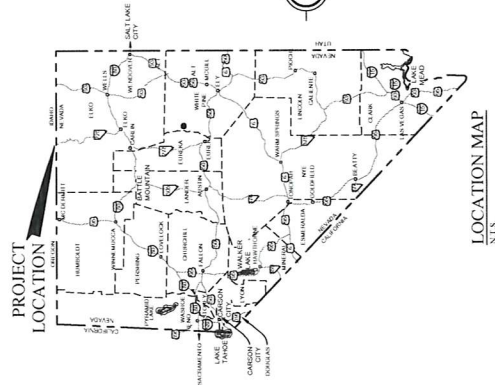


DRAWING ON 11"x17" IS HALF SCALE

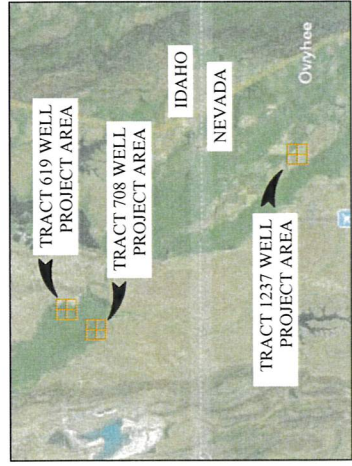
811
Know what's below.
Call before you dig.

VICINITY MAP

Professional Engineer Seal for Logan M. Jensen, State of Nevada, License No. 22266, Civil, Exp. 6/30/21.

10	DRAWING NUMBER	ELKO COUNTY	NEVADA
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Sheet Number	Drawing Number	Sheet List Table	Sheet Title
1	01		COVER SHEET
2	02		PROJECT NOTES
3	03		DV TRACT 1237 SQAAR WELL SYSTEM
4	04		DV TRACT 619 SQAAR WELL SYSTEM
5	05		DV TRACT 708 SQAAR WELL SYSTEM
6	06		WELL DESIGN AND DETAILS
7	07		LIVESTOCK TROUGH PLAN AND DETAILS

[illegible]

1. PROPOSED PIPE IS HIGH DENSITY POLYETHYLENE (HDPE PIPE, DIAMETER RATIO (D90) 11, MANUFACTURED FROM 4710 RESIN.
2. MINIMUM BEND RADIUS OF HDPE PIPE SHALL BE PER MANUFACTURER SPECIFICATIONS.
3. ANY JOINTS IN UNFINISHED PIPING OR APPURTENANCES MUST BE SEALED AT THE END OF EACH WORKING DAY.
4. IF THE PIPE SHALL BE LAYED TO THE UNDER AND GRAVELLY SOILS ON THE DRAWINGS AND NOTED THEREIN, THE PIPE SHALL BE LINED TO THE UNDER SOILS. THERE IS NO REQUIREMENT OF GRAVEL BEDDING UNLESS OTHERWISE NOTED ON THE DRAWINGS. THE PIPE SHALL NOT BE DEFORMED OR DAMPED ON THE UNDER SOILS. THE PIPE SHALL BE LAYED TO THE UNDER SOILS AND SHALL BE FREE OF LOOSE ROCKS AND STONES GREATER THAN ONE (1) INCH IN DIAMETER.

1. BEST MANAGEMENT PRACTICES SHALL BE IN PLACE FOR DUST CONTROL AND EROSION CONTROL DURING CONSTRUCTION (COIR LOGS, GRAVEL BARS, SILT FENCE).

2. THE CONTRACTOR SHALL IMPLEMENT ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO PREVENT EXCESSIVE WATER FROM ACCUMULATING ON THE PROJECT SITE. EXCESSIVE WATER SHALL BE DIVERTED FROM THE AREA OF EROSION. INFILTRATION OF RUNOFF OR SEDIMENTATION FENCING IS REQUIRED AT THE LIMITS OF GRAZING.

3. IF NECESSARY, CONTRACTOR SHALL ENHANCE EROSION CONTROL MEASURES IN THE FIELD.

4. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL:

- 5.1. CONDUCT A PRELIMINARY EROSION CONTROL ASSESSMENT.
- 5.2. INSTALL SEDIMENT CONTROL DEVICES, AND
- 5.3. INSTALL WASH DOWN AREA.

NON	BY	LMI	LMI	
INSTRUCTION	LMI	LMI		
INSTRUCTION	LMI	LMI		
DATE	APP			
08/12/20				
10/02/20				

JOE NO.: 4003-003	REVISION	DESCRIPTION	ISSUED FOR COM	ISSUED FOR COM	SCALE: AS SHOWN	DATE: AUGUST 2020	DESIGNED: LM	DRAWN: LM	CHECKED: --
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CONTRACTOR IS RESPONSIBLE FOR PROVIDING CONTROLLABLE FLOWING DUST FROM THE PRODUCTS INSTALLED HERE TO BECOME AIRBORNE ON A 7-TWENTYSEVEN, 24-HOUR-A-YEAR BASIS FROM COMMENCEMENT OF THE PROJECT TO FINAL COMPLETION.

STOCKPILED MATERIALS SHALL BE STABILIZED BY MAINTAINING A VISIBLE CRUST BY APPLYING AQUEOUS MOISTURE OR COVERING THE MATERIALS WITH A TARP TO PREVENT VISIBLE DUSTING.

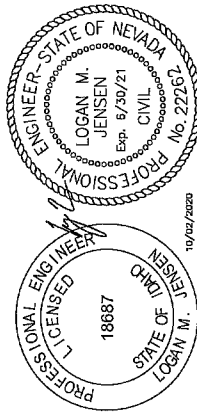
ALL TRUCKS MOVING OR EXCAVATING ROCK OR OTHER BULK MATERIALS SHALL PROTECT SURFACES OR LOSS OF BULK MATERIAL FROM PILES OR OTHER PREPARATION FLOOR, SIDES, AND/OR TAILGATE. ALL BULK TRUCKS MUST BE COVERED WITH A TARP OR OTHER SUITABLE COVERINGS OR BULK MATERIALS MUST CONTAIN ENOUGH MOISTURE AND/OR DUST SUPPRESSANT TO PREVENT VISIBLE DUSTING DURING TRAVEL OR LOAD. ALL TRUCKS MUST HAVE THE FOLLOWING INFORMATION POSTED ON THE REAR OF THE TRUCK:

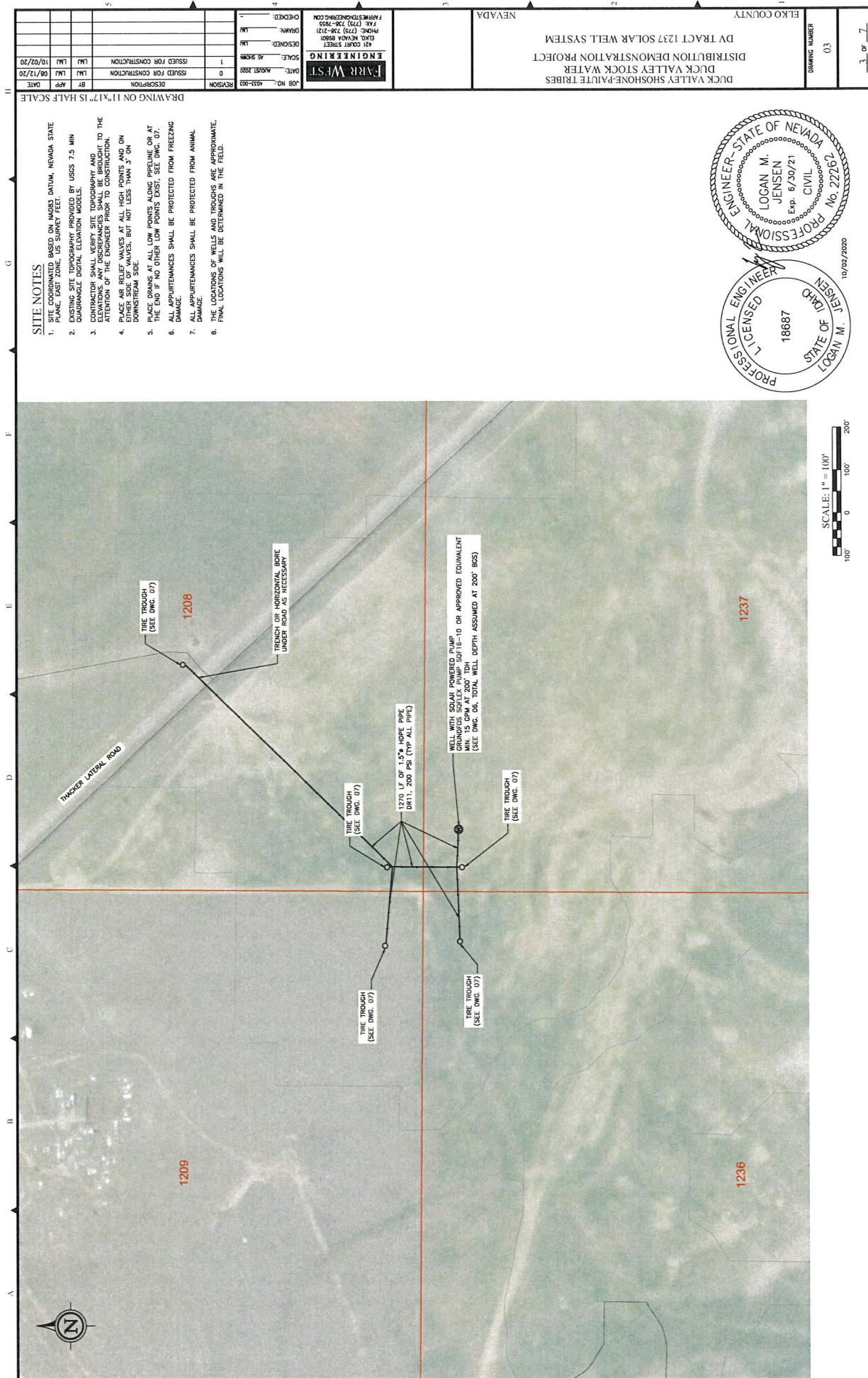
1. SITE COORDINATED BASED ON MADS DATA, NEWADA STATE PLAIN, EAST ZONE, US SURVEY FEET.
2. EXISTING SITE TOPOGRAPHY PROVIDED BY USGS 7.5 MIN QUADRANGLE DIGITAL ELEVATION MODEL.
3. CONTRACTOR SHALL VERIFY SITE TOPOGRAPHY AND ELEVATIONS FOR DISCREPANCIES SHALL BE IDENTIFIED AND CORRECTED PRIOR TO CONSTRUCTION.
4. PLACES HIGHER BELIEF VALVES AT ALL HIGH POINTS AND ON EITHER SIDE OF VALVES, BUT NOT LESS THAN 3' ON DOWNSTREAM SIDE.
5. PLACES DRAINS AT ALL LOW POINTS ALONG PRELINE OR AT THE END IF NO OTHER LOW POINTS EXIST.
6. ALL APURTANCES SHALL BE PROTECTED FROM FREEZING DAMAGE.
7. ALL APURTANCES SHALL BE PROTECTED FROM ANIMAL DAMAGE.
8. THE DEPTHS OF WELLS AND TECHNIQS ARE APPROXIMATE. FINAL LOCATIONS WILL BE DETERMINED IN THE FIELD.

1. VALVES AND/OR FITTERS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS WITH NO LEAKAGE AT THE MAXIMUM OPERATING PRESSURE. ALL SEALING MATERIALS OR BUCKETS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
2. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTION TO PROTECT THE FACTORY APPLIED FINISHES FROM DAMAGE. IF DAMAGE TO THE FINISHES IS OBSERVED, THE CONTRACTOR SHALL HANDLE AND/OR REPAIR. ALL NECESSARY REPAIRS TO COATINGS SHALL BE MADE.
3. VALVES, FITTERS, AND APPURTENANCES THAT HAVE BEEN INSTALLED SHALL BE CLEANED, LUBRICATED, AND SERVICED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE CONTRACTOR SHALL MAINTAIN THE PROPER PRESSURE, FLOW RATE, AND FLOW DIRECTION OF THE FLUID BEING PUMPED, PRESSURED, AND FLOW PRIOR TO USE.

1. TO THE EXTENT THAT THEY ARE NEEDED, ALL SURFACE MATERIALS REMOVED FROM THE SPECTERED EXCAVATIONS SHALL BE USED TO RECONSTRUCT THE EXCAVATION. THE CONTRACTOR SHALL NOT WASTE OR UNNECESSARILY DISPOSE OF SURFACE EXCAVATED MATERIALS.
2. ALL SURFACES EXCAVATED MATERIALS WILL BE OBSERVED AT WATER AND SHALL BE OBSERVED AT THE LOCATIONS SHOWN ON PLANS. EXCAVATED MATERIALS SHALL BE PROTECTED TO PREVENT EROSION AND THE PRODUCTION OF SEDIMENT. PROTECTIVE MEASURES MAY INCLUDE BUT ARE NOT LIMITED TO IMPERMEABLE SEEDING, MULCHING, SEDIMENT BASINS, AND SILT FENCES.
3. THE REMOVED DIMENSIONS AND THE SLOPES OF ALL STRUCTURE AND TRENCH EXCAVATIONS SHALL BE AS SHOWN ON THE PLANS.

1. ALL FILL MATERIALS SHALL BE OBTAINED FROM REPUTED QUARRIES AND DESIGNATED GORGEWAY AREAS. THE SELECTION, MINERALOGICAL ANALYSIS, TESTING, AND DISPOSITION OF MATERIALS IN THE VARIOUS FILLS SHALL BE SUBJECT TO APPROVAL BY ENGINEER.
2. FILL MATERIALS SHALL CONTAIN NO SOD, SHELLS, ROOTS, FROZEN SOIL, OR OTHER UNDESIRABLE MATERIALS. STONES LARGER THAN THREE TIMES THE THICKNESS OF THE UNCOMPACTED LAYER THICKNESS SHALL BE REMOVED FROM THE MATERIALS PRIOR TO COMPACTATION OF THE FILL.
3. NO FILL SHALL BE PLACED UPON A FROZEN SURFACE NOR SHALL SNOW, ICE OR FROZEN MATERIAL BE INCORPORATED IN THE FILL.

