

Mr. William Kutash Florida Department of Environmental Protection Waste Management Division 13051 N. Telecom Parkway Temple Terrace, FL 33637-0926 14055 Riveredge Drive Suite 400 Tampa Florida 33637

ARCADIS

Tel 813.933.06973125 Fax 813.903.3129 www.arcadis-us.com

CONSTRUCTION

Subject

Amendment to Corrective Action Plan for Interim Groundwater Treatment System Former American Beryllium Company Site OGC #04-1328
Tallevast, Manatee County, Florida

Dear Mr. Kutash:

Lockheed Martin Corporation (Lockheed Martin) submitted a Corrective Action Plan for the Interim Groundwater Treatment System on September 19, 2008. We would like to amend the plan submitted to replace rather than repair the existing influent tank/containment dike system and also add instrumentation to monitor for leaks in the dual containment piping between the building and the new double-wall tank. After further review, it was determined that there would be significantly less impact to the site and surrounding community if we were to simply replace the existing system with a double-walled tank system. The use of a double-walled tank system will still allow the use of triple-redundant level switches/alarms for monitoring the primary tank level as well as the interstitial space between the inner and outer tanks, however, the specific types of switches will be slightly modified because the tank construction. The revised level monitoring approach is described below.

The primary tank will include an ultrasonic level transmitter that will be programmed with multiple actuation levels that include:

- 1. Low Level Alarm shuts down the extraction and treatment system
- 2. Low Level stops the influent pump to the treatment system and the aeration recirculation pump.
- Start Level 1 starts the aeration recirculation pump. This set point is
 intended to ensure that the influent tank contains oxygenated water and the
 iron remains precipitated so that the iron removal system functions properly

Date:

September 30, 2008

Contact:

James M. Bedessem, P.E.

Phone:

813.903.3125

Email:

jim.bedessem@arcadisus.com

Our ref: B0038055

Florida License Numbers

Engineering EB00007917

Geology GB310

Landscape Architecture LC26000269

Surveying LB7062

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when the treatment system influent pump turns on.

- 4. Start Level 2 starts the treatment system influent pump.
- 5. High Level Alarm shuts down the extraction and treatment system, including the aeration recirculation system.

To provide redundant backup to this ultrasonic level transmitter, two additional high level switches and one low level switch will be installed in the tank. The switch type, alarm condition, and action for each are shown below.

| Switch Type | Alarm Condition | Action on Alarm |
|---------------------|-----------------------|--|
| Float Switch | Low-Low Level Alarm | Shuts down the extraction and treatment system, including the aeration recirculation system. |
| Float Switch | High-High Level Alarm | Shuts down the extraction and treatment system, including the aeration recirculation system. |
| Conductivity Switch | High-High Level Alarm | Shuts down the extraction and treatment system, including the aeration recirculation system. |

A similar triple redundant switch and alarm setup will be used to monitor for liquid within the interstitial space between the inner and outer tank walls. Three (3) independent conductivity switches will be installed to monitor and alarm on detection of liquid in the interstitial space of the double wall tank. An alarm condition for any of the switches will shut down the extraction system and treatment system, including the aeration recirculation system.

Instrumentation monitoring of the containment piping between the new double-wall influent tank and building will be done using conductivity switches. This will provide an additional factor of safety over visual monitoring of the containment piping. The drawing package has been revised to show the location of the new double-walled tank and process monitoring modifications. The drawings are provided in Attachment 1.

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Mr. William Kutash
September 30, 2008

If you have any questions or need additional information regarding the proposed amendment to the Corrective Action Plan, please contact me directly at 813.903.3125, or jim.bedessem@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.

James M. Bedessem, P.E. Associate Vice President

M. Bul

Florida P.E. License No. 55694

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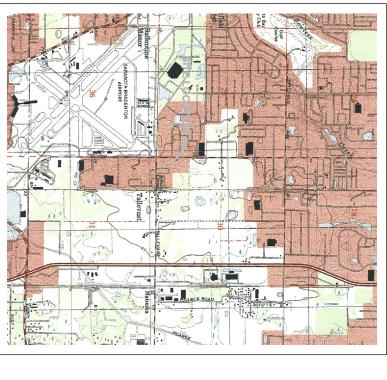
Attachment 1

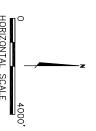
Design Drawings

AERATION SYSTEM RED CONSTRUCTION DRAW NGS ESIGN

FORMER AMERICAN BERYLLIUM CO MPANY

1600 TELLEVAST ROAD SARASOTA, FLORIDA





SOURCE: MAPTECH-TERRAIN NAVIGATOR PRO - ST. PETERSBURG, FLORIDA 200°

SEPTEMBER 2008

INDEX OF DRAWINGS

TITLE

GENERAL INFORMATION AND SPECIFICATIONS
LAYOUT OF PROPOSED IRON REMOVAL MODIFICATIONS
PROCESS & INSTRUMENTATION DIAGRAM
PROCESS & INSTRUMENTATION DIAGRAM
PROCESS & INSTRUMENTATION DIAGRAM
INTERLOCKS, LEGEND, AND ABBREVIATIONS

M-1 M-2 M-3 M-4 M-4 M-5 M-6 M-6 M-7 **ELECTRICAL DETAILS**

9/26/08 9/19/08 9/10/08 9/4/08 Date

NOT TO SCALE

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

TITLE, LOCATION, INDEX OF DRAWINGS

ORMER AMERICAN BERYLLIUM COMPANY SITE • TALLEVAST, FLORIDA CONSTRUCTION DRAVVINGS

Date SEPTEMBER 2008 ARCADIS Project No. 90038055.0002.00010

ARCADIS 3350 BUSCHWOOD PARK DR. SUITE 100 SHEET COVER NOT

9/26/08 9/19/08 9/10/08 9/4/08 Date

ISSUED FOR PERMITS
ISSUE TO FLORIDA DEP
AERATION SYSTEM REDESIGN
PRELIMINARY CONCEPT REVIEW

MS JB
MS JB
JR JB
By Ckd

Date Signed

Project Mgr. DS Checked by

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

JAMES MICHAEL BEDESSEM Professional Engineer's No.

<u>Project Overview</u>

The information and drawings in this design package are for the construction of a new aeration system within the existing groundwater extraction and treatment system located at the Former American Beryllium Company (FABC) Site at the following address: American Beryllium Company

The existing system was designed to extract groundwater that has been impacted with volatile organic compounds (VOCs), treat the water to reduce the concentrations of VOCs, and then discharge the treated water to the City of Sarasota sanitary sewer system. The system includes ten groundwater extraction wells (RW-1 through RW-10) and an interim groundwater treatment system that was installed on the FABC property. The 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 treatment process

Proposed Changes to Flow Equalization

Groundwater pumped from the groundwater recovery system is initially discharged into a 20,000 gallon tank that sits inside a 22,000 gallon containment dike. 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. The tank has a passive vent used to regulate pressure as the tank is filled and drained. This air venting from this tank is treated using vapor—phase GAC. This influent tank/containment dike system will be replaced with a 17,640 gallon double—wall tank. be

Proposed Changes to Aeration System

Groundwater is circulated from the influent equalization tank through an aeration system to aid in removal of iron from the water. After groundwater passes through the aeration system, it is saturated with oxygen. The oxygen saturated water is returned to the influent equalization tank for further mixing with incoming groundwater. The existing aeration system will be removed from its existing location within the containment dike and replaced inside the adjacent treatment system building. The proposed aeration system will include of a new centrifugal pump, with double mechanical seals and associated seal flushing system; two inline aerators; an air compressor and associated piping, instrumentation, and appurtenances.

Pre-AOP Filtration Systems

After the groundwater is aerated, the water is pumped through a series of bag 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 will remove particulates and protect the subsequent AOP system from scaling and clagging. As the bag and cartridge filters become clagged, they are manually changed out by the system operator.

Advanced Oxidation Processes (AOPs)
The AOP technology is the primary treatment method to reduce concentrations of VOCs in the recovered groundwater. The unit was 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 hydroxy radicals that attack the bands in the organic molecules, progressively oxidizing these compounds into benign end—products of carbon dioxide (CO2) and water (H2O), and salts.

Granular Activated Carbon Polishing

A series of three GAC vessels provide an additional level of treatment for the chlorinated VOCs including chlorinated ethanes and ethenes in the event of an upset condition in the AOP process. Thus, the GAC is intended to provide a factor or safety against unintended discharges of chlorinated organics and not primary treatment. Two GAC vessels operate at one time, while the other remains in standby mode. As the useful life of the operating GAC vessel is reached the vessel is taken out of service and replaced with the standby vessel.

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

The following specifications apply to the proposed changes to the of the existing Groundwater Treatment System: aeration

- 1. CONTRACTOR must comply with all applicable local, state, and codes at all times. All CONTRACTOR and their subcontractor perso HAZWOPER trained and current with all applicable refresher training.
 2. The contaminants of concern include VOCs and metals that has Site's soil and groundwater. Additional information e, and federal health personnel shall be and safety 40-hour OSHA
- Site's soil and groundwater. Additional information regarding the types contaminants at the Site will be provided upon request. types and concentrations 앜
- 3. It is CONTRACTOR's responsibility for educating its supervisors, employees, and subcontractors of all health and safety requirements. CONTRACTOR is responsible for worker safety and maintenance of traffic during construction. CONTRACTOR shall maintain a Health and Safety Plan on Site during construction.

 4. At a minimum, all ansite CONTRACTOR personnel shall be in Level D at all times (hard hat,
- I toes, and safety glasses with hard side shields) NO SMOKING will be permitted at any time on the the facility property.

Pipe and Valve Materials

steel 5.

- Pipe identified materials include stainless steel and polyvinyl chloride (PVC). Piping materials are on the Piping and Instrumentation Diagram. Additional specifications are identified
- 2. Stainless Steel Pipe shall be Type 316L SS, Schedule 40 for all pipe sizes, conform ASTM A312 UNS Alloy S31603 for ¼" to 30" diameter seamless and welded austentitic stainless steel piping. Stainless steel fittings shall be manufactured in accordance with / A403 for wrought austenitic stainless steel piping fittings. Connections shall be welded flanged with beveled ends for pipe larger than 2" diameter and plain ends for pipe smal 2" diameter.

 3. Stainless steel flanged according to the control of the con pipe smaller than conforming ASTM d or
- 3. Stainless steel flanged connections shall be provided, at a minimum, at piping connections to equipment, tonks, 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 stainless steel, shop welded to the pipe at the locations shown on the drawings.

 4. Stainless steel tubing for air service shall be rated for 150 psi minimum and shall have 0.032" minimum wall thickness, Seamless, ASTM A269 GR. TP 316, Soft Annealed 316 Stainless Steel. Compression fittings shall be flareless, consisting of type 316 stainless steel body, nut and ferrules. Acceptable manufacturer's include Swagelock, Gyrolock or A-Lock.

 5. 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 vitan seals, unless otherwise specified on contract drawings. All valves shall be furnished with lockable handles.

 7. Globe valves shall be manual globe valves with tefan seats, vitan seals, and socket connections, as manufactured by asahi america or equal.

Above—ground Piping Installation

- 1. The CONTRACTOR shall provide adequate pipe supports for both horizontal and vertically-mounted pipes. For stainless steel piping, pipe supports shall be provided spacing of no more than 7 feet, and within 2 feet of all joints.

 2. The piping shall be positioned to minimize tripping hazards and maintain head where possible. Walkways shall be installed over pipes installed at ground level in forms. provided
- 4. 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 or his own expense.

 The underside of all overhead piping in treatment building shall be at least 7-6" above are easily read Pressure gauges, flow meters, and other instrumentation shall be installed in locations that easily readable and accessible for maintenance.
- finished floor.

 6. The exact locations of drains, vents, sample taps, and pressure gauges shall be determined in the field during constructions.
- beling of equipment and piping shall include, but not be limited to flow directional type of material being contained by piping, equipment identification placards, and safety

and Liquid Service

- CONTRACTOR shall complete pipe tests for aboveground piping. The ENGINEER shall rve the pipe tests.

 Pipe tests for liquid service shall be conducted using clean potable water. Pipe shall be conducted using clean potable water.
- 2. 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 pressure of 90 psi and will lost for a minimum of 1 hour ar as much time as may be required to properly inspect all joints and connections. Hydrostatic test acceptance shall be +/- 5 percent 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.

 4. CONTRACTOR shall provide a pressure test of the pressure and 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 pressure of 150 psi. Pressure test will last for a minimum of 1 hour. Hydrostatic test acceptance shall be +/-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.
- Hydrostatic test acceptance shall be +/- 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 10 psig for at least 2 hours.

 6. 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. Records of the pipe test shall be made by the CONTRACTOR of each pipe segment c submitted to the ENGINEER. The test records shall include the following:

 a. Date of test
 b. Description of pipe segment tested
 c. Test pressure, air temperature, and time before and after test
 d. Remarks (including description of test results, description of leaks, and leak repairs)
 e. Signature of CONTRACTOR. ntify and repair the leaks. The pipe(s) must be re—tested after the e test results are achieved.

 e test shall be made by the CONTRACTOR of each pipe segment and NEER. The test records shall include the following:

Welding Specifications

- Welders shall be certified in accordance with ASME BPVC Section IX, Welding and Brazing Qualifications 2007). certified in accordance with ASME BPVC Sec IX (Boiler and Pressure Vessel na and Brazing Qualifications — 2007). CONTRACTOR shall submit welding
- Code Section IX, Welding and Brazing Qualifications 2007). CONTRACTOR shall submit welding certificates for personnel.

 2. 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.

 3. Welding preparations, preheating, welding execution, heat treatment, assembly, and erection of piping shall be performed in accordance with ASME B31.3, Process Piping 2006.

 4. CONTRACTOR shall minimize the number and location of field welds required for assembly of process piping.

 5. CONTRACTOR shall be responsible for field verification of all piping lengths for shap

- fabrication.

 No welding shall be performed when the quality of the completed weld may be impaired by the prevailing working or weather conditions.

 Welds shall be visually inspected as follows:

 Before welding for compliance with requirements for joint preparation, alignment, cleanliness, etc.

 b. After welding for cracks, contour, finish, undercutting, overlap, and size of fillet welds.

 Ten percent of welds shall be tested using radiography to verify completion.

Restoration of Surfaces

- disturbed, quality of equivalent OWNER. R All types of surfaces, pavement, sidewalks, curbs, gutters, culverts and other features isturbed, damaged, or destroyed during the performance of work shall be restored. The uality of materials and the work used in the restoration shall produce a surface or feature quivalent or superior to the prior existing condition subject to approval by ENGNEER and WNER. Replacement paving for asphalt surfaces shall be as shown an construction drawings.
- asphalt 2. Cı 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 be limited to soil, rubble, asphalt, concrete, pipe, etc. The disposal of all construction debris be at a licensed waste disposal/treatment facility. Cuttings and excavated materials stored onsite, in an area designated by ENGINEER, shall ding but not debris shall

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ENERAL INFORMATION A ND SPECIFICATIONS

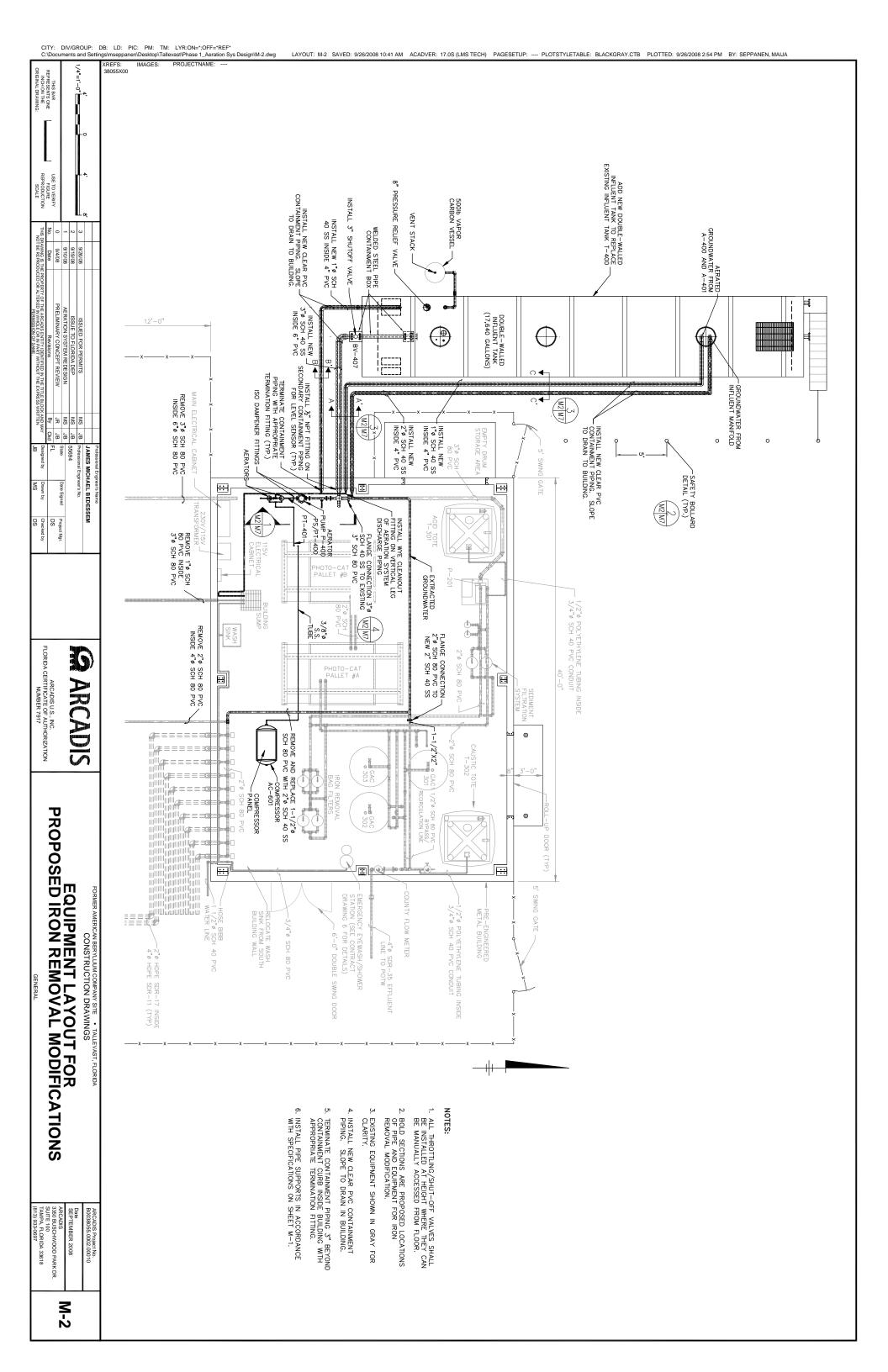
AMERICAN BERYLLIUM COMPANY SITE • TALL
CONSTRUCTION DRAWINGS

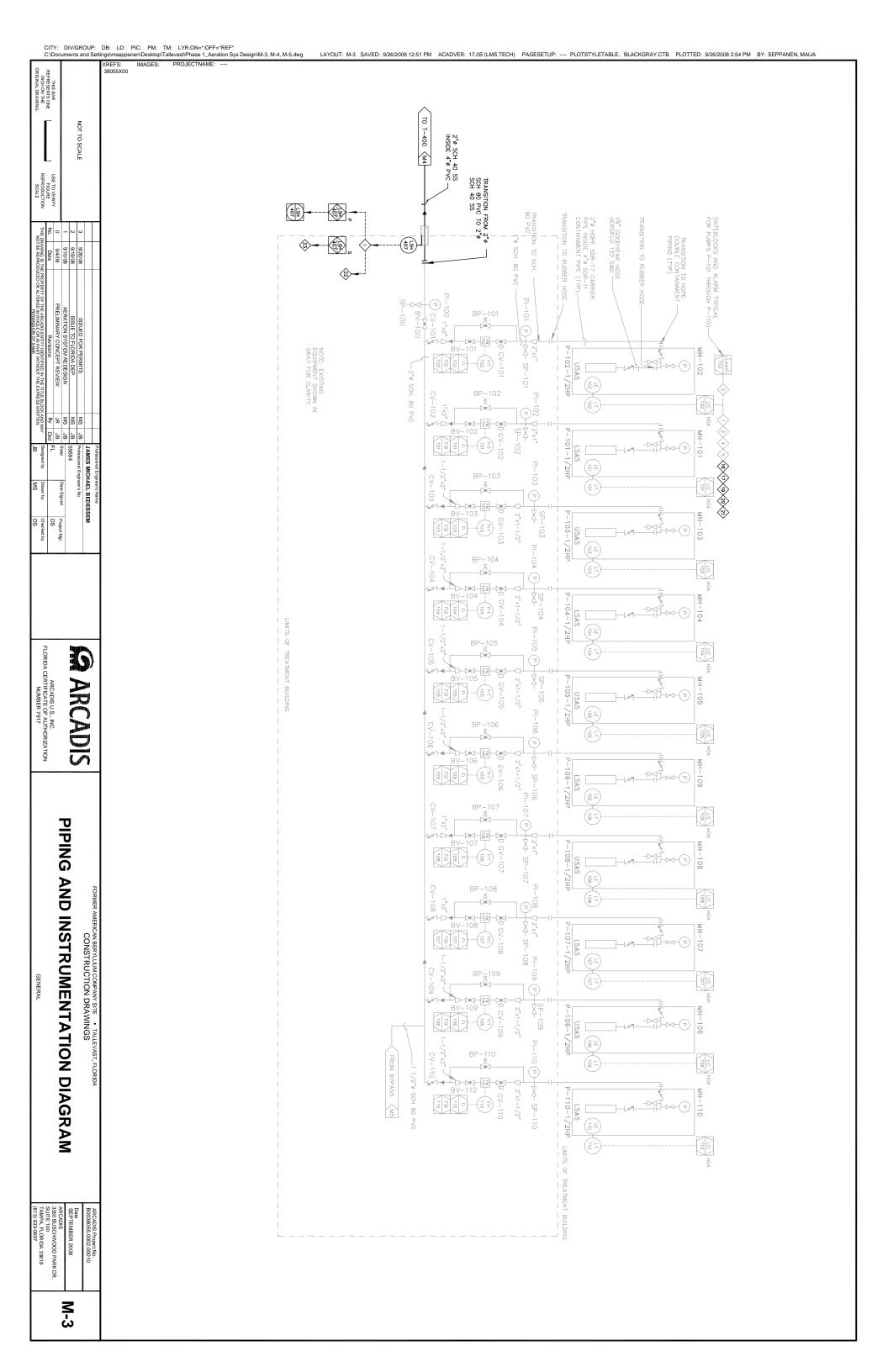
LEVAST, FLORIDA

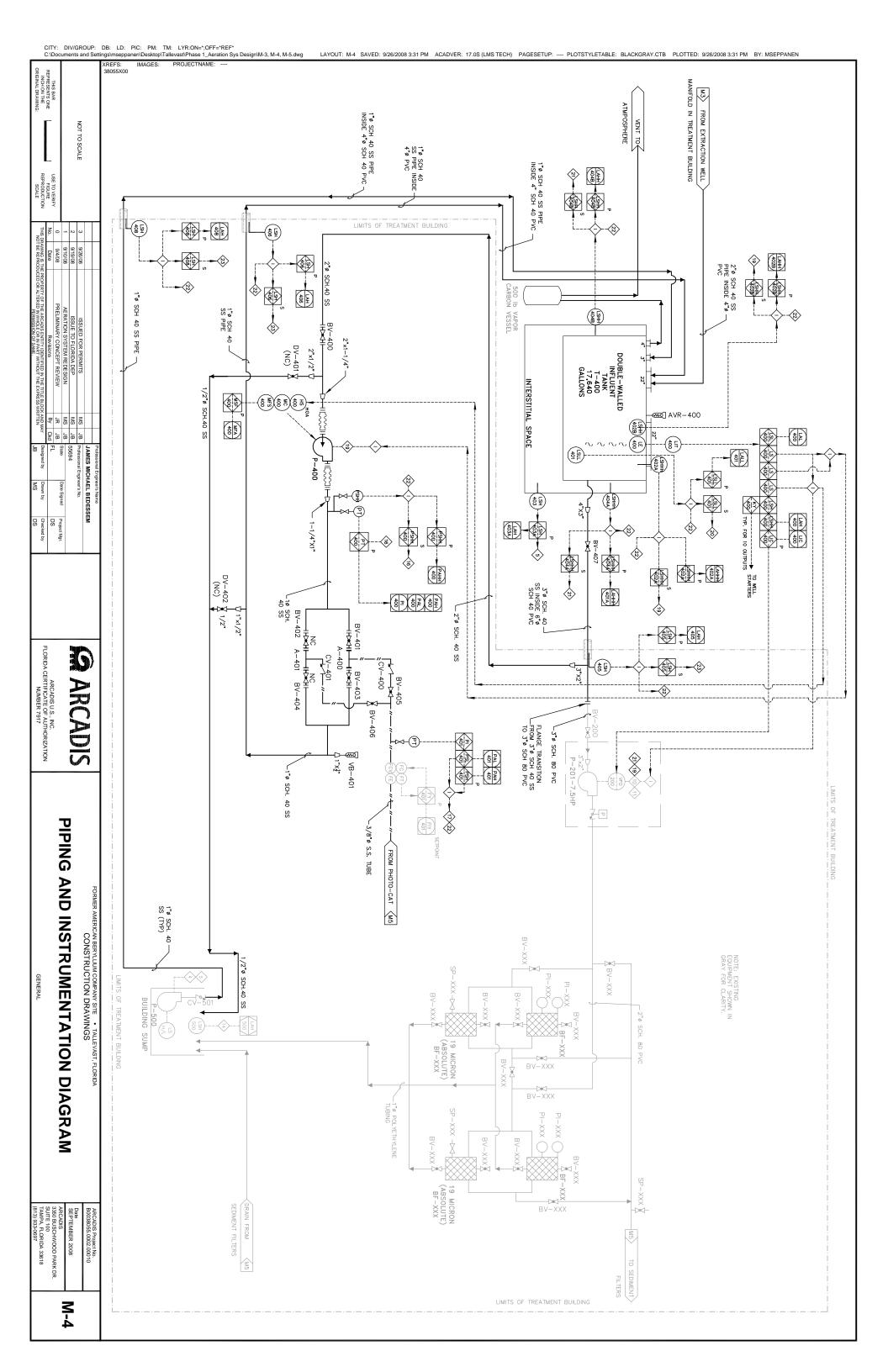
SEPTEMBER 2008

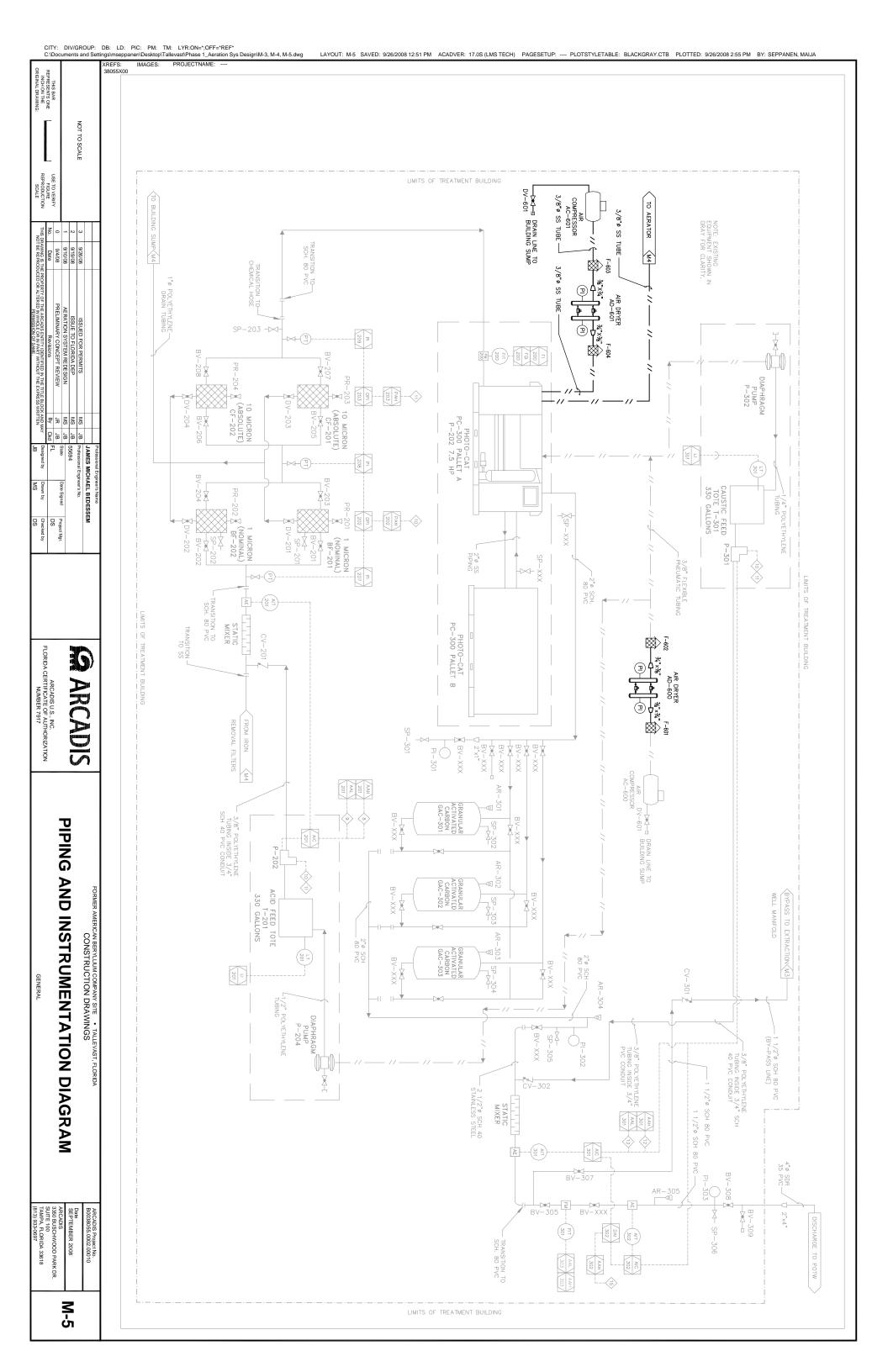
ARCADIS Project No. B0038055.0002.00010

3350 BUSCHWOOD PARK DR.
SUITE 100
TAMPA, FLORIDA 33618
(813) 933-0607









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ALL ANALOG SETPOINTS SHALL BE FIELD ADJUSTED BY OPERATOR AT HIN INTERFACE SCREEN.

GENERAL NOTES:

3. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. 2. ALARMS THAT SHUT DOWN EXTRACTION WELLS AND TREATMENT EQUIPMENT MUST BE CLEARED BY OPERATOR BEFORE BEING RESTARTED.

INTERLOCKS, LEGEND AI AN BERYLLUM COMPANY SITE • TALLEVAST, FLORIDA CONSTRUCTION DRAWINGS

ND ABBREVIATIONS

3350 BUSCHWOOD PARK DR. SUITE 100 TAMPA, FLORIDA 33618 (813) 933-0697 Date SEPTEMBER 2008 ARCADIS ARCADIS Project No. B0038055.0002.00010 **⊠**-6

Z = POSITION, DIMENSION M = USER'S CHOICEY = EVENT, STATUS OR PRESENCE X = UNCLASSIFIEDW = WEIGHT, FORCE0 = USER'S CHOICED = USER'S CHOICE B = BURNER, COMBUSTIONHAND A = ANALYSIS= VIBRATION, MECH. = SPEED, FREQUENCY = RADIATION = QUANTITY = PRESSURE, VACUUM = TIME, TIME SCHEDULE = CURRENT (ELECTRICAL) = FLOW RATE = VOLTAGE = USER'S CHOICE = MULTIVARIABLE = TEMPERATURE USER'S USER'S CHOICE MEASURE OR INITIATING VARIABLE ANALYSIS RATIO (FRACTION) SAFETY INTERGRATE, Ĭ SCAN DIFFERENTIAL AXIS AXIS AXIS RATE OF CHANGE TOTALIZE MODIFIER RECORD SWITCH WELL POINT (TEST) CONNECTION 띥단 ALARM UNCLASSIFIED MULTIFUNCTION ORIFICE, RESTRICTION INDICATE GLASS, VIEWING DEVICE SENSOR (PRIMARY ELEMENT) USER'S CHOICE USER'S CHOICE READOUT OR PASSIVE FUNCTION DRIVE, ACTUATOR,
UNCLASSIFIED
FINAL CONTROL ELEMENT RUN SPEN MULTIFUNCTION CONTROL STATION RELAY, COMPUTE, UNCLASSIFIED USER'S CHOICE CONTROL, CLOSED VALVE, DAMPER, LOUVER TRANSMIT JSER'S CHOICE OUTPUT FUNCTION DING LETTERS INTERMEDIATE MIDDLE, Ξ MULTIFUNCTION UNCLASSIFIED USER'S CHOICE NO L USER'S CHOICE MODIFIER

INSTRUMENT

IDENTIFICATION LETTERS

NOTES:

VARIABLE.

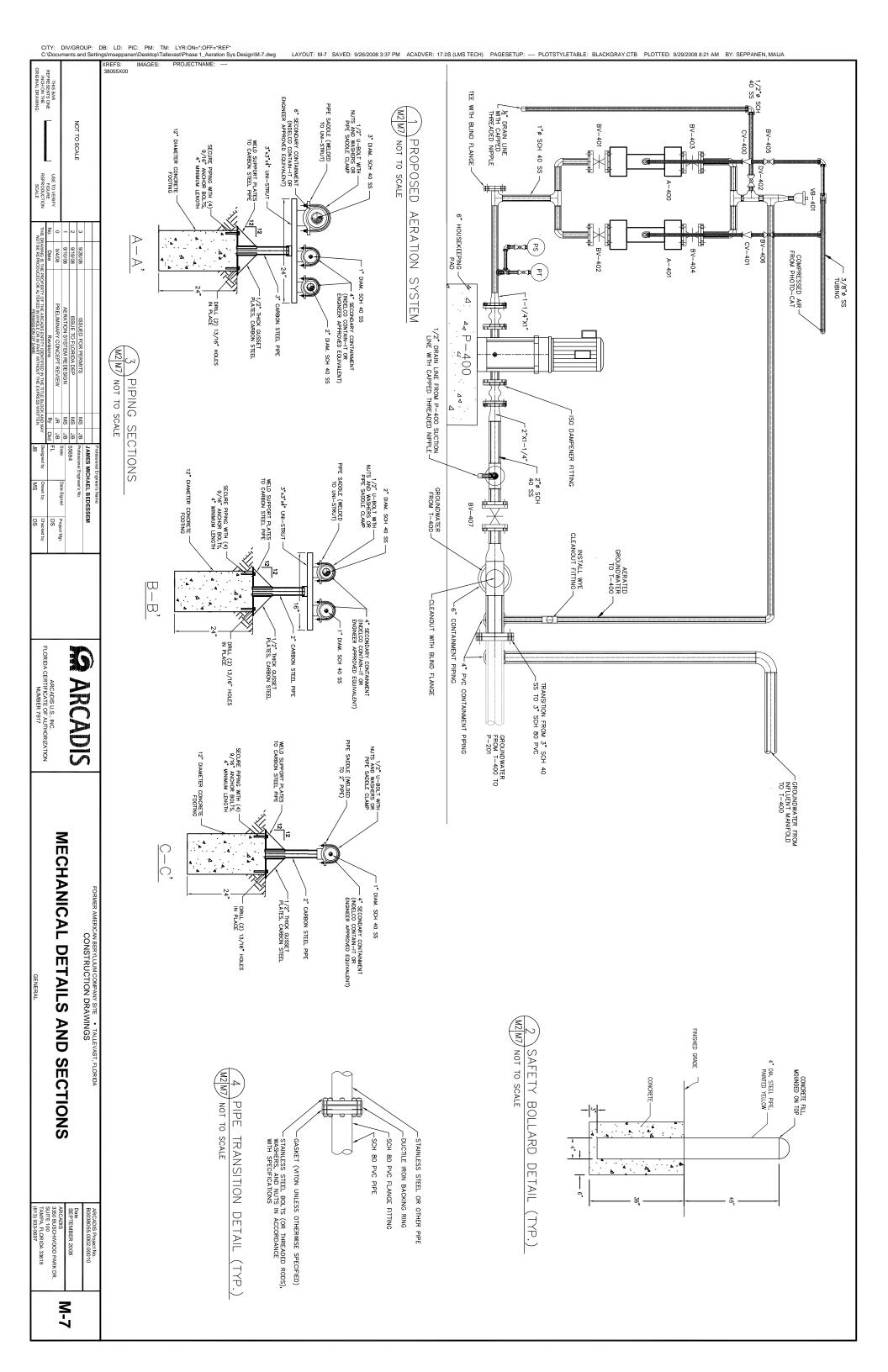
1. ANY FIRST LETTER COMBINED WITH MODIFIER REPRESENTS A NEW AND SEPARARE MEASURED EXAMPLES: PD = DIFFERENTIAL PRESSURE FQ = TOTALIZED OR INTEGRATED FLOW. EXCEPTION IS THE MODIFIER "J" FOR MULTIPOINT SCANNING.

2. FOR AMALYSIS NOT IDENTIFIED BY A SPECIFIC LETTER IN THE TABLE, USE FIRST LETTER "A" NEAR THE INSTRUMENT SYMBOL, SPECIFY THE MATURE OF THE AMALYSIS. EXAMPLE: PH 3. MEANING OF A "USER CHOICE" LETTER SHALL BE CONSISTENT THROUGHOUT A PROJECT, AND SHALL BE SPECIFED IN THE DRAWING LEGEND.

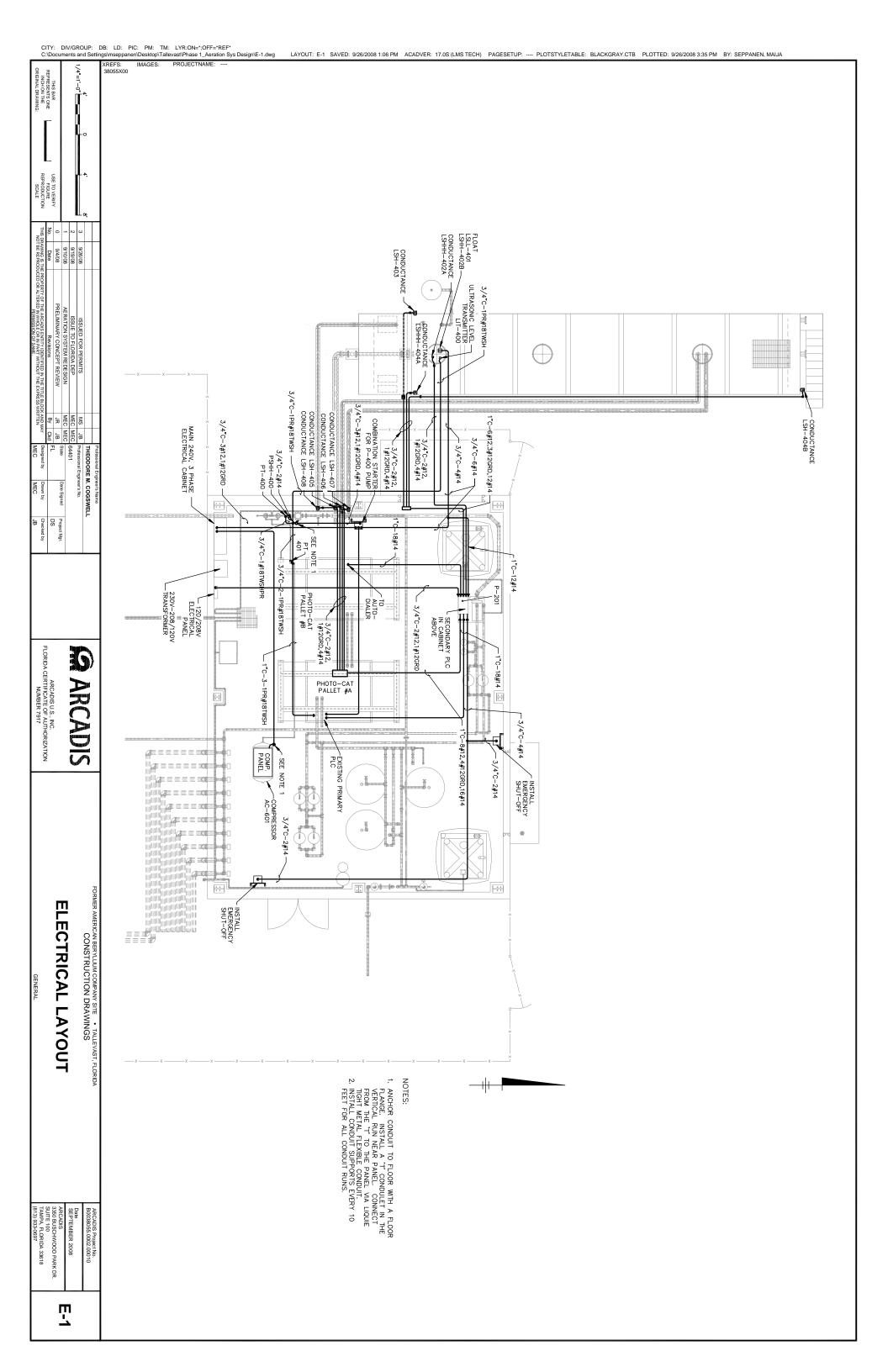
4. HOLASSIFED LETTER MAY HAVE A FEW DIFFERENT MEANINGS ON A PROJECT, THE MEANING SHALL BE SPOTFED NEAR EACH INSTRUMENTS SYMBOL USING THE UNCLASSIFIED STITEM STATEMENT SYMBOL USING THE UNCLASSIFIED STITEMENT SOME SHALL BE SPOTFED NEAR EACH INSTRUMENTS, SUCH AS CARS (MULTIPOINT CONDUCTIVITY RECORDER WITH ALARM SWITCHES).

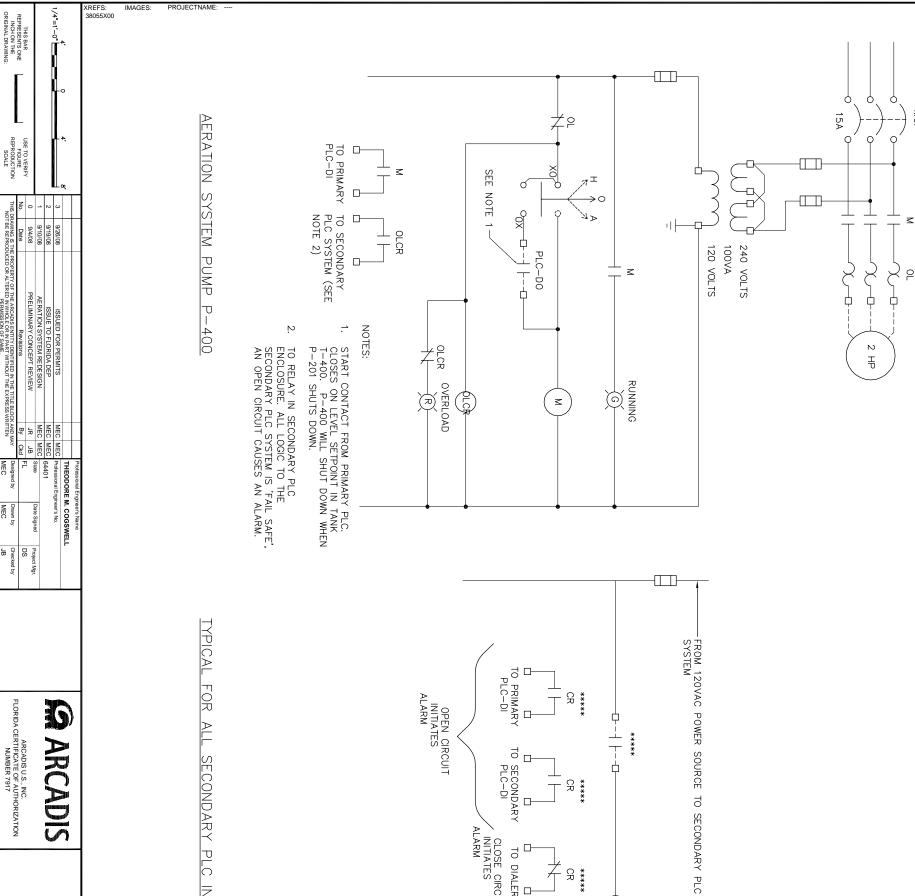
INSTRUMENT SYMBOLS

| | | | | ED LETTER. |
|---|---|-----------------------------------|----------|---|
| PROGRAMMABLE LOGIC CONTROLLER FUNCTION | COMPUTER FUNCTION INCLUDING DISTRIB. CNTL. SYS. | SHARED DISPLAY, SHARED CONTROL | DISCRETE | |
| | \Diamond | | Ф | PRIMARY CONTROL PANEL NORMALLY ACCESSIBLE TO OPERATOR |
| | | | | FIELD MOUNTED |
| | • | | | AUXILIARY PANEL OR RACK NORMALLY ACCESSIBLE TO OPERATOR |



<u>Ş-1</u>





OPEN CIRCUIT INITIATES ALARM

7

) SECONDARY PLC-DI

TO DIALER

CR ***

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CLOSE CIRCUIT
INITIATES
ALARM

<u>ELECTRICAI</u> **SPECIFICATIONS**

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 LABELED 'AERATION SYSTEM COMPRESSOR AC-601'.

INSTALL ONE 15 AMP SINGLE POLE BREAKER IN THE 120/208 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 AS THE EXISTING BREAKERS. PLC SYSTEM'.

2. 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 CONDUIT 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 \$\frac{1}{4}\$ FROM ANY SURFACE. ALL

CHANNEL FOR CONDUIT SPACING, CONDUIT SPORT, TRAPEZE SYSTEMS,

EQUIPMENT 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 \$\frac{1}{4}\$ 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 \$16 SS. ALL BOLTS, NUTS, WASHERS, CHANNEL SPRINGS, ETC. SHALL

BE \$16 SS. ALL BOLTS, NUTS, WASHERS, CHANNEL SPRINGS, ETC. SHALL

BE \$16 SS. BE EITHER OR 316 SS. BE 316 SS.

WRING — WIRING SHALL BE STRANDED XHHW EXCEPT SIGNAL CABLE. SIGNAL CABLE SHALL BE TWSTED SHIELDED #18AWG. THE SHIELD SHALL BE 100% FOIL TYPE WITH DRAIN WIRE. SIGNAL WIRING 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 WIRING, 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.

4. 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 CONITAIN A UPS CAPABLE OF PROVIDING 2 HOURS
OF OPERATING TIME AT MAXIMUM LOAD. EVERY THING WITHIN THE
ENCLOSURE AND POWER BY THE LIGHTING PANEL CIRCUIT FOR THE
SECONDARY PLC SYSTEM SHALL BE CONSIDERED THE LOAD FOR THE UPS.
THE SECONDARY PLC SYSTEM SHALL 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 PLC
I/O SHALL HAVE A MINIMUM OF 25% SPARES AND SHALL BE EXPANDABLE
BEYOND THE SPARES.

SECONDARY

PLC

INPUTS

SUBMIT SHOENGINEER'S DRAWINGS FOR ALL EQUIPMENT, CONDUIT, WIRE, ETC. FOR

LECTRICAL DETAILS

AN BERYLLIUM COMPANY SITE • TALLEVAST, FLORIDA
CONSTRUCTION DRAWINGS

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

ARCADIS

SEPTEMBER 2008 ARCADIS Project No. 30038055.0002.00010 0 BUSCHWOOD PARK DR. TE 100 MPA, FLORIDA 33618 I) 933-0607

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