TOWN OF KEARNY

WELL 4 SITE IMPROVEMENTS

VOLUME 3 of 3:

Design Drawings

FINAL DESIGN SUBMITTAL

May 2026

EXPIRATION DATE: 06/30/2028

202 E Earll Drive, Ste 110, Phoenix, AZ 85012
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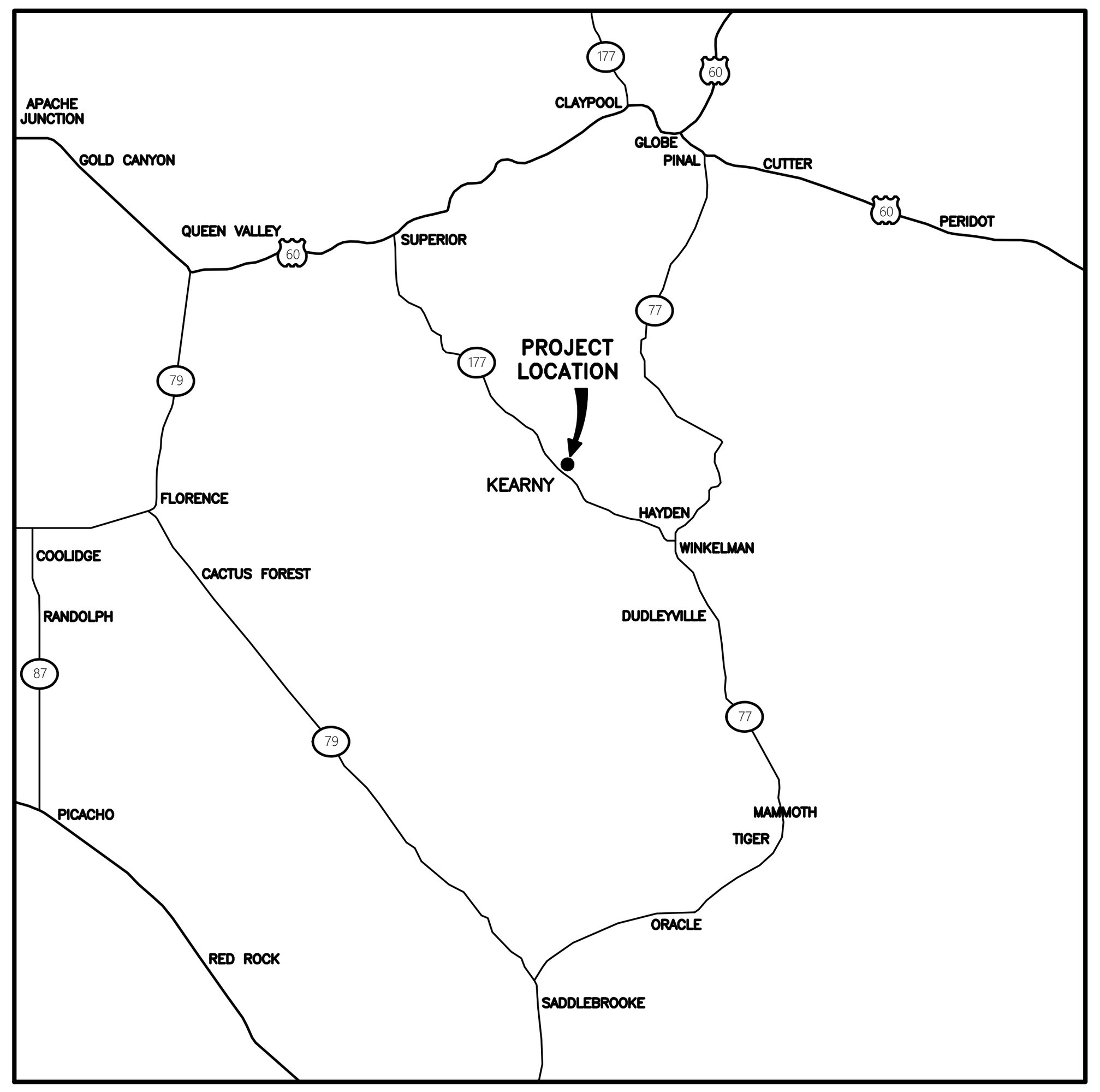
TOWN OF KEARNY

WELL SITE 4 IMPROVEMENTS

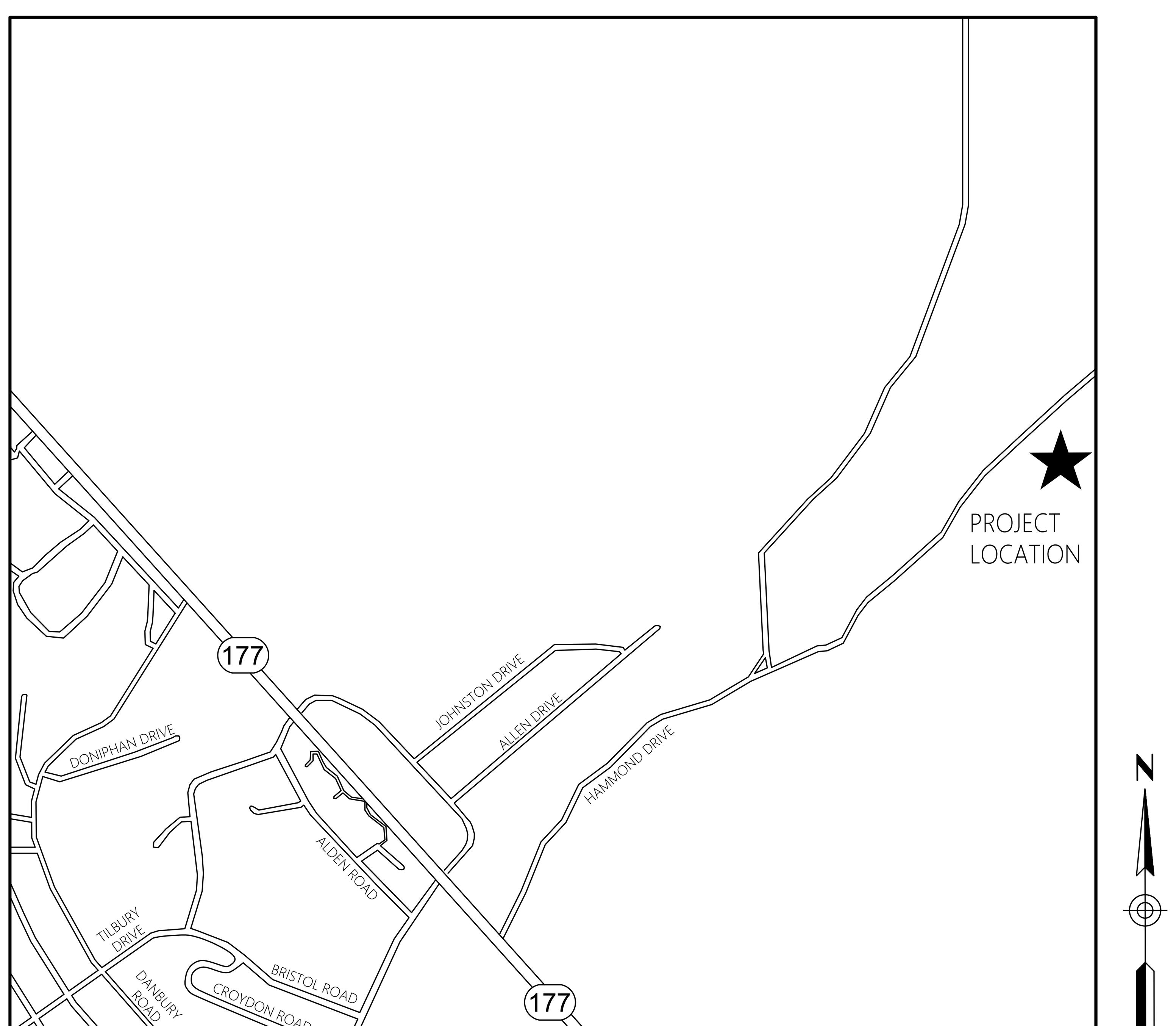
MAY 2026
100% SUBMITTAL



LOCATION MAP
SCALE: NTS

PARCEL NO.: APN 301-09-027B

PROJECT DESCRIPTION: NE SW SW OF SW OF SEC 23-4S-14E 2.50 AC



VICINITY MAP
SCALE: NTS

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TOWN OF KEARNY, AZ
WELL SITE 4 IMPROVEMENTS

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40714
BRIAN A. HAMRICK
ARIZONA, U.S.A.
EXPIRATION DATE: 06/30/2028

Drawn By:	BSW/JAH
Designed By:	BSW/KJA
Approved By:	BH
Client Project No.	
Project No.	0729
Sheet No.	G-01

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE MOST CURRENT UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION AS FURNISHED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS. ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THIS AMENDED SPECIFICATIONS AND DETAILS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
2. CONTRACTOR TO OBTAIN ANY PERMITS REQUIRED UNLESS OTHERWISE INDICATED. THE CONTRACTOR IS ADVISED THAT AN EXCAVATIONS AND DIRT MOVING PERMIT MAY BE REQUIRED BY THE PINAL COUNTY ENVIRONMENTAL SERVICES DEPARTMENT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THIS PERMIT, IF NECESSARY, AND COMPLY WITH ITS REQUIREMENTS.
3. CONTRACTOR TO COORDINATE ALL DRIVEWAY LOCATIONS, AND REMOVAL OR RESETS OF PRIVATE PROPERTY ON ALL STREETS WITH OWNERS AND UTILITY'S INSPECTOR.
4. THE CONTRACTOR SHALL COORDINATE WORK SCHEDULES WITH PIMA UTILITY COMPANY AND TRAFFIC CREWS SO AS TO PREVENT ANY CONFLICTING WORK CONDITIONS.
5. EXISTING PIPING, ELECTRICAL, AND UTILITIES ARE BASED ON EXISTING RECORDS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF ALL EXISTING PIPING, ELECTRICAL, AND UTILITIES AND AVOIDING DAMAGE TO THE SAME. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL CONTACT BLUE STAKE. NOTE: BLUE STAKE DOES NOT STAKE SEWER SERVICES. CONTRACTOR SHALL CONFIRM LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION AND SHALL BE RESPONSIBLE FOR:
   a. DAMAGE WORK TO SUCH UTILITIES CAUSED AS A RESULT OF THE WORK.
   b. DAMAGES TO EXISTING WALKS, WALLS, CURBS, PAVEMENTS AND TREES, ETC.
7. CONTRACTOR TO POTHOLE EXISTING UTILITIES AHEAD OF CONSTRUCTION, TO ALLOW FOR ANY NECESSARY ADJUSTMENT IN GRADE LINE AND TO VERIFY PIPE TYPES FOR ORDERING PROPER TRANSITION, AND/OR TIE-IN FITTINGS WHICH MAY BE REQUIRED.
8. CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL PLANS FOR DEMOLITION ITEMS.
9. ALL UTILITIES SHALL BE PROTECTED FROM DAMAGE AS A RESULT OF THE WORK. THE CONTRACTOR SHALL RELOCATE, REPAIR OR REPLACE AT HIS EXPENSE, ANY AFFECTED UTILITIES TO THE SATISFACTION OF THE UTILITIES OR THE CITY OF PHOENIX.
10. PROVIDE TEMPORARY THRUST RESTRAINT FOR EXISTING PIPING WHENEVER THE WORK REQUIRES. CONTRACTOR TO REPLACE OR RESTORE THE EXISTING RESTRAINT SYSTEM TO LIKE-NEW CONDITION.
11. CONTRACTOR SHALL PROTECT THE ADJACENT PROPERTY AND IMPROVEMENTS THERETO FROM ANY DAMAGE DURING CONSTRUCTION. ANY DAMAGE TO ADJACENT PROPERTY OR IMPROVEMENTS MUST BE REPAIRED OR REPLACED TO THE PROPERTY OWNER'S SATISFACTION, AT THE CONTRACTOR'S EXPENSE.
12. DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATION TO BE DETERMINED BASED UPON EQUIPMENT MANUFACTURER SELECTED.
13. WHERE INDICATED, DIMENSIONS AND ELEVATIONS TO BE FIELD VERIFIED.
14. EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED FOR DELIVERY TO THE OWNER WILL BE MARKED BY ENGINEER PRIOR TO WORK, UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS. CONTRACTOR TO REMOVE AND PROPERLY STORE SALVAGED EQUIPMENT ON THE SITE.
15. CONTRACTOR TO MAINTAIN ACCESS TO EXISTING FACILITIES FOR MAINTAINING OPERATIONS DURING CONSTRUCTION. IF THE WORK REQUIRES INTERRUPTION OF EXISTING ACCESS TO OPERATING FACILITIES, THE CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS (APPROVED BY TOWN OF KEARNY) TO THESE FACILITIES.
16. THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLES, VALVE BOXES, CLEANOUTS, BLIND FLANGED PIPING, AND FIRE HYDRANTS WITHIN WORK LIMITS REQUIRED TO MATCH PROPOSED FINAL GRADE.
17. GOVERNING BUILDING CODES:
    2018 INTERNATIONAL BUILDING CODE (IEC)
    2017 NATIONAL ELECTRICAL CODE (NEC)
    2018 UNIFORM PLUMBING CODE (UPC)
    2018 INTERNATIONAL FIRE CODE
18. CONTRACTOR TO MAINTAIN ACCESS FOR EMERGENCY RESPONSE VEHICLES DURING CONSTRUCTION.
19. CONTRACTOR SHALL COORDINATE WORK SCHEDULES WITH OWNER SO AS TO PREVENT ANY CONFLICTING WORK CONDITIONS. LOCATIONS OF TEMPORARY FACILITIES, PARKING, ETC. SHALL BE COORDINATED WITH OWNER. FOR WORK IN THE RIGHT OF WAY, CONTRACTOR SHALL COORDINATE WITH THE OWNER AND MARICOPA COUNTY.
20. CONTRACTOR SHALL PROVIDE TEMPORARY SAFETY AND SECURITY FENCING AND SITE IMPROVEMENTS AS NEEDED AT NO EXTRA COST.
21. CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT LEAST WEEKLY BY THE CONTRACTOR. KEEP SITE AREA CLEAN.
22. EXCAVATED SOIL IS TO BE USED TO FILL IN LOW SPOTS PRIOR TO BEING HAULED OFF SITE. CONTRACTOR SHALL ESTABLISH A SUITABLE STAGING AREA FOR STORAGE OF EXCAVATED SOIL.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY AT THE SITE WHILE CONSTRUCTION IS IN PROGRESS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE PUBLIC FROM ANY HAZARDS ARISING FROM CONSTRUCTION OPERATIONS AND PROTECTING EXISTING AND NEW IMPROVEMENTS FROM DAMAGE DUE TO ACCIDENT OR VANDALISM.
24. PROPERTY LINES AND DIMENSIONS FOR THE SITE ARE BASED ON PINAL COUNTY ASSESSOR MAPS.
25. IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NSF INTERNATIONAL STANDARD 60 AND 61.
26. REFER TO PROJECT SPECIFICATION FOR MAG DETAILS REFERRED TO IN THE DRAWINGS.
27. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
28. COORDINATES AND DIMENSIONS SHOWN FOR ROADWAY IMPROVEMENTS ARE TO FACE OF CURB OR EDGE OF PAVEMENT.
29. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
30. UNLESS SHOWN ON THE GRADING & DRAINAGE DRAWINGS, ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE OR GRAVEL SURFACE SHALL BE GRADED SMOOTH AND COMPACTED AS SPECIFIED.
31. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. EROSION CONTROL DEVICES, SILT FENCING, RUNOFF CONTAINMENT BERMS, AND STRAW BALES ARE THE MINIMUM REQUIRED.
32. CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE.
33. WHERE WATERLINES, RECLAIMED WATERLINES OR SANITARY SEWER LINES (NEW OR EXISTING) CROSS OVER OR UNDER EACH OTHER WITHIN THE RIGHT OF WAY, SEPARATION DISTANCES AND/OR PIPE LINE ENCASEMENTS SHALL BE PROVIDED AS NECESSARY IN ACCORDANCE WITH MAG DETAIL 404.

ADEQ NOTES

1. DISINFECTION SHALL BE COMPLETED PER THE REQUIREMENTS OF MAG SECTION 611, CONTRACTOR SHALL PROVIDE COPIES OF DISINFECTION TESTING RESULTS FROM AN ARIZONA STATE ACCREDITED LABORATORY TO SHOW THAT DISINFECTION HAS BEEN COMPLETED IN COMPLIANCE WITH ADEQ REQUIREMENTS.
2. NEW WATER SYSTEM COMPONENTS, INCLUDING PIPE, VALVES, FITTINGS, AND EQUIPMENT SHALL NOT BE PUT INTO SERVICE UNTIL DISINFECTION HAS BEEN COMPLETED IN ACCORDANCE WITH ENGINEERING BULLETIN NO. 8, AAC R9-8-266.B OR AWWA C652-92.
3. PRESSURE AND LEAKAGE TESTING SHALL BE COMPLETED PER THE REQUIREMENTS OF MAG SECTION 611 , PRESSURE AND LEAKAGE TESTING. TESTS SHALL BE WITNESSED BY THE ENGINEER AND/OR OWNER AND COPIES OF THE TESTING RESULTS SHALL BE PROVIDED TO THE ENGINEER.
4. IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODE (A.A.C). R18-5-504, ALL CONSTRUCTION MATERIALS SHALL BE LEAD FREE.
5. ALL COMPONENTS THAT ARE USED FOR DRINKING WATER MUST BE NSF 60 AND 61 CERTIFIED FOR USE IN POTABLE WATER APPLICATIONS.

CONSTRUCTION NOTES

1. ALL ABOVE GROUND PIPING AND FITTINGS TO BE CLASS 350 DUCTILE IRON PIPE, FLANGED, CEMENT MORTAR LINED AND COATED PER AWWA C115 AND C110, CLASS 125 FLANGES
2. BELOW GROUND PIPING AND FITTINGS TO BE CLASS 350 MECHANICAL JOINT, RESTRAINED WHERE INDICATED ON PLANS AND POLYETHYLENE WRAPPED PER MAG 303.
3. ALL ABOVE GROUND FITTINGS TO BE CAST IRON.