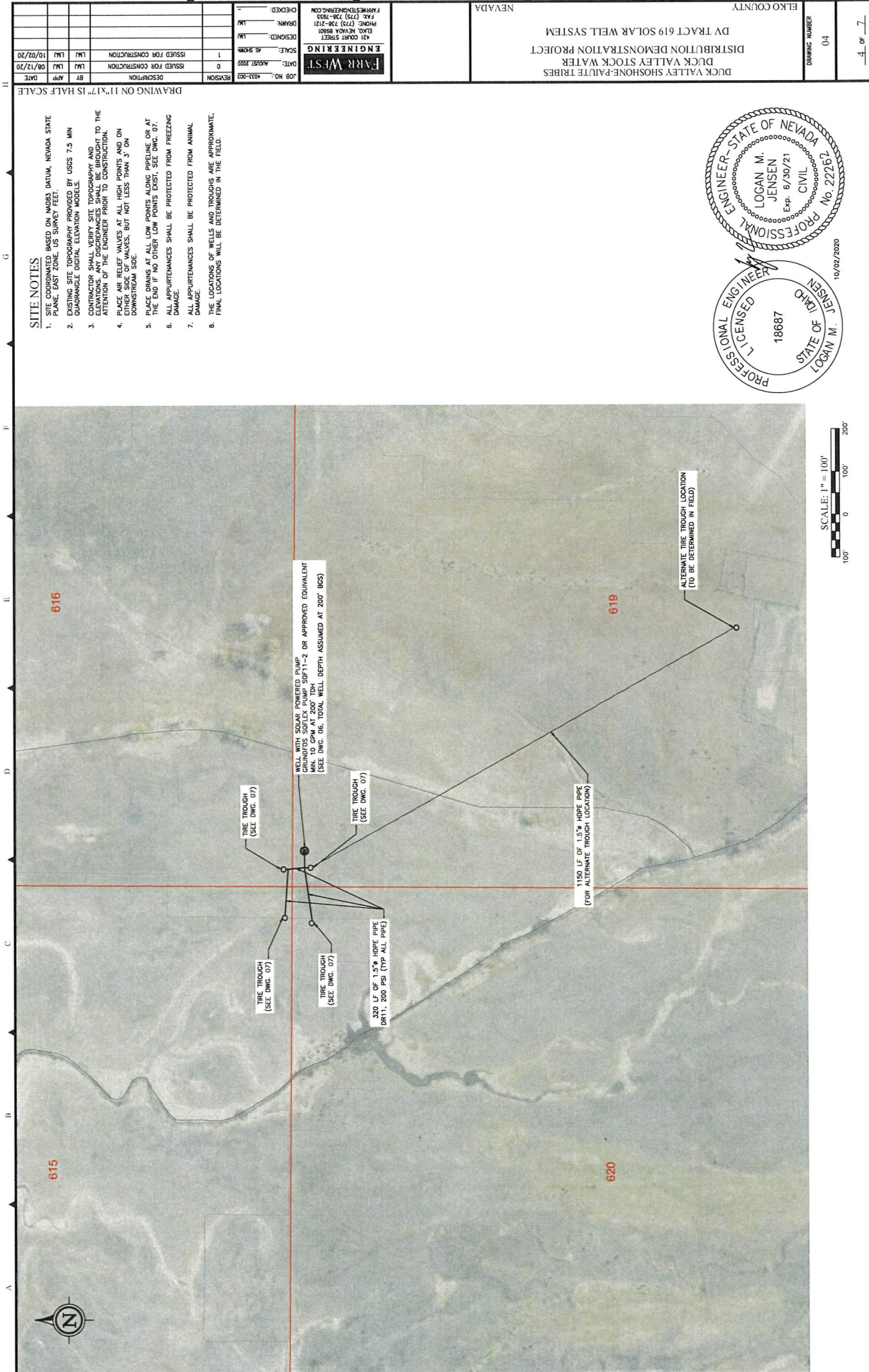




SITE NOTES

1. SITE COORDINATED BASED ON NAD83 DATUM, NEVADA STATE PLANE, EAST ZONE, US SURVEY FEET.
2. EXISTING SITE TOPOGRAPHY PROVIDED BY USGS 7.5 MIN QUADRANGLE DIGITAL ELEVATION MODELS.
3. CONTRACTOR SHALL VERIFY SITE TOPOGRAPHY AND ELEVATIONS PRIOR TO CONSTRUCTION. ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION.
4. PLACE AIR RELIEF VALVES AT ALL HIGH POINTS AND ON EITHER SIDE OF VALVES, BUT NOT LESS THAN 3' ON DOWNSTREAM SIDE.
5. PLACE BRAMS AT ALL LOW POINTS ALONG PIPELINE OR AT THE END IF NO OTHER LOW POINTS EXIST. SEE DWG. 07.
6. ALL APPURTENANCES SHALL BE PROTECTED FROM ANIMAL DAMAGE.
7. THE LOCATIONS OF WELLS AND TRENCHES ARE APPROXIMATE. FINAL LOCATIONS WILL BE DETERMINED IN THE FIELD.

DRAWING NUMBER		03	
ELKO COUNTY		NEVADA	
DUCK VALLEY HOSHONAPAI TRIBES		DISTRIBUTION DEMONSTRATION PROJECT	
DUCK VALLEY STOCK WATER		DV TRACT 1237 SOLAR WELL SYSTEM	
FAIR WEST ENGINEERING		421 COURT STREET ELKO, NEVADA 89601 PHONE: (775) 726-1211 FAX: (775) 726-1955 WWW.FAIRWESTENGINEERING.COM	
DATE: AUGUST 2020		DESIGNED: LM	
SCALE: AS SHOWN		DRAWN: LM	
0		ISSUED FOR CONSTRUCTION	
1		ISSUED FOR CONSTRUCTION	
06/12/20		LM LM	
10/02/20		LM LM	



SITE NOTES

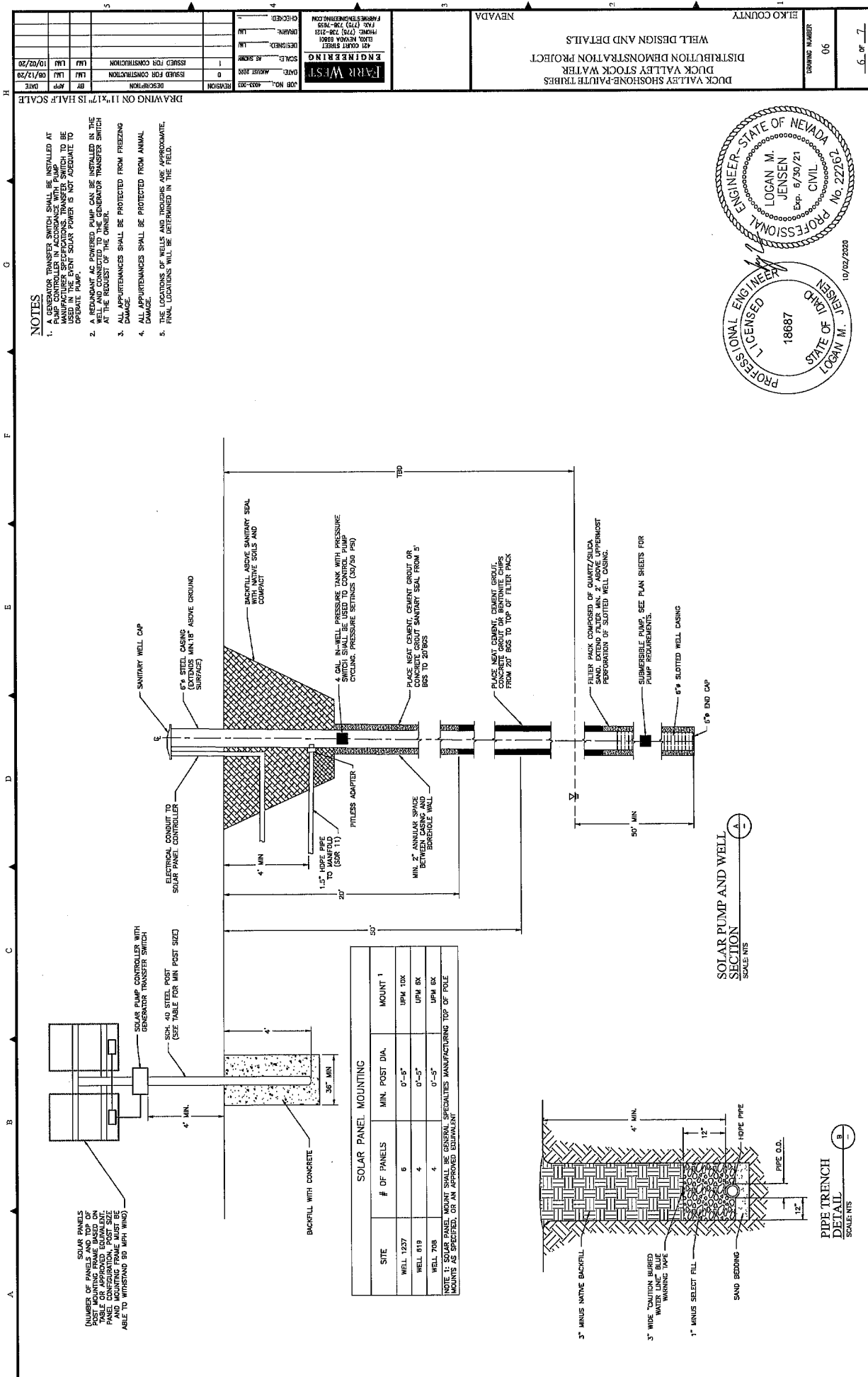
1. SITE COORDINATED BASED ON MDS3 DATUM, NEVADA STATE PLANE, EAST ZONE, US SURVEY FEET.
2. EXISTING SITE TOPOGRAPHY PROVIDED BY USGS 7.5 MIN QUANTILE DATA, 1984, 100' X 100' GRID.
3. EXISTING AND PROPOSED TIRE TROUGH LOCATIONS AND LOCATIONS OF THE ENGINEER SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO CONSTRUCTION.
4. PLACE AIR RELIEF VALVES AT ALL HIGH POINTS AND ON EITHER SIDE OF VALVES, BUT NOT LESS THAN 3' ON DOWNHILL SIDE.
5. IF THERE ARE ANY LOW POINTS ALONG PIPELINE OR AT THE END OF NO OTHER LOW POINTS EXIST, SEE DWG. 07.
6. ALL APPURTENANCES SHALL BE PROTECTED FROM FREEZING DAMAGE.
7. ALL APPURTENANCES SHALL BE PROTECTED FROM ANIMAL DAMAGE.
8. THE LOCATIONS OF WELLS AND TROUGH ARE APPROXIMATE. FINAL LOCATIONS WILL BE DETERMINED IN THE FIELD.

