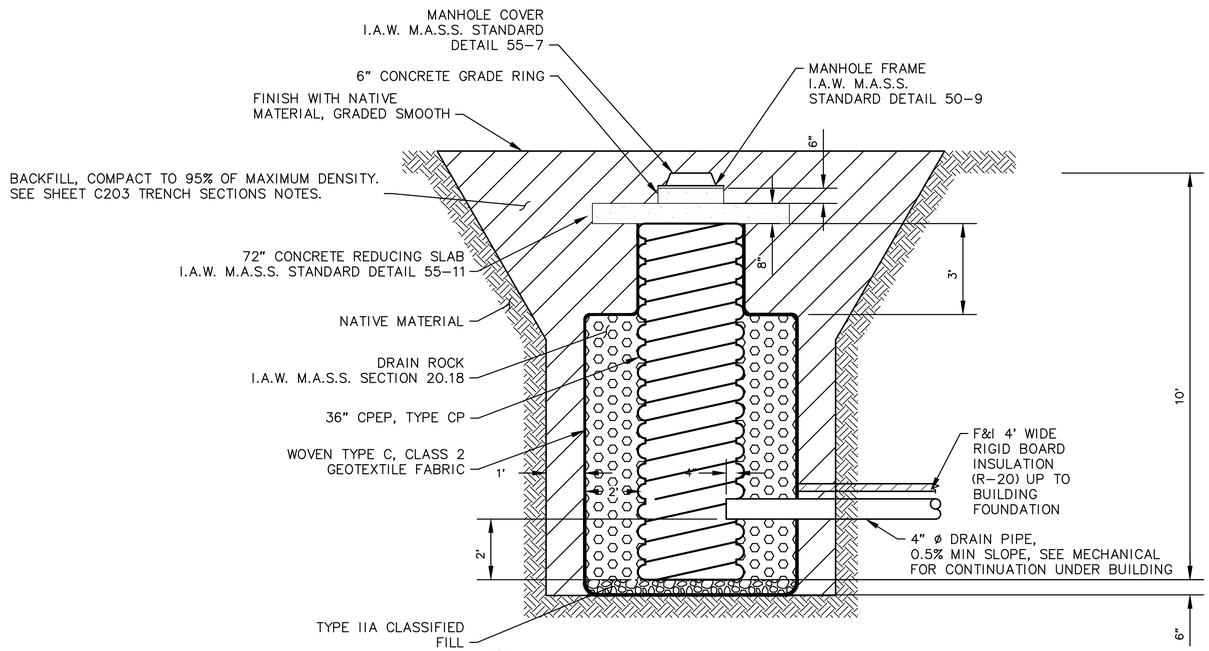
PLOT DATE:4/27/2022



1 **WELL DETAIL**
SCALE: NTS



2 **WELL PAD**
SCALE: NTS



3 **DRY WELL DETAIL**
SCALE: NTS

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FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

CIVIL DETAILS

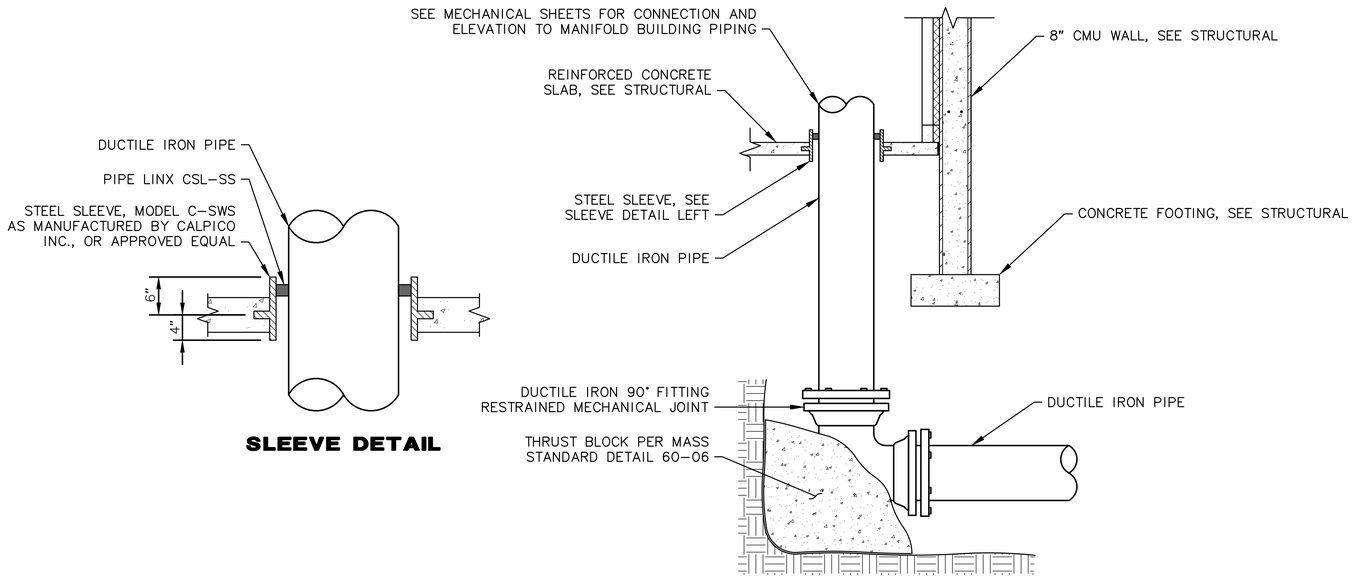
REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.
C204

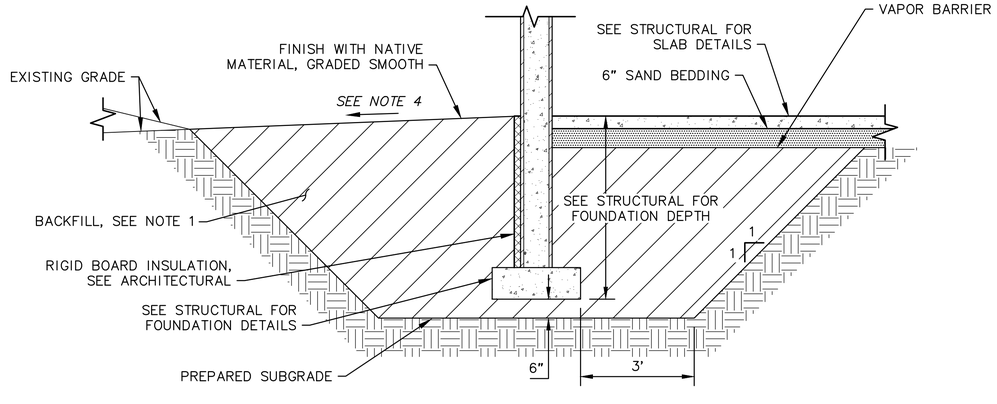
PLOT DATE:1/4/2022



SLEEVE DETAIL

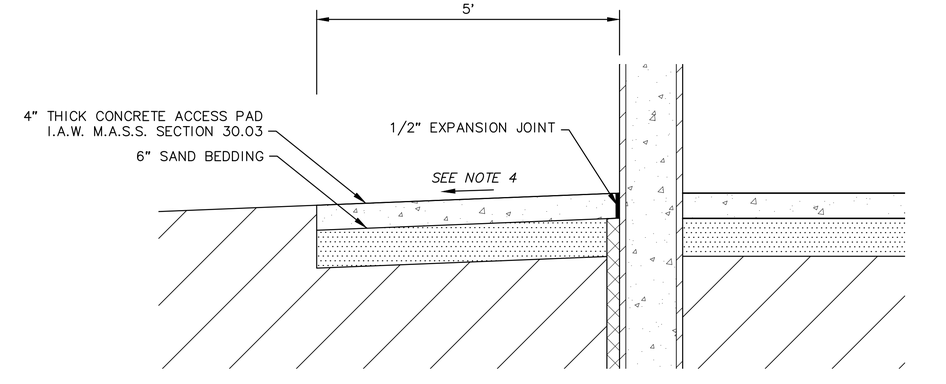
1 **WATER PIPE FLOOR PENETRATION**

SCALE: NTS



2 **BUILDING FOUNDATION DETAIL**

SCALE: NTS



3 **EXTERIOR CONCRETE ACCESS PAD DETAIL**

SCALE: NTS

BUILDING FOUNDATION NOTES:

1. BACKFILL SHALL BE NATIVE MATERIAL AS APPROVED BY ENGINEER OR IMPORTED TYPE IIA CLASSIFIED FILL, AND COMPACTED IN 12" MAX. LIFTS TO 95% OF MAXIMUM DENSITY.
2. SUBGRADE EXPOSED AT BOTTOM OF EXCAVATION SHALL BE SCARIFIED A MINIMUM 4", MOISTURE CONDITIONED, AND COMPACTED TO 95% OF MAXIMUM DENSITY.
3. EXCAVATE NATIVE MATERIAL TO A MINIMUM 3' BELOW GROUND SURFACE WITHIN FOOTPRINT OF BUILDING AND FOUNDATION. REMOVE AND DISPOSE OF ALL ORGANIC MATERIALS IN ACCORDANCE WITH MASS SECTION 20.27. REMOVE ROCKS LARGER THAN 8". PLACE AND COMPACT REUSED NATIVE MATERIAL TO 95% OF MAX DENSITY.
4. SEE SHEET C102 FOR GRADING.

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STATE OF ALASKA
49TH
Pete Bellezza
CE-8970
12/04/2021
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

CIVIL DETAILS

REVISION SCHEDULE

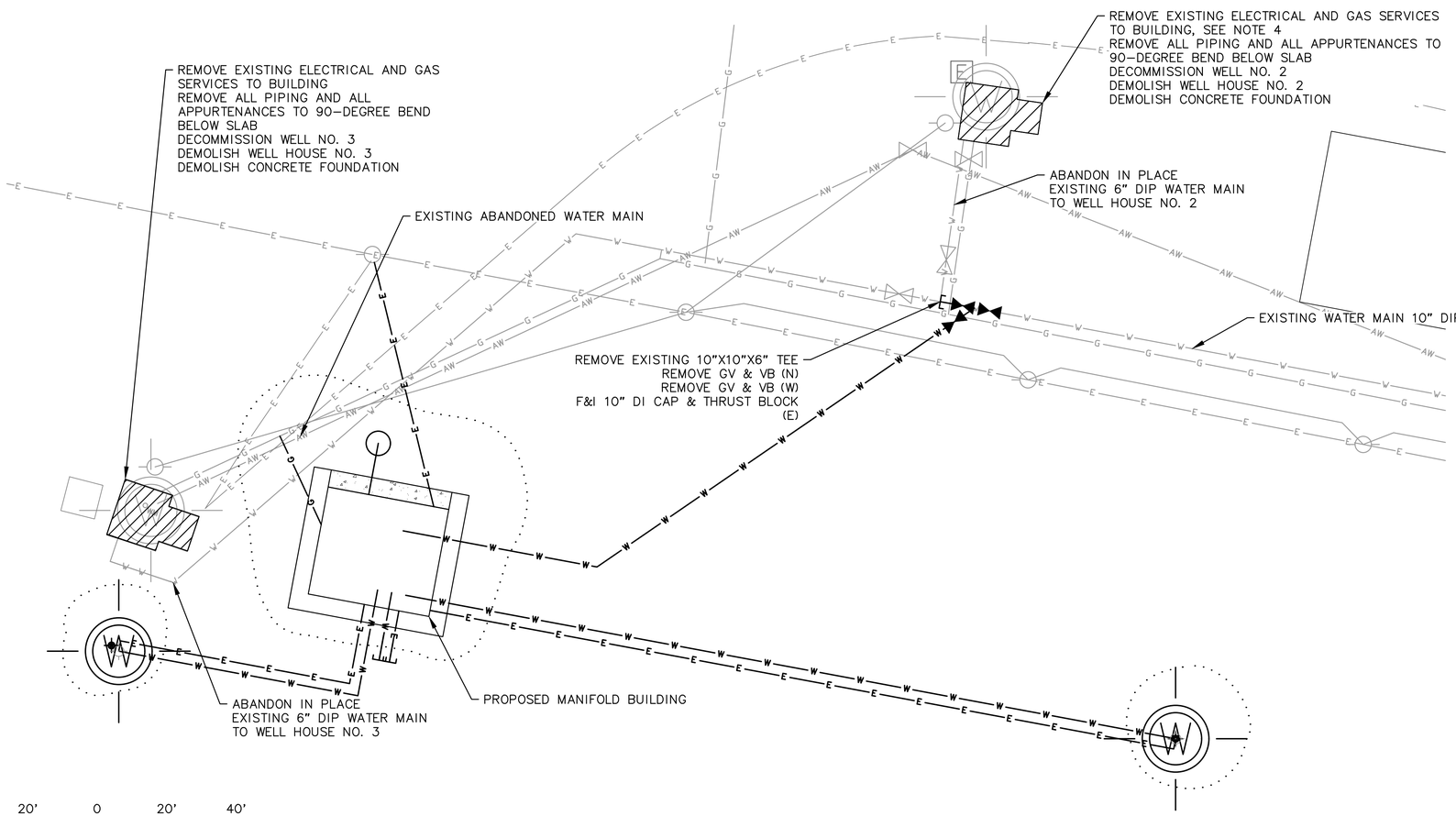
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.

C205

PLOT DATE:1/4/2022



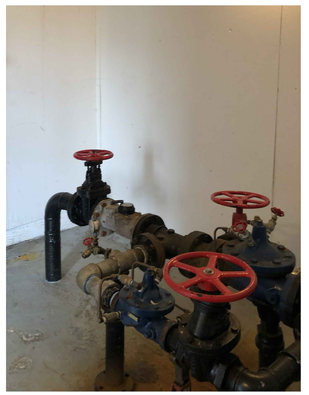
NOTES:

1. REFER TO SHEET E003 FOR ELECTRICAL DEMO OF WELL HOUSE NO. 2 AND 3.
2. COORDINATE ALL NECESSARY WATER SHUT DOWNS WITH CITY OF WHITTIER.
3. DEMO TO OCCUR AFTER COMMISSIONING PROPOSED MANIFOLD BUILDING, WELL A, AND B.
4. COORDINATE WITH ENSTAR TO ABANDON GAS SERVICES AS CLOSE AS ALLOWED TO ENSTAR'S GAS MAIN.
5. CONTRACTOR SHALL PROVIDE CITY OF WHITTIER 72–HOUR NOTICE OF POWER SHUTOFF. CITY OF WHITTIER HAS FIRST RIGHT TO SALVAGE, REFER TO SPECS.

1 **WELL NO. 2 & 3 SITE PLAN - DEMOLITION**

2 **WELL NO. 3**

3 **WELL NO. 2**



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STATE OF ALASKA
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12/04/2020
REGISTERED PROFESSIONAL ENGINEER

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

DEMOLITION PLAN - WELLS 2 AND 3

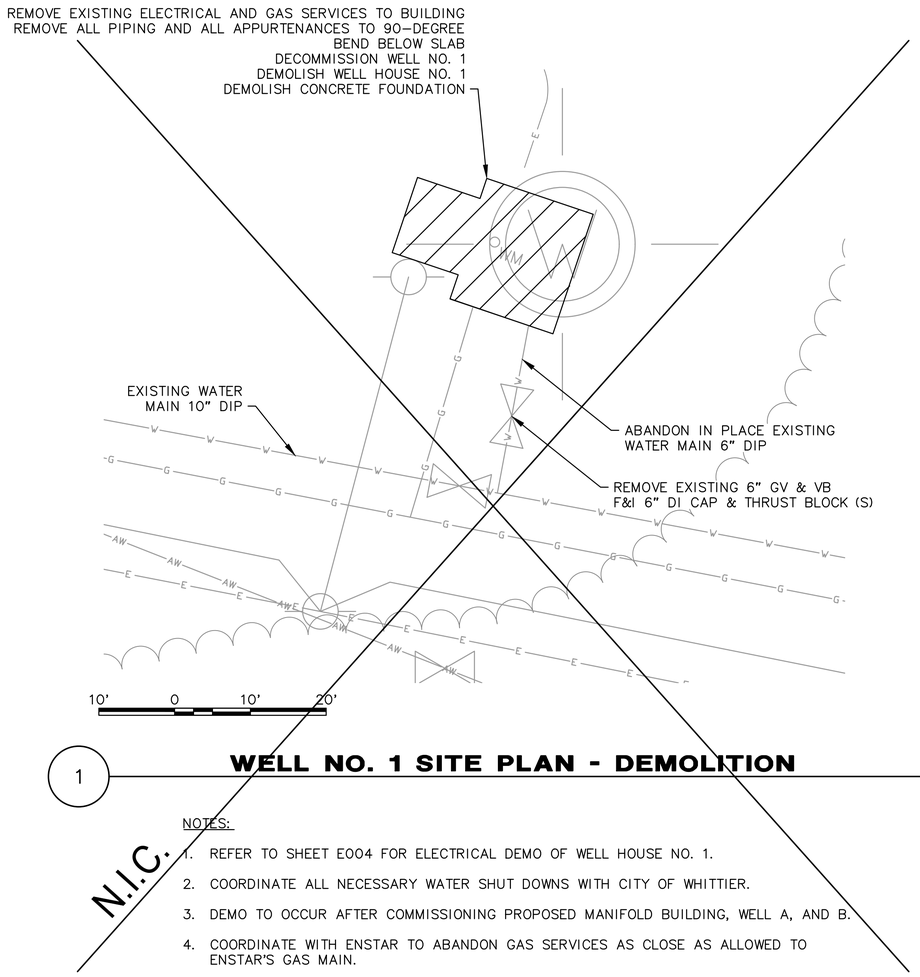
REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.
C301

PLOT DATE:1/4/2022

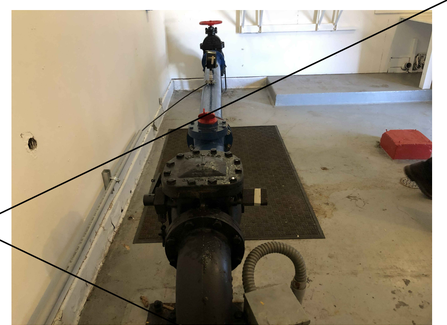


1 WELL NO. 1 SITE PLAN - DEMOLITION

N.I.C.

NOTES:

1. REFER TO SHEET E004 FOR ELECTRICAL DEMO OF WELL HOUSE NO. 1.
2. COORDINATE ALL NECESSARY WATER SHUT DOWNS WITH CITY OF WHITTIER.
3. DEMO TO OCCUR AFTER COMMISSIONING PROPOSED MANIFOLD BUILDING, WELL A, AND B.
4. COORDINATE WITH ENSTAR TO ABANDON GAS SERVICES AS CLOSE AS ALLOWED TO ENSTAR'S GAS MAIN.
5. CONTRACTOR SHALL PROVIDE CITY OF WHITTIER 72-HOUR NOTICE OF POWER SHUTOFF. CITY OF WHITTIER HAS FIRST RIGHT TO SALVAGE, REFER TO SPECS.



N.I.C.

2 WELL NO. 1

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STATE OF ALASKA
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Pete Bellezza
Pete Bellezza
CE-8970
12/04/2020
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

DEMOLITION PLAN - WELL 1 (N.I.C.)

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	KEG
DESIGNED	WVS
REVIEWED	PB

SHEET NO.

C302

PLOT DATE:1/4/2022

SYMBOL LEGEND

BUILDING SECTION — 1 / A303

WALL SECTION — 1 / A401; 1 / A401

EXTERIOR ELEVATION — 1 / A301

PARTIAL/ENLARGED PLAN OR DETAIL — 1 / A501

INTERIOR ELEVATION — 1 / 4 A701 2 / 3

DOOR NUMBER — 121A
RELITE NUMBER — R1

WINDOW NUMBER — A
LOUVER NUMBER — L1

ROOM NAME — ROOM NAME
ROOM NUMBER — 100

ASSEMBLY TYPE — CA.4

INTERIOR PARTITION — 11A / 4 1

CEILING HEIGHT — **8'-0"AFF**

MATERIAL LEGEND

BATT INSULATION

GYPSUM BOARD

SOIL

CMU

RIGID INSULATION

PLYWOOD

CONCRETE

BLOCKING

CONTINUOUS BLOCKING

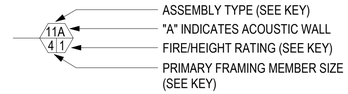
STANDARD ARCHITECTURAL ABBREVIATIONS

AB	AIR BARRIER
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISHED GRADE
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATE
ARGYP	ABUSE RESISTANT GYPSUM
AWW	ALL WEATHER WOOD
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CUH	CABINET UNIT HEATER
DBL	DOUBLE
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DTL	DETAIL
EA	EACH
EF	EPOXY FLOOR
ELEC	ELECTRICAL
EQ	EQUAL
EXIST	EXISTING
EXT	EXTERIOR
FBG	FIBERGLASS
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FACTORY FINISH
FLR	FLOOR
FIN	FINISH
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOS	FACE OF STUD
FRP	FIBERGLASS REINFORCED PLASTIC PANEL
FRT	FIRE RETARDANT TREATED
FT	FOOT / FEET
FTG	FOOTING
FURR	FURRING
GA	GAUGE
GALV	GALVANIZED
GLB	GLULAM BEAM
GYP	GYPSUM BOARD
HB	HOSE BIB
HGT	HEIGHT
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
HW-X	HARDWARE (IF PROVIDED, X INDICATES DOOR HARDWARE GROUP #)
ID	INSIDE DIAMETER
INSUL	INSULATION
INT	INTERIOR
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MRGYP	MOISTURE-RESISTANT GYPSUM BOARD
MR	MOP RACK
MTD	MOUNTED
MTL	METAL
NA	NOT APPLICABLE
NFS	NON-FROST SUSCEPTIBLE
NIC	NOT IN CONTRACT
OC	ON CENTER
OH	OVERHEAD
OPP	OPPOSITE
OTS	OPEN TO STRUCTURE
OWS	OIL-WATER SEPARATOR
PLYWD	PLYWOOD
PR	PAIR
P	PAINT
RAD	RADIUS
REQ	REQUIRED
REV	REVISED / REVISION
RM	ROOM
RO	ROUGH OPENING
SECT	SECTION
SF	SQUARE FEET
SIM	SIMILAR
SPEC	SPECIFICATIONS
SSTL	STAINLESS STEEL
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
TBD	TO BE DETERMINED
TO CONC	TOP OF CONCRETE
TO DECK	TOP OF DECKING
TO PLT	TOP OF PLATE
TO SLAB	TOP OF SLAB
TO STL	TOP OF STEEL
TO SUB	TOP OF SUBFLOOR
TSTAT	THERMOSTAT
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
VR	VAPOR RETARDER
VTR	VENT THROUGH ROOF
WB	WEATHER BARRIER
WD	WOOD
WP	WATER PROOF
WPT	WOOD PRESERVATIVE TREATED
WSCT	WAINSCOT

ASSEMBLY TYPE KEY

TYPE	DESCRIPTION
11 THRU 99	INTERIOR PARTITIONS
FA, FB, FC, ETC.	FLOORS
RA, RB, RC, ETC.	ROOFS
EA, EB, EC,ETC.	EXTERIOR WALLS

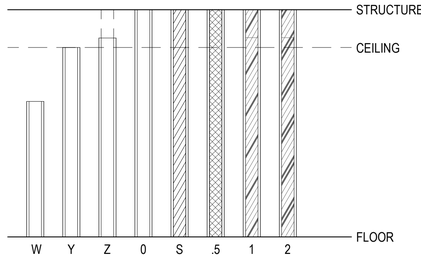
INTERIOR PARTITION KEY



PRIMARY FRAMING KEY

#		METAL	WOOD	CONC	MASONRY
1	=	7/8"	1x1	NA	NA
2	=	2 1/2"	2x2	NA	NA
3	=	3 5/8"	2x3	NA	NA
4	=	4"	2x4	4"	3 5/8"
6	=	6"	2x6	6"	5 5/8"
8	=	8"	2x8	8"	7 5/8"

FIRE RATING/PARTITION HEIGHT KEY



FIRE RATING/PARTITION HEIGHT NOTES

W = NON-RATED, PARTIAL HEIGHT

Y = NON-RATED, CEILING HEIGHT

Z = NON-RATED, ABOVE CEILING HEIGHT

0 = NON-FIRE-RATED, ACOUSTIC WALL

S = SMOKE PARTITION

.5 = 1/2-HR RATED

1 = 1-HR RATED

2 = 2-HR RATED

3 = 3-HR RATED

4 = 4- HR RATED

5 = 1-HR RATED SMOKE BARRIER

BETTISWORTH NORTH

STATE OF ALASKA 49TH — Roy L. Rountree No. A-8259 01/04/2022 — REGISTERED PROFESSIONAL ARCHITECT

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

ABBREVIATIONS, GENERAL PROJECT NOTES, SYMBOLS

REVISION SCHEDULE

#	DESCRIPTION	DATE

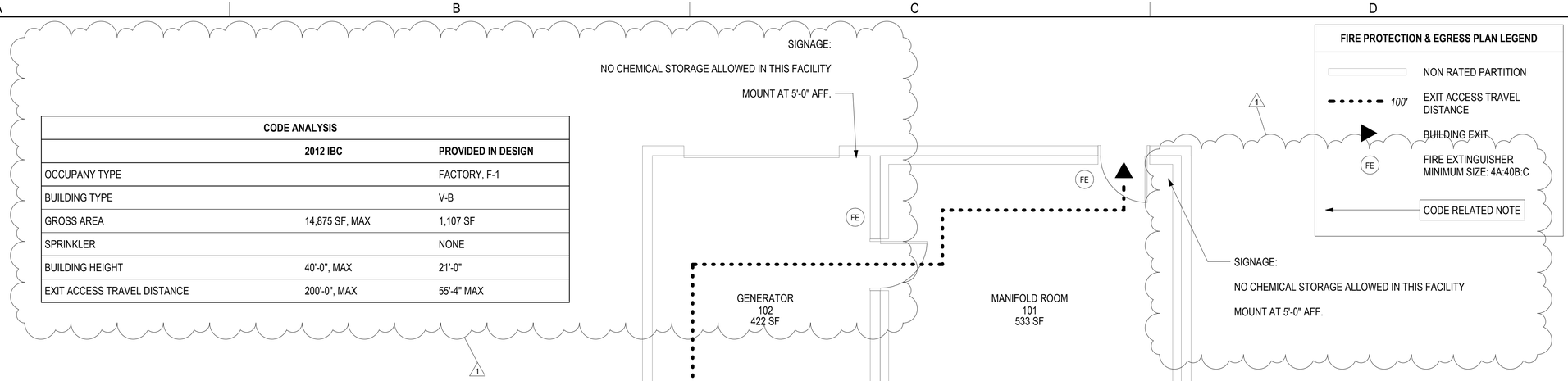
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	KEI
REVIEWED	KEI

SHEET NO.

A001

PLOT DATE: 4/14/2022 8:54:44 AM

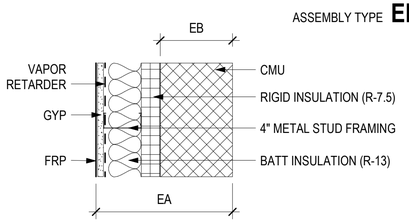
CODE ANALYSIS		
	2012 IBC	**PROVIDED IN DESIGN**
OCCUPANY TYPE		FACTORY, F-1
BUILDING TYPE		V-B
GROSS AREA	14,875 SF, MAX	1,107 SF
SPRINKLER		NONE
BUILDING HEIGHT	40'-0", MAX	21'-0"
EXIT ACCESS TRAVEL DISTANCE	200'-0", MAX	55'-4" MAX



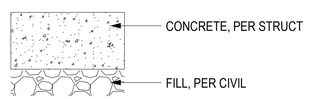
1 A002 CODE PLAN
1/4" = 1'-0"

EXTERIOR WALL
UNRATED
ASSEMBLY TYPE **EA**

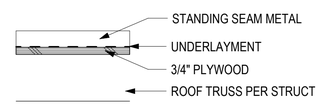
ASSEMBLY TYPE **EB**



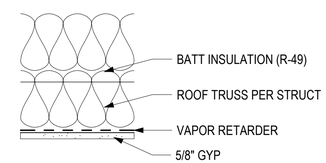
FLOOR ASSEMBLY
SLAB ON GRADE
ASSEMBLY TYPE **FA**



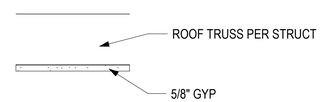
ROOF ASSEMBLY
ASSEMBLY TYPE **RA**



CEILING ASSEMBLY
ASSEMBLY TYPE **CA**



CEILING ASSEMBLY
ASSEMBLY TYPE **CB**



BETTISWORTH NORTH

STATE OF ALASKA
49TH
Roy L. Rountree
No. A-8259
01/04/2022
REGISTERED PROFESSIONAL ARCHITECT

FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE
WHITTIER, ALASKA
PROJECT No. 20403.14

CODE ANALYSIS, CODE PLAN, ASSEMBLY TYPES

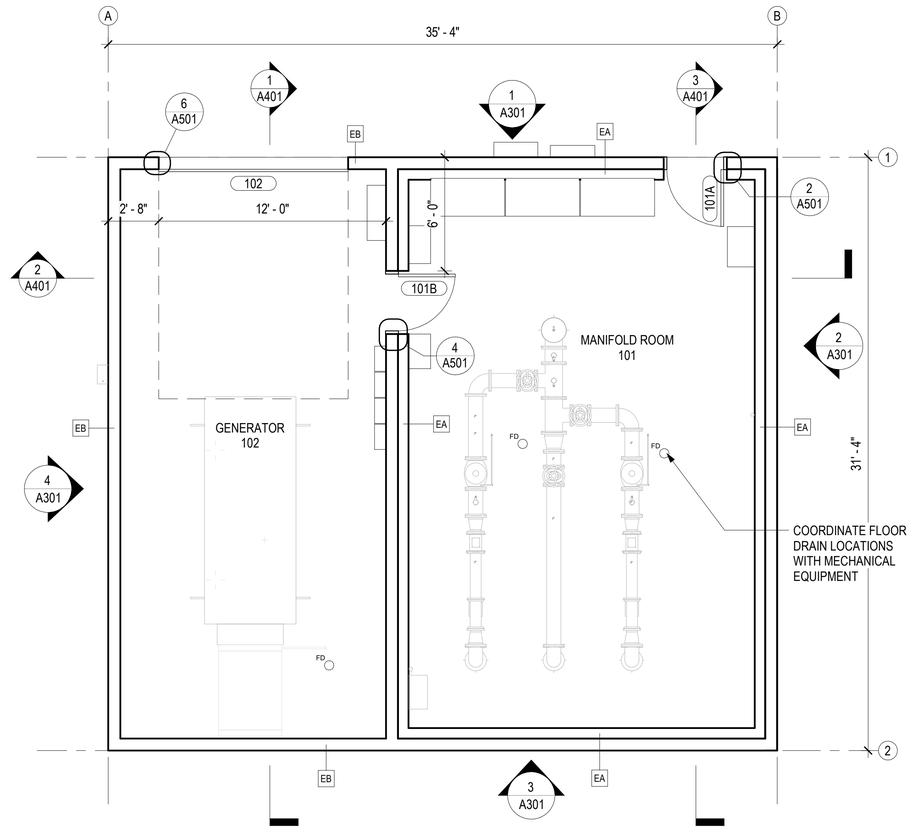
REVISION SCHEDULE

#	DESCRIPTION	DATE
1	ASI-001	2022-09-19

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	KEI
REVIEWED	KEI

SHEET NO.
A002

PLOT DATE: 9/19/2022 3:35:52 PM

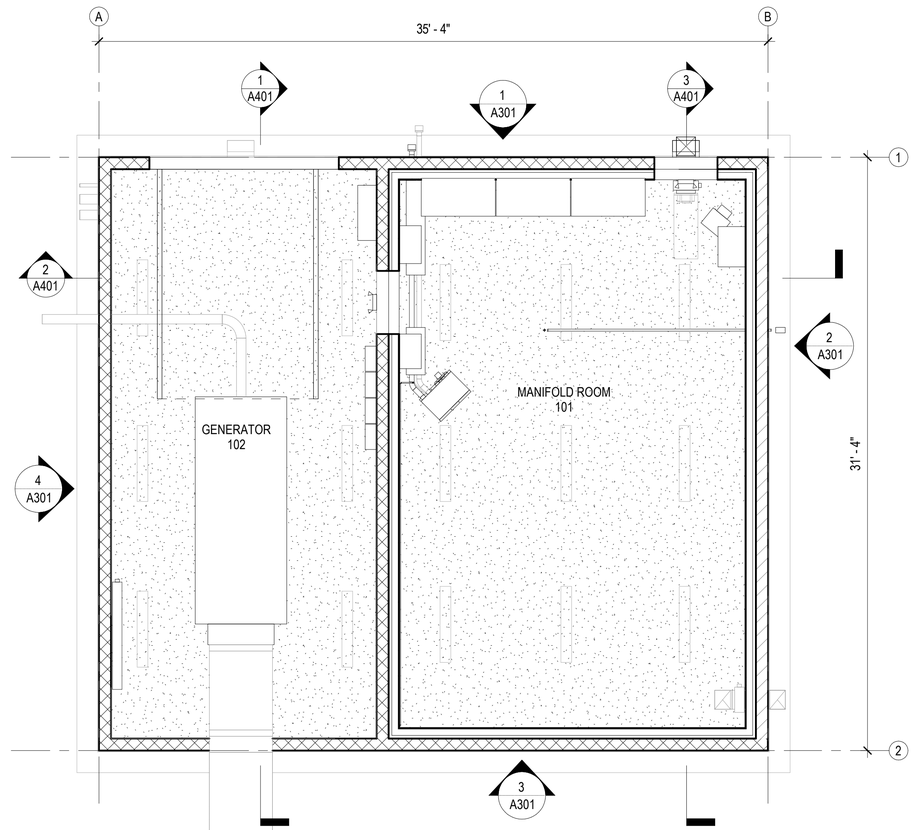


1 A110 FIRST FLOOR PLAN

1/4" = 1'-0"

0 1 2 3 4 5 10

PLAN NORTH



2 A110 FIRST FLOOR REFLECTED CEILING PLAN

1/4" = 1'-0"

0 1 2 3 4 5 10

PLAN NORTH

GENERAL FLOOR PLAN NOTES

FIELD VERIFICATION: THE CONTRACTOR SHALL FIELD-VERIFY ALL DIMENSIONS PRIOR TO WORK. PROMPTLY NOTIFY THE ARCHITECT, OWNER'S REPRESENTATIVE, AND/OR THE CONTRACTING OFFICER IN WRITING OF ALL DISCREPANCIES IN NEW OR EXISTING CONDITIONS.

DIMENSIONING GUIDE: ALL DIMENSIONS ARE TAKEN FROM GRIDS, FACE OF METAL/WOOD STUD PARTITION, OR FACE OF MASONRY UNLESS OTHERWISE NOTED. DIMENSIONS BETWEEN SURFACES WILL BE NOTED WHERE APPLICABLE FROM MATERIAL FINISHES. UNLESS OTHERWISE NOTED ALL DIMENSIONS REFERENCED HEREIN ARE IMPERIAL STANDARDS AND SHALL BE TREATED WITHOUT ANY HIERARCHY OR ORDER OF PRECEDENCE.

REFERENCE ELEVATION: ALL ELEVATIONS NOTED ON THIS PLAN CORRESPOND TO REFERENCE ELEVATION 0'-0" FOR THIS FLOOR LEVEL. VARIANCES IN THIS ELEVATION MAY EXIST, AS INDICATED. UPPER FLOOR ELEVATIONS TO BE NOTED ACCORDINGLY.

DOOR OPENINGS: ALL DOOR OPENINGS ARE TAGGED IN CORRESPONDENCE WITH THE DOOR TYPE SCHEDULE ON SHEET A401. THIS MAY INCLUDE MISCELLANEOUS OPENINGS SUCH AS OVERHEAD SECTIONAL OR COILING, SLIDING, AND OPERABLE PANEL ASSEMBLIES. TYPICAL DOOR JAMBS ARE LOCATED 6" FROM FACE OF STUD AT ADJACENT WALL TO JAMB ROUGH OPENING UNO.

FLOOR SLOPE: UNLESS OTHERWISE NOTED THE FLOOR SHALL BE SLOPED TO THE DRAIN IN AREAS TO RECEIVE FLOOR DRAINS.

REFLECTED CEILING PLAN LEGEND

GYPSUM WALL BOARD CEILING

LIGHT FIXTURE, SEE ELECTRICAL

BETTISWORTH NORTH

STATE OF ALASKA 49TH
Roy L. Rountree
No. A-8259
01/04/2022
REGISTERED PROFESSIONAL ARCHITECT

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

FIRST FLOOR PLAN, FIRST FLOOR REFLECTED CEILING PLAN

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	KEI
REVIEWED	KEI

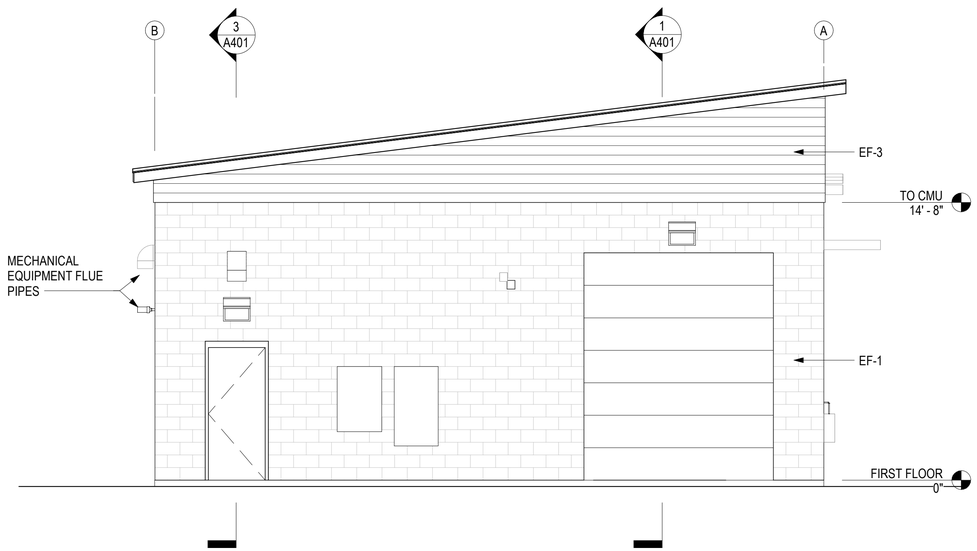
SHEET NO.

A110

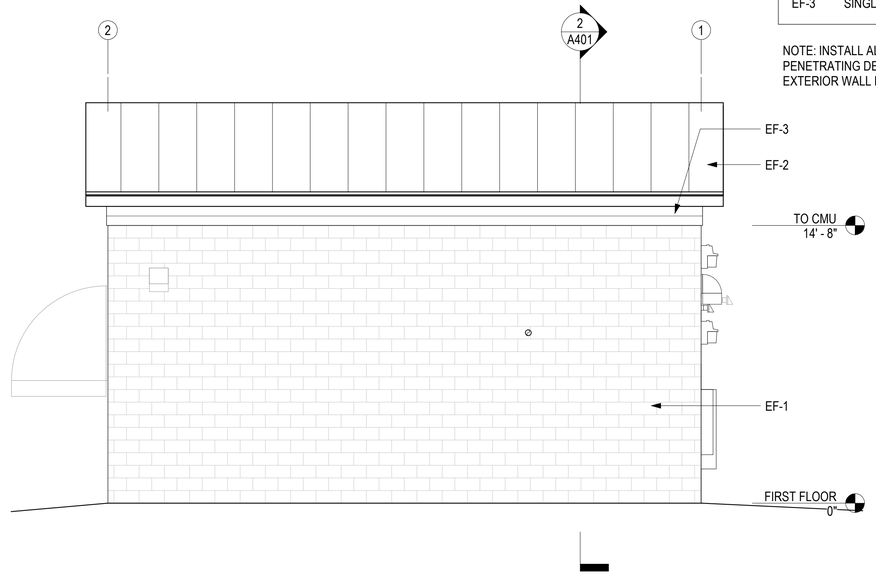
PLOT DATE: 4/14/2022 8:54:44 AM

EXTERIOR FINISH LEGEND	
EF-1	CMU
EF-2	STANDING SEAM METAL ROOF
EF-3	SINGLE SKIN METAL PANEL SIDING

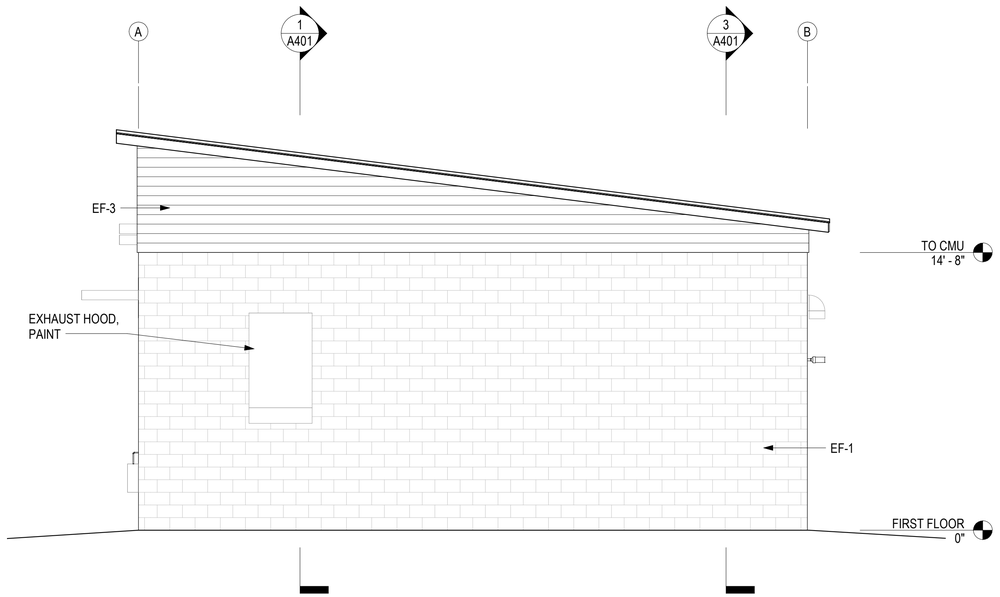
NOTE: INSTALL ALL EXTERIOR WALL PENETRATING DEVICES PER MFR. SEAL ALL EXTERIOR WALL PENETRATIONS.



