

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS AND FLARE STATION

3380 AMERICANA TERRACE, SUITE 201  
BOISE, ID 83706  
PHONE: 208-389-1030



www.tetratech.com

PROJECT LOCATION:  
INTERSECTION OF MISSOURI AVENUE  
AND PERCH ROAD

CLIENT INFORMATION:  
PICKLES BUTTE LANDFILL  
15500 MISSOURI AVENUE  
NAMPA, ID 83686

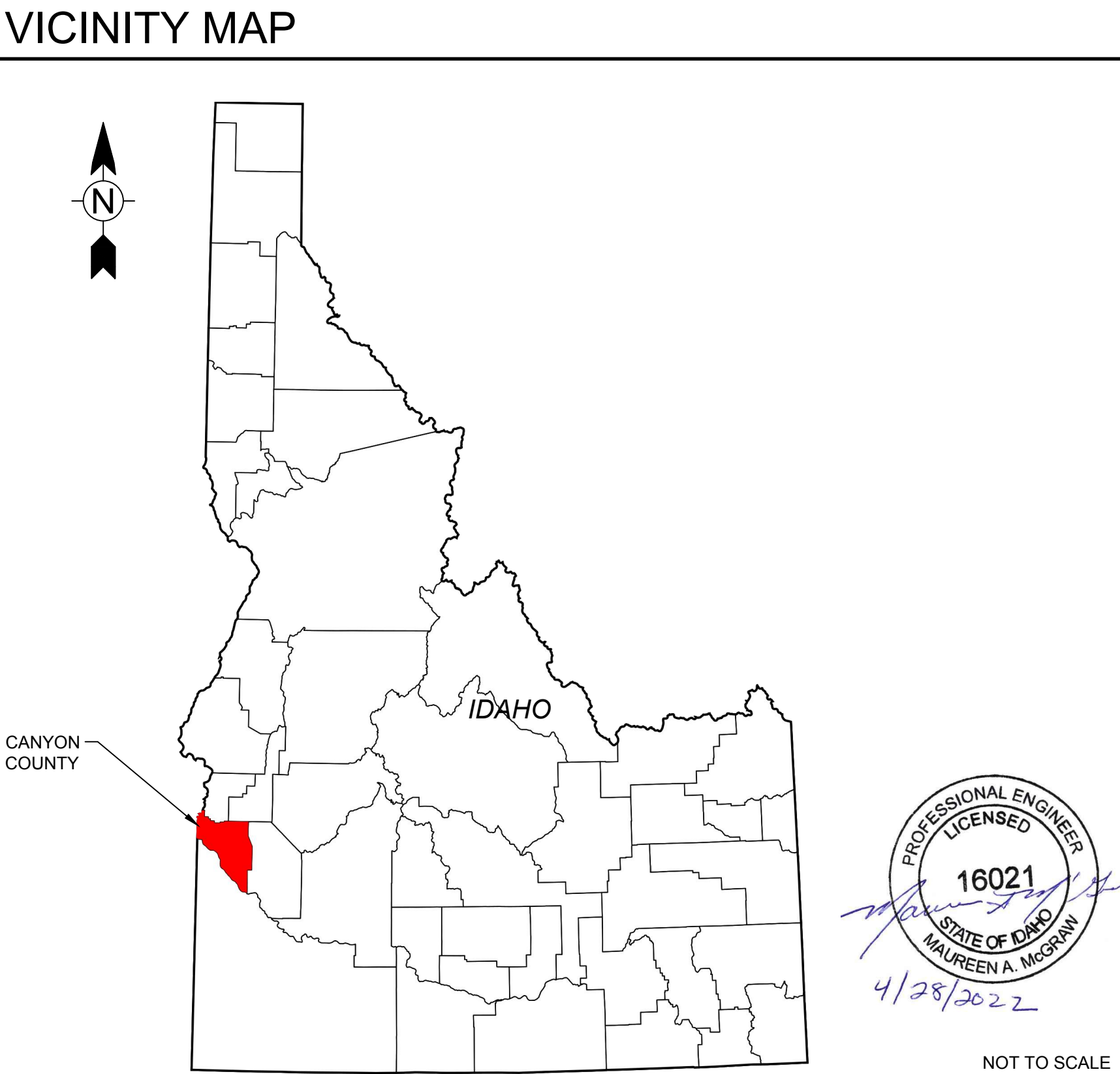
Tt PROJECT No.:  
114-571040-2022

CLIENT PROJECT No.:  
NONE

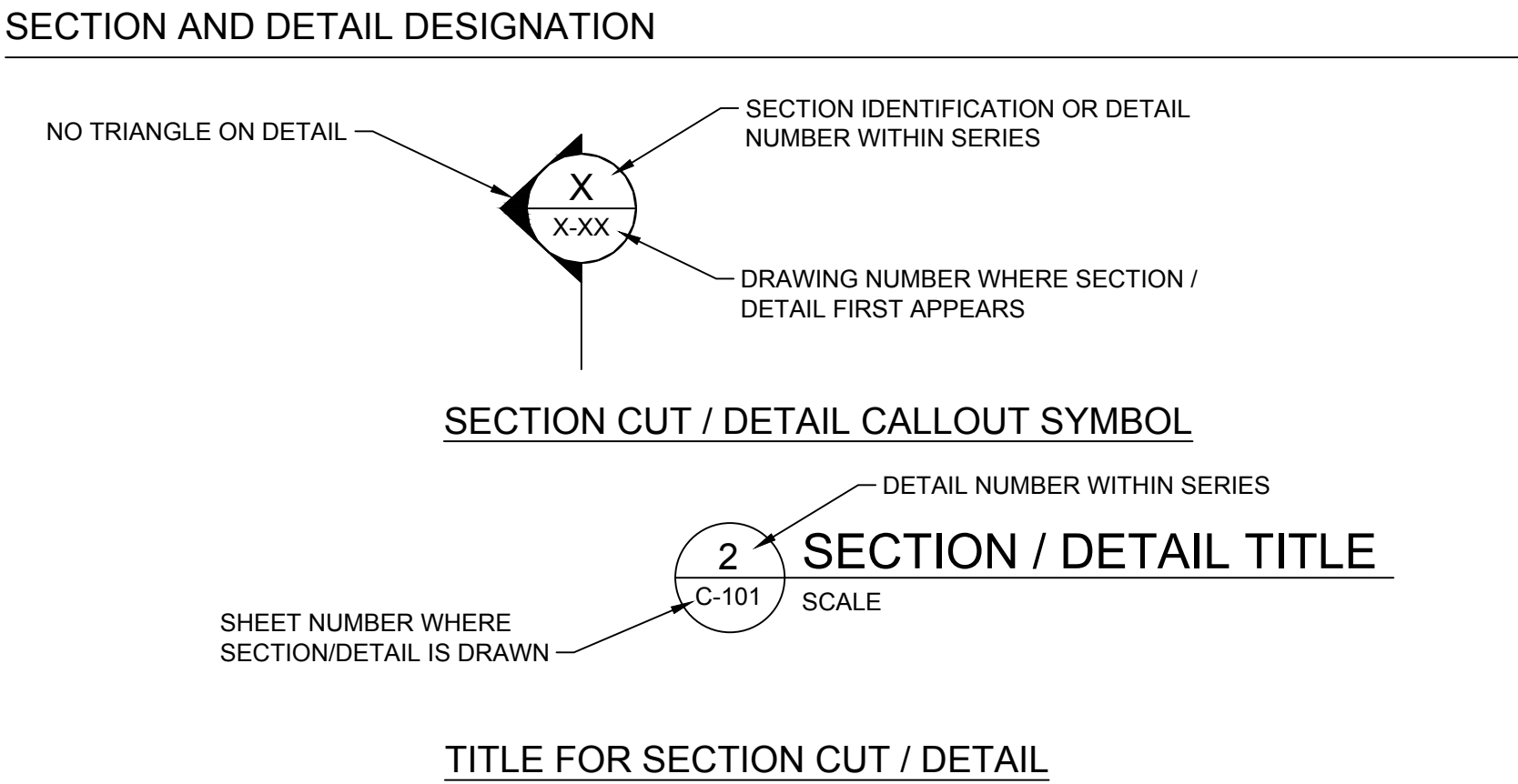
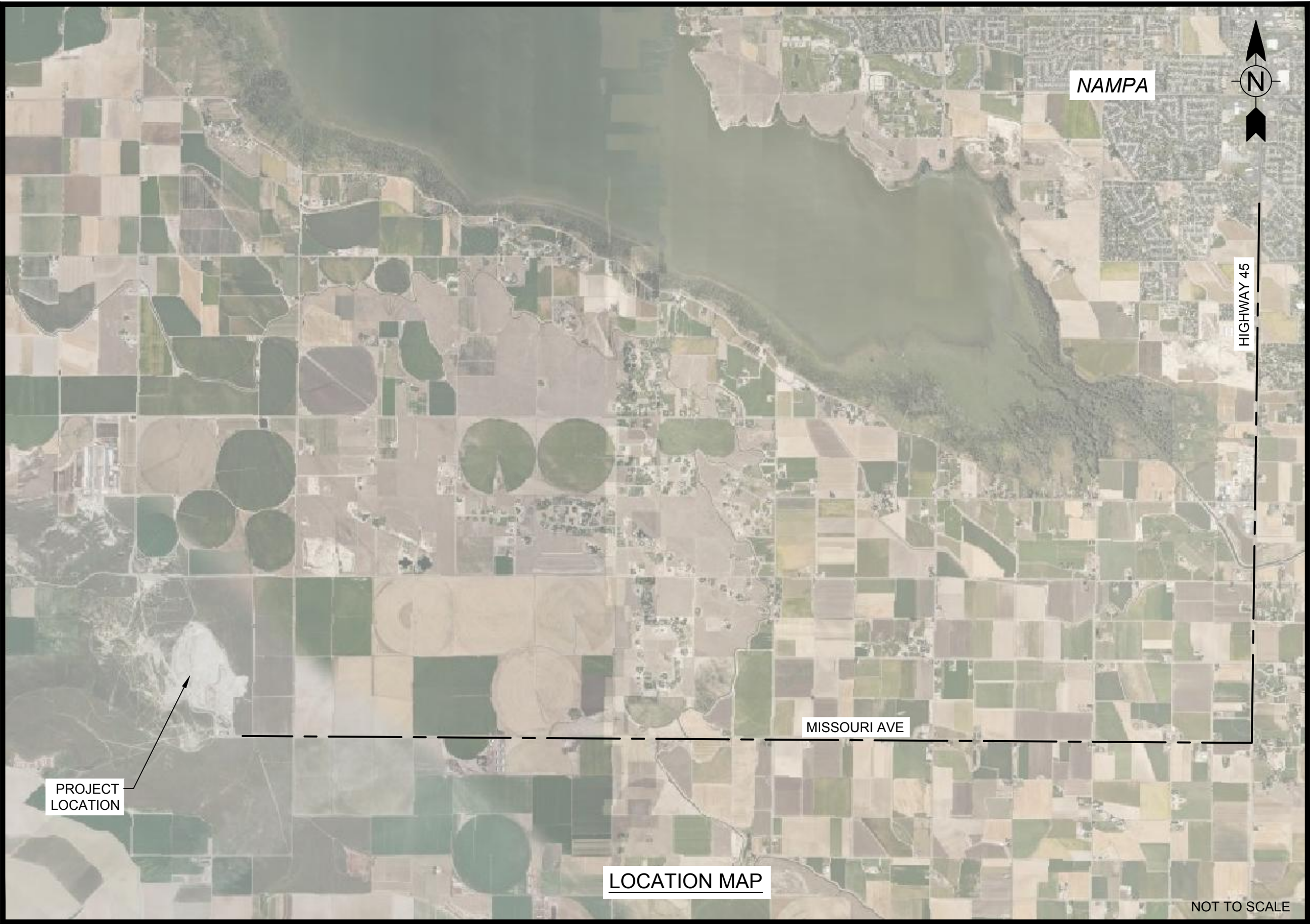
PROJECT DESCRIPTION / NOTES:  
GAS COLLECTION AND CONTROL SYSTEM (GCCS)  
AND FLARE STATION (UTILITY FLARE)

ISSUED:

DRAFT 60% DESIGN SUBMITTAL-2/15/2022  
DRAFT 90% DESIGN SUBMITTAL-4/1/2022  
100% DESIGN SUBMITTAL-4/28/2022



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C-102	GCCS PLAN (SOUTHWEST AREA)
C-103	GCCS PLAN (NORTHWEST AREA)
C-104	GCCS PLAN (NORTHEAST AREA)
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SURVEY DATUM INFORMATION:  
2021 STATE PLANE  
LOCATION: SECTION 21, T2N, R3W  
CANYON COUNTY, IDAHO  
BASIS OF BEARING:  
VERTICAL DATUM:  
UNIT OF MEASURE: U.S. SURVEY FOOT

PROJECT\_DESCRIPTION\_1\_PROJECT\_DESCRIPTION\_2

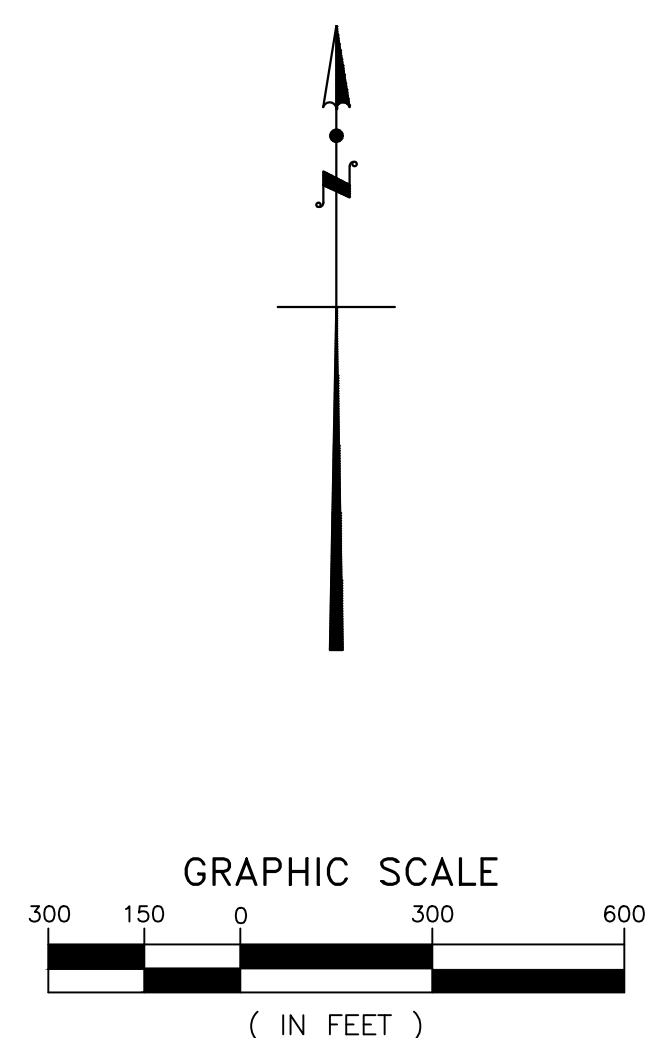
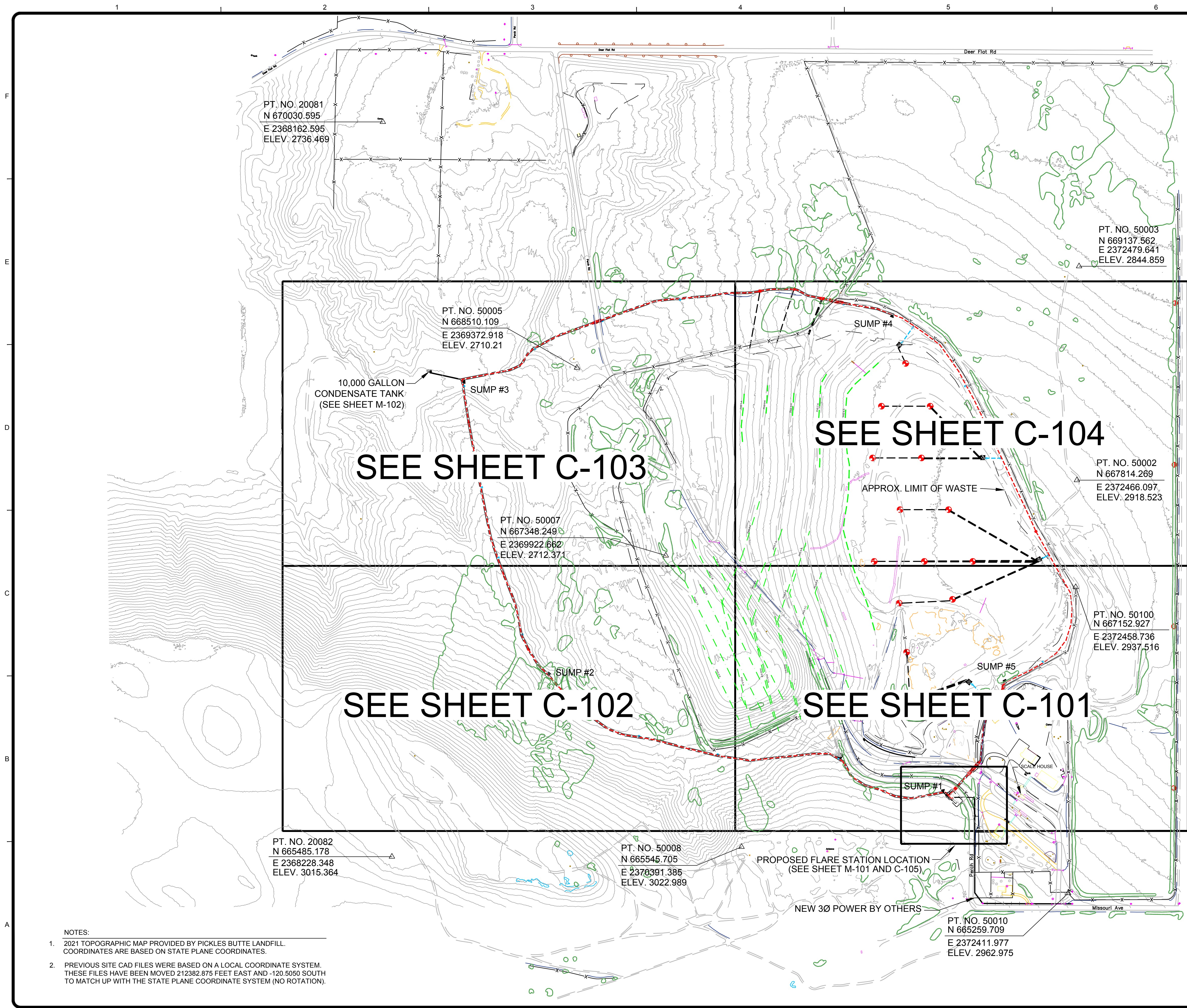



AC or A/C	=	ACTUATOR	FX or FLEX	=	FLEXIBLE HOSE	MOD	=	MODEM	SOV	=	SOLENOID VALVE
ACFM	=	AIR CONDITIONER	FLTP	=	PORT FILTER	MOT	=	MOTOR	SP	=	SAMPLE PORT
ADMS	=	ACTUAL CUBIC FEET PER MINUTE	F.O.	=	FAIL OPEN	MOV	=	MOTOR OPERATED VALVE	SPECS	=	SPECIFICATION
ADS	=	AUTO DIALER SYSTEM	FOR	=	FORWARD	MS	=	MOTOR STARTER	SS	=	STAINLESS STEEL
AF	=	AMPERE FRAME SIZE (CIRCUIT BREAKER)	FQI	=	FLOW TOTALIZER INDICATOR	MSB	=	MAIN SWITCH BOARD	SSR	=	SURGE ARRESTOR
AFF	=	ABOVE FINISH FLOOR	FR	=	FLOW RECORDER	MTD	=	MOUNTED	ST	=	SHUNT TRIP
AI	=	ANALOG INPUT	FRG	=	FILTER REGULATOR	M.W.	=	MANWAY	STA	=	STATION
AIO	=	ANALOG INPUT OUTPUT	FRL	=	FILTER/REGULATOR/LUBRICATOR	NA	=	NON-AUTOMATIC	STD	=	STANDARD
AOUT	=	ANALOG OUTPUT	FRP	=	FIBERGLASS REINFORCED PLASTIC	NBK	=	NEUTRAL BLOCK	STR	=	STRAINER
AL	=	ALUMINUM	FS	=	FLOW SWITCH OR FINISH SURFACE	N.C.	=	NORMALLY CLOSED	SW	=	SWITCH
AMP	=	AMPERES, AMPERAGE	FSH	=	FLOW SWITCH HIGH	N.C.T.C.	=	NORMALLY CLOSED TIMED TO CLOSE	SYS	=	SYSTEM
AT	=	AMPERE TRIP	FSL	=	FLOW SWITCH LOW	N.C.T.O.	=	NORMALLY CLOSED TIMED TO OPEN	T or TK	=	TANK
AUTO	=	AUTOMATIC	FSV	=	FLOW SAFETY VALVE (CHECK VALVE)	NEG	=	NEGATIVE	TACH	=	TACHOMETER
AWG	=	AMERICAN WIRE GAUGE	FT	=	FLOW TRANSMITTER	NIC	=	NOT IN CONTRACT	TAH	=	TEMPERATURE ALARM HIGH
B	=	BLOWER	FU	=	FUSE	N.O.	=	NORMALLY OPEN	TAHH	=	TEMPERATURE ALARM HIGH HIGH
BALL	=	BURNER ALARM LOW LOW	FUH	=	FUSE HOLDER	N.O.T.C.	=	NORMALLY OPEN TIMED TO CLOSE	TAL	=	TEMPERATURE ALARM LOW
BATT	=	BATTERY	FUT	=	FUTURE	N.O.T.O.	=	NORMALLY OPEN TIMED TO OPEN	TALL	=	TEMPERATURE ALARM LOW LOW
BC	=	BARE COPPER	FV	=	FLOW VALVE	NP	=	NAMEPLATE	TB	=	TERMINAL BLOCK
BG	=	BURNER GLASS	GAC	=	GRANULAR ACTIVATED CARBON	NTS	=	NOT TO SCALE	TC	=	TEMPERATURE CONTROLLER
BE	=	BURNER ELEMENT (UV SCANNER)	GB	=	GRADE BREAK	NOX	=	OXIDES OF NITROGEN	TCV	=	TEMPERATURE CONTROL VALVE
BKR	=	BREAKER	GCSS	=	GAS COLLECTION AND CONTROL SYSTEM	O	=	OXYGEN	TCZ	=	TEMPERATURE CONTROLLER POSITIONER
BOM	=	BILL OF MATERIAL	GF	=	GROUND FAULT	O/C	=	OPEN/CLOSE	TD or TDR	=	TIME DELAY RELAY
BPS	=	BUILDING PROTECTION SYSTEM	GFI	=	GROUND FAULT INTERRUPTER	O.C.	=	ON CENTER	TE	=	TEMPERATURE ELEMENT (THERMOCOUPLE)
BS	=	BURNER SWITCH (FLAME SAFEGUARD)	GM	=	GAS MONITOR	OA	=	OXYGEN ANALYZER	TEMP	=	TEMPERATURE
BTM	=	BOTTOM	GND or GRND	=	GROUND	OAHH	=	OXYGEN ALARM HIGH	TES	=	TEMPERATURE ELEMENT SWITCH
BTU	=	BRITISH THERMAL UNIT	HDPE	=	HIGH DENSITY POLYETHYLENE	OAH	=	OXYGEN ALARM HIGH HIGH	TEW	=	TEMPERATURE ELEMENT WELL
C	=	CONDUIT	HOA	=	HAND-OFF-AUTO	OE	=	OXYGEN ELEMENT	THERM	=	THERMOSTAT
CAH	=	CURRENT ALARM HIGH	HP	=	HORSEPOWER OR HIGH POINT	OI	=	OXYGEN INDICATOR	TI	=	TEMPERATURE INDICATOR
CAL	=	CURRENT ALARM LOW	HS	=	HAND SWITCH	OIR	=	OXYGEN INDICATING RECORDER	TIC	=	TEMPERATURE INDICATOR CONTROLLER
CBL	=	CABLE	HT	=	HEAT TRACE	OT	=	OXYGEN TRANSMITTER	TIR	=	TEMPERATURE INDICATOR RECORDER
CC	=	CENTER TO CENTER	HTR	=	HEATER	OT	=	OXYGEN INDICATOR TRANSMITTER	TIT	=	TEMPERATURE INDICATOR TRANSMITTER
CGH	=	COMBUSTIBLE GAS HIGH	HV	=	HAND VALVE	OSF	=	OXYGEN SENSOR FAILURE	TMR	=	TIMER
CGHH	=	COMBUSTIBLE GAS HIGH HIGH	HVP	=	HAND VALVE PORT	OL	=	OVERLOAD	TR	=	TEMPERATURE RECORDER
CGI	=	COMBUSTIBLE GAS INDICATOR	HZ	=	HERTZ	PDI	=	PRESSURE DIFFERENTIAL INDICATOR	TS	=	TEMPERATURE SWITCH OR TOP OF SLAB
CGT	=	COMBUSTIBLE GAS TRANSMITTER	I	=	CURRENT	PMP or P	=	PUMP	TSE	=	TEMPERATURE SAFETY ELEMENT
CH	=	CHANNEL	II	=	CURRENT INDICATOR	PB	=	PUSH BUTTON	TSH	=	TEMPERATURE SWITCH HIGH
CHR	=	CHART RECORDER	I/I	=	CURRENT TRANSFORMER	PA	=	PURGE AUTO	TSL	=	TEMPERATURE SWITCH LOW
CJ	=	CURRENT INDICATOR	IAH	=	CURRENT ALARM HIGH	PAH	=	PRESSURE ALARM HIGH	TSO	=	TIGHT SHUTOFF
CIR	=	CIRCUIT	IAHH	=	CURRENT ALARM HIGH HIGH	PAHH	=	PRESSURE ALARM HIGH HIGH	TSV	=	TEMPERATURE SAFETY VALVE
CNT	=	COUNTER	IAL	=	CURRENT ALARM LOW	PAL	=	PRESSURE ALARM LOW	TT	=	TEMPERATURE TRANSMITTER
CO	=	CONDUIT ONLY	IALL	=	CURRENT ALARM LOW LOW	PALL	=	PRESSURE ALARM LOW LOW	TV	=	TEMPERATURE VALVE
COMM	=	COMMUNICATION	IAS	=	INSTRUMENT AIR SUPPLY	PC	=	PRESSURE CONTROLLER	TYP	=	TYPICAL
CMP or COMP	=	COMPRESSOR	IG or IGN	=	IGNITOR	PCV	=	PRESSURE CONTROL VALVE	UG	=	UNDERGROUND
CP	=	CONTROL PANEL	IIR	=	CURRENT INDICATING RECORDER	PDI	=	PRESSURE DIFFERENTIAL INDICATOR	UPS	=	UNINTERRUPTIBLE POWER SUPPLY
CPT	=	CONTROL POWER TRANSFORMER	INST	=	INSTANTANEOUS	PE	=	POLYETHYLENE	UV	=	ULTRAVIOLET SCANNER
CPVC	=	CHLORINATED POLYVINYL CHLORIDE	INSTR	=	INSTRUMENT	PG					


# G-002



4/28/2022 8:34:29 AM - I:\DWG\PICKLES BUTTE LANDFILL\FGCGCS DESIGN\C-001.DWG - ANGUS, SCOTT



**TETRA TECH**  
  
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Phone: 208.369.1030



MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

**SITE PLAN AND INDEX  
TO PLAN SHEETS**

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

**C-001**



CONSTRUCTION NOTES/BILL OF MATERIAL

- 1

PROTECT IN PLACE
- 2

INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE) 

4

C-504
- 3

INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE) 

