ARCADIS

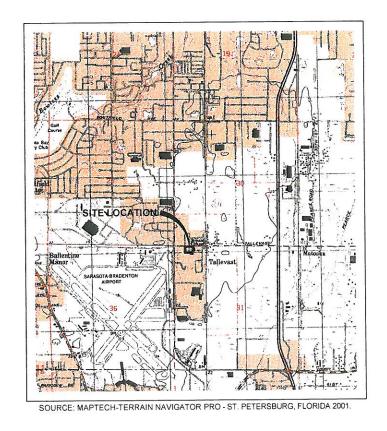
Appendix A

Record Drawings

CONSTRUCTION DRAWINGS **AERATION SYSTEM REDESIGN**

LOCKHEED MARTIN CORPORATION TALLEVAST SITE

1600 TALLEVAST ROAD SARASOTA, FLORIDA



AUGUST 2011

INDEX OF DRAWINGS

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INFLUENT MANIFOLD ELECTRICAL DETAIL

IAMES MICHAEL BEDESSEN

AS-BUILT DRAWING UPDATE

AS-BUILT DRAWING UPDATE

AS-BUILT DRAWINGS

TITLE, LOCATION, INDEX OF DRAWINGS

LOCKHEED MARTIN TALLEVAST SITE . TALLEVAST, FLORIDA

CONSTRUCTION DRAWINGS

ARCADIS Project No. 30038055,0038,00002 COVER ARCADIS 3350 BUSCHWOOD PARK DR SHEET SUITE 100 TAMPA, FLORIDA 33618 (813) 933-0697

FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 7917

NOT TO SCALE

Former American Beryllium Company 1600 Tallevast Road Sarasota, Florida 34243

The system treats extracted groundwater impacted with volatile organic compounds (VOCs) and 1.4—dioxane, and discharges the treated water to the Manatee County sanitary sewer system. The system includes ten groundwater extraction wells (EW-101 through EW-110) and an interim groundwater treatment system that was installed on the FABC property. The design maximum flow rate from the entire recovery well system is approximately 75 gpm. The groundwater recovery and treatment system is operated with flexibility so that all of the recovery wells may not be pumping at the same time or at their maximum designed flow rate.

Description of Treatment Process

Recovered groundwater is pumped into an influent equalization tank, then treated by an aeration system followed by filtration. The groundwater is then further treated using an Advanced Oxidation Process (AOP) and granular activated carbon (GAC) adsorption. Following treatment, the water is discharged to the sanitary sewer. A more detailed description of the treatment process is provided below.

Flow Equalization

Groundwater pumped from the groundwater recovery system is discharged into a 17,640 gallon influent equalization tank. The purpose of this tank is flow equalization, mixing of groundwater from the multiple recovery wells, and mixing of recovered groundwater with water saturated with oxygen for iron removal purposes. Vapors emitted from the tank are treated passively using vapor-phase GAC.

The aeration system includes a centrifugal pump; two inline aerators; an air compressor and associated piping, instrumentation, and appurtenances. Groundwater is pumped from the influent equalization tank through the inline aerators where air is injected into the water stream. The water is then recirculated back to the influent tank.

Pre-AOP Filtration Systems

After the groundwater is aerated, the water is pumped through a series of bog filters to facilitate the removal of oxidized iron. The water is then pumped through an additional series of cartridge filters for sediment removal prior to treatment through the AOP process. The filters remove particulates and protect the subsequent ADP system from scaling and clagging. As the bag and cartridge filters become clagged, they are manually changed out by the system

Advanced Oxidation Processes (AOPs)

e technology is the primary treatment method to reduce concentrations of VOCs in the recovered groundwater. The unit is furnished by, Purifics ES, Inc. (Purifics). The Purifics' system is installed on its own pallet and is an independently controlled treatment system. The technology uses a patented closed—loop titanium dioxide (TiO2) slurry—based photocatalytic oxidation process that is referred to as the Photo Cat system. The Photo Cat system uses air and ultraviolet light, in the presence of a TiO2 catalyst, to generate hydroxyl radicals that attack the bonds in the organic molecules, progressively oxidizing these compounds into benign end-products of carbon dioxide (CO2), water (H2O), and salts.

Granular Activated Carbon Polishing

A series of three GAC vessels provide a tertiary level of treatment for the residual chlorinated VOCs. Two GAC vessels operate in series, while the other remains in standby mode. As the useful life of the lead operating GAC vessel is reached the vessel is taken out of service and replaced with the standby vessel

Discharge

Following treatment, the groundwater is discharged to the Manatee County Publicly Owned Treatment Works (POTW) through an on-site connection to the sanitary sewer in accordance with on Industrial Wastewater Treatment Permit.

The following specifications were used to construct the aeration system component of the Groundwater Treatment System:

Site Health and Safety

- CONTRACTOR shall comply with all applicable local, state, and federal health and safety codes at all times. All CONTRACTOR and their subcontractor personnel shall be 40-hour OSHA HAZWOPER trained and current with all applicable refresher training.

 2. The contaminants of concern include VOCs, 1,4-dioxane, and metals that have been
- detected in the Site's soil and groundwater. Additional information regarding the types and concentrations of contaminants at the Site will be provided upon request.
- It is CONTRACTOR's responsibility for educating its supervisors, employees, and subcontractors of all health and safety requirements. CONTRACTOR is responsible for worker sofety and maintenance of traffic during construction. CONTRACTOR shall maintain a Health and Safety Plan on Site during construction
- At a minimum, all ansite CONTRACTOR personnel shall be in Level D which is defined as hard hat, steel toes, and safety glasses with hard side shields.

AS-BUILT DRAWING UPDATE AS-BUILT DRAWINGS

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7 8/26/11

6 8/26/10

5 1/30/09

No. Date

Site Health and Safety cont.

5. NO SMOKING is permitted at any time on the facility property.

Pipe and Valve Materials

- Pipe materials shall include primarily stainless steel and clear polyvinyl chloride (PVC). Piping materials are identified on the Piping and Instrumentation Diagram. Additional specifications are identified below.
- Stainless Steel Pipe shall be Type 316L SS, Schedule 40 for all pipe sizes, conforming to ASTM A312 - UNS Alloy S31603 for 1/4" to 30" diameter seamless and welded austenitic stainless steel piping with beveled ends for pipe larger than 2" diameter and plain ends for pipe smaller than 2" diameter. Stainless steel fittings shall be manufactured in accordance with ASTM A403 for wrought austenitic stainless steel piping fittings. Connections shall be welded or flanged.
- Stainless steel flanged connections shall be provided, at a minimum, at piping connections to equipment, tanks, in-line specialties and all valves. Unions shall not be used at any piping connections. All flanges shall be weld neck type and flanged connections shall include a viton gasket between pipe materials. Threaded pipe, gauge or instrument connections shall be made using stoinless steel, shop welded to the pipe at the locations shown on the drawings.

 4. Stainless steel tubing for air service shall be rated for a minimum of 150 psi and shall have 0.032" minimum wall thickness, Seamless, ASTM A269 CR. TP 316, Soft Annealed 316
- Stainless Steel. Compression fittings shall be flareless, consisting of Type 316 stainless steel body, nut and ferrules. Acceptable manufacturers include Swagelock, Gyrolock or A-Lock.
- Polyvinyl chloride (PVC) piping shall be schedule 40. Acceptable joining methods include PVC solvent glue (fittings only). PVC pipe will be used as secondary containment piping only.

 6. Ball valves shall be flanged ball valves with viton seals, unless otherwise specified on contract drawings. All valves shall be furnished with lockable handles.
- Globe valves shall be manual globe valves with viton seals and socket connections, as manufactured by Asahi America or equal.
- All stainless steel piping shall be shop fabricated as much as practicable. Field welds shall he defined on shop drawings

Above-ground Piping Installation

- The CONTRACTOR shall provide adequate pipe supports for both horizontal and vertically-mounted pipes
- 2. The piping shall be positioned to minimize tripping hazards and maintain head clearance where possible. Walkways shall be installed over pipes installed at ground level in foot-traffic areas as shown on the drawings.
- Pressure gauges, flow meters, and other instrumentation shall be installed in locations that are easily readable and accessible for maintenance.
- All pipe fittings and specials shall be carefully inspected in the field before installation Cracked, broken, warped, out-of-round, damaged pipe joints including damaged pipelining or coatings or specials, as determined by the ENGINEER, shall not be installed. Such rejected pipe shall be clearly tagged in such a manner as to not deface or damage it, and the pipe shall then be removed from the job site by the CONTRACTOR at his own expense.
- The underside of all overhead piping in the treatment building shall be at least 7'-6" above finished floor.
- The exact locations of drains, vents, sample taps, and pressure gauges shall be determined
- in the field during construction. All piping shall be easily drained.