LEGEND (LINE-TYPES, HATCHES)

CONCRETE

CONTOUR LINE — 100

DIRT ROAD LIMITS (EXISTING)

DIRT ROAD LIMITS (NEW)

FEMA FLOOD PLAIN LIMITS

FENCING (EXISTING) — X — X —

FENCING (NEW)

NORTH ARROW

ABBREVIATIONS

ABC	AGGREGATE BASE COURSE
ADEQ	ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
APN	ARIZONA PARCEL NUMBER
AWWA	AMERICAN WATER WORKS ASSOCIATION
BE	BASE ELEVATION
Cl_2	CHLORINE
DET	DETAIL
E	EAST
EW	EACH WAY
FG	FINISHED GRADE
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
IE	INVERT ELEVATION
L	LENGTH
LHC	LAKE HAVASU CITY
MAG	MARICOPA ASSOCIATION OF GOVERNMENTS
MIN	MINIMUM
N	NORTH
NTS	NOT TO SCALE
NSF	NATIONAL SANITATION FOUNDATION
OC	ON-CENTER
OD	OUTSIDE DIAMETER
OE	OVERHEAD ELECTRIC
PE	PLAIN END
PO	PUMP-OUT
RW	RAW WATER
SPEC	SPECIFICATIONS
TYP	TYPICAL
W	WEST/WIDTH

LEGEND (ANNOTATION)

DETAIL — 4 — DETAIL NUMBER; M-02 M-01 — LOCATION CALLED OUT/LOCATION OF DETAIL

KEYNOTE (CONSTRUCTION) — 1

KEYNOTE (HORIZONTAL CONTROL) — 1

KEYNOTE (REMOVALS AND RECONSTRUCTION) — 1

PIPE TAG — 1.5" PO 2 — PIPE DIAMETER/IDENTIFIER/PIPE MATERIAL (1=DUCTILE IRON, 2=SCH 80 PVC)

SECTION CUT — 23 — SECTION LETTER; C-02 C-03 — LOCATION CALLED OUT/LOCATION OF SECTION

TYPICAL DETAIL — TYP 100 — TYPICAL NUMBER

PIPE TAGS

2" CL_2 2	2" CHLORINE, PVC LINE
4" PO 1	4" DIAMETER, DUCTILE IRON PUMP-OUT LINE
4" RW 1	4" DIAMETER, DUCTILE IRON RAW WATER LINE

Rev No	Revision Note	Date	Design	Drawn	Checked

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Registered Professional Engineer
40714
BRIAN A. HAMRICK
Date Signed 05/22/2026
ARIZONA, U.S.A.

EXPIRATION DATE: 06/30/2028

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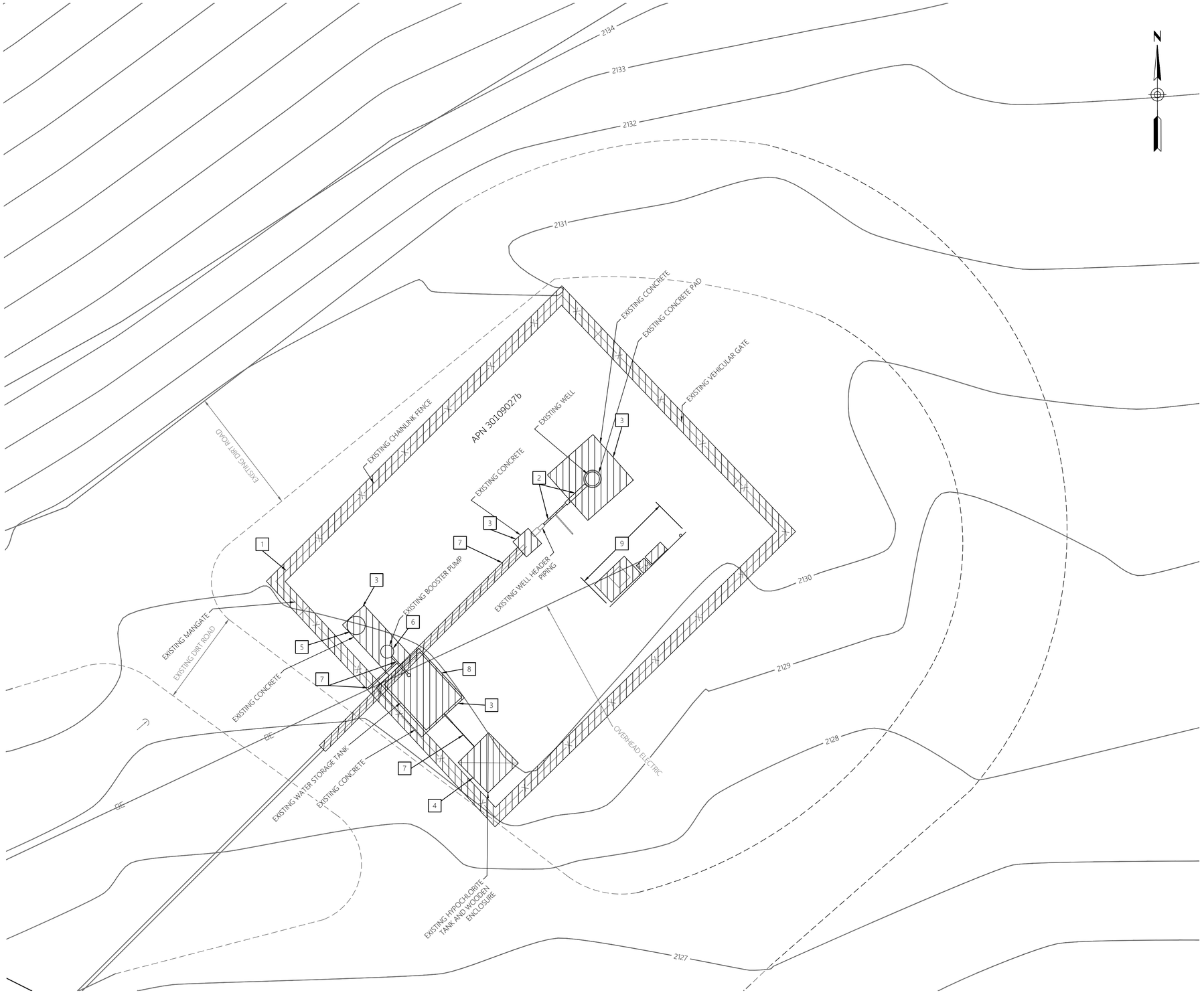
Sheet Title: GENERAL NOTES

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	G-02



DEMOLITION PLAN
SCALE: 1"=5'-0"

REMOVAL AND RECONSTRUCTION NOTES

NO.	DESCRIPTION
1	REMOVE EXISTING CHAINLINK FENCE, GATES
2	REMOVE EXISTING WELL HEADER EQUIPMENT, PIPING
3	DEMOLISH EXISTING CONCRETE
4	REMOVE EXISTING WOOD SHADE STRUCTURE
5	REMOVE EXISTING TANK
6	REMOVE EXISTING BOOSTER PUMP
7	REMOVE EXISTING PIPING
8	REMOVE EXISTING WATER STORAGE TANK
9	REMOVE EXISTING ELECTRICAL EQUIPMENT. RETAIN EXISTING RACKS. PROTECT EXISTING OVERHEAD ELECTRIC

NOTE:

CONTRACTOR SHALL FOLLOW THE REQUIREMENTS PER A.A.C R12-15-816 FOR WELL ABANDONMENT.

1. REMOVE 20 FT OF WELL CASING.
2. FILL THE WELL WITH CEMENT GROUT OR OTHER MATERIALS PER A.A.C R12-15-816(I).
3. FILL OUT THE WELL ABANDONMENT REPORT PER A.A.C R12-15-816.

Rev No	Revision Note	Date	Design	Drawn	Checked

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ARIZONA, U.S.A.
EXPIRATION DATE: 06/30/2028

2.5' 0' 2.5' 5'
HORIZ SCALE IN FEET

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Sheet Title:
DEMOLITION PLAN

Project name
WELL SITE 4 IMPROVEMENTS

Project Location
TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	C-01

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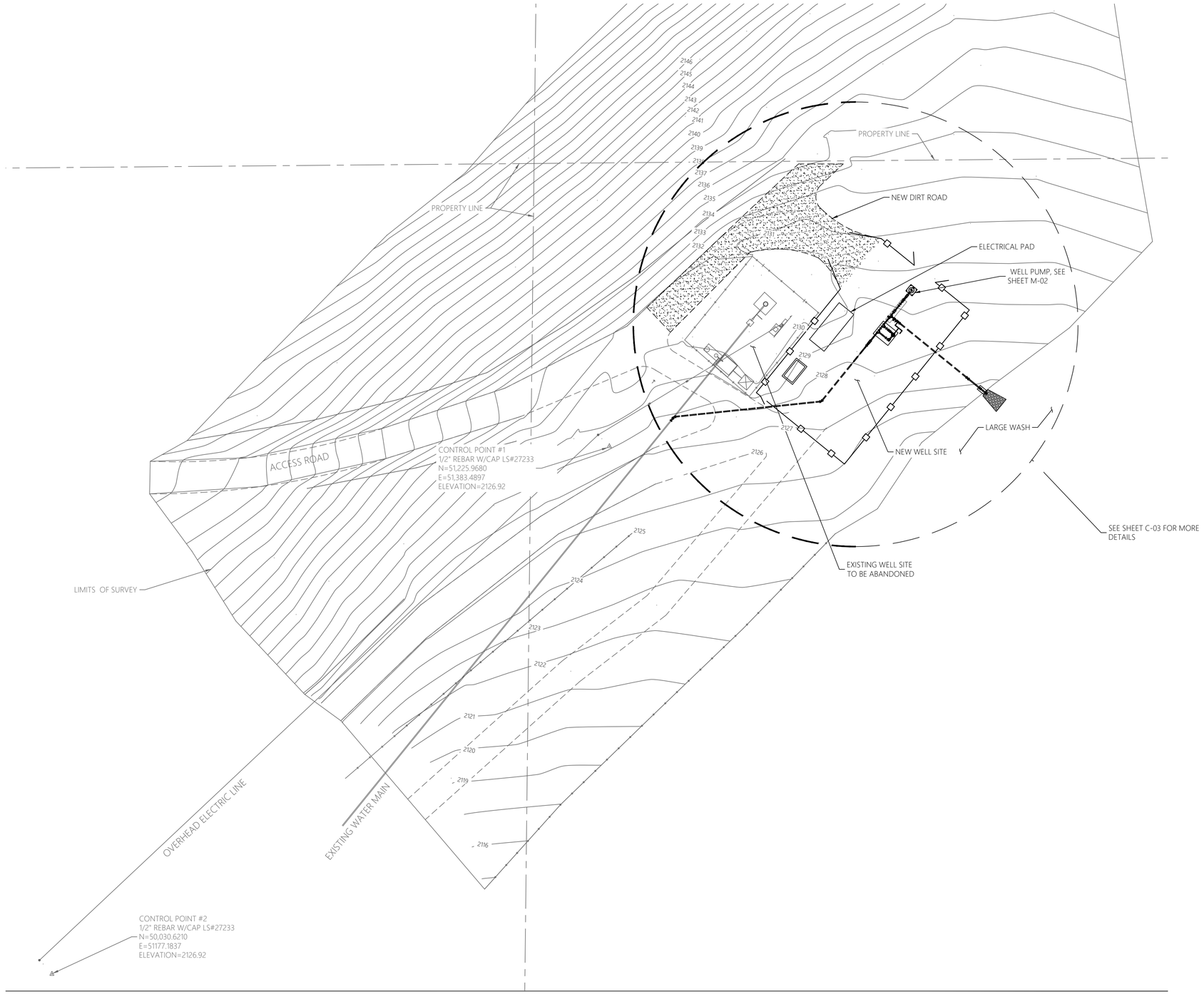

NOTE:
1. ALL GRADES AND ELEVATIONS SHOWN ARE PER THE SURVEY FROM J.G. ELLIS LAND SURVEYING SERVICES, INC FOR WELL SITE 4 IN MAY, 2019.

OVERALL SITE IMPROVEMENTS
SCALE: 1"=20'-0"

10' 0' 10' 20'
HORIZ SCALE IN FEET

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EXPIRATION DATE: 06/30/2025

Sheet Title: OVERALL SITE PLAN

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	C-02

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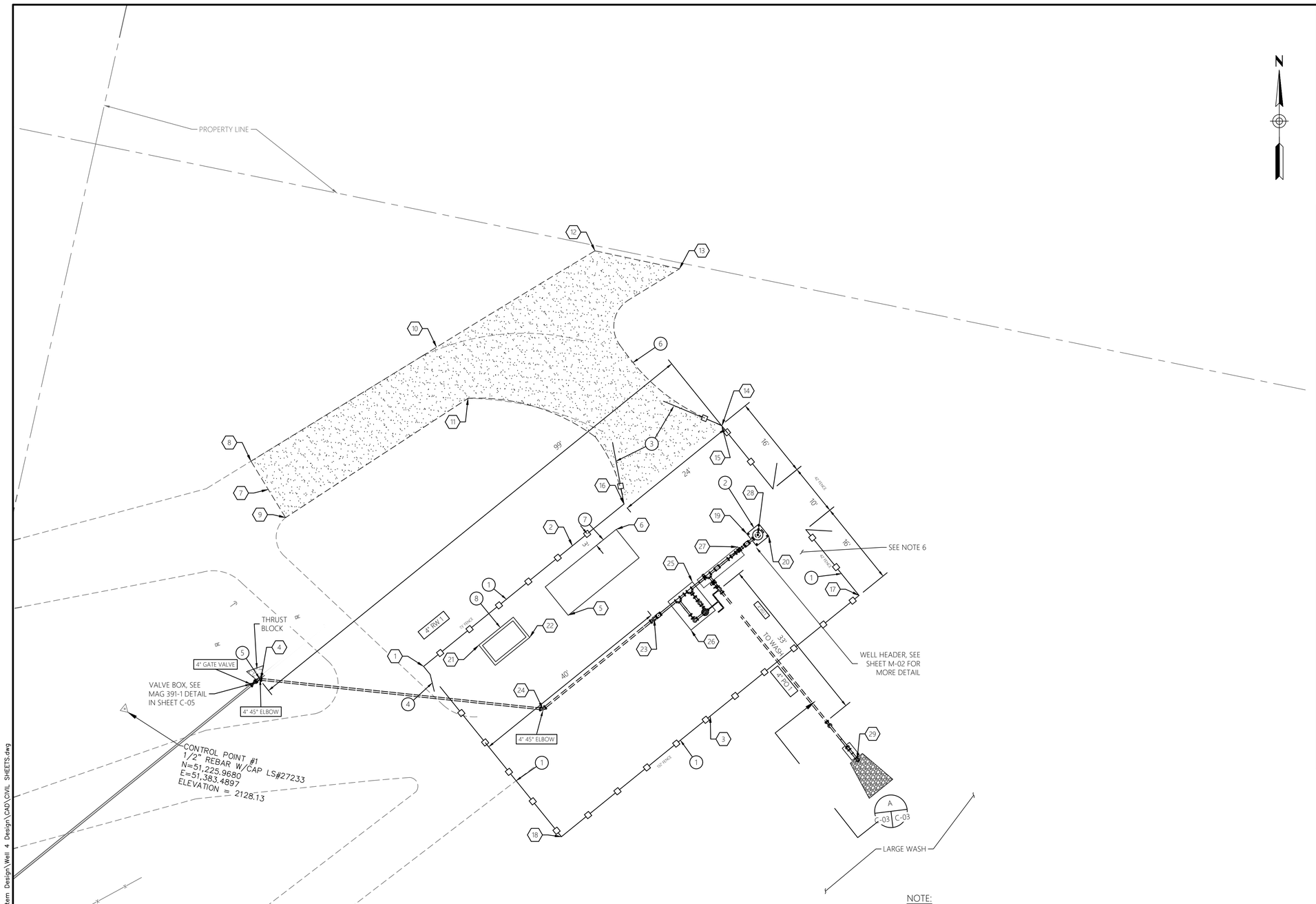

SITE IMPROVEMENTS

SCALE: 1"=10'-0"

CONSTRUCTION NOTES

NO.	DESCRIPTION
1	6' TALL CHAINLINK FENCE PER MAG STANDARD DETAIL 160
2	4'x4' CONCRETE PAD PER DETAIL 4 SHEET M-04
3	24' DOUBLE SWING GATE PER MAG STANDARD DETAIL 160
4	4' MANGATE
5	CONNECT TO EXISTING DISTRIBUTION LINE, FIELD-VERIFY LOCATION
6	NEW 14' DIRT ROAD WITH APPROXIMATELY 650 CF DECOMPOSED GRANITE PER DETAIL 3 SHEET C-05
7	17'-6"Lx7'-0"Wx6" THICK ELECTRICAL PAD PER DETAIL 1 SHEET C-05
8	8'-6"Lx5'-0"Wx6" THICK GENERATOR PAD PER DETAIL 1 SHEET C-05
9	10' SWING GATE

HORIZONTAL CONTROL POINTS

NO.	NORTHING	EASTING
1	51245.81	51437.83
2	51279.13	51468.50
3	51247.90	51493.55
4	51236.88	51407.59
5	51255.46	51456.58
6	51274.32	51460.94
7	51272.79	51401.67
8	51277.39	51397.31
9	51268.20	51406.03
10	51306.13	51427.57
11	51297.80	51435.50
12	51330.48	51453.45
13	51330.48	51470.00
14	51302.73	51484.20
15	51302.73	51484.20
16	51284.20	51468.95
17	51276.42	51516.66
18	51219.38	51470.45
19	51283.51	51493.15
20	51283.95	51497.37
21	51261.13	51462.91
22	51252.00	51447.34
23	51263.87	51479.16
24	51242.57	51461.88
25	51272.33	51484.86
26	51263.25	51486.52
27	51280.69	51491.98
28	51283.73	51495.26
29	51245.64	51522.81

NOTE:

1. ALL DUCTILE IRON PIPING SHALL BE RESTRAINED MECHANICAL JOINT AND POLY WRAPPED PER MAG DETAIL 303.
2. CONTRACTOR SHALL FIELD LOCATE THE NEAREST MJ JOINT ON EXISTING PIPING AND CONNECT THE GATE VALVE TO THE JOINT.
3. THRUST BLOCKS SHALL BE MAG STANDARD DETAIL 380
4. ALL BURIED YARD PIPING SHALL HAVE A MINIMUM 3' BURIAL DEPTH
5. ALL 4" DIAMETER PIPES SHALL BE TRENCHED PER DETAIL 2 SHEET C-05
6. SITE AND ROAD SHALL BE GRADED PER DETAIL 3 SHEET C-05.
7. NEW PIPING AND VALVES FORM WELL HEADER PIPING TO THE TIE-IN LOCATION SHALL BE DISINFECTED PRIOR TO TIE-IN PER SPECIFICATION SECTION 15495.
8. CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE LHC STANDARD DETAILS 503, 504 A, B, C AND 505 OR AS OTHERWISE DIRECTED BY THE ENGINEER.

5' 0' 5' 10'

HORIZ SCALE IN FEET

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Registered Professional Engineer
CERTIFICATE NO.
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BRIAN A. HAMRICK
Date Signed 05/22/2026
ARIZONA, U.S.A.