4

C-504
- 4

INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER 

6

C-504
- 5

INSTALL 4" HDPE ELBOW
- 6

INSTALL 4" HDPE TO PVC TRANSITION FITTING
- 7

INSTALL 4" SCH 80 PVC PIPE
- 8

INSTALL 4" PVC FLANGE (SOC X FL)
- 9

INSTALL 4" PVC BLIND FLANGE, BOLT AND GASKET KIT
- 10

INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER 

4

C-504
- 11

INSTALL 10" SDR 17 HDPE ABOVE GRADE HEADER
- 12

INSTALL 10" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- 13

JOIN EXISTING PIPE
- 14

INSTALL 18" CSP ROAD CROSSING SLEEVE PER 

5

C-504
- 15

INSTALL 10" BUTTERFLY VALVE, ABOVE GRADE PER 

3

C-504
- 16

INSTALL 10" BUTTERFLY VALVE ASSEMBLY, BELOW GRADE PER 

2

C-504
- 17

INSTALL 10" HDPE TEE
- 18

INSTALL 10" HDPE ELBOW, 90°
- 19

INSTALL 10" HDPE ELBOW, 45°
- 20

INSTALL 12" SDR 17 HDPE PIPE, ABOVE GRADE
- 21

INSTALL 12" HDPE TEE
- 22

INSTALL 12" X 10" HDPE REDUCER
- 23

INSTALL 12" HDPE ELBOW
- 24

INSTALL R.E.P. PRODUCTS SERIES 7000-R-8 PNEUMATIC CONDENSATE PUMP STATION
- 25

INSTALL VERTICAL GAS EXTRACTION WELL PER 

1

C-507
- 26

INSTALL CONDENSATE SUMP #1, REP OR EQUAL PER 

1

C-502
- 27

INSTALL CONDENSATE SUMP (#2-#5), REP OR EQUAL PER 

1

C-503
- 28

INSTALL 1" SS THREADED COUPLING
- 29

INSTALL 8" PVC BLIND FLANGE
- 30

INSTALL FLARE STATION INLET PIPING PER 

4

C-506
- 31

INSTALL 4" SCH 80 PVC TEE (SxSxS)
- 32

INSTALL 1/4" PVC LABCOCK VALVE, FPT X HOSE (DRILL & TAP PIPING AS NEEDED)
- 33

INSTALL 8" X 6" HDPE REDUCER
- 34

INSTALL 6" X 4" HDPE REDUCER
- 35

INSTALL 4" X 2" HDPE REDUCER
- 36

INSTALL 2" FERNCO ADAPTER
- 37

INSTALL MANIFOLD #1 PER 

1

C-505
- 38

INSTALL 10" HDPE CROSS
- 39

INSTALL QED VERTICAL ORP215 WELLHEAD PER 

1

C-506
- 40

INSTALL 2" HDPE TEE
- 41

INSTALL QED HORIZONTAL ORP215HL WELLHEAD PER 

2

C-506
- 42

INSTALL VERTICAL WELL I.D. TAG PER 

7

C-504
- 43

INSTALL HORIZONTAL COLLECTOR I.D. TAG PER 

8

C-504
- 44

INSTALL 2" X 1" HDPE REDUCER, SDR 11
- 45

INSTALL 1 1/2" X 1" HDPE REDUCER
- 46

SAWCUT AND REPLACEMENT AC PAVEMENT SECTION (MATCH EXISTING)
- 47

INSTALL 1" X 1/2" CS THREADED BUSHING AND 1/2" THREADED NIPPLE
- 48

INSTALL 1" X 3/4" SS THREADED BUSHING AND 3/4" THREADED NIPPLE
- 49

INSTALL 2" HDPE CLEAN-OUT, WITH THREADED PLUG
- 50

INSTALL 1" HDPE TO STAINLESS STEEL TRANSITION FITTING (BUTT X MPT)
- 51

INSTALL BOLLARD PER 

1

C-504
- 52

SAWCUT AND REPLACE CONCRETE SIDEWALK (MATCH EXISTING)
- 53

INSTALL 1/4" STAINLESS STEEL MALE ADAPTER
- 54

SWAGelok STAINLESS STEEL FLEXIBLE METAL HOSE, PART # SS-FM4PF4PM4
- 55

INSTALL 2" HDPE TO STAINLESS STEEL TRANSITION FITTING (BUTT X MPT)
- 56

INSTALL 2" SCH 80 PVC COUPLING, SOC X FPT
- 57

INSTALL LANDFILL GAS MONITORING PROBE PER 

2

C-507
- 58

INSTALL 12" CIRCULAR CONCRETE VAULT, TRAFFIC RATED
- 59

INSTALL 10" x 4" HDPE REDUCING TEE, MOLDED
- 60

INSTALL WELL MANIFOLD #2 PER 

1

C-507

61

INSTALL WELL MANIFOLD #3, #4, #5 PER 

1

C-508

62

INSTALL 2" HDPE CAP

63

INSTALL 2" FLEX HOSE (QED SOLARGUARD OR EQUAL) WITH PIPE CLAMPS

64

INSTALL 2" SDR 11 HDPE ELBOW

65

INSTALL 12" PIPE SUPPORT AND FOOTING PER 

9

C-504

66

INSTALL REMOTE VERTICAL WELLHEAD PER 

10

C-504

67

INSTALL 1 1/2" HDPE BALL VALVE, BUTT X BUTT

68

INSTALL 10" HDPE VALVE SPACER

69

INSTALL 8" SDR 17 HDPE LATERAL, BELOW GRADE PER 

6

C-504

70

INSTALL 10" X 8" HDPE REDUCER

71

INSTALL PIPE RACK PER 

3

M-103

72

INSTALL 4" DIXON AIR & VACUUM TANK VENT VALVE OR EQUAL

73

INSTALL 4" COUPLING

74

INSTALL 1/4" PVC LABCOCK VALVE, FPT X HOSE (DRILL & TAP PIPE)

75

INSTALL 2" HDPE TO SS TRANSITION FITTING

76

INSTALL PIPE SUPPORT PER 

1

M-507

77

INSTALL 2" PVC MALE ADAPTER, SOC X MPT

78

INSTALL 2" GROTH FLAME CHECK, THREADED, GROTH OR EQUAL

79

INSTALL 10,000 GALLON DOUBLE WALL CONDENSATE STORAGE TANK PER 

1

M-103

2

M-103

80

(DELETED)

81

INSTALL 3/4" STAINLESS STEEL BALL VALVE, THREADED

82

INSTALL 1 5/8" GALVANIZED STRUT CHANNEL, FITTINGS, AND HARDWARE

83

INSTALL CONDENSATE PUMP FOUNDATION PER 

2

S-107

84

INSTALL 1 5/8" X 1 5/8" STRUT CHANNEL POST BASE, GALVANIZED

85

INSTALL 4" PVC BLIND FLANGE, FLAT (MODIFIED FOR TANK ADAPTER)

86

INSTALL 1" STAINLESS STEEL THREADED COUPLING

87

INSTALL PIPE ANCHOR PER 

2

M-507

88

INSTALL 1" X 3/4" SS THREADED BUSHING AND 3/4" THREADED NIPPLE

89

INSTALL 2" SCH 80 PVC PIPE AND FITTINGS

90

INSTALL 2" PVC TRUE UNION BALL VALVE

91

INSTALL 2" PVC UNION

92

INSTALL/ANCHOR 2" WILDEN PNEUMATIC DIAPHRAGM PUMP, MODEL P820 STAINLESS STEEL

93

INSTALL 3/4" COMPRESSED AIR FLEX HOSE, STEEL STEEL, FPT, 250 PSI MIN RATING

94

INSTALL 2" PVC CAMLOCK AND PLUG

95

INSTALL 4" PVC FLANGE AND BOLT KIT (FL X SOC)

96

INSTALL 2" HUSKY NPS DEF OVERFILL GUARD TANK GAUGE (MECHANICAL FLOAT ASSEMBLY)

97

INSTALL 4" X 2" PVC REDUCER BUSHING (SPIG X FPT)

98

(DELETED)

99

INSTALL 1/2"Ø X 4" LONG SIMPSON TITEN HD ANCHOR BOLT

100

INSTALL CHRISTY B12-61G UTILITY BOX WITH GALV STL CHECKER PLATE AND 6" READING LID (REMOVE AS NEEDED)

101

INSTALL 2" BUTTERFLY VALVE WITH 6" VALVE EXTENSION

102

INSTALL 2" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, BOLT KIT, AND GASKETS

103

INSTALL 1" HUDSON AUTOMATIC FLOAT VALVE, ANTI-SIPHON (SET 1' FROM TOP OF TANK)

104

INSTALL 2" X 1" PVC REDUCER BUSHING (MPT X FPT)

105

INSTALL 2" PVC BULKHEAD FITTING, SOC X FPT

106

INSTALL 1" SCH 80 PVC NIPPLE (LENGTH TBD)

107

INSTALL 2" PVC FLANGE (FL X SOC)

108

INSTALL CARBTROL 55 GALLON GRANULAR ACTIVATED CARBON DRUM

109

INSTALL 2" PVC STRAINER, SxS

110

INSTALL 2" HDPE WYE FITTING

111

INSTALL ANCHOR BOLTS FOR 8" UTILITY FLARE ASSEMBLY PER 

2

S-507

112

INSTALL EQUIPMENT/FLARE FOUNDATION PER 

1

S-107

113

INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS (CONDENSATE DRAIN LINE)

114

INSTALL PERENNIAL ENERGY, INC. OR EQUAL GAS HANDLING SKID AND FLARE ASSEMBLY (PURCHASED BY COUNTY). INCLUDES: SKID MOUNTED CONDENSATE KNOCK-OUT/FILTER, 2 MULTI-STAGE CENTRIFUGAL BLOWERS WITH VFDS, PIPING, INSTRUMENTATION, FLOW METER, FLAME ARRESTOR, UTILITY FLARE STACK, PILOT SYSTEM, GAUGES, SWITCHES, TRANSMITTERS, VALVES, AND CONTROL PANEL PER P&ID (D-601), ASSEMBLY PLAN (M-101/M-102), AND PROJECT SPECIFICATIONS.

115

INSTALL COMPRESSOR WORLD OR EQUAL COMPRESSOR SYSTEM (PURCHASED BY COUNTY). SYSTEM INCLUDES A PRE-ASSEMBLED DUPLEX 7.5 HP ROTARY SCREW COMPRESSORS (24 CFM MIN @ 125 PSI), 120 GALLON RECIEVER, DESICCANT DRYER, PRE & POST FILTRATION, ISOLATION VALVE, CONTROL PANEL, OIL/WATER SEPARATOR IN 10' X 20' HEATED/INSULATED STEEL STORAGE CONTAINER WITH INTERIOR AND EXTERIOR LIGHTING, EXHAUST FANS, 480V DISCONNECT SWITCH, AND TRANSFORMER. 60 AMP FEEDER (480V/3Ø/60Hz) SHALL BE CONNECTED TO SYSTEM BY CONTRACTOR.

116

GRADE AREA TO CONTOURS SHOWN

117

INSTALL ELECTRICAL CONDUITS PER FLARE MANUFACTURER AND SHEET E200

118

INSTALL #2/0 COPPER GROUND RING PER SHEET E200 AND E301

119

INSTALL #2 COPPER GROUND WIRE PER E200 AND E301

120

INSTALL 3/4" ROCK WITHIN GRADING LIMITS

121

INSTALL/ANCHOR PIPE SUPPORT TO FOUNDATION PER 

3

M-507

122

INSTALL/ANCHOR BLOWER SKID TO FOUNDATION PER 

3

S-507

123

INSTALL CONDUIT/PIPE ANCHOR PER 

2

M-507

124

INSTALL 2" SCH 80 PVC PHONE/DATA LINE CONDUIT AND WIRE

125

CONNECT PHONE/DATA LINE TO EXISTING J-BOX AT OFFICE BUILDING

126

INSTALL 1/2" SCH 40 BLACK IRON PIPE AND FITTINGS (PAINT RED)

127

INSTALL 1/2" SCH 40 CARBON STEEL PIPE AND FITTINGS, GALVANIZED

128

INSTALL 1 1/2" X 1/2" HDPE REDUCER

129

INSTALL 1/2" HDPE TO SS TRANSITION FITTING (BUTT X MPT)

130

INSTALL 1/2" CS OR SS THREADED COUPLING

131

INSTALL 5 GALLON PROPANE BOTTLE (PILOT FUEL)

132

CONNECT CONDUIT/WIRING TO ELECTRICAL DEVICES AND PROPANE @ FLARE (SEE P&ID AND FLARE DWGS)

133

INSTALL 4" x 2" SCH 80 PVC TEE, SxSxS

134

INSTALL HEADER FLANGE CONNECTION (FUTURE CONNECTION POINT) PER 

3

C-506

135

INSTALL 8" SDR 17 HDPE LATERAL ON GRADE

136

INSTALL 8" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT

137

INSTALL 8" HDPE TEE

138

INSTALL 8" HDPE ELBOW, 90°

139

INSTALL 8" x 2" HDPE REDUCING TEE, MOLDED (NOT FABRICATED)

140

INSTALL 10" x 6" HDPE REDUCER

141

INSTALL FIBERGLASS CAUTION GAS PIPELINE MARKER

142

INSTALL 12" CSP ROAD CROSSING SLEEVE PER 

5

C-504

143

INSTALL PIPE INSULATION AND HEAT TRACE WIRE

144

INSTALL 400W, 12V SOLAR PANEL, CONTROLLER, MOUNTING KIT

TETRA TECH



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Terrace, Suite 201  
Boise, ID 83796  
Phone: 208.369.1030



MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

CONSTRUCTION NOTES

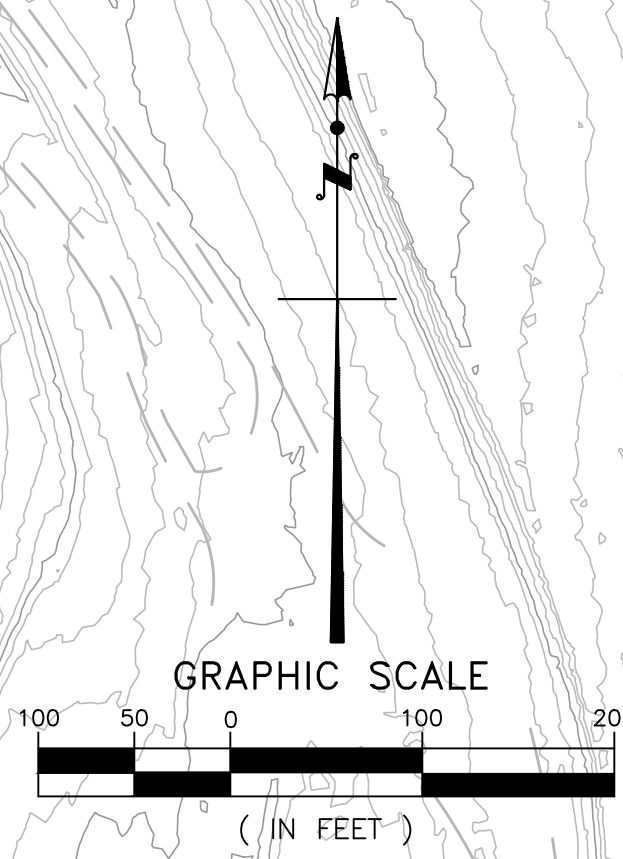
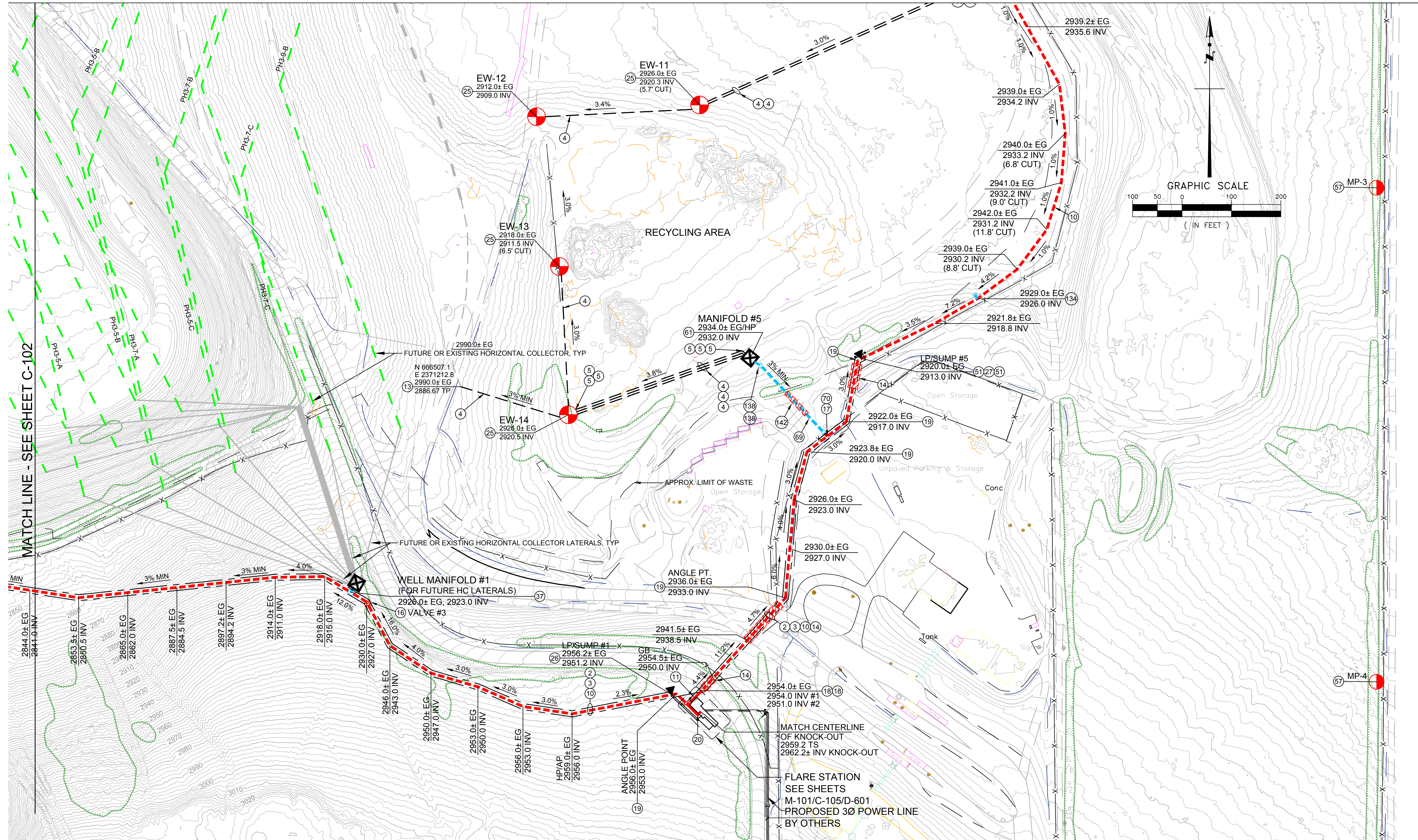
Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

C-002



4/28/2022 8:40:17 AM - I:\DWG\PICKLES BUTTE LANDFILL\FGCGCS DESIGN\C-101.DWG - ANGUS, SCOTT

MATCH LINE - SEE SHEET C-104



LEGEND

- PROPOSED 10" BELOW GRADE GAS HEADER
- PROPOSED 8" BELOW GRADE GAS LATERAL
- PROPOSED 4" BELOW GRADE GAS LATERAL
- PROPOSED 2" CONDENSATE CONVEYANCE LINE
- PROPOSED 1 1/2" COMPRESSED AIR LINE
- FUTURE OR EXISTING HORIZONTAL GAS COLLECTOR
- FUTURE OR EXISTING HORIZONTAL COLLECTOR LATERAL
- APPROXIMATE LIMIT OF WASTE
- PROPOSED ROAD CROSSING (CSP SLEEVE)
- PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED WELL MANIFOLD VAULT
- PROPOSED PNEUMATIC CONDENSATE PUMP STATION
- PROPOSED HEADER ISOLATION VALVE WITH SAMPLE PORTS
- PROPOSED LANDFILL GAS MONITORING PROBE
- PROPOSED HEADER TEE & BLIND FLANGE

CONSTRUCTION NOTES/BILL OF MATERIAL

- INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE)
- INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER
- INSTALL 4" HDPE ELBOW
- INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER
- INSTALL 10" SDR 17 HDPE ABOVE GRADE HEADER
- JOIN EXISTING PIPE
- INSTALL 18" CSP SLEEVE ROAD CROSSING PER
- INSTALL 10" BUTTERFLY VALVE ASSEMBLY, BELOW GRADE PER
- INSTALL 10" HDPE TEE
- INSTALL 10" HDPE ELBOW, 45°
- INSTALL 12" SDR 17 HDPE PIPE, ABOVE GRADE
- INSTALL VERTICAL GAS EXTRACTION WELL PER
- INSTALL CONDENSATE SUMP #1, REP OR EQUAL PER
- INSTALL CONDENSATE SUMP (#2-#5), REP OR EQUAL PER
- INSTALL MANIFOLD #1 PER
- INSTALL BOLLARD PER
- INSTALL LANDFILL GAS MONITORING PROBE PER
- INSTALL WELL MANIFOLD #3, #4, #5 PER
- INSTALL 8" SDR 17 HDPE BELOW GRADE HEADER PER
- INSTALL 10" x 8" HDPE REDUCER
- INSTALL HEADER TEE AND BLIND FLANGE PER
- INSTALL 8" HDPE ELBOW
- INSTALL 12" CSP SLEEVE ROAD CROSSING PER



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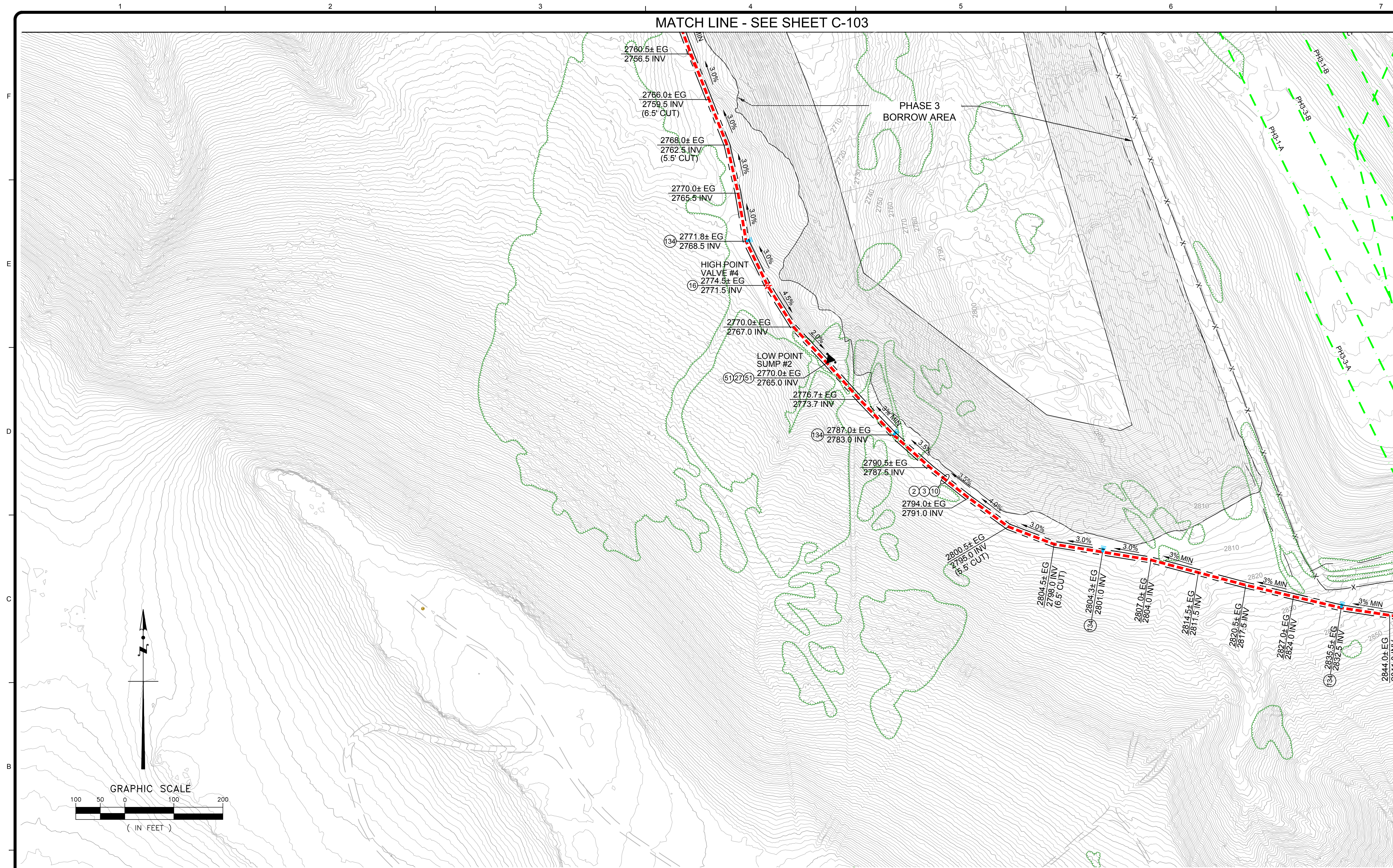
PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
GCCS PLAN  
(SOUTHEAST AREA)

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

C-101



4/28/2022 8:43:01 AM - I:\DWG\PICKLES BUTTE LANDFILL\FGCGCS DESIGN\C-102.DWG - ANGUS, SCOTT



MATCH LINE - SEE SHEET C-101

### LEGEND

- PROPOSED 10" BELOW GRADE GAS HEADER
- PROPOSED 8" BELOW GRADE GAS LATERAL
- PROPOSED 4" BELOW GRADE GAS LATERAL
- PROPOSED 2" CONDENSATE CONVEYANCE LINE
- PROPOSED 1 1/2" COMPRESSED AIR LINE
- FUTURE OR EXISTING HORIZONTAL GAS COLLECTOR
- FUTURE OR EXISTING HORIZONTAL COLLECTOR LATERAL
- APPROXIMATE LIMIT OF WASTE
- PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED WELL MANIFOLD VAULT
- PROPOSED PNEUMATIC CONDENSATE PUMP STATION
- PROPOSED HEADER ISOLATION VALVE WITH SAMPLE PORTS
- PROPOSED HEADER TEE AND BLIND FLANGE

### CONSTRUCTION NOTES/BILL OF MATERIAL

- INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE)
- INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER
- INSTALL 10" BUTTERFLY VALVE ASSEMBLY, BELOW GRADE PER
- INSTALL CONDENSATE SUMP (#2-#5), REP OR EQUAL PER
- INSTALL BOLLARD PER
- INSTALL HEADER TEE AND BLIND FLANGE PER

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
GCCS PLAN  
(SOUTHWEST AREA)