 7. Labeling of equipment and piping shall include, but not be limited to flow directional arrows, equipment identification placards, and safety placards.

Pipe Hangers and Supports

JAMES MICHAEL BEDESSEN

Date Signed Project Mgr.

MS JB

55694

- 1. Install structural supports to support pipe filled with water with a safety factor of five. Unless otherwise noted on drawings, use the following as a guide for spacing of supports for both vertical and harizantal nine
- All piping 1—inch diameter and less shall be supported every 7 feet using a rod with minimum diameter of 3/8-inch.
- All 1-1/4 inch diameter piping shall be supported every 7 feet using a rod with minimum diameter of 1/2-inch.
- All piping 1-1/2 inch through 3-inch diameter shall be supported every 9 feet using a rod with minimum diameter of 1/2-inch.
- All piping 4-inch diameter and greater shall be supported every 9 feet using a rod with minimum diameter of 5/8-inch.
- Install in occordance with ASTM B31.9, ASTM F708, and MSS SP89 as applicable Install female welded studs in manner recommended by stud manufacturer for attaching hanger
- rods to steel members. Install hangers to provide minimum 1/2—inch space between finished covering and adjacent Work. 9. Install 'Hilti-Drop in Type' concrete rod hanger fasteners in concrete in manufacturer's approved fashion where necessary for attaching hanger rods to concrete. Do not install insert in concrete veneer
- used for fireproofing structural steel members.

 10. Support pipe within two feet of end of all pipe runs.
- Support riser piping independently of connected horizontal piping.
- 11. Support riser piping independently of connected norizontal piping.

 12. Unless noted on the Construction Drawings, install trapeze and shelves by accepted method described in AISC Steel Construction Manual where necessary. The use of trapeze type pipe hangers is preferred in areas where multiple pipes can be supported, to reduce the number of hangers. Trapeze hangers constructed of tubing or pipe are preferred. Where pipe or tubing is used, ends shall be capped and sealed. Angle iron, if used, shall only be used as vertical members.

 13. Wall, Floor, or ceiling sleeves shall not be used to support pipe.
- 14. Provide additional supports for concentrated loads such as flanges, valves, or specialties, and at changes in direction.

 15. Support all valves, fittings, and tubing such that all swing joints make and break freely and such
- that undo stress is not placed on tubing by valves or other in-line components.

Pipe Testing - For Air and Liquid Service

- CONTRACTOR shall complete pipe tests for all piping. The ENGINEER shall observe the pipe tests.
- Pipe tests for liquid service shall be conducted using clean potable water. Pipe shall be capped before testing and equipment such as flow meters, pressure relief valves, etc., should be isolated to prevent damage. The piping system may be tested in sections with the approval from the ENGINEER. Hydrostatic tests will be completed at a minimum pressure of 200 psi and will last for a minimum of 1 hour or as much time as may be required to properly inspect all joints and connections. Hydrostatic test acceptance shall be \pm /- 5 percent of the pressure
- joints and connections, hydrostatic test acceptance shall be 17 3 per let of the pressure rating. Deviations regarding test pressure and times shall require approvals by the ENGINEER.

 3. Leokage testing shall be conducted concurrently with the pressure test. The section tested shall be drip tight with no signs of leakage.
- CONTRACTOR shall provide a pressure test of the air piping system. Isolate equipment (e.g. air compressor, aeration defusers, etc.) that may be damaged by the test. The piping system may be tested in sections with approval from the ENGINEER. Stainless steel piping shall be tested at a minimum pressure of 150 psi. Pressure test will last for a minimum of 1 hour. Test acceptance shall be $\pm/-$ 5 percent of the pressure rating. Deviations regarding test pressure and times shall require approvals by the ENGINEER.
- 5. All containment pipe shall be pneumatically leak tested prior to being placed in service. Test shall be at least 5 psig for a minimum of 2 hours.
- If the test results are not considered to be acceptable by the ENGINEER, then the CONTRACTOR shall identify and repair the leaks. The pipe(s) must be re-tested after the repairs until acceptable test results are achieved.
- 7. Written records of the pipe test shall be made by the CONTRACTOR of each pipe segment and submitted to the ENGINEER. The test records shall include the following: Date of test
- Description of pipe segment tested
- Test pressure, air temperature, and time before and after test
- Remarks (including description of test results, description of leaks, and leak repairs)
- Signature of CONTRACTOR.

Welding Specifications

- Welders shall be certified in accordance with ASME BPVC Sec IX (Boiler and Pressure Vessel Code Section IX, Welding and Brazing Qualifications - 2007). CONTRACTOR shall submit welding certificates for all personnel.
- Welding materials shall comply with Section 328.3 of ASME B31.3, Process Piping 2006 Welding equipment, electrodes, welding wire, and fluxes shall be capable of producing satisfactory welds when used by a qualified welder using qualified procedures.
- Welding preparations, preheating, welding execution, heat treatment, assembly, and erection piping shall be performed in accordance with ASME B31.3, Process Piping 2006. CONTRACTOR shall minimize the number and location of field welds required for assembly
- of process pip CONTRACTOR shall be responsible for field verification of all piping lengths for shop fabrication
- No welding shall be performed when the quality of the completed weld may be impaired by
- the prevailing working or weather conditions.

 7. Welds shall be visually inspected as follows:
- Before welding for compliance with requirements for joint preparation, alignment, cleonliness, etc
- b. After welding for cracks, contour, finish, undercutting, overlap, and size of fillet welds.

Restoration of Surfaces

- All types of surfaces, pavement, sidewalks, curbs, gutters, culverts and other features disturbed, damaged, or destroyed during the performance of work shall be restored. The quality of materials and the work used in the restoration shall produce a surface or feature equivalent or superior to the prior existing condition subject to approval by ENGINEER and OWNER. Replacement paying for asphalt surfaces shall be as shown on construction drawings. If concrete is used to replace asphalt CONTRACTOR shall paint concrete surface to match asphalt.
- 2. Cuttings and excavated materials stored onsite, in an area designated by ENGINEER, shall
- be covered and/or contained to prevent contact with ground, personnel, and runoff water.

 3. All construction debris shall be disposed of after the completion of work, including but not limited to soil, rubble, asphalt, concrete, pipe, etc. The disposal of all construction debris shall be at a licensed waste disposal/treatment facility.