EXPIRATION DATE: 06/30/2028

Sheet Title:
SITE IMPROVEMENTS 1

Project name
WELL SITE 4 IMPROVEMENTS

Project Location
TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	C-03

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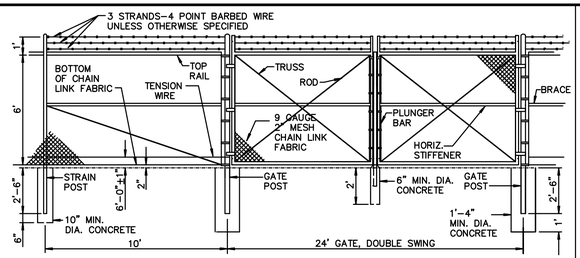
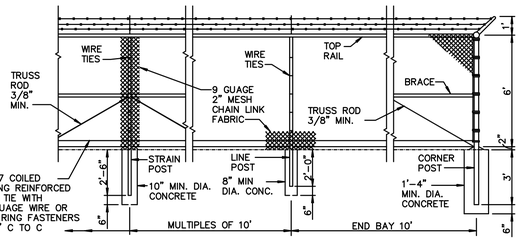


NOTES

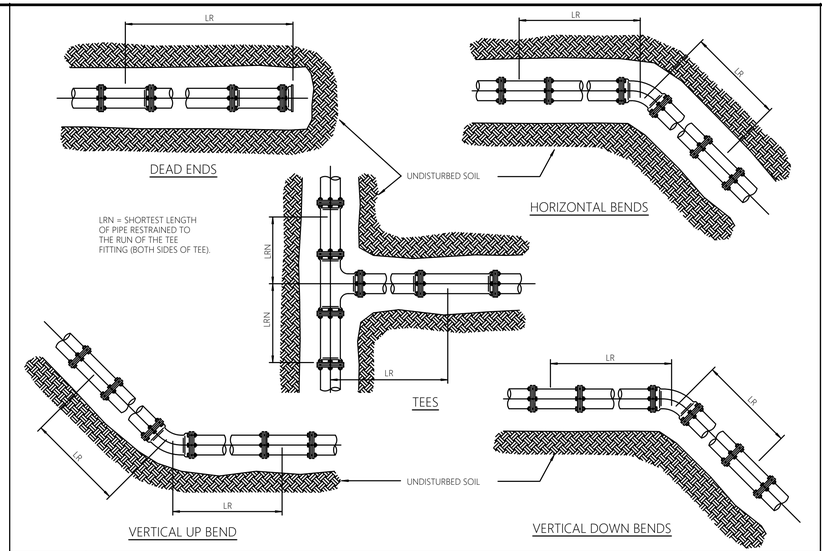
1. ALL CONCRETE SHALL BE CLASS 'C' PER SECT. 725.
2. FITTINGS NOT SPECIFICALLY DETAILED SHALL BE HEAVY DUTY DESIGN.
3. STRAIN POSTS SHALL BE SPACED AT 500' MAXIMUM SPACING.
4. BOTH CORNER AND STRAIN POSTS SHALL HAVE STRAIN PANELS.
5. ALL POSTS SHALL BE CAPPED.
6. MEMBER SIZES SHALL BE THE FOLLOWING:

MEMBER	AISC SIZE	OUTSIDE DIA.
CORNER POST	2–1/2"	2.875"
LINE POST	1–1/2"	1.900"
STRAIN POST	1–1/2"	1.900"
BRACE	1–1/4"	1.666"
STRETCH BAR	3/16"x3/4" FLAT	3/16"x3/4" FLAT
GATE POST	3–1/2"	4.000"
TOP RAIL	1–1/4"	1.666"

7. CONSTRUCTION AND MATERIALS SHALL CONFORM TO SECT. 420 AND 772, RESPECTIVELY. SEE TABLE 772–1 FOR WEIGHTS OF MEMBERS.



DETAIL NO.			REVISED	DETAIL NO.
160	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	6' CHAIN LINK FENCE AND GATE	01–01–2013	160



DETAIL NO.			REVISED	DETAIL NO.
303-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	JOINT RESTRAINT FOR DUCTILE IRON, POLYETHYLENE WRAPPED DUCTILE IRON AND PVC WATER PIPES	01-01-2019	303-1

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE

NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
	90°	45°	22-1/2°	LRN=0'	LRN=10'	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	18	7	4	30	8	31	18	13	7	6	3	31
6	25	10	5	43	20	44	25	18	10	9	5	44
8	32	13	6	56	34	58	32	24	13	11	6	58
10	38	16	8	68	45	69	38	29	16	14	8	69
12	45	19	9	80	57	81	45	34	19	16	9	81
14	51	21	10	91	68	92	51	38	21	18	10	92
16	57	24	11	103	79	104	57	43	24	21	11	104
18	62	26	12	113	90	115	62	48	26	23	12	115
20	68	28	14	125	100	126	68	52	28	25	14	126
24	79	33	16	145	121	147	79	61	33	29	16	147

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON WITH POLYETHYLENE WRAP AND PVC PIPE

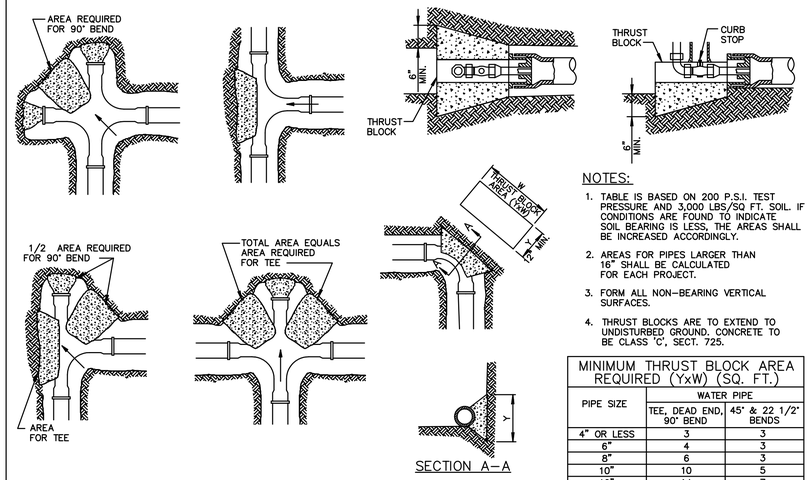
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22-1/2° BEND FITTINGS		
	90°	45°	22-1/2°	LRN=0'	LRN=10'	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	26	11	5	69	18	72	26	30	11	14	5	72
6	36	15	7	99	47	102	36	42	15	20	7	102
8	47	19	9	130	78	133	47	55	19	26	9	133
10	56	23	11	157	103	159	56	66	23	32	11	159
12	65	27	13	185	131	187	65	77	27	37	13	187
14	74	31	15	211	156	214	74	89	31	42	15	214
16	82	34	16	238	183	241	82	100	34	48	16	241
18	90	37	18	263	207	266	90	110	38	53	18	266
20	98	41	20	289	233	292	98	121	41	58	20	292
24	113	47	22	337	280	340	113	141	47	68	22	340

NOTES:

1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

DETAIL NO.			REVISED	DETAIL NO.
303-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	JOINT RESTRAINT FOR DUCTILE IRON, POLYETHYLENE WRAPPED DUCTILE IRON AND PVC WATER PIPES	01-01-2019	303-2

TYPICAL LOCATIONS OF THRUST BLOCKS



NOTES:

1. TABLE IS BASED ON 200 P.S.I. TEST PRESSURE AND 3,000 LBS/SQ FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPES LARGER THAN 16" SHALL BE CALCULATED FOR EACH PROJECT.
3. FORM ALL NON–BEARING VERTICAL SURFACES.
4. THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND. CONCRETE TO BE CLASS 'C', SECT. 725.

MINIMUM THRUST BLOCK AREA REQUIRED (YxW) (SQ. FT.)

PIPE SIZE	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° & 22 1/2° BENDS
4" OR LESS	3	3
6"	4	3
8"	6	3
10"	10	5
12"	14	7
16"	24	12

DETAIL NO.			REVISED	DETAIL NO.
380	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	THRUST BLOCKS FOR WATER LINES	01-01-1998	380

Checked | Drawn | Design | Date | Rev No. | Revision Note

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Registered Professional Engineer
40714
BRIAN A. HAMRICK
Date Signed 05/22/2026
ARIZONA, U.S.A.
EXPIRATION DATE: 06/30/2028

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Sheet Title: CIVIL DETAILS - 1

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	C-04

May 27, 2026 – 1:38pm
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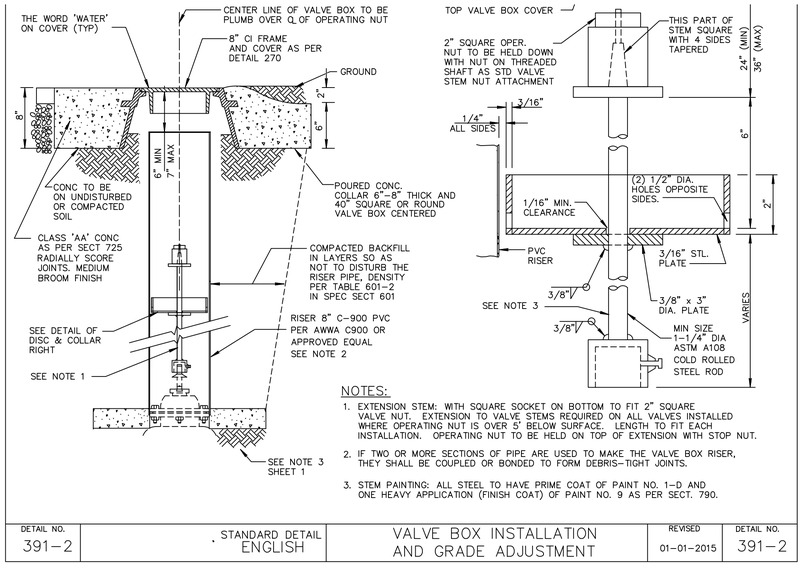
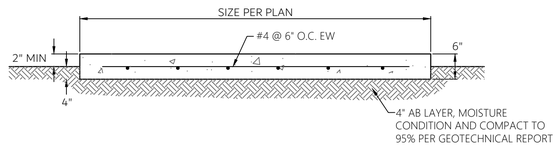


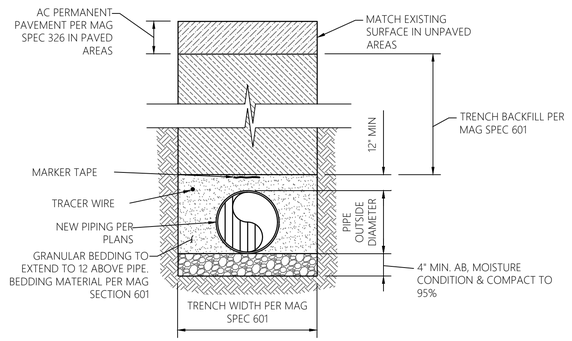
NOTES:

1. EXTENSION STEM: WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT. EXTENSION TO VALVE STEMS REQUIRED ON ALL VALVES INSTALLED WHERE OPERATING NUT IS OVER 5' BELOW SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP OF EXTENSION WITH STOP NUT.
2. IF TWO OR MORE SECTIONS OF PIPE ARE USED TO MAKE THE VALVE BOX RISER, THEY SHALL BE COUPLED OR BONDED TO FORM DEBRIS–TIGHT JOINTS.
3. STEM PAINTING: ALL STEEL TO HAVE PRIME COAT OF PAINT NO. 1–D AND ONE HEAVY APPLICATION (FINISH COAT) OF PAINT NO. 9 AS PER SECT. 790.

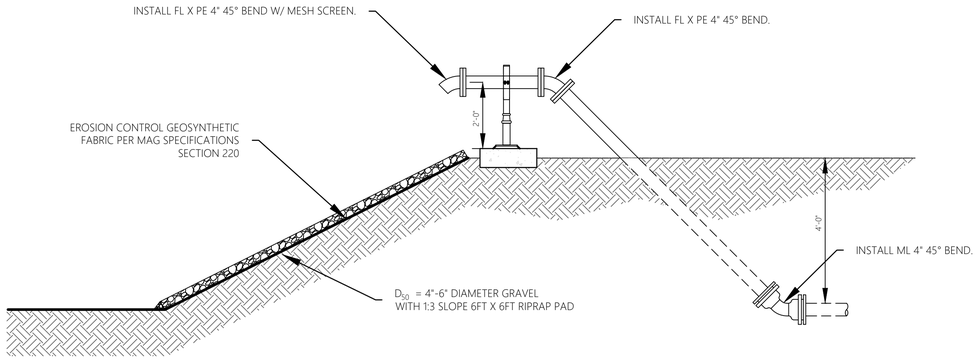
DETAIL NO.	STANDARD DETAIL	VALVE BOX INSTALLATION AND GRADE ADJUSTMENT	REVISED	DETAIL NO.
391–2	ENGLISH		01–01–2015	391–2



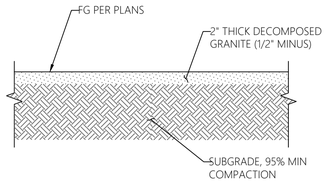
EQUIPMENT PAD 1
SCALE: NTS C-03 C-05



PIPE TRENCH 2
SCALE: NTS C-03 C-05



SECTION A
SCALE: NTS C-03



SITE & ROAD DETAIL 3
SCALE: NTS C-03 C-05

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Registered Professional Engineer (Civil) 67714 BRIAN A. HAMRICK Date Signed 05/22/2026 ARIZONA, U.S.A.

EXPIRATION DATE: 06/30/2028

Sheet Title: CIVIL DETAILS - 2

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	C-05

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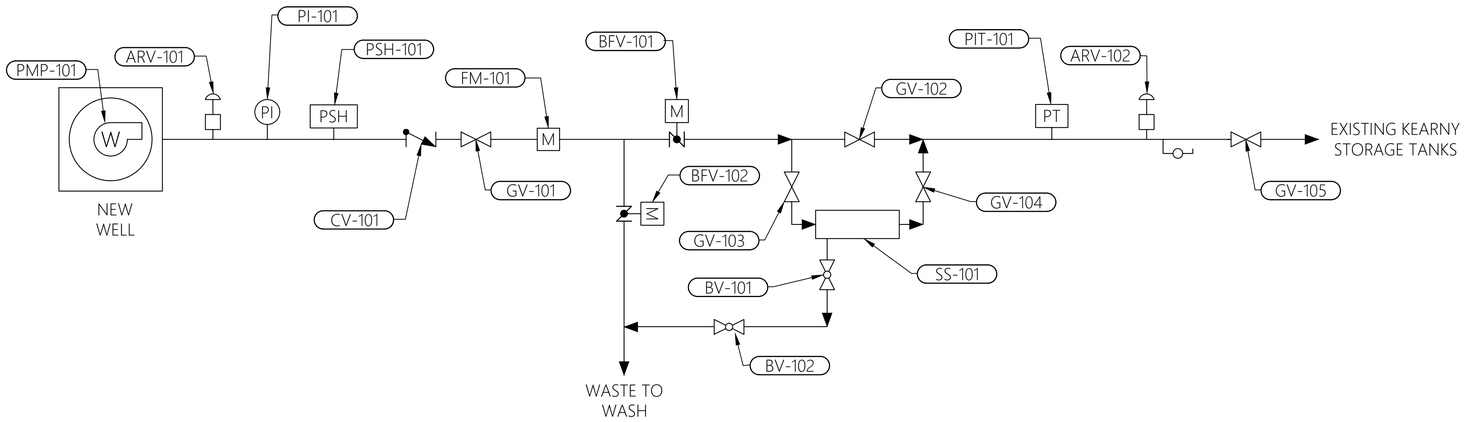

SCHEMATIC SYMBOL LEGEND:

- AIR RELEASE VALVE
- BALL VALVE
- CHECK VALVE
- M — MOTOR OPERATED GATE VALVE
- M — MAGNETIC FLOW METER
- PI — PRESSURE GAUGE
- PSH — PRESSURE SWITCH HIGH
- PUMP
- SAMPLE TAP
- W — WELL
- GATE VALVE
- FS_ — FLOW SWITCH

KEARNY WELL 4 VALVE & FITTINGS SCHEDULE									
TAG NUMBER	LOCATION	SERVICE	VALVE TYPE	SIZE (IN.)/ RANGE	BODY MATERIAL	QUANTITY	MANUFACTURER	PRESSURE RATING	REMARKS
ARV-101	WELL HEADER LINE	RAW WATER	AIR RELEASE VALVE	1	DIP	1	APCO OR APPROVED EQUAL	150 PSI	
ARV-102	WELL HEADER LINE	RAW WATER	COMBO AIR RELEASE VALVE	2	DIP	1	APCO OR APPROVED EQUAL	150 PSI	
CV-101	WELL HEADER LINE	RAW WATER	SWING CHECK VALVE	4	DIP	1	MUELLER OR APPROVED EQUAL	350 PSI	
PSH-101	WELL HEADER LINE	RAW WATER	HIGH PRESSURE SWITCH	0-60 PSI		1	TRERICE OR APPROVED EQUAL	150 PSI	PRESSURE SWITCH SHALL BE SET BASED ON THE OPERATING PRESSURES
PI-101	WELL HEADER LINE	RAW WATER	PRESSURE INDICATOR	0-50 PSI		1	TRERICE OR APPROVED EQUAL	200 PSI	
PIT-101	WELL HEADER LINE	RAW WATER	PRESSURE TRANSMITTER	0-50 PSI		1	TRERICE OR APPROVED EQUAL	200 PSI	
BFV-101	WELL HEADER LINE	RAW WATER	BUTTERFLY VALVE	4	DIP	1	VALWORX-567305C OR APPROVED EQUAL	230 PSI	
BFV-102	WELL HEADER LINE	WASTE LINE	BUTTERFLY VALVE	4	DIP	1	VALWORX-567305C OR APPROVED EQUAL	230 PSI	
GV-101	WELL HEADER LINE	RAW WATER	GATE VALVE	4	DIP	1	-	350 PSI	
GV-102	WELL HEADER LINE	RAW WATER	GATE VALVE	4	DIP	1	-	350 PSI	
GV-103	WELL HEADER LINE	RAW WATER	GATE VALVE	4	DIP	1	-	350 PSI	
GV-104	WELL HEADER LINE	RAW WATER	GATE VALVE	4	DIP	1	-	350 PSI	
GV-105	WELL HEADER LINE	RAW WATER	GATE VALVE	4	DIP	1	-	350 PSI	
BV-101	WELL HEADER LINE	DRAINLINE (SAND SEPARATOR)	BALL VALVE	2	PVC	1	-	150 PSI	
BV-102	WELL HEADER LINE	DRAINLINE (SAND SEPARATOR)	BALL VALVE	2	PVC	1	-	150 PSI	

KEARNY WELL 4 PUMP SCHUELDLE					
TAG NUMBER	LOCATION	SERVICE	PUMP TYPE	SIZE (HP)	RATED FLOW
PMP-101	WELL HEADER LINE	RAW WATER	MULTI STAGE SUBMERSIBLE PUMP	25	100 GPM

KEARNY WELL 4 FLOW METER SCHUELDLE					
TAG NUMBER	LOCATION	SERVICE	TYPE	QUANTITY	RATED FLOW
FM-101	WELL HEADER LINE	RAW WATER	MAGNETIC	1	50-200 GPM

PIPING MATERIALS SCHEDULE									
EXPOSED PIPING									
LOCATION	MATERIAL	CLASS/TYPE	FITTINGS&PIPE						
KEARNY WELL 4	DIP	350	FLANGED						
BELOW GROUND PIPING									
LOCATION	MATERIAL	CLASS/TYPE	FITTINGS&PIPE	DESCRIPTION					
KEARNY WELL 4	DIP	350	MJ	POLY WRAPPED					
EQUIPMENT SCHEDULE									
TAG NUMBER	LOCATION	DESCRIPTION	MANUFACTURER	RATED FLOW					
SS-101	WELL HEADER LINE	SAND SEPARATOR	LAKOS MODEL JPX-0085-V OR APPROVED EQUAL	85-145 GPM					

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Registered Professional Engineer CERTIFICATE 40714 BRIAN A. HAMRICK Date Signed 06/30/2026 ARIZONA, U.S.A.