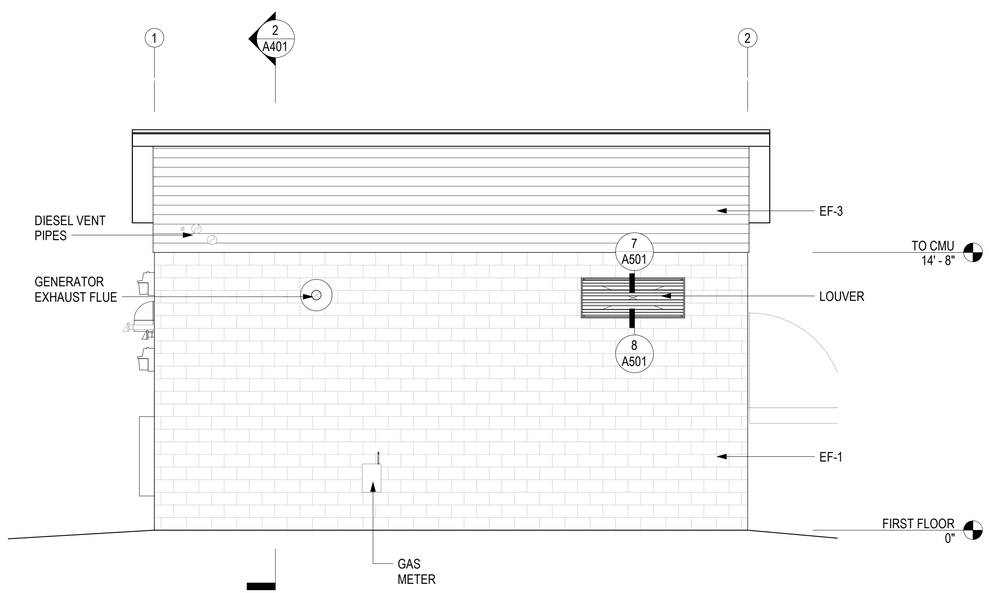
1 A301 NORTH ELEVATION
1/4" = 1'-0"



2 A301 EAST ELEVATION
1/4" = 1'-0"



3 A301 SOUTH ELEVATION
1/4" = 1'-0"



4 A301 WEST ELEVATION
1/4" = 1'-0"

BETTISWORTH NORTH

STATE OF ALASKA
49TH
Roy L. Rountree
No. A-8259
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FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

EXTERIOR ELEVATIONS

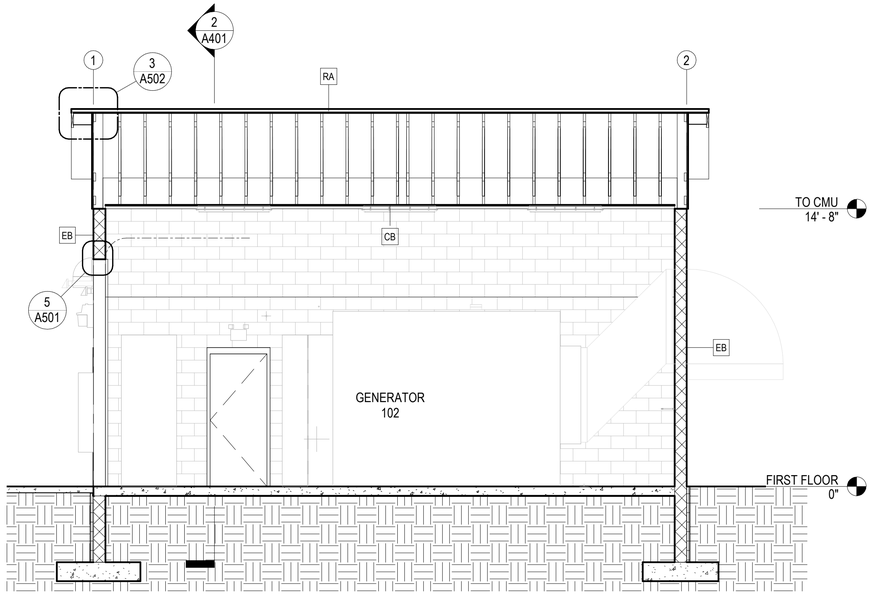
REVISION SCHEDULE

#	DESCRIPTION	DATE

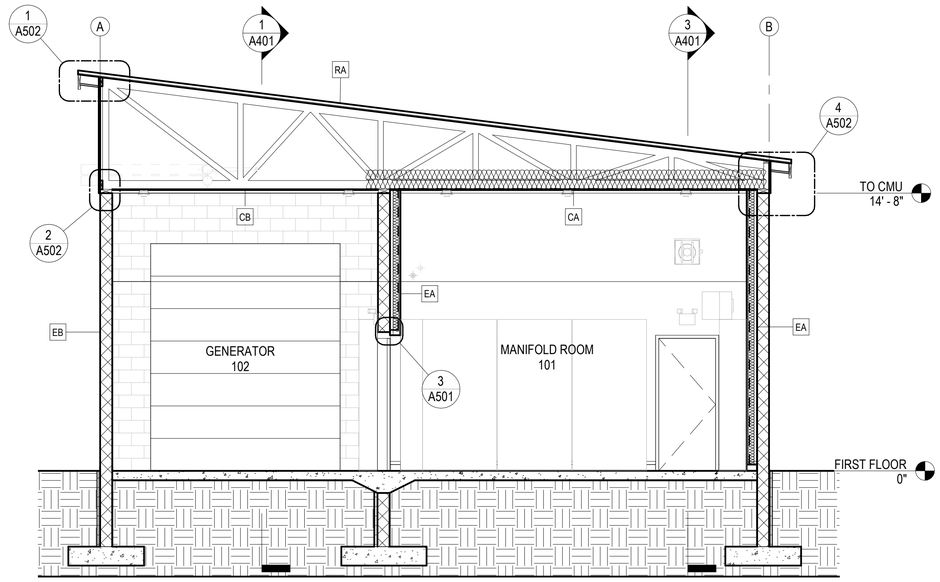
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	KEI
REVIEWED	KEI

SHEET NO.
A301

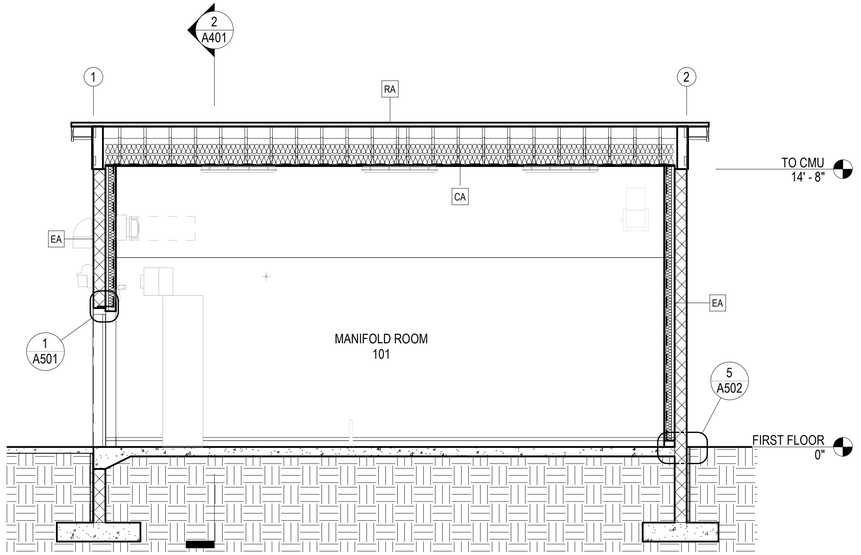
PLOT DATE: 4/14/2022 8:54:46 AM



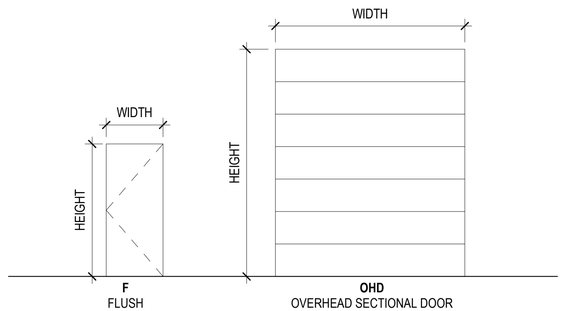
1 A401 SECTION - N-S GENERATOR
1/4" = 1'-0"



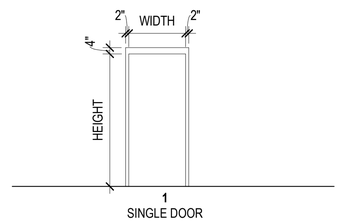
2 A401 SECTION - E-W
1/4" = 1'-0"



3 A401 SECTION - N-S MANIFOLD ROOM
1/4" = 1'-0"



DOOR PANEL TYPES



DOOR FRAME TYPES

DOOR NO.	PANEL						FRAME						
	TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	JAMB	HEAD	FIRE RATING	HARDWARE
101A	F	3' - 0"	7' - 0"	1 3/4"	FBG	FF	1	FBG	FF				01
101B	F	3' - 0"	7' - 0"	1 3/4"	FBG	FF	1	FBG	FF				02
102	OHD	10' - 0"	12' - 0"	1 1/2"	STL	FF	-	STL	FF				

BETTISWORTH NORTH

STATE OF ALASKA
49TH
Roy L Rountree
No. A-8259
01/04/2022
REGISTERED PROFESSIONAL ARCHITECT

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

BUILDING SECTIONS. DOOR AND FRAME TYPES, DOOR SCHEDULE

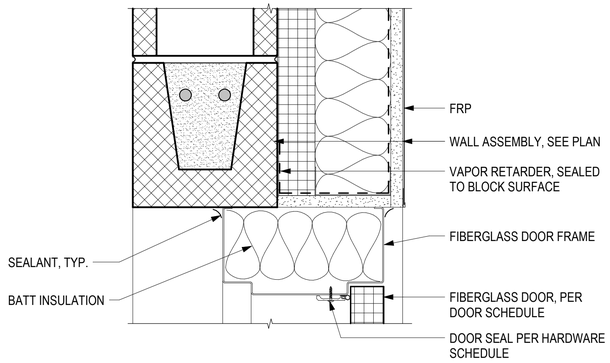
REVISION SCHEDULE

#	DESCRIPTION	DATE

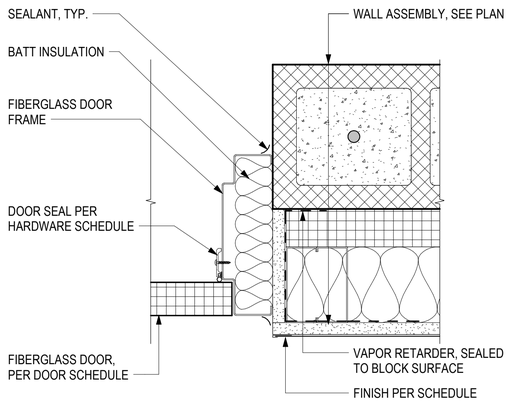
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	KEI
REVIEWED	KEI

SHEET NO.
A401

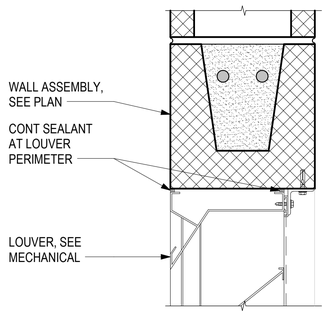
PLOT DATE: 4/14/2022 8:54:48 AM



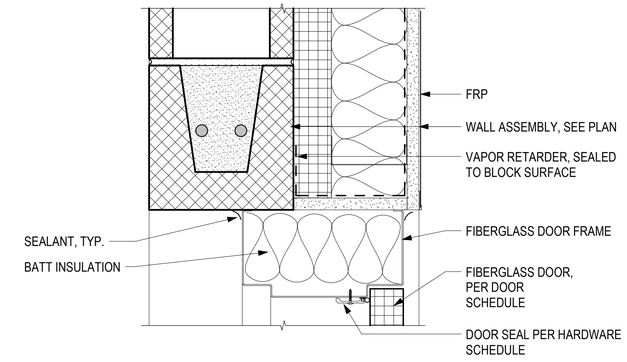
1 A501 EXTERIOR DOOR HEAD
3" = 1'-0"



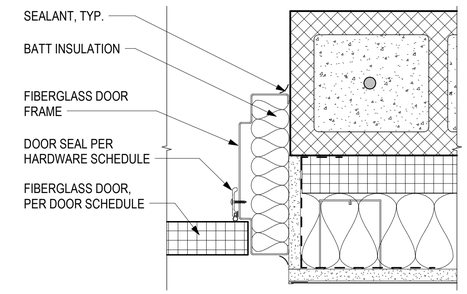
2 A501 EXTERIOR DOOR JAMB
3" = 1'-0"



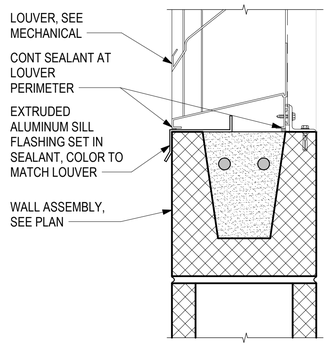
7 A501 LOUVER HEAD
3" = 1'-0"



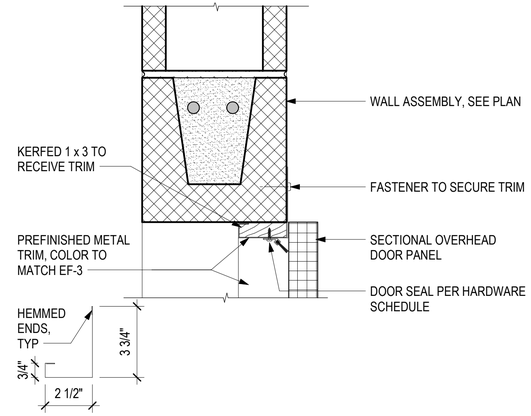
3 A501 INTERIOR DOOR HEAD
3" = 1'-0"



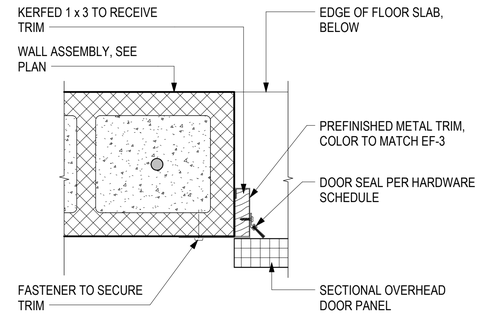
4 A501 INTERIOR DOOR JAMB
3" = 1'-0"



8 A501 LOUVER SILL
3" = 1'-0"



5 A501 OHD HEAD
3" = 1'-0"



6 A501 OHD JAMB
3" = 1'-0"

BETTISWORTH NORTH

STATE OF ALASKA 49TH
Roy L. Rountree
No. A-8259
01/04/2022
REGISTERED PROFESSIONAL ARCHITECT

FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

EXTERIOR DETAILS - OPENINGS

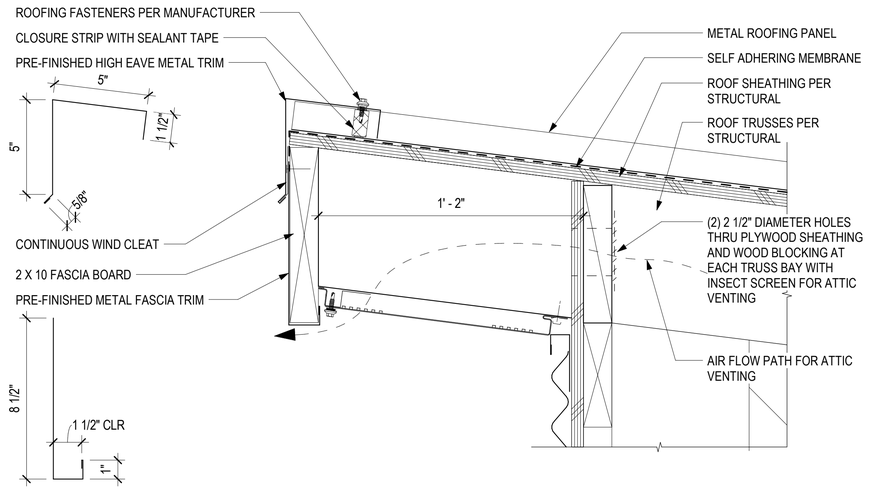
REVISION SCHEDULE

#	DESCRIPTION	DATE

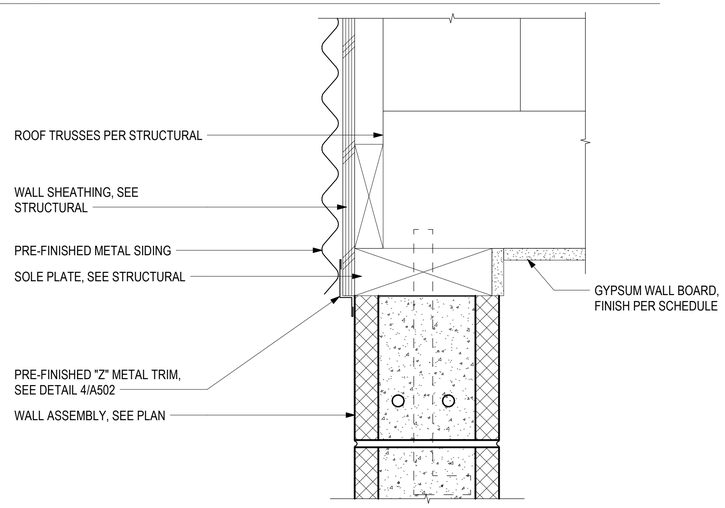
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	
REVIEWED	KEI

SHEET NO.
A501

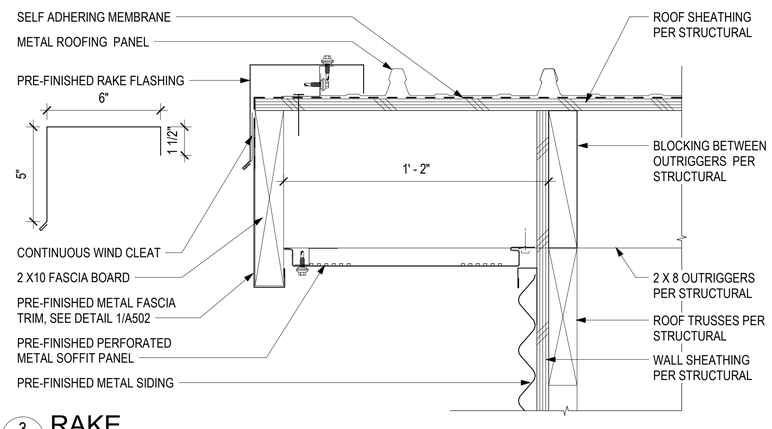
PLOT DATE: 4/14/2022 8:54:49 AM



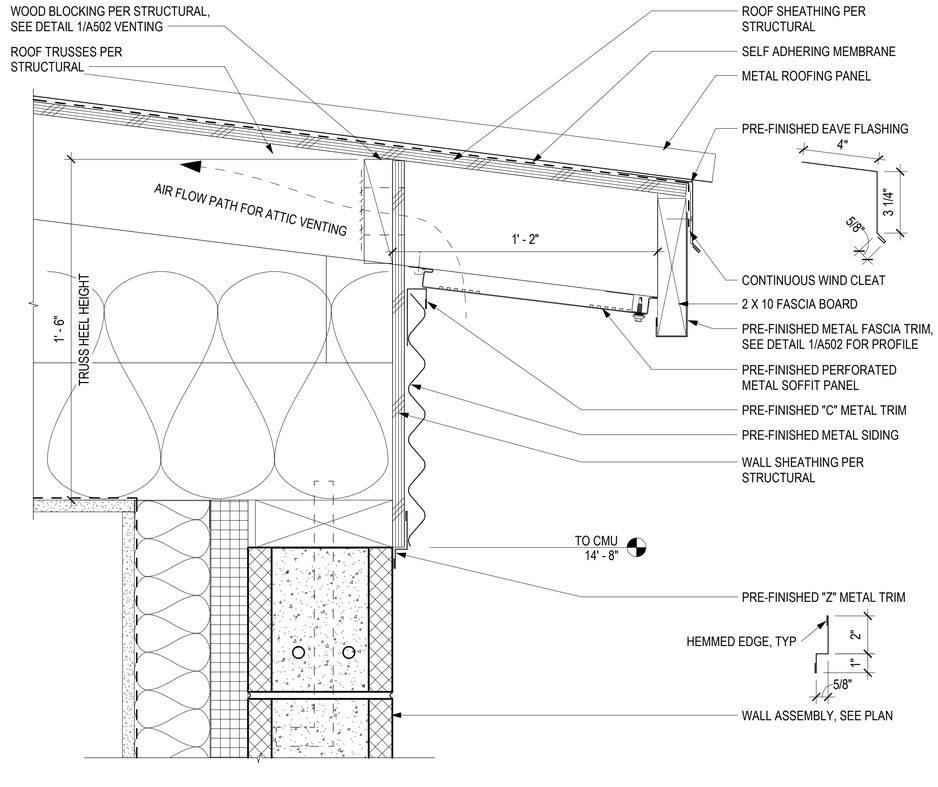
1 A502 EAVE - HIGH END
3" = 1'-0"



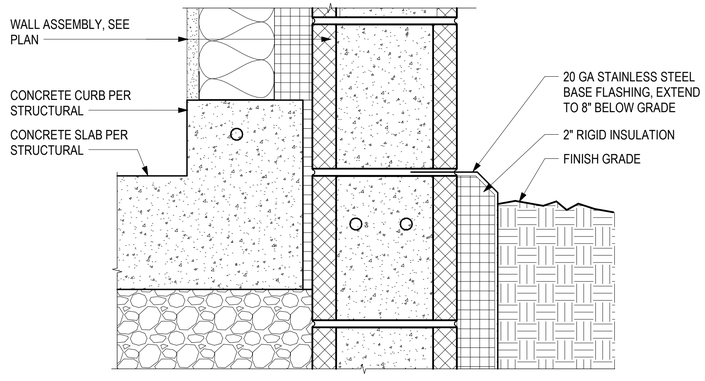
2 A502 TOP OF CMU
3" = 1'-0"



3 A502 RAKE
3" = 1'-0"



4 A502 EAVE - LOW END
3" = 1'-0"



5 A502 WALL BASE
3" = 1'-0"

BETTISWORTH NORTH

STATE OF ALASKA 49TH
Roy L. Rountree
No. A-8259
01/04/2022
REGISTERED PROFESSIONAL ARCHITECT

FINAL DESIGN

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0" 1"

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

EXTERIOR DETAILS

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	JLL
DESIGNED	
REVIEWED	KEI

SHEET NO.
A502

PLOT DATE: 4/14/2022 8:54:50 AM

ABBREVIATIONS

(E)	EXISTING
(N)	NEW
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ALT	ALTERNATE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ALLOWABLE STRESS DESIGN
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWPA	AMERICAN WOOD PROTECTION ASSOCIATION
AWS	AMERICAN WELDING SOCIETY
BM	BEAM
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DECK
BOF	BOTTOM OF FOUNDATION
BOS	BOTTOM OF STEEL
BOT	BOTTOM
C&C	COMPONENTS AND CLADDING
CFS	COLD-FORMED STEEL
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMP	COMPRESSIVE
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
DET	DETAIL
DF	DOUGLAS-FIR
DIA	DIAMETER
DIM(S)	DIMENSION(S)
DL	DEAD LOAD
DN	DOWN
DWG(S)	DRAWING(S)
EA	EACH
EJ	EXPANSION JOINT
EQ	EQUAL
EQUIP	EQUIPMENT
ESR	EVALUATION SERVICE REPORT
EW	EACH WAY
FFE	FINISHED FLOOR ELEVATION
FPSF	FROST PROTECTED SHALLOW FOUNDATION
FS	FROST SUSCEPTIBLE
FT	FOOT OR FEET
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
GLB	GLUE-LAMINATED BEAM
GP	GUSSET PLATE
GR	GRADE
GSN	GENERAL STRUCTURAL NOTES
HF	HEM-FIR
HOR	HORIZONTAL
HS	HIGH STRENGTH
HSS	HOLLOW STRUCTURAL SECTION
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
ICF	INSULATED CONCRETE FORM
IEBC	INTERNATIONAL EXISTING BUILDING CODE
IN	INCH
JT	JOINT
K	KIP (1000 POUNDS)
KSI	KIPS PER SQUARE INCH
LBS	POUNDS
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LRFD	LOAD AND RESISTANCE FACTOR DESIGN

ABBREVIATIONS

LSL	LAMINATED STRAND LUMBER
LVL	LAMINATED VENEER LUMBER
LWC	LIGHT WEIGHT CONCRETE
MAX	MAXIMUM
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MIN	MINIMUM
MRF	MANUFACTURER
MT	MAGNETIC PARTICLE TESTING
N/A	NOT APPLICABLE
NDS	NATIONAL DESIGN SPECIFICATION
NFS	NON-FROST SUSCEPTIBLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
OC	ON CENTER
OPP	OPPOSITE (MIRRORED)
PAF	POWDER ACTUATED FASTENER
PC	PILE CAP
PCC	PRECAST CONCRETE
PEMB	PRE-ENGINEERED METAL BUILDING
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
R	RADIUS
REINF	REINFORCED/REINFORCING
RT	RADIOGRAPHIC TESTING
SC	SLIP CRITICAL
SCH	SCHEDULE
SDI	STEEL DECK INSTITUTE
SEC	SECOND
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SIP	STRUCTURAL INSULATED PANEL
SLH	SHORT LEG HORIZONTAL
SLRS	SEISMIC LOAD RESISTING SYSTEM
SLV	SHORT LEG VERTICAL
SOG	SLAB ON GRADE
SP	SPACE
SPF	SPRUCE-PINE-FIR
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STR	STRUCTURAL
SUP	SUPPORT
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
TG	TRUSS GIRDER
THK	THICK OR THICKNESS
THRD	THREADED
TL	TOTAL LOAD
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOD	TOP OF DECK
TOF	TOP OF FOUNDATION
TOM	TOP OF MASONRY
TOP	TOP OF PLATE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UT	ULTRASONIC TESTING
VERT	VERTICAL
VSC2	VERCO SIDELAP CONNECTION
W/	WITH
W/C	WATER-TO-CEMENT
W/O	WITHOUT
WP	WORKING POINT
WPS('S)	WELDING PROCEDURE SPECIFICATION(S)
WSP	WOOD STRUCTURAL PANEL
WWF	WELDED WIRE FABRIC

SYMBOLS

- DETAIL NUMBER / SHEET NUMBER — DETAIL CUT/CALLOUT
- SECTION NUMBER / SHEET NUMBER — SECTION CUT
- ELEVATION NUMBER / SHEET NUMBER — ELEVATION
- IMAGE NUMBER / SHEET NUMBER — IMAGE REFERENCE
- # — KEYNOTE
- 8" MASONRY WALL, UNO
- CJ — WALL CONTROL JOINT
- DIRECTION OF SLOPE
- CHANGE IN ELEVATION OR SLAB DEPRESSION
- SPOT ELEVATION
- ℄ — CENTER LINE
- Ø — DIAMETER
- OPENING
- MECHANICAL EQUIPMENT
- SPAN DIRECTION
- REVISION SYMBOL

DESIGN CRITERIA

DESIGN CODES AND STANDARDS

IBC-12: INTERNATIONAL BUILDING CODE, WITH LOCAL AMENDMENTS
ASCE/SEI 7-10: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
ACI 318-11: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
ACI 530-11: BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES
ACI 530.1-11: SPECIFICATIONS FOR MASONRY STRUCTURES
TMS 402-11: BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES
TMS 602-11: SPECIFICATION FOR MASONRY STRUCTURES
AWPA C1-03: ALL TIMBER PRODUCTS-PRESERVATIVE TREATMENT BY PRESSURE PROCESSES
NDS-2012: NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION
PWF-2007 ANSI/AF&PA: PERMANENT WOOD FOUNDATION DESIGN SPECIFICATION
SDPWS-2008: SPECIAL DESIGN PROVISIONS FOR WIND AND SEISMIC

RISK CATEGORY	**IV**

DESIGN DEAD LOADS

LOCATION	UNIFORM PSF	CONCENTRATED LBS	REMARKS
ROOFS, UNO	15	---	---

DESIGN LIVE LOADS

LOCATION	UNIFORM PSF	CONCENTRATED LBS	REMARKS
ROOFS, UNO	20*	---	---
*SNOW LOADS GOVERN			

DESIGN SNOW LOADS

GROUND SNOW LOAD, Pg	300 PSF
SNOW IMPORTANCE FACTOR, Is	1.2
SNOW EXPOSURE FACTOR, Ce	1.0
SNOW THERMAL FACTOR, Ct (COLD)	1.2
FLAT-ROOF SNOW LOAD, Pf (COLD)	305 PSF

DESIGN WIND LOADS

ULTIMATE WIND SPEED, Vult	155 MPH
NOMINAL WIND SPEED, Vasd	121 MPH
WIND EXPOSURE	C
INTERNAL PRESSURE COEFFICIENT	±0.18
C&C EDGE AND CORNER DISTANCE, "a"	3.1 FT
C&C PRESSURES (ULTIMATE):	

LOCATION	REGION	ZONE	10 SQFT***	100 SQFT***	500 SQFT***
ROOF	INTERIOR	1	-57	-57	-57
	EDGE	2	-79	-75	-75
	CORNER	3	-123	-79	-79
WALL	INTERIOR	4	-52	-45	-40
	CORNER	5	-64	-50	-40

***VALUES MAY BE LINEARLY INTERPOLATED

DESIGN SEISMIC LOADS

SEISMIC IMPORTANCE FACTOR, Ie	1.50
SITE CLASS	D
MAPPED SPECTRAL RESPONSE, Ss / S1	1.50g / 0.73g
DESIGN SPECTRAL RESPONSE, SDS / SD1	1.00g / 0.73g
SEISMIC DESIGN CATEGORY	D
SEISMIC FORCE RESISTING SYSTEM	SPECIAL REINF MASONRY SHEAR WALLS
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE
RESPONSE MODIFICATION COEFFICIENT, R	5.0
SEISMIC RESPONSE COEFFICIENT, Cs	0.300
DESIGN BASE SHEAR (NOMINAL)	69.0 KIPS

EARTHWORK

ALLOWABLE BEARING PRESSURE	3,000 PSF
1/3 INCREASE FOR SHORT-TERM LOADS	YES
MIN FOOTING DEPTH BELOW FINISHED GRADE:	
ON NON-FROST SUSCEPTIBLE SOILS	60 IN
ON FROST SUSCEPTIBLE SOILS	120 IN

MATERIALS & STRENGTH

CONCRETE

ITEMS	MIN COMP STRENGTH	MAX W/C RATIO	AIR ENTRAINMENT	SLUMP
FOUNDATIONS	3,000 PSI	0.50	5%, ±1%	1 - 3 IN
SLAB ON GRADE	4,000 PSI	0.45	---	1 - 4 IN

STRUCTURAL STEEL

ITEMS	ASTM	GRADE	MIN YIELD STRESS, Fy	REMARKS
PLATES, UNO	A36	---	36 KSI	---
THREADED RODS	A36	---	36 KSI	---
COMMON BOLTS	A307	A	---	---
WASHERS	F436	---	---	---
NUTS	A563	---	---	---

REINFORCING STEEL

ITEMS	ASTM	GRADE	MIN YIELD STRESS, Fy	REMARKS
REBAR, #3	A615	40	40 KSI	---
REBAR, #4 - #9	A615	60	60 KSI	---
REBAR, WELDABLE	A706	60	60 KSI	---

CONCRETE MASONRY UNITS

ITEMS	COMPRESSIVE STRENGTH	TYPE	GRADE	REMARKS
UNITS	2,500 PSI	ASTM C90	---	---
MORTAR	3,000 PSI	TYPE S	---	---
GROUT	3,000 PSI	COARSE	---	---

WOOD

ITEMS	SIZE	SPECIES	GRADE	SPACING
STUDS	2x4	DF	STUD	16" OC
	2x6 OR LARGER	DF	#2	16" OC
JOISTS	2x4	DF	STUD	---
	2x6 OR LARGER	DF	#2	---
LEDGERS	---	DF	#2	---
PLATES	---	DF	#2	---
BLOCKING	---	DF	#2	---

PLYWOOD SHEATHING

ITEMS	THICKNESS	SPAN/INDEX RATIO	EDGE ATTACHMENT	FIELD ATTACHMENT
ROOF	3/4"...	40/20	PER PLAN	PER PLAN
WALL	7/16"	24/0	8d AT 6" OC	8d AT 12" OC

POST INSTALLED ANCHORS

ITEMS	BASE MATERIAL	CONNECTOR	PRODUCT	REMARKS
EPOXY ANCHOR	CONCRETE	THREADED ROD	HIT-HY 200-R ADHESIVE (HILTI)	ICC ESR-3187
	MASONRY	THREADED...	HIT-HY 70 ADHESIVE (HILTI)	ICC ESR-3342
EXPANSION ANCHOR	CONCRETE	---	KWIK BOLT TZ (HILTI)	ICC ESR-1917

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA
49 TH
Nicholas J. Choromanski
SE-14180
1/4/2022
REGISTERED STRUCTURAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" — 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

STRUCTURAL GENERAL INFORMATION

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

SHEET NO.
S001

PLOT DATE: 1/31/2022 12:34:35 PM

GENERAL STRUCTURAL NOTES

(APPLY UNLESS NOTED OTHERWISE)

GENERAL

THE STRUCTURAL ENGINEER AND/OR ARCHITECT HAVE NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND/OR CONSTRUCTION REVIEW SERVICES RELATED TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES FOR THE CONTRACTOR TO PERFORM HIS WORK. THE UNDERTAKING OF PERIODIC SITE VISITS BY THE ENGINEER SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION NOR MAKE THEM RESPONSIBLE FOR PROVIDING A SAFE PLACE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR, SUBCONTRACTORS, SUPPLIERS OR THEIR EMPLOYEES, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.

DRAWINGS INDICATE STRUCTURE IN FINAL FORM CAPABLE OF SUPPORTING DESIGN LOADS. PROVIDE TEMPORARY SUPPORT DURING CONSTRUCTION AS REQUIRED, UNTIL STRUCTURAL ELEMENTS ARE PERMANENTLY INSTALLED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES AND SEQUENCES OF PROCEDURES REQUIRED TO PERFORM THE WORK.

CONSTRUCTION MATERIALS SHALL BE DISTRIBUTED APPROPRIATELY IF PLACED ON FRAMED CONSTRUCTION. LOADS SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.

DO NOT SCALE DRAWINGS.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER IN WRITING OF ANY DISCREPANCIES.

COORDINATE DIMENSIONS, OPENINGS, EMBEDDED ITEMS AND CONDITIONS WITH ARCHITECTURAL, CIVIL, MECHANICAL AND ELECTRICAL CONTRACT DOCUMENTS AND TRADES PRIOR TO CONSTRUCTION. NOT ALL ITEMS ARE INDICATED ON STRUCTURAL CONTRACT DOCUMENTS. NOTIFY STRUCTURAL ENGINEER IN WRITING OF ANY AND ALL DISCREPANCIES.

ALL DETAILS ARE TYPICAL. INCORPORATE INTO PROJECT AT APPROPRIATE LOCATIONS WHETHER SPECIFICALLY INDICATED OR NOT.

SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE THE NOTES, DRAWINGS, AND/OR SPECIFICATIONS DIFFER, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.

REFER TO ARCHITECTURAL AND CIVIL DRAWINGS FOR EXTERIOR SLABS AND WALLS.

NOTIFY STRUCTURAL ENGINEER OF ALL FIELD CHANGES PRIOR TO INSTALLATION.

THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF RED-LINE DRAWINGS ON SITE REFLECTING ALL DESIGN CHANGES TO THE ORIGINAL CONTRACT DOCUMENTS.

FOUNDATIONS AND EARTHWORK

REFERENCE GEOTECHNICAL REPORT NO. 20403.14, BY CRW ENGINEERING GROUP, LLC, DATED 11.5.2021 FOR FOUNDATION AND EXCAVATION INFORMATION.

FOOTINGS AND SLABS ON GRADE SHALL BEAR ON ENGINEERED SOIL PER CIVIL DRAWINGS.

PROVIDE POSITIVE DRAINAGE SLOPES, BOTH DURING AND AFTER CONSTRUCTION, FOR SURFACE AND ROOF RUNOFF, MINIMUM 10'-0" FROM BUILDING FOUNDATIONS.

ALL CONTINUOUS FOOTINGS SHALL BE CENTERED ON THE WALL UNO.

REINFORCED CAST IN PLACE CONCRETE

DETAILING PER APPLICABLE ACI DETAILING MANUAL, UNO.

SIZE, SPACING AND MINIMUM LAP SPLICES OF REINFORCING STEEL SHALL BE PROVIDED AS SHOWN IN CONTRACT DOCUMENTS.

REINFORCEMENT SPACINGS INDICATED ON THE DRAWINGS AND DETAILS ARE GIVEN AS A MAXIMUM ON CENTER.

CONTRACTOR SHALL ACCURATELY PLACE, LOCATE, SECURE AND/OR SUPPORT ALL REINFORCING BARS, ANCHOR BOLTS/RODS, AND EMBEDDED ITEMS PRIOR TO PLACING CONCRETE. CONTRACTOR SHALL USE GALVANIZED METAL CHAIRS, SPACERS, DOBIES OR HANGERS FOR THE CLEAR CONCRETE COVERAGES.

MINIMUM CONCRETE COVER, UNO:

CONCRETE CAST AGAINST AND EXPOSED TO EARTH:	3"
CONCRETE EXPOSED TO EARTH OR WEATHER:	1-1/2"
SLABS:	3/4"

TACK WELDING OF REINFORCING BARS SHALL NOT BE ALLOWED WITHOUT PRIOR REVIEW OF THE PROCEDURE WITH THE STRUCTURAL ENGINEER.

SPLICE HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS.

REINFORCING HOOPS SHALL BE PROVIDED WITH CLASS B BAR LAPS REQUIRED FOR THE SPECIFIC BAR SIZE.

CHAMFER EXPOSED CORNERS ¾" UNO.

DO NOT DROP CONCRETE MORE THAN FIVE FEET WITHOUT THE USE OF TREMIES.

MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED.

ALL CONCRETE SLABS ON GRADE SHALL BE BOUND BY CONTROL JOINTS (KEYED OR SAW CUT), SUCH THAT THE JOINT SPACING DOES NOT EXCEED 36 TIMES THE SLAB THICKNESS AND THE ASPECT RATIO OF THE ENCLOSED AREA DOES NOT EXCEED 1.5 TO 1.0. SAW CUTS SHALL BE 1/8" WIDE AND ¼ TIMES THE SLAB THICKNESS IN DEPTH.

REINFORCED CONCRETE MASONRY UNITS (CMU)

DETAILING PER APPLICABLE ACI DETAILING MANUAL, UNO.

LAY UNITS IN RUNNING BOND.

CENTER REINFORCING IN CMU, UNO.

SOLID GROUT ALL CELLS.

SIZE, SPACING AND MINIMUM LAP SPLICES OF REINFORCING STEEL SHALL BE PROVIDED AS SHOWN IN CONTRACT DOCUMENTS. REINFORCEMENT SPACINGS INDICATED ON THE DRAWINGS AND DETAILS ARE GIVEN AS A MAXIMUM ON CENTER.

DOWEL ALL VERTICAL REINFORCING TO THE FOUNDATION WITH DOWELS TO MATCH SIZE AND SPACING OF VERTICAL REINFORCING.

CONTRACTOR SHALL ACCURATELY PLACE, LOCATE, SECURE AND/OR SUPPORT ALL REINFORCING BARS, ANCHOR BOLTS/RODS, EMBEDDED ITEMS, AND WELDED WIRE FABRIC PRIOR TO PLACING GROUT.

REBAR SPLICES SHALL LAP 48 DIAMETERS UNO. SPLICE HORIZONTAL REINFORCING AT ALL CORNERS AND INTERSECTIONS.

PROVIDE (1) VERTICAL BAR (MATCH VERTICAL WALL REINFORCING SIZE) AT ALL CORNERS, INTERSECTIONS AND ENDS, UNO.

AT OPENINGS PROVIDE (2) #5 HORIZONTAL AT HEAD AND SILL AND (1) #5 VERTICAL AT JAMBS, UNO. EXTEND 2'-0" BEYOND OPENING EACH SIDE, UNO.

FABRICATE SLEEVES FOR UTILITY LINES THROUGH WALLS WITH STANDARD WEIGHT STEEL PIPE, UNO.

CONTROL JOINTS: SPACE AT 24'-0" OC MAX, UNO.

MAXIMUM GROUT LIFT IS 4'-8" WITHOUT CLEANOUTS, 8'-0" WITH CLEANOUTS.

MECHANICALLY VIBRATE GROUT IN VERTICAL SPACE IMMEDIATELY AFTER PLACEMENT AND AGAIN ABOUT FIVE MINUTES LATER. DO NOT INTERRUPT GROUTING FOR MORE THAN ONE HOUR.

POST-INSTALLED ANCHORS

POST-INSTALLED ANCHOR EMBEDMENT SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS. ALL POST-INSTALLED ANCHORS AND DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS INCLUDING DRILL BIT SIZE, HOLE DEPTH AND CLEANING, MINIMUM EMBEDMENT, EDGE DISTANCES, MATERIAL PLACEMENT, TEMPERATURE AND MOISTURE CONTROL AND FINAL TORQUING REQUIREMENTS.

CONTRACTOR MAY NOT USE SUBSTITUTES FOR POST-INSTALLED ANCHORS WITHOUT PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.

NO REINFORCING BARS SHALL BE CUT TO INSTALL ANCHORS. ALL DEFECTIVE ANCHOR HOLES SHALL BE GROUTED WITH EPOXY ADHESIVE AND A NEW HOLE DRILLED A MINIMUM OF (3) BOLT DIAMETERS AWAY.

SPECIAL INSPECTION OF POST-INSTALLED ANCHORS IS REQUIRED.

STRUCTURAL STEEL

ALL STRUCTURAL STEEL CONSTRUCTION SHALL CONFORM WITH APPLICABLE AISC HANDBOOK.

ALL STRUCTURAL STEEL SHALL BE SURFACE PREPARED AND SHOP PAINTED AS NOTED. SURFACE PREPARATION SHALL CONFORM TO SSPC SP-3 POWER TOOL CLEANING TO REMOVE ALL SCALE AND RUST. ALL STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PRIOR TO FABRICATION. SHOP DRAWINGS SHALL INCLUDE PIECE MARKS, ERECTION PLANS SHOWING BEAM SIZES AND DETAILS WITH CORRESPONDING CONTRACTOR DOCUMENT INDICATORS. SHOP DRAWINGS SHALL MAKE A DISTINCTION BETWEEN SHOP WELDS AND FIELD WELDS.

STRUCTURAL STEEL WELDING

ALL STRUCTURAL WELDING SHALL BE PRE-QUALIFIED AND CONFORM TO AISC AND AWS SPECIFICATIONS.

ALL WELDING SHALL BE IN ACCORDANCE WITH THE APPLICABLE AWS CODE. USE E70 SERIES LOW HYDROGEN ELECTRODES STORED AND MAINTAINED IN DRY CONDITION.

ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS HAVING CURRENT CERTIFICATES AND EXPERIENCE IN THE TYPE OF WELD BEING PERFORMED. WELDING CERTIFICATES SHALL BE THOSE ISSUED BY AN ACCEPTED TEST AGENCY.

ALL CJP GROOVE WELDS SHALL HAVE FILLER MATERIAL THAT HAS A MINIMUM CHARPY-V-NOTCH TOUGHNESS OF 20 FT-LB AT -20 °F AND 40 FT-LB AT 70 °F. CONTRACTOR SHALL SUBMIT WELDER QUALIFICATIONS AND PROCEDURE QUALIFICATIONS. WHERE NOT SHOWN, USE MINIMUM WELD SIZE PER AISC AND AWS.

STRUCTURAL CONSTRUCTION DRAWINGS DO NOT DISTINGUISH BETWEEN SHOP WELDS AND FIELD WELDS. THE CONTRACTOR SHALL COORDINATE WELDING DESIGNATIONS BETWEEN FABRICATOR AND ERECTOR. ALL STEEL SHOP DRAWINGS SHALL MAKE DISTINCTION BETWEEN SHOP WELDS AND FIELD WELDS.

ROUGH CARPENTRY AND PLYWOOD

ALL FRAMING SHALL BE PROVIDED IN ACCORDANCE WITH IBC CHAPTER 23. FRAMING LUMBER SHALL COMPLY WITH THE APPLICABLE NDS CODE.

MAXIMUM MOISTURE CONTENT OF LUMBER SHALL NOT EXCEED 19 PERCENT.

ALL SAWN LUMBER SHALL BE STAMPED WITH THE GRADE MARK OF AN APPROVED LUMBER GRADING AGENCY.

ALL LUMBER IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESERVATIVE-TREATED WOOD STAMPED BY AN APPROVED AGENCY.

ALL PLYWOOD SHALL CONFORM TO PS-1 OR APA PRP-108, SHALL HAVE AN EXTERIOR OR EXPOSURE 1 CLASSIFICATION AND SHALL BEAR THE STAMP OF AN APPROVED TESTING AGENCY.

PLYWOOD SHALL BE INSTALLED WITH FACE GRAIN ORIENTED PERPENDICULAR TO SUPPORTS, STAGGER JOINTS. PLYWOOD NAILING SHALL BE PROVIDED ON ALL BOUNDARIES, EDGES AND INTERMEDIATE SUPPORTS.

METAL FRAMING CONNECTORS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INCORPORATED, OR OTHER APPROVED EQUIVALENT MANUFACTURER. ALL NAIL/SCREW HOLES IN CONNECTORS SHALL BE FILLED WITH NAILS/SCREWS OF THE LARGEST SIZE INDICATED IN THE MANUFACTURER'S CATALOG UNO.

METAL FRAMING CONNECTORS AND FASTENERS IN CONTRACT WITH PRESERVATIVE-TREATED WOOD SHALL BE GALVANIZED OR STAINLESS STEEL.

NAILING SHALL CONFORM TO TABLE 2304.9.1 OF THE IBC. ALL NAILS SHALL BE COMMON SIZE IN ACCORDANCE WITH ASTM F1667.

SILL PLATES SHALL HAVE 5/8" DIA ANCHOR PLACED AT ALL JAMBS, CORNERS, INTERSECTIONS AND DISCONTINUOUS WALL ENDS, AND AT 48" OC MAX UNO (MINIMUM TWO ANCHORS PER PLATE SECTION).