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

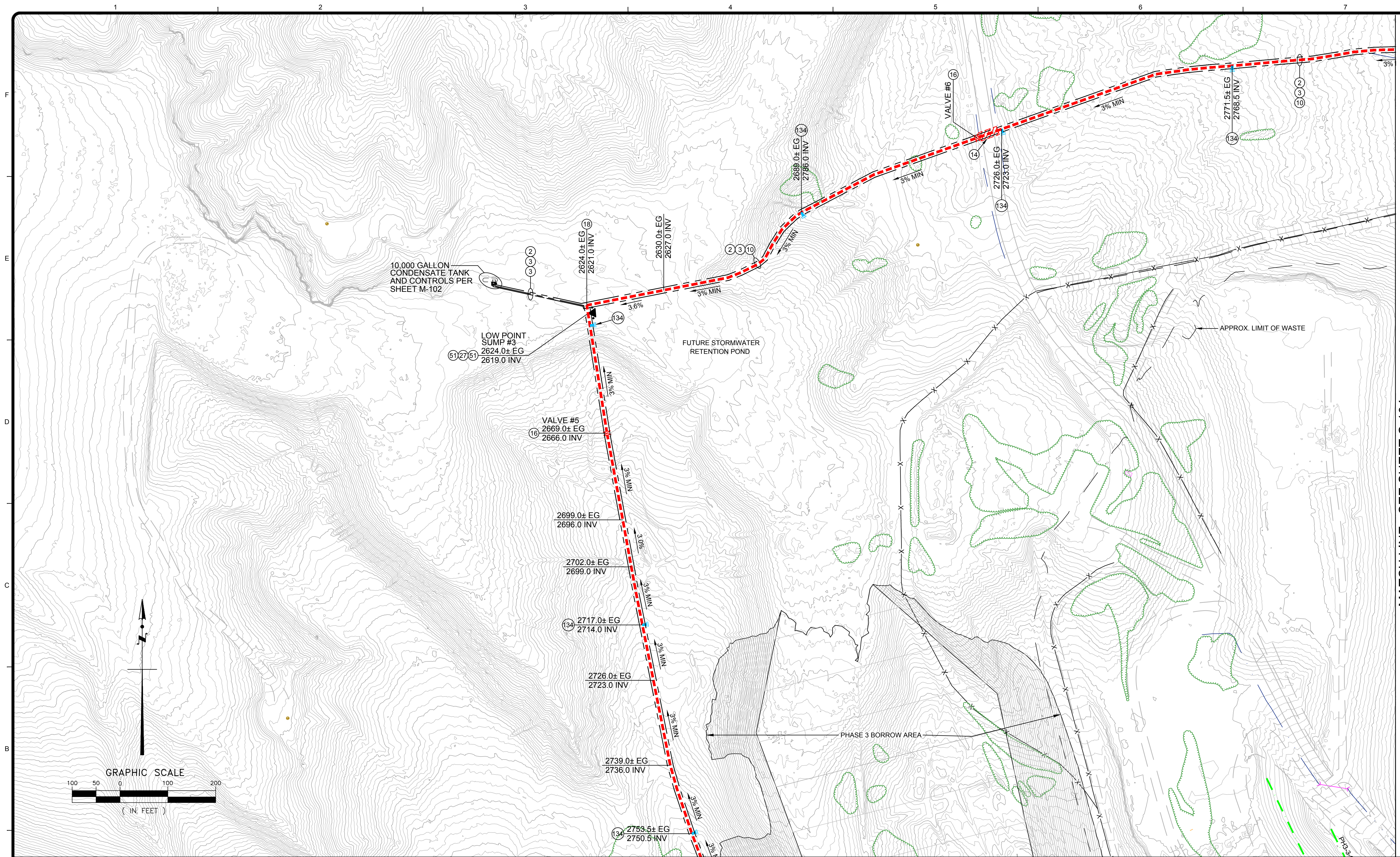
C-102

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MATCH LINE - SEE SHEET C-104

### LEGEND

- PROPOSED 10" BELOW GRADE GAS HEADER
- PROPOSED 8" BELOW GRADE GAS LATERAL
- PROPOSED 4" BELOW GRADE GAS LATERAL
- PROPOSED 2" CONDENSATE CONVEYANCE LINE
- PROPOSED 1 1/2" COMPRESSED AIR LINE
- FUTURE OR EXISTING HORIZONTAL GAS COLLECTOR
- FUTURE OR EXISTING HORIZONTAL COLLECTOR LATERAL
- APPROXIMATE LIMIT OF WASTE
- PROPOSED ROAD CROSSING (CSP SLEEVE)
- PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED WELL MANIFOLD VAULT
- PROPOSED PNEUMATIC CONDENSATE PUMP STATION
- PROPOSED HEADER ISOLATION VALVE WITH SAMPLE PORTS
- PROPOSED HEADER TEE AND BLIND FLANGE

MATCH LINE - SEE SHEET C-102

### CONSTRUCTION NOTES/BILL OF MATERIAL

- INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE)
- INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER
- INSTALL 18" CSP SLEEVE ROAD CROSSING PER
- INSTALL 10" BUTTERFLY VALVE ASSEMBLY, BELOW GRADE PER
- INSTALL 10" HDPE TEE
- INSTALL 10" HDPE ELBOW, 90°
- INSTALL CONDENSATE SUMP (#2-#5), REP OR EQUAL PER
- INSTALL BOLLARD PER
- INSTALL HEADER TEE AND BLIND FLANGE PER



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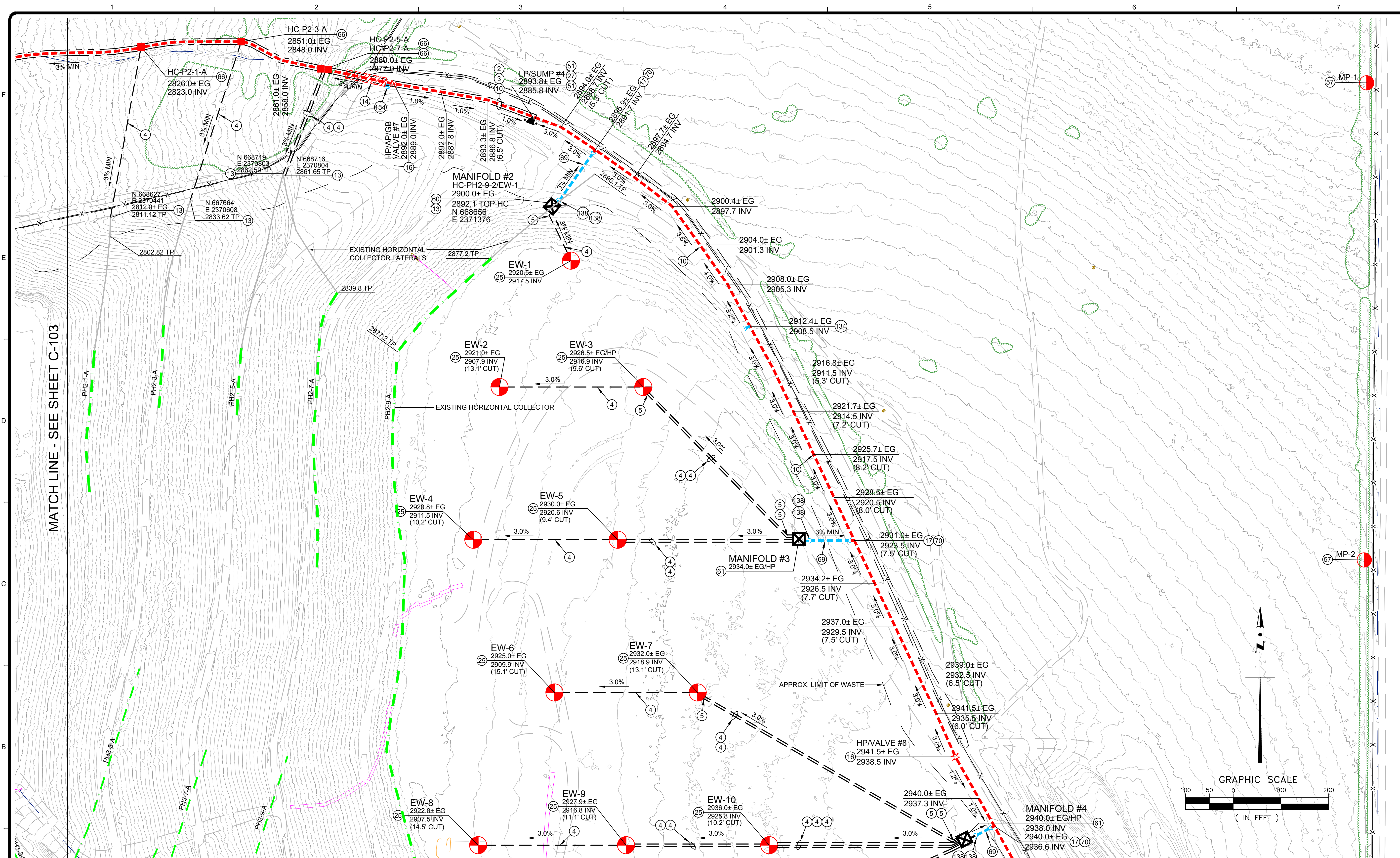
PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
GCCS PLAN  
(NORTHWEST AREA)

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

C-103



4/28/2022 8:47:26 AM - I:\DWG\PICKLES BUTTE LANDFILL\GCGCS DESIGN\C-104.DWG - ANGUS, SCOTT



### LEGEND

- PROPOSED 10" BELOW GRADE GAS HEADER
- PROPOSED 8" BELOW GRADE GAS LATERAL
- PROPOSED 4" BELOW GRADE GAS LATERAL
- PROPOSED 2" CONDENSATE CONVEYANCE LINE
- PROPOSED 1 1/2" COMPRESSED AIR LINE
- FUTURE OR EXISTING HORIZONTAL GAS COLLECTOR
- FUTURE OR EXISTING HORIZONTAL COLLECTOR LATERAL
- APPROXIMATE LIMIT OF WASTE
- PROPOSED ROAD CROSSING (CSP SLEEVE)
- PROPOSED VERTICAL GAS EXTRACTION WELL
- PROPOSED WELL MANIFOLD
- PROPOSED PNEUMATIC CONDENSATE PUMP STATION
- PROPOSED REMOTE WELLHEAD FOR HORIZONTAL COLLECTOR
- PROPOSED LANDFILL GAS MONITORING PROBE
- PROPOSED HEADER ISOLATION VALVE WITH SAMPLE PORTS
- PROPOSED HEADER TEE AND BLIND FLANGE

### CONSTRUCTION NOTES/BILL OF MATERIAL

- INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE)
- INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER
- INSTALL 4" HDPE ELBOW
- INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER
- INSTALL 10" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- JOIN EXISTING PIPE
- INSTALL 18" CSP SLEEVE ROAD CROSSING PER
- INSTALL 10" BUTTERFLY VALVE ASSEMBLY, BELOW GRADE PER
- INSTALL 10" HDPE TEE
- INSTALL VERTICAL GAS EXTRACTION WELL PER
- INSTALL CONDENSATE SUMP (#2-#5), REP OR EQUAL PER
- INSTALL BOLLARD PER
- INSTALL LANDFILL GAS MONITORING PROBE PER
- INSTALL WELL MANIFOLD #2 PER
- INSTALL WELL MANIFOLD #3, #4, #5 PER
- INSTALL REMOTE VERTICAL WELLHEAD PER
- INSTALL 8" SDR 17 HDPE BELOW GRADE LATERAL PER
- INSTALL 10" X 8" HDPE REDUCER
- INSTALL HEADER TEE AND BLIND FLANGE PER
- INSTALL 8" HDPE ELBOW

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PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
GCCS PLAN  
(NORTHEAST AREA)

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

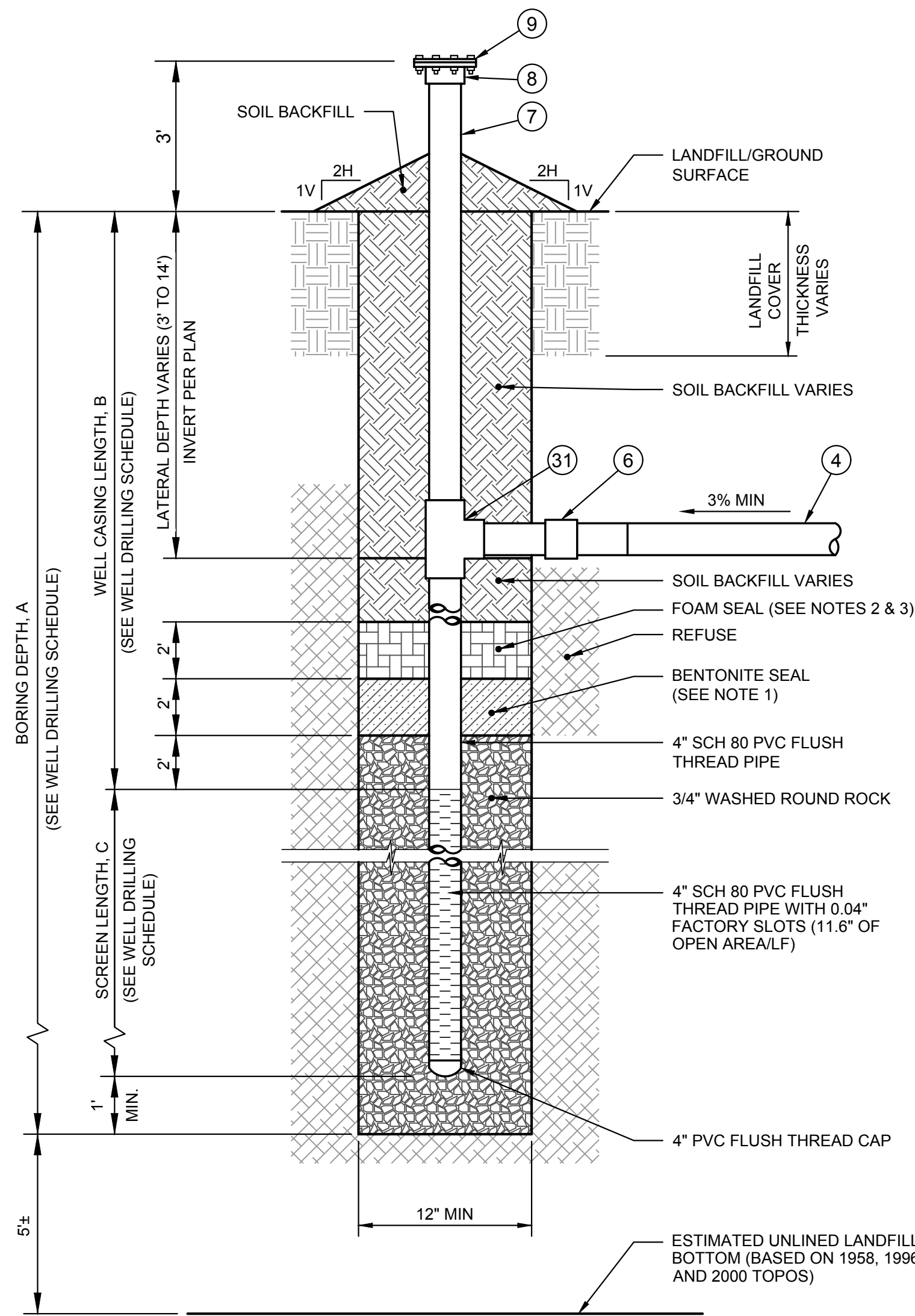
**C-104**







4/28/2022 8:54:51 AM - I:\DWG\PICKLES BUTTE LANDFILL\FGCGCS DESIGN\C-501.DWG - ANGUS, SCOTT



NOTES:

- HYDRATED BENTONITE SEAL SHALL INCLUDE COARSE GRANULAR BENTONITE CHIPS (3/8" TO 1/4") AND FINE GRANULAR BENTONITE (8 MESH BAROID BENISEAL) PRE-MIXED AT RATIO 2:1 OR APPROVED EQUAL. MINIMUM 60% BENTONITE TO MAXIMUM 40% WATER (BY VOLUME) AND POLYMER (GEICO INSTA-VIS PLUS OR APPROVED EQUAL) SHALL BE MIXED TO THICK SLURRY CONSISTENCY BEFORE PLACEMENT. DO NOT HYDRATE BENTONITE IN PLACE BY ADDING WATER DOWN THE BOREHOLE.
- MATERIALS REQUIRED FOR A 2-FOOT FOAM SEAL:
  - 2 BAGS OF FOAM CONCEPTS POUR SYSTEM ES 24-005 (TYPICAL - ROOM TEMPERATURE).
  - THE PROCESS IS TO BE COMPLETED IN "BATCHES" FOR EACH LIFT. A LIFT IS CONSIDERED TO BE 1-FOOT.
- EACH "BATCH" TO BE PREPARED AS FOLLOWS:
  - STEP 1: REMOVE THE FOAM FROM THE SHIPPING BOX AND OUTER BAG.
  - STEP 2: PLACE THE BAG ON A FLAT CLEAN WORK AREA AND REMOVE THE CENTER WHITE DIVIDER STRIP.
  - STEP 3: TWIST THE BAG BACK AND FORTH BY TWO CORNERS SEVERAL TIMES TO MIX THE 2 SIDES OF THE BAG TOGETHER.
  - STEP 4: KNEAD THE BAG VIGOROUSLY FOR ~40-60 SECONDS UNTIL MIXED TO A CONSISTENT CREAM COLOR.
  - STEP 5: REMOVE THE 8" PVC CAP FROM THE WELL PIPE TO RELIEVE GAS PRESSURE.
  - STEP 6: CUT OFF THE CORNER OF THE BAG CREATING A 3-5" HOLE.
  - STEP 7: ALLOW THE FOAM TO RISE OUT OF THE BAG AND EVENLY DISTRIBUTE THE FOAM AROUND THE BOREHOLE MINIMIZING THE AMOUNT OF FOAM CONTACTING THE PIPE AND WELL SIDEWALLS.
  - STEP 8: WAIT AS THE FOAM EXPANDS TO FILL THE BOREHOLE DIAMETER, APPROXIMATELY 5 MINUTES (UP TO 10 MINUTES).
  - STEP 9: ENSURE THAT THE FOAM IS FULLY EXPANDED BY TOSsing A ROCK IN THE BOREHOLE. IF ROCK BOUNCES OFF FOAM, THEN FOAM IS FULLY EXPANDED. IF ROCK SINKS INTO THE FOAM, THEN CONTINUE TO WAIT.
  - STEP 10: MEASURE THE EXPANSION OF THE BAG AFTER INSTALLATION.
  - STEP 11: REPEAT STEPS 1-10 UNTIL A 2-FOOT SEAL IS ACHIEVED (1 TO 3 TIMES POSSIBLE). THE SEAL DEPTH IS TO BE CONFIRMED BY MEASUREMENT.
- THICKNESS OF RESULTING FOAM SEAL IS HIGHLY DEPENDENT ON OUTSIDE TEMPERATURE. THE WARMER IT IS OUTSIDE, THE MORE THE FOAM WILL EXPAND. IT IS POSSIBLE FOR 1 BAG OF FOAM TO EXPAND ANYWHERE FROM 6-INCHES TO 3-FEET. CONTRACTOR TO PAY CLOSE ATTENTION DURING INSTALLATION OF TOP SEAL TO ENSURE THAT SEAL WILL NOT END UP ABOVE GRADE.
- NEVER EMPTY THE CONTENTS OF THE FOAM BAG INTO THE HOLE BEFORE THE FOAM HAS STOPPED EXPANDING OUT OF THE BAG.
- CONTRACTOR IS REQUIRED TO WAIT AT LEAST 20 MINUTES AFTER COMPLETION OF THE ENTIRE SEAL PRIOR TO PLACING THE SOIL BACKFILL.

DRILLING SCHEDULE								
WELL I.D.	COORDINATES		WELL GROUND ELEVATION	ESTIMATED LANDFILL BOTTOM ELEV.	LAT INV ELEV	BORING DEPTH DIMENSION "A" IN FEET	WELL CASING LENGTH DIMENSION "B" IN FEET	SCREEN LENGTH DIMENSION "C" IN FEET
	NORTHING	EASTING						
EW-1	668537	2371406	2920.5	2875	2917.5	40	20	19
EW-2	668272	2371256	2921.0	2802	2907.9	114	20	93
EW-3	668272	2371558	2926.5	2847	2916.9	74	20	53
EW-4	667952	2371202	2920.8	2806	2911.5	109	20	88
EW-5	667952	2371504	2930.0	2846	2920.6	79	20	58
EW-6	667632	2371372	2925.0	2800	2909.9	120	20	99
EW-7	667632	2371672	2932.0	2849	2918.9	78	20	57
EW-8	667312	2371212	2922.0	2760	2907.5	157	20	136
EW-9	667312	2371522	2927.9	2794	2916.8	128	20	107
EW-10	667312	2371822	2936.0	2868	2925.8	63	20	42
EW-11	667077	2371696	2926.0	2811	2920.3	110	20	89
EW-12	667054	2371366	2912.0	2802	2902.3	105	20	84
EW-13	666750	2371412	2918.0	2805	2911.5	108	20	87
EW-14	666450	2371431	2926.0	2845	2920.5	76	20	55

TOTAL DRILLING: 1,361 VF

WELL DRILLING SCHEDULE NOTES:

- THE ENGINEER SHALL CONFIRM ALL WELL DEPTHS AFTER WELL LOCATIONS ARE SURVEYED. THIS WELL SCHEDULE IS DRAFT UNTIL APPROVED BY ENGINEER.
- SURVEYOR SHALL STAKE THE WELL LOCATIONS AND VERIFY SURFACE ELEVATIONS PRIOR TO CONSTRUCTION. INCLUDE ON EACH STAKE IN THE FIELD THE NORTHING, EASTING, ELEVATION, SURVEY STAKE ID, SURVEY POINT NUMBER. ALL INFORMATION SHALL CORRESPOND TO WELL DRILLING SCHEDULE.
- 3 FEET OF SOLID PIPE STICK-UP NOT INCLUDED IN THE PIPING TOTAL.

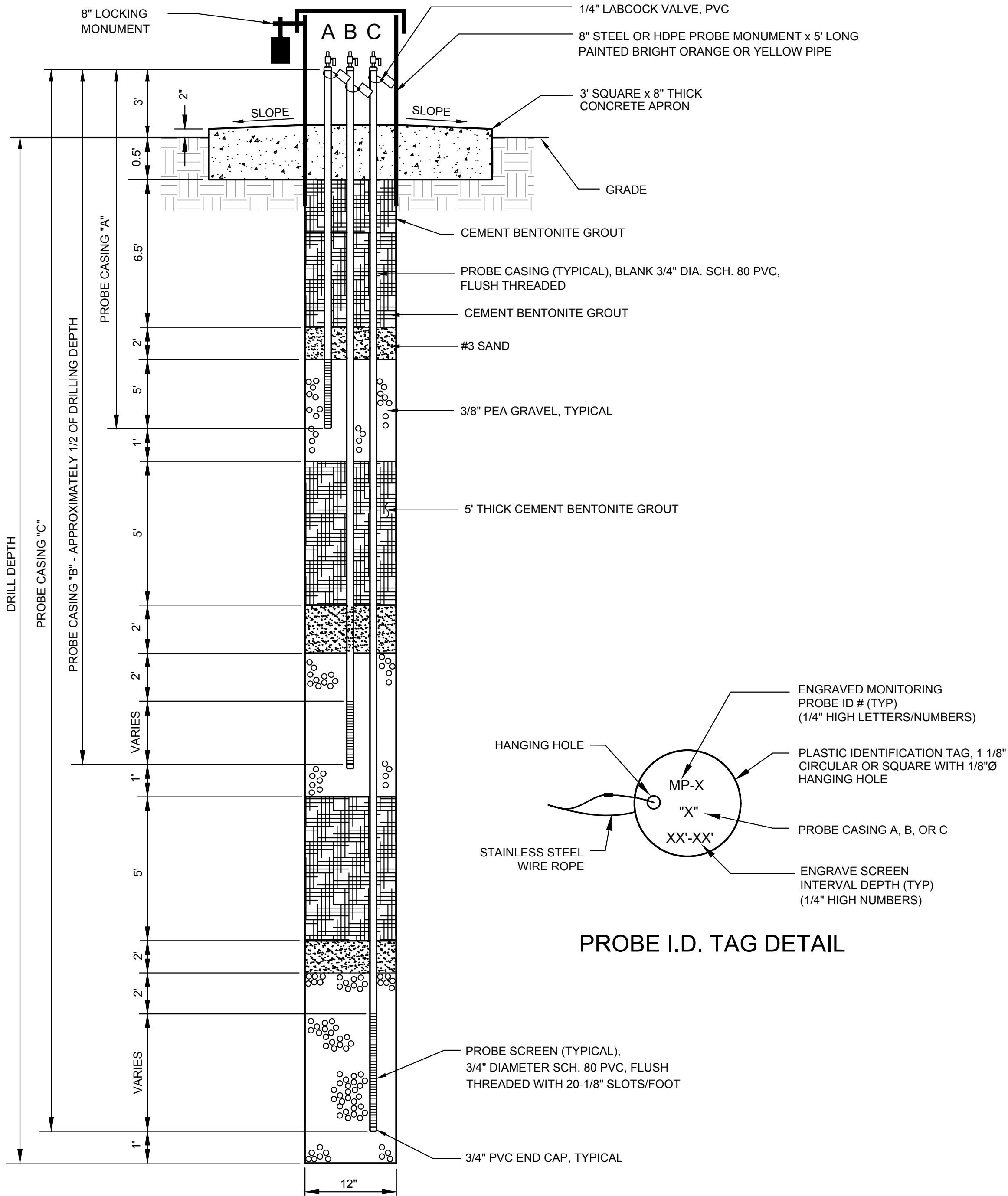
PROBE DRILLING/COMPLETION SCHEDULE

PROBE I.D.	PROBE COORDINATES		PROBE GROUND ELEVATION (SEE NOTE 6)	ESTIMATED TOTAL DRILLING DEPTH (SEE NOTE 1)	PROBE CASING "A"			PROBE CASING "B"			PROBE CASING "C"			NOTES
	NORTHING	EASTING			SOLID (FT.)	PERF. (FT.)	TOTAL (FT.)	SOLID (FT.)	PERF. (FT.)	TOTAL (FT.)	SOLID (FT.)	PERF. (FT.)	TOTAL (FT.)	
MP-1	668909	237074	2840	260	12	5	17	27	105	132	142	120	262	
MP-2	667910	237069	2892	312	12	5	17	27	131	158	168	146	314	
MP-3	666910	237066	2903	323	12	5	17	27	137	164	174	151	325	
MP-4	665910	237066	2889	309	12	5	17	27	130	157	167	144	311	

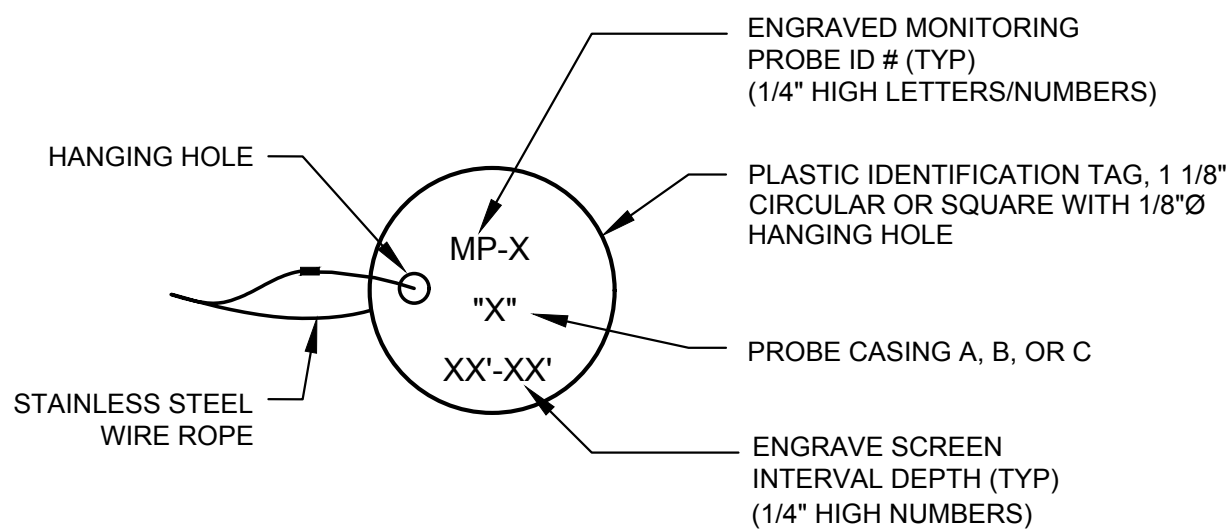
TOTAL DRILLING: 1,204 VF

NOTES:

- BASIS FOR PROBE DEPTHS IS LOWEST FUTURE LANDFILL BOTTOM ELEVATION (PH-8-2), ELEVATION 2580 (AMSL).
- GROUNDWATER LEVEL IS ESTIMATED TO BE BETWEEN ELEVATION 2360-2420 AMSL.
- PRECISE LOCATIONS, DEPTHS, AND SCREEN LENGTHS WILL BE FINALIZED BY A REGISTERED CIVIL ENGINEER OR A CERTIFIED ENGINEERING GEOLOGIST REGISTERED IN THE STATE OF IDAHO BASED ON SUBSURFACE CONDITIONS ENCOUNTERED DURING DRILLING.
- COORDINATES ARE BASED ON IDAHO STATE PLANE COORDINATES.
- ALL PROBES SHALL BE INSTALLED ABOVE THE PERMANENT LOW SEASONAL WATER TABLE, ABOVE AND BELOW PERCHED GROUND WATER, AND ABOVE BEDROCK. THE GEOLOGIST OR ENGINEERING GEOLOGIST SHALL ADJUST THE PROBE CASING LENGTHS, AS NEEDED, TO ADHERE TO THE INTENT OF THE PROBE DETAIL.
- GROUND ELEVATIONS ROUNDED TO THE NEAREST WHOLE FOOT (ROUNDED UP OR DOWN).