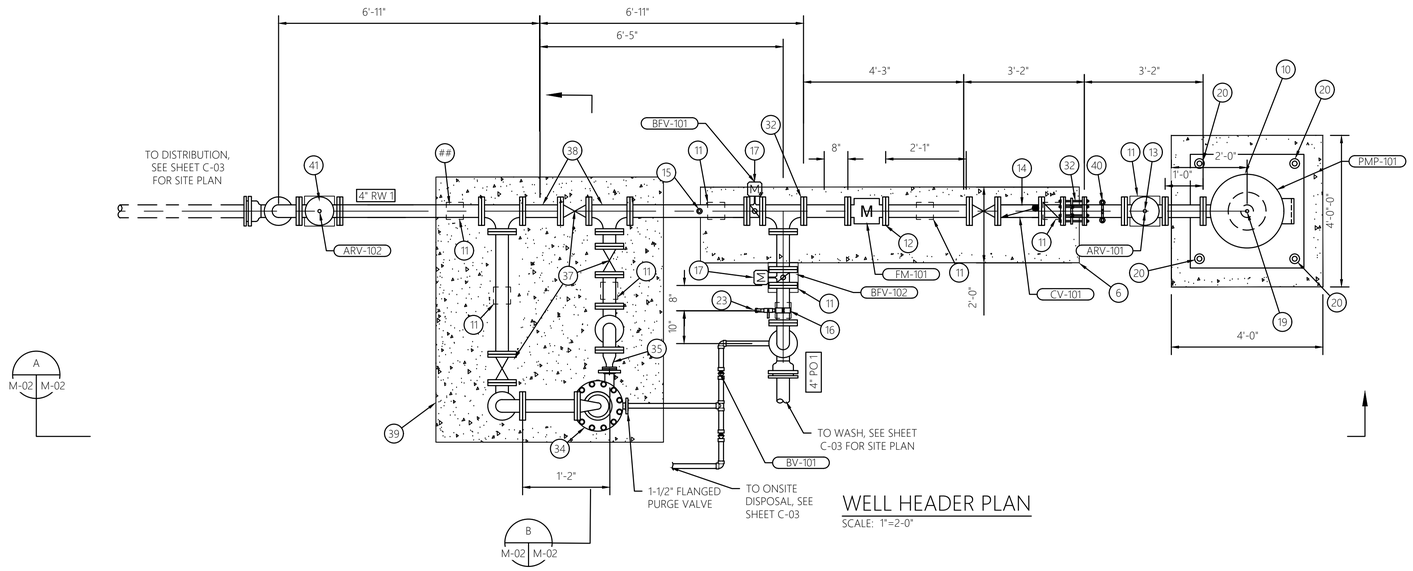
EXPIRATION DATE: 06/30/2028

Sheet Title: PROCESS FLOW DIAGRAM

Project name: WELL SITE 4 IMPROVEMENTS

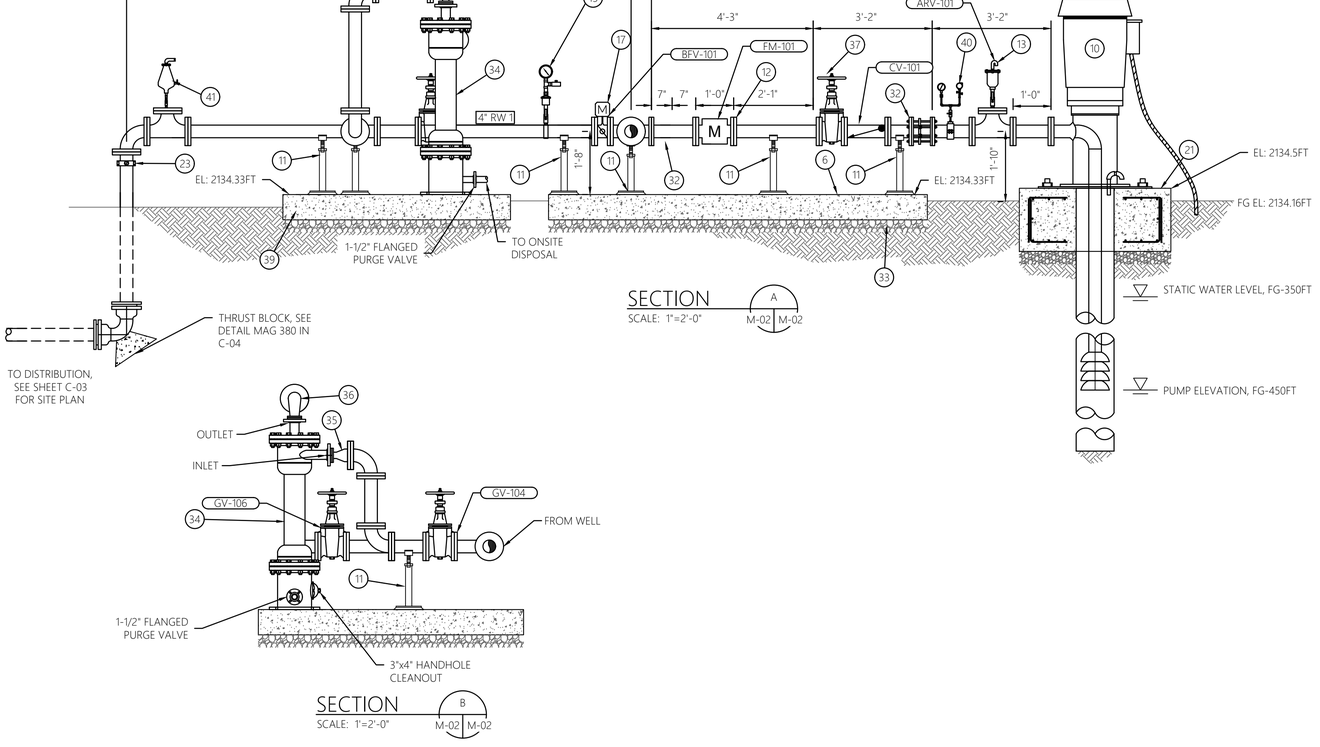
Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	M-01



WELL HEADER PLAN

SCALE: 1"=2'-0"



SECTION

SCALE: 1"=2'-0"

A M-02 M-02

SECTION

SCALE: 1"=2'-0"

B M-02 M-02

CONSTRUCTION NOTES

NO.	DESCRIPTION
6	10'Lx2'Wx6" THICK CONCRETE PAD PER 1 / C-03 / M-02
10	20 HP, 100-GPM VERTICAL TURBINE PUMP AND MOTOR
11	PIPE SUPPORT PER TYP 1
12	ELECTROMAGNETIC FLOW METER
13	1" AIR-RELEASE VALVE WITH BALL VALVE, THREADED INTO BLIND FLANGE ON TEE* PER TYP 151
14	CHECK VALVE, SWING-STYLE
15	PRESSURE INDICATOR WITH CALIBRATION CONNECTION AND BALL VALVE, THREADED INTO BLIND FLANGE ON TEE* TYP 402A
16	SS DOUBLE STRAP SERVICE SADDLE WITH 2" AWWA TAPER THREADS (DRESSER STYLE 291 OR EQUAL)
17	MOTORIZED BUTTERFLY VALVE
18	BLIND FLANGE, TAPPED AND THREADED
19	1" PVC VENT WITH STAINLESS STEEL MESH
20	1" DIAMETER EPOXY ANCHOR BOLTS WITH MINIMUM 9" EMBEDMENT
21	48" SQUARE, 1" THICK SOLE PLATE, LEVELED WITH 1/2" NON-SHRINK GROUT
22	12"x12" CONCRETE FOOTING FOR PIPE SUPPORT
23	SAMPLE TAP PER TYP 2
32	INSTALL DISMANTLING JOINT
33	4" AGGREGATE MOISTURE CONDITIONED AND COMPACTED TO 95%
34	SAND SEPARATOR, LAKOS MODEL JPX-0085-V OR EQUAL, 85-145 GPM, CARBON STEEL
35	4" x 2" REDUCER
36	4" x 2" REDUCING ELBOW
37	4" GATE VALVE
38	4" TEE
39	7'LX6'WX6" THICK CONCRETE PAD PER 1 / C-03 / M-02
40	PRESSURE GAUGE WITH HIGH PRESSURE SWITCH PER TYP 403
41	2" COMBINATION AIR RELEASE VALVE WITH BALL VALVE, THREADED INTO BLIND FLANGE ON TEE* PER TYP 402

GENERAL NOTES

NO.	
1	ASSEMBLED WITH 316 WITH THREADED CONNECTIONS, STAINLESS STEEL PIPE
4	VERIFY ALL CONNECTIONS AND ELEVATIONS WITH PUMP MANUFACTURER PRIOR TO CONSTRUCTION

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Registered Professional Engineer (Civil) 45714 BRIAN A. HAMRICK Date Signed 05/22/2026 ARIZONA, U.S.A.

EXPIRATION DATE: 06/30/2025

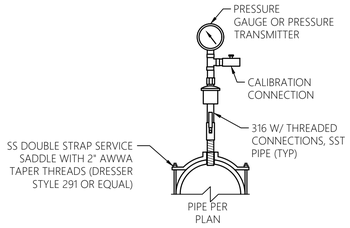
HORIZ SCALE IN FEET 1' 0 1' 2'

Sheet Title: WELL 4 MECHANICAL PLAN & SECTION

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

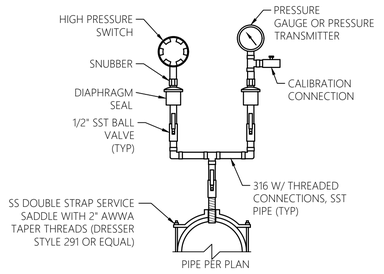
Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	M-02



PRESSURE GAUGE

SCALE: NTS

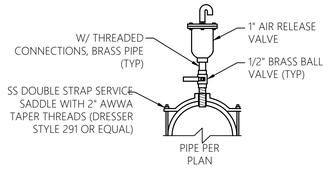
TYP 402 A



PRESSURE GAUGE WITH HIGH PRESSURE SWITCH

SCALE: NTS

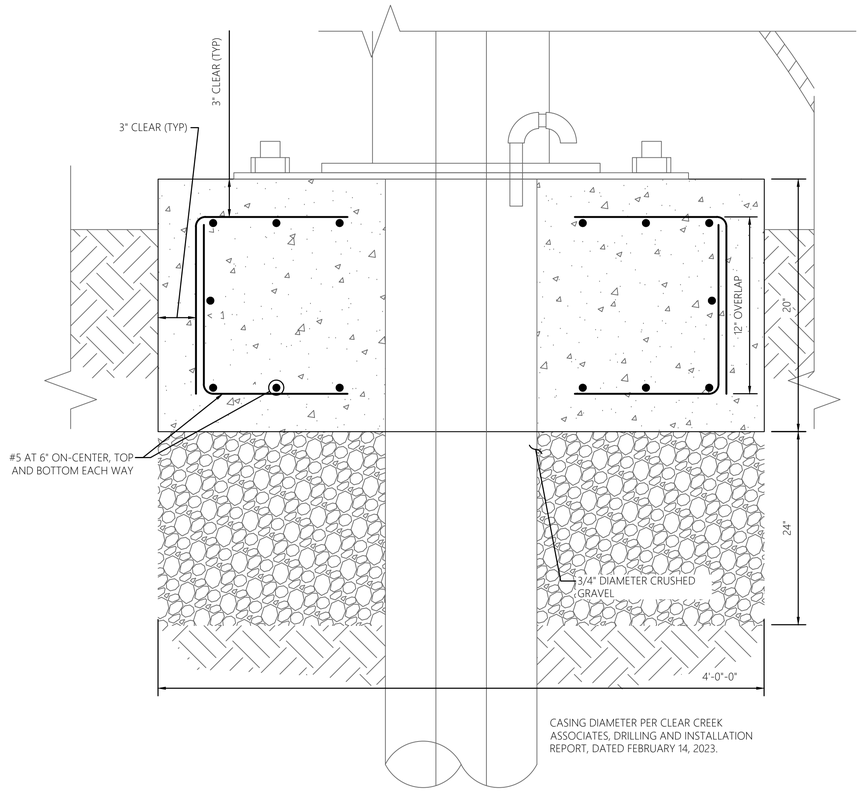
TYP 403



AIR RELEASE VALVE INSTALLATION

SCALE: NTS

TYP 151

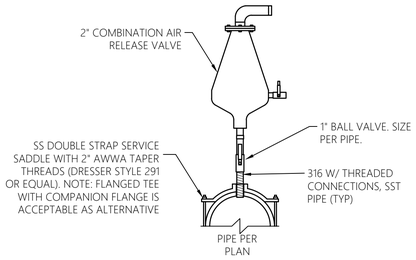


WELL HEADER PUMP PAD STRUCTURAL DETAIL

SCALE: NTS

4

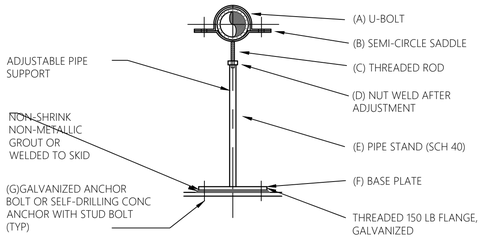
C-03 | M-04



COMBINATION AIR RELEASE VALVE INSTALLATION

SCALE: NTS

TYP 402



PIPE SIZE	A	B	C, D	E	F	G
2"-4"	1/2"	2"x1/4"	1"	1 1/2" Ø	6"x6"x3/8"	4-1/2" DIA
6"-10"	5/8"	2"x1/4"	1 1/2"	2" Ø	6"x6"x3/4"	4-1/2" DIA
12"-18"	3/4"	3"x3/8"	2"	3" Ø	10"x10"x3/8"	4-5/8" DIA

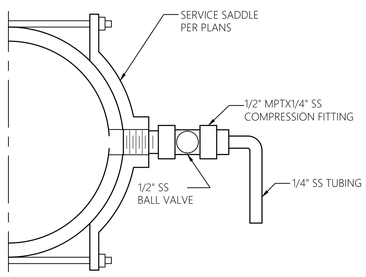
NOTE:

1) ALL ADJUSTABLE PIPE SUPPORTS WILL BE CARBON STEEL.
2) PROVIDE 3" EMBEDMENT FOR ALL ANCHOR BOLTS INTO CONCRETE SLAB.

PIPE SUPPORT

SCALE: NTS

TYP 1



SAMPLE TAP

SCALE: NTS

TYP 2

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CERTIFICATE NO.
40714
BRIAN A. HAMRICK
Date Signed
ARIZONA, U.S.A.