PREFABRICATED WOOD TRUSSES

THE TRUSS MANUFACTURER SHALL BE RESPONSIBLE FOR THE COMPLETE DESIGN, FABRICATION AND ERECTION PROCEDURES OF ALL TRUSSES, BRIDGING AND/OR BLOCKING PANELS, HANGERS, BRACING, ETC. FOR A COMPLETE INSTALLATION OF THE TRUSS SYSTEM. TRUSS CONFIGURATIONS ARE INDICATED ON THE DRAWINGS. ALL BRACING AND BRIDGING SIZES AND SPACINGS PER THE TRUSS MANUFACTURER IN ACCORDANCE WITH THE LATEST RECOMMENDATIONS OF THE TRUSS PLATE INSTITUTE.

TRUSSES SHALL BE DESIGNED AND FABRICATED IN ACCORDANCE WITH IBC CHAPTER 23 TO SUPPORT SELF WEIGHT PLUS LIVE LOAD, SUPERIMPOSED DEAD LOADS, AND LATERAL LOADS STATED IN THE GENERAL STRUCTURAL NOTES OR LOCATED ON PLANS. ROOF TRUSSES SHALL BE DESIGNED TO ACCOMMODATE A FUTURE TOP CHORD DEAD LOAD OF 300 POUNDS AT ANY LOCATION. THE UNIFORM LOADS DO NOT INCLUDE SPECIAL OR ADDITIONAL LOADS NOTED ON THE PLANS OR DETAILS. THE ROOF LOAD DURATION FACTOR IS 1.15.

LIMIT TOTAL LOAD DEFLECTIONS TO SPAN/240 AT SIMPLE SPANS UNO. LIMIT LIVE LOAD DEFLECTIONS TO SPAN/360 AT SIMPLE SPANS UNO. ALL TRUSSES SHALL BE CAMBERED FOR 1.5 TIMES THE DESIGN DEAD LOAD.

ADDITIONAL TRUSSES SHALL BE SUPPLIED AS REQUIRED TO SUPPORT MECHANICAL EQUIPMENT AND AS REQUIRED TO FRAME AROUND DUCT PENETRATIONS. GENERAL CONTRACTOR TO COORDINATE WITH ALL DISCIPLINES AND TRADES.

ALL CONNECTORS SHALL HAVE CURRENT ICC APPROVAL. ALL TRUSS TO TRUSS CONNECTORS SHALL BE DESIGNED BY THE TRUSS MANUFACTURER. MULTIPLE TRUSS MEMBERS SHALL BE FASTENED TOGETHER TO ALLOW TRANSFER OF SHEAR AND TENSION FORCES (MINIMUM 200 PLF) AT PLYWOOD SHEATHING JOINTS AND TO PREVENT CROSS GRAIN BENDING OF TOP CHORDS. ATTACHMENT SHALL BE A CONTINUOUS 20 GAGE METAL PLATE OR OTHER APPROVED MEANS. METHOD OF ATTACHMENT SHALL BE INDICATED ON SHOP DRAWINGS FOR REVIEW.

WHERE PERMANENT BRACING OF TRUSS MEMBERS IS REQUIRED BY THE TRUSS DESIGN, IT SHALL BE ACCOMPLISHED BY THE FOLLOWING METHOD: THE TRUSSES SHALL BE DESIGNED SO THAT THE BUCKLING OF ANY INDIVIDUAL TRUSS MEMBER CAN BE RESISTED INTERNALLY BY THE STRUCTURE (E.G. BUCKLING MEMBER T-BRACING, L-BRACING, ETC.) OF THE INDIVIDUAL TRUSS. THE TRUSS INDIVIDUAL MEMBER BUCKLING REINFORCEMENT SHALL BE INSTALLED AS SHOWN ON THE TRUSS DESIGN DRAWING OR ON SUPPLEMENTAL TRUSS MEMBER BUCKLING REINFORCEMENT DIAGRAMS PROVIDED BY THE TRUSS DESIGNER.

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, ERECTION DRAWINGS AND DESIGN CALCULATIONS SEALED BY A REGISTERED ENGINEER FOR REVIEW PRIOR TO MANUFACTURE. CALCULATIONS AND SHOP DRAWINGS SHALL SHOW ANY SPECIAL DETAILS REQUIRED AT BEARING POINTS.

ALL FABRICATION SHALL BE PERFORMED ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION.

STRUCTURAL SHOP DRAWINGS AND PRODUCT DATA SUBMITTALS

SUBMIT SHOP DRAWINGS AND/OR PRODUCT DATA FOR THE FOLLOWING ITEMS, PRIOR TO FABRICATION:

CONCRETE MATERIALS
CONCRETE REINFORCING STEEL
MASONRY MATERIALS
MASONRY REINFORCING STEEL
STRUCTURAL STEEL FRAMING
WOOD TRUSSES

CONTRACTOR SHALL REVIEW AND STAMP SUBMITTALS PRIOR TO SUBMISSION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS PLACED PRIOR TO RECEIPT OF REVIEWED SHOP DRAWINGS. CONTRACTOR SHALL ALLOW A MINIMUM OF (10) WORKING DAYS FOR REVIEW.

CONTRACT DOCUMENTS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS. THE MANUFACTURER OR FABRICATOR SHALL CLOUD ANY CHANGES, SUBSTITUTIONS AND/OR DEVIATIONS FROM THE CONTRACT DOCUMENTS. ANY CHANGES, SUBSTITUTIONS AND/OR DEVIATIONS THAT ARE NOT CLOUDED OR FLAGGED SHALL NOT BE CONSIDERED ALLOWED AFTER THE ENGINEER'S REVIEW UNO.

THE ENGINEER'S REVIEW IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS AND COMPLETENESS SHALL REST WITH THE CONTRACTOR. SHOP DRAWINGS WILL BE RETURNED FOR RESUBMITTAL IF SIGNIFICANT ERRORS ARE FOUND DURING REVIEW.

THE SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. SHOP DRAWINGS PROCESSED BY THE ENGINEER SHALL NOT BE CONSIDERED CHANGE ORDERS. ITEMS THAT ARE OMITTED OR SHOWN INCORRECTLY AND THAT ARE NOT FLAGGED BY THE ENGINEER ARE NOT TO BE CONSIDERED CHANGES TO CONTRACT DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONSTRUCT ITEMS ACCORDING TO THE CONTRACT DOCUMENTS. SHOULD A DISCREPANCY EXIST BETWEEN THE PROCESSED SHOP DRAWINGS AND THE CONTRACT DOCUMENTS, THE CONTRACT DOCUMENTS SHALL GOVERN.

THE ENGINEER RESERVES THE RIGHT TO MAKE CHANGES TO THE CONTRACT DOCUMENTS, AT ANY TIME BEFORE OR AFTER SHOP DRAWING REVIEW.

FOR HARD COPY SUBMITTALS, PROVIDE NO MORE THAN FOUR SETS FOR REVIEW (ONE COPY TO BE RETAINED BY THE ENGINEER OF RECORD). FOR ELECTRONIC SUBMITTALS, PROVIDE PDF FILES ONLY. ALL SUBMITTALS WITH A REQUESTED REVIEW TIME OF LESS THAN (10) WORKING DAYS MAY BE RETURNED WITHOUT REVIEW AT THE ENGINEER'S DISCRETION.

DEFERRED STRUCTURAL SUBMITTALS

THE FOLLOWING ITEMS ARE DESIGNED AND DETAILED BY THE CONTRACTOR USING THE LOADING AND CRITERIA SHOWN IN THE CONTRACT DOCUMENTS. DEFERRED SUBMITTALS SHALL INCLUDE CALCULATIONS AND DRAWINGS STAMPED BY AN ALASKA REGISTERED ENGINEER AND ARE TO BE SUBMITTED TO THE CONTRACTING OFFICER PRIOR TO FABRICATION:

WOOD TRUSSES
MECHANICAL UNIT SEISMIC RESTRAINT
ROOFING ATTACHMENT

REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL FOR OTHER DEFERRED SUBMITTALS.

DEFERRAL OF ANY SUBMITTAL ITEMS SHALL HAVE PRIOR APPROVAL OF THE BUILDING OFFICIAL. THE ARCHITECT OR ENGINEER OF RECORD SHALL LIST THE DEFERRED SUBMITTALS ON THE CONTRACT DOCUMENTS AND THE CONTRACTOR SHALL SUBMIT THE DEFERRED SUBMITTAL DOCUMENTS FOR REVIEW BY THE BUILDING OFFICIAL.

SUBMITTAL DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE CONTRACTING OFFICIAL OR ENGINEER OF RECORD A MINIMUM OF 30 DAYS PRIOR TO FABRICATION. THE DOCUMENTS SHALL BE REVIEWED FOR GENERAL CONFORMANCE WITH THE DRAWINGS. A COPY OF THE DEFERRED SUBMITTAL DOCUMENTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THEIR DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.

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STATE OF ALASKA
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Nicholas J. Choromanski
SE-14180
1/4/2022
REGISTERED STRUCTURAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

GENERAL STRUCTURAL NOTES

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

SHEET NO.

S002

PLOT DATE: 1/31/2022 12:34:36 PM

GENERAL STRUCTURAL NOTES (CONTINUED)

(APPLY UNLESS NOTED OTHERWISE)

SPECIAL STRUCTURAL INSPECTIONS AND TESTING

THE OWNER (OR REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT) SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTION AND TESTING DURING CONSTRUCTION OF THE TYPES OF WORK REQUIRING SPECIAL INSPECTION AS INDICATED ON THE DRAWINGS.

EACH SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL AND STRUCTURAL ENGINEER OF RECORD, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR

THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS.

THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL AND TO THE ENGINEER OR ARCHITECT OF RECORD. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS DONE IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN IF UNCORRECTED, TO THE ENGINEER OR ARCHITECT OF RECORD AND THE BUILDING OFFICIAL.

UPON COMPLETION OF THE ASSIGNED WORK, THE SPECIAL INSPECTOR SHALL COMPLETE AND SIGN THE APPROPRIATE FORMS CERTIFYING THAT, TO THE BEST OF THEIR KNOWLEDGE, THE WORK IS IN CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.

DEFINITIONS

CONTINUOUS SPECIAL INSPECTION: CONTINUOUS SPECIAL INSPECTION IS THE FULL TIME OBSERVATION OF THE WORK BY THE SPECIAL INSPECTOR PRESENT IN THE WORK AREA WHENEVER WORK IS BEING PERFORMED. PERFORM CONTINUOUS SPECIAL INSPECTION WHERE SPECIFIED AS INDICATED IN THE SPECIAL INSPECTION TABLES.

PERIODIC SPECIAL INSPECTION: PERIODIC SPECIAL INSPECTION IS THE INTERMITTENT OBSERVATION OF THE WORK BY A SPECIAL INSPECTOR PRESENT IN THE WORK AREA WHILE WORK IS BEING PERFORMED. THE INTERMITTENT OBSERVATION PERIODS SHALL BE AT TIME OF SIGNIFICANT WORK, RECURRENT OVER THE COMPLETE WORK PERIOD AND TOTAL AT LEAST 25 PERCENT OF THE TOTAL WORK TIME FOR A GIVEN TASK. PERFORM PERIODIC SPECIAL INSPECTION WHERE SPECIFIED FOR ITEMS AS INDICATED IN THE SPECIAL INSPECTION TABLES.

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REF	CODE OR STANDARD REFERENCE	FREQUENCY: CONTINUOUS	FREQUENCY: PERIODIC	REMARKS
CONCRETE					
REINFORCING STEEL AND PRESTRESSING TENDONS AND PLACEMENT	1705.3 1910.4	ACI 318 3.5 ACI 318 7.1 ACI 318 7.2 ACI 318 7.3 ACI 318 7.4 ACI 318 7.5 ACI 318 7.6 ACI 318 7.7		X	---
PLACEMENT OF CAST-IN-PLACE ANCHOR BOLTS	1705.3 1908.5 1909.1	ACI 318 8.1.3 ACI 318 21.1.8		X	ALL ANCHOR BOLTS ARE VISUALLY INSPECTED
VERIFY USE OF REQUIRED MIX DESIGNS(S)	1705.3 1904.2 1910.2 1910.3	ACI 318 5.2 ACI 318 5.3 ACI 318 5.4 ACI 318 CHAPTER 4		X	---
SAMPLING OF CONCRETE FOR STRENGTH, SLUMP, AIR TESTS, AND TEMPERATURE DETERMINATION	1705.3 1910.10	ACI 318 5.8 ASTM C 31 ASTM C 172	X		---
CONCRETE AND SHOTCRETE PLACEMENT	1705.3 1910.6 1910.7 1910.8	ACI 318 5.9 ACI 318 5.10	X		---
CONCRETE AND SHOTCRETE CURING	1705.3 1910.9	ACI 318 5.11 ACI 318 5.12 ACI 318 5.13		X	---

STRUCTURAL SPECIAL INSPECTIONS (CONT.)

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REF	CODE OR STANDARD REFERENCE	FREQUENCY: CONTINUOUS	FREQUENCY: PERIODIC	REMARKS
MASONRY (LEVEL C)					
VERIFY COMPLIANCE WITH THE APPROVED SUBMITTALS	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 1.5		X	---
VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
A. PROPORTIONS OF SITE-MIXED MORTAR, GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 2.1, 2.6 A, 2.6 B, 2.6 C, 2.4 G.1.b		X	---
B. GRADE, TYPE, AND SIZE OF REINFORCEMENT AND ANCHOR BOLTS, AND PRESTRESSING TENDONS AND ANCHORAGES	1705.4	ACI 530 SEC. 1.16 ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 2.4, 3.4		X	---
C. PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS	1705.4	ACI 530 SEC. 1.16 ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 2.4, 3.4		X	---
D. PLACEMENT OF REINFORCEMENT, CONNECTORS AND PRESTRESSING TENDONS AND ANCHORAGES	1705.4	ACI 530 SEC. 1.16 ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 3.2 E, 3.4, 3.6 A	X		---
E. GROUT SPACE PRIOR TO GROUTING	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 3.2 D, 3.2 F	X		---
F. PLACEMENT OF GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 3.5, 3.6 C	X		---
G. SIZE AND LOCATION OF STRUCTURAL ELEMENTS	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 3.3 F		X	---
H. TYPE, SIZE, AND LOCATION OF ANCHORS INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	1705.4	ACI 530 SEC. 1.16.4.3, 1.17.1 ACI 530.1 TABLE 1.19.3	X		---
I. WELDING OF REINFORCEMENT	1705.4	ACI 530 SEC. 3.3.3.4 (c), 8.3.3.4 (b) ACI 530.1 TABLE 1.19.3	X		---
J. PREPARATION, CONSTRUCTION AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F) OR HOT WEATHER (TEMPERATURE ABOVE 90°F)	1705.4	ACI 530.1 1.19.3 ACI 530.1 ART. 1.8 C, 1.8 D		X	---
K. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 3.6 B	X		---
L. PLACEMENT OF AAC MASONRY UNITS AND CONSTRUCTION OF THIN-BED MORTAR JOINTS	1705.4	ACI 530.1 TABLE 1.19.3 ART. 3.3 B.8	X		---
M. PROPERTIES OF THIN-BED MORTAR FOR AAC MASONRY	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 2.1 C.1	X		---
OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS	1705.4	ACI 530.1 TABLE 1.19.3 ACI 530.1 ART. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3, 1.4 B.4	X		---
POST-INSTALLED ANCHORS					
POST-INSTALLED ANCHORS	1705.3 1901.1	ACI 3.8.6 ACI 8.1.3 ACI 318 21.1.8 ICC EVALUATION REPORT		X	SPECIAL INSPECTIONS APPLY TO ANCHOR PRODUCT NAME, TYPE, DIMENSIONS, HOLE DIMENSIONS, COMPLIANCE WITH DRILL BIT REQUIREMENTS, CLEANLINESS OF THE HOLE AND ANCHOR, ADHESIVE EXPIRATION DATE, ANCHOR/ADHESIVE INSTALLATIO...
STRUCTURAL WOOD FRAMING					
FABRICATION OF HIGH-LOAD WOOD DIAPHRAGMS:					
A. VERIFY STRUCTURAL GRADE AND THICKNESS	1705.5.1 TABLE 2306.2(2)		X		---
B. VERIFY NOMINAL SIZE OF FRAMING MEMBERS AT ADJOINING PANEL EDGES	1705.5.1 TABLE 2306.2(2)		X		---
C. VERIFY NAIL OR STAPLE DIAMETER AND LENGTH, NUMBER OF FASTENER LINES AND SPACING BETWEEN FASTENERS IN EACH LINE AND AT EDGE MARGINS	1705.5.1 TABLE 2306.2(2)		X		---

GEOTECHNICAL SPECIAL INSPECTIONS

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REF	CODE OR STANDARD REFERENCE	FREQUENCY: CONTINUOUS	FREQUENCY: PERIODIC	REMARKS
SOILS					
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE DESIGN BEARING CAPACITY	1705.6	I.B.C.		X	---
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	1705.6	I.B.C.		X	---
PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS	1705.6	I.B.C.		X	---
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	1705.6	I.B.C.	X		---
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY SITE HAS BEEN PROPERLY PREPARED	1705.6	I.B.C.		X	---

TESTING FOR SPECIAL INSPECTIONS

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REF	CODE OR STANDARD REFERENCE	FREQUENCY: CONTINUOUS	FREQUENCY: PERIODIC	REMARKS
GEOTECHNICAL					
FILL IN-PLACE DENSITY OR PREPARED SUBGRADE DENSITY	VARIES	I.B.C.			
MATERIAL VERIFICATION	VARIES	I.B.C.			
CONCRETE					
CONCRETE STRENGTH	1705.3 1905.6	ASTM C39			FREQUENCY: EACH 50 CUBIC YARDS. NOT LESS THAN ONE TEST EACH 5,000 SQUARE FEET OF SLAB OR WALL PLACED EACH DAY
CONCRETE SLUMP	1705.3 1905.6	ASTM C143			FREQUENCY: EACH 50 CUBIC YARDS. NOT LESS THAN ONE TEST EACH 5,000 SQUARE FEET OF SLAB OR WALL PLACED EACH DAY
CONCRETE AIR CONTENT	1705.3 1905.6	ASTM C231			FREQUENCY: EACH 50 CUBIC YARDS. NOT LESS THAN ONE TEST EACH 5,000 SQUARE FEET OF SLAB OR WALL PLACED EACH DAY
CONCRETE TEMPERATURE	1705.3 1905.6	ASTM C1064			FREQUENCY: EACH 50 CUBIC YARDS. NOT LESS THAN ONE TEST EACH 5,000 SQUARE FEET OF SLAB OR WALL PLACED EACH DAY
SHOTCRETE STRENGTH	1705.3 1910.10	ASTM C39			FREQUENCY: EACH 50 CUBIC YARDS. NOT LESS THAN ONE TEST EACH 5,000 SQUARE FEET OF SLAB OR WALL PLACED EACH DAY

SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REF	CODE OR STANDARD REFERENCE	FREQUENCY: CONTINUOUS	FREQUENCY: PERIODIC	REMARKS
STRUCTURAL WOOD					
FIELD GLUING OPERATIONS OF DIAPHRAGM AND SHEAR WALL ELEMENTS	1705.11.2		X		---
NAILING, SCREWING, BOLTING, ANCHORING AND OTHER FASTENING OF COMPONENTS WITHIN THE MAIN SEISMIC FORCE-RESISTING SYSTEM, INCLUDING WOOD SHEAR WALLS, WOOD DIAPHRAGMS, DRAG STRUTS, BRACES AND HOLD-DOWNS	1705.11.2			X	SPECIAL INSPECTION IS NOT REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS, AND DIAPHRAGMS, INCLUDING NAILING, SCREWING, BOLTING, ANCHORING AND OTHER FASTENING COMPONENTS OF THE MAIN WINDFORCE RESISTING SYSTEM, WHEN THE FASTENER SPACING OF THE SHEATHING IS MORE THAN 4 INCHES ON CENTER
MECHANICAL AND ELECTRICAL COMPONENTS					
INSTALLATION OF ANCHORAGE OF ELECTRICAL EQUIPMENT FOR EMERGENCY OR STANDBY POWER SYSTEMS	1705.11.6			X	APPLIES TO STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY C, D, E OR F
INSTALLATION OF ANCHORAGE OF ALL ELECTRICAL EQUIPMENT	1705.11.6			X	APPLIES TO STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY E OR F

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Nicholas J. Choromanski
SE-14180
1/4/2022
REGISTERED STRUCTURAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

SPECIAL INSPECTION AND TESTING TABLES

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

SHEET NO.

S003

PLOT DATE: 1/31/2022 12:34:36 PM

FOUNDATION (F) SCHEDULE

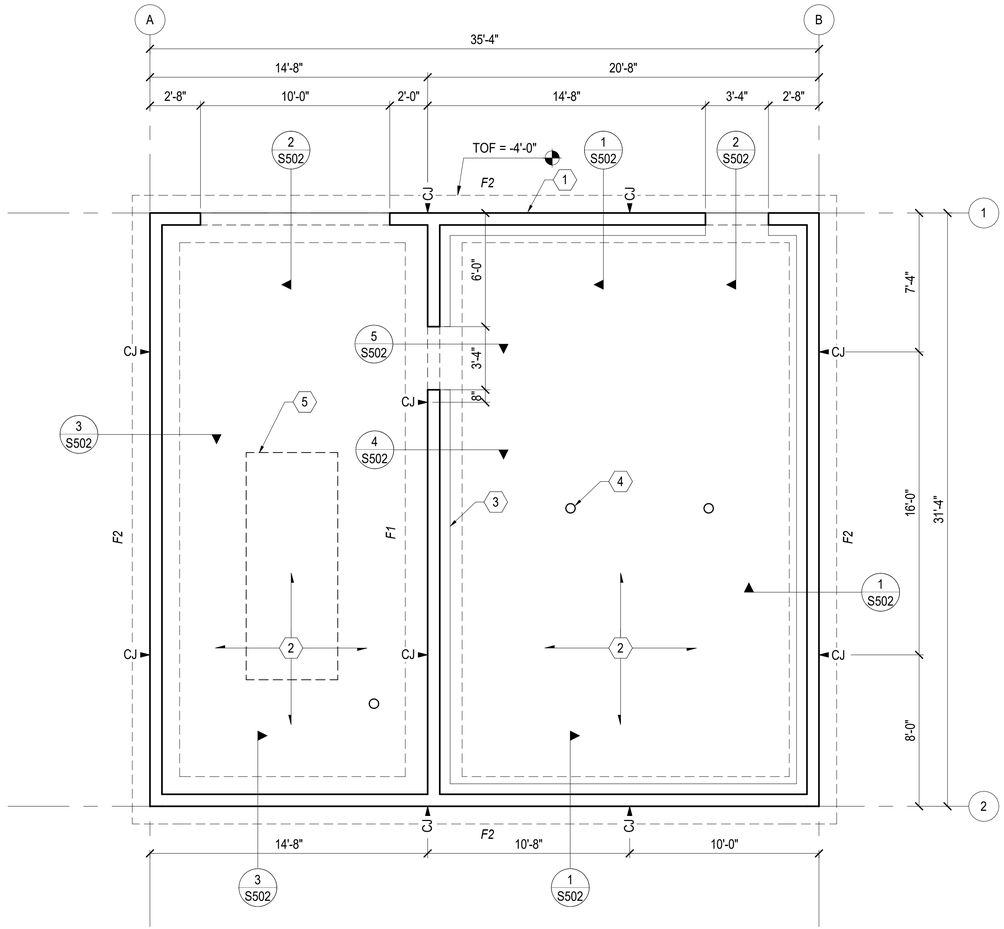
NOTES:
1. FOR FOOTING BEARING DEPTH BELOW GRADE, SEE GSN, UNO.
2. CENTER FOOTINGS UNDER WALLS OR COLUMNS, UNO.
3. WHERE FOOTINGS INTERSET, THE GREATER REINFORCING REQUIREMENTS SHALL GOVERN.

KEYED NOTES:
A. PROVIDE CLEAR DISTANCE FOR TOP REINFORCING OF 6".
B. PROVIDE 1" CLEAR SPACE BETWEEN DOUBLE LAYER OF BARS.

MARK	DIMENSIONS			FOOTING REINFORCING	REMARKS
	HEIGHT	WIDTH	LENGTH		
F1	1'-0"	3'-0"	30'-0 3/4"CONT	(4) #5 BARS CONT. T&B, AND #5 AT 12" OC TRANSVERSE T&B	---
F2	1'-0"	2'-6"	CONT	(4) #5 BARS CONT. T&B, AND #5 AT 12" OC TRANSVERSE T&B	---

FOUNDATION KEYNOTES:

1 TYPICAL: 8" CMU WALL, REINF w/ #5 VERTICAL BARS AT 16" OC AND #5 HORIZONTAL BARS AT 24" OC.
2 8" CONC SLAB ON GRADE, REINF w/ #4 BARS AT 16" OC, EA WAY, IN TOP 1/3 OF SLAB.
3 TYPICAL: CONCRETE CURB, SEE DETAILS.
4 TYPICAL: FLOOR DRAIN, COORDINATE WITH MECHANICAL AND ARCHITECTURAL DRAWINGS. SLOPE SLABS TOWARDS FLOOR DRAINS.
5 ELECTRIC GENERATOR, COORDINATE WITH ELECTRICAL DRAWINGS. ANCHOR TO SLAB WITH (8) 5/8" DIA. STAINLESS STEEL POST-INSTALLED ANCHORS WITH 6" EMBEDMENT [4 EACH SIDE, EVENLY SPACED].



1 FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

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WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

FOUNDATION PLAN

REVISION SCHEDULE

#	DESCRIPTION	DATE

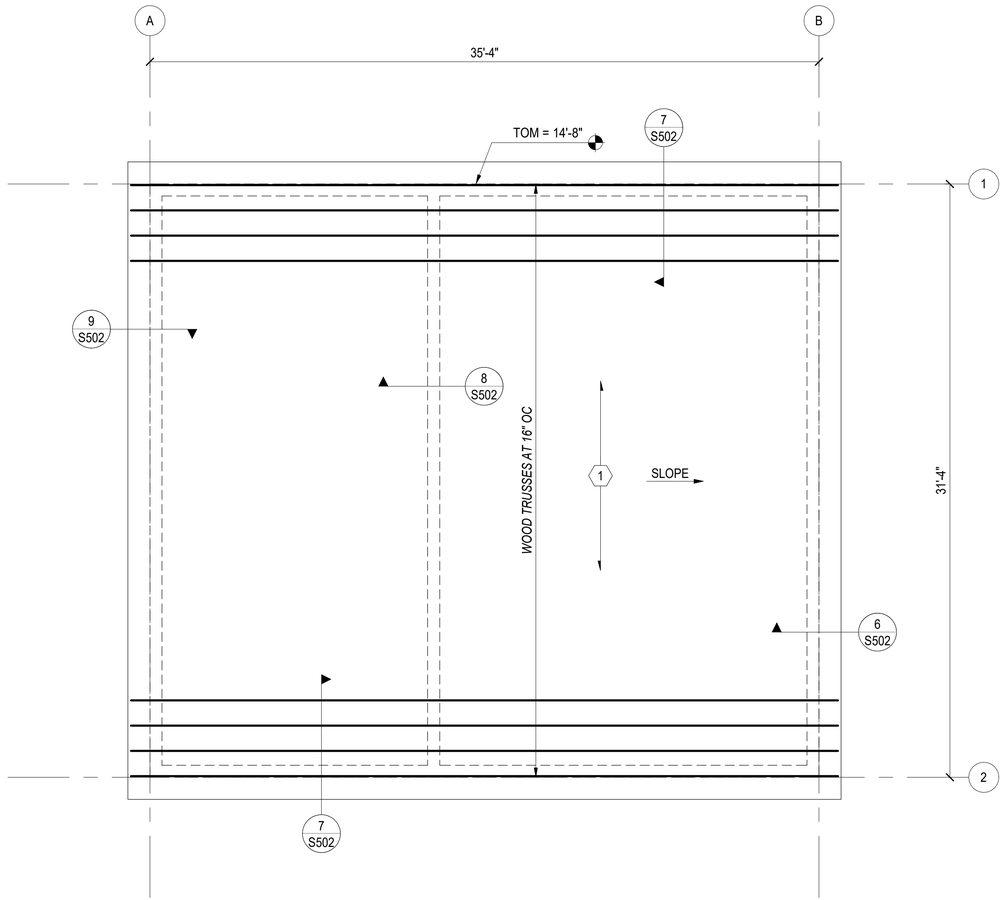
PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

SHEET NO.
S201

PLOT DATE: 1/31/2022 12:34:37 PM

FRAMING KEYNOTES:

1 ROOF SHEATHING PER SHEET S001. BLOCK ALL EDGES. ATTACH WITH 10D NAILS AT 2" OC AT BOUNDARIES AND 3" OC ALL OTHER EDGES AND 8" OC IN FIELD.



1 **ROOF FRAMING PLAN**
SCALE: 1/4" = 1'-0"

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WHITTIER, ALASKA
PROJECT No. 20403.14

ROOF FRAMING PLAN

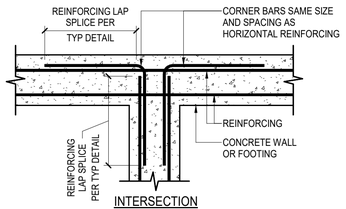
REVISION SCHEDULE

#	DESCRIPTION	DATE

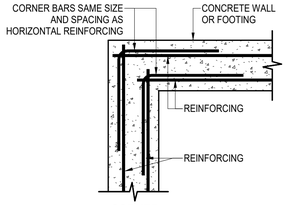
PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

SHEET NO.
S202

PLOT DATE: 1/31/2022 12:34:37 PM



INTERSECTION



CORNER

1 TYPICAL CONCRETE REINFORCING AT WALLS & FOOTINGS

SCALE: NTS

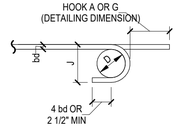
CONCRETE PSI	TENSION SPLICE LENGTHS (CLASS B)												COMPRESSION BARS			
	f'_c = 2,500/3,000 PSI				f'_c = 4,000/4,500 PSI				f'_c = 5,000 PSI				f'_c < 3,000 PSI		$f'_c \geq$ 3,000 PSI	
BAR LOCATION	REGULAR		TOP		REGULAR		TOP		REGULAR		TOP		STD LAP	ENCLOSED WITH SPIRAL TIES	STD LAP	ENCLOSED WITH SPIRAL TIES
SPACING / SIZE	≥$2d_b$	OTHER	≥$2d_b$	OTHER	≥$2d_b$	OTHER	≥$2d_b$	OTHER	≥$2d_b$	OTHER	≥$2d_b$	OTHER				
#3	24"	36"	31"	46"	19"	28"	25"	37"	17"	25"	22"	33"	12"	12"	12"	12"
#4	32"	47"	41"	61"	25"	37"	33"	49"	23"	34"	29"	44"	20"	15"	15"	12"
#5	39"	59"	51"	77"	31"	47"	41"	61"	28"	42"	36"	54"	25"	19"	19"	15"
#6	47"	71"	61"	92"	37"	56"	49"	73"	34"	50"	44"	65"	30"	23"	23"	18"
#7	69"	103"	89"	134"	54"	81"	71"	106"	49"	73"	63"	95"	35"	27"	27"	21"
#8	78"	117"	102"	153"	62"	93"	81"	121"	56"	83"	72"	108"	40"	30"	30"	23"
#9	88"	132"	115"	172"	70"	105"	91"	136"	63"	94"	81"	122"	46"	35"	35"	26"
#10	100"	149"	129"	194"	79"	118"	102"	153"	71"	106"	92"	137"	51"	39"	39"	30"
#11	110"	165"	143"	215"	87"	131"	114"	170"	78"	117"	102"	152"	57"	43"	43"	33"

NOTES:
1. TOP BARS ARE ANY HORIZONTAL BARS PLACED SO THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.
2. CONCRETE COVERAGE AROUND REINFORCING SHALL NOT BE LESS THAN THE DIAMETER OF THE BAR.
3. APPLICABLE TO BARS HAVING A YIELD STRESS OF 60,000 PSI OR LOWER.
4. WHEN BARS OF DIFFERENT SIZE ARE LAP SPLICED IN TENSION, SPLICE LENGTH SHALL BE BASED ON LARGER BAR DIAMETER.
5. LAP SPLICES SHALL BE STAGGERED AT LEAST 24 INCHES.
6. FOR SPIRALS, LAP SPLICE SHALL BE THE GREATER OF 12 INCHES OR 48 BAR DIAMETERS.

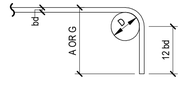
2 TYPICAL MINIMUM REINFORCING BAR SPLICE LENGTHS IN CONCRETE

SCALE: NTS

END HOOKS, ALL GRADES				
BAR SIZE	FINISHED BEND DIA	180° HOOKS		90° HOOKS
	D	A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	24"
#14	18 1/4"	27"	21 3/4"	31"
#18	24"	36"	28 1/2"	41"



180° HOOK

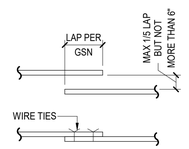


90° HOOK

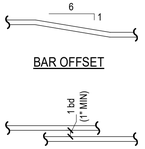
3 TYPICAL REINFORCING HOOK SCHEDULE

SCALE: NTS

NOTES:
1. RADIUS = 3 bd FOR BARS NOT OVER #8; 4 bd FOR #9, #10 AND #11 BARS; 5 bd FOR #14 AND # 18 BARS. 5 bd FOR ALL GRADE 40 BARS WITH 180° HOOK.
2. BEND AROUND 1 1/2" PIN FOR # 3 BARS. BEND AROUND 2" PIN FOR #4 BARS. BEND AROUND 2 1/2" PIN FOR #5 BARS.

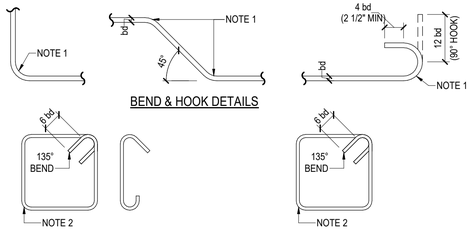


SPLICE DETAIL



BAR OFFSET

BAR CLEARANCE



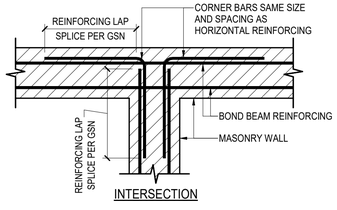
BEND & HOOK DETAILS

COLUMN/PEDESTAL TIES

BEAM STIRRUPS

4 TYPICAL CONCRETE REINFORCING BAR DETAILS

SCALE: NTS



INTERSECTION

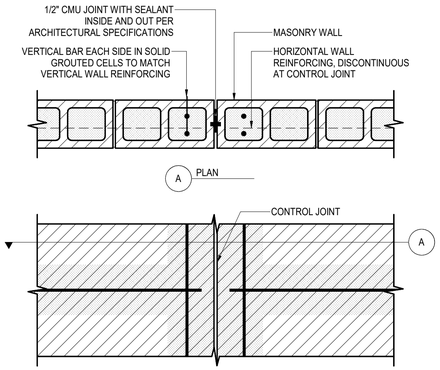
CORNER

END/OPENING

5 TYPICAL MASONRY REINFORCING AT WALLS

SCALE: NTS

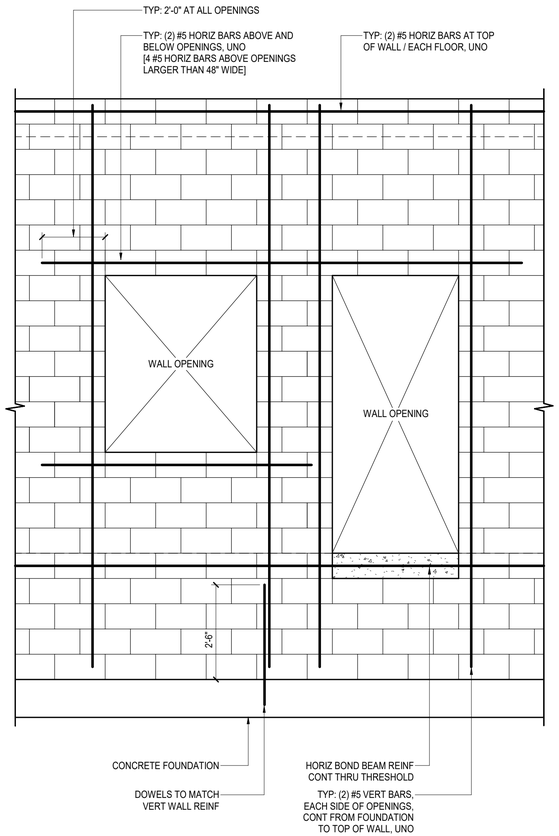
GENERAL NOTES:
A. HORIZONTAL REINFORCING IS CONTINUOUS THRU CONTROL JOINT AT ROOF.



6 TYPICAL CONTROL JOINT IN MASONRY WALL

SCALE: NTS

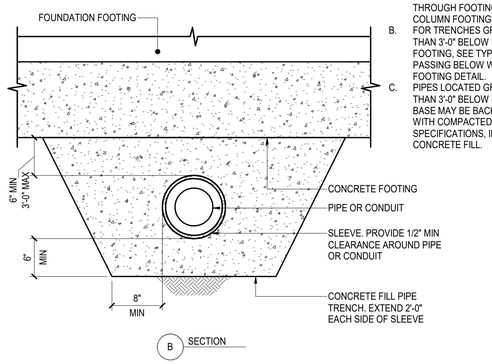
GENERAL NOTES:
A. UNIFORM WALL REINFORCING NOT SHOWN FOR CLARITY. SEE PLANS FOR BALANCE OF WALL REINFORCING.

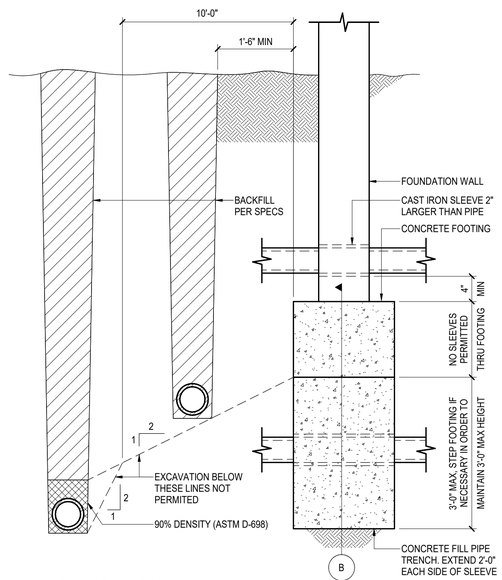


9 TYPICAL MASONRY WALL OPENING REINFORCING

SCALE: NTS

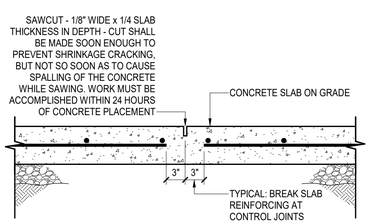
GENERAL NOTES:
A. NO PIPE SHALL PASS THROUGH FOOTING OR UNDER COLUMN FOOTINGS.
B. FOR TRENCHES GREATER THAN 3'-0" BELOW BOTTOM OF FOOTING, SEE TYPICAL PIPE PASSING BELOW WALL FOOTING DETAIL.
C. PIPES LOCATED GREATER THAN 3'-0" BELOW FOOTING BASE MAY BE BACKFILLED WITH COMPACTED FILL PER SPECIFICATIONS, IN LIEU OF CONCRETE FILL.





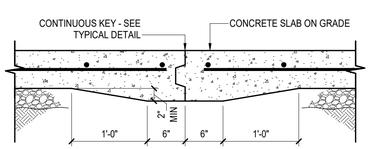
10 TYPICAL PIPE THROUGH FOUNDATION WALL AND TRENCH

SCALE: NTS



SAW CUT JOINT

GENERAL NOTES:
A. KEYED JOINTS NEED ONLY OCCUR AT EXPOSED EDGES DURING PLACEMENT UNLESS SPECIFICALLY NOTED ON THE PLANS. "TOOL WET JOINT", "SIP STRIP", ETC. SHALL MATCH SAWCUT REQUIREMENTS.
B. SEE GSN FOR JOINT SPACING SPECIFICATIONS.



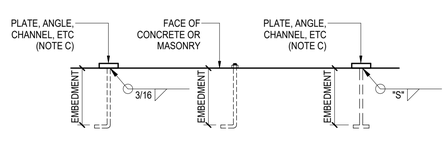
KEYED JOINT

7 TYPICAL CONTROL JOINTS IN CONCRETE SLAB ON GRADE

SCALE: NTS

ANCHOR DIAMETER	VERT BOLT EMBEDMENT LENGTH	HORIZ BOLT EMBEDMENT LENGTH	HEADED STUD FILLET WELD SIZE, "S"
1/2"	7"	4"	1/4"
5/8"	7"	4"	5/16"
3/4"	7"	5"	5/16"
7/8"	8"	6"	5/16"
1"	9"	7"	3/8"
1 1/8"	10"	8"	---
1 1/4"	11"	9"	---

GENERAL NOTES:
A. PROVIDE ANCHORS, ANCHOR BOLTS, AND HEADED STUDS PER THIS SCHEDULE, UNO ON PLANS OR DETAILS.
B. SCHEDULE APPLIES TO ANCHORS IN CONCRETE AND MASONRY.
C. THICKNESS OF DRYPACK DOES NOT APPLY TOWARDS EMBEDMENT.



ANCHOR ANCHOR BOLT HEADED STUD

8 TYPICAL CAST-IN-PLACE ANCHOR, ANCHOR BOLT AND HEADED STUD SCHEDULE

SCALE: NTS

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3940 ARCTIC BLVD. SUITE 300
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PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA 49 TH
Nicholas J. Choromanski
SE-14180
1/4/2022
REGISTERED STRUCTURAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

TYPICAL DETAILS AND SCHEDULES

REVISION SCHEDULE

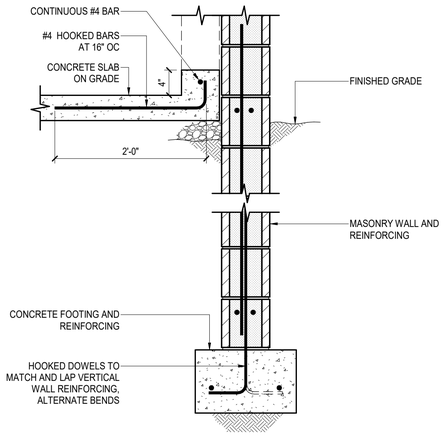
#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

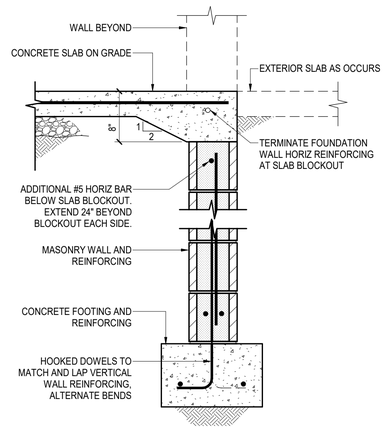
SHEET NO.