PROBE I.D. TAG DETAIL



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PROFESSIONAL ENGINEER  
LICENSED  
16021  
STATE OF IDAHO  
MAUREN L. SCOTT  
4/28/2022

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

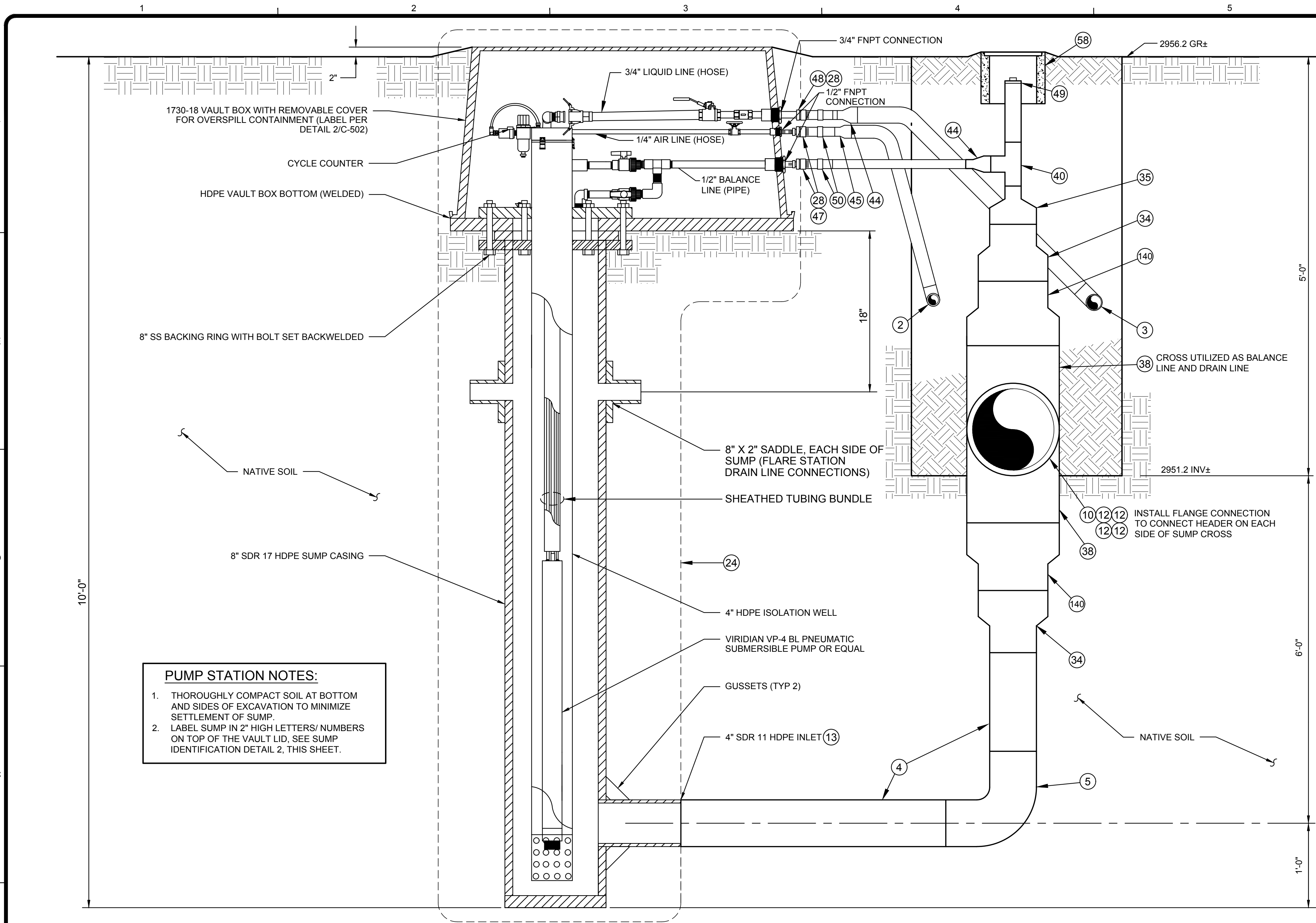
**GAS WELL AND  
MONITORING PROBE  
DETAILS**

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

**C-501**

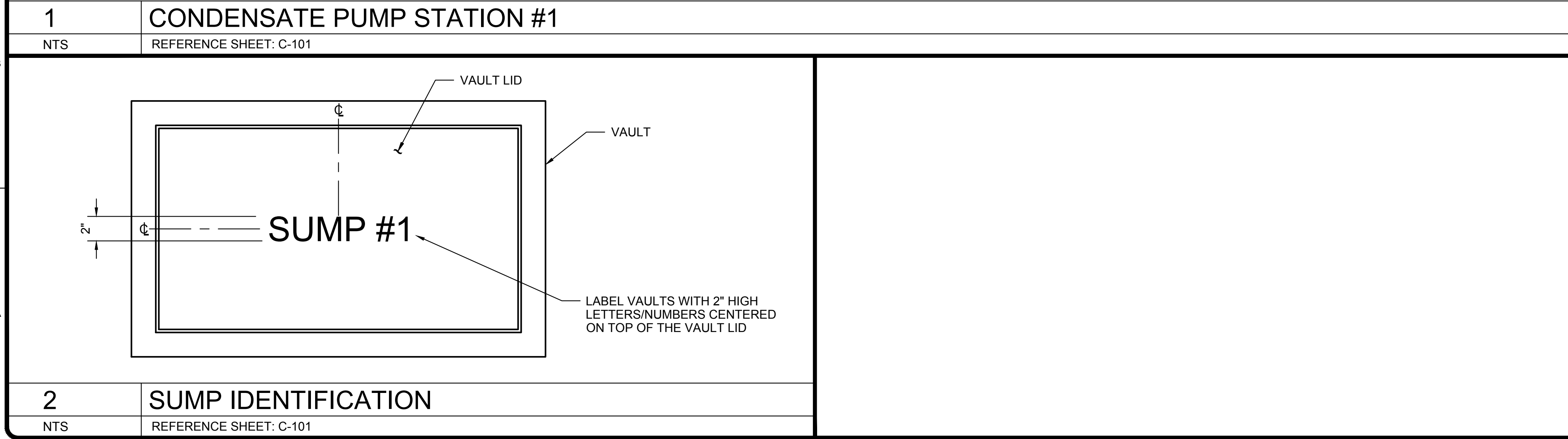


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**PUMP STATION NOTES:**

1. THOROUGHLY COMPACT SOIL AT BOTTOM AND SIDES OF EXCAVATION TO MINIMIZE SETTLEMENT OF SUMP.
2. LABEL SUMP IN 2" HIGH LETTERS/ NUMBERS ON TOP OF THE VAULT LID, SEE SUMP IDENTIFICATION DETAIL 2, THIS SHEET.



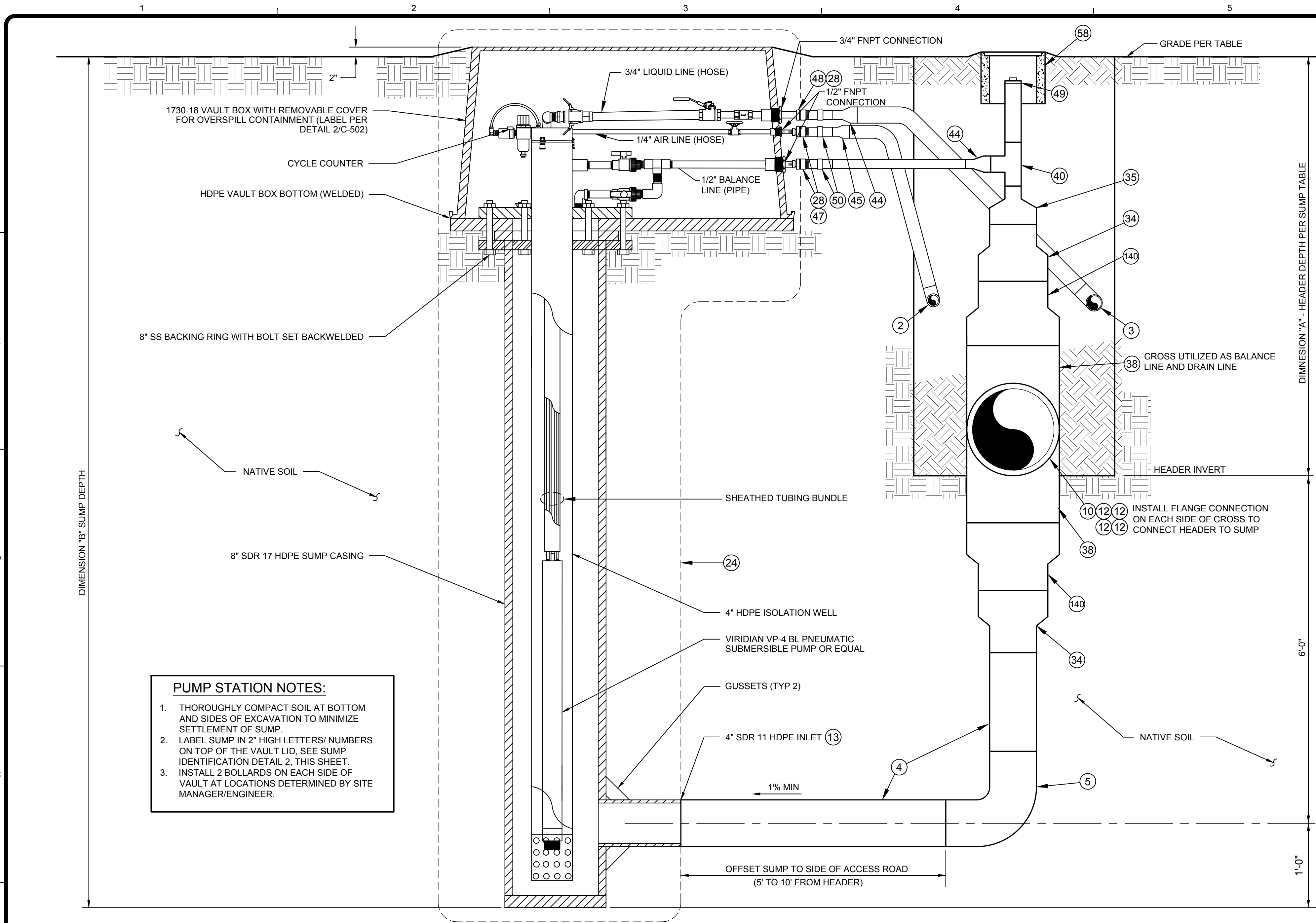
**CONSTRUCTION NOTES/BILL OF MATERIAL**

- 2 INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE)
- 3 INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- 4 INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER
- 5 INSTALL 4" HDPE ELBOW
- 10 INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER
- 12 INSTALL 10" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- 13 JOIN EXISTING PIPE
- 24 INSTALL R.E.P. PRODUCTS SERIES 7000-R-8 PNEUMATIC CONDENSATE PUMP STATION
- 28 INSTALL 1" SS THREADED COUPLING
- 34 INSTALL 6" X 4" HDPE REDUCER
- 35 INSTALL 4" X 2" HDPE REDUCER
- 38 INSTALL 10" HDPE CROSS
- 40 INSTALL 2" HDPE TEE
- 44 INSTALL 2" X 1" HDPE REDUCER, SDR 11
- 45 INSTALL 1 1/2" X 1" HDPE REDUCER
- 47 INSTALL 1" X 1/2" CS THREADED BUSHING AND 1/2" THREADED NIPPLE
- 48 INSTALL 1" X 3/4" SS THREADED BUSHING AND 3/4" THREADED NIPPLE
- 49 INSTALL 2" HDPE CLEAN-OUT, WITH THREADED PLUG
- 50 INSTALL 1" HDPE TO STAINLESS STEEL TRANSITION FITTING (BUTT X MPT)
- 58 INSTALL 12" CIRCULAR CONCRETE VAULT, TRAFFIC RATED
- 140 INSTALL 10" X 6" HDPE REDUCER

<b>TETRA TECH</b> 	www.tetratech.com 3880 Americana Terrace, Suite 201 Boise, ID 83796 Phone: 208.389.1030
	
BY	
MARK	
DATE	
DESCRIPTION	
PICKLES BUTTE LANDFILL CANYON COUNTY, ID GAS COLLECTION SYSTEM IMPROVEMENTS AND FLARE STATION CONDENSATE PUMP STATION #1 DETAIL	
Project No.: 114-571040-2022	
Designed By: KAJ/SNA	
Drawn By: SNA	
Checked By: MM/KAJ	
<b>C-502</b>	



4/28/2022 9:02:08 AM - I:\DWG\PICKLES BUTTE LANDFILL\FGCGCS DESIGN\C-503.DWG - ANGUS, SCOTT



- PUMP STATION NOTES:**
1. THOROUGHLY COMPACT SOIL AT BOTTOM AND SIDES OF EXCAVATION TO MINIMIZE SETTLEMENT OF SUMP.
  2. LABEL SUMP IN 2" HIGH LETTERS/ NUMBERS ON TOP OF THE VAULT LID. SEE SUMP IDENTIFICATION DETAIL 2, THIS SHEET.
  3. INSTALL 2 BOLLARDS ON EACH SIDE OF VAULT AT LOCATIONS DETERMINED BY SITE MANAGER/ENGINEER.

1	CONDENSATE PUMP STATION #2-#5	3	SUMP CONSTRUCTION TABLE
NTS	REFERENCE SHEET: C-101 - C-104	NTS	REFERENCE SHEET: C-101 - C-104
2	SUMP IDENTIFICATION		
NTS	REFERENCE SHEET: C-101 - C-104		

VAULT LID

VAULT

SUMP #\_

LABEL VAULTS WITH 2" HIGH LETTERS/NUMBERS CENTERED ON TOP OF THE VAULT LID

SUMP #	APPROXIMATE GRADE AT SUMP	HEADER DEPTH (FT) DIMENSION "A"	SUMP DEPTH (FT) DIMENSION "B"
2	2770.0	5	12
3	2624.0	5	12
4	2893.8	8	15
5	2920.0	7	14

## CONSTRUCTION NOTES/BILL OF MATERIAL

- 2 INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE)
- 3 INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- 4 INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER
- 5 INSTALL 4" HDPE ELBOW
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ANGUS SCOTT  
16021  
STATE OF IDAHO  
MECHANICAL  
4/28/2022

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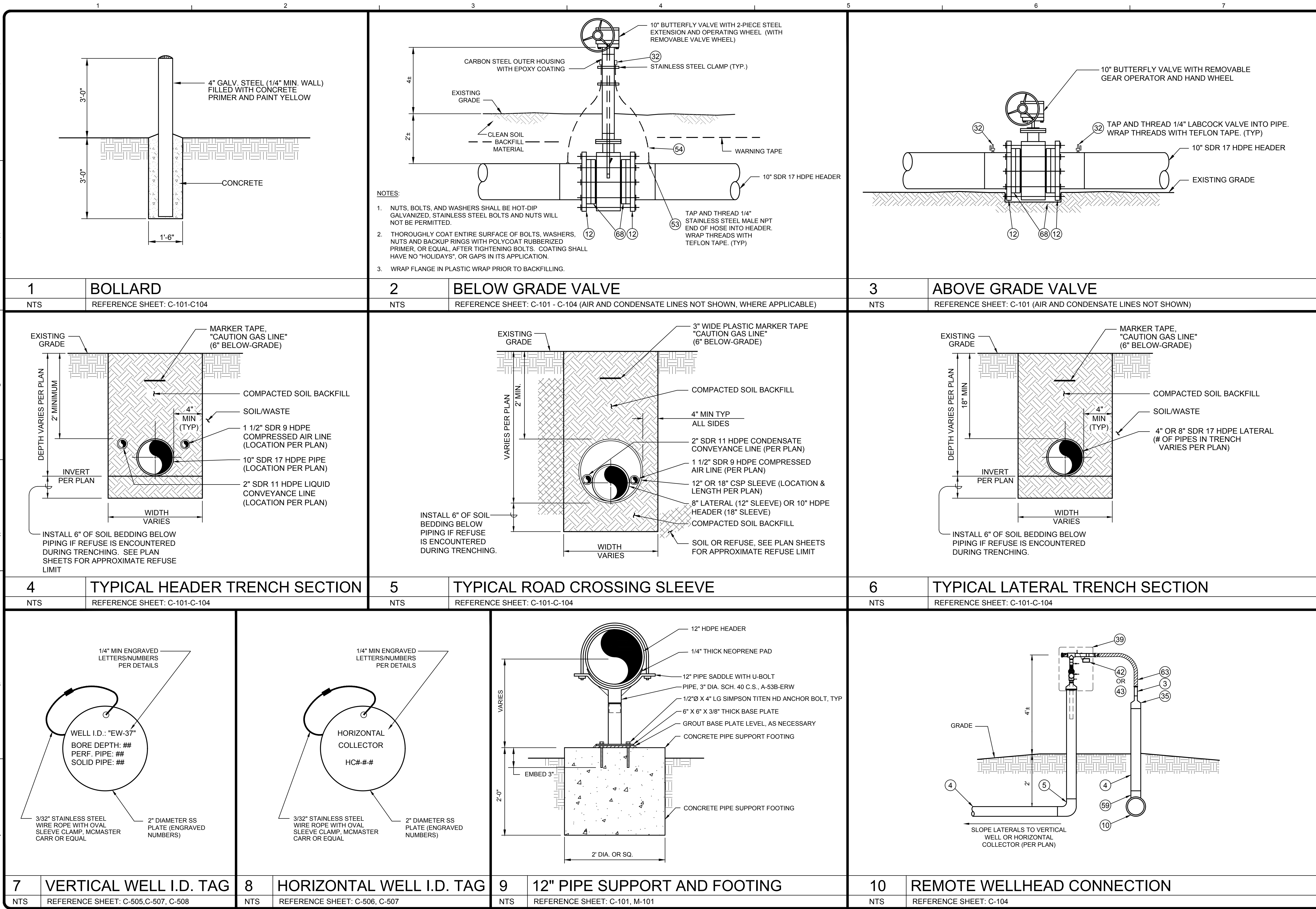
PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
CONDENSATE PUMP  
STATION #2 - #5 DETAIL

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

C-503



4/28/2022 9:49:39 AM - I:\DWG\PICKLES BUTTE LANDFILL\FGCGCS DESIGN\C-504.DWG - ANGUS, SCOTT



**TETRA TECH**

www.tetratech.com  
3880 Americana Terrace, Suite 201  
Boise, ID 83796  
Phone: 208.369.1030

PROFESSIONAL ENGINEER  
LICENSED  
16021  
STATE OF IDAHO  
4/28/2022

BY  
DATE  
DESCRIPTION  
MARK

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
GCCS DETAILS

Project No.: 114-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

**C-504**



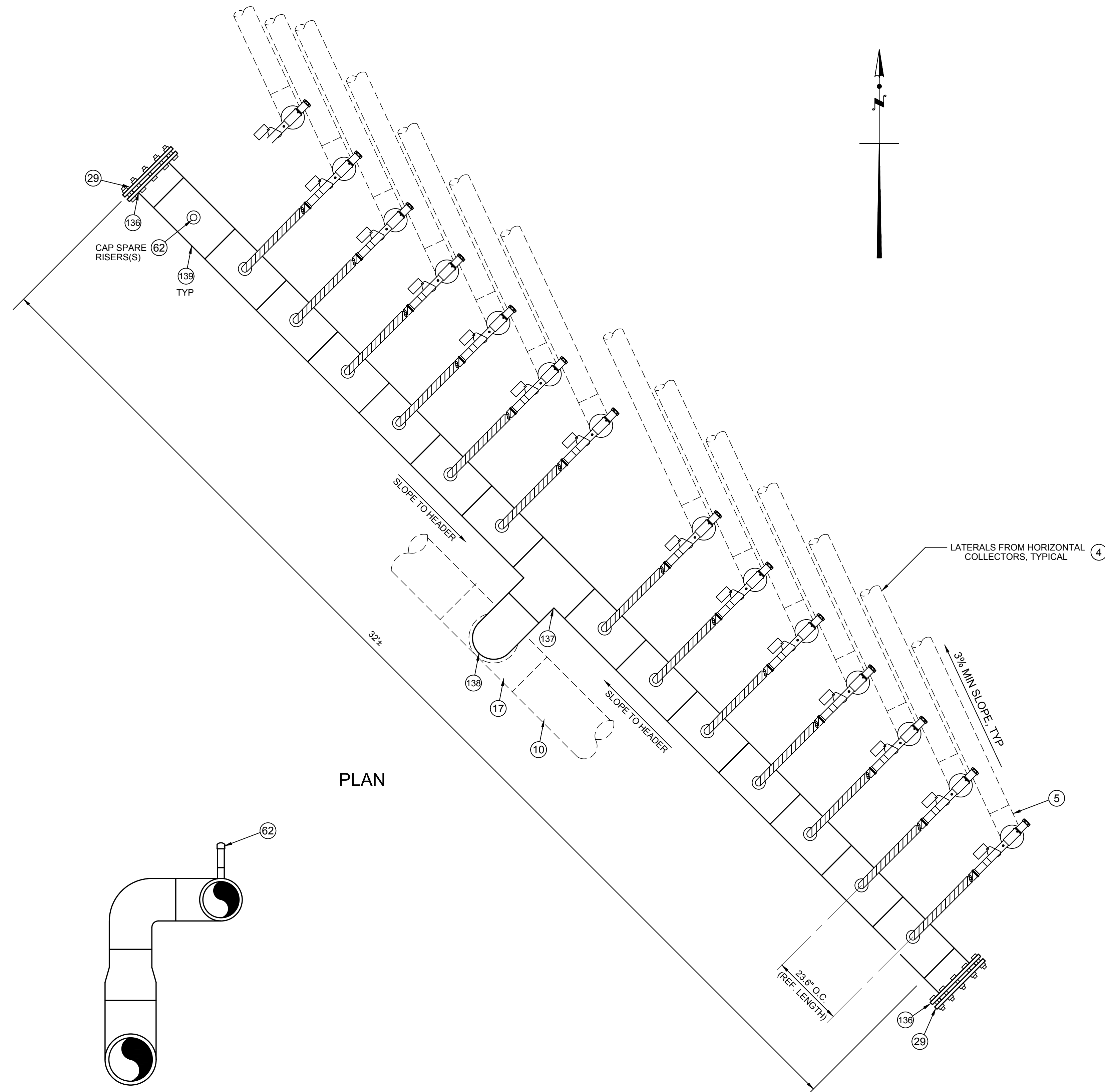
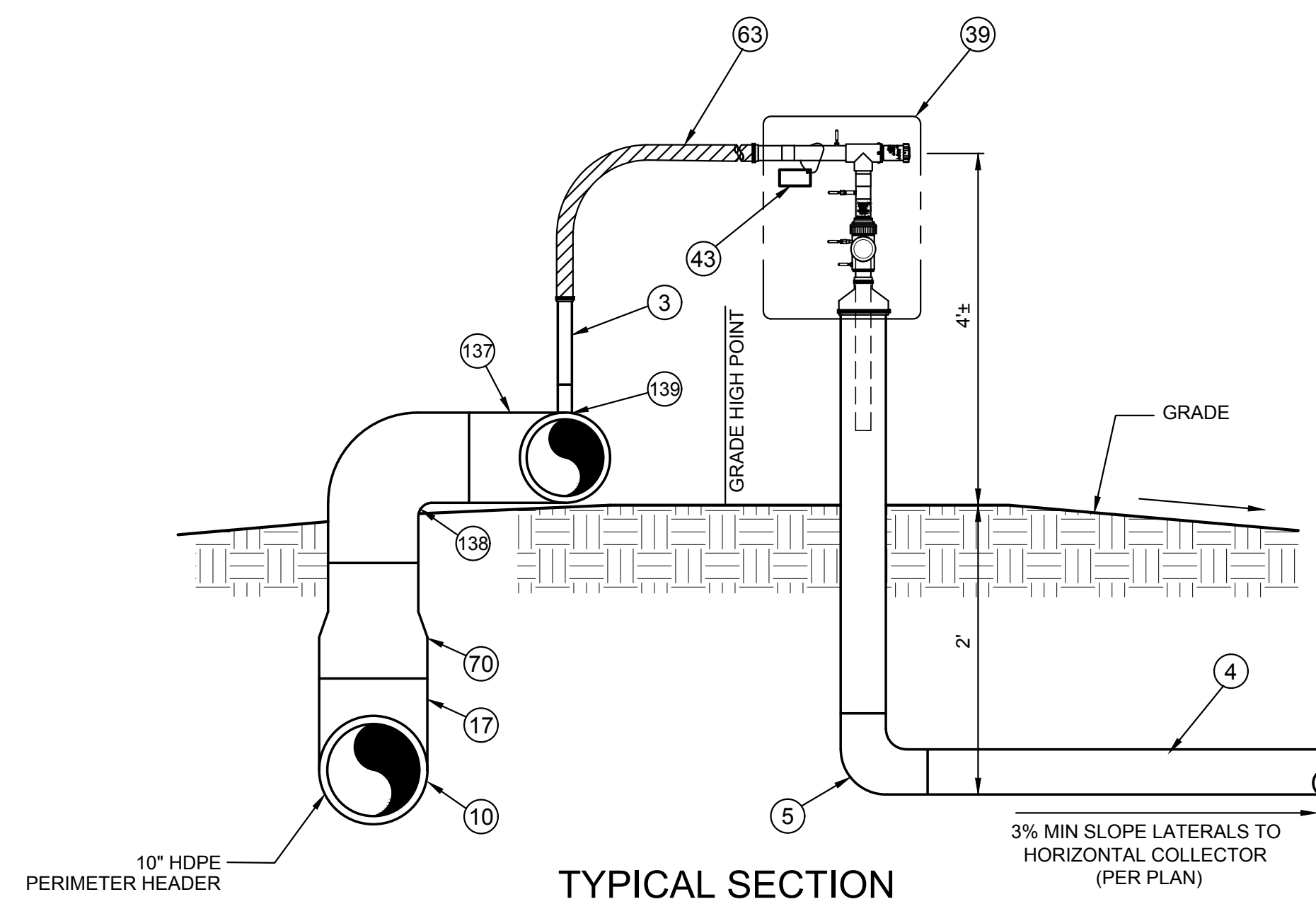
### CONSTRUCTION NOTES/BILL OF MATERIAL

- 3 INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- 4 INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER 6  
C-504
- 5 INSTALL 4" HDPE ELBOW
- 10 INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER 4  
C-504
- 17 INSTALL 10" HDPE TEE
- 29 INSTALL 8" PVC BLIND FLANGE
- 39 INSTALL QED VERTICAL ORP215 WELLHEAD PER 1  
C-505
- 43 INSTALL HORIZONTAL COLLECTOR I.D. TAG PER 8  
C-504
- 62 INSTALL 2" HDPE CAP
- 63 INSTALL 2" FLEX HOSE (QED SOLARGUARD OR EQUAL) WITH PIPE CLAMPS
- 63 INSTALL 10" x 8" HDPE REDUCER
- 70 INSTALL 10" x 8" HDPE REDUCER
- 136 INSTALL 8" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- 137 INSTALL 8" HDPE TEE
- 138 INSTALL 8" HDPE ELBOW, 90°
- 139 INSTALL 8" x 2" HDPE REDUCING TEE, MOLDED