EXPIRATION DATE: 06/30/2028

Sheet Title: MECHANICAL DETAILS

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	JAH	Date:	05/22/2026
Design By:	KJA	Date:	05/22/2026
Approved By:	BH	Date:	05/22/2026
Client Project No.	Project No. 0729	Sheet	M-03

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SCHEMATIC DIAGRAM SYMBOLS

- CR — CONTROL RELAY
- HAND / AUTO / XO — 2 POSITION SELECTOR SWITCH POSITION LEGEND: X=CLOSED O=OPEN
- TD — TIME DELAY RELAY
- HAND / OFF / AUTO / XOO — 3 POSITION SELECTOR SWITCH HAND – OFF – AUTO POSITION LEGEND: X=CLOSED O=OPEN
- AR — ALARM RELAY
- NORMALLY CLOSED PUSH BUTTON
- ETM — ELAPSED TIME METER
- LOCKOUT STOP PUSH BUTTON
- M — MOTOR STARTER OR CONTACTOR COIL
- NORMALLY OPEN PUSH BUTTON
- PC — PHOTO CELL
- EMERGENCY STOP PUSH BUTTON (MAINTAINED)
- R — BEACON ALARM LIGHT LETTER INDICATES COLOR R=RED, A=AMBER, B=BLUE, G=GREEN
- AMPS — DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES
- R — PILOT LIGHT LETTER INDICATES COLOR R=RED, A=AMBER, B=BLUE, G=GREEN
- LIMIT OR POSITION SWITCH
- OUTPUT DV/DT FILTER
- PSH — PRESSURE SWITCH HIGH
- HEATING ELEMENT
- PSL — PRESSURE SWITCH LOW
- TRANSFORMER
- FLOW SWITCH
- CT — CURRENT TRANSFORMER
- LEVEL FLOAT SWITCH
- GROUND CONNECTION
- T / ICTO — TIMER RELAY CONTACT INSTANTANEOUS CLOSE TIME DELAY OPEN
- GENERATOR
- T / NOTC — TIMER RELAY CONTACT NORMALLY OPEN TIME DELAY CLOSE
- HORN — HORN
- TEMPERATURE SWITCH
- FULL VOLTAGE NON–REVERSING (FVNR) MOTOR STARTER OR CONTACTOR NUMBER DESIGNATES NEMA SIZE
- FUSE
- NORMALLY OPEN CONTACT
- AMPS — FUSEHOLDER OR FUSEBLOCK
- NORMALLY CLOSED CONTACT
- THERMAL OVERLOAD RELAY
- DI — RTU OR PLC CONTACT
- TERMINAL BLOCK
- DEVICE LOCATED AT REMOTE LOCATION
- CONDUIT SEALOFF

POWER SINGLE LINE DIAGRAM SYMBOLS

- JUNCTION BOX WITH POWER DISTRIBUTION BLOCK OR LUGS
- AMPS / POLES — CIRCUIT BREAKER, SHOWN WITH TRIP RATING AND NUMBER OF POLES
- CONDUIT SEALOFF
- AMPS MCP / POLES — MOTOR CIRCUIT PROTECTOR WITH TRIP RATING AND NUMBER OF POLES
- LTC CONNECTION
- AMPS / POLES — DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES
- MC CONNECTION
- MMR — MOTOR MANAGEMENT RELAY
- BOND TO METALLIC WATER PIPE
- SPD — SURGE PROTECTIVE DEVICE
- SSS — SOLID STATE STARTER
- UM — UTILITY METER
- VFD — VARIABLE FREQUENCY DRIVE
- HP — MOTOR, NUMBER DESIGNATES NEMA HORSEPOWER SIZE
- HF — HARMONIC FILTER
- FUSE
- EOL — ELECTRONIC OVERLOAD RELAY
- AMPS — FUSEHOLDER OR FUSEBLOCK
- GROUND CONNECTION
- TRANSFORMER
- GENERATOR
- CONTACTOR

SITE PLAN SYMBOLS

- TELEPHONE OUTLET
- FIELD DEVICE
- $ — SINGLE POLE SWITCH
- GROUND ROD
- $3 — 3 WAY SWITCH
- DUPLEX RECEPTACLE
- $4 — 4–WAY SWITCH
- ANTENNA MAST
- $M — MANUAL MOTOR STARTER
- CONDUIT SEALOFF
- SPECIAL PURPOSE OR WELDING OUTLET
- DISCONNECT SWITCH
- S — SMOKE DETECTOR
- M — MOTOR
- T — THERMOSTAT
- CONDUIT TURN UP
- CONDUIT TURN DOWN

CIRCUIT SCHEDULE LEGEND

AAA–BC

- AAA: DEVICE SERVED
- B: TYPE C=CONTROL P=POWER
- C: SEQUENCE NUMBER

ELECTRICAL ABBREVIATIONS

A	AMPERE
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AI	ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
AO	ANALOG OUTPUT
AS	AIR SUPPLY
ATS	AUTOMATIC TRANSFER SWITCH
BC	BYPASS CONTACTOR
C	CONDUIT
CB	CIRCUIT BREAKER
CCW	COUNTER CLOCKWISE
CL2	CHLORINE
CON	CONTACTOR
CPB	CONTROL PULLBOX
CU	COPPER, BARE
CV	CONTROL VALVE
CW	CLOCKWISE
DCS	DISTRIBUTED CONTROL SYSTEM
DI	DISCRETE INPUT
DO	DISCRETE OUTPUT
DP	DISTRIBUTION PANEL
DV/DT	DIFFERENTIAL VOLTAGE/TIME
DWG	DRAWING
ETM	ELAPSED TIME METER
EOL	ELECTRONIC OVERLOAD
EXIST	EXISTING
FA	FOUL AIR
FC	FAIL CLOSED
FE	FLOW ELEMENT
FLA	FULL LOAD AMPS
FS	FLOW SWITCH
FVNR	FULL VOLTAGE NON–REVERSING
FW	FINISHED WATER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS	GALVANIZED RIGID STEEL
H, HI	HIGH
H2S	HYDROGEN SULFIDE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
I	CURRENT
IC	INSTRUMENTATION CABLE
ICR	INTERMITTENT CYCLE REACTOR
IO	INPUT/OUTPUT
ISC	SHORT CIRCUIT CURRENT
JB	JUNCTION BOX
L, LO	LOW
LAN	LOCAL AREA NETWORK
LC	LOOP CONTROLLER
LCL	LEVEL CONTROL, LOW
LCP	LOCAL CONTROL PANEL
LOS	LOCK–OUT–STOP
LOR	LOCAL/OFF/REMOTE
LS	LEVEL (i.e., FLOAT) SWITCH
LTC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
M	MOTOR
MA	MANUAL/AUTO
mA	MILLIAMP
MAX	MAXIMUM
MC	MANUFACTURER'S CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR(S)	MANUFACTURER(S)
MGD	MILLION GALLONS PER DAY
MGL	MILLIGRAMS PER LITER
MH	MANHOLE
MIN	MINIMUM
MOV	MOTOR OPERATED VALVE
MMR	MOTOR MANAGEMENT RELAY
MTU	MASTER TELEMETRY UNIT
NEC	NATIONAL ELECTRICAL CODE
NECA	NATIONAL ELECTRICAL CONTRACTOR ASSOCIATION
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NIC	NOT IN CONTRACT
NOTC	NORMALLY OPEN TIMED CLOSED
NPW	NON–POTABLE WATER
NS	NITROGEN SUPPLY
NTS	NOT TO SCALE
NTU	TURBIDITY
OF	OVERFLOW
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
OLR	OVERLOAD RELAY
OO	ON/OFF (MAINTAINED)
OR	OFF–REMOTE
OSC	OPEN/STOP/CLOSE
P	PHASE
PB	PULL BOX
PCP	PROCESS CONTROL PANEL
PCV	PRESSURE CONTROL VALVE
PFR	PHASE/POWER FAILURE RELAY
PI	PULSE INPUT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLI	PLANT INFLUENT
PMP	PUMP
PNL	PANEL
PO	PULSE OUTPUT
PPB	POWER PULLBOX
PPG	POUNDS PER GALLON
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PR	PAIR
PRES	PRESSURE
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH, HIGH
PSI	POUNDS PER SQUARE INCH
PV	PROCESS VARIABLE
RAS	RETURN ACTIVATED SLUDGE
RW	RAW WATER
RF	RADIO FREQUENCY
RIO	REMOTE INPUT OUTPUT
RS	RAW SEWAGE
RSP	RAW SEWAGE PUMP
RST	RESET
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RWT	REFLECTED WAVE TRAP
SCA	SHORT CIRCUIT AMPS
SCCR	SHORT CIRCUIT CURRENT RATING
SEQ	SERVICE ENTRANCE EQUIPMENT
SES	SERVICE ENTRANCE SECTION
SLC	SINGLE LOOP CONTROLLER
SLOS	START–LOCK–OUT–STOP
SMC	SUBMERSIBLE MANUFACTURER CABLE
SO2	SULFUR DIOXIDE
SP	SET POINT
SPC	SPARE CONDUIT
SPR	SPARE
SS	START/STOP
SSS	SOLID STATE STARTER (SOFT START)
ST	SHUNT TRIP
TC	TELEPHONE CABLE
TS	TEMPERATURE SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UM	UTILITY METER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATT, WIRE
WAS	WASTE ACTIVATED SLUDGE
WP	WEATHERPROOF
XFMR	TRANSFORMER
XMR	TRANSFORMER
XMTR	TRANSMITTER
ZS	POSITION (i.e.. LIMIT) SWITCH

ELECTRICAL LINETYPES

- EXPOSED CONDUIT
- EXISTING EXPOSED CONDUIT
- UNDERGROUND CONDUIT
- EXISTING UNDERGROUND CONDUIT
- BARE COPPER GROUND CONDUCTOR
- EXISTING OR FUTURE
- NEW ELECTRICAL EQUIPMENT
- DEMOLITION
- DETAIL VIEW OR MATCHING
- CAPPED CONDUIT STUB OUT

PXXX / CXXX — GROUPED CONDUIT AND CIRCUIT IDENTIFICATION TAGS. REFER TO THE POWER SINGLE–LINE, SCHEMATIC CONNECTION DIAGRAMS AND CIRCUIT SCHEDULE FOR CONDUIT SIZES AND CONTENTS.

P=POWER
C=CONTROL

GENERAL NOTES

1. THE COMPLETED INSTALLATION SHALL COMPLY WITH LATEST REVISION OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, AND REGULATIONS. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. ALL WORK SHALL BE COMPLETED IN A NEAT, WORKMANLIKE MANNER IN ACCORDANCE WITH THE LATEST NECA STANDARDS OF INSTALLATION UNDER COMPETENT SUPERVISION. INSTALL GROUNDING PER NEC.
2. VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND OTHER FACTORS, WHICH MAY AFFECT THE EXECUTION OF THE WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
3. THE CONTRACTOR SHALL COORDINATE WORK WITH THE UTILITIES PROVIDING SERVICES ON THIS PROJECT, AND SHALL COMPLY WITH ALL THEIR INSTALLATION REQUIREMENTS.
4. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF NEMA, ANSI, UL, OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURERS' NAMES, MODELS, AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS, AND BID PRICE.
5. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED AGAINST DAMAGE BY OTHER TRADES, WEATHER CONDITIONS, OR ANY OTHER PREVENTABLE CAUSES. EQUIPMENT DAMAGED DURING SHIPPING OR CONSTRUCTION, PRIOR TO ACCEPTANCE BY THE ENGINEER OR THE OWNER, WILL BE REJECTED AS DEFECTIVE.
6. LEAVE THE SITE CLEAN. REMOVE ALL DEBRIS, EMPTY CARTONS, TOOLS, CONDUIT, WIRE SCRAPS AND ALL MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THE WORK DURING CONSTRUCTION. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK. DAMAGED PAINT AND FINISHES SHALL BE TOUCHED UP OR REPAINTED WITH MATCHING COLOR PAINT AND FINISH.
7. CIRCUIT CONDUCTORS #6 AWG OR SMALLER SHALL BE THWN STRANDED COPPER. #4 AWG THROUGH #2 AWG SHALL BE XHHW STRANDED COPPER. #1 AWG OR LARGER SHALL BE XHHW–2 STRANDED COPPER. MINIMUM POWER CONDUCTOR SIZE SHALL BE #12 AWG WITH #12 AWG GROUND.
8. UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC. MINIMUM CONDUIT DEPTH SHALL BE 24 INCHES. MINIMUM UNDERGROUND CONDUIT SIZE SHALL BE 1 INCH.
9. CONDUITS SHALL BE MARKED AT EACH END WITH MATCHING NUMBERED BRASS TAGS. SPARE CONDUITS SHALL HAVE A PULL STRING INSTALLED, SECURED, AND CAPPED.
10. EXPOSED CONDUITS SHALL BE GALVANIZED RIGID STEEL (GRS). MINIMUM SIZE 3/4 INCH, UNLESS OTHERWISE NOTED ON THE PLANS.
11. SAFETY SWITCHES, ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, AND OTHER ELECTRICAL DEVICES SHALL BE UL LISTED, AND RATED FOR HEAVY DUTY SERVICE.
12. WIRING DEVICES SHALL BE SPECIFICATION GRADE.
13. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING, SCHEDULING, DOCUMENTING, AND PERFORMING THE WORK SO THAT A COMPLETE ELECTRICAL, INSTRUMENTATION AND CONTROL SYSTEM FOR THE FACILITY IS PROVIDED. ACCURATE SHOP AND RECORD DRAWINGS, AND O&M MANUALS SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.
14. TYPICAL DETAILS SHALL APPLY IN ALL CASES, WHETHER SPECIFICALLY REFERRED TO OR NOT.

Rev No	Revision Note	Date	Design	Drawn	Checked

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Registered Professional Engineer (Inactive)
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AARON G. ARMENTA
Date Signed 12/31/25
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title: ELECTRICAL NOTES, SYMBOLS, AND LEGEND

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E–01

May 22, 2026 – 12:02pm
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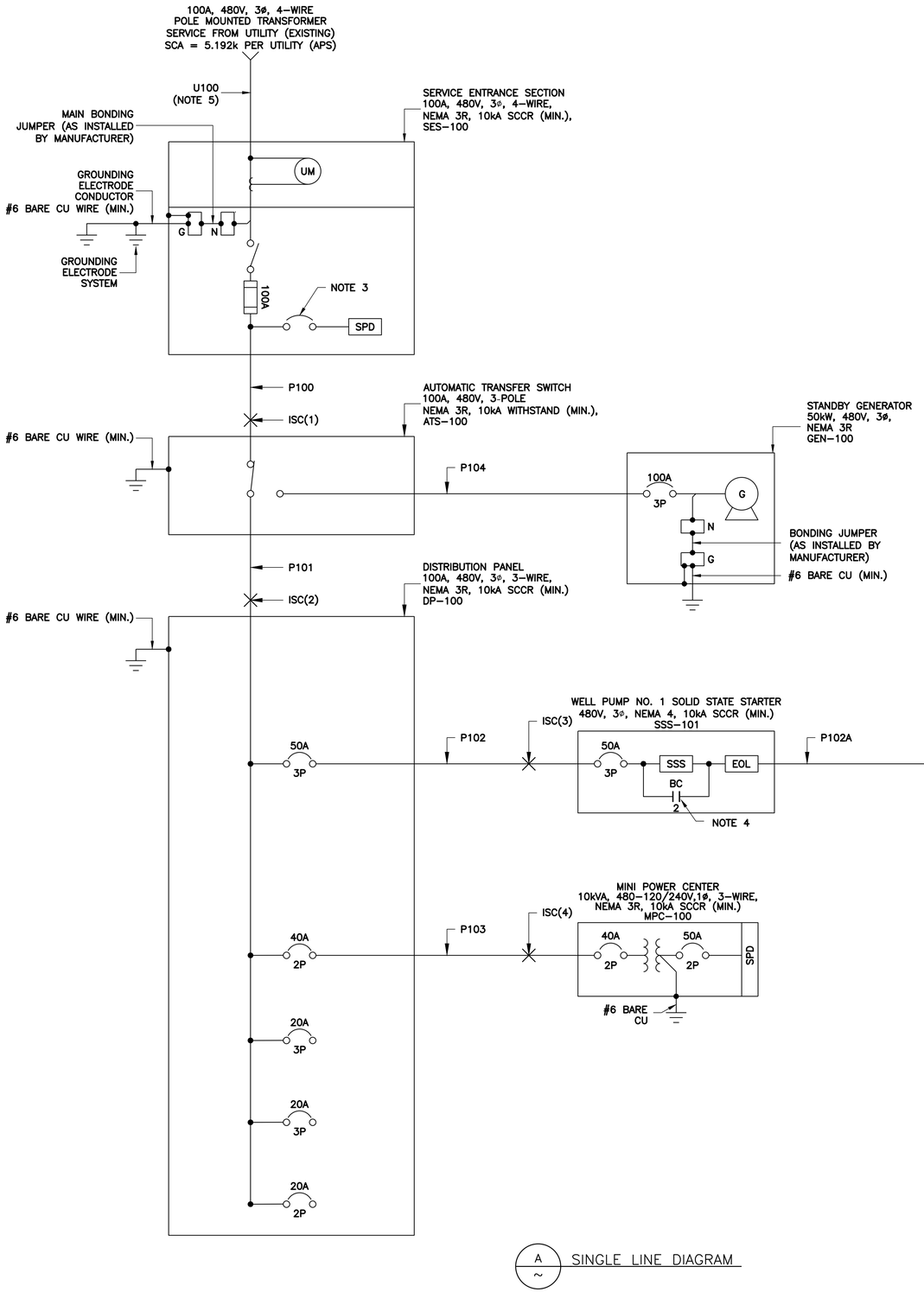

A SINGLE LINE DIAGRAM

CIRCUIT/DESCRIPTION	KVA	HP	FLA
MOTOR LOADS			
WELL PUMP NO.1 PMP-101		25.0	34.0
NON-MOTOR LOADS			
MINI POWER CENTER MPC-100	10.0		20.8
SUBTOTAL			54.8
+ 25% OF LARGEST MOTOR			8.5
TOTAL AMPS @ 480V/3PHASE			63.3
SERVICE SIZE (AMPS)			100.0

B LOAD CALCULATIONS

CALLOUT NO.	NO. SETS	CONDUIT SIZE	CIRCUIT CONDUCTORS	CIRCUIT NO.'s
U100	PER UTILITY	PER UTILITY	PROVIDED BY UTILITY	SES100-P1
P100	1	1 1/2"	3 - #1, #8 GND	ATS100-P1
P101	1	1 1/2"	3 - #1, #8 GND	DP100-P1
P102	1	1"	3 - #6, #10 GND	SSS101-P1
P102A	1	1"	3 - #6, #10 GND	PMP101-P1
P103	1	1"	2 - #8, #10 GND	MPC100-P1
P104	1	1 1/2"	3 - #1, #8 GND	GEN100-P1

C CALLOUT SCHEDULE

NOTES:

1. ALL SHORT CIRCUIT INTERRUPTING AND PROTECTING DEVICES SHALL HAVE A SHORT CIRCUIT INTERRUPTING RATING EQUAL TO OR GREATER THAN THE ASSOCIATED AVAILABLE FAULT CURRENT.
2. OVERCURRENT PROTECTIVE DEVICES ARE TO BE COORDINATED SUCH THAT FAULTS ARE LOCALIZED/ISOLATED TO THEIR NEAREST RESPECTIVE OCPD.
3. UNSIZED OVERCURRENT PROTECTIVE DEVICES ARE TO BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
4. BYPASS AND EOL ARE NOT REQUIRED IF SOLID STATE STARTER PROVIDES INTEGRAL BYPASS CONTACTOR AND EOL. EOL MUST PROTECT MOTOR IN BYPASS AND NON–BYPASS MODES OF OPERATION.
5. CONTRACTOR SHALL INTERCEPT EXISING UTILITY CONDUIT AND PROVIDE NEW CONDUIT TO SES–100. COORDINATE WITH ARIZONA PUBLIC SERVICE (APS) FOR REPLACEMENT OF CONDUCTORS AND CONDUIT INTERCEPTION.