S501

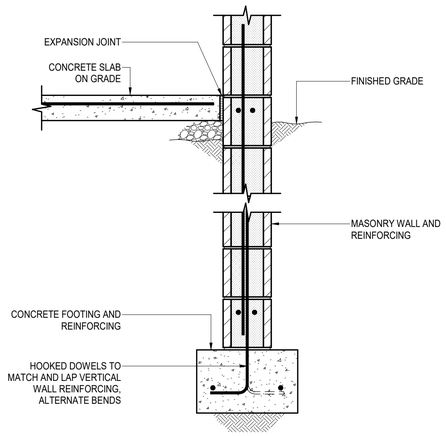
PLOT DATE: 1/31/2022 12:34:39 PM



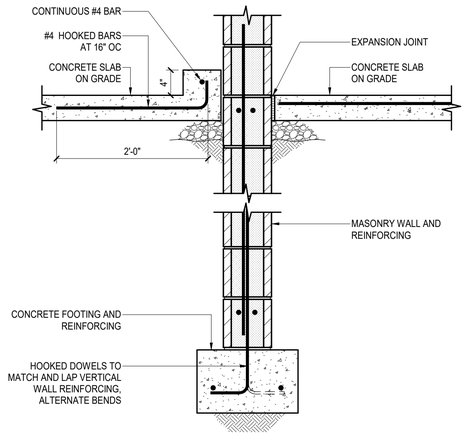
1 MASONRY WALL AT CONCRETE FOOTING
SCALE: NTS



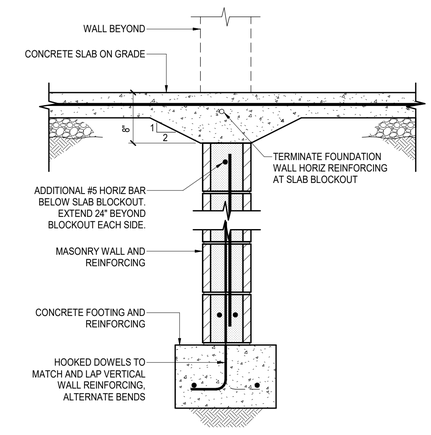
2 WALL OPENING AT CMU FOUNDATION
SCALE: NTS



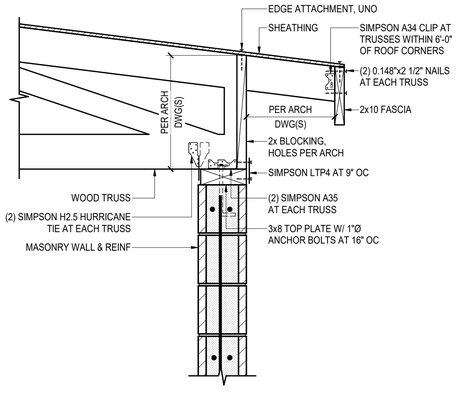
3 MASONRY WALL AT CONCRETE FOOTING
SCALE: NTS



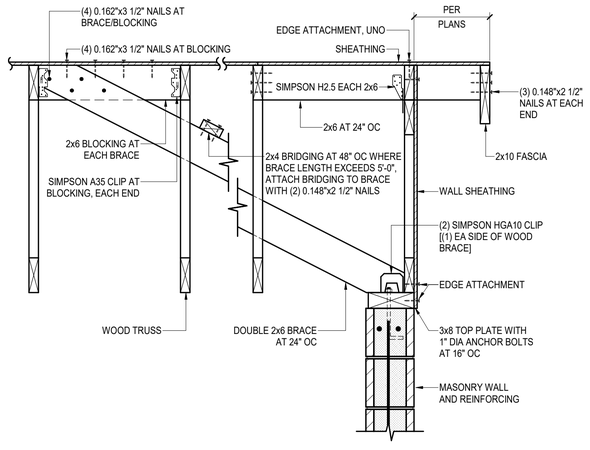
4 MASONRY WALL AT CONCRETE FOOTING
SCALE: NTS



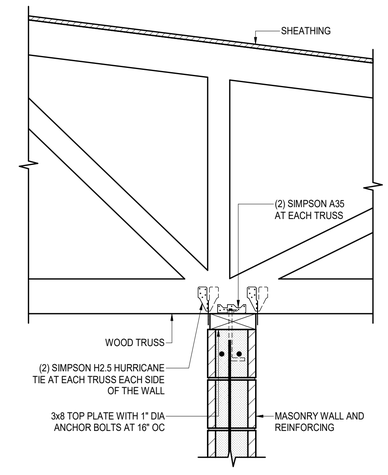
5 WALL OPENING AT CMU FOUNDATION
SCALE: NTS



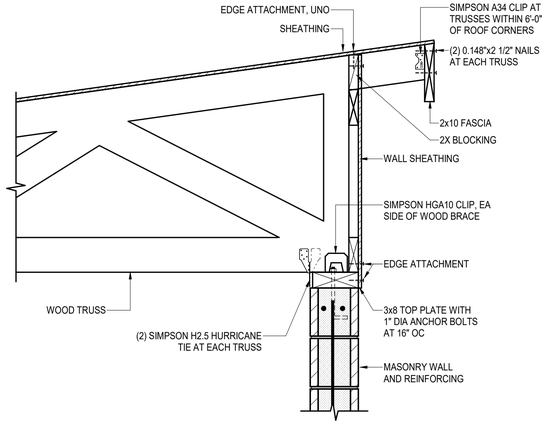
6 WOOD TRUSS AT MASONRY WALL
SCALE: NTS



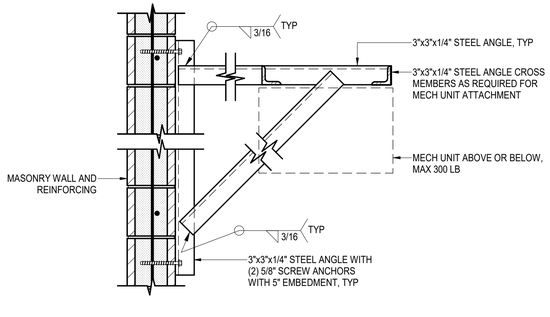
7 WOOD TRUSS AT MASONRY WALL
SCALE: NTS



8 WOOD TRUSS AT MASONRY WALL
SCALE: NTS



9 WOOD TRUSS AT MASONRY WALL
SCALE: NTS



10 TYP MECH UNIT SUPPORT AT MASONRY WALL
SCALE: NTS

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3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA
49 TH
Nicholas J. Choromanski
SE-14180
1/4/2022
REGISTERED STRUCTURAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

STRUCTURAL DETAILS

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	1/4/2022
DRAWN	MEH
DESIGNED	WS
REVIEWED	NJC

SHEET NO.
S502

PLOT DATE: 1/31/2022 12:34:40 PM

PIPING LEGEND

PROPOSED	VENT	PROPOSED	PROCESS PIPE
	WASTE		NATURAL GAS

PIPING SYMBOL LEGEND

	PIPE DOWN		ISO FLANGE
	PIPE UP		CAP
	TEE DOWN		REDUCER
	TEE UP		CLEANOUT
	UNION		CONTINUATION

PIPING SYMBOL LEGEND (CONTINUED)

M	3-WAY MOTORIZED CONTROL VALVE
	BALL VALVE / ISOLATION VALVE
	GATE VALVE
	CHECK VALVE
	STRAINER
	PRESSURE GAUGE W/ ISOLATION VALVE
	FLOOR DRAIN
	PUMP
	THERMOMETER

HVAC/DUCTWORK LEGEND

PROPOSED	INSULATED DUCTWORK	PROPOSED	SUPPLY AIR UP
	VOLUME DAMPER		SUPPLY AIR DOWN
10/20	DUCTWORK SIZE (SIDE SHOWN/SIDE NOT SHOWN)		EXHAUST AIR UP
1	MOTORIZED CONTROL DAMPER		EXHAUST AIR DOWN

LOGIC LEGEND

	CONNECTION POINT TO EXISTING
1	SHEET NOTE
T	THERMOSTAT
S	SENSOR
X / XXX	DETAIL NUMBER / SHEET LOCATED ON

ABBREVIATIONS

AFF	ABOVE FINISH FLOOR	DEG	DEGREE	FD-X	FLOOR DRAIN DESIGNATOR	MIN	MINIMUM	OAE	OR APPROVED EQUAL	UPC	UNIVERSAL PLUMBING CODE
AGA	AMERICAN GAS ASSOCIATION	DIA/Ø	DIAMETER	FT	FEET	N.C.	NORMALLY CLOSED	PH	PHASE	V	VENT
BTUH	BRITISH THERMAL UNIT/HOUR	DIP	DUCTILE IRON PIPE	G	NATURAL GAS	NEC	NATIONAL ELECTRICAL CODE	PSI	POUNDS PER SQUARE INCH	VOLTS	VOLTAGE
C/A	CUMBUSTION AIR	E/A	EXHAUST AIR	GUH-X	GAS UNIT HEATER DESIGNATOR	NO.	NUMBER	S/A	SUPPLY AIR	VTR	VENT THROUGH ROOF
CFH	CUBIC FEET PER HOUR	EAT	ENTERING AIR TEMPERATURE	HP	HORSEPOWER	N.O.	NORMALLY OPEN	SS	STAINLESS STEEL	W	WASTE
CFM	CUBIC FEET PER MINUTE	EH-X	ELECTRIC UNIT HEATER DESIGNATOR	KW	KILOWATT	NTS	NOT TO SCALE	TYP	TYP	WC	WATER COLUMN
DA	MOTORIZED CONTROL DAMPER	F	FAHRENHEIT	MAX	MAXIMUM	O/A	OUTSIDE AIR	UL	UNDERWRITERS LABORATORIES		

PLUMBING FIXTURE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	MOUNTING	WASTE	REMARKS
FD-1	ZURN	Z415B	FLOOR	4	DURA-COATED CAST IRON BODY WITH SEEPAGE SLOTS AND ROUND HEAVY DUTY SLOTTED GRATE.

GAS FIRED UNIT HEATER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	FUEL	INPUT (BTUH)	OUTPUT (BTUH)	EAT (DEG F)	CFM	HP	MOTOR DATA (VOLTS/PH)	MAX MOUNTING HEIGHT (FT)	REMARKS
GUH-1	MODINE	HDS30AS01	NATURAL GAS	30,000	24,600	50	505	1/15	115/1	10	CEILING MOUNTED, OSHA FAN GUARD.

ELECTRIC UNIT HEATER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	CAPACITY (KW)	ELECTRICAL DATA (VOLTS/PH)	MAX MOUNTING HEIGHT (FT)	REMARKS
EH-1	MODINE	HER 75C 1201	7.5	240/1	8	CEILING MOUNTED ELECTRIC UNIT HEATER. PROVIDE WITH UNIT MOUNTED THERMOSTAT, THERMAL OVERLOAD PROTECTION, AND UL LISTED.

FAN SCHEDULE

SYMBOL	MANUFACTURER	MODEL	SERVICE	CAPACITY (CFM)	TOTAL STATIC PRESSURE (IN WC)	HP	MOTOR DATA (VOLTS/PH)	REMARKS
SF-1	GREENHECK	SS1-10-428-P	SUPPLY AIR	355	0.20	1/20	115/1	PROVIDE WITH WALL MOUNT, FACTORY MOUNTED DISCONNECT, FAN SPEED CONTROLLER, THERMAL OVERLOAD PROTECTION, UL LISTED AND AMCA CERTIFIED.

LOUVER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	SERVICE	MATERIAL	FINISH	SIZE (IN)	REMARKS
L-1	RUSKIN	ELF6375DX	GENERATOR C/A	ALUMINUM	50% PVDF	64 W X 24 H	HORIZONTAL DRAINABLE BLADES AT 37.5 DEGREES, STAINLESS STEEL BEARINGS, AND WITH 3/4" BIRD SCREEN.

DEHUMIDIFIER SCHEDULE

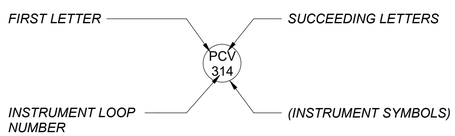
SYMBOL	MANUFACTURER	MODEL	TYPE	CFM	ENTERING DRY BULB (DEG F)	ENTERING HUMIDITY	MOISTURE REMOVAL (LB/HR)	KW	ELECTRICAL DATA (VOLTS/PH)	DIMENSIONS (IN)	WEIGHT (LBS)	REMARKS
DH-1	QUEST DEHUMIDIFIERS	QUEST 70	SELF CONTAINED	150	80	60%	3.0	0.68	115/1	12 W X 21.5 L X 12 H	55	

TAG IDENTIFICATIONS

TAG	*DEFINITION*
FIT	*FLOW INDICATOR TRANSMITTER*
PCV	*PRESSURE CONTROL VALVE*
PIT	*PRESSURE INDICATOR TRANSMITTER*
PLC	*PROGRAMMABLE LOGIC CONTROLLER*
PT	*PRESSURE TRANSMITTER*
TT	*TEMPERATURE TRANSMITTER*
YYC	*VALVE CLOSE REQUEST*
ZS	*POSITION CONTROL*

TAG NUMBERS

TYPICAL: *PCV314* - *INSTRUMENT IDENTIFICATION OR TAG NUMBER*
FORMAT *PCV* - *FUNCTIONAL IDENTIFICATION*
P - *FIRST-LETTER*
CV - *SUCCEEDING-LETTER(S)*



EXPANDED: *PCV314* - *TAG NUMBER*
FORMAT *A* - *OPTIONAL SUFFIX*

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA
49 TH
Tracy L. McKeon
ME-11388
01/04/2022
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN
WHITTIER, ALASKA
PROJECT No. 20403.14

MECHANICAL LEGEND AND ABBREVIATIONS

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	BCA
DESIGNED	TLM
REVIEWED	TLM

SHEET NO.
M001

PLOT DATE: 4/26/2022 4:45:30 PM

SHEET NOTES:

1. CAPPED 2 INCH HUB DRAIN.
2. 2 INCH WASTE UP FOR INDIRECT DRAIN.
3. DEHUMIDIFIER, DH-1, TO BE MOUNTED ON WALL. ROUTE CONDENSATE DRAIN TO NEAREST INDIRECT DRAIN. SEE 5/M501 FOR DETAIL.
4. LOUVER, L-1, TO BE HEAT TRACED. SEE 6/M501 FOR DETAIL.
5. 3/4 INCH DRAIN FROM GENERATOR E/A DUCT, ROUTE TO NEAREST FLOOR DRAIN. TERMINATE WITH 1 INCH AIR GAP. PROVIDE FABRICATED DIAMOND PLATE COVER OVER PIPING TO PROTECT DRAIN PIPING. BARE PIPING IS A TRIPPING HAZARD, SECURE COVER TO FLOOR.
6. PROVIDE WATER TIGHT DRIP PAN BELOW VENT PIPING OVER ELECTRICAL PANELS.
7. TERMINATE AT A 45 DEGREE ANGLE WITH WELDED BIRDSCREEN. FLASH AND SEAL WATERTIGHT.

HVAC SEQUENCE OF OPERATION

SPACE HEATING

GAS-FIRED UNIT HEATER, GUH-1, SHALL CYCLE ON A CALL FOR HEAT FROM THE WALL MOUNTED THERMOSTAT (50 DEG F, ADJUSTABLE). ELECTRIC UNIT HEATER, EH-1, SHALL CYCLE ON CALL FOR HEAT FROM THE ADJUSTABLE INTEGRAL THERMOSTAT. EH-1 IS INTENDED TO SERVE AS BACK-UP HEAT SOURCE SHOULD GUH-1 FAIL TO MAINTAIN SPACE TEMPERATURE.

DEHUMIDIFICATION

DEHUMIDIFIER, DH-1, SHALL OPERATE BASED ON CALL FOR DEHUMIDIFICATION FROM INTEGRAL HUMIDISTAT SET TO LOW.

VENTILATION

SUPPLY FAN, SF-1, SHALL OPERATE BASED ON A CALL FOR VENTILATION FROM THE WALL MOUNTED THERMOSTAT (90 DEG F, ADJUSTABLE). WHEN SF-1 ENABLED, DA-1 AND DA-2 TO MODULATE TO FULL OPEN POSITION. WHEN SF-1 DISABLED, DA-1 AND DA-2 TO MODULATE TO FULL CLOSE POSITION.

GENERATOR VENTILATION

MOTORIZED CONTROL DAMPER FOR L-1 TO BE INTERLOCKED WITH MOTORIZED INTAKE LOUVER ON GENERATOR ENCLOSURE. WHEN MOTORIZED INTAKE LOUVER ON GENERATOR ENCLOSURE OPENS, MOTORIZED CONTROL DAMPER FOR L-1 TO OPEN TO FULL OPEN POSITION. WHEN MOTORIZED INTAKE LOUVER ON GENERATOR ENCLOSURE CLOSES, MOTORIZED CONTROL DAMPER FOR L-1 TO CLOSE TO FULL CLOSE POSITION.

1 MECHANICAL FLOOR PLAN
SCALE: 1/2" = 1'-0"

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA
49 TH
Tracy L. McKeon
ME-11388
01/04/2022
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN
WHITTIER, ALASKA
PROJECT No. 20403.14
MECHANICAL FLOOR PLAN

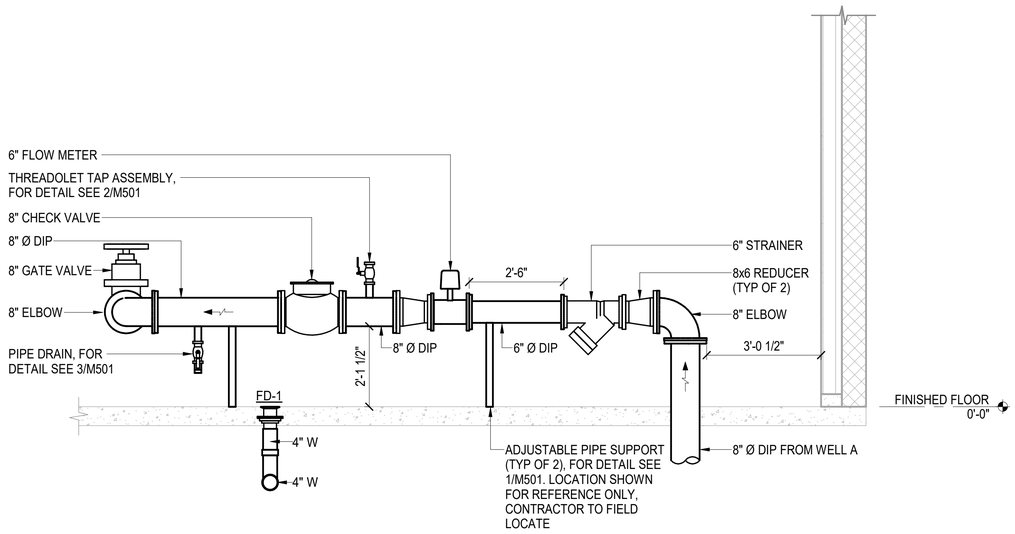
REVISION SCHEDULE

#	DESCRIPTION	DATE

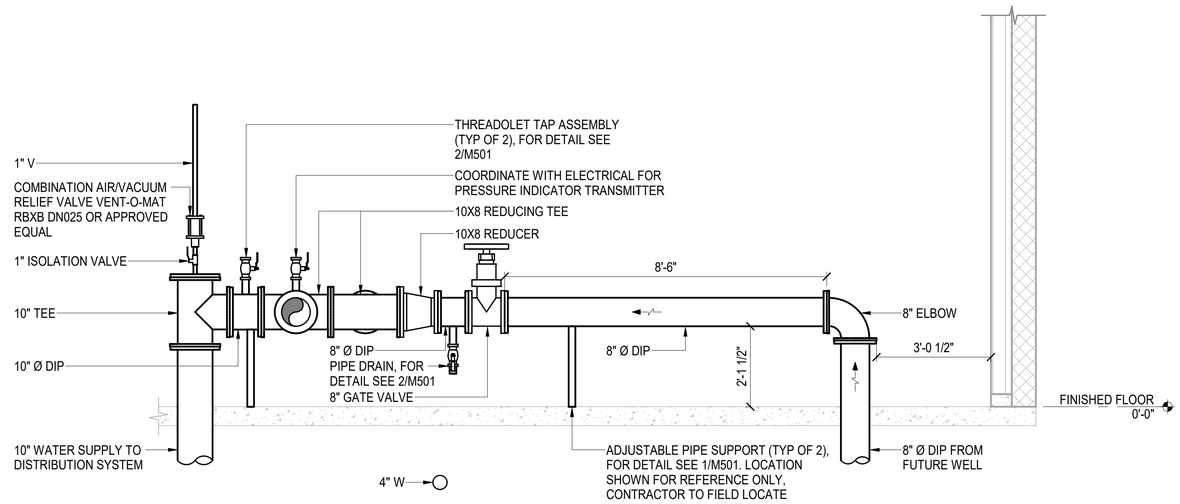
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	BCA
DESIGNED	TLM
REVIEWED	TLM

SHEET NO.
M101

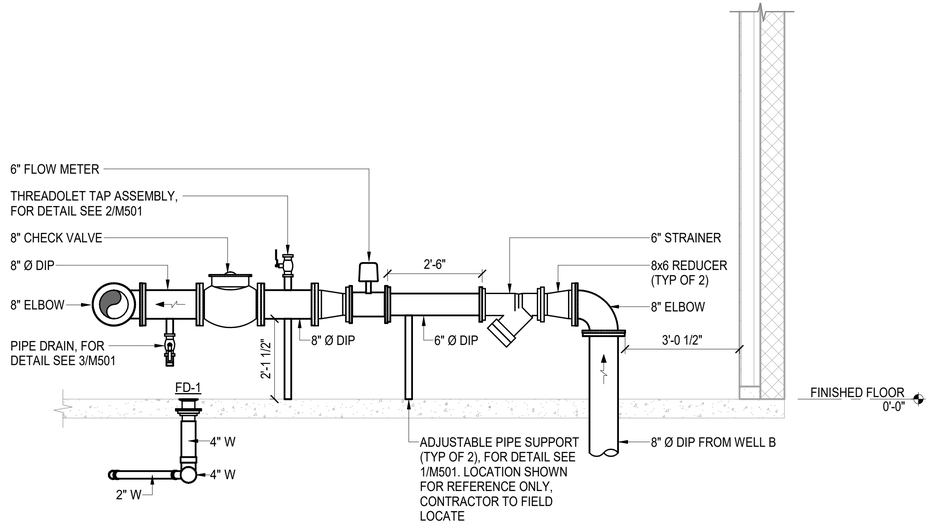
PLOT DATE: 4/26/2022, 4:45:31 PM



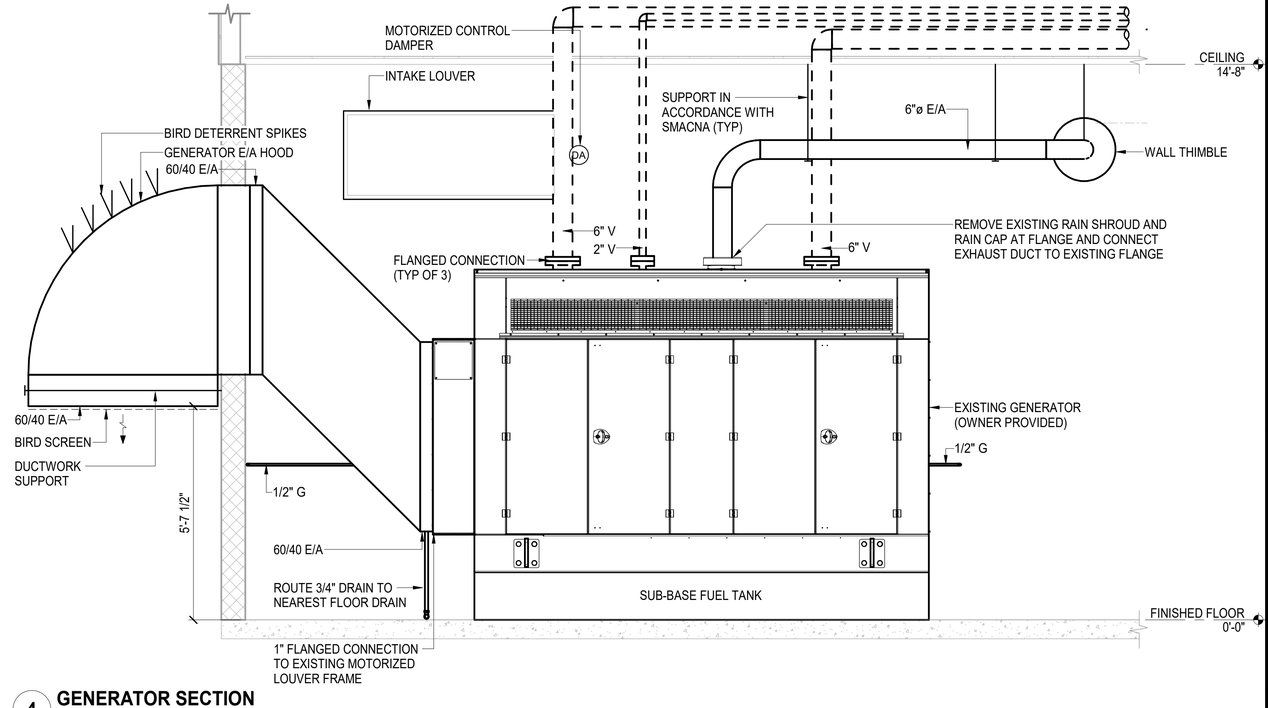
1 WELL A SECTION
SCALE: 1/2" = 1'-0"



2 FUTURE WELL SECTION
SCALE: 1/2" = 1'-0"



3 WELL B SECTION
SCALE: 1/2" = 1'-0"



4 GENERATOR SECTION
SCALE: 1/2" = 1'-0"

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA
49 TH
Tracy L. McKeon
ME-11388
01/04/2022
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

SECTION VIEWS

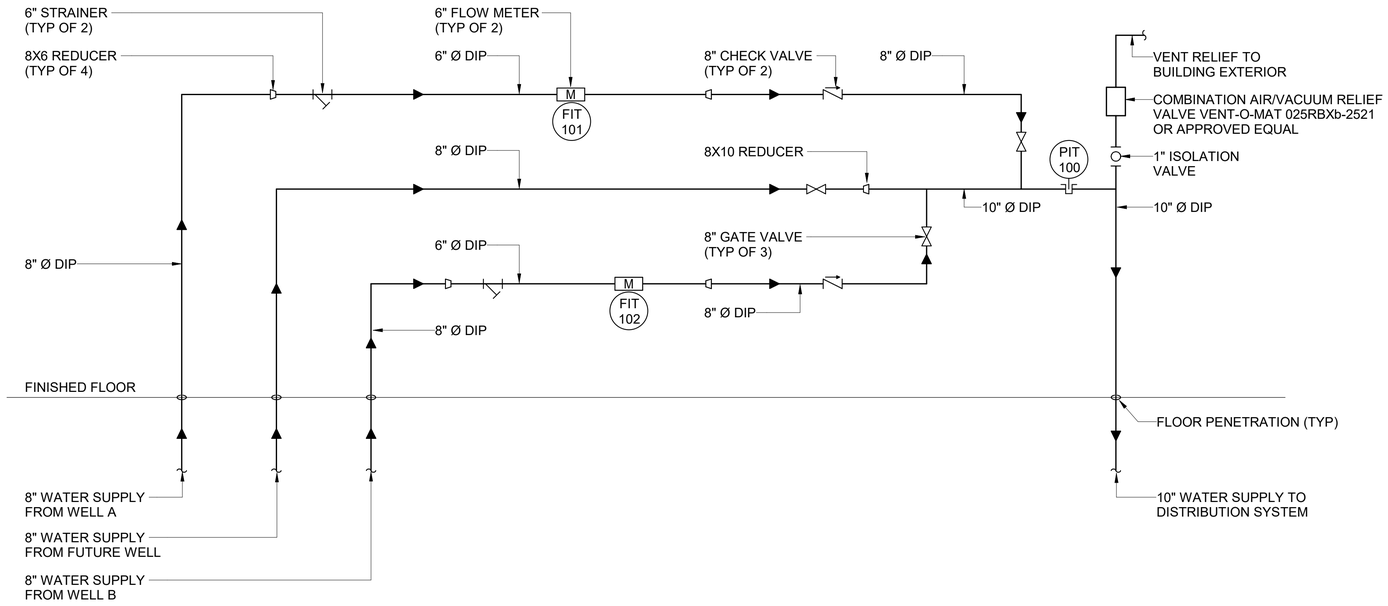
REVISION SCHEDULE

#	DESCRIPTION	DATE

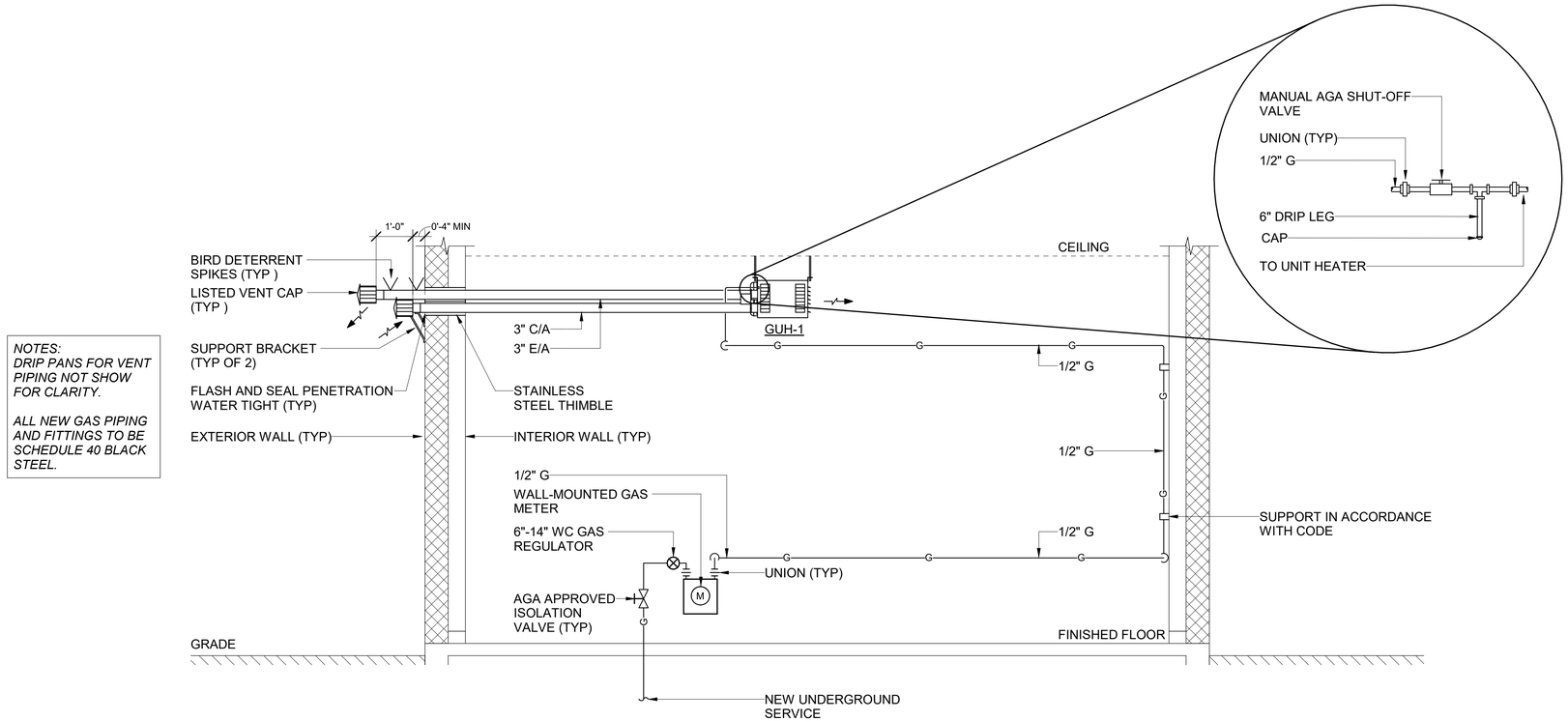
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	BCA
DESIGNED	TLM
REVIEWED	TLM

SHEET NO.
M301

PLOT DATE: 4/26/2022 4:45:32 PM



2 PIPING SCHEMATIC
SCALE: NTS



NOTES:
DRIP PANS FOR VENT PIPING NOT SHOW FOR CLARITY.

ALL NEW GAS PIPING AND FITTINGS TO BE SCHEDULE 40 BLACK STEEL.

GAS METER SET AND SIZED BY ENSTAR UTILITY	
UPC 2018	TABLE 1215.2(1)
TOTAL CONNECTED LOAD	29.0 CFH
TOTAL DEVELOPED LENGTH	65 FT

1 GAS-FIRED UNIT HEATER AND GAS PIPING SCHEMATIC
SCALE: NTS

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WHITTIER WELL FIELD DESIGN
WHITTIER, ALASKA
PROJECT No. 20403.14

PIPING AND INSTRUMENTATION SCHEMATICS

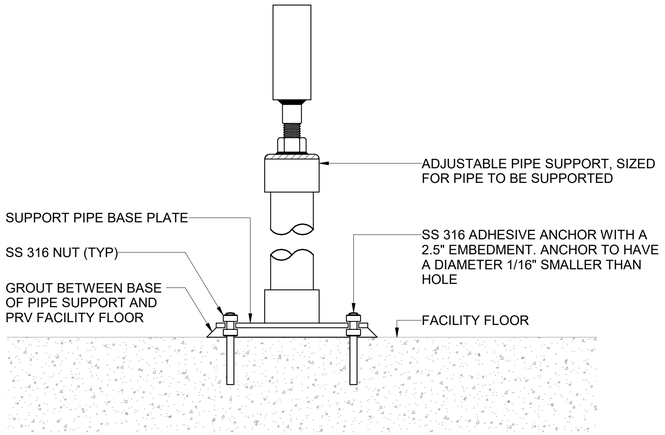
REVISION SCHEDULE

#	DESCRIPTION	DATE

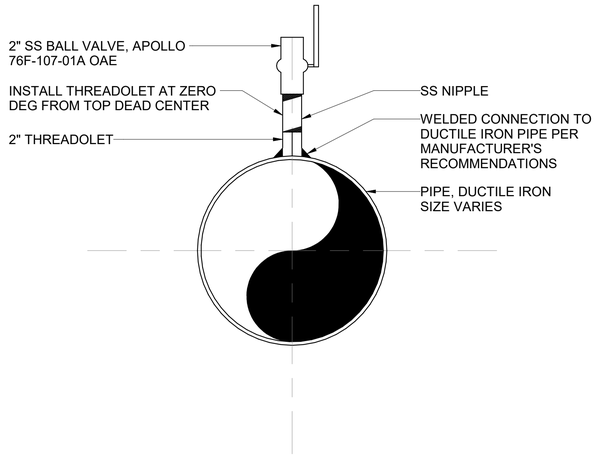
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	BCA
DESIGNED	TLM
REVIEWED	TLM

SHEET NO.
M401

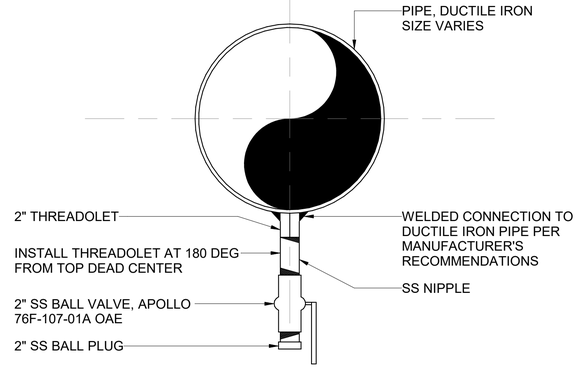
PLOT DATE: 4/26/2022, 4:45:33 PM



1 PIPE SUPPORT DETAIL
SCALE: NTS



2 THREADOLET TAP ASSEMBLY DETAIL
SCALE: NTS



3 PIPE DRAIN DETAIL
SCALE: NTS

4 FLOOR DRAIN DETAIL
SCALE: NTS

5 DEHUMIDIFIER
SCALE: NTS

6 LOUVER HEAT TRACE
SCALE: NTS

7 RELIEF HOOD DETAIL
SCALE: NTS

8 SUPPLY FAN DETAIL
SCALE: NTS

NOTES:
1. MANUFACTURED BY GTE INDUSTRIES OR APPROVED EQUAL.
2. VERIFY WALL THICKNESS PRIOR TO ORDERING.
3. EXHAUST THIMBLE SHALL BE STAINLESS STEEL.

9 EXHAUST THIMBLE
SCALE: NTS

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WHITTIER WELL FIELD DESIGN

WHITTIER, ALASKA
PROJECT No. 20403.14

MECHANICAL DETAILS

REVISION SCHEDULE

#	DESCRIPTION	DATE

PROJECT NO.	20403.14
DATE	DEC 2021
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REVIEWED	TLM

SHEET NO.

M501

PLOT DATE: 4/26/2022 4:45:34 PM

LEGEND

BUS

EXPOSED CONDUIT

CONDUIT/CABLE RUN UNDERGROUND OR IN CONCRETE

X–Y,Z — HOMERUN TO PANEL "X", CIRCUITS NO. Y AND Z
CONDUIT RUNS NOT DEFINED ARE 1/2" C with 3#12.

GROUND

CONDUIT RUN – CHANGE IN ELEVATION

GROUND ROD

LIQUID–TIGHT FLEXIBLE CONDUIT

HP — MOTOR, HP AS SHOWN, SINGLE PHASE, "F" = FRACTIONAL

X — SHEET NOTE "X"

X — ELECTRICAL EQUIPMENT TAG "X"

ELECTRICAL ENCLOSURE AS NOTED

DISCONNECT SWITCH

TRANSFORMER

M — KILOWATT–HOUR METER

GFI — 125V DUPLEX GROUND FAULT INTERRUPT WEATHER PROOF RECEPTACLE, CONFIGURATION 5 – 20R

G — GENERATOR

TRANSFER SWITCH

FLEX CONDUIT

STARTER

CURRENT TRANSFORMER

MOTOR OVERLOAD

XX / YY — FIELD MOUNTED INSTRUMENT
XX = FUNCTION; YY = TAG NO.

INSTRUMENT DEVICE LOCATION (SEE TAG)

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

R — PILOT LIGHT
R=RED, B=BLUE, A=AMBER, G=GREEN, W=WHITE

XX / XXXX — RELAY COIL

XXX / YYY — TIME DELAY ENERGIZED RELAY CONTACTS NORMALLY CLOSED TIMED OPEN
XXX= DESCRIPTION
YYY=RELATED COIL & CONTACT #

XXX / YYY — TIME DELAY ENERGIZED RELAY CONTACTS NORMALLY OPEN TIMED CLOSED
XXX= DESCRIPTION
YYY=RELATED COIL & CONTACT #

XXX / YYY — TIME DELAY DE–ENERGIZED RELAY CONTACTS NORMALLY OPEN TIMED OPEN
XXX= DESCRIPTION
YYY=RELATED COIL & CONTACT #

XXX / YYY — TIME DELAY DE–ENERGIZED RELAY CONTACTS NORMALLY CLOSED TIMED CLOSED
XXX= DESCRIPTION
YYY=RELATED COIL & CONTACT #

FLOAT OPERATED SWITCH, NORMALLY CLOSED

FLOAT OPERATED SWITCH, NORMALLY OPEN

PUSHBUTTON NORMALLY CLOSED,
MOMENTARY CONTACT

PUSHBUTTON NORMALLY OPEN,
MOMENTARY CONTACT

MV — MOTORIZED VALVE

TEMPERATURE SWITCH, CLOSE ON RISE

TEMPERATURE SWITCH, OPEN ON RISE

JB-X-XX / J — JUNCTION BOX OR FITTING

CONDUIT TEE

X — FUSE, X=SIZE IN AMPS

X/Y — MOLDED CASE CIRCUIT BREAKER, X = AMPERE RATING, Y = NO. OF POLES
THERMAL/MAGNETIC UON

CONTROL PANEL

$ — SINGLE POLE SWITCH 120/277V 20A

SEAL–OFF FITTING

PC — PHOTO ELECTRIC CONTROL

INSTRUMENT DEVICE LOCATION (SEE TAG)

MUSHROOM HEAD, EMERGENCY PUSHBUTTON

REMOTE OPERATOR FOR CONTROL PANEL

X — PUSH TO TEST PILOT LIGHT
X= LENS TINT

X — TERMINAL – X = CONTRACTOR DERIVED NUMBERING

ST — STROBE ALARM

H O A — HAND–OFF–AUTO SWITCH

ABBREVIATIONS

A	AMPERE
AFF	ABOVE FINISH FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
bCU	BARE COPPER
C	CONDUCTOR
C	CONDUIT
C1D1	CLASS 1, DIVISION 1
C1D2	CLASS 1, DIVISION 2
CEA	CHUGACH ELECTRIC ASSOCIATION
COAX	COAXIAL CABLE
CP	CONTROL PANEL
CPP	CONTROL POWER PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
DWG	DRAWING
EA	EACH
ESD	EMERGENCY SHUTDOWN
EXP	EXPLOSION PROOF
FD	FUSED DISCONNECT
FVNR	FULL VOLTAGE NON–REVERSING, THERMAL MAGNETIC OCP
G	GROUND CONDUCTOR
GFI	GROUND FAULT INTERRUPTING
H	HOT CONDUCTOR
HOA	HAND OFF AUTO
HP	HORSEPOWER
KVA	KILO–VOLT–AMPERES
KW	KILOWATT
LFMC	LIQUID–TIGHT FLEXIBLE METAL CONDUIT
LTG	LIGHTING
MAX	MAXIMUM
MCM	THOUSAND CIRCULAR MILLS
MCP	MAIN CONTROL PANEL
MIN	MINIMUM
MV	MOTORIZED VALVE
MS	MOTOR STARTER
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL CONDUCTOR
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
NTS	NOT TO SCALE
OCP	OVERCURRENT PROTECTION
P	POLE
PNL/MPZ	PANEL / MINI POWER ZONE
RCP	RECEPTACLE
RMC	RIGID METAL CONDUIT, GALVANIZED
SIG	SIGNAL CONDUCTOR
SL	SWITCH LEG
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
TDD	TIME DELAY DE–ENERGIZED
TDE	TIME DELAY ENERGIZED
TSP	TWISTED/SHIELDED PAIR
TWSH	TWISTED/SHIELDED CONDUCTOR
TYP	TYPICAL
U/G	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT–AMPERES
VAC	VOLTS AC POWER
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHER PROOF
XFMR	TRANSFORMER

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Ian L. Hofmann
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01/04/22
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" — 1"

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

ELECTRICAL LEGEND

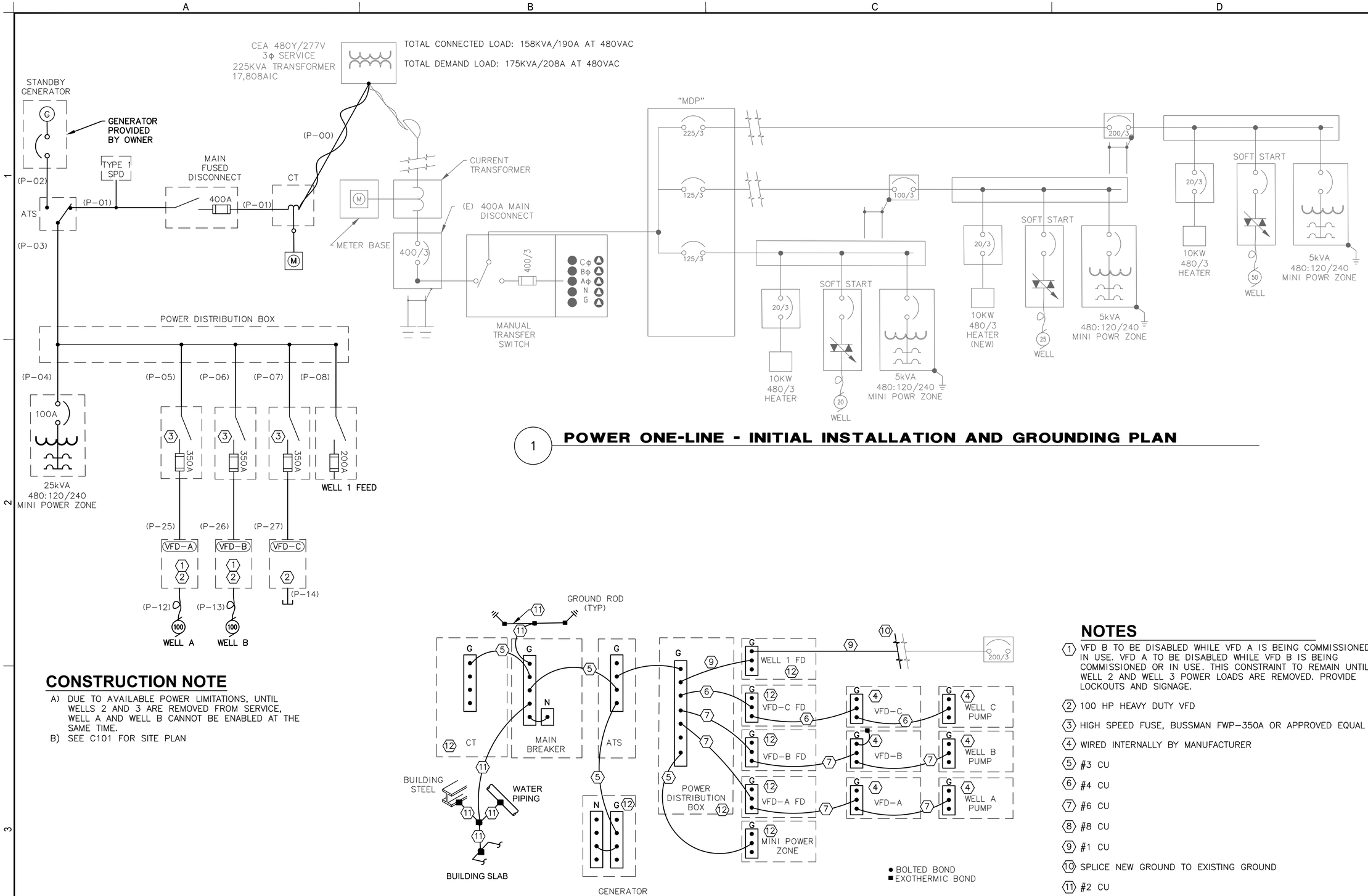
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
E001