1KM RW 11/20/10 FLORIDA CERTIFICATE OF AUTHORIZATION

LOCKHEED MARTIN TALLEVAST SITE . TALLEVAST, FLORIDA CONSTRUCTION DRAWINGS

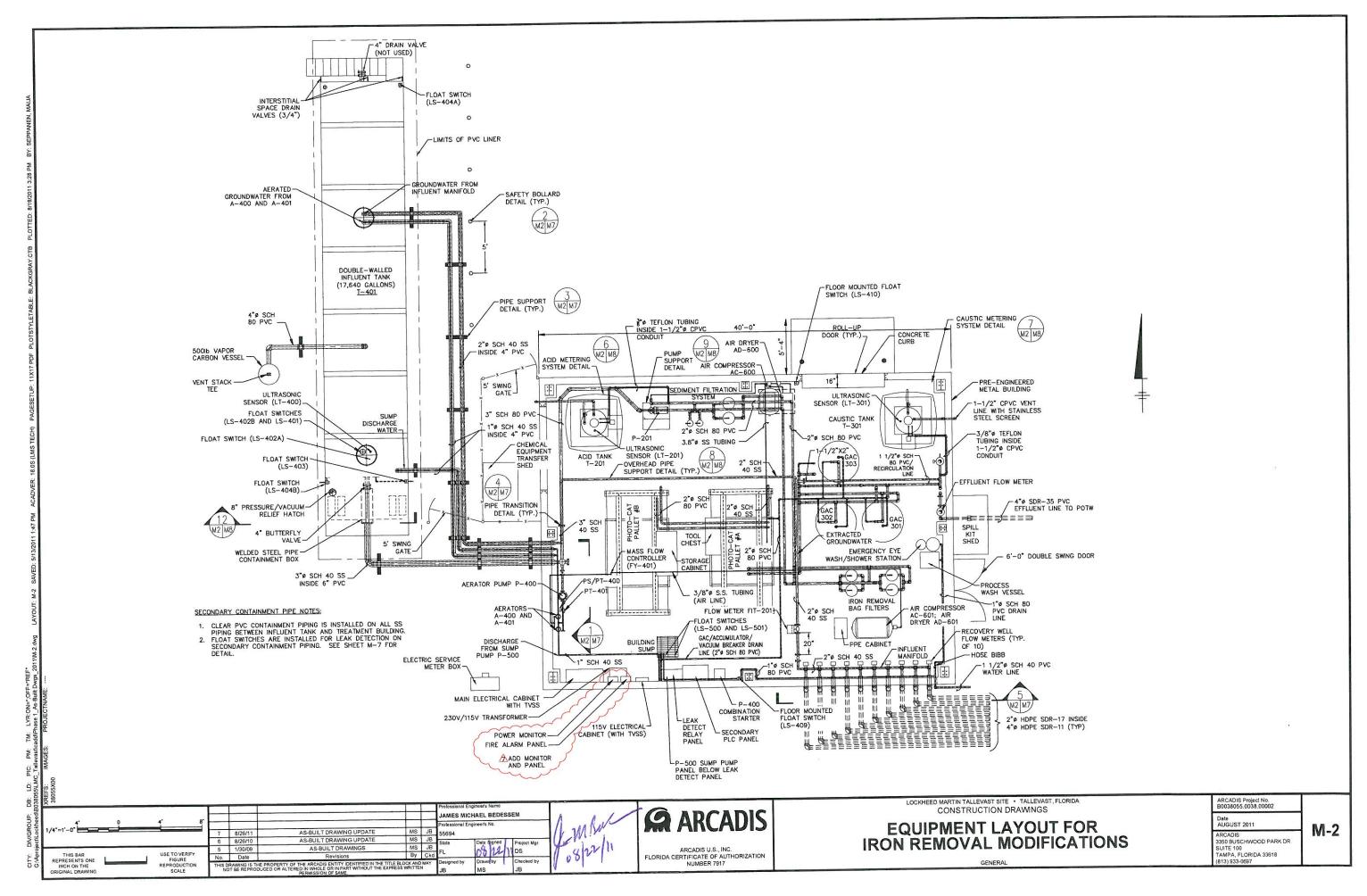
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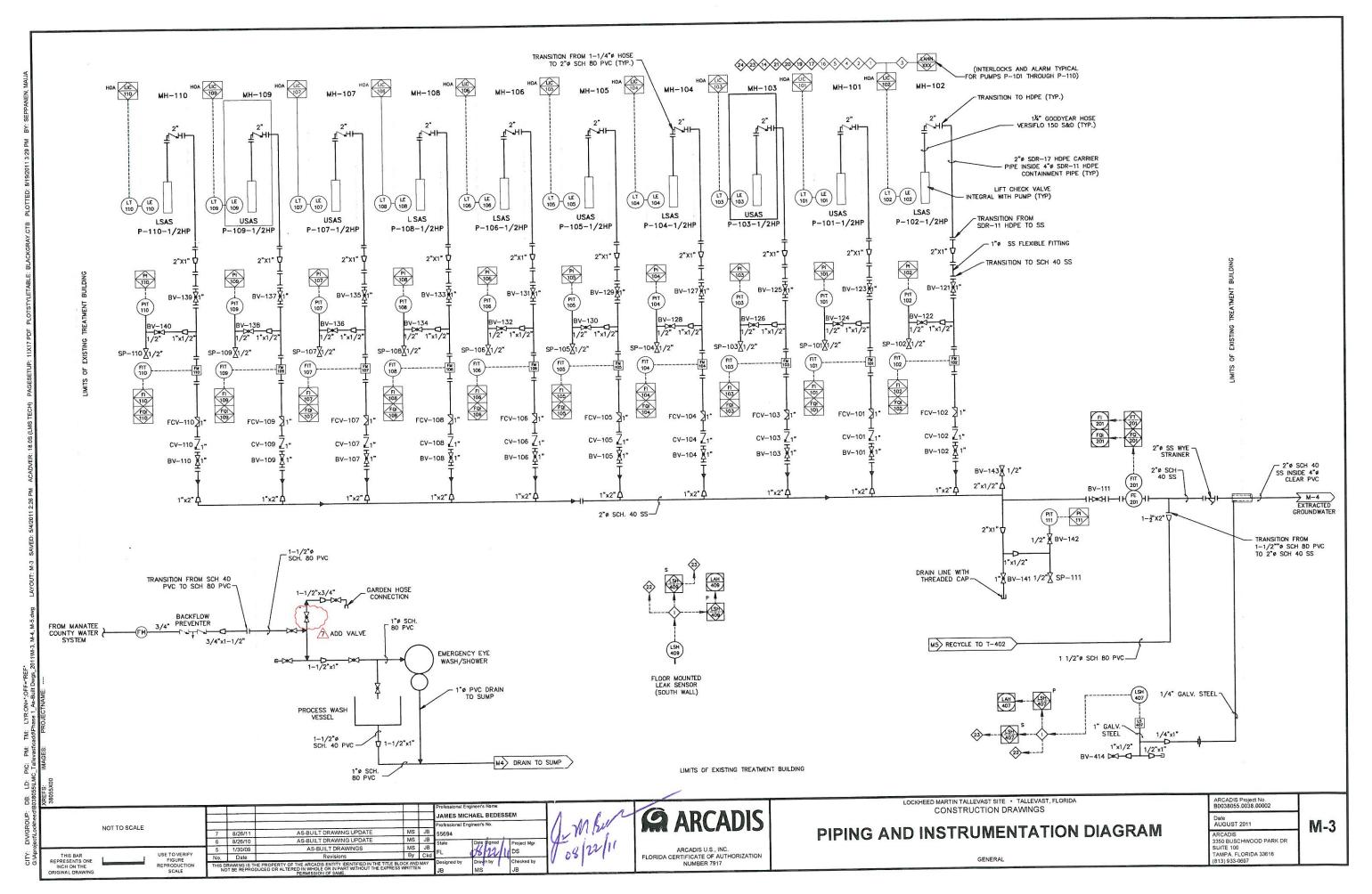
Date AUGUST 2011 3350 BUSCHWOOD PARK DR SUITE 100 AMPA, FLORIDA 33618 13) 933-0697