SHORT CIRCUIT CALCULATIONS			
DEFINITIONS		**FORMULAS**	
ISC =	SHORT CIRCUIT CURRENT (AMPS)	3 PH: f =	1.732 x L x Isc / N x C x V L-L
N =	NUMBER OF CONDUCTORS/PHASE		
L =	LENGTH OF CONDUCTOR (FEET)	1 PH: f =	2 x L x Isc / N x C xV L-L
C =	CONSTANT FROM TABLE OF "C"		
Isc =	AVAILABLE SHORT-CIRCUIT AMPS		
V L-L =	LINE TO LINE VOLTAGE (VOLTS)		
V P =	PRIMARY VOLTAGE	1 PH XFMR: f =	Iscx VP x % Z / 100,000 x KVA
V s =	SECONDARY VOLTAGE		
% Z =	TRANSFORMER % IMPEDANCE		

ISC(1)

$f1 = \frac{1.732}{1} \times \frac{4}{7493} \times \frac{5{,}192}{480} = 0.01$

$M = \frac{1}{1 + 0.01} = 0.9901$

ISC(1) = 5,192 x 0.9901 = 5,141 A

ISC(2)

$f2 = \frac{1.732}{1} \times \frac{4}{7493} \times \frac{5{,}141}{480} = 0.0099$

$M = \frac{1}{1 + 0.0099} = 0.9902$

ISC(2) = 5,141 x 0.9902 = 5,091 A

ISC(3)

$f3 = \frac{1.732}{1} \times \frac{4}{2430} \times \frac{5{,}091}{480} = 0.0302$

$M = \frac{1}{1 + 0.0302} = 0.9707$

ISC(3) = 5,091 x 0.9707 = 4,942 A

ISC(4)

$f4 = \frac{2}{1} \times \frac{8}{1558} \times \frac{5{,}091}{480} = 0.1089$

$M = \frac{1}{1 + 0.1089} = 0.9018$

ISC(4) = 5,091 x 0.9018 = 4,591 A

D SHORT CIRCUIT CALCULATIONS

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AARON G. ARMENTA
Date Signed 12/31/25
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title: SINGLE LINE DIAGRAM

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E–02

PANEL TAG No.	MPC-100					**NEMA TYPE/MOUNTING**	3R/SURFACE						
LOCATION	MINI POWER CENTER					**MAIN DEVICE**	50A MCB						
BUS AMPACITY	100					**AIC RATING**	10K (MIN.)						
VOLTS, PHASE, WIRE	240 V/1-PHASE/3-WIRE					**FED FROM**	DP-100						
REMARKS						**ACCESSORIES**	SPD						

LOAD VA												LOAD VA	
PHASE A	**PHASE B**	**LOAD DESCRIPTION**	**WIRE SIZE**	**DEMAND**	**BKR**	**BKR. NO.**		**BKR**	**DEMAND**	**WIRE SIZE**	**LOAD DESCRIPTION**	**PHASE A**	**PHASE B**
0		SPARE			20/1	1	2	20/1			SPARE	0	
	100	SAND SEPARATOR CONTROLLER	#12	1.25	20/1	3	4	20/1	1.00	#12	RECEPTACLE		180
0		SPARE			20/1	5	6	20/1	1.25	#12	FLOW METER FIT-101	50	
	100	LIGHTING	#12	1.25	20/1	7	8	20/1	1.25	#12	RTU-100		250
400		RTU AC UNIT	#12	1.25	20/1	9	10	20/2	1.25	#12	GENERATOR BLOCK HEATER	400	
	0	SPACE				11	12		1.25	#12	GENERATOR BLOCK HEATER		400
0		SPACE				13	14	20/1			SPARE	0	
	0	SPACE				15	16	20/1	1.25	#12	GENERATOR BATTERY CHARGER		250
400	200	CONNECTED VA									CONNECTED VA	450	1080
500	250	DEMAND VA									DEMAND VA	563	1305

		VA	AMPS			
* - Each branch circuit				TOTAL CONNECTED VA - PER PHASE	850	1280
shall have an	TOTAL PANEL CONNECTED LOAD	2130	8.88	TOTAL DEMAND VA - PER PHASE	1063	1555
equipment grounding conductor	TOTAL PANEL DEMAND LOAD	2618	10.91	TOTAL DEMAND PHASE AMPS	8.9	13.0
sized per N.E.C. Article 250	PANEL DEMAND FACTOR	123%				

A ~ MPC-100 PANEL SCHEDULE

LIGHTING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	MOUNTING	MANUFACTURER	LAMPS	REMARKS
	120V, 4' LED FIXTURE, NARROW LENSED STRIPLIGHT, UL LISTED FOR DAMP LOCATIONS.	SURFACE/ PENDANT	EATON METALUX SNLED LENSED LED OR APPROVED EQUAL	2.5K-4K LUMEN OUTPUT, 3500K LED, WIDE DISTRIBUTION	E = FIXTURE TO BE PROVIDED WITH BATTERY BACKUP

B ~ FIXTURE SCHEDULE

SHEET NO.	CIRCUIT	CONDUCTORS
E-05	SSS101-C1	2 - #14, #14 GND
E-05	SSS101-C2	10 - #14, #14 GND
E-05	SSS101-C3	1 - CAT6
E-05	TSH101-C1	2 - #14, #14 GND
E-05	PSH101-C1	2 - #14, #14 GND
E-06	ATS100-C1	2 - #14, #14 GND
E-06	ATS100-C2	6 - #14, #14 GND
E-06	FIT101-C1	1 - IC, #14 GND
E-06	GEN100-C1	2 - #14, #14 GND
E-06	GEN100-C2	1 - IC, #14 GND
E-06	GEN100-C3	6 - #14, #14 GND
E-06	BFV101-C1	3 - #14, #14 GND
E-06	BFV101-C2	3 - #14, #14 GND
E-06	BFV102-C1	3 - #14, #14 GND
E-06	BFV102-C2	3 - #14, #14 GND
E-06	PIT101-C1	1 - IC, #14 GND
E-06	LAKOS-C1	3 - #14, #14 GND

C ~ MASTER CIRCUIT SCHEDULE

Checked | Drawn | Design | Date | Revision Note | Rev No.

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AARON G. ARMENTA
Date Signed 05/22/26
ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Sheet Title: ELECTRICAL SCHEDULES

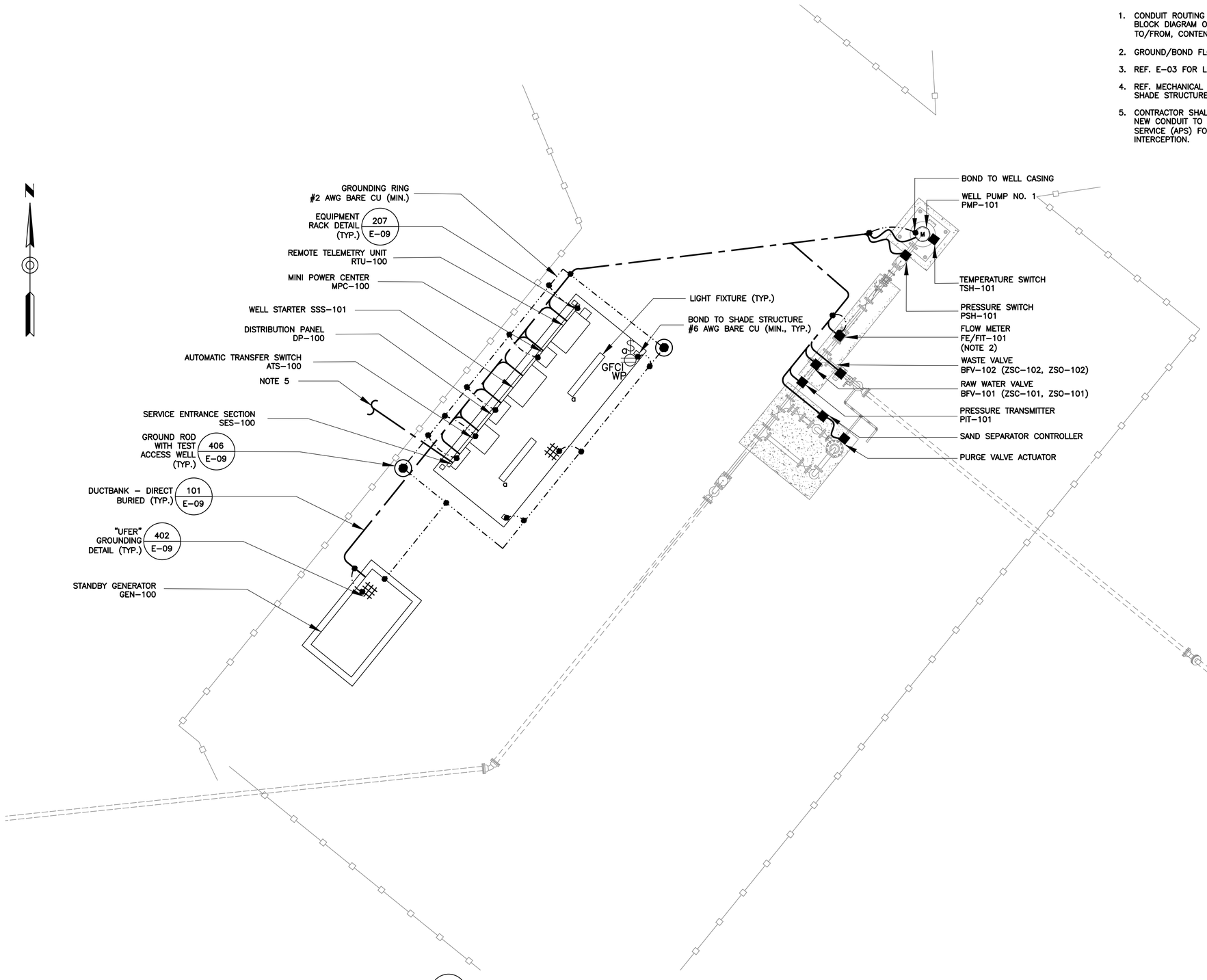
Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E-03

NOTES:

1. CONDUIT ROUTING SHALL BE FIELD DETERMINED. REFER TO CONDUIT BLOCK DIAGRAM ON E–08 FOR CONDUIT REQUIREMENTS INCLUDING TO/FROM, CONTENTS, ETC.
2. GROUND/BOND FLOW METER PER MANUFACTURER'S RECOMMENDATIONS.
3. REF. E–03 FOR LIGHTING FIXTURE SCHEDULE.
4. REF. MECHANICAL DRAWINGS FOR ELECTRICAL EQUIPMENT PAD AND SHADE STRUCTURE DETAILS.
5. CONTRACTOR SHALL INTERCEPT EXISTING UTILITY CONDUIT AND PROVIDE NEW CONDUIT TO SES–100. COORDINATE WITH ARIZONA PUBLIC SERVICE (APS) FOR REPLACEMENT OF CONDUCTORS AND CONDUIT INTERCEPTION.



A ELECTRICAL SITE PLAN

4 3 2 1 0 2 4

SCALE: 1/4" = 1'–0"

Rev No	Revision Note	Date	Design	Drawn	Checked

NCS ENGINEERS EST. 1998
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Registered Professional Engineer (Electrical) 74459 AARON G. ARMENTA Not Signed Without Seal ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Sheet Title: ELECTRICAL SITE PLAN

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E–04

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or visit Arizona811.com

May 22, 2026 – 12:03pm
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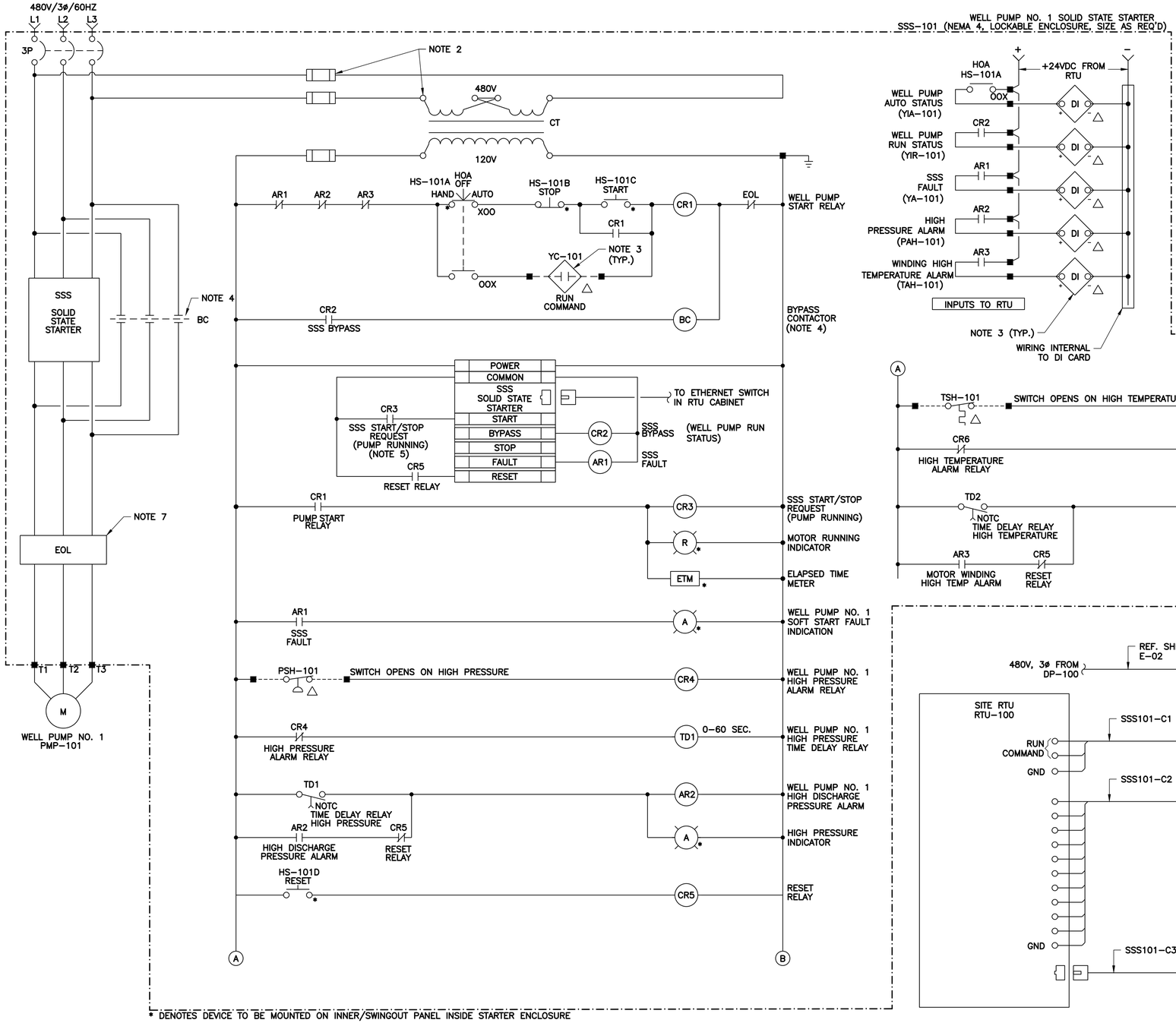

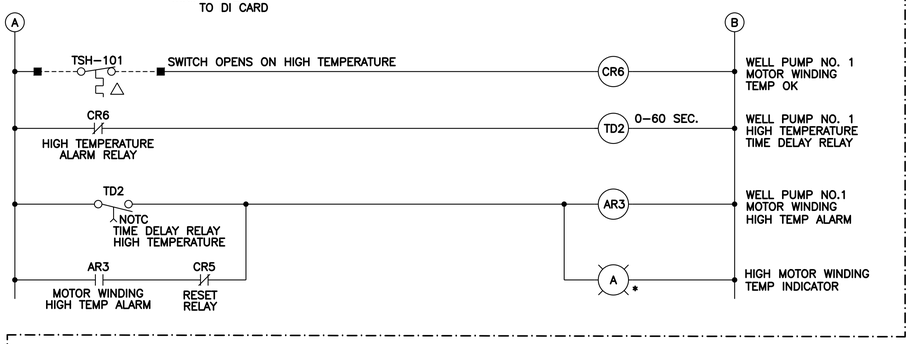

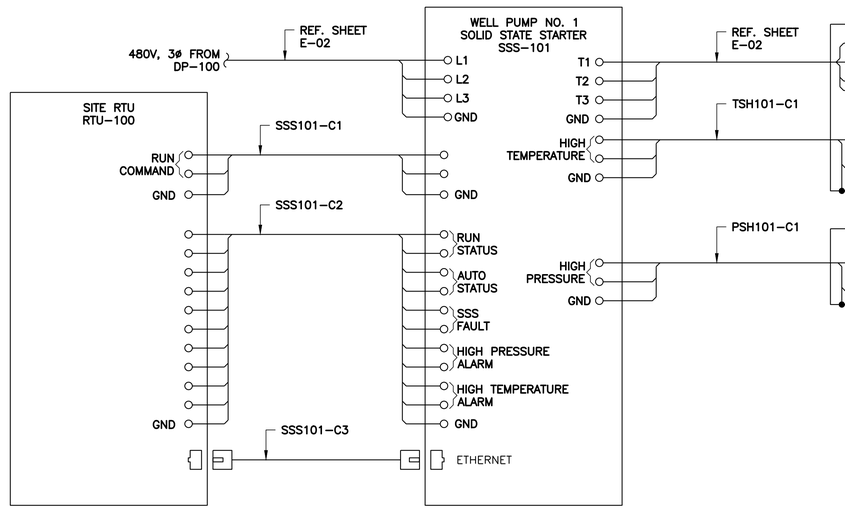

NOTES:

1. TYPICAL SCHEMATIC DIAGRAMS ARE INTENDED TO REFLECT THE GENERAL CONTROL STRATEGY. ACTUAL CIRCUITRY MAY VARY FOR SPECIFIC EQUIPMENT SUPPLIED. THE NUMBER AND TYPE OF DEVICES SHALL BE FURNISHED AS REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT.
2. CONTROL POWER TRANSFORMERS (CPT) SHALL BE ADEQUATELY SIZED AND SHALL BE PROVIDED WITH PROPERLY SIZED FUSES FOR BOTH THE PRIMARY AND SECONDARY WINDINGS.
3. CONNECTIONS TO DIGITAL INPUTS AND OUTPUTS ARE SHOWN IN A CONCEPTUALIZED AND SIMPLIFIED MANNER.
4. BYPASS CONTACTOR SHOWN IS ONLY APPLICABLE IF SOLID STATE STARTER PROVIDED DOES NOT HAVE AN INTEGRAL BYPASS CONTACTOR.
5. CONFIGURE SOFT START FOR 2-WIRE START/STOP OPERATION.
6. UNSIZED OVERCURRENT PROTECTIVE DEVICES ARE TO BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
7. EOL SHOWN IS ONLY APPLICABLE IF SOLID STATE STARTER PROVIDED DOES NOT HAVE INTEGRAL EOL PROTECTION BUILT-IN THAT PROTECTS THE MOTOR IN BOTH BYPASS AND NON-BYPASS MODES.
8. REFER TO SHEET E-03 FOR MASTER CIRCUIT SCHEDULE.

A ~ WELL PUMP NO. 1 SOLID STATE STARTER (SSS-101) SCHEMATIC
SCHEMATIC

B ~ WELL PUMP NO. 1 SOLID STATE STARTER (SSS-101) CONNECTION
CONNECTION

Checked			
Drawn			
Design			
Date			
Revision Note			
Rev No.			