PLOT DATE:1/7/2022



1 **POWER ONE-LINE - INITIAL INSTALLATION AND GROUNDING PLAN**

2 **GROUNDING PLAN**

CONSTRUCTION NOTE

A) DUE TO AVAILABLE POWER LIMITATIONS, UNTIL WELLS 2 AND 3 ARE REMOVED FROM SERVICE, WELL A AND WELL B CANNOT BE ENABLED AT THE SAME TIME.
B) SEE C101 FOR SITE PLAN

NOTES

1. VFD B TO BE DISABLED WHILE VFD A IS BEING COMMISSIONED OR IN USE. VFD A TO BE DISABLED WHILE VFD B IS BEING COMMISSIONED OR IN USE. THIS CONSTRAINT TO REMAIN UNTIL WELL 2 AND WELL 3 POWER LOADS ARE REMOVED. PROVIDE LOCKOUTS AND SIGNAGE.
2. 100 HP HEAVY DUTY VFD
3. HIGH SPEED FUSE, BUSSMAN FWP–350A OR APPROVED EQUAL
4. WIRED INTERNALLY BY MANUFACTURER
5. #3 CU
6. #4 CU
7. #6 CU
8. #8 CU
9. #1 CU
10. SPLICE NEW GROUND TO EXISTING GROUND
11. #2 CU
12. BOND ENCLOSURE PER NEC ART 250

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WHITTIER WELL FIELD UPGRADE
WHITTIER, ALASKA
PROJECT No. 20403.14

POWER ONE-LINE - INITIAL INSTALLATION AND GROUNDING PLAN

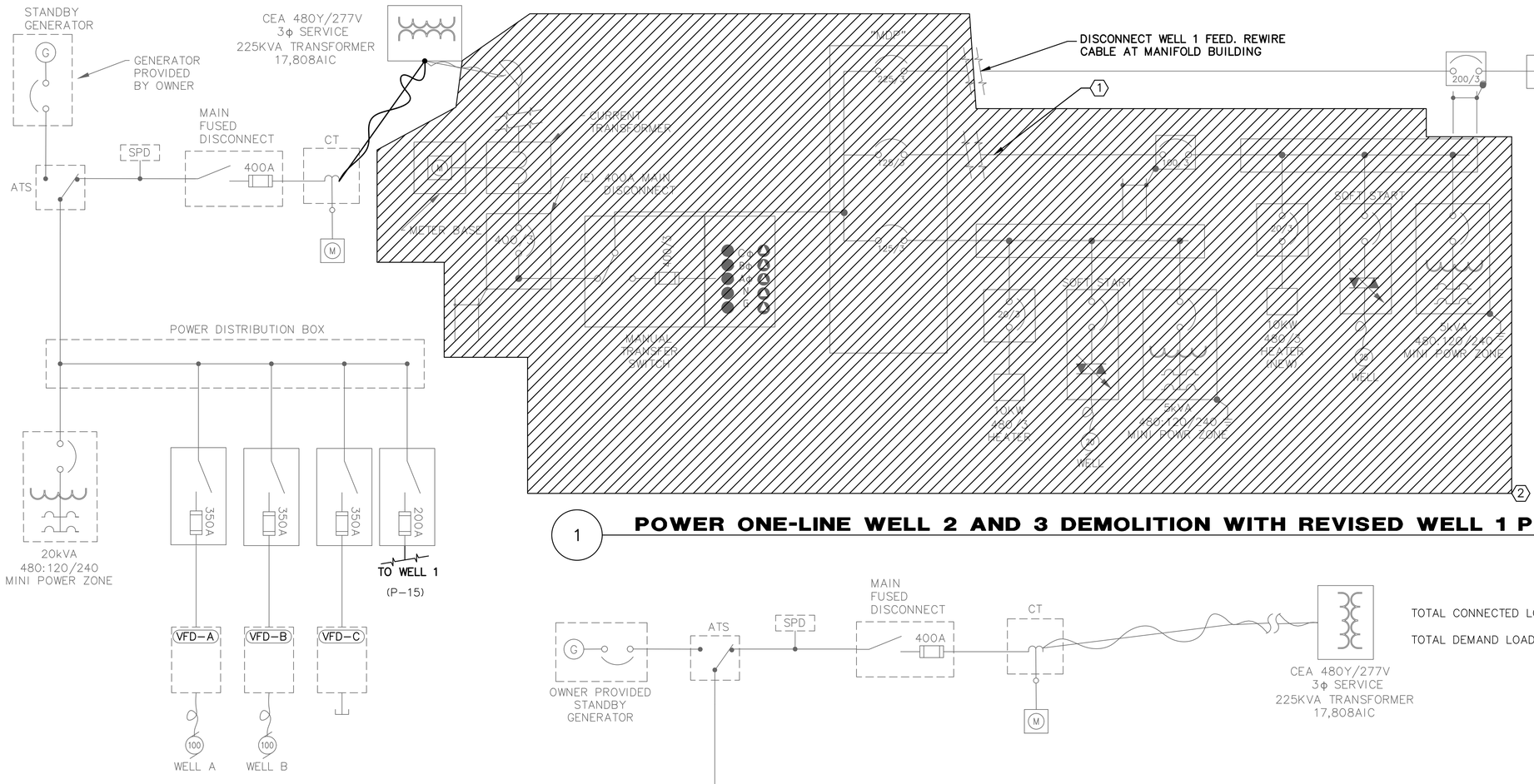
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

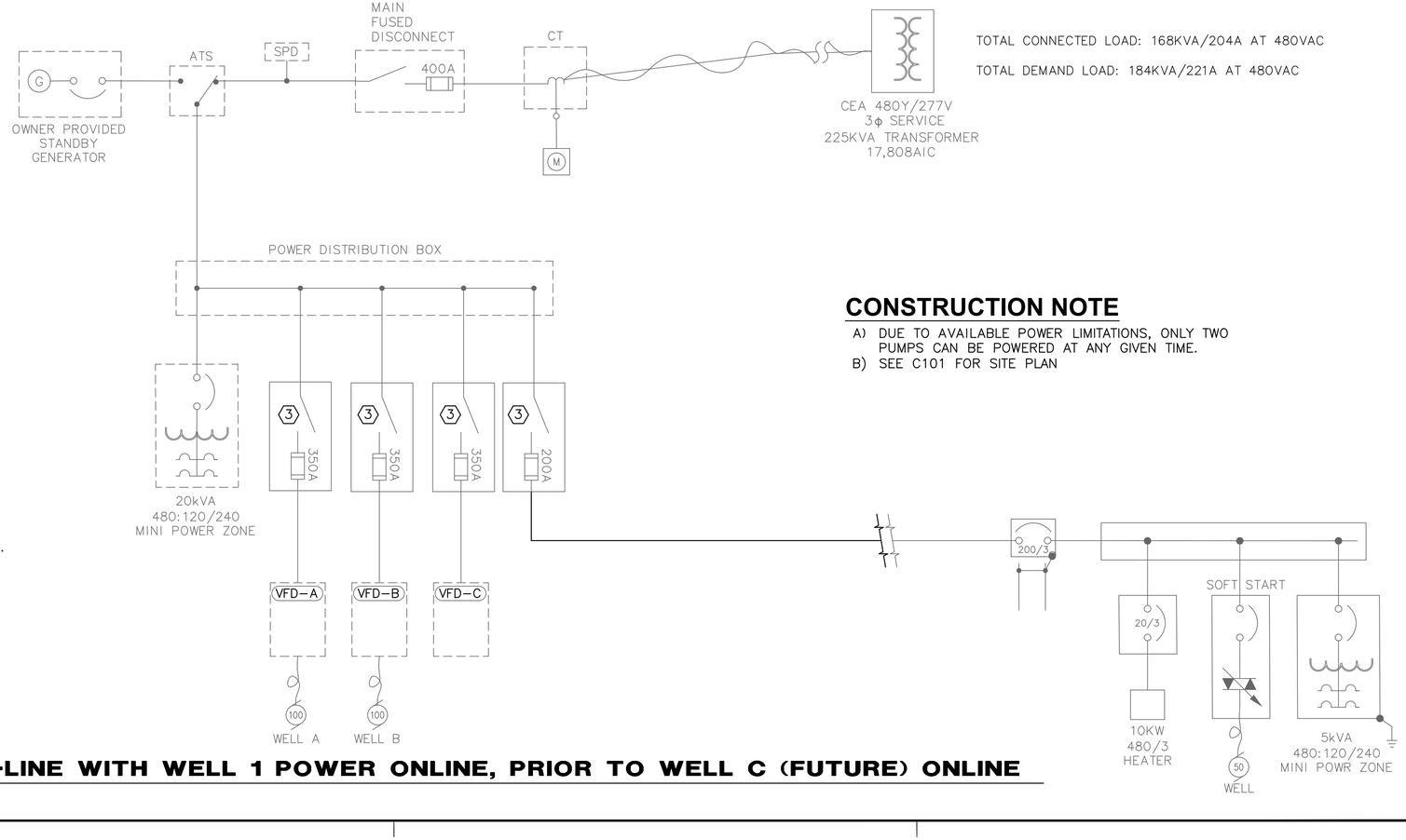
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
E002

PLOT DATE:1/7/2022



1 POWER ONE-LINE WELL 2 AND 3 DEMOLITION WITH REVISED WELL 1 POWER FEED



CONSTRUCTION NOTE

A) DUE TO AVAILABLE POWER LIMITATIONS, ONLY TWO PUMPS CAN BE POWERED AT ANY GIVEN TIME.
B) SEE C101 FOR SITE PLAN

NOTES

1. FOR IN-GROUND CONDUIT, REMOVE CABLES, INSTALL PULLSTRING, CAP CONDUIT
2. DEMOLISH WELLHOUSES, IN GROUND JUNCTION BOXES, AND ELECTRICAL EQUIPMENT. SEE SHEETS C301, C302
3. PROVIDE LOCKOUTS AND SIGNAGE INDICATING THAT DUE TO POWER LIMITATIONS OF THE UTILITY TRANSFORMER, ONLY TWO WELLS CAN BE POWERED AT ANY GIVEN TIME. DO NOT POWER MORE THAN TWO PUMPS AT ANY GIVEN TIME UNTIL THE TRANFORMER IS UPSIZED.

2 POWER ONE-LINE WITH WELL 1 POWER ONLINE, PRIOR TO WELL C (FUTURE) ONLINE

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WHITTIER, ALASKA
PROJECT No. 20403.14

POWER ONE-LINE - WELL 2, 3 DEMO AND WELL 1 POWER FEED RELOCATION

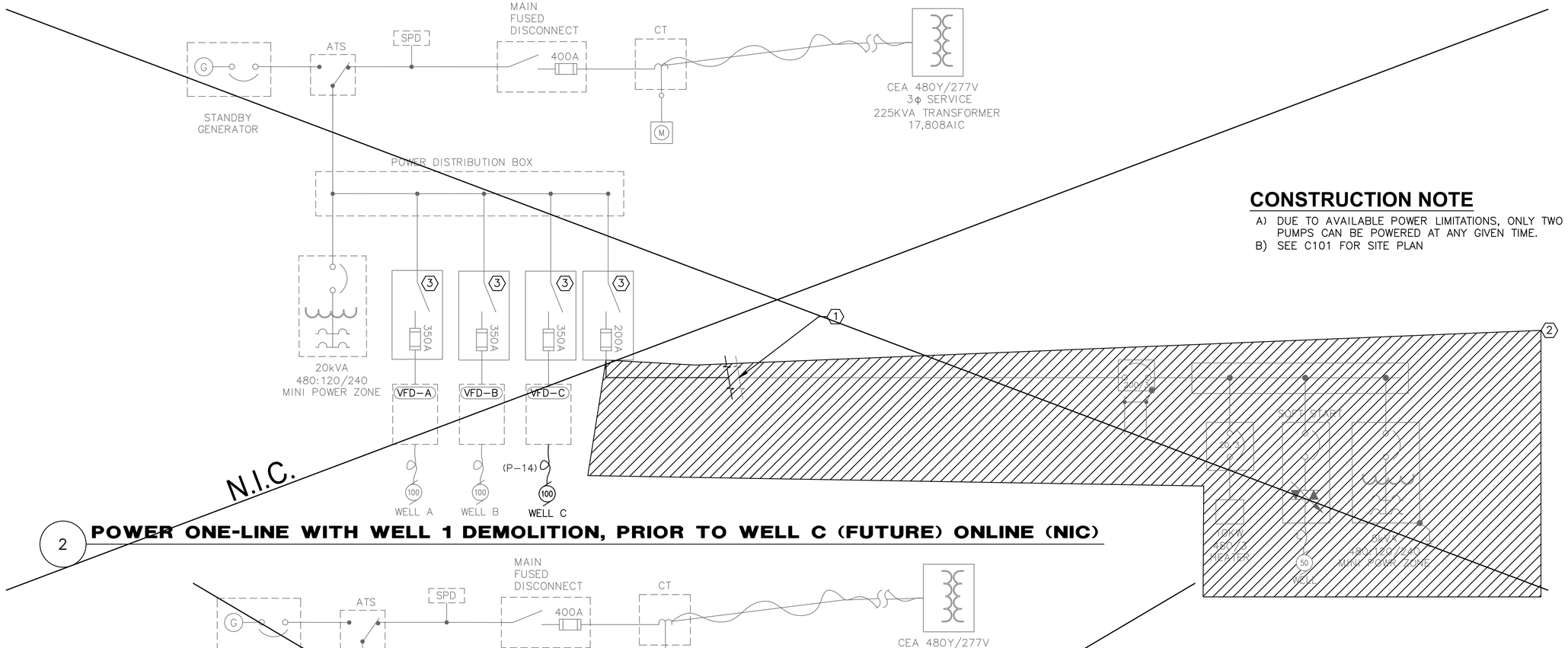
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

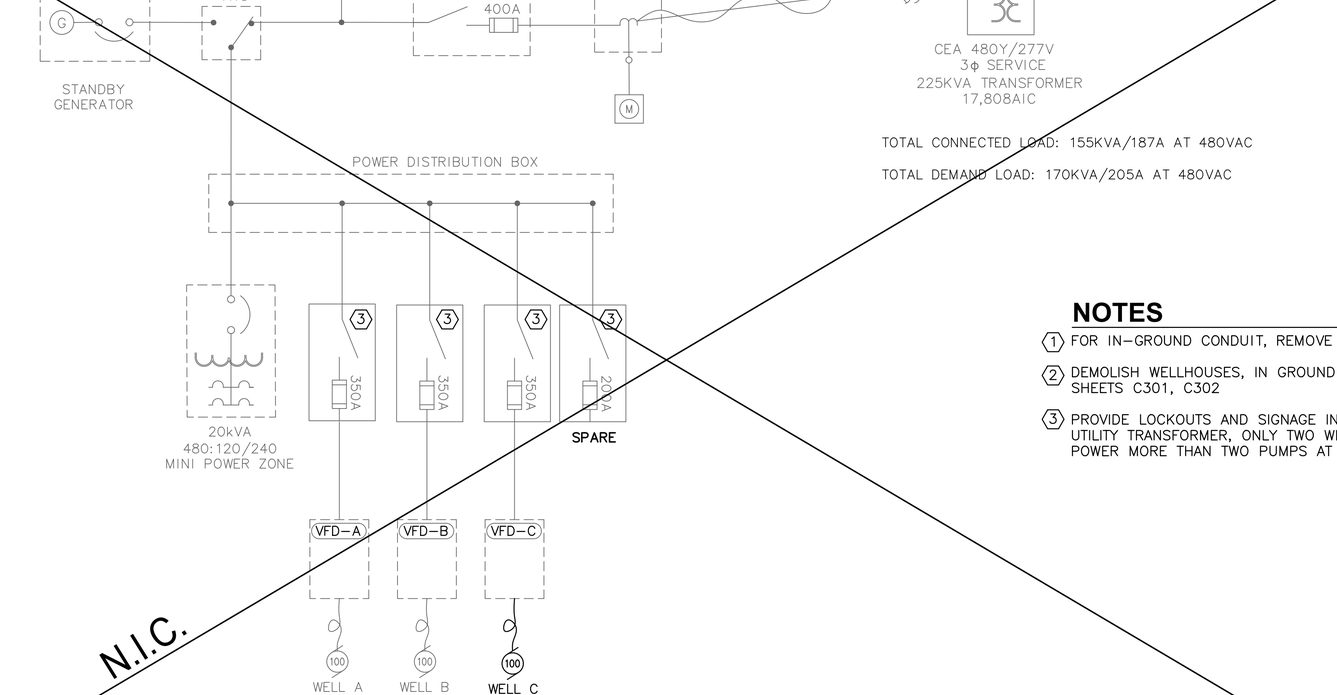
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
E003

PLOT DATE:1/7/2022



2 POWER ONE-LINE WITH WELL 1 DEMOLITION, PRIOR TO WELL C (FUTURE) ONLINE (NIC)



1 POWER ONE-LINE WITH WELL 1 POWER ONLINE, WELL C (FUTURE) INSTALLED (NIC)

TOTAL CONNECTED LOAD: 155KVA/187A AT 480VAC

TOTAL DEMAND LOAD: 170KVA/205A AT 480VAC

CONSTRUCTION NOTE

A) DUE TO AVAILABLE POWER LIMITATIONS, ONLY TWO PUMPS CAN BE POWERED AT ANY GIVEN TIME.
B) SEE C101 FOR SITE PLAN

NOTES

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2. DEMOLISH WELLHOUSES, IN GROUND JUNCTION BOXES, AND ELECTRICAL EQUIPMENT. SEE SHEETS C301, C302
3. PROVIDE LOCKOUTS AND SIGNAGE INDICATING THAT DUE TO POWER LIMITATIONS OF THE UTILITY TRANSFORMER, ONLY TWO WELLS CAN BE POWERED AT ANY GIVEN TIME. DO NOT POWER MORE THAN TWO PUMPS AT ANY GIVEN TIME UNTIL THE TRANFORMER IS UPSIZED.

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WHITTIER, ALASKA
PROJECT No. 20403.14

POWER ONE-LINE - WELL 1 DEMO AND WELL C POWER FEED (N.I.C.)

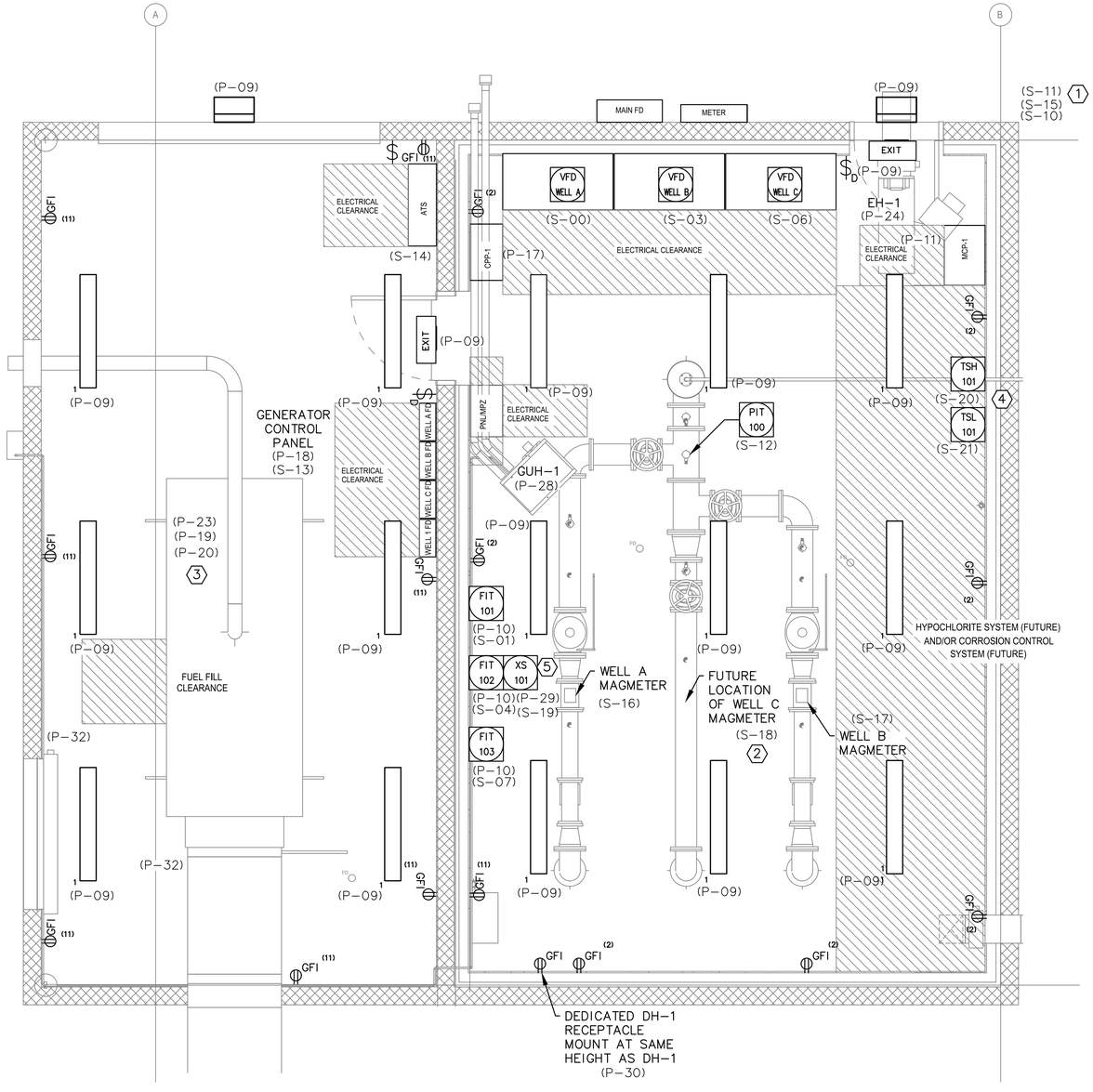
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
E004

PLOT DATE=1/7/2022



1 ELECTRICAL AND CONTROLS FLOOR PLAN

SYMBOL	DESCRIPTION	MANUFACTURER	PART #	MOUTING
	INSIDE LIGHTS	LITHONIA	FEM L48 4000LM LPPCL WD MVOLT GZ10 50K 90CRI	CEILING
	OUTSIDE LIGHTS	LITHONIA	TWP LED ALO 40K T3M MVOLT PE TP DBLBXD	WALL
EXIT	EMERGENCY/EXIT LIGHTS	LITHONIA	ECRG HO SQ M6	CEILING

2 LIGHTING SCHEDULE

NOTES

1. PROVIDE THE FOLLOWING ALL MOUNTED TO THE POLE: SIGNAL LIGHTS, CLAXON, AND ANTENNA
2. WELL C MAGMETER TO BE INSTALLED IN THE FUTURE. INSTALL FIT-103, RACEWAY AND CONDUCTORS TO ALLOW FOR EASE OF INSTALL OF WELL C MAGMETER IN THE FUTURE.
3. CONDUITS FOR GENERATOR STRIP HEATER, BATTTERY CHARGER, JACKET WATER HEATER. LOCATION OF CONDUITS APPROXIMATE. COORDINATE LOCATIONS WITH ACTUAL GENERATOR DRAWINGS.
4. MOUNT TSH AT 6' AFF, AND TSL AT 3' AFF.
5. MOUNT XS-101 ON FLOOR BELOW FIT-102. PROVIDE BLACK PLACARD WITH WHITE TEXT ON WALL AT 3' AFF ABOVE XS-101 STATING "LEAK DETECTOR LOCATED BELOW"

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WHITTIER, ALASKA
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ELECTRICAL AND INSTRUMENTATION FLOOR PLAN

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

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DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
E005

PLOT DATE:1/7/2022

RACEWAY AND CONDUCTOR SCHEDULE – MANIFOLD BUILDING						
TAG	FROM	TO	RACEWAY	CONDUCTORS	TYPE	COMMENT
P–00	UTILITY TRANSFORMER	CT	3"	2 OF (3) 3/0	XHHW–2	TAP AT TRANSFORMER OR INSTALL SPLICE. SHOWN ON ONELINE.
P–01	CT	ATS VIA MAIN DISCONNECT	3"	2 OF (3) 3/0	XHHW–2	SHOWN ON ONELINE
P–02	GENERATOR	ATS	3"	2 OF (3) 3/0	XHHW–2	SHOWN ON ONELINE
P–03	ATS	POWER DIST BOX	3"	2 OF (3) 3/0	XHHW–2	SHOWN ON ONELINE
P–04	POWER DIST BOX	MINI POWER ZONE	1–1/4"	(3) #3, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–05	POWER DIST BOX	VFD WELL A DISCONNECT	2–1/2"	(3) 3/0, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–06	POWER DIST BOX	VFD WELL B DISCONNECT	2–1/2"	(3) 3/0, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–07	POWER DIST BOX	VFD WELL C DISCONNECT	2–1/2"	(3) 3/0, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–08	POWER DIST BOX	WELL 1 FUSED DISCONNECT	2"	(3) 3/0, (1) #1 G	XHHW–2	SHOWN ON ONELINE
P–09	MINI POWER ZONE	LIGHTS	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–10	CPP–1	FLOWMETERS	3/4"	(2) #14, (1) #14 G	XHHW–2	
P–11	CPP–1	MCP–1	3/4"	(2) #14, (1) #14 G	XHHW–2	
P–12	VFD WELL A	WELL A PUMP	3"	(3) 2/0, (1) #3 G	VFD CABLE	SHOWN ON ONELINE, FIELD ROUTE WITH PIPE, INSTALL IN CONDUIT WHEN EXPOSED, DIRECT BURY WHEN IN GROUND, SEE TRENCH DETAIL
P–13	VFD WELL B	WELL B PUMP	3"	(3) 2/0, (1) #3 G	VFD CABLE	SHOWN ON ONELINE, FIELD ROUTE WITH PIPE, INSTALL IN CONDUIT WHEN EXPOSED, DIRECT BURY WHEN IN GROUND, SEE TRENCH DETAIL
P–14	VFD WELL C	WELL C PUMP	3"	(3) 3/0, (1) #3 G	VFD CABLE	SHOWN ON ONELINE, UPSIZED FOR VOLTAGE DROP, FIELD ROUTE WITH PIPE, INSTALL IN CONDUIT WHEN EXPOSED, DIRECT BURY WHEN IN GROUND, SEE TRENCH DETAIL
P–15	WELL 1 FUSED DISCONNECT	WELL 1	3"	(3) 3/0, (1) #1 G	XHHW–2	SHOWN ON ONELINE
P–16	MINI POWER ZONE	RECEPTS–MANIFOLD ROOM	3/4"	(2) #12, (1) #12 G	XHHW–2	NOT SHOWN ON FLOOR PLANS
P–17	MINI POWER ZONE	CPP–1	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–18	MINI POWER ZONE	GENERATOR CONTROL PANEL	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–19	MINI POWER ZONE	GENERATOR BATTERY CHARGER	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–20	MINI POWER ZONE	GENERATOR STRIP HEATER	1"	(2) #10, (1) #10 G	XHHW–2	
P–21	MINI POWER ZONE	RECEPTS–GENERATOR ROOM	3/4"	(2) #12, (1) #12 G	XHHW–2	NOT SHOWN ON FLOOR PLANS
P–22	NOT USED					NOT USED
P–23	MINI POWER ZONE	GENERATOR JACKET WATER HTR	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–24	MINI POWER ZONE	EH–1	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–25	VFD WELL A DISCONNECT	VFD WELL A	2–1/2"	(3) 3/0, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–26	VFD WELL B DISCONNECT	VFD WELL B	2–1/2"	(3) 3/0, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–27	VFD WELL C DISCONNECT	VFD WELL C	2–1/2"	(3) 3/0, (1) #3 G	XHHW–2	SHOWN ON ONELINE
P–28	MINI POWER ZONE	GUH–1	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–29	CPP–1	LEAK SWITCH (XS–101)	3/4"	(1) #14	XHHW–2	CAN BE COMBINED WITH CABLES FROM S–19
P–30	CPP–1	DH–1 RECEPT.	3/4"	(2) #12, (1) #12 G	XHHW–2	
P–31	MINI POWER ZONE	FAN	3/4"	(2) #12, (1) #12 G	XHHW–2	NOT SHOWN ON FLOORPLANS
P–32	MINI POWER ZONE	DAMPER ACTUATORS	3/4"	(2) #12, (1) #12 G	XHHW–2	

RACEWAY AND CONDUCTOR SCHEDULE – OFFICE BUILDING						
TAG	FROM	TO	RACEWAY	CONDUCTORS	TYPE	COMMENT
P–100	EXISTING ELECTRICAL PANEL	CPP–2	3/4"	(2) #12, (1) #12 G	XHHW–2	NOT SHOWN ON FLOOR PLANS
P–101	CPP–2	LEVEL CONTROL PANEL	3/4"	(2) #14, (1) #14 G	XHHW–2	NOT SHOWN ON FLOOR PLANS, (1) #14 SPARE
P–102	CPP–2	RCP–1	3/4"	(2) #14, (1) #14 G	XHHW–2	NOT SHOWN ON FLOOR PLANS

25 KVA MINI POWER ZONE									
LOCATION: MANIFOLD BUILDING			120V/240V			2ϕ, 4 WIRE		18,000 AIC	
SERVED FROM: ATS VIA POWER DISTRIBUTION BOX			100					NEMA 3R	
POLE #	AMP TRIP	LOAD DESCRIPTION	POLE kVA	MLO Aϕ	MLO Bϕ	POLE Kva	LOAD DESCRIPTION	AMP TRIP	POLE #
1	15/1	LIGHTING	0.45	1.89		1.44	RECEPTACLES – MANIFOLD ROOM	15/1	2*
3	15/1	GUH – GAS FIRED UNIT HEATER	0.24		0.56	0.32	CPP–1	15/1	4
5*	20/1	HEAT TRACE FOR GENERATOR VENT	0.12	0.22		0.10	GENERATOR CONTROL PANEL	15/1	6
7	20/2	GENERATOR JACKET WATER HEATER	0.90		1.69	0.79	GENERATOR BATTERY CHARGER	20/1	8
9			0.90	4.03		3.13	GENERATOR STRIP HEATER	30/1	10
11*	15/1	RECEPTACLES – GENERATOR ROOM	1.26		1.29	0.03	DAMPER ACTUATORS AND TSTATS	20/1	12
13*		SPACE		0.76		0.76	DH–1 DEHUMIDIFIER	20/1	14*
15	20/3	EH–1 – 7.5 KW ELECTRIC UNIT HEATER	3.75		3.91	0.16	FAN	20/1	16
17			3.75	3.75					18
19					0.00				20
21				0.00					22
23					0.00				24
				10.64	7.46		Total kVA =		18.1 kVA
* = GFCI Circuit Breaker							Total Amps @ 240V =		75.4 A

RACEWAY AND CONDUCTOR SCHEDULE – MANIFOLD BUILDING						
TAG	FROM	TO	RACEWAY	CONDUCTORS	TYPE	COMMENT
S–00	MCP–1	VFD WELL A	3/4"	(9) #14, (2) #16 TSP	XHHW–2	
S–01	MCP–1	FIT–101	3/4"	(3) #14, (1) #16 TSP	XHHW–2	
S–02	MCP–1	WELL A SALINITY, LEVEL AND PUMP OVERTEMP SENSORS	1"	(3) #16 TSP	XHHW–2 IN MC–HL	DIRECT BURY, FIELD ROUTE WITH PIPE, SEE TRENCH DETAIL
S–03	MCP–1	VFD WELL B	3/4"	(9) #14, (2) #16 TSP	XHHW–2	
S–04	MCP–1	FIT–102	3/4"	(3) #14, (1) #16 TSP	XHHW–2	
S–05	MCP–1	WELL B SALINITY, LEVEL AND PUMP OVERTEMP SENSORS	1"	(3) #16 TSP	XHHW–2 IN MC–HL	DIRECT BURY, FIELD ROUTE WITH PIPE, SEE TRENCH DETAIL
S–06	MCP–1	VFD WELL C	3/4"	(9) #14, (2) #16 TSP	XHHW–2	
S–07	MCP–1	FIT–103	3/4"	(3) #14, (1) #16 TSP	XHHW–2	
S–08	MCP–1	WELL B SALINITY, LEVEL AND PUMP OVERTEMP SENSORS	1"	(3) #16 TSP	XHHW–2 IN MC–HL	DIRECT BURY, FIELD ROUTE WITH PIPE, SEE TRENCH DETAIL
S–09	MCP–1	MODEM	3/4"	CAT6	TBD	
S–10	MCP–1	OUTSIDE BEACONS AND CLAXON	3/4"	(6) #14	XHHW–2	
S–11	MCP–1	IO ANTENNA	3/4"	COAX	TBD	PROCURE CABLE FROM WIRELESS IO VENDOR
S–12	MCP–1	PIT–100	3/4"	(1) #16 TSP	XHHW–2	
S–13	MCP–1	GENERATOR CONTROL PANEL	3/4"	(4) #14	XHHW–2	
S–14	GENERATOR CONTROL PANEL	ATS–1	3/4"	(2) #14	XHHW–2	WIRE ATS TWO WIRE START TO GENERATOR E25 AND E29
S–15	MODEM	INTERNET ANTENNA	3/4"	COAX	TBD	PROCURE FROM MODEM VENDOR
S–16	FIT–101	WELL A MAGMETER	N/A	ARMORED VENDOR CABLE	TBD	PROCURED WITH MAGMETER
S–17	FIT–102	WELL B MAGMETER	N/A	ARMORED VENDOR CABLE	TBD	PROCURED WITH MAGMETER
S–18	FIT–103	WELL C MAGMETER	N/A	ARMORED VENDOR CABLE	TBD	PROCURED WITH MAGMETER
S–19	MCP–1	LEAK SWITCH (XS–101)	3/4"	(3) #14	XHHW–2	CAN BE COMBINED WITH CABLES FROM P–29
S–20	MCP–1	TSH–101	3/4"	(2) #14	XHHW–2	
S–21	MCP–1	TSL–101	3/4"	(2) #14	XHHW–2	

RACEWAY AND CONDUCTOR SCHEDULE – OFFICE BUILDING						
TAG	FROM	TO	RACEWAY	CONDUCTORS	TYPE	COMMENT
S–100	RCP–1	LEVEL CONTROL PANEL	3/4"	(2) #14	XHHW	ONE SPARE, NOT SHOWN ON DRAWINGS
S–101	RCP–1	OFFICE ANTENNA	3/4"	COAX	TBD	PROCURE CABLE FROM WIRELESS IO VENDOR, NOT SHOWN ON DRAWINGS

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FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

ELECTRICAL SCHEDULES AND RACEWAY

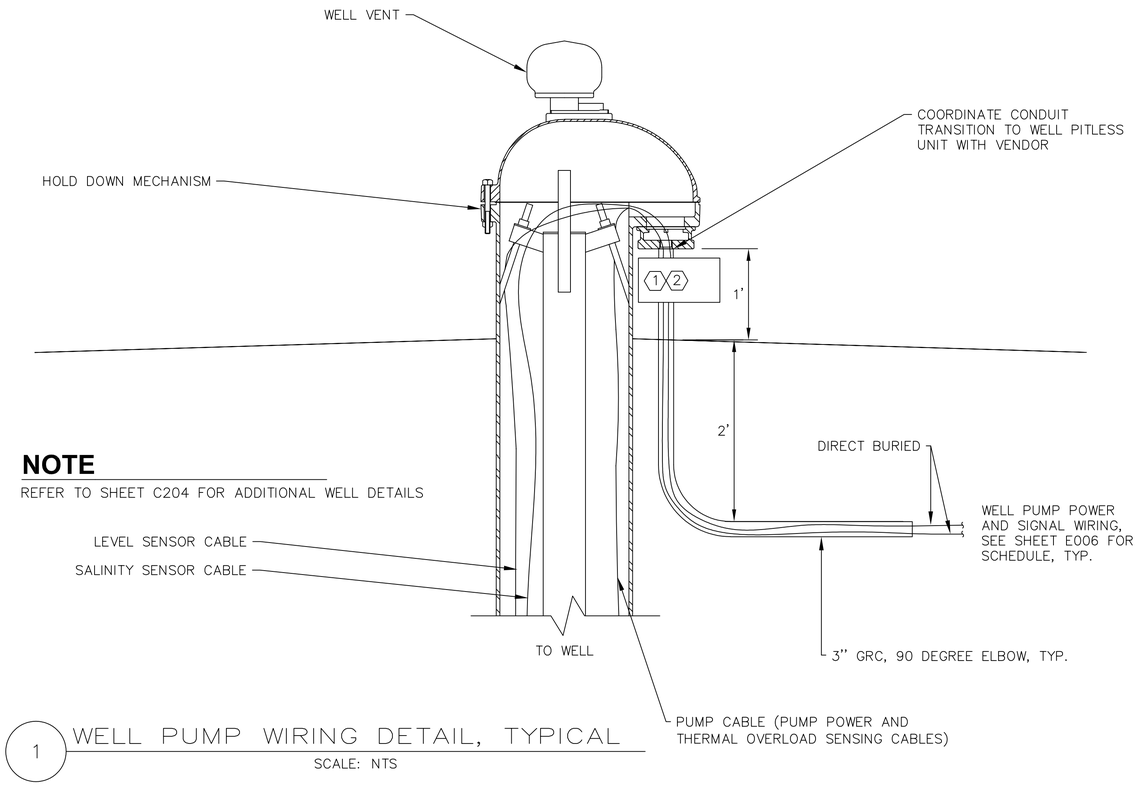
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
E006

PLOT DATE=1/22/2024



NOTE

REFER TO SHEET C204 FOR ADDITIONAL WELL DETAILS

1 WELL PUMP WIRING DETAIL, TYPICAL

SCALE: NTS

NOTES

1. PROVIDE TERMINAL BOX WITH TERMINALS AND DIVIDER TO SEPARATE SIGNAL CABLES AND TERMINAL BLOCKS (LEVEL SENSING, SALINITY SENSING, THERMAL OVERLOAD SENSING) FROM PUMP POWER CABLES. REFER TO TERMINAL BOX NOTES BELOW.
2. MOUNT TERMINAL BOX ON UNISTRUT MOUNTED TO WELL HEAD.

TEMRINAL BOX NOTES

PROVIDE NEMA 4 OR 4X LOCKABLE TERMINAL BOX.

PROVIDE TERMINALS TO TERMINATE THE PUMP POWER CABLES, PUMP THERMAL OVERLOAD SWITCH CABLES, LEVEL SENSING CABLES, AND SALINITY SENSING CABLES

PROVIDE DIVIDER TO SEPARATE SENSOR CABLES AND POWER CABLES.

PROVIDE WARNING LABELING ON THE OUTSIDE INDICATING MIXED VOLTAGES PRESENT IN BOX, AND LABELING ON THE INSIDE INDICATING POWER AND SIGNAL SECTIONS.

CONTRACTOR TO NOTE THAT THE THERMAL OVERLOAD SENSING CONDUCTORS ARE BUNDLED WITH THE POWER CABLES IN THE MANUFACTURERS PUMP CABLE COMING FROM THE PUMP TO THE TERMINAL BOX AND ARE BUNDLED WITH THE SIGNAL CABLES FROM THE TERMINAL BOX TO MCP–1

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WHITTIER, ALASKA
PROJECT No. 20403.14

WELL PUMP WIRING DETAIL

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
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DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

E007

PLOT DATE=1/22/2024

MANIFOLD BUILDING NOTES
1) WELL C CONTROLS AND ALLOCATION FOR HOOKUP TO BE INSTALLED WITH INITIAL INSTALLATION. WELL C MAGMETER, VFD, PUMP, AND WELLS SENSORS TO BE INSTALLED IN THE FUTURE. UNTIL WELL C IS INSTALLED, WELL C HOA TO BE SET IN THE OFF POSITION.
2) OWNER PROVIDED GENERATOR CONTROL PANEL TO BE INSTALLED IN THE GENERATOR ROOM.
3) GENERATOR AND ATS POWER CABLES NOT SHOWN FOR CLARITY

CITY OFFICE NOTES
1) FIELD LOCATE CPP–2 NEAR RCP–1
2) FIELD LOCATE RCP–1 IN COORDINATION WITH OWNER.
3) FIELD LOCATE 900 MHZ ANTENNA

⟨#⟩ NOTES

1) PANEL SHALL BE UL508A LISTED
2) PROVIDE THE FOLLOWING PLACARDS ON THE OUTSIDE OF THE PANEL: IDENTIFIER, TROUBLESHOOTING MATRIX, WHAT PROVIDES POWER TO THE PANEL.
3) PROVIDE THE FOLLOWING ADDITIONAL PLACARDS ON MCP–1 AND RCP–1: "CAUTION: THIS EQUIPMENT IS POWERED BY MULTIPLE SOURCES"
4) PROVIDE THE FOLLOWING LAMINATED LABEL ON CPP–1 AND –2: "REPLACE BATTERY EVERY 3 YEARS", "BATTERY LAST REPLACED: ".
5) DATA RECORDER MAY BE LOCATED AS PART OF MCP–1 OR IN A STAND ALONE ENCLOSURE
6) GENERATOR AND SKID–MOUNTED CONTROL PANEL FURNISHED BY OWNER, INSTALLED AND WIRED BY CONTRACTOR
7) "BYPASS PRESSURE SWITCH" LOCATED ON PANEL BACKPLANE INSIDE CONTROL PANEL.
8) PROVIDE LAMINATED FULL SCALE PHOTO OF CONTROL PANEL FRONT MOUNTED ON WALL NEXT TO CONTROL PANEL WITH BRIEF SUMMARY OF SWITCH, LIGHTS, AND INDICATOR MEANING AND USE. REFER TO SPECIFICATION 409513 FOR MORE DETAILS.

1 CONTROLS SYSTEM DESIGN

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FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

CONTROLS SYSTEM DESIGN

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
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DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
I001

PLOT DATE:1/23/2024

WHITTIER CONTROL NARRATIVE
THE CONTROL NARRATIVE BELOW OUTLINES HOW WELLS A, B AND C (FUTURE) WILL OPERATE. WELL 1 FUNCTIONALITY IS NOT CHANGED BY THIS PROJECT. REFER TO ELECTRICAL ONELINE FOR POWER FEED CHANGES FOR WELL 1.