WELL MANIFOLD TABLE		
MANIFOLD #	NUMBER OF WELLHEADS	WELL I.D.
1	13 CONNECTIONS, 1 SPARE (14)	FUTURE PH3-5-A, PH3-7-A, PH3-5-B, PH3-7-B, PH3-5-C, PH3-7-C, PH3-3-B, PH3-A-1, PH3-3-C, PH3-1-E FUTURE PH3-7-C, PH3-9-A, PH3-9-B

NOTE:

1. IN THE EVENT THAT A LATERAL FROM A VERTICAL WELL OR HORIZONTAL COLLECTOR SLOPES TOWARDS THE MANIFOLD, A HORIZONTAL WELLHEAD (PER DETAIL 2/C-506) SHALL BE USED IN PLACE OF A VERTICAL WELLHEAD. THE LATERAL SHALL SLOPE CONTINUOUSLY FROM THE CONNECTION POINT TO THE PERIMETER HEADER TO AVOID A LOW POINT IN THE LATERAL (CONDENSATE BLOCKAGE). THE LATERAL SHALL BE SLOPED TO DAYLIGHT AT THE MANIFOLD IN ORDER TO INSTALL THE WELLHEAD ON GRADE (SIMILAR TO DETAIL 5, C-506)



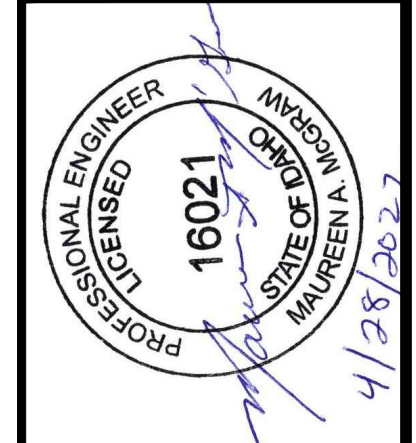
## PLAN

CAP SPARE RISER(S)

**Tt** **TETRA TECH**

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Boise, ID 83796  
Phone: 208.389.1030

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[illegible]

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

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**GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
GCCS DETAILS**

Project No.: 114-571040-2022	
Designed By:	KAJ/SNA
Drawn By:	SNA
Checked By:	MM/KAJ

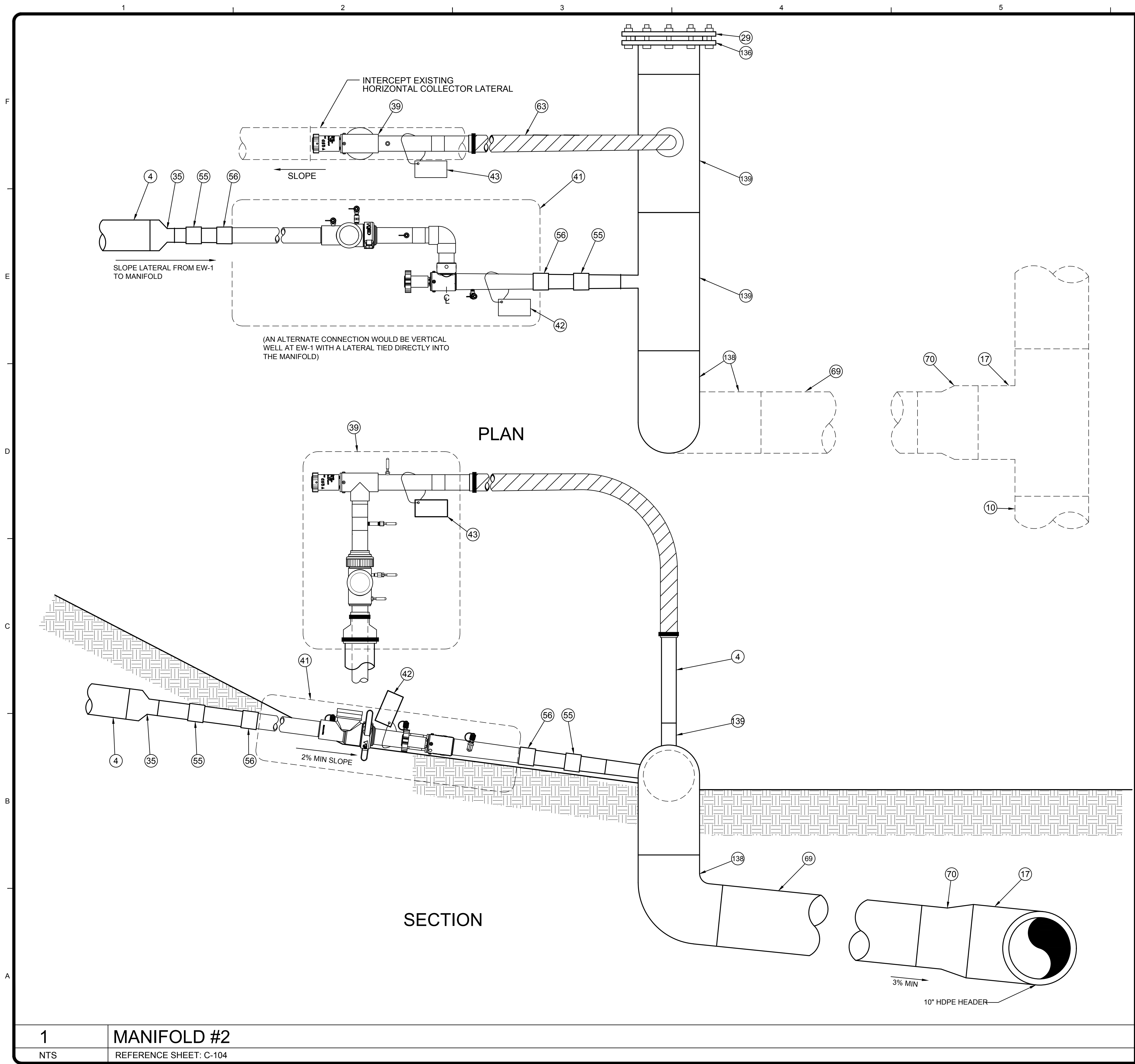
C-505







4/28/2022 10:08:48 AM - LDW/GPICKLES BUTTE LANDFILL/GCCS DESIGN/C-507.DWG - ANGUS, SCOTT



CONSTRUCTION NOTES/BILL OF MATERIAL

- 4 INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER 6 C-504
- 10 INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER 4 C-504
- 17 INSTALL 10" HDPE TEE
- 18 INSTALL 10" HDPE ELBOW, 90°
- 29 INSTALL 8" PVC BLIND FLANGE
- 35 INSTALL 4" X 2" HDPE REDUCER
- 39 INSTALL QED VERTICAL ORP215 WELLHEAD PER 1 C-506
- 41 INSTALL QED HORIZONTAL ORP215HL WELLHEAD PER 2 C-506
- 42 INSTALL VERTICAL WELL I.D. TAG PER 7 C-504
- 43 INSTALL HORIZONTAL COLLECTOR I.D. TAG PER 8 C-504
- 55 INSTALL 2" HDPE TO STAINLESS STEEL TRANSITION FITTING (BUTT X MPT)
- 56 INSTALL 2" SCH 80 PVC COUPLING, SOC X FPT
- 63 INSTALL 2" FLEX HOSE (QED SOLARGUARD OR EQUAL) WITH PIPE CLAMPS
- 69 INSTALL 8" SDR 17 HDPE LATERAL, BELOW GRADE
- 70 INSTALL 10" x 8" HDPE REDUCER
- 136 INSTALL 8" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- 138 INSTALL 8" HDPE ELBOW
- 139 INSTALL 8" x 2" HDPE REDUCING TEE, MOLDED

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Phone: 208.389.1030

PROFESSIONAL ENGINEER  
16021  
STATE OF IDAHO  
MAY 1991

4/28/2022

MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

GCCS DETAILS

Project No.: 114-571040-2022

Designed By: KAJ/SNA

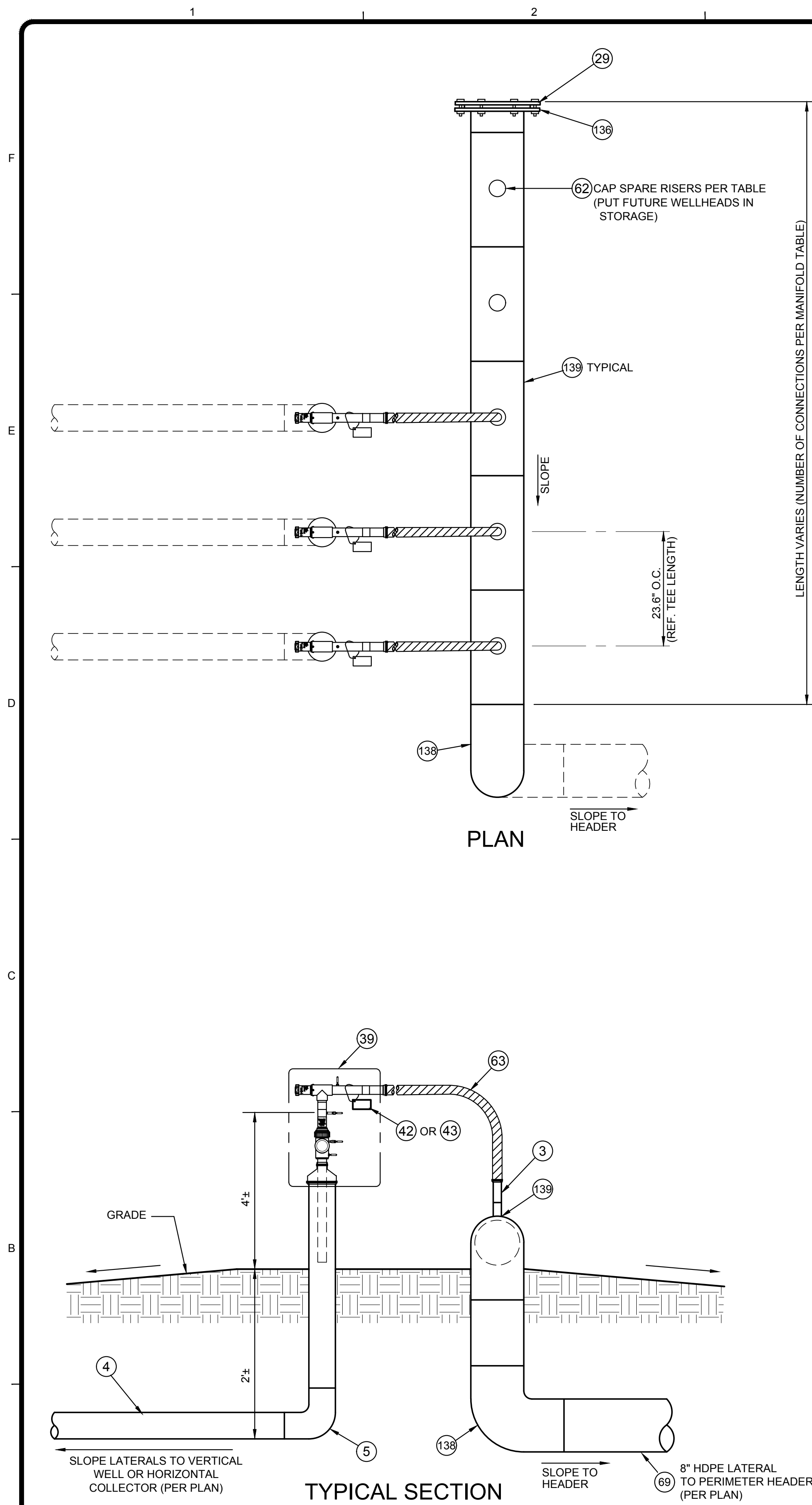
Drawn By: SNA

Checked By: MM/KAJ

C-507



4/28/2022 10:10:39 AM - LDW/GPICKLES BUTTE LANDFILL/GCCS DESIGN/C-508.DWG - ANGUS, SCOTT

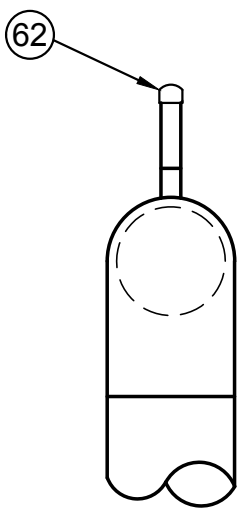


WELL MANIFOLD AND WELLHEAD TABLE			
MANIFOLD #	NUMBER OF WELLHEADS CONNECTED TO MANIFOLD	WELL I.D.	
1	13 CONNECTIONS AND 1 SPARE (14)	FUTURE PH3-5-A, PH3-7-A, PH3-5-B, PH3-7-B, PH3-5-C FUTURE PH3-3-A, PH3-3-B, PH3-A-1, PH3-3-C, PH3-1-B FUTURE PH3-7-C, PH3-9-A, PH3-9-B	SEE DETAIL 1, C-505
2	2 CONNECTIONS (SEE SHEET C-508)	PH2-9-A, EW-1 (1 HORIZ. & 1 VERTICAL WELLHEAD)	SEE DETAIL 1, C-508
3	4 CONNECTIONS AND 2 SPARES (6)	EW-2, EW-3, EW-4, EW-5	SEE DETAIL 1, C-507
4	7 CONNECTIONS AND 1 SPARE (8)	EW-6, EW-7, EW-8, EW-9, EW-10, EW-11, EW-12	SEE DETAIL 1, C-507
5	2 CONNECTIONS AND 2 SPARES (4)	EW-13, EW-14	SEE DETAIL 1, C-507
OTHERS	INDIVIDUAL CONNECTIONS TO HEADER	PH2-1-A, PH2-3-A, PH2-5-A, PH2-7-A (4 VERT. WELLHEADS)	SEE DETAIL 10, C-504

TOTAL CONNECTED AND FUTURE WELLHEADS: 32 (31 VERTICAL WELLHEADS AND 1 HORIZONTAL WELLHEAD).  
INSTALL WELL I.D. TAGS ONLY FOR WELLS THAT ARE CONNECTED FOR THIS PROJECT PER MANIFOLD TABLE ABOVE.

NOTE:

- IN THE EVENT THAT A LATERAL FROM A VERTICAL WELL OR HORIZONTAL COLLECTOR SLOPES TOWARDS THE MANIFOLD, A HORIZONTAL WELLHEAD (PER DETAIL 2/C-505) SHALL BE USED IN PLACE OF A VERTICAL WELLHEAD. THE LATERAL SHALL SLOPE CONTINUOUSLY FROM THE CONNECTION POINT TO THE PERIMETER HEADER TO AVOID A LOW POINT IN THE LATERAL (CONDENSATE BLOCKAGE). THE LATERAL SHALL BE SLOPED TO DAYLIGHT AT THE MANIFOLD IN ORDER TO INSTALL THE WELLHEAD ON GRADE (SIMILAR TO DETAIL 5, C-506)




CAP SPARE RISERS


(SEE WELL MANIFOLD TABLE FOR SPARE CONNECTIONS. WELLHEADS FOR FUTURE CONNECTIONS TO BE PUT IN STORAGE UNTIL LATERALS ARE CONNECTED)

CONSTRUCTION NOTES/BILL OF MATERIAL

- 3 INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE)
- 4 INSTALL 4" SDR 17 HDPE BELOW GRADE LATERAL PER 6
- 5 INSTALL 4" HDPE ELBOW
- 12 INSTALL 10" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- 18 INSTALL 10" HDPE ELBOW, 90°
- 29 INSTALL 8" PVC BLIND FLANGE
- 35 INSTALL 4" X 2" HDPE REDUCER
- 39 INSTALL QED VERTICAL ORP215 WELLHEAD PER 1
- 42 INSTALL VERTICAL WELL I.D. TAG PER 7
- 43 INSTALL HORIZONTAL COLLECTOR I.D. TAG PER 8
- 62 INSTALL 2" HDPE CAP
- 63 INSTALL 2" FLEX HOSE (QED SOLARGUARD OR EQUAL) WITH PIPE CLAMPS
- 69 INSTALL 8" SDR 17 HDPE LATERAL, BELOW GRADE
- 138 INSTALL 8" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT
- 139 INSTALL 8" HDPE ELBOW
- 139 INSTALL 8" x 2" HDPE REDUCING TEE, MOLDED

**TETRA TECH**  


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Terrace, Suite 201  
Boise, ID 83796  
Phone: 208.369.1030



4/28/2022

MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

GCCS DETAILS

Project No.: 141-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

C-508

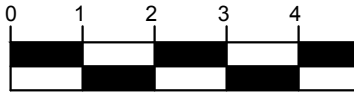






4/28/2022 11:22:22 AM - LDWG/PICKLES BUTTE LANDFILL/GCCS DESIGN/M-101.DWG - ANGUS, SCOTT

GRAPHIC SCALE



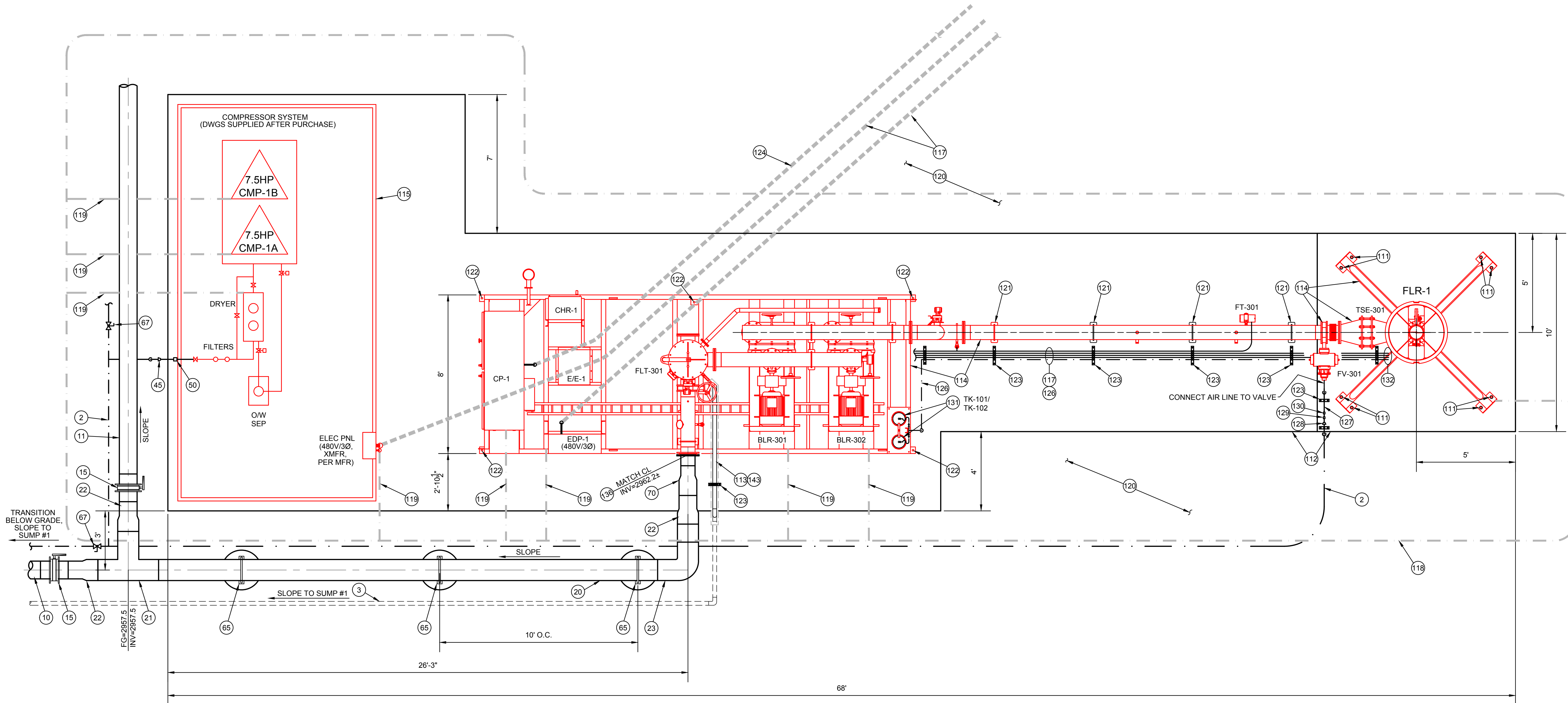
NOTE:

1. FLARE, CONTROL PANEL, BLOWER SKID, COMPRESSOR SYSTEM/BUILDING AND ASSOCIATED EQUIPMENT WILL BE PURCHASED BY COUNTY AND INSTALLED BY CONTRACTOR (SHOWN IN RED). ALL OTHER EQUIPMENT SHOWN SHALL BE PURCHASED AND INSTALLED BY CONTRACTOR.

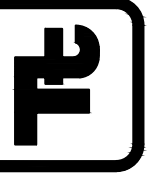
CONSTRUCTION NOTES/BILL OF MATERIAL

- (2) INSTALL 1 1/2" SDR 9 HDPE PIPE AND FITTINGS, BELOW GRADE (COMPRESSED AIR LINE) (C-504)  
(3) INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS, BELOW GRADE (CONDENSATE OR GAS LINE) (C-504)  
(10) INSTALL 10" SDR 17 HDPE BELOW GRADE HEADER PER (C-504)  
(11) INSTALL 10" SDR 17 HDPE ABOVE GRADE HEADER (C-504)  
(15) INSTALL 10" BUTTERFLY VALVE, ABOVE GRADE PER (3) (C-504)  
(20) INSTALL 12" SDR 17 HDPE PIPE, ABOVE GRADE OR ON PIPE SUPPORTS  
(21) INSTALL 12" HDPE TEE  
(22) INSTALL 12" X 10" HDPE REDUCER  
(23) INSTALL 12" HDPE ELBOW  
(45) INSTALL 1 1/2" X 1" HDPE REDUCER  
(50) INSTALL 1" HDPE TO STAINLESS STEEL TRANSITION FITTING  
(65) INSTALL 12" PIPE SUPPORT AND FOOTING PER (9) (C-504)  
(67) INSTALL 1 1/2" HDPE BALL VALVE, BUTT X BUTT  
(70) INSTALL 10" X 8" HDPE REDUCER  
(111) INSTALL ANCHOR BOLTS FOR 8" UTILITY FLARE ASSEMBLY PER (2) (S-501)  
(112) INSTALL EQUIPMENT/FLARE FOUNDATION PER (1) (S-101)  
(113) INSTALL 2" SDR 11 HDPE PIPE AND FITTINGS (CONDENSATE DRAIN LINE)  
(114) INSTALL PERENNIAL ENERGY, INC. OR EQUAL GAS HANDLING SKID AND FLARE ASSEMBLY (PURCHASED BY COUNTY), INCLUDES: SKID MOUNTED CONDENSATE KNOCK-OUT/FILTER, 2 MULTI-STAGE CENTRIFUGAL BLOWERS WITH VFDs, PIPING, INSTRUMENTATION, FLOW METER, FLAME ARRESTOR, UTILITY FLARE STACK, PILOT SYSTEM, GAUGES, SWITCHES, TRANSMITTERS, VALVES, AND CONTROL PANEL PER P&ID (D-601), ASSEMBLY PLAN (M-101/M-102), AND PROJECT SPECIFICATIONS.

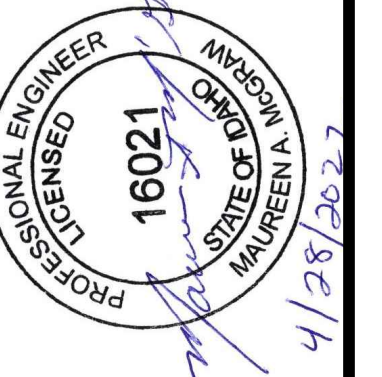
- INSTALL COMPRESSOR WORLD OR EQUAL COMPRESSOR SYSTEM (PURCHASED BY COUNTY). SYSTEM INCLUDES PRE-ASSEMBLED DUPLEX 7.5 HP ROTARY SCREW COMPRESSORS (24 CFM MIN @ 125 PSI), 120 GALLON RECIEVER, DESICCANT DRYER, PRE & POST FILTRATION, ISOLATION VALVE, CONTROL PANEL, OIL/WATER SEPARATOR IN 10' X 20' HEATED/INSULATED STEEL STORAGE CONTAINER WITH INTERIOR AND EXTERIOR LIGHTING, EXHAUST FANS, 480V DISCONNECT SWITCH, AND TRANSFORMER. 60 AMP FEEDER (480V/3Ø/60Hz) SHALL BE CONNECTED TO SYSTEM BY CONTRACTOR.  
(117) INSTALL ELECTRICAL CONDUITS PER FLARE MANUFACTURER AND SHEET E200  
(118) INSTALL #2/0 COPPER GROUND RING PER SHEET E200 AND E301  
(119) INSTALL #2 COPPER GROUND WIRE PER E200 AND E301  
(120) INSTALL 3/4" ROCK WITH GRADING LIMITS  
(121) INSTALL/ANCHOR PIPE SUPPORT TO FOUNDATION PER  
(122) INSTALL/ANCHOR BLOWER SKID TO FOUNDATION PER (3) (M-501)  
(123) INSTALL CONDUIT/PIPE ANCHOR PER (3) (S-501)  
(124) INSTALL 2" SCH 80 PVC PHONE/DATA LINE CONDUIT AND WIRE (2) (M-501)  
(126) INSTALL 1/2" SCH 40 BLACK IRON PIPE AND FITTINGS (PAINT RED)  
(127) INSTALL 1/2" SCH 40 CARBON STEEL PIPE AND FITTINGS, GALVANIZED  
(128) INSTALL 1 1/2" X 1/2" HDPE REDUCER  
(129) INSTALL 1/2" HDPE TO SS TRANSITION FITTING (BUTT X MPT)  
(130) INSTALL 1/2" CS OR SS THREADED COUPLING  
(131) INSTALL 5 GALLON PROPANE BOTTLE (PILOT FUEL)  
(132) CONNECT CONDUIT/WIRING TO ELECTRICAL DEVICES AND PROPANE @ FLARE (SEE P&ID AND FLARE DWGS)  
(136) INSTALL 8" HDPE FLANGE ADAPTER, D.I. BACK-UP RING, GASKET, AND BOLT KIT  
(143) INSTALL PIPE INSULATION AND HEAT TRACE WIRE



TETRA TECH



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Terrace, Suite 201  
Boise, ID 83796  
Phone: 208.389.1030



MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
FLARE STATION  
ASSEMBLY PLAN