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer (Electrical) 74459 AARON G. ARMENTA Date Signed 05/22/26 ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title:
SSS-101
SCHEMATIC AND CONNECTION DIAGRAM

Project name
WELL SITE 4 IMPROVEMENTS

Project Location
TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E-05

May 22, 2026 - 12:03pm
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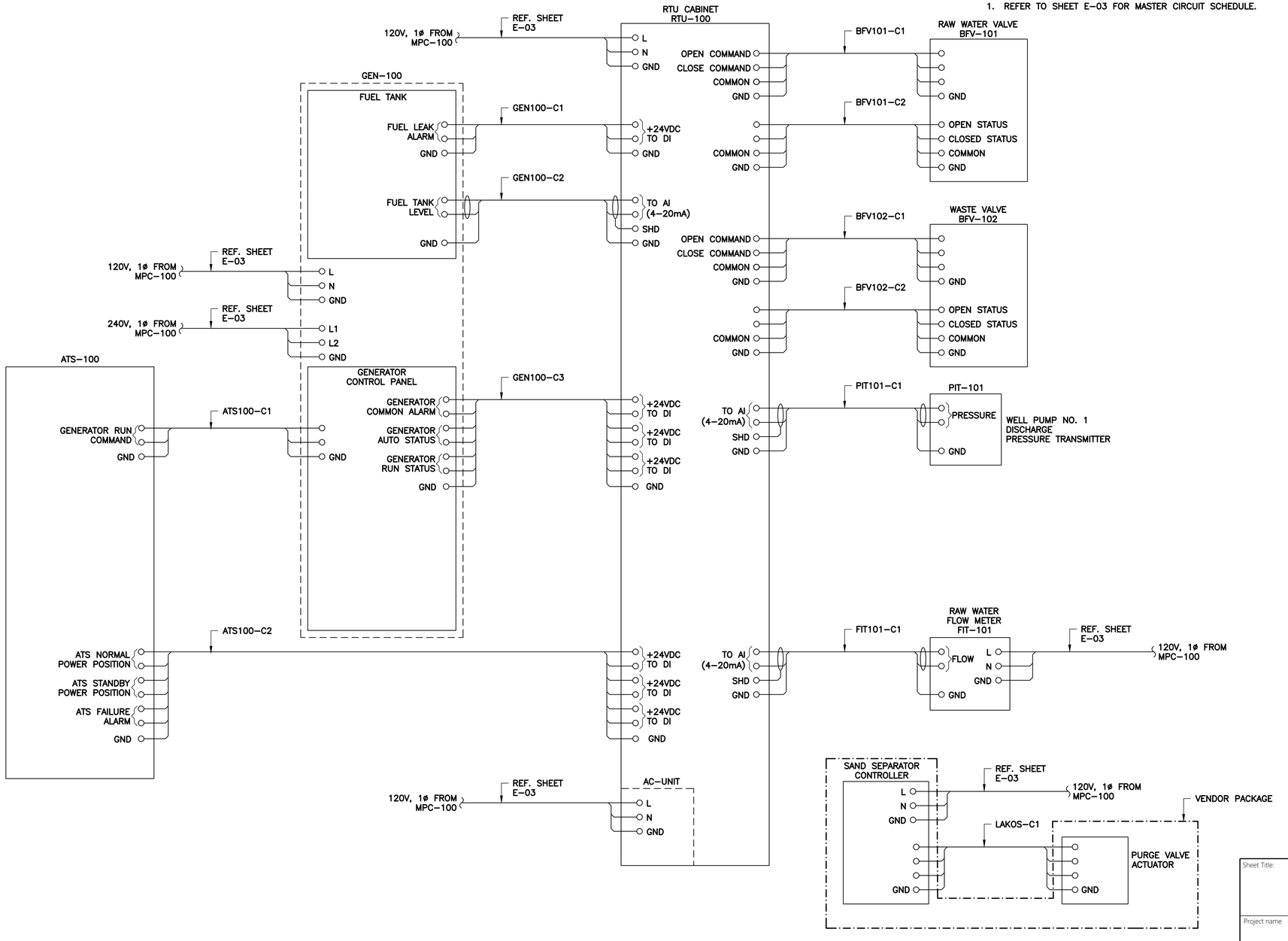
NOTES:

1. REFER TO SHEET E-03 FOR MASTER CIRCUIT SCHEDULE.



A CONNECTION DIAGRAM

Rev No. | Revision Note | Date | Design | Drawn | Checked

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(602) 629-0206

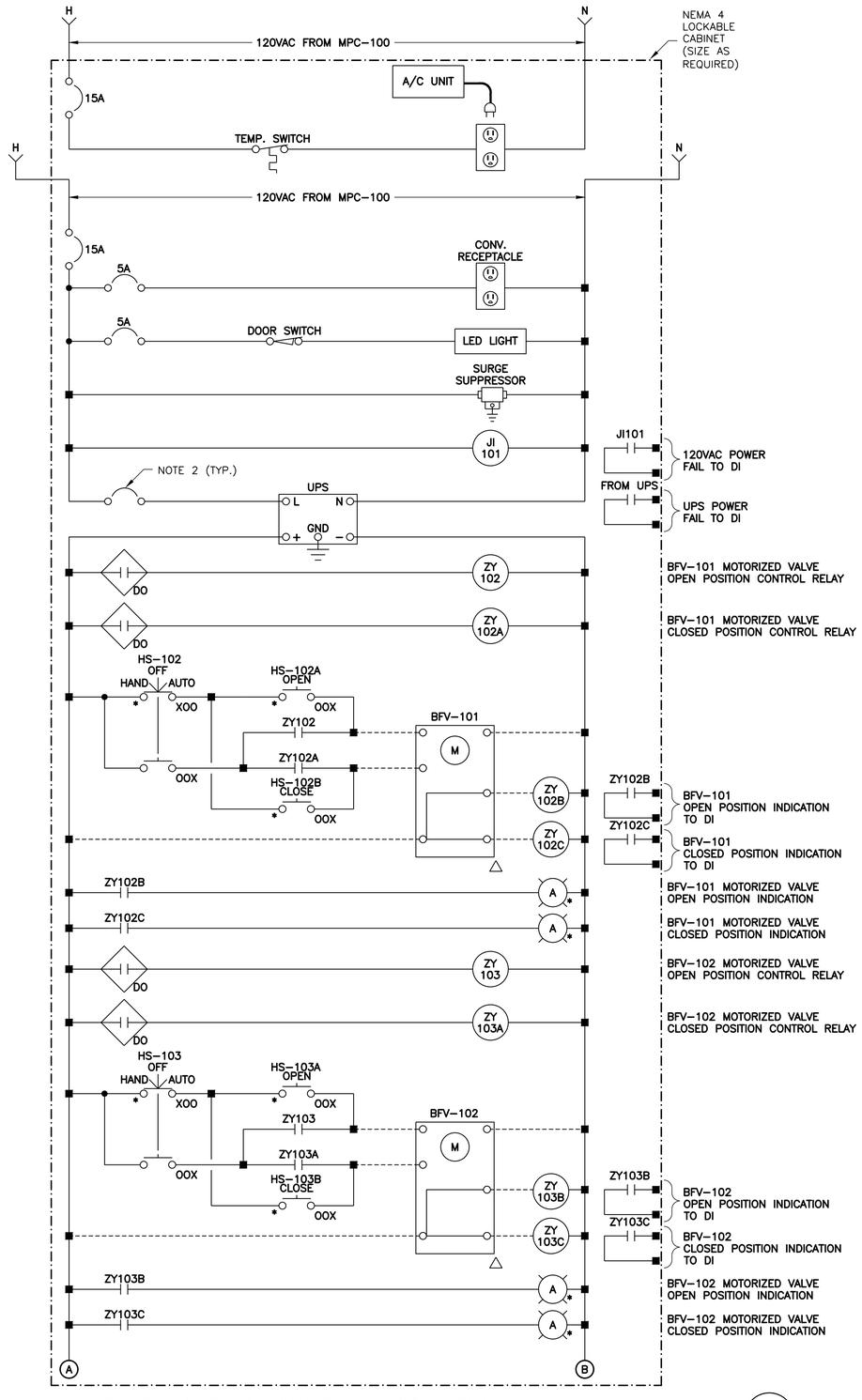
Registered Professional Engineer (Electrical) 74459 AARON G. ARMENTA Date Signed 12/31/25 ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title: CONNECTION DIAGRAM

Project name: WELL SITE 4 IMPROVEMENTS

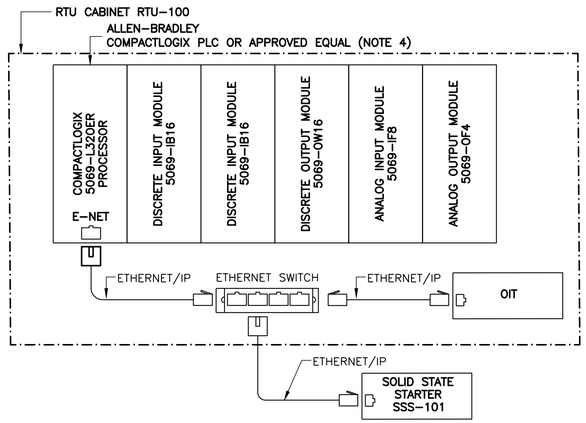
Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E-06

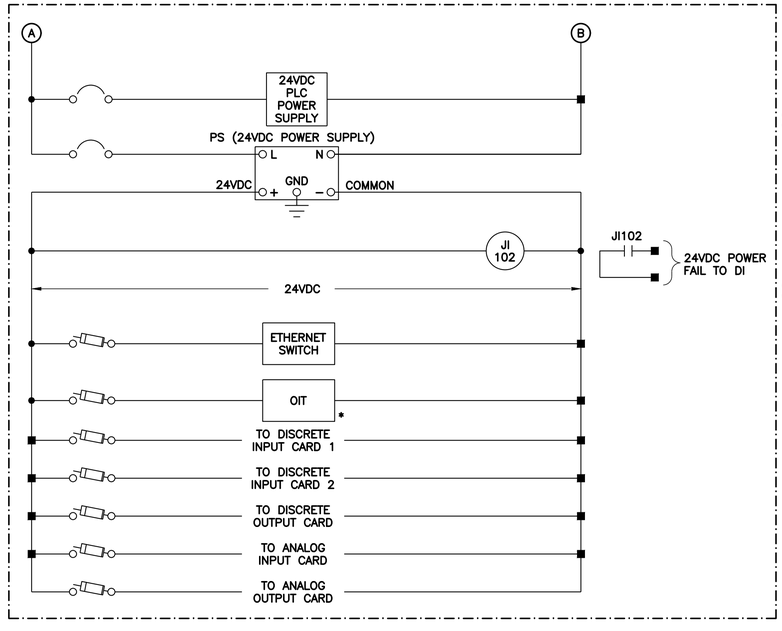


* DENOTES DEVICE TO BE MOUNTED ON SWING-OUT PANEL INSIDE ENCLOSURE.

A ~ RTU POWER DISTRIBUTION SCHEMATIC
SCHEMATIC

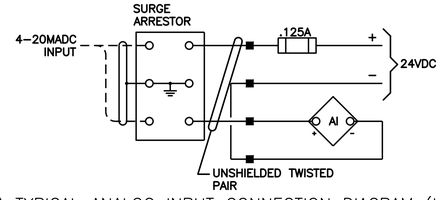


B ~ COMMUNICATION DIAGRAM
SCHEMATIC

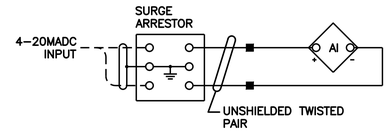


NOTES:

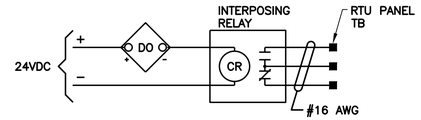
1. TYPICAL SCHEMATIC DIAGRAMS ARE INTENDED TO REFLECT THE GENERAL CONTROL STRATEGY. ACTUAL CIRCUITRY MAY VARY FOR SPECIFIC EQUIPMENT SUPPLIED. THE NUMBER AND TYPE OF DEVICES SHALL BE FURNISHED AS REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT.
2. CONTROL FUSES AND CIRCUIT BREAKERS SHALL BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURERS' RECOMMENDATIONS.
3. RTU PANEL SHALL BE LABELED TO INDICATE IT IS SUPPLIED BY MULTIPLE POWER SOURCES.
4. IO MODULES BE COMPATIBLE WITH SELECTED PLC MAKE AND MODEL.



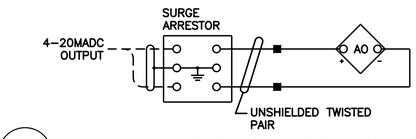
C ~ TYPICAL ANALOG INPUT CONNECTION DIAGRAM (LOOP POWERED)
SCHEMATIC



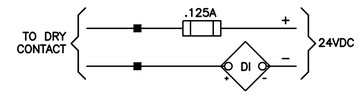
D ~ TYPICAL ANALOG INPUT CONNECTION DIAGRAM (ISOLATED)
SCHEMATIC



E ~ TYPICAL DIGITAL OUTPUT CONNECTION DIAGRAM
SCHEMATIC



F ~ TYPICAL ANALOG OUTPUT CONNECTION DIAGRAM
SCHEMATIC



G ~ TYPICAL DIGITAL INPUT CONNECTION DIAGRAM
SCHEMATIC

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Registered Professional Engineer (Inactive)
74459
AARON G. ARMENTA
Date Signed 12/27/25
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title:
COMMUNICATION DIAGRAM & RTU SCHEMATICS

Project name
WELL SITE 4 IMPROVEMENTS

Project Location
TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E-07

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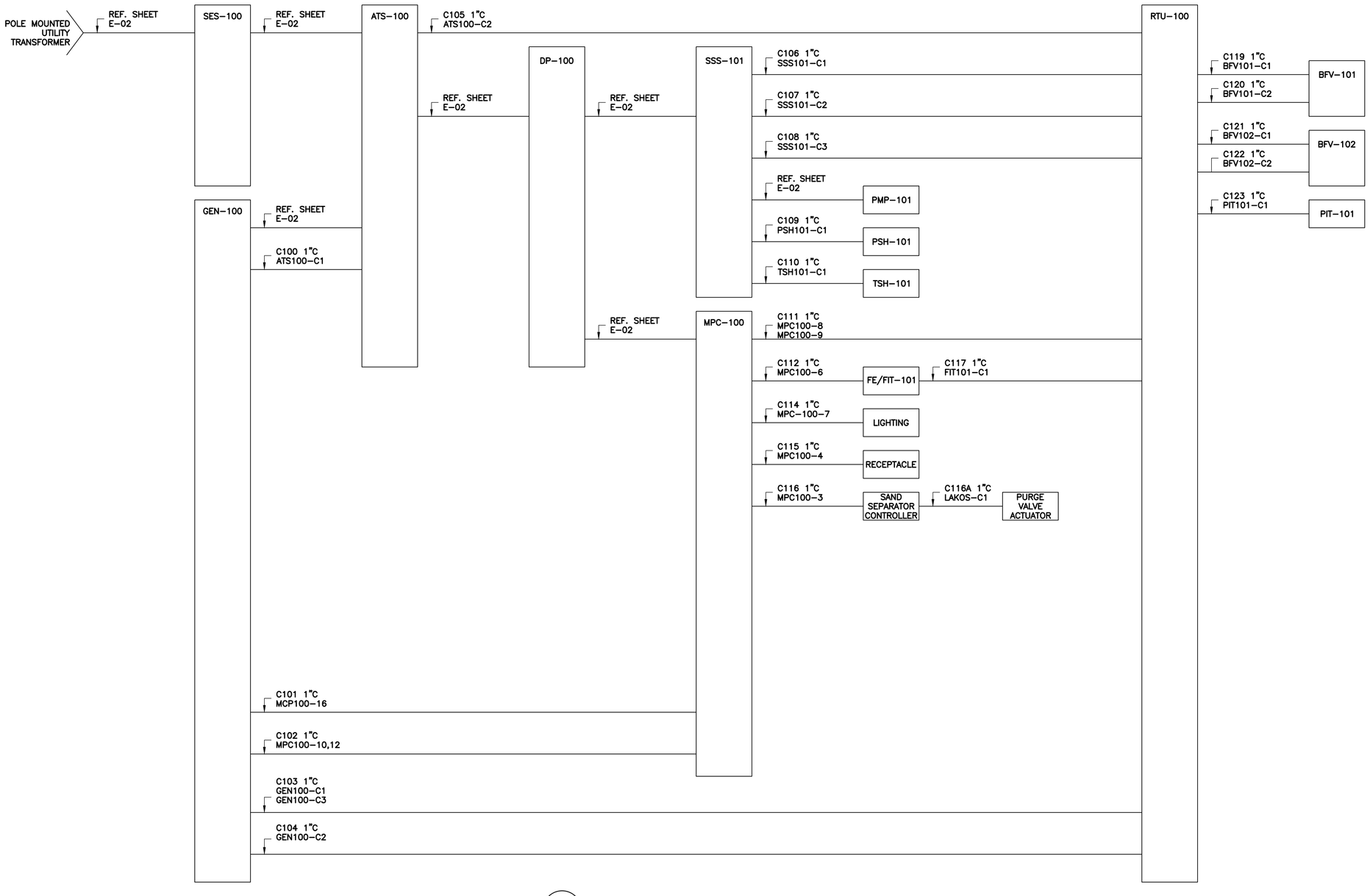
LEGEND:

C200 1"C ← CONDUIT NUMBER & SIZE
RTU200-1 ← CIRCUIT NUMBER(S)

NOTES:



A CONDUIT BLOCK DIAGRAM

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Date			
Rev No.	Revision Note		

NCS ENGINEERS EST 1998
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(602) 629-0206

Registered Professional Engineer (Electrical) 74459 AARON G. ARMENTA Date Signed 05/22/2026 ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Sheet Title: CONDUIT BLOCK DIAGRAM

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E-08

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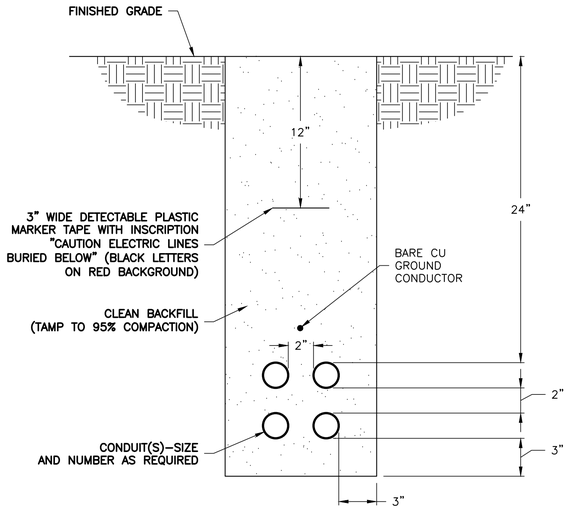
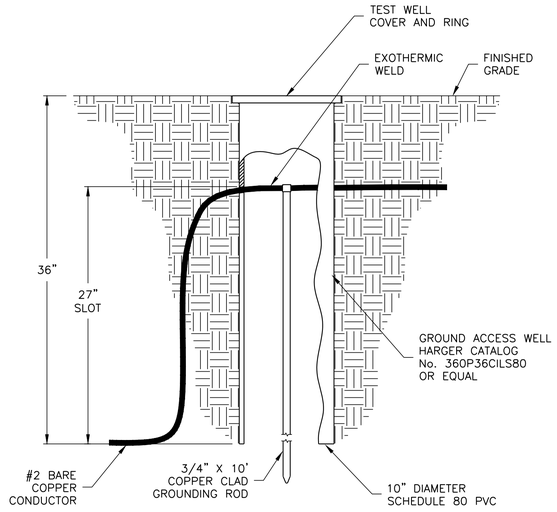


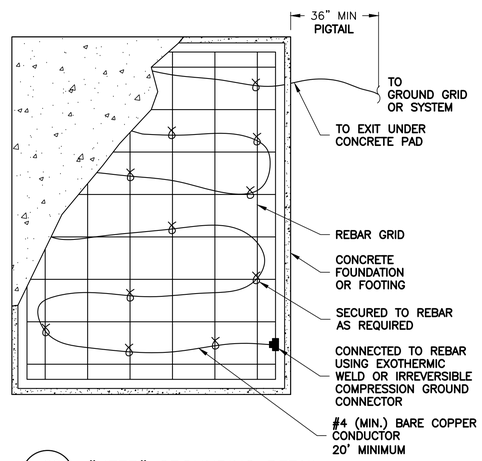
NOTES:

1. GROUND CONDUCTOR SHALL RUN CONTINUOUSLY THROUGH MANHOLES AND SHALL CONTINUE FROM DUCTBANK INTO SWITCHGEAR OR BUILDING GROUNDING SYSTEM AND SHALL BE BONDED TO EACH RIGID METAL CONDUIT. SIZE TO BE #2 (MIN.) UNLESS OTHERWISE INDICATED ON PLANS.
2. ALL DIMENSIONS ARE MINIMUM.