LOCATIONS AND IO
THERE ARE THREE LOCATIONS THAT ARE INVOLVED WITH THIS NARRATIVE: RESERVOIR, CITY OFFICE, AND THE MANIFOLD BUILDING

- WATER RESERVOIR:
  - MEASUREMENTS
    - WATER LEVEL (NEW)
    - WATER LEVEL (EXISTING, UNAFFECTED BY THIS PROJECT)
- CITY OFFICE
  - OUTPUTS:
    - WELLS 1, 2, AND 3 HOA (EXISTING)
    - WELLS A, B, AND C (FUTURE) HOA
    - RESERVOIR WATER LEVEL (TO MANIFOLD BUILDING)
  - INPUTS:
    - WELLS 1, 2, AND 3 "READY" AND "FAIL" STATUS LIGHTS (EXISTING)
    - WELLS A, B, AND C (FUTURE)
      - i) "READY"
      - ii) "ALARM"
      - iii) "RUNNING"
      - iv) PUMP FLOW
      - v) AQUIFER LEVEL
    - SYSTEM PRESSURE
    - RESERVOIR TANK WATER LEVEL (FROM RESERVOIR TANK) (EXISTING)
  - RADIO SIGNAL
    - CONNECTION TO MANIFOLD BUILDING
- MANIFOLD BUILDING
  - MEASUREMENTS
    - WELLS A, B, AND C (FUTURE)
      - i) FLOW
      - ii) SALINITY
      - iii) LEVEL
      - iv) VFD ALARM
      - v) VFD RUNNING
    - SYSTEM PRESSURE
    - GENERATOR
      - i) MINOR ALARM
      - ii) FAIL
      - iii) RUNNING
  - CONTROLS
    - WELLS A, B, AND C (FUTURE)
      - i) HOA (VIA HANDSWITCH)
      - ii) MAX FLOWRATE (VIA VFD PARAMETERS)
      - iii) MIN FLOWRATE (VIA VFD PARAMETERS)
    - MAX FLOW MOMENTARY PUSHBUTTON (ALL WELLS)
  - OUTPUTS:
    - WELLS A, B, AND C (FUTURE)
      - i) "READY"
      - ii) "ALARM"
      - iii) "RUNNING"
      - iv) AQUIFER LEVEL
    - SYSTEM PRESSURE
    - BUILDING LOW TEMPERATURE
    - BUILDING HIGH TEMPERATURE
    - LEAK ALARM
  - INPUTS:
    - WELLS A, B, AND C (FUTURE) HOA FROM CITY OFFICE
    - RESERVOIR LEVEL
  - RADIO SIGNAL
    - CONNECTION TO CITY OFFICE

1 CONTROLS NARRATIVE - LOCATIONS AND IO

WELL A LEVEL
WELL A SALINITY
WELL A VFD SPEED
WELL A FLOW
WELL A RUNTIME (CALCULATED)
WELL B LEVEL
WELL B SALINITY
WELL B VFD SPEED
WELL B FLOW
WELL B RUNTIME (CALCULATED)
WELL C LEVEL
WELL C SALINITY
WELL C VFD SPEED
WELL C FLOW
WELL C RUNTIME (CALCULATED)
TOTAL FLOW (CALCULATED)
TANK LEVEL
SYSTEM PRESSURE
RCP-1 COMMUNICATION OK
GENERATOR RUNNING
LEAD DEMAND
LAG DEMAND

3 DATA RECORDER DR-1 DATA POINTS

WELL	MIN GPM	DESIGN GPM	MAX GPM
A	TBD	750	850
B	TBD	500	700
C	TBD	TBD	TBD

	LOW LOW SETPOINT	LOW SETPOINT	HIGH SETPOINT	HIGH HIGH SETPOINT
SYSTEM PRESSURE	70 PSI	80 PSI	95 PSI	110 PSI
TANK LEVEL	75%	85%	98%	N/A
SALINITY	N/A	N/A	800 US/CM	N/A

NOTE
1) VFDS WILL RUN AT MAX GPM ONLY WHEN "MAX FLOW OVERRIDE" PUSHBUTTON IS PUSHED.
2) VFDS WILL RUN AT MAX GPM ONLY FOR 6 HRS, AFTER WHICH THE VFD WILL NOT RUN AT FOR 18 HRS
3) VFDS WILL BE NORMALLY SET AT DESIGN GPM FLOW RATES, AND BE SIZED TO BE ABLE TO BE RUN AT THAT GPM INDEFINITELY.
4) WELL GPM SETPOINTS ADJUSTABLE THROUGH THE VFD HMI AS PARAMETER VALUES.
5) SYSTEM PRESSURE SETPOINTS ADJUSTABLE THROUGH DIP SWITCHES ON THE LIMIT ALARM RELAY.
6) TANK LEVEL SETPOINTS ADJUSTABLE THROUGH DIP SWITCHES ON THE LIMIT ALARM RELAY.

2 SETPOINT TABLES

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FINAL DESIGN

VERIFY SCALE
BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE
WHITTIER, ALASKA
PROJECT No. 20403.14
CONTROLS NARRATIVE

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
I101

PLOT DATE=1/7/2022

WHITTIER CONTROL NARRATIVE (CONTINUED)

CONTROL SEQUENCE

- THE WELLS ENABLE WHEN THERE IS DEMAND.
  - WHEN SYSTEM PRESSURE IS AT THE LOW SETPOINT, THERE IS A DEMAND FOR THE LEAD PUMP
    - PRESSURE BECOMES LOW DUE TO LOW WATER RESERVOIR AND/OR EXCESSIVE WATER USAGE
    - LOW WATER RESERVOIR LEVEL ALARM FROM THE CITY OFFICE ALSO ENABLES THE DEMAND
  - WHEN SYSTEM PRESSURE IS AT THE LOW LOW SETPOINT, THERE IS A DEMAND FOR THE LAG PUMP
    - LOW LOW WATER RESERVOIR LEVEL ALARM FROM THE OFFICE BUILDING ALSO ENABLES THE DEMAND
- THE WELLS DISABLE WHEN THE DEMAND IS GONE.
  - WHEN SYSTEM PRESSURE IS AT THE HIGH SETPOINT, THE DEMAND IS REMOVED.
  - HIGH WATER RESERVOIR LEVEL ALARM FROM THE OFFICE BUILDING ALSO REMOVES THE DEMAND.
- IN THE EVENT THERE IS A CONFLICT:
  - SYSTEM HIGH PRESSURE WILL OVERRIDE WATER RESERVOIR LOW AND LOW LOW SIGNAL
  - SYSTEM HIGH PRESSURE WILL OVERRIDE VFD IN HAND POSITION
  - SYSTEM LOW PRESSURE WILL OVERRIDE TANK HIGH LEVEL
- WELLS A/B/C ROTATE LEAD/LAG/LAG2
- WHEN A WELL IS IN DEMAND, THE LEAD WELL VFD RAMPS UP TO IDEAL FLOW.
- LAG IS IN DEMAND WHEN THE LEAD PUMP RUNS ALONE FOR 5 HOURS, PRESSURE LOW LOW OCCURS, OR TANK LEVEL LOW LOW OCCURS.
- LAG 2 IS IN DEMAND WHEN THE LAG PUMP HAS BEEN RUNNING FOR 5 HOURS
- WHEN THE WELL IS NO LONGER IN DEMAND, THE VFD RAMPS DOWN TO STOP.
- HAND–OFF–AUTO SWITCHES MANUALLY TURN ON OR DISABLE THE VFD. WHEN MANUALLY TURNED ON THE ASSOCIATED WELL WILL BE CONTINUOUSLY IN DEMAND.
- THE RESTRICT TO ONE PUMP SWITCH WILL DISABLE THE LAG AND LAG 2 PUMP FUNCTIONALITY, AND THERE WILL NEVER BE DEMAND OF LAG OR LAG 2.
- WELL LEVELS WILL BE RECORDED CONTINUOUSLY.
- WHEN THE MAX FLOW OVERRIDE PUSHBUTTON IS PRESSED, THE LEAD, LAG, AND LAG2 PUMP ALL PUMP FOR 6 HOURS AT THE PRESET MAXIMUM FLOW RATE. TO PREVENT DAMAGE TO THE AQUIFER, THE PUMPS WILL BE DISABLED FOR 18 HOURS AFTER THE 6 HOURS OF MAXIMUM FLOW.
- WHEN THE BYPASS HIGH PRESSURE DISABLE SWITCH IS ENABLED, THE HIGH PRESSURE ALARM IS DISABLED.
- DUE TO THE HAND–OFF–AUTO SWITCHES EXISTING AT BOTH THE MANIFOLD BUILDING AND THE WATER OFFICE FOR THE WELL VFDS, THERE IS A POTENTIAL FOR A CONFLICT OF COMMAND. BELOW IS WHAT WILL OCCUR BASED ON THE SWITCH POSITIONS:

CITY OFFICE	MANIFOLD BUILDING	VFD STATUS
HAND	OFF	DISABLED
HAND	HAND	ENABLED, RUNNING
HAND	AUTO	ENABLED, RUNNING
OFF	OFF	DISABLED
OFF	HAND	DISABLED
OFF	AUTO	DISABLED
AUTO	OFF	DISABLED
AUTO	HAND	ENABLED, RUNNING
AUTO	AUTO	FUNCTION PER CONTROL NARRATIVE

- IN THE EVENT OF A COMMUNICATION LOSS TO THE MANIFOLD BUILDING THE WIRELESS I/O DEVICE WILL RECOGNIZE LOSS OF SIGNAL AND THE FOLLOWING WILL OCCUR:
  - PUMPING WILL CONTINUE TO FUNCTION NORMALLY BASED SOLELY OFF SYSTEM PRESSURE
  - AN OVERRIDE WILL OCCUR REGARDING THE RCP–1 HOA SWITCH POSITIONS. MCP–1 WILL FUNCTION AS IF ALL RCP–1 HOA SWITCHES ARE IN THE AUTO POSITION.
  - UPON REESTABLISHMENT OF COMMUNICATION, CONTROLS WILL RETURN TO NORMAL.

1 **CONTROLS NARRATIVE CONTINUED - SEQUENCE**

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FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

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IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

CONTROLS NARRATIVE CONTINUED

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
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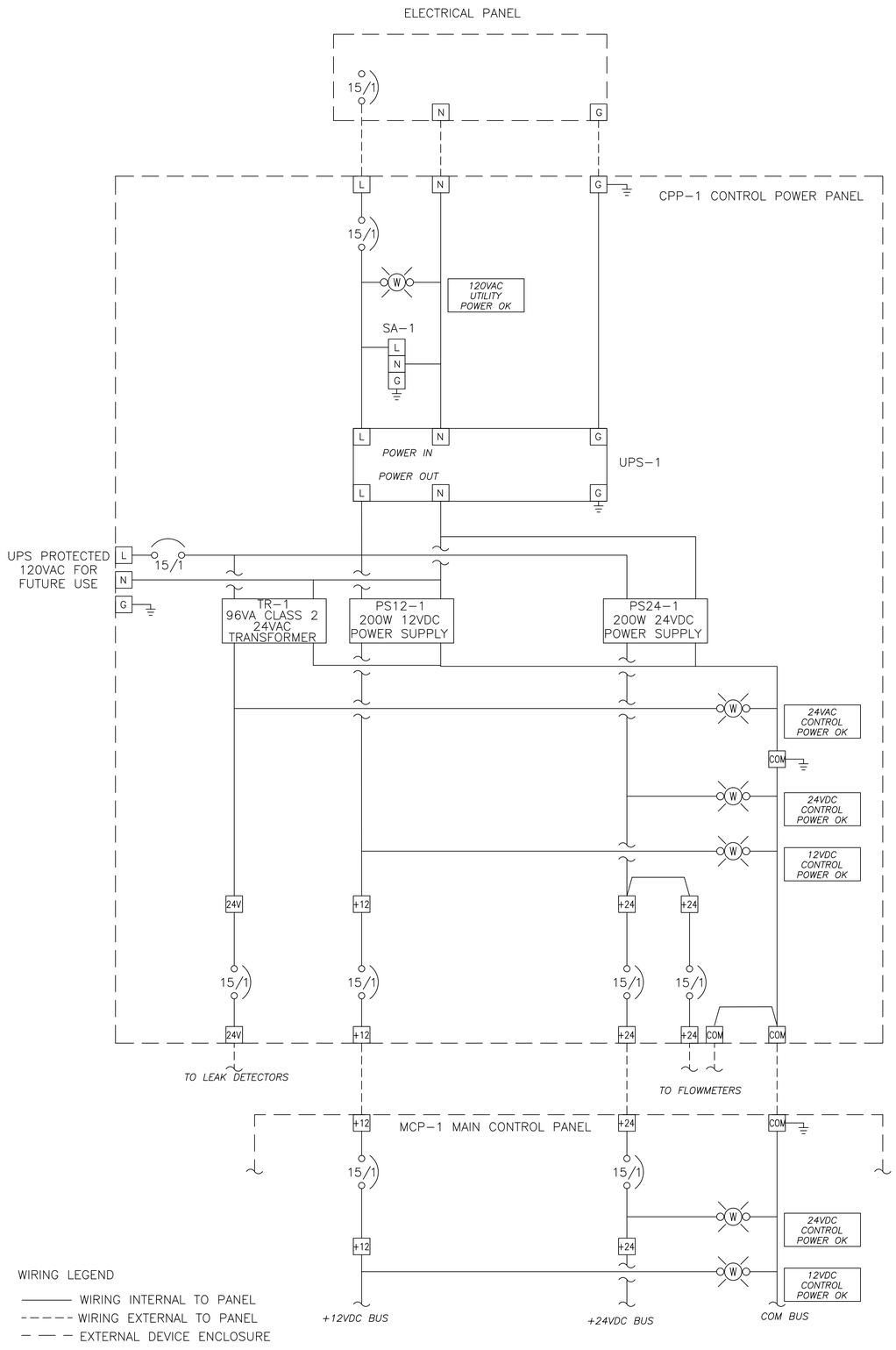
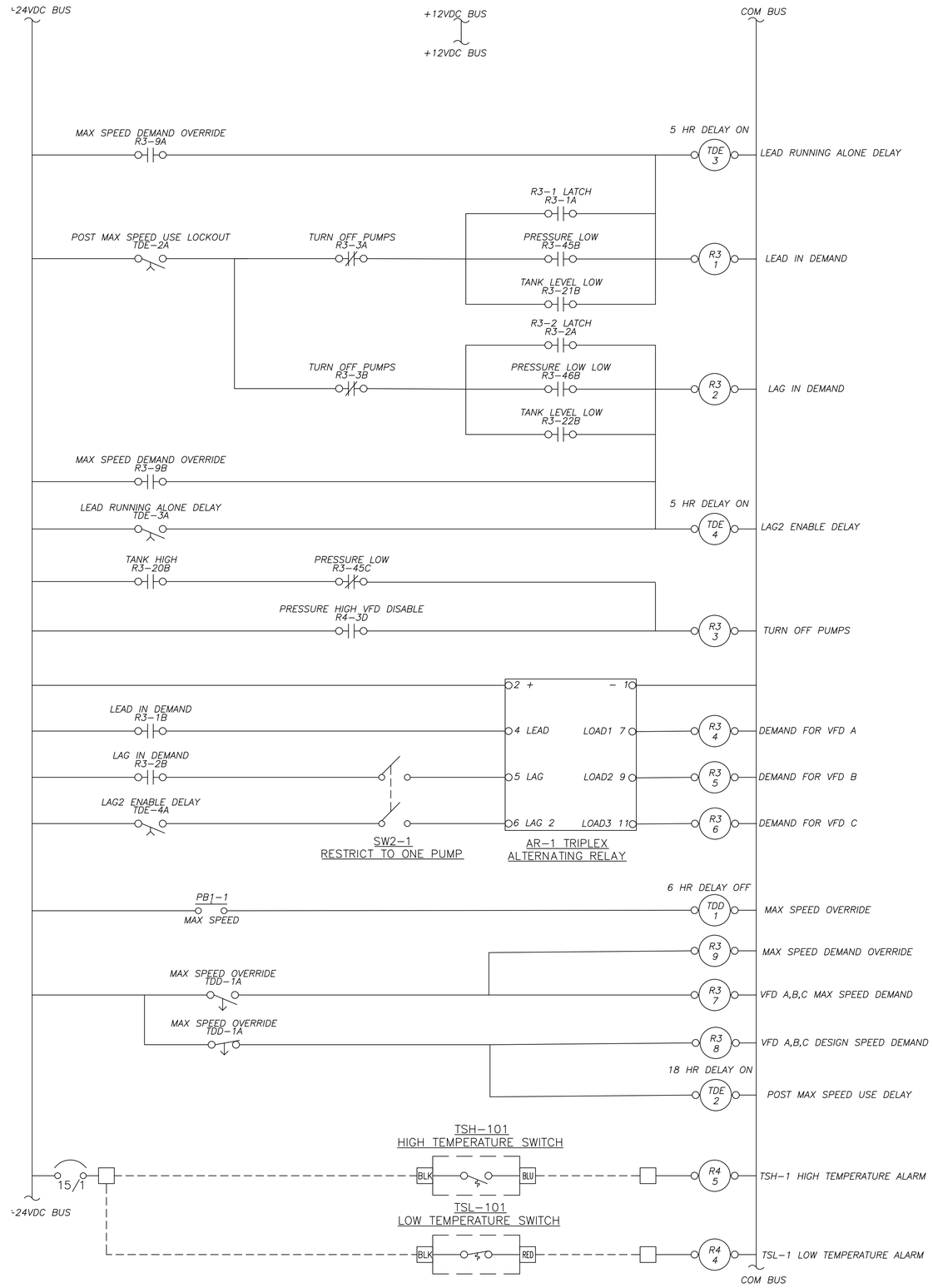
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I102

PLOT DATE:1/7/2022





CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 382–3252
#ECL0382–AK

STATE OF ALASKA 49 TH
Ian L. Hofmann
EE–13829
01/22/24
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
CPP–1 WIRING AND MCP–1 MAIN LOGIC

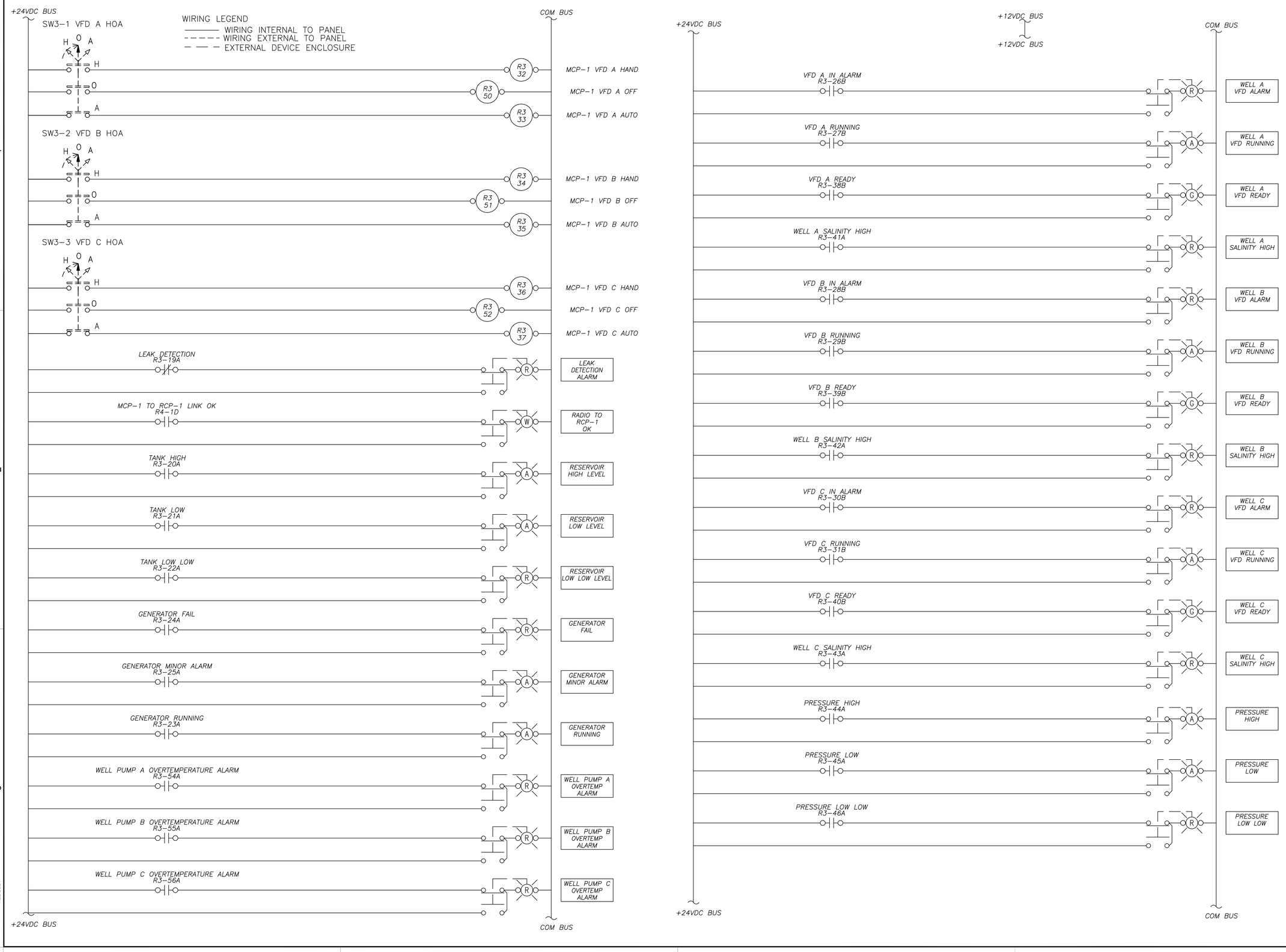
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
I601

PLOT DATE=1/22/2024



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Ian L. Hofmann
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01/22/24
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
MCP-1 HOA AND LIGHTS

REVISION SCHEDULE

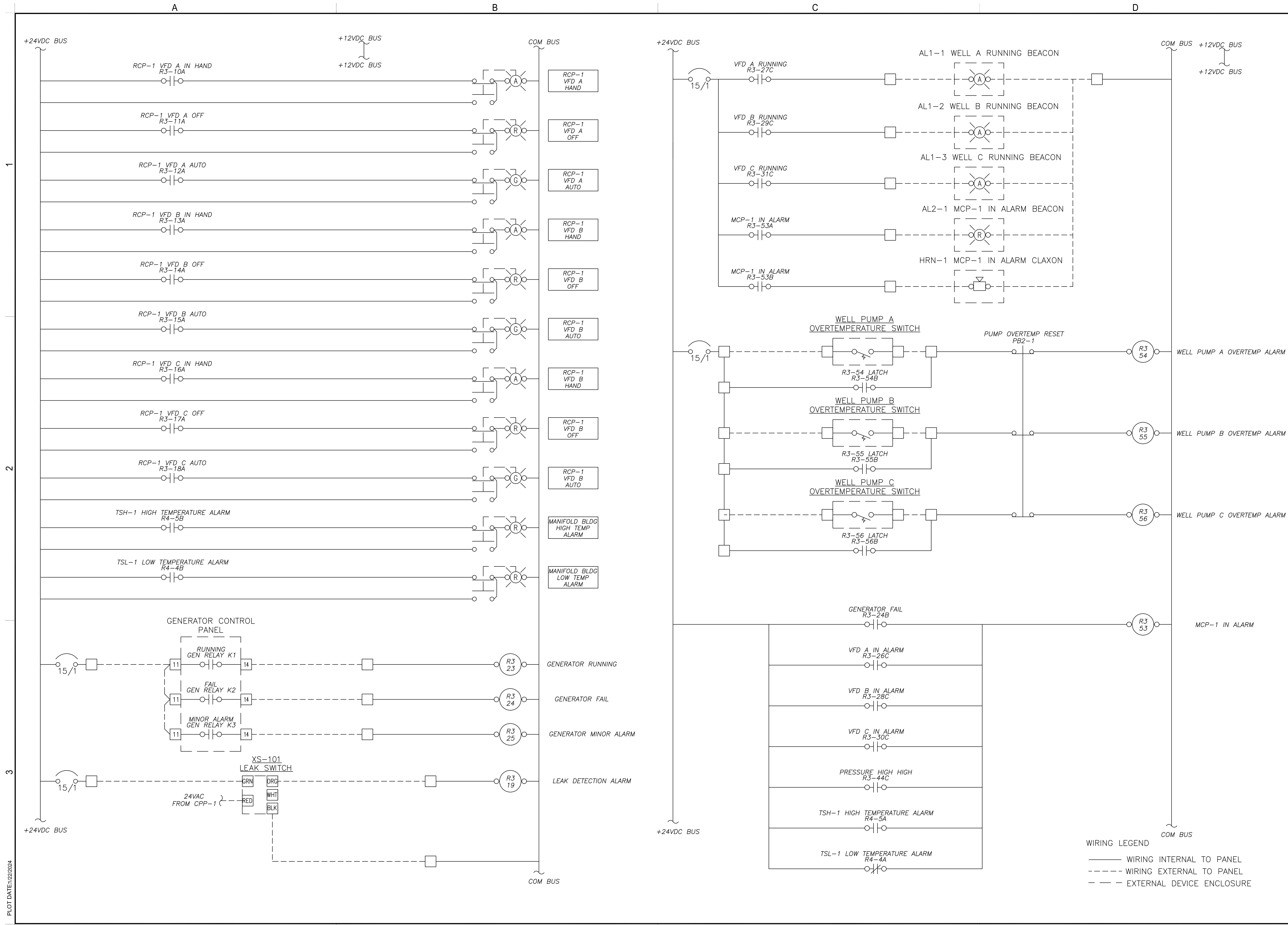
#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I602

PLOT DATE=1/22/2024



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01/22/24
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

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0" 1"
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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS MCP-1 LIGHTS, CONTACTS, CLAXON

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
I603

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FINAL DESIGN

VERIFY SCALE

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTACTS
MCP-1 ENABLE VFD LOGIC

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I604

PLOT DATE:1/7/2022

CRW ENGINEERING GROUP, LLC
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01/04/22
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FINAL DESIGN

VERIFY SCALE

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0" ——— 1"

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
MCP–1 DIGITAL RADIO CONNECTION

REVISION SCHEDULE

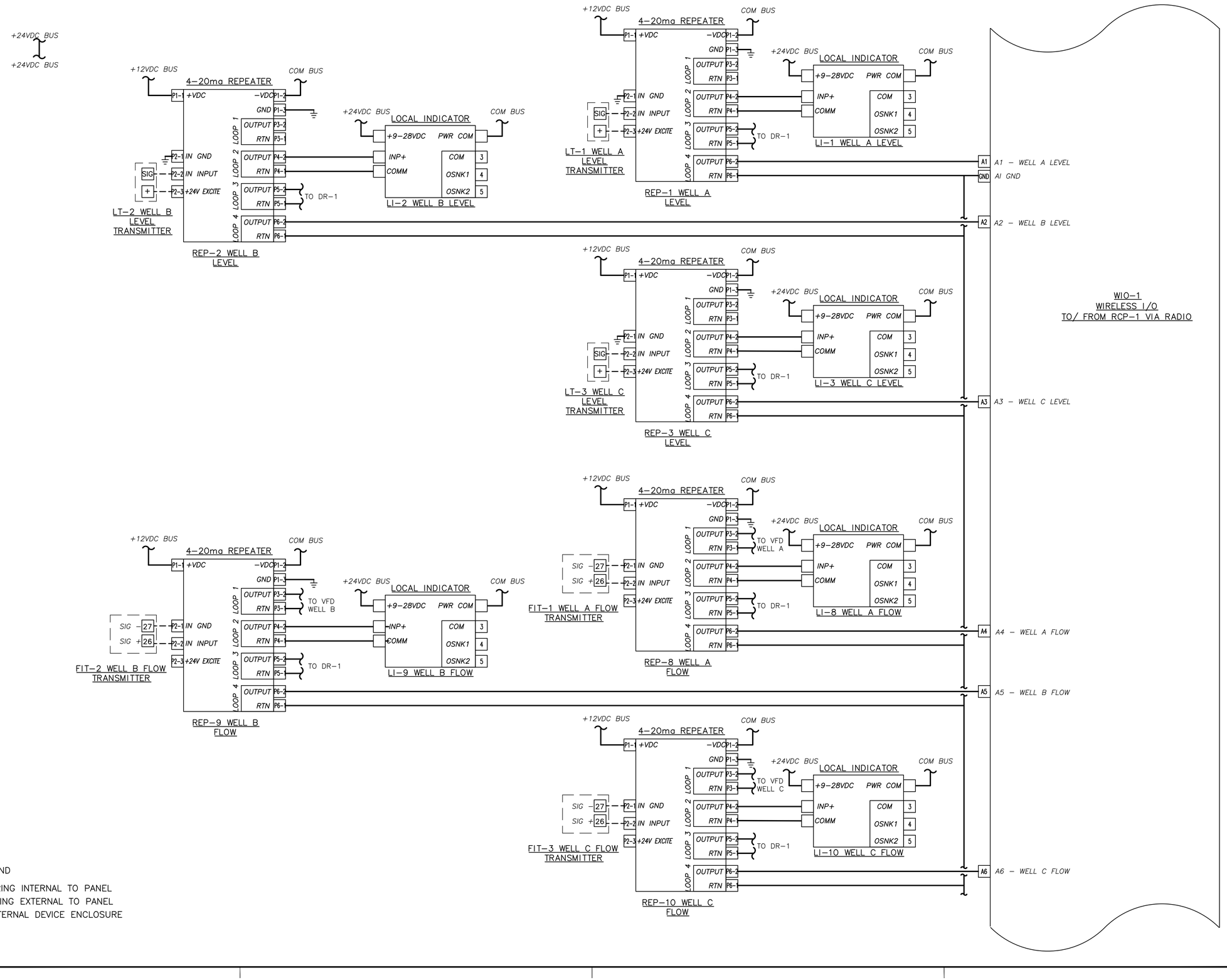
#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I605

PLOT DATE=1/7/2022



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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
MCP-1 ANALOG RADIO CONNECTION

REVISION SCHEDULE

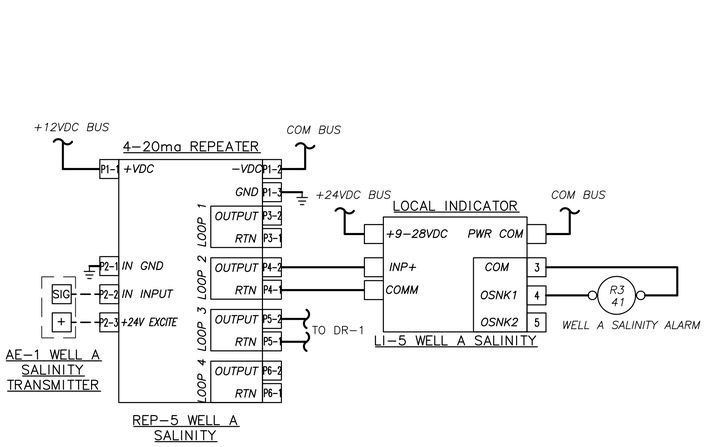
#	DESCRIPTION	DATE
0	IFC	12/21

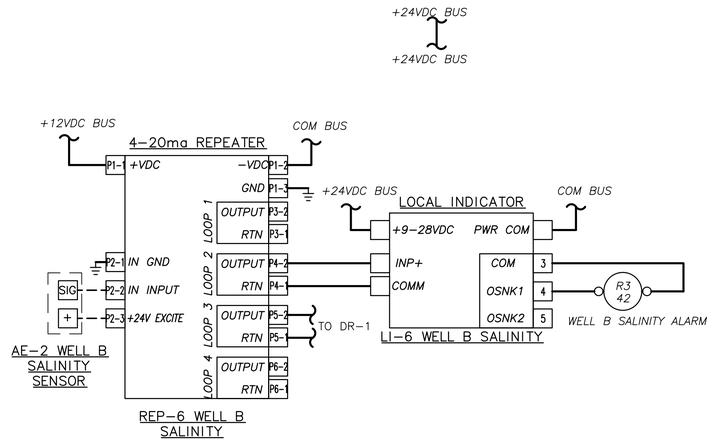
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

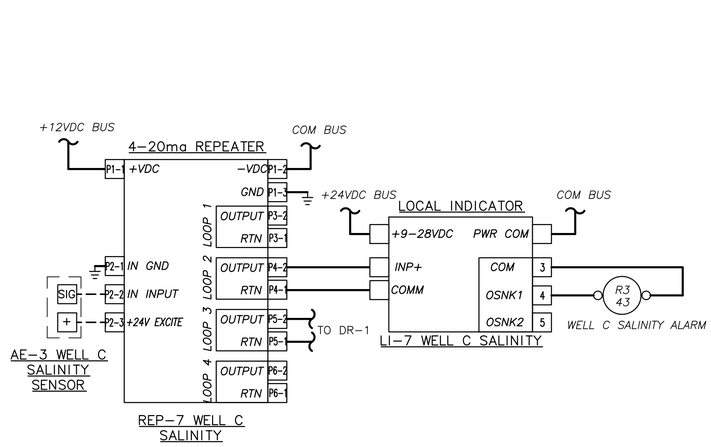
SHEET NO.

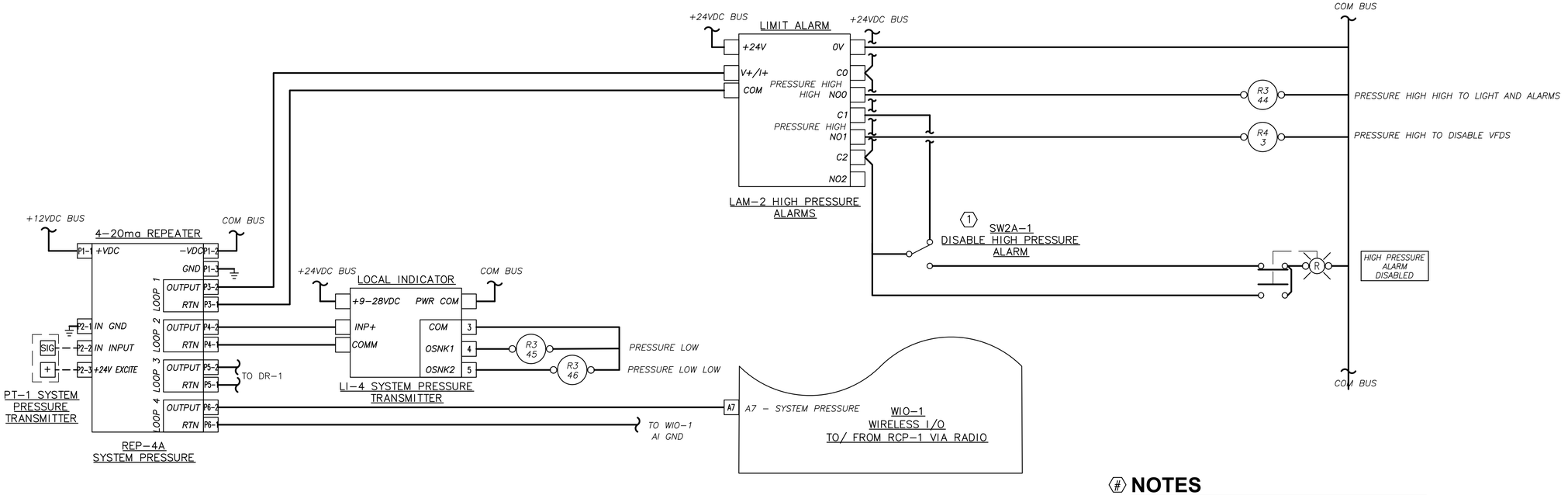
I606

PLOT DATE=1/7/2022









NOTES

1) MOUNT SWITCH INSIDE THE CONTROL PANEL ON THE BACKPLANE

WIRING LEGEND

- ——— WIRING INTERNAL TO PANEL
- – – – – WIRING EXTERNAL TO PANEL
- — — — EXTERNAL DEVICE ENCLOSURE

PLOT DATE=1/7/2022

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
MCP-1 SALINITY, FLOW REPEATERS

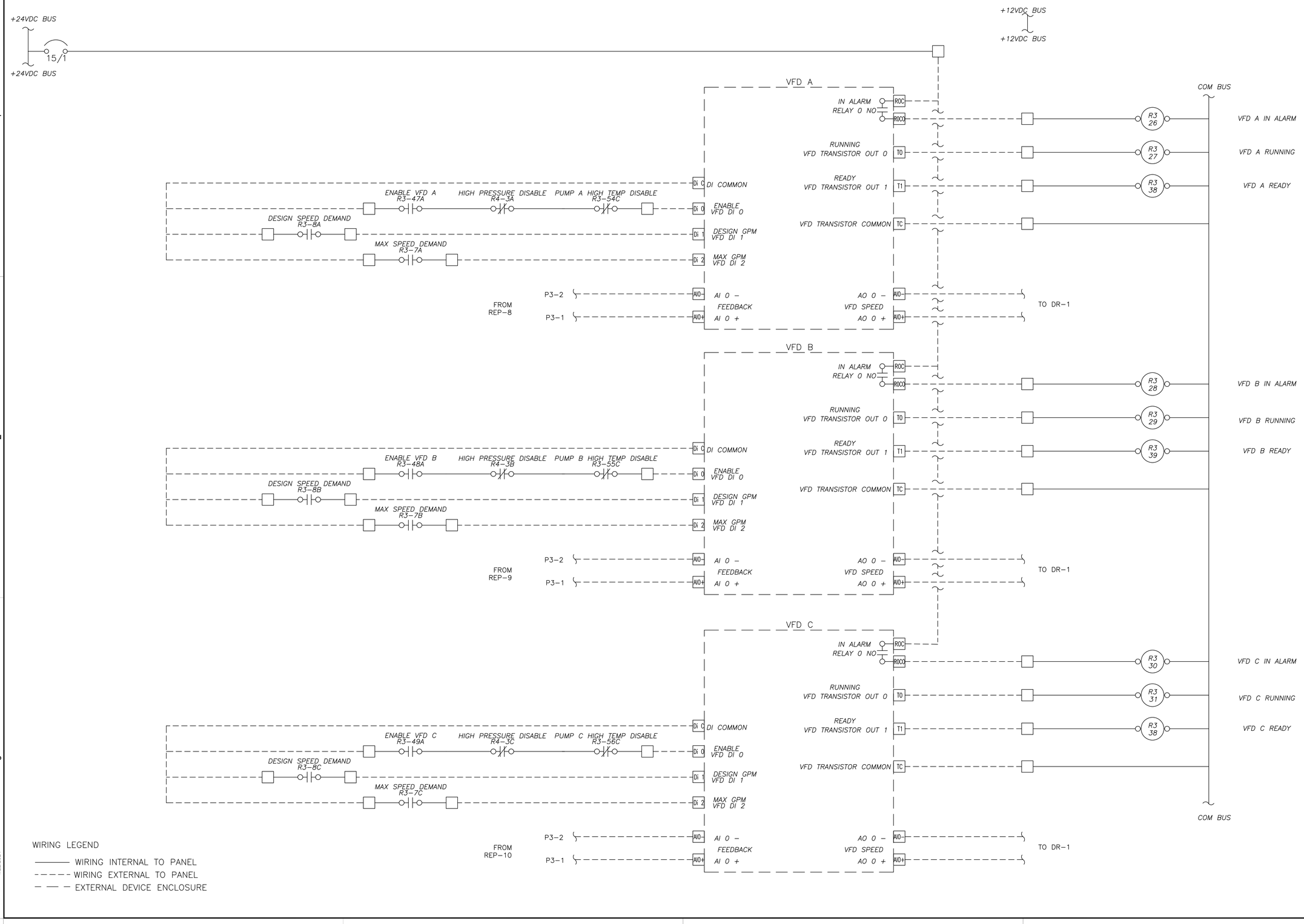
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I607



PLOT DATE:1/22/2024

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01/22/24
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WHITTIER WELL FIELD UPGRADE

WHITTIER ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
MCP-1 VFD WIRING

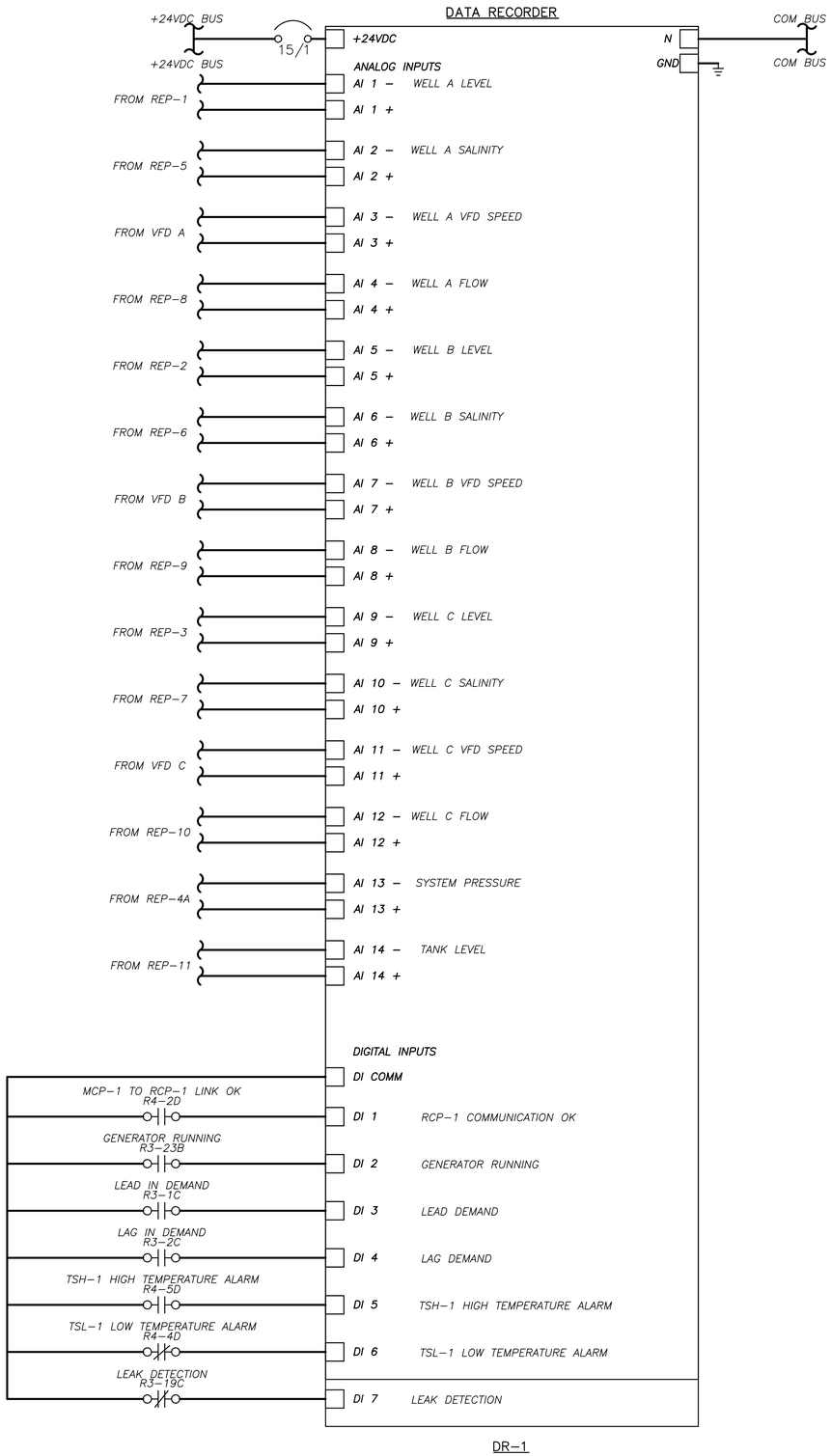
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

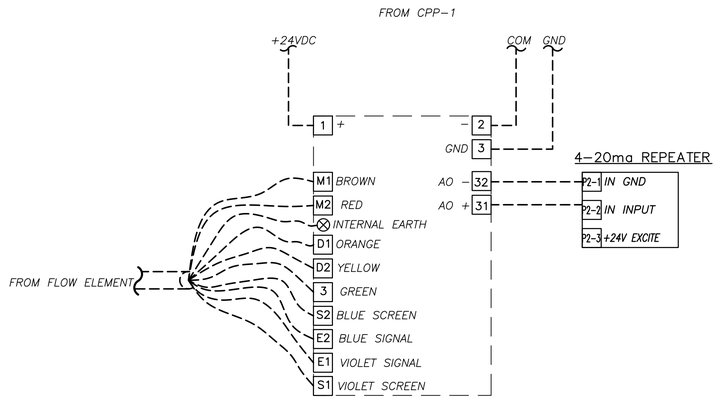
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I608



DR–1



TYPICAL FLOW TRANSMITTER WIRING

WIRING LEGEND

WIRING INTERNAL TO PANEL

WIRING EXTERNAL TO PANEL

EXTERNAL DEVICE ENCLOSURE

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01/04/22
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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS
MCP-1 DATA RECORDER, FIT WIRING