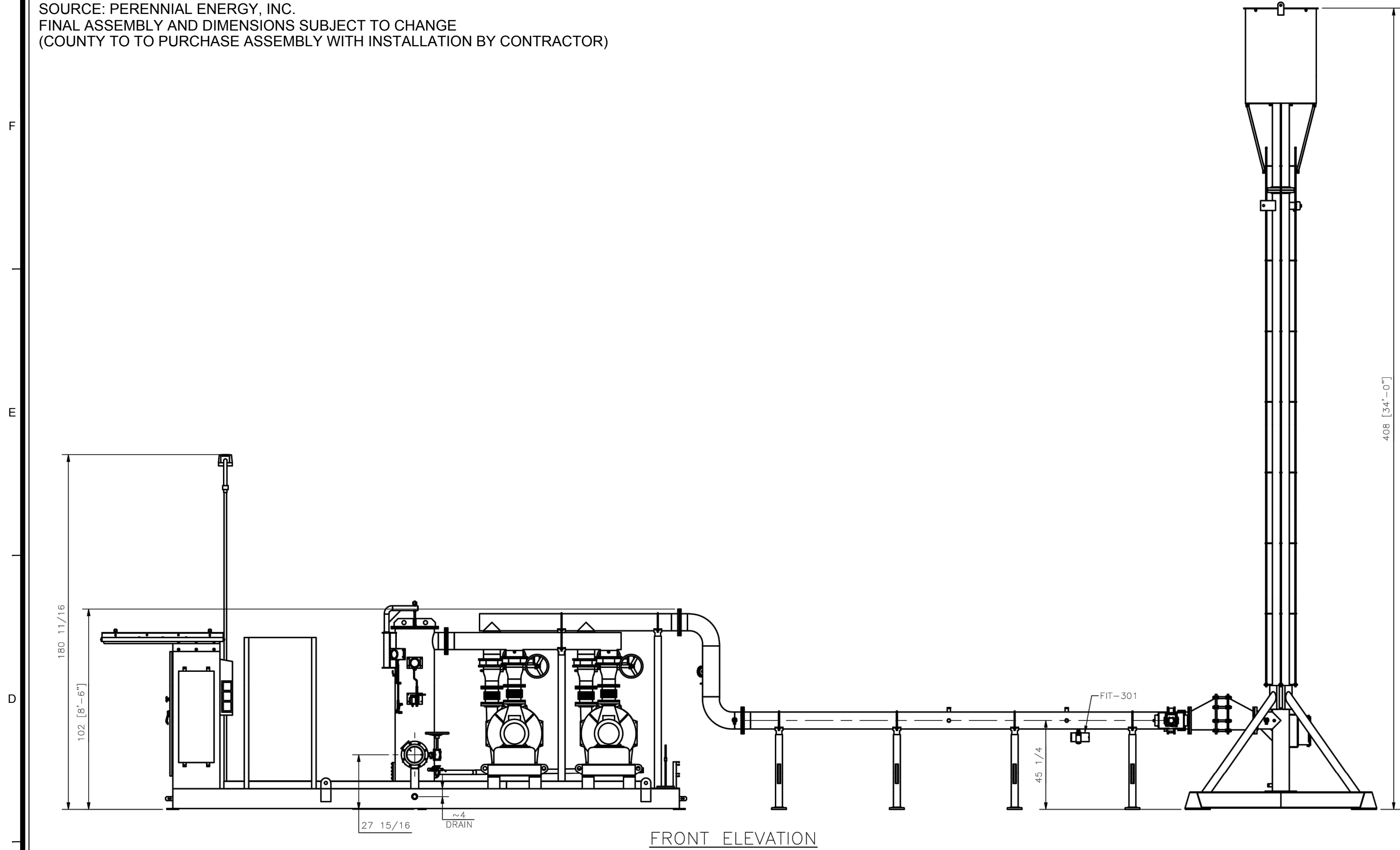
Project No.: 141-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

M-101



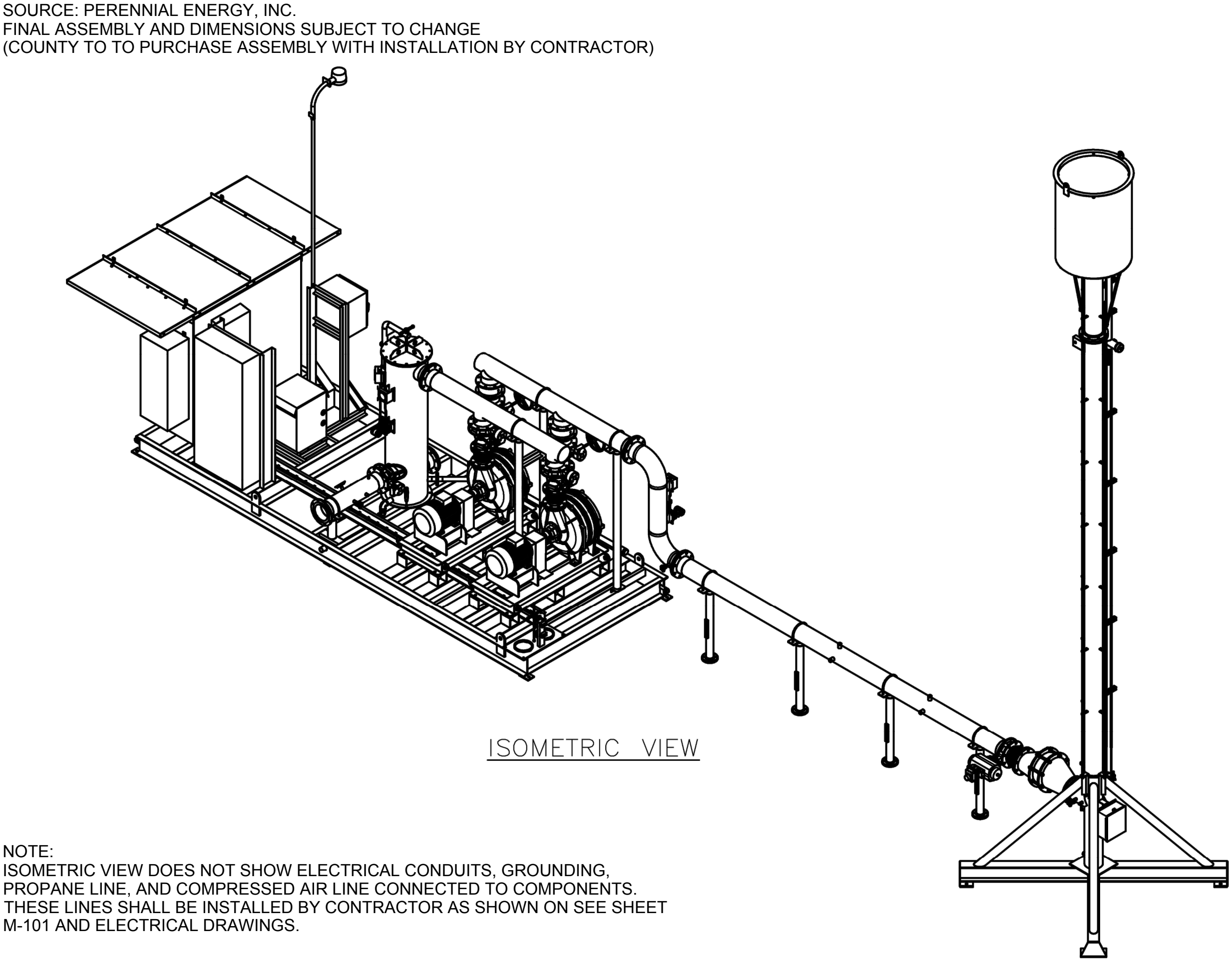
4/28/2022 11:14:05 AM - LDW/GPICKLES BUTTE LANDFILL/GCCS DESIGN/M-102.DWG - ANGUS, SCOTT

SOURCE: PERENNIAL ENERGY, INC.  
FINAL ASSEMBLY AND DIMENSIONS SUBJECT TO CHANGE  
(COUNTY TO TO PURCHASE ASSEMBLY WITH INSTALLATION BY CONTRACTOR)



1 BLOWER SKID/FLARE STACK ELEVATION  
SCALE: NONE REFERENCE SHEET: M-101

SOURCE: PERENNIAL ENERGY, INC.  
FINAL ASSEMBLY AND DIMENSIONS SUBJECT TO CHANGE  
(COUNTY TO TO PURCHASE ASSEMBLY WITH INSTALLATION BY CONTRACTOR)



NOTE:  
ISOMETRIC VIEW DOES NOT SHOW ELECTRICAL CONDUITS, GROUNDING,  
PROPANE LINE, AND COMPRESSED AIR LINE CONNECTED TO COMPONENTS.  
THESE LINES SHALL BE INSTALLED BY CONTRACTOR AS SHOWN ON SEE SHEET  
M-101 AND ELECTRICAL DRAWINGS.

2 BLOWER SKID/FLARE STACK ISOMETRIC  
SCALE: NONE REFERENCE SHEET: M-101

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3680 Americana Terrace, Suite 201  
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PROFESSIONAL ENGINEER  
LICENSED  
16021  
STATE OF  
IDAHO  
MAY 1991  
4/28/2022

MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
BLOWER SKID AND FLARE  
STACK ELEVATION AND  
ISOMETRIC

Project No.: 141-571040-2022  
Designed By: KAJ/SNA  
Drawn By: SNA  
Checked By: MM/KAJ

M-102



1	CONDENSATE TANK PLAN
SCALE: 3/8"=1'-0"	REFERENCE SHEET: C-103

2	CONDENSATE TANK ELEVATION
SCALE: 3/8"=1'-0"	REFERENCE SHEET: C-103

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[illegible]





# PIPE SUPPORT



# CONDUIT/PIPE ANCHOR

REFERENCE SHEET: M-101, M-103

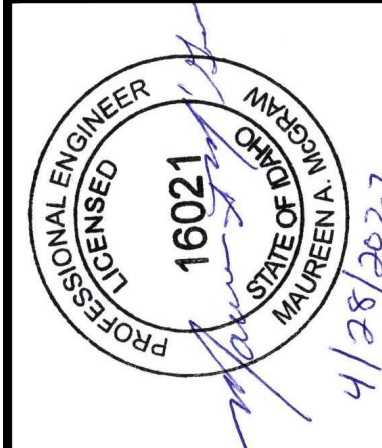


# FLARE PIPE/CONDUIT SUPPORT

REFERENCE SHEET: M-101



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 Anna Terrace, Suite 201  
 Boise, ID 83796  
 Phone: 208.389.1030

[illegible]

# PICKLES BUTTE LANDFILL CANYON COUNTY, ID

## GAS COLLECTION SYSTEM IMPROVEMENTS AND FLARE STATION DETAILS

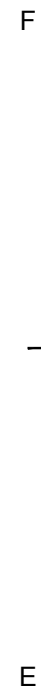
Project No.: 141-571040-2022	
Designed By:	KAJ/SNA
Drawn By:	SNA
Checked By:	MM/KAJ

M-501





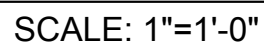




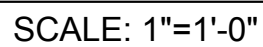
SCALE: 1"=1'-0"	REFERENCE SHEET: S-101, M-101
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SCALE: 1"=1'-0"	REFERENCE SHEET: S-101, M-103, C-103
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REFERENCE SHEET: S-101, M-101



REFERENCE SHEET: M-101

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

---

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

---

STRUCTURAL DETAILS

S-501



3880 Americana Terrace, Suite 201  
Boise, ID 83796  
Phone: 208.389.1030  
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FIRE ALARM SYMBOLS	
	FIRE ALARM CONTROL PANEL
	NOTIFICATION EXTENDER PANEL
	REMOTE FIRE ALARM ANNUNCIATION PANEL
	MANUAL PULL STATION
	TAMPER SWITCH
	FLOW SWITCH
	SMOKE DETECTOR - PHOTOELECTRIC
	IN-DUCT SMOKE DETECTOR
	HEAT DETECTOR
DEVICES ARE WALL MOUNTED (UNO), C = CEILING MOUNTED CANDELA RATING (AS INDICATED)	
	FIRE ALARM HORN/STROBE
	FIRE ALARM HORN ONLY
	FIRE ALARM STROBE ONLY
	FIRE ALARM SPEAKER/STORBE
	FIRE ALARM SPEAKER ONLY
	KNOX BOX
	ADDRESSABLE MONITOR MODULE
	ADDRESSABLE RELAY MODULE
	POST INDICATOR VALVE
1. ALL VISUAL NOTIFICATION APPLIANCES THAT ARE WALL MOUNTED ARE TO BE MOUNTED WITH ENTIRE LENS ABOVE +80" AFF AND BELOW +90" AFF. 2. MOUNT FACP, NAC, FAA AT +60" AFF.	

TELE/COMM SYMBOLS	
	TELE/DATA OUTLET, +18" AFF (UNO)
	FLOOR MOUNTED DATA OUTLET
	CEILING MOUNTED SPEAKER
	WALL MOUNTED SPEAKER
	VOLUME CONTROLLER, +46" AFF (UNO)
	CEILING TV OUTLET
	TV OUTLET, +18" AFF (UNO)
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SECURITY SYMBOLS	
	CARD READER, +46" AFF (UNO)
	CCTV CAMERA
	MOTION SENSOR
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LIGHTING SYMBOLS	
	2'X4' GRID MOUNT LIGHT
	*W/ EMERGENCY BATTERY
	2'X2' GRID MOUNT LIGHT
	*W/ EMERGENCY BATTERY
	4' SURFACE WRAP
	*W/ EMERGENCY BATTERY
	STRIP LIGHT (LENGTH AS SHOWN)
	*W/ EMERGENCY BATTERY
	LINEAR PENDANT MOUNT (LENGTH AS SHOWN)
	RECESSED CAN LIGHT
	*W/ EMERGENCY BATTERY
	ROUND SURFACE LIGHT
	PENDANT LIGHT
	WALL LIGHT (LENGTH AS SHOWN)
	*W/ EMERGENCY BATTERY
	TRACK LIGHT (LENGTH AS SHOWN)
	POLE MOUNTED AREA LIGHT
	WALL MOUNTED LIGHT
	*W/ EMERGENCY BATTERY
	'BUG EYE' EGRESS LIGHT
	COMBO EXIT SIGN & EGRESS LIGHT
	SINGLE FACE, WALL MOUNTED EXIT SIGN
	DUAL FACE, WALL MOUNTED EXIT SIGN
	SINGLE FACE, CEILING MOUNTED EXIT SIGN
	DOUBLE FACE, CEILING MOUNTED EXIT SIGN
	ARROW INDICATED CHEVRON MARKERS
1. 'X' INDICATED LIGHT FIXTURE CALL OUT. SEE LIGHT FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION. 2. EXIT SIGNS TO BE CENTERED ABOVE DOORS OR OPENINGS WITH EXIT SIGN CENTER MOUNTED 12" ABOVE TOP OF DOOR.	

DEVICES & EQUIPMENT	
	SIMPLEX RECEPTACLE, +18" AFF (UNO)
	DUPLEX RECEPTACLE, +18" AFF (UNO)
	DUPLEX REC. (HALF SWITCHED), +18" (UNO)
	GFCI - DUPLEX RECEPTACLE, +18" (UNO)
	DOUBLE DUPLEX RECEPTACLE, +18" AFF (UNO)
	GFCI - DOUBLE DUPLEX REC., +18" (UNO)
	SPECIAL CONNECTION, +18" AFF (UNO)
	DUPLEX FLOOR RECEPTACLE
	DOUBLE DUPLEX FLOOR RECEPTACLE
	SINGLE SWITCH, +46" AFF (UNO)
	DIMMER SWITCH, +46" AFF (UNO)
	3-WAY SWITCH, +46" AFF (UNO)
	4-WAY SWITCH, +46" AFF (UNO)
	LOW VOLTAGE MOMENTARY SWITCH, +46" AFF (UNO)
	LOW VOLTAGE SWITCH, +46" AFF (UNO)
	SWITCH MOUNTED OCCUPANCY SENSOR, +46" AFF
	SWITCH MOUNTED VACANCY SENSOR, +46" AFF
	CEILING MOUNTED OCCUPANCY SENSOR
	CEILING MOUNTED VACANCY SENSOR
	TIME CLOCK
	PHOTOCELL
	DRY-TYPE TRANSFORMER
	ELECTRICAL ENCLOSURE
	ELECTRICAL PANEL, SURFACE MOUNTED
	ELECTRICAL PANEL, FLUSH MOUNTED
	FUSED SAFETY SWITCH
	NON-FUSED SAFETY SWITCH
60/33R	SWITCH RATING (AMP/POLES/NEMA RATING)
	CONNECTION TO MOTOR
	---
	---
	---

ONE-LINE SYMBOLS	
	PAD MOUNTED TRANSFORMER
	ELECTRICAL PANEL
	CIRCUIT BREAKER
	GROUND CONNECTION
	CONDUCTOR CALL OUT
	ELECTRICAL METER
	---
	---
	---
	---
	---
	---

DRAFTING SYMBOLS	
	KEYED NOTE CALL OUT
	CONDUIT STUB-UP
	CONDUIT STUB-DOWN
	CONDUIT STUB (CAP, MARK, INSTALL PULL LINE)
	EQUIPMENT CALL OUT
	---
	---
	---

CIRCUITING LEGEND	
NEW LINE TYPE	_____
EXISTING LINE TYPE	-----
DEMOLITION LINE TYPE	-----
FUTURE LINE TYPE	-----
UNDERGROUND LINE TYPE	-----
**WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.	

COMMON ABBREVIATIONS	
A	AMPERE
AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AF	AMP FRAME
AIC	AMPERE INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUAGE
AL	ALUMINUM
AT	AMP TRIP
BKR	BREAKER
BLDG	BUILDING
C	CEILING
CT	CURRENT TRANSFORMER
CU	COPPER
dB	DECIBEL
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY
EMT	ELECTRICAL METALLIC CONDUIT
EPO	EMERGENCY POWER OFF
F	FUSE
FA	FIRE ALARM
FLA	FULL LOAD AMPS
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GFEP	GROUND FAULT EQUIPMENT PROTECTION
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT-AMPERES
KVAR	KILOVOLT-AMPERES REACTIVE
LTG	LIGHTING
LRA	LOCKED ROTOR AMPS
MC	METAL CLAD CONDUIT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MI	MINERAL INSULATED
MLO	MAIN LUG ONLY
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
P	POLE
PT	POTENTIAL TRANSFORMER
REC	RECEPTACLE
RMC	RIGID METALLIC CONDUIT
RTU	ROOF TOP UNIT
SP	SPARE
ST	SHUNT TRIP
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
V	VOLT
WP	WEATHER PROOF
XFMR	TRANSFORMER
%Z	PERCENT IMPEDANCE

PROJECT ELECTRICAL GENERAL NOTES	
1.	ALL WORK TO BE COMPLETED PER THE LATEST ADDITION OF NATIONAL ELECTRICAL CODE (NEC) ADOPTED BY THE AHJ AND ALL LOCAL CODES AND RESTRICTIONS.
2.	CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL REQUIRED PERMITS, TESTS AND INSPECTIONS THAT MAY BE REQUIRED DURING CONSTRUCTION.
3.	THIS DOCUMENT SET IS TO BE CONSIDERED THE CONSTRUCTION DOCUMENTS INCLUDING ALL DRAWINGS, DETAILS, SCHEDULES AND SPECIFICATIONS. ANY DISCREPANCIES OR ISSUES SHROUD BE IMMEDIATELY BROUGHT TO THE ENGINEERS ATTENTION TO CLARIFICATION.
4.	ALL MATERIALS PROVIDED AND INSTALLED SHALL BE UL LISTED AND SHALL BE NEW UNLESS OTHERWISE NOTED.
5.	ALL DEVICES, EQUIPMENT, CONDUIT, ETC. SHALL BE FLUSH MOUNTED OR CONCEALED IN WALL UNLESS OTHERWISE NOTED.
6.	ELECTRICAL CONTRACTOR TO COORDINATE WITH OTHER TRADES TO AVOID INSTALLATION CONFLICTS PRIOR TO ROUGH-IN.
7.	HACR RATED BREAKERS SHALL BE PROVIDED FOR ALL HVAC EQUIPMENT.
8.	ALL BRANCH CIRCUITS AND FEEDER CIRCUITS ARE TO BE PROVIDED WITH SEPARATE APPROPRIATELY SIZED GROUNDING CONDUCTOR.
9.	ALL WIRE IS SIZED BASED ON 75°C COPPER. COMPACT ALUMINUM IS APPROVED FOR ALL BRANCH AND FEEDER CIRCUITS OVER 100A (UNLESS COPPER IS REQUIRED BY EQUIPMENT MANUFACTURE, VERIFICATION IS THE RESPONSIBILITY OF THE CONTACTOR). IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UPSIZE CONDUIT AND CONDUCTORS AND VERIFY TERMINATION REQUIREMENTS AS REQUIRED IF ALUMINUM IS USED.

ELECTRICAL SHEET INDEX	
E000	ELECTRICAL COVER SHEET
E100	SITE ELECTRICAL PLAN
E200	FLARE STATION ELECTRICAL PLAN
E300	ONE-LINE DIAGRAM
E301	ELECTRICAL SCHEDULES
E400	ELECTRICAL SPECIFICATIONS
E401	ELECTRICAL SPECIFICATIONS
E402	ELECTRICAL SPECIFICATIONS

TETRA TECH

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3880 Americana Terrace, Suite 201  
Boise, ID 83796  
Phone: 208.389.1030

PROFESSIONAL ENGINEER

16238

4/27/23

STATE OF IDAHO

KEITH W. ADAMS

BY							
MARK							
DATE							
DESCRIPTION							

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID

GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION

ELECTRICAL COVER  
SHEET

Project No.: 197-2021-0175

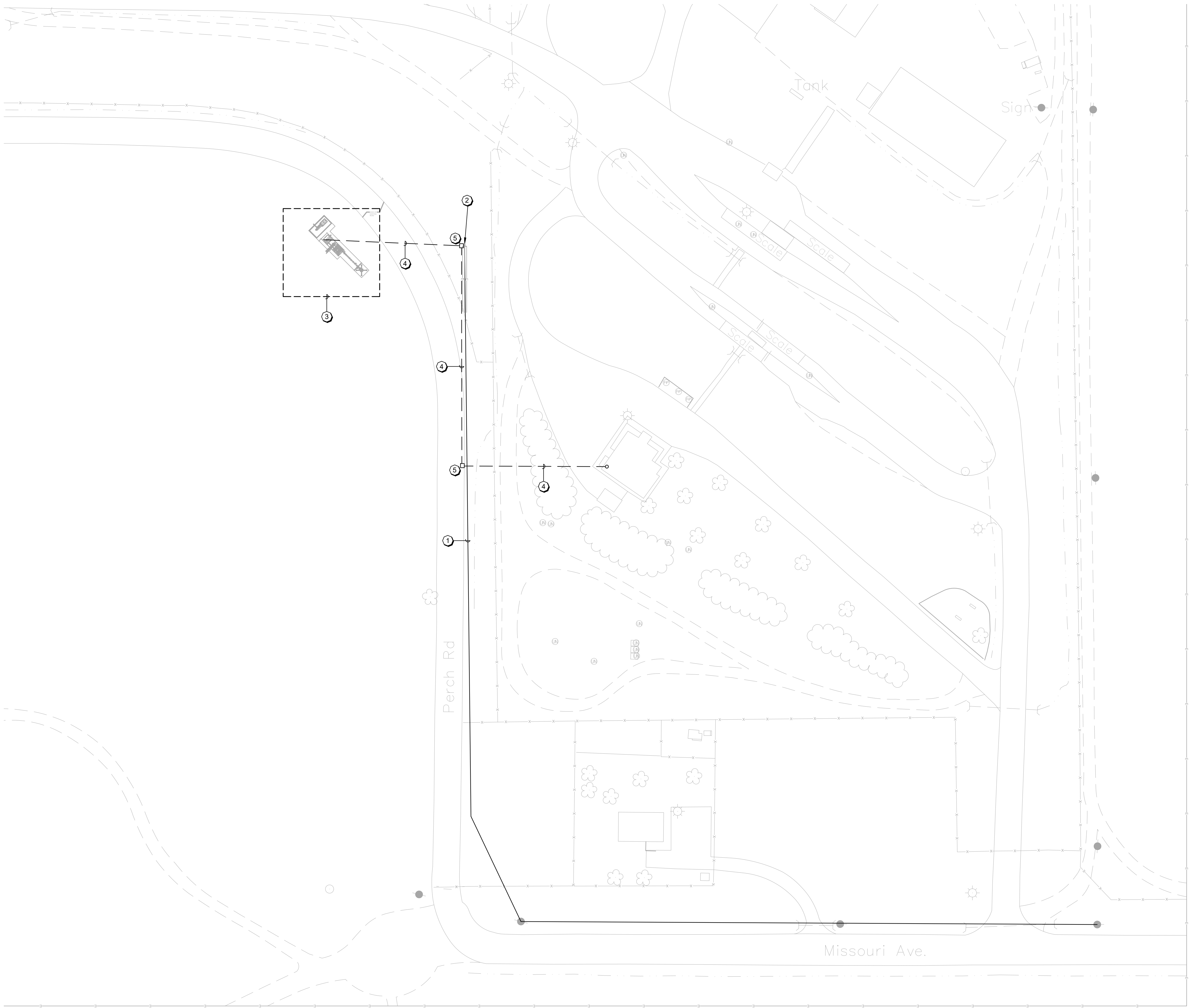
Designed By: KWA/NAA

Drawn By: NAA

Checked By: KWA

E000





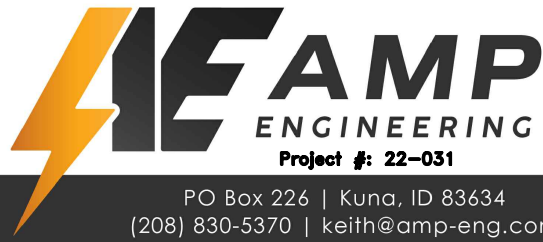
GENERAL NOTES:

- A. EQUIPMENT LAYOUT ON THIS SHEET IS SUBJECT TO CHANGE. CONTRACTOR TO COORDINATE ALL UTILITY INSTALLATIONS WITH LOCAL UTILITY COMPANIES PRIOR TO ANY WORK BEING STARTED. VERIFY LOCATIONS OF UTILITY TRENCHES AND EQUIPMENT AND COORDINATE WITH OTHER SITE FEATURES AND EQUIPMENT TO VERIFY ANY CONFLICTS.
- B. ALL CONDUITS TO BE INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE. ALL PRIMARY AND SECONDARY CONDUITS TO BE INSTALLED PER LOCAL UTILITY COMPANY REQUIREMENTS.
- C. CONTRACTOR TO COORDINATE ALL SITE WORK WITH CIVIL AND ARCHITECTURAL SITE PLANS PRIOR TO STARTING ANY WORK.
- D. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH PULL LINE AND BE LABELED ON BOTH ENDS FOR FUTURE USE.
- E. UNLESS OTHERWISE NOTED, ALL UNDERGROUND CONDUIT SHALL BE PVC COATED RIGID GALVANIZED STEEL. ALL EXPOSED CONDUIT SHALL BE RIGID GALVANIZED STEEL. FINAL CONNECTION TO FIELD DEVICES SHALL BE MADE WITH SHORT LENGTH (MAX 18") OF METALLIC SEALTITE FLEXIBLE CONDUIT AND APPROVED FITTINGS.
- F. WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.

KEYED NOTES:

- 1. APPROXIMATE ROUTING OF NEW PROPOSED 3-PHASE OVERHEAD PRIMARY POWER BY IDAHO POWER COMPANY. SHOWN FOR REFERENCE ONLY.
- 2. NEW 480Y/277V POLE MOUNTED TRANSFORMERS BY IDAHO POWER COMPANY.
- 3. LOCATION OF NEW FLARE. SEE ENLARGED PLANS ON SHEET E200 FOR WORK IN THIS AREA.
- 4. NEW UNDERGROUND CONDUIT FROM EXISTING OFFICE TO NEW FLARE FOR PHONE/DATA CONNECTION. SEE CIVIL SHEET C-105 FOR DETAILS.
- 5. FURNISH AND INSTALL NEW PRE-CAST OPEN BOTTOM CONCRETE VAULT. PROVIDE 12" GRAVEL BED FOR DRAINAGE. PROVIDE CORE-DRILLED HOLES AS REQUIRED FOR CONDUIT INSTALLATION AND CONDUCTORS ROUTING. MINIMUM INTERIOR DIMENSIONS TO BE 24"x24"x24".

