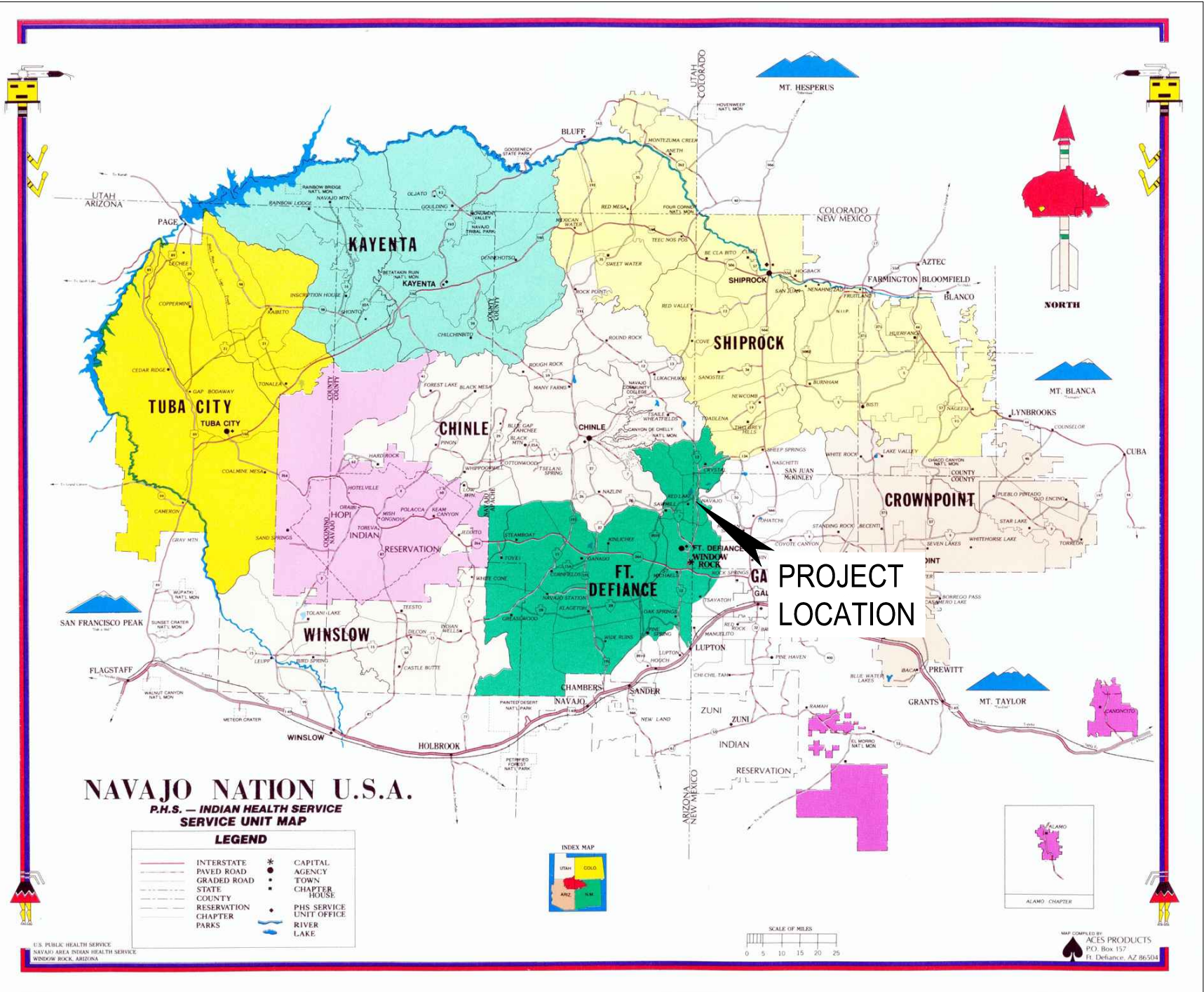


REFURBISHMENT & UPGRADE OF EXISTING LIFT STATION

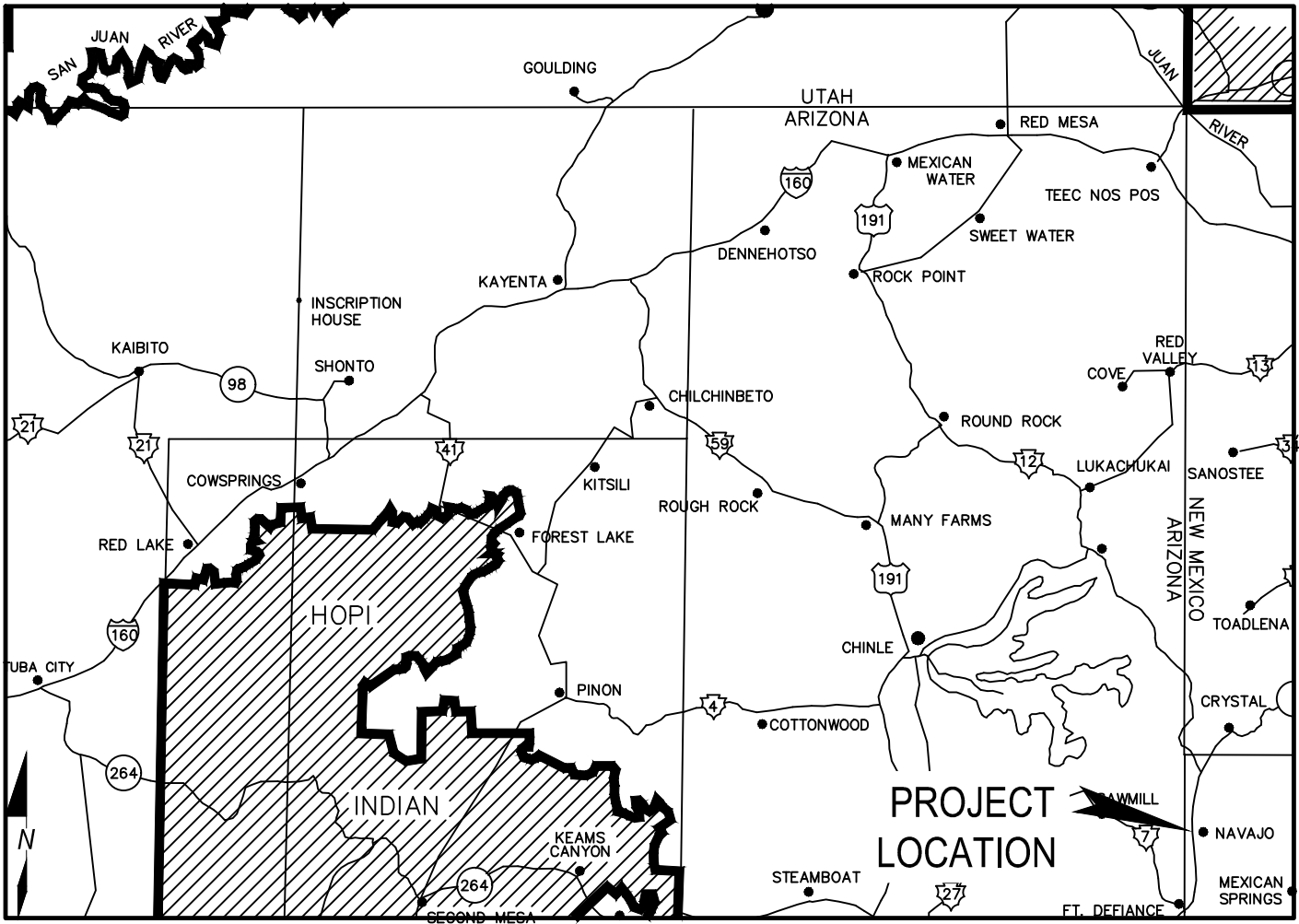
NAVAJO (RED LAKE) CHAPTER, MCKINLEY COUNTY, NEW MEXICO
OCTOBER 2020



SITE LOCATION MAP
(NOT TO SCALE)



100% PLANS
ISSUED FOR CONSTRUCTION
BY:LASPAAS DATE:Oct 12, 2020 4:20pm



VICINITY MAP
(NOT TO SCALE)

REFURBISHMENT & UPGRADE OF LIFT STATION-NAVAJO SHEET INDEX:

DRAWINGS	
G-01	EXISTING FACILITY PLAN
G-02	EXISTING SITE CONDITIONS LAYOUT
G-03	BILL OF MATERIALS
G-04	SITE PLAN
G-05	MECHANICAL SPECIFICATIONS
G-06	MECHANICAL SPECIFICATIONS
D-01	INSTRUMENTATION AND CONTROL STANDARDS
D-02	PROCESS AND INSTRUMENTATION DIAGRAM
M-01	MECHANICAL PLAN
M-02	MECHANICAL SECTIONS
S-01	STRUCTURAL SECTIONS
EI-601	ELECTRICAL ONE-LINE DIAGRAM
EI-701	ELECTRICAL INSTRUMENTATION PANEL

PREPARED FOR:

NAVAJO TRIBAL UTILITY AUTHORITY
P.O. BOX 170
FORT DEFIANCE, AZ 86504

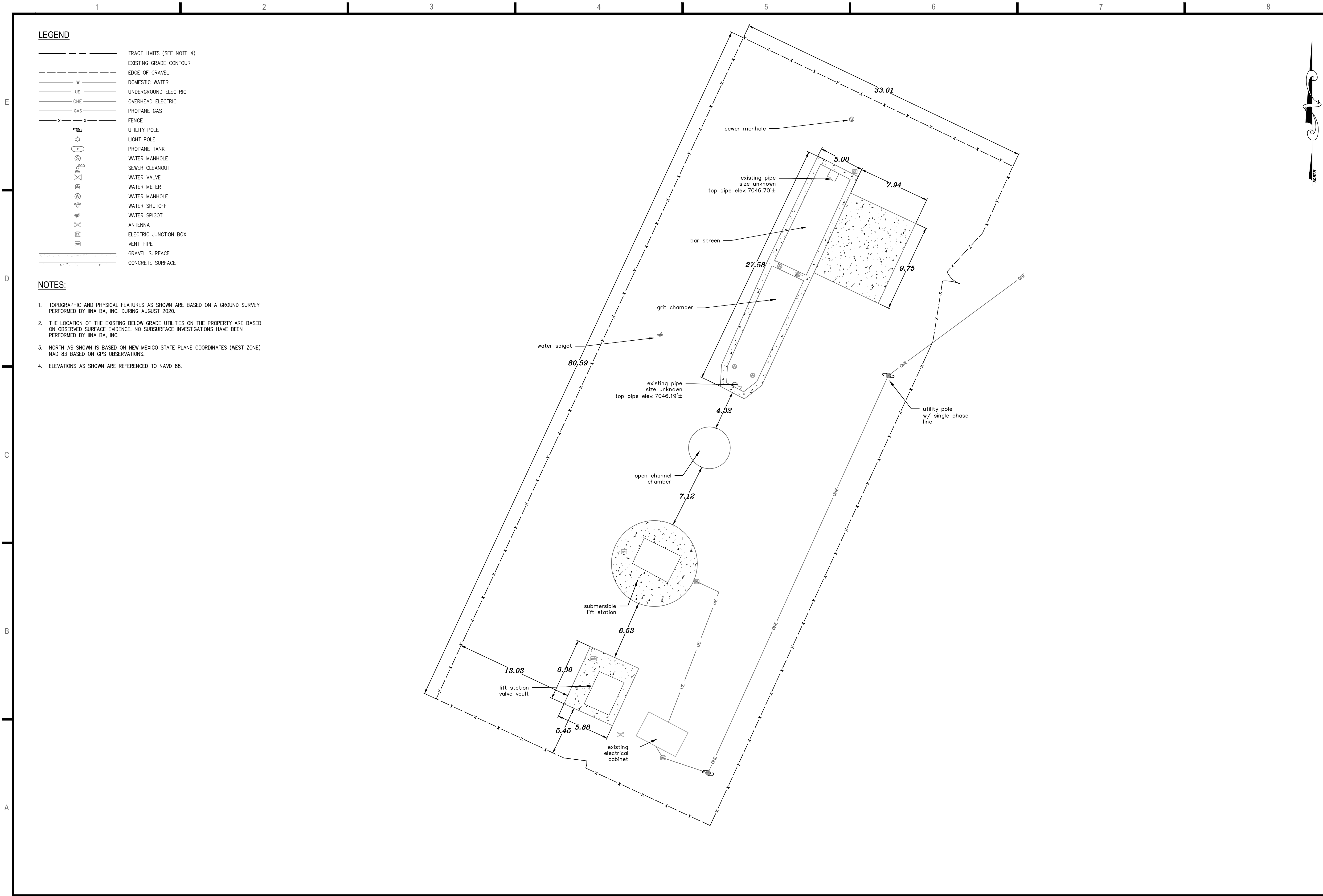
PREPARED BY:



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Farmington, NM 87401 Farmington, NM 87499



IBI #20-050-02



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CLIENT:

**NAVAJO TRIBAL UTILITY
AUTHORITY**
P.O. BOX 170
Ft. Defiance, AZ, 86504

PROJECT:

**REFURBISHMENT & UPGRADE OF
EXISTING LIFT STATION**

35°54'12.32"N, 109°02'33.21"W
NAVAJO, NEW MEXICO, 87238

ONLY VALID WITH ORIGINAL STAMP

REVISIONS:

REV	DESCRIPTION	DATE	DETR	CHKR

PROJECT NUMBER:	20-050-02
ENGINEER:	XXX
DRAWING SIZE:	ANSI D
DRAWING SCALE:	1" = 5'



DRAWING TITLE:

EXISTING FACILITY PLAN

DRAWING NUMBER:

G01

_____	TRACT LIMITS (SEE NOTE 4)
_____	EXISTING GRADE CONTOUR
_____	EDGE OF GRAVEL
_____	DOMESTIC WATER
_____	UNDERGROUND ELECTRIC
_____	OVERHEAD ELECTRIC
_____	GAS
_____	PROPANE GAS
_____ X _____	FENCE
	UTILITY POLE
	LIGHT POLE
	PROPANE TANK
	WATER MANHOLE
	SEWER MANHOLE
	WATER VALVE
	WATER METER
	WATER MANHOLE
	WATER SHUTOFF
	WATER SPIGOT
	ANTENNA
	ELECTRIC JUNCTION BOX
_____	VENT PIPE
_____	GRAVEL SURFACE
_____	CONCRETE SURFACE



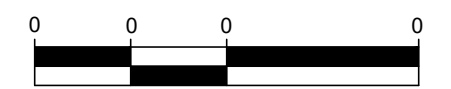
P.O. BOX 2606
Farmington, NM 87499

REFURBISHMENT & UPGRADE OF
EXISTING LIFT STATION

35°54'12.32"N, 109°02'33.21"W

NAVAJO, NEW MEXICO, 87238

ONLY VALID WITH ORIGINAL STAMP

[illegible]

DRAWING NUMBER:

G-02

1

2

3

4

5

6

7

8

E

D

C

B

A

BILL OF MATERIALS					
DWG	ITEM NUMBER	QUANTITY	PART NUMBER	MANUFACTURER	DESCRIPTION
M-02	21	1	30005-0008-DI	JWC	MUFFIN MONSTER
M-02	-	1	PC 2200	JWC	CONTROLLER ASSEMBLY
M-02	22	1	(INCLUDED)-	JWC	CUSTOM FRAME ASSEMBLY
M-02	23	1	(INCLUDED)	JWC	CUSTOM GUIDE RAIL ASSEMBLY
M-02	24	1	(INCLUDED)	JWC	CUSTOM LIFTING BAIL ASSEMBLY
M-02		3	(INCLUDED)	JWC	O&M MANUALS (HARD COPY)
M-02	25	1	32537R	JWC	FRAME WALL MOUNT
M-02	26	1	32523	JWC	GUIDE PLATE
M-02	27	8	30249	JWC	HHCS 3/8-16 X ¾ SST
M-02	28	8	30140	JWC	LOCKWASHERS SPLIT 3/8 SST
S-01	29	1	D3A24E	HALLIDAY PRODUCTS	PORTABLE HOIST – 1,500 LB LIMIT; SST
S-01	30	1	SERIES D3S	HALLIDAY PRODUCTS	HOIST SOCKET; LINED



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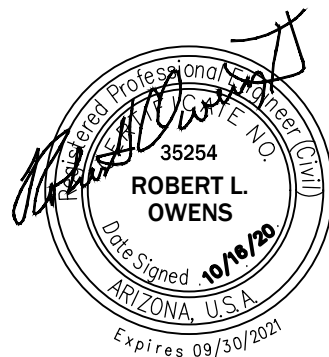
CLIENT:

NAVAJO TRIBAL UTILITY
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PROJECT:

REFURBISHMENT & UPGRADE OF
EXISTING LIFT STATION

35°54'12.32"N, 109°02'33.21"W
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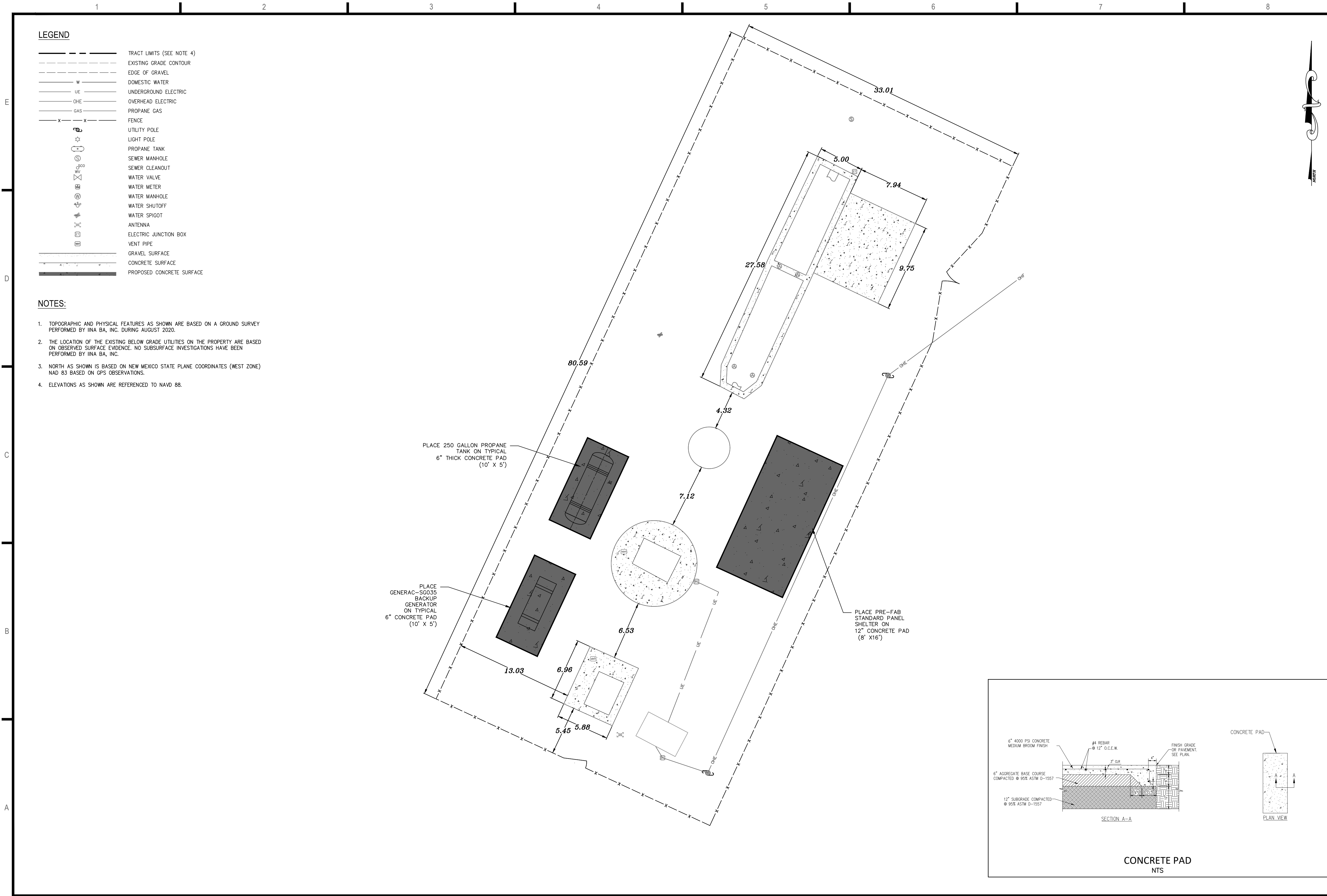
REVISIONS:					
REV	DESCRIPTION	DATE	DFTR	CHKR	
PROJECT NUMBER: 20-050-02					
ENGINEER: XXX					
DRAWING SIZE: ANSI D					
DRAWING SCALE: 1" = 5'					

DRAWING TITLE:

BILL OF MATERIALS

DRAWING NUMBER:

G-03




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Ft. Defiance, AZ, 86504

PROJECT:

**REFURBISHMENT & UPGRADE OF
EXISTING LIFT STATION**

35°54'12.32"N, 109°02'33.21"W
NAVAJO, NEW MEXICO, 87238


EXPIRES: _____

ONLY VALID WITH ORIGINAL STAMP

REVISIONS:					
REV	DESCRIPTION	DATE	DETR	CHKR	
	PROJECT NUMBER: 20-050-02				
	ENGINEER: XXX				
	DRAWING SIZE: ANSI D				
	DRAWING SCALE: 1" = 5'				
					
DRAWING TITLE:					
SITE PLAN					
DRAWING NUMBER:					
G-04					

NAVAJO PUMPING STATION

GENERAL

This section applies to all mechanical equipment specified in all divisions. The contractor is responsible for ensuring that all mechanical equipment meets the requirements of this section in addition to the specific requirements of the individual equipment specification.

- A. Arrangement – the arrangement of equipment shown is based on information available at the time of design and site surveys. It is not intended to show exact dimensions peculiar to a specific manufacturer. The drawings are in part diagrammatic and some features of the equipment may require revision to meet actual equipment installation requirements. Structural supports, foundations, connected piping, valves, and electrical conduit specified may have to be altered to accommodate the equipment provided.
- B. Standards – this section contains references to the following standards. They are a part of this section as specified and modified.
- C. Unit responsibility – equipment systems made up of two or more components shall be provided as a unit by a single manufacturer. Unless otherwise specified, the Contractor shall obtain each system by the supplier of the driven equipment.
- D. Nameplates – nameplates shall be provided on each item of equipment including valves, and shall contain the specified equipment name or abbreviation and equipment number as listed on the master equipment list or as directed by the field engineer. Equipment nameplates shall be engraved or stamped stainless steel and fastened to the equipment in an accessible location with stainless steel screws or drive pins.
- E. Protection Against Electrolysis – where dissimilar metals are used in conjunction with each other, provide suitable insulation between adjacent surfaces so as to eliminate direct contact and any transient electrolysis. Connections of dissimilar piping materials shall utilize dielectric unions, flanges, couplings or bushings.
- F. Tools loose parts and lubricants – provide an inventory of tools and loose parts required to be supplied under the project. Turn over inventory and parts to the field engineer. Also provide a list of recommended spare parts and supplies for each equipment furnished with the current prices and a source of supply.

MOTORS

REFERENCE STANDARDS

- A. National Electrical Manufacturers Association (NEMA) Standard:

1. MG 1 Motors and Generators
- B. Institute of Electrical and Electronics Engineers (IEEE) Standard:

1. 112 Test Procedure for Polyphase Induction Motors and Generators
- C. Underwriters Laboratories (UL) Publication: Recognized Component Directory
- b. Service factor of 1.15 or better.
- c. Class F insulation, Class B temperature rise.
- d. Rated for 6 starts per hour.
- e. Listed by either UL or FM for Class 1, Division 1, Groups C and D hazardous locations.
- f. Suitable for operating in free air continuously (i.e., not submerged in sewage).
- g. Bearing B10 life 18,000 hours minimum.
- h. Tungsten carbide seals.
- i. Lower bearings of either the ball or roller type.
- j. If required by the manufacturer to not void the motor warranty, provide a moisture detection system and a motor winding thermostat system. These systems shall be complete, including all necessary interfaces, control panels, conduits, and wires, even though these may not be shown on the Drawings.

INSULATION

- A. Unless otherwise specified with the driven equipment, provide motors with Class B or F insulation, non-hygroscopic. *[For motors located in altitudes between 3,300 and 6,600 feet or in ambient temperatures exceeding 40°C, provide Class F insulation with Class B temperature rise. In motors to be used with adjustable frequency drives, provide Class F insulation with Class B temperature rise].* In single phase motors 1/2 horsepower or smaller, provide Class A insulation or better.
- B. Where called for in the Specifications for the driven equipment, provide the following type of insulation:

1. Moderate Moisture Resistant: Provide extra dip and bake of epoxy or polyester varnish to resist somewhat higher than normal moisture in the atmosphere.

MOTOR HORSEPOWER

- A. The maximum permissible motor loading:

1. Motors with service factor 1.15 or greater: 100% of nameplate horsepower.

2. Motors with service factor less than 1.15: 90% of nameplate horsepower.

MOTOR NOMINAL EFFICIENCIES AT FULL LOAD

HP	900 RPM	1,200 RPM	1,800 RPM	3,600 RPM
Open Drip-Proof and Weather Protected Type 1 Motors				
1	78.5	78.5	82.5	80.0
1.5	80.0	80.0	84.0	81.5

SUBMITTALS

- A. For each motor, include the following data in the shop drawing submittal for the driven equipment:

1. Manufacturer's name.

2. Manufacturer's type and frame designation.

3. Horsepower output.

4. Time rating.

5. Maximum ambient temperature rating.

6. Insulation system designation.

7. Rpm at full load.

8. Voltage, number of phases, frequency and full load amperes.

9. Code letter for locked rotor kVA.

10. Service factor at 40°C ambient.

11. NEMA design letter.

12. Enclosure type.

13. Lubrication requirements, including type and frequency.

14. KW input power and power factor at 75% and 100% of rated horsepower output.

15. Guaranteed minimum efficiency and nominal efficiency per MG1-12.55.

16. Nominal efficiency.

COORDINATION

- A. General: Coordinate motors with driven equipment requirements. Unless otherwise specified, equipment manufacturers or suppliers shall select and provide motors for their equipment in conformance with these Specifications. Give particular attention to coordination of requirements for:

1. Power.

2. Starting torque.

3. Speed.

4. Bearing load.

5. Ambient temperature.

6. Frequency of starting.

7. Moisture exposure.

8. Adjustable speed control, where applicable.
- B. Suppliers of motors to be used with adjustable speed systems shall:

1. Provide all relevant motor data to the adjustable speed control manufacturer for analysis. Provide motors in conformance with and compatible with the adjustable speed control manufacturer's equipment and requirements.

2. Provide all relevant motor data to the pump manufacturer for vibration, reed critical frequency and other required analyses.