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I609

PLOT DATE:1/7/2022

R3-1	LEAD IN DEMAND	B	TO R3-4/5/6	
		C	TO DR-1	
R3-2	LAG IN DEMAND	A	LATCH	
		B	TO R3-4/5/6	
		C	TO DR-1	
R3-3	TURN OFF PUMPS	A	TO R3-1	
		B	TO R3-2	
R3-4	DEMAND FOR VFD A	A	TO R3-47	
		B	NOT USED	
R3-5	DEMAND FOR VFD B	A	TO R3-48	
		B	NOT USED	
R3-6	DEMAND FOR VFD C	A	TO R3-49	
		B	NOT USED	
R3-7	VFD A, B, C, MAX SPEED DEMAND	A	TO VFD A	
		B	TO VFD B	
		C	TO VFD C	
R3-8	VFD A, B, C, DESIGN SPEED DEMAND	A	TO VFD A	
		B	TO VFD B	
		C	TO VFD C	
R3-9	MAX SPEED DEMAND OVERRIDE	A	TO R3-1	
		B	TO R3-2	
R3-10	RCP-1 VFD A HAND	A	LIGHT	
		B	TO R3-47	
R3-11	RCP-1 VFD A OFF	A	LIGHT	
		B	TO R3-47	
R3-12	RCP-1 VFD A AUTO	A	LIGHT	
		B	TO R3-47	
R3-13	RCP-1 VFD B HAND	A	LIGHT	
		B	TO R3-47	
R3-14	RCP-1 VFD B OFF	A	LIGHT	
		B	TO R3-48	
R3-15	RCP-1 VFD B AUTO	A	LIGHT	
		B	TO R3-48	
R3-16	RCP-1 VFD C HAND	A	LIGHT	
		B	TO R3-49	
R3-17	RCP-1 VFD C OFF	A	LIGHT	
		B	TO R3-49	
R3-18	RCP-1 VFD C AUTO	A	LIGHT	
		B	TO R3-49	
R3-19	LEAK DETECTION SWITCH XS-101	A	LIGHT	
		B	TO RADIO DI12	
		C	TO DR-1	
R3-20	TANK HIGH	A	LIGHT	
		B	TO R3-3	
R3-21	TANK LOW	A	LIGHT	
		B	TO R3-1	
R3-22	TANK LOW LOW	A	LIGHT	
		B	TO R3-2	
R3-23	GENERATOR RUNNING	A	LIGHT	
		B	TO DR-1	
R3-24	GENERATOR FAIL	A	LIGHT	
		B	TO R3-53	
R3-25	GENERATOR MINOR ALARM	A	LIGHT	
R3-26	VFD A IN ALARM	A	TO RADIO DI1	
		B	LIGHT	
		C	TO R3-53	
R3-27	VFD A RUNNING	A	TO RADIO DI4	
		B	LIGHT	
		C	EXTERNAL LIGHT	
R3-28	VFD B IN ALARM	A	TO RADIO DI2	
		B	LIGHT	
		C	TO R3-53	
R3-29	VFD B RUNNING	A	TO RADIO DI5	
		B	LIGHT	
		C	EXTERNAL LIGHT	
R3-30	VFD C IN ALARM	A	TO RADIO DI3	
		B	LIGHT	
		C	TO R3-53	
R3-31	VFD C RUNNING	A	TO RADIO DI6	
		B	LIGHT	
		C	EXTERNAL LIGHT	
R3-32	MCP-1 VFD A HAND	A	NOT USED	
		B	TO R3-47	
R3-33	MCP-1 VFD A AUTO	A	NOT USED	
		B	TO R3-47	
R3-34	MCP-1 VFD B HAND	A	NOT USED	
		B	TO R3-48	
R3-35	MCP-1 VFD B AUTO	A	NOT USED	
		B	TO R3-48	
R3-36	MCP-1 VFD C HAND	A	NOT USED	
		B	TO R3-49	
R3-37	MCP-1 VFD C AUTO	A	NOT USED	
		B	TO R3-49	
R3-38	VFD A READY	A	TO RADIO DI7	
		B	LIGHT	
R3-39	VFD B READY	A	TO RADIO DI8	
		B	LIGHT	
R3-40	VFD C READY	A	TO RADIO DI9	
		B	LIGHT	
R3-41	WELL A SALINITY ALARM	A	LIGHT	
R3-42	WELL B SALINITY ALARM	A	LIGHT	
R3-43	WELL C SALINITY ALARM	A	LIGHT	
R3-44	PRESSURE HIGH HIGH TO LIGHTS AND ALARM	A	LIGHT	
		B	NOT USED	
		C	TO R3-53	
R3-45	PRESSURE LOW	A	LIGHT	
		B	TO R3-1	
		C	TO R3-3	
R3-46	PRESSURE LOW LOW	A	LIGHT	
		B	TO R3-2	
		C	TO R3-53	
R3-47	ENABLE VFD A	A	TO VFD A ENABLE	
		B	NOT USED	
R3-48	ENABLE VFD B	A	TO VFD B ENABLE	
		B	NOT USED	
R3-49	ENABLE VFD C	A	TO VFD C ENABLE	
		B	NOT USED	
R3-50	MCP-1 VFD A OFF	A	TO R3-47	
		B	NOT USED	
R3-51	MCP-1 VFD B OFF	A	TO R3-48	
		B	NOT USED	
R3-52	MCP-1 VFD C OFF	A	TO R3-49	
		B	NOT USED	
R3-53	MCP-1 IN ALARM	A	EXTERNAL LIGHT	
		B	CLAXON	
R3-54	WELL PUMP A OVER TEMPERATURE ALARM	A	LIGHT	
		B	LATCH	
		C	VFD A	
R3-55	WELL PUMP B OVER TEMPERATURE ALARM	A	LIGHT	
		B	LATCH	
		C	VFD B	
R3-56	WELL PUMP C OVER TEMPERATURE ALARM	A	LIGHT	
		B	LATCH	
		C	VFD C	
R4-1	MCP-1 TO RCP-1 LINK OK	A	TO R3-47	
		B	TO R3-48	
		C	TO R3-49	
		D	LIGHT	
R4-2	MCP-1 TO RCP-1 LINK OK	A	TO R3-47	
		B	TO R3-48	
		C	TO R3-49	
		D	TO DR-1	
R4-3	PRESSURE HIGH DISABLE VFDS	A	TO VFD A ENABLE	
		B	TO VFD B ENABLE	
		C	TO VFD C ENABLE	
		D	TO R3-3	
R4-4	TSL-1 LOW TEMP SWITCH	A	R3-53	
		B	LIGHT	
		C	TO RADIO DI11	
		D	TO DR-1	
R4-5	TSH-1 HIGH TEMP SWITCH	A	R3-53	
		B	LIGHT	
		C	TO RADIO DI11	
		D	TO DR-1	
TDD-1	MAX SPEED DEMAND OVERRIDE	NO	TO R3-7, 9	6 HR DELAY OFF
		NC	TO R3-8, TDR0-2	6 HR DELAY OFF
TDE-2	POST MAX SPEED USE DELAY	NO	TO R3-1, 2	18 HR DELAY OFF
TDE-3	LEAD RUNNING ALONE DELAY	NO	TO R3-2	5 HR DELAY ON
TDE-4	LAG2 ENABLE DELAY	NO	AR-1 LAG 2	5 HR DELAY ON

IF	REASONS	HOW TO CHECK	HOW TO FIX
PUMPS DO NOT RUN WHEN TANK IS LOW	SYSTEM PRESSURE IS HIGH	CHECK PRESSURE READING	N/A – WORKING PROPERLY
	RCP-1 TO MCP-1 COMMUNICATION FAILED	CHECK IF RCP-1 COMM OK LIGHT IS ON	IF LIGHT IS OFF, REFER TO "MCP-1 ALARMS", ITEM "RCP-1 COMM OK"
	HOA IS IN OFF	CHECK HOA POSITIONS	CHECK WITH SUPERVISOR THEN TURN TO AUTO
	VFD HMI IS IN OFF	CHECK VFD HMI	CHECK VFD MANUAL
	VFD IS FAULTED	CHECK VFD ALARM LIGHT AND/OR VFD HMI	CHECK VFD MANUAL
	NO POWER TO THE VFD	CHECK IF VFD HMI LCD IS LIT	CLOSE DISCONNECT AND/OR REPLACE FUSES IN DISCONNECT
	RELAY OR DEVICE FAILED	CHECK THE RELAYS/DEVICES	CHECK ITEMS ABOVE THEN PROCEED TO THE FOLLOWING STEPS. 1) CHECK IF RELAY R3-1 IS LIT AND HAS POWER. IF THERE IS POWER AND IS NOT LIT, REPLACE RELAY. IF THERE IS NO POWER, GO TO 2. IF IT IS LIT, GO TO STEP 4. 2) CHECK IF RELAY R3-21 IS LIT AND HAS POWER. IF THERE IS POWER AND IS NOT LIT, REPLACE RELAY. IF THERE IS NO POWER, GO TO 3. 3) CHECK LOCAL INDICATOR FOR THE TANK LEVEL. IF THE INDICATOR IS CORRECT, REPLACE LAM-1 LIMIT ALARM MODULE. IF THE INDICATOR IS INCORRECT, REPLACE REP-11 TANK LEVEL. 4) CHECK IF RELAY R3-4, 5, OR 6 ARE LIT. IF NONE ARE LIT, REPLACE AR-1 (ALTERNATING RELAY). IF ONE IS LIT, GO TO THE FOLLOWING: R3-4 STEP 5A, R3-5 STEP 5B, R3-6 STEP 5C 5A) CHECK IF RELAYS R3-12, 33 ARE LIT AND HAS POWER. IF THERE IS POWER AND IS NOT LIT, REPLACE RELAY. 5B) CHECK IF RELAYS R3-15, 35 ARE LIT AND HAS POWER. IF THERE IS POWER AND IS NOT LIT, REPLACE RELAY. 5C) CHECK IF RELAYS R3-18, 37 ARE LIT AND HAS POWER. IF THERE IS POWER AND IS NOT LIT, REPLACE RELAY.
PUMPS DO NOT TURN OFF WHEN TANK IS HIGH	SYSTEM PRESSURE IS LOW	CHECK PRESSURE READING	N/A – WORKING PROPERLY
	RCP-1 TO MCP-1 COMMUNICATION FAILED	CHECK IF RCP-1 COMM OK LIGHT IS ON	IF LIGHT IS OFF, REFER TO "MCP-1 ALARMS", ITEM "RCP-1 COMM OK"
	HOA IS IN HAND	CHECK HOA POSITIONS	CHECK WITH SUPERVISOR THEN TURN TO AUTO
	VFD HMI IS IN MANUAL	CHECK VFD HMI	CHECK VFD MANUAL
	RELAY OR DEVICE FAILED	CHECK THE RELAYS/DEVICES	CHECK ITEMS ABOVE THEN PROCEED TO THE FOLLOWING STEPS. 1) CHECK IF RELAY R3-20 IS LIT AND HAS POWER. IF THERE IS POWER AND IS NOT LIT, REPLACE RELAY. IF THERE IS NO POWER, GO TO 2. IF IT IS LIT, REPLACE RELAY R3-3 2) CHECK IF LOCAL INDICATOR LI-11 TANK LEVEL IS READING CORRECTLY. IF IT DOES, REPLACE LAM-1 TANK ALARMS. IF NOT, REPLACE REP-11 TANK LEVEL.
PUMPS DO NOT RUN WHEN PRESSURE IS LOW	HOA IS IN OFF	CHECK HOA POSITIONS	CHECK WITH SUPERVISOR THEN TURN TO AUTO
	VFD HMI IS IN OFF	CHECK VFD HMI	CHECK VFD MANUAL
	VFD IS FAULTED	CHECK VFD ALARM LIGHT AND/OR VFD HMI	CHECK VFD MANUAL
	NO POWER TO THE VFD	CHECK IF VFD HMI LCD IS LIT	CLOSE DISCONNECT AND/OR REPLACE FUSES IN DISCONNECT
	PUMP HAS OVERHEATED	CHECK IF WELL OVERTEMP LIGHT	PRESS "PUMP OVERTEMPERATURE RESET" BUTTON
	RELAY OR DEVICE FAILED	CHECK THE RELAYS/DEVICES	CHECK ITEMS ABOVE THEN PROCEED TO THE FOLLOWING STEPS. 1) CHECK IF PT-1 SYSTEM PRESSURE TRANSMITTER DISPLAY INDICATES LOW PRESSURE. IF IT DOES NOT, REPLACE PT-1. IF IT DOES, GO TO STEP 2. 2) CHECK IF LOCAL INDICATOR LI-4 SYSTEM PRESSURE IS READING CORRECTLY. IF NOT, REPLACE REP-4A SYSTEM PRESSURE. IF IT DOES, GO TO STEP 3. 3) CHECK IF RELAY R3-45 IS LIT AND HAS POWER. IF IT HAS POWER BUT IS NOT LIT, REPLACE RELAY. IF THERE IS NO POWER REPLACE LAM-2B LOW PRESSURE ALARMS.
PUMPS DO NOT TURN OFF WHEN PRESSURE IS HIGH	HOA IS IN HAND	CHECK HOA POSITIONS	CHECK WITH SUPERVISOR THEN TURN TO AUTO
	VFD HMI IS IN MANUAL	CHECK VFD HMI	CHECK VFD MANUAL
	RELAY OR DEVICE FAILED	CHECK THE RELAYS/DEVICES	CHECK ITEMS ABOVE THEN PROCEED TO THE FOLLOWING STEPS. 1) CHECK IF PT-1 SYSTEM PRESSURE TRANSMITTER DISPLAY INDICATES HIGH PRESSURE. IF IT DOES NOT, REPLACE PT-1. IF IT DOES, GO TO STEP 2. 2) CHECK IF LOCAL INDICATOR LI-4 SYSTEM PRESSURE IS READING CORRECTLY. IF NOT, REPLACE REP-4A SYSTEM PRESSURE. IF IT DOES, GO TO STEP 3. 3) CHECK IF RELAY R3-44 IS LIT AND HAS POWER. IF IT HAS POWER BUT IS NOT LIT, REPLACE RELAY. IF THERE IS NO POWER REPLACE LAM-2 HIGH PRESSURE ALARMS.
ALARM BEACON AND CLAXON ARE ON	GENERATOR FAIL	CHECK GENERATOR CONTROL PANEL	REFER TO GENERATOR MANUAL
	VFD IN ALARM	CHECK VFD THAT IS IN ALARM, SEE VFD MANUAL	REFER TO VFD MANUAL
	SYSTEM PRESSURE IS HIGH HIGH	CHECK SYSTEM PRESSURE READING	PUT ALL PUMPS IN OFF.
	MANIFOLD BUILDING OVER TEMPERATURE	CHECK IF BUILDING IS HOT	OPEN DOOR TO BUILDING, USE PORTABLE FAN TO COOL ROOM
	MANIFOLD BUILDING UNDER TEMPERATURE	CHECK IF BUILDING IS COLD	CHECK ELECTRIC AND GAS FIRED HEATERS (EH-1 AND GUH-1) ARE WORKING
	RELAY OR DEVICE FAILED	CHECK IF ANY ALARMS EXIST	REMOVE THE FOLLOWING RELAYS, ONE OF THEM HAS FAILED. IF THE ALARM STOPS WHEN THE RELAY IS REMOVED, THAT IS THE BAD RELAY: R3-24, 26, 30, 46, 54, 55

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FINAL DESIGN

VERIFY SCALE
BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS MCP-1 RELAY SCHEDULE, TROUBLESHOOTING

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
I610

PLOT DATE:1/22/2024

LIGHT	STATUS	MEANS	HOW TO FIX	PARTS TO REPLACE
24 VDC CONTROL POWER OK	OFF	24 VDC POWER IS OFF	IF 12 VDC CONTROL POWER LIGHT IS ON, REPLACE 24 VDC POWER SUPPLY IN CPP-1	N/A
			IF 12 VDC CONTROL POWER LIGHT IS OFF, CHECK BREAKER FEEDING CPP-1 AND BREAKER INSIDE CPP-1	N/A
			IF 12 VDC CONTROL POWER LIGHT IS OFF, AND BREAKER FEEDING CPP-1 OK, REPLACE UPS IN CPP-1.	UPS-1
12 VDC CONTROL POWER OK	OFF	12 VDC POWER IS OFF	IF 24 VDC CONTROL POWER LIGHT IS ON, REPLACE 12 VDC POWER SUPPLY IN CPP-1	N/A
			IF 24 VDC CONTROL POWER LIGHT IS OFF, CHECK BREAKER FEEDING CPP-1 AND BREAKER INSIDE CPP-1	N/A
			IF 24 VDC CONTROL POWER LIGHT IS OFF, AND BREAKER FEEDING CPP-1 OK, REPLACE UPS IN CPP-1.	UPS-1
MANIFOLD BUILDING HIGH TEMPERATURE	ON	BUILDING TEMPERATURE IS TOO HIGH	IF THE BUILDING IS HOT, PROVIDE TEMPORARY COOLING FOR THE BUILDING	N/A
			IF THE BUILDING IS NOT HOT, TURN THE TSH-101 HIGH TEMPERATURE SWITCH DIAL TO 100 DEG F	N/A
			IF THIS DOES NOT RESOLVE THE PROBLEM, CHECK RELAY R4-5	R4-5
MANIFOLD BUILDING LOW TEMPERATURE	ON	BUILDING TEMPERATURE IS TOO LOW	IF THE BUILDING IS TOO COLD, PROVIDE TEMPORARY HEATING FOR THE BUILDING	N/A
			IF THE BUILDING IS NOT COLD, TURN THE TSL-101 HIGH TEMPERATURE SWITCH DIAL TO 35 DEG F	N/A
			IF THIS DOES NOT RESOLVE THE PROBLEM, CHECK RELAY R4-4	R4-4
LEAK	ON	WATER SENSOR ON FLOOR DETECTS STANDING WATER	CHECK FLOOR FOR WATER AND PIPES FOR LEAKS	N/A
			IF NO LEAKS ARE IDENTIFIED AND THERE IS FLUID IN THE FLOOR DRAIN, THE LEAK STOPPED.	N/A
			IF NO LEAKS ARE IDENTIFIED , CHECK LEAK SWITCH NEAR FLOR TRANSMITTERS. THE SENSOR HAS A 'MOISUTRE' LED THAT LIGHTS UP RED WHEN MOISTURE IS PRESENT. DRY FLOOD SWITCH AND HIT RESET.	XS-101
RCP-1 COMM OK	OFF	NO COMMUNICATION TO RCP-1	CHECK IF REMOTE CONTROL PANEL HAS POWER. IF REMOTE CONTROL PANEL HAS NO POWER, REFER TO RCP-1 TROUBLESHOOTING. IF REMOTE CONTROL PANEL HAS POWER, CHECK ANTENNAS AT OFFICE BUILDING AND MANIFOLD BUILDING.	N/A
RESERVOIR HIGH LEVEL	ON	RESERVOIR IS AT HIGH LEVEL	CHECK TO CONFIRM NO PUMPS ARE ON. IF NO PUMPS ARE ON, NO ACTION (NORMAL)	N/A
			-IF PUMPS ARE ON, CONFIRM PRESSURE IS NOT HIGH (LESS THEN 110 PSI). IF THE PRESSURE IS LESS THEN 110 PSI, THEN THIS IS NORMAL ACTIVITY. THERE WAS A DEMAND (PRESSURE OR TANK WAS LOW) AND PUMP(S) ARE RUNNING UNTIL THE HIGH STATUS IS REACHED. -IF THERE IS LOW PRESSURE AND HIGH TANK, THE PUMPS WILL STILL BE ENABLED.	N/A
			IF PUMPS ARE ON AND PRESSURE IS HIGH, REFER TO PRESSURE HIGH ALARM	N/A
RESERVOIR LOW LEVEL / LOW LOW LEVEL	ON	RESERVOIR IS AT LOW LEVEL	CHECK TO CONFIRM AT LEAST ONE PUMPS IS ON. IF AT LEAST ONE PUMP IS ON, NO ACTION (NORMAL)	N/A
			IF NO PUMPS ARE ON, CHECK PRESSURE HIGH IS ON. IF PRESSURE HIGH IS ON, PUMPS SHOULD NOT BE PUMPING. NO ACTION (NORMAL)	N/A
			IF PUMPS ARE OFF, AND THERE IS PRESSURE HIGH STATUS, VERIFY HOA SWITCHES AT MCP-1 AND RCP-1 ARE IN AUTO, VFDS HAVE POWER, VFD ALARM LIGHTS ARE OFF.	N/A
			-IF THE SWITCHES ARE IN OFF, THEN THE PUMP WILL NOT RUN (NORMAL) -IF THE SWITCHES ARE IN HAND, THEN THE PUMPS SHOULD BE RUNNING (NORMAL) -IF THE VFDS DO NOT HAVE POWER, VERIFY BREAKERS TO VFDS ARE CLOSED -IF THE VFDS ALARM LIGHTS ARE ON, CHECK VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
PRESSURE HIGH	ON	WATER PRESSURE IS HIGH	CHECK TO CONFIRM NO PUMPS ARE ON. IF NO PUMPS ARE ON, NO ACTION (NORMAL)	N/A
			-IF PUMPS ARE STILL ON, ROTATE HOA SWITCH TO OFF TO DISABLE PUMP. VERIFY PUMP IS OFF. - IF VFD FOR THE PUMP IS STILL RUNNING, TURN OFF VFD AT THE VFD LCD. CHECK THE VFD LCD SCREEN IF THE VFD LCD WAS IN MANUAL MODE. - IF THE VFD IS IN MANUAL, PUT THE VFD IN AUTO MODE AND ROTATE HOA TO AUTO. - IF NOT, THE ISSUE IS WITH THE VFD. REFER TO VFD MANUAL REGARDING A VFD RUNNING IN AUTO MODE WHEN NOT ENABLED.	N/A
PRESSURE LOW / PRESSURE LOW LOW	ON	RESERVOIR IS AT LOW LEVEL	CHECK TO CONFIRM AT LEAST ONE PUMP IS ON. IF AT LEAST ONE PUMP IS ON, NO ACTION (NORMAL)	N/A
			IF PUMPS ARE OFF, VERIFY HOA SWITCHES AT MCP-1 AND RCP-1 ARE IN AUTO, VFDS HAVE POWER, VFD ALARM LIGHTS ARE OFF.	N/A
			-IF THE SWITCHES ARE IN OFF, THEN THE PUMP WILL NOT RUN (NORMAL). SOMEONE PUT THE SWITCH IN OFF FOR A REASON, CHECK WITH TEAM PRIOR TO ROTATING TO AUTO.	N/A
			-IF THE VFDS DO NOT HAVE POWER, VERIFY DISCONNECTS TO VFDS ARE CLOSED (IN THE ON POSITION). IF THE DISCONNECT IS IN THE ON POSITION AND THERE IS NO POWER TO THE VFD, GET AN ELECTRICIAN TO REPLACE THE DISCONNECT FUSES	WELL A - 300A FUSES WELL B, C - 200A FUSES
			-IF THE VFDS HAVE POWER AND ALARM LIGHTS ARE ON, CHECK VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
GENERATOR FAIL	ON	GENERATOR FAILED TO START UPON DEMAND	GO TO GENERATOR CONTROL PANEL, REFER TO GENERATOR TROUBLESHOOTING MANUAL	N/A
GENERATOR MINOR ALARM	ON	GENERATOR CONTROL PANEL HAS A MINOR ALARM	GO TO GENERATOR CONTROL PANEL, REFER TO GENERATOR TROUBLESHOOTING MANUAL	N/A
WELL A VFD ALARM	ON	WELL A VFD IS IN ALARM	LOOK AT VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
WELL A SALINITY ALARM	ON	WELL A SALINITY IS TOO HIGH	LOOK AT LOCAL INDICATOR TO CONFIRM HIGH READING (GREATER THEN 800 uS/cm).	N/A
			IF LOCAL INDICATOR CONFIRMS ALARM, OBTAIN SAMPLE OF WELL A AND PERFORM MANUAL TESTING TO CONFIRM SALINITY IS HIGH.	N/A
			IF MANUAL TESTING SALINITY IS HIGH, INFORM SUPERVISOR. ALARM IS ACCURATE AND CAN NOT BE RESOLVED. DO NOT USE WELL.	N/A
			IF MANUAL TESTING SALINITY IS LOW, SALINITY AT THE DATA RECORDER. IF READING IS LOW, REPLACE INDICATOR.	LI-5
			IF MANUAL TESTING SALINITY IS LOW, AND DATA RECORDER READS MATCHES THE INDICATOR, REPLACE REPEATER.	REP-5
			IF MANUAL TESTING SALINITY IS LOW, AND REPLACING THE REPEATOR DOES NOT WORK, REPLACE SALINITY SENSOR.	AE-1
WELL B VFD ALARM	ON	WELL B VFD IS IN ALARM	LOOK AT VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
WELL B SALINITY ALARM	ON	WELL B SALINITY IS TOO HIGH	LOOK AT LOCAL INDICATOR TO CONFIRM HIGH READING (GREATER THEN 800 uS/cm).	N/A
			IF LOCAL INDICATOR CONFIRMS ALARM, OBTAIN SAMPLE OF WELL B AND PERFORM MANUAL TESTING TO CONFIRM SALINITY IS HIGH.	N/A
			IF MANUAL TESTING SALINITY IS HIGH, INFORM SUPERVISOR. ALARM IS ACCURATE AND CAN NOT BE RESOLVED. DO NOT USE WELL.	N/A
			IF MANUAL TESTING SALINITY IS LOW, SALINITY AT THE DATA RECORDER. IF READING IS LOW, REPLACE INDICATOR.	LI-6
			IF MANUAL TESTING SALINITY IS LOW, AND DATA RECORDER READS MATCHES THE INDICATOR, REPLACE REPEATER.	REP-6
			IF MANUAL TESTING SALINITY IS LOW, AND REPLACING THE REPEATOR DOES NOT WORK, REPLACE SALINITY SENSOR.	AE-2
WELL C VFD ALARM	ON	WELL C VFD IS IN ALARM	LOOK AT VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
WELL C SALINITY ALARM	ON	WELL C SALINITY IS TOO HIGH	LOOK AT LOCAL INDICATOR TO CONFIRM HIGH READING (GREATER THEN 800 uS/cm).	N/A
			IF LOCAL INDICATOR CONFIRMS ALARM, OBTAIN SAMPLE OF WELL C AND PERFORM MANUAL TESTING TO CONFIRM SALINITY IS HIGH.	N/A
			IF MANUAL TESTING SALINITY IS HIGH, INFORM SUPERVISOR. ALARM IS ACCURATE AND CAN NOT BE RESOLVED. DO NOT USE WELL.	N/A
			IF MANUAL TESTING SALINITY IS LOW, SALINITY AT THE DATA RECORDER. IF READING IS LOW, REPLACE INDICATOR.	LI-7
			IF MANUAL TESTING SALINITY IS LOW, AND DATA RECORDER READS MATCHES THE INDICATOR, REPLACE REPEATER.	REP-7
			IF MANUAL TESTING SALINITY IS LOW, AND REPLACING THE REPEATOR DOES NOT WORK, REPLACE SALINITY SENSOR.	AE-3
ALARM BEACON	ON	ONE OF THE FOLLOWING ALARMS HAS OCCURRED: WELL A VFD ALARM, WELL B VFD ALARM, WELL C VFD ALARM, GENERATOR FAIL, PRESSURE HIGH	REFER TO SPECIFIC ALARM	N/A
ALARM CLAXON	ON			

LIGHT	CONDITION	MEANS
24 VDC CONTROL POWER OK	ON	24 VDC POWER IS OK
12 VDC CONTROL POWER OK	ON	24 VDC POWER IS OK
RCP-1 COMM OK	ON	COMMUNICATION LINK TO REMOTE CONTROL PANEL OK
MANIFOLD BUILDING HIGH TEMPERATURE	OFF	MANIFOLD BUILDING TEMPERATURE BELOW 100 DEG F
MANIFOLD BUILDING LOW TEMPERATURE	OFF	MANIFOLD BUILDING TEMPERATURE ABOVE 35 DEG F
WATER LEAK	OFF	NO SIGNIFICANT AMOUNT OF WATER ON THE FLOOR
RESERVOIR HIGH LEVEL	OFF	RESERVOIR IS NOT IN HIGH LEVEL
RESERVOIR LOW LEVEL	OFF	RESERVOIR IS NOT IN LOW LEVEL
RESERVOIR LOW LOW LEVEL	OFF	RESERVOIR IS NOT IN LOW LEVEL
PRESSURE HIGH	OFF	PRESSURE IS NOT HIGH
PRESSURE LOW	OFF	PRESSURE IS NOT LOW
PRESSURE LOW LOW	OFF	PRESSURE IS NOT LOW LOW
GENERATOR FAIL	OFF	GENERATOR DID NOT FAIL
GENERATOR RUNNING	OFF	GENERATOR IS NOT RUNNING
	ON	GENERATOR IS RUNNING
GENERATOR MINOR ALARM	OFF	GENERATOR DOES NOT HAVE AN ALARM
WELL A OVERTEMP ALARM	OFF	PUMP A IS NOT OVERHEATING
WELL A VFD ALARM	OFF	VFD A DOES NOT HAVE AN ALARM
WELL A SALINITY ALARM	OFF	WELL A SALINITY IS OK
WELL A VFD RUNNING	OFF	VFD A IS NOT RUNNING
	ON	VFD A IS RUNNING
WELL A VFD READY	OFF	VFD A IS EITHER RUNNING OR HAS AN ALARM
	ON	VFD A IS READY TO RUN
WELL B OVERTEMP ALARM	OFF	PUMP B IS NOT OVERHEATING
WELL B VFD ALARM	OFF	VFD B DOES NOT HAVE AN ALARM
WELL B SALINITY ALARM	OFF	WELL B SALINITY IS OK
WELL B VFD RUNNING	OFF	VFD B IS NOT RUNNING
	ON	VFD B IS RUNNING
WELL B VFD READY	OFF	VFD B IS EITHER RUNNING OR HAS AN ALARM
	ON	VFD B IS READY TO RUN
WELL C OVERTEMP ALARM	OFF	PUMP C IS NOT OVERHEATING
WELL C VFD ALARM	OFF	VFD C DOES NOT HAVE AN ALARM
WELL C SALINITY ALARM	OFF	WELL C SALINITY IS OK
WELL C VFD RUNNING	OFF	VFD C IS NOT RUNNING
	ON	VFD C IS RUNNING
WELL C VFD READY	OFF	VFD C IS EITHER RUNNING OR HAS AN ALARM
	ON	VFD C IS READY TO RUN
RCP-1 WELL A IN OFF	OFF	RCP-1 HOA WELL A IS NOT IN OFF POSITION
	ON	RCP-1 HOA WELL A IS IN OFF POSITION
RCP-1 WELL A IN AUTO	OFF	RCP-1 HOA WELL A IS NOT IN AUTO POSITION
	ON	RCP-1 HOA WELL A IS IN AUTO POSITION
RCP-1 WELL A IN HAND	OFF	RCP-1 HOA WELL A IS NOT IN HAND POSITION
	ON	RCP-1 HOA WELL A IS IN HAND POSITION
RCP-1 WELL B IN OFF	OFF	RCP-1 HOA WELL B IS NOT IN OFF POSITION
	ON	RCP-1 HOA WELL B IS IN OFF POSITION
RCP-1 WELL B IN AUTO	OFF	RCP-1 HOA WELL B IS NOT IN AUTO POSITION
	ON	RCP-1 HOA WELL B IS IN AUTO POSITION
RCP-1 WELL B IN HAND	OFF	RCP-1 HOA WELL B IS NOT IN HAND POSITION
	ON	RCP-1 HOA WELL B IS IN HAND POSITION
RCP-1 WELL B IN OFF	OFF	RCP-1 HOA WELL B IS NOT IN OFF POSITION
	ON	RCP-1 HOA WELL B IS IN OFF POSITION
RCP-1 WELL B IN AUTO	OFF	RCP-1 HOA WELL B IS NOT IN AUTO POSITION
	ON	RCP-1 HOA WELL B IS IN AUTO POSITION
RCP-1 WELL B IN HAND	OFF	RCP-1 HOA WELL B IS NOT IN HAND POSITION
	ON	RCP-1 HOA WELL B IS IN HAND POSITION
WELL A RUNNING BEACON	OFF	VFD A IS NOT RUNNING
	ON	VFD A IS RUNNING
WELL B RUNNING BEACON	OFF	VFD B IS NOT RUNNING
	ON	VFD B IS RUNNING
WELL C RUNNING BEACON	OFF	VFD C IS NOT RUNNING
	ON	VFD C IS RUNNING
ALARM BEACON	OFF	MCP-1 IS NOT IN ALARM
ALARM CLAXON	OFF	MCP-1 IS NOT IN ALARM

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Ian L. Hofmann
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01/22/24
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

MANIFOLD BUILDING CONTROLS TROUBLESHOOTING CONTINUED

REVISION SCHEDULE

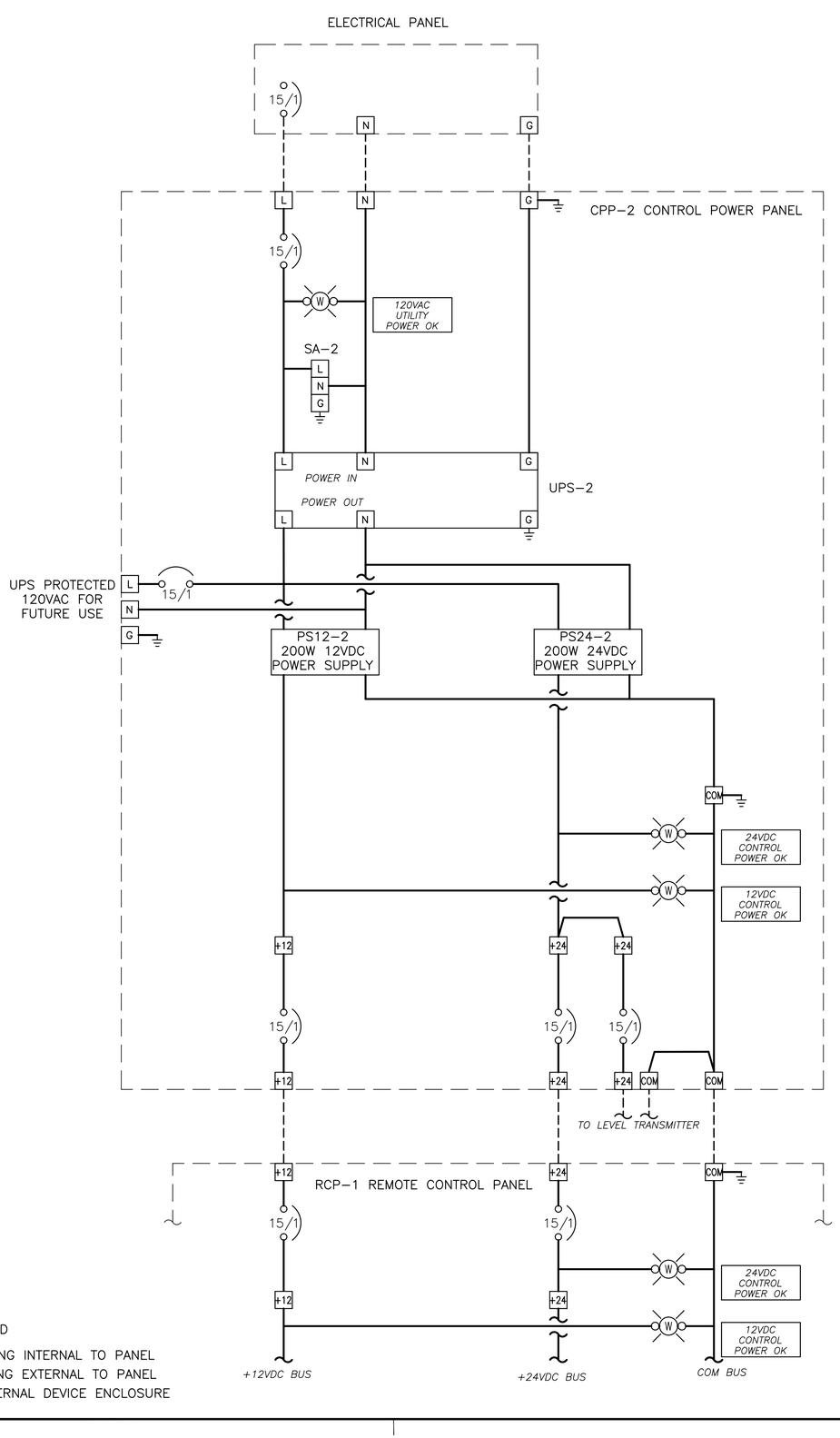
#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

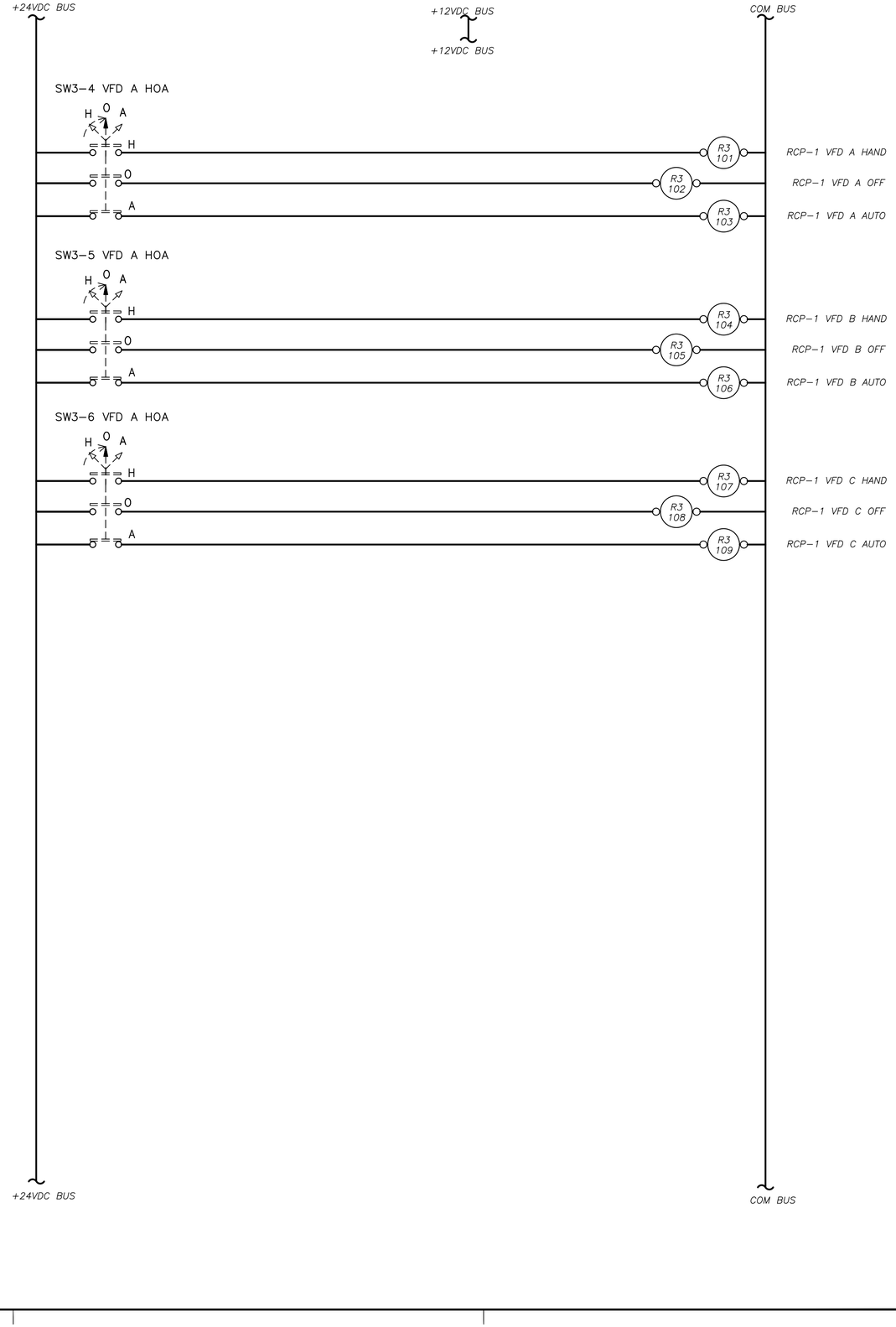
I611

PLOT DATE:1/22/2024



WIRING LEGEND

- WIRING INTERNAL TO PANEL
- WIRING EXTERNAL TO PANEL
- EXTERNAL DEVICE ENCLOSURE



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STATE OF ALASKA 49 TH
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01/04/22
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

OFFICE BUILDING CONTROLS
CPP-2 WIRING AND RCP-1 HOA

REVISION SCHEDULE

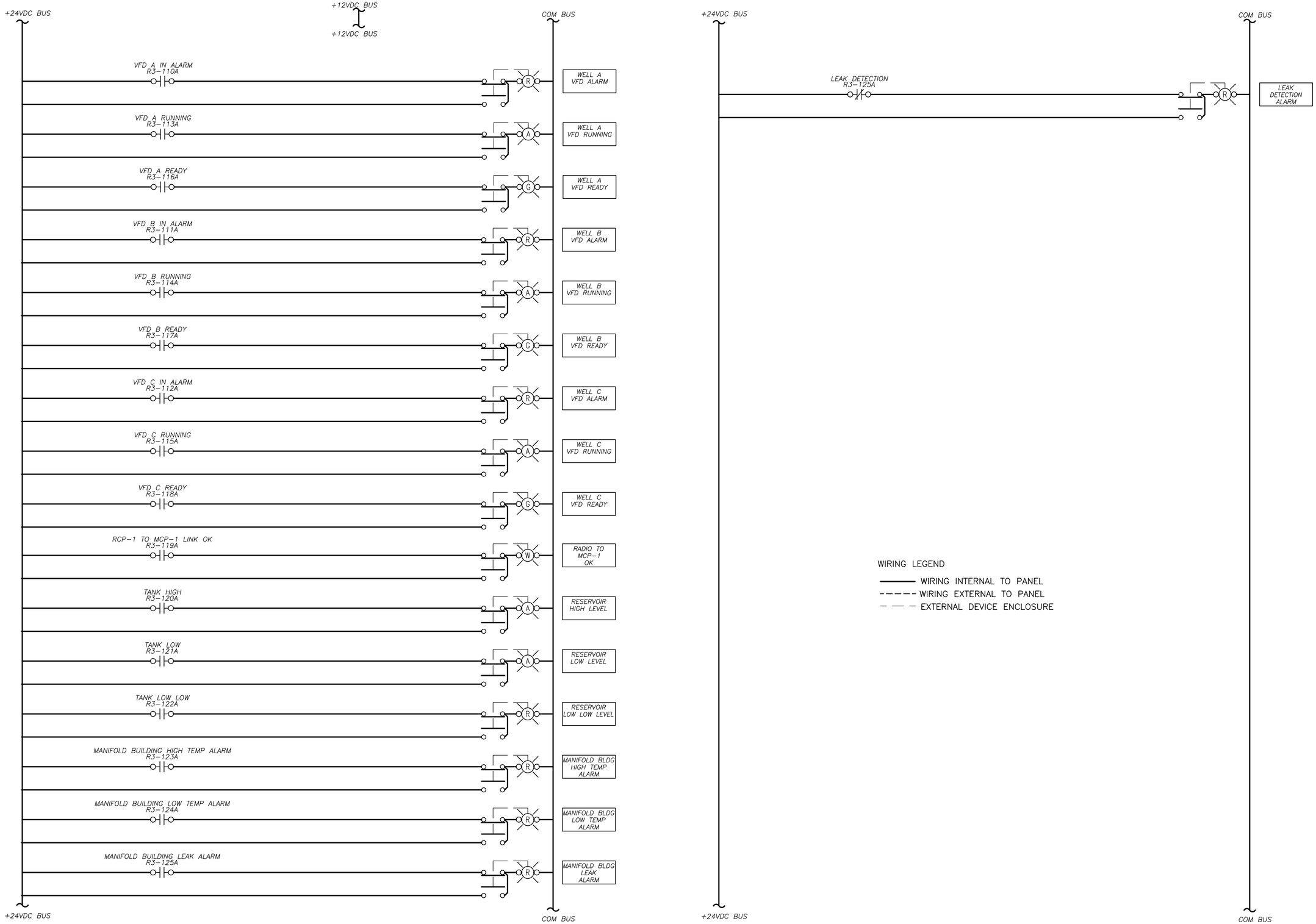
#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I612

PLOT DATE:1/7/2022



PLOT DATE:1/7/2022

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

OFFICE BUILDING CONTROLS
RCP-1 LIGHTS

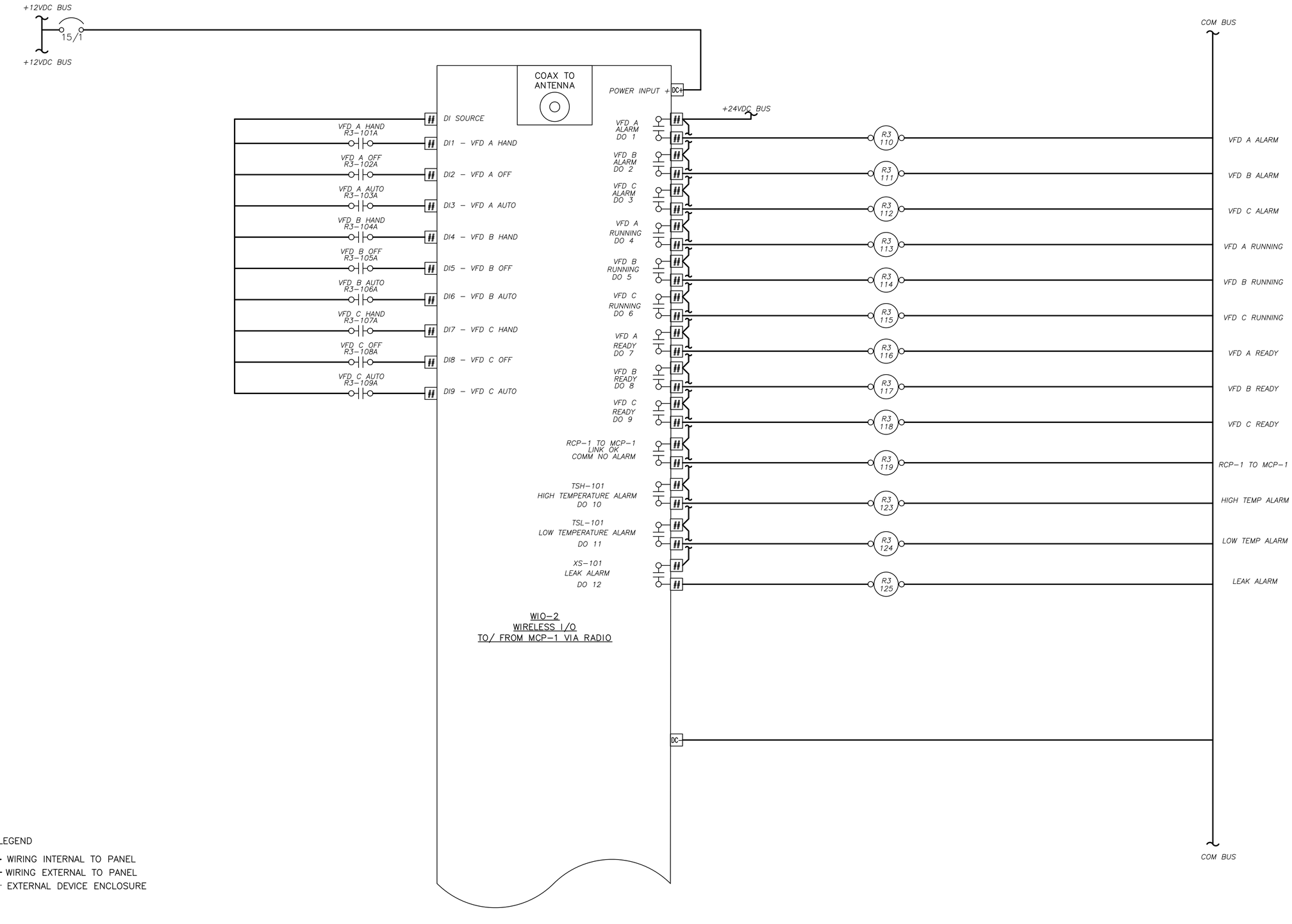
REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I613



WIRING LEGEND

- ——— WIRING INTERNAL TO PANEL
- - - - - WIRING EXTERNAL TO PANEL
- — — — EXTERNAL DEVICE ENCLOSURE

PLOT DATE=1/7/2022

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FINAL DESIGN

VERIFY SCALE

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WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

OFFICE BUILDING CONTROLS RCP-1
DIGITAL RADIO CONNECTION

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

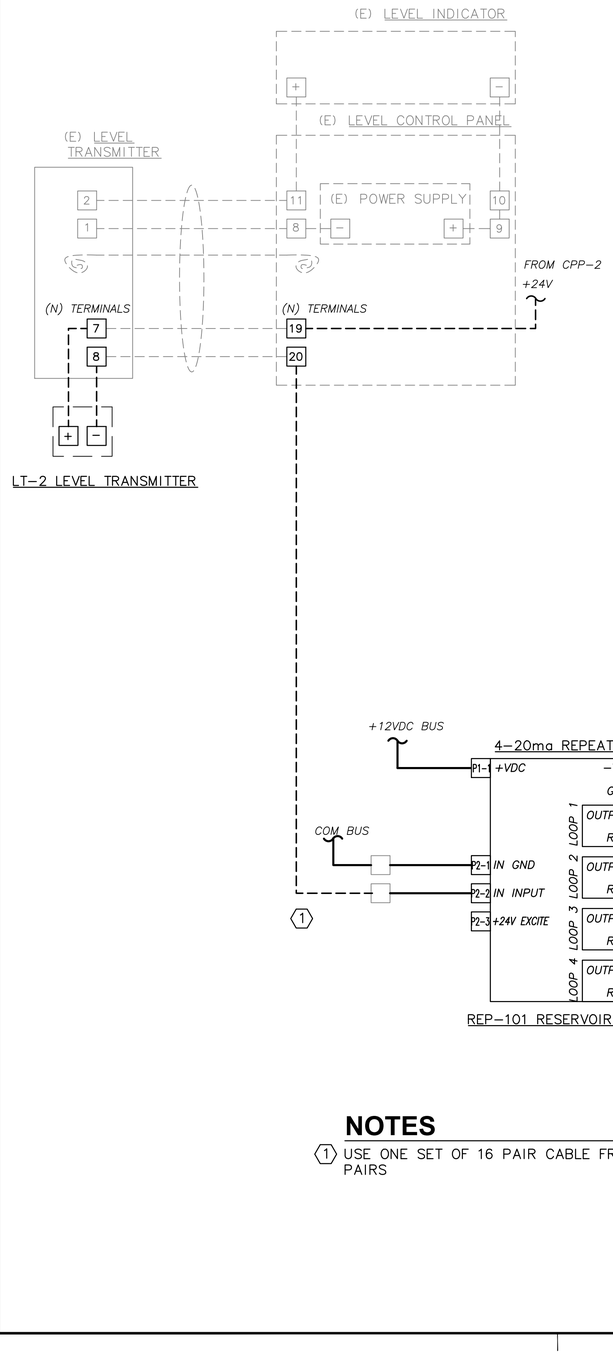
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

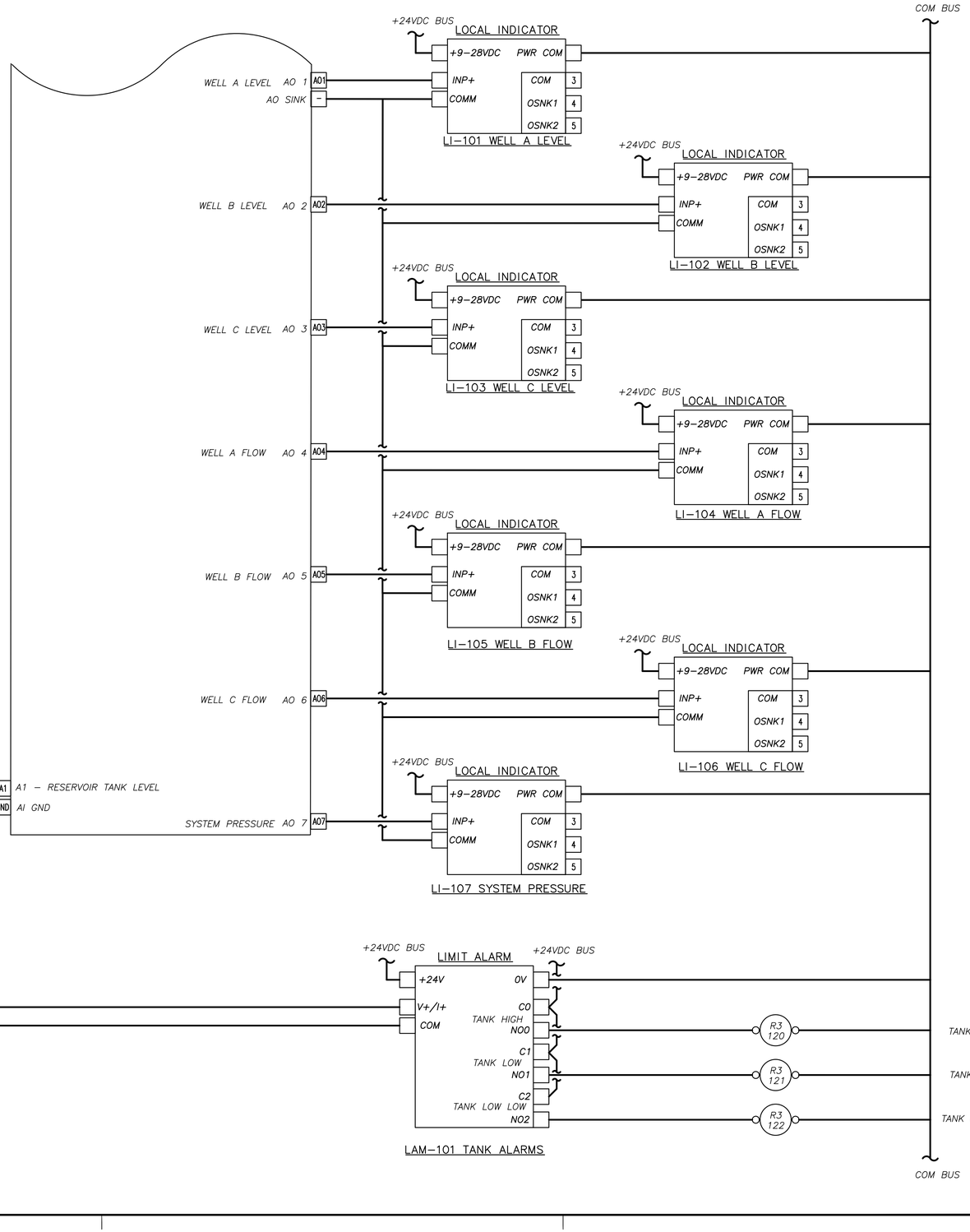
SHEET NO.

I614

WIRING LEGEND

- WIRING INTERNAL TO PANEL
- WIRING EXTERNAL TO PANEL
- EXTERNAL DEVICE ENCLOSURE





NOTES

1. USE ONE SET OF 16 PAIR CABLE FROM EXISTING THREE PAIRS

PLOT DATE:1/7/2022

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WHITTIER, ALASKA
PROJECT No. 20403.14

OFFICE BUILDING CONTROLS RCP-1
ANALOG RADIO CONNECTION

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I615

RCP-1 RELAYS				
RELAY	PURPOSE	CONTACTS	PURPOSE	NOTES
R3-101	RCP-1 VFD A HAND	A	TO RADIO DI1	
		B		
R3-102	RCP-1 VFD A OFF	A	TO RADIO DI2	
		B		
R3-103	RCP-1 VFD A AUTO	A	TO RADIO DI3	
		B		
R3-104	RCP-1 VFD B HAND	A	TO RADIO DI4	
		B		
R3-105	RCP-1 VFD B OFF	A	TO RADIO DI5	
		B		
R3-106	RCP-1 VFD B AUTO	A	TO RADIO DI6	
		B		
R3-107	RCP-1 VFD B HAND	A	TO RADIO DI7	
		B		
R3-108	RCP-1 VFD B OFF	A	TO RADIO DI8	
		B		
R3-109	RCP-1 VFD B AUTO	A	TO RADIO DI9	
		B		
R3-110	VFD A ALARM	A	LIGHT	
		B		
R3-111	VFD B ALARM	A	LIGHT	
		B		
R3-112	VFD C ALARM	A	LIGHT	
		B		
R3-113	VFD A RUNNING	A	LIGHT	
		B		
R3-114	VFD B RUNNING	A	LIGHT	
		B		
R3-115	VFD C RUNNING	A	LIGHT	
		B		
R3-116	VFD A READY	A	LIGHT	
		B		
R3-117	VFD B READY	A	LIGHT	
		B		
R3-118	VFD C READY	A	LIGHT	
		B		
R3-119	MCP-1 TO RCP-1 LINK OK	A	LIGHT	
		B		
R3-120	TANK HIGH	A	LIGHT	
		B		
R3-121	TANK LOW	A	LIGHT	
		B		
R3-122	TANK LOW LOW	A	LIGHT	
		B		
R3-123	TSH-101 HIGH TEMP SWITCH	A	LIGHT	
		B		
R3-124	TSL-101 LOW TEMP SWITCH	A	LIGHT	
		B		
R3-125	XS-101 LEAK ALARM	A	LIGHT	
		B		

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STATE OF ALASKA
49 TH
Ian L. Hofmann
EE-13829
01/04/22
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" ——— 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

OFFICE BUILDING CONTROLS
RCP-1 RELAY SCHEDULE

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I616

PLOT DATE:1/7/2022

LIGHT	STATUS	MEANS	HOW TO FIX	PARTS TO REPLACE
24 VDC CONTROL POWER OK	OFF	24 VDC POWER IS OFF	IF 12 VDC CONTROL POWER LIGHT IS ON, REPLACE 24 VDC POWER SUPPLY IN CPP-2	N/A
			IF 12 VDC CONTROL POWER LIGHT IS OFF, CHECK BREAKER FEEDING CPP-1 AND BREAKER INSIDE CPP-2	N/A
			IF 12 VDC CONTROL POWER LIGHT IS OFF, AND BREAKER FEEDING CPP-120K, REPLACE UPS IN CPP-2.	UPS-2
12 VDC CONTROL POWER OK	OFF	12 VDC POWER IS OFF	IF 24 VDC CONTROL POWER LIGHT IS ON, REPLACE 12 VDC POWER SUPPLY IN CPP-2	N/A
			IF 24 VDC CONTROL POWER LIGHT IS OFF, CHECK BREAKER FEEDING CPP-1 AND BREAKER INSIDE CPP-2	N/A
			IF 24 VDC CONTROL POWER LIGHT IS OFF, AND BREAKER FEEDING CPP-2 OK, REPLACE UPS IN CPP-2.	UPS-2
MANIFOLD BUILDING HIGH TEMPERATURE	ON	BUILDING TEMPERATURE IS TOO HIGH	IF THE BUILDING IS HOT, PROVIDE TEMPORARY COOLING FOR THE BUILDING	N/A
			IF THE BUILDING IS NOT HOT, TURN THE TSH-101 HIGH TEMPERATURE SWITCH DIAL TO 100 DEG F	N/A
			IF THIS DOES NOT RESOLVE THE PROBLEM, CHECK RELAY R4-5 IN MCP-1 AND R3-123 IN RCP-1	R4-5, R3-123
MANIFOLD BUILDING LOW TEMPERATURE	ON	BUILDING TEMPERATURE IS TOO LOW	IF THE BUILDING IS TOO COLD, PROVIDE TEMPORARY HEATING FOR THE BUILDING	N/A
			IF THE BUILDING IS NOT COLD, TURN THE TSL-101 HIGH TEMPERATURE SWITCH DIAL TO 35 DEG F	N/A
			IF THIS DOES NOT RESOLVE THE PROBLEM, CHECK RELAY R4-4 IN MCP-1 AND R3-124 IN RCP-1	R4-4, R3-124
WATER LEAK	ON	WATER SENSOR ON FLOOR DETECTS STANDING WATER	CHECK FLOOR FOR WATER AND PIPES FOR LEAKS	N/A
			IF NO LEAKS ARE IDENTIFIED AND THERE IS FLUID IN THE FLOOR DRAIN, THE LEAK STOPPED.	N/A
			IF NO LEAKS ARE IDENTIFIED , CHECK LEAK SWITCH NEAR FLOR TRANSMITTERS. THE SENSOR HAS A 'MOISUTRE' LED THAT LIGHTS UP RED WHEN MOISTURE IS PRESENT. DRY FLOOD SWITCH AND HIT RESET.	XS-101
MCP-1 COMM OK	OFF	NO COMMUNICATION TO MCP-1	CHECK IF MAIN CONTROL PANEL HAS POWER AND IS FUNCTIONING. IF MAIN CONTROL PANEL HAS NO POWER OR IS MALFUNCTIONING, REFER TO MCP-1 TROUBLESHOOTING. IF MAIN CONTROL PANEL HAS POWER AND IS FUNCTIONAL, CHECK ANTENNAS AT OFFICE BUILDING AND MANIFOLD BUILDING.	N/A
RESERVOIR HIGH LEVEL	ON	RESERVOIR IS AT HIGH LEVEL	CHECK TO CONFIRM NO PUMPS ARE ON. IF NO PUMPS ARE ON, NO ACTION (NORMAL)	N/A
			-IF PUMPS ARE ON, CONFIRM PRESSURE IS NOT HIGH (LESS THEN 110 PSI). IF THE PRESSURE IS LESS THEN 110 PSI, THEN THIS IS NORMAL ACTIVITY. THERE WAS A DEMAND (PRESSURE OR TANK WAS LOW) AND PUMP(S) ARE RUNNING UNTIL THE HIGH STATUS IS REACHED. -IF THERE IS LOW PRESSURE AND HIGH TANK, THE PUMPS WILL STILL BE ENABLED.	N/A
			IF PUMPS ARE ON AND PRESSURE IS HIGH, REFER TO PRESSURE HIGH ALARM	N/A
			CHECK TO CONFIRM AT LEAST ONE PUMPS IS ON. IF AT LEAST ONE PUMP IS ON, NO ACTION (NORMAL)	N/A
			IF NO PUMPS ARE ON, CHECK PRESSURE HIGH IS ON. IF PRESSURE HIGH IS ON, PUMPS SHOULD NOT BE PUMPING. NO ACTION (NORMAL)	N/A
RESERVOIR LOW LEVEL / LOW LOW LEVEL	ON	RESERVOIR IS AT LOW LEVEL	IF PUMPS ARE OFF, AND THERE IS PRESSURE HIGH STATUS, VERIFY HOA SWITCHES AT MCP-1 AND RCP-1 ARE IN AUTO, VFDS HAVE POWER, VFD ALARM LIGHTS ARE OFF.	N/A
			-IF THE SWITCHES ARE IN OFF, THEN THE PUMP WILL NOT RUN (NORMAL) -IF THE SWITCHES ARE IN HAND, THEN THE PUMPS SHOULD BE RUNNING (NORMAL) -IF THE VFDS DO NOT HAVE POWER, VERIFY BREAKERS TO VFDS ARE CLOSED -IF THE VFDS ALARM LIGHTS ARE ON, CHECK VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
			CHECK TO CONFIRM NO PUMPS ARE ON. IF NO PUMPS ARE ON, NO ACTION (NORMAL)	N/A
PRESSURE HIGH	ON	WATER PRESSURE IS HIGH	CHECK TO CONFIRM NO PUMPS ARE ON. IF NO PUMPS ARE ON, NO ACTION (NORMAL)	N/A
			-IF PUMPS ARE STILL ON, ROTATE HOA SWITCH TO OFF TO DISABLE PUMP. VERIFY PUMP IS OFF. - IF VFD FOR THE PUMP IS STILL RUNNING, TURN OFF VFD AT THE VFD LCD. CHECK THE VFD LCD SCREEN IF THE VFD LCD WAS IN MANUAL MODE. - IF THE VFD IS IN MANUAL, PUT THE VFD IN AUTO MODE AND ROTATE HOA TO AUTO. - IF NOT, THE ISSUE IS WITH THE VFD. REFER TO VFD MANUAL REGARDING A VFD RUNNING IN AUTO MODE WHEN NOT ENABLED.	N/A
PRESSURE LOW / PRESSURE LOW LOW	ON	RESERVOIR IS AT LOW LEVEL	CHECK TO CONFIRM AT LEAST ONE PUMP IS ON. IF AT LEAST ONE PUMP IS ON, NO ACTION (NORMAL)	N/A
			IF PUMPS ARE OFF, VERIFY HOA SWITCHES AT MCP-1 AND RCP-1 ARE IN AUTO, VFDS HAVE POWER, VFD ALARM LIGHTS ARE OFF.	N/A
			-IF THE SWITCHES ARE IN OFF, THEN THE PUMP WILL NOT RUN (NORMAL). SOMEONE PUT THE SWITCH IN OFF FOR A REASON, CHECK WITH TEAM PRIOR TO ROTATING TO AUTO.	N/A
			-IF THE VFDS DO NOT HAVE POWER, VERIFY DISCONNECTS TO VFDS ARE CLOSED (IN THE ON POSITION). IF THE DISCONNECT IS IN THE ON POSITION AND THERE IS NO POWER TO THE VFD, GET AN ELECTRICIAN TO REPLACE THE DISCONNECT FUSES	WELL A – 300A FUSES WELL B, C – 200A FUSES
			-IF THE VFDS HAVE POWER AND ALARM LIGHTS ARE ON, CHECK VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
WELL A VFD ALARM	ON	WELL A VFD IS IN ALARM	LOOK AT VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
WELL B VFD ALARM	ON	WELL B VFD IS IN ALARM	LOOK AT VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
WELL C VFD ALARM	ON	WELL C VFD IS IN ALARM	LOOK AT VFD LCD SCREEN FOR ALARM CODE AND REFER TO VFD MANUAL	N/A
ALARM BEACON	ON	ONE OF THE FOLLOWING ALARMS HAS OCCURRED: WELL A VFD ALARM, WELL B VFD ALARM, WELL C VFD ALARM, GENERATOR FAIL, PRESSURE HIGH	REFER TO SPECIFIC ALARM	N/A
ALARM CLAXON	ON			

LIGHT	CONDITION	MEANS
24 VDC CONTROL POWER OK	ON	24 VDC POWER IS OK
12 VDC CONTROL POWER OK	ON	24 VDC POWER IS OK
MCP-1 COMM OK	ON	COMMUNICATION LINK TO MAIN CONTROL PANEL OK
MANIFOLD BUILDING HIGH TEMPERATURE	OFF	MANIFOLD BUILDING TEMPERATURE BELOW 100 DEG F
MANIFOLD BUILDING LOW TEMPERATURE	OFF	MANIFOLD BUILDING TEMPERATURE ABOVE 35 DEG F
WATER LEAK	OFF	NO SIGNIFICANT AMOUNT OF WATER ON THE FLOOR
RESERVOIR HIGH LEVEL	OFF	RESERVOIR IS NOT IN HIGH LEVEL
RESERVOIR LOW LEVEL	OFF	RESERVOIR IS NOT IN LOW LEVEL
RESERVOIR LOW LOW LEVEL	OFF	RESERVOIR IS NOT IN LOW LEVEL
WELL A VFD ALARM	OFF	VFD A DOES NOT HAVE AN ALARM
WELL A VFD RUNNING	OFF	VFD A IS NOT RUNNING
	ON	VFD A IS RUNNING
WELL A VFD READY	OFF	VFD A IS EITHER RUNNING OR HAS AN ALARM
	ON	VFD A IS READY TO RUN
WELL B VFD ALARM	OFF	VFD B DOES NOT HAVE AN ALARM
WELL B VFD RUNNING	OFF	VFD B IS NOT RUNNING
	ON	VFD B IS RUNNING
WELL B VFD READY	OFF	VFD B IS EITHER RUNNING OR HAS AN ALARM
	ON	VFD B IS READY TO RUN
WELL C VFD ALARM	OFF	VFD C DOES NOT HAVE AN ALARM
WELL C VFD RUNNING	OFF	VFD C IS NOT RUNNING
	ON	VFD C IS RUNNING
WELL C VFD READY	OFF	VFD C IS EITHER RUNNING OR HAS AN ALARM
	ON	VFD C IS READY TO RUN
WELL A RUNNING BEACON	OFF	VFD A IS NOT RUNNING
	ON	VFD A IS RUNNING
WELL B RUNNING BEACON	OFF	VFD B IS NOT RUNNING
	ON	VFD B IS RUNNING
WELL C RUNNING BEACON	OFF	VFD C IS NOT RUNNING
	ON	VFD C IS RUNNING
ALARM BEACON	OFF	MCP-1 IS NOT IN ALARM
ALARM CLAXON	OFF	MCP-1 IS NOT IN ALARM

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STATE OF ALASKA
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Ian L. Hofmann
EE-13829
01/04/22
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

OFFICE BUILDING CONTROLS
TROUBLESHOOTING LOGIC

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I617

PLOT DATE:1/7/2022

INSTRUMENT INDEX, CONTROL PANEL COMPONENTS, AND CONTRACTOR PROVIDED SPARES

INSTRUMENT INDEX

TAG	DESCRIPTION	MAKE	MODEL	OR APPROVAL EQUAL?	QTY	COMMENTS
LT-#	WELL LEVEL SENSOR, 2 WIRE	ENDRESS + HAUSER	FMX21-AA211MDE25H+F1LRPOPRPUPW	YES	3	PROVIDE THE FOLLOWING ACCESSORIES: SUSPENSION CLAMP, CABLE MOUNTING SCREWS, ADDITIONAL WEIGHT, CABLE SHORTENING KIT. SENSOR TO BE APPROVED FOR DRINKING WATER AND BE NRTL LISTED PRIOR TO ORDERING CONTRACTOR TO CONFIRM SENSOR CABLE LENGTH AND ORDER SENSOR WITH APPROPIATE LENGTH AS REQUIRED.
PT-#	SYSTEM PRESSURE SENSOR AND TRANSMITTER, 2 WIRE	ENDRESS + HAUSER	PMP51-AA12ID2PGFACJA1+F1HALRMHPA	YES	1	
AE-#	SALINITY SENSOR ELEMENT, 2 WIRE	PHIONICS	ST SERIES, 0-1000 uS/CM	NO	3	VERIFY LENGTH REQUIRED PRIOR TO ORDERING
AL1-#	LIGHT BEACON, AMBER, STEADY	EDWARDS SIGNALLING	125LEDSA24D WITH 125GRD	YES	3	MOUNT ON EXTERIOR POLE
AL2-#	LIGHT BEACON, RED, FLASHING	EDWARDS SIGNALLING	125LEDFR24D WITH 125GRD	YES	1	MOUNT ON EXTERIOR POLE
LT2-#	RESERVOIR LEVEL SENSOR, 2 WIRE	ENDRESS + HAUSER	FMX21-AA211HDE11H+F1LRPOPRPUPW	YES	1	PROVIDE THE FOLLOWING ACCESSORIES: SUSPENSION CLAMP, CABLE MOUNTING SCREWS, ADDITIONAL WEIGHT, CABLE SHORTENING KIT. SENSOR TO BE APPROVED FOR DRINKING WATER AND BE NRTL LISTED PRIOR TO ORDERING CONTRACTOR TO CONFIRM SENSOR CABLE LENGTH AND ORDER SENSOR WITH APPROPIATE LENGTH AS REQUIRED.
HRN-#	ALARM CLAXON	EDWARDS SIGNALLING	868-AQ WITH 869-WPB BACK BOX	YES	1	MOUNT ON EXTERIOR POLE
FIT-10#	WELL A FLOW METER - 6" MAG METER WITH TRANSMITTER	ABB	FEV121.150.V.1.S.1.A1.B.1.A.1.A.2.A.3.B.4.A.1-M5.V0.CWC.T3	YES	3	<1% ERROR OVER 700 GPM TO 850 GPM RANGE, FIT-103 FOR FUTURE USE
TS#-#	TEMPERATURE SWITCH	COLUMBUS ELECTRIC	ETD9STGS	YES	2	TSL CLOSES ON LOW TEMP, TSH CLOSES AT HIGH TEMP. COORDINATE WITH PANEL WIRING.
VFD-#	VFD FOR WELL PUMP	ALLEN BRADLEY	CSB-24G163D156LNDCNNNNN-P51-HD-A-P0-A-A-N-B-D-A-A-N-B-D-N-B1-ENG	NO	3	VFD-C FOR FUTURE USE
XS-#	LEAK DETECTION SWITCH	DIVERSITECH	WS-1	YES	1	

Panel	TAG	DESCRIPTION	MAKE	MODEL	OR APPROVAL EQUAL?	Qty	COMMENTS
MCP-1	N/A	15 AMP SINGLE POLE BREAKER - UL 489	ALLEN BRADLEY	1489-M1C150	YES	9	RATED TO 10 KAIC
	N/A	PANEL ENCLOSURES - VARIOUS SIZES	HOFFMAN	VARIOUS SIZES - NEMA 12	YES	1	CONTRACTOR TO SIZE AS REQUIRED
	WIO-#	WIRELESS I/O SYSTEM - MAIN MODULE	SYNETCOM	DIN-S-9	NO	1	
		WIRELESS I/O SYSTEM - MULTI MODULE	SYNETCOM	DIN-IO-1	NO	2	
		WIRELESS I/O SYSTEM - DI MODULE	SYNETCOM	DIN-IO-4	NO	1	CONTRACTOR TO COORDINATE WITH VENDOR TO DETERMINE APPROPIATE LENGTH AND INSTALLATION OF COAXIAL CABLE AND ANTENNA. ALL ACCESSORIES FOR THE WIRELESS I/O SYSTEM MUST BE BOUGHT FROM SYNETCOM TO ENSURE A COMPLETE SYSTEM.
		WIRELESS I/O SYSTEM - DO MODULE	SYNETCOM	DIN-IO-5	NO	1	
		WIRELESS I/O SYSTEM - AI MODULE	SYNETCOM	DIN-IO-2	NO	1	
		WIRELESS I/O SYSTEM - AO MODULE	SYNETCOM	DIN-IO-3	NO	1	
		WIRELESS I/O SYSTEM - ACCESSORIES	SYNETCOM	DIRECTIONAL ANTENNA, COAX CABLE, CONNECTIONS	NO	1	
	R3-#	THREE POLE DOUBLE THROW RELAY 24 VDC COIL	OMRON	MKS3PIN-D 24VDC	YES	55	WITH MECHANICAL INDICATOR , LOCKABLE TEST BUTTON, LED INDICATOR, DIODE, BASE
	R4-#	FOUR POLE DOUBLE THROW RELAY 24 VDC COIL	PHOENIX CONTACT	REL-IR4/LDP- 24DC/4X21	YES	3	WITH MECHANICAL INDICATOR , LOCKABLE TEST BUTTON, LED INDICATOR, DIODE, BASE
	TD#-#	TIME DELAY DOUBLE POLE DOUBLE THROW RELAY 12/24 VDC COIL	DAYTON	5DRA3	YES	4	PROVIDE WITH BASE
	REP-#	QUAD OUTPUT 4-20MA SPLITTER/RETRANSMITTER	LAUREL ELECTRONICS	QLS-2	NO	11	
	LAM-#	LIMIT ALARM MODULE, AI INPUT FOUR RELAY OUTPUT	AUTOMATION DIRECT	FC-3RLY4	NO	2	
	LI-#	LOCAL INDICATOR WITH DUAL SINKING OUTPUT CARD	REDLION	CUB5PB00 WITH CUB5SNK0	NO	11	
	DR-#	DATA RECORDER	ENDRESS + HAUSER	MEMOGRAPH M, RSG45	NO	1	WITH TELEALARM SOFTWARE, AND CAPACITY FOR AT LEAST TWENTY 4-20 MA INPUTS, TEN DIGITAL INPUTS, AND SIX DRY CONTACT OUTPUTS CONTRACTOR TO CONFIGURE GRAPHING AND DATA LOGGING FOR DATA POINTS AS SHOWN ON SHEET I102, DETAIL 3, AND FOUR ADDITIONAL DATA POINTS . CONTRACTOR TO CONFIGURE TELEALARM SOFTWARE FOR TEN UNIQUE ALARM SCENARIOS
	AR-#	TRIPLEX ALTERNATING RELAY	MACROMATIC	ATP024A7R WITH SD12-PC SOCKET	NO	1	
	PB1-#	MOMENTARY PUSHBUTTON, NO, LOCKABLE COVER	ALLEN BRADLEY	800TC-A6 WITH 800H-N163	YES	1	MOUNT KEY WITH CHAIN ON PANEL. PROVIDE SPARE KEY, LABELED, INSIDE PANEL ENCLOSURE
	SW3-#	THREE POSITION HOA SWITCH	ALLEN BRADLEY	800HC-JR2KC1B	YES	3	OFF POSITION IS WIRED TO A RELAY IN THE PANEL
	SW2-#	TWO POSITION SWITCH, DOUBLE THROW, LOCKABLE COVER	ALLEN BRADLEY	800TC-H2B WITH 800H-N163	YES	1	MOUNT KEY WITH CHAIN ON PANEL. PROVIDE SPARE KEY, LABELED, INSIDE PANEL ENCLOSURE
	SW2A-#	TWO POSITION SWITCH, SINGLE THROW	ALLEN BRADLEY	800TC-H2A	YES	1	MOUNT ON PANEL BACKPLANE
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, AMBER, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW25B5	YES	12	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 12VDC,	ALLEN BRADLEY	800T-QH2W	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, GREEN, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW23B5	YES	6	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW21B5	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 24VAC/DC	SCHNEIDER	XB4FVB1	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 120VAC	SCHNEIDER	XB4FVG1	YES	0	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, RED, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW24B5	YES	16	

Panel	TAG	DESCRIPTION	MAKE	MODEL	OR APPROVAL EQUAL?	Qty	COMMENTS
RCP-1	N/A	15 AMP SINGLE POLE BREAKER - UL 489	ALLEN BRADLEY	1489-M1C150	YES	3	RATED TO 10 KAIC
	N/A	PANEL ENCLOSURES - VARIOUS SIZES	HOFFMAN	VARIOUS SIZES - NEMA 12	YES	1	CONTRACTOR TO SIZE AS REQUIRED
	WIO-#	WIRELESS I/O SYSTEM - MAIN MODULE	SYNETCOM	DIN-S-9	NO	1	
		WIRELESS I/O SYSTEM - MULTI MODULE	SYNETCOM	DIN-IO-1	NO	2	
		WIRELESS I/O SYSTEM - DI MODULE	SYNETCOM	DIN-IO-4	NO	1	CONTRACTOR TO COORDINATE WITH VENDOR TO DETERMINE APPROPIATE LENGTH AND INSTALLATION OF COAXIAL CABLE AND ANTENNA. ALL ACCESSORIES FOR THE WIRELESS I/O SYSTEM MUST BE BOUGHT FROM SYNETCOM TO ENSURE A COMPLETE SYSTEM.
		WIRELESS I/O SYSTEM - DO MODULE	SYNETCOM	DIN-IO-5	NO	1	
		WIRELESS I/O SYSTEM - AI MODULE	SYNETCOM	DIN-IO-2	NO	1	
		WIRELESS I/O SYSTEM - AO MODULE	SYNETCOM	DIN-IO-3	NO	1	
		WIRELESS I/O SYSTEM - ACCESSORIES	SYNETCOM	DIRECTIONAL ANTENNA, COAX CABLE, CONNECTIONS	NO	1	
	R3-#	THREE POLE DOUBLE THROW RELAY 24 VDC COIL	OMRON	MKS3PIN-D 24VDC	YES	25	WITH MECHANICAL INDICATOR , LOCKABLE TEST BUTTON, LED INDICATOR, DIODE, BASE
	REP-#	QUAD OUTPUT 4-20MA SPLITTER/RETRANSMITTER	LAUREL ELECTRONICS	QLS-2	NO	1	
	LAM-#	LIMIT ALARM MODULE, AI INPUT FOUR RELAY OUTPUT	AUTOMATION DIRECT	FC-3RLY4	NO	1	
	LI-#	LOCAL INDICATOR WITH DUAL SINKING OUTPUT CARD	REDLION	CUB5PB00 WITH CUB5SNK0	NO	8	
	SW3-#	THREE POSITION HOA SWITCH	ALLEN BRADLEY	800HC-JR2KC1B	YES	3	OFF POSITION IS WIRED TO A RELAY IN THE PANEL
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, AMBER, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW25B5	YES	5	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, GREEN, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW23B5	YES	3	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW21B5	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 24VAC/DC	SCHNEIDER	XB4FVB1	YES	2	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, RED, 24VDC, PUSH TO TEST	SCHNEIDER	XB4BW24B5	YES	8	

Panel	TAG	DESCRIPTION	MAKE	MODEL	OR APPROVAL EQUAL?	QTY	COMMENTS
CPP-1	UPS-#	850VA/510W UPS WITH BATTERIES	SOLA/HEVI-DUTY	SDU 850	YES	1	PROVIDE WITH BATTERIES
	PS12-#	12 VDC POWER SUPPLY	SOLA/HEVI-DUTY	SDN 16-12-100P	YES	1	
	PS24-#	24 VDC POWER SUPPLY	SOLA/HEVI-DUTY	SDN 10-24-100P	YES	1	
	SA-#	SURGE ARRESTOR	DEHNGUARD	1P120R	YES	1	
	N/A	15 AMP SINGLE POLE BREAKER - UL 489	ALLEN BRADLEY	1489-M1C150	YES	6	RATED TO 10 KAIC
	N/A	PANEL ENCLOSURES - VARIOUS SIZES	HOFFMAN	VARIOUS SIZES - NEMA 12	YES	1	CONTRACTOR TO SIZE AS REQUIRED
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 12VDC,	ALLEN BRADLEY	800T-QH2W	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 24VAC/DC	SCHNEIDER	XB4FVB1	YES	2	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 120VAC	SCHNEIDER	XB4FVG1	YES	1	
	TR-#	96 VA CLASS 2 TRANSFORMER, 120VAC TO 24 VAC	DAYTON	4VZF8	YES	1	

Panel	TAG	DESCRIPTION	MAKE	MODEL	OR APPROVAL EQUAL?	QTY	COMMENTS
CPP-2	UPS-#	850VA/510W UPS WITH BATTERIES	SOLA/HEVI-DUTY	SDU 850	YES	1	PROVIDE WITH BATTERIES
	PS12-#	12 VDC POWER SUPPLY	SOLA/HEVI-DUTY	SDN 16-12-100P	YES	1	
	PS24-#	24 VDC POWER SUPPLY	SOLA/HEVI-DUTY	SDN 10-24-100P	YES	1	
	SA-#	SURGE ARRESTOR	DEHNGUARD	1P120R	YES	1	
	N/A	15 AMP SINGLE POLE BREAKER - UL 489	ALLEN BRADLEY	1489-M1C150	YES	5	RATED TO 10 KAIC
	N/A	PANEL ENCLOSURES - VARIOUS SIZES	HOFFMAN	VARIOUS SIZES - NEMA 12	YES	1	CONTRACTOR TO SIZE AS REQUIRED
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 12VDC,	ALLEN BRADLEY	800T-QH2W	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 24VAC/DC	SCHNEIDER	XB4FVB1	YES	1	
	N/A	CONTROL PANEL INDICATOR LIGHT, LED, WHITE, 120VAC	SCHNEIDER	XB4FVG1	YES	1	

TAG	MAKE	MODEL	CONTRACTOR PROVIDED SPARES
PS12-#	SOLA/HEVI-DUTY	SDN 16-12-100P	1
PS24-#	SOLA/HEVI-DUTY	SDN-10-24-100P	1
SA-#	DEHNGUARD	1P120R	1
N/A	ALLEN BRADLEY	1489-M1C150	1
R3-#	OMRON	MKS3PIN-D 24VDC	2
R4-#	PHOENIX CONTACT	REL-IR4/LDP- 24DC/4X21	1
TDRO-#	DAYTON	5DRA3	1
REP-#	LAUREL ELECTRONICS	QLS-2	1
LAM-#	AUTOMATION DIRECT	FC-3RLY4	1
LI-#	REDLION	CUB5PB00 WITH CUB5SNK0	1
AR-#	MACROMATIC	ATP024A7R WITH SD12-PC SOCKET	1
PB1-#	ALLEN BRADLEY	800TC-A6 WITH 800H-N163	1
SW3-#	ALLEN BRADLEY	800HC-JR2KC1B	1
SW2-#	ALLEN BRADLEY	800TC-H2B WITH 800H-N163	1
SW2A-#	ALLEN BRADLEY	800TC-H2A	1
N/A	SCHNEIDER	XB4BW25B5	1
N/A	ALLEN BRADLEY	800T-QH2W	1
N/A	SCHNEIDER	XB4BW23B5	1
N/A	SCHNEIDER	XB4FVB1	1
N/A	SCHNEIDER	XB4FVG1	1
N/A	SCHNEIDER	XB4BW24B5	1
TS#-#	COLUMBUS ELECTRIC	ETD9STGS	1
XS-#	DIVERSITECH	WS-1	1

1 INSTRUMENT INDEX, CONTROL PANEL COMPONENTS, AND CONTRACTOR PROVIDED SPARES

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECL882-AK

STATE OF ALASKA
49 TH
Ian L. Hofmann
EE-13829
01/04/22
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE
BAR REPRESENTS 1" ON ORIGINAL DRAWING
0" 1"
IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE
WHITTIER, ALASKA
PROJECT No. 20403.14

INSTRUMENT INDEX AND OVERALL PANEL BOM

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

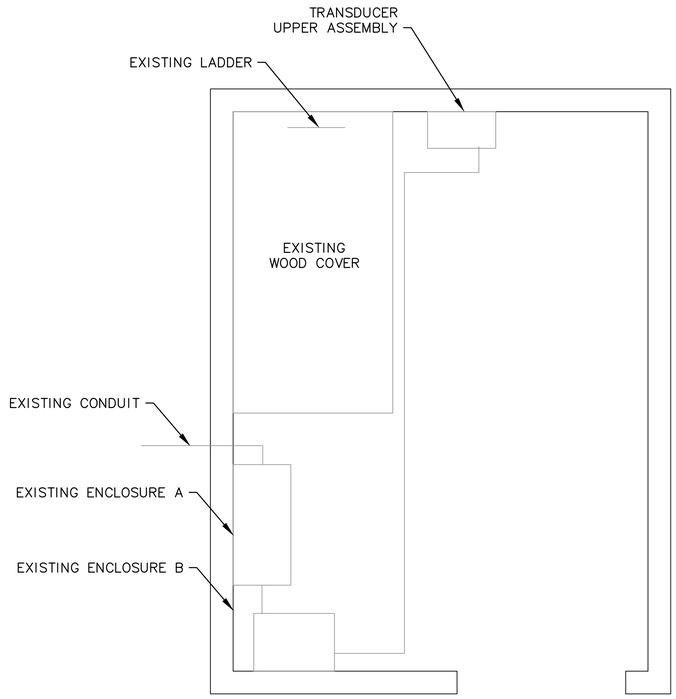
PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.
I618

PLOT DATE:1/7/2022

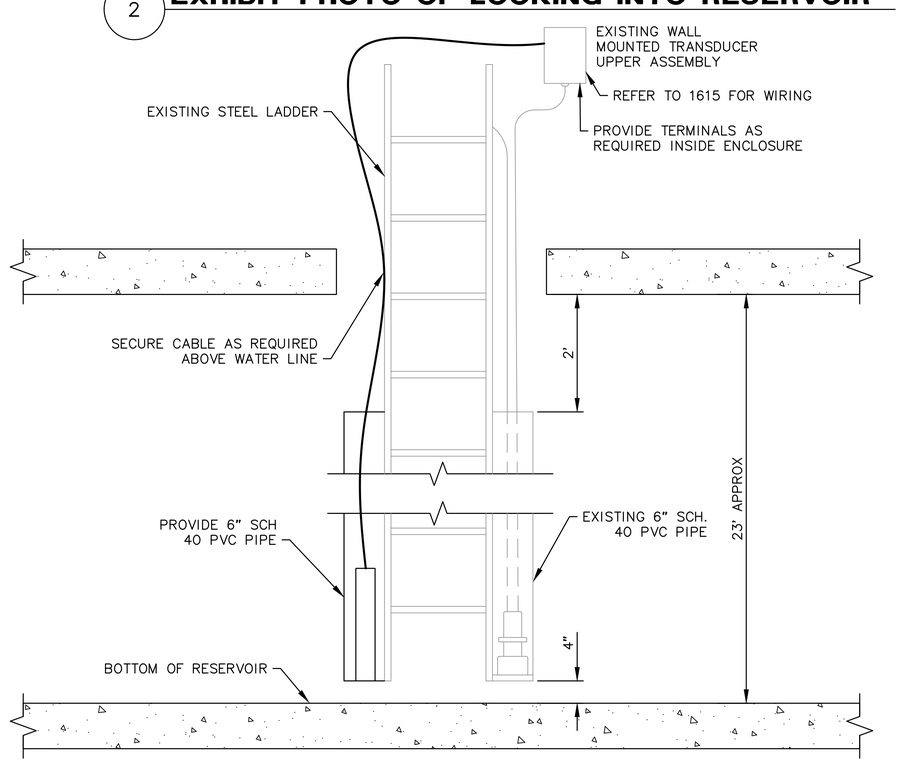
1 EXHIBIT PHOTO OF RESERVOIR TOPSIDE

2 EXHIBIT PHOTO OF LOOKING INTO RESERVOIR



3 RESERVOIR BUILDING FLOOR PLAN

NTS



4 TRANSDUCER CONNECTION

NTS

CRW ENGINEERING GROUP LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
#AECC262-AK

STATE OF ALASKA
49 TH
Ian L. Hofmann
EE-13829
01/04/22
REGISTERED PROFESSIONAL ENGINEER

FINAL DESIGN

VERIFY SCALE

BAR REPRESENTS 1" ON ORIGINAL DRAWING

0" 1"

IF BAR IS NOT 1", ADJUST DRAWING SCALE ACCORDINGLY

WHITTIER WELL FIELD UPGRADE

WHITTIER, ALASKA
PROJECT No. 20403.14

WATER RESERVOIR
INSTRUMENT DETAILS

REVISION SCHEDULE

#	DESCRIPTION	DATE
0	IFC	12/21

PROJECT NO.	20403.14
DATE	DEC 2021
DRAWN	ILH
DESIGNED	ILH
REVIEWED	ILH

SHEET NO.

I619

PLOT DATE=1/7/2022