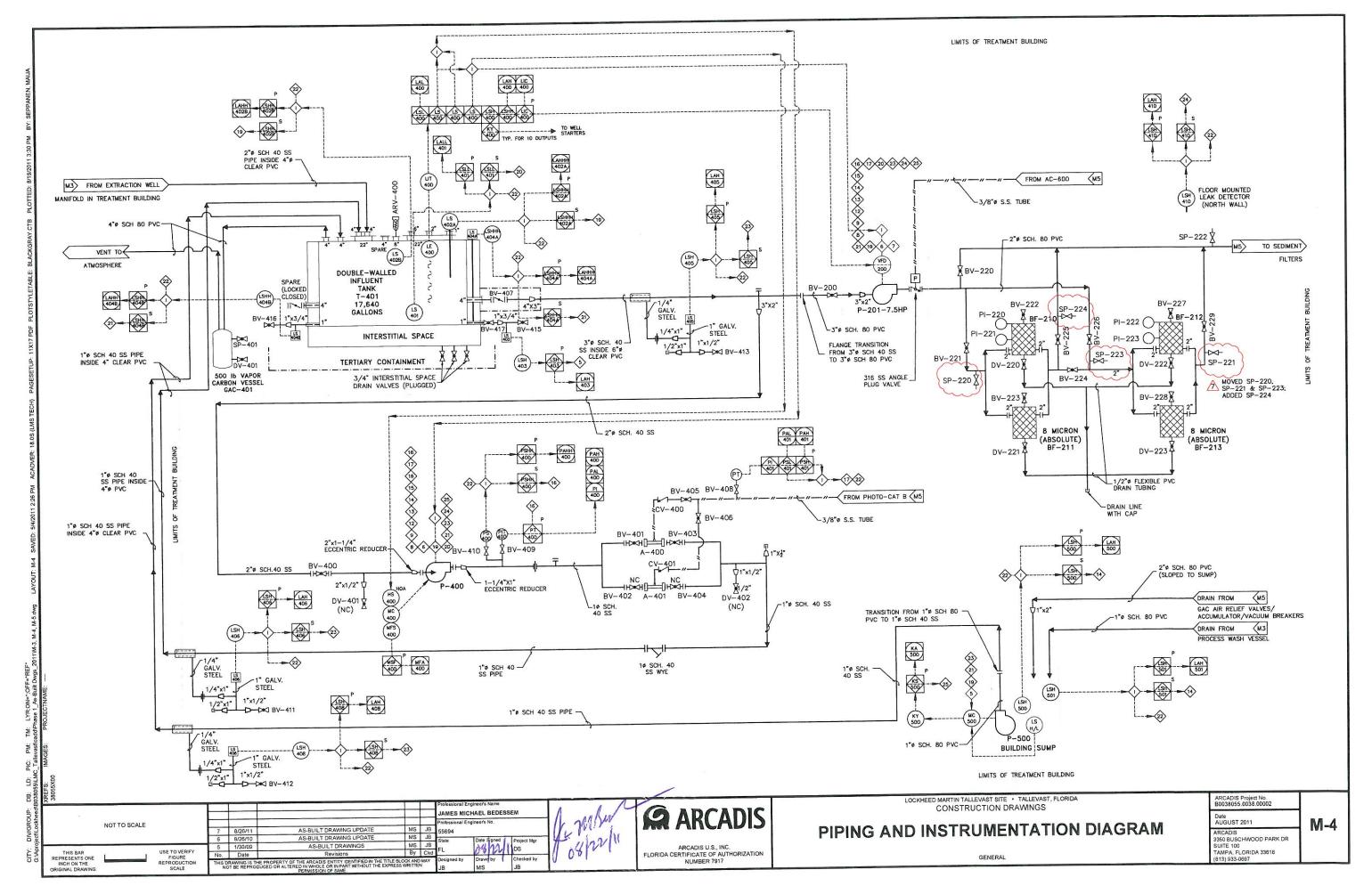
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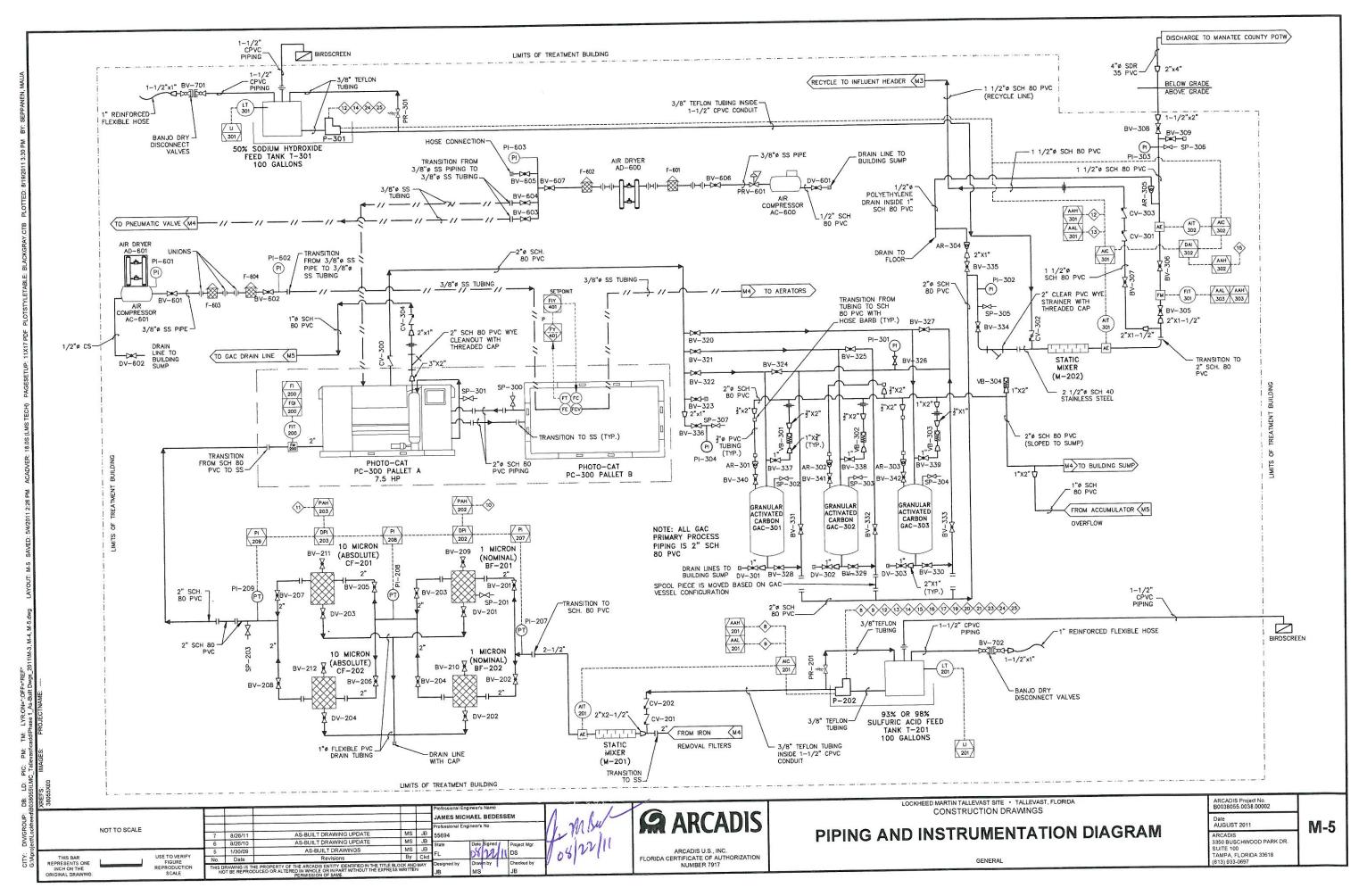
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USE TO VERIFY FIGURE REPRODUCTION SCALE









INTERLOCKS: HIGH LEVEL AT EXTRACTION WELL (MH-101 THROUGH MH-110), TURN ON RESPECTIVE PUMP (P-101 THROUGH P-110). IF PLC DOES NOT REGISTER FLOW AT RESPECTIVE FLOW METER (FIT-101 THROUGH FIT-110), TURN OFF PUMP. LOW LEVEL AT EXTRACTION WELL (MH-101 THROUGH MH-110), TURN OFF RESPECTIVE PUMP (P-101 THROUGH P-110). 3 HIGH HIGH LEVEL AT EXTRACTION WELL (MH-101 THROUGH MH-110), SIGNAL ALARM AT PLC (LAHH-101 THROUGH LAHH-110). PLC TO SIGNAL AUTO DIALER. HIGH LEVEL ALARM (LAH-400) AT INFLUENT TANK T-401. TURN OFF EXTRACTION WELL PUMPS P-101 THROUGH P-110, PUMPS P-201, P-202, P-301, P-400, P-500 AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC HIGH LEVEL ALARM (LAH-403) AT INFLUENT TANK T-401 INTERSTITIAL SPACE. TURN OFF EXTRACTION WELL PUMPS P-101 THROUGH P-110, PUMPS P-201, P-202, P-301, P-400, P-500 AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC (LAH-403). PLC TO SIGNAL AUTO DIALER. 6 PUMP OFF SET POINT AT INFLUENT TANK (T-401). TURN OFF P-201 AND P-400. PUMP ON SET POINT AT INFLUENT TANK (T-401). TURN ON P-201. PH ALARM HIGH (AAH-201) AT ACID INJECTION POINT. TURN OFF PUMPS P-201, P-202, P-301, P-400, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. HIGH DIFFERENTIAL PRESSURE ALARM (PAH-202) ACROSS BAG FILTERS (BF-201 AND BF-202). SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. HIGH DIFFERENTIAL PRESSURE ALARM (PAH-203) ACROSS CARTRIDGE FILTERS (CF-201 AND CF-202). SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. PH ALARM HIGH (AAH-301) AT CAUSTIC INJECTION POINT. TURN OFF PUMPS P-201, P-202, P-301, P-400, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. HIGH LEVEL ALARM (LAH-500) AND HIGH LEVEL ALARM (LAH-501) AT BUILDING SUMP. TURN OFF PUMPS P-101 THROUGH P-110, P-201, P-202, P-301, P-400, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. PLC TO HIGH DIFFERENTIAL PH ALARM (AAH-302) ACROSS EFFLUENT PH PROBES. TURN OFF PUMPS P-201, P-202, P-301. P-400, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. HIGH/LOW PRESSURE IN AERATOR PIPING (PAH-400, PAL-400, PAHH-400). TURN OFF PUMPS P-101 THROUGH P-110, P-201, P-202, P-301, P-400, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. HIGH/LOW PRESSURE IN AIR LINE TO AERATOR PIPING (PAH-401, PAL-401). TURN OFF PUMPS P-101 THROUGH P-110, P-201, P-202, P-301, P-400, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. PLC TO SIGNAL AUTO DIALER. PUMP ON SET POINT AT INFLUENT TANK (T-401). TURN ON P-400. HIGH/HIGH LEVEL ALARM (LAHHH-402A AND LAHH-402B) AT INFLUENT TANK T-401. TURN OFF PUMPS P-201, P-202, P-301, P-400, P-500, EXTRACTION WELL PUMPS P-101 THROUGH P-110 AND PHOTOCAT SYSTEM. LOW/LOW LEVEL ALARM (LALL-401) AT INFLUENT TANK T-401. TURN OFF EXTRACTION WELL PUMPS P-101 THROUGH P-110, PUMPS P-201, P-202, P-301, P-400, AND PHOTOCAT SYSTEM. HIGH/HIGH ALARM (LAHHH-404A, LAHH-404B) AT INFLUENT TANK INTERSTITIAL SPACE. TURN OFF EXTRACTION WELL PUMPS P-101 THROUGH P-110, PUMPS P-201, P-202, P-301, P-400, P-500, AND PHOTOCAT SYSTEM. SIGNAL ALARM AT PLC. 22 SIGNALS ALARM AT AUTO DIALER. HIGH ALARM (LAH—405, LAH—406, LAH—407, AND LAH—408) AT DOUBLE CONTAINED PROCESS PIPING. TURN OFF PUMPS P-201, P-202, P-301, P-400, EXTRACTION WELL PUMPS P-101 THROUGH P-110, AND PHOTOCAT SYSTEM. TURN OFF PUMP P-500 FOR HIGH ALARM (LAH-408) ONLY. HIGH ALARM (LAH-409 AND LAH-410) AT FLOOR MOUNTED CONDUCTANCE PROBES. TURN OFF PUMPS P-201, P-202, P-301, P-400, EXTRACTION WELL PUMPS P-101 THROUGH P-110, AND PHOTOCAT SYSTEM. KY-500 Time delay relay is initiated when P-500 starts and is reset when P-500 stops. KY-500 is set for 30 minutes. When KY-500 times out it shuts off pumps P-101 through P-110, P-201, P-202, P-301, P-400, and Photocat system.

		LEGEND:	ABBREV	VIATIONS:
		PROCESS PIPING	A	AERATOR
		EXISTING PIPING/EQUIPMENT	AAH	PH ANALYZER ALARM HIGH
1	4 #	PNEUMATIC PIPING	AAL	PH ANALYZER ALARM LOW
		SKID MOUNTED EQUIPMENT	AC	AIR COMPRESSOR
		BUILDING PERIMETER	AD	AIR DRYER
	x	FENCE	AE	PH ANALYZER ELEMENT
	≥	BALL VALVE	Al	pH ANALYZER INDICATOR
	~	BUTTERFLY VALVE	AIT	PH ANALYZER INDICATING TRANSMITTE
	☆	GLOBE VALVE	AR	AIR RELEASE
	Le ²]	BALL CHECK VALVE	AVR	AIR/VACUUM RELEASE
	7	SWING CHECK VALVE	BF	BAG FILTER
	-₩-	SAMPLE TAP	BP	BY-PASS
1	- ₩ -P	PRESSURE GAUGE	BV	BALL VALVE
	AE	ANALYZER ELEMENT	CF	CARTRIDGE FILTER
	FM	FLOW METER (MECH.)	CV	CHECK VALVE
	11	FLANGED CONNECTION	DAI	DIFFERENTIAL pH INDICATOR
	D	ECCENTRIC REDUCER	DPI	DIFFERENTIAL PRESSURE INDICATOR
	D	REDUCER	DS	DISCONNECT SWITCH
	—-С	FEMALE HOSE FITTING	DWG	DRAWING
		OFNITOISUON DUMB	DV	DRAIN VALVE
	\mathcal{L}	CENTRIFUGAL PUMP	FCV	FLOW CONTROL VALVE
	(Щ)	DIAPHRAGM PUMP	GAC	GRANULAR ACTIVATED CARBON
		METERING PUMP	GV	GLOBE VALVE
		METERINO TOM	HDPE	HIGH DENSITY POLYETHYLENE
		INSTRUMENT SIGNAL	MC	MOTOR CONTROLLER
	*	PRESSURE RELIEF	мн	MANHOLE
	\square	VALVE	NC	NORMALLY CLOSED
	Z	PRESSURE REGULATING VALVE	P	PRIMARY PLC
	P	PNEUMATIC ACTUATOR	PC	PHOTO-CAT PRESSURE CONTROL VALVE
	Υ'		PCV	PRESSURE INDICATOR
		MALE HOSE FITTING	PI	PUBLICLY OWNED TREATMENT WORKS
-	\sim	FLEXIBLE HOSE	POTW PRV	PRESSURE REGULATING VALVE
		National Company of the Company of t	PVC	POLYVINYL CHLORIDE PIPE
		PURIFICS IN-LINE AERATOR	S	SECONDARY PLC
	Ø	AIR RELEASE	SCH	SCHEDULE
	₩ ₩		SDR	STANDARD DIMENSIONAL RATIO
	₩	AIR/VACUUM RELEASE	SP	SAMPLE PORT
	8	VACUUM BREAKER	T	TANK
		ICO DANDENED EITENO	TYP	TYPICAL
	الكككا	ISO DAMPENER FITTING	VB	VACUUM BREAKER
	ø	UNION	VFD	VARIABLE FREQUENCY DRIVE
		CAP	ø	DIAMETER
		w. u		

AIR FILTER

JAMES MICHAEL BEDESSEN

MS JB By Ckd

Date signed Project

INSTRUMENT IDENTIFICATION LETTERS

FIRST	LETTER		SUCCEEDING LETTERS		
MEASURE 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 = USER'S CHOICE	DIFFERENTIAL				
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 = USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE	
N = USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE	
0 = USER'S CHOICE		ORIFICE, RESTRICTION	OPEN		
P = PRESSURE, VACUUM		POINT (TEST) CONNECTION			
Q = QUANTITY	INTEGRATE, TOTALIZE				
R = RADIATION		RECORD	RUN		
S = SPEED, FREQUENCY	SAFETY	SWITCH	STOP		
T = TEMPERATURE			TRANSMIT		
U = MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION	
V = VIBRATION, MECH. ANALYSIS			VALVE, DAMPER, LOUVER		
W = WEIGHT, FORCE		WELL			
X = UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	
Y = EVENT, STATUS OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT		
Z = POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT		

- ANY FIRST LETTER COMBINED WITH MODIFIER REPRESENTS A NEW AND SEPARATE MEASURED VARIABLE. EXAMPLES: PD = DIFFERENTIAL PRESSURE FQ = TOTALIZED OR INTEGRATED FLOW. EXCEPTION IS THE MODIFIER "J" FOR MULTIPOINT SCANNING.
- EXCEPTION I THE MODIFIER S FOR MOLITHOUS STANDARD.

 2. FOR ANALYSIS NOT IDENTIFIED BY A SPECIFIC LETTER IN THE TABLE, USE FIRST LETTER "A"

 NEAR THE INSTRUMENT SYMBOL, SPECIFY THE NATURE OF THE ANALYSIS. EXAMPLE: PH

 3. MEANING OF A "USER CHOICE" LETTER SHALL BE CONSISTENT THROUGHOUT A PROJECT,

 AND SHALL BE SPECIFIED IN THE DRAWING LEGEND.

4. UNCLASSIFIED LETTER MAY HAVE A FEW DIFFERENT MEANINGS ON A PROJECT,
THE MEANING SHALL BE SPECIFIED NEAR EACH INSTRUMENT SYMBOL USING THE UNCLASSIFIED LETTER.

5. THE MODIFIER "SCAN" APPLIES TO MULTIPOINT PRINTING INSTRUMENTS,

SUCH AS CURS (MULTIPOINT CONDUCTIVITY RECORDER WITH ALARM SWITCHES).

INSTRUMENT SYMBOLS

	PRIMARY CONTROL PANEL NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY PANEL OR RACK NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS	\ominus	0	Θ
SHARED DISPLAY, SHARED CONTROL			
COMPUTER FUNCTION INCLUDING DISTRIB. CNTL. SYS.	\ominus	\bigcirc	\ominus
PROGRAMMABLE LOGIC CONTROLLER FUNCTION			

GENERAL NOTES:

- 1. ALL ANALOG SETPOINTS SHALL BE FIELD ADJUSTED BY OPERATOR AT HMI
- ALARMS THAT SHUT DOWN EXTRACTION WELLS AND TREATMENT EQUIPMENT MUST BE CLEARED BY OPERATOR BEFORE BEING RESTARTED.
- 3. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

ADCADIC	,
ARCADIS)

ARCADIS U.S., INC.

FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 7917

LOCKHEED MARTIN TALLEVAST SITE . TALLEVAST, FLORIDA CONSTRUCTION DRAWINGS

INTERLOCKS, LEGEND, AND ABBREVIATIONS

ARCADIS Project No. 30038055.0038.00002 ARCADIS 350 BUSCHWOOD PARK DR TAMPA FLORIDA 33618

M-6

NOT TO SCALE

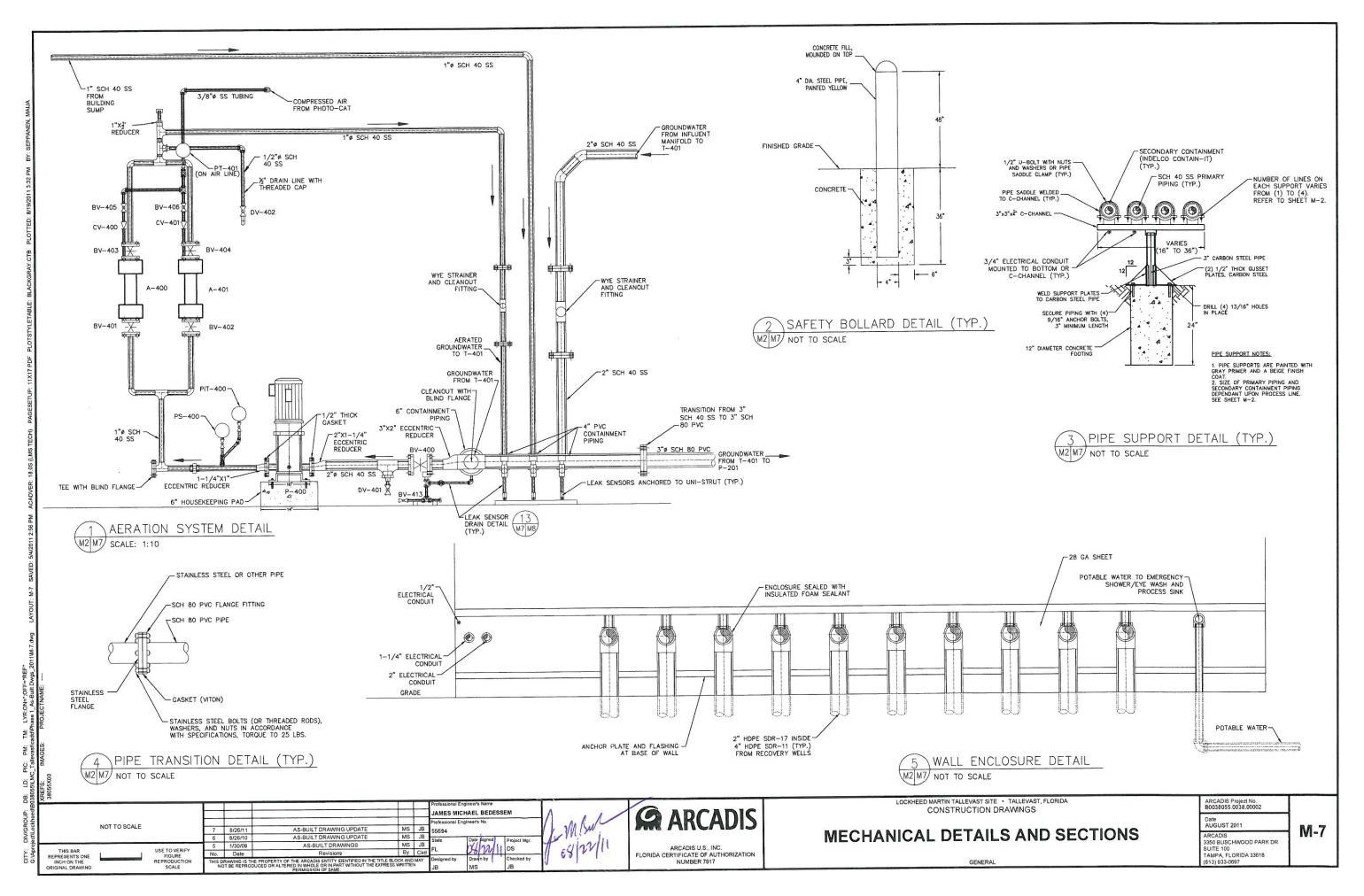
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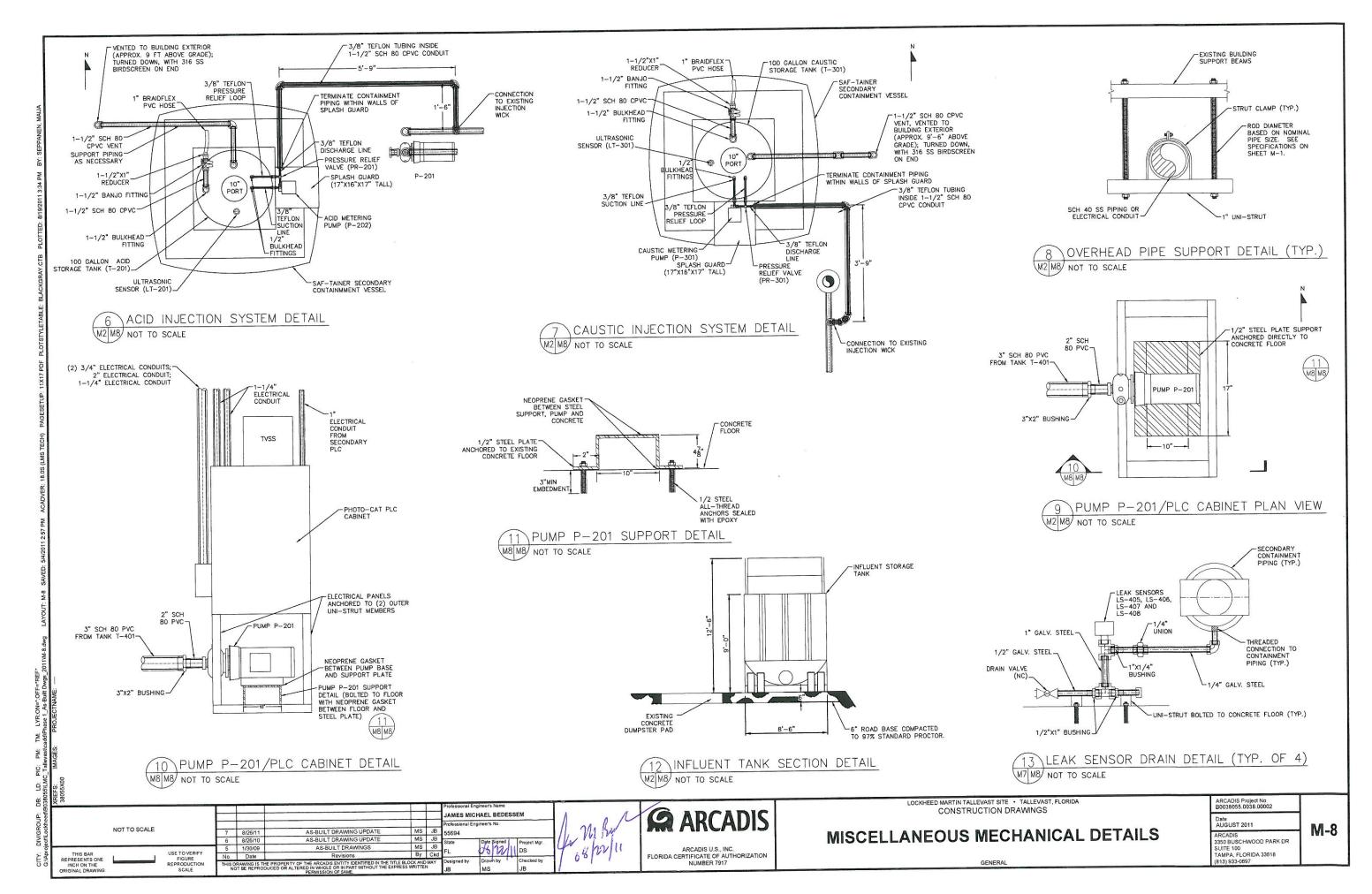
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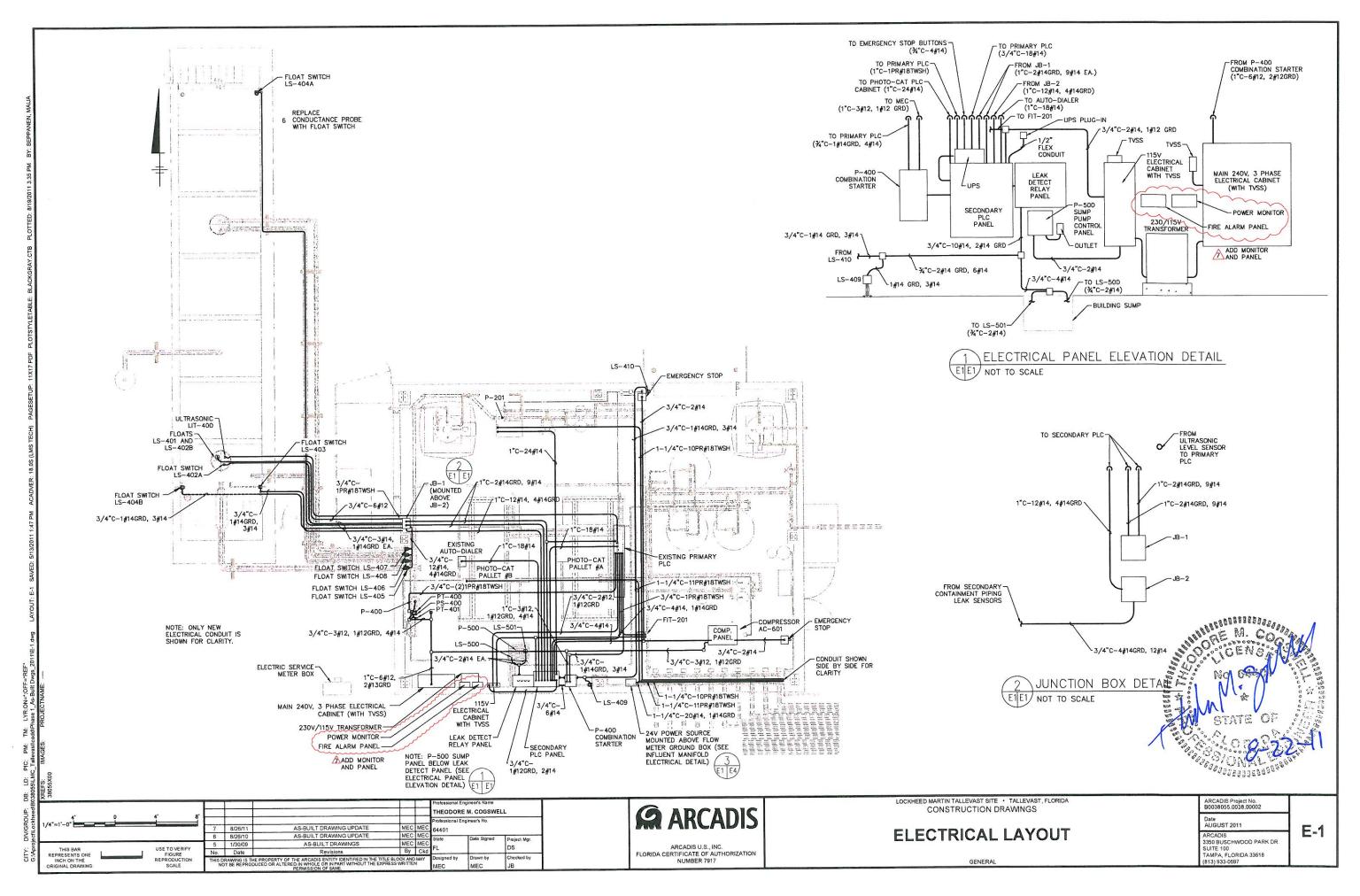
AS-BUILT DRAWING UPDAT

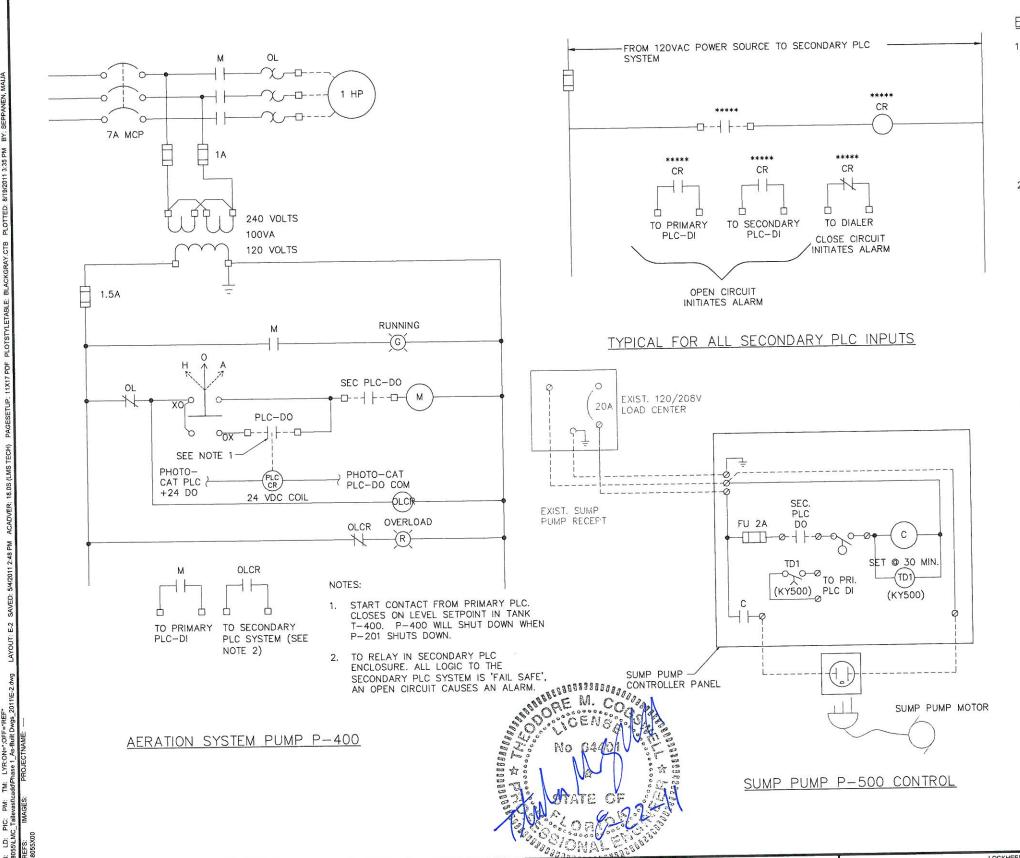
AS-BUILT DRAWING UPDATE

AS-BUILT DRAWINGS









ELECTRICAL SPECIFICATIONS

1. INSTALL TWO NEW THERMAL—MAGNETIC 15A, 3 POLE BREAKERS IN THE EXISTING 240 VOLT, 3 PHASE MAIN DISTRIBUTION PANEL. THE BREAKERS SHALL BE OF THE SAME MANUFACTURE AS THE EXISTING BREAKERS AND SHALL HAVE THE SAME INTERRUPTING RATING AS THE EXISTING BREAKERS. ONE BREAKER SHALL BE LABELED 'AERATION PUMP P—400' AND THE OTHER BREAKER SHALL BE I ABELED 'AERATION SYSTEM COMPRESSOR AC—601.

INSTALL ONE 15 AMP SINGLE POLE BREAKER IN THE 115 VOLT LOAD CENTER TO SUPPLY POWER TO THE SECONDARY PLC SYSTEM. THE BREAKERS SHALL BE OF THE SAME MANUFACTURE AS THE EXISTING BREAKERS AND SHALL HAVE THE SAME INTERRUPTING RATING AS THE EXISTING BREAKERS. THE BREAKER LABEL SHALL BE 'SECONDARY PLC SYSTEM'.

- CONDUIT ALL CONDUIT SHALL BE HOT DIPPED GALVANIZED STEEL (RGS). ALL FLEXIBLE CONDUIT SHALL BE LIQUID TIGHT METAL FLEXIBLE (LTMF) CONDUIT UL LISTED AS GROUND CONDUCTING. ALL FITTINGS SHALL BE THREADED TYPE. LTMF CONDUIT SHALL BE NOT GREATER THAT 24" AND NOT LESS THAN 9" IN LENGTH. CONDUIT IN GRADE SHALL BE PVC SCHEDULE 80. PVC CONDUIT SHALL CONVERT TO RGS NOT LESS THAN 2" ABOVE FINISHED GRADE AND NOT MORE THAN 6" ABOVE FINISHED GRADE. ALL METAL CONDUIT CONNECTIONS SHALL BE MADE USING A LIBERAL COATING OF A CONDUCTIVE SEALANT SUCH AS T&B'S KOPR SHIELD. THE CONDUCTIVE SEALANT SHALL BE UL APPROVED FOR ELECTRICAL CONDUIT USE. ALL JUNCTION AND PULL BOXES BELOW 30" ABOVE FINISHED FLOOR (AFF) INDOORS AND ALL BOXES OUTDOORS SHALL BE NEMA 4 METALLIC. CONDUIT SHALL BE SPACED A MINIMUM OF 1" FROM ANY SURFACE. ALL CHANNEL FOR CONDUIT SPACING, CONDUIT SUPPORT, TRAPEZE SYSTEMS, FOUIPMENT MOUNTING, ETC. SHALL BE HOT DIPPED GALVANIZED STEEL WITH A MINIMUM 1.5 OUNCES PER SQUARE FOOT PER SIDE AS PER ASTM A123. THE HANGER RODS FOR THE TRAPEZE SHALL BE &" DIAMETER 316 SS ALL THREAD ROD. MOUNTING HARDWARE SUCH AS BEAM CLAMPS, ETC. SHALL BE EITHER HOT DIPPED GALVANIZED STEEL TO THE COATING SPEC ABOVE OR 316 SS. ALL BOLTS, NUTS, WASHERS, CHANNEL SPRINGS, ETC. SHALL BE 316 SS.
- WRING WIRING SHALL BE STRANDED XHHW EXCEPT SIGNAL CABLE. SIGNAL CABLE SHALL BE TWISTED SHIELDED #18AWG. THE SHIELD SHALL BE 100% FOIL TYPE WITH DRAIN WRE. SIGNAL WRING SHALL NOT BE SPLICED. AT ITS TERMINI, A GIVEN SIGNAL CABLE SHALL WIRED TO 3 CONSECUTIVE TERMINALS (+, -, DRAIN) IN ORDER TO KEEP THE STRIPPING OF THE OUTER INSULATION AND SHIELD TO A MINIMUM. SPLICING OF CONTROL AND POWER WRING, WHERE NECESSARY, SHALL BE DONE VIA TERMINALS IN A JUNCTION BOX WITH A BACK PANEL TO MOUNT THE TERMINALS. WIRE NUT SPLICES ARE NOT ACCEPTABLE.
- THE SECONDARY PLC SYSTEM SHALL BE MOUNTED WITHIN A NEMA 12 METALLIC ENCLOSURE. THE ENCLOSURE SHALL BE SUPPLIED WITH AN INTERNAL MOUNTING PANEL. THE ENCLOSURE SHALL BE OF SUFFICIENT SIZE TO HOUSE THE SECONDARY PLC RACK AND ALL ITS COMPONENTS; THE 3 POLE RELAYS TERMINALS FOR ALL FIELD WIRING, ETC. THE ENCLOSURE SHALL ALSO CONTAIN A UPS CAPABLE OF PROVIDING 2 HOURS OF OPERATING TIME AT MAXIMUM LOAD. EVERY THING WITHIN THE ENCLOSURE POWERED BY THE LIGHTING PANEL CIRCUIT FOR THE SECONDARY PLC SYSTEM SHALL BE CONSIDERED THE LOAD FOR THE THE SECONDARY PLC SHALL NOT BE CONNECTED TO ANY REMOTE VIEWING, PROGRAMMING OR REMOTE SET POINT DEVICE. EACH SECONDARY PLC DIGITAL OUTPUT POINT SHALL BE ISOLATED, RELAY OUTPUT TYPE. THE DIGITAL OUTPUT SHALL DRIVE A RELAY WITH A 120V COIL AND THE OUTPUT SHALL BE IN SERIES WITH THE LOAD DEVICES INTENDED TO BE SHUT DOWN. ALL SYSTEMS SHALL BE FAIL SAFE. THE RELAY COILS SHALL BE ENERGIZED UNDER NORMAL CONDITIONS. THE PLC I/O SHALL HAVE A MINIMUM OF 25% SPARES AND SHALL BE EXPANDABLE BEYOND THE SPARES. THE RELAY SHALL BE A "ICE CUBE" PLUG-IN TYPE WITH 3PDT CONTACTS RATED FOR \$ HP AT 120 VAC. THE COIL SHALL BE 120VAC WITH PILOT LIGHT.
- 5. SUMP PUMP CONTROL PANEL CONTACTOR—SQUARE D 8502SB05V02; TIME DELAY RELAY—SQUARE D 9050JCK18V20 WITH 8501NR51 RELAY BASE; FUSE, FIELD TERMINAL STRIP AND DIN RAIL; TWO BOTTOM MOUNTED METALLIC CORD GRIP CONNECTORS FOR THE PUMP CORD AND THE FLOAT CORD; ENCLOSURE—NEMA 12 METAL WITH CONTINUOUS PIANO HINGE AND FLANGE CLAMPS, INTERIOR EQUIPMENT MOUNTING PANEL.

| Professional Engineer's Name | Professional Engineer's Name

ARCADIS

ARCADIS U.S., INC.
FLORIDA CERTIFICATE OF AUTHORIZATION
NUMBER 7917

LOCKHEED MARTIN TALLEVAST SITE • TALLEVAST, FLORIDA CONSTRUCTION DRAWINGS

ELECTRICAL DETAILS

ARCADIS Project No. B0038055.0038.00002

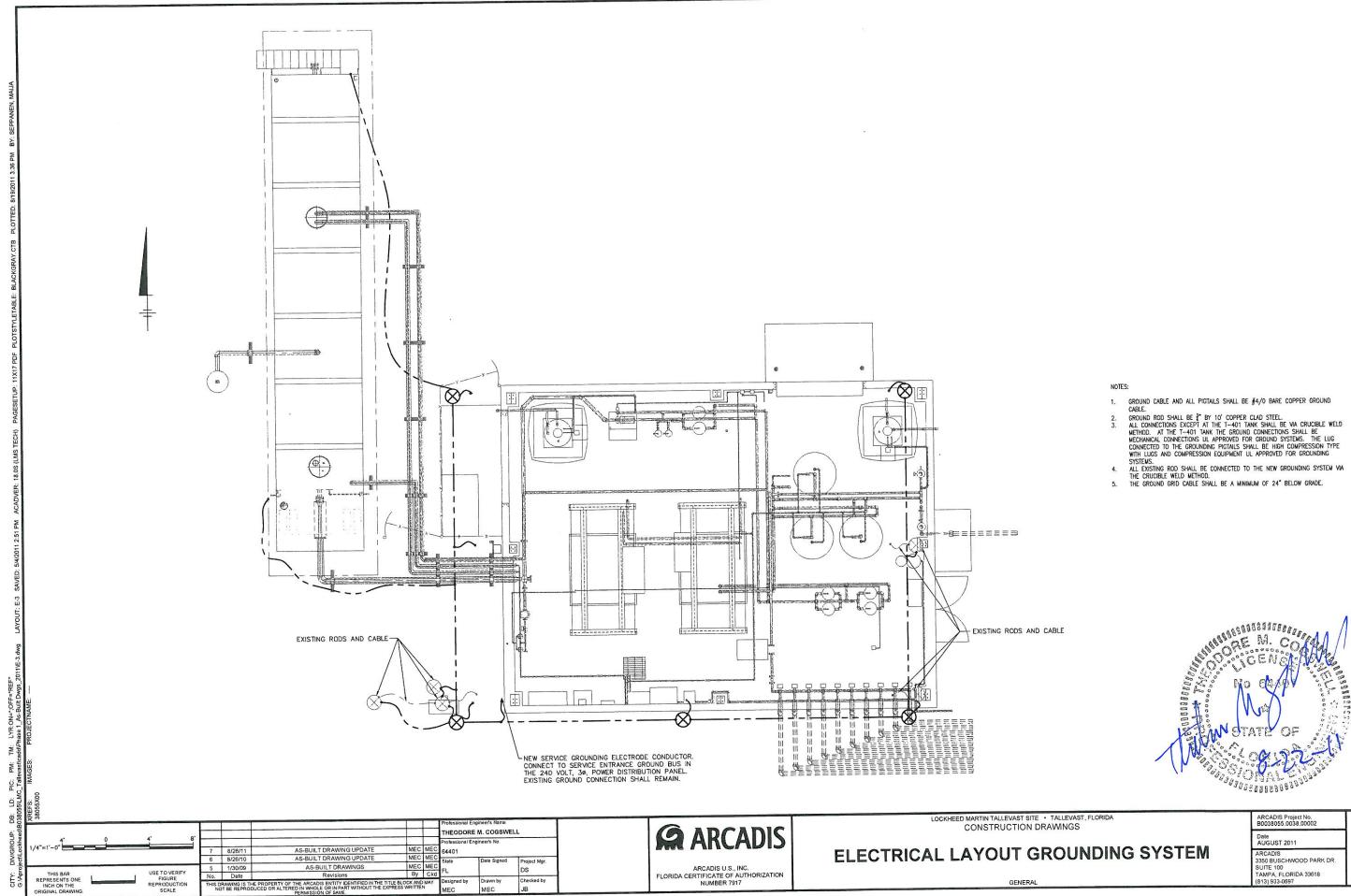
Date AUGUST 2011

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