SCALE: 1" = 50'-0"



MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL  
CANYON COUNTY, ID  
GAS COLLECTION SYSTEM IMPROVEMENTS  
AND FLARE STATION  
SITE ELECTRICAL PLAN

Project No.: 197-2021-0175  
Designed By: KWA/NAA  
Drawn By: NAA  
Checked By: KWA

E100



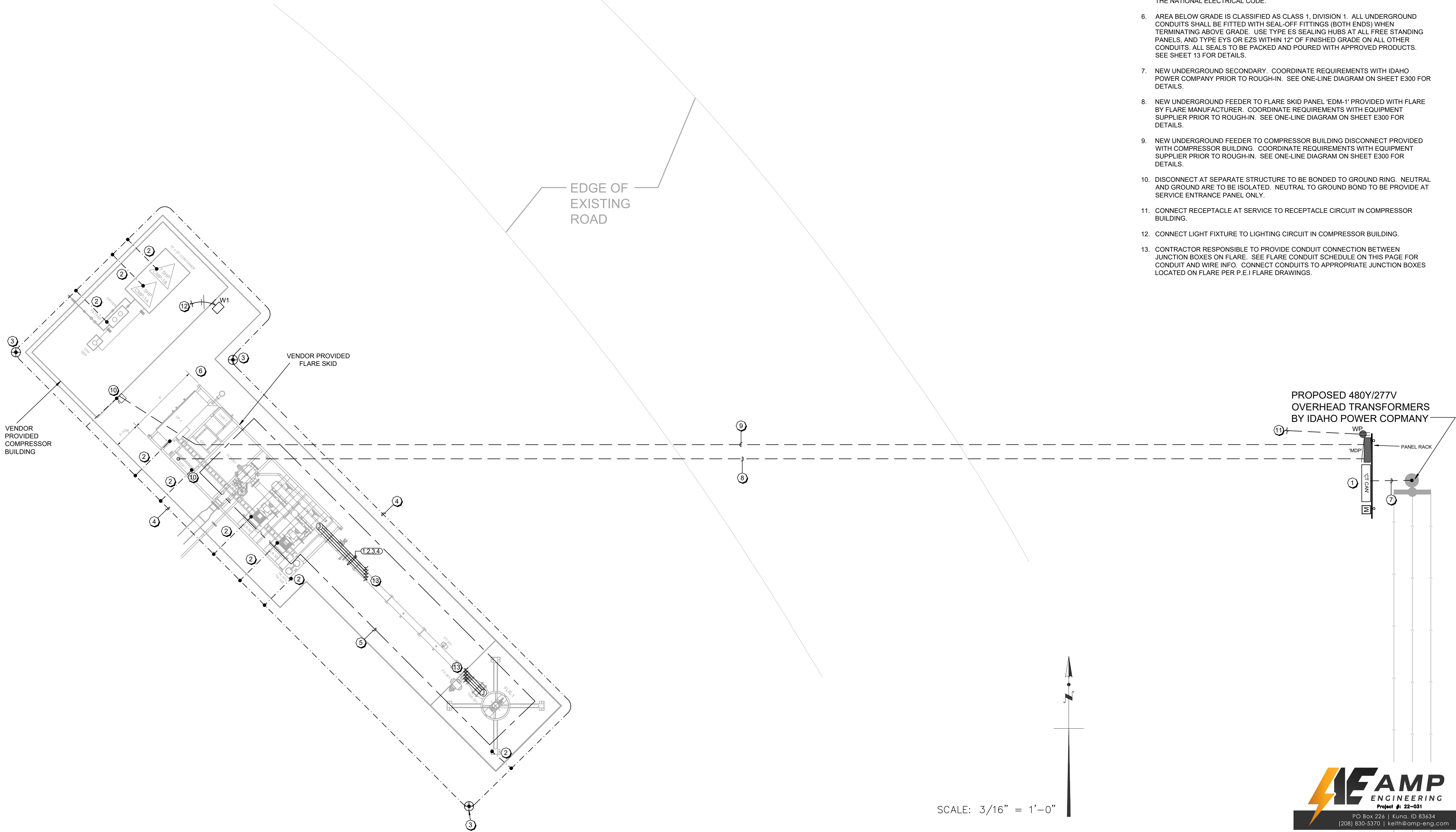
FLARE SKID CONDUIT SCHEDULE						
TAG	CONDUIT SIZE	WIRE	TYPE	FROM	TO	NOTES
1	3/4"	(2) BELDEN 8760, (4) TYPE 'KX' T/C 18 GUAGE WITH SHIELD, PVC JACKET, 1 #12 GND	SIGNAL	CONTROL PANEL	J-BOX (LV) @ FLARE (TE/FE/FCV)	FLARE MANUFATURER TO PROVIDE WIRING
2	3/4"	7 #16, 1 #12	120V	CONTROL PANEL	J-BOX (HV) @ FLARE	
3	3/4"	UV SENSOR CABLES	SIGNAL	CONTROL PANEL	BE-501 @ FLARE	FLARE MANUFATURER TO PROVIDE WIRING
4	3/4"	(1) BELDEN 8760	SIGNAL	CONTROL PANEL	FE/FT-301	LFG PIPING TO FLARE

GENERAL NOTES:

- A. COORDINATE ALL LOCATIONS AND POWER REQUIREMENTS WITH OWNER PRIOR TO ROUGH-IN AND FINAL COVER.
- B. WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER UNLESS NOTED OTHERWISE. PROVIDE APPROPRIATELY SIZED EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. WIRE SIZE SHALL NOT BE LESS THAN CORRESPONDING CIRCUIT BREAKER RATING AS REQUIRED BY NEC.
- C. UNLESS OTHERWISE NOTED, ALL UNDERGROUND CONDUIT SHALL BE PVC COATED RIGID GALVANIZED STEEL. ALL EXPOSED CONDUIT SHALL BE RIGID GALVANIZED STEEL. FINAL CONNECTION TO FIELD DEVICES SHALL BE MADE WITH SHORT LENGTH (MAX 18") OF METALLIC SEALTITE FLEXIBLE CONDUIT AND APPROVED FITTINGS.

KEYED NOTES:

- MOUNT NEW ELECTRICAL SERVICE ON EQUIPMENT RACK. SEE DETAIL ON SHEET E300 FOR DETAILS.
- FURNISH AND INSTALL BONDING CONDUCTOR FROM GROUND RING TO EQUIPMENT INDICATED. BOND EQUIPMENT WITH #2 BARE COPPER BY MEANS OF EXOTHERMIC WELD OR LISTED COMPRESSION FITTING. SEE DETAIL ON SHEET E301.
- PROVIDE 3/4" x 10' COPPER CLAD GROUND ROD AND INSPECTION WELL AT LOCATIONS SHOWN. CONNECT TO GROUND RING BY LISTED MEANS AND PROVIDE IN-GROUND ACCESS. SEE DETAIL ON SHEET E301.
- FURNISH AND INSTALL #2/0 BARE COPPER GROUND RING AROUND FLARE AS INDICATED. GROUND RING TO BE BURIED AT A DEPTH NOT LESS THAN 30" PER NEC 250.53(F).
- AREA WITHIN 36" OF GAS PIPING IS CLASSIFIED AS CLASS 1, DIVISION 2. ALL WIRING WITHIN THIS AREA SHALL COMPLY WITH SECTION 501 OF THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE.
- AREA BELOW GRADE IS CLASSIFIED AS CLASS 1, DIVISION 1. ALL UNDERGROUND CONDUITS SHALL BE FITTED WITH SEAL-OFF FITTINGS (BOTH ENDS) WHEN TERMINATING ABOVE GRADE. USE TYPE ES SEALING HUBS AT ALL FREE STANDING PANELS, AND TYPE EYS OR EZS WITHIN 12" OF FINISHED GRADE ON ALL OTHER CONDUITS. ALL SEALS TO BE PACKED AND POURED WITH APPROVED PRODUCTS. SEE SHEET 13 FOR DETAILS.
- NEW UNDERGROUND SECONDARY. COORDINATE REQUIREMENTS WITH IDAHO POWER COMPANY PRIOR TO ROUGH-IN. SEE ONE-LINE DIAGRAM ON SHEET E300 FOR DETAILS.
- NEW UNDERGROUND FEEDER TO FLARE SKID PANEL 'EDM-1' PROVIDED WITH FLARE BY FLARE MANUFACTURER. COORDINATE REQUIREMENTS WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. SEE ONE-LINE DIAGRAM ON SHEET E300 FOR DETAILS.
- NEW UNDERGROUND FEEDER TO COMPRESSOR BUILDING DISCONNECT PROVIDED WITH COMPRESSOR BUILDING. COORDINATE REQUIREMENTS WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. SEE ONE-LINE DIAGRAM ON SHEET E300 FOR DETAILS.
- DISCONNECT AT SEPARATE STRUCTURE TO BE BONDED TO GROUND RING. NEUTRAL AND GROUND ARE TO BE ISOLATED. NEUTRAL TO GROUND BOND TO BE PROVIDE AT SERVICE ENTRANCE PANEL ONLY.
- CONNECT RECEPTACLE AT SERVICE TO RECEPTACLE CIRCUIT IN COMPRESSOR BUILDING.
- CONNECT LIGHT FIXTURE TO LIGHTING CIRCUIT IN COMPRESSOR BUILDING.
- CONTRACTOR RESPONSIBLE TO PROVIDE CONDUIT CONNECTION BETWEEN JUNCTION BOXES ON FLARE. SEE FLARE CONDUIT SCHEDULE ON THIS PAGE FOR CONDUIT AND WIRE INFO. CONNECT CONDUITS TO APPROPRIATE JUNCTION BOXES LOCATED ON FLARE PER P.E.I FLARE DRAWINGS.



MARK	DATE	DESCRIPTION	BY



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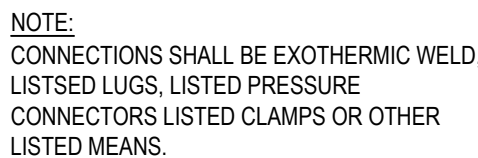
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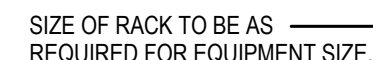
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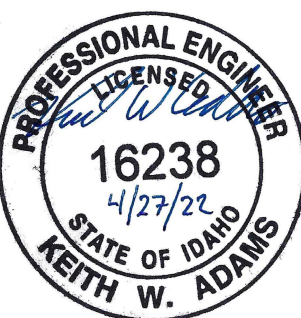
SCALE POINTS



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- A. SERIES RATED COMBINATIONS SHALL BE UL LISTED AND LABELED PER NEC 110.22.
- B. ELECTRICAL EQUIPMENT SHALL BE FIELD OR FACTORY MARKED TO WARN OF POTENTIAL ARC-FLASH HAZARDS PER NEC 110.16.
- C. SERVICE EQUIPMENT SHALL BE MARKED WITH AVAILABLE FAULT CURRENT PER NEC 110.24.
- D. CONTRACTOR TO MAINTAIN ALL WORKING CLEARANCES AROUND ELECTRICAL EQUIPMENT PER NEC 110.26. ANY CONFLICTS THAT ARISE ARE TO BE REPORTED IMMEDIATELY TO THE ENGINEER FOR REVIEW
- E. ALL GROUNDING ELECTRODES THAT ARE PRESENT AT EACH BUILDING OR STRUCTURE SERVED SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM PER NEC 250.50.

1. COORDINATE NEW ELECTRICAL SERVICE WITH IDAHO POWER COMPANY PRIOR TO STARTING WORK OR ORDERING EQUIPMENT.



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Boise, ID 83796  
Phone: 208.389.1030

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No

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**MARK**

PICKLES BUTTE LANDFILL

## ONE-LINE DIAGRAM

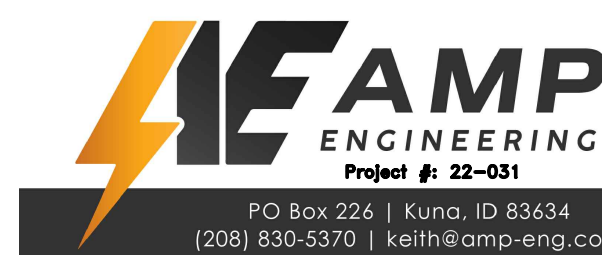
Project No.: 197-2021-0175

Designed By: KWA/NAA

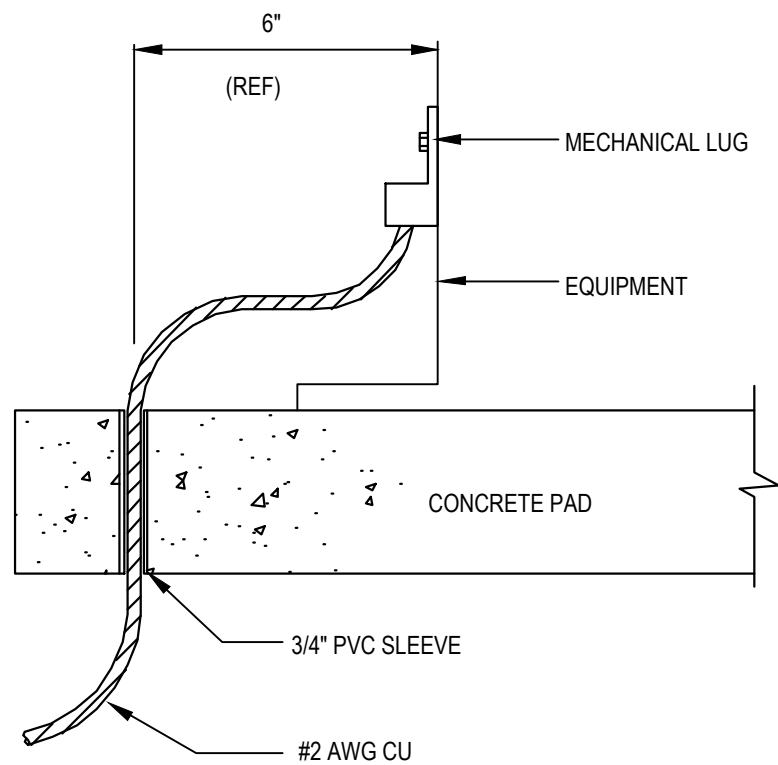
Drawn By: NAA

Checked By: KWA

# E300

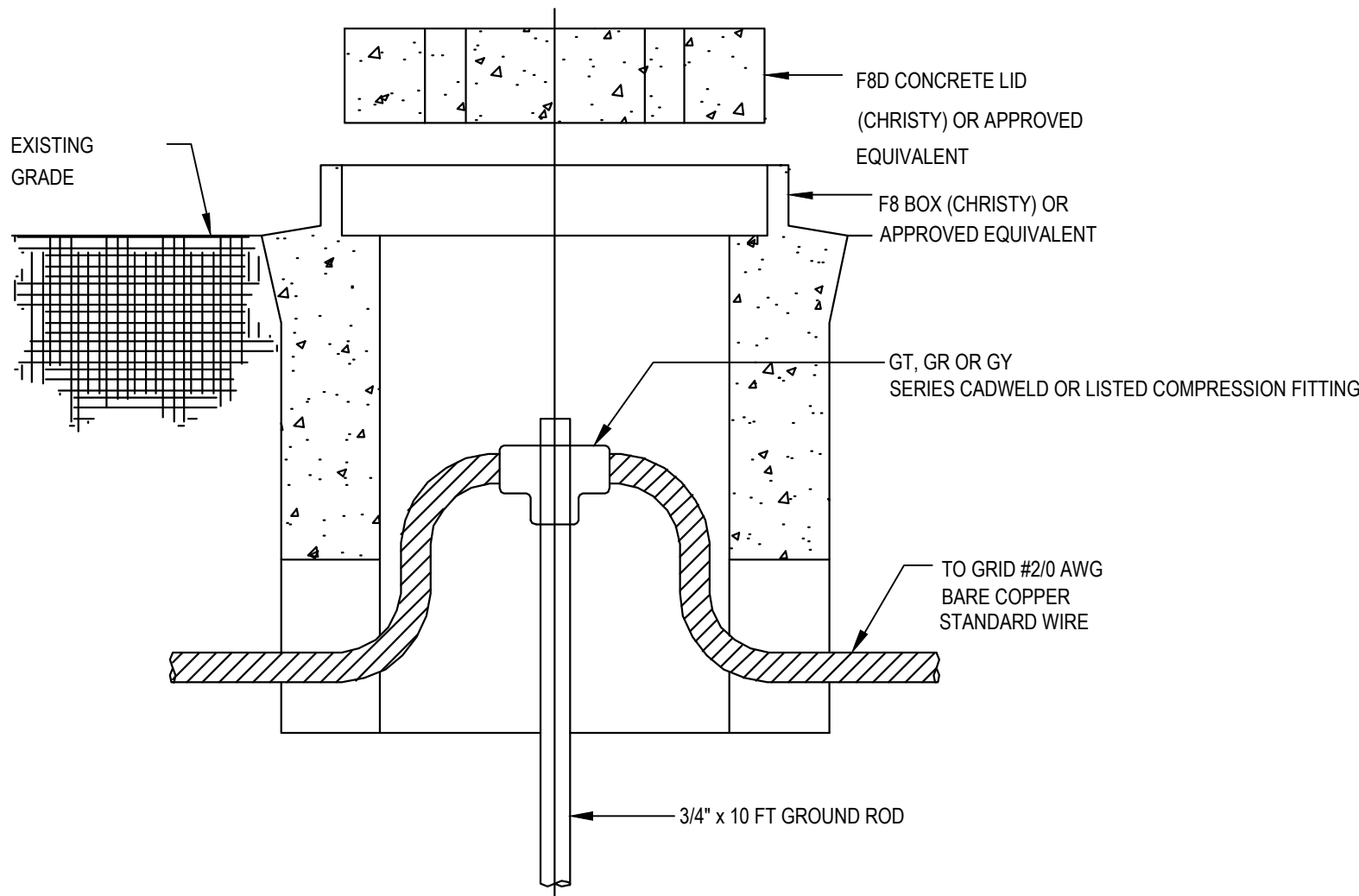






GROUND RING CONCRETE PENETRATION DETAIL

SCALE: NTS



GROUND ROD INSPECTION WELL DETAIL

SCALE: NTS

ELECTRICAL SERVICE LOAD SUMMARY									
PROJECT: PICKLES BUTTE									
EQUIPMENT: MDP									
VOLTAGE: 480Y/277									
PHASE, WIRE: 3-PHASE, 4-WIRE + GND									
OCPD RATING: 300 AMPS STANDARD									
BUS RATING: 400 AMPS									
ENCLOSURE: NEMA 3R, LOCKABLE									
MAIN: BREAKER									
MOUNTING: SURFACE									
FED FROM: IP XFMR									
NEUTRAL: 100%									
LOCATION: BY IP POLE									



AVAILABLE FAULT CURRENT:		9,137	AMPS	AVAILABLE FAULT CURRENT TO BE MARKED ON SERVICE EQUIPMENT PER NEC 110.24					
EQUIPMENT RATING:		35K	AIC						
PANEL 'MDP'		LTG (KVA)	REC (KVA)	MOTOR (KVA)	KITCHEN (KVA)	CONT. (KVA)	NON-CONT. (KVA)	HVAC (KVA)	ELEC. HEAT (KVA)
		-	-	172.9	-	-	-	-	-
TOTAL CONN. LOAD	(KVA):	-	-	172.9	-	-	-	-	-
	(AMPS):	-	-	207.9	-	-	-	-	-
DEMAND FACTOR:		-	-	106%	-	-	-	-	-
TOTAL DEMAND LOAD	(KVA):	-	-	183.6	-	-	-	-	-
	(AMPS):	-	-	220.9	-	-	-	-	-
		LARGEST (KVA)		43.0	0	TOTAL KITCHEN UNITS			

OVERALL LOAD SUMMARY				
TOTAL CONNECTED		DEMAND FACTOR		TOTAL DEMAND
(KVA)	(AMPS)	(KVA)	(AMPS)	(KVA)
172.9	207.9	106%	183.6	220.9
EQUIPMENT OCPD OR BUS RATING: 300				
PANEL 'OK'				

SCHEDULE - PANEL 'MDP'										PROJECT: PICKLES BUTTE									
VOLTAGE: 480Y/277										AIC RATING: 35K									
PHASE, WIRE: 3-PHASE, 4 WIRE + GND										MOUNTING: SURFACE									
OCPD RATING: 300 AMPS										FED FROM: POLE XFMR									
BUS RATING: 400 AMPS										NEUTRAL: 100%									
ENCLOSURE: NEMA 3R, LOCKABLE										LOCATION: RACK BY UTILITY POLE									
MAIN: BREAKER										MAIN RATING: STANDARD RATED									
										PANEL NOTES: A. SERIES COMBINATIONS SHALL BE UL LISTED AND LABELED PER NEC 110.22.									
NOTES	LOAD TYPE	CKT #	DESCRIPTION	BRK SIZE	# POLE	LOAD (VA)	LOAD (A)	PHASE LOADS (VA)			LOAD (A)	LOAD (VA)	# POLE	BRK SIZE	DESCRIPTION	CKT #	LOAD TYPE	NOTES	
	M	1		200		44,320	160.0	44,320			-			50		2			
	M	3	EDP - 1 (FLARE PANEL)	200	3	44,320	160.0		44,320		-		3	50	SPARE	4			
	M	5		200		44,320	160.0			44,320	-			50		6			
	M	7		60		13,302	48.0	13,302			-		1	20	SPARE	8			
	M	9	COMPRESSOR BUILDING	60	3	13,302	48.0		13,302		-		1	20	SPARE	10			
	M	11		60		13,302	48.0			13,302	-		1	20	SPARE	12			
		13		20		-	0				-				BLANK	14			
		15	SPARE	20	3	-	-		0		-				BLANK	16			
		17		20		-	-			0	-				BLANK	18			
		19	BLANK			-	0				-				BLANK	20			
		21	BLANK			-	-		0		-				BLANK	22			
		23	BLANK			-	-			0	-				BLANK	24			
		25	BLANK			-	0				-				BLANK	26			
		27	BLANK			-	-		0		-				BLANK	28			
		29	BLANK			-	-			0	-				BLANK	30			
		31	BLANK			-	0				-				BLANK	32			
		33	BLANK			-	-		0		-				BLANK	34			
		35	BLANK			-	-			0	-				BLANK	36			
		37	BLANK			-	0				-				BLANK	38			
		39	BLANK			-	-		0		-				BLANK	40			
		41	BLANK			-	-			0	-				BLANK	42			
						TOTAL (VA)	57,622	57,622	57,622										
						TOTAL (AMPS)	207.9	207.9	207.9										
						% UNBALANCE	0.0%	0.0%	0.0%										
PANEL LOAD SUMMARY						LOAD TYPE	CONN. LOAD	DEMAND FACTOR	DEMAND LOAD										
172.9						CONNECTED LOAD (KVA)	0	125%	0										
207.9						CONNECTED LOAD (AMPS)	0	-	0										
183.6						DEMAND LOAD (KVA)	172,866	106%	183,616	43	LARGEST (KVA)								
220.9						DEMAND LOAD (AMPS)	0	-	0	0	EQUIP. COUNT								
						MOTORS (VA):	0	125%	0										
						KITCHEN (VA):	0	100%	0										
						HVAC (VA):	0	100%	0										
						NON-CONTINUOUS (VA):	0	100%	0										
						ELECTRIC HEAT (VA):	0	100%	0										
						TOTAL:	172,866	106%	183,616										
PANEL 'OK'										BRANCH CIRCUIT NOTES:									
										1. PROVIDE CLASS 'A' GFCI TYPE BREAKER									
										2. PROVIDE CLASS 'B' GFEP TYPE BREAKER									
										3. ROUTE CIRCUIT THROUGH RELAY PANEL FOR CONTROL									
										4. BREAKER TO BE LOCKABLE PER NEC 110.25.									
										5. ROUTE CIRCUIT THROUGH HOOD CONTACTOR FOR ANSUL SHUT DOWN									
										7. BREAKER HANDLE TO BE RED PER NFPA 72.									
										8. BREAKER TO BE LOCKABLE IN THE 'ON' POSITION.									
										9. SUB FEED LOAD INCLUDED IN PANEL LOAD SUMMARY									
										10. --									



SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes general electrical requirements which apply to the entire electrical division including, but not necessarily restricted to, the following:
1. Procedural requirements.
  2. Specifications for general items not specifically covered in other technical sections.
- 1.2 RELATED WORK SPECIFIED ELSEWHERE
- A. Section 019100, General Commissioning Requirements
- B. Section 024119, Selective Interior Demolition
- C. Section 083100, Access Doors and Panels
- D. Section 260533, Raceway and Boxes for Electrical Systems
- E. Section 271000, Structured Cabling

1.3 REFERENCES

- A. All equipment and materials shall be in accordance with the applicable standards of the following organizations:
1. ANSI: American National Standards Institute
  2. IBC: International Building Code
  3. ICEA: Insulated Cable Engineers Association
  4. IEEE: Institute of Electrical and Electronic Engineers
  5. NEC: National Electrical Code
  6. NEMA: National Electrical Manufacturers Association
  7. NFPA: National Fire Protection Association
  8. UL: Underwriters Laboratories

1.4 CODES, PERMITS, AND CERTIFICATES

- A. See Division 1 for specific requirements relating to codes enforced, permits, and inspections.
- B. Notify the electrical inspector of jurisdiction having authority sufficiently in advance to completely inspect the work in the various stages necessary. Uncover concealed work and provide qualified staff to assist inspectors.
- C. In preparation for final inspection, all electrical equipment shall have wires installed under terminal posts, and circuit schedule and labeling complete.
- D. Deliver certificates from inspection authorities, certifying work is complete and satisfactory, before acceptance of the work.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Store and handle materials to protect against corrosion or mechanical damage. Remove damaged materials from site immediately after detection.
- B. Deliver materials in manufacturer's packaging. Deliver conductors and cables in complete coils.
- 1.6 ELECTRICAL DRAWINGS
- A. The drawings are diagrammatic and do not show every detail of installation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Supply all materials to complete and provide the operating system specified, unless it is specifically indicated that materials are being furnished by others, or that existing equipment shall or may be reused.
- B. All materials shall be new and meet the requirements of these specifications.
- C. All components and equipment provided and normally tested and labeled by Underwriters Laboratories (UL), or similar recognized third party approval authority, shall be so labeled.

PART 3 - EXECUTION

3.1 LAYOUT AND COORDINATION

- A. Contractor shall visit site prior to bid or beginning in work to become familiar with project scope and requirements.
- B. Layout of the various equipment is very specific with the dimensioning, relative location and/or dimensions shown on the drawings. Call attention to any error, conflict, or discrepancy in the drawings or specifications. Do not proceed with any questionable items of work until clarification has been received.
- C. Work under this division shall be conducted in a cooperative manner with work of other divisions employed on the project, for proper installation of all items of equipment.
- D. Verify the physical dimensions of each item of electrical equipment to fit the available space and provide prompt notification prior to roughing in, if conflicts appear. Coordinate equipment to fit into the available spaces and coordinate access routes through the construction site.

3.2 PROTECTION

- A. Electrical work, wire and cable, materials, and other equipment specified in this division shall be protected against damage by other construction activities, weather conditions, or any other causes as a part of this work. Equipment found damaged or in other than new condition shall be rejected as defective.
- B. Keep light fixtures and electrical equipment covered or closed to exclude moisture, dust, dirt, cement, or paint and shall be free of all contamination before acceptance. Enclosures and trims shall be in new condition, free of rust, scratches or other finish defects. Properly refinish to new condition if damaged.
- C. Keep conduit and raceways closed during construction to prevent entrance of dirt, moisture, concrete or foreign objects. Raceways shall be clean and dry before installation of wire and shall be so at the time of final acceptance.

3.3 GENERAL INSTALLATION METHODS

- A. Install all material and equipment in accordance with the manufacturer's recommendations, instructions, and/or installation drawings, and in accordance with NEC and specifications.
- B. Unless otherwise noted on the drawings, conceal all wiring in finished spaces. Exposed conduit is acceptable only when and where prior specific authorization is obtained from the owner. If exposed conduit is installed, it shall be parallel to structural lines.
- C. Unless otherwise noted on the drawings, all wiring devices, recessed light fixtures, etc., in finished spaces shall be flush-mounted.
- D. Provide necessary rigid conduit sleeves, openings, and chases where conduits or cables are required to pass through floors, ceilings, or walls. Seal all openings around conduits against leaks and in a manner to maintain the fire rating of the structure penetrated. Prevent unnecessary cutting in connection with the finished work.
- E. Cutting or notching shall be kept to a minimum. Structural members shall not be disturbed or cut in any way without specific written approval from the structural engineer. Patch and correct finished surfaces damaged by electrical work.
- F. Provide all backing and mounting hardware required to complete the electrical systems in a safe, working condition as part of the contract work.
- G. Comply with code requirements and methods.
- H. In general, mounting heights shall be as noted on the drawings. Where no heights are indicated, request clarification. All device dimensions are to the center above finish floor unless specified otherwise. Lighting dimensions are to the bottom of suspended fixtures.