DRAWING ON 11"x17" IS HALF SCALE		REVISION		DATE	
1	ISSUED FOR CONSTRUCTION	LM	LM	10/02/20	
2	ISSUED FOR CONSTRUCTION	LM	LM	08/12/20	
3		LM	LM		
4		LM	LM		
5		LM	LM		
6		LM	LM		
7		LM	LM		
8		LM	LM		
9		LM	LM		
10		LM	LM		

JOB NO. 4433-003		DATE: AUGUST 2020	
DESIGNED: 421 COURT STREET		SCALE: AS SHOWN	
DRAWN: 1000 W. 10TH STREET		CHECKED: 1000 W. 10TH STREET	
PROJECT: 619 SOLAR WELL SYSTEM		SHEET: 04	
CLIENT: FARMER/TECHNICAL CORP.		PROJECT: 619 SOLAR WELL SYSTEM	
LOCATION: NEVADA		PROJECT: 619 SOLAR WELL SYSTEM	

DUCK VALLEY SHOSHONE-PAIUTE TRIBES		BY TRACT 619 SOLAR WELL SYSTEM	
DISTRIBUTION DEMONSTRATION PROJECT		ELKO COUNTY	
DRAWING NUMBER		04	
10/02/2020		10/02/2020	

PROFESSIONAL ENGINEER - STATE OF NEVADA		LOGAN M. JENSEN	
18687		Exp. 6/30/21	
CIVIL		No. 222962	



NOTES

1. A GENERATOR TRANSFER SWITCH SHALL BE INSTALLED AT THE PUMP CONTROLLER. THE PUMP CONTROLLER SHALL BE USED IN THE EVENT SOLAR POWER IS NOT ADEQUATE TO OPERATE PUMP.
2. A REDUNDANT AC POWERED PUMP CAN BE INSTALLED IN THE FIELD. THE PUMP CONTROLLER SHALL BE USED IN THE EVENT SOLAR POWER IS NOT ADEQUATE TO OPERATE PUMP.
3. ALL APPURTENANCES SHALL BE PROTECTED FROM FREEZING DAMAGE.
4. ALL APPURTENANCES SHALL BE PROTECTED FROM ANNUAL DAMAGE.
5. THE LOCATIONS OF WELLS AND TROUGHS ARE APPROXIMATE. FINAL LOCATIONS WILL BE DETERMINED IN THE FIELD.

FAIR WEST ENGINEERING
 5511 W. 20th St.
 Las Vegas, NV 89110
 (702) 736-2121
 FAX: (702) 736-2121
 WWW.FAIRWESTENGINEERING.COM

NEVADA

10/02/2020

PROJECT: DUCK VALLEY SHOSHONE-PAIUTE TRIBES
 DISTRIBUTION DEMONSTRATION PROJECT

WELL DESIGN AND DETAILS

DATE: 10/02/2020

REVISIONS:

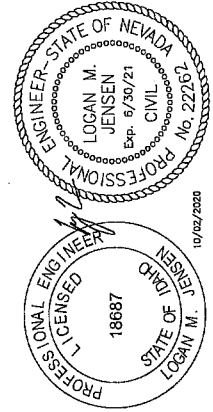
NO.	DATE	DESCRIPTION
1	10/02/2020	ISSUED FOR CONSTRUCTION
2	10/02/2020	ISSUED FOR CONSTRUCTION

DESIGNED BY: LAM
CHECKED BY: LAM
SCALE: AS SHOWN
DATE: 10/02/2020

PROJECT NUMBER: 06

SOLAR PUMP AND WELL SECTION
SCALE: NTS

PIPE TRENCH DETAIL
SCALE: NTS







Cautions: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at <https://sam.nrel.gov>) that allow for more precise and complex modeling of PV systems.

The expected range is based on 30 years of actual weather data at the given location and is intended to provide an indication of the variation you might see. For more information, please refer to this NREL report: The Error Report.

Disclaimer: The PVWatts® Model ("Model") is provided by the National Renewable Energy Laboratory ("NREL"), which is operated by the Alliance for Sustainable Energy, LLC ("Alliance") for the U.S. Department Of Energy ("DOE") and may be used for any purpose whatsoever.

The names DOE/NREL/ALLIANCE shall not be used in any representation, advertising, publicity or other manner whatsoever to endorse or promote any entity that adopts or uses the Model. DOE/NREL/ALLIANCE shall not provide

any support, consulting, training or assistance of any kind with regard to the use of the Model or any updates, revisions or new versions of the Model.

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The energy output range is based on analysis of 30 years of historical weather data for nearby , and is intended to provide an indication of the possible interannual variability in generation for a Fixed (open rack) PV system at this location.

RESULTS

2,929 kWh/Year*

System output may range from 2,825 to 3,044 kWh per year near this location.

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)	Value (\$)
January	2.52	131	15
February	3.23	152	18
March	4.97	252	30
April	5.78	276	33
May	6.57	317	37
June	7.45	331	39
July	7.50	334	40
August	7.51	339	40
September	6.28	284	34
October	4.76	234	28
November	3.05	149	18
December	2.54	130	15
Annual	5.18	2,929	\$ 347

Location and Station Identification

Requested Location	Owyhee Nevada
Weather Data Source	Lat, Lon: 41.93, -116.1 0.6 mi
Latitude	41.93° N
Longitude	116.1° W

PV System Specifications (Residential)

DC System Size	2 kW
Module Type	Standard
Array Type	Fixed (open rack)
Array Tilt	20°
Array Azimuth	180°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2

Economics

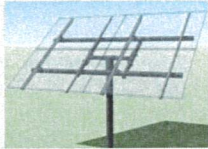
Average Retail Electricity Rate	0.118 \$/kWh
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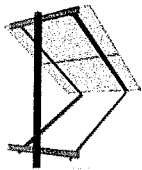
Performance Metrics

Capacity Factor	16.7%
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PV Panel Mount Capacity Chart

When placing an order, specify the mount model and panel size (example: UPM10X "A"). Note the quantity and type of panels you will be using and provide a spec sheet. Mounting post to be supplied by customer and all sizes refer to "A53 Schedule" pipe. To upgrade to a larger sized post than the standard size listed, please inquire. All panels are in **LANDSCAPE** orientation.

 Top of Pole Mount	<u>Panel Size "A"</u>	<u>Panel Size "B"</u>	<u>Panel Size "C"</u>	<u>Panel Size "D"</u>
	up to 160 watts or Dimensions 26.5" X 59.5" 10.94 Sq.Ft. MAX	165-205 watts or Dimensions 32.5" X 62.5" 14.10 Sq.Ft. MAX	210 - 295 watts or Dimensions 39.5" X 65.5" 17.96 Sq.Ft. MAX	300+ watts (72 cell) or Dimensions 39.2" X 77.1" 20.98 Sq.Ft. MAX
UPM 2X for 3" post SCH 80 only	3 modules 2 rails, 1 column	2 modules 2 rails, 1 column	2 modules 2 rails, 1 column	1 module 2 rails, 1 column
UPM 3X for 4" post SCH 40 or 80	3 modules 2 rails, 1 column	2 modules 2 rails, 1 column	2 modules 2 rails, 1 column	1 module 2 rails, 1 column
UPM 4X for 4" post SCH 40 or 80	4 modules 2 rails, 1 column	3 modules 2 rails, 1 column	N/A	2 modules 2 rails, 1 column
UPM 6X for 5" post SCH 40 or 80	6 modules 4 rails, 2 columns	4 modules 4 rails, 2 columns	4 modules 4 rails, 2 columns	N/A
UPM 6X Custom for 5" post SCH 40 or 80	N/A	N/A	3 modules 2 rails, 1 column	3 modules 2 rails, 1 column
UPM 8X for 6" post SCH 40 or 80	8 modules 4 rails, 2 columns	6 modules 4 rails, 2 columns	N/A	N/A
UPM 10X for 6" post SCH 40 or 80	10 modules 4 rails, 2 columns	8 modules 4 rails, 2 columns	6 modules 4 rails, 2 columns	4 modules 4 rails, 2 columns
UPM 10X HD for 6" post SCH 40 or 80, can upgrade to 8" post on request	12 modules 4 rails, 2 columns	10 modules 4 rails, 2 columns	8 modules 4 rails, 2 columns	6 modules 4 rails, 2 columns
UPM 12X HD 9 panels 8" post SCH 40 or 80, 10 panels 8" SCH 80 <u>only</u> . Can upgrade to 10" SCH 40 or 80 on request	Special Order Only	Special Order Only	9-10 modules 6 rails 3 columns of 3 or 3 columns of 3,4,3	N/A
UPM 12XHD Custom for 8" post SCH 80 <u>only</u> , can upgrade to 10" SCH 40 or 80 on request	Special Order Only	Special Order Only	Special Order Only	8 modules 4 rails 2 columns of 4
UPM 15X for 8" post SCH 80 <u>only</u> , can upgrade to 10" SCH 40 or 80 on request	Special Order Only	Special Order Only	12 modules 6 rails, 3 columns of 4	10 modules 6 rails, 3 columns of 3,4,3
UPM 18X for 8" post SCH 80 <u>only</u> , can upgrade to 10" SCH 40 or 80 on request	Special Order Only	Special Order Only	15 modules 6 rails, 3 columns of 5	12 modules 6 rails, 3 columns of 4
UPM 18XHD for 8" post SCH 80 <u>only</u> , can upgrade to 10" SCH 40 or 80 on request	N/A	N/A	N/A	12 modules 6 rails, 3 columns of 4