HP	900 RPM	1,200 RPM	1,800 RPM	3,600 RPM
2	85.5	82.5	82.5	85.5
3	85.5	82.5	82.5	84.0
5	86.5	86.5	85.5	86.5
7.5	87.5	89.5	87.5	88.5
10	90.2	90.2	89.5	86.5
15	90.2	91.7	90.2	89.5
20	91.7	91.7	91.0	90.2
25	91.7	92.4	91.7	90.2
30	92.4	93.0	92.4	92.4
40	91.7	93.0	93.6	93.6
50	93.0	93.0	93.6	93.6
60	93.6	93.6	94.1	94.1
75	94.1	93.6	94.1	93.6
100	94.5	94.5	94.5	94.1
125	94.5	95.0	95.0	94.1
150	95.0	94.5	95.0	94.1
200	95.0	95.0	95.0	94.1
250	94.5	95.0	95.0	94.5
300-500	95.0	95.8	95.8	94.5
Total Enclosed Fan Cooled Motors				
1	78.5	78.5	82.5	80.0
1.5	80.0	80.0	84.0	81.5
2	85.5	82.5	82.5	85.5
3	86.5	86.5	82.5	84.0
5	88.5	87.5	85.5	86.5
7.5	89.5	90.2	87.5	88.5
10	90.2	91.0	89.5	90.2
15	90.2	92.4	91.0	91.7
20	91.7	92.4	91.0	91.7
25	91.7	93.0	92.4	92.4
30	92.4	93.0	93.0	93.0
40	92.4	93.6	94.1	94.1
50	93.6	93.6	94.1	94.1
60	93.6	94.1	94.1	94.1
75	94.1	94.1	94.1	94.5
100	94.5	95.0	95.0	94.5
125	94.5	95.0	95.4	95.0
150	94.5	95.0	95.4	95.4
200	95.0	95.0	95.4	95.4

SPECIFIC REQUIREMENTS

- A. The following motor characteristics are specified with the driven equipment in all cases:

1. Speed.

2. Horsepower or supplier responsibility to determine.

3. Horizontal or vertical arrangement.

4. Indoor or outdoor location.
- B. Additional motor characteristics are specified with the driven equipment only where the required motor differs from the typical characteristics described below or where additional properties or characteristics are required that are not specified in this Section.

PRODUCTS

GENERAL

- A. Motors shall be designed, built, and installed in the driven equipment, to provide long, trouble-free life in industrial service and shall be rated in conformance with NEMA MG1. Motors rated 100 horsepower or less and rated 600V or less shall be listed in UL Recognized Component Directory or shall be listed and labeled by other organizations acceptable to the authority having code enforcement jurisdiction.
- B. Unless otherwise specified with the driven equipment, provide motors with the following typical characteristics:

1. Motors shall be single speed, and designed for continuous duty and full voltage starting. Motors shall provide standard starting torque.

2. Voltage Ratings:

a. 1/2 horsepower or less: 115 volts, single phase, 60 Hz, capacitor start. Small fan motors may be split phase or shaded pole type if standard for the equipment.

b. Above 1/2 horsepower: 460 volts, three phase, 60 Hz, squirrel cage induction motors.

3. All motors shall have a service factor of 1.15 in an ambient temperature of 40°C.

a. Exceptions: Motors, which have special enclosures or winding configurations, may carry a Unity (1.0) Service Factor. Examples are totally enclosed, explosion proof, or submersible motors.

4. Windings shall be copper.

5. Provide ground lug inside the terminal box.

6. Provide lifting eye on each motor weighing more than 50 pounds.

7. Each motor shall be suitable for six starts per hour (5 minutes on and 5 minutes off, continuously) when powering the specific driven equipment required for this project.

8. Each motor shall have an overall sound power level at no load not greater than given in NEMA MG1-12.49.

9. Motors, which have special operating characteristics such as multi-speed, high torque/high slip, short time intermittent ratings shall be nameplated to show how these characteristics differ from standard design.

HP	900 RPM	1,200 RPM	1,800 RPM	3,600 RPM
250	95.0	95.4	95.8	95.8
300-500	95.0	95.8	95.8	95.8

- B. Probable motor horsepower ratings have been specified or shown on the Drawings. Changes from the specified horsepower may be accepted, if necessary to assure that motors do not exceed their maximum permissible loading, as defined above, under normal operation. Motor horsepower ratings shall not be less than those specified in driven equipment sections. If a larger horsepower rating is required by the driven equipment, provide all changes required to motor starting and control equipment and to the conduit and wiring system without any additional cost to NTUA.

EFFICIENCY

- A. For motors 1 Horsepower and Larger:

1. Provide premium efficiency motors unless otherwise specified. Premium efficiency motors shall have nominal efficiencies at full load not less than those listed in Table 11002-1.

2. Guaranteed minimum efficiencies of premium efficiency motors shall correspond to nominal values as tabulated in NEMA MG-1, Table 12-8.
- B. Efficiencies shall be determined by using the IEEE 112, Test Method B using segregated loss determination.
- C. Single-phase fractional horsepower motors 1/4 HP through 3/4 HP motors shall be high-efficiency split-capacitor types having minimum efficiency ratings of not less than 64% and power factors of not less than 94.5%.

LOCKED ROTOR KVA - CODE LETTER

- A. Provide motors with locked rotor kVA values less than or equal to those corresponding to the following:

Horsepower	Code Letter
≤5	M
7-1/2-10	H
≥15	G

THERMAL PROTECTION

- C. Motors used with adjustable frequency drives shall have inverter duty complying with NEMA MG-1, Section IV, Part 31.

NAMEPLATE

- A. Provide stainless steel nameplate for each motor, attached to the motor by stainless steel screws or drive pins. Nameplates shall indicate clearly the information required by NEMA MG1, Part 10 and Part 12.

ENCLOSURE TYPE BY LOCATION

- A. Unless otherwise specified with the driven equipment, provide motors with the following typical enclosures:

1. Indoors: Horizontal motors shall be open, drip-proof; vertical motors shall be drip-proof with guard.

2. Outdoors: Vertical motors shall be weather-protected type I. Horizontal motors shall be totally enclosed, fan cooled. All motors shall have the following features:

a. Bearing protection.

b. Anti-corrosion treatment of external hardware and internal metal parts.

c. Weatherproof terminal box with gaskets between the motor, terminal box and terminal box cover.

d. Guard screens on ventilation openings.

e. Moderate moisture resistant insulation, specified hereinafter.

f. Interior and exterior corrosion protection coatings.

g. Special attention to leads into terminal box.

B. When specifically called for in the Specifications for the driven equipment or required by Code, provide the following enclosure types:

1. Hazardous locations: Motors shall be explosion-proof and shall be UL listed for Class I, Division 1, Groups C and D locations; motors shall bear the UL label.

2. Severe duty: Motors shall have the following features:

a. Totally enclosed, fan cooled enclosure.

b. Stainless steel nameplate.

c. Cast iron housing, bearing brackets and fan guard.

d. Cast iron conduit box with threaded conduit entrance.

e. Corrosion resistant fan.

f. Corrosion resistant hardware.

g. Automatic breather/drain.

h. Ground lug.

i. Regreasable bearings.

j. Provision for excluding water and dust from bearings.

k. Class F insulation.

l. Service factor of 1.15.

m. Epoxy coating on all external surfaces.

3. Submersible: Submersible motors shall comply with the following:

a. Air filled or oil filled squirrel cage induction type.

- A. In each motor to be used with adjustable speed drives, in all motors 60 horsepower and larger, or where called for in the Specifications for the driven equipment, provide integral thermostats or other approved devices to protect the motor from overheating. Thermostats or other devices shall be rated 125 Vac, 1 amp.

SPACE HEATERS

- A. Where called for in the Specifications for the driven equipment, provide space heaters or solid state motor winding heating systems for motors. Heaters shall be 120 or 240 volts, single phase, as required by the control circuit voltage or be of the SCR voltage controlled type. Heater wattage and voltage ratings shall be indicated on motor nameplate. Motor winding heating systems shall be as recommended by manufacturer.

INSTALLATION

- A. Install motors in driven equipment in conformance with motor manufacturer's recommendations and requirements. Motor nameplate shall be visible when installed on the driven equipment.

COMMINUTORMACERATOR



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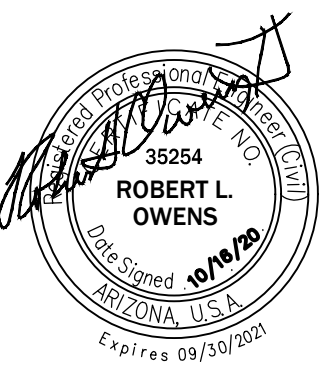
CLIENT:

NAVAJO TRIBAL UTILITY
AUTHORITY
P.O. BOX 170
Ft. Defiance, AZ, 86504

PROJECT:

REFURBISHMENT & UPGRADE OF
EXISTING LIFT STATION

35°54'12.32"N, 109°02'33.21"W
NAVAJO, NEW MEXICO, 87238



REVISIONS:

REV DESCRIPTION DATE DFTR CHKR

PROJECT NUMBER: 20-059-02

ENGINEER: XXX

DRAWING SIZE: ANSI D

DRAWING SCALE: 1" = 5'

DRAWING TITLE:

MECHANICAL SPECIFICATIONS

DRAWING NUMBER:

G-05

E
D
C
B
A

2

3

INSTRUMENT SYMBOL IDENTIFIERS

J-3

J-1

J-2

J-6

J-4, J-5

J-1: IDENTIFICATION LETTERS (SEE TABLE BELOW)

J-2: LOOP NUMBER

J-3: VENDOR DESIGNATOR (NOTE 3)

J-4: FUNCTION BLOCK (SEE TABLE BELOW)

J-5: PANEL NUMBER

J-6: HANDSWITCH DESIGNATOR (SEE BELOW)

FIRST LETTER			SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL	DAMPER		
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY	SWITCH		
T	TEMPERATURE			TRANSMIT	
U	MULTI VARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, OR LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

GENERAL INSTRUMENT OR FUNCTION SYMBOLS	FIELD MOUNTED	PRIMARY LOCATION ACCESSIBLE TO OPERATOR	AUXILIARY LOCATION ACCESSIBLE TO OPERATOR	NORMALLY INACCESSIBLE OR BEHIND THE PANEL
DISCRETE INSTRUMENTS				
SHARED DISPLAY, SHARED CONTROL				
COMPUTER FUNCTION				
PROGRAMMABLE LOGIC CONTROL				

J-4 FUNCTION BLOCK DESIGNATORS

SUMMING

DIFFERENCE

INTEGRAL

DERIVATIVE

MULTIPLYING

DIVIDING

CONVERT:

ROOT EXTRACTION

SQUARE ROOT

EXPONENTIAL

HIGH SELECTING

LOW SELECTING

BIAS

NONLINEAR OR UNSPECIFIED FUNCTION

E - VOLTAGE

I - CURRENT

P - PNEUMATIC

A - ANALOG

B - BINARY

H - HYDRAULIC

O - ELECTROMAGNETIC, SONIC

R - RESISTANCE (ELECT)

D - DIGITAL

J-6 HANDSWITCH DESIGNATORS

HOA HAND-OFF-AUTO

HOR HAND-OFF-REMOTE

F-R FORWARD-REVERSE

1-O ON-OFF

LR LOCAL-REMOTE

OC OPEN-CLOSE

OCA OPEN-CLOSE-AUTO

INSTRUMENT SERVICES

AS> INSTRUMENT AIR SUPPLY (NOTE 4)

> 120 VAC ELECTRICAL SERVICE (DIFFERENT VOLTAGES ARE SPECIFICALLY NOTED)

PLC INPUT/OUTPUT

DISCRETE INPUT

DISCRETE OUTPUT

ANALOG INPUT

ANALOG OUTPUT

FLOW PRIMARY ELEMENTS	
	ORIFICE PLATE
	SINGLE PORT PITOT TUBE OR PITOT-VENTURI TUBE
	VENTURI TUBE
	AVERAGING PITOT TUBE
	FLUME
	WEIR
	TURBINE OR PROPELLER-TYPE PRIMARY ELEMENT
	ROTAMETER
	ROTAMETER WITH INTEGRAL VALVE
	THERMAL MASS FLOWMETER
	POSITIVE DISPLACEMENT TYPE FLOW TOTALIZING INDICATOR
	VORTEX SENSOR
	TARGET TYPE SENSOR
	FLOW NOZZLE
	MAGNETIC FLOWMETER
	SONIC FLOWMETER

LINES	
	MAIN PROCESS
	SECONDARY PROCESS
	DOUBLE CONTAINED PIPE
	REFERENCES TO OTHER SHEET
	LINE CONTINUATION DRAWING REFERENCE
	PIPE SYSTEM
	PIPE SIZE IN INCHES
	PNEUMATIC
	ELECTRICAL SIGNAL ANALOG
	ELECTRICAL SIGNAL DISCRETE
	HYDRAULIC
	CAPILLARY TUBE
	SOFTWARE OR DATA LINK
	ELECTROMAGNETIC OR SONIC (GUIDED)
	MECHANICAL OR CONNECTED
	ELECTRICAL CONNECTED
	NOT CONNECTED
	NOT CONNECTED

VALVES	
	GATE VALVE
	GLOBE VALVE
	PLUG VALVE
	CHECK VALVE
	PINCH VALVE
	DIAPHRAGM VALVE
	BUTTERFLY VALVE
	BALL VALVE
	NEEDLE VALVE
	PLUG (COCK)
	PRESSURE REDUCING REGULATING VALVE, SELF-CONTAINED
	BACK PRESSURE REGULATING VALVE, SELF-CONTAINED
	PRESSURE REDUCING REGULATOR WITH EXTERNAL PRESSURE TAP
	3-WAY VALVE
	4-WAY VALVE
	ANGLE VALVE
	PRESSURE RELIEF VALVE
	* FC = FAIL CLOSED LC = LOCKED CLOSED
	FO = FAIL OPEN LO = LOCKED OPEN
	CLOSED DURING NORMAL OPERATION
	SHADING INDICATES PORT TO BE CLOSED DURING NORMAL OPERATION. DOT INDICATES PORT TO BE CLOSED DURING ALTERNATE OPERATION.

VALVE OPERATORS	
	DIAPHRAGM
	DIAPHRAGM PRESSURE BALANCED
	HAND
	MOTOR
	CYLINDER OPERATOR
	SOLENOID
	SOLENOID VALVE

TYPICAL CONNECTION	
	DIRECT CONNECTION TO PROCESS
	TEMPERATURE ELEMENT WITH WELL
	IN-LINE DEVICE
	RADIATION OR SONIC SENSING
	FILLED SYSTEM, DIAPHRAGM SEAL CONNECTION

EQUIPMENT	
	PUMP
	SUBMERSIBLE PUMP
	BLOWER
	CHEMICAL PUMP
	INJECTOR
	DOUBLE DIAPHRAGM AIR DRIVEN PUMP
	MIXER
	TURBINE PUMP
	PERISTALTIC PUMP

MISCELLANEOUS	
	FLANGE
	UNION
	Y STRAINER
	FLOW STRAIGHTENING VANE
	TEE
	SCREWED CAP
	WELDED CAP
	BLIND FLANGE
	REDUCER
	HOSE BIBB CONNECTION
	DIAPHRAGM SEAL
	RUPTURE DISK, PRESSURE
	RUPTURE DISK, VACUUM
	PURGE
	DRAIN
	THERMOMETER WELL
	TORQUE SWITCH
	INTERLOCK. NUMBER IS THE CROSS REFERENCE TO A SPECIFIC ELEMENTARY DIAGRAM OR TO A SPECIFIC CONTROL STRATEGY DESCRIBED IN THE SPECS
	EXPANSION JOINT
	FLEXIBLE COUPLING
	SLUICE GATE OR SLIDE GATE
	* AV - AIR VALVE
	F - FILTER
	T - TRAP
	FH - FIRE HYDRANT
	WATER

NOTES

- THIS IS A GENERALIZED LEGEND SHEET. THIS CONTRACT MAY NOT USE ALL INFORMATION SHOWN.
- INSTRUMENTS MARKED WITH AN ASTERISK ARE FURNISHED WITH THE EQUIPMENT.
- INFORMATION SHOWN MAY NOT BE ALL INCLUSIVE. SEE ALSO ISA S5.1, S5.3 AND S7.3.
- REFER TO ISA RP7.7 FOR INSTRUMENT AIR QUALITY STANDARDS.

linabá, Inc.
www.linaba.com

1812 Schofield Lane
Farmington, NM 87401
P.O. BOX 2606
Farmington, NM 87499

CLIENT:

NAVAJO TRIBAL UTILITY AUTHORITY
P.O. BOX 170
Ft. Defiance, AZ, 86504

PROJECT:

REFURBISHMENT & UPGRADE OF EXISTING LIFT STATION

35°54'12.32"N, 109°02'33.21"W
NAVAJO, NEW MEXICO, 87238

REVISIONS:

REV	DESCRIPTION	DATE	DFTR	CHKR

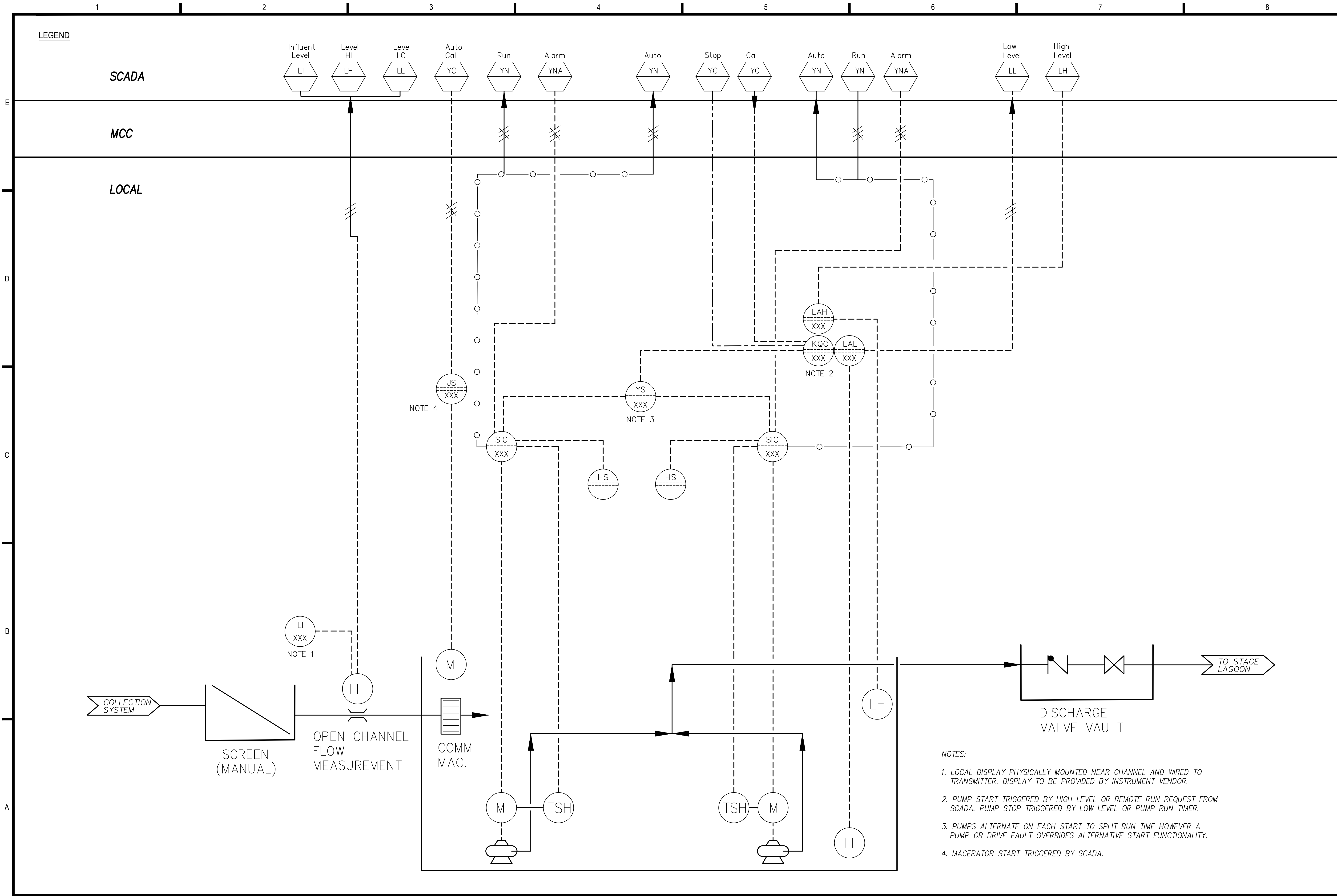
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ENGINEER: XXX
DRAWING SIZE: ANSI D
DRAWING SCALE: 1" = 5'

DRAWING TITLE:

INSTRUMENTATION AND CONTROL STANDARDS

DRAWING NUMBER:

D-01



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CLIENT:

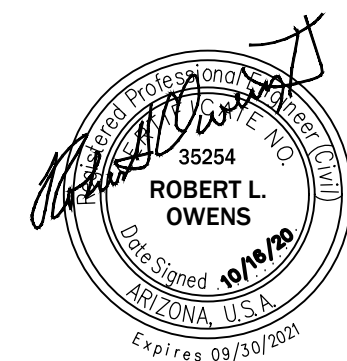
NAVAJO TRIBAL UTILITY
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ONLY VALID WITH ORIGINAL STAMP

REVISIONS:

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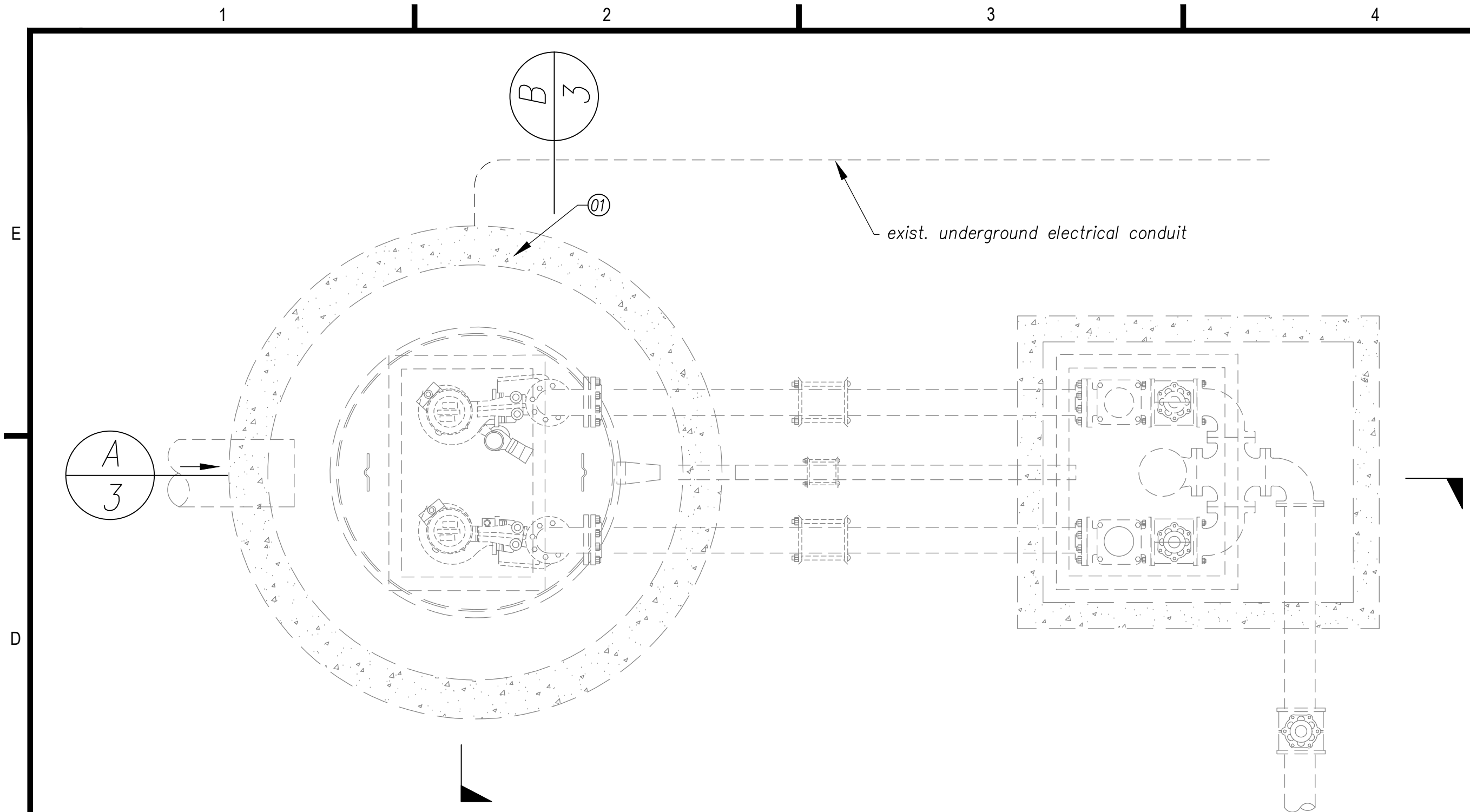
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ENGINEER: XXX
DRAWING SIZE: ANSI D
DRAWING SCALE: 1" = 5'

DRAWING TITLE:

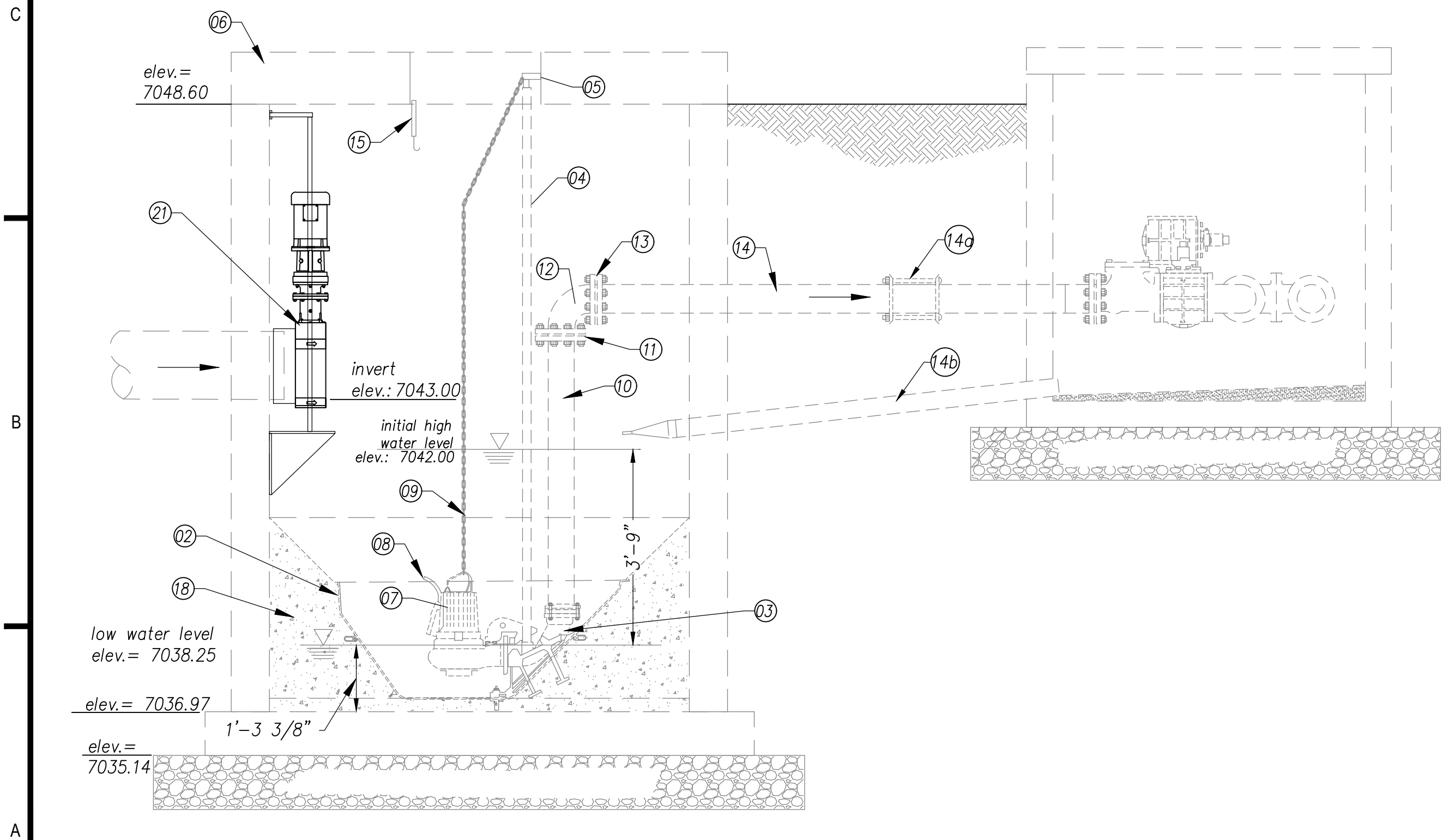
PROCESS AND INSTRUMENTATION
DIAGRAM

DRAWING NUMBER:

D-02



LIFT STATION / VALVE VAULT
N.T.S.



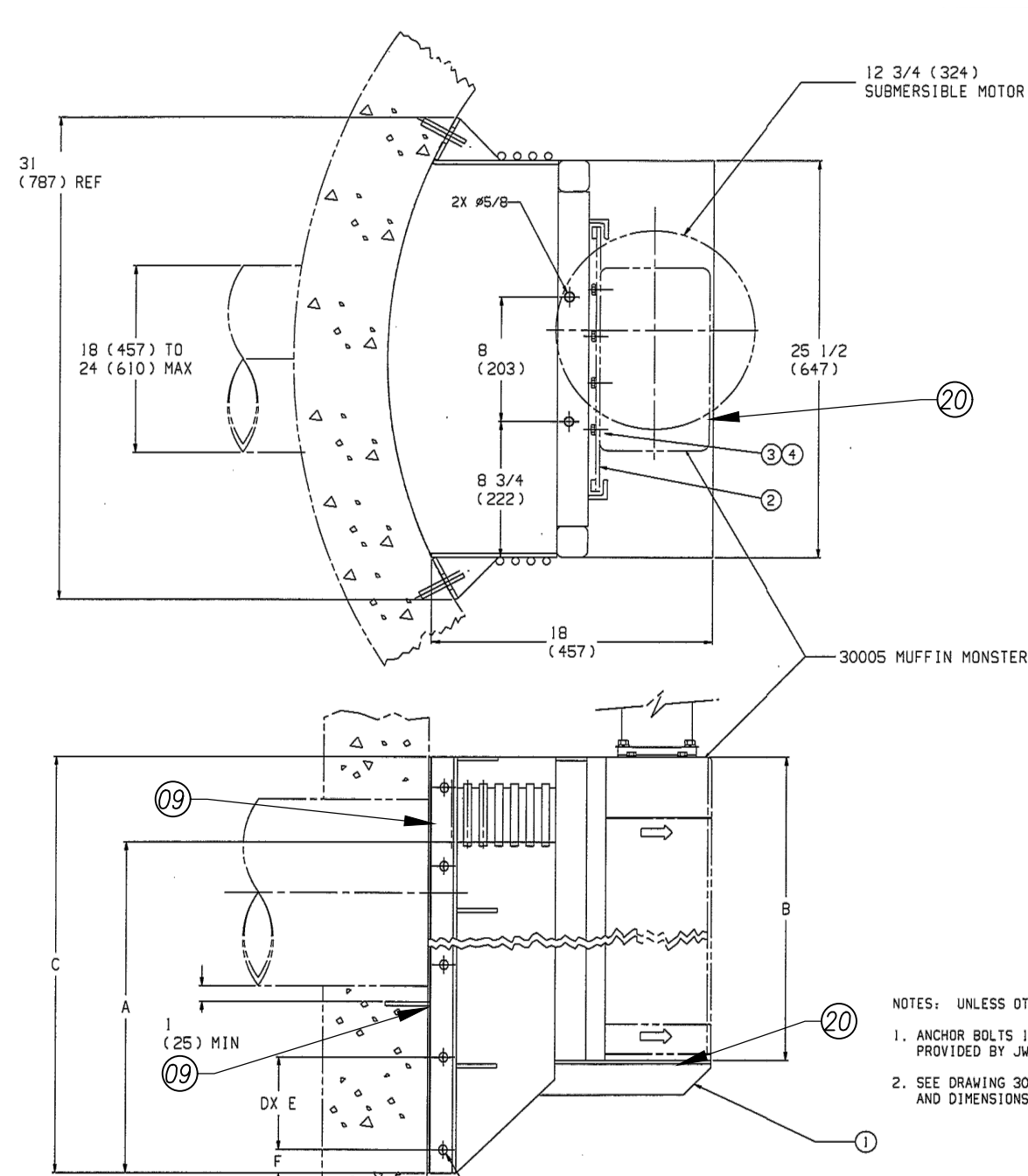
SECTION 'A'
N.T.S.

flygt NP3102.180 pump specifications:
365 gpm @ 21' tdh
full load amperage: 6.6 amps
5 hp, 460 v/ 3 phase / 60 hz

EXIST. LIFT STATION MATERIALS		
No.	Quantity	Description
01	1	8' i.d. concrete pre-cast manhole
02	1	flygt top 150 basin
03	2	flygt 4" top basin discharge elbow w/ anchoring kit
04	4	2" guide bar, cut to length at assembly
05	2	guide bar bracket, bolted to access hatch
06	1	8' I.D. concrete manhole cover w/ flygt fle-Baosh hatch cast in place
07	2	Pump, Flygt NP3102.80
08	2	power cable
09	2	lifting chain
10	2	4" d.i. pipe (approx. 5' each)
11	2	4" d.i. flange adaptor
12	2	6" x 4" d.i. flange 90° reducing elbow
13	2	6" d.i. field flange adaptor
14	2	6" d.i. pipe (approx 11' each)
14a	2	6" d.i. transition coupling
14b	2'-8"	3" pvc/dwv valve vault drain
15	1	cable holder
16	1	flygt mix flush valve w/hardware to connect to pump volute
17	1	duplex pump control panel
18	As Needed	concrete
19	1	submersible pressure transducer pipe
20	2	liquid level sensors (mechanical switch back-up)

NEW LIFT STATION MATERIALS		
No.	Quantity	Description
21	1	NEW COMMUNUTOR / MACERATOR
22	1	CUSTOM FRAME ASSEMBLY
23	1	CUSTOM GUIDE RAIL ASSEMBLY
24	1	CUSTOM LIFTING BAIL ASSEMBLY
25	1	FRAME WALL MOUNT
26	1	GUIDE PLATE
27	8	HHCS 3/8-16 X 3/4 SST
28	8	LOCK WASHERS SPIT 3/8 SST
29	1	PORTABLE HOIST - 1,500 LB LIMIT; SST
30	1	HOIST SOCKET; LINED

"ALL STAINLESS STEEL FOR STRUCTURAL ITEMS SHALL BE 316 TYPE"

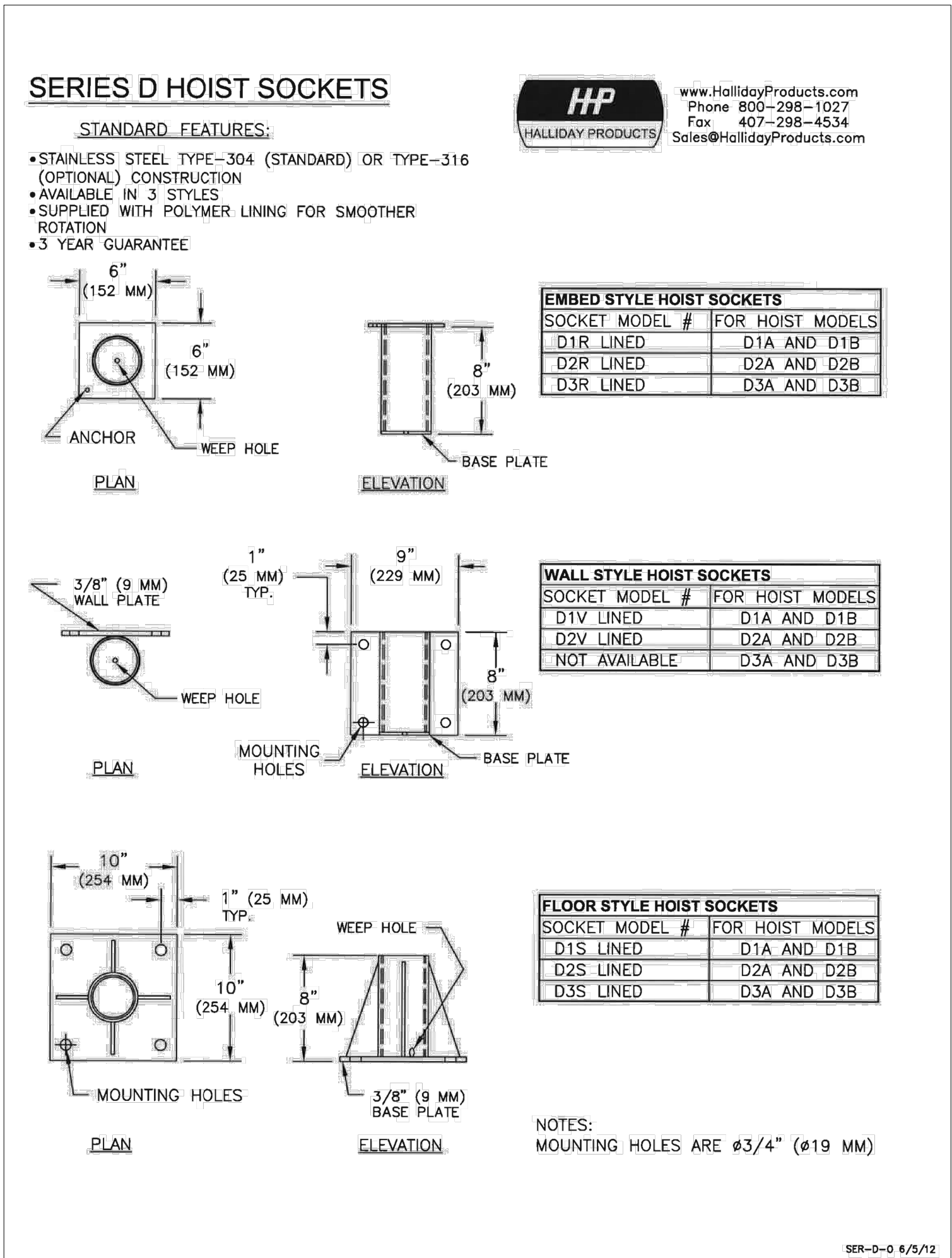
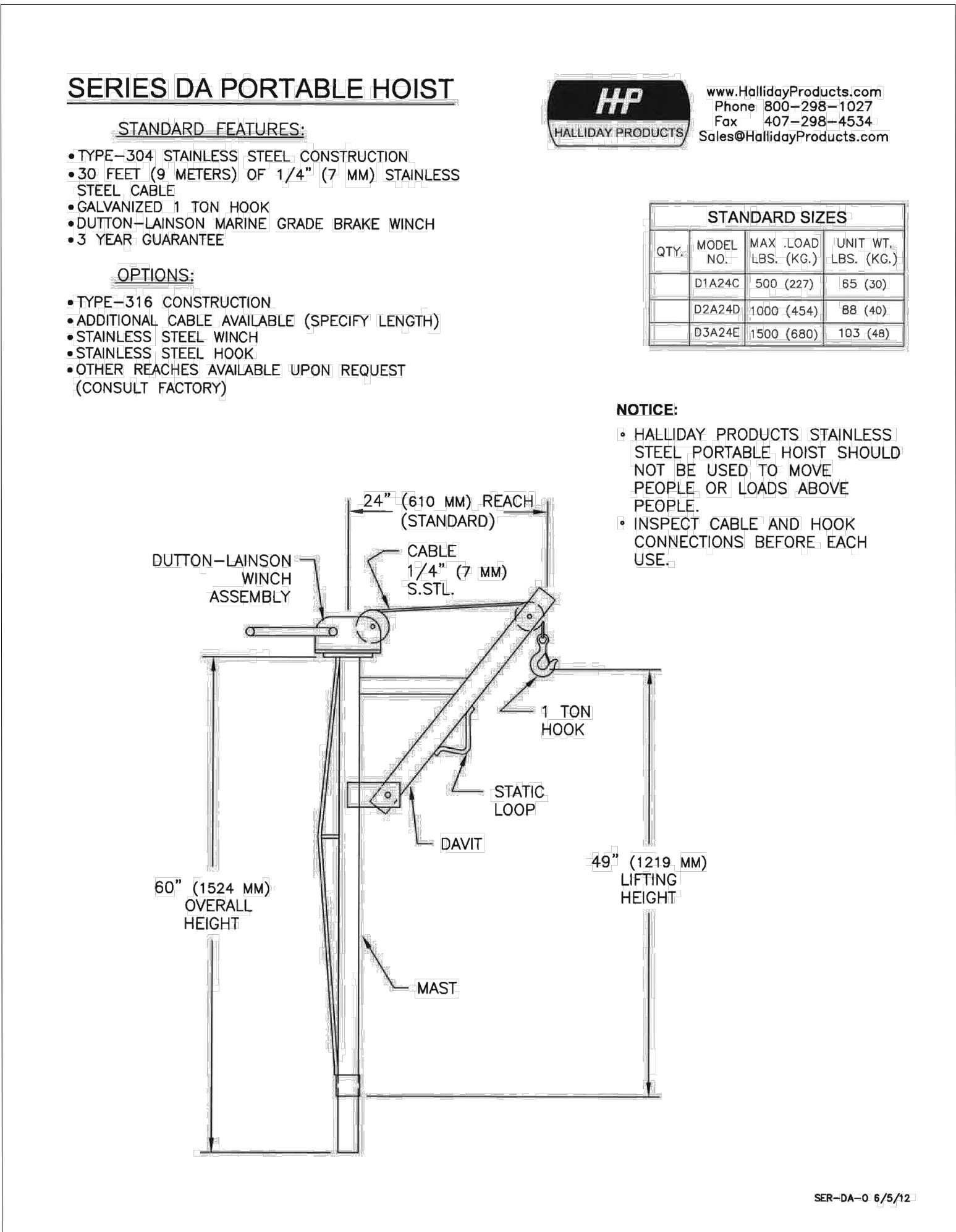
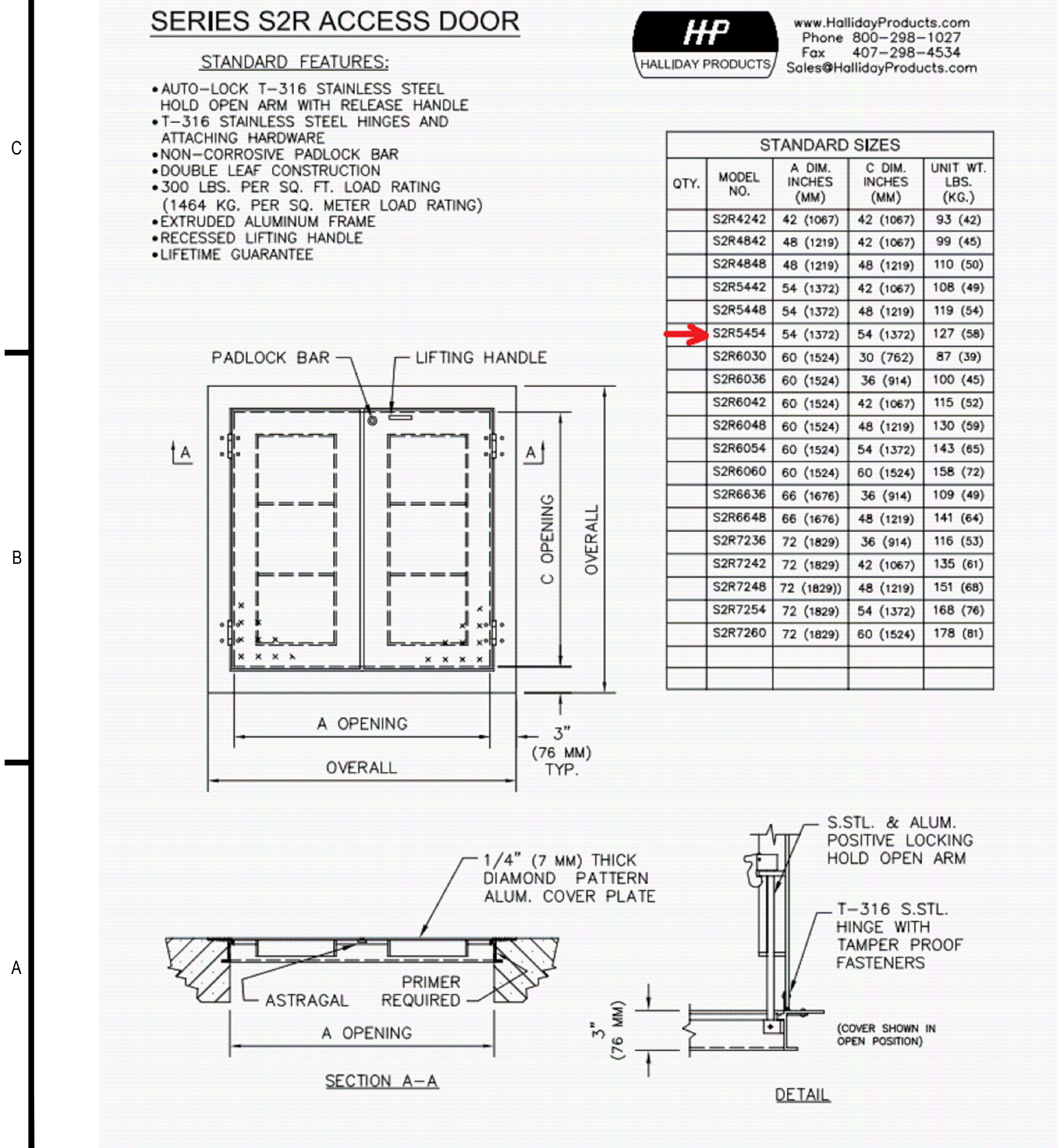
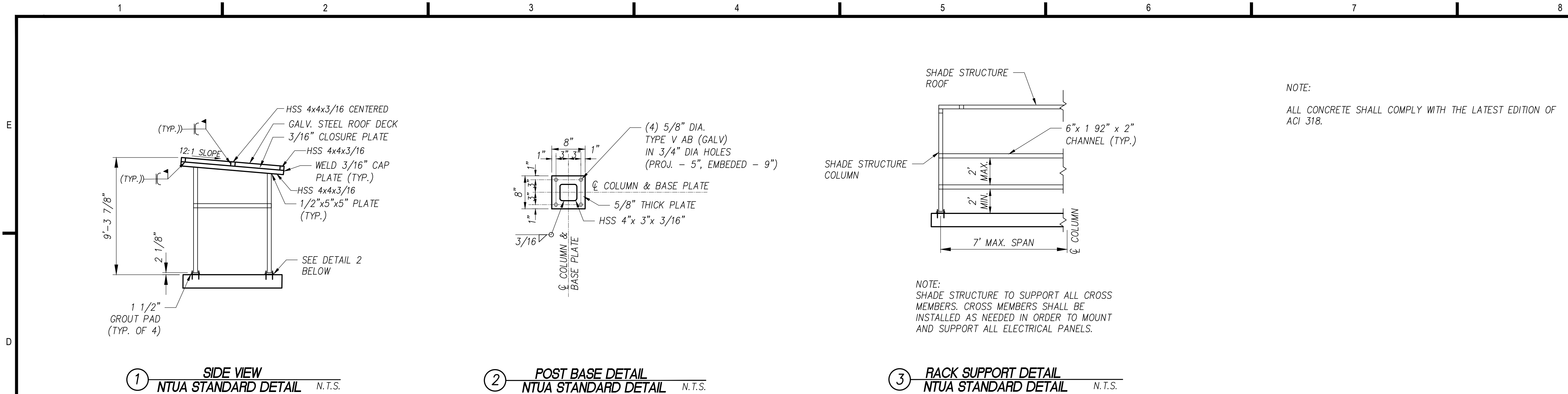


NOTES: UNLESS OTHERWISE SPECIFIED
1. ANCHOR BOLTS 1/2 (6) X 3 3/4 (96) MIN NOT PROVIDED BY JAC.
2. SEE DRAWING 3000S-CD FOR GRINDER DETAILS AND DIMENSIONS.

COMMINTOR MACERATOR DETAIL

Not to Scale

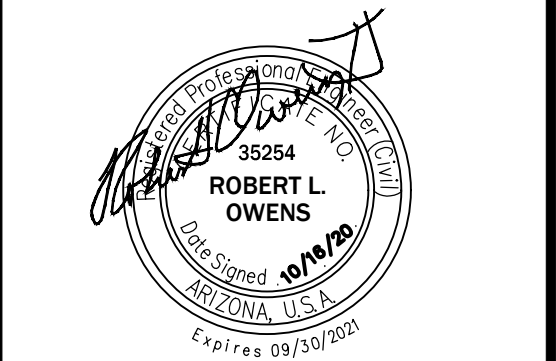
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REVISIONS			
DATE	NO.	DESCRIPTION	APPROVED
08-01-02	1	INITIAL RELEASE	3-2606 CO
09-01-04	2	C COLUMN C WAS 1270MM 15 400MM	09-01-04 3-2946 JAC



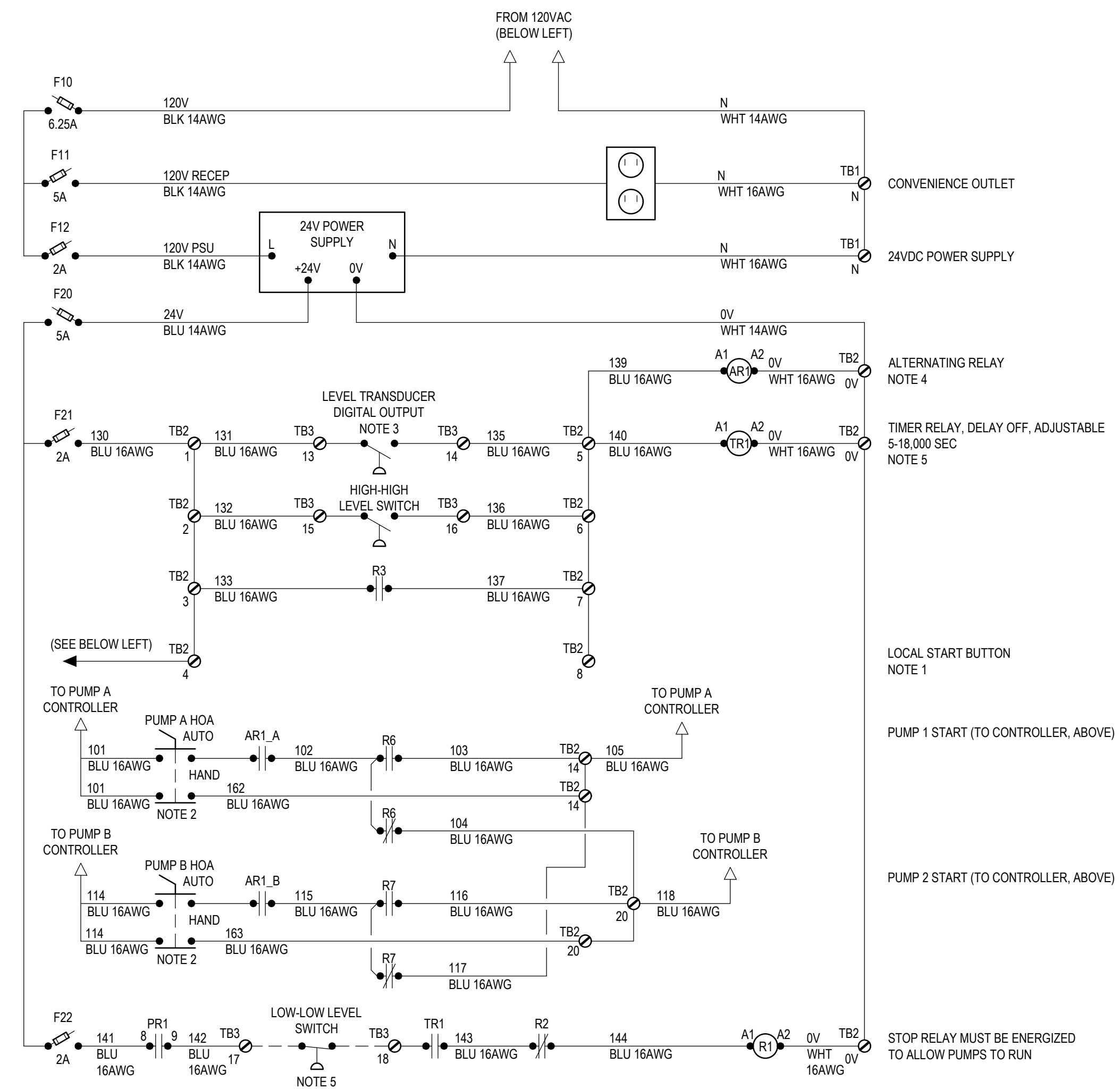
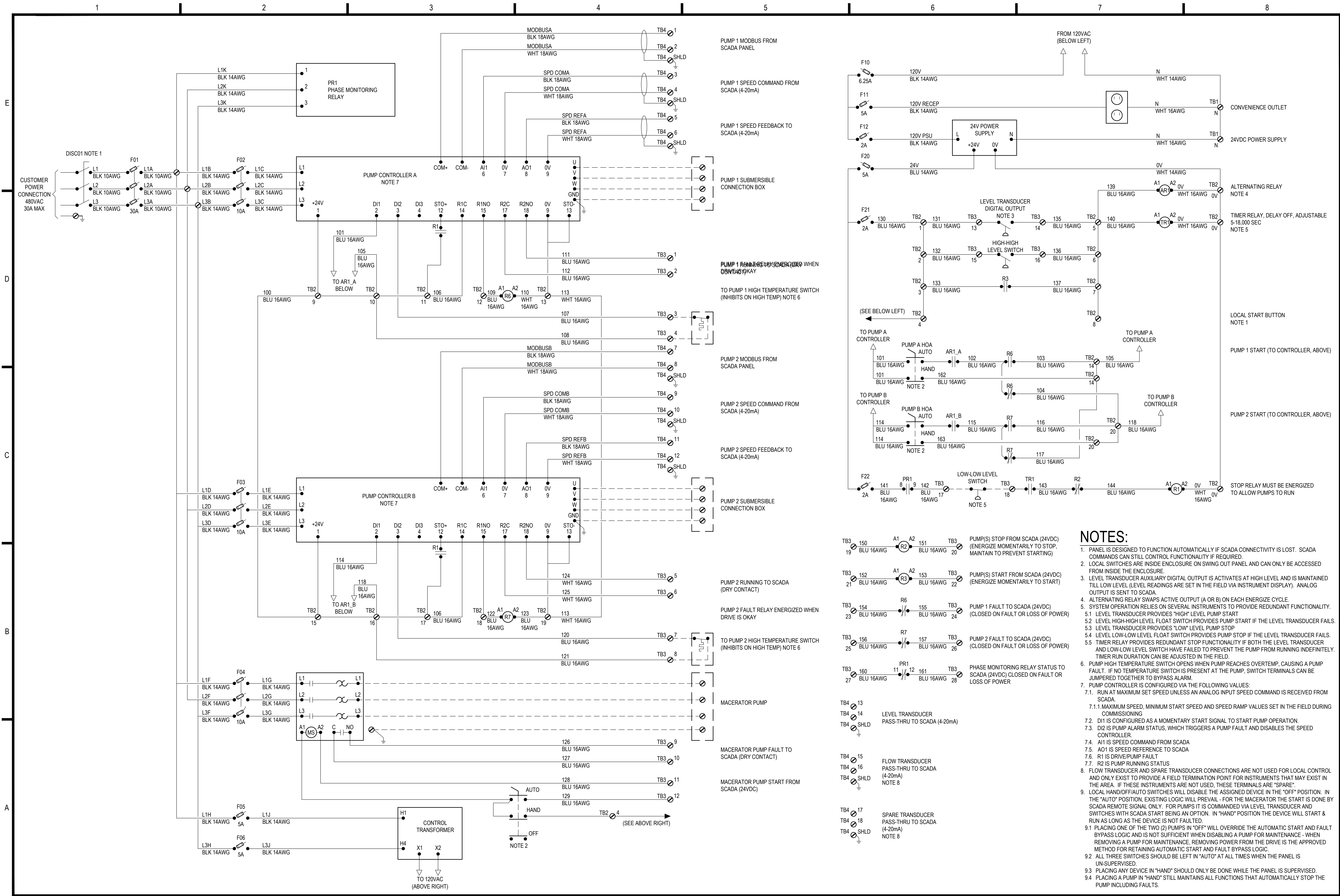
1812 Schofield Lane
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REVISIONS:				
REV	DESCRIPTION	DATE	DFTR	CHKR
PROJECT NUMBER: 20-059-02				
ENGINEER: XXX				
DRAWING SIZE: ANSI D				
DRAWING SCALE: 1" = 5'				
DRAWING TITLE:				
SPECIFICATIONS DETAILS				
DRAWING NUMBER:				
S-01				



- NOTES:**
- PANEL IS DESIGNED TO FUNCTION AUTOMATICALLY IF SCADA CONNECTIVITY IS LOST. SCADA COMMANDS CAN STILL CONTROL FUNCTIONALITY IF REQUIRED.
 - LOCAL SWITCHES ARE INSIDE ENCLOSURE ON SWING OUT PANEL AND CAN ONLY BE ACCESSED FROM INSIDE THE ENCLOSURE.
 - LEVEL TRANSDUCER AUXILIARY DIGITAL OUTPUT IS ACTIVATES AT HIGH LEVEL AND IS MAINTAINED TILL LOW LEVEL (LEVEL READINGS ARE SET IN THE FIELD VIA INSTRUMENT DISPLAY). ANALOG OUTPUT IS SENT TO SCADA.
 - ALTERNATING RELAY SWAPS ACTIVE OUTPUT (A OR B) ON EACH ENERGIZE CYCLE.
 - SYSTEM OPERATION RELIES ON SEVERAL INSTRUMENTS TO PROVIDE REDUNDANT FUNCTIONALITY.
 - 5.1 LEVEL TRANSDUCER PROVIDES "HIGH" LEVEL PUMP START
 - 5.2 LEVEL HIGH-HIGH LEVEL FLOAT SWITCH PROVIDES PUMP START IF THE LEVEL TRANSDUCER FAILS.
 - 5.3 LEVEL TRANSDUCER PROVIDES "LOW" LEVEL PUMP STOP
 - 5.4 LEVEL LOW-LOW LEVEL FLOAT SWITCH PROVIDES PUMP STOP IF THE LEVEL TRANSDUCER FAILS.
 - 5.5 TIMER RELAY PROVIDES REDUNDANT STOP FUNCTIONALITY IF BOTH THE LEVEL TRANSDUCER AND LOW-LOW LEVEL SWITCH HAVE FAILED TO PREVENT THE PUMP FROM RUNNING INDEFINITELY. TIMER RUN DURATION CAN BE ADJUSTED IN THE FIELD.
 - PUMP HIGH TEMPERATURE SWITCH OPENS WHEN PUMP REACHES OVERTEMP, CAUSING A PUMP FAULT. IF NO TEMPERATURE SWITCH IS PRESENT AT THE PUMP, SWITCH TERMINALS CAN BE JUMPED TOGETHER TO BYPASS ALARM.
 - PUMP CONTROLLER IS CONFIGURED VIA THE FOLLOWING VALUES:
 - 7.1. RUN AT MAXIMUM SET SPEED UNLESS AN ANALOG INPUT SPEED COMMAND IS RECEIVED FROM SCADA.
 - 7.1.1. MAXIMUM SPEED, MINIMUM START SPEED AND SPEED RAMP VALUES SET IN THE FIELD DURING COMMISSIONING.
 - 7.2. DI1 IS CONFIGURED AS A MOMENTARY START SIGNAL TO START PUMP OPERATION.
 - 7.3. DI2 IS PUMP ALARM STATUS, WHICH TRIGGERS A PUMP FAULT AND DISABLES THE SPEED CONTROLLER.
 - 7.4. AI1 IS SPEED COMMAND FROM SCADA
 - 7.5. AO1 IS SPEED REFERENCE TO SCADA
 - 7.6. R1 IS DRIVE/PUMP FAULT
 - 7.7. R2 IS PUMP RUNNING STATUS
 - FLOW TRANSDUCER AND SPARE TRANSDUCER CONNECTIONS ARE NOT USED FOR LOCAL CONTROL AND ONLY EXIST TO PROVIDE A FIELD TERMINATION POINT FOR INSTRUMENTS THAT MAY EXIST IN THE AREA. IF THESE INSTRUMENTS ARE NOT USED, THESE TERMINALS ARE "SPARE".
 - LOCAL HAND/OFF/AUTO SWITCHES WILL DISABLE THE ASSIGNED DEVICE IN THE "OFF" POSITION. IN THE "AUTO" POSITION, EXISTING LOGIC WILL PREVAIL. -FOR THE MACERATOR THE START IS DONE BY SCADA REMOTE SIGNAL ONLY. FOR PUMPS IT IS COMMANDED VIA LEVEL TRANSDUCER AND SWITCHES WITH SCADA START BEING AN OPTION. IN "HAND" POSITION THE DEVICE WILL START & RUN AS LONG AS THE DEVICE IS NOT FAULTED.
 - PLACING ONE OF THE TWO (2) PUMPS IN "OFF" WILL OVERRIDE THE AUTOMATIC START AND FAULT BYPASS LOGIC AND IS NOT SUFFICIENT WHEN DISABLING A PUMP FOR MAINTENANCE - WHEN REMOVING A PUMP FOR MAINTENANCE, REMOVING POWER FROM THE DRIVE IS THE APPROVED METHOD FOR RETAINING AUTOMATIC START AND FAULT BYPASS LOGIC.
 - ALL THREE SWITCHES SHOULD BE LEFT IN "AUTO" AT ALL TIMES WHEN THE PANEL IS UNSUPERVISED.
 - PLACING ANY DEVICE IN "HAND" SHOULD ONLY BE DONE WHILE THE PANEL IS SUPERVISED.
 - PLACING A PUMP IN "HAND" STILL MAINTAINS ALL FUNCTIONS THAT AUTOMATICALLY STOP THE PUMP INCLUDING FAULTS.



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FT. DEFIANC, AZ 86504

REFURBISHMENT & UPGRADE OF
EXISTING LIFT STATION

35°54'12.32"N, 109°02'33.21"W
NAVAJO, NEW MEXICO, 87238

PROJECT:

REVISIONS:

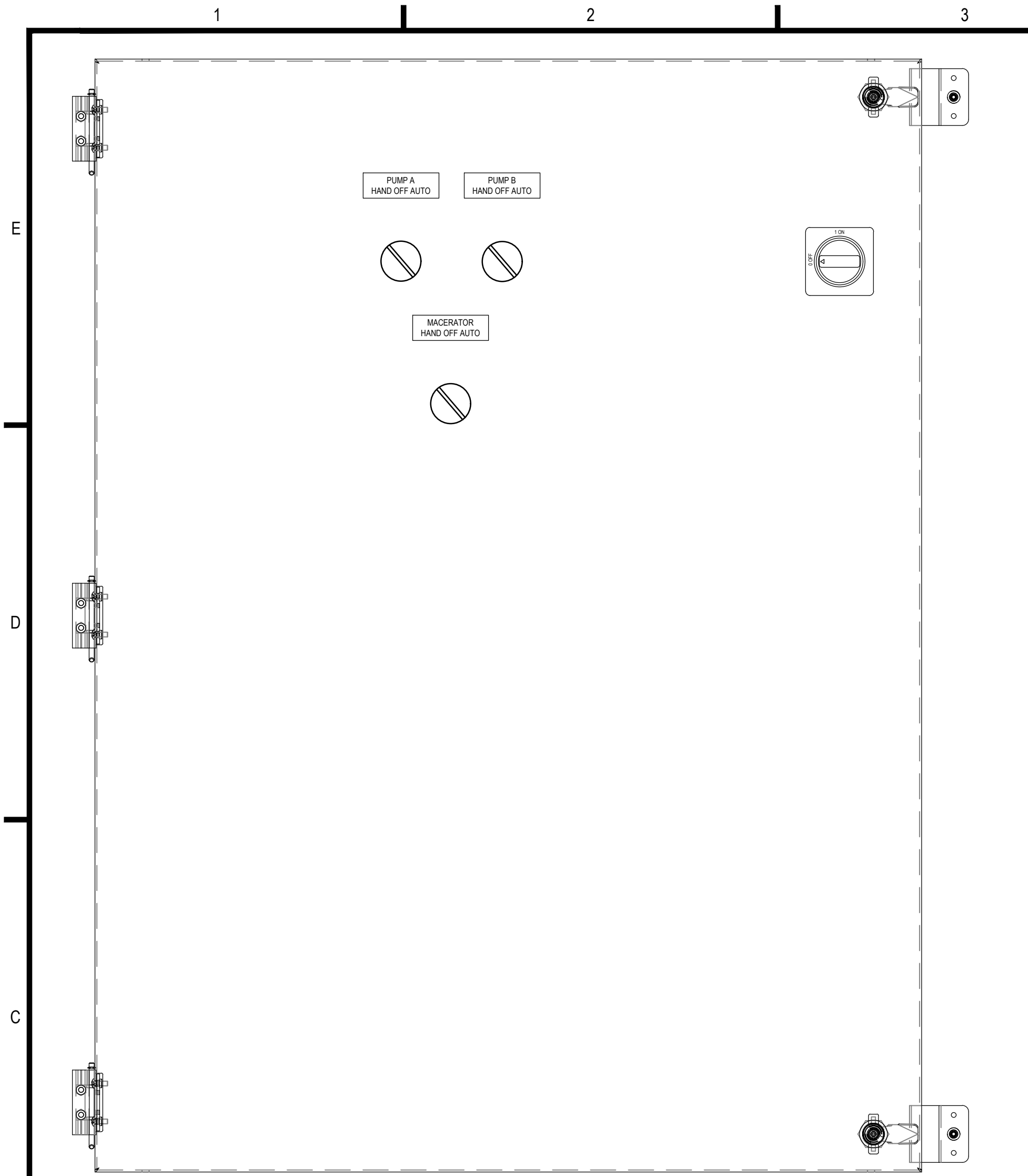
REV	DESCRIPTION	DATE	BY	CHK
0	100% SUBMISSION	2020-10-06	SBV	GMC
1	PROJECT NUMBER: 20244			
2	ENGINEER: GMC			
3	DRAWING SCALE: NTS			
4	DRAWING SIZE: ANSI D			

DRAWING TITLE:

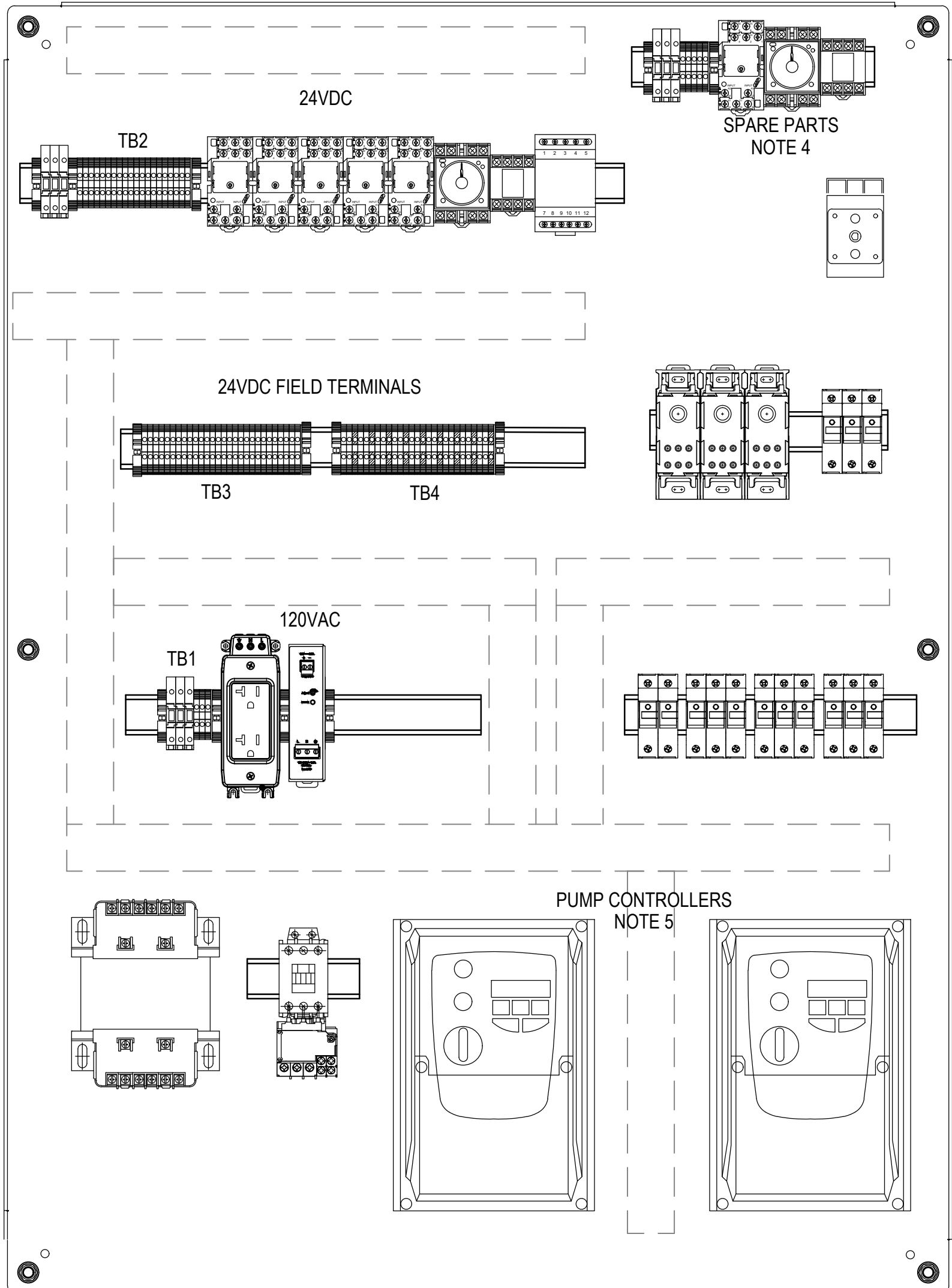
NAVAJO SITE PUMP PANEL 480V
ONE-LINE DIAGRAM

DRAWING NUMBER:

EI601

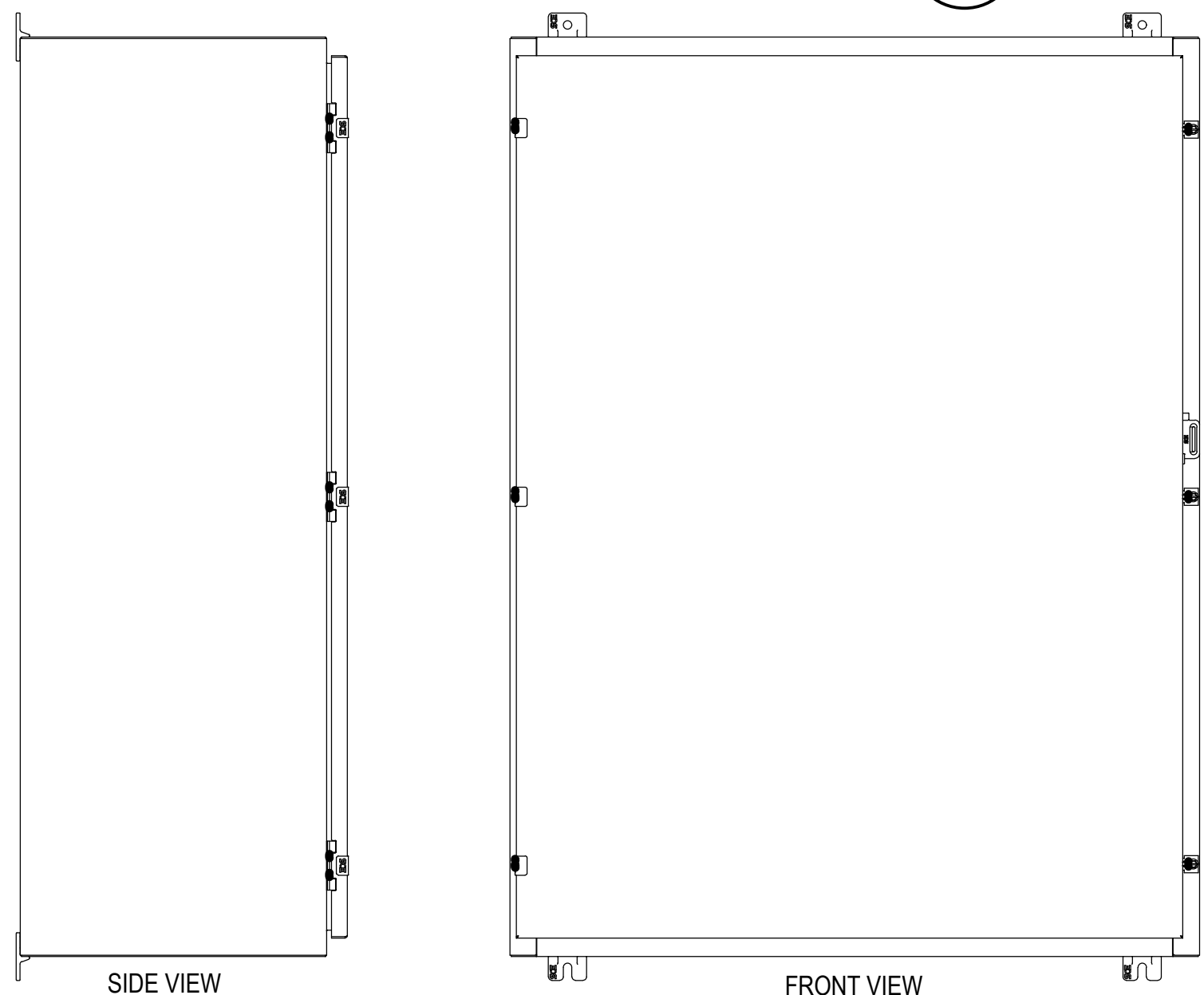


INTERIOR DEAD PANEL LAYOUT



INTERIOR SUB PANEL LAYOUT

1 PANEL LAYOUT
SCALE: 3" = 1'-0"



SIDE VIEW

FRONT VIEW

2 PANEL DOOR LAYOUT
SCALE: 1 1/2" = 1'-0"

NOTES:

- PANEL EXTERNAL LABELS, WARNINGS AND TAGGING TO BE DETERMINED FOR EACH SITE. ENCLOSURE MUST INDICATE POWER DISCONNECT IS MOUNTED INTERNALLY.
- PANEL EXTERIOR HAS CAPABILITY FOR EXTERNALLY MOUNTED PADLOCK TO SECURE THE EXTERIOR DOOR. NO CONTROLS ARE ACCESSIBLE ON THE OUTSIDE OF THE ENCLOSURE.
- WHEN OPENED, PANEL REVEALS AN INTERIOR DEAD PANEL, LEAVING ROUGHLY 2.5" BETWEEN THE INNER FACE OF THE DOOR AND THE DEAD PANEL. PANEL CANNOT BE OPENED UNLESS THE PANEL IS DE-ENERGIZED.
- SPARE PARTS LISTED ARE TO BE INCLUDED AND MOUNTED TO DINRAIL (EXCEPT FUSES) WHICH SHALL BE CLEARLY LABELED AS "SPARE FUSES" AND PROTECTED INSIDE A CLEAR WATERPROOF BAG. BAG MUST BE SECURED TO THE PANEL INTERIOR BEFORE SHIPPING.
- PANEL HAS BEEN DESIGNED TO ACCOMMODATE TWO (2) FIVE HORSEPOWER PUMP DRIVES. THESE DRIVES SHALL BE SPECIFIED AND PROVIDED BY THE PUMP SUPPLIER AND INSTALLED IN THIS PANEL.
- PANEL HAS BEEN DESIGNED TO POWER A FIVE HORSEPOWER MACERATOR VIA REMOTE COMMAND.

BILL OF MATERIALS

ITEM	QTY	MANUFACTURER	PART NO	DESCRIPTION
1	1	SAGINAW CONTROL	SCE-48H3616LP	48 X 36 X 16 NEMA 4 ENCLOSURE
2	1	SAGINAW CONTROL	SCE-48P36	45 X 33 SUB PANEL FOR 48 X 36 ENCLOSURE
3	1	SAGINAW CONTROL	SCE-DF48EL36LP	DEAD FRONT SWING-OUT INTERNAL PANEL 2.5" FROM DEAD PANEL TO DOOR
4	1	C3 CONTROLS	DDS2-330-DHMRY	DISCONNECT, 32A, 3 POLE NON-FUSED
5	4	EDISON	EHM3DU	3 POLE FUSE HOLDER, 30A MAX, MIDGET FUSES
6	2	EDISON	EHM1DU	1 POLE FUSE HOLDER, 30A MAX, MIDGET FUSES
7	3	EDISON	EPDB306	DISTRIBUTION BLOCK, FINGER SAFE
9	3	AUTOMATION DIRECT	KN-F10L24DC	6.3A FUSE BLOCK, 24VDC LED
10	3	AUTOMATION DIRECT	KN-F10L110AC	6.3A FUSE BLOCK, 120VAC LED
11	1	HAMMOND MFG	PH750MQMJ	480V TO 120V TRANSFORMER, 750VA
12	1	RHINO	PSB24-060S	24VDC POWER SUPPLY, 60W
13	2	(BY VENDOR) NOTE 5	(BY VENDOR) NOTE 5	5HP PUMP CONTROLLER, VFD, INCLUDING RELAY CARD AND MODBUS COMMUNICATION
14	1	FUJI ELECTRIC	SC-E03G-24VDC	IEC CONTACTOR, 24VDC COIL, 12A FRAME
15	1	FUJI ELECTRIC	TK26E-007	THERMAL OVERLOAD RELAY, ADJUSTABLE, 7-10.5A
16	1	AUTOMATION DIRECT	FA-REC2	DIN RAIL MOUNT RECEPTACLE
17	5	AUTOMATION DIRECT	783-3C-24D	ICE CUBE RELAY, 24VDC, 3PDT, 15A
18	5	AUTOMATION DIRECT	783-3C-SKT	RELAY BASE, 3PDT
19	1	FUJI ELECTRIC	MS4SM-CE-ADC	TIMER RELAY, 24VDC, DPDT, ADJUSTABLE
20	1	FUJI ELECTRIC	TP411X	TIMER RELAY BASE FOR MS4SM SERIES
21	1	LITTELFUSE	ALT024-S-SW	ALTERNATING RELAY, 24VDC, INCLUDES MANUAL OVERRIDE SWITCH
22	1	LITTELFUSE	OT08PC	RELAY SOCKET, 10A
23	3	FUJI ELECTRIC	AR30PR-311BZC	30MM SWITCH, 3POS, MAINTAINED, 1NO/1NC
24	69	AUTOMATION DIRECT	KN-T12GRY	TERMINAL BLOCK, GREY, SINGLE TIER, 0.20 WIDE
25	4	AUTOMATION DIRECT	KN-ECT6GRY-25	TERMINAL BLOCK BARRIER, GREY
26	11	AUTOMATION DIRECT	KN-EB4-10	TERMINAL BLOCK END BRACKET, GREY
27	9	AUTOMATION DIRECT	KN-G12SP-10	GROUND BLOCK, GREEN_YEL, SINGLE TIER
28	3			MIDGET FUSE, 30A
29	9			MIDGET FUSE, 10A
30	2			MIDGET FUSE, 5A
31	1			5 X 20MM FUSE, 6.25A
32	2			5 X 20MM FUSE, 5A
33	3			5 X 20MM FUSE, 2A
34	1	EATON	D65VMLS480C	PHASE MONITORING RELAY

SPARE PARTS

ITEM	QTY	MANUFACTURER	PART NO	DESCRIPTION
1	2	AUTOMATION DIRECT	KN-F10L24DC	6.3A FUSE BLOCK, 24VDC LED
2	1	AUTOMATION DIRECT	KN-F10L110AC	6.3A FUSE BLOCK, 120VAC LED
3	1	AUTOMATION DIRECT	783-3C-24D	ICE CUBE RELAY, 24VDC, 3PDT, 15A
4	1	AUTOMATION DIRECT	783-3C-SKT	RELAY BASE, 3PDT
5	1	FUJI ELECTRIC	MS4SM-CE-ADC	TIMER RELAY, 24VDC, DPDT, ADJUSTABLE
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8	1	LITTELFUSE	OT08PC	RELAY SOCKET, 10A
9	5	AUTOMATION DIRECT	KN-T12GRY	TERMINAL BLOCK, GREY, SINGLE TIER, 0.20 WIDE
10	1	AUTOMATION DIRECT	KN-ECT6GRY-25	TERMINAL BLOCK BARRIER, GREY
11	2	AUTOMATION DIRECT	KN-EB4-10	TERMINAL BLOCK END BRACKET, GREY
12	3			MIDGET FUSE, 30A
13	3			MIDGET FUSE, 10A
14	2			MIDGET FUSE, 5A
15	2			5 X 20MM FUSE, 6.25A
16	2			5 X 20MM FUSE, 5A
17	2			5 X 20MM FUSE, 2A



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3	DRAWING SCALE: NTS			
4	DRAWING SIZE: ANSI D			

DRAWING TITLE:

NAVAJO SITE PUMP PANEL 480V
FABRICATION DIAGRAM

DRAWING NUMBER:

EI701