3.4 POWER SERVICE OR UTILITY COORDINATION

- A. Power Service:
1. Submit for approval, arrangement layouts and installation details for the service equipment. Install the equipment in accordance with the approved drawings.
- B. Utility Coordination:
1. Coordinate all aspects of incoming electrical service indicated with the appropriate provider. Requirements of the utility company exceeding the provisions made on the drawings or covered in these specifications shall take precedence. Provisions made on the drawings or specifications in excess of the utility company requirements shall take precedence.

3.5 TESTING

- A. Upon completion, test systems to show the equipment installed operates as designed and specified, free of faults and unintentional grounds. Submit testing plans per Section 013300, Submittal Procedures, for review prior to testing. The system tests shall be set up for as many at one time as possible to work into construction phasing.
- B. A journeyman electrician with required tools shall be available to conduct all tests, with or without the equipment factory representative present.
- C. Systems to be tested shall include, but not be limited to the following:
1. Power Distribution system.
  2. Emergency power system.
  3. Lighting systems.
  4. Lighting control system.
- D. A written record of performance tests shall be compiled, dated, witnessed, and submitted along with operating and maintenance data prior to substantial completion.
- E. See other sections for possible testing requirements as they apply to those sections.

END OF SECTION 260500

SECTION 26 0519 - LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Copper building wire rated 600 V or less.
  2. Aluminum building wire rated 600 V or less.
  3. Metal-clad cable, Type MC, rated 600 V or less.
  4. Fire-alarm wire and cable.
  5. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following
1. Alpha Wire Company.
  2. Belden Inc.
  3. Cerni Wire LLC.
  4. Encore Wire Corporation.
  5. General Cable Technologies Corporation.
  6. Houston Wire & Cable.
  7. Service Wire Co.
  8. Southwire Company.
- C. Standards:
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
  2. RoHS compliant.
  3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- E. Conductor Insulation:
1. Type NM: Comply with UL 83 and UL 719.
  2. Type RHH and Type RHW-2: Comply with UL 44.
  3. Type USE-2 and Type SE: Comply with UL 854.

4. Type THHN and Type THWN-2: Comply with UL 83.
5. Type THW and Type THW-2: Comply with NEMA WC-70/ ISEA S-95-658 and UL 83.
6. Type XHHW-2: Comply with UL 44.

2.2 FIRE-ALARM WIRE AND CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Allied Wire & Cable Inc.
  2. CommScope, Inc.
  3. Comtran Corporation.
  4. Draka Cabletek USA; a Prysmian Group company.
  5. Genesis Cable Products; Honeywell International, Inc.
  6. Radix Wire.
  7. Rockbestos-Supremant Cable Corp.
  8. Superior Essex Inc.
  9. West Penn Wire.
- B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- C. Signaling Line Circuits: Twisted, shielded pair, size as recommended by system manufacturer.
- D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
  2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.
- C. Multiconductor Armored Cable: NFPA 70, Type MC, copper conductors, Type TFF/THHN conductor insulation, copper drain wire, copper armor with red identifier stripe, NRTL listed for fire-alarm and cable tray installation, plenum rated.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. 3M Electrical Products.
  2. AFC Cable Systems; a part of Akore International.
  3. Hubbell Power Systems, Inc.
  4. Thomas & Betts Corporation; A Member of the ABB Group.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
1. Material: Copper.
  2. Type: Two hole with long barrels.
  3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders & Branch Circuits: Copper, stranded for No. 12 AWG and larger.
- B. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTI-CONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway or Metal-clad cable, Type MC.
- E. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTION

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-lightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unsplined conductors.
1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260563 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SLANT INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Advanced Lightning Technology, Ltd.
  2. Dossier; AFL Telecommunications LLC.
  3. ERICO; a brand of nVent.
  4. Galvan Industries, Inc.; Electrical Products Division, LLC.
  5. Hubbell Incorporated (Construction and Energy Group).
  6. ILSCO.
  7. Robbins Lightning, Inc.
  8. Siemens Industry, Inc.; Energy Management Division.
  9. Thomas & Betts Corporation; A Member of the ABB Group.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
1. Stranded Conductors: ASTM B8.
  2. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
  3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  4. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 8 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.
- D. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- E. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.
- F. Conduit Hubs: Mechanical type, terminal with threaded hub.
- G. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.
- H. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.
- I. Straps: Solid copper, [cast-bronze clamp] [copper lugs]. Rated for 600 A.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.
- B. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
- C. Conductor Terminations and Connections:
1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
  3. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.
1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a electric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
  2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
  3. Bond each above-ground portion of gas piping system downstream from equipment shutoff valve.

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Inspect physical and mechanical condition. Verify lightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
  4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- B. Grounding system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 20 ohms.
  2. Power and Lighting Equipment or System with Capacity of 500 or more kVA: 10 ohms.
  3. Power Distribution Units or Panels Serving Electronic Equipment: 5 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design hanger and support system.
- B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified and the supported equipment and systems will be fully operational after the seismic event."
  2. Component Importance Factor: 1.5.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit; a part of Akore International.
    - b. B-line, an Eaton business.
    - c. CADDY; a brand of nVent.
    - d. Flex-Strut Inc.
    - e. Gripple Inc.
    - f. Thomas & Betts Corporation; A Member of the ABB Group.
    - g. Unistrut; Part of Akore International.
  2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
  3. Material for Channel, Fittings, and Accessories: Galvanized steel.
  4. Channel Width: Selected for applicable load criteria.
  5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  6. Protect finishes on exposed surfaces from damage by applying a stripable, temporary protective covering before shipping.
- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
  2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
  3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325.
  6. Toggle Bolts: Springing type.
  7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.
- 3.2 APPLICATION
- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
1. NECA 1.
- B. Comply with requirements for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with conduit clamps.
- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.3 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
  2. To New Concrete: Bolt to concrete inserts.
  3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  4. To Existing Concrete: Expansion anchor fasteners.
  5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
  7. To Light Steel: Sheet metal screws.
  8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.
- 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS
- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Metal conduits and fittings.
  2. Nonmetallic conduits and fittings.
  3. Metal wireways and auxiliary gutters.
  4. Nonmetal wireways and auxiliary gutters.
  5. Surface raceways.
  6. Boxes, enclosures, and cabinets.
  7. Handholes and boxes for exterior underground cabling.
- B. Related Requirements:
1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.
  2. Section 270528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.
- 1.2 ACTION SUBMITTALS
- A. Product Data: For each type of product.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

- A. Metal Conduit:
1. Manufacturers: Subject to compliance with requirements:
  2. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  3. GRC: Comply with ANSI C80.1 and UL 6.
  4. IMC: Comply with ANSI C80.6 and UL 1242.
  5. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
    - a. Comply with NEMA RN 1.
    - b. Coating Thickness: 0.040 inch minimum.
  6. EMT: Comply with ANSI C80.3 and UL 797.
  7. FMC: Comply with UL 1-zinc-coated steel.
  8. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- B. Metal Fittings: Comply with NEMA FB 1 and UL 514B.
1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  2. Fittings: General: Listed and labeled for type of conduit, location, and use.
  3. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
  4. Fittings for EMT:
    - a. Material: Steel.
    - b. Type: Setscrew or compression as required for installation environment.
  5. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
  6. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.
- C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

- A. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
1. ENT: Comply with NEMA TC 13 and UL 1653.
  2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
  3. LFNC: Comply with UL 1660.
- B. Nonmetallic Fittings:
1. Fittings: General: Listed and labeled for type of conduit, location, and use.
  2. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
  3. Fittings for LFNC: Comply with UL 514B.
  4. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 otherwise indicated, and sized according to NFPA 70.
1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and



2. Hinged door in front cover with flush latch and concealed hinge.
3. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 2.6 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING**
- A. General Requirements for Handholes and Boxes:
1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers of fiberglass.
1. Standard: Comply with SCTE 77.
2. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.

**PART 3 - EXECUTION**

**3.1 RACEWAY APPLICATION**

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: EMT (with appropriate fittings), GRC or IMC.
3. Underground Conduit: RNC, Type EPC-40-PVC. Transmission to Schedule 80 Above ground.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated.
1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
- a. Loading dock.
- b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
- c. Mechanical rooms.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: GRC or PVC.
6. Boxes and Enclosures: NEMA 250, Type 1, unless noted otherwise.
- C. Minimum Raceway Size: 1/2-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and number of coats recommended by manufacturer.
3. EMT: Use setscrew or compression fittings as required for location. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install surface raceways only where indicated on Drawings.

**3.2 INSTALLATION**

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- C. Do not fasten conduits onto the bottom side of a metal deck roof.
- D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Make bends in raceway using large-radius preformed els. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.
- H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- I. Support conduit within 12 inches of enclosures to which attached.
- J. Raceways Embedded in Slabs:
1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to GRC before rising above floor.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- L. Surface Raceways:
1. Install surface raceway with a minimum 2-inch radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- M. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.
- N. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Conduit extending from interior to exterior of building.
4. Conduit extending into pressurized duct and equipment.
5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6. Where otherwise required by NFPA 70.
- O. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- P. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- Q. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.
- R. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- S. Locate boxes so that cover or plate will not span different building finishes.
- T. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- U. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- V. Set metal floor boxes level and flush with finished floor surface.
- W. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

**3.3 INSTALLATION OF UNDERGROUND CONDUIT**

- A. Direct-Buried Conduit:
1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
4. Install manufactured duct elbows for stub-up at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
- a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
- b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

**3.4 FIRESTOPPING**

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

**3.5 PROTECTION**

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

**SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**PART 2 - PRODUCTS**

**2.1 PERFORMANCE REQUIREMENTS**

- A. Comply with NFPA 70.
- B. Comply with NFPA 70E requirements for arc-flash warning labels.
- C. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks

**2.2 COLOR AND LEGEND REQUIREMENTS**

- A. Color-Coding for Phase and Voltage-Level Identification, 600 V or Less: Use colors listed below for service, feeder and branch-circuit conductors.
1. Color shall be factory applied or field applied for sizes larger than No. 1 AWG if authorities having jurisdiction permit.
2. Colors for 208/120-V Circuits:
- a. Phase A: Black.
- b. Phase B: Red.
- c. Phase C: Blue.
- d. Neutral: White.
3. Colors for 240-V Circuits:
- a. Phase A: Black.
- b. Phase B: Red.
- c. Neutral: White.
4. Colors for 480/277-V Circuits:
- a. Phase A: Brown.
- b. Phase B: Orange.
- c. Phase C: Yellow.
- d. Neutral: Gray.
5. Color for Equipment Grounds: Green.
6. Colors for Isolated Grounds: Green two or more yellow stripes.
- B. Warning Label Colors:
1. Identify system voltage with black letters on an orange background.
- C. Warning labels and signs shall include, but are not limited to, the following legends:
1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
3. Electrical Arc Flash Hazard Per NEC 110.16(A).
- D. Equipment Identification Labels:
1. Black letters on a white field.

**2.3 LABELS**

- A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
- B. Snap-around Labels: Silt, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameter and that stay in place by gripping action.
- C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
2. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.
- D. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
1. Minimum Nominal Size:
- a. 1-1/2 by 6 inches (37 by 150 mm) for raceway and conductors.
- b. 3-1/2 by 5 inches (76 by 127 mm) for equipment.
- c. As required by authorities having jurisdiction.

**2.4 TAPES AND STENCILS**

- A. Underground-Line Warning Tape:
1. Tape:
- a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
- b. Printing on tape shall be permanent and shall not be damaged by burial operations.
- c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
2. Color and Printing:
- a. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
- b. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
- B. Laminated Acrylic or Melamine Plastic Signs:
1. Engraved legend.
2. Thickness:
- a. For signs up to 20 sq. in. minimum 1/16 inch thick.
- b. For signs larger than 20 sq. in., 1/8 inch thick.
- c. Engraved legend with white letters on a black background.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Apply identification devices to surfaces that require finish after completing finish work.
- E. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- F. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.
- G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
1. Secure tight to surface of conductor, cable, or raceway.
- H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.
1. Secure tight to surface of conductor, cable, or raceway.
- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- J. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
- K. Floor Marking Tape: Apply stripes to finished surfaces following manufacturer's written instructions.
- L. Underground Line Warning Tape:
1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench [or concrete envelope exceeds 16 inches overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- M. Laminated Acrylic or Melamine Plastic Signs:
1. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on minimum 1-1/2-inch- high sign; where two lines of text are required, use signs minimum 2 inches high.

**3.2 IDENTIFICATION SCHEDULE**

- A. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- B. Arc Flash Warning Labeling: Self-adhesive labels.
- C. Equipment Identification Labels:
1. Indoor Equipment: Laminated acrylic or melamine sign
2. Outdoor Equipment: Laminated acrylic or melamine sign
3. Equipment to Be Labeled:
- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.
- d. Switchgear.
- e. Switchboards.
- f. Transformers: Label that includes tag designation indicated on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- g. Emergency system boxes and enclosures.
- h. Motor-control centers.
- i. Enclosed switches.
- j. Enclosed circuit breakers.
- k. Enclosed controllers.
- l. Push-button stations.
- m. Contactors.
- n. Remote-controlled switches, dimmer modules, and control devices.
- o. Receptacles are to be labeled with panel and circuit designation.

END OF SECTION 260553

**SECTION 26276 - WIRING DEVICES**

**PART 1 - GENERAL**

**1.1 ACTION SUBMITTALS**

- C. Product Data: For each type of product.
- D. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

**PART 2 - PRODUCTS**

**2.1 GENERAL WIRING-DEVICE REQUIREMENTS**

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Device Color:
1. Wiring Devices Connected to Normal Power System: White unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Essential Electrical System: Red.
3. SPD Devices: Blue.
4. Isolated-Ground Receptacles: Orange with triangle on face.
- F. Wall Plate Color: For plastic covers, match device color.
- G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
- 2.2 COMMERCIAL-GRADE RECEPTACLES, 125 V, 20 A**
- A. Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.
- B. Tamper-Resistant Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.
- C. Weather-Resistant Duplex Receptacle, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.
- D. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 20 A:
1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

**2.3 GFCI RECEPTACLES, 125 V, 20 A**

- A. Duplex GFCI Receptacles, 125 V, 20 A:
1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
- B. Tamper-Resistant Duplex GFCI Receptacles, 125 V, 20 A:
1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.
- C. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:
1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

**2.6 WALL PLATES**

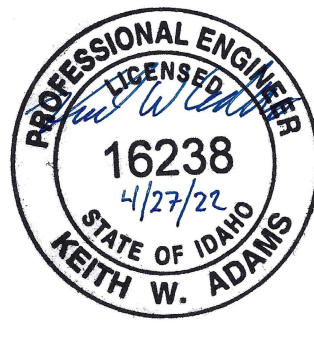
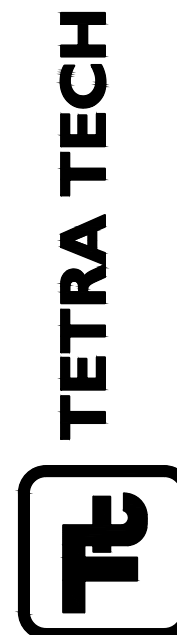
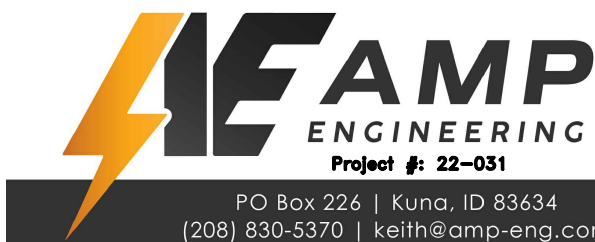
- A. Single Source: Obtain wall plates from same manufacturer of wiring devices.
- B. Single and combination types shall match corresponding wiring devices.
1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: 0.035-inch-thick, satin-finished, stainless steel.
3. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.
4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover and listed and labeled for use in wet and damp locations.
- C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant die-cast aluminum with lockable cover.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
1. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
2. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
3. Install wiring devices after all wall preparation, including painting, is complete.
- C. Device Installation:
1. Connect devices to branch circuits using pigtail that are not less than 6 inches in length.
2. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- D. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.
- E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- F. Dimmers:
1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multitag wall plates.
- H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.
- 3.2 FIELD QUALITY CONTROL**
- A. Tests for Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Wiring device will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

**6. END OF SECTION 26276**



MARK	DATE	DESCRIPTION	BY

PICKLES BUTTE LANDFILL CANYON COUNTY, ID	GAS COLLECTION SYSTEM IMPROVEMENTS AND FLARE STATION	ELECTRICAL SPECIFICATIONS
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Project No.:	197-2021-0175
Designed By:	KWA/NAA
Drawn By:	NAA
Checked By:	KWA

E401

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SECTION 265619 - LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
- Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
  - Luminaire supports.
  - Luminaire-mounted photoelectric relays.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color rendering index.
- C. Lumen: Measured output of lamp and luminaire, or both.
- D. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of luminaire.
- B. Shop Drawings: For nonstandard or custom luminaires.
- Include plans, elevations, sections, and mounting and attachment details.
  - Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - Include diagrams for power, signal, and control wiring.
- C. Delegated-Design Submittal: For luminaire supports.
- Include design calculations for luminaire supports and seismic restraints.
- 1.4 INFORMATIONAL SUBMITTALS
- A. Coordination Drawings: Plans, drawn to scale and coordinated.
- B. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.
- C. Product Certificates: For each type of the following:
- Luminaire.
  - Photoelectric relay.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.
- Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
  - Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.6 FIELD CONDITIONS

- A. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.7 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
- D. UL Compliance: Comply with UL 1598 and listed for wet location.
- E. Lamp base complying with ANSI C81.61 or IEC 60061-1.
- F. CRI of minimum 70. CCT as listed on the fixture schedule.
- G. L70 lamp life minimum of 50,000 hours.
- H. Lamps dimmable from 100 percent to 10 percent of maximum light output.

2.3 LUMINAIRE TYPES

- A. As noted on the fixture schedule.

2.4 MATERIALS

- A. Metal Parts: Free of burrs and sharp corners and edges.
- B. Sheet Metal Components: Stainless steel. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.
- D. Housings:
- Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
  - Provide filter/breather for enclosed luminaires.

2.5 FINISHES

- A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with NECA 1.
- B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.
- C. Install lamps in each luminaire if not provided with the luminaire.
- D. Fasten luminaire to structural support.
- E. Supports:
- Sized and rated for luminaire weight.
  - Able to maintain luminaire position after cleaning and relamping.
  - Support luminaires without causing deflection of finished surface.
  - Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
- F. Wall-Mounted Luminaire Support:
- Attached per manufacturer recommendations.
- G. Wiring Method: Install cables in raceways. Conceal raceways and cables.
- H. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.
- I. Coordinate layout and installation of luminaires with other construction.
- J. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

3.2 INSTALLATION OF INDIVIDUAL GROUND-MOUNTED LUMINAIRES

- A. Aim as indicated on Drawings.
- B. Install on concrete base with top 30 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth.

3.3 CORROSION PREVENTION

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch (0.254-mm)-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- B. Perform the following tests and inspections.
- Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
  - Verify operation of photoelectric controls.
- C. Illumination Tests:
- Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
- D. Luminaire will be considered defective if it does not pass tests and inspections.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

END OF SECTION 265619

SECTION 271513 - COMMUNICATIONS COPPER HORIZONTAL CABLING

PART 1 - GENERAL

1.1 COPPER HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cabling system shall provide interconnections between Distributor A, Distributor B, or Distributor C, and the equipment outlet, otherwise known as "Cabling Subsystem 1," in the telecommunications cabling system structure. Cabling system consists of horizontal cables, intermediate and main cross-connects, mechanical terminations, and patch cords or jumpers used for horizontal-to-horizontal cross-connection.
- TIA-568-C.1 requires that a minimum of two equipment outlets be installed for each work area.
  - Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications equipment outlet.
  - Bridged taps and splices shall not be installed in the horizontal cabling.
- B. A work area is approximately 100 sq. ft. (9.3 sq. m), and includes the components that extend from the equipment outlets to the station equipment.
- C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment or in the horizontal cross-connect.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Software and Firmware Operational Documentation:
- Software operating and upgrade manuals.
  - Program Software Backup: On USB media.
  - Device address list.
  - Printout of software application and graphic screens.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1.6 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA-568-C.1, when tested according to test procedures of this standard.
- B. Telecommunications Pathways and Spaces: Comply with TIA-569-D.
- C. Grounding: Comply with TIA-607-B.

2.2 GENERAL CABLE CHARACTERISTICS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with the applicable standard and NFPA 70 for the following types:
- Communications, Plenum Rated: Type CMP complying with UL 1665.
  - Communications, Non-plenum: Type CMR complying with UL 1666.
- B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- Flame-Spread Index: 25 or less.
  - Smoke-Developed Index: 50 or less.
- C. RoHS compliant.

2.3 CATEGORY 6 TWISTED PAIR CABLE

- A. Description: Four-pair, balanced-twisted pair cable, [ with internal spline,] certified to meet transmission characteristics of Category 6 cable at frequencies up to 250MHz.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 3M.
  - AMP NETCONNECT; a TE Connectivity Ltd. company.
  - Beiden CDT Networking Division/NORDX.
  - Berk-Tek Leviton; a Nexans/Leviton alliance.
  - CommScope, Inc.
  - Superior Essex Inc.
  - SYSTIMAX Solutions; a CommScope Inc. brand.
- C. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568-C.2 for Category 6 cables.
- D. Conductors: 100-ohm, 23 AWG solid copper.
- E. Shielding/Screening: Unshielded twisted pairs (UTP).
- F. Jacket: Blue thermoplastic.

2.4 TWISTED PAIR CABLE HARDWARE

- A. Description: Hardware designed to connect, splice, and terminate twisted pair copper communications cables.
- B. General Requirements for Twisted Pair Cable Hardware:
- Comply with the performance requirements of Category 6.
  - Comply with TIA-568-C.2, IDC type, with modules designed for punch-down caps or tools.
  - Cables shall be terminated with connecting hardware of same category or higher.
- C. Source Limitations: Obtain twisted pair cable hardware from single source from single manufacturer.
- D. Connecting Blocks.
- 110-style IDC for Category 6.
  - Provide blocks for the number of cables terminated on the block, including plugs and jacks where indicated.
- E. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
- Number of Terminals per Field: One for each conductor in assigned cables.
- F. Patch Panel: Modular panels housing numbered jack units with IDC-type connectors at each jack location for permanent termination of pair groups of installed cables.
- Features:
    - Universal T568A and T568B wiring labels.
    - Labeling areas adjacent to conductors.
    - Replaceable connectors.
    - 24 or 48 ports.

- Construction: 16-gauge steel and mountable on 19-inch (483 mm) equipment racks.
  - Number of Jacks per Field: One for each four-pair cable indicated.
- G. Plugs and Plug Assemblies:
- Male, eight position; color-coded modular telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
  - Standard: Comply with TIA-568-C.2.
- H. Jacks and Jack Assemblies:
- Female; eight position; modular; fixed telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
  - Designed to snap-in to a patch panel or faceplate.
  - Standard: Comply with TIA-568-C.2.
- I. Faceplate:
- Six port, vertical single gang faceplates designed to mount to single gang wall boxes.
  - Plastic Faceplate: High-impact plastic. Coordinate color with Section 262726 "Wiring Devices."
  - Metal Faceplate: Stainless steel, complying with requirements in Section 262726 "Wiring Devices."
  - For use with snap-in jacks accommodating any combination of twisted pair, optical fiber, and coaxial work area cords.
    - Flush mounting jacks, positioning the cord at a 45-degree angle.

J. Legend:

- Machine printed, in the field, using adhesive-tape label.
- Snap-in, clear-label covers and machine-printed paper inserts.

2.5 GROUNDING

- A. Comply with requirements in Section 270526 "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.
- B. Comply with TIA-607-B.

PART 3 - EXECUTION

3.1 INSTALLATION OF TWISTED-PAIR HORIZONTAL CABLES

- A. Comply with NECA 1 and NECA/BICSI 568.
- B. Wiring Method: Install cables in raceways and cable trays, except within consoles, cabinets, desks, and counters. Conceal raceway and cables, except in unfinished spaces.
- Install plenum cable in environmental air spaces, including plenum ceilings.
- C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools. Install conductors parallel with or at right angles to sides and back of enclosure.
- D. General Requirements for Cabling:
- Comply with TIA-568-C.1.
  - Comply with BICSI's Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section.
  - Install 110-style IDC termination hardware unless otherwise indicated.
  - Do not twist twisted pair cables more than 1/2 inch from the point of termination to maintain cable geometry.
  - Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
  - Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
  - Install lacing bars to restrain cables, prevent straining connections, and prevent bending cables to smaller radii than minimums recommended by manufacturer.
  - Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section. Use lacing bars and distribution spools.
  - Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation, and replace it with new cable.
  - Pulling Cable: Comply with BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Pulling and Installing Cable" Section. Monitor cable pull tensions.
- E. Group connecting hardware for cables into separate logical fields.
- F. Separation from EMI Sources:
- Comply with recommendations from BICSI's "Telecommunications Distribution Methods Manual" and TIA-569-D for separating unshielded copper communication cable from potential EMI sources, including electrical power lines and equipment.

3.2 FIRESTOPPING

- A. Comply with requirements in Section 078413 "Penetration Firestopping."
- B. Comply with TIA-569-D, Annex A, "Firestopping."
- C. Comply with "Firestopping Systems" Article in BICSI's "Telecommunications Distribution Methods Manual."

3.3 GROUNDING

- A. Install grounding according to the "Grounding, Bonding, and Electrical Protection" chapter in BICSI's "Telecommunications Distribution Methods Manual."
- B. Comply with TIA-607-B and NECA/BICSI-607.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall, allowing at least a 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar to suitable electrical building ground, using a minimum No. 4 AWG grounding electrode conductor.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than a No. 6 AWG equipment grounding conductor.

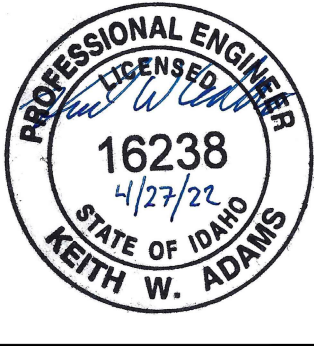
3.4 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA-606-B. Comply with requirements for identification specified in Section 270553 "Identification for Communications Systems."
- B. Paint and label colors for equipment identification shall comply with TIA-606-B for Class 2 level of administration, including optional identification requirements of this standard.
- C. Equipment grounding conductors.
- D. Cable and Wire Identification:
- Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
  - Each wire connected to building-mounted devices is not required to be numbered at the device if wire color is consistent with associated wire connected and numbered within panel or cabinet.
- E. Labels shall be preprinted or computer-printed type, with a printing area and font color that contrast with cable jacket color but still comply with TIA-606-B requirements for the following:
- Cables use flexible vinyl or polyester that flexes as cables are bent.

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
- Visually inspect jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA-568-C.1.
  - Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
  - Test twisted pair cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
- C. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similarly to Table 10.1 in BICSI's "Telecommunications Distribution Methods Manual," or shall be transferred from the instrument to the computer, saved as text files, printed, and submitted.
- D. Remove and replace cabling where test results indicate that they do not comply with specified requirements.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

END OF SECTION 271513



BY									

MARK	DATE	DESCRIPTION

PICKLES BUTTE LANDFILL CANYON COUNTY, ID	GAS COLLECTION SYSTEM IMPROVEMENTS AND FLARE STATION	ELECTRICAL SPECIFICATIONS
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Project No.:	197-2021-0175
Designed By:	KWA/NAA
Drawn By:	NAA
Checked By:	KWA

E402