 Side of Pole Mount	Panel Size "A" up to 160 watts or Dimensions 26.5" X 59.5" 10.94 Sq.Ft. MAX	Panel Size "B" 165-205 watts or Dimensions 32.5" X 62.5" 14.10 Sq.Ft. MAX	Panel Size "C" 210 - 295 watts or Dimensions 39.5" X 65.5" 17.96 Sq.Ft. MAX	Panel Size "D" 300+ watts (72 cell) or Dimensions 39.2" X 77.1" 20.98 Sq.Ft. MAX
SOP-K for 3" post SCH 40 or 80, can upgrade to a 4" post on request	1 module	1 module	NA	NA
SOP-X for 3" post SCH 40 or 80, can upgrade to a 4" post on request	NA	NA	1 module	1 module
SOP-S for 3" post SCH 40 or 80, can upgrade to a 4" post on request	2 modules	NA	NA	NA
SOP-Y for 4" post SCH 40 or 80 or upgrade to larger on request	NA	2 modules	2 modules	2 modules
 Roof/Ground Mount	Panel Size "A" up to 160 watts or Dimensions 26.5" X 59.5" 10.94 Sq.Ft. MAX	Panel Size "B" 165-205 watts or Dimensions 32.5" X 62.5" 14.10 Sq.Ft. MAX	Panel Size "C" 210 - 295 watts or Dimensions 39.5" X 65.5" 17.96 Sq.Ft. MAX	Panel Size "D" 300+ watts (72 cell) or Dimensions 39.2" X 77.1" 20.98 Sq.Ft. MAX
Z-Brackets 4 feet no rails or braces	1 Module	1 Module	1 Module	1 Module
RV Rails 4 feet & rails no braces	2 Modules	2 Modules	2 Modules	2 Modules
S-Rail Single 4 feet, 2 rails, 2 braces	1 Module	1 Module	1 Module	1 Module
S-Rail 4 feet, 2 rails, 2 braces	2 Modules	2 Modules	2 Modules	2 Modules

New modules come on the market all the time with different wattage, mounting hole spacing and frame dimensions. This chart gives an approximate guideline of how many modules fit on our mounts. If you find that you have a panel that has wattage specified in one size category, and dimensions that fit in a different size category, go with the mount that fits the **dimensions** of the panel.

To calculate square footage, multiply frame width by frame height (in inches) and divide that by 144. This will equal your panel square footage. NOTE: millimeters divided by 25.4 = inches.

All mounting poles for post mounts are to be supplied by customer - note size required. Post mounts are built to go on "A53 Schedule" pipe. This is the most common type of pipe and is readily available in most steel yards. The **Outside Diameter** of the pipe is larger than the SCH size indicates. The OD is the critical measurement for our sockets to fit correctly on the mounting post.

3" schedule pipe = 3 1/2" OD 4" schedule pipe = 4 1/2" OD 5" schedule pipe = 5 9/16" OD
6" schedule pipe = 6 5/8" OD 8" schedule pipe = 8 5/8" OD 10" schedule pipe = 10 3/4" OD

Revised 10/18

**Duck Valley Shoshone – Pauite Tribes
Duck Valley Stock Water Project
Solar Distribution Demonstration Project**

TECHNICAL SPECIFICATIONS

August 2020

PREPARED BY:



421 Court Street
Elko Nevada 89801
(775) 738-2121

SPECIFICATIONS
TABLE OF CONTENTS

SECTION	SPECIFICATION TITLE
01340	Shop Drawings, Product Data, and Samples
01400	Quality Control
01500	Construction Facilities and Temporary Controls
01630	Product Options and Substitutions
01631	Request for Substitution
01700	Contract Closeout
01710	Cleaning
02200	Earthwork
02220	Water Well
02624	HDPE Pressure Pipe
11306	Submersible Pump
13300	Watering Facility
15060	Pipe and Pipe Fittings
15100	Valves, Cocks, and Hydrants

SECTION 01340
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submission of all shop Drawings and product data as required by the Contract Documents for all equipment and materials to be furnished under this contract unless specifically indicated otherwise

1.2 RELATED SECTIONS

- A. Section 01400—Quality Control
- B. Section 01630—Product Options and Substitutions
- C. Section 01700—Contract Closeout
- D. Sections for Divisions 1 through 16—Required Submittals

1.3 SUBMITTALS

- A. Shop Drawings—Drawings shall be presented in a clear and thorough manner:
 - 1. Identify details by reference to sheet and detail shown on Contract Drawings
 - 2. Identify equipment by reference to equipment name and tag number shown on Contract Drawings
 - 3. Scale and Measurements: Make drawings accurate to a scale with sufficient detail to show the kind, size, arrangement and function of component materials and devices
 - 4. Minimum sheet size: 8-1/2 inch by 11 inch
 - 5. Fabrication drawing size: 11 inch by 17 inch
- B. Product Data—Preparation:
 - 1. Clearly mark each copy to identify pertinent products or models submitted for review
 - 2. Identify equipment by reference to equipment name and tag number
 - 3. Catalog cut sheets: Cross-out or delete irrelevant data
 - 4. Show performance characteristics and capacities
 - 5. Show dimensions and clearances required for installation and maintenance
 - 6. Show wiring or piping diagrams and controls
 - 7. Show external connections, anchorages, and supports required
- C. "Certificate of Compliance":

1. Provided by manufacturer or supplier in lieu of submittal data required
 2. Certifies that product data or item identified in certificate is in total compliance with Contract Document requirements
 3. Specifically identifies project name and that there is no deviation from Contract Documents
 4. Identify equipment by reference to equipment name and tag number
 5. Identify limits of equipment, materials or work provided
 6. Provide for specific product data or item only as indicated herein
- D. Samples—Office samples shall be of sufficient size and quantity to clearly illustrate:
1. Functional characteristics of the product, with integrally related parts and attachment devices
 2. Full range of color, texture and pattern
 3. Comply with requirements identified in individual specification sections
- E. Manufacturer's standard schematic drawings and diagrams:
1. Modify drawings and diagrams to delete information which is not applicable to the Work by crossing out or omitting irrelevant data
 2. Supplement standard information to provide information specifically applicable to the Work

1.4 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings and product data prior to submission for accuracy and completeness of each submission
- B. Approve and stamp each submission before submitting it
- C. Determine and verify:
1. Field measurements
 2. Field construction criteria
 3. Catalog numbers and similar data
 4. Conformance with specifications
- D. Prior to each submission, carefully review and coordinate all aspects of each item being submitted
- E. Verify that each item and the submittal for it conform in all respects with specified requirements of the Work and of the Contract Documents with respect to means, methods, techniques, sequences, and operations of construction, and safety precautions and programs incidental thereto
- F. Make submissions promptly in accordance with Construction Schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor

- G. Notify Engineer in writing, at time of submission, of any deviations in the submittals from Contract Document requirements:
 - 1. Identify and tabulate all deviations in transmittal letter
 - 2. Indicate essential details of all changes proposed, including modifications to other facilities that may be a result of the deviation
 - 3. Include required piping and wiring diagrams
- H. Provide resubmissions within 30 calendar days following return of reviewed submissions for submittal items with disposition of either "Rejected" or "Revise and Resubmit". Promptly address noted Contract Document requirements, unresolved issues and all other comments of Engineer prior to final review and approval by Engineer of resubmissions. Contractor will be notified by Engineer of any deficient submittal items after the specified number of calendar days required for resubmissions has expired.