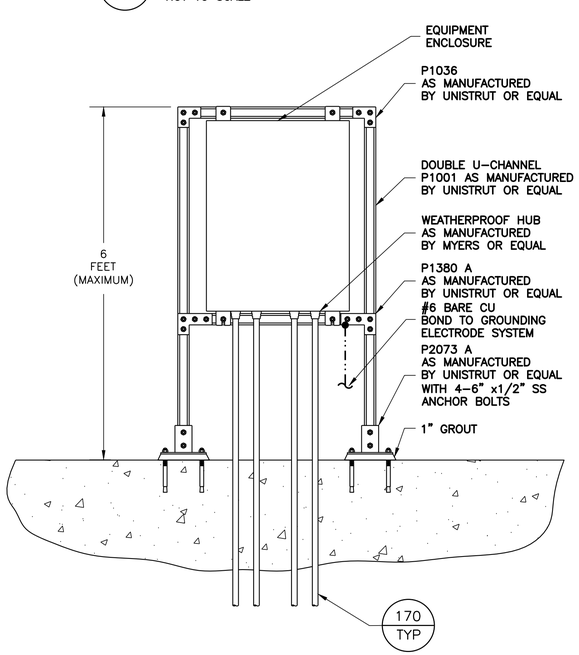
101 TYP — DUCTBANK – DIRECT BURIED
NOT TO SCALE



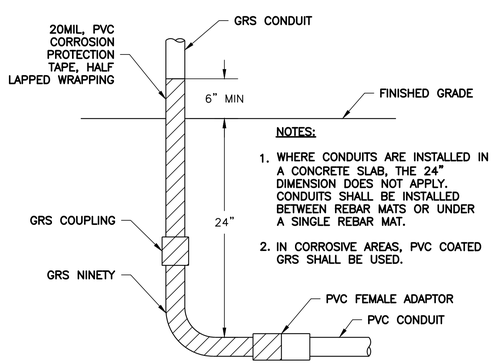
406 TYP — GROUND ROD WITH TEST ACCESS WELL
NOT TO SCALE



402 TYP — "UFER" GROUNDING DETAIL
NOT TO SCALE



207 TYP — EQUIPMENT RACK DETAIL – NON–CLASSIFIED AREAS
NOT TO SCALE



170 TYP — GRS STUB UP DETAIL
NOT TO SCALE

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Rev No.	Revision Note		

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AARON G. ARMENTA
Date Signed 05/22/26
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title: ELECTRICAL DETAILS

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	E–09

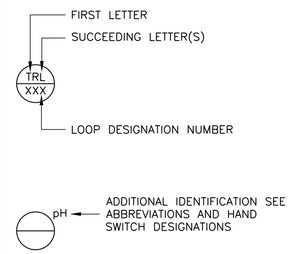
ISA INSTRUMENT IDENTIFICATION TABLE

FIRST LETTERS			SUCCEEDING LETTERS		
MEASURED OR INITIATING VARIABLE		MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYZER		ALARM		AUTO
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		ELEMENT		
F	FLOW	RATIO			
G	GAUGE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHED.	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOTION				MIDDLE
N	INTRUSION				NORMAL
O	TORQUE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT CONNECTION		STOP
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD, OR PRINT		RUN OR REMOTE
S	SPEED, FREQUENCY	SAFETY		SWITCH	START
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, LOUVER	
W	WEIGHT		WELL		
X	MOTOR	X-AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z-AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

P&ID ABBREVIATIONS

A	AMPERE
AFD	ADJUSTABLE FREQUENCY DRIVE
AI	ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
ARV	AIR RELIEF VALVE
AO	ANALOG OUTPUT
AS	AIR SUPPLY
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
CB	CIRCUIT BREAKER
CL2	CHLORINE
CON	CONTACTOR
CU	COPPER
CV	CONTROL VALVE
DCS	DISTRIBUTED CONTROL SYSTEM
DI	DISCRETE INPUT
DO	DISSOLVED OXYGEN, DISCRETE OUTPUT
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
EGO	EMERGENCY GAS OFF
ETM	ELAPSED TIME METER
ETMf	ELAPSED TIME METER (FAST SPEED)
ETMs	ELAPSED TIME METER (SLOW SPEED)
EOL	ELECTRONIC OVERLOAD
EXIST	EXISTING
FA	FOUL AIR
FC	FAIL CLOSED
FE	FINAL EFFLUENT
FR	FORWARD-REVERSE
FS	FLOAT SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FW	FINISHED WATER
GND	GROUND
GAL	GALLONS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H, HI	HIGH
H2S	HYDROGEN SULFIDE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTO
I	CURRENT
IO	INPUT/OUTPUT
IOE	INTERNAL-OFF-EXTERNAL
JB	JUNCTION BOX
L, LO	LOW
LAN	LOCAL AREA NETWORK
LC	LOOP CONTROLLER
LCP	LOCAL CONTROL PANEL
LOS	LOCK-OFF-STOP
LR	LOCAL/REMOTE
LS	LEVEL (i.e.. FLOAT) SWITCH
M	MOTOR
MA	MANUAL/AUTO
mA	MILLIAMP
MC	MANUFACTURE CABLE
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR(S)	MANUFACTURER(S)
MGD	MILLION GALLONS PER DAY
MGL	MILLIGRAMS PER LITER
MH	MANHOLE
MLR	MIXED LIQUOR RETURN
MO	MOISTURE
MOD	MODULATED
MTU	MASTER TELEMETRY UNIT
NPW	NON-POTABLE WATER
NS	NITROGEN SUPPLY
NTU	TURBIDITY
O/C	OPEN / CLOSE
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
OO	ON/OFF (MAINTAINED)
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
PAH	PRESSURE ALARM HIGH
PER	PERMISSIVE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PO	PULSE OUTPUT
POS	POSITION
POT	POTENTIOMETER
PPG	POUNDS PER GALLON
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PR	PAIR
PRES	PRESSURE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PV	PROCESS VARIABLE
RAS	RETURN ACTIVATED SLUDGE
RAW	RAW WATER
REM	REMOTE
RF	RADIO FREQUENCY
RIO	REMOTE INPUT OUTPUT
RS	RAW SEWAGE
RSP	RAW SEWAGE PUMP
RST	RESET
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RUNf	RUN (FAST SPEED)
RUNs	RUN (SLOW SPEED)
SB	SLUDGE BLANKET
SEQ	SERVICE ENTRANCE EQUIPMENT
SES	SERVICE ENTRANCE SECTION
SLC	SINGLE LOOP CONTROLLER
SLOS	START-LOCK-OFF-STOP
SO2	SULFUR DIOXIDE
SOV	SOLENOID OPERATED VALVE
SP	SET POINT
SPD	SPEED
SPR	SPARE
SS	START/STOP (MAINTAINED)
SSS	SOLID STATE STARTER (SOFT START)
STR	MOTOR STARTER
TAH	TEMPERATURE ALARM HIGH
T/M	TEMPERATURE AND/OR MOISTURE
TEMP	TEMPERATURE
TS	TEMPERATURE SWITCH
TSS	TOTAL SUSPENDED SOLIDS
UG	UNDERGROUND
USD	UP/STOP/DOWN
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATER
WAS	WASTE ACTIVATED SLUDGE
WW	WASTEWATER
XMTR	TRANSMITTER
ZS	POSITION (i.e. LIMIT) SWITCH

TAG NUMBERS AND DESIGNATIONS



HAND SWITCH DESIGNATIONS

ES	EMERGENCY STOP
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORA	HAND-OFF-REMOTE-AUTO
JOA	JOG-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
OC	OPEN-CLOSE
OO	ON-OFF
S/S	START STOP PUSH BUTTONS

LINE SYMBOLS

- MAJOR PROCESS PIPING OR FLOW CHANNEL
- EXISTING PROCESS PIPING
- SECONDARY PROCESS PIPING
- EXISTING SECONDARY PROCESS PIPING
- EXISTING PIPING AND EQUIPMENT
- FUTURE PIPING AND EQUIPMENT
- ELECTRICAL SIGNAL
- HYDRAULIC SIGNAL
- PNEUMATIC SIGNAL
- ELECTRICAL DIRECTION ARROW
- SIGNAL CONNECTION POINT
- FLOW ARROW FOR PROCESS PIPING
- PROCESS OR SIGNAL LINE GOING TO ANOTHER SHEET (MATCH LETTERS) — I-3 /A
- PROCESS OR SIGNAL LINE FROM ANOTHER SHEET (MATCH LETTERS) — I-2 /A
- PROCESS LINES CROSSING (NOT CONNECTED)
- INTERNAL SYSTEM SIGNAL LINK (SOFTWARE OR DATA LINK)

P&ID VALVE SYMBOLS

- GATE OR GENERIC VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- ANGLE VALVE
- BUTTERFLY VALVE
- PLUG VALVE
- ECCENTRIC PLUG VALVE
- BALL VALVE
- CHECK VALVE
- SWING CHECK VALVE
- STOP CHECK VALVE
- BALL CHECK VALVE
- PINCH VALVE
- DIAPHRAGM VALVE
- DIAPHRAGM VALVE (ALTERNATE)
- GLOBE VALVE
- HAND VALVE
- KNIFE VALVE
- MOTORIZED VALVE ACTUATOR
- SOLENOID VALVE 2-WAY
- SOLENOID VALVE 3-WAY
- PUMP CONTROL VALVE
- FLOW CONTROL VALVE
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- PRESSURE REGULATOR WITH REMOTE PROCESS CONNECTION
- PRESSURE REGULATOR SELF CONTAINED
- AIR RELEASE VALVE

P&ID EQUIPMENT AND PROCESS SYMBOLS

- METERING PUMP WITH MANUAL STROKE CONTROL
- ROTARY LUBE PUMP
- SUBMERSIBLE MIXER
- AERATOR
- SUBMERSIBLE PUMP
- DIESEL GENERATOR
- CENTRIFUGAL PUMP
- BLOWER
- LIFT PUMP
- MOTOR OR MOTOR ACTUATOR
- PNEUMATIC ACTUATOR
- SOLENOID
- VERTICAL TURBINE PUMP
- CL_2 CHLORINE TANK
- WEIGHT SCALE
- AIR COMPRESSOR
- SLUICE GATE
- SAMPLER
- PROPELLER FLOWMETER ELEMENT
- MAGNETIC FLOWMETER ELEMENT
- CL2 FLOWMETER
- MASS FIT 6 — INSERTION TYPE MASS FLOW METER
- MASS FIT 6 — MASS FLOW METER ANNUBAR TYPE
- DRAIN
- OUTLET SILENCER
- INLET SILENCER
- ROTAMETER
- AIR RELIEF VALVE
- EJECTOR
- DIAPHRAGM SEAL
- DIFFUSER
- DIAPHRAGM
- Y-TYPE STRAINER
- IPS CORPORATION STOP
- PVC DIFFUSER WITH IPS CORPORATION STOP

SENSING, INDICATION, AND CONTROL SYMBOLS

- LE — ULTRASONIC LEVEL TRANSDUCER
- LS — FLOAT SWITCH
- BEACON R — BEACON R=RED, A=AMBER, B=BLUE, G=GREEN
- STOP YL G — INDICATING LIGHT
- HOA HS — HAND SWITCH
- ORP AIT — ORP ANALYZER
- pH AIT — pH ANALYZER
- AE — ANALYZER ELEMENT
- DO AE — DO SENSOR
- ORP AE — ORP SENSOR
- pH AE — pH SENSOR
- DO AIT — DO ANALYZER
- CL2 AE — RESIDUAL CL2 CHLORINE SENSOR
- CL2 AIT — RESIDUAL CL2 CHLORINE ANALYZER

P&ID INTERFACE SYMBOLS

- AAA BBB X — PILOT LIGHT X= LENS COLOR, R=RED, G=GREEN, A=AMBER B=BLUE
- AAA BBB CCC — FIELD DEVICE
- AAA BBB CCC — PANEL DEVICE
- AAA BBB CCC — DEVICE MOUNTED IN SUBPANEL
- BBB CCC — REMOTE I/O TERMINAL
- BBB CCC — HMI OR OIT FUNCTION
- I X — INTERLOCK DEVICE OR RELAY X=NOTE REF.
- I/I — DUAL CHANNEL CURRENT ISOLATOR
- DISCRETE INPUT
- DISCRETE OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT
- PULSE INPUT

NOTE:

REFER TO ISA INSTRUMENT IDENTIFICATION TABLE FOR DEFINITION OF LETTERS BBB INSIDE THE BUBBLES. CCC REPRESENTS LOOP ID (IF USED). SEE ABBREVIATIONS LIST FOR SUPERSCRIPT AAA.

Rev No	Revision Note	Date	Design	Drawn	Checked

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

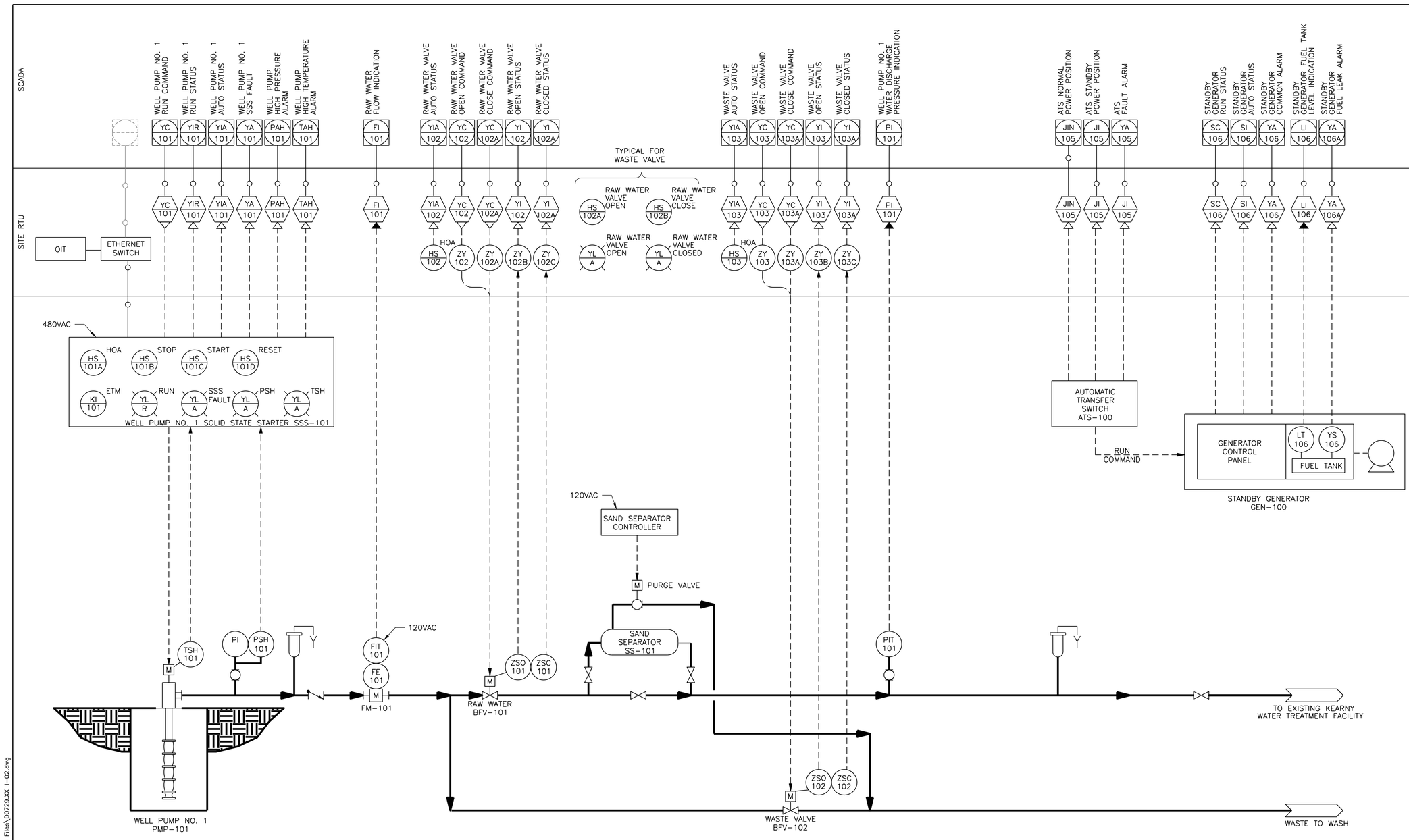
Registered Professional Engineer (Electrical) — 74459 AARON G. ARMENTA — ARIZONA, U.S.A. — EXPIRATION DATE: 12/31/27

Sheet Title: P&ID SYMBOLS AND LEGEND

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	I-01



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NCS ENGINEERS
EST 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
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Registered Professional Engineer (Electrical)
74459
AARON G. ARMENTA
Date Signed 05/22/26
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Sheet Title: P&ID

Project name: WELL SITE 4 IMPROVEMENTS

Project Location: TOWN OF KEARNY, AZ
33°03'57.8"N 110°53'26.7"W

Drawn By:	GAR	Date:	05/22/26
Design By:	GAR	Date:	05/22/26
Approved By:	AGA	Date:	05/22/26
Client Project No.	Project No. 0729	Sheet	I-02

May 22, 2026 - 12:03pm
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