1.5 SUBMISSION REQUIREMENTS

- A. Make submissions far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmissions, and for placing orders and securing delivery
- B. In scheduling, allow a minimum of 14 calendar days for review by Engineer following receipt of submission in Engineer's office:
 - 1. Time required to mail submissions or resubmissions is not considered part of review period
- C. Consecutively number all submissions:
 - 1. Assign unique number to include all shop Drawings, product data and other information required for individual specification sections
 - 2. Each specification section may still have more than one submittal number for later submissions (i.e., Preliminary O&M Manuals, Final O&M Manuals, etc.)
- D. Number of Submittals Required:
 - 1. Shop Drawings and Product Data: Submit a maximum of 2 copies for Contractor's use, plus a maximum of 3 copies which will be distributed by Engineer when approved. Do not submit more than 5 copies
 - 2. Samples: Submit 3 of each office sample unless specified otherwise in individual specification section
- E. Accompany each submission with letter of transmittal showing all information required for identification and checking. Submittals shall contain:
 - 1. Submittal number
 - 2. Date of submission and dates of any previous submissions
 - 3. Project title and number
 - 4. Owner Contract identification number if applicable
 - 5. The names of:

- a. Contractor
- b. Supplier
- c. Manufacturer
- 6. Identification of the product, with specification section number
- 7. Field dimensions, clearly identified as such
- 8. Relation to adjacent or critical features of the Work or materials
- 9. Applicable standards, such as ASTM numbers
- 10. Identification of deviations from Contract Documents:
 - a. If Contractor proposes to provide material or equipment of work which deviates from the Contract Documents, indicate so under “deviations” on the transmittal form accompanying the submittal copies
 - b. Identify all requested deviations as specified and on copies of Specifications and Drawings required per paragraph 1.5.E.11
 - c. If deviations from specifications are indicated and, therefore requested by Contractor, the submittal shall be accompanied by a detailed, written justification for each deviation
 - d. Failure to include a copy of marked-up specification sections, along with justification for any requested deviations to specification requirements, with the submittal shall be cause for rejection of the entire submittal with no further consideration by Engineer
- 11. Confirmation of compliance with Contract Documents:
 - a. Unless a Certificate of Compliance is permitted for material or equipment where specified, provide the following documents to demonstrate compliance with the Contract Documents:
 - 1) Copy of relevant Drawings with all addendum updates that apply to equipment in Divisions 11, 13, 14 and 15 marked to show specific changes necessary for equipment proposed in Contractor’s submittal:
 - a) If no changes are required, Drawing(s) shall be marked “no changes required”
 - b) Failure to include copies of relevant drawings with submittal, whether changes are required or not, shall be cause for rejection of entire submittal with no further review by Engineer
 - c) Relevant Drawings include as a minimum control diagrams, process and instrumentation diagrams (P&IDs), and Process (P) drawings
 - 2) A copy of each pertinent specification section in Divisions 11, 13, 14 and 15 with all addendum updates included, and all referenced and applicable specification sections, with their respective addendum updates included, with each paragraph check-marked to indicate specification compliance. Otherwise mark to indicate requested deviations from specification requirements per paragraph 1.5.E.10

12. Identification of revisions on resubmissions
13. An 8 inch by 4 inch blank space for Contractor's and Engineer's stamps
14. Stamp cover sheet of each submittal as identified in letter of transmittal
15. Contractor's stamp: Initialed or signed, certifying review and approval of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents. Use stamp to include wording similar to the following:

This submittal has been reviewed by [*name of contractor*] and approved with respect to the means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incidental thereto. [*Name of contractor*] also warrants that this submittal complies with contract documents and comprises no deviations thereto:

Section No: _____ Submittal No: _____

DATE: _____ BY: _____

- F. Submittal Log:
1. Maintain an accurate submittal log for duration of the Work showing current status of all submissions
 2. Show submittal number, section number, section title, submittal description dates and disposition of submittal
 3. Make submittal log available to Engineer for Engineer's review upon request
- G. Unless specified otherwise, make submissions in groups to facilitate efficient review and approval:
1. Include all associated items from individual specification sections to assure that all information is available for checking each item when it is received
 2. Submit a complete initial submittal including all components when an item consists of components from several sources
 3. Partial submittals may be rejected as not complying with provisions of the Contract
 4. Engineer will not be held liable for delays due to poorly organized or incomplete submissions
 5. Do not include items from more than one specification section for any one submittal number
- H. Contractor may require subcontractors to provide drawings, setting diagrams and similar information to help coordinate the Work, but such data shall remain between Contractor and his subcontractors and will not be reviewed by Engineer unless specifically called for within the Contract Documents

1.6 DISPOSITION OF SHOP DRAWINGS AND PRODUCT DATA

- A. "Approved As Submitted": Approved with No Exceptions Noted:
 - 1. One copy sent to Owner
 - 2. One copy retained in Engineer's file
 - 3. Remaining copies returned to Contractor for his use:
 - a. One copy to be kept on file at Contractor's office at job site
 - b. Remaining copies for Contractor's office file, suppliers, or subcontractors
 - 4. No corrections or comments noted on submittal or in transmittal letter
 - 5. Issues or miscellaneous comments pertaining to other related items of the Work may be included in transmittal letter
 - 6. Resubmission not required
- B. "Exceptions Noted": Approved with Corrections Noted:
 - 1. One copy sent to Owner
 - 2. One copy retained in Engineer's file
 - 3. Remaining copies returned to Contractor for his use:
 - a. One copy to be kept on file at Contractor's office at job site
 - b. Remaining copies for Contractor's office file, suppliers or subcontractors
 - c. Copies of submittal data in operation and maintenance manuals to be revised according to corrections
 - 4. Comply with corrections or comments as noted on submittal and in transmittal letter
 - 5. Resubmission not required
- C. "Revise And Resubmit": Incorrect or Specific Information Still Required:
 - 1. One copy retained in Engineer's file
 - 2. All remaining copies returned to Contractor for revision and resubmittal
 - 3. Copy of transmittal letter sent to Owner. An "Approved As Submitted" or "Exceptions Noted" submittal will be forwarded to Owner upon resubmission and review per above disposition requirements
 - 4. Submittal is either: incorrectly annotated; specific comments need to be addressed and incorporated in resubmittal; and/or additional information may be required as noted in transmittal letter
 - 5. Submitted information may not include or address specific item required per the specification as identified in transmittal letter
 - 6. Specific information related to identified item may be required for final approval of submittal
 - 7. Resubmission of entire submittal may be required or resubmission of specific item may be required as identified in transmittal letter
- D. "Rejected": Returned for Correction:
 - 1. One copy retained in Engineer's file
 - 2. All remaining copies returned to Contractor
 - 3. Copy of transmittal letter sent to Owner

4. Contractor required to resubmit complete submittal package in accordance with Contract Documents
5. Submittal does not comply with provisions of Contract Documents as noted in transmittal letter
6. Resubmission required

E. "Receipt Acknowledged": For Reference Purposes Only or for Record Copy:

1. One copy retained in Engineer's file
2. One copy returned to Contractor
3. Copy of transmittal letter sent to Owner
4. Remaining submittal copies destroyed
5. Detailed review and comment by Engineer not required
6. Resubmission not required

1.7 DISPOSITION OF SAMPLES

A. "Approved As Submitted": Approved with No Exceptions Noted:

1. One sample sent to Owner
2. One sample retained in Engineer's file
3. Acknowledgment: Copy of transmittal letter sent to Contractor
4. Resubmission not required

B. "Exceptions Noted": Approved with Corrections Noted:

1. One sample sent to Owner
2. One sample retained in Engineer's file
3. Acknowledgment: Copy of transmittal letter sent to Contractor
4. Work performed or products furnished to comply with exceptions noted in acknowledgment
5. Resubmission not required

C. "Rejected": Returned for Correction:

1. One sample retained in Engineer's file
2. Remaining samples sent to Contractor for resubmittal and compliance with the Contract Documents as noted in transmittal letter
3. Copy of transmittal letter sent to Owner
4. Resubmission required

1.8 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in submittals required by Engineer and resubmit until approved
- B. Transmit each resubmission under new letter of transmittal. Use number of original submittal followed directly by a capital letter corresponding to the number of times a submittal is resubmitted (i.e., 1, 1A, 1B, etc.)

- C. Shop Drawings and Product Data:
 - 1. Revise initial Drawings or data and resubmit as specified for the initial submittal
 - 2. Indicate any changes which have been made other than those requested by Engineer
- D. Samples: Submit new samples as required for initial submittal
- E. Reimbursement of Resubmission Review Costs:
 - 1. Review of first submittal and one resubmittal will be performed by Engineer at no cost to the Contractor
 - 2. Costs for review of subsequent resubmissions will be directly paid by Contractor
 - 3. Engineer will document work-hours required for review and costs for Engineer review will be deducted from payments due Contractor as Change Order deducts
 - 4. Charges for review of resubmissions will include Engineer at maximum rate of \$95 per hour and Submittal Clerk at maximum rate of \$45 per hour

1.9 ENGINEER'S DUTIES

- A. Review submittals with reasonable promptness and in accord with approved submission schedule provided that each submittal has been called for by the Contract Documents and is stamped by Contractor as indicated above:
 - 1. In the event that Engineer will require more than 14 calendar days to perform an expedited submittal review as requested by Contractor, Engineer shall so notify Contractor or indicate so on the submission schedule
 - 2. No extensions of time are allowed due to Engineer's delay in reviewing submittals unless all the following criteria are met:
 - a. Contractor has notified Engineer in writing that an expedited review of particular submittal in question is critical to the progress of the Work and Contractor has identified the requested submittal return date
 - b. Engineer has failed to return submittal within 21 days of receipt of the submittal or receipt of said notice, whichever is later
 - c. Contractor demonstrates that delay in progress of the Work was directly attributable to Engineer's failure to return submittal within 21 days
 - 3. No extensions of time are allowed due to delays in progress of the Work caused by rejection and subsequent resubmission of data, including multiple resubmissions
- B. Review drawings and data submitted only for general conformity with Contract Documents:
 - 1. Engineer's review of drawings and data returned marked "Approved As Submitted" or "Exceptions Noted" does not indicate a thorough review of all dimensions, quantities, and details of material, equipment device or items shown
 - 2. Engineer's review does not relieve Contractor of responsibility for errors, omissions or deviations nor responsibility for compliance with the Contract Documents

3. Engineer's review shall not extend to means, methods, techniques, sequences, operations of construction, and safety precautions and programs incidental thereto. No information regarding these items will be reviewed whether or not included in submittals
- C. Assume that no shop Drawing or related submittal comprises a deviation to the Contract Documents unless Contractor advises Engineer otherwise in writing which is acknowledged by Engineer in writing:
 1. Consider and review only those deviations from the Contract Documents clearly identified as such in submittal and tabulated in the Letter of Transmittal
 2. At the discretion of the Engineer, notify Contractor that review of specific deviations will be reviewed under provisions of Section 01630
- D. Return submittals to Contractor for distribution or for resubmission
- E. Transmit, unreviewed, to Contractor all copies of submittals received directly from suppliers, manufacturers and subcontractors
- F. Transmit, unreviewed, to Contractor all copies of submittals not called for by the Contract Documents or which have not been approved by Contractor
- G. Engineer will not review uncalled-for shop drawings or product data except by special arrangement
- H. Affix stamp and indicate approval for submittal or resubmission requirements with the following stamp:

☐ Approved As Submitted	☐ Exceptions Noted
☐ Revise And Resubmit	☐ Rejected
This review was performed only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Modifications or comments made on the shop drawings and product data during this review do not relieve contractor from responsibility for compliance with the requirements of the plans and specifications. Approval of a specific item does not include approval of the assembly of which the item is a component. Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences, and procedures of construction; coordination of the work of all trades; and for performing all work in a safe and satisfactory manner.	
Farr West Engineering	
Date _____ By _____	

1.10 SUBMITTAL SCHEDULE

- A. Unless indicated otherwise, provide all submittals required by individual sections of the Contract Documents to establish compliance with the specified requirements
- B. Contractor may provide "Certificate of Compliance" in lieu of product data submittal as required above for the following sections:

Section Number	Section Title	Product Data or Item
15100	Valves, Cocks, and Hydrants	
15140	Supports and Anchors	
16075	Electrical Identification	

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation
- B. Inspection and testing laboratory services and qualifications
- C. Laboratory duties and limitations of authority of testing laboratory
- D. Contractor's responsibilities
- E. Field testing
- F. Testing and services schedule

1.2 RELATED SECTIONS

- A. Section 01090—Reference Standards
- B. Section 01340—Shop Drawings, Product Data, and Samples
- C. Section 01600—Material and Equipment
- D. Section 01650—Starting of Systems

1.3 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents
- B. Obtain copies of standards when required by Contract Documents
- C. Where specified reference standards conflict with Contract Documents, request clarification for Engineer before proceeding
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document

1.4 SUBMITTALS

- A. Submit under provisions of Section 01340

- B. Provide copies of written reports for materials, equipment or systems as scheduled at the end of this section. Reference each report by respective section number
- C. Laboratory qualifications—Provide statement of qualifications from testing firm and testing firm personnel for review and acceptance by Engineer
- D. Field personnel qualifications—Provide statement of qualifications for review and acceptance by Engineer for the following:
 - 1. ACI certification
 - 2. Independent special inspector and testing as specified
- E. Field test reports: Provide reports detailing results of the tests. Indicate compliance or non-compliance with Contract Documents. Identify corrective action for materials and equipment which fails to pass field tests

1.5 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality
- B. Comply fully with manufacturer's instructions, including each step in sequence
- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship
- E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement
- F. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities: Conditions of the Contract
- G. Certification of products: Respective sections of specifications
- H. Testing, adjusting and balancing of equipment: Respective sections of specifications
- I. Laboratory tests required and standards for testing: Respective sections of specifications

1.6 INSPECTION AND TESTING LABORATORY SERVICES

- A. Owner will employ and pay for the services of an independent testing laboratory to perform specified laboratory testing of materials where the technical specifications specifically obligate the Owner to provide the services:

1. Contractor shall cooperate with the laboratory to facilitate the execution of its required services
 2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract
- B. Contractor shall employ and pay for the services of an independent testing laboratory to perform all specified services and testing not specifically identified in the technical specifications to be provided by Owner related to the design of mixes, products and equipment, to Engineer's review of proposed materials and equipment before, during and after incorporation in the Work and to retest materials and equipment which fail original tests:
1. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract
- C. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the Contract Sum/Price

1.7 QUALIFICATION OF LABORATORY

- A. Perform all tests to determine compliance with Contract Documents by an independent commercial testing firm acceptable to Engineer
- B. Testing firm's laboratory: Staffed with experienced technicians, properly equipped and fully qualified to perform tests in accordance with specified standards
- C. Meet basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction" as applicable
- D. Authorized to operate in the State in which the Project is located
- E. Testing equipment:
 1. Calibrated at reasonable intervals by devices of accuracy traceable to either:
 - a. National Bureau of Standards
 - b. Accepted values of natural physical constants

1.8 LABORATORY DUTIES

- A. Cooperate with Engineer and Contractor; provide qualified personnel after due notice
- B. Perform specified inspections, sampling, and testing of materials and methods of construction:
 1. Comply with specified standards
 2. Ascertain compliance of materials with requirements of Contract Documents

- C. Promptly notify Engineer and Contractor of observed irregularities or deficiencies of work or products

1.9 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents
 - 2. Approve or accept any portion of the Work
 - 3. Owner employed laboratory shall not perform any duties of the Contractor

1.10 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel and provide access to Work
- B. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete and other material mixes which require control by the testing laboratory
- D. Furnish copies of product test reports as required
- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested
 - 2. To obtain and handle samples at the project site or at the source of the product to be tested
 - 3. To facilitate inspections and tests
 - 4. For storage and curing of test samples
- F. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested:
 - 1. Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services to allow for scheduling of tests and laboratory assignment of personnel
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use

1.11 FIELD TESTING

- A. Contractor shall pay all costs associated with field testing of materials and equipment as required in respective sections of the specifications
- B. Provide all required materials, labor, equipment, water, and power required for testing
- C. Perform all tests in presence of Engineer and provide one copy of field test results to Engineer same day of tests

- D. Repair with no additional compensation all materials and equipment which fail during testing

1.12 TESTING AND SERVICES SCHEDULE

- A. Testing laboratory services shall be provided by Owner for, but shall not be limited to, the following:

<u>Specification Equipment Section</u>	<u>Type of Material, or System</u>
Section 02200	Earthwork: Gradations, Sieve Analysis, Proctors with Optimum Moisture Content
Section 03000	Concrete: Mix Design, Cement, Compressive Strength, Admixtures

1.13 FIELD TESTING

- A. Field testing shall be provided by Owner for, but shall not be limited to,

the following: Specification Type of Material, Equipment

<u>Section</u>	<u>or System</u>
Section 02200	Earthwork: Compaction, Moisture Content
Section 03000	Concrete: Air Content, Slump, Compressive Strength

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heating, ventilating, telephone service, water, and sanitary facilities
- B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control
- C. Construction Facilities: Access roads, parking, progress cleaning, project signage, storage, and temporary buildings

1.2 GENERAL REQUIREMENTS

- A. Furnish, install and maintain all temporary utilities to provide continuous service required for the Work, except as allowed herein, and remove on completion of Work. Modify and extend systems as work progress requires
- B. Furnish, install and maintain all construction aids required for the Work, except as allowed herein, and remove on completion of the Work
- C. Furnish, install and maintain fences and barriers as required for protection of the public, property and the Work
- D. Contractor may use existing roadways for access and parking to the extent practical. Provide any additional access and parking required for Contractor's personnel or operations
- E. Provide storage sheds as required by the Contractor
- F. Products may be new or used, but must be serviceable, adequate for the intended purpose, and must not violate the requirements of any applicable codes or standards
- G. Clean and repair damage caused by temporary installations or use of temporary facilities
- H. Provide a project identification sign as stipulated in the Supplementary Conditions

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Comply with applicable Federal and State rules and regulations, local codes and ordinances

2. Comply with Owner's requirements

1.4 TEMPORARY ELECTRICITY

- A. Contractor shall arrange with owner and pay as necessary all costs associated with power service to the field office and to Contractor's storage sheds and pay all costs for energy used
- B. Equipment testing:
 1. Owner shall pay for energy
 2. Contractor shall pay all costs for temporary wiring, if required
- C. Provide power outlets for construction operations, with branch wiring and distribution boxes located at the site. Provide flexible power cords as required
- D. Provide main service disconnect and overcurrent protection at convenient location
- E. Permanent convenience receptacles may not be utilized during construction
- F. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting:
 1. Provide 20 ampere duplex outlets, single phase circuits for power tools
 2. Provide 20 ampere, single phase branch circuits for lighting
- G. Pay all costs for installation and removal of temporary electrical service
- H. Contractor may use existing receptacle outlets for small power tools with 120V, single phase, 15 amp and grounding connection plugs at no charge for power energy:
 1. Use of existing receptacle outlets shall be in such a manner to minimize inconvenience to Owner and Owner's employees
 2. Contractor shall provide any required extension cords
 3. Extension cords shall be supported or guarded to positively prevent any hazard of any kind to Owner's personnel

1.5 TEMPORARY LIGHTING

- A. Provide and maintain incandescent lighting for construction operations
- B. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes as required
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required
- D. Maintain lighting and provide routine repairs

1.6 TEMPORARY HEATING

- A. Provide and pay for all temporary heat as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions of the installation of materials and to protect materials and finishes from damage due to temperature or humidity
- B. Portable heaters shall be standard approved units complete with controls
- C. Pay all costs of installation, maintenance, operation and removal and for fuel consumed
- D. Provide temporary heating for all subcontractors as required

1.7 TEMPORARY VENTILATING

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases
- B. Provide and pay for temporary ventilation equipment as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials and to protect materials and finishes from damage due to temp or humidity
- C. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases
- D. Portable ventilators shall be standard approved units complete with controls
- E. Pay all costs of installation, maintenance, operation and removal and for power consumed

1.8 TEMPORARY WATER SERVICE

- A. Owner to provide water connection for construction use

1.9 TEMPORARY SANITARY FACILITIES

- A. Provide sanitary facilities:
 - 1. As required by laws and regulations
 - 2. Not less than 1 facility for every 20 employees of Contractor and subcontractors at the site
- B. Service, clean, and maintain facilities and enclosures
- C. Do not permit construction personnel to use Owner's facilities

1.10 CONSTRUCTION AIDS

- A. Provide construction aids and equipment required by personnel and to facilitate the execution of the Work: Scaffolds staging, ladders, stairs, ramps, runways, platforms, railways, hoists, cranes, chutes, and other such facilities and equipment
- B. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements by Owner
- C. Completely remove temporary materials, equipment, and services at completion of the Project
- D. Clean and repair damage caused by installation or by use of temporary facilities:
 - 1. Remove foundations and underground installations for construction aids
 - 2. Grade the areas for the site affected by temporary installations to required elevations and slopes and clean the area

1.11 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition
- B. Provide suitable barriers as required for public protection of Owner's employees
- C. Protect non-owned vehicular traffic, stored materials, site and structures from damage
- D. Install facilities of a neat and reasonable uniform appearance, structurally adequate for the required purposes
- E. Relocate barriers as required by progress of construction
- F. Completely remove barriers, including foundations, when construction has progressed to the point that they are no longer needed
- G. Clean and repair damage caused by installation, fill and grade the areas of the site to required elevations and slopes and clean the area

1.12 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion

1.13 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks
- B. Provide temporary roofing as required to protect work and equipment

1.14 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings
- D. Protect finished driving surfaces, floors, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials
- E. Prohibit storage upon waterproofed or roofed surfaces. If activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer
- F. Prohibit traffic from landscaped areas unless necessary for the performance of Work

1.15 SECURITY

- A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft
- B. Coordinate with Owner's security program

1.16 ACCESS ROADS

- A. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow
- B. Provide and maintain access to fire hydrants, free of obstructions
- C. Existing on-site roads may be used for construction traffic

1.17 PARKING

- A. Temporary dirt surface parking areas adjacent to the site can accommodate construction personnel

- B. When site space is not adequate, provide additional off-site parking
- C. Do not allow vehicle parking on existing pavement

1.18 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition
- B. Remove debris and rubbish from remote spaces prior to enclosing the space
- C. Remove waste materials, debris, and rubbish from site periodically and dispose off-site in accordance with local and state regulations
- D. Broom and vacuum clean interior areas prior to start of surface finishing

1.19 FIELD OFFICES AND SHEDS

- A. Construction:
 - 1. Structurally sound, weathertight, with floors raised above ground
 - 2. Temperature transmission resistance: Compatible with occupancy and storage requirements
 - 3. At Contractor's option, portable or mobile buildings modified for office use may be used
 - 4. Fill and grade sites for temporary structures to provide surface drainage
 - 5. Construct temporary field offices and storage sheds on proper foundations, provide connections for utility services:
 - a. Secure portable or mobile buildings when used
 - b. Provide steps and landings at entrance door
 - 6. Mount thermometer at convenient outside location, not in direct sunlight
 - 7. Provide periodic maintenance and cleaning for temporary structures, furnishings, equipment and services
 - 8. Remove temporary field offices, contents, and service at a time they are no longer needed
 - 9. Remove storage sheds when they are no longer needed
 - 10. Remove foundations and debris; grade the site to required elevations and clean the areas
- B. Contractor's Office and Facilities: As required
- C. Existing facilities at the site shall not be used for field offices or storage
- D. New permanent facilities shall not be used for field offices or for storage

1.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Final Application for Payment
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated
- C. Clean and repair damage caused by installation or use of temporary work
- D. Restore existing facilities used during construction to original condition.
Restore permanent facilities used during construction to specified condition

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION