

Prepared for:

County of Kaua'i Solid Waste Division

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**REPORT OF
CONSTRUCTION QUALITY ASSURANCE**

**PHASE II LEACHATE MANAGEMENT SYSTEM
MODIFICATIONS**

**Kekaha Sanitary Landfill
Kaua'i, Hawai'i**

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**Project Number: WG1548
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1. INTRODUCTION

1.1 Background

This report summarizes the construction quality assurance (CQA) monitoring activities performed by Geosyntec Consultants, Inc. (Geosyntec) for the Phase II Leachate Management System Modifications at the Kekaha Sanitary Landfill (Kekaha Landfill) in Kaua'i, Hawai'i. This report has been prepared for the County of Kaua'i Solid Waste Division to satisfy the requirements of the Hawai'i Department of Health (HDOH). The CQA activities were performed in accordance with the project specifications and construction drawings for the project [AECOM, 2010a, 2010b, and 2014].

The construction and CQA oversight were completed in two stages. The first stage involved multiple mobilizations between 16 February 2012 and 7 May 2013 and included the retrofit of the leachate collections manhole (LCMs) and replacement of the two existing wet wells and associated pumping systems per the original design [AECOM 2010a and 2010b]

Geosyntec issued a draft CQA report in August 2013 covering the work completed during the first stage of construction. As of the date of the draft report, the construction activities associated with the original project had been completed; however, sustained, automated operation of the pumping systems had not yet been achieved.

After subsequent review and troubleshooting, AECOM issued a retrofit design [2014] for replacement of the original pumps, reconfiguration some of the electrical components and pump controls. This construction of this second stage of the project was completed between 31 August and 25 September 2015.

This report summarized the construction and CQA activities for both stages of construction.

1.2 Organization of Report

The remainder of this report is organized as follows:

- a description of the project including a summary of changes to the original design is presented in Section 2;
- the CQA program is summarized in Section 3;
- details of the CQA program during earthwork are presented in Section 4;
- details of the CQA program related to HPDE piping and manhole structures are presented in Section 5;
- a summary of the system start-up demonstration tests is presented in Section 6;
- the summary and conclusions from the CQA work are presented in Section 7;
- certification is presented in Section 8;
- references are included in Section 9; and
- limitations on the application of information presented in this report are described in Section 10.

Photographic documentation related to the CQA activities is presented in Appendix A. Project correspondence and contractor submittals, are included in Appendices B and C respectively. CQA documentation, including daily field reports, laboratory soil test results, field moisture/density test results, and high density polyethylene (HDPE) pipe pressure tests results, are included in Appendices D through G. Red-lined construction drawings are provided in Appendix H. The as-built survey drawings, are presented in Appendix I. The system demonstration documentation and the operations and maintenance manual are in Appendix J and K, respectively.

1.3 Responsible Parties

The responsible parties involved in the Phase II Leachate System Modifications included the Owner, the Design Engineer, the Construction Manager, the General Contractor, and the CQA Consultant. The technical personnel for each entity, who were key participants in the construction, are listed in Section 1.4.

The County of Kaua'i (County) is the owner of the site, and was responsible for funding and project management.

Waste Management of Hawai'i (WMH) is the operator of the site, and was responsible for site access and construction management.

AECOM was the Design Engineer, and prepared the Phase II Leachate Management System Modification construction drawings and project specifications. As the Design Engineer, AECOM was responsible during construction for interpreting and answering design questions, reviewing design modifications and addressing material submittals if they did not meet the requirements of the technical specifications.

The General Contractor for the project was Earthworks Pacific, Inc. (EP). EP was responsible for all construction associated with the removal of the existing Wet Wells #1 and #2, installation of new Wet Wells #1 and #2 and modifications to the existing leachate collection manholes (LCM's) 1-14.

The Surveyor was Esaki Surveying and Mapping, Inc. (Esaki). Esaki was responsible for performing surveys for various constructed components and providing the final record survey drawing.

CQA services were provided by Geosyntec. Geosyntec's responsibilities included, reviewing contractor submittals, sampling and testing of materials for conformance with technical specifications, observing and testing of contractor's work, documenting conformance with project specifications, and preparing this report.

1.4 Project Technical Personnel

The key technical personnel involved in the modification of the existing leachate collection system are listed below:

County of Kaua'i (Owner)

Donald M. Fujimoto, P.E. - Project Manager (Stage one)

Troy Tanigawa, P.E. - Engineer

AECOM (Design Engineer)

Kenneth J. Bergschultz, P.E. - Design Engineer of Record (Stage one)

Paul Wintheiser – Senior Engineer

Frank Cioffi, P.E. - Senior Engineer

Waste Management of Hawai'i, Inc. (Operator/Construction Manager)

Jesse Frey, P.E. – Construction Manager (Stage one)

John Ruiz- District Manager

Earthworks Pacific, Inc. (General Contractor)

Keith Perry - Regional Manager/Project Manager

Bryan Davidson - Regional Manager/Project Manager

David Abreu - Site Foreman

EPG Companies, Inc. (Pump and Control Supplier to EP)

Howard Lester – Technician (Stage one)

Jim Hasslen – Technician (Stage two)

Joe Hasslen – President

Esaki Surveying & Mapping, Inc. (Surveyor)

Dennis M. Esaki, L.S. - Surveyor-of-Record (Stage one)

Geosyntec Consultants, Inc. (CQA Consultant)

Michael J. Minch, P.E. - CQA Officer

Chris Scott - Field Manager

2. PROJECT DESCRIPTION

2.1 Background

Kekaha Landfill is an approximate 98-acre disposal facility owned by the County, and operated by WMH. Kekaha Landfill is located on the southwest side of the Island of Kaua'i, Hawai'i, approximately 1.3 miles northwest of the town of Kekaha. The disposal facility comprises two distinct disposal units, Phase I and Phase II, a leachate evaporation pond, and administration and maintenance facilities.

Phase II, which was began operations in 1993, has a sloped base liner system which drains to the north. Leachate drains through the leachate collection and removal system (LCRS) by gravity and exits Phase II through pipes into a series of manholes located immediately north of the landfill edge. There are 14 leachate collection manholes (LCMs) which are connected by piping and drain by gravity to two wet well pumping stations. From these two wet wells, leachate is pumped to the leachate evaporation pond.

The original configuration of the LCMs and wet wells resulted in localized emission of landfill gas along the north side of Phase II. This project involved retrofitting the LCMs and replacing wet wells and associated pumps and utilities to reduce emissions and to upgrade the system to accommodate future landfill expansion.

2.2 Reference Documents

The following references include the applicable design and construction documents related to the construction of the overall project:

- *Construction Drawings, Phase II Leachate Management System Modifications, Kekaha Sanitary Landfill, Kauai, Hawaii, HI*, prepared by AECOM, October 2010.

- *Project Specifications for Phase II Leachate Management System Modifications, Kekaha Sanitary Landfill, County of Kauai, HI, prepared by AECOM, October 2010.*
- *Construction Drawings, Pumping System Modifications, Phase II Leachate Management System Modifications, Kekaha Sanitary Landfill, Kauai, Hawaii, HI, prepared by AECOM, May 2014*

2.3 Description of Work

The Phase II Leachate Management System Modification project included the following primary activities:

- surveying;
- removal of existing Wet Wells #1 and #2;
- removal of existing valve boxes;
- installation of the new Wet Well #1 and #2;
- installation of the new meter valve boxes;
- installation of the new control panels for Wet Well #1 and #2;
- installation of new pumping systems and automated level control for Wet Well #1 and 2; and
- modification of existing LCMs 1 thru 14.

2.4 Design Modifications

2.4.1 Introduction

A few changes to the design were made during construction. These changes were made either to improve the performance of the project, to simplify its construction, or to adjust for field conditions. Each change was reviewed and approved by AECOM, the Design Engineer, prior to implementation. The changes were documented either in written email correspondence or in the RFI process¹ (Appendix B). The following subsections describe the amendments and modifications along with the reasons for each change.

2.4.2 Wet Well # 1 and 2 Configuration (RFI 1)

During the submittal process for the Wet Well #1 and #2 HDPE structures, EP proposed revisions to the design in shop drawings for approval. The revised configuration included the following:

- moving the pump discharge tee from inside to outside the wet well for clearance reasons;
- adding a HDPE mounting bracket to support the pump rain system;
- adjusting pipe penetration locations;
- adjusting the standpipe location to match the hatch location; and
- adding ports for pressure testing of the interstitial space.

Shop drawings and related correspondence are provided in RFI 1 – R1 and R2 in Appendix B. The revised configuration was found to meet the design intent and was approved by AECOM.

¹ The RFI process included clarifications and responses from the Design Engineer which may or may not impact the design. Therefore, the RFIs described in Section 2.4 do not necessarily include all RFIs. Additionally, changes to the design were not necessarily captured in the RFI process. Therefore, some changes may not have an associated RFI.

2.4.3 LCM Fitting and Connection Changes (RFIs 2, 3, 15, 17, and 18)

Adjustments to the pre-fabricated LCM fittings and connections were proposed by EP due to the as-delivered condition, clearance issues, fitting availability, and existing pipe configurations. A combination of Fernco fittings and HDPE pipe adjustments were made to connect the pipes while creating a gas-tight seal consistent with the design intent. These changes were reviewed and approved by AECOM and are included in RFIs 2, 3, 15, 17, and 18 (Appendix B)

2.4.4 LCM 2 thru 13 Surface Completions (RFIs 5 and 16)

The prefabricated HDPE pipe fitting designed to connect the LCM inlet and outlet pipes sections were found to be too large to install through the top of the 24-inch diameter manhole openings. In response to RFI 5 (Appendix B), AECOM provided an approved modification to the LCM surface completions. The modification involved removing the upper sections of LCMs 2 thru 13 to provide access through the full 48-inch manhole section. After fitting installation, a cast-in-place concrete footing was installed and an epoxy-coated precast concrete lid was installed over the opening. Backfill soil was placed over the lids to restore grade. Raven AquataPoxy A6 epoxy was used to coat the lids as described in RFI 16.

2.4.5 Meter Valve Box Piping Configuration (RFI 6)

The specified 3-inch EPG meter and piping did not fit inside the 5-ft diameter meter valve box as shown in Construction Drawings. EP proposed modifying the piping as shown in RFI 6 and RFI 6-R1 (Appendix B). AECOM has approved the modification shown in RFI 6-R1 which was found to meet the design intent.

2.4.6 Stainless Steel Check Valve Obstruction (RFI 7)

During installation of the 3-inch LCRS discharge piping inside the wet well structure the support rail system was found to obstruct installation of the 3-inch external stainless steel check valves. In response to RFI 7 (Appendix B) AECOM has approved omitting the redundant 3-inch stainless steel check valve since the SurePump system is equipped with an internal check valve.

2.4.7 Electrical Breakout Junction Box Seal (RFI 8)

During installation of the electrical breakout junction boxes located at the top of the wet well structures excessive moisture was observed inside of the junction box. In response to RFI 8 (Appendix B), AECOM recommended filling the conduit with silicone caulk or other non-hardening water proof compound to complete the seal rather than using EYS seal-offs.

2.4.8 Interstitial Leak Detection Control (RFI 9)

Control wiring for the wet well interstitial space leak detection system was not included in the original control panels provided by EPG. During installation, EP's electrical subcontractor, R Electric identified the issue. In response to RFI 9 (Appendix B) AECOM recommended a Warrick Control monitoring panel for the leak detection system. These separate panels were installed into both of the main control panels to monitor the interstitial spaces.

2.4.9 Meter Valve Box Relocation (RFI 10)

The 5-ft diameter meter valve box design originally showed the boxes in close proximity to the main access road as shown on Sheets 8 and 10 of the Construction Drawings. The meter valve boxes are not traffic-rated and therefore, were located outside of the access road. In response to RFI 10 (Appendix B), AECOM approved relocating both meter valve boxes to new location provided that the fundamental design concepts are maintained. The as-built locations are shown in Appendix I.

2.4.10 Wet Well #1 Surface Restoration and Protection (RFI 11)

Due to the proximity to the road and landfill traffic, EP recommended a surface completion around Wet Well #1 which included a concrete slab and bollards. Based on EP's cost estimate, the County of Kaua'i elected to use ecology blocks, and gravel as a surface completion instead of the proposed concrete to reduce overall cost.

2.4.11 Wet Well #1 Invert Elevation Field Modification (RFI 12)

During installation of the Wet Well #1 structure, the existing 18-inch inlet piping entering the wet well from adjacent LCM 5 was higher than expected in the Construction Drawings. In response to RFI 12 (Appendix B), AECOM approved modification to the existing piping to connect the new wet well piping to the existing 18 inch inlet piping.

2.4.12 Leachate Collection Manhole 14 Piping Configuration (RFI 14-R1)

During inspection of existing LCM 14 structure, several issues were discovered affecting the plumbing connections within the LCM. EP's proposed re-configurations are shown in RFI 14-R1 (Appendix B), were approved by AECOM, and met the design intent.

2.4.13 Wet Wells #1 and #2 Set Point Elevations (RFI 21)

During troubleshooting of the pumping system, adjustments were made at the recommendation of AECOM to various pump set points (high level alarm, pump on, pump off, low level alarm) for each of the four pumps. These recommended set points are shown in RFI 21 (Appendix B)

2.4.14 Air Relief Valves

During troubleshooting of the pumping system, air relief valves were installed in the pump discharge piping within the wet wells and in the valve boxes. Photos of the air relief valve locations are provided in Appendix A. Sketches of the valve locations are shown in Appendix D, report number 94.

2.4.14 Replacement of Original Pumping System and Pump Controls

In May 2014, AECOM revised the design of the pumping system and level controls for both Wet Well #1 and #2. The original dual EPG model VSD 30-26 Surepumps and associated brackets and discharge piping were removed and replaced with a single Flygt

Model NP-3085.92 pumps and new discharge piping and anchor point. Coupled with the pump replacement was a re-configuration of the pump controls and the addition of two float switches to serve as a backup system to the pressure transducer for the high level alarm and low level/pump cutoff controls. Details of the replacement pump system and controls are shown in the 2014 Construction Drawings in RFI #25 in Appendix B. These revisions are documented in Submittals 33 through 38 in Appendix C and daily field reports 102 through 115 in Appendix D.

3. CONSTRUCTION QUALITY ASSURANCE (CQA) PROGRAM

3.1 Scope

3.1.1 Introduction

Geosyntec's scope of work for the Phase II Leachate System Modifications included the following:

- construction quality assurance; and
- preparation of this report.

3.1.2 Construction Quality Assurance

Geosyntec's primary role during the Phase II Leachate Management System Modifications was as the CQA Consultant. The services performed were consistent with the project specifications and included:

- visually classifying, collecting samples of, and evaluating test results for all borrow soils to assure suitability for construction;
- monitoring compaction and final grading for surface completion;
- monitoring HDPE pipe welding and pressure air testing;
- monitoring the installation of pipes, fittings, pumps, vaults, panels, and associated utilities;
- monitoring and documenting system start-up testing; and
- documenting construction activities.

4. EARTHWORK QUALITY ASSURANCE

4.1 Soil Excavation

Geosyntec CQA personnel monitored the excavation of soils to remove the existing Wet Wells # 1 and #2, portions of the LCMs, meter valve boxes, and associated utilities. EP excavated the soil with an excavator and stockpiled the soil adjacent to where backfill would be needed. The excavated material was used as backfill.

4.2 Backfill Placement

Geosyntec personnel monitored placement of backfill as needed to restore grades around the underground structures and utilities. The CQA activities performed during these phases of construction included:

- observing the placement and compaction procedures for compacted fills;
- modified Proctor compaction tests (ASTM D1557) for maximum density evaluation; and
- in-situ moisture/density testing (ASTM D6938) of the compacted fills.

Backfill was placed in conformance with Section 02334 of the project specifications. The backfill (onsite soil) was placed in a manner such that the maximum compacted lift thickness was approximately 6 inches upon the completion of compactive effort. The fills were compacted to a minimum relative compaction of 95% as determined by ASTM D1557.

Areas that did not meet the required minimum dry density were reworked as necessary until field testing indicated that the areas met the specification. Daily field reports describing the construction and CQA activities were completed and are presented in Appendix D. Laboratory soil test results are presented in Appendix E. The results of fill in-situ moisture/density tests are included in Appendix F.

5. HDPE PIPE AND MANHOLE QUALITY ASSURANCE

5.1 General

JM Eagle-manufactured HDPE pipe and fittings were used for the Leachate Management System Modifications. Pre-fabricated HDPE wet well and meter valve boxes were manufactured by Plastic Fusion Fabricators, Inc. of Huntsville, Alabama.

Geosyntec observed the delivery and offloading of the HDPE materials and verified that the delivered materials conformed to the technical specifications. Offloading, storage, and assembly was monitored and Geosyntec verified that no damage occurred during handling and placement. The sizes of the various pipe were verified to conform with the construction drawings. Welding and placement of the pipes was performed by EP and was observed by Geosyntec to ensure that the welding techniques met industry standards and requirements of the project specifications.

5.2 Pressure testing

Pressure testing was performed on both the wet well and meter valve box structures and the assembled leachate discharge piping system. Plastic Fusion Fabricators pressure tested Wet Wells #1 and #2 and meter valve boxes under vacuum for 30 minutes. No leaks were detected. To verify that no damage occurred during shipping, EP performed onsite pressure tests of the interstitial space of dual-contained Wet Well #1 and #2. One-hour pressure tests of 3 psi and 5 psi were performed on Well Well #1 and #2², respectively and no leaks or pressure drops were observed. EP also tested the HDPE discharge piping in three segments at 10 psi pressure for 1 hour. Geosyntec monitored all of the onsite pressure testing and all tests as met the project specifications². Results of all vacuum and pressure testing are presented in Appendix G.

² Based on discussions with the fabricator and AECOM, onsite testing of the wet well structures was performed as lower pressures than the HDPE pipes in order to reduce the risk of damage due to testing.

6. SYSTEM START-UP DEMONSTRATION

Sections 01814 and 01816 of the project specifications require a system operations demonstration be performed in the presence of the equipment supplier and Engineer or Owner's representative. Three separate start-up system demonstration tests were performed as part of the CQA activities.

The first two start-up demonstration tests were performed on the original EPG pumps in 2012 and 2013. The start-up demonstration tests reports for these test are included in Appendix J for completeness, however these two tests have been superseded.

Following the 2015 pump replacement, system start-up demonstrations tests were performed on the pump and control systems in both Wet Wells #1 and #2. The start-up demonstration procedure for the pumps and controllers include the following steps:

- 1) Set the system in automatic mode;
- 2) Fill the Wet Well using the water truck until the pump starts;
- 3) Record the pump-on level, pump rate, pump cycle duration, volume pumped, and pump-off level;
- 4) Run the pump on manually and record the low-alarm level;
- 5) Turn the pump off and fill the wet well until the high alarm comes on;
- 6) Place the pump in automatic mode for operation; and
- 7) Remove the leak detection sensor and submerge in a container of water to verify the leak detection light is illuminated.

At the end of the testing, the control panels, pumps, transducer, and floats were verified to function as designed. Start-up demonstration test reports are provided in Appendix J. The pump operation levels for Wet Wells #1 and #2 are shown in Figures 1 and 2.

7. SUMMARY AND CONCLUSIONS

The modification of Phase II leachate management system at the Kekaha Sanitary Landfill in Kaua'i, Hawai'i, occurred during the period of 16 February 2012 through 25 September 2015. Geosyntec provided qualified CQA personnel on site to monitor the construction activities as required by the project specifications.

During construction, Geosyntec verified that the project was constructed in accordance with the contract documents, including the approved construction drawings and project specifications as revised by the Design Engineer during construction. Geosyntec also verified that conditions or materials identified as non-conforming to the project specifications were rejected, resolved, or repaired and retested as described in this report.

8. CERTIFICATION

Based on the observations of Geosyntec Consultants, Inc. during construction, as well as on the data presented in the appendices of this report, the leachate management system modifications at the Kekaha Sanitary Landfill in Kaua'i, Hawai'i, were constructed in accordance with the project specifications and construction drawings with revisions as stated in this report.



Michael J. Minch
14901-C
CQA Officer

9. REFERENCES

AECOM [2010a] “*Construction Drawings, Phase II Leachate Management System Modifications, Kekaha Sanitary Landfill, Kauai, Hawaii*,” October 2010.

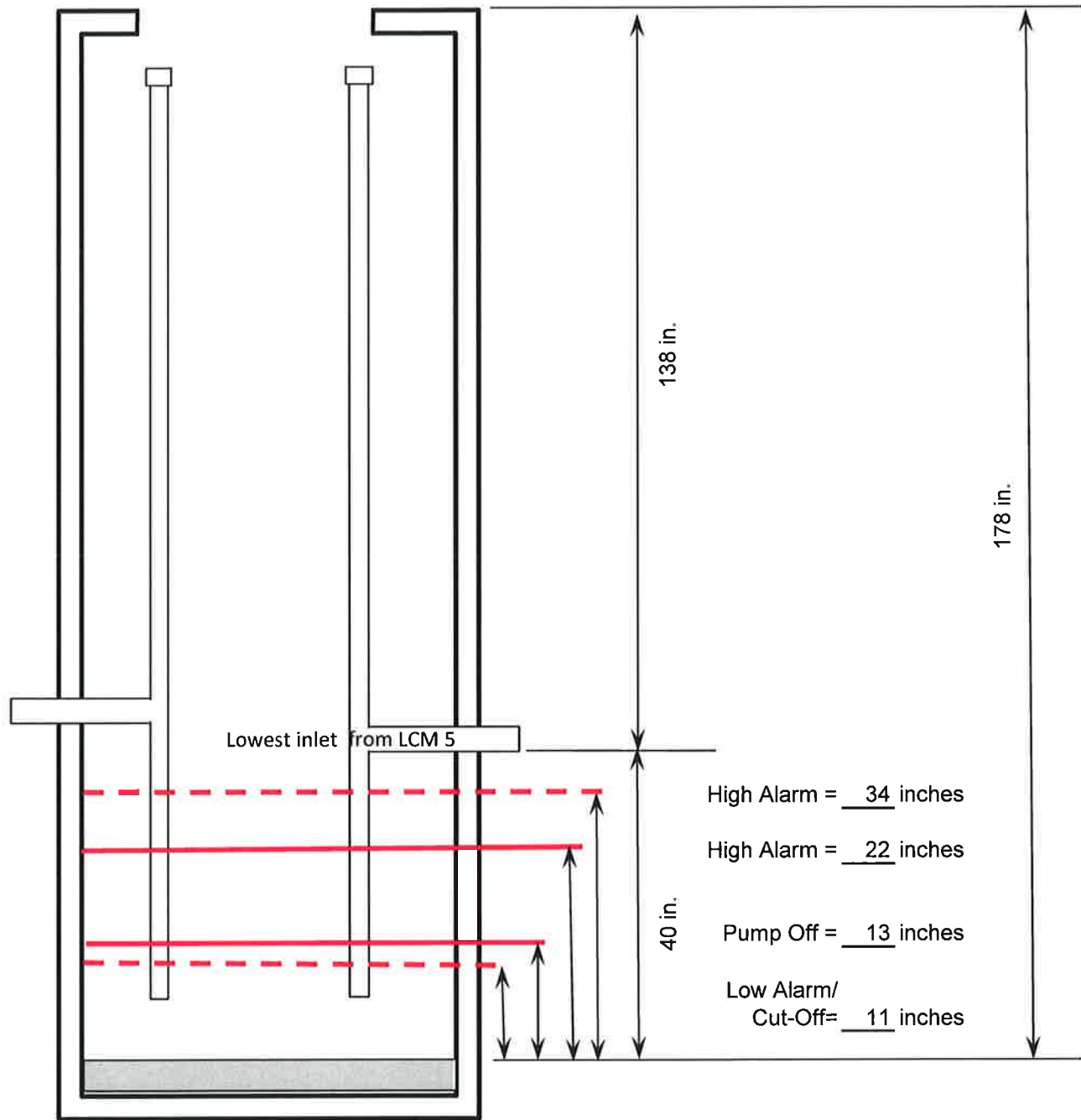
AECOM [2010b] “*Project Specifications and Drawings for Phase II Leachate Management System Modifications, Kekaha Sanitary Landfill, County of Kauai, HI*,” October 2010.

AECOM [2014] “*Construction Drawings, Pumping System Modifications, Construction Drawings, Phase II Leachate Management System Modifications, Kekaha Sanitary Landfill, Kauai, Hawaii*”, May 2014

10. LIMITATIONS

This report was prepared in general accordance with the accepted standard of practice, which existed in Hawai'i at the time this report was submitted to the County of Kaua'i. Geosyntec Consultants, Inc. has prepared this report for the exclusive use by the County of Kaua'i. No other representations, expressed or implied, and no warranty or guarantee is included or intended. No other party is authorized to use this report, unless granted permission in writing by Geosyntec Consultants, Inc.

Figures



Lowest inlet from LCM 5

High Alarm = 34 inches

High Alarm = 22 inches

Pump Off = 13 inches

Low Alarm/
Cut-Off = 11 inches

Measured dimensions rounded to the nearest inch
Not to scale

Geosyntec
consultants

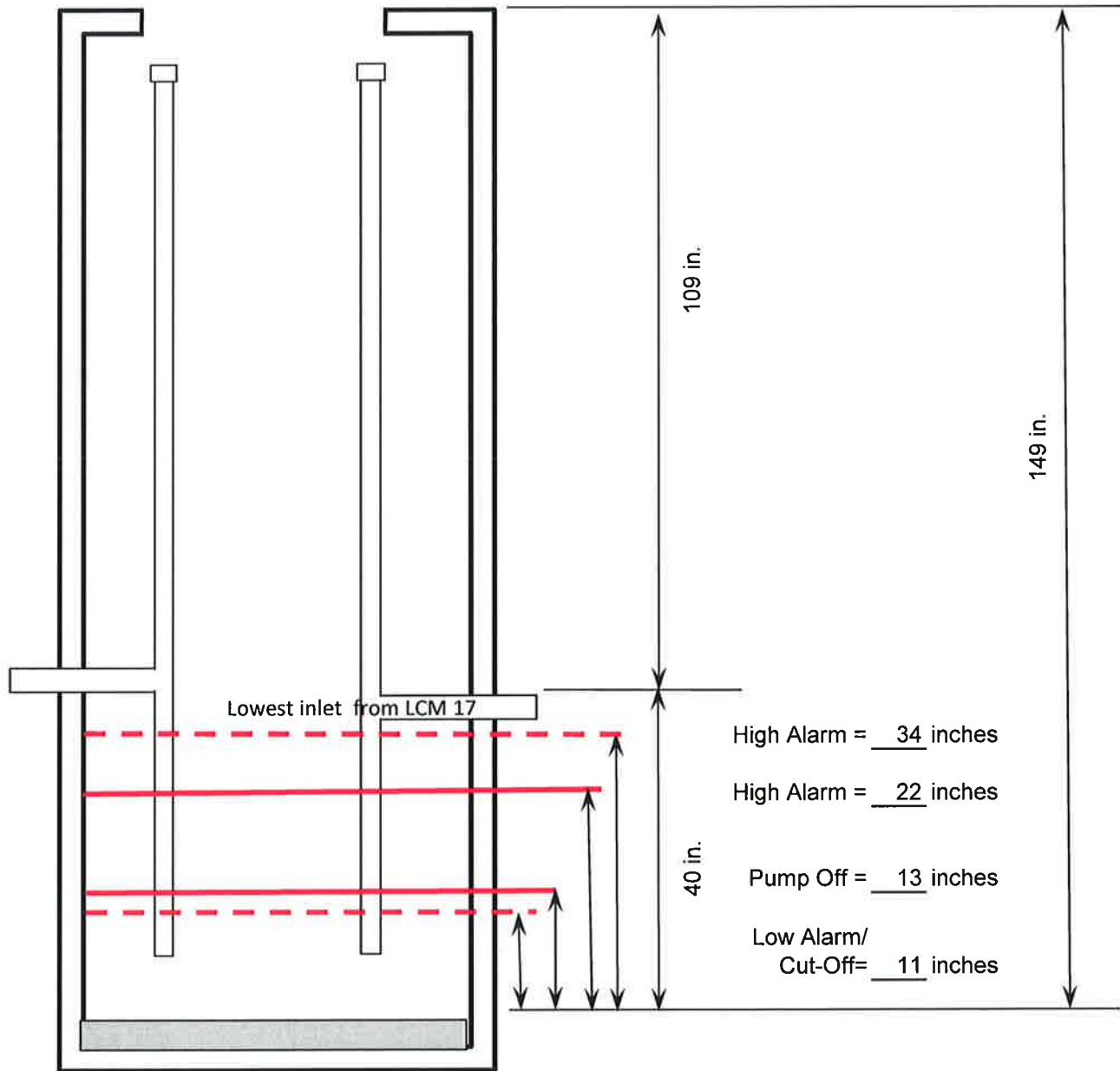
As-built Pump Set Action Levels

Wet Well #1
Kekaha Sanitary Landfill

Figure 1

PROJECT NO. WG1548

DATE: 16-Jan-16



Measured dimensions rounded to the nearest inch
Not to scale

Appendix A
Photographic Documentation



Photo 1. Wet well and meter valve box assemblies.



Photo 2. Offloading wet wells and meter valve boxes using an excavator.



Photo 3. Excavation to remove existing Wet Well #2 and valve box.



Photo 4. Sample of onsite backfill material.



Photo 5. Removal of existing Wet Well #2.



Photo 6. Removal of the existing lower section of Wet Well #2.



Photo 7. Dewatering excavation using a 3-inch trash pump.



Photo 8. Pressure testing interstitial space to verify wet wells do not leak.



Photo 8. Gravel placement to achieve design grades for new Wet Well #2 placement.



Photo 10. Form boards to construct new Wet Well #2 concrete ballast.



Photo 11. Concrete poured into prepared forms to construct the concrete ballast system.

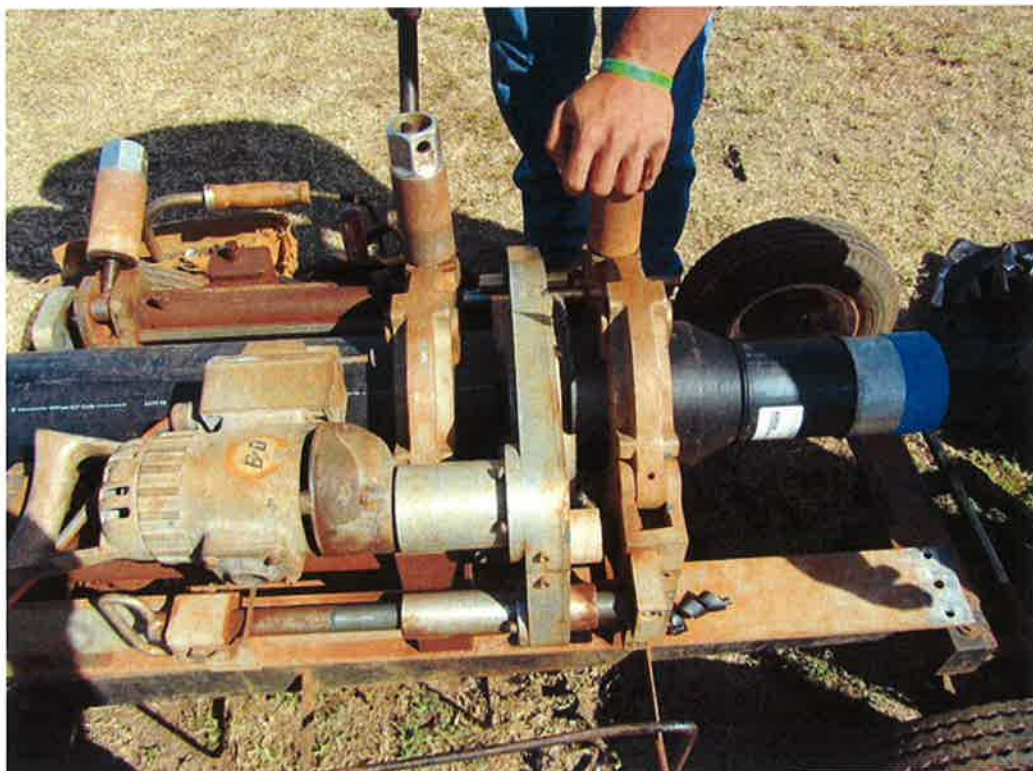


Photo 12. HDPE pipe welding to connect cleanout risers pipe in Wet Well #2.

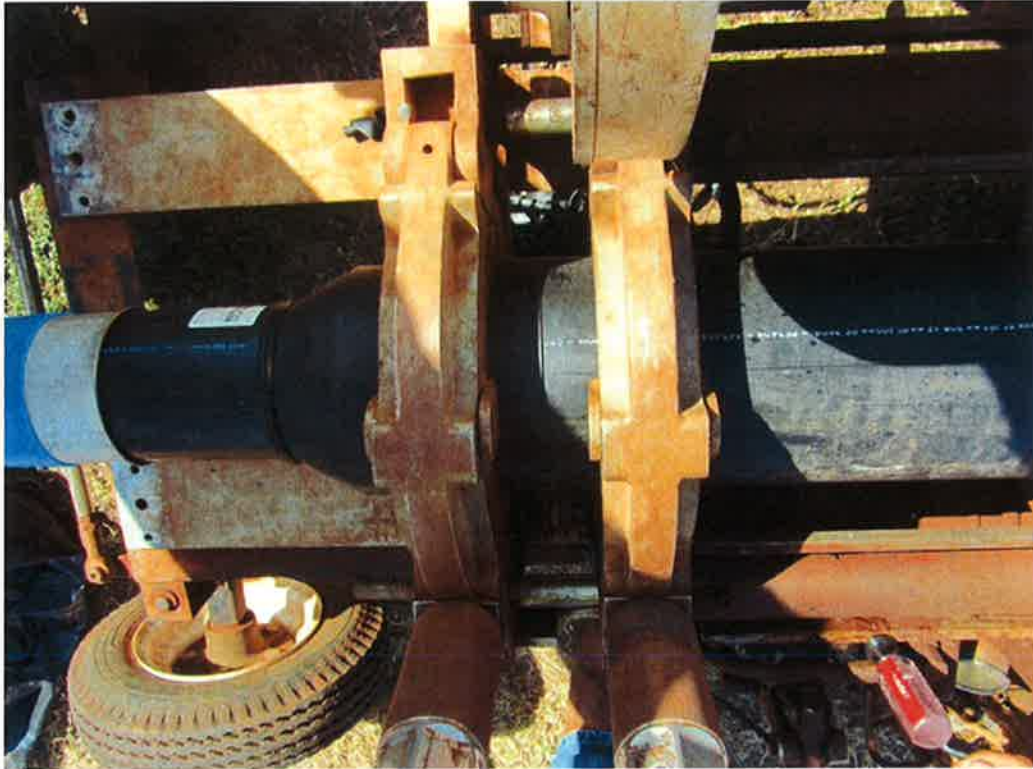


Photo 13. Final cooling process to complete the fusion weld.

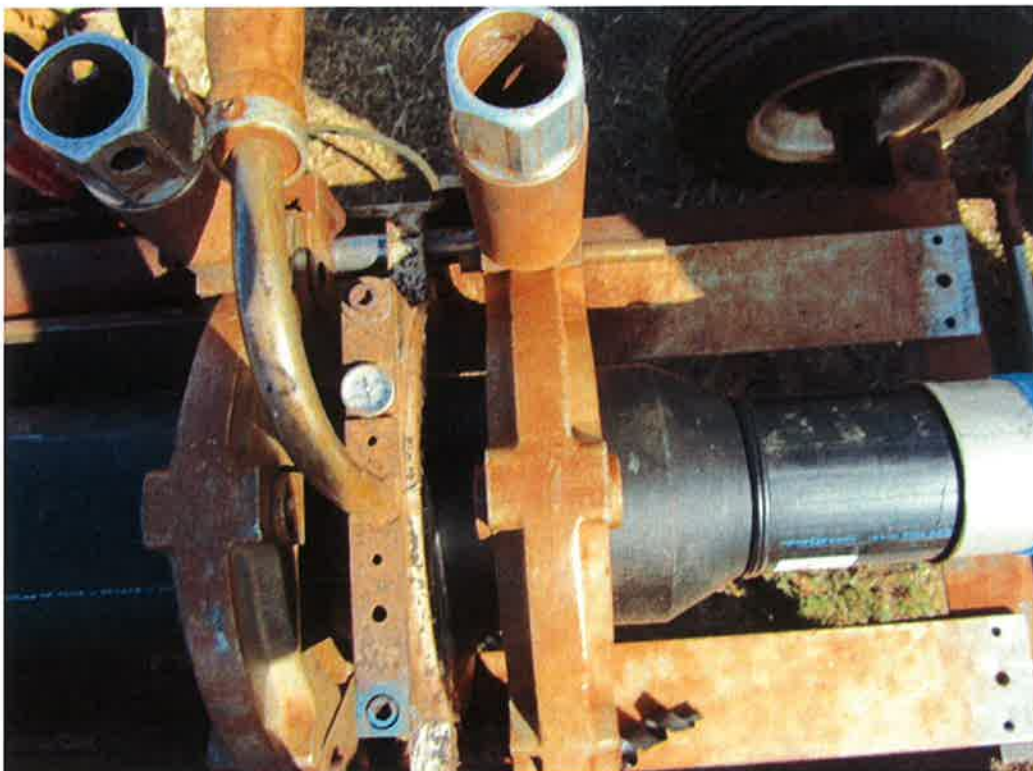


Photo 14. HDPE fusion welding for Wet Well #2 components.



Photo 15. Various fusion welded components connected together to perform system air pressure tests.



Photo 16. Electro-fusion coupler used to join existing plumbing to the new Wet Well #2 system.



Photo 17. Completed connection to join the leachate collection manhole to the new wet well.



Photo 18. 18-inch electro-fusion coupler to join the existing plumbing to the new Wet Well 2 system.



Photo 19. Moisture conditioning during backfill around the newly installed Wet Well #2.



Photo 20. EP continues to backfill around Wet Well #2.



Photo 21. Field density testing using a Troxler portable moisture/density gauge.



Photo 22. Backfill to construct the foundation for the new meter valve box assembly.



Photo 23. Gravel placement to support the meter valve box #2 assembly.



Photo 24. Form boards to construct the meter valve box #2 assembly ballast.



Photo 25. Concrete poured directly into prepared forms.



Photo 26. Air pressure test to verify Wet Well #2 discharge piping integrity.



Photo 27. New meter valve box assembly tie-in location to existing discharge lines.



Photo 28. Electro-fusion coupler to join the new meter valve box assembly to the existing discharge line.



Photo 29. New Wet Well #2 system installation looking north.



Photo 30. Electrical conduit and trenches for the new Wet Well #2 control panel.



Photo 31. Newly installed Wet Well #2 control panel.



Photo 32. Wet Well #2 electrical system conduit location (later modified).



Photo 33. Wet Well #2 lower rail system support bracket bolted to poured concrete floor (later removed)



Photo 34. Installed pump and discharge piping in Wet Well #2 (later modified).



Photo 35 Completed Wet Well #2 electrical junction box (later modified).



Photo 36. Completed Wet Well #2 control panel (later modified).

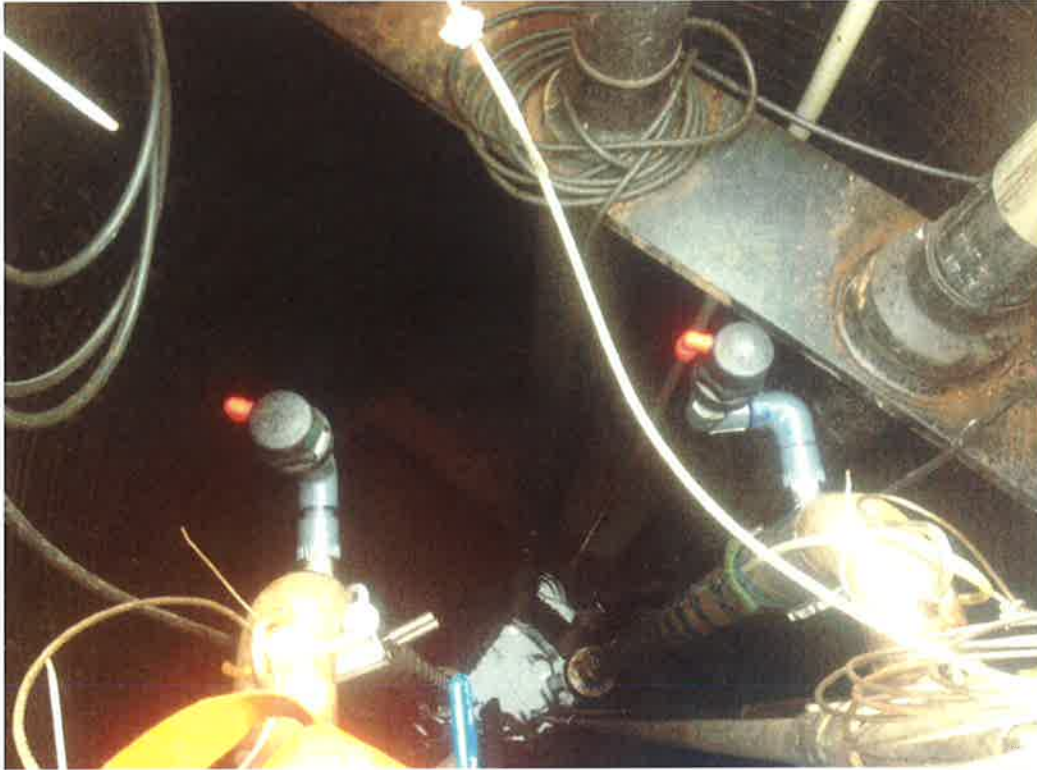


Photo 37. Air relief valves installed on the pump discharge pipes within the wet well (later modified).



Photo 38. Air relief valve installed on the discharge piping within the meter valve box.



Photo 39. Leachate management via LCM 14 during construction of the new system



Photo 40. Leachate collection manhole isolation and ventilation during construction



Photo 41. Positive pressure ventilation within the existing valve box in preparation for removal.



Photo 42. Dust suppression during excavation of the existing Wet Well #1 1.



Photo 43. Excavation to remove the existing Wet Wet#1 and existing valve box.



Photo 44. Saw cutting to remove existing asphalt paving to allow for access of the trench box shoring.



Photo 45. Excavation to remove the existing wet well and valve box assembly.



Photo 46. Excavation to remove the lower section of the existing Wet Well #1.



Photo 47. Removal of the existing concrete Wet Well #1 assembly using an excavator.



Photo 48. Trench box shoring to provide access during installation of the new Wet Well #1.



Photo 49. Inflatable isolation plug to manage leachate during construction.



Photo 50. Installed form boards to construct the Wet Well #1 ballast system.



Photo 51. 3 inch suction pump to manage groundwater during construction.



Photo 52. Concrete poured directly into the forms to construct the Wet Well #1 ballast system.



Photo 53. Wet Well #1 completed ballast system.



Photo 54. Backfill around ballast system using 3B course gravel.



Photo 55. Cleaning plumbing connection in preparation for electro-fusion coupler installation.



Photo 56. Electro-fusion coupler to connect cleanout riser assembly to the new Wet Well #1.



Photo 57. Electrofusion coupler installation using a Friatec electrofusion system



Photo 58. 18 inch HDPE reducing fitting to connect the existing system to the new Wet Well #1 assembly.



Photo 59. Existing 12-inch HDPE pipe inlet connection to the newly installed Wet Well #1 assembly.



Photo 60. Completed assembly to connect the existing system to the new Wet Well #1 assembly.



Photo 61. Wet Well #1 plumbing to connect the existing inlet to the cleanout riser assembly.



Photo 62. Prefabricated catch basin drain pipe connection.



Photo 63. Existing 8-inch HDPE catch basin drain pipe installation to the new Wet Well #1



Photo 64. Final connection to complete the existing catch basin drain pipe assembly.



Photo 65. Completed Wet Well #1 plumbing assembly.



Photo 66. Wet Well #1 backfill using onsite sand.



Photo 67. Field density tests using a Troxler portable moisture/density gauge.



Photo 68. Compaction effort using a walk behind "jumping jack" compactor.



Photo 69. 3B course gravel used to construct the meter valve box foundation.



Photo 70. New 3-inch HDPE discharge piping, which connects the new Wet Well #1 assembly to the meter valve box.



Photo 71. 6-inch HDPE pipe connection to connect the existing discharge to the new meter valve box.



Photo 72. Concrete poured directly into prepared forms to construct the ballast system.

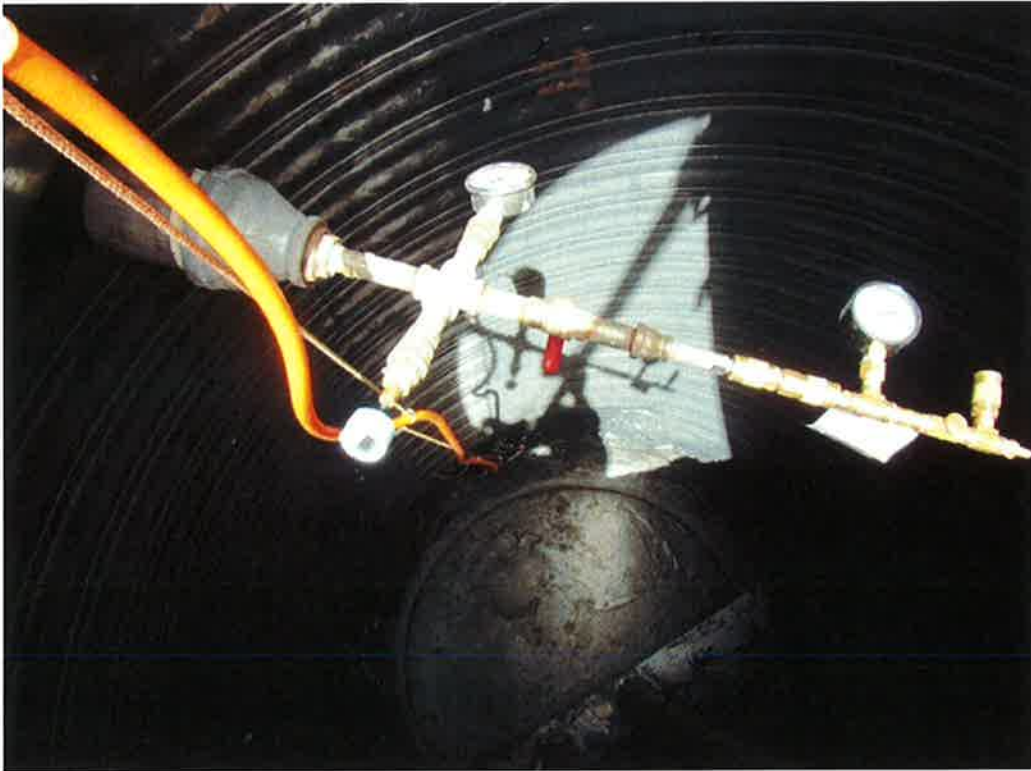


Photo 73. Air pressure tests to verify piping integrity for Wet Well #1.



Photo 74. Final connection to complete the discharge piping connection.



Photo 75. Stainless steel check valve assembly within the EPG pump system (later removed).



Photo 76. Check valve system verified within EPG pump system before installation (later removed)..



Photo 77. Wet Well #1 pumping system installation (later removed).



Photo 78. Wet Well #1 rail system pump support (later removed)..



Photo 79. Wet Well #1 rail system support bolted to poured concrete floor (later removed)..

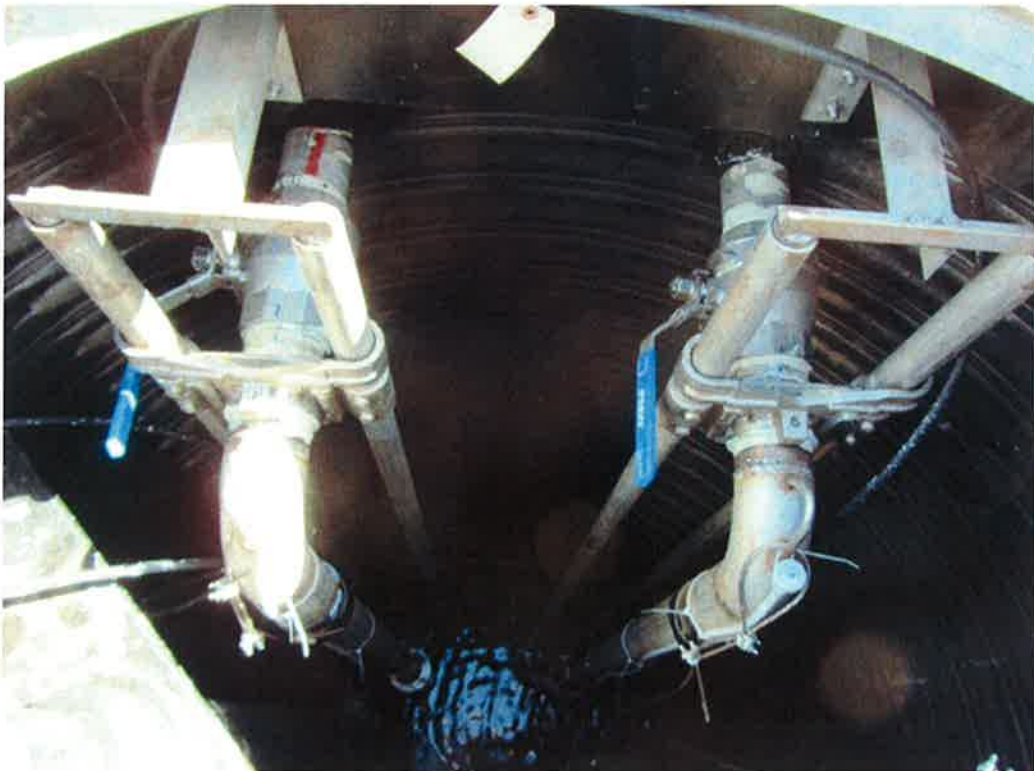


Photo 80. Wet Well #1 pumping configuration prior to installation of air relief valves (later modified).



Photo 81. Wet Well #1 electrical conduit installation (later modified).



Photo 82. Completed Wet Well #1 EPG master control panel (later modified).



Photo 83. LCM 2-13 upper bell section removal for access to fittings (typical).



Photo 84. . LCM 2-13 foundation footing reinforcing and water stop to support precast concrete cap (typical).



Photo 85. LCM 2-13 lean concrete foundation poured around LCM to support final cap (typical).



Photo 86. LCM 2-13 concrete foundation support (typical)..



Photo 87. .Preparing precast concrete lids for epoxy coating.



Photo 88. Prepared concrete lids ready for epoxy coating.



Photo 89. Epoxy coating to cover underside of the concrete lids.



Photo 90. LCM 2-13 reinforced concrete protective cover installation, with water stop seal (typical).



Photo 91. LCM 2-13 cover installation (typical).



Photo 92. LCM 2-12 backfill using onsite sand (typical). Compaction effort using a “jumping-jack” compactor.



Photo 93. Troxler portable moisture/density gauge used to verify backfill above reinforced concrete lids



Photo 94. LCM 1 modification.



Photo 95 LCM 1 Surface completion.

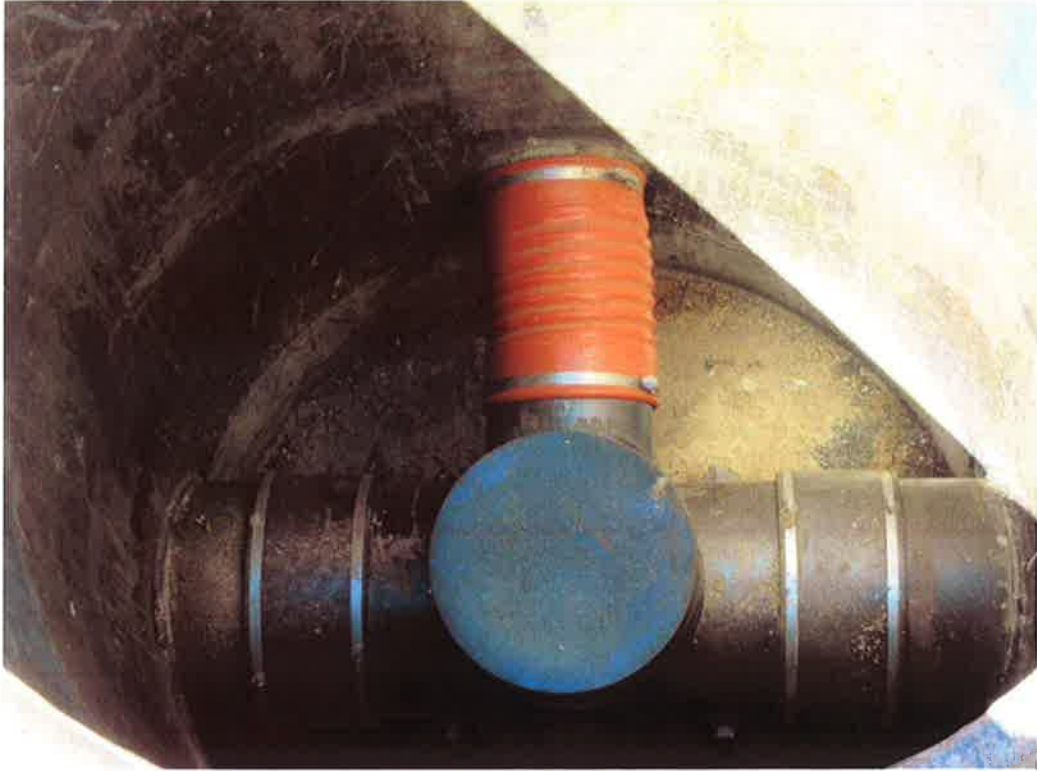


Photo 96. LCM 2 completion with typical 12 inch Fernco cap

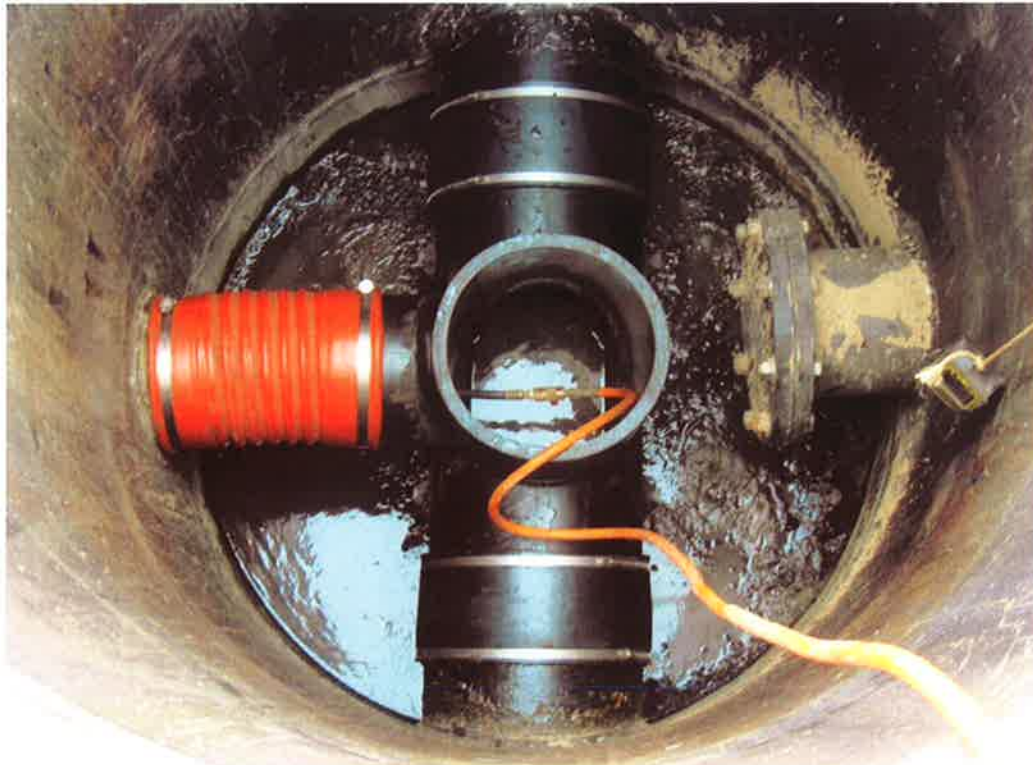


Photo 97. LCM 3 modification with isolation plug prior to installation of Fernco cap.

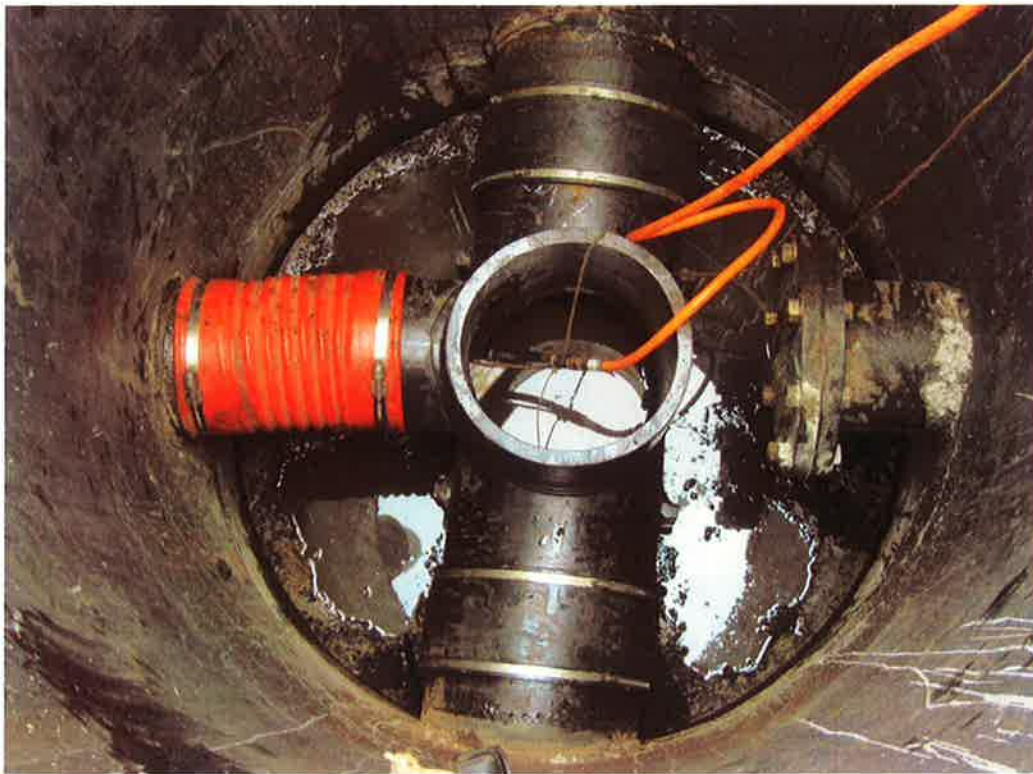


Photo 98. LCM 4 modification with isolation plug prior to installation of Fernco cap.



Photo 99. LCM 5 modification with isolation plug prior to installation of Fernco cap.

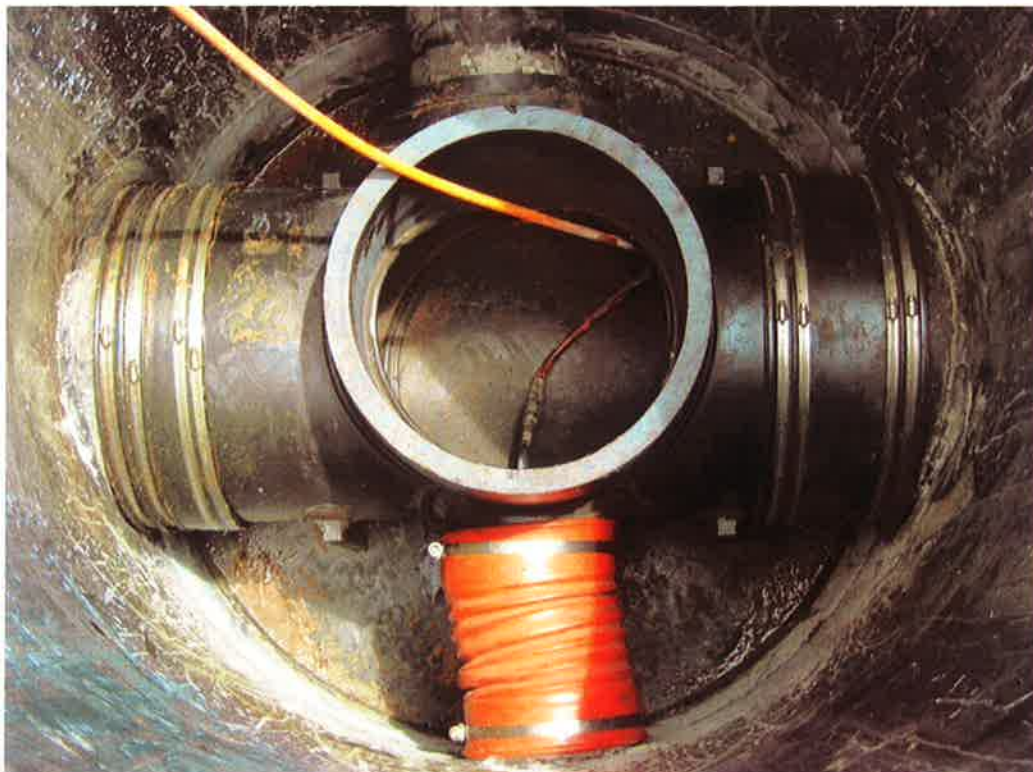


Photo 100. LCM 6 modification with isolation plug prior to installation of Fernco cap.

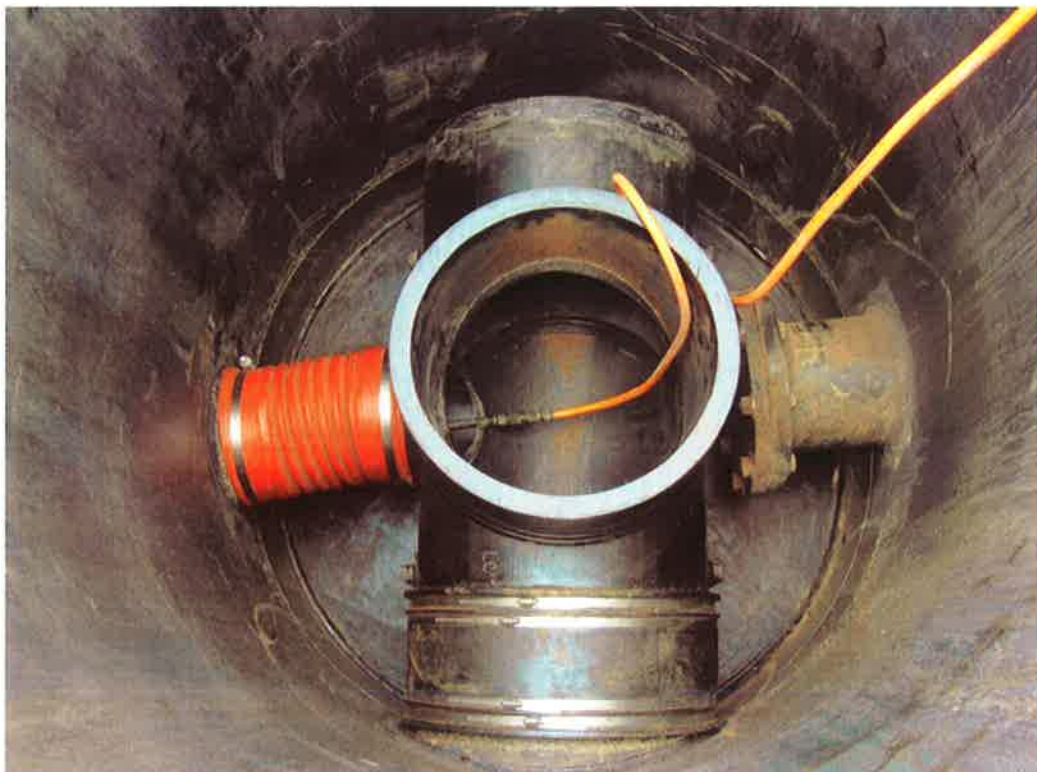


Photo 101. LCM 7 modification with isolation plug prior to installation of Fernco cap.



Photo 102. LCM 8 modification with isolation plug prior to installation of Fernco cap.

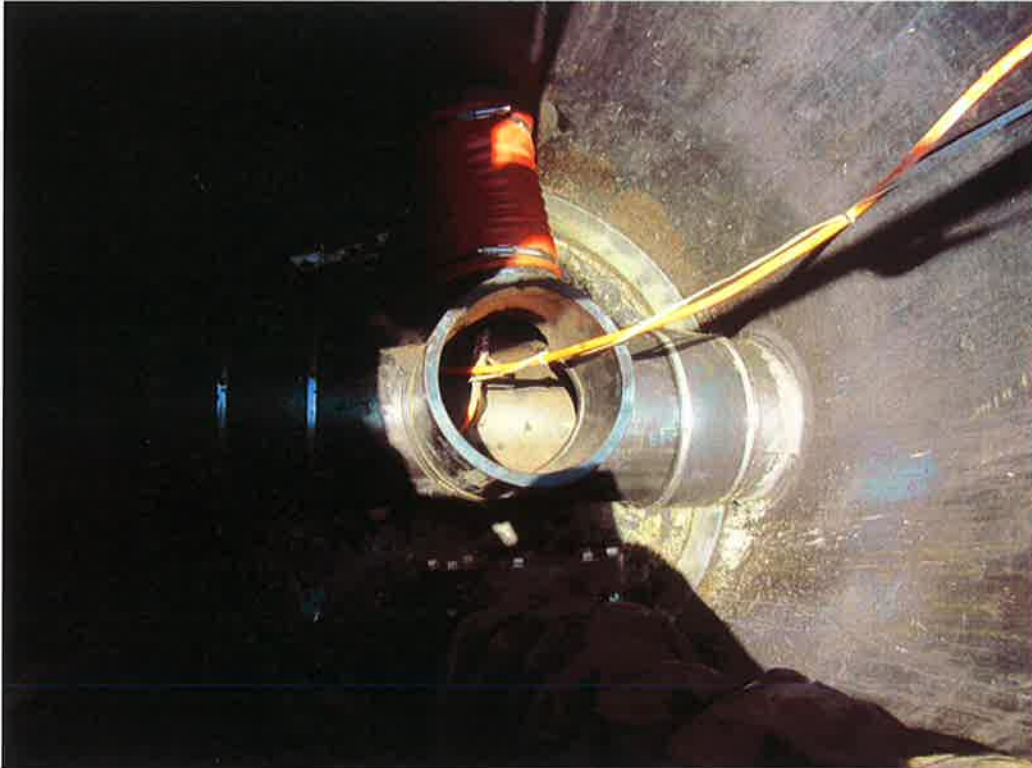


Photo 103. LCM 9 modification with isolation plug prior to installation of Fernco cap.



Photo 104. LCM 10 modification with isolation plug prior to installation of Fernco cap.



Photo 105. LCM 11 modification with isolation plug prior to installation of Fernco cap.



Photo 106. LCM 12 modification with isolation plug prior to installation of Fernco cap.

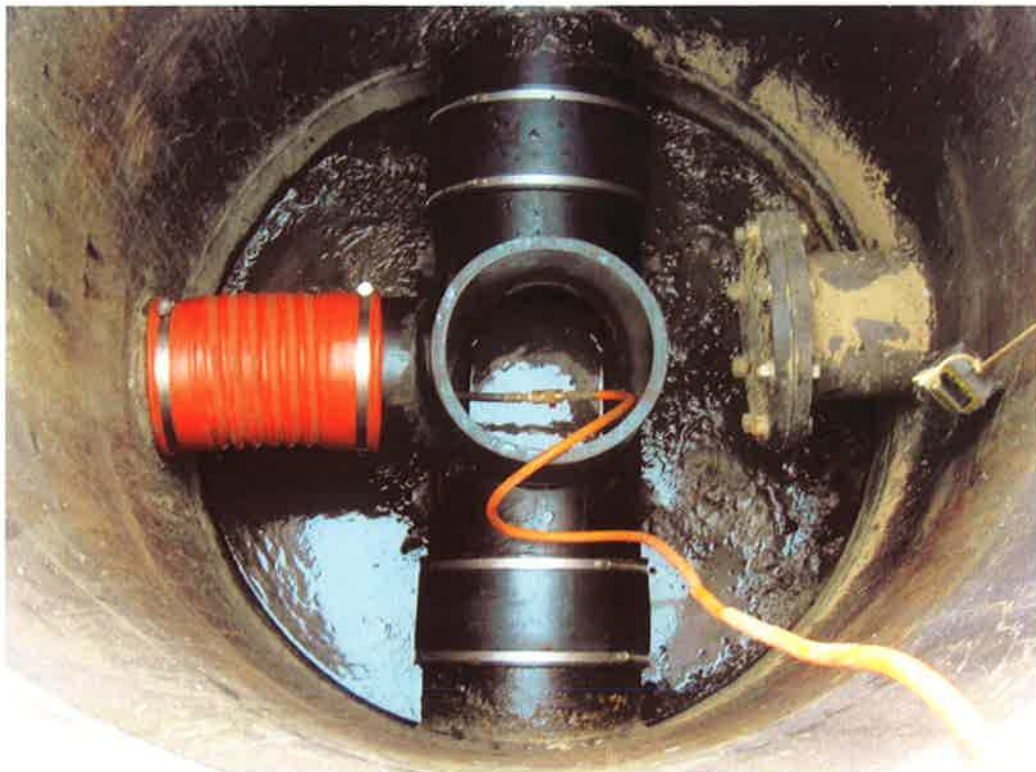


Photo 107. LCM 13 modification with isolation plug prior to installation of Fernco cap.



Photo 108. LCM 14 excavation to expose upper bell section to gain access for the modification.



Photo 109. LCM 14 system modification in accordance with RFI-14R1.



Photo 110. LCM 14 system installation in accordance with RFI 14r1.



Photo 111. Asphalt surface restoration.



Photo 112. Completed asphalt surface.



Photo 113. Additional conduit installed from control panel to wet wells in 2015 in preparation for pump replacement. (typical).



Photo 114. Additional conduit at base of panel (typical).



Photo 115. Preparing for confined space entry for pump replacement in Wet Well #2.



Photo 116. New Flygt pump, mounting system, and discharge piping installed in Wet Well #2 in 2015 (typical).



Photo 117. New Flygt pump, mounting system, and discharge piping installed in Wet Well #2 in 2015 (typical).



Photo 118. Stainless steel lifting chain connected to new Flygt pump in Wet Well #1 (typical).



Photo 119. Interior of Wet Well #2 control panel for after full re-wiring in EPG's Minnesota shop (typical).



Photo 120. Exterior of Wet Well #2 control panel (typical).



Photo 121. New float switch system installed in Wet Well #2 as back-up control for the High Alarm and Low Alarm/Shut-off transducer readings (typical).



Photo 122. New flexible conduit installed at Wet Well#1 to replace faulty T1 and T2 temperature sensor wires.

Appendix B
Requests for Information and Project
Correspondence

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 1 Project Name: Kekaha Landfill Leachate

Cust. Job #:	.....	EPI Job #:	176
To:	Waste Management	Date:	(7/15/11 via e-mail) 10/28/11
Attn:	Jesse Frey	Requested by:	Jeff Fisher
Address:	.....	Subject:	.....
	.....	Spec. Section:	.....
Tel No:	.....	Plan Ref:	8 and 10
Fax No:	808.668.1366	Revision Control #	.....
Respond by:	ASAP	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

EPI would like to request to make changes to Wet Well #1 and Wet Well #2 based on the attached sketches.

Signed Jeff Fisher Date (first requested 7/15/11) 10/31/11

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed _____ Date _____



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 1-R2

Job No:	_____	Date:	January 6, 2012
To:	COK - DPW	Spec Section:	_____
Attention:	Jesse Frey	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	_____
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	Pacific Industrial Products
Fax No:	808.241.6887	Manufacturer:	Plastic Fusion Fabricators, Inc.
Respond by:	_____		_____

This submittal contains the following:

Description: Re-Revised Wet Well Drawings for Wet Well #1 and #2

Submittal No:	1-R2
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	_____
Items Description	<input type="checkbox"/> Submittal Conforms to Specifications <input checked="" type="checkbox"/> Exceptions to Drawings & Specs as specifically noted Revised Base Detail
Spec Section:	_____
Spec Para:	_____
Drawing No:	_____
Subcontractor:	_____
Supplier:	Pacific Industrial Products
Manufacturer:	Plastic Fusion Fabricators, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: <u>1-6-12</u> for: <i>Jeff Fisher</i>	

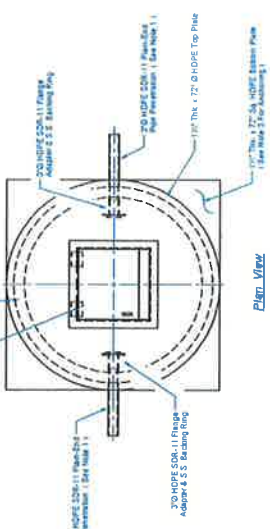
cc: File

The Drawing (Sheet) is to be used only for the Project Specified by the User. It is intended for Professional Use Only and is not to be used for any other purpose. The Project Specifier is to be responsible for the accuracy of the information provided. The Project Specifier is to be responsible for the accuracy of the information provided. The Project Specifier is to be responsible for the accuracy of the information provided.

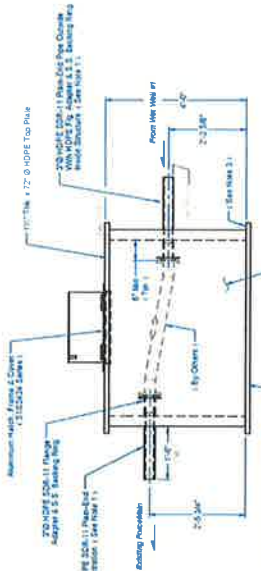
Valve Vault #1
(At Wet Well # 1)



Iso View
(Reduced Scale)

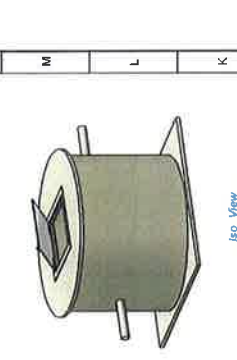


Plan View

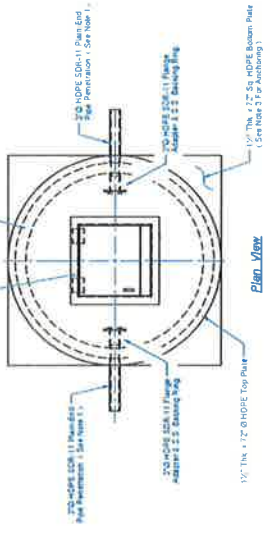


Elevation View

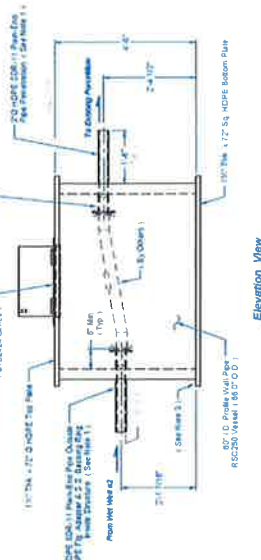
Valve Vault #2
(At Wet Well # 2)



Iso View
(Reduced Scale)



Plan View



Elevation View

General Notes:

- All Penetration are as detailed in Elevation. Where needed, outside of Penetration, use a 2" x 2" x 1/4" Aluminum Angle for Support.
- The Ring, SDR-11 of Probe Well Pipe, use RSC250.
- Both 197.75" x 72" HDPE Bottom Pipe and 807.0 Probe Well Pipe are to be provided and installed in accordance with the details shown in the Elevation of this Vault.
- Where Elevation is not shown, use the details shown in the other required elevations.
- Install Level Details Per PFD Drawings 8 02 24 2-14. Attention = 1 (Drawn & Checked 10/26/17)



Project Name		Sheet No. 2 of 3	
Revision		Date	
1	Issue	10/26/17	10/26/17
2	Issue	10/26/17	10/26/17
3	Issue	10/26/17	10/26/17
4	Issue	10/26/17	10/26/17
5	Issue	10/26/17	10/26/17
6	Issue	10/26/17	10/26/17
7	Issue	10/26/17	10/26/17
8	Issue	10/26/17	10/26/17
9	Issue	10/26/17	10/26/17
10	Issue	10/26/17	10/26/17
11	Issue	10/26/17	10/26/17
12	Issue	10/26/17	10/26/17
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17	Issue	10/26/17	10/26/17
18	Issue	10/26/17	10/26/17
19	Issue	10/26/17	10/26/17
20	Issue	10/26/17	10/26/17
21	Issue	10/26/17	10/26/17
22	Issue	10/26/17	10/26/17

Project Engineer: **Richard J. Jones**
 Date: 10/26/17
 Project: **Wet Well #2**
 Location: **Wet Well #2**
 Scale: **As Shown**
 Drawing No.: **2** of 3

Bergschultz, Ken

From: Bergschultz, Ken
Sent: Tuesday, December 13, 2011 1:50 PM
To: Frey, Jesse
Cc: MMinch@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RE: Kekaha, Leachate System Mods, Submittal 1R
Attachments: WW and VV LCM RFI 1 121311.pdf

Jesse,

AECOM has reviewed RFI 1R as modified which includes shop drawings for Wet Wells 1& 2 revision dates of 11/15/11 as well as valve vaults at each of the wet wells with the same revision date. The dimensions of the wet wells have been confirmed based upon the drawings provided, however further detail is needed on the mounting brackets and the interstitial area.

Per the email provided on 11/29/11 WM and Geosyntec are looking for guidance on fastening the pump rail to the sidewall of the wet well and indicate whether there will be any test ports for testing of the interstitial space of the wet wells. The response is:

- For the brackets, please have the fabricator plan to weld HDPE plates (like gusset plates or lift lugs) to the interior of the wet well and drilled to allow guide rail to be installed. Please add and show the detail on the drawings. AECOM does not want any perforations through the interior manhole section.] Done 12/13/11

- Interstitial monitoring and testing. The details as submitted do not include or show conduit/entrance into the interstitial area as defined on the Section B-B of drawings 8 and 10. Please add and show the detail on the drawings. AECOM suggests the conduit used to access the interstitial area could also be the location to field pressure test the interstitial area. AECOM suggests a 2-inch diameter HDPE x stainless steel transition fitting be utilized. Pressure testing should occur at maximum 5 psig for 1 hour. If vacuum testing is preferred, coordinate with AECOM prior to testing verifying vacuum equipment and suitable vacuum criteria will be supplied.] Done 12/13/11

For the wet well vaults, the requested forcemain pipe penetrations heights are provided in the attached drawings.] Done 12/13/11

As these requested revisions are completed, AECOM will determine the final concrete anchor dimensions to resist uplift for the wet wells.

Any questions, please let me know.

Kenneth J. Bergschultz, PE
Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Friday, November 18, 2011 2:38 PM

To: Bergschultz, Ken
Cc: MMinch@Geosyntec.com; KHuynh@Geosyntec.com
Subject: FW: Kekaha, Leachate System Mods, Submittal 1

Hi Kenny,

I wanted to pass on this information for your records and your use.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Kimi Matsuda [<mailto:kimi@earthworkspacific.com>]
Sent: Thursday, November 17, 2011 1:30 PM
To: Frey, Jesse
Subject: Kekaha, Leachate System Mods, Submittal 1

Hi Jesse,

Attached please find submittal No. 1 revised. Please let us know if you have any questions. I included the originals in color, let me know if you would like me to scan into one for you.

Mahalo,

Kimi Matsuda

Earthworks Pacific, Inc.

P.O. Box 1326

Lihue, HI 96766

P: 808.246.8808

F: 808.246.8812

kimi@earthworkspacific.com

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 1-R2

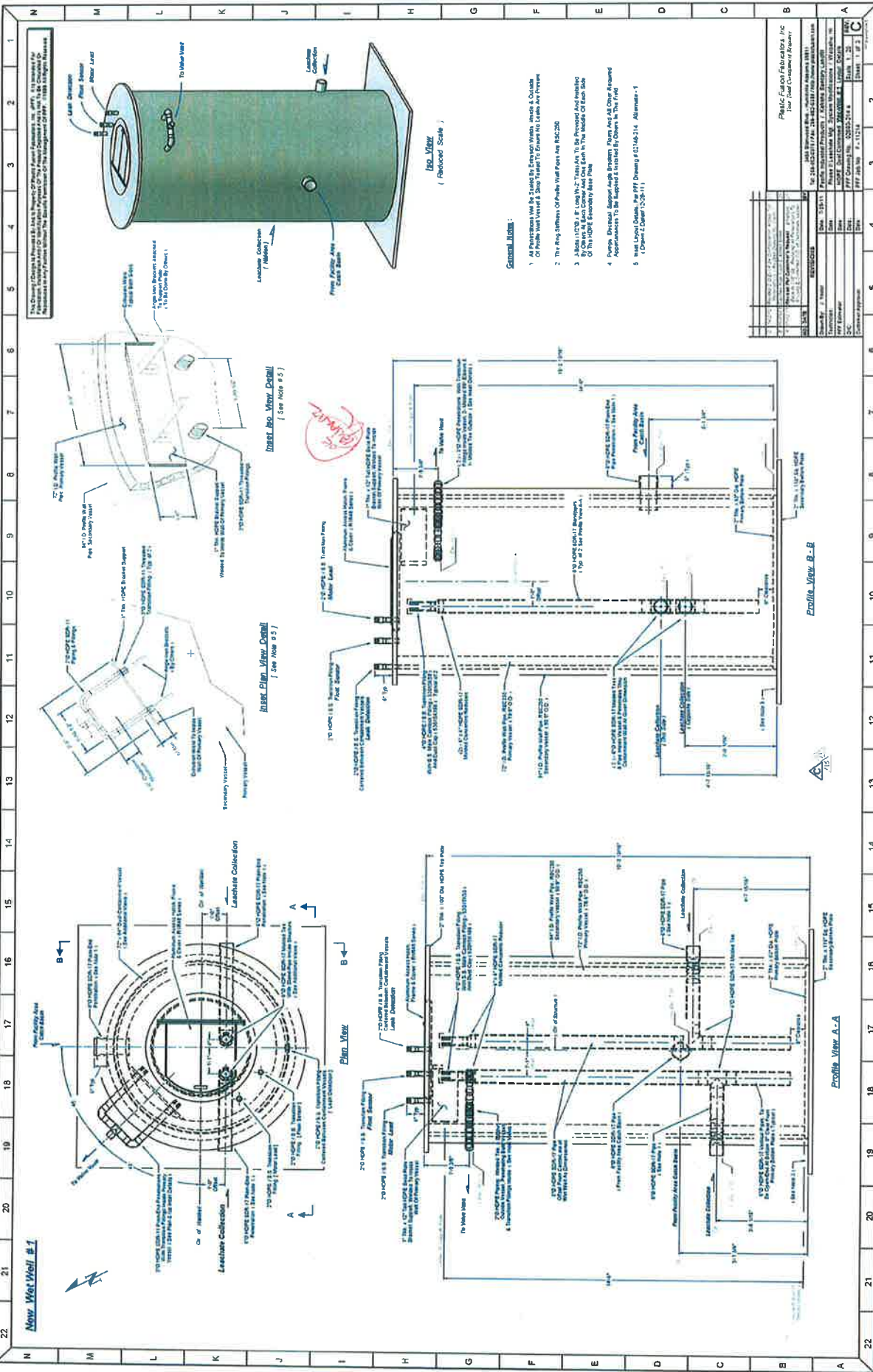
Job No:		Date:	January 6, 2012
To:	COK - DPW	Spec Section:	
Attention:	Jesse Frey	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	
Fax No:	808.241.6887	Supplier:	Pacific Industrial Products
Respond by:		Manufacturer:	Plastic Fusion Fabricators, Inc.

This submittal contains the following:

Description: Re-Revised Wet Well Drawings for Wet Well #1 and #2

Submittal No:	1-R2
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input type="checkbox"/> Submittal Conforms to Specifications <input checked="" type="checkbox"/> Exceptions to Drawings & Specs as specifically noted Revised Base Detail
Spec Section:	
Spec Para:	
Drawing No:	
Subcontractor:	
Supplier:	Pacific Industrial Products
Manufacturer:	Plastic Fusion Fabricators, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: 1-6-12 for: <i>[Signature]</i>	

cc: File



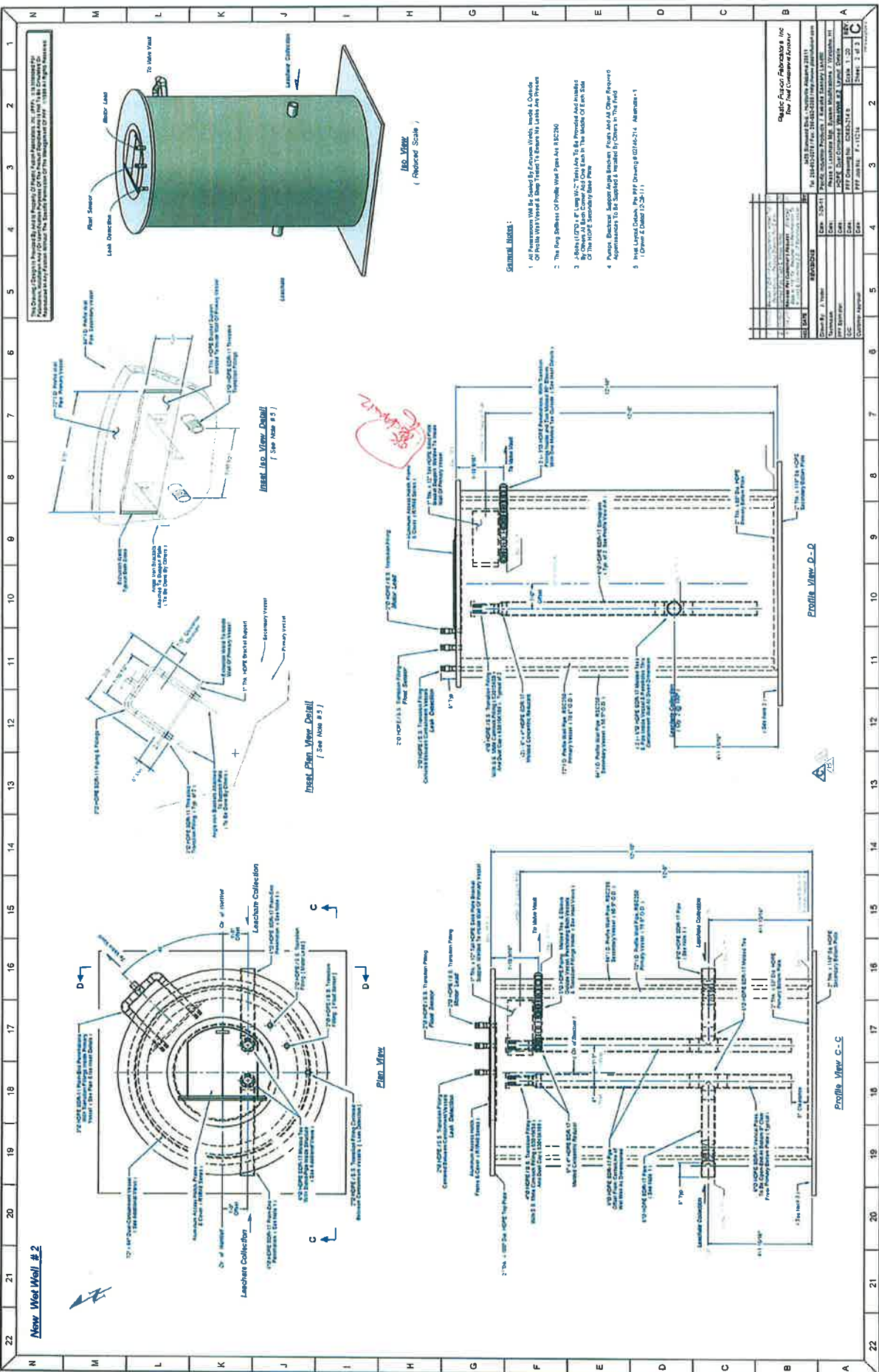
This drawing shall be drawn in accordance with the American Institute of Steel Construction, Inc. (AISC) Manual for Structural Steelwork, 13th Edition, Part 5, and the American Institute of Steel Construction, Inc. (AISC) Manual for Structural Steelwork, 13th Edition, Part 8, unless otherwise indicated.

GENERAL NOTES:

1. All materials shall be tested by an approved laboratory in accordance with AISC Manual for Structural Steelwork, 13th Edition, Part 5, and the American Institute of Steel Construction, Inc. (AISC) Manual for Structural Steelwork, 13th Edition, Part 8, unless otherwise indicated.
2. The Ring Stiffeners of Profile View Part are RSC-250.
3. 1/4" Dia. (20#) 1/4" Dia. A.S. Sh. are provided for handling by Chain Hoist, A. B. Crane and Chain Hoist to the Head of Each Side of This W.C.W. Secondary Base Plate.
4. Pumps, Structural Support and Brackets, Flanges and All Other Required Appointments To be Supplied & Installed by Others to This Field.
5. Item Labels: Item Labels (S) 100-110, 100-111, 100-112, 100-113, 100-114, 100-115, 100-116, 100-117, 100-118, 100-119, 100-120, 100-121, 100-122, 100-123, 100-124, 100-125, 100-126, 100-127, 100-128, 100-129, 100-130, 100-131, 100-132, 100-133, 100-134, 100-135, 100-136, 100-137, 100-138, 100-139, 100-140, 100-141, 100-142, 100-143, 100-144, 100-145, 100-146, 100-147, 100-148, 100-149, 100-150, 100-151, 100-152, 100-153, 100-154, 100-155, 100-156, 100-157, 100-158, 100-159, 100-160, 100-161, 100-162, 100-163, 100-164, 100-165, 100-166, 100-167, 100-168, 100-169, 100-170, 100-171, 100-172, 100-173, 100-174, 100-175, 100-176, 100-177, 100-178, 100-179, 100-180, 100-181, 100-182, 100-183, 100-184, 100-185, 100-186, 100-187, 100-188, 100-189, 100-190, 100-191, 100-192, 100-193, 100-194, 100-195, 100-196, 100-197, 100-198, 100-199, 100-200, 100-201, 100-202, 100-203, 100-204, 100-205, 100-206, 100-207, 100-208, 100-209, 100-210, 100-211, 100-212, 100-213, 100-214, 100-215, 100-216, 100-217, 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100-662, 100-663, 100-664, 100-665, 100-666, 100-667, 100-668, 100-669, 100-670, 100-671, 100-672, 100-673, 100-674, 100-675, 100-676, 100-677, 100-678, 100-679, 100-680, 100-681, 100-682, 100-683, 100-684, 100-685, 100-686, 100-687, 100-688, 100-689, 100-690, 100-691, 100-692, 100-693, 100-694, 100-695, 100-696, 100-697, 100-698, 100-699, 100-700, 100-701, 100-702, 100-703, 100-704, 100-705, 100-706, 100-707, 100-708, 100-709, 100-710, 100-711, 100-712, 100-713, 100-714, 100-715, 100-716, 100-717, 100-718, 100-719, 100-720, 100-721, 100-722, 100-723, 100-724, 100-725, 100-726, 100-727, 100-728, 100-729, 100-730, 100-731, 100-732, 100-733, 100-734, 100-735, 100-736, 100-737, 100-738, 100-739, 100-740, 100-741, 100-742, 100-743, 100-744, 100-745, 100-746, 100-747, 100-748, 100-749, 100-750, 100-751, 100-752, 100-753, 100-754, 100-755, 100-756, 100-757, 100-758, 100-759, 100-760, 100-761, 100-762, 100-763, 100-764, 100-765, 100-766, 100-767, 100-768, 100-769, 100-770, 100-771, 100-772, 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100-995, 100-996, 100-997, 100-998, 100-999, 100-1000.

Check No.	Check Item	Date	Checked By
1	Check Item 1		
2	Check Item 2		
3	Check Item 3		
4	Check Item 4		
5	Check Item 5		
6	Check Item 6		
7	Check Item 7		
8	Check Item 8		
9	Check Item 9		
10	Check Item 10		
11	Check Item 11		
12	Check Item 12		
13	Check Item 13		
14	Check Item 14		
15	Check Item 15		
16	Check Item 16		
17	Check Item 17		
18	Check Item 18		
19	Check Item 19		
20	Check Item 20		
21	Check Item 21		
22	Check Item 22		

Prepared by: [Name]
 Checked by: [Name]
 Date: [Date]



New Wet Well #2

THIS DRAWING IS A PART OF THE PROJECT'S ARCHITECTURAL DRAWINGS. IT IS INTENDED FOR THE ARCHITECT'S USE ONLY. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT. ANY REVISIONS TO THIS DRAWING SHALL BE INDICATED BY A REVISION TABLE.

BEST ELEVATION
(Reduced Scale)

BEST PLAN VIEW DETAIL
(See Note #5)

PLAN VIEW

PROFILE VIEW D-D

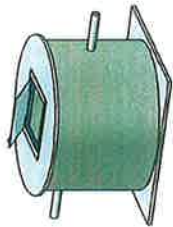
PROFILE VIEW C-C

SECTIONAL DETAILS:

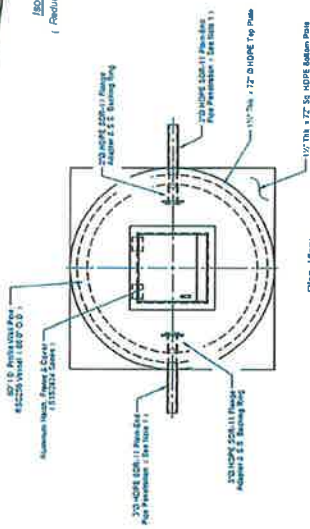
1. The Wet Well is to be constructed of 12" diameter galvanized steel pipe with a minimum wall thickness of 1/2".
2. The Wet Well is to be supported on a concrete foundation with a minimum depth of 48" below the finished ground level.
3. The Wet Well is to be equipped with a float valve and a secondary system to prevent overflow.
4. The Wet Well is to be equipped with a lead-side collection system to collect and transport debris.
5. The Wet Well is to be equipped with a secondary system to collect and transport debris.
6. The Wet Well is to be equipped with a float valve to prevent overflow.

PROJECT INFORMATION	
Project Name	New Wet Well #2
Location	Site 12345
Client	ABC Company
Architect	XYZ Architects
Contract No.	123456
Sheet No.	1 of 1
Date	12/31/2023

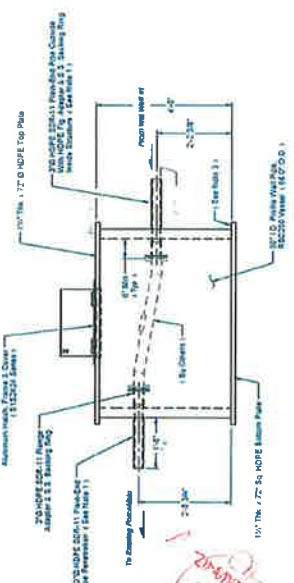
Valve Vault #1
(At Wet Well #1)



ISO View
(Reduced Scale)



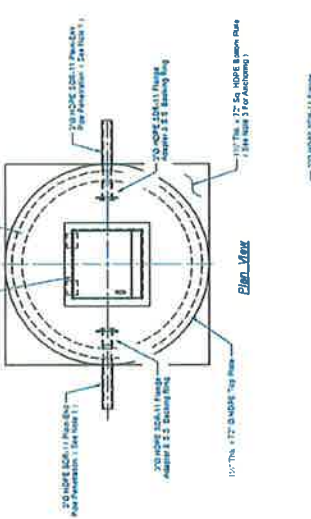
Elevation View



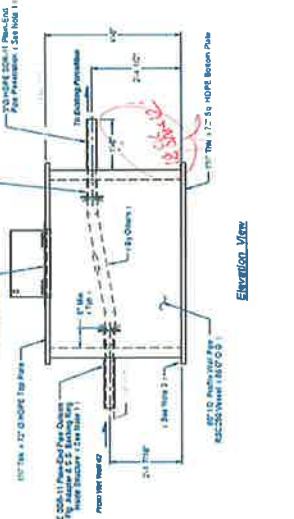
Valve Vault #2
(At Wet Well #2)



ISO View
(Reduced Scale)



Elevation View



General Notes:

1. Puddle Vault shall be installed in accordance with the details shown on this drawing. The vault shall be installed in a concrete pad. The vault shall be installed in a concrete pad. The vault shall be installed in a concrete pad.
2. The Ring Diameter of Puddle Vault Pipe shall be 24" O.D.
3. All 20" HDPE Pipe shall be installed in accordance with the details shown on this drawing. The pipe shall be installed in a concrete pad. The pipe shall be installed in a concrete pad.
4. Puddle Vault Support shall be installed in accordance with the details shown on this drawing. The support shall be installed in a concrete pad. The support shall be installed in a concrete pad.
5. Puddle Vault shall be installed in accordance with the details shown on this drawing. The vault shall be installed in a concrete pad. The vault shall be installed in a concrete pad.



Item	Description	Quantity	Unit	Notes
1	67" ID Puddle Vault Pipe (6225) (18" O.D.)	1	Linear Foot	
2	Aluminum Hatch Frame & Cover (151222) (24" dia)	1	Each	
3	20" HDPE (20" I.D. 24" O.D.) 15' Run	6	Linear Feet	
4	10" Dia. 12" ID HDPE Top Pipe (15' Run 2" For Anchoring)	1	Linear Foot	
5	20" HDPE (20" I.D. 24" O.D.) 15' Run	6	Linear Feet	

Client: Rustic Fusion Fabricators, Inc.	Project: Wet Well #1 & #2
Drawn By: [Name]	Date: [Date]
Checked By: [Name]	Date: [Date]
Scale: [Scale]	Sheet: [Sheet]

Scale: 1" = 10' - 0"

Bergschultz, Ken

From: MMinch@Geosyntec.com
Sent: Tuesday, January 17, 2012 6:45 PM
To: JFrey@wm.com
Cc: Bergschultz, Ken; kimi@earthworkspacific.com; CScott@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RE: Kekaha Landfill

Jesse,

Geosyntec has reviewed submittal 1-R2 and note the following changes:

- 1) Addition of brackets and a bracket support plate for the guide rail system;
- 2) Addition of the three ports on the top of the wet wells to allow for the motor lead, float sensor, and leak detection (and also pressure/vacuum testing);
- 3) Inclusion of the vertical dimensions on the vault boxes per AECOM's earlier comments;
- 4) Re-alignment of the one standpipe in each wet well to match up with the hatch openings; and
- 5) Moving the 3" discharge tee from inside the well to outside the well.

Geosyntec does not see any issues with the first 4 changes. Change #5 does not match the construction drawings and would present a conflict with approved Submittal 11R which shows the discharge piping tee and ball valves inside the wet well. In preparation for Friday's construction meeting, Geosyntec requests that Earthworks provide the reason or explanation for proposed Change #5, above.

In addition to the discussion of the discharge piping configuration, the other item that remains unresolved is AECOM's assessment of Earthwork's proposed concrete anchoring configuration.

Please let me know if you have any questions.

Thanks,

Mike

From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Friday, January 06, 2012 4:34 PM
To: Bergschultz, Ken; Mike Minch; Kimi Matsuda; Chris Scott
Subject: FW: Kekaha Landfill

Please see the attached revised submittal 1-R2 for the wet well structures for review and approval. Please let me know if there are any questions.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

Bergschultz, Ken

From: Frey, Jesse [JFrey@wm.com]
Sent: Tuesday, January 17, 2012 8:22 PM
To: Bergschultz, Ken; MMinch@Geosyntec.com; KHuynh@Geosyntec.com; CScott@Geosyntec.com
Subject: FW: 3" Discharge piping
Attachments: WWSketch.PDF

FYI.

From: keith Perry [mailto:keith@earthworkspacific.com]
Sent: Tuesday, January 17, 2012 4:03 PM
To: Frey, Jesse
Subject: FW: 3" Discharge piping

Jesse,

Just a quick response to the 1-R2 submittal. As I mentioned in the January 6th email, the ball valves and check valves will remain in the wet well. The HDPE flat plate (to hold the guiderail bracket) conflicted with the horn. Again, only the tee would be outside the wet well. Moving the horn into the wet well will place the pumps outside the lid opening as well as a conflict with the 6" risers.

Thanks,
kp

From: keith Perry [mailto:keith@earthworkspacific.com]
Sent: Friday, January 06, 2012 12:56 PM
To: 'Frey, Jesse'
Subject: 3" Discharge piping

Jesse,

This is a "heads-up" on an additional change to the revised wet well drawings.

When we sketched up the individual pieces and how it fit into the wet wells we noticed a problem with the location of the "horn" (the horn being the 3" discharge tee with check valves and ball valves), pumps, hatch opening, and 6" risers. The problem was caused by the horn location and size pushing the pumps out beyond the hatch openings and into the risers.

Our solution was to move the 3" horn tee outside the manhole while keeping the ball and check valves in the manhole. This would move the pumps into a location in line with the hatch (so they can be removed), along with the rails being out of the way of the 6" risers.

The revised wet well submittal is appears clear, however I will include a sketch on how it fits together.

Aloha,
kp

From: Frey, Jesse [mailto:JFrey@wm.com]
Sent: Friday, January 06, 2012 10:00 AM

To: keith Perry
Subject: RE: HASP

Keith,

We prepared a HASP for the part Cell 1 expansion project which I could send over. However, we are very close to completing our HASP for the current project. If EP can wait until next week, we can send them a more project-relevant HASP.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: keith Perry [<mailto:keith@earthworkspacific.com>]
Sent: Friday, January 06, 2012 9:42 AM
To: Frey, Jesse
Subject: HASP

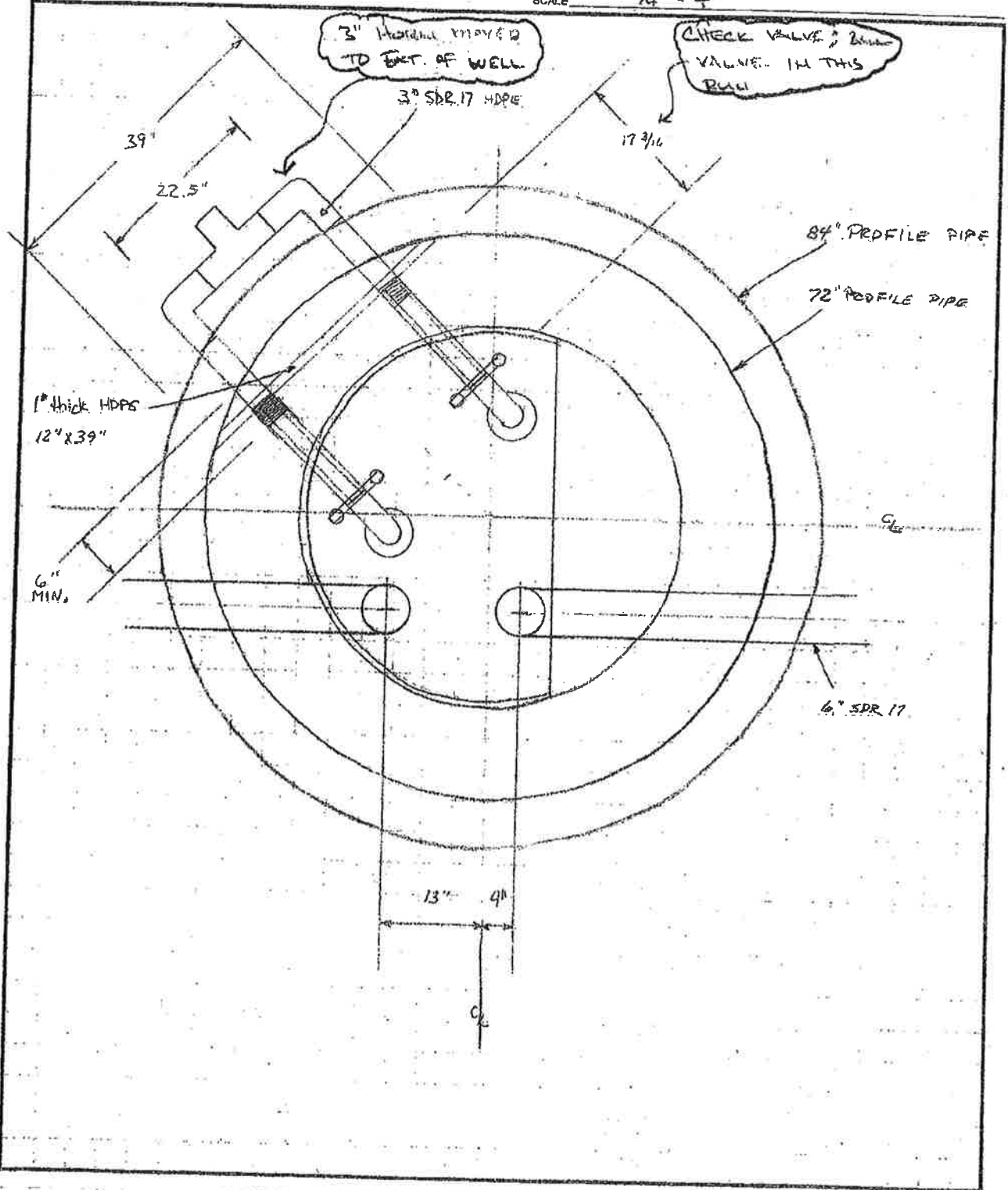
Jesse,

We discussed the submittal of a site-specific HASP (specified for this project). Would you have a previous HASP to review? It may help us in submitting something that hits the mark the first time around. EPI has a company Health and Safety Plan that I am working with, but a template of something that has been reviewed and accepted would be of assistance.

Aloha,
kp

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

JOB KEKAHA LF
 SHEET NO. 01 OF 01
 CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE 12-28-11
 SCALE $\frac{1}{4}'' = 4'$



FAXED
OCT 26 2011

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 2 Project Name: Kekaha Landfill Leachate

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	10/28/11
Attn:	Jesse Frey	Requested by:	Jeff Fisher
Address:	_____	Subject:	Fernco Reducers
	_____	Spec. Section:	15019 2.03
Tel No:	_____	Plan Ref:	13 and 14
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	Wednesday, November 2, 2011	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

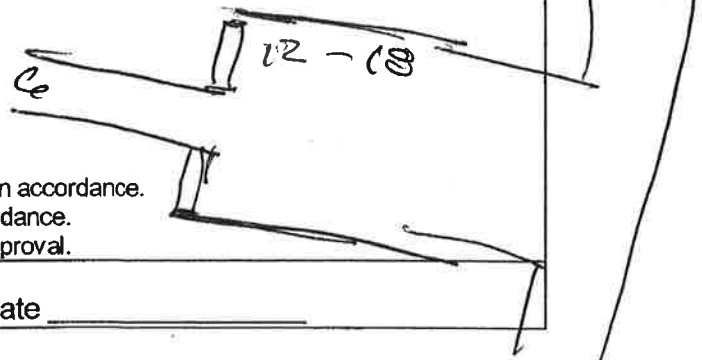
For the 18" x 6" reducer and 12" x 6" reducer in LCM #1, #7, #8 & #14 for the 6" cleanout connection, we propose that the reducers be (2) piece as they do not manufacture a (1) piece reducer to get from the larger size directly to 6"

18x6 AND 12x6 ARE NOT "STOCK". MFR SAID THEY WILL MAKE ANYTHING. CONTRACTOR PROPOSED 2-PIECE IS OK. PREFERRED ALTERNATIVE TO TWO FLEX COUPLINGS IS 6" PIPE TERMINATED WITH 12.75 OR 18.00 IN OD. RING AND 12x12 OR 18x18 FLEX COUPLING, RESPECTIVELY.

(Handwritten signature/initials)

Signed Jeff Fisher Date 10/28/11

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)



- Check one:**
- Approved for construction and/or clarification, proceed in accordance.
 - Approved for construction and pricing, proceed in accordance.
 - Approved for pricing only. Proceed only after written approval.

Signed _____ Date _____



P.O. Box 1326 Phone 808-246-8808
 Lihue, HI 96766 Fax 808-246-8812
 License # AC-24741

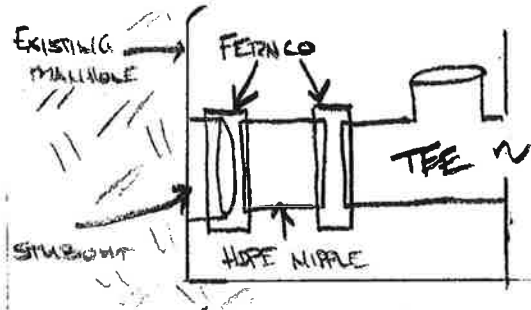
REQUEST FOR INFORMATION - RFI# 03
Project Name: Leachate Modifications Kekaha Landfill

Cust. Job #:	8515	EPI Job #:	176
To:	Waste Management	Date:	3.1.2012
Attn:	Jesse Frey	Requested by:	Keith Perry
Address:		Subject:	LCM Modifications
		Spec. Section:	
Tel No:		Plan Ref:	Sheets 12 - 15
Fax No:	808.668.1366	Revision Control #	
Respond by:	3-5-2012	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

The inlet and outlet pipe flanges in existing manholes have previously been cut back to LCM walls with 3"-8" of stub out. Is it acceptable to have an HDPE nipple and two Fernco fittings to make up the gap between the tee and the existing pipe?



Signed _____ Date _____

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Please see attached e-mail response from AECOM dated 5/5/12.

Check one:

- Approved for construction and/or clarification, proceed in accordance.
- Approved for construction and pricing, proceed in accordance.
- Approved for pricing only. Proceed only after written approval.

5/5/12

Signed _____ Date _____

Bergschultz, Ken

From: Wintheiser, Paul
Sent: Monday, March 05, 2012 9:57 AM
To: Bergschultz, Ken
Subject: RE: RFI 3

During the design phase of the project, AECOM was provided with information that indicated that some (but not all) of the flanges in the manholes had been cut off. The details on Drawings No. 11 through 15 show non-flanged connections where the information provided to AECOM indicated that flanges no longer existed.

If other locations are also missing flanges, the contractor may use any of the connection styles shown on the drawings, including: butt fusion, electro-fusion couplings, Snook® couplings, and/or Fernco® couplings. Field extrusion welds are not acceptable. However, as shown on Drawings No. 11 – 15, when non-load bearing flexible connections such as Snook® couplings, and Fernco® couplings are used, the pipe and/or fittings SHALL be supported (both vertically and laterally) so that their weight does not result in sagging, misaligned piping and stress on the flexible couplings.

The original intent of the flexible connectors shown on Drawings No. 11 – 15 was to: 1) provide a liquid and gas tight connection between a pipe and a fitting where there was no room to make a rigid (flanged, butt fusion or electro-fusion) connection, and 2) compensate for the short gap between a pipe and a fitting necessary to rotate the new fitting into place. Aside from these two situations, AECOM did not intend for flexible couplings to link multiple sections of pipe (as opposed to a pipe and a fitting). Therefore, with regard to the Contractors proposal, the preferred solution would be to fusion weld the pipe nipple to the tee and use one flexible connector between the new pipe nipple and the existing pipe. If field geometry prevents rotating the new tee into place with a pipe nipple fusion welded to it, then AECOM will approve the Contractors proposal to use two Fernco® couplings (one between the existing pipe and the new pipe nipple and the other between the new pipe nipple and the new tee).

From: Bergschultz, Ken
Sent: Monday, March 05, 2012 8:31 AM
To: Wintheiser, Paul
Subject: Fwd: RFI 3

Paul,

Could you please take a look this morning at this RFI for Kekaha leachate manholes?

Thank you.

Kenny

Begin forwarded message:

From: "Frey, Jesse" <JFrey@wm.com>
Date: March 2, 2012 5:40:55 PM CST
To: "'ken.bergschultz@aecom.com'" <ken.bergschultz@aecom.com>
Cc: "'MMinch@Geosyntec.com'" <MMinch@Geosyntec.com>, "'CScott@Geosyntec.com'" <CScott@Geosyntec.com>
Subject: Fw: RFI 3

Hi Kenny,

Please see the attached RFI from Earthworks Pacific. The suggested approach in the RFI seems

reasonable and straight forward.

Thanks,
Jesse

From: keith Perry [<mailto:keith@earthworkspacific.com>]
Sent: Friday, March 02, 2012 11:42 AM
To: Frey, Jesse
Cc: cscott@geosyntec.com <cscott@geosyntec.com>; sean@earthworkspacific.com
<sean@earthworkspacific.com>
Subject: RFI 3

Jesse,

RFI 3 as we discussed with Chris yesterday.

-kp

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Please recycle any printed emails.**



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 Lihue, HI 96766 Fax 808-246-8812
 License # AC-24741

REQUEST FOR INFORMATION - RFI# 04
Project Name: Leachate Modifications Kekaha Landfill

Cust. Job #:	<u>8515</u>	EPI Job #:	<u>176</u>
To:	<u>Waste Management</u>	Date:	<u>3.8.2012</u>
Attn:	<u>Jesse Frey</u>	Requested by:	<u>Keith Perry</u>
Address:	<u></u>	Subject:	<u>LCM Modifications</u>
		Spec. Section:	<u></u>
Tel No:	<u></u>	Plan Ref:	<u>Sheets 12 - 15</u>
Fax No:	<u>808.668.1366</u>	Revision Control #	<u></u>
Respond by:	<u>3-13-2012</u>	Page(s):	<u>1, including cover</u>

Discrepancy **Conflict** **Confirm** **Clarification** **Suggestion** **Other**

Request:

We are unable to proceed with the modifications of the Leachate Manholes due to LEL's higher than permitted by OSHA regulations for a safe work environment. Please advise on a remedy.


Signed _____ Date _____

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Please see attached e-mail dated 3/16/12 from AECOM to WM in response.

Check one:

- Approved for construction and/or clarification, proceed in accordance.
- Approved for construction and pricing, proceed in accordance.
- Approved for pricing only. Proceed only after written approval.

Signed  Date 3/16/12

Bergschultz, Ken

To: Frey, Jesse
Cc: Troy Tanigawa; Cioffi, Frank; MMinch@Geosyntec.com; CScott@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RE: RFI #4

Good afternoon Jesse.

The following is in response to RFI #4 on a resolution to aid in the access of the leachate collection manholes (LCMs) at Kekaha LF. Based upon the RFI and recent project discussions, the levels of LFG in each LCM is exceeding the LEL for suitable access. AECOM has been asked to evaluate a resolution completing the design through access or provide an alternate design solution.

In review of the RFI, project drawings, and the associated project specifications in relation to health and safety to complete the design as presented, AECOM provides the following discussions.

Drawing references:

General Note 3 on Drawings No. 11, 12, 13, 14, and 15 states "Fitting installation shall be coordinated to minimize the amount of time each pipe inlet is temporarily blocked...". **AECOM provided Note 3 to the Contractor as a strong suggestion as to one possible solution to this issue (and a solution that AECOM discussed with Waste Management and the County prior to the Bid process).**

AECOM has two preferred physical suggestions to resolve the situation based upon suggestions, experience, and further discussions with WM through yesterday. These are:

1. Complete the insertion of inflatable pipe bladders (or "pigs") into the pipe stub ends from outside the manhole. This entails manufacturing a segmented extension rod with associated air pressure hose to maneuver the pig into place and inflate from an air compressor also located outside the manhole. AECOM has spent today at local hardware stores and automotive parts stores developing the actual hose connections for a specified pig that can operate in pipe diameters from 6 to 18 inches. AECOM is working on the sketch and associated part numbers to expedite construction of several of these and will specify the corresponding pig. We will even send the mocked-up components. The extension rod is expected to be minimum ½" diameter black pipe that is rigid and can be threaded to multiple lengths.

This will take some finesse and trial-and-error, but this is very achievable. AECOM is working through the geometry of the process based upon the LCM shop drawings which have been provided to the contractor previously. AECOM is expecting to have the final sketch/drawing and parts breakdown by COB Monday given the prototyping.

2. The second option is to subcontract a firm that can complete the entrance into a LFG rich environment. There is a firm called Methane Divers which enters LFG environments. They are a branch of a ship salvage type firm from the Great lakes area. Given this, the Islands of Hawaii may also have the very same capabilities. All that is needed is a person to complete pig placements, the rest of the work and removal of the pigs can happen by others.

Specification Section 01355 – Onsite Health and Safety Requirements, the following should be noted and have been expected by the contractor for completion of the project, no matter the resulting environment in the LCMs.

The first sentence (subpart 1.01 A) of Project Specification Section 01355 (Onsite Health and Safety Requirements) states "Construction/remediation activities at landfills or other waste disposal sites may place CONTRACTOR'S personnel, personnel of other Contractors hired by OWNER to perform Work at site, and public in potentially hazardous situations due to exposure to landfill refuse, leachate and gas". **Why would the landfill gas causing the "readings" in question would be "unexpected". In addition the contractor was present at the prebid where at least 1 if not 2 manholes were opened to demonstrate the confined entry, restricted access and the known hazardous environment for entry. AECOM also understands the Contractor had been on site additional times to further gain survey verification data in each LCM for fitting sizing.**

The second sentence (subpart 1.01 B) of Project Specification Section 01355 states "CONTRACTOR is responsible for implementation and enforcement of safe work practices including, but not limited to, personnel exposure to refuse, leachate, and gasses; ... materials handling ...; operation of equipment; and safety of public during progress of Work". **Therefore, having been warned of the likelihood of hazardous conditions due to (among other things) landfill gas (LFG), the Earthworks Pacific should have incorporated provisions for addressing those hazards in the bid.**

The third sentence (subpart 1.01 C 1) of Project Specification Section 01355 states "Work specified in this Section is considered incidental and cost shall be included as part of appropriate lump sum or unit prices negotiated with OWNER". **Therefore access to the manholes should have been accounted for in the bid process.**

The eighth sentence (subpart 1.03 A) of Project Specification Section 01355 states "CONTRACTOR is responsible for initiating, maintaining, and supervising safety precautions and programs in connection with Work". **Therefore access to the manholes should have been accounted for in the bid process.**

If you have any questions, please let us know.

Kenneth J. Bergschultz, PE
Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Frey, Jesse [mailto:JFrey@wm.com]
Sent: Friday, March 09, 2012 5:31 PM
To: Bergschultz, Ken
Cc: Troy Tanigawa; Cioffi, Frank; MMinch@Geosyntec.com; CScott@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RFI #4

Kenny,

Per our discussions yesterday, please see the attached RFI #4. I anticipate some group discussions on the proposed remedy/remedies to decide on the most practical and efficient solution, since there appear to be several different approaches we can take to get past the current issue.

Thank you,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: keith Perry [<mailto:keith@earthworkspacific.com>]
Sent: Friday, March 09, 2012 1:12 PM
To: Frey, Jesse
Cc: ttanigawa@kauai.gov; jeff@earthworkspacific.com; bryan@earthworkspacific.com
Subject: RFI #4

Jesse,

Please see attached.

Aloha,
Keith

Keith Perry
Project Manager
Earthworks Pacific, Inc.
Office (808)246-8808
Fax (808)246-8812
Cell (808)639-2722

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

Memorandum

Date: 27 March 2012

To: Jesse Frey, Construction Manager, Waste Management of Hawaii, Inc.

From: Mike Minch, Associate *MM*
Chris Scott, CQA Field Manager *CS*

Subject: Kekaha Sanitary Landfill, Phase II Leachate System Modification
Geosyntec Project Number: WG1548

Geosyntec Consultants, Inc. (Geosyntec) was contracted by Waste Management of Hawaii, Inc. (WMH) to provide Construction Quality Assurance (CQA) during implementation of the Phase II Leachate System Modification at the Kekaha Sanitary Landfill. The construction activities involve connecting fittings within the 14 existing leachate collection manholes (LCMs) which are confined spaces. Because landfill gas was anticipated in the LCMs, a pre-construction evaluation was performed on each of the LCMs using a photo ionizing detector (PID) between 18 and 21 January 2012. This evaluation confirmed that the presence of methane at concentrations exceeding 100% of the lower explosive limit (LEL). At these concentrations, an ignition source and oxygen supply will cause combustion.

The general contractor, Earthworks Pacific, Inc. (EP) initiated their first confined space permit on 29 February 2012 in accordance with 29 CFR 1910.146 and the project's permit-required confined space entry (PRCSE) program. The cover of LCM-4 was removed and the confined space was initially measured with a PID to contain high methane concentrations in excess of 100% LEL. Once the initial PID gas readings were documented, two 12-inch positive pressure blowers were placed into the opening of the LCM to reduce landfill gas concentrations and attempt to achieve a safe condition for entry. During ventilation, the methane concentration decreased, however the lowest steady reading was approximately 40% LEL. For safety, the PRCSE limits entry to concentrations of 25% LEL or less. After two continuous hours of ventilation with only achieving 40% LEL, EP terminated the permit, closed the LCM, and work was suspended until a better method for creating a safe atmosphere could be determined. EP submitted a request for information (RFI #4) asking for a method to remedy to hazard.

Entry into this type of confined space is not routine, and each one can present unique hazards. Nationwide, Geosyntec has been recently involved at the following three similar types of projects where confined space entry was required in manholes or other vessels which were part leachate collection and removal systems:

- Deolia ES Taylor County Landfill in Mauk, GA;
- Cherry Island Landfill in Wilmington, DE; and
- Lee County Landfill in South Carolina.

In each case the initial concentrations of methane exceeded 25% of the LEL. At the Lee County Landfill initial readings were reported at approximately 30% LEL, Taylor County Landfill was between 50% and 60% LEL, and Cherry Island Landfill was at least 100% LEL. In order to conduct a safe entry in each case, the contractors plugged or otherwise blocked (with valves) the supply pipes and ventilated the space with positive pressure blowers and reduced the concentration to below 10% LEL. In the case of the Lee County Landfill, the active landfill gas collection system was connected to the manhole which also created negative pressure to remove some of the methane.

In response to EP's RFI #4, AECOM suggests the installation of temporary inflatable plugs within the inlet and discharge pipes of the LCMs to isolate the source of methane and aid in achieving a safe atmosphere. Based on Geosyntec's recent experiences, this approach has the potential to improve the working conditions within the LCMs, provided that the installation and removal of the plugs can be done successfully.

* * * * *

Earthworks Pacific, Inc.

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4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 005

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	04/02/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	Leachate Collection Manhole Custom-Fabricated Fittings
Tel No:	_____	Spec. Section:	01600
Fax No:	808.668.1366	Plan Ref:	11 through 15
Respond by:	Wednesday, November 2, 2011	Revision Control #	_____
		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

During our site meeting on March 29, 2010, it became apparent that the custom-fabricated HDPE fittings will not fit into the existing Leachate Collection Manholes (LCM's) through the existing 24" diameter manhole tops. Because of this, we are unable to proceed with the modifications of the LCM's as designed. Per our discussions during the site meeting, it was determined that the removal of the tops of the manholes would provide the access necessary for the installation of the custom HDPE fittings. Removal of the LCM tops, as well as the concurrent installation of plugs in all of the 8" leachate pipes during installation of the fittings for each management system, will also be beneficial in providing a much safer and more OSHA-compliant solution for addressing the excessive levels of LEL's discussed in RFI #4.

Please provide a repair solution for the LCM Manhole tops so that we can repair/modify the tops of the 14 LCM's once the necessary internal modifications have been made.

Signed Bryan Davidson  Date 04/02/12

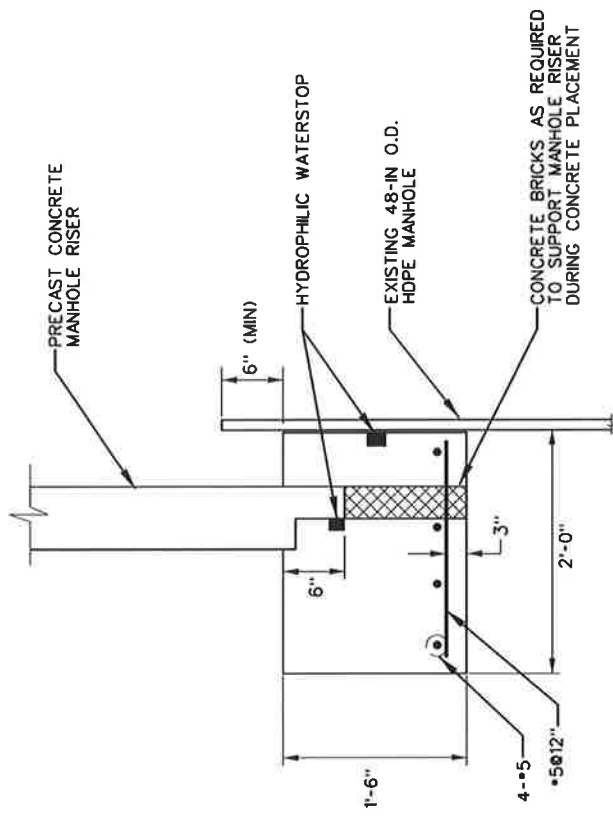
Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Upon removal of the existing LCM manhole top, the proposed means discussed on 3/29/12 would be to install a concrete manhole and safety hatch over the remaining manhole section. AECOM is providing the attached detail based upon email correspondence to date with WM and EPI and the desire to construct a solid foundation to manhole connection.

Check one:

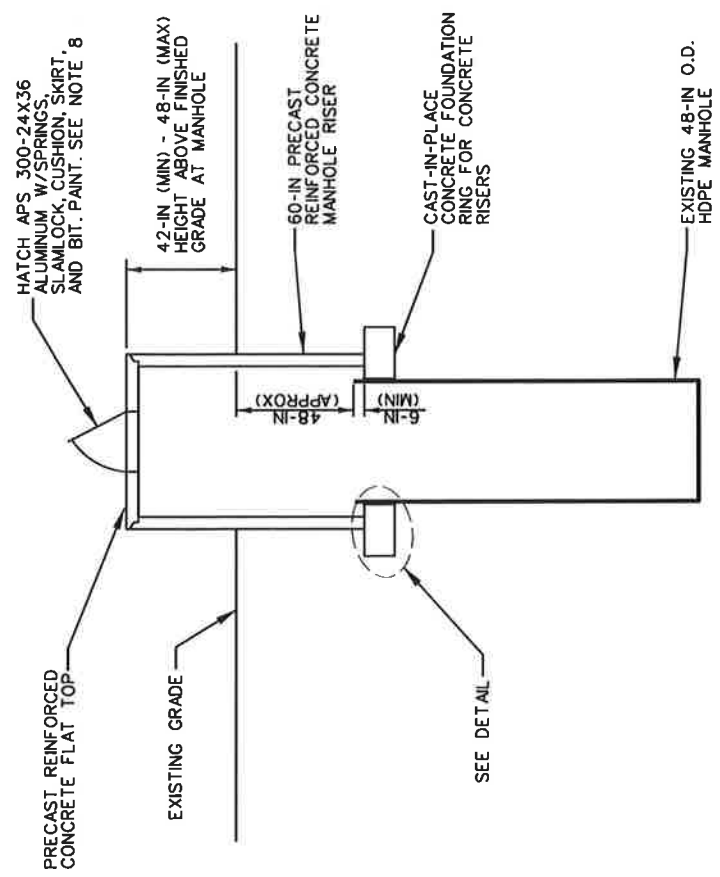
- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed  Date April 13, 2012



NOTES:

1. PRECAST CONCRETE MANHOLE RISERS AND TOPS SHALL MEET ASTM C-478 REQUIREMENTS.
2. COAT INSIDE SURFACES OF MANHOLE RISERS AND TOPS WITH EPOXY POLYANINE EQUAL TO TNEPEC PERMA SHIELD FR SERIES 436.
3. JOINT SEAL SHALL COMPLY WITH PHYSICAL REQUIREMENTS FOR TYPE B GASKETS IN AASHTO DESIGNATION M-198.
4. CONCRETE SHALL HAVE 28-DAY COMPRESSIVE STRENGTH OF 4000 psi.
5. REINFORCING SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
6. HYDROPHILIC WATERSTOP SHALL BE HYDROTITE CJ-1020-2K BY GREENSTREAK INC. OR EQUAL.
7. BACKFILL WITH EXCAVATED ON-SITE SAND FILL. BACKFILL SHALL BE PLACED IN LIFTS AND COMPACTED.
8. APPROVED HATCH PER AECOM EMAIL DATED APRIL 3, 2012.



CONCRETE MANHOLE RISER

NTS

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REQUEST FOR INFORMATION - RFI# 006

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	.....	EPI Job #:	176
To:	Waste Management	Date:	04/27/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	.....	Subject:	Meter Vault Conflict
Tel No:	.....	Spec. Section:	15019
Fax No:	808.668.1366	Plan Ref:	8, 10
Respond by:	.....	Revision Control #	.....
		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

- 1.) During installation of Meter Vault #2, we discovered that the specified 3" EPG Paddlewheel Flow Meter would not fit in the vault as depicted. The space between the two integral HDPE flanges measures 47", while the meter itself, without the PVC Flange adapter, the 11.25 degree bends, or the male adapters, measures 45". I talked with EPG's technical service representative, and he said that the main criteria are that the meter needs to have a straight flow path length of 30" going into the meter, and 15" coming out of the meter. I made a "blank" utilizing the necessary fittings to see what configuration would work. Please see the attached sketch. I was unable to find a configuration that would allow us to install the meter per the manufactures criteria. Please review the attached sketch and advise. We will face a similar situation for Meter Vault #1, as well.
- 2.) The meter vaults do not have a penetration for the wire leads from the meter. Please advise how this should be addressed.

Signed Bryan Davidson Date 04/27/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

- 1.) THE CONTRACTORS PROPOSAL IS NOT APPROVED. AS DRAWN, IT IS BACKWARDS. PLEASE SEE SUGGESTED ALTERNATIVE (ATTACHED)
- 2.) AECOM SUGGESTS DRILLING A HOLE IN THE VAULT WALL (AS HIGH AS POSSIBLE), TAP (THREAD) THE HOLE, AND INSTALL A STRAIN

Check one: RELIEF GRID CONNECTOR EQUAL TO ARLINGTON INDUSTRIES
 Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

CATALOG NUMBER
LPCG 503 OR 753. PLEASE USE ATTACHMENT.

Signed [Signature]

Date 5/14/12

SCH 80 PVC ONE PIECE
FLANGE (SOCKET)
WITH GASKET AND
3" PVC PIPE STUB

SCH 80 PVC ONE PIECE
FLANGE (SOCKET)
AND GASKET

METER VALVE
WELL (TYP.)

EPG
METER

15"

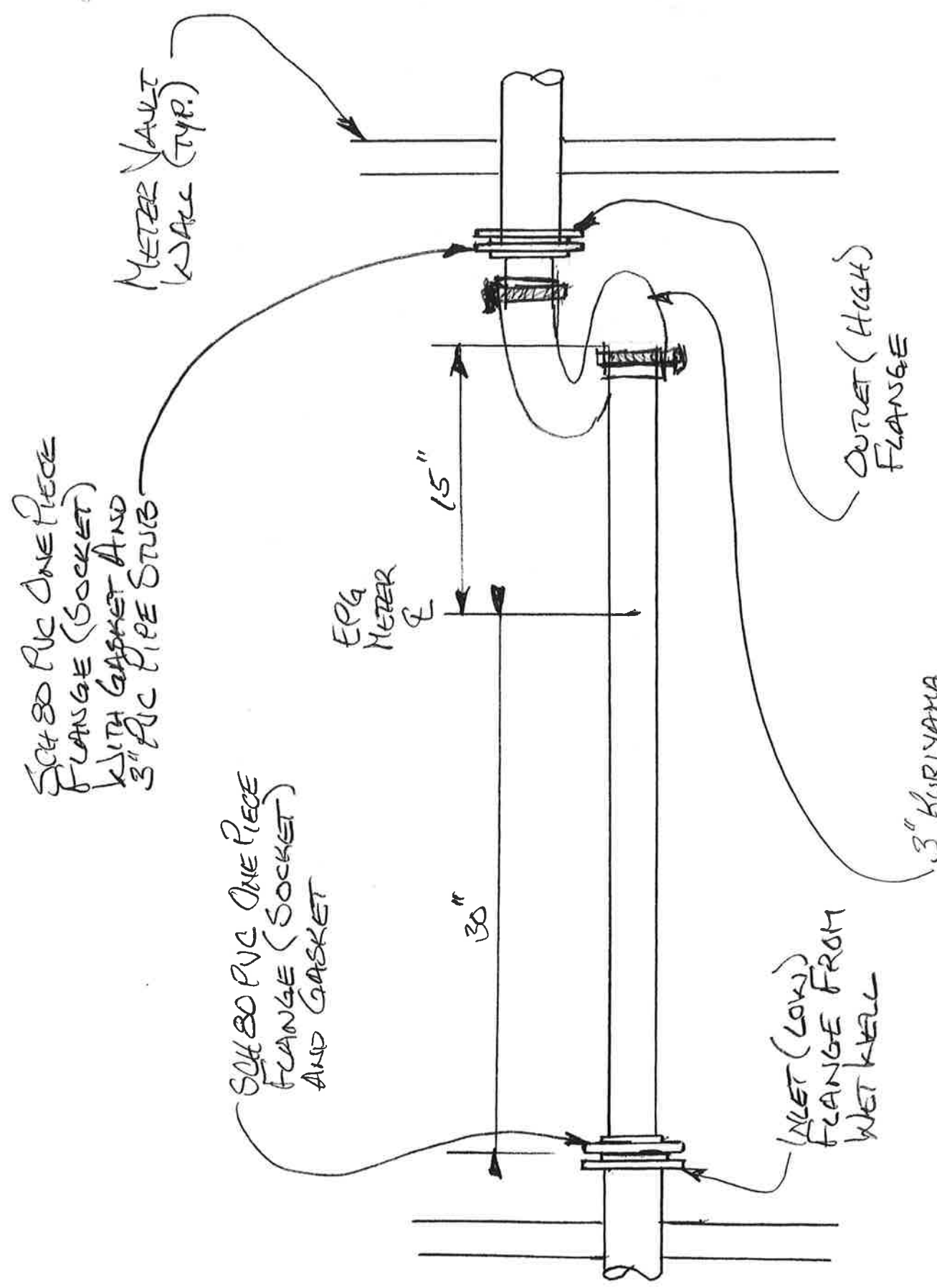
30"

OUTLET (HIGH)
FLANGE

INLET (LOW)
FLANGE FROM
WELL

3" KURIYAMA
OF AMERICA
TIGER FLEX HOSE (OR EQUAL)

WITH SS COUPLER END CLAMPS



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License AC-24741

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Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 006-R1

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	05/30/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	Meter Vault Conflict
Tel No:	_____	Spec. Section:	15019
Fax No:	808.668.1366	Plan Ref:	8, 10
Respond by:	_____	Revision Control #	_____
		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

- 1.) Per the attached e-mail response from EPG Companies, would it be acceptable to cut the body of the flow meter as necessary to allow installation of the flow meter into the valve vault, as long as we maintain a minimum of 30" from the last direction-changing fitting upstream of the paddlewheel sensor, and a minimum of 15" between the paddlewheel sensor and first direction-changing fitting downstream of the paddlewheel sensor (not including the flange connections, which do not change the direction of the flow)?
- 2.) In lieu of the 3" Kuriyama hose discussed in the response to RFI #006, would it be acceptable to utilize 3" Schedule 80 pipe & fittings to plumb the flow meter in the meter vaults, as shown on the attached sketch?

Signed Bryan Davidson Date 04/27/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

IF THE CHANGES SHOWN IN RED ON THE SKETCH
ARE INCORPORATED, THEN THE BASIC CONCEPT
IS APPROVED

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed [Signature] Date 10 Aug 12

Bryan,

I reviewed your installation sketch. You should be fine as it shows the 30" of straight pipe before the 3" paddlewheel flow sensor, and 15" of straight pipe after. This is best for flow meter accuracy.

Jim Bailey
EPG Companies Inc.
800-443-7426
FAX: 763-493-4812
www.epgco.com

From: bryan@earthworkspacific.com [<mailto:bryan@earthworkspacific.com>]
Sent: Monday, May 07, 2012 4:19 PM
To: hlester@epgco.com
Cc: 'Jim Bailey'
Subject: FW: Kekaha, Hawaii Leachate Wetwells, EPG Project No. 11-

Howard-

Mahalo for your assistance yesterday with the start-up of our pump station. Your willingness to assist us, even after your normal working hours is appreciated, and allowed us to get the wetwell operational and turned on before the weekend, which will also allow me to proceed with additional work on Monday.

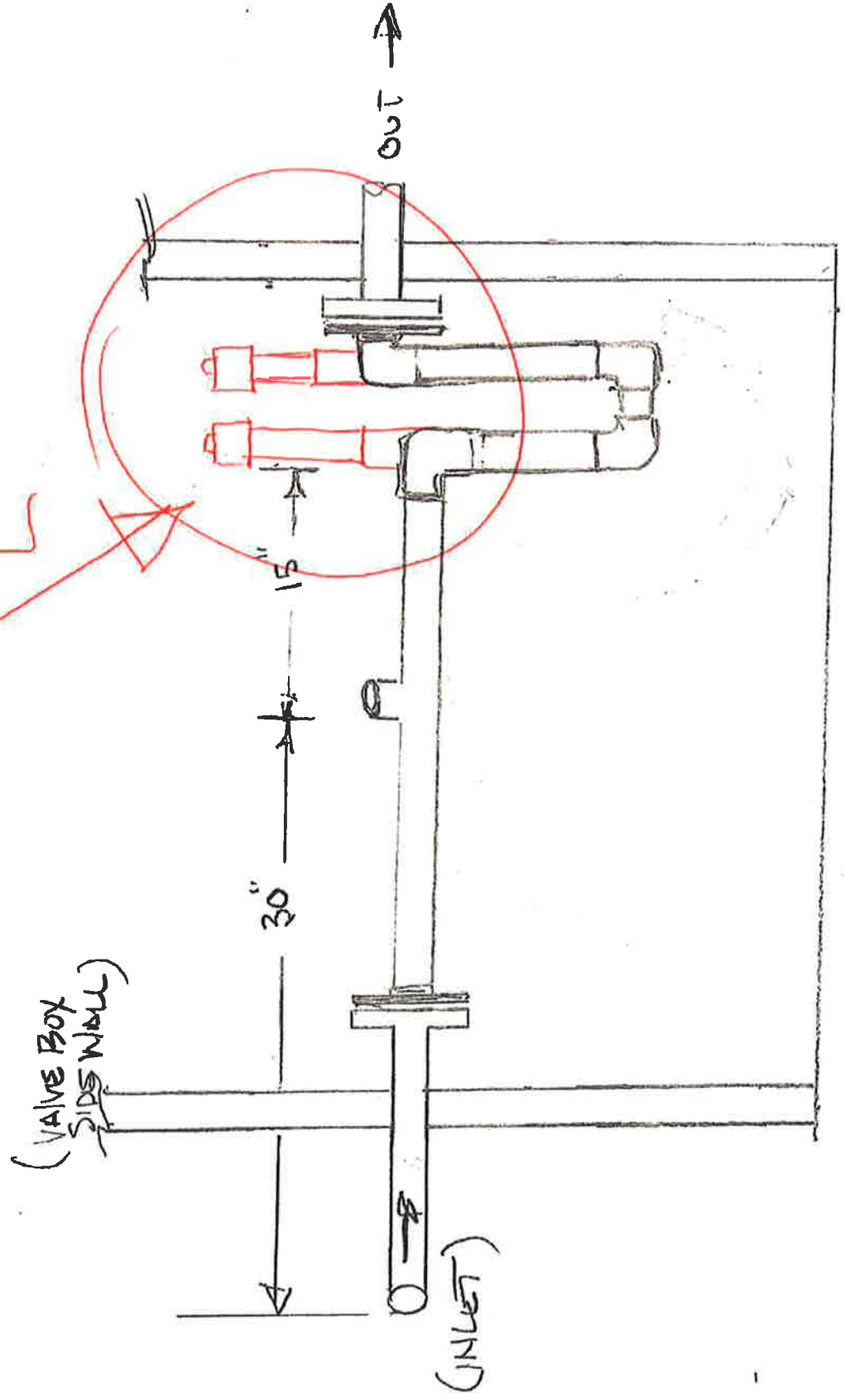
Can you please send me the necessary paperwork to return the VFD to you? Also, I will need to schedule an EPG rep to come out to the site to do the start-up of our second wetwell, as well as testing/checking of both wetwells for proper operation, and training for the landfill personnel. Should I coordinate with you or Jim with regards to this?

Aloha,
Bryan

Bryan Davidson
Earthworks Pacific, Inc.
Project Manager / Superintendent
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(f) 808.246.8812
(m) 808.651.1070
www.earthworkspacific.com



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Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 007

**Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL**

Cust. Job #:	.....	EPI Job #:	176
To:	Waste Management	Date:	04/28/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	.....	Subject:	Wetwell #2 Piping Installation
	.....	Spec. Section:	.....
Tel No:	.....	Plan Ref:	8, 10
Fax No:	808.668.1366	Revision Control #	.....
Respond by:	.....	Page(s):	3, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

During installation of Wet Well #2, we discovered that the piping and appurtenances for Pump #2, which is the pump closest to the incoming leachate line from LCM-8 through 10, would not fit in Wet Well #2 as depicted. We were able to install the 3" SS ball valve, but we could not install the 3" check valve without hitting the cleanout riser or support structure for the same. Please see attached photo for reference. We reviewed the submittal data for the EPG SurePump and noticed that it states that an internal check valve is installed in the pumps. I also spoke with their technical representative and he said that, from their standpoint, it is acceptable to install these pumps without a secondary check valve.

Is it acceptable to install the pump without the secondary check valve in both Wet Well #2 and Wet Well #1, as we will likely encounter the same situation here, as well? If not, additional fabrication will be required, at an additional expense to the County. Please advise.

Signed Bryan Davidson Date 04/28/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

THE SECONDARY CHECK VALVES MAY BE OMITTED AND THE COUNTY SHOULD BE CREDITED FOR THEIR COST. CONTRACTOR SHALL VERIFY THAT PUMPS HAVE CHECK VALVES IN PLACE AND THAT NO HOLES HAVE BEEN DRILLED IN PUMP CHECK VALVES.

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

VERIFY BY PROVIDING PHOTOS OF PUMP CHECK VALVES

APPROVED AS NOTED
Signed *[Signature]*

Date *5/1/12*

Earthworks Pacific, Inc.

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REQUEST FOR INFORMATION - RFI# 008

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	04/30/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	Wetwell #2 Electrical Installation
	_____	Spec. Section:	16050
Tel No:	_____	Plan Ref:	8, 10
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	4/30/12	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

On Friday, April 27, our electrical subcontractor installed the two breakout boxes on top of Wet Well #2, and then the boxes were closed up for the weekend. Upon returning to work on Monday, the breakout box covers were removed, and excessive condensation had collected in the breakout boxes. As the boxes were closed, the condensation had to come from the wetwell, through the 2" stubs through the top of the wetwell, and into the boxes. The plans show EYS seal-offs on the 1" conduit coming out of the breakout boxes, but does not show EYS seal-offs on the 2" stubs going into the breakout boxes. Due to the excess moisture present, should EYS seal-offs be installed on the 2" stub-outs into the breakout boxes? These can be provided and installed, but it will be an additional expense to the County. Please advise ASAP, as installation is in progress, and the seal-offs will need to be installed prior to the completion of the conduit installation, and the EYS's will need to be flown in from off-island.

Signed Bryan Davidson Date 04/30/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

NO! THE REFERENCED SEAL-OFFS WILL MAKE IT IMPOSSIBLE TO REMOVE THE PUMPS FOR SERVICE WITHOUT CUTTING THE MOTOR LEADS. IN ADDITION, THE REFERENCED SEAL-OFFS ARE NOT CODE COMPLIANT IN SOME JURISDICTIONS FOR THIS APPLICATION. INSTEAD - AFTER CHECK ONE: WIRING IS IN PLACE FILL CONDUIT FROM WETWELL WITH

Approved for construction and/or clarification, proceed in accordance.

Approved for construction and pricing, proceed in accordance.

Approved for pricing only. Proceed only after written approval.

SILICONE CAULK OR OTHER NON-HARDENING WATER PROOF COMPOUND

NOT APPROVED
Signed _____

Date 01 MAY 2012

Earthworks Pacific, Inc.

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Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 009

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	05/05/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	Wetwell #2 Electrical Installation
	_____	Spec. Section:	16050
Tel No:	_____	Plan Ref:	8, 10, 17
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	_____	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

During installation of the controls for Wetwell #2, it became apparent that the plans do not show where to terminate the control wiring for the leak detector sensor mounted in the interstitial space. Please provide more information for the desired function and termination point of this sensor.

Signed Bryan Davidson Date 05/05/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Rather than modifying the EPG pump control panels after the fact, it may be easier to add a separate leak detection system at both of the new wet wells. I have attached information for a simple leak detection system that has been used successfully on other projects. This system could be powered from the splice box(es) that power the control panel(s), or from the control panel(s).

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed [Signature] Date 11 May 2012



**WARRICK
CONTROLS**

TA-730 SERIES

Intrinsically Safe MONITORING PANEL

APPLICATIONS

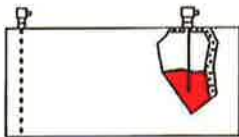


Non-Hazardous Area

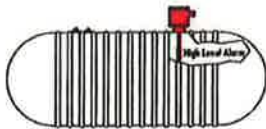
Seal Off Fitting

Hazardous Area

**Aboveground Fuel
Storage Tanks
Leak Detection,
Overfill**



**Underground Fuel
Storage Tanks
High Level Alarm,
Leak Detection,
Piping Sumps**



**Liquid Level Alarms
High/Low Floats**



- A** Power and auxiliary contact wiring
- B** Adjustable sound level from 77-97 dB via moveable horn shutter
- C** Red LED indicates current fault condition
- D** Green LED indicates panel has power
- E** For TA-731, yellow LED indicates fault condition has occurred, even if fault has cleared itself (TA-732 "Alarm 2" red LED)
- F** Test button allows alarm activation and system testing
- G** Acknowledge button allows direct alarm silencing
- H** Intrinsically safe sensor wiring

Warrick TA-730 Series intrinsically safe monitoring panels solve simple tank monitoring needs. Packaged in secure 3R rated electrical enclosures, they are designed to interface with a variety of leak detection or overfill sensors. Applications include refill alarm, overfill alarm, high level alarm and leak detection.

These cost-effective, solid state TA-730 monitoring panels offer many features not commonly found in controls of this type:

- Intrinsically safe sensor circuit(s)
- Auxiliary contact for remote alarm or cutoff
- Field selectable operation of auxiliary relay for cutoff mode or alarm mode
- Caution LED to warn when a fault condition has occurred and cleared itself (TA-731 only)
- Available in 1-channel model (TA-731) and 2-channel model (TA-732)
- Indoor or outdoor installation
- Low cost, long life
- High impact polycarbonate plastic housing
- Compact design, small footprint
- Easy-to-reach screw-in wiring terminals for easy installation and secure connections
- Options for either normally open or normally closed contacts

TA-730 SERIES

I.S. MONITORING PANEL

SPECIFICATIONS

- **Supply Voltage:**
120 VAC +10%,
-15%, 6.6 VA
maximum
- **Indicators:**
Red, green and
yellow (TA-731)
solid state LEDs
- **Audible Alarm:**
Field adjustable
from 77-97 dB at 2 ft.
- **Enclosure:**
NEMA 3R polycar-
bonate (6 1/4"H x
3 1/4"W x 3 1/2"D)
- **Sensor Circuit(s):**
12 VDC,
.238 milli-amp
- **Terminals:**
Size 6 pan head
screws with
captivated wire
clamping plate
- **Temperature:**
-22° to 150° F
ambient
- **Sensitivity:**
0-26K ohm
maximum specific
resistance
- **U.L. 913 Listing:**
Process control
equipment associ-
ated apparatus,
intrinsically safe
- **Conduit
Connections:**
sensor 3/4" NPT,
PVC material;
power 1/2" NPT,
metal
- **Auxiliary Contact:**
SPDT, 10A @
120/240 VAC,
resistive

TA-731 Operation:

The green LED will light when power is applied to the unit. When the remote contact changes state (fault condition), the audible alarm will activate and the red and yellow LEDs will light. When the acknowledge pushbutton is pressed, the audible alarm will stop and the yellow LED will clear. The red LED will remain lit as long as the fault condition exists. When the fault condition is corrected, the red LED will clear.

When a fault condition occurs and corrects itself prior to depressing the acknowledge button, the audible alarm and red LED will automatically activate and clear, matching the fault condition. However, the yellow LED will remain lit to indicate that the fault condition had previously occurred. Pressing the acknowledge button will clear the yellow LED.

TA-732 Operation:

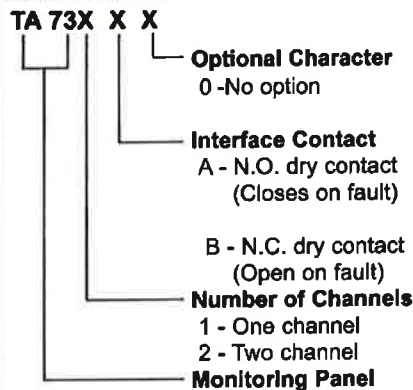
The green LED will light when power is applied to the unit. When the

appropriate sensor contact changes state (fault condition), the audible alarm will activate and the appropriate red LED will light. When the acknowledge pushbutton is pressed, the audible alarm will stop. The alarm LED will remain lit as long as the fault condition exists. When the fault condition is corrected, the alarm LED will clear.

TA-73XXO models include an onboard selector switch to change the operating mode of the auxiliary relay. In cut-off mode, the relay mimics the red LED. The relay activates on fault condition and remains activated until the fault condition has been cleared. Pressing the acknowledge button will not reset the auxiliary relay. On the model TA-732XO, the auxiliary contact will only operate off of channel 1 (Sensor 1).

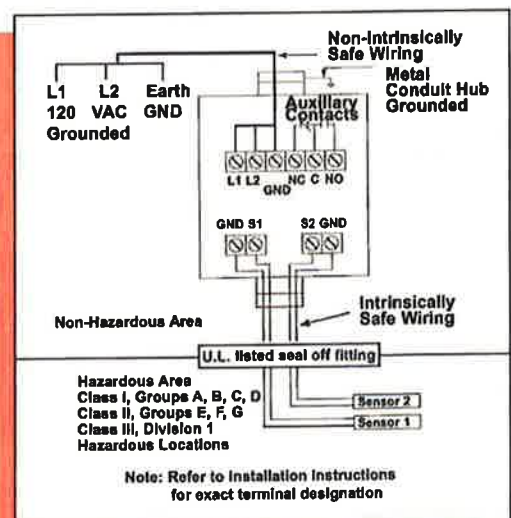
In the alarm mode, the relay mimics the horn. The relay will activate on fault condition and will reset on pressing the acknowledge button or clearing the fault condition.

Ordering Information:



Maximum Sensor Wire Run:
5000 feet based on 12 through 22
gauge wire

Caution: The TA-730 must be located in a non-hazardous area.



Authorized Distributor:

Warrick Controls Inc. • One Cowles Rd. • Plainville, CT 06062-1198 • Telephone: (860) 793-4579 • Fax: (860) 793-4580

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 010

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	05/05/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	Meter Vault #2 Location
	_____	Spec. Section:	_____
Tel No:	_____	Plan Ref:	8, 10
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	_____	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

As designed and shown on the plans, Meter Vault #2 will be located in the roadway. This structure is not traffic-rated. Can it be relocated to be out of the roadway, between the edge of the anchor trench and the asphalt, and then as-built as installed? Meter Vault #1 will also likely be in a similar location. Can this vault also be relocated and as-built?

Signed Bryan Davidson Date 05/05/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Yes, both meter vaults (1 and 2) may be relocated out of the roadway(s), and "as-built" as long as the fundamental design concepts (meter run rises from inlet to discharge) are maintained.

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed [Signature] Date 11 May 2012

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REQUEST FOR INFORMATION - RFI# 011

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	.....	EPI Job #:	176
To:	Waste Management	Date:	05/09/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	.....	Subject:	Meter Vault #2 Surface Restoration
	.....	Spec. Section:	.....
Tel No:	.....	Plan Ref:	10
Fax No:	808.668.1366	Revision Control #	.....
Respond by:	.....	Page(s):	3, including

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

Would the attached sketch be a suitable surface restoration method for Wetwell #1? This sketch is based on field conversations with Waste Management and Geosyntech. If so, I will provide pricing for review and approval as a change order.

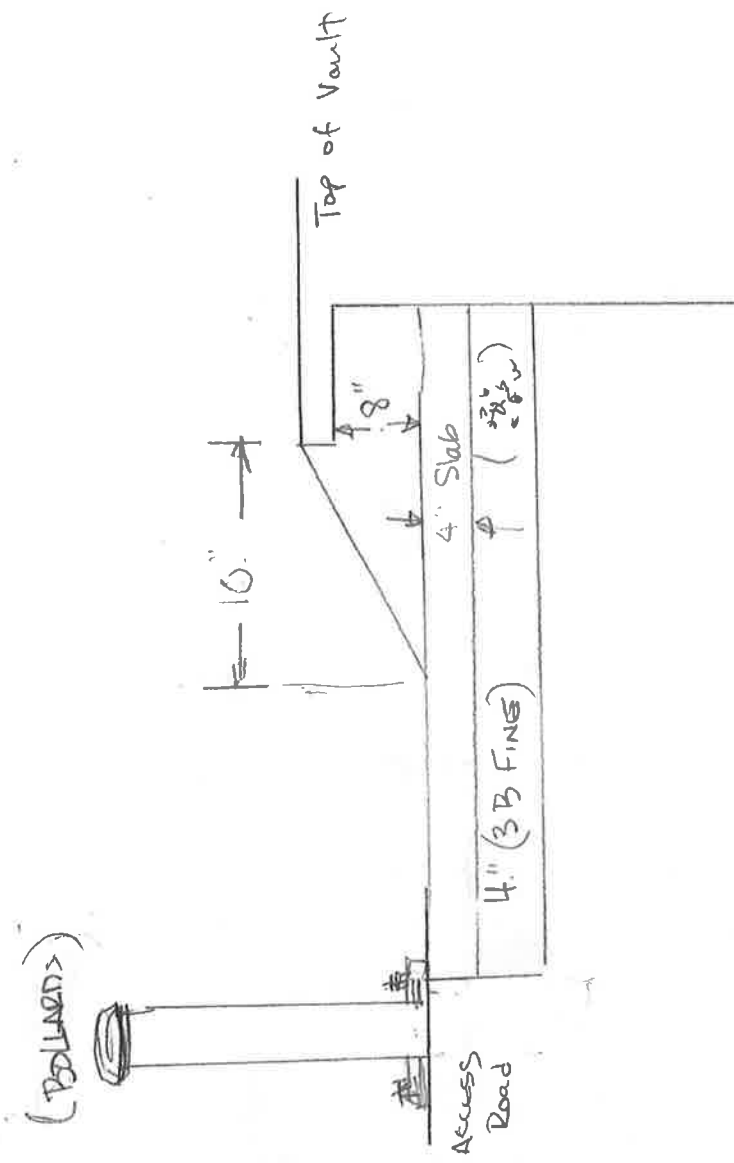
Signed Bryan Davidson Date 05/09/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Check one:

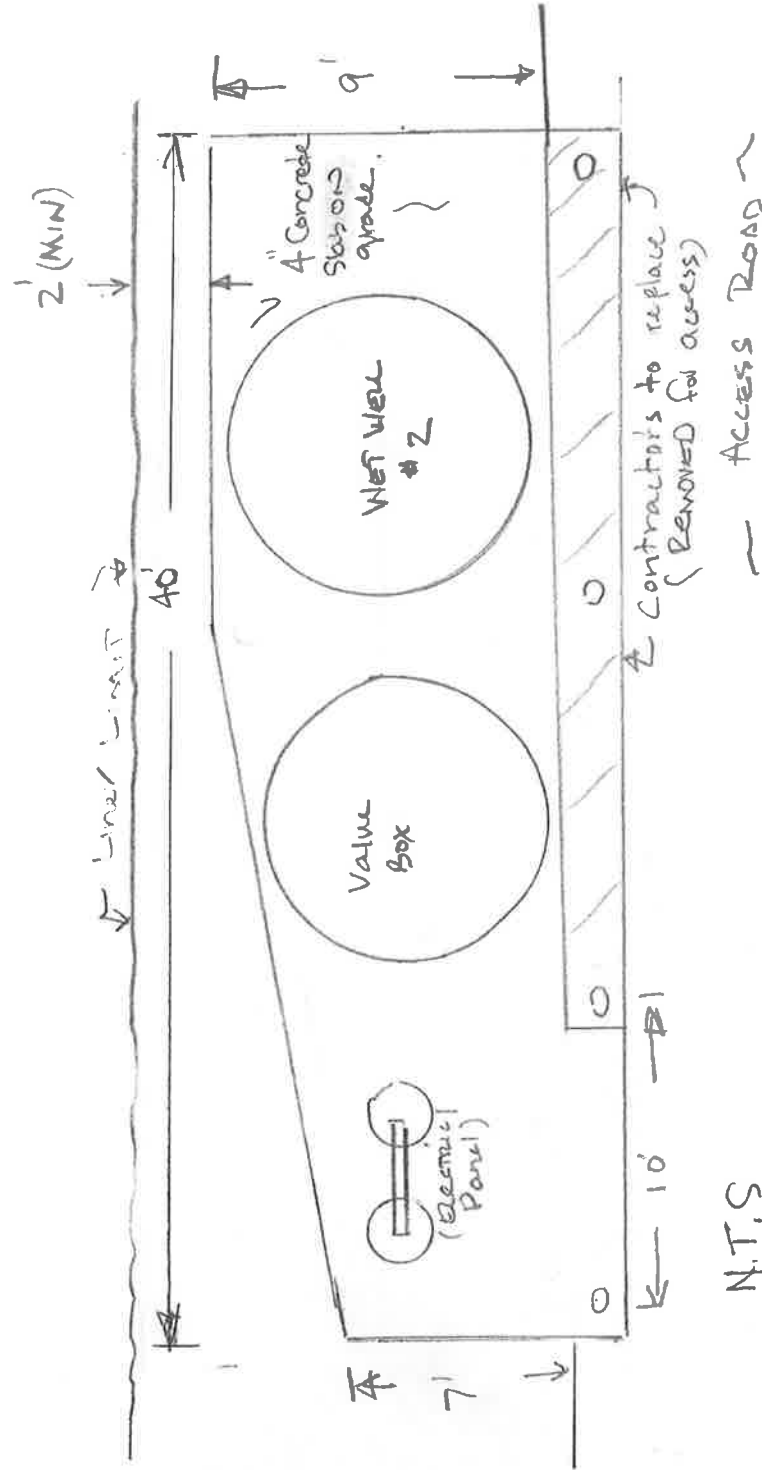
- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed _____ Date _____



N.T.S

(Supply 20 Blocks - 10 each)



N.T.S.

Earthworks Pacific, Inc.

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License AC-24741

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Lihue, HI 96766
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REQUEST FOR INFORMATION - RFI# 012

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	05/09/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	Wetwell #1 Pipe Inverts
	_____	Spec. Section:	01160
Tel No:	_____	Plan Ref:	8
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	5/9/12	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

The plans indicate that the existing 18" pipe coming into Wetwell #1 from LCM-5 is EL 6.5. As measured in the field, the invert is EL 6.91, which is 0.41' higher than designed. To make the wetwell work, we believe that we can rotate the 18" x 6" eccentric reducer to make up the height difference, and we can make adjustments to make the horizontal difference work. Is this acceptable?

Signed Bryan Davidson Date 05/09/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

If the 18-inch diameter pipe from LCM's 5-7 is 0.41-foot *higher* than anticipated, I suggest excavating along the 18-in pipe so that the 18-in pipe with the new 18 x 6-in eccentric reducer installed on the end as shown on Drawing No. 8 (with both the 18-in and 6-in inverts aligned at the pipe flow line) can be relayed (sloped downward) to meet the elevation of the 6-in nozzle on the new wet well. And, because the pipe has a minimum bend radius, it may be easiest to place the 18 x 6 reducer about 50-ft away from the new wet well and slope the 6-in pipe to the new wet well. The 6-in pipe has a much shorter minimum bend radius than the 18-in pipe.

Check one:

- Approved for construction and/or clarification, proceed in accordance.
- Approved for construction and pricing, proceed in accordance.
- Approved for pricing only. Proceed only after written approval.

Signed *Carroll Wulfsohn* Date *11 May 2012*

Chris Scott

From: Frey, Jesse <JFrey@wm.com>
Sent: Wednesday, May 23, 2012 7:22 PM
To: bryan@earthworkspacific.com
Cc: Chris Scott
Subject: FW: KLF - RFI #13 - Waste Disposal

See attached response from Kauai County. In my mind, this serves as the formal response to the RFI.

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Troy Tanigawa [mailto:ttanigawa@kauai.gov]
Sent: Wednesday, May 23, 2012 3:16 PM
To: Frey, Jesse
Subject: RE: KLF - RFI #13 - Waste Disposal

Jesse,

As discussed in Thursday's meeting, there are also large sections of reinforced concrete as well as HDPE. We are in agreement that the HDPE and concrete materials are not recyclable.

Earthworks shall crush the concrete into manageable pieces, as determined by Waste Management, that can be used for landfill road stabilization etc. near the working face of the landfill. All metal reinforcement shall be removed and taken to the Puhī Metals Recycling Center by Earthworks. HDPE shall also be cut to manageable pieces in order to minimize voids when incorporated into the landfill.

Please contact me if there are any questions.

TROY TANIGAWA
Environmental Services Management Engineer
Department of Public Works - County of Kauai
4444 Rice Street, Room 295
Lihue, Hawaii 96766
Ph# 241-4838
Fax# 241-6887

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From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Wednesday, May 16, 2012 9:16 AM
To: Troy Tanigawa
Subject: RE: KLF - RFI #13 - Waste Disposal

My recommendation is to dispose of the material at the landfill. Most of the materials are HDPE, so to my knowledge they are not recyclable. I believe the total weight of the materials in question is around 20 tons. At this point I do not believe anything has been disposed of in the landfill. The contractor is awaiting direction.

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Troy Tanigawa [<mailto:ttanigawa@kauai.gov>]
Sent: Wednesday, May 16, 2012 9:09 AM
To: Frey, Jesse
Subject: RE: KLF - RFI #13 - Waste Disposal

Thanks Jesse. Please provide your recommendation regarding Earthworks Pacific's suggestion to dispose at the landfill rather than recycle. Bryan mentioned last week that the items are weighed before being taken into the landfill. Is there a total weight for items slated for disposal in the landfill (i.e. wet wells, etc.)?

TROY TANIGAWA
Environmental Services Management Engineer
Department of Public Works - County of Kauai
4444 Rice Street, Room 295
Lihue, Hawaii 96766
Ph# 241-4838
Fax# 241-6887

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From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Tuesday, May 15, 2012 7:16 PM
To: Troy Tanigawa
Subject: Fw: KLF - RFI #13 - Waste Disposal

Troy,

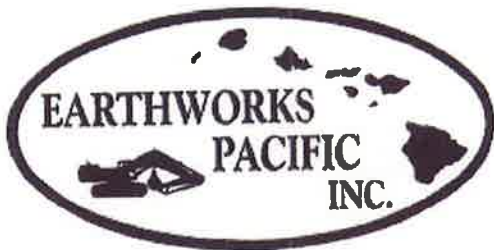
Please see the attached RFI regarding disposal of construction generated debris per our conversations last week.

Thanks,
Jesse

From: bryan@earthworkspacific.com [<mailto:bryan@earthworkspacific.com>]
Sent: Tuesday, May 15, 2012 11:36 PM
To: Frey, Jesse
Cc: kimi@earthworkspacific.com <kimi@earthworkspacific.com>
Subject: KLF - RFI #13 - Waste Disposal

Jesse-
As requested by Troy, please find attached RFI #13 regarding waste disposal.
Mahalo,
Bryan

Bryan Davidson
Earthworks Pacific, Inc.
Project Manager / Superintendent
(o) 808.246.8808
(f) 808.246.8812
(m) 808.651.1070
www.earthworkspacific.com



Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

Earthworks Pacific, Inc.

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REQUEST FOR INFORMATION - RFI# 014r1

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	08/15/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	LCM-14 Modifications
	_____	Spec. Section:	01110
Tel No:	_____	Plan Ref:	N/A
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	_____	Page(s):	4, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

Earthworks Pacific, Inc (EPI) recently looked at LCM-14 and have determined two things:

- 1.) The top of the existing manhole is below the immediately adjacent access ramp to the active portion of the landfill by at least two feet, so it should be raised accordingly. We propose to utilize two pieces of 48" SDR 32.5 HDPE pipe that we have on-site, one approximately 2.5' long, and the other approximately 4' long, by cleaning and planning both joining surfaces parallel to each other, chamfering one edge to accept the extrusion weld bead, and extrusion welding the two sections of pipe together. We would then remove the cone section from LCM-14, and extrusion weld the 6.5' (approx.) section of 48" SDR 32.5 to the top of the existing LCM-14 48" SDR 32.5 riser section, utilizing the same joint preparation method as described above, which would extend the top of the manhole by approximately 2.5 feet. Once the riser section is made up, we propose to add a 48" x 44" (48" OD x 44" Structure ID) U.S.F. Fabrication Basin Cover with a 22" x 34" rectangular covered opening (**Series BPS**) to close the top of the manhole. As a final measure, we would protect the manhole with three existing eco blocks that are currently retaining dirt adjacent to this manhole. See attached sketch for proposed modifications to raise the top of the existing manhole. Is this an acceptable method for raising the top of this structure?

- 2.) The 8" x 4" dual-wall HDPE line that enters LCM-14 does not appear to be located as shown on the plan on Drawing No. 13. This pipe is located almost directly above the 12" x 8" dual-wall HDPE pipe, and does not appear to enter the manhole at an angle that would allow connection of this pipe to the vertical riser without either providing fittings in the structure to make this connection or first shortening the existing pipe and changing the point at which this pipe enters the manhole.

Would it be acceptable to shorten the 8" x 4" dual-wall HDPE in the manhole and Utilize Sch. 80 PVC pipe and glue fittings within the manhole to make up the 6" cleanout riser pipe and/or horizontal connection between the 6" x 4" Tee and the existing 8" x 4" dual-wall HDPE? Also, although the plans do not indicate this, is it acceptable to use an 8" x 6" Femco reducer to connect the 8" inner pipe to the 6" cleanout riser?

Signed Bryan Davidson Date 08/15/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Check one:

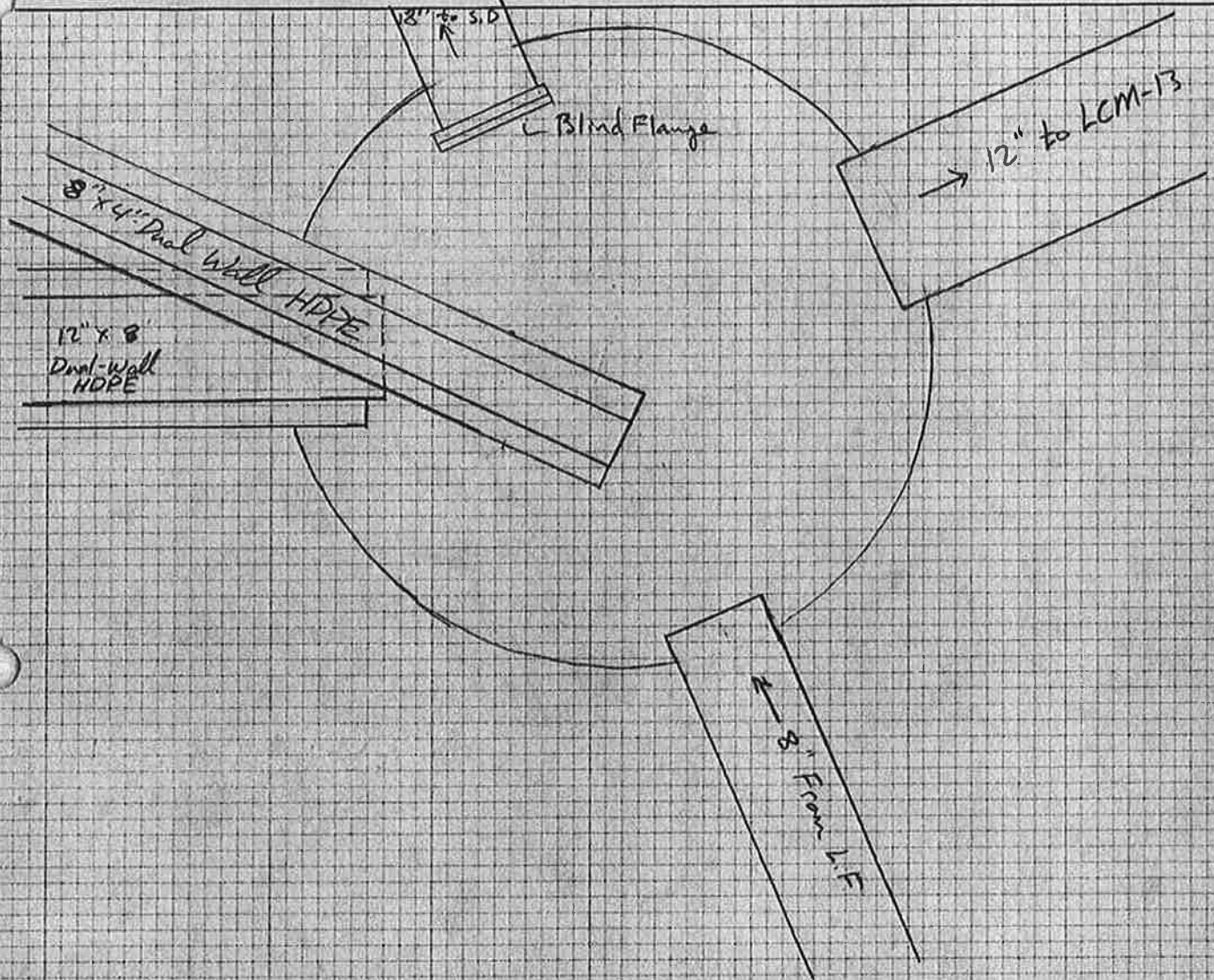
- Approved for construction and/or clarification, proceed in accordance.
- Approved for construction and pricing, proceed in accordance.
- Approved for pricing only. Proceed only after written approval.

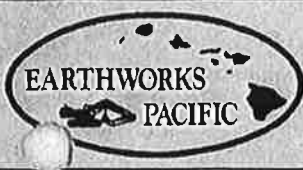
Signed *Carl W. [Signature]* Date *16 Aug 12*

6"



PROJECT Kekaha L.F. Phase II Leachate Management System Mod
 SUBJECT LCM-14 As-built For RFI
 BY B. Swidson DATE 6-4-12 PAGE 1 of

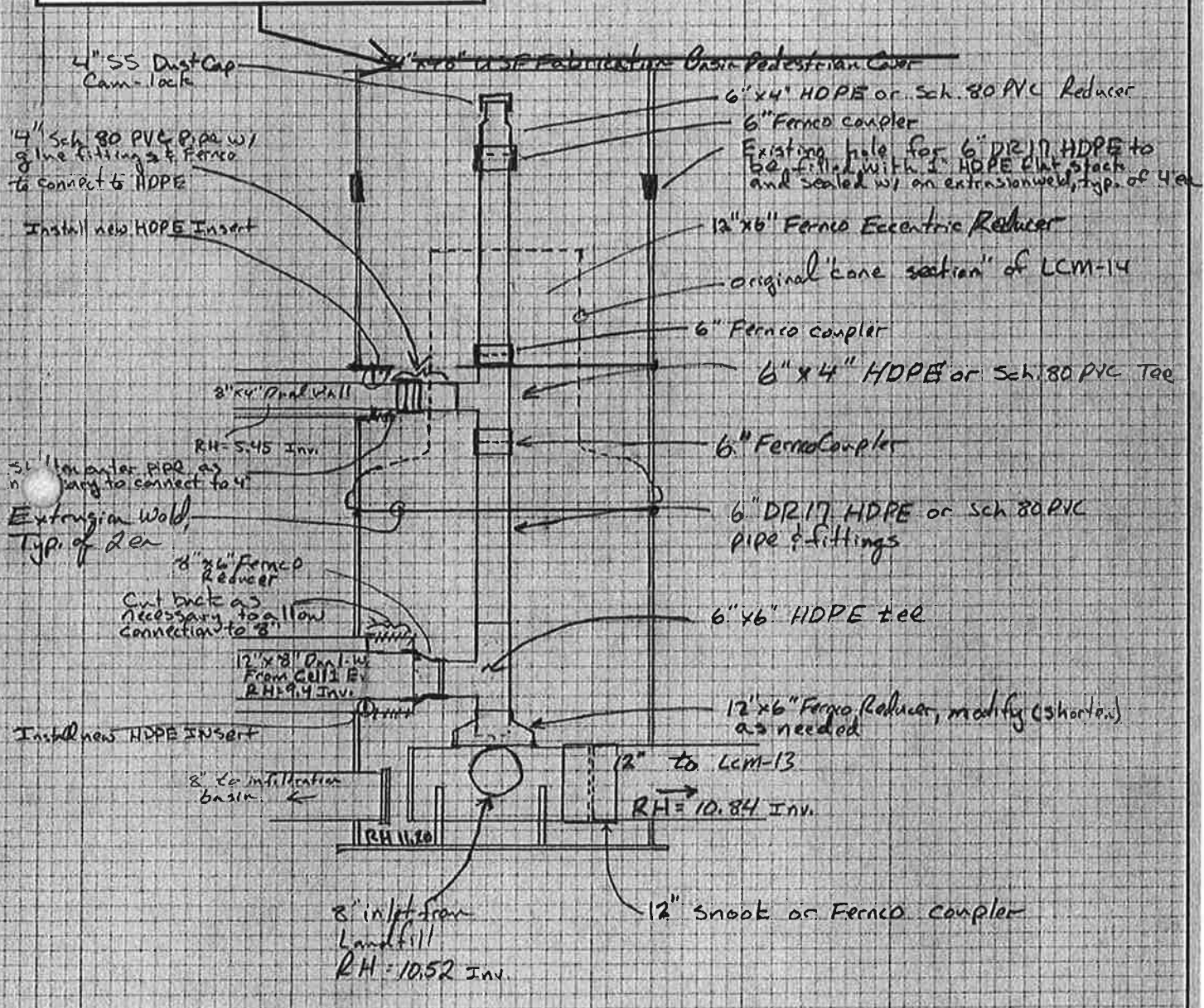




PROJECT Kekaha L.F. Phase II Leachate Mgmt. System Mods
 SUBJECT LCM-14 As-Built for RFI
 BY B. Davidson DATE 6/4/12 PAGE 2 of

48" x 44" (48" OD x 44" Structure ID)
 U.S.F. Fabrication Basin Cover with a 22"
 x 34" rectangular covered opening

Revised 6/18/12 Per review comments
 Revised 8/15/12 Per RFI #014 Review
 Comments



Earthworks Pacific, Inc.

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Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 015

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	_____	EPI Job #:	176
To:	Waste Management	Date:	06/22/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:	_____	Subject:	LCM-8 Fabricated HDPE Fitting
	_____	Spec. Section:	15019
Tel No:	_____	Plan Ref:	N/A
Fax No:	808.668.1366	Revision Control #	_____
Respond by:	_____	Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

Submittal No. 21, Shop Drawing for LCM-8 showed a 1" thick HDPE extruder welded end plate on one side of the fabricated fitting. When we received the fitting, we noticed that this plate had not been installed. **Would it be acceptable to use a Femco 12" Cap in lieu of the end plate?** See attached drawing for reference.

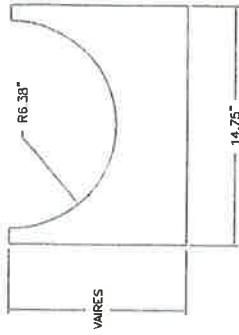
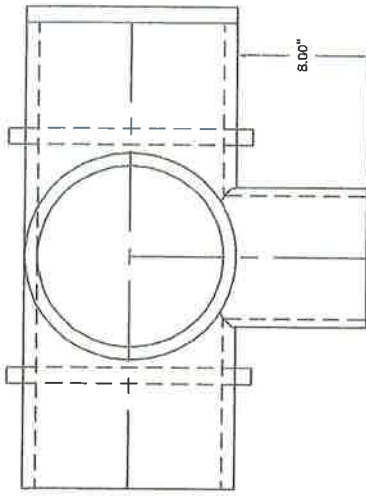
Signed Bryan Davidson Date 06/22/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

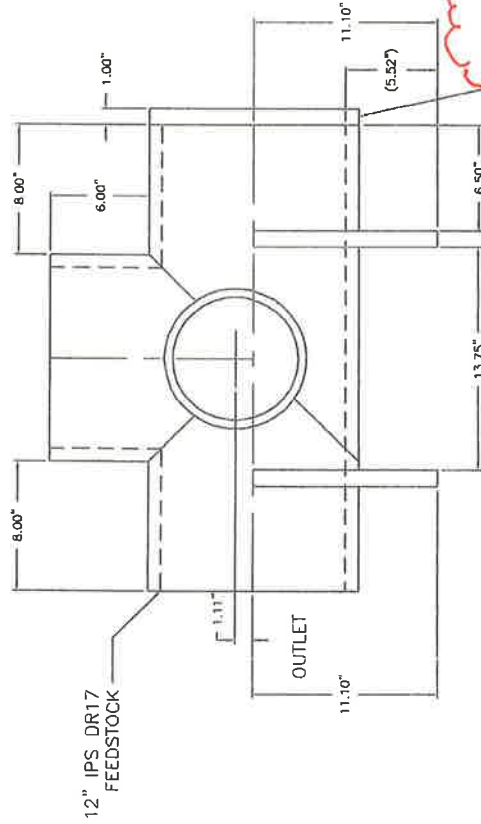
Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed _____ Date _____



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



EXTRUDER
WELDED LEG

12" IPS DR17
FEEDSTOCK

OUTLET

1" THK HDPE EXTRUDER WELDED END PLATE

LCM-8
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

*Factory did not install.
Is it acceptable to use a 1/2" Femco cap? with supports.*

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Van-Tech
ORDER/QUOTE #: IPF-7125
APPROVED FOR FABRICATION

SIGNATURE: _____
DATE: _____

REV.	DATE	DESCRIPTION	DEPT.	APPROVAL	DATE	INDUSTRIAL PIPE FITTINGS, LLC
4	12/12/11	Changes per Red-Lined Drawings	MFG.	MFG_APP	MFG_DATE	
3	12/6/11	Changes per Red-Lined Drawings Added gussets to Tees Made some size adjustments	MKT.	MKT_APP	MKT_DATE	Various Custom Extruder Welded Tees Kadana L.F. Kauai, HI
2	5/19/11		TECH.	TECH_APP	TECH_DATE	DRAWING NUMBER: C70186 SH 8 of 14 REVISION: 4

DRAWN BY: JMB	DATE: 8-22-11
CHECKED BY: VFW	SCALE: NONE
TOLERANCES:	DECIMAL: .3
FRACTIONAL: 3/16	ANGULAR: .5

Earthworks Pacific, Inc.

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Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96786
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 016

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	<u>Contract No. 8515</u>	EPI Job #:	<u>176</u>
To:	<u>Waste Management</u>	Date:	<u>7/31/12</u>
Attn:	<u>Jesse Frey</u>	Requested by:	<u>Bryan Davidson</u>
Address:	<u></u>	Subject:	<u>Epoxy Coating for Precast Concrete Lids, LCM-2 through LCM-13</u>
Tel No:	<u></u>	Spec. Section:	<u>N/A</u>
Fax No:	<u>808.668.1366</u>	Plan Ref:	<u>RFI# 005-R3</u>
Respond by:	<u></u>	Revision Control #	<u></u>
		Page(s):	<u>1, including cover</u>

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

On behalf of our coatings subcontractor, EPI requests to substitute Raven AquataPoxy A6 for the previously approved Raven 405 FS for the epoxy coating of the under-side of the precast concrete tops for LCM-2 through LCM-13. The DFT would remain at 80-mils. Attached is a product data sheet for the AquataPoxy A6 product for your information and use.

Signed Bryan Davidson Date 7/31/12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

APPROVED 9/3/12


Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed  Date 7-31-12

AquataPoxy A-6



DESCRIPTION

AquataPoxy® A-6 and A-6 Thick are solvent-free, 100% solids, corrosion resistant epoxy coatings that can be applied to dry or damp surfaces. Formulated for broad range corrosion protection as well as certified safe for potable water and incidental food contact.

TYPICAL USES

Any surface where corrosion and water resistance is needed, including:

- Potable water structures
- Water mains, distribution and transmission lines
- Tanks, reservoirs and basins
- Secondary containment
- General maintenance

COLOR

White is the standard product color. Black, blue, gray, green and tan are available. Special colors are available on a limited basis. Contact RLS for more information and verification of NSF 61 certified colors.

SOLIDS BY VOLUME

100% solids by volume.

Volatile Organic Compounds: 0.0 lbs/gallon

FILM THICKNESS

AquataPoxy A-6 is a 100% solids epoxy with zero shrinkage. Therefore, actual wet film thickness and final dry film thickness are the same (i.e. 10 mils WFT = 10 mils DFT). Generally, 8-10 mils (A-6) or 10-80 mils (A-6 Thick) maximum per coat are recommended to prevent sagging on vertical or overhead surfaces. Repeat applications may be necessary to achieve specified coating thickness.

THEORETICAL COVERAGE

160 sq. ft. per gallon at 10 mils thickness. Actual surface coverage will depend on surface irregularities. Trials are recommended to determine the actual coverage required to yield a desired film thickness for each individual type of installation. Recommended thickness will vary from 20-150+ mils depending on the installation. Additional information is available by contacting RLS.

APPLICATION METHOD

Brush, roller, heated plural component airless or air-assisted spray. For specific information on application, spray system design, approved systems and Certified Applicators contact RLS.

THINNING

Do not thin with solvents; pinholing and loss of adhesion can result. Drum heaters and inline heaters on specialized spray systems can be used to lower viscosity of the epoxy. Material components should not be heated beyond manufacturer's suggested limits.

CLEAN-UP

To clean tools, use acetone, xylene or MEK. To clean skin, immediately wash thoroughly with soap and water. Refer to the Material Safety Data Sheet for additional information on health and safety.

POT LIFE

30 minutes for 1 gallon at 75°F.

20 minutes for 2 gallons at 75°F.

The amount of pot life and working life will vary depending on the quantity and temperature of epoxy mixed, ambient temperature and the container in which the mixed material is held. Contact RLS for additional information.

CURE AND RECOAT TIME

Initial set generally occurs within 8 hours at 70°F. Curing continues for several days, even underwater. When applying multiple coats, no more than 24 hours at 70°F should be permitted to pass between coats. Environmental conditions may shorten this window. Protect surfaces from contamination of any type between coats. Before recoating, inspect, dry and clean surface thoroughly to remove all contaminants, including amine blush and condensation. If the recoat window is missed, clean and abrade surfaces prior to topcoating. For additional information contact RLS.

SURFACE TEMPERATURE

Minimum recommended: 40°F.

Maximum recommended: 120°F.

CERTIFICATIONS

Potable Water: AquataPoxy A-6 and A-6 Thick are certified to the requirements of ANSI/NSF Standard 61-Drinking Water System Components. Contact RLS for certified colors.

USDA: AquataPoxy A-6 and A-6 Thick are acceptable as coatings for application to surfaces where there is a possibility of incidental food contact.

AWWA: AquataPoxy A-6 and A-6 Thick meet the physical and performance requirements of ANSI/AWWA C 210-03, "Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines".

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 017

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	Contract No. 8515	EPI Job #:	176
To:	Waste Management	Date:	8/7/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson Femco Series 1056 Flexible Couplers
Address:		Subject:	
		Spec. Section:	N/A
Tel No:		Plan Ref:	Sheets 11 through 15
Fax No:	808.668.1366	Revision Control #	
Respond by:		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

We are having a difficult time trying to install the larger 18" Tees. With the 18" vertical portion of the tee, along with the support legs on the tees, we are unable to install full-width couplers on LCM-5. The width of the 18" Femco is 10". We would like to reduce this by up to 5", if necessary, to allow installation of the tee. Is it acceptable to reduce the width of the Femco, as long as we are able to maintain an acceptable width to allow installation of the two stainless-steel bands on each side of the Femco?

Signed Bryan Davidson Date 8-7-12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

AS LONG AS BOTH ENDS OF THE FERCO COUPLING
AS MODIFIED BY THE CONTRACTOR HAVE A MINIMUM
OF 2.50 INCHES OF 18-INCH PIPE INSIDE (I.E. 5.0-IN

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed [Signature] Date 8/7/12

MODIFICATIONS TO
ACCOMMODATE THE TEES
PROVIDED BY THE
CONTRACTOR

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 018

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	Contract No. 8515	EPI Job #:	176
To:	Waste Management	Date:	8/13/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:		Subject:	Potential Conflict with 8" Blind Flange Coupling
Tel No:		Spec. Section:	N/A
Fax No:	808.668.1366	Plan Ref:	Sheets 11 through 15
Respond by:		Revision Control #	
		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

While making preparations for the installation of the custom-fabricated fittings for LCM-8 through LCM-13, we found a potential conflict between the new custom fitting and the blind flange coupling in LCM-11. It appears that the new fitting will contact the blind flange and bolts, which would cause us to not be able to install the fitting. This could be an issue in more than one LCM. If necessary, can the blind flange coupling be cut from the existing 8" pipe? When the new fitting is installed, there will no longer be any leachate present in the structure. As additional assurance, a Fernco pipe cap could be installed on the 8" pipe.

Signed Bryan Davidson Date 8-13-12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

APPROVED - AS LONG AS CONTRACTOR LEAVES SUFFICIENT LENGTH OF PIPE FOR FERSCO QUICK CAP OR EQUAL WITH REMOVING FLANGE

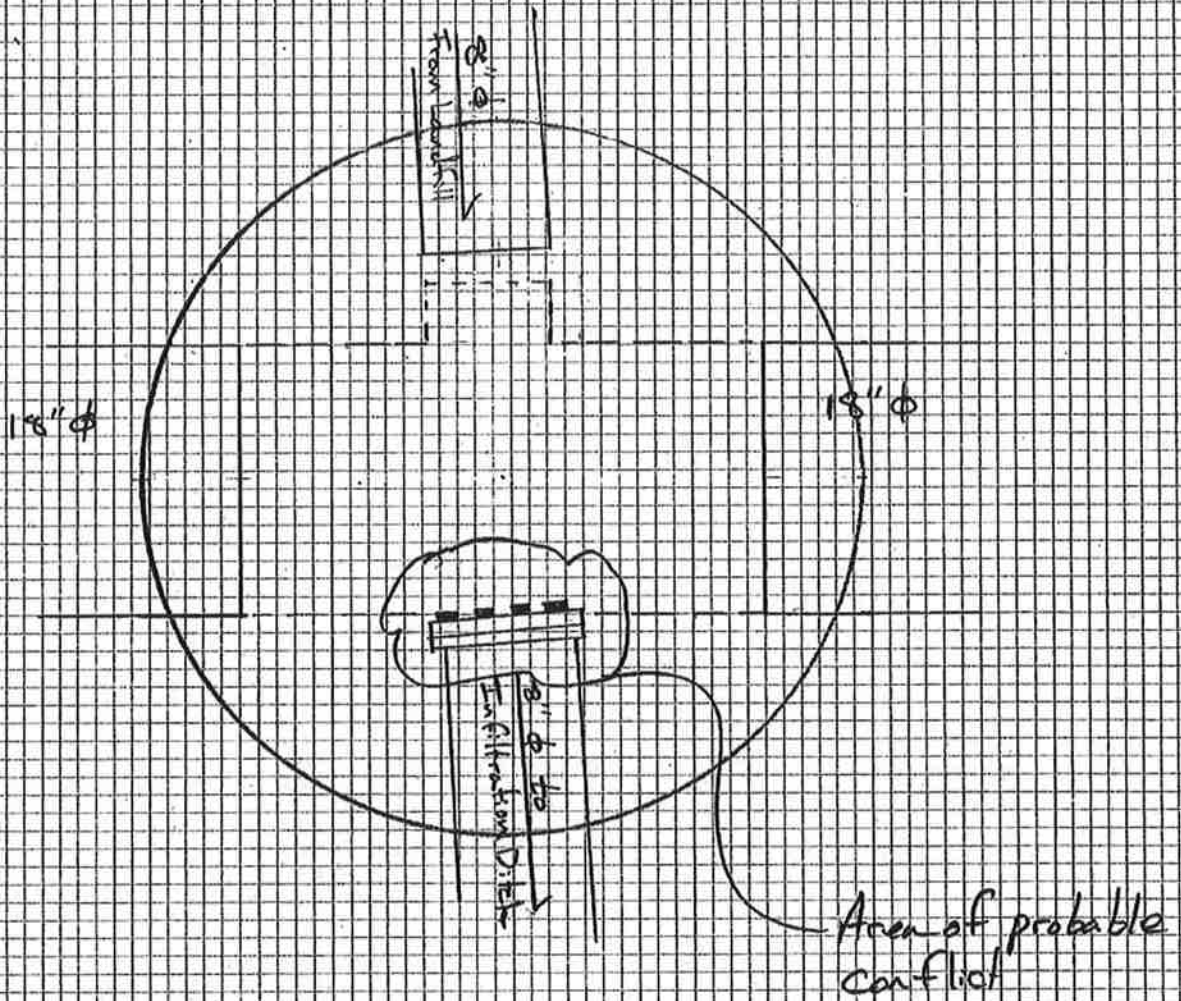
Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed *Charles Davidson* Date 14 Aug 12



PROJECT Kekaha Landfill - Phase II Leachate Mods
SUBJECT Potential Conflict w/ 8" Blind flange Coupling
BY B. Davidson DATE 8-13-12 PAGE _____ of _____



Earthworks Pacific, Inc.

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License AC-24741

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Lihue, HI 96766
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019

REQUEST FOR INFORMATION - RFI# 018

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA SANITARY LANDFILL

Cust. Job #:	Contract No. 8515	EPI Job #:	176
To:	Waste Management	Date:	8/29/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
			Control Panel Leak Detection Function
Address:		Subject:	
		Spec. Section:	16050
Tel No:		Plan Ref:	Sheets 8, 10, 17
Fax No:	808.668.1366	Revision Control #	
Respond by:		Page(s):	1, including cover

Discrepancy
 Conflict
 Confirm
 Clarification
 Suggestion
 Other

Request:

In response to RFI #009, we are having the parts assembled for making the panel modifications to accommodate the leak detection function. Should the leak detection alarm shut the pumps off, or just alarm?

Signed Bryan Davidson Date 8-29-12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

THE LEAK DETECTOR DOES NOT SHUT OFF PUMPS.
 THE LEAK DETECTOR FUNCTION INITIATES AN
 ALARM SIGNAL THAT ILLUMINATES AN ALARM

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

CONTACTS FOR
 REMOTE ALARM

Signed [Signature] Date 04 SEPT 12

Earthworks Pacific, Inc.

P. O. Box 1326 4180 Hoala St.
 Lihue, HI 96766 Lihue, HI 96766
 Phone 808-246-8808 Fax 808-246-8812
 License AC-24741

REQUEST FOR INFORMATION - RFI# 020

**Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
 SANITARY LANDFILL**

Cust. Job #:	<u>Contract No. 8515</u>	EPI Job #:	<u>176</u>
To:	<u>Waste Management</u>	Date:	<u>10/08/12</u>
Attn:	<u>Jesse Frey</u>	Requested by:	<u>Bryan Davidson</u>
Address:	<u></u>	Subject:	<u>Ground Rod Termination at Control Panel</u>
Tel No:	<u></u>	Spec. Section:	<u>16050</u>
Fax No:	<u>808.668.1366</u>	Plan Ref:	<u>Sheet 17</u>
Respond by:	<u></u>	Revision Control #	<u></u>
		Page(s):	<u>13, including cover</u>

 Discrepancy Conflict Confirm X Clarification Suggestion Other

Request:
 Drawing No. 17 indicates that a ground rod is to be installed at each Wet Well, and connected to the Control Panel via cables designated 1G and 2G. Please indicate how and where these cables should be terminated at/in the control panel. For reference, I have attached the wiring diagrams for the two control panels.

Signed Bryan Davidson Date 10-08-12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

All of the grounds (≡) shown on the EPI Panel Drawings shall be wired to a ground bus inside the panel. That ground bus must be connected to the service ground as shown on AECOM Drawing No. 17 by tags E1 and E2. The grounds indicated on AECOM Drawing No. 17 by tags 1G and 2G are supplemental grounds and are intended to be wired to the ground bus inside the panel.

Check one:
 Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed [Signature] Date 10-8-12 *(CONNECTED)*

*discrepancy
 Request*

The panels CANNOT be grounded only by the supplemental ground. The panels MUST be grounded to the main service at the "EMERGENCY DISTRIBUTION PANEL" at the MAINTENANCE BUILDING. While the panels MUST be grounded to the main electric service as shown on AECOM Drawing No. 17, tags E1 and E2, the system will work without the supplemental grounds. Therefore, and in light of the UNBELIEVABLE AMOUNT OF CONFUSION CAUSED BY THE SUPPLEMENTAL GROUNDS AECOM HEREBY REVISES THE DESIGN TO ELIMINATE THE SUPPLEMENTAL GROUNDS SHOWN ON AECOM DRAWING No. 17, TAGS 1G AND 2G

Earthworks Pacific, Inc.

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REQUEST FOR INFORMATION - RFI# 021

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA SANITARY LANDFILL

Cust. Job #:	Contract No. 8515	EPI Job #:	176
To:	Waste Management	Date:	10/08/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:		Subject:	Wetwell #1 & #2 Level Meter Set-up
Tel No:		Spec. Section:	15019
Fax No:	808.668.1366	Plan Ref:	Drawing No. 8 & 10, as marked-up by AECOM and provided via e-mail to WM on 10-31-12
Respond by:		Revision Control #	
		Page(s):	2, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

Per AECOM's direction via e-mail on 10/31/12, we have recorded the requested as-built measurements and made the level setting changes. Please see attached spreadsheet with these values. Note that the Pump On and Pump Off levels provided by AECOM are different than those originally recommended by EPG (and as submitted as part of Submittal No. 11). EPI has programmed the Pump On levels per AECOM's recommendations, but has raised the Pump Off level to 15". During EPG's field visit in September, it was observed that the 9" Pump Off level that had been programmed into the EPG LevelMaster were not sufficiently high enough to prevent pump cavitation. It was determined in the field by EPG's field rep that this point should be closer to 14 or 15", which is why I have set the pumps to shut off at 15".

Are the levels, as programmed into the LevelMaster, correct?

Signed Bryan Davidson Date 11-26-12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed _____ Date _____

Wetwell #1 Level Meter Set-up

Display	Description	Elevations, per AECOM	Level, inches, per AECOM	Level, Inches, as Programmed	Elevations, as Programmed	Level, inches, per Minimum EPG recommendations	Elevations, per EPG Minimum Recommendations
Pr Hi	Pump 1 ON set point	6.08	35.0	35	6.08	40	6.49
PR Lo	Pump 1 OFF set point	3.91	9.0	15	4.41	19	4.74
PRHi2	Pump 2 ON set point	6.50	40.1	40	6.49	46	6.99
PrLo2	Pump 2 OFF set point	3.91	9.0	15	4.41	19	4.74
AL Hi	High Level Alarm set point	7.33	50.0	50	7.33	Not Provided	
Hy Hi	Shut off point for the high level alarm	Not Provided		49	7.24	Not Provided	
AL Lo	Low Level Alarm set point	3.74	7.0	12	4.16	Not Provided	
Offset	Offset Programmed into level Meter (Setup code 25)	Not Provided		-33.6			N/A
	Governing value						

Wetwell #1 As-Built Data

As-Built Top of Wetwell, MSL 17.99
 As-Built Bottom of Wetwell, MSL 3.16 All elevations are based on measurements taken, or calculations, from this point
 As-Built Top of Pump Shroud, MSL 7.32
 As-Built Bottom of Pump Shroud, MSL 3.26
 Distance from Bottom of Pump to Invert of Wetwell Pump 1 -----> 1 1/4" Pump 2 -----> 1 3/16"
 Distance from Invert of Wetwell to Bottom of Level Sensor 1" Confirmed by hand-measuring water level and comparing it to level on display.

Wetwell #2 Level Meter Set-up

Display	Description	Elevations, per AECOM	Level, inches, per AECOM	Level, Inches, as Programmed	Elevations, as Programmed	Level, inches, per Minimum EPG recommendations	Elevations, per EPG Minimum Recommendations
Pr Hi	Pump 1 ON set point	6.33	31.7	31.7	6.33	40	7.02
PR Lo	Pump 1 OFF set point	4.44	9.0	15.0	4.94	19	5.27
PRHi2	Pump 2 ON set point	6.75	36.7	36.7	6.75	46	7.52
PrLo2	Pump 2 OFF set point	4.44	9.0	15.0	4.94	19	5.27
AL Hi	High Level Alarm set point	7.86	50.0	50.0	7.86	Not Provided	
Hy Hi	Shut off point for the high level alarm	Not Provided		49.0	7.77	Not Provided	
AL Lo	Low Level Alarm set point	4.27	7.0	12.0	4.69	Not Provided	
Offset	Offset Programmed into level Meter (Setup code 25)	Not Provided		-32.3			N/A
	Governing value						

Wetwell #2 As-Built Data

As-Built Top of Wetwell, MSL 16.11
 As-Built Bottom of Wetwell, MSL 3.69 All elevations are based on measurements taken, or calculations, from this point
 As-Built Top of Pump Shroud, MSL (approx.) 7.83
 As-Built Bottom of Pump Shroud, MSL 3.77
 Distance from Bottom of Pump to Invert of Wetwell Pump 1 -----> 1" Pump 2 -----> 1 1/4"
 Distance from Invert of Wetwell to Bottom of Level Sensor 2.3" Confirmed by hand-measuring water level and comparing it to level on display.

Chris Scott

From: Frey, Jesse <JFrey@wm.com>
Sent: Monday, December 10, 2012 1:13 PM
To: bryan@earthworkspacific.com
Cc: Mike Minch; Chris Scott
Subject: FW: Kekaha Landfill - RFI for Greenwaste and Silt in Wetwell #1

Bryan,

Please see below from AECOM.

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Bergschultz, Ken [mailto:KEN.BERGSCHULTZ@aecom.com]
Sent: Monday, December 10, 2012 11:08 AM
To: Frey, Jesse
Cc: Cioffi, Frank
Subject: FW: Kekaha Landfill - RFI for Greenwaste and Silt in Wetwell #1

Jesse,

Please see below regarding the requested response.

Kenneth J. Bergschultz, PE
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Wintheiser, Paul
Sent: Friday, December 07, 2012 11:17 AM
To: Bergschultz, Ken
Subject: RE: Kekaha Landfill - RFI for Greenwaste and Silt in Wetwell #1

Ken:

Following yesterday's conference call, I spoke again with Joe Hasslen at EPG about pump operating levels. **As a result, I recommend taking a relatively conservative approach to the pump operating levels that is consistent with what Howard from EPG said when he was on site in October.** As Joe explained to me yesterday, there are several concerns:

- 1) The accuracy of the pressure transducers that provide liquid level information to the pump controller starts out at ± 3 -inches and drifts (gets worse) over time.
- 2) EPG would rather not have had us mount the pressure transducer in a separate stilling well. They typically like to see the pressure transducer mounted in a purpose built holder on the outside of their VSDPT sump drainers; so that the location (elevation) of the pressure transducer cannot change relative to the pump.
- 3) They don't ever want to break suction at the inlet to the sump drainer tube. As the liquid level approaches the top of the sump drainer inlet screen vortices may form, which allow the system to cavitate and break suction before the liquid level in the sump falls to the elevation of the top of the sump drainer screen. So, they like to have a "cushion" above the top of the sump drainer inlet screen to prevent formation of vortices and subsequent loss of suction.
- 4) Any accumulation of silt around the pressure transducer results in a delayed (slower) response to changes in liquid level. If the response time is delayed, there is risk that the pressure transducer will not react until after the liquid level has dropped well below the point where the pump starts to cavitate and cause damage. The recent inundation of wet well number 1 with silt and debris from the catch basin at the public drop-off area adds to their concern about this issue, as does the fact that the pressure transducer in the stilling well is mounted lower than would be possible if we had specified the EPG VSDPT sump drainer installation. To address this, it may be a good long term solution to raise the pressure transducer in the stilling well about 7 inches above the finished invert of the wet well (a location similar to what it would be with the EPG VSDPT sump drainers). However, the discussion yesterday indicated that there were several feet of silt in wet well no. 1. So, short term we need to find a way to keep silt out of the wet wells.
- 5) The above issues mean that EPG is strongly recommending minimum pump on elevations at least 40-inches above the bottom of the sump drainer inlet screen, and minimum pump off elevations at least 15-inches above the bottom of the sump drainer inlet screens. As a result, AECOM recommends the following pump operating settings.

Wet Well No. 1

High level alarm (distance above bottom of EPG Sump Drainer® inlet screen)	46.00 inches	= 3.27 +
(46.00 / 12) = elevation 7.10 ft		
Pump 2 "on" level (distance above bottom of EPG Sump Drainer® inlet screen)	43.00 in	= 3.27 +
(43.00 / 12) = elevation 6.85 ft		
Pump 1 "on" level (distance above bottom of EPG Sump Drainer® inlet screen)	40.00 in	= 3.27 +
(40.00 / 12) = elevation 6.61 ft		
Pumps 1 and 2 "off" level (distance above bottom of EPG Sump Drainer® inlet screen)	18.00 in	= 3.27 +
(18.00 / 12) = elevation 4.77 ft		
Low level alarm (distance above bottom of EPG Sump Drainer® inlet screen)	15.00 in	= 3.27 +
(15.00 / 12) = elevation 4.52 ft		
Distance between finished wet well invert and bottom of EPG Sump Drainer® inlet screen	1.25 inches	= 3.16
+ (1.25 / 12) = elevation 3.27 ft		
Finished wet well invert elevation	0.00 in	= 3.16 =
(0.00 / 12) = elevation 3.16 ft		

Wet Well No. 2

High level alarm (distance above bottom of EPG Sump Drainer® inlet screen)	46.00 inches	= 3.80 +
(46.00 / 12) = elevation 7.64 ft		
Pump 2 "on" level (distance above bottom of EPG Sump Drainer® inlet screen)	43.00 in	= 3.80 +
(43.00 / 12) = elevation 7.39 ft		

Pump 1 "on" level (distance above bottom of EPG Sump Drainer® inlet screen)	40.00 in	= 3.80 +
(40.00 / 12) = elevation 7.14 ft		
Pumps 1 and 2 "off" level (distance above bottom of EPG Sump Drainer® inlet screen)	18.00 in	= 3.80 +
(18.00 / 12) = elevation 5.30 ft		
Low level alarm (distance above bottom of EPG Sump Drainer® inlet screen)	15.00 in	= 3.80 +
(15.00 / 12) = elevation 5.05 ft		
Distance between finished wet well invert and bottom of EPG Sump Drainer® inlet screen	1.25 inches	= 3.69
+ (1.25 / 12) = elevation 3.80 ft		
Finished wet well invert elevation	0.00 in	= 3.69 =
(0.00 / 12) = elevation 3.69 ft		

The minimum change of elevation in the above tables is 3-inches, to account for the initial accuracy of the pressure transducers (please refer to item 1, above).

The pump "on" and "high level alarm" elevations shown in the above tables will back up liquid into the incoming header pipes (up to 100 – 200 ft of header pipe length). However, based on the design grades of the gravity pipes from the landfill (elevation 8.19, minimum) this should not cause a problem with head build-up in the landfill. The apparent worst case (wet well no. 2 and LCM-12) provides 0.55 ft between the "high level alarm" in the wet well and the invert of the gravity drain from the landfill.

If you have questions, please let me know. THANKS

From: Bergschultz, Ken
Sent: Friday, November 30, 2012 4:50 PM
To: Wintheiser, Paul
Subject: FW: Kekaha Landfill - RFI for Greenwaste and Silt in Wetwell #1

Paul,

Give this some thought and we can talk Monday. Next week the site is wanting a teleconference to respond to your comments and info on the pumps.

Have a good weekend.

Kenny

From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Friday, November 30, 2012 3:44 PM
To: Bergschultz, Ken
Cc: Cioffi, Frank
Subject: FW: Kekaha Landfill - RFI for Greenwaste and Silt in Wetwell #1

Kenny,

Please see the attached RFI from Earthworks Pacific regarding the inlet structure feeding stormwater and debris the wetwell. The stormwater is what it is and I understand will ultimately be addressed by Cell 2 construction. However, as you can read in the RFI and observe in the embedded video in the RFI, the mud and debris has caused and will continue to cause problems with the leachate pumps. Troy has asked EWP to provide a change order to install BMPs/filter products to minimize the debris/mud entering the wetwell. Each change order is predicated on a changed condition for the project and has been documented in this way via RFIs.

We look forward to your response. Let me know should you have any questions.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: bryan@earthworkspacific.com [<mailto:bryan@earthworkspacific.com>]
Sent: Friday, November 30, 2012 10:54 AM
To: Frey, Jesse
Subject: Kekaha Landfill - RFI for Greenwaste and Silt in Wetwell #1

Jesse-

Here is the RFI I was talking about. I also talked to Troy to let him know that the wetwell had not been cleaned out yet and let him know that this RFI is coming.

Bryan

Bryan Davidson
Earthworks Pacific, Inc.
Project Manager / Superintendent
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(f) 808.246.8812
(m) 808.651.1070
www.earthworkspacific.com



Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

Chris Scott

From: Frey, Jesse <JFrey@wm.com>
Sent: Thursday, November 29, 2012 12:47 PM
To: bryan@earthworkspacific.com; Chris Scott; Mike Minch
Subject: FW: Kekaha Landfill - RFI #21 - Level Meter Set-up for Wetewlls 1 & 2

Please see the email response below from AECOM. When you have had a chance to digest it, I suggest we hold a call between the three of us to discuss where we are at and where we go from here.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Bergschultz, Ken [mailto:KEN.BERGSCHULTZ@aecom.com]
Sent: Wednesday, November 28, 2012 8:57 PM
To: Frey, Jesse
Cc: Cioffi, Frank
Subject: FW: Kekaha Landfill - RFI #21 - Level Meter Set-up for Wetewlls 1 & 2

Jesse,

AECOM's response and concerns on the wet wells are listed below.

Kenneth J. Bergschultz, PE
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Wintheiser, Paul
Sent: Tuesday, November 27, 2012 1:39 PM
To: Bergschultz, Ken
Subject: RE: Kekaha Landfill - RFI #21 - Level Meter Set-up for Wetewlls 1 & 2

Hi Ken:

The Contractor's latest submittal prompts lots more questions than answers. Please see below.

1) General Comment: During design, the distance between the invert of the lowest pipe coming in to each wet well and the invert of the wet wells was critical because we wanted to provide a minimum pump operating range inside the wet wells without having to back liquid too far up into the incoming pipes. The "as-built" survey data provided by the Contractor in their 26 Nov 2012 email indicates that the invert of wet well (WW) #1 is 0.41-foot HIGHER ($3.16 - 2.75 = 0.41$) than required by Drawing No. 8, and that the invert of WW #2 is 0.69-ft HIGHER than required by Drawing No. 10 ($3.69 - 3.00 = 0.69$). The average difference is 0.55-ft. That is NOT acceptable for this type of construction, and may result in liquid being backed up too far into the incoming pipes. The Contractors "as-built" survey does not include incoming pipe invert elevations. So, there is no way to verify whether this will be a problem (i.e.: back liquid too far into the incoming pipes).

2) Regarding "pump on" levels: The "height above floor of wet well" distances stated in the "Wet Well Pump Controls" tables on Drawings No. 8 and 10 are based on EPG literature (specifically EPG document 05778-0040) and on my project specific telephone conversations with John Hasslen and Joe Hasslen (both with EPG). For their Model 30-2, 5 Hp, 3-ph vertical sump drainers, EPG requires a minimum depth of liquid above the bottom on the sump drainer intake screen of 40-inches to "pump on". Our design assumption is that the bottom of the sump drainer intake screen is very close (within about 1-inch) to the invert of the wet well; and the Contractors "as-built" data indicates that the 2 pumps in wet wells #1 and #2 average about 1.03-in and 1.13-in between the bottom of the sump drainer intake screen and the wet well invert, respectively (therefore, ok).

The "feet above MSL" elevations stated in the "Wet Well Pump Controls" tables on Drawings No. 8 and 10 are based on the required "pump on" liquid depths added to the required wet well invert elevations. In other words, the "heights" govern, not the "elevations". When the "as-built" elevation of the wet well invert varies from that required by the design, the required "height above floor of wet well" must be added to the "as-built" wet well invert elevation to arrive at adjusted "elevation(s) above MSL". The Contractor appears to have subtracted the "as-built" wet well invert elevations from AECOM's adjusted "elevation(s) above MSL" to arrive at different "levels". This is NOT acceptable, because it results in "height(s) above floor of wet well" distances that do not meet EPG's requirements. This issue is due to the apparent fact that the invert elevations of the 2 wet wells were raised without AECOM's knowledge or consent.

Conclusion: The "pump on" heights for pumps 1 and 2 in both wet wells MUST be 40 and 45-inches, respectively, above the as-built wet well inverts (as shown in AECOM's 31 Oct 2012 email attachments).

3) Regarding "pump off" levels: As I pointed out in my 31 Oct 2012 email, the pumps will require 15-inches from wet well invert to "pump off" *if the pumps are not equipped with EPG vent tubes and vent valves*. One of the things I asked (in my 31 Oct 2012 email) to be verified is whether or not the pumps had EPG vent tubes and vent valves.

Even though the Contractor's RFI# 021 does not verify whether the EPG vent tubes and vent valves were provided, they do reference a Submittal No. 11 (which I don't recall seeing – I checked the files on the server and did not find a copy) and a September field visit by EPG during which "it was determined by EPG's field rep that this point ("pump off") should be closer to 14 or 15-inches". Prior to receiving RFI# 021, I had no knowledge that EPG had, based in a field visit, determined that 15-inches were required between "pump off" and the wet well invert (meaning that no vent tubes and vent valves were installed).

From the information provided in RFI# 021 I conclude that no vent tubes and vent valves were provided, although I am not sure why. Vents are clearly called out on Drawings No. 8 and 10. The "pump off" levels shown on Drawings No. 8 and 10 require EPG sump drainers with vent tubes and vent valves (to draw the liquid level down below the pump inlet to the top of the sump drainer intake screen). And sump drainers are clearly called out on Drawings No. 8 and 10. Based on what is required by Drawings No. 8 and 10, it is my opinion that EPG vent tubes and vent valves should have been provided on the EPG sump drainers by the Contractor so that the required "pump off" levels can be achieved.

Conclusion: EPG vent tubes and vent valves should be provided on all sump drainers, as required to meet the design conditions shown on Drawings No. 8 and 10.

4) **Regarding "high level alarm set points":** Because the Contractor's 26 Nov 2012 "as-built" data does not provide invert elevations for the pipes coming into the wet wells (we didn't ask for it, because we did not know that the Contractor was building this project to \pm a half of a foot when the Drawings clearly call for a tolerance of \pm 0.01-ft), the "as-built" invert elevations of ALL pipes coming into both wet wells should be surveyed to allow us to determine whether liquid will be backed up too far into the incoming pipes. "as-built" pipe invert elevations in all of the LCM's should also be surveyed to assist with determining whether the "as-built" (raised) wet well inverts may be a problem.

5) **Regarding "low level alarm set point":** My project specific telephone conversations with John Hasslen and Joe Hasslen (both with EPG) indicate that when EPG sump drainers are equipped with EPG vent tubes and vent valves they are capable of drawing the liquid level down to the top of the inlet screen on the sump drainer (which is below the inlet of the pump inside the sump drainer). EPG literature (specifically EPG document 05778-0040) indicates that the top of the intake screen on an EPG VSD 30-2 is 6.50 inches high (measured from the bottom of the sump drainer). The 7-inch low level alarm "height above floor of wet well" called out on Drawings No. 8 and 10 is intended to initiate an alarm BEFORE the liquid level drops below the top of the inlet screen. The "as-built" "low level alarm set point(s)" shown in the tables in the Contractor's 26 Nov 2012 "as-built" email are both BELOW the top of the intake screens. I believe this is due, in part, to the Contractor's apparently placing priority on "elevation", rather than on "level", as discussed in item 2, above. The "low lever alarm set points" shown in the Contractor's 26 Nov 2012 submittal are not correct.

Conclusion: The "low level alarm set points" should be set to a level just above the top of the intake screens on the sump drainers.

6) **Overall recommendations:**

- A) As stated in item 2, above, the "pump on" heights for pumps 1 and 2 in both wet wells MUST be 40 and 45-inches, respectively, above the as-built wet well inverts (as shown in AECOM's 31 Oct 2012 email attachments).
- B) As stated in item 3, above, EPG vent tubes and vent valves should be provided on all sump drainers, as required to meet the design conditions shown on Drawings No. 8 and 10. Once EPG vent tubes and vent valves have been properly installed, the "pump off" levels for all 4 pumps should be set to 9-inches above the respective wet well invert.
- C) As stated in item 4, above, the "as-built" invert elevations of ALL pipes coming into both wet wells should be surveyed to allow us to determine whether liquid will be backed up too far into the incoming pipes. "As-built" pipe invert elevations in all of the LCM's should also be surveyed to assist with determining whether the "as-built" (raised) wet well inverts may be a problem.
- D) As stated in item 5, above, the "low level alarm set points" should be set to a level just above the top of the intake screens on the sump drainers (i.e.: about 7.7-inches above the invert of the 2 wet wells; based on "as-built" survey data that indicates that the bottoms of the sump drainers are about 1.15-inches above the wet well invert).

From: Bergschultz, Ken
Sent: Tuesday, November 27, 2012 8:01 AM
To: Wintheiser, Paul
Subject: Fwd: Kekaha Landfill - RFI #21 - Level Meter Set-up for Wetewlls 1 & 2

Paul can you address this? I will also send over another email received on this.

Thanks.

Kenny

Begin forwarded message:

From: "Frey, Jesse" <JFrey@wm.com>
To: "Bergschultz, Ken" <KEN.BERGSCHULTZ@aecom.com>
Cc: "Cioffi, Frank" <Frank.Cioffi@aecom.com>
Subject: FW: Kekaha Landfill - RFI #21 - Level Meter Set-up for Wetewlls 1 & 2

Kenny,

Please see the attached RFI (should be the last one) for the pump level settings for WWs 1 and 2. We all received the email from AECOM on this a while back but there have been some issues with it in the field. The RFI explains it in detail.

Thank you,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: bryan@earthworkspacific.com [<mailto:bryan@earthworkspacific.com>]
Sent: Monday, November 26, 2012 10:02 AM
To: Frey, Jesse
Cc: 'Chris Scott'
Subject: Kekaha Landfill - RFI #21 - Level Meter Set-up for Wetewlls 1 & 2

Jesse-

Please find attached RFI #21 regarding the as-built measurements and levels programmed into the LevelMaster for Wetwells #1 &2.

Mahalo,
Bryan

Bryan Davidson
Earthworks Pacific, Inc.
Project Manager / Superintendent
(o) 808.246.8808
(f) 808.246.8812
(m) 808.651.1070
www.earthworkspacific.com<<http://www.earthworkspacific.com>>

[EW Logo]



P.O. Box 1326 Phone 808-246-8808
Lihue, HI 96766 Fax 808-246-8812
License # AC-24741

February 6, 2013

Waste Management of Hawaii Inc.

ATTN: Jesse Frey

92-460 Farrington Highway

Kapolei, HI 96707

Re: Contract No 8515, Phase II Leachate Management System Modifications,
Kekaha Sanitary Landfill, County of Kauai, HI
Maintenance/Inspection Items

Jesse,

Per the County's request, we have determined that the following maintenance/inspection items should take place for the Wetwell #1 & 2 pumping systems:

- I. Daily Inspection
 - Check panels to make sure that there are no fault (red or yellow) lights on, and that the warning light is not flashing
- II. Weekly Inspection
 - Record the amount of leachate that has been pumped through each system
 - Check to make sure that there is not any floating debris in the wetwell
 - Check to make sure that the level sensor is accurate by using a tape measure to check actual level of the leachate in the wetwell against what the panel is reading
 - At same time, try to feel if there is sediment in the bottom of the wetwell. If there is 1-2" in the bottom, schedule vac truck to clean the wetwells out.
- III. Every 6 months
 - Schedule vac truck to clean out both wetwells and meter vaults.
 - Check desiccant tubes for the level sensor vent tubes. There is one for each wetwell. Open the breakout box cover. The desiccant tube has yellow caps on it. The desiccant is visible in a plastic vial. If desiccant has turned pink, it is time to replace it.
 - Open panel to see if there are insects present. If so, use bug spray to kill them.
- IV. Annually
 - Replace corrosion inhibitors in the panel
 - Remove and inspect each pump. Contact EPG for details. Will likely need to replace o-ring on disconnect
 - Turn panel off and remove level sensor from stilling well. Soak in CLR or similar cleaner for 5-10 minutes. Rinse with water and reinstall level sensor in

stilling tube. Turn panel back on, and double check level reading on panel against tape measured depth of leachate in wetwell.

- Remove paddle wheel sensor from flow meter and check operation. You should be able to move the paddle wheel by blowing on it with your mouth. Remove any debris, and soak in CLR for 5-10 minutes. Rinse with clean water and reinstall.
- Complete a general inspection of the wetwell and control panel, and determine if there are any other items that need to be replaced.

Please review and contact me with any questions or comments you may have.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bryan Davidson', with a long horizontal flourish extending to the right.

Bryan Davidson

Project Manager/Superintendent

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 022

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	Contract No. 8515	EPI Job #:	176
To:	Waste Management	Date:	11/30/12
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:		Subject:	Green Waste and Silt in Wetwell #1
		Spec. Section:	N/A
			N/A
Tel No:		Plan Ref:	
Fax No:	808.668.1366	Revision Control #	
Respond by:		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

After a rain event early Friday morning (11/23/12), the pumps at Wetwell #1 were running, but not pumping, and the leachate level was at 54" above the invert. I turned the pumps off, let them sit for a few minutes, and then turned them back on, and they started pumping, but both were pumping at a lower rate and less amperage than normal, indicating that there was a restricted flow into the pumps. The EPG pumps drew the leachate down to 15" above the invert of the wetwell and shut off automatically. I used a 2" submersible pump to pump the remaining leachate out. The invert was covered with at least 4" to 6" of silt and debris. On Saturday, I took a video of the bottom of the well and saw that there was debris stuck to the pump intake screens. One pump looked to be at least 50% blocked (see video at <http://youtu.be/eaCVsZt-9pl>). I talked to EPG, the pump manufacturer on Monday, and they said that any blockage of the screens will reduce the performance of the pumps. Per EPG, blockage of approximately 50% of the screen or more will damage their pumps, as these pumps are not designed to handle silt or trash.

Please provide 1.) A maintenance plan and short-term solution and, 2.) A permanent solution for keeping this debris out of the wetwell. I talked to our local erosion control supplier for possible short-term and long-term solutions, and he provided several suggestions. Please see attached product info.

Signed Bryan Davidson Date 11-30-12

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed _____ Date _____

Earthworks Pacific, Inc.

P. O. Box 1326
Lihue, HI 96766
Phone 808-246-8808
License AC-24741

4180 Hoala St.
Lihue, HI 96766
Fax 808-246-8812

REQUEST FOR INFORMATION - RFI# 023

Project Name: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA
SANITARY LANDFILL

Cust. Job #:	Contract No. 8515	EPI Job #:	176
To:	Waste Management	Date:	10/25/13
Attn:	Jesse Frey	Requested by:	Bryan Davidson
Address:		Subject:	Pump Savers Not Working Properly
		Spec. Section:	N/A
			N/A
Tel No:		Plan Ref:	
Fax No:	808.668.1366	Revision Control #	
Respond by:		Page(s):	1, including cover

Discrepancy Conflict Confirm Clarification Suggestion Other

Request:

As requested by the Engineer and the County, Earthworks Pacific provided a change request to furnish and install Symcom 777-KWHP-P2 pump saver/power monitors for each pump in both Wetwells #1 & #2. Upon approval and issuance of Change Order #10, we procured and installed the requested pump savers. It was then discovered, after several visits to the site, much testing, and phone calls with the pump saver manufacturer, the pump and control panel supplier, and the VFD manufacturer, that these pump savers would not work correctly with the Variable Frequency Drives that are installed in the control panel, at the settings that were directed by the Engineer. EGP further proved this by installing a mock set-up in their shop, and found the same thing. It is my understanding that the pump savers will work fine when the hertz are set to 50 or higher, but not when they are set at the engineer-recommended 40 hertz. Right now, we have turned the pump savers off so that the pumps and control panel will work the way that they did prior to the installation of the pump savers. Please advise as to how we should proceed.

Signed Bryan Davidson  Date 10-25-13

Reply: (To be completed by addressee. Please reply by returning a copy of this form.)

Please see revised attached response.

Check one:

- Approved for construction and/or clarification, proceed in accordance.
 Approved for construction and pricing, proceed in accordance.
 Approved for pricing only. Proceed only after written approval.

Signed  Date 12/2/13

AECOM response to Request For Information - RFI#023
Kekaha Sanitary Landfill, Phase II LCM Modifications
November 26, 2013 (Revised 12/2/13)

AECOM's understands the recently acquired pump saver/power monitors for Wet Wells #1 and #2 (model Symcom 777-KW/HP-P2) for use with the current installed variable frequency drives (VFDs) are not operational due to several variables.

EPG Companies, Inc. (EPG)(pump supplier for this project) has developed a revised and separate load monitoring system to provide protection to the pump motor, but not to the VFDs, as this new system is installed between the VFD and the pump motor. The system is intended to:

1. Stop the pump if the pump attempts to start when there is no liquid in the pump (such as air binding).
2. Stops the pump from operating if the pump inlet is clogged (similar to the instance during a large rain event and sediment was introduced into the wet well).
3. Stops the pump if the discharge is clogged.
4. Be installed for each pump, a total of 4 systems are required.
5. Stops the pump should prime or a no load situation is encountered by the pump.*
6. Provides capability for inclusion to future SCADA system installation.*

EPG has provided the attached specification sheets to AECOM by e-mail on November 14, 2013 with multiple additional conversations between AECOM and EPG having occurred. AECOM understands EPG has been testing the system with positive results. Based upon this information, AECOM supports EPG's recommendation to install this system. AECOM did not recommend or specify the previous pump saver (model Symcom 777-KW/HP-P2) in question.

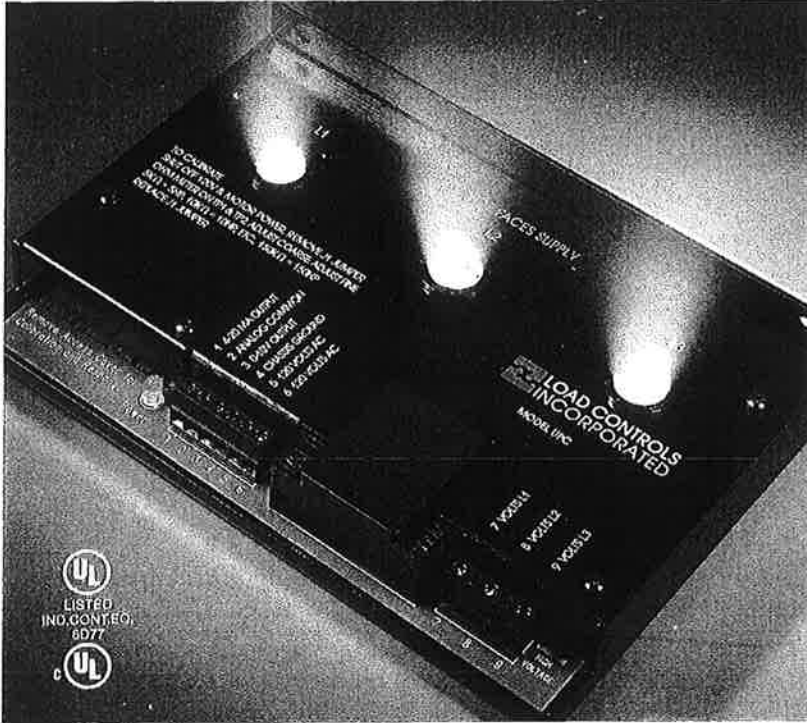
AECOM also understands EPG will work directly with Earthworks Pacific, Inc. for the system quote which will include modified drawings, programming, specific components, and instructions to add the load monitor system.

Please note this system as AECOM understands is intended to provide protection to the installed project specified pumps only and not the VFDs. There remain multiply outlying questions and tasks being completed in regards to power supplied to the facility and backup generator operation.

Attachments: Universal Power Cell – Model UPC (2 pages)
MAN0963-04EN Specifications/Installation (6 pages)

*Revision: Added Items 5 and 6 as characteristics of the pump saver in response to email correspondence/questions from County of Kaua'i on 11/26/13 and 11/27/13 and telephone conversation with EPG on 12/2/13.

UNIVERSAL POWER CELL – MODEL UPC



GIVES YOU VALUABLE INFORMATION ABOUT MACHINE AND PROCESS PERFORMANCE BY MONITORING MOTOR LOAD

- Mixture Viscosity
- Tool Condition
- Optimum Feed Rate
- Pump or Fan Flow
- Beginning or End Process
- Obstructions
- Overloads
- Loss of Load

THE UNIVERSAL POWER CELL SENSES TRUE MOTOR POWER THREE PHASE, VARIABLE FREQUENCY, SINGLE PHASE OR DC

FULLY SELF CONTAINED

- Easy to install
- No Current Transformers
- No Voltage Transformers

COMPACT

- Only 1 3/4" x 5 3/8" x 8"

YOU CAN ADJUST FULL SCALE TO MATCH YOUR MOTOR

- Coarse and Fine Adjustment Pots
- 5HP to 150HP
- Take extra turns for small motors

VERSATILE

- Works on both Fixed and Variable Frequency Power
- ALSO Single Phase & DC

THREE BALANCED HALL EFFECT SENSORS

SAMPLE VOLTAGE DIRECTLY

- Up to 600 Volts

BUILT-IN POWER SUPPLY

- Powers the Analog Signals

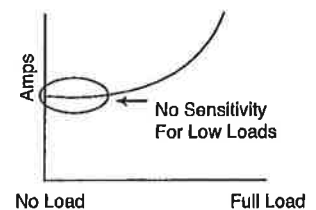
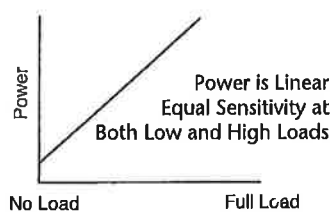
BUILT-IN RESPONSE ADJUSTMENT

- Lets you slow the response of the Power Cell to average the readings

TWO ANALOG OUTPUTS

- 4-20 MA
- 0-10 Volts DC
- Electrically isolated

WHY MONITOR POWER INSTEAD OF JUST AMPS?



 **LOAD CONTROLS
INCORPORATED**

INSTALLATION – MODEL UPC

The Universal Power Cell is a Motor Load Sensor that monitors power (HP or KW). It works on both fixed and variable frequency power and has two analog outputs. It also works on single phase, DC, and brushless DC. The Universal Power Cell has Three Balanced Hall Effect Sensors, each with a flux concentrator. Each phase passes through a window. A voltage sample for each phase is also taken. The Hall Effect Semiconductor does a vector multiplication of the current flow and voltage which also calculates the power factor. The output is proportional to power (HP or KW).

MOUNTING

The Universal Power Cell is direction sensitive. Locate the Power Cell so that the motor electrical supply lines can be passed through the Cell. The Terminal side of the Cell faces the Supply. (It is convenient to adjust the Full Scale before installing the unit.)

INPUT CONNECTIONS

Pass each of the phases through the L1, L2, L3 holes in the Cell. Be certain direction is correct. The Terminal side of the Cell faces the supply. Provide a voltage sample for each phase with 20 gauge or larger wire. When a Variable Frequency Drive is being used, locate the Power Cell on the output side of the drive. Take the voltage samples on the output side also. It doesn't matter which phase goes through each hole. But, the Voltage sample from the wire that goes through the L1 hole must go to Terminal 7, L2 hole to Terminal 8, and L3 hole to Terminal 9.

L1 Volts to Terminal 7

L2 Volts to Terminal 8

L3 Volts to Terminal 9

ANALOG OUTPUTS

The Analog Output is powered by the Power Cell. Use shielded cable 20 gauge or larger for the analog output. Shield is ungrounded at Power Cell, grounded at device.

4-20 Milliamp Terminal 1

0-10 Volts DC Terminal 3

Analog Common Terminal 2

120 VOLT SUPPLY

Terminals 5 and 6

GROUND

Terminal 4

TO ADJUST FULL SCALE

The Full Scale can be adjusted to match your motor with the Coarse and Fine Pots located under the Access Cover.

Convenient Scaling

5K Ohm = 5HP (This is the minimum setting)

10K Ohm = 10HP

Etc.

150K Ohm = 150HP (This is the maximum setting)

(KW=HP x .746)

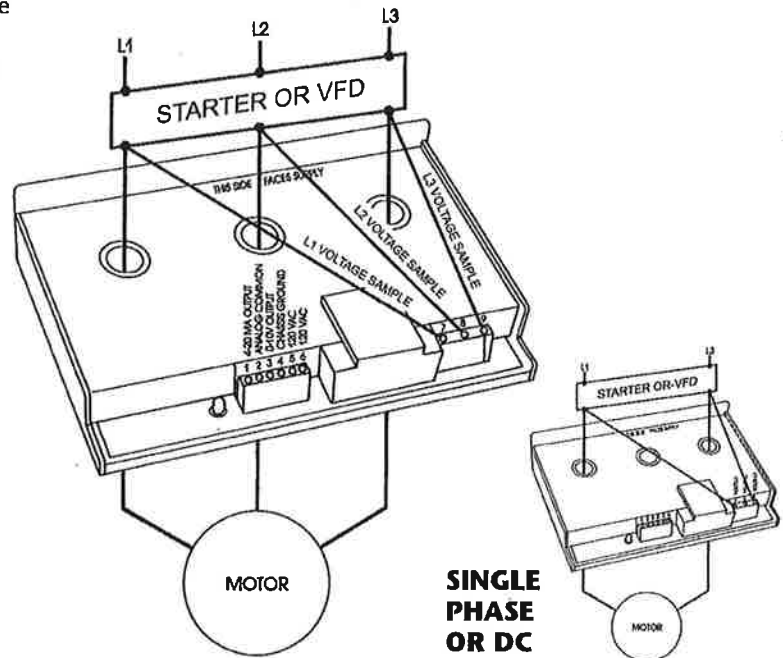
1. Turn off 120 Volt power and motor power
2. Remove access cover
3. Remove J1 jumper
4. Ohm meter leads on Test Points TP1 and TP2
5. Adjust Full Scale Coarse Pot then Fine 20 Turn Pot
6. Replace J1 jumper

FOR SMALL MOTORS

Reduce the capacity by taking additional "Turns" through each hole for each phase (mount the Power Cell on standoffs). Example: 5HP Full Scale is reduced to 1HP with 5 Turns.

RESPONSE ADJUSTMENT

In some cases, the average power signal may be more useful than instantaneous power. The Response Adjustment slows the response of the Universal Power Cell. Pot is located under Access Cover. Clockwise is fastest.



SPECIFICATIONS

ACCURACY

- .5% Full Scale

ANALOG OUTPUT

- 4-20 Milliamp, 500 Ohm maximum connected impedance
- 0-10 Volt DC, 2000 Ohm minimum load

RESPONSE-ADJUSTABLE

- .5 seconds to 12seconds

FREQUENCY

- 3Hz to 1KHz

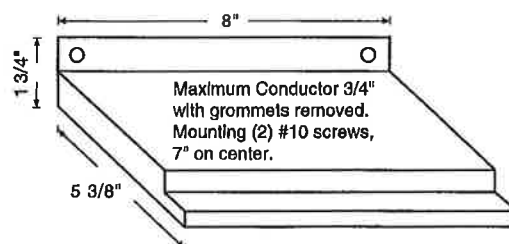
TEMPERATURE

- 60°C maximum

POWER CONSUMPTION

- 6VA @ 120 Volts

DIMENSIONS



XL4 OCS

Datasheet for

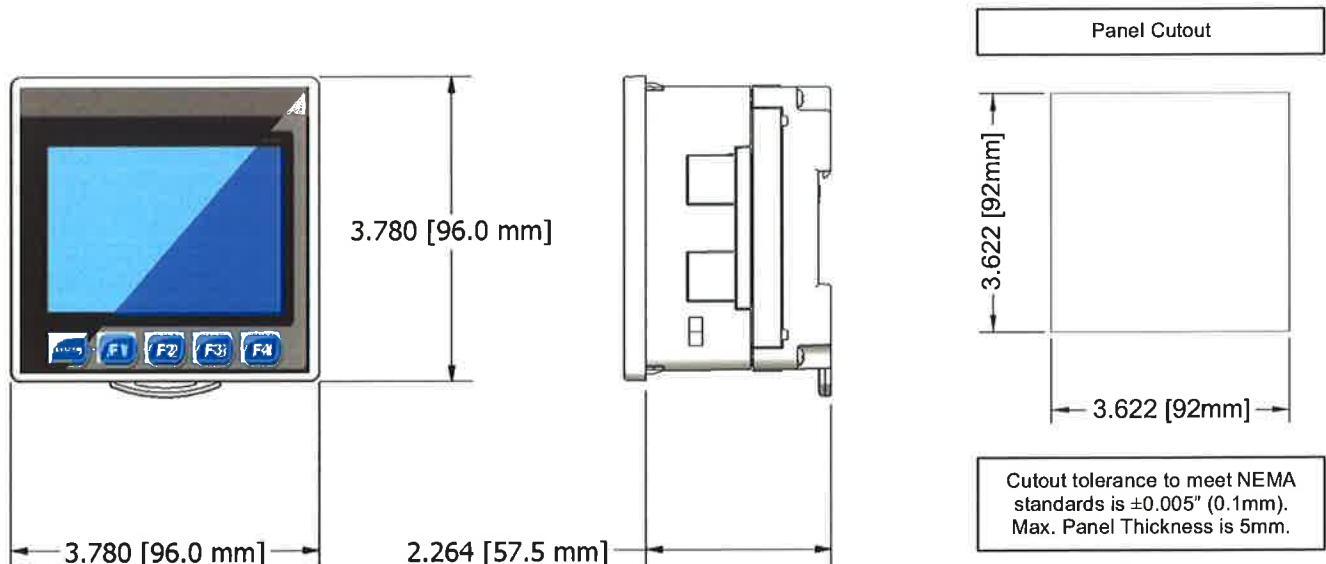
HE-XC1E0, HE-XC1E2, HE-XC1E3, HE-XC1E4, HE-XC1E5

HEXT251C100, HEXT251C112, HEXT251C113, HEXT251C114, HEXT251C115

1 Specifications

General Specifications				Control & Logic Specifications						
Required Power (Steady state)	95 mA @ 24 VDC 190 mA @ 12 VDC			Control Language Support	Advanced Ladder Logic Full IEC 1131-3 Languages					
Required Power (Inrush)	2A for <1 ms @ 24 VDC DC Switched			Logic Program Size & Logic Scan Rate	1MB, maximum 0.013mS/K					
Primary Power Range	10 – 30 VDC			Online Programming Changes	Supported in Advanced Ladder					
Relative Humidity	5 to 95% Non-condensing			I/O Support	Digital Inputs	2048				
Clock Accuracy	+/- 20 ppm maximum at 25° C (+/- 1 Minutes per Month)				Digital Outputs	2048				
Operating Temp	-10°C to +60°C			General Purpose Registers	Analog Inputs	512				
Storage Temp	-30°C to +70°C				Analog Outputs	512				
Weight	12 oz. (340 g)					50,000 (words) Retentive				
UL / CE	USA: http://www.heapg.com/Pages/TechSupport/ProductCert.html					16,384 (bits) Retentive				
	Europe: http://www.horner-appg.com/en/support/certification.aspx					16,384 (bits) Non-retentive				
Display Specifications				Connectivity						
Display Type	3.5" TFT Transmissive Color			Serial Ports	1 RS-232 & 1 RS-485 on single Modular Jack					
Resolution	QVGA (320x240)			USB mini-B	USB 2.0 (480MHz) Programming & Data Access					
Color	16-bit (65,535)			USB A	USB 2.0 (480MHz) for USB FLASH Drives (2TB)					
Screen Memory	64MB			CAN	Remote I/O, Peer-to-Peer Comms, Cscape					
User-Programmable Screens	1023			Ethernet	10/100 Mb (Auto-MDX) Modbus TCP C/S, HTTP, FTP, SMTP, Cscape					
Backlight	LED – 50,000 hour life			Remote I/O	SmartRail, SmartStix, SmartBlock, SmartMod					
Screen Update Rate	User Configurable within the scan time. (perceived as instantaneous in many cases)			Removable Memory	MicroSD, support for >32GB max. Application Updates, Datalogging, more					
Input / Output Specifications								High-Speed Counters		
Model	DC In	DC Out	Relays	HS In	HS Out	mA/V In	mA/V RTD/Tc	mA/V Out	Number of Counters	2
Model 2	12		6	4		4			Maximum Frequency	>500kHz each
Model 3	12	12		4	2	2			Accumulator Size	32-bits each
Model 4	24	16		4	2	2			Modes Supported	
Model 5	12	12		4	2		2	2	Totalizer	Quadrature
There are 4 high-speed inputs of the total DC Inputs. There are 2 high-speed outputs of the total DC outputs. Model 2, 3 & 4 feature 12-bit Analog I/O. Model 5 features 14/16-bit Analog I/O. High-speed Outputs can be used for PWM and Pulse Train Outputs, currently limited to <65kHz.								Pulse Meas.	Frequency Meas.	
								2 Position Controlled Outputs		
								1 ON/OFF Setpoint per Output		

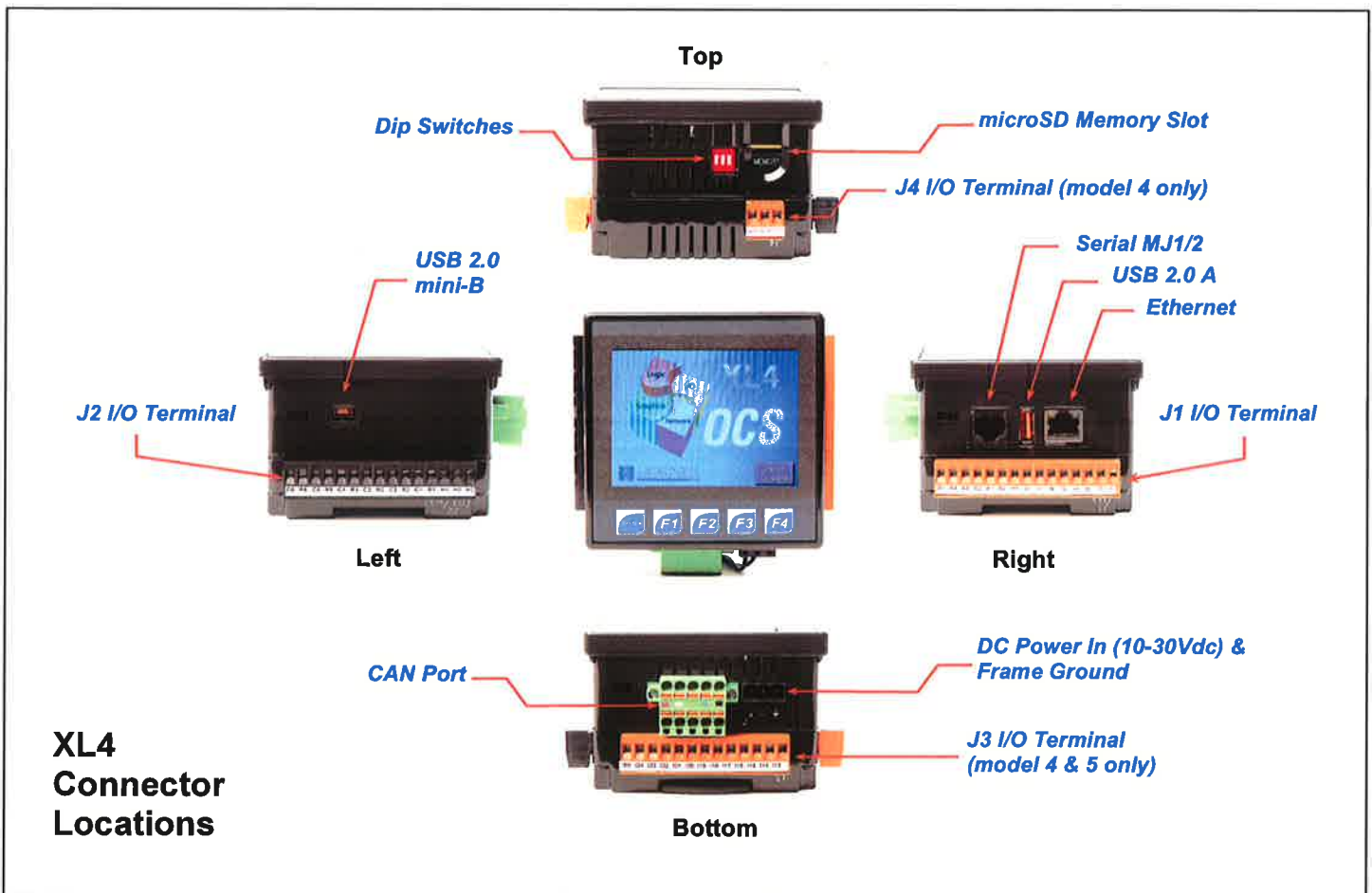
2 Dimensions & Panel Cutout

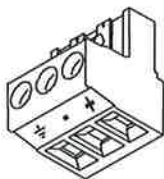


3 Installation Procedures

1. Carefully locate an appropriate place to mount the XL4. Be sure to leave enough room at the top of the unit for insertion and removal of the microSD card. Also leave enough room at the bottom for the insertion and removal of USB FLASH drives
2. Carefully cut the host panel per the diagram on Page 1, creating a 92mm x 92mm ± 0.1 mm opening into which the XL4 may be installed. If the opening is too large, water may leak into the enclosure, potentially damaging the XL4. If the opening is too small, the OCS may not fit through the hole without damage.
3. Remove all Removable Terminals from the XL4. Insert the XL4 through the panel cutout (from the front). The gasket needs to be between the host panel and the XL4.
4. Install and tighten the four mounting clips (provided in the box) until the gasket forms a tight seal (max torque 1.5Nm / 13.2Lb-in).
5. Reinstall the XL4 I/O Removable Terminal Blocks. Connect communications cables to the serial port, USB ports, Ethernet port, and CAN port as required.

4 Ports and Connectors



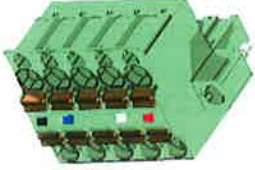


DC Input / Frame

Torque rating
4.5 – 7 Lb-In
(0.50 – 0.78 N-m)

DC- is internally connected to I/O V-, but is isolated from CAN V-

Primary Power Port Pins		
Pin	Signal	Description
1	Ground	Frame Ground
2	DC-	Input Power Supply Ground
3	DC+	Input Power Supply Voltage

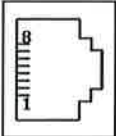


CAN

Locking Spring-Clamp,
Two-terminators
Per Conductor

SHLD and V+ pins are not internally connected to XL4

CAN1 Port Pin Assignments			
Pin	Signal	Signal Description	Direction
1	V-	CAN Ground - Black	-
2	CN L	CAN Data Low - Blue	In/Out
3	SHLD	Shield Ground - None	-
4	CN H	CAN Data High - White	In/Out
5	V+ (NC)	No Connect - Red	-

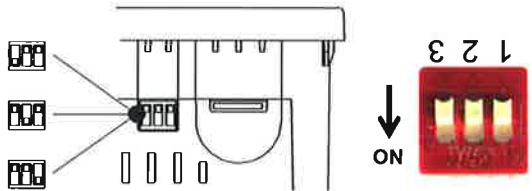


MJ1/2 Serial Ports

MJ1: RS-232 w/Full Handshaking
MJ2: RS-485 Half-Duplex

Two Serial Ports on One Modular Jack (8posn)

Pin	MJ1 Pins		MJ2 Pins	
	Signal	Direction	Signal	Direction
8	TXD	OUT	-	-
7	RXD	IN	-	-
6	0 V	Ground	0 V	Ground
5	+5V@60mA	OUT	+5V@60mA	OUT
4	RTS	OUT	-	-
3	CTS	IN	-	-
2	-	-	RX- / TX-	IN / OUT
1	-	-	RX+ / TX+	IN / OUT



DIP Switches

ON

Pin	Name	Function	Default
1	RS-485 Termination	ON = Terminated	OFF
2	Spare	Always Off	OFF
3	Factory Use	Always Off	OFF

5 Safety

WARNING: Only qualified electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

WARNING: To avoid the risk of electric shock or burns, always connect the earth ground before making any other connections.

WARNING: To reduce the risk of fire, electrical shock, or physical injury it is strongly recommended to fuse all Power Sources connected to the OCS. Be sure to locate fuses as close to the source as possible.

WARNING: Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.

WARNING: In the event of repeated failure, do not replace the fuse again as a repeated failure indicates a defective condition that will not clear by replacing the fuse.

WARNING: Battery may explode if Mistreated. Do Not Recharge, Disassemble or Dispose Of in Fire injury or loss of life.

WARNING: EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS

6 Built-in I/O (Model 2, 3, 4 & 5)

All XL4 models (except the HE-XCE0) feature built-in I/O. The I/O is mapped into OCS Register space, in three separate areas – Digital/Analog I/O, High-Speed Counter I/O, and High-speed Output I/O. Digital/Analog I/O location is fixed starting at 1, but the High-speed Counter and High-speed Output references may be mapped to any open register location. For more details on using the High-Speed Counter and High-Speed Outputs, see the **XL4 High-Speed I/O Supplement**.

Fixed Address	Digital/Analog I/O Function	XL4 Model			
		2	3	4	5
%I1	Digital Inputs	1-12	1-12	1-24	1-12
	Reserved	13-32	13-31	25-31	13-31
	ESCP Alarm	n/a	32	32	32
%Q1	Digital Outputs	1-6	1-12	1-16	1-12
	Reserved	7-24	13-24	17-24	13-24
%AI1	Analog Inputs	1-4	1-2	1-2	1-2
	Reserved	5-12	3-12	3-12	3-12
	Reserved	n/a	1-8	1-8	1-8
%AQ1	Analog Outputs	n/a	n/a	n/a	9-10

Reserved areas maintain backward compatibility with other XL Series OCS models

Default Address*	High-Speed Counter Function	XL4 Models 2-5
%I1601	Status Bits	1-8
%Q1601	Command Bits	1-32
%AI0401	Accumulator 1 & 2	1-8
%AQ0401	Preload & Match Values	1-12

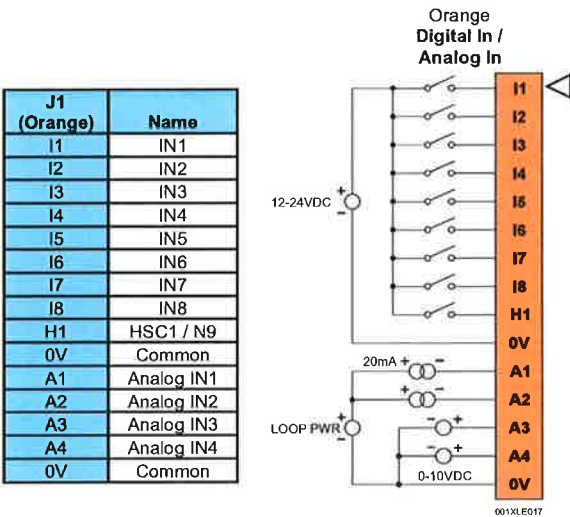
*Starting Address locations for %, %Q, %AI & %AQ may be re-mapped by user

Default Address*	High-Speed Output Function	XL4 Models 2-5
%I1617	Status Bits	1-8
%Q1**	Command Bits	1-2
n/a	n/a	n/a
%AQ421	PWM or Pulse-Train Parameters	1-20

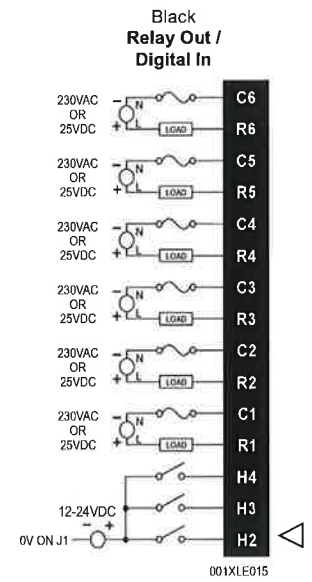
*Starting Address locations for %I & %AQ may be remapped by user
 **Q1-Q2 are part of the Fixed I/O Map. In High-Speed Output mode they can be used to initiate a Stepper/PTO Move

Model 2 I/O

The XL4 model 2 (HE-XC1E2) features 12 DC Inputs, 6 Relay outputs, and 4 Analog Inputs. The DC Inputs are 12/24Vdc compatible, and can be jumpered for Positive Logic (sinking), or Negative Logic (sourcing). Four of the inputs (H1-H4) can be used for high-speed functions up to 500kHz. The 12-bit Analog Inputs can be jumpered for voltage (0-10V) or current (4-20mA) on a channel by channel basis. The Relay outputs are isolated, supporting AC and DC voltages, with output currents of up to 3A/relay, 5A total.



J2 (Black)	Name
C6	Relay 6 COM
R6	Relay 6 NO
C5	Relay 5 COM
R5	Relay 5 NO
C4	Relay 4 COM
R4	Relay 4 NO
C3	Relay 3 COM
R3	Relay 3 NO
C2	Relay 2 COM
R2	Relay 2 NO
C1	Relay 1 COM
R1	Relay 1 NO
H4	HSC4 / IN12
H3	HSC3 / IN11
H2	HSC2 / IN10



Model 2 Jumper Setting Details

Location of I/O jumpers (JP1 & JP2) and wiring connectors (J1 and J2) with back cover removed.

JP1 Digital DC In / HSC

Positive Logic	Negative Logic
Default	001XLE026

JP2 Analog In (A1 – A4)

Current (20 mA)	Voltage (10 V)
Default	001XLE027

Note: The Escape Module Setup configuration must match the selected I/O (JP) jumper settings.

Note: When using JP2 (A1-A4), each channel can be independently configured.

Relay Life Expectancy

Contact Current (A)	Operation (x10 ⁴)
1	30
2	25
3	15
4	10

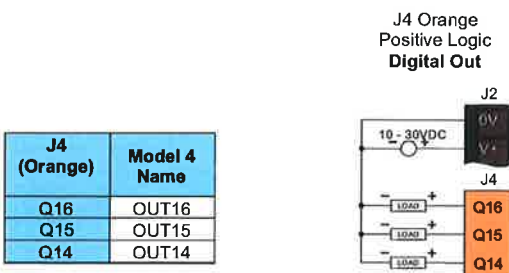
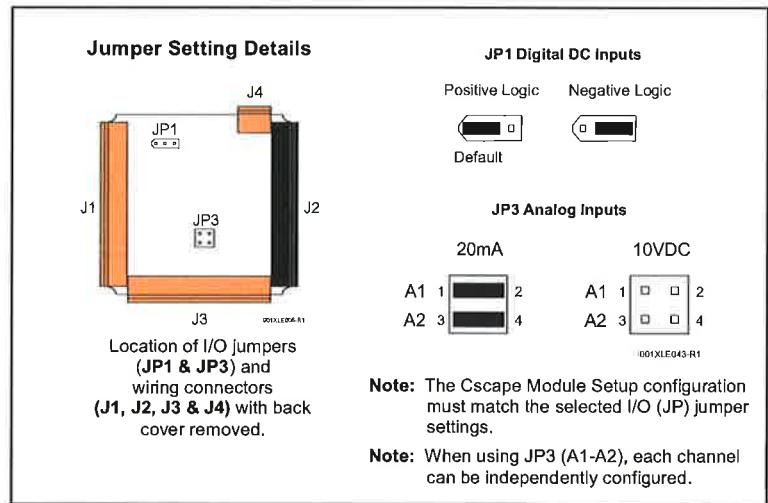
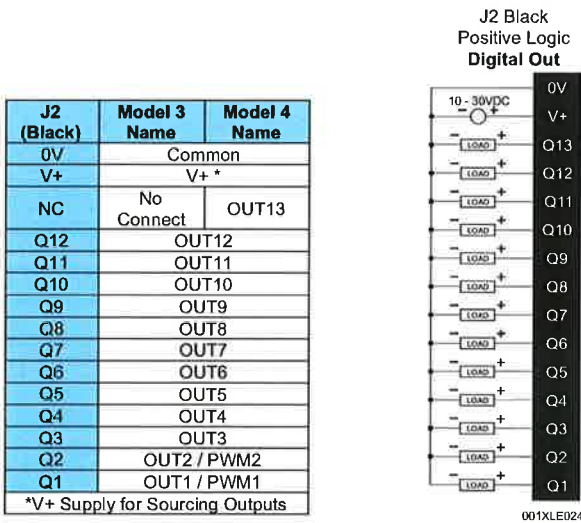
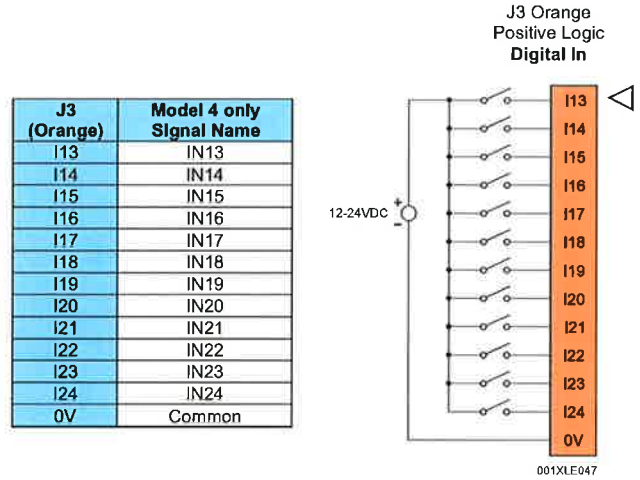
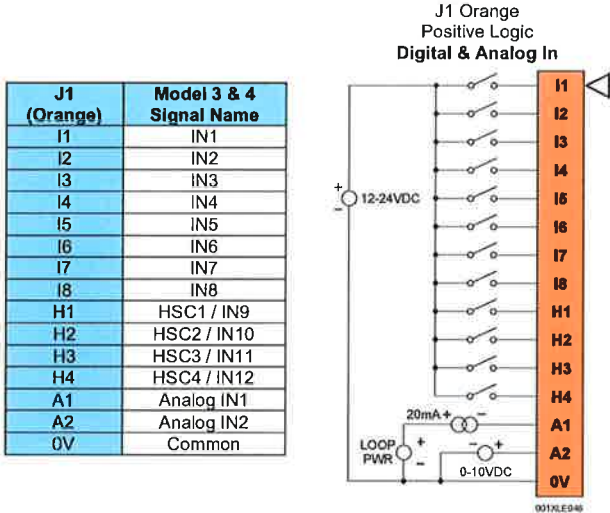
WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE Tyco relay PCJ

Cover / case & base: Mitsubishi engineering Plastics Corp.
 5010GN6-30 or 5010GN6-30 M8 (PBT)
 Sealing Material: Kishimoto 4616-50K (1 part epoxy resin)

It is recommended to periodically inspect the relay for any degradation of properties and replace if degradation is found

Model 3 & Model 4 I/O

The XL4 model 3 (HE-XC1E3) features 12 DC Inputs, 12 DC outputs, and 2 Analog Inputs. The XL4 model 4 (HE-XC1E4) increases the I/O count up to 24 DC Inputs, and 16 DC Outputs and 2 Analog Inputs. The DC Inputs are 12/24Vdc compatible, and can be jumpered for Positive Logic (sinking), or Negative Logic (sourcing). Four of the inputs (H1-H4) can be used for high-speed functions up to 500kHz. The 12-bit Analog Inputs can be jumpered for voltage (0-10V) or current (4-20mA) on a channel by channel basis. The 12/24VDC Outputs feature Electronic Short Circuit protection, and support currents up to 0.5A per point, and 4A total. Two of the DC Outputs can be used for high speed functions (PWM or PTO). The output frequency is limited by the switching capability of the output drivers (about 10kHz), although an optional accessory (HE-XHSQ) can be added to provide parallel output drivers supporting frequencies up to 200kHz.



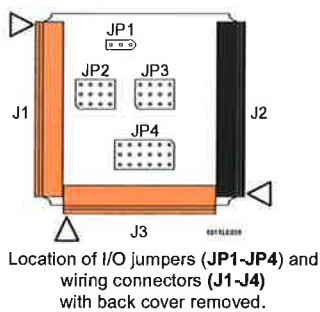
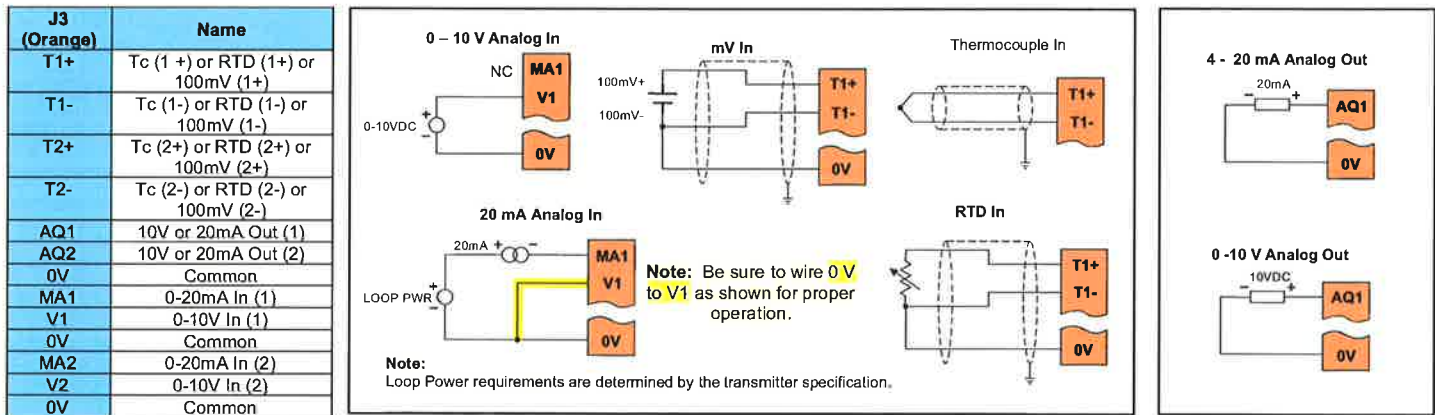
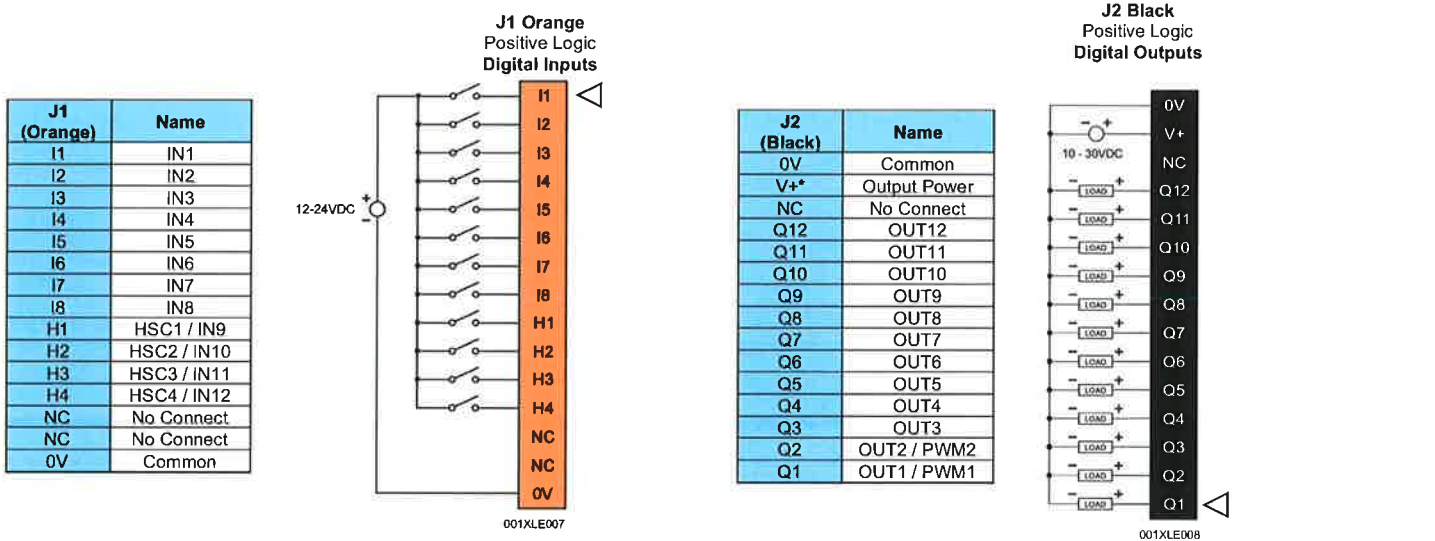
Note:
Model 3 uses J1 & J2 only.

Model 4 uses J1, J2, J3 & J4.

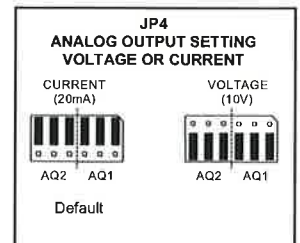
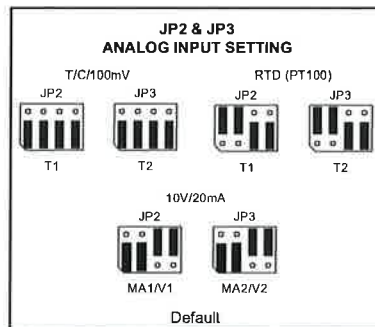
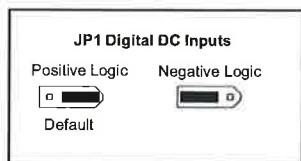
Model 5 I/O

The XL4 model 5 (HE-XC1E5) features 12 DC Inputs, 12 DC outputs, with high performance, highly configurable Analog Inputs (2) and Analog Outputs (2). The DC Inputs are 12/24Vdc compatible, and can be jumpered for Positive Logic (sinking), or Negative Logic (sourcing). Four of the inputs (H1-H4) can be used for high-speed functions up to 500kHz. The 12/24VDC Outputs feature Electronic Short Circuit protection, and support currents up to 0.5A per point, and 4A total. Two of the DC Outputs can be used for high speed functions (PWM or PTO). The output frequency is limited by the switching capability of the output drivers (about 10kHz), although an optional accessory (HE-XHSQ) can be added to provide parallel output drivers supporting frequencies up to 200kHz.

The two high resolution Analog Inputs can be configured for 4-20mA, 0-10V, or 0-100mV at 14-bit resolution. They also can be configured for 16-bit temperature measurement – supporting Thermocouples or RTDs with 0.05°C resolution. The Analog Outputs are sourcing, and can be configured for 4-20mA or 0-10V at 14-bit resolution. Each Analog Input or Output channel can be configured independently for maximum flexibility.



Jumper Setting Details



Mike Minch

From: Frey, Jesse <JFrey@wm.com>
Sent: Thursday, May 14, 2015 5:09 PM
To: Bryan Davidson (bryan@earthworkspacific.com)
Cc: Mike Minch; Chris Scott
Subject: FW: Kekaha Landfill - RFI No. 025 - Floats
Attachments: 5282014 ELECTRICAL Binder.pdf; Figures1and2.pdf

FYI. See below and the attachments regarding AECOM's response to RFI No. 25.

Jesse Frey, PE

Engineer
Waste Management of Hawaii
jfrey@wm.com

Waste Management of Hawaii

92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Wright, Nancy [mailto:NANCY.WRIGHT@aecom.com]
Sent: Thursday, May 14, 2015 10:39 AM
To: Frey, Jesse; dfujimoto@kauai.gov; ttanigawa@kauai.gov
Cc: Cioffi, Frank
Subject: FW: Kekaha Landfill - RFI No. 025 - Floats

Donald, Troy, and Jesse,

Frank asked me to send this response to you regarding RFI No. 25.

The attached Drawing No. 17, Revision 3, Dated 5/22/2014, includes the revisions for the added floats as required by Note 7 on Figures 1 and 2, dated 6/04/2014 (also attached).

Our Electrical Engineer provided the following:

"Note 7 is addressed on sheet 17 of the electrical binder. The upper left shows a cloud around LS and also the clouds that contain the floats on the right hand side of the same drawing. A new conduit is shown for each set of floats."

We do confirm that:

1. The two floats are required to be used to indicate low and high alarm conditions, that the low-low float will shut down the pump and activate the lights on the control panel, and that the high alarm will only activate the lights on the control panel.
2. The desired levels that these floats should be set to operate at are provided on the Tables on Figures 1 and 2. They are stated in terms of measurements above the floor of the wet wells or below the lowest leachate inlet pipe inverts.

Nancy

Nancy K. Wright, P.E.
Senior Project Engineer
Environment
D 920.406.3142
nancy.wright@aecom.com

AECOM
1035 Kepler Drive,
Green Bay, WI 54311
T 920.468.1978 F 920.468.3312
www.aecom.com

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From: Cioffi, Frank
Sent: Wednesday, May 13, 2015 6:01 PM
To: Wright, Nancy
Subject: FW: Kekaha Landfill - RFI No. 025 - Floats

Mahalo,

Frank Cioffi, P.E.
Senior Engineer
AECOM, Pacific Division
(808) 223-7168
frank.cioffi@aecom.com
www.aecom.com

From: [Frey, Jesse](#)
Sent: 5/13/2015 12:58 PM
To: [Cioffi, Frank](#)
Cc: [Donald Fujimoto \(dfujimoto@kauai.gov\)](mailto:dfujimoto@kauai.gov); ttanigawa@kauai.gov
Subject: FW: Kekaha Landfill - RFI No. 025 - Floats

Hello Frank,

Please see the attached RFI from Earthworks Pacific requiring input on the design end.

Thank you,

Jesse Frey, PE

Engineer
Waste Management of Hawaii
jfrey@wm.com

Waste Management of Hawaii

92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Bryan Davidson [<mailto:bryan@earthworkspacific.com>]
Sent: Monday, May 11, 2015 10:02 AM
To: Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa
Subject: Kekaha Landfill - RFI No. 025 - Floats

Jesse-

Please see attached RFI No. 25, as requested by EPG, regarding the additional floats for the Wetwells #1 & 2.

Mahalo,

Bryan Davidson,
Project Manager/Superintendent
Earthworks Pacific, Inc
(o)808-246-8808
(m)808-651-1070
www.earthworkspacific.com

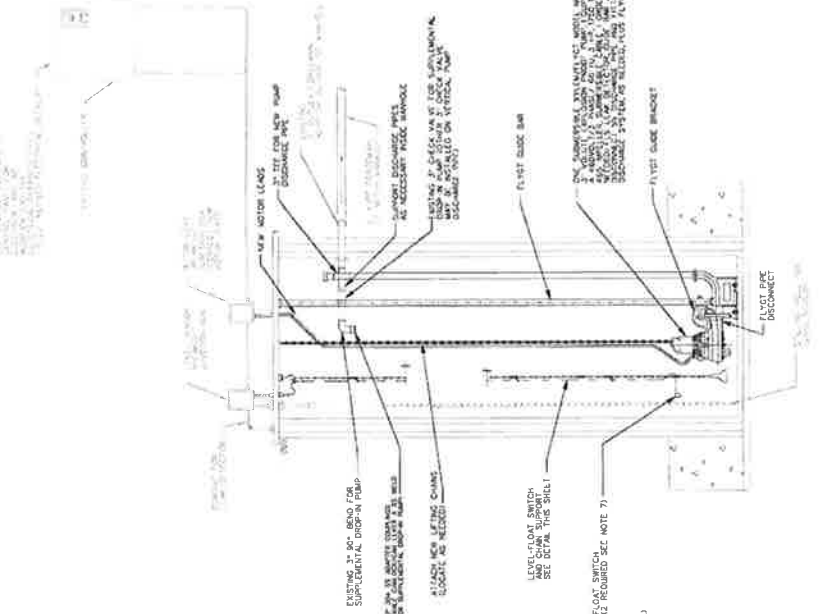
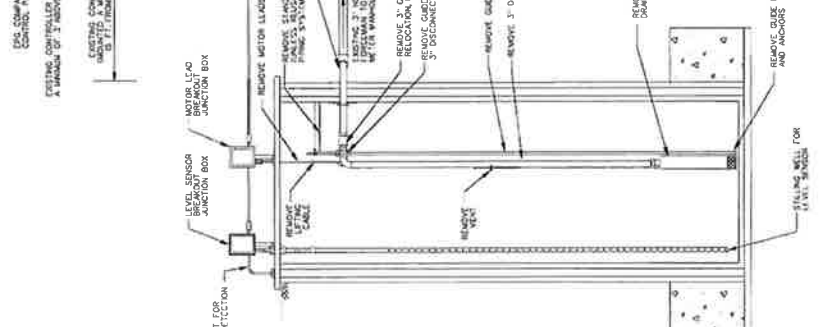
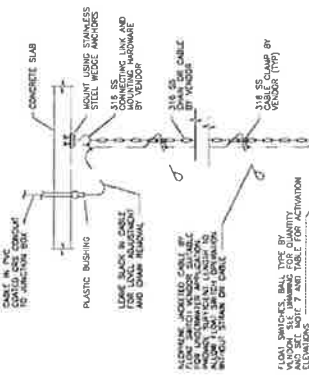


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CONTROL ACTION	HEIGHT ABOVE FLOSH OF #2 WET WELL	CONT. WELLS BELOW	CONDUCTOR BELOW
HIGH LEVEL ALARM	11'	6'	11'
PUMP ON	12'	11'	11'
LOW LEVEL PUMP SHUT-OFF AND ALARM	11'	11'	11'

* CONTROL ACTION TO TAKE PLACE BASED ON SIGNAL FROM OTHER COMPASSIONARY WELLS.



1. REMOVE 3" 80' BRND FOR SUPPLEMENTAL DIAPHRAGM PUMP
2. REMOVE 3" CHECK VALVE FOR RELOCATION IF NECESSARY
3. REMOVE GATED DISCONNECT
4. REMOVE GUIDE RAILS
5. REMOVE 3" DISCHARGE PIPE
6. REMOVE DUAL SUREPUMP VERTICAL SUPPLEMENTAL DIAPHRAGM PUMP (EPC MODEL VS0 302 OR EQUAL)
7. REMOVE GUIDE RAIL FOOT
8. REMOVE GUIDE RAIL AND BRACKET
9. REMOVE WET WELL FOR STALLING WELL FOR #1 WELLS BRUNNEN
10. CONDUIT FOR LEAD SECTION
11. LEVEL SENSOR JUNCTION BOX
12. MOTOR LEAD JUNCTION BOX
13. EXISTING CONTROLLER, INSTALLED IN A MANNER OF 3' WEDGE BRACKET
14. 1 1/2" CONDUIT AREA ONLY
15. EXISTING CONTROL PANEL, LEADERS, SWITCHES

1. PROVIDE 3" 80' BRND FOR SUPPLEMENTAL DIAPHRAGM PUMP
2. PROVIDE 3" CHECK VALVE FOR RELOCATION IF NECESSARY
3. PROVIDE GATED DISCONNECT
4. PROVIDE GUIDE RAILS
5. PROVIDE 3" DISCHARGE PIPE
6. PROVIDE DUAL SUREPUMP VERTICAL SUPPLEMENTAL DIAPHRAGM PUMP (EPC MODEL VS0 302 OR EQUAL)
7. PROVIDE GUIDE RAIL FOOT
8. PROVIDE GUIDE RAIL AND BRACKET
9. PROVIDE WET WELL FOR STALLING WELL FOR #1 WELLS BRUNNEN
10. PROVIDE CONDUIT FOR LEAD SECTION
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15. PROVIDE EXISTING CONTROL PANEL, LEADERS, SWITCHES

INDEX

- 1. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
- 2. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
- 3. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
- 4. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
- 5. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
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- 13. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
- 14. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR
- 15. PUMP WELLS WITH MAINLINE MAINLINE FOR LOW LEVEL INDICATOR

DATE	DESCRIPTION	REVISED BY	DATE	DESCRIPTION	REVISED BY

ACCOM

PLUMBING SYSTEM MODIFICATIONS

PHASE II LEACHATE MAINLINE SYSTEM MODIFICATIONS

KAWAII, HAWAII

WET WELL #2 DETAIL

FIGURE 2

PREPARED BY: [Name]

CHECKED BY: [Name]

DATE: [Date]

SCALE: [Scale]

PROJECT NO: [Project No]

SHEET NO: [Sheet No]

TITLE: [Title]

REVISIONS:

NO.	DESCRIPTION	DATE
1	[Revision]	[Date]

52
#

NO.	DATE	DESCRIPTION
1	10/20/2010	ISSUED ELECTRICAL WIRING FOR PUMP STATION
2	11/17/2011	ISSUED ELECTRICAL WIRING FOR PUMP STATION
3	11/17/2011	ISSUED ELECTRICAL WIRING FOR PUMP STATION

REVISIONS

NO. 1 DATE 10/20/2010 DESCRIPTION ISSUED ELECTRICAL WIRING FOR PUMP STATION

NO. 2 DATE 11/17/2011 DESCRIPTION ISSUED ELECTRICAL WIRING FOR PUMP STATION

NO. 3 DATE 11/17/2011 DESCRIPTION ISSUED ELECTRICAL WIRING FOR PUMP STATION

REVISED ELECTRICAL DETAILS

PHASE 2 LEAKAGE MANAGEMENT SYSTEM IMPROVEMENTS

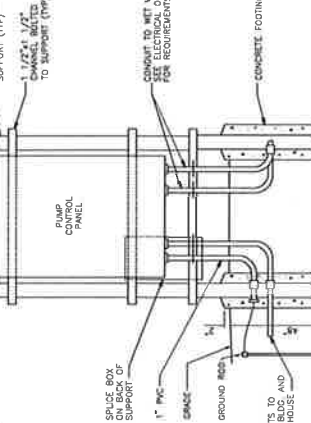
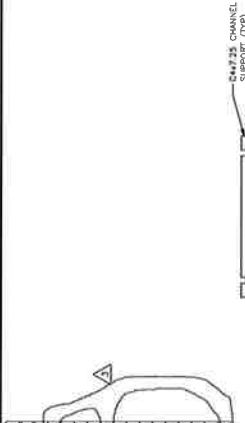
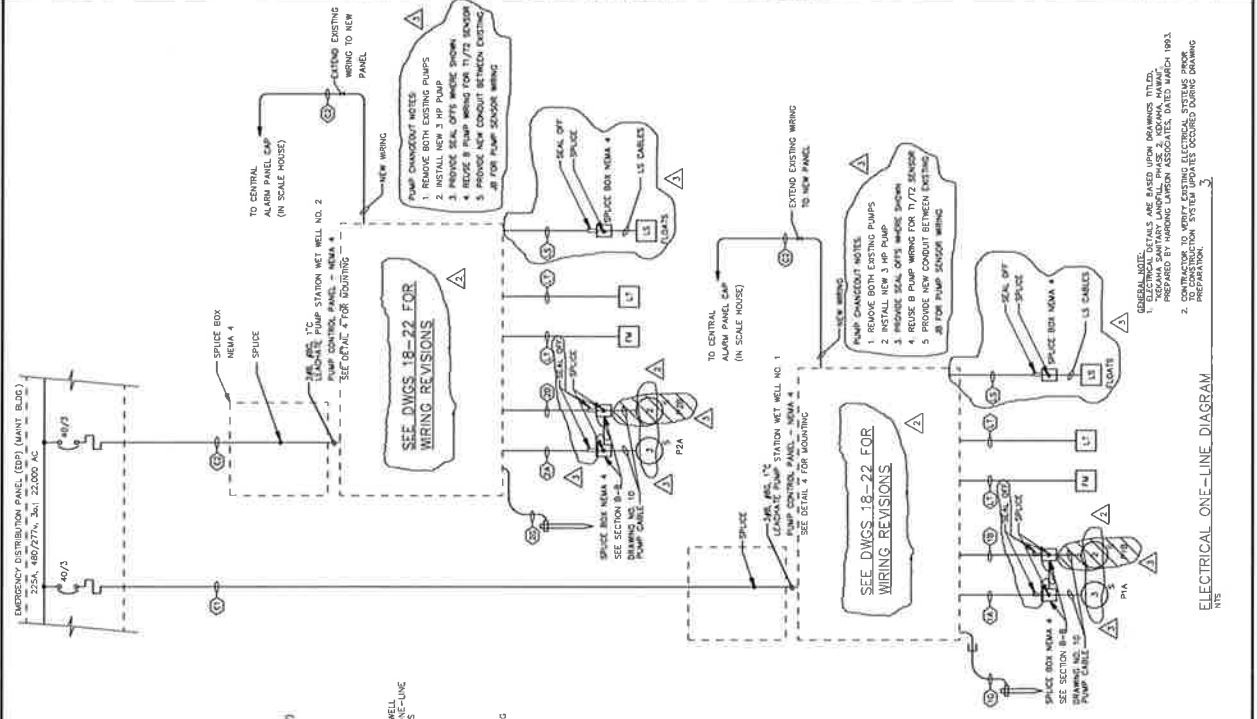
DRAFT CONSTRUCTION DRAWINGS

REVISIONS

NO. 1 DATE 10/20/2010 DESCRIPTION ISSUED ELECTRICAL WIRING FOR PUMP STATION

NO. 2 DATE 11/17/2011 DESCRIPTION ISSUED ELECTRICAL WIRING FOR PUMP STATION

NO. 3 DATE 11/17/2011 DESCRIPTION ISSUED ELECTRICAL WIRING FOR PUMP STATION



NOTE: COORDINATE CONDUIT LOCATIONS & ROUTING WITH PUMP CONTROL PANEL & FIELD CONDITIONS.

4

PUMP CONTROL PANEL MOUNTING DETAIL

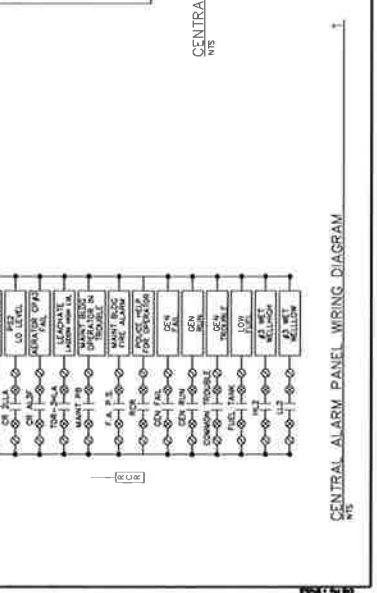
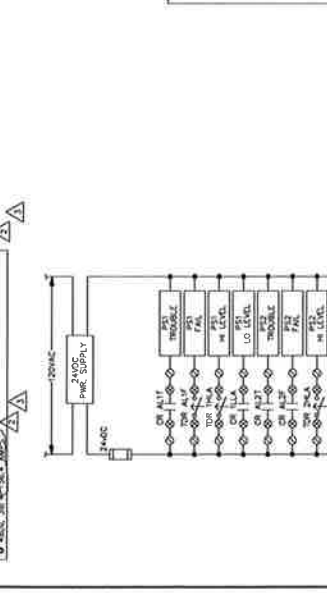
TERMINAL	DESCRIPTION	WIRE SIZE	TERMINAL	DESCRIPTION	WIRE SIZE
1	PS TRIP	14	11	PS FUEL	14
2	PS FUEL	14	12	PS FUEL	14
3	PS FUEL	14	13	PS FUEL	14
4	PS FUEL	14	14	PS FUEL	14
5	PS FUEL	14	15	PS FUEL	14
6	PS FUEL	14	16	PS FUEL	14
7	PS FUEL	14	17	PS FUEL	14
8	PS FUEL	14	18	PS FUEL	14
9	PS FUEL	14	19	PS FUEL	14
10	PS FUEL	14	20	PS FUEL	14

REMAIN CONDUIT & WIRE SCHEDULE

NO.	CONDUIT	WIRE	QUANTITY
1	1 1/2" EMT	3 #12	1
2	1 1/2" EMT	3 #10	1
3	1 1/2" EMT	3 #8	1
4	1 1/2" EMT	3 #6	1
5	1 1/2" EMT	3 #4	1
6	1 1/2" EMT	3 #2	1
7	1 1/2" EMT	3 #1	1
8	1 1/2" EMT	3 #0	1
9	1 1/2" EMT	3 #00	1
10	1 1/2" EMT	3 #000	1
11	1 1/2" EMT	3 #0000	1
12	1 1/2" EMT	3 #00000	1
13	1 1/2" EMT	3 #000000	1
14	1 1/2" EMT	3 #0000000	1
15	1 1/2" EMT	3 #00000000	1
16	1 1/2" EMT	3 #000000000	1
17	1 1/2" EMT	3 #0000000000	1
18	1 1/2" EMT	3 #00000000000	1
19	1 1/2" EMT	3 #000000000000	1
20	1 1/2" EMT	3 #0000000000000	1
21	1 1/2" EMT	3 #00000000000000	1
22	1 1/2" EMT	3 #000000000000000	1
23	1 1/2" EMT	3 #0000000000000000	1
24	1 1/2" EMT	3 #00000000000000000	1
25	1 1/2" EMT	3 #000000000000000000	1
26	1 1/2" EMT	3 #0000000000000000000	1
27	1 1/2" EMT	3 #00000000000000000000	1
28	1 1/2" EMT	3 #000000000000000000000	1
29	1 1/2" EMT	3 #0000000000000000000000	1
30	1 1/2" EMT	3 #00000000000000000000000	1
31	1 1/2" EMT	3 #000000000000000000000000	1
32	1 1/2" EMT	3 #0000000000000000000000000	1
33	1 1/2" EMT	3 #00000000000000000000000000	1
34	1 1/2" EMT	3 #000000000000000000000000000	1
35	1 1/2" EMT	3 #0000000000000000000000000000	1
36	1 1/2" EMT	3 #00000000000000000000000000000	1
37	1 1/2" EMT	3 #000000000000000000000000000000	1
38	1 1/2" EMT	3 #0000000000000000000000000000000	1
39	1 1/2" EMT	3 #00000000000000000000000000000000	1
40	1 1/2" EMT	3 #000000000000000000000000000000000	1
41	1 1/2" EMT	3 #0000000000000000000000000000000000	1
42	1 1/2" EMT	3 #00000000000000000000000000000000000	1
43	1 1/2" EMT	3 #000000000000000000000000000000000000	1
44	1 1/2" EMT	3 #0000000000000000000000000000000000000	1
45	1 1/2" EMT	3 #00000000000000000000000000000000000000	1
46	1 1/2" EMT	3 #000000000000000000000000000000000000000	1
47	1 1/2" EMT	3 #0000000000000000000000000000000000000000	1
48	1 1/2" EMT	3 #00000000000000000000000000000000000000000	1
49	1 1/2" EMT	3 #000000000000000000000000000000000000000000	1
50	1 1/2" EMT	3 #0000000000000000000000000000000000000000000	1

DEMAND LOAD MAIN BLDG SERVICE

LOAD	WIRE	QUANTITY
1	14	1
2	12	1
3	10	1
4	8	1
5	6	1
6	4	1
7	2	1
8	1	1
9	0	1
10	0	1
11	0	1
12	0	1
13	0	1
14	0	1
15	0	1
16	0	1
17	0	1
18	0	1
19	0	1
20	0	1
21	0	1
22	0	1
23	0	1
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25	0	1
26	0	1
27	0	1
28	0	1
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32	0	1
33	0	1
34	0	1
35	0	1
36	0	1
37	0	1
38	0	1
39	0	1
40	0	1
41	0	1
42	0	1
43	0	1
44	0	1
45	0	1
46	0	1
47	0	1
48	0	1
49	0	1
50	0	1



GENERAL NOTE: ELECTRICAL DETAILS ARE BASED UPON DRAWINGS TITLE, DATE, AND REVISIONS. CONTRACTOR TO VERIFY EXISTING ELECTRICAL SYSTEMS PRIOR TO CONSTRUCTION. SYSTEM UPDATES OCCURRED DURING DRAWING PREPARATION.

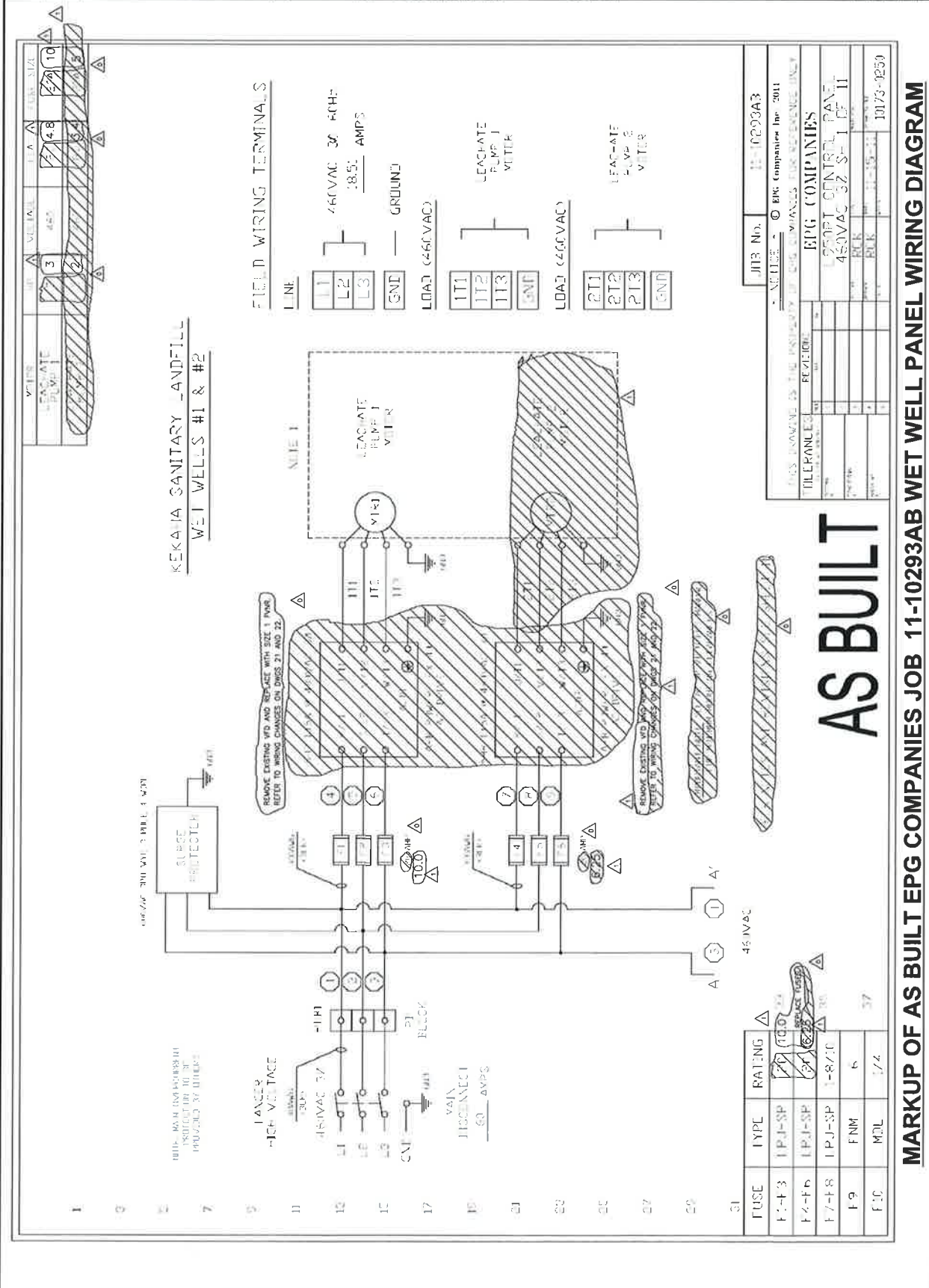
17

RFI #28

ELECTRICAL ONE-LINE DIAGRAM

CENTRAL ALARM PANEL ARRANGEMENT DIAGRAM

CENTRAL ALARM PANEL WIRING DIAGRAM



RFI #5

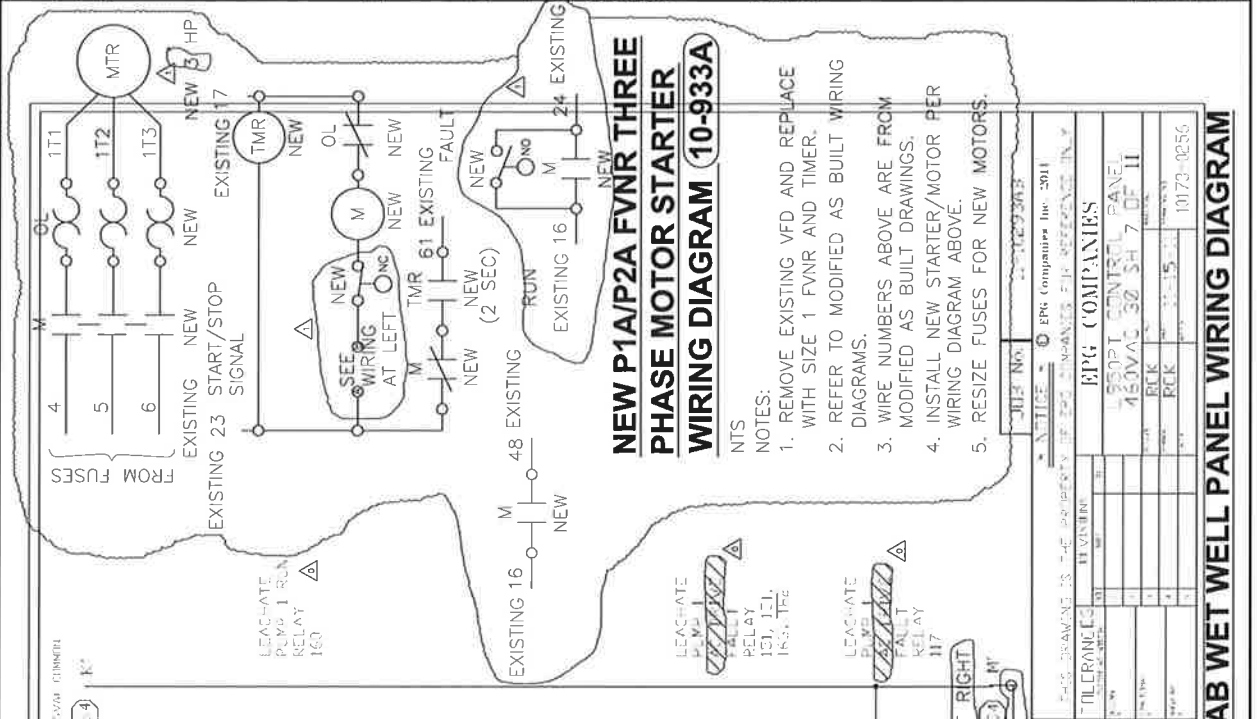
DATE	DESCRIPTION	BY	CHECKED
10/17/2011	REVISIONS		
10/17/2011	1. ADDING ELECTRICAL WIRING FOR 10-933A		
10/17/2011	2. ADDING ELECTRICAL WIRING TO REPLACE 10-933A		



REVISIONS ELECTRICAL DETAILS

PHASE 1 LEACHATE PUMP ELECTRICAL WIRING

DATE: OCTOBER 2011
PROJECT NO: 11-10293AB
DRAWING NO: 10173-0256
PAGE NO: 21

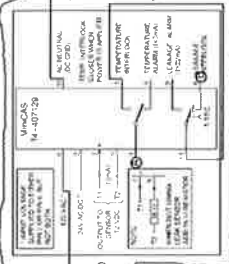
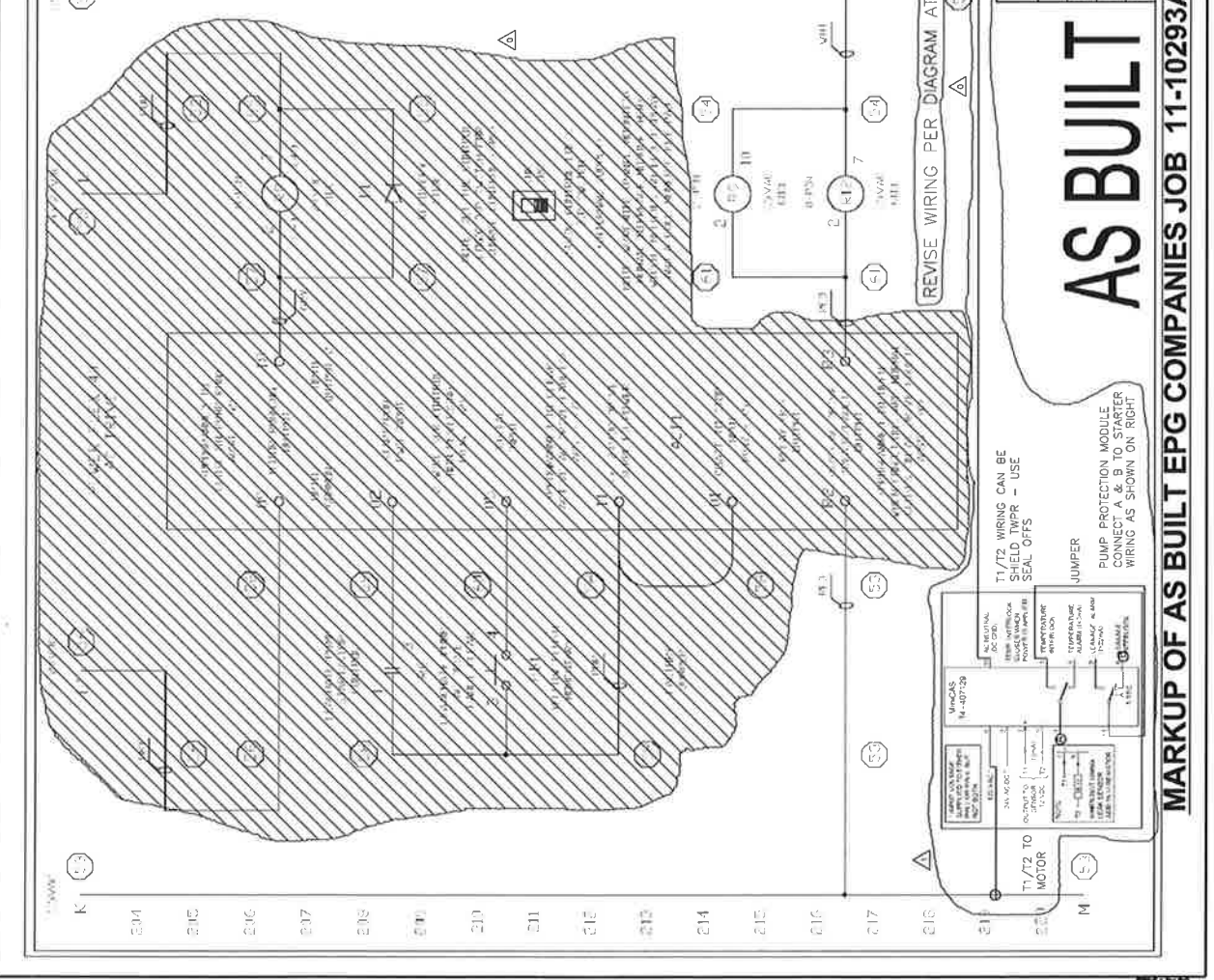


NEW P1A/P2A FVNR THREE PHASE MOTOR STARTER WIRING DIAGRAM (10-933A)

- NOTES:
1. REMOVE EXISTING VFD AND REPLACE WITH SIZE 1 FVNR AND TIMER.
 2. REFER TO MODIFIED AS BUILT WIRING DIAGRAMS.
 3. WIRE NUMBERS ABOVE ARE FROM MODIFIED AS BUILT DRAWINGS.
 4. INSTALL NEW STARTER/MOTOR PER WIRING DIAGRAM ABOVE.
 5. RESIZE FUSES FOR NEW MOTORS.

AS BUILT

MARKUP OF AS BUILT EPG COMPANIES JOB 11-10293AB WET WELL PANEL WIRING DIAGRAM

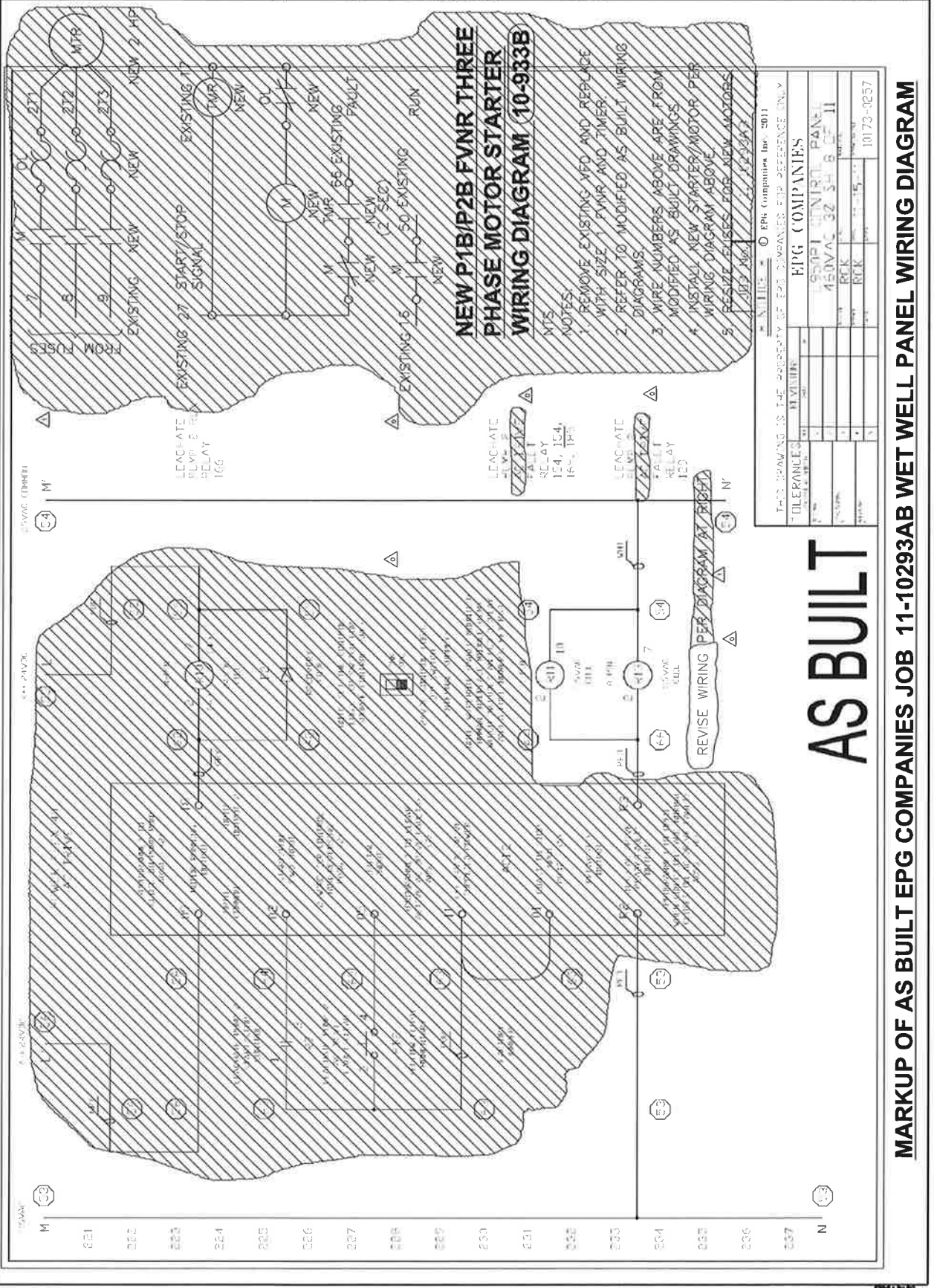


RFI #25

DATE	DESCRIPTION
10/23/2011	REVISIONS
10/23/2011	1. APPROVED ELECTRICAL WORK TO REPLACE WET WELL MOTOR
10/23/2011	2. APPROVED ELECTRICAL WORK TO REPLACE WET WELL FAN



REVISED ELECTRICAL DETAILS
 PHASE 2 LEADWIRE SYSTEMS INDICATIONS
 DRAFT CONSTRUCTION DRAWINGS
 REVISIONS
 DATE: OCTOBER 2011
 PROJECT NO: 11-10293AB
 DRAWING NO: 10173-0237
 SHEET NO: 22



**NEW P1B/P2B FVNR THREE
 PHASE MOTOR STARTER
 WIRING DIAGRAM (10-933B)**

- NTS. NOTES:
1. REMOVE EXISTING VFD AND REPLACE WITH SIZE 1 FVNR AND TIMER.
 2. REFER TO MODIFIED AS-BUILT WIRING DIAGRAMS.
 3. WIRE NUMBERS ABOVE ARE FROM MODIFIED AS-BUILT DRAWINGS.
 4. INSTALL NEW STARTER/MOTOR PER WIRING DIAGRAM ABOVE.
 5. RESIZE FUSES FOR NEW MOTORS.

AS BUILT

MARKUP OF AS BUILT EPG COMPANIES JOB 11-10293AB WET WELL PANEL WIRING DIAGRAM

#28
 LF

Appendix C
Contractor Submittals

**Kekaha Landfill Leachate Management System Modifications
Submittal Log**

Submittal No.	Item	Response	Status
1	Wet Well Structures	Revise and Resubmit	
1R	Wet Well Structures		Modified by RFI#1 (Appendix B)
2	Galvanized Conduit	Approved	
3	Straps, Nut, Bushings	Approved	
4	Plastic Conduit	Approved	
5	Bolts, Nuts, Washers, Clamps	Approved	
6	Coated Conduit	does not meet spec.	Withdrawn
7	Sealing Fittings	does not meet spec.	Withdrawn
8	Conduit Fittings	Approved	
9	Wire and Cable	Approved	
10	Unit Strut	Revise and Resubmit	Withdrawn
11	Panel, Pumps, Controllers, etc.	Revise and Resubmit	EP clarified the guide rail dimensions with Submittal 11R
11-R	Guide Rail	Approved	
12	Flexible Couplers	Approved	
13	Quick Connect Fittings	Approved	
14	HDPE Reducer	Approved	
15	U Bolt	Approved	
16	Fernco Couplings	Approved*	*Based on AECOM's response to RFI#2
17	Fernco Bushings, etc.	Approved*	*Based on AECOM's response to RFI#2
18	Coated Galvanized Conduit	does not meet spec.	Withdrawn
19	Metal Framing Channels	Approved	
20	(not used)		
21	Custom LCM Fittings	Approved	
22	Electrofusion Coupler	Approved	
23	Concrete	Approved	
24	Aggregate	Approved	
25	Stainless Check Valve	Approved	
26	Breakout Box	Approved	
27	Power Monitors	Approved	
28	Float Switches	Approved	
29	Stainless CAM fittings	Approved	
30	Stainless Chain and Shackle	Approved	
31	Bulkhead Fitting	Approved	
32	Stainless Wedge Anchors	Approved	
33	Stainless Fittings	Approved	
34	Stainless Nipples	Approved	
35	Flanged Coupler	Approved	
36	Stainless Pipe	Approved	
37	Flygt Pumps	Approved	Met original design, but revised as indicated in 37-R1
37-R1	Epoxy Coted Flygt Pumps	Approved	
38	Panel Wiring	Revise and Resubmit	
38-R1	Panel Wiring	Approved	

TRANSMITAL

To: Frank Cioffi
Company: AECOM

Date: August 12, 2011
Phone No.: (808) 356-5380
Fax No.: _____

From: Troy Tanigawa
Company: County of Kauai

Phone No.: (808) 241-4838
Fax No.: (808) 241-6887

Subject: Leachate System Modifications, Phase II of Kekaha Landfill

=====

Comments:

Attached please find Submittals 1 thru 10 for the subject project which were submitted by Earthworks Pacific.

Please review and recommend approval as appropriate.

Should you have any questions, please call me at (808) 241-4838.

DIVISION OF SOLID WASTE MANAGEMENT

**COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS**



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 01

Job No:		Date:	August 1, 2011
To:	COK - DPW	Spec Section:	
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295	Drawing No:	8 & 10
	Lihue, HI 96766	Subcontractor:	
Phone No:	808.241.4838	Supplier:	Pacific Industrial Products
Fax No:	808.241.6887	Manufacturer:	Plastic Fusion Fabricators, Inc.
Respond by:			

This submittal contains the following:

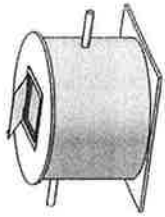
Description: Revised Wet Well Drawings for Wet Well #1 and #2

- NO EXCEPTIONS NOTED
 - MAKE CORRECTIONS NOTED
 - REJECT REVISE AND RESUBMIT
 - SUBMIT UNREVIEWED ITEM
- SUBMITTED: *[Signature]* DATE: 26 October 2011
- GEOSYNTEC CONSULTANTS

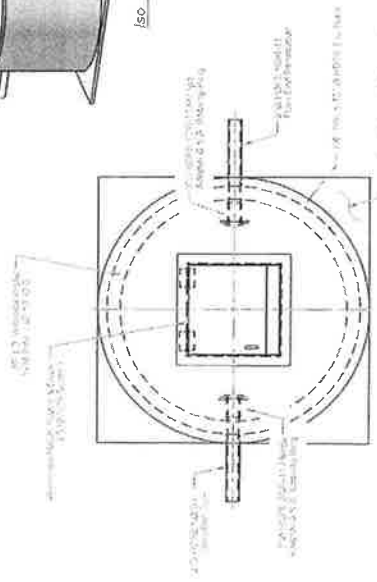
Submittal No	01
Project Name	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No	
Items Description	<input type="checkbox"/> Submittal Conforms to Specifications <input checked="" type="checkbox"/> Exceptions to Drawings & Specs as specifically noted Revised Base Detail
Spec Section	
Spec Para	
Drawing No	8 & 10
Subcontractor	
Supplier	Pacific Industrial Products
Manufacturer	Plastic Fusion Fabricators, Inc.
Contractor	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: 7.29.11 for: Jeffrey Fisher	

cc: File

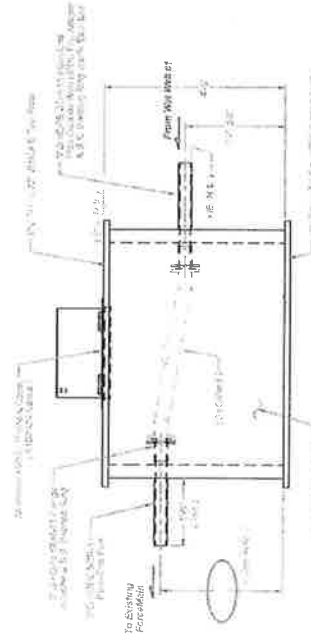
Valve Vault
(At Wet Well # 1)



Iso View



Plan View



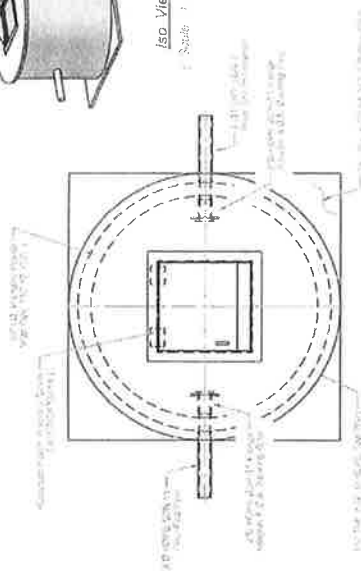
Elevation View

Notes:
Customer To Verify Dimension Cabled in Red
(Not Provided On Engineer's Drawing)

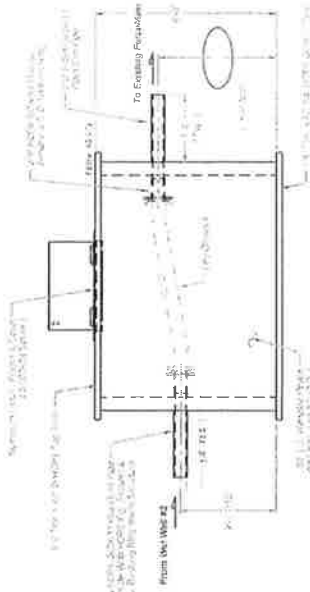
Valve Vault
(At Wet Well # 2)



Iso View
Scale : 1" = 10'



Plan View



Elevation View

PFF Plastic Fusion Fabricators, Inc.
Plastic Fusion Equipment Division

3405 Burroughs Blvd., North York, Ontario M2H 1P1
Tel: 754-852-0078 Fax: 754-852-2084 / <http://www.pffusa.com>

Plastic Fusion Products : Polypropylene Lined
Plastic Fusion Applications : Wastewater
877 LD, HDPE, Valve Vault Labels, Details

PFF Drawing No: 02083-014 c
PFF Job No: F-11214

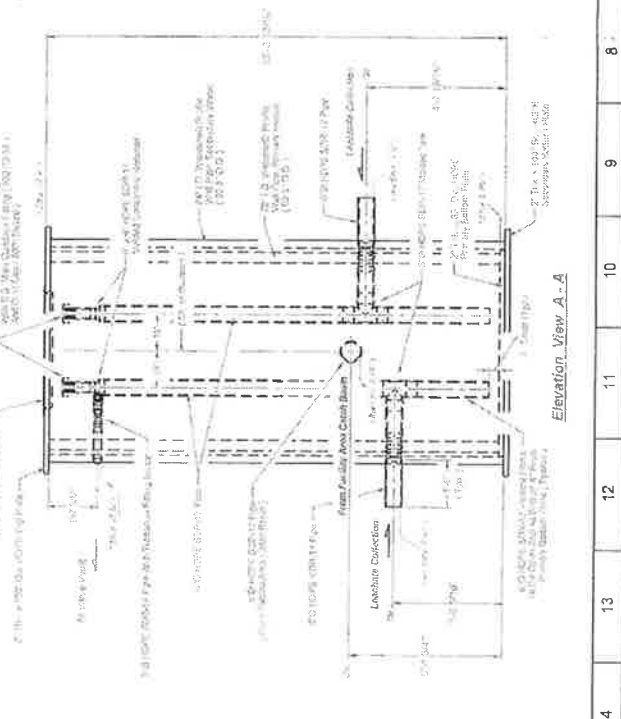
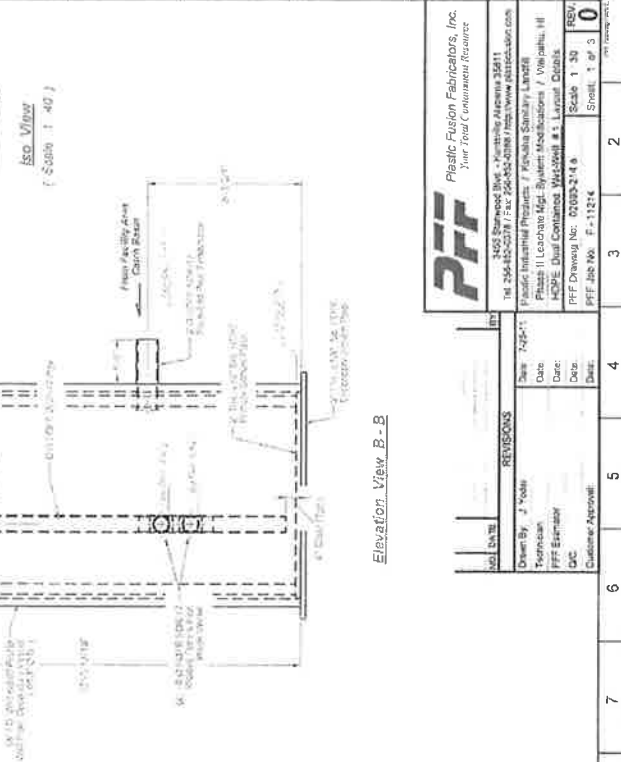
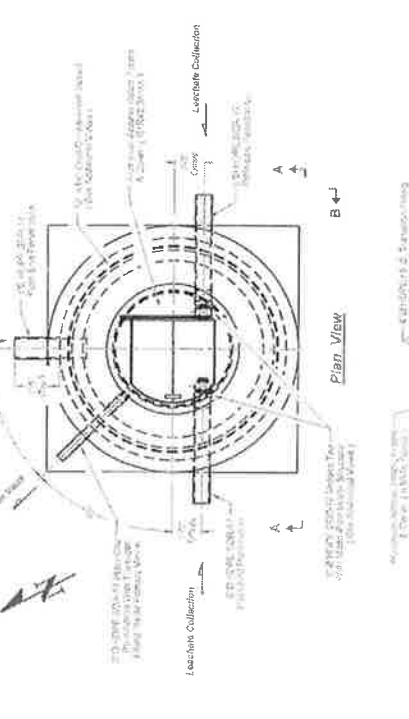
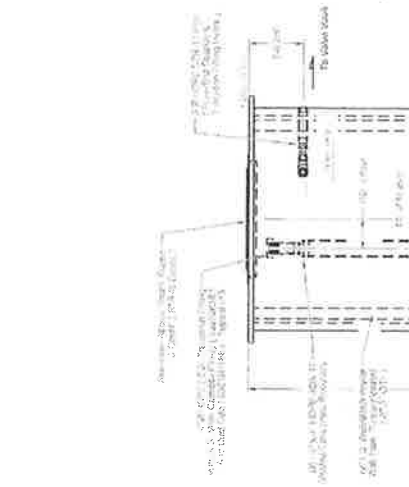
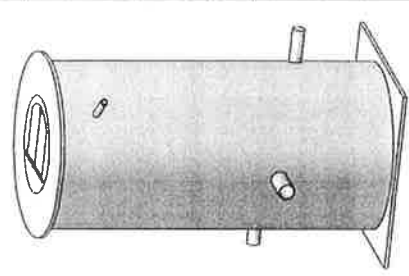
Scale: 1" = 30'
Sheet 3 of 3

NO.	DATE	REVISIONS
1		Drawn By : J. Taylor
2		Checked By : PFF Engineer
3		QC
4		Customer Approval

The Drawing (Design) is provided for use as a property of Plastic Fusion Fabricators, Inc. (PFF). It is intended for use by the customer for the project for which it was prepared. It is not to be used for any other project without the written consent of PFF. PFF is not responsible for any errors or omissions in this drawing.

New Wet Well #1

The Utility Design is provided by Arvin Products of Plastic Fusion Fabricators, Inc. (PFF). It is intended for use as a guide only. It is not to be used as a construction document. For more information, contact PFF at 256-455-0378.



PFF
Plastic Fusion Fabricators, Inc.
Your Total Construction Resource

3405 Sprague Blvd. - Vero Beach, Florida 32981
Tel: 256-455-0378 / Fax: 256-455-0388 / <http://www.plasticfusion.com>
Plastic Industrial Products / Polyurea Specialty Lanes
Plastic III Leachate Mgt. System Modifications / Vero Beach, FL
HQ/E Dual Containment Washwell #1 Layout Details
PFF Drawing No. 0209-214-B
PFF Job No. F-11214

REVISIONS	
Drawn By: J. Voda	Date: 7/20/07
Technician: PFF Estimator	Date: 7/20/07
QC: QC	Date: 7/20/07
Customer Approval:	Date: 7/20/07

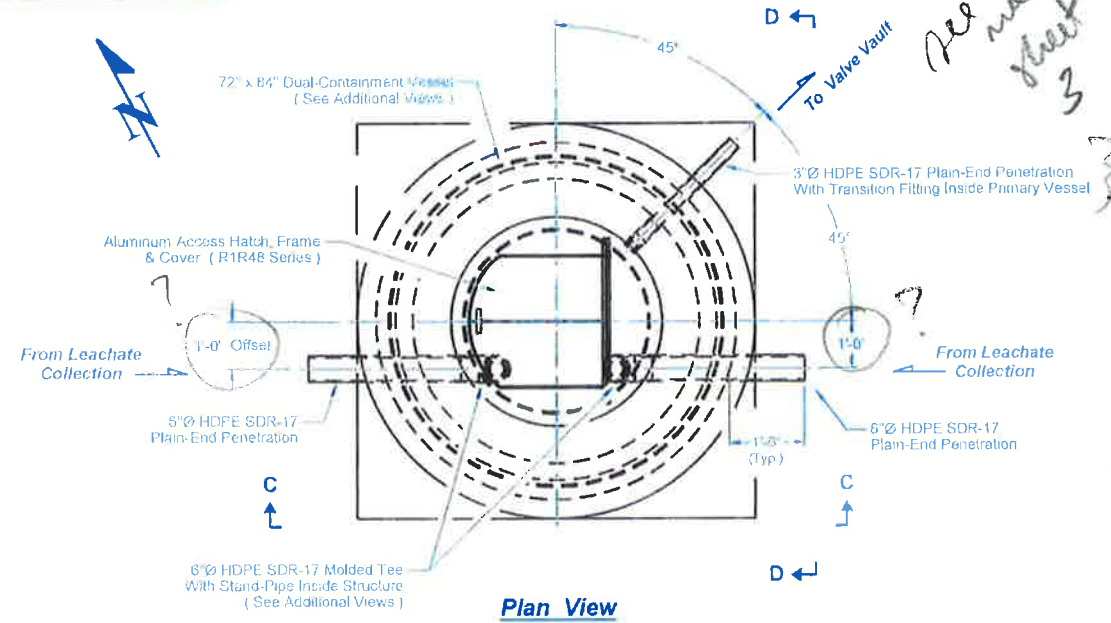
NO.	DATE	BY	DESCRIPTION
1	7/20/07	J. Voda	Issue for Construction

J I H G F E D C B A

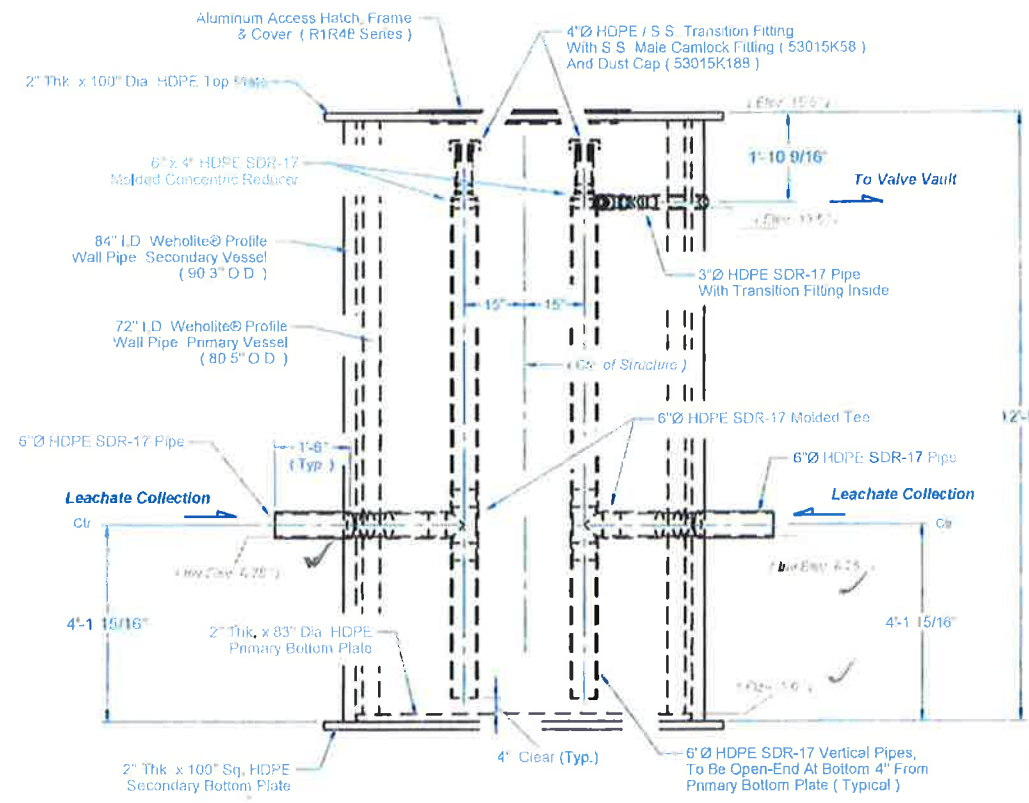
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New Wet Well # 2

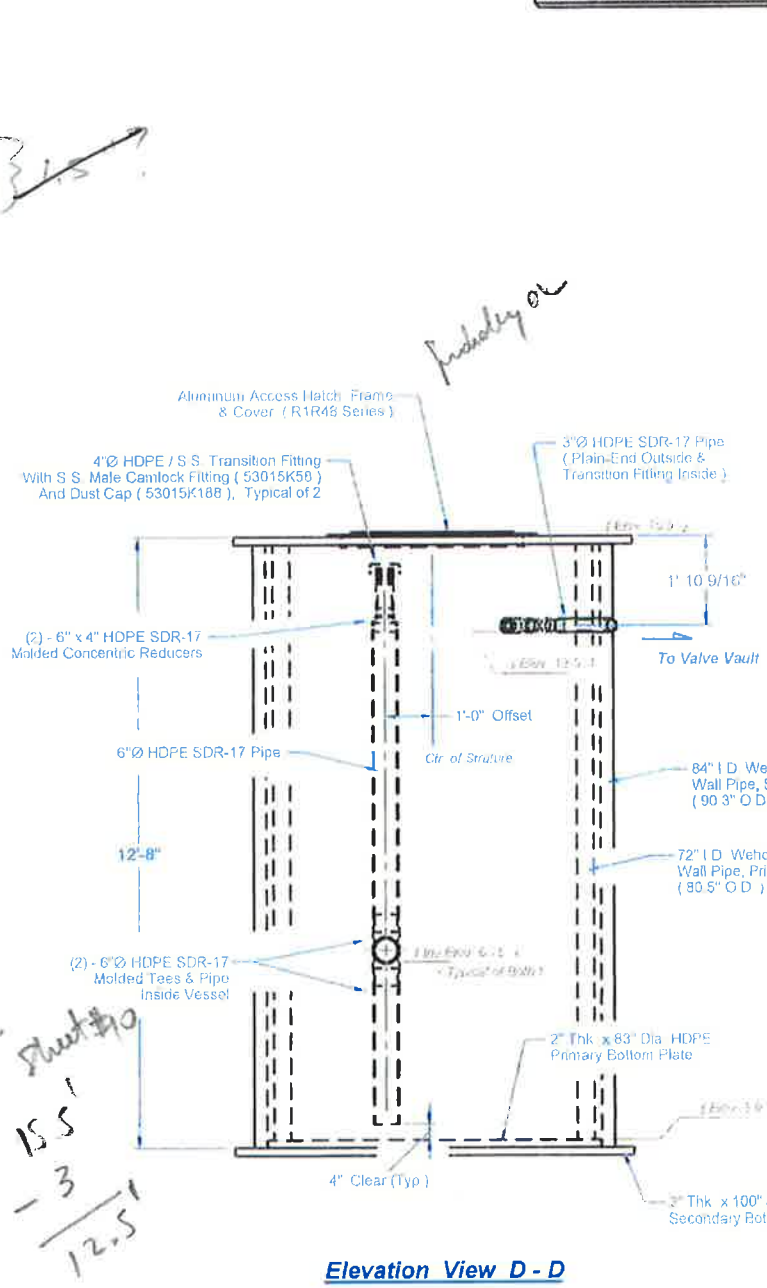
This Drawing / Design Is Provided By And Is Property Of Plastic Fusion Fabricators, Inc. (PFF). It Is Intended For Fabrication, Installation And / Or Identification Purposes Of The Product Depicted And Is Not To Be Circulated Or Reproduced In Any Fashion Without The Specific Permission Of The Management Of PFF. ©1999 All Rights Reserved.



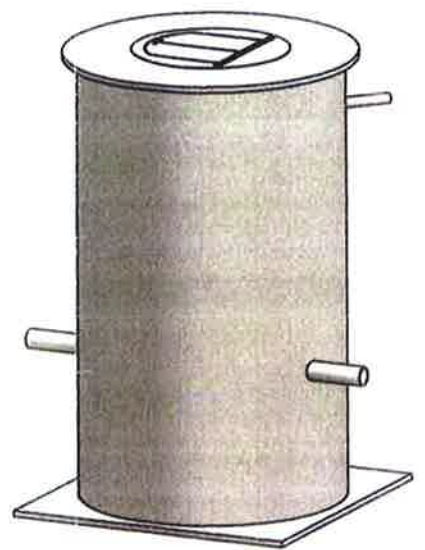
Plan View



Elevation View C - C



Elevation View D - D



Iso View
(Scale 1 : 40)

See next sheet 3

Probably ok

*6'
7'*

*Start @
15.5'
- 3
12.5'*

NO.	DATE	REVISIONS	BY

PFF Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

3455 Stanwood Blvd. - Huntsville Alabama 35811
Tel: 256-852-3378 / Fax: 256-852-0388 / http://www.plasticfusion.com

Pacific Industrial Products / Kekaha Sanitary Landfill
Phase II Leachate Mgt. System Modifications / Waipahu, HI
HDPE Dual Contained Wet-Well # 2 Layout Details

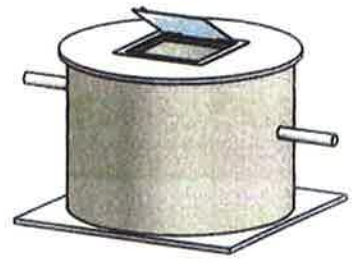
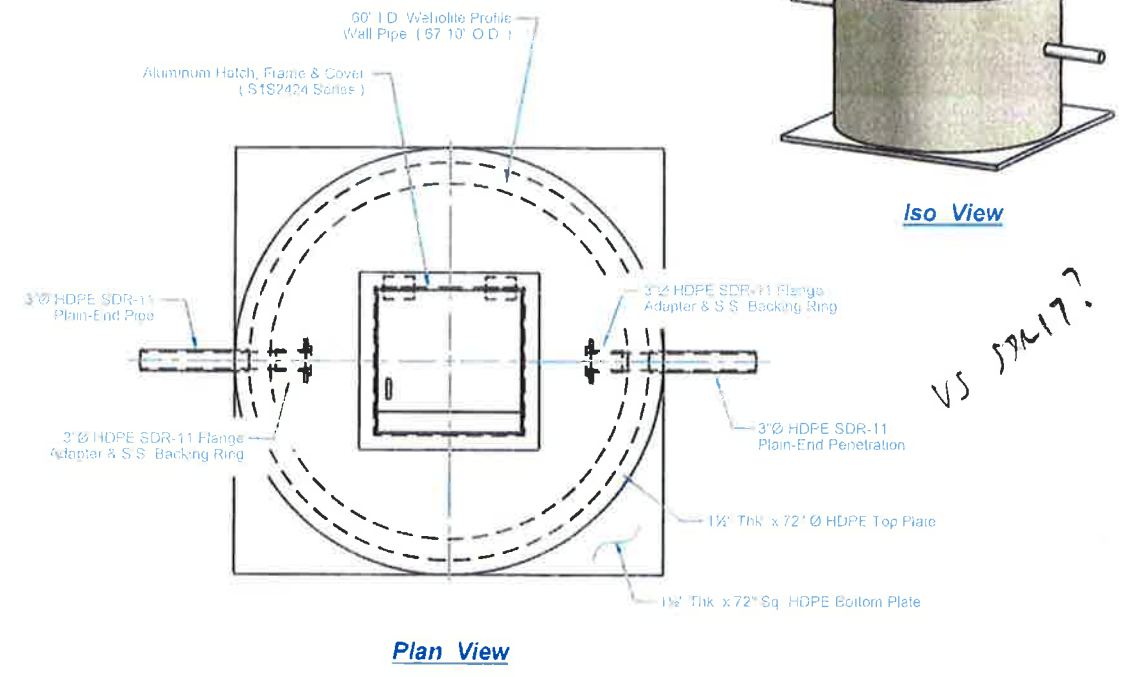
PFF Drawing No: 02693-214 b Scale: 1 : 30
PFF Job No: F - 11214 Sheet: 2 of 3

REV. **0**

PFF Drawing Form C

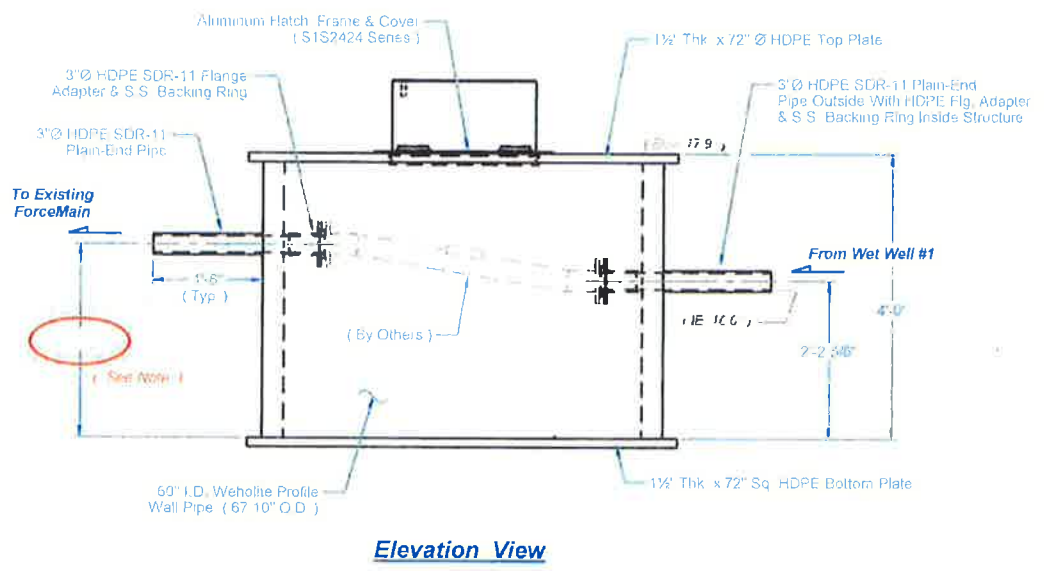
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Valve Vault
(At Wet Well # 1



Iso View

VS 5/26/17?

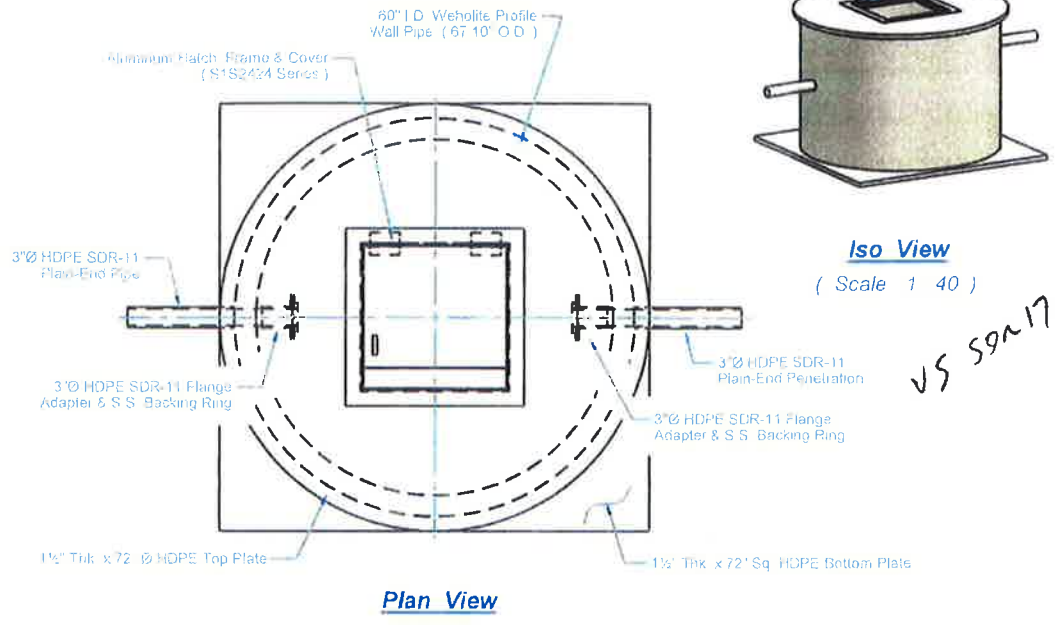


Elevation View

Note :
Customer To Verify Dimension Circled In Red
(Not Provided On Engineer's Drawing)

The Drawing / Design Is Provided By And Is Property Of Plastic Fusion Fabricators, Inc (PFF) It Is Intended For Fabrication, Installation And / Or Identification Purposes Of The Product Depicted And Is Not To Be Calculated Or Reproduced In Any Fashion Without The Specific Permission Of The Management Of PFF ©1999 All Rights Reserved

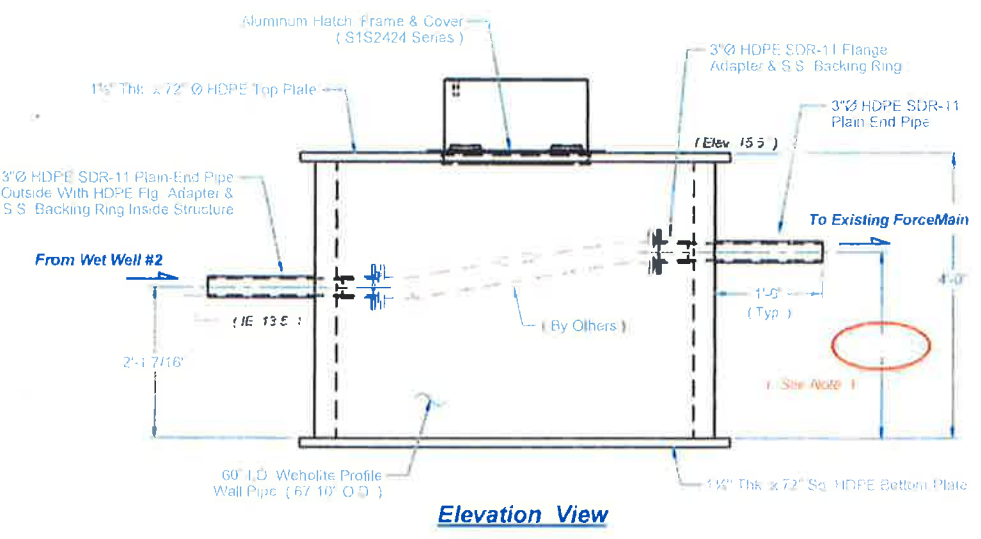
Valve Vault
(At Wet Well # 2



Iso View

(Scale 1 : 40)

VS 5/26/17



Elevation View

*is this available?
on 8?*

14 13 12 11 10 9 8 7 6 5 4 3 2 1

NO.	DATE	REVISIONS	BY

PFF Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

3455 Stanwood Blvd - Huntsville Alabama 35811
Tel 256-852-0378 / Fax 256-852-0388 / http://www.plasticfusion.com
Pacific Industrial Products / Kekaha Sanitary Landfill
Phase II Leachate Mgt System Modifications / Waipahu, HI
80" I.D. HDPE Valve Vault Layout Details
PFF Drawing No: 02693-214 c Scale 1 : 30 REV. 0
PFF Job No: F-11214 Sheet: 3 of 3

PFF Drawing Form C



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 1-R

Job No:	_____	Date:	November 17, 2011
To:	COK - DPW	Spec Section:	_____
Attention:	Troy Tanigawa	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	8 & 10
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	Pacific Industrial Products
Fax No:	808.241.6887	Manufacturer:	Plastic Fusion Fabricators, Inc.
Respond by:	_____		_____

This submittal contains the following:

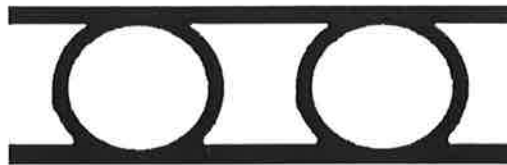
Description: Revised Wet Well Drawings for Wet Well #1 and #2

Submittal No:	1-R
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input type="checkbox"/> Submittal Conforms to Specifications <input checked="" type="checkbox"/> Exceptions to Drawings & Specs as specifically noted Revised Base Detail
Spec Section:	
Spec Para:	
Drawing No:	8 & 10
Subcontractor:	
Supplier:	Pacific Industrial Products
Manufacturer:	Plastic Fusion Fabricators, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: 11-17-11	

cc: File



ProCor™ 60" CPR-RSC250



60" Class 250 ProCor™ CPR is a high-density polyethylene (HDPE) closed profile pipe produced to meet or exceed the requirements of ASTM F-894. Typical physical and mechanical properties are shown below.

PIPE PROPERTIES	Units	Test Procedure	Typ. Value
Pipe Class	none	ASTM F-894	250
Inside Diameter	inches	ASTM F-894 / D-2212	60.00
Outside Diameter	inches	ASTM F-894 / D-2212	66.00
Bell OD (may vary)	inches	ASTM F-894 / D-2212	66.00
Joint Type	optional	ASTM F-894	Plain End
Min. Waterway Wall Thickness	inches	ASTM F-894	0.24
Min. Spigot Thickness	inches	ASTM F-894	0.24
Min. Bell Thickness	inches	ASTM F-894	0.60
Standard Lay Length	feet/inches	ASTM F-894	20' ± 2"
Design Weight	lbs/ft		82.00
Co-Extruded Yellow Interior			Standard

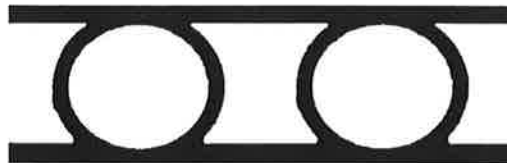
HDPE PROPERTIES	Units	Test Procedure	Typ. Value
Material Designation		PPI TR-4	PE4710
Cell Classification		ASTM D3350	445576C
Base Resin Density	gms/cc	ASTM D792	0.959
Melt Index ¹	gms/10 min	ASTM F1238	7
Hydrostatic Design Basis, HDB 73° F (23° C)	psi	ASTM D2837	1600
Color / Carbon Black		ASTM D3350	2-2.5%
Tensile Strength at Yield ²	psi	ASTM D638	3500
Tensile Strength at Break ²	psi	ASTM D638	4500
Elongation at Break ²	%	ASTM D638	> 500
Flexural Modulus ³	psi	ASTM D790	150,000
Environmental Stress Crack Resistance ⁴	hours	ASTM D1693	> 2000
Environmental Stress Crack Resistance ⁵	hours	ASTM D1693	> 5000
Notch Tensile (PENT) Test	hours	ASTM F1473	> 10,000
Hardness (Shore D)		ASTM D256	68
Thermal Properties			
Vicat Softening Temperature	°F	ASTM D1525	259
Brittleness Temperature	°F	ASTM D746	< -103
Thermal Expansion Coefficient	In/in/°F	ASTM D696	1.0 X 10 ⁻⁴

- 1 190° C/12,600 grams
- 2 2 inches/minute rate of strain
- 3 2 % secant – Method 1
- 4 Condition B, 10%
- 5 Condition C

11/3/2011



ProCor™ 72" CPR-RSC250



72" Class 250 ProCor™ CPR is a high-density polyethylene (HDPE) closed profile pipe produced to meet or exceed the requirements of ASTM F-894. Typical physical and mechanical properties are shown below.

PIPE PROPERTIES	Units	Test Procedure	Typ. Value
Pipe Class	none	ASTM F-894	250
Inside Diameter	inches	ASTM F-894 / D-2212	72.00
Outside Diameter	inches	ASTM F-894 / D-2212	78.60
Bell OD (may vary)	inches	ASTM F-894 / D-2212	78.60
Joint Type	optional	ASTM F-894	Plain End
Min. Waterway Wall Thickness	inches	ASTM F-894	0.31
Min. Spigot Thickness	inches	ASTM F-894	0.31
Min. Bell Thickness	inches	ASTM F-894	0.60
Standard Lay Length	feet/inches	ASTM F-894	20' ± 2"
Design Weight	lbs/ft		126.00
Co-Extruded Yellow Interior			Standard

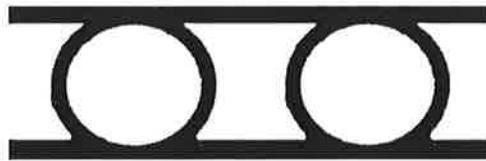
HDPE PROPERTIES	Units	Test Procedure	Typ. Value
Material Designation		PPI TR-4	PE4710
Cell Classification		ASTM D3350	445576C
Base Resin Density	gms/cc	ASTM D792	0.959
Melt Index ¹	gms/10 min	ASTM F1238	7
Hydrostatic Design Basis, HDB 73° F (23° C)	psi	ASTM D2837	1600
Color / Carbon Black		ASTM D3350	2-2.5%
Tensile Strength at Yield ²	psi	ASTM D638	3500
Tensile Strength at Break ²	psi	ASTM D638	4500
Elongation at Break ²	%	ASTM D638	> 500
Flexural Modulus ³	psi	ASTM D790	150,000
Environmental Stress Crack Resistance ⁴	hours	ASTM D1693	> 2000
Environmental Stress Crack Resistance ⁵	hours	ASTM D1693	> 5000
Notch Tensile (PENT) Test	hours	ASTM F1473	> 10,000
Hardness (Shore D)		ASTM D256	68
Thermal Properties			
Vicat Softening Temperature	°F	ASTM D1525	259
Brittleness Temperature	°F	ASTM D746	< -103
Thermal Expansion Coefficient	In/in/°F	ASTM D696	1.0 X 10 ⁻⁴

- 1 190° C/12,600 grams
- 2 2 inches/minute rate of strain
- 3 2 % secant – Method 1
- 4 Condition B, 10%
- 5 Condition C

11/3/2011



ProCor™ 84" CPR-RSC250



84" Class 250 ProCor™ CPR is a high-density polyethylene (HDPE) closed profile pipe produced to meet or exceed the requirements of ASTM F-894. Typical physical and mechanical properties are shown below.

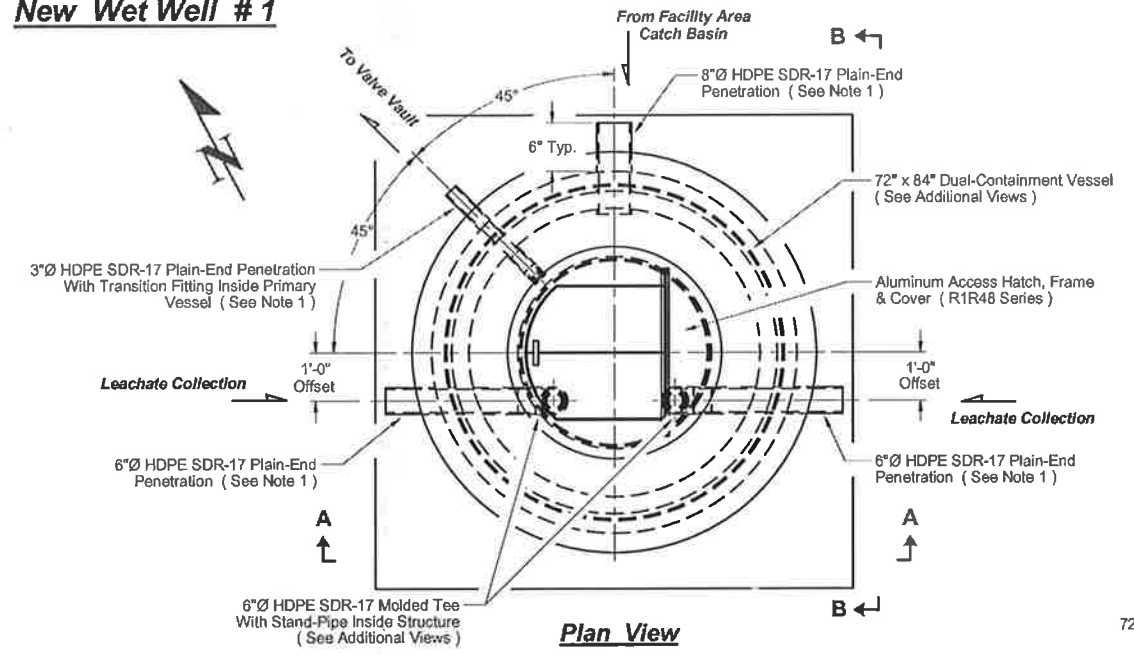
PIPE PROPERTIES	Units	Test Procedure	Typ. Value
Pipe Class	none	ASTM F-894	250
Inside Diameter	inches	ASTM F-894 / D-2212	84.00
Outside Diameter	inches	ASTM F-894 / D-2212	90.90
Bell OD (may vary)	inches	ASTM F-894 / D-2212	90.90
Joint Type	optional	ASTM F-894	Plain End
Min. Waterway Wall Thickness	inches	ASTM F-894	0.31
Min. Spigot Thickness	inches	ASTM F-894	0.31
Min. Bell Thickness	inches	ASTM F-894	0.70
Standard Lay Length	feet/inches	ASTM F-894	20' ± 2"
Design Weight	lbs/ft		173.00
Co-Extruded Yellow Interior			Standard

HDPE PROPERTIES	Units	Test Procedure	Typ. Value
Material Designation		PPI TR-4	PE4710
Cell Classification		ASTM D3350	445576C
Base Resin Density	gms/cc	ASTM D792	0.959
Melt Index ¹	gms/10 min	ASTM F1238	7
Hydrostatic Design Basis, HDB 73° F (23° C)	psi	ASTM D2837	1600
Color / Carbon Black		ASTM D3350	2-2.5%
Tensile Strength at Yield ²	psi	ASTM D638	3500
Tensile Strength at Break ²	psi	ASTM D638	4500
Elongation at Break ²	%	ASTM D638	> 500
Flexural Modulus ³	psi	ASTM D790	150,000
Environmental Stress Crack Resistance ⁴	hours	ASTM D1693	> 2000
Environmental Stress Crack Resistance ⁵	hours	ASTM D1693	> 5000
Notch Tensile (PENT) Test	hours	ASTM F1473	> 10,000
Hardness (Shore D)		ASTM D256	68
Thermal Properties			
Vicat Softening Temperature	°F	ASTM D1525	259
Brittleness Temperature	°F	ASTM D746	< -103
Thermal Expansion Coefficient	In/in/°F	ASTM D696	1.0 X 10 ⁻⁴

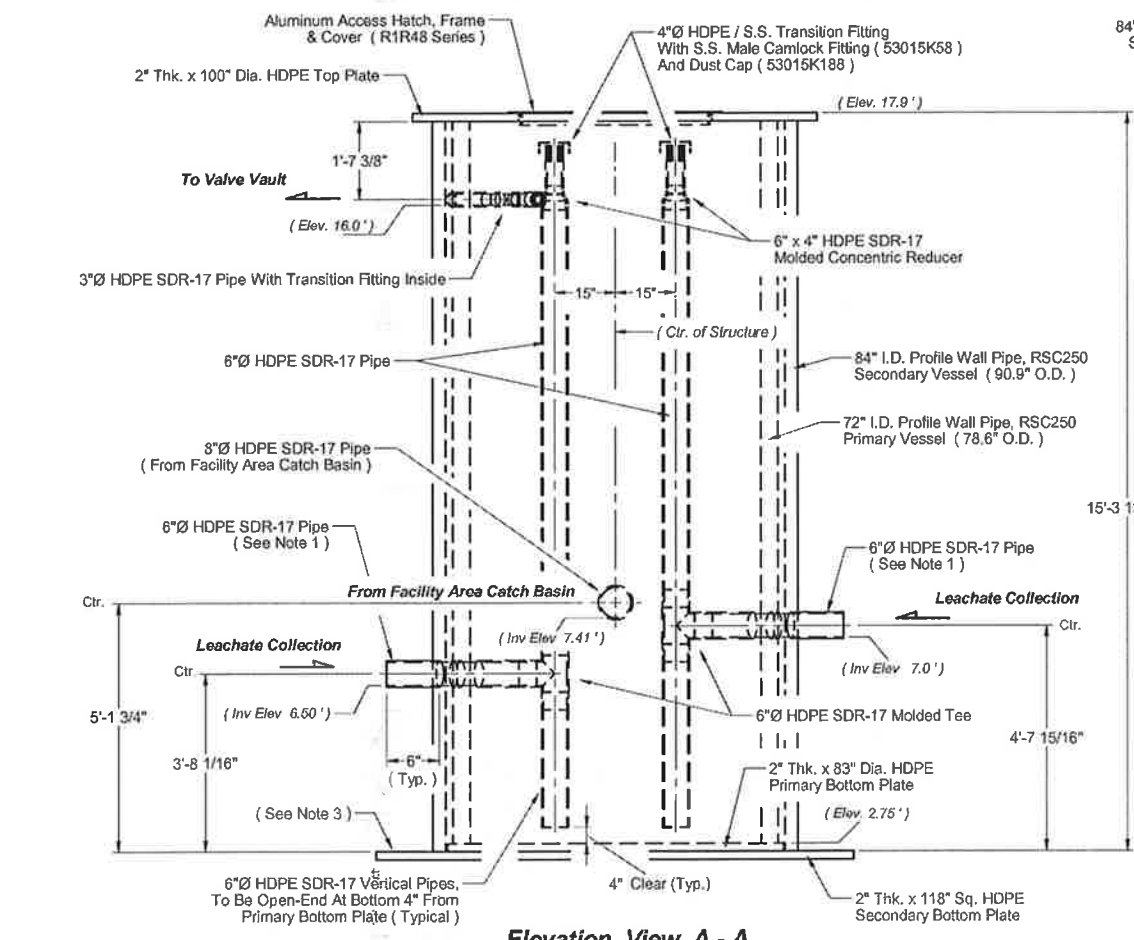
- 1 190° C/12,600 grams
- 2 2 inches/minute rate of strain
- 3 2 % secant – Method 1
- 4 Condition B, 10%
- 5 Condition C

11/3/2011

New Wet Well #1



Plan View

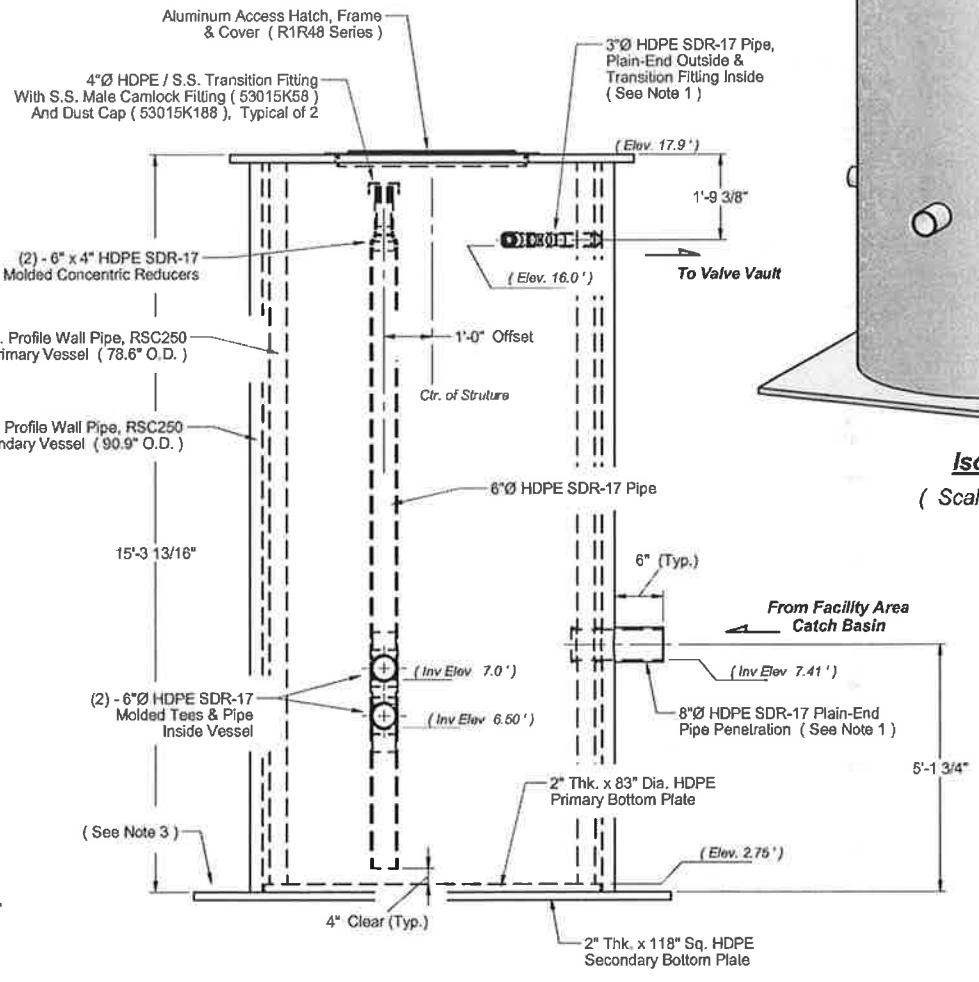


Elevation View A - A

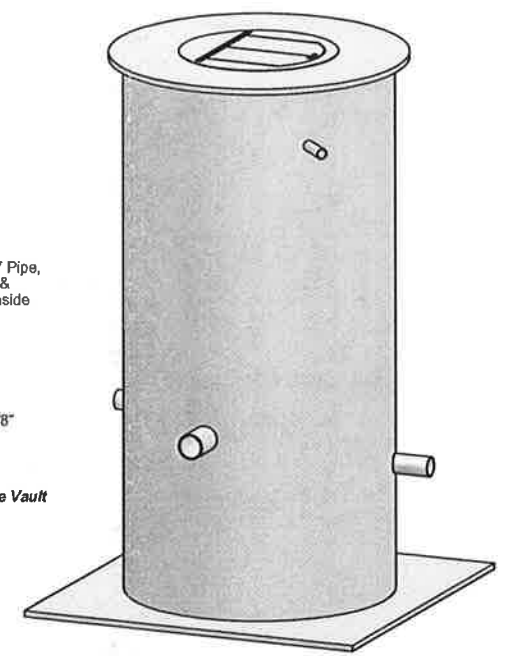
Notes :

1. All Penetrations Will Be Sealed By Extrusion Welds, Inside & Outside Of Profile Wall Vessel.
2. The Ring Stiffness Of Profile Wall Pipes Are RSC250.
3. J-Bolts (1/2"Ø x 8" Long W-2" Tails), To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The Base.

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Elevation View B - B



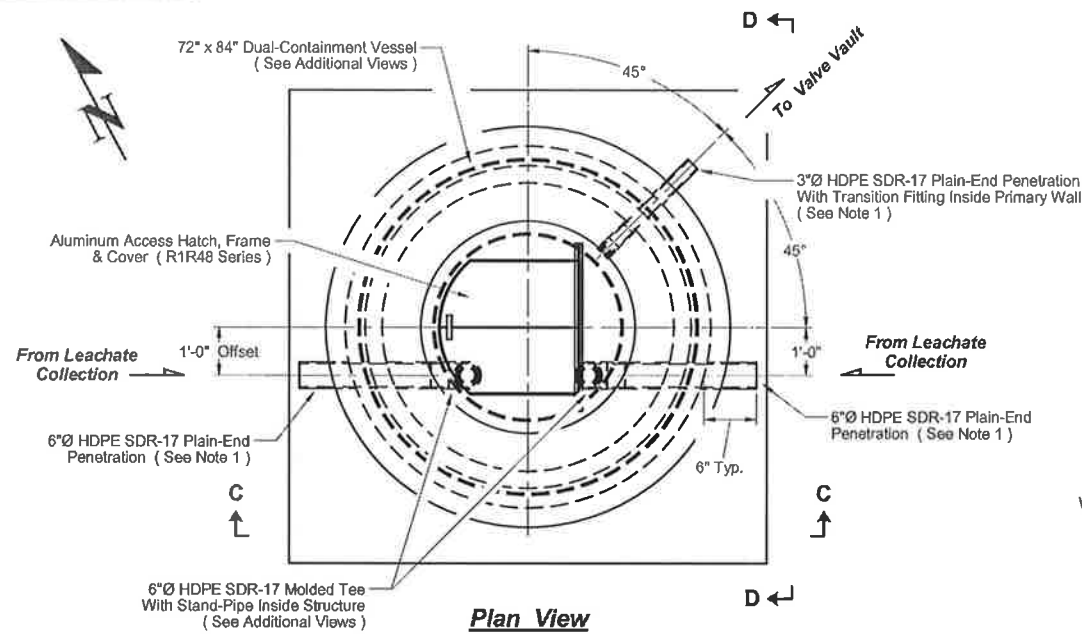
Iso View
(Scale 1:40)

<table border="1"> <tr> <td>B</td> <td>11-15-11</td> <td>Clarified Pipe Class & Added Notes</td> <td>JY</td> </tr> <tr> <td>A</td> <td>11-02-11</td> <td>Revised Per Customer's Request: Enlarged Base to 118" Sq, Reduced All Penetrations To 6" Long & Corrected O.D. of Secondary Vessel</td> <td>JY</td> </tr> </table>		B	11-15-11	Clarified Pipe Class & Added Notes	JY	A	11-02-11	Revised Per Customer's Request: Enlarged Base to 118" Sq, Reduced All Penetrations To 6" Long & Corrected O.D. of Secondary Vessel	JY	<p>Plastic Fusion Fabricators, Inc. Your Total Containment Resource</p> <p>3455 Stanwood Blvd. - Huntsville Alabama 35811 Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com</p>					
B	11-15-11	Clarified Pipe Class & Added Notes	JY												
A	11-02-11	Revised Per Customer's Request: Enlarged Base to 118" Sq, Reduced All Penetrations To 6" Long & Corrected O.D. of Secondary Vessel	JY												
<table border="1"> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <td>NO.</td> <td>DATE</td> <td>DESCRIPTION</td> <td>BY</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>				REVISIONS				NO.	DATE	DESCRIPTION	BY				
REVISIONS															
NO.	DATE	DESCRIPTION	BY												
Drawn By: J. Yoder Technician: PFF Estimator: Q/C: Customer Approval:		Date: 7-25-11 Date: Date: Date:		Pacific Industrial Products / Kekaha Sanitary Landfill Phase II Leachate Mgt. System Modifications / Waipahu, HI HDPE Dual Contained Wet-Well #1 Layout Details PFF Drawing No: 02693-214 a PFF Job No: F - 11214											
		Scale 1:30 Sheet: 1 of 3		REV. B											

14 13 12 11 10 9 8 7 6 5 4 3 2 1

New Wet Well #2

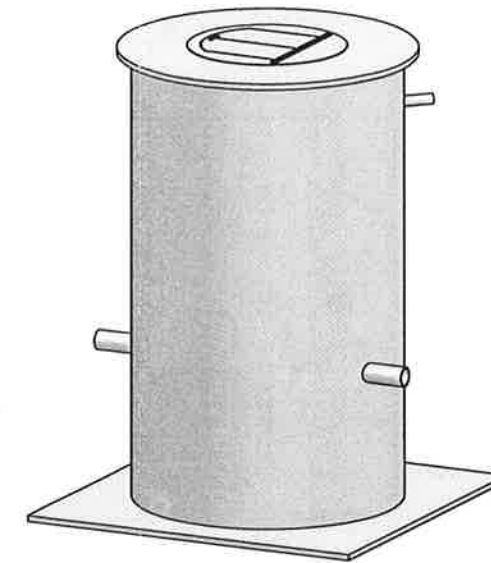
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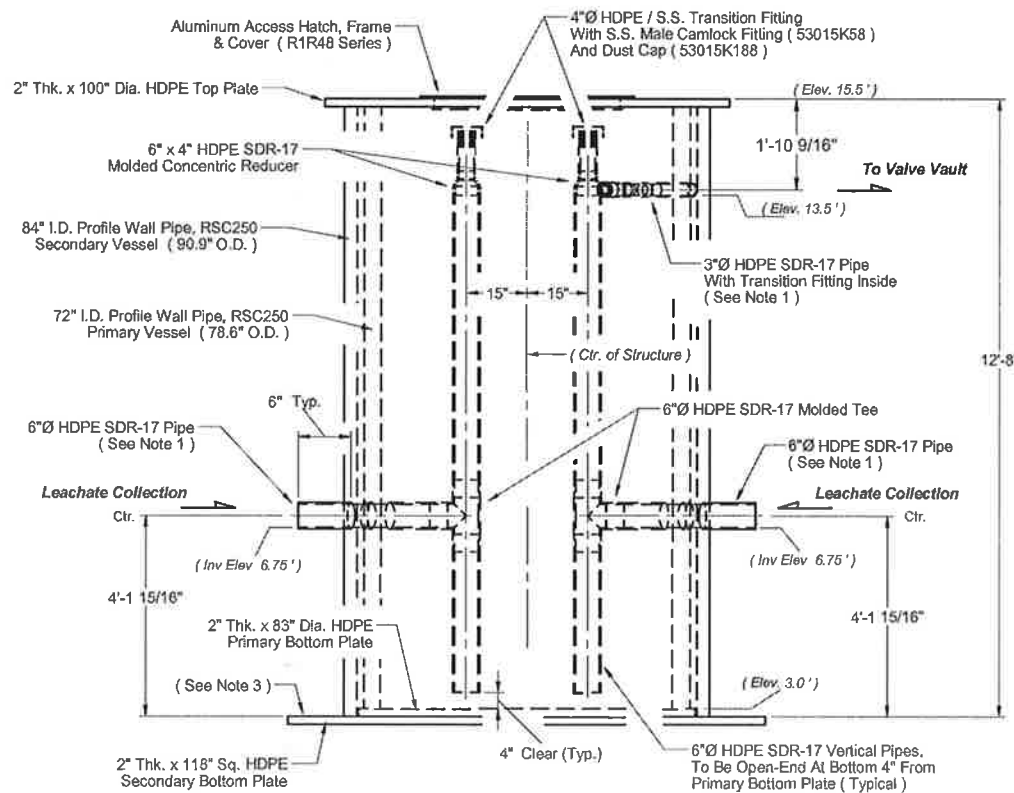
Plan View

Notes :

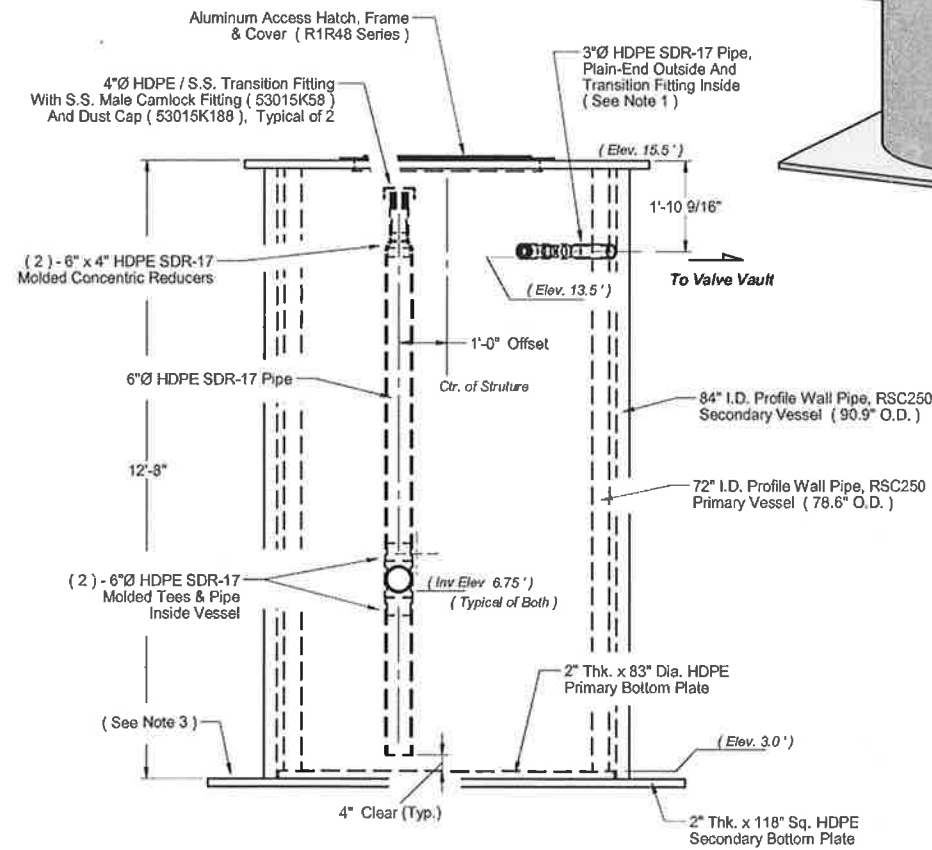
1. All Penetrations Will Be Sealed By Extrusion Welds, Inside & Outside Of Profile Wall Vessel.
2. The Ring Stiffness Of Profile Wall Pipes Are RSC250.
3. J-Bolts (1/2"Ø x 8" Long W-2" Tails), To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The Base.



Iso View
(Scale 1 : 40)



Elevation View C - C



Elevation View D - D

NO.	DATE	REVISIONS	BY
B	11-15-11	Clarified Pipe Class & Added Notes	JY
A	11-02-11	Revised Per Customer's Request: Enlarged Base to 118" Sq., Reduced All Penetrations To 6" Long & Corrected O.D. of Secondary Vessel	JY

Drawn By: J. Yoder	Date: 7-25-11	Pacific Industrial Products / Kekaha Sanitary Landfill	
Technician:	Date:	Phase II Leachate Mgt. System Modifications / Waipahu, HI	
PFF Estimator:	Date:	HDPE Dual Contained Wet-Well #2 Layout Details	
Q/C:	Date:	PFF Drawing No: 02693-214 b	Scale 1 : 30
Customer Approval:	Date:	PFF Job No: F - 11214	Sheet 2 of 3

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Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com

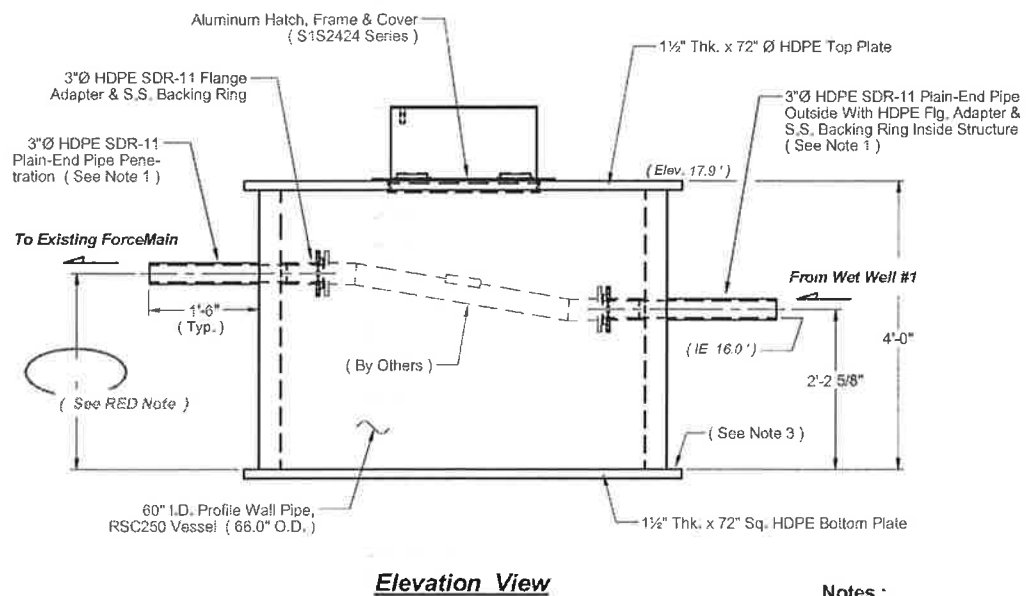
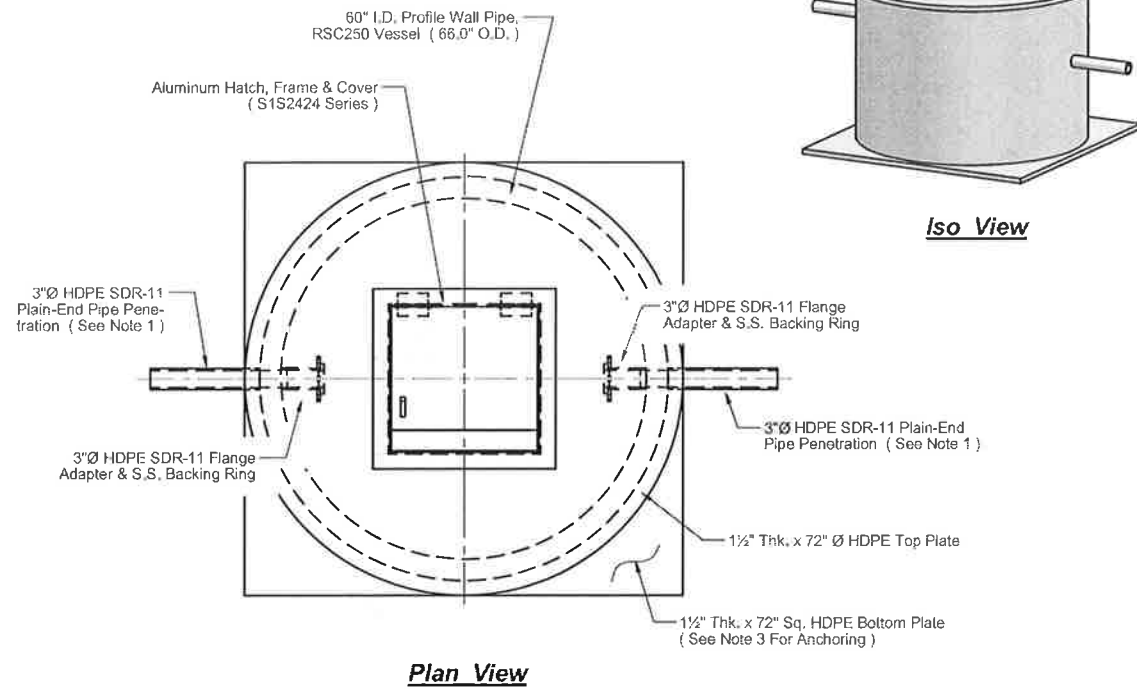
REV. **B**

PFF Drawing Form C

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14 13 12 11 10 9 8 7 6 5 4 3 2 1

Valve Vault
(At Wet Well # 1)

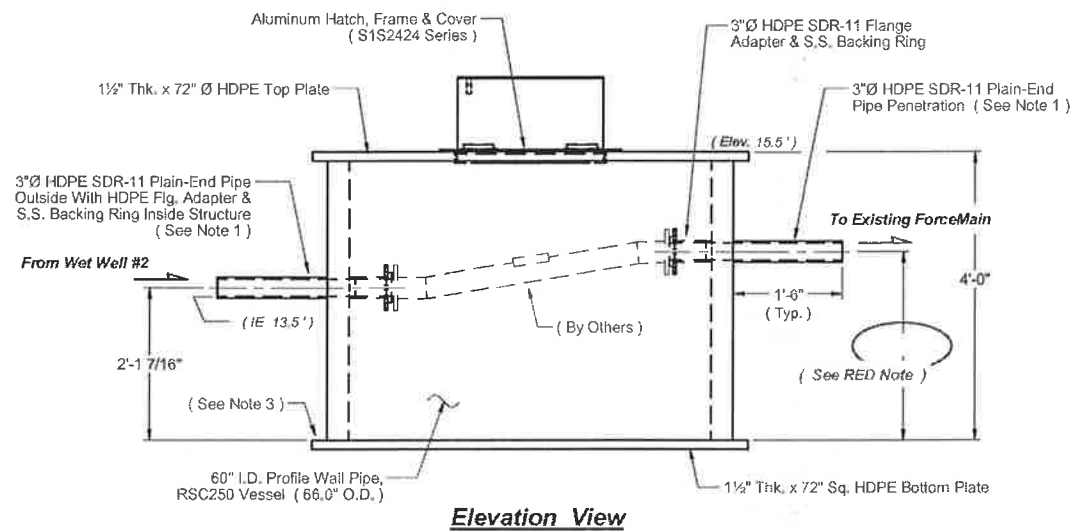
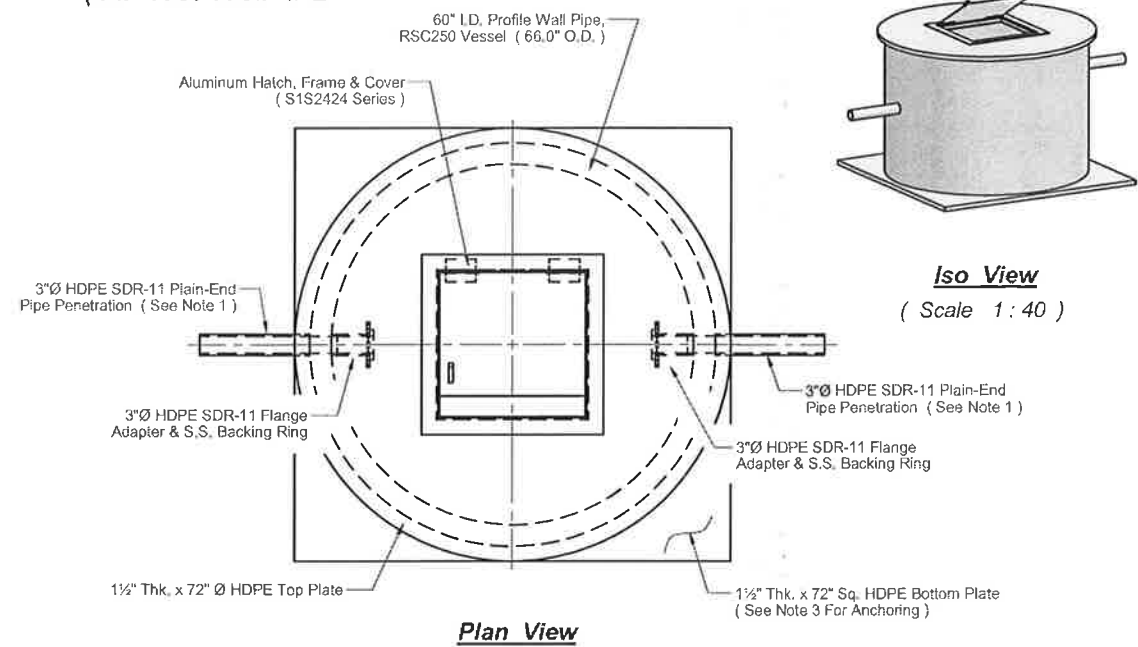


Note :
Customer To Verify Dimension Circled In Red (Not Provided On Engineer's Drawing)

- Notes :**
- All Penetrations Will Be Sealed By Extrusion Welds, Inside & Outside Of Profile Wall Vessel.
 - The Ring Stiffness Of Profile Wall Pipes Are RSC250.
 - J-Bolts (1/2"Ø x 8" Long W-2" Tails), To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The Base.

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Valve Vault
(At Wet Well # 2)



A		11-15-11	Clarified Pipe Class & Added Notes	JY	BY
NO.		DATE			
REVISIONS					
Drawn By:		J. Yoder	Date:	7-25-11	PFF Plastic Fusion Fabricators, Inc. Your Total Containment Resource 3455 Stanwood Blvd. - Huntsville Alabama 35811 Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com Pacific Industrial Products / Kekaha Sanitary Landfill Phase II Leachate Mgt. System Modifications / Waipahu, HI 60" I.D. HDPE Valve Vault Layout Details PFF Drawing No: 02693-214 c Scale 1:30 PFF Job No: F-11214 Sheet: 3 of 3
Technician:			Date:		
PFF Estimator:			Date:		
O/C:			Date:		
Customer Approval:			Date:		

14 13 12 11 10 9 8 7 6 5 4 3 2 1



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 1-R2³

19

Job No: _____ Date: January 8, 2012
 To: COK - DPW Spec Section: _____
 Attention: Jesse Frey Spec Para: _____
 Address: 4444 Rice Street, Ste 295 Drawing No: _____
 Lihue, HI 96766 Subcontractor: _____
 Phone No: 808.241.4838 Supplier: Pacific Industrial Products
 Fax No: 808.241.6887 Manufacturer: Plastic Fusion Fabricators, Inc.
 Respond by: _____

This submittal contains the following:

Description: Re-Revised Wet Well Drawings for Wet Well #1 and #2

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: *[Signature]* DATE: 23 JAN 2012

GEOSYNTEC CONSULTANTS

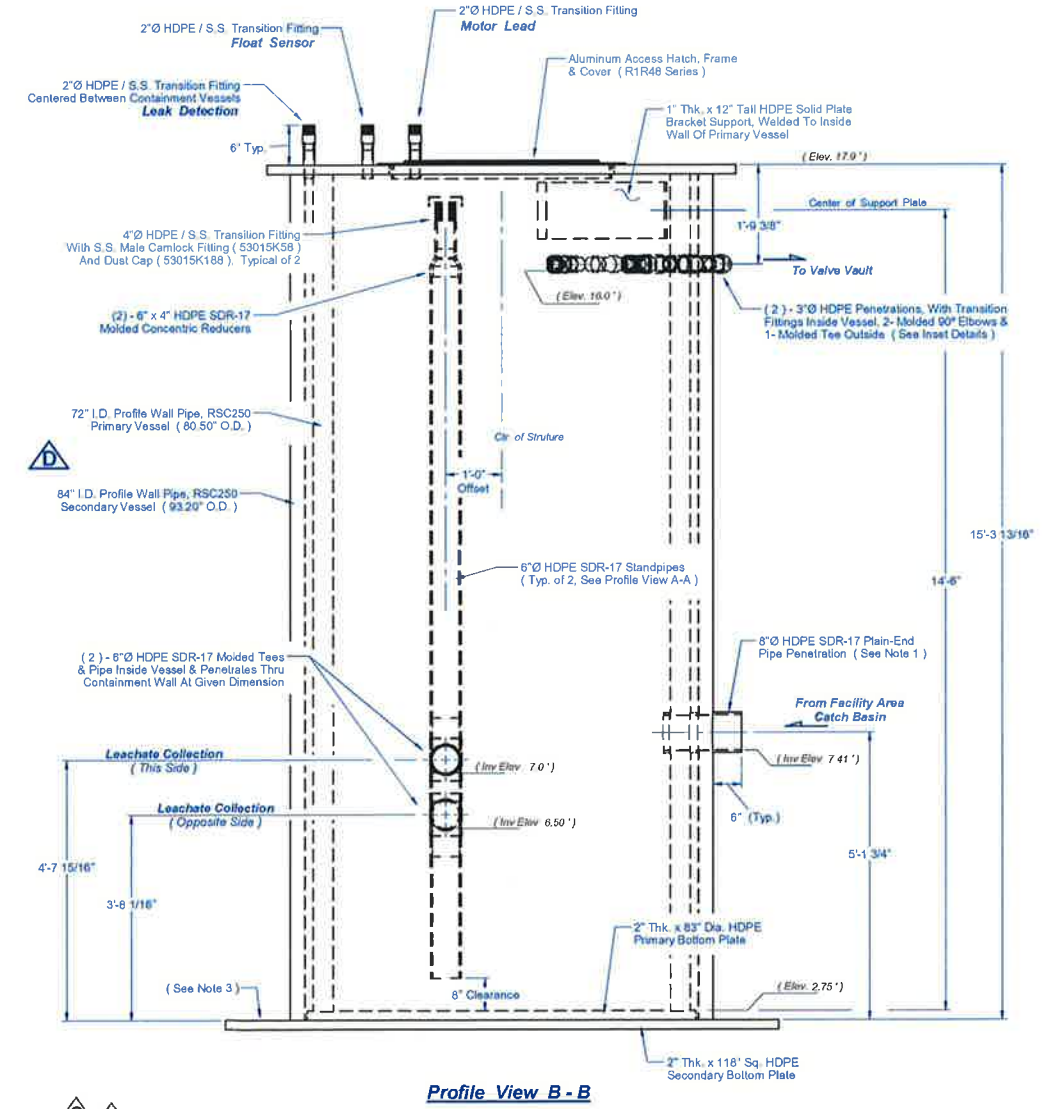
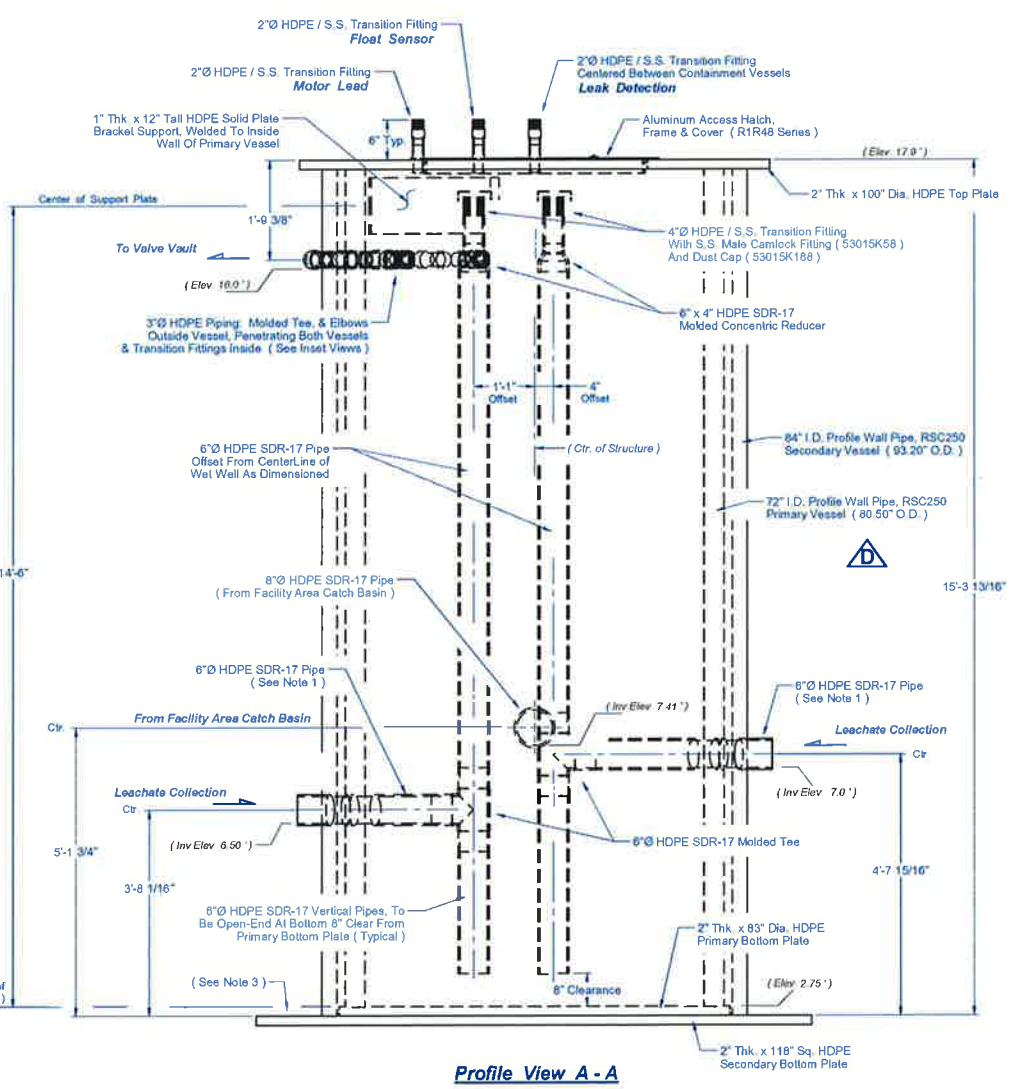
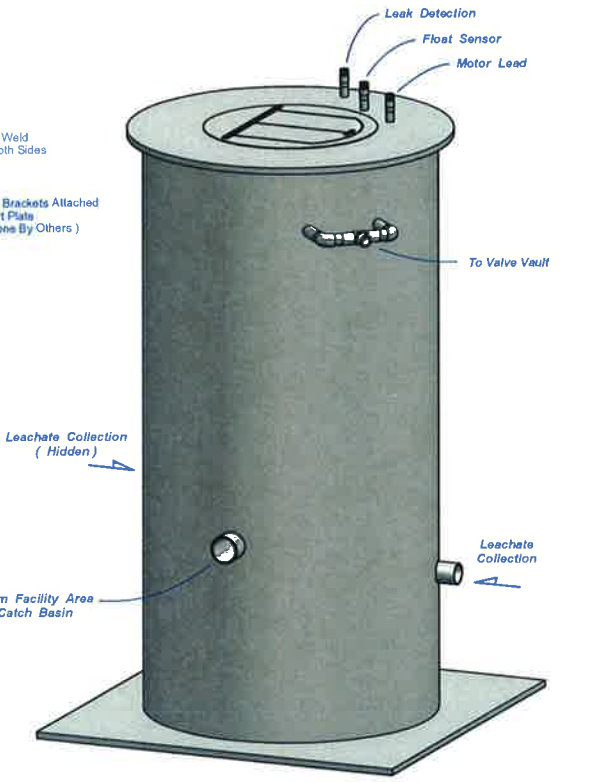
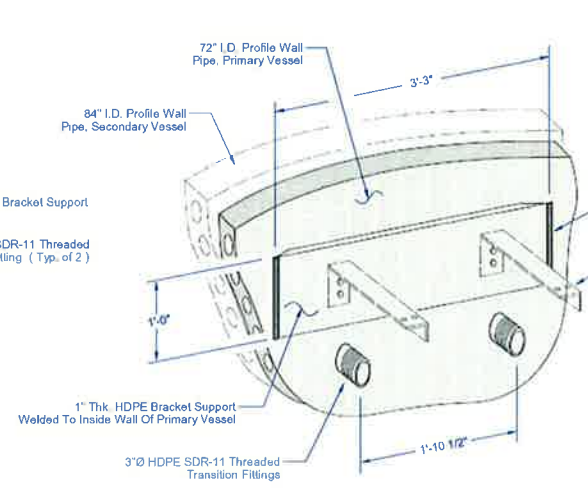
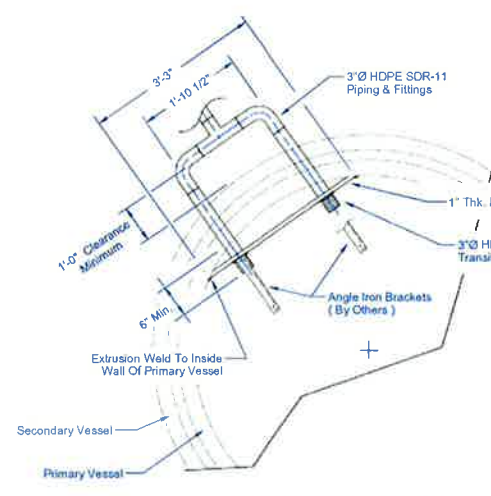
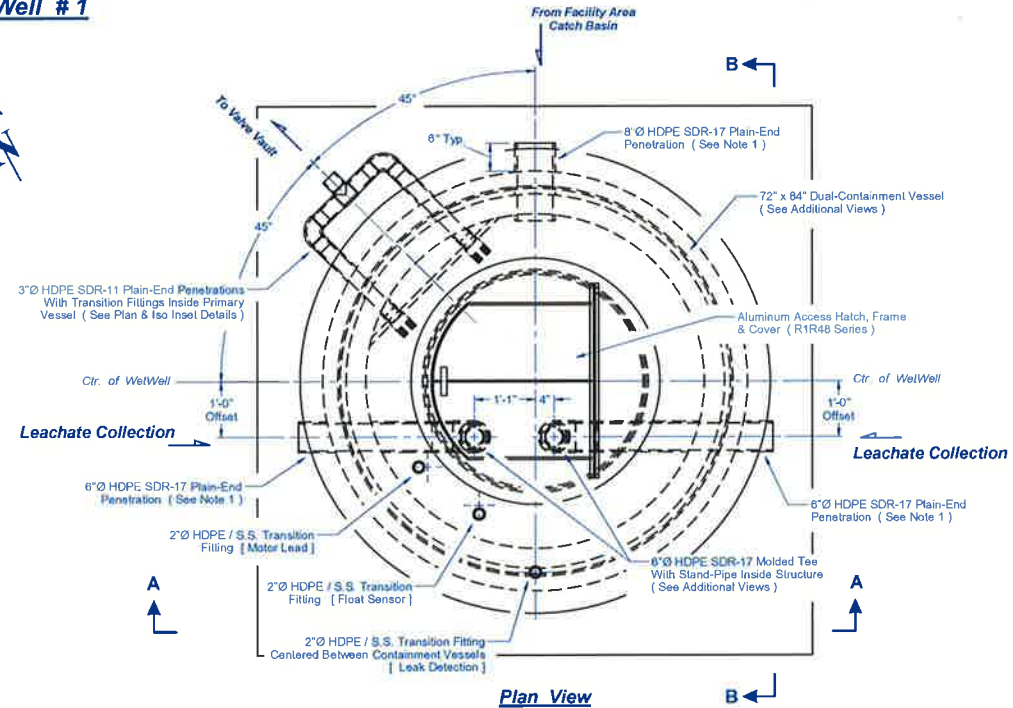
PER AECOM'S APPROVAL ON 20 JAN 2012, CONFIRMING THAT THE REVISION MEETS THE DESIGN INTENT.

cc: File

Submittal No:	1-R2
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	Submittal Conforms to Specifications <input checked="" type="checkbox"/> Exceptions to Drawings & Specs as specifically noted Revised Base Detail
Spec Section:	
Spec Para:	
Drawing No:	
Subcontractor:	
Supplier:	Pacific Industrial Products
Manufacturer:	Plastic Fusion Fabricators, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: 1-6-12 for: Jeff Fisher	

New Wet Well #1

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General Notes :

- All Penetrations Will Be Sealed By Extrusion Welds, Inside & Outside Of Profile Wall Vessel & Shop Tested To Ensure No Leaks Are Present.
- The Ring Stiffness Of Profile Wall Pipes Are RSC250.
- J-Bolts (1/2"Ø x 6" Long W-2" Tails) Are To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The HDPE Secondary Base Plate.
- Pumps, Electrical, Support Angle Brackets, Floats And All Other Required Appertanances To Be Supplied & Installed By Others In The Field.
- Inset Layout Details, Per PFF Drawing # 02746-214, **Alternate - 1** (Drawn & Dated 12-28-11).

NO	DATE	REVISIONS	BY
D	1-19-12	Revised O.D. Size Dimensions of Structure Pipes	JY
C	1-02-12	Revised 3rd End Pipe Configuration, Added Top Penetrations (Resized Drawing For Clarity)	JY
B	11-15-11	Clarified Pipe Class & Added Notes	JY
A	11-02-11	Revised Per Customer's Request: Enlarged Base to 118" Sq., Reduced All Penetrations To 6" Long & Corrected O.D. of Secondary Vessel	JY

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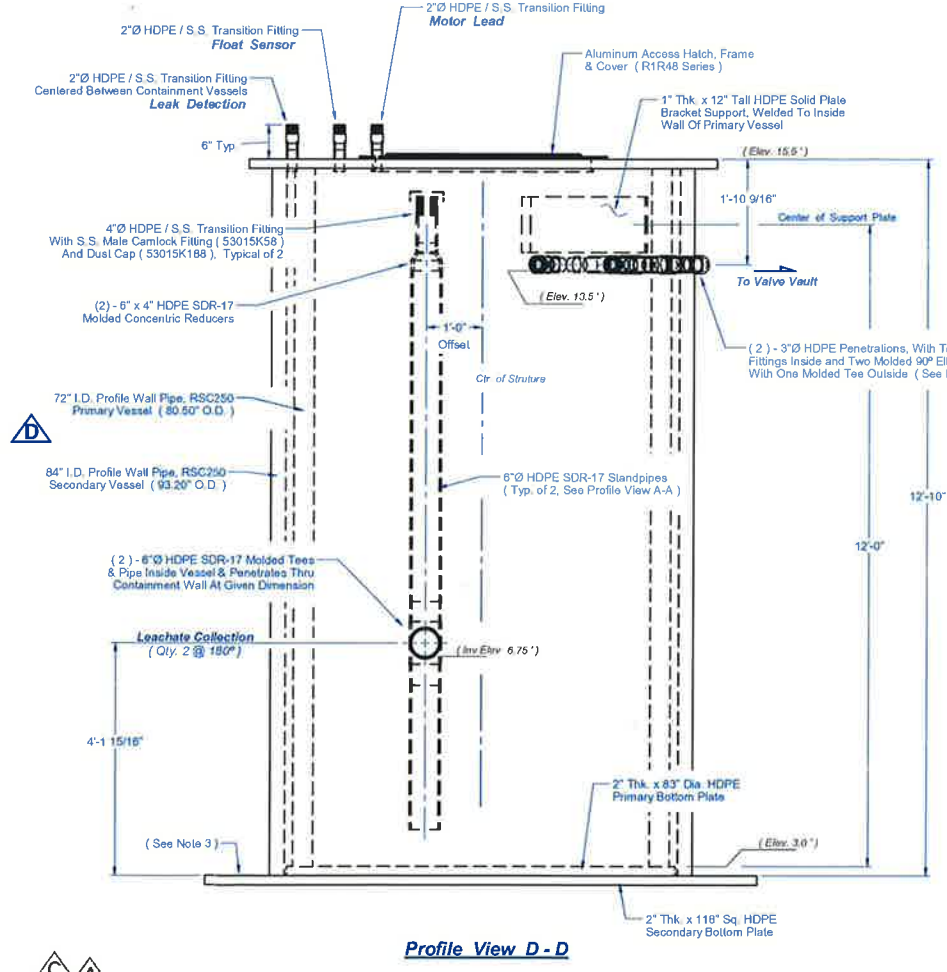
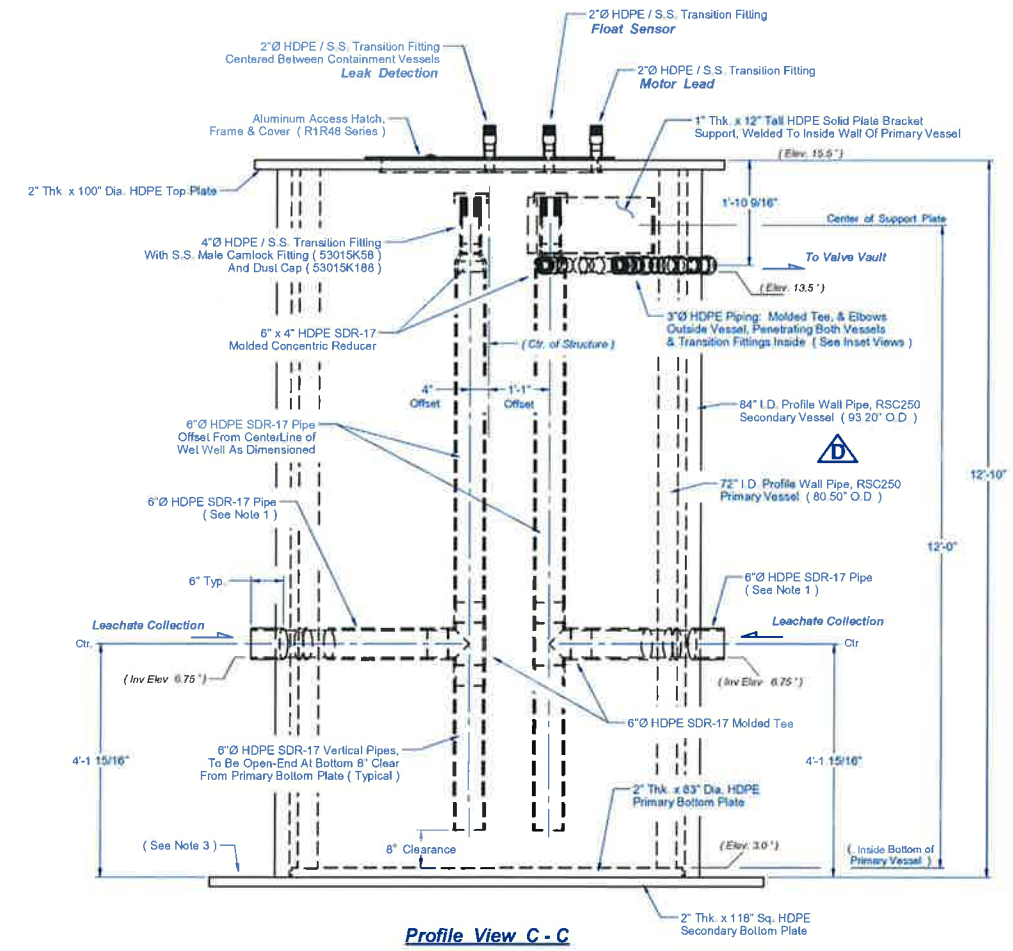
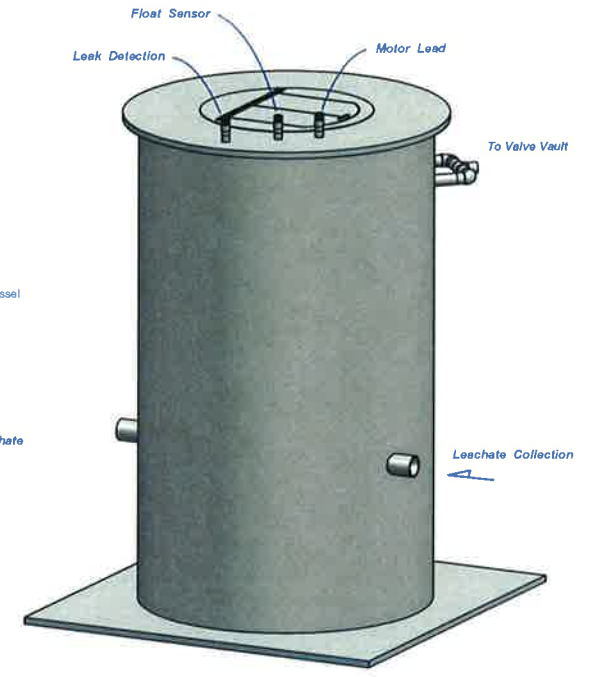
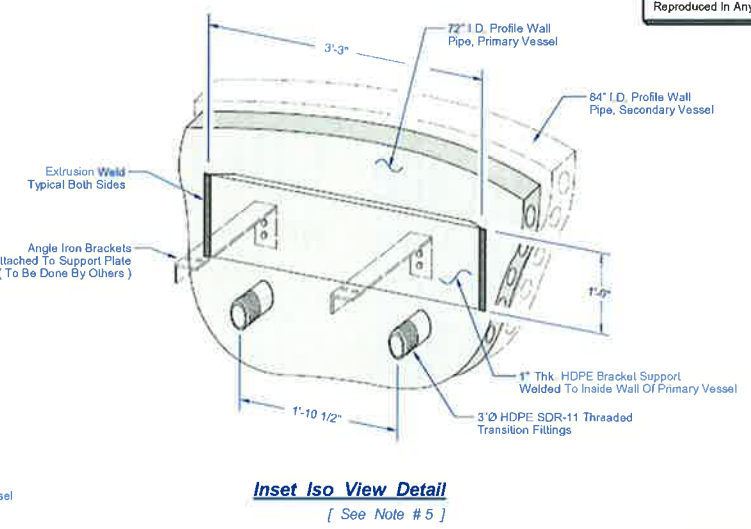
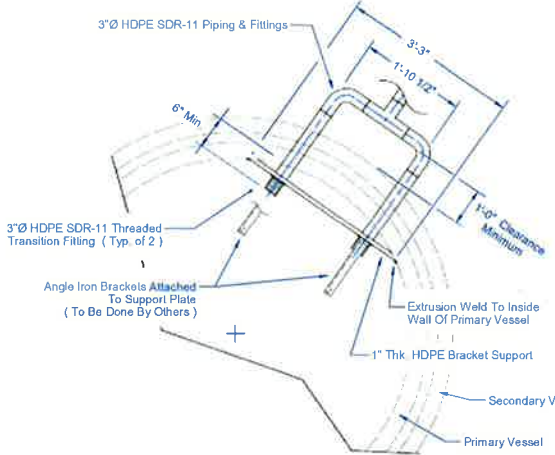
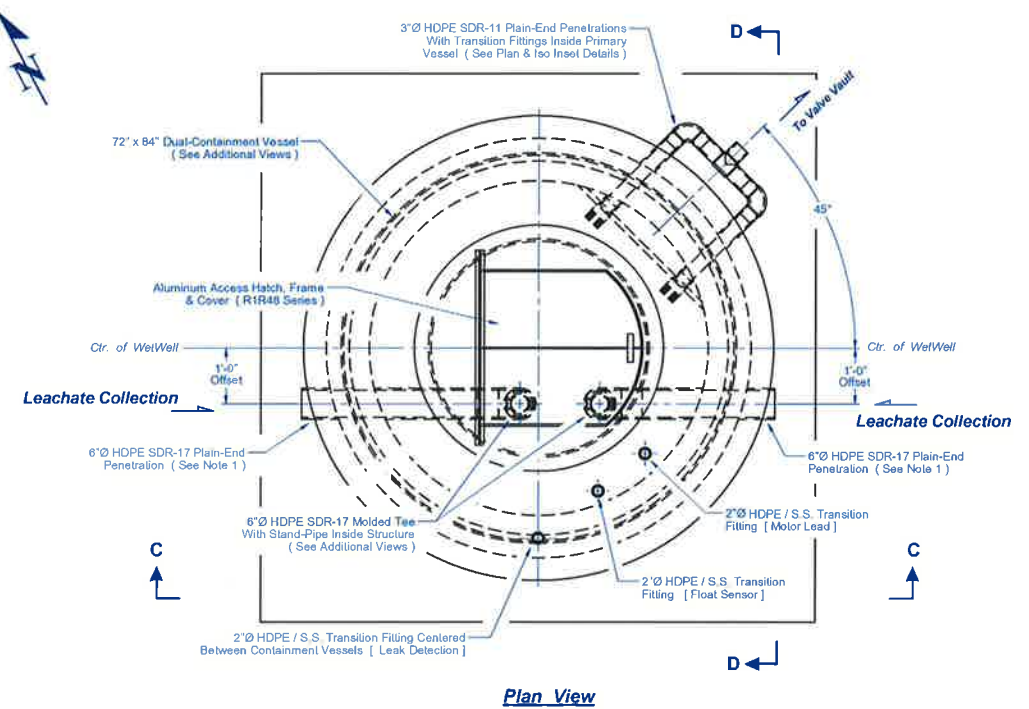
3455 Stanwood Blvd. - Huntsville Alabama 35811
Tel: 256-852-0376 / Fax: 256-852-0388 / http://www.plasticfusion.com

Phase II Leachate Mgt. System Modifications / Waipahu, HI
HDPE Dual Contained Wet-Well #1 Layout Details

Drawn By: J. Yoder Date: 7-25-11
Technician: Date:
PFF Estimator: Date:
Q/C: Date: PFF Drawing No: 02693-214 a Scale 1:20
Customer Approval: Date: PFF Job No: F - 11214 Sheet: 1 of 3

New Wet Well #2

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- General Notes :**
- All Penetrations Will Be Sealed By Extrusion Welds, Inside & Outside Of Profile Wall Vessel & Shop Tested To Ensure No Leaks Are Present.
 - The Ring Stiffness Of Profile Wall Pipes Are RSC250.
 - J-Bolts (1/2" x 8" Long W-2" Tails) Are To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The HDPE Secondary Base Plate.
 - Pumps, Electrical, Support Angle Brackets, Floats And All Other Required Appertanances To Be Supplied & Installed By Others In The Field.
 - Inset Layout Details, Per PFF Drawing # 02748-214, Alternate - 1 (Drawn & Dated 12-28-11).

NO.	DATE	REVISIONS	BY
D	1-19-12	Revised OD Size Dimensions of Structure Pipes	JY
C	1-02-12	Revised 3" OD Exit Pipe Configuration, Added Top Penetrations (Revised Drawing For Clarity)	JY
B	11-15-11	Classified Pipe Class & Added Notes	JY
A	11-02-11	Revised Per Customer's Request - Enlarged Base to 118" Sq., Reduced All Penetrations To 6" Long & Corrected O.D. of Secondary Vessel	JY

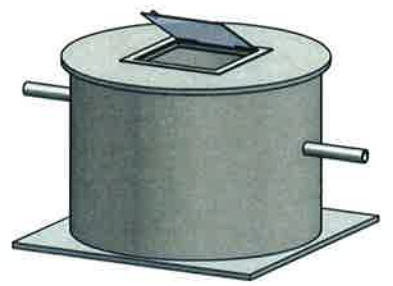
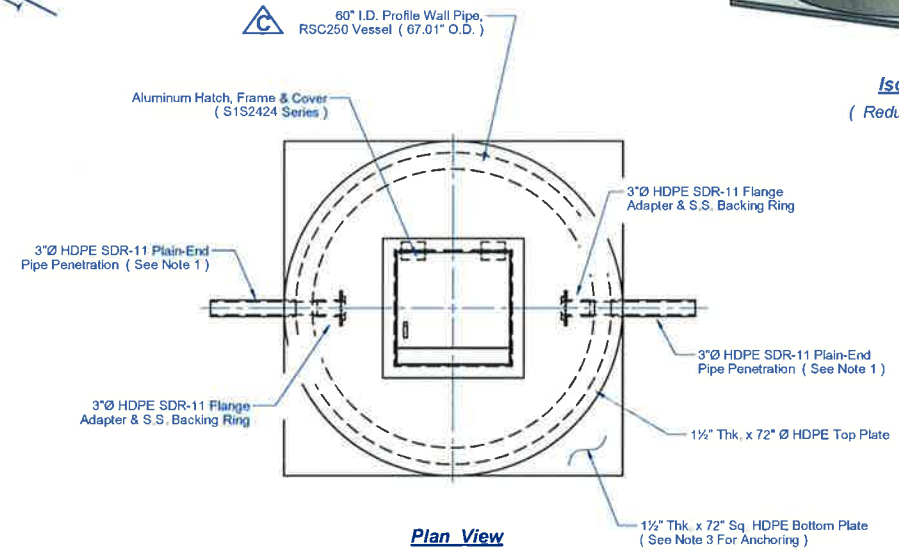
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3455 Stanwood Blvd. - Huntsville Alabama 35811
Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com

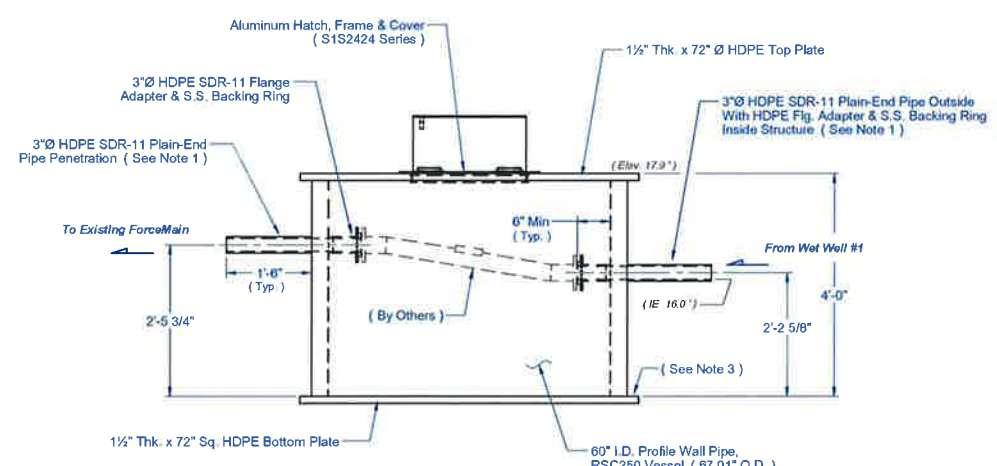
Drawn By: J. Yoder Date: 7-25-11 Pacific Industrial Products / Kekaha Sanitary Landfill
Technician: Date: Phase II Leachate Mgt. System Modifications / Waipahu, HI
PFF Estimator: Date: HDPE Dual Contained Wet Well #2 Layout Details
Q/C: Date: PFF Drawing No: 02683-214 b Scale: 1:20
Customer Approval: Date: PFF Job No: F-11214 Sheet: 2 of 3

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Valve Vault #1
(At Wet Well #1)



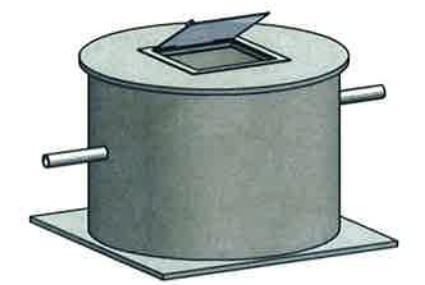
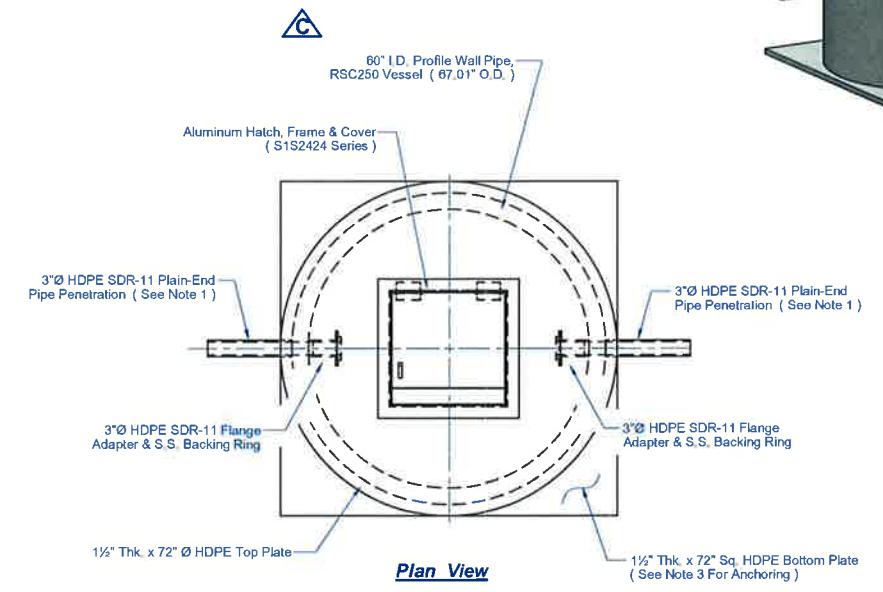
Iso View
(Reduced Scale)



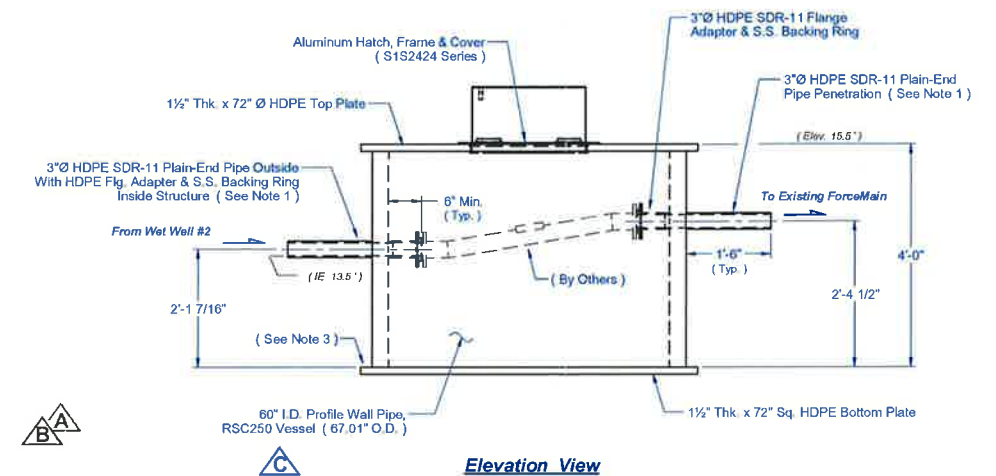
Elevation View



Valve Vault #2
(At Wet Well #2)



Iso View
(Reduced Scale)



Elevation View

General Notes :

1. All Penetrations Will Be Sealed By Extrusion Welds, Inside & Outside Of Profile Wall Vessel & Shop Tested To Ensure No Leaks Are Present.
2. The Ring Stiffness Of Profile Wall Pipes Are RSC250.
3. J-Bolts (1/2" x 8" Long W-2" Tails) Are To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The HDPE Secondary Base Plate.
4. Pumps, Electrical, Support Angle Iron Brackets, Floats And All Other Required Appertanances To Be Supplied & Installed By Others In The Field.
5. Inset Layout Details, Per PFF Drawing # 02746-214, Alternate -1 (Drawn & Dated 12-28-11).

NO.	DATE	REVISIONS	BY
D	1-19-12	Revised OD Size Dimensions of Structure Pipes	JY
B	1-2-12	Entered Exit Penetration Dimension (Also Revised Drawing Size	JY
A	11-15-11	Clarified Pipe Class & Added Notes	JY

Drawn By: J. Yoder	Date: 7-25-11	Pacific Industrial Products / Kekaha Sanitary Landfill Phase II Leachate Mgt. System Modifications / Waipohu, HI 60" I.D. HDPE Valve Vault #1 & #2 Layout Details PFF Drawing No: 02693-214 c PFF Job No: F - 11214
Technician:	Date:	
PFF Estimator:	Date:	
QC:	Date:	
Customer Approval:	Date:	

Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

3455 Stanwood Blvd. - Huntsville Alabama 35811
Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com

Scale: 1:20
Sheet: 3 of 3

Kim Huynh

From: Bergschultz, Ken <KEN.BERGSCHULTZ@aecom.com>
Sent: Thursday, January 19, 2012 11:00 AM
To: Bergschultz, Ken; Mike Minch; 'JFrey@wm.com'
Cc: 'kimi@earthworkspacific.com'; Chris Scott; Kim Huynh; Cioffi, Frank
Subject: RE: Kekaha Landfill

Importance: High

Jesse an Earthworks,

A question has come up on this submittal when completing the concrete anchor design. We have noticed that the OD of the secondary and primary vessels as they are called out on the shop drawings do not match any pipe data we have for RSC250 pipe. We have looked at Weholite, Spirolite, Hancor, and one or two others and the pipe dimensions do not match those provided by Plastic Fusion Fabricators.

Please provide the supporting pipe data from Plastic Fusion Fabricators to insure this is actually profile pipe and RSC250.

Kenneth J. Bergschultz, PE
Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Bergschultz, Ken
Sent: Wednesday, January 18, 2012 12:16 PM
To: MMinch@Geosyntec.com; JFrey@wm.com
Cc: kimi@earthworkspacific.com; CScott@Geosyntec.com; KHuynh@Geosyntec.com; Cioffi, Frank
Subject: RE: Kekaha Landfill

Jesse,

AECOM has completed its review of submittal 1R-2 and find the submittal approved (see attached). AECOM has also considered Item 5 below and the review question raised by Geosyntec. Based upon the additional email supplied on 1/17/12 from Earthworks through WM, AECOM approves Item 5.

The expected concrete collar for the wet wells are expected to be 3 high and 2 feet wide based upon the new wet well configuration. This is very similar to the original design of 2.75 feet high by 2 feet wide.

Any questions, please let us know.

Kenneth J. Bergschultz, PE
Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
P 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: MMinch@Geosyntec.com [<mailto:MMinch@Geosyntec.com>]
Sent: Tuesday, January 17, 2012 6:45 PM
To: JFrey@wm.com
Cc: Bergschultz, Ken; kimi@earthworkspacific.com; CScott@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RE: Kekaha Landfill

Jesse,

Geosyntec has reviewed submittal 1-R2 and note the following changes:

- 1) Addition of brackets and a bracket support plate for the guide rail system;
- 2) Addition of the three ports on the top of the wet wells to allow for the motor lead, float sensor, and leak detection (and also pressure/vacuum testing);
- 3) Inclusion of the vertical dimensions on the vault boxes per AECOM's earlier comments;
- 4) Re-alignment of the one standpipe in each wet well to match up with the hatch openings; and
- 5) Moving the 3" discharge tee from inside the well to outside the well.

Geosyntec does not see any issues with the first 4 changes. Change #5 does not match the construction drawings and would present a conflict with approved Submittal 11R which shows the discharge piping tee and ball valves inside the wet well. In preparation for Friday's construction meeting, Geosyntec requests that Earthworks provide the reason or explanation for proposed Change #5, above.

In addition to the discussion of the discharge piping configuration, the other item that remains unresolved is AECOM's assessment of Earthwork's proposed concrete anchoring configuration.

Please let me know if you have any questions.

Thanks,

Mike

From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Friday, January 06, 2012 4:34 PM
To: Bergschultz, Ken; Mike Minch; Kimi Matsuda; Chris Scott
Subject: FW: Kekaha Landfill

Please see the attached revised submittal 1-R2 for the wet well structures for review and approval. Please let me know if there are any questions.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Kimi Matsuda [<mailto:kimi@earthworkspacific.com>]
Sent: Friday, January 06, 2012 2:04 PM
To: Frey, Jesse
Subject: Kekaha Landfill

Hi Jesse,

Happy New Year!!!!

Sorry about that delay, slight hic-cup with my computer. But here's the re-revised submittal.

Mahalo,

Kimi Matsuda
Earthworks Pacific, Inc.
P.O. Box 1326
Lihue, HI 96766
P: 808.246.8808
F: 808.246.8812
kimi@earthworkspacific.com

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

Bergschultz, Ken

From: Bergschultz, Ken
Sent: Tuesday, December 13, 2011 1:50 PM
To: Frey, Jesse
Cc: MMinch@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RE: Kekaha, Leachate System Mods, Submittal 1R
Attachments: WW and VV LCM RFI 1 121311.pdf

Jesse,

AECOM has reviewed RFI 1R as modified which includes shop drawings for Wet Wells 1& 2 revision dates of 11/15/11 as well as valve vaults at each of the wet wells with the same revision date. The dimensions of the wet wells have been confirmed based upon the drawings provided, however further detail is needed on the mounting brackets and the interstitial area.

Per the email provided on 11/29/11 WM and Geosyntec are looking for guidance on fastening the pump rail to the sidewall of the wet well and indicate whether there will be any test ports for testing of the interstitial space of the wet wells. The response is:

- For the brackets, please have the fabricator plan to weld HDPE plates (like gusset plates or lift lugs) to the interior of the wet well and drilled to allow guide rail to be installed. Please add and show the detail on the drawings. AECOM does not want any perforations through the interior manhole section.

- Interstitial monitoring and testing. The details as submitted do not include or show conduit/entrance into the interstitial area as defined on the Section B-B of drawings 8 and 10. Please add and show the detail on the drawings. AECOM suggests the conduit used to access the interstitial area could also be the location to field pressure test the interstitial area. AECOM suggests a 2-inch diameter HDPE x stainless steel transition fitting be utilized. Pressure testing should occur at maximum 5 psig for 1 hour. If vacuum testing is preferred, coordinate with AECOM prior to testing verifying vacuum equipment and suitable vacuum criteria will be supplied.

For the wet well vaults, the requested forcemain pipe penetrations heights are provided in the attached drawings.

As these requested revisions are completed, AECOM will determine the final concrete anchor dimensions to resist uplift for the wet wells.

Any questions, please let me know.

Kenneth J. Bergschultz, PE
Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
D 920.451.2452 C 920.918.3209
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Friday, November 18, 2011 2:38 PM

To: Bergschultz, Ken
Cc: MMinch@Geosyntec.com; KHuynh@Geosyntec.com
Subject: FW: Kekaha, Leachate System Mods, Submittal 1

Hi Kenny,

I wanted to pass on this information for your records and your use.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Kimi Matsuda [<mailto:kimi@earthworkspacific.com>]
Sent: Thursday, November 17, 2011 1:30 PM
To: Frey, Jesse
Subject: Kekaha, Leachate System Mods, Submittal 1

Hi Jesse,

Attached please find submittal No. 1 revised. Please let us know if you have any questions. I included the originals in color, let me know if you would like me to scan into one for you.

Mahalo,

Kimi Matsuda
Earthworks Pacific, Inc.
P.O. Box 1326
Lihue, HI 96766
P: 808.246.8808
F: 808.246.8812
kimi@earthworkspacific.com

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 1-R2

Job No:	_____	Date:	January 6, 2012
To:	COK - DPW	Spec Section:	_____
Attention:	Jesse Frey	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	_____
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	Pacific Industrial Products
Fax No:	808.241.6887	Manufacturer:	Plastic Fusion Fabricators, Inc.
Respond by:	_____		_____

This submittal contains the following:

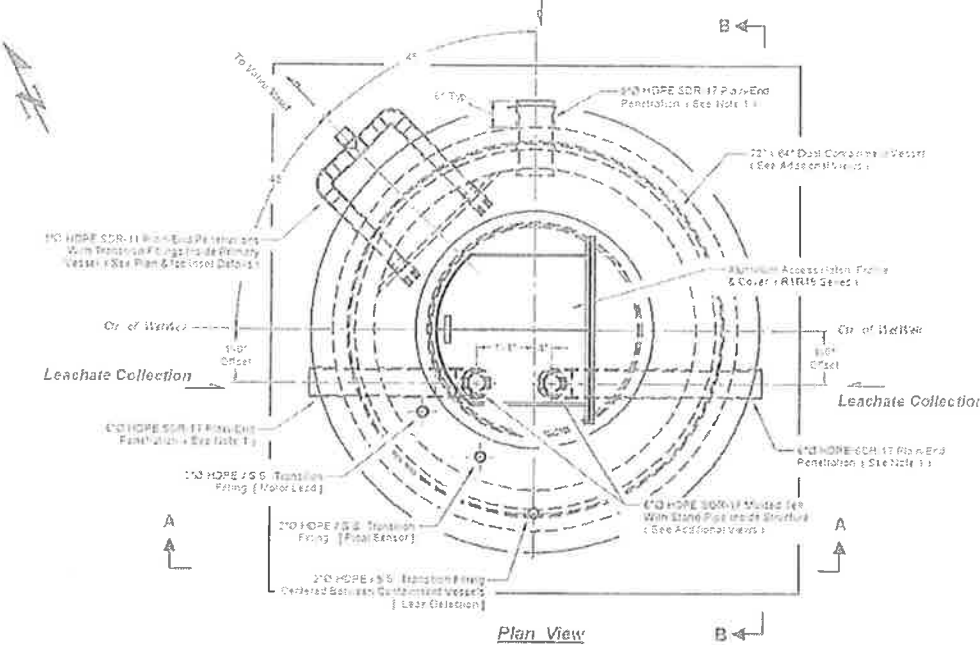
Description: Re-Revised Wet Well Drawings for Wet Well #1 and #2

Submittal No:	1-R2
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	_____
Items Description	<input type="checkbox"/> Submittal Conforms to Specifications <input checked="" type="checkbox"/> Exceptions to Drawings & Specs as specifically noted Revised Base Detail
Spec Section:	_____
Spec Para:	_____
Drawing No:	_____
Subcontractor:	_____
Supplier:	Pacific Industrial Products
Manufacturer:	Plastic Fusion Fabricators, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: <u>1-6-12</u> for: <i>[Signature]</i>	

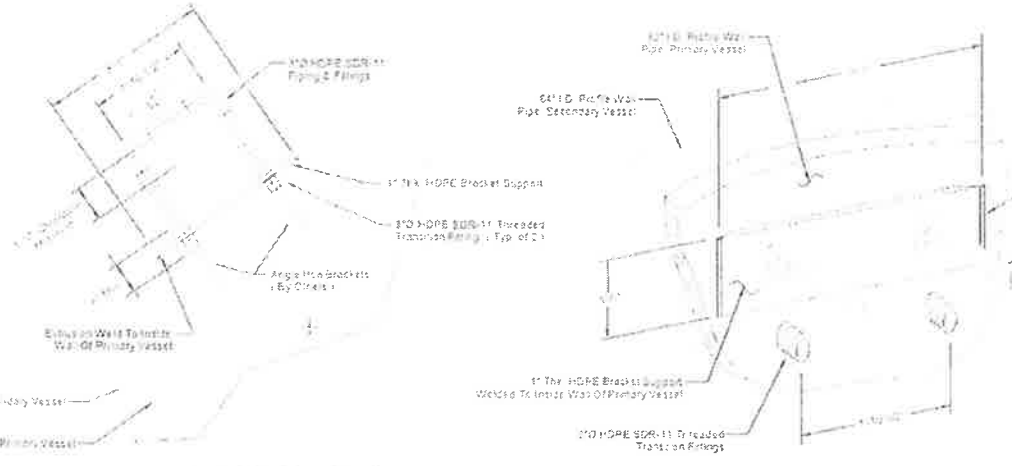
cc: File

New Wet Well #1

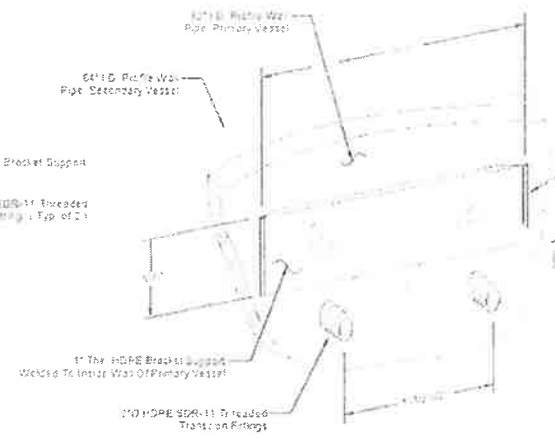
This Drawing Design is Reserved by And is Property of Pacific Fusion Fabricators, Inc. (PFF). It is Intended For Fabrication Installation And is Identical in Purposes of The Project Depicted And is Not To Be Copied Or Reproduced In Any Fashion Without The Specific Permission of The Management of PFF. © 1999 All Rights Reserved



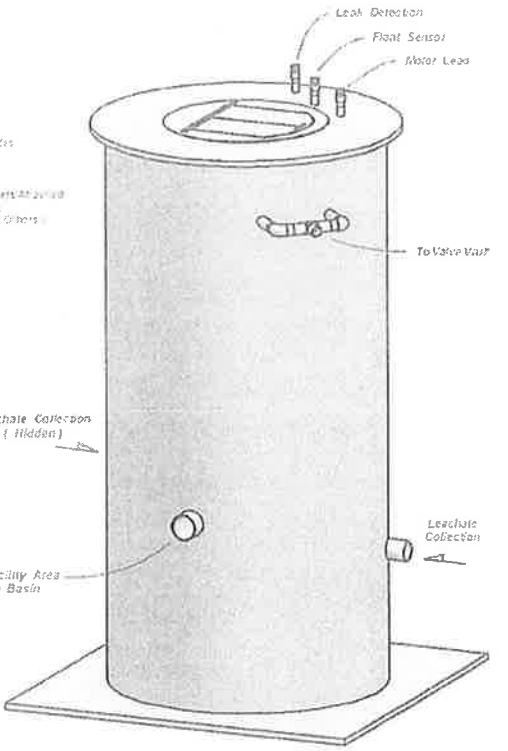
Plan View



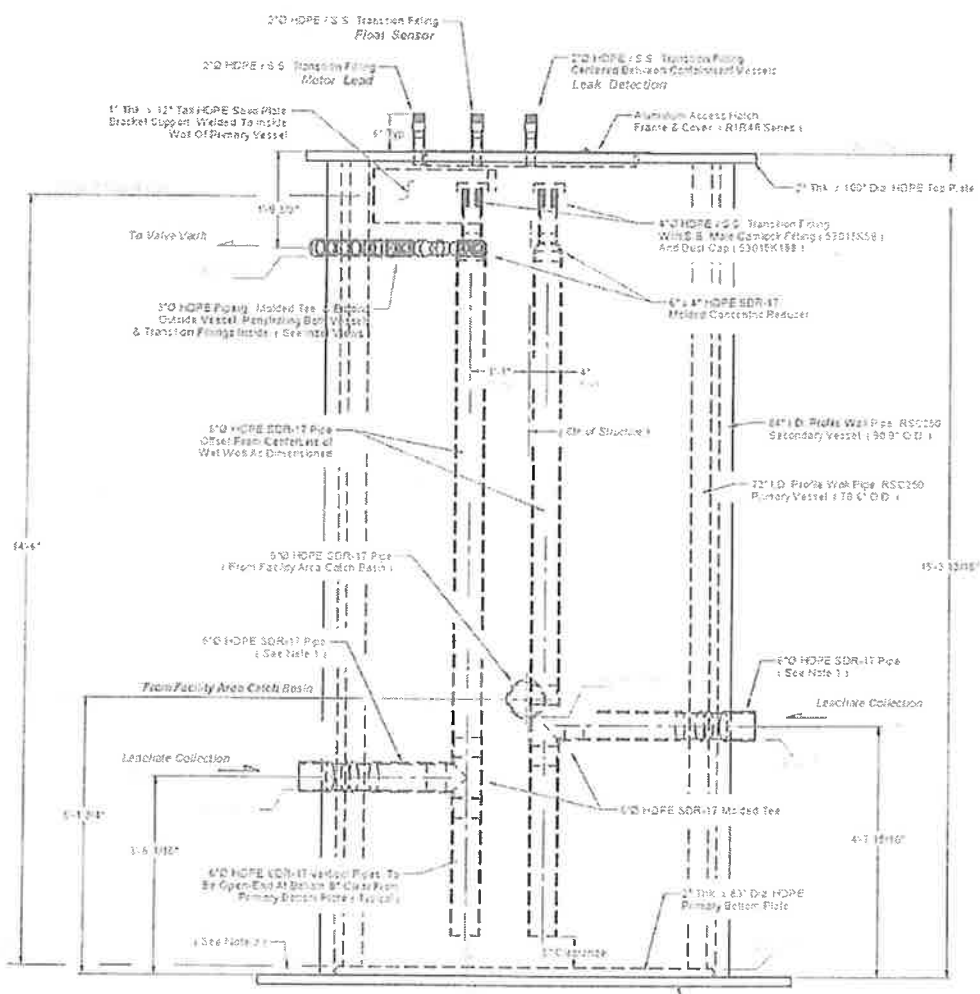
Inset Plan View Detail
[See Note # 5]



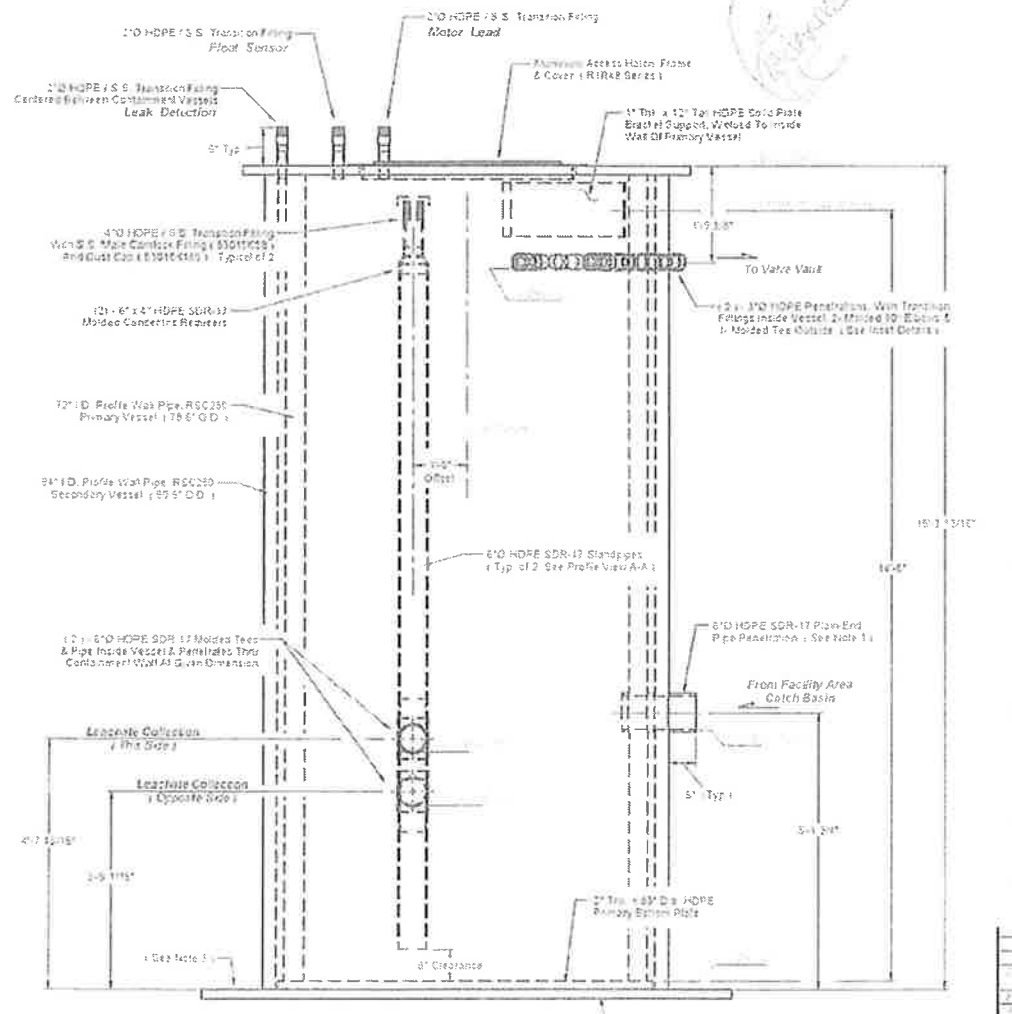
Inset Iso View Detail
[See Note # 5]



Iso View
(Reduced Scale)



Profile View A-A



Profile View B-B

General Notes:

1. All Penetrations Will Be Sealed By Exusion Welds Inside & Outside Of Profile Wall Vessel & Shop Tested To Ensure No Leaks Are Present
2. The Ring Stiffness Of Profile Wall Pipes Are RSD200
3. J-Bolts 1/2" x 8" Long With T-nuts Are To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The HDPE Secondary Base Plate
4. Pumps, Electrical Support Angle Brackets, Floats And All Other Required Appointments To Be Supplied & Installed By Others In The Field
5. Inset Layout Details, Per PFF Drawing # 02746-214 Alternate - 1, Draw. # 6 Dated 12-29-11

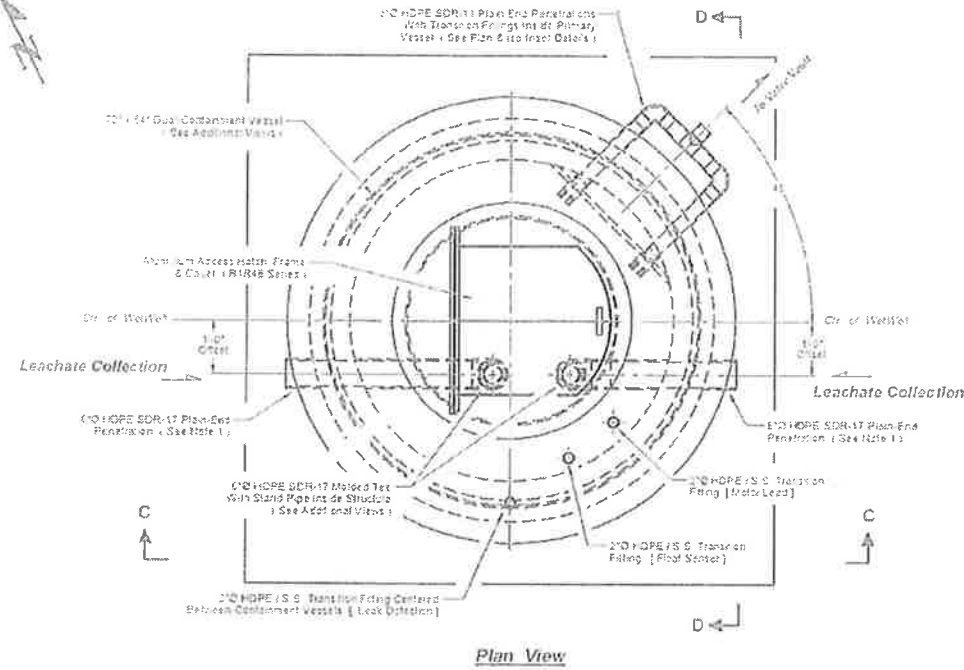
NO.	DATE	REVISIONS	BY

Drawn By:	J. Vobler	Date:	7-25-11
Technician:		Date:	
PFF Estimator:		Date:	
QC:		Date:	
Customer Approval:		Date:	

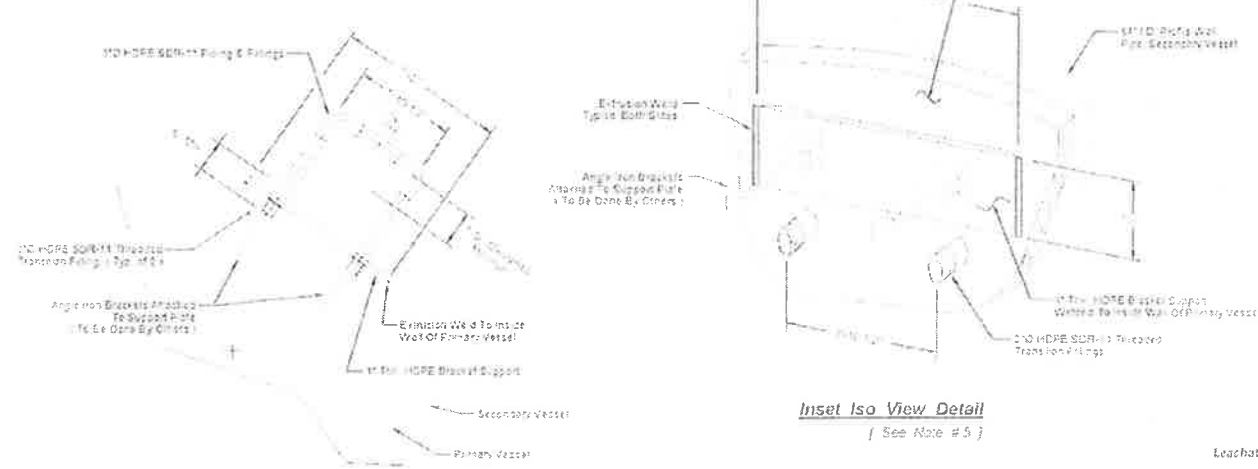
Pacific Fusion Fabricators, Inc. Your Food's continuous Resource	
2455 Siskiyou Blvd - Kula, HI 96753	
Tel: 235-855-0338 / Fax: 235-852-0388 / http://www.pacificfusion.com	
Pacific Industrial Products / Kekaha Sanitary Landfill	
Phase 1: Leachate Mgt. System Modifications / Waipahu, HI	
HDPE Dual Contained Wet Well #1 Layout Details	
PFF Drawing No.	02693-214 a
Scale	1:20
PFF Job No.	F - 11214
Sheet	1 of 3

New Wet Well # 2

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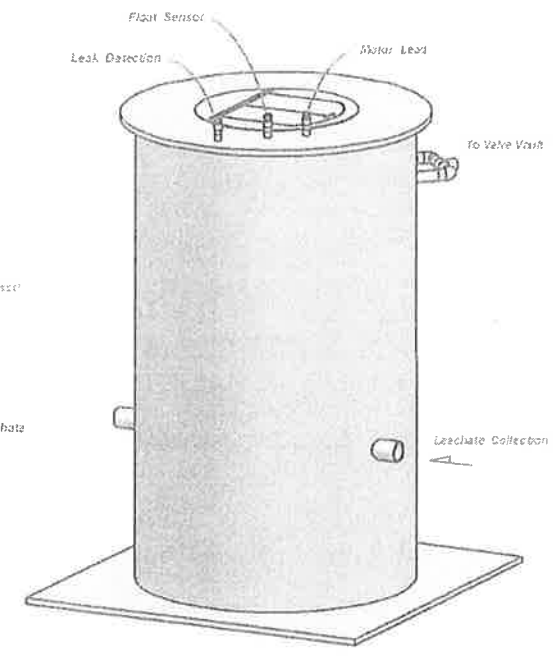


Plan View

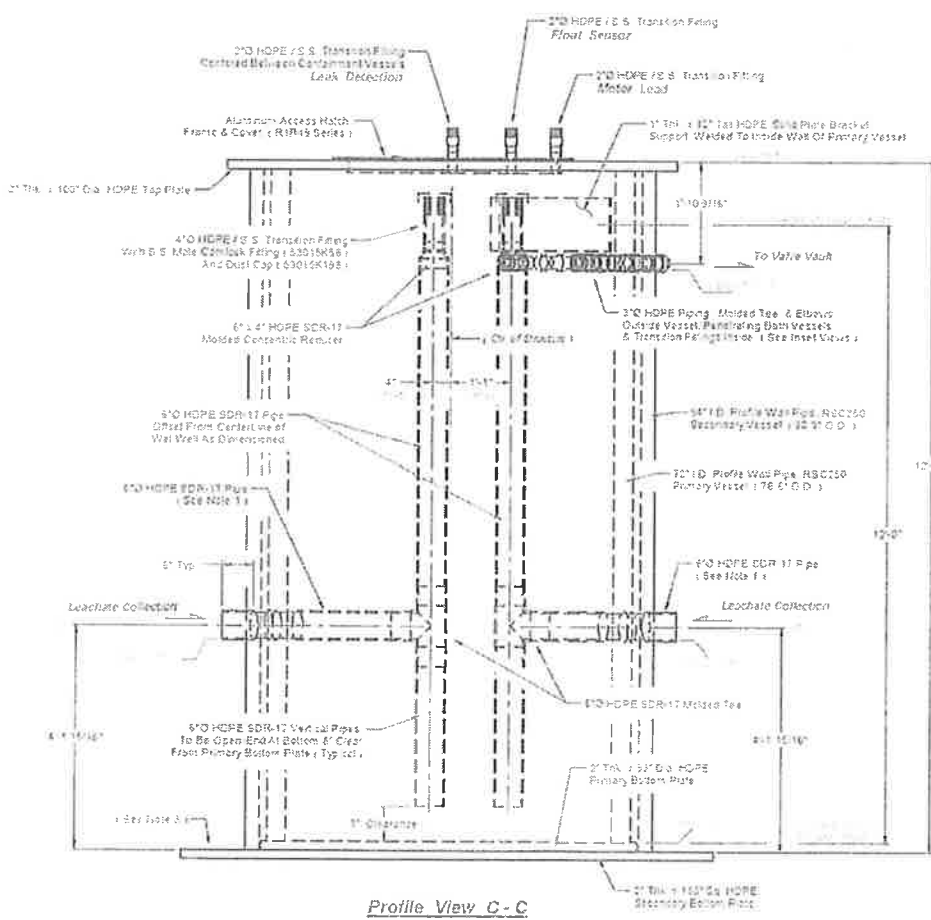


Inset Plan View Detail
(See Note # 5)

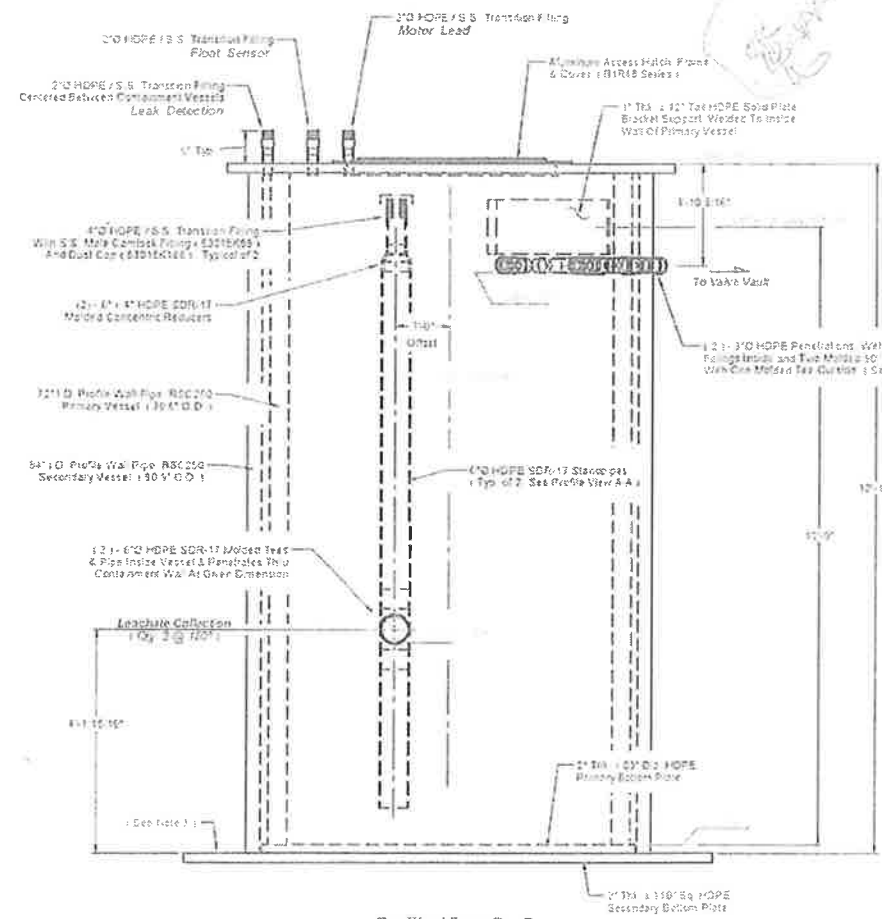
Inset Iso View Detail
(See Note # 5)



Iso View
(Reduced Scale)



Profile View C-C



Profile View D-D

General Notes:

1. All Penetrations Will Be Sealed By Extrusion Welds Inside & Outside Of Profile Wall Vessel & Shop Tested To Ensure No Leaks Are Present
2. The Ring Stiffness Of Profile Wall Pipes Are RSC250
3. J-Bolts (1/2" x 8" Long w/ 2" Tees) Are To Be Provided And Installed By Others At Each Corner And One Each In The Middle Of Each Side Of The HDPE Secondary Base Plate
4. Pumps, Electrical, Support Angle Brackets, Floats And All Other Required Apparances To Be Supplied & Installed By Others In The Field
5. Inset Layout Details: Per PFF Drawing # 02746-214 - Alternate 1 (Drawn & Dated 12/28/11)

NO	DATE	REVISORS	BY

Drawn By: J. Yoder Technician PFF Estimator: QAC: Customer Approval:	Date: 1-25-11 Date: Date: Date:	Plastic Fusion Fabricators, Inc. 2445 Brantley Blvd., Huntsville, Alabama 35891 Tel: 256-952-9376 / Fax: 256-952-9378 / http://www.plasticfusion.com PFF Job No. P-11214	Plastic Fusion Fabricators, Inc. New Job / Unapproved Revision PFF Job No. P-11214 Scale: 1:20 Sheet: 2 of 3
----------------------------------------------------------------------------------	------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------

Bergschultz, Ken

From: MMinch@Geosyntec.com
nt: Tuesday, January 17, 2012 6:45 PM
U: JFrey@wm.com
Cc: Bergschultz, Ken; kimi@earthworkspacific.com; CScott@Geosyntec.com; KHuynh@Geosyntec.com
Subject: RE: Kekaha Landfill

Jesse,

Geosyntec has reviewed submittal 1-R2 and note the following changes:

- 1) Addition of brackets and a bracket support plate for the guide rail system;
- 2) Addition of the three ports on the top of the wet wells to allow for the motor lead, float sensor, and leak detection (and also pressure/vacuum testing);
- 3) Inclusion of the vertical dimensions on the vault boxes per AECOM's earlier comments;
- 4) Re-alignment of the one standpipe in each wet well to match up with the hatch openings; and
- 5) Moving the 3" discharge tee from inside the well to outside the well.

Geosyntec does not see any issues with the first 4 changes. Change #5 does not match the construction drawings and would present a conflict with approved Submittal 11R which shows the discharge piping tee and ball valves inside the wet well. In preparation for Friday's construction meeting, Geosyntec requests that Earthworks provide the reason or explanation for proposed Change #5, above.

In addition to the discussion of the discharge piping configuration, the other item that remains unresolved is AECOM's assessment of Earthwork's proposed concrete anchoring configuration.

Please let me know if you have any questions.

Thanks,

Mike

From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Friday, January 06, 2012 4:34 PM
To: Bergschultz, Ken; Mike Minch; Kimi Matsuda; Chris Scott
Subject: FW: Kekaha Landfill

Please see the attached revised submittal 1-R2 for the wet well structures for review and approval. Please let me know if there are any questions.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
: 808-250-0574
Fax: 808-668-1366

Bergschultz, Ken

From: Frey, Jesse [JFrey@wm.com]
ent: Tuesday, January 17, 2012 8:22 PM
To: Bergschultz, Ken; MMinch@Geosyntec.com; KHuynh@Geosyntec.com; CScott@Geosyntec.com
Subject: FW: 3" Discharge piping
Attachments: WWSketch.PDF

FYI.

From: keith Perry [mailto:keith@earthworkspacific.com]
Sent: Tuesday, January 17, 2012 4:03 PM
To: Frey, Jesse
Subject: FW: 3" Discharge piping

Jesse,

Just a quick response to the 1-R2 submittal. As I mentioned in the January 6th email, the ball valves and check valves will remain in the wet well. The HDPE flat plate (to hold the guiderail bracket) conflicted with the horn. Again, only the tee would be outside the wet well. Moving the horn into the wet well will place the pumps outside the lid opening as well as a conflict with the 6" risers.

Thanks,
kp

From: keith Perry [mailto:keith@earthworkspacific.com]
Sent: Friday, January 06, 2012 12:56 PM
To: 'Frey, Jesse'
Subject: 3" Discharge piping

Jesse,

This is a "heads-up" on an additional change to the revised wet well drawings.

When we sketched up the individual pieces and how it fit into the wet wells we noticed a problem with the location of the "horn" (the horn being the 3" discharge tee with check valves and ball valves), pumps, hatch opening, and 6" risers. The problem was caused by the horn location and size pushing the pumps out beyond the hatch openings and into the risers.

Our solution was to move the 3" horn tee outside the manhole while keeping the ball and check valves in the manhole. This would move the pumps into a location in line with the hatch (so they can be removed), along with the rails being out of the way of the 6" risers.

The revised wet well submittal is appears clear, however I will include a sketch on how it fits together.

Aloha,
kp

From: Frey, Jesse [mailto:JFrey@wm.com]
Sent: Friday, January 06, 2012 10:00 AM

To: keith Perry
Subject: RE: HASP

Keith,

We prepared a HASP for the part Cell 1 expansion project which I could send over. However, we are very close to completing our HASP for the current project. If EP can wait until next week, we can send them a more project-relevant HASP.

Thanks,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: keith Perry [<mailto:keith@earthworkspacific.com>]
Sent: Friday, January 06, 2012 9:42 AM
To: Frey, Jesse
Subject: HASP

Jesse,

We discussed the submittal of a site-specific HASP (specified for this project). Would you have a previous HASP to review? It may help us in submitting something that hits the mark the first time around. EPI has a company Health and Safety Plan that I am working with, but a template of something that has been reviewed and accepted would be of assistance.

Aloha,
kp

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

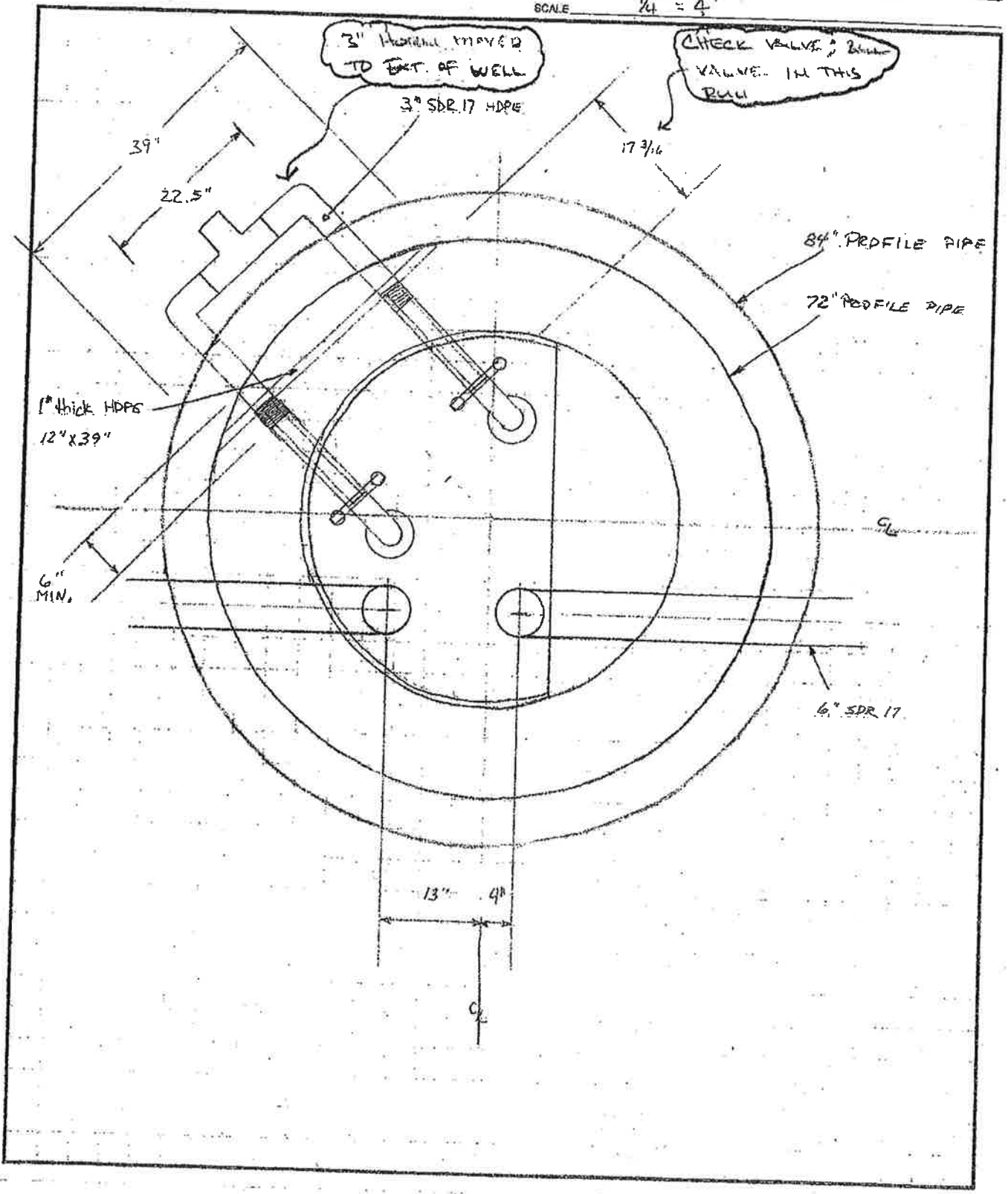
JOB KEKAHA LF

SHEET NO. 01 OF 01

CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE 12-28-11

SCALE $\frac{1}{4}'' = 4'$





PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 2

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	2.01 (A)
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	Allied Tube & Conduit

This submittal contains the following:

Description: Galvanized Rigid Steel Conduit

- NO EXCEPTIONS NOTED
 - MAKE CORRECTIONS NOTED
 - REJECT REVISE AND RESUBMIT
 - SUBMIT SPECIFIED ITEM
- SIGNED: *Kirihy* DATE: 7 Oct 2011
GEOSYNTEC CONSULTANTS

Submittal No:	2
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	2.01 (A)
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	Allied Tube & Conduit
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u><i>Jeff Fisher</i></u> Date: <u>8.11.11</u>	

cc: File

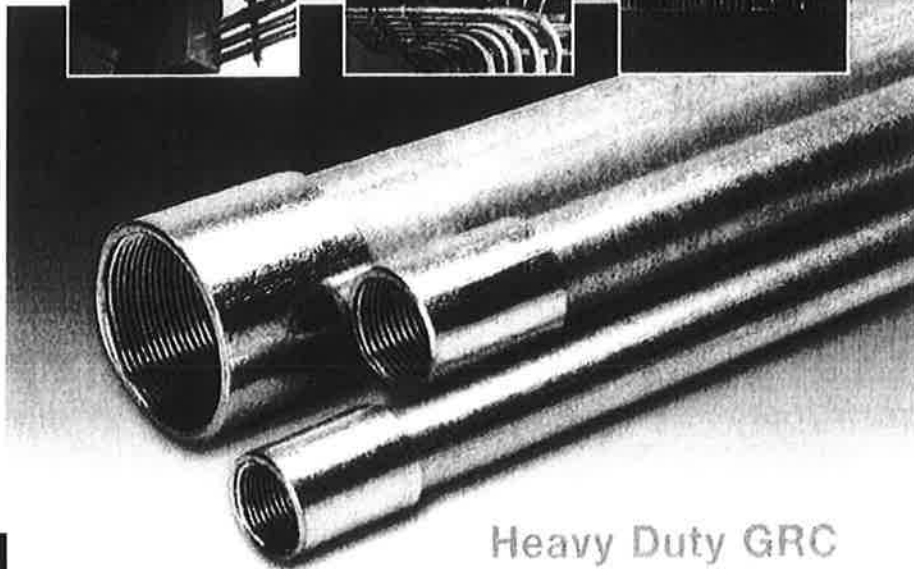
RIGID STEEL CONDUIT (GRC)



Quality, Long Lasting Steel Conduit

Allied Rigid Steel Conduit is precision manufactured for dependable, long-lasting value and ultimate protection for electrical conductors. Covered by article 344 of the National Electrical Code® (NEC®), rigid steel conduit is highly resistant to damage from impact. It can be installed in all occupancies and locations, including Class I Division 1 hazardous locations.

Rigid steel conduit, is recognized as an equipment grounding conductor in Section 250.118 of the NEC and also provides excellent shielding from electromagnetic fields.



Heavy Duty GRC

Hot-dip galvanized to protect against white rust and increase corrosion resistance

High strength ductile steel for long life and easy bending

Smooth, continuous raceways for fast wire-pulling

UL listed to UL 6, manufactured in accordance with ANSI C80.1

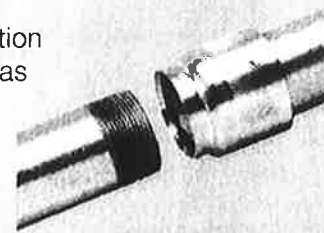
Available in trade sizes 1/2 – 6

For Faster Installations Use the Kwik-Couple® Connection

Innovation from the conduit leaders at Allied.

Allied's patented* Kwik-Couple rigid steel conduit reduces threaded conduit installation time and cost significantly. Kwik-Couple has an integrated coupling on the conduit or elbows, exactly where you need it.

Just line up the ends, spin the coupling forward onto the next piece and wrench tighten. It's that easy! Trade sizes 2-1/2 – 5.



* U.S. Patent Numbers 4258936,4547004.

RIGID STEEL CONDUIT (GRC)



Specifications

Manufactured from mild steel, Allied's Rigid Steel Conduit is highly resistant to damage from impact per NEC article 344 yet ductile to facilitate bending. Hot-dip galvanized inside and out to provide galvanic corrosion protection, it is also top-coated with a compatible organic layer to protect against white rust. The inside surface is evenly coated for wire-pulling ease, even through multiple 90° bends.

The 3/4" taper NPT threads (ANSI B1 20.1) are full cut and hot galvanized after cutting. Color-coded end-cap thread protectors keep the threads clean, sharp and also provide instant trade size recognition. Trade sizes are color-coded blue, 1/2 trade sizes black, and 1/4 trade sizes red.

Allied RIGID is very effective in reducing electromagnetic field levels for encased power distribution circuits, shielding computers and other sensitive electronic equipment from the effects of electromagnetic interference. Visit www.steelconduit.org/gemi.htm to obtain the GEMI (Grounding and Electro-magnetic Interference) software analysis program.

Allied RIGID is covered by article 344 of the National Electrical Code. It is listed to Underwriters Laboratories Safety Standard UL 6 and is manufactured to ANSI C80.1, both of which have been adopted as Federal Specifications in lieu of WWC 581. Allied RIGID is recognized as an equipment grounding conductor by NEC Article 250.

Installation of Rigid Metal Conduit shall be in accordance with the National Electrical Code and UL General Information card #DYIX. Master bundles conform to NEMA standard RN2.

Rigid Steel Conduit shall be hot-dip galvanized and manufactured by Allied Tube & Conduit. Threads shall be hot galvanized after cutting. Rigid steel conduit shall be listed to UL Safety Standard 6 by a nationally-recognized testing laboratory with follow-up service. It shall be manufactured in accordance with ANSI C80.1. Kwik-Couple Rigid steel conduit shall be listed to UL 6 and UL 514B and manufactured in accordance with ANSI C80.1.

Note: Federal specification WW-C-581, Class 1, Type A has been superseded by UL Standard 6, which has been adopted by the federal government.

Weights and Dimensions for Galvanized Rigid Steel Conduit

Trade Size Designator		Approx. Wt.* Per 100 Ft. (30.5M)		Outside Diameter ¹		Nominal Wall Thickness ²		Quantity In Master Bundle*	
U.S.	Metric	lb.	kg	in.	mm	in.	mm	ft.	m
1/2	16	82	37.2	0.840	21.3	0.104	2.60	2500	762.5
3/4	21	109	49.4	1.050	26.7	0.107	2.70	2000	610.0
1	27	161	73.0	1.315	33.4	0.126	3.20	1250	381.3
1-1/4	35	218	98.9	1.660	42.2	0.133	3.40	900	274.5
1-1/2	41	263	119.3	1.900	48.3	0.138	3.50	800	244.0
2	53	350	158.7	2.375	60.3	0.146	3.70	600	183.0
2-1/2	63	559	253.5	2.875	73.0	0.193	4.90	370	112.9
3	78	727	329.7	3.500	88.9	0.205	5.20	300	91.5
3-1/2	91	880	399.1	4.000	101.6	0.215	5.50	250	76.3
4	103	1030	467.1	4.500	114.3	0.225	5.70	200	61.0
5	129	1400	634.9	5.563	141.3	0.245	6.20	150	45.8
6	155	1840	834.5	6.625	168.3	0.266	6.80	100	30.5

* Tolerances: Trade Size 1/2 to 1-1/2: ±0.015" (0.38mm); Trade Size 2-6: ± 1%
Length equals 10 ft. (3.05m) with a tolerance of +/- .25 in. (6.35mm)

² For information only. Not a requirement of the UL standard.

* NEMA RN-3 Standard

Weights and Dimensions for Kwik-Couple® Rigid

Trade Size Designator		Approx. Wt. Per 100 Ft. (30.5M)		Nominal Outside Diameter ¹		Nominal Wall Thickness		Quantity In Master Bundle	
U.S.	Metric	lb.	kg	in.	mm	in.	mm	ft.	m
2-1/2	63	559	253.5	2.875	73.0	0.193	4.90	400	122.0
3	78	727	329.7	3.500	88.9	0.205	5.20	300	91.5
3-1/2	91	880	399.1	4.000	101.6	0.215	5.50	250	76.3
4	103	1030	467.1	4.500	114.3	0.225	5.70	200	61.0
5	129	1400	634.9	5.000	141.3	0.245	6.20	150	45.8

¹Outside diameter tolerances: +/- .025 in. (.64mm)

²For information only; not a spec requirement.

For more information, contact Allied at
(800) 882-5543
or visit our website at www.alliedeg.us



Allied Tube & Conduit
Registered to ISO 9001:2000
File Numbers A1156, A1654, A1774

• Allied Tube & Conduit Corporation - Electrical

16100 S. Lathrop Avenue, Harvey, IL 60426 Tel. 708-339-1610 800-882-5543 Fax 708-339-0615

Electrical & Support Division

www.alliedeg.us

• Allied Tube & Conduit® • AFC Cable Systems® • Power-Strut® & Unistrut® Metal & Fiberglass Framing • Cope® Cable Tray

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PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 3

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	Hubbell Raco

This submittal contains the following:

- Description:** - Steel Straps
 - Steel Lock Nuts
 - Polypropylene - Insulated Bushings

page 16050-3

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: *[Signature]* DATE: 24 OCT 2011

GENSYNTEC CONSULTANTS

Submittal No:	3
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	Hubbell Raco
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u><i>[Signature]</i></u> Date: <u>8-11-11</u> FOR: <u><i>Jeff Fisher</i></u>	

cc: File



B22

EMT FITTINGS

STEEL - STRAPS

RACO COMMERCIAL FITTINGS

Application

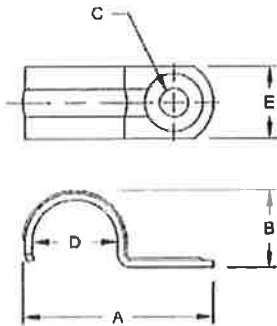
- For use in mounting EMT conduit

Product Features

- All steel construction insures mechanical protection
- RACO® steel one-hole straps snap on to the conduit, allowing the installer to easily position the strap before mounting
- Oversized bolt holes make alignment of the fastener quick and easy
- All straps are zinc electro plated for corrosion protection



ONE HOLE PUSH-ON STRAPS
STAMPED STEEL



A = Overall length
B = Height
C = Hole size
D = Diameter
E = Width of strap

ORDERING INFORMATION - DIMENSIONS

ONE HOLE PUSH-ON STRAPS STAMPED - STEEL

CATALOG NUMBER	TRADE SIZE	UNIT CTN. QTY.	SHIP CTN. QTY.	UPC BAR CODE
2082	1/2"	100	1000	—
2083	3/4"	50	500	—
2084	1"	50	500	—
2085	1-1/4"	—	50	—
2086	1-1/2"	—	50	—
2088	2"	—	25	—
1337	2-1/2"	—	25	—
1339	3"	—	25	—
1340	3-1/2"	—	10	—
1341	4"	—	10	—

DIMENSIONS

CATALOG NUMBER	A	B	C	D	E
2082	1-5/8"	49/64"	1/4"	23/32"	5/8"
2083	2-3/16"	1"	9/32"	59/64"	5/8"
2084	2-9/16"	1-9/32"	9/32"	1-11/64"	3/4"
2085	3-1/8"	1-41/64"	9/32"	1-17/32"	7/8"
2086	3-5/8"	1-57/64"	11/32"	1-3/4"	1"
2088	4-7/16"	2-25/64"	11/32"	2-3/16"	1-1/8"
1337	5-5/16"	3-1/16"	21/32"	2-7/8"	1-1/4"
1339	6-1/16"	3-11/16"	21/32"	3-1/2"	1-1/4"
1340	6-7/8"	4-1/4"	21/32"	4"	1-1/4"
1341	7-3/8"	4-3/4"	21/32"	4-1/2"	1-1/4"





B38

RIGID AND IMC FITTINGS

STEEL-LOCKNUTS

RACO COMMERCIAL FITTINGS

Application

- For use in dry locations on threaded rigid/IMC conduit to secure conduit to a box or enclosure

Product Features

- All steel construction insures mechanical protection
- Zinc electro plated for corrosion protection

Compliances

- - Standard 514B
- - C22.2 #18

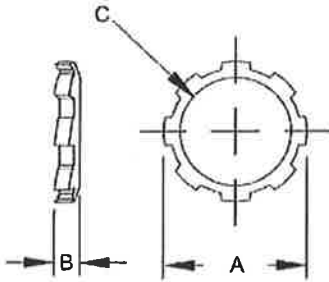


Locknuts
Steel

ORDERING INFORMATION - DIMENSIONS

LOCKNUTS - STEEL

CATALOG NUMBER	TRADE SIZE	UNIT CTN. QTY.	SHIP CTN. QTY.	UPC BAR CODE
1001	3/8"	100	1000	—
1002	1/2"	100	1000	—
1003	3/4"	100	1000	—
1004	1"	—	100	—
1005	1-1/4"	—	50	—
1006	1-1/2"	—	50	—
1008	2"	—	50	—
1010	2-1/2"	—	30	—
1012	3"	—	25	—
1014	3-1/2"	—	15	—
1016	4"	—	10	—
1020	5"	—	8	—
1024	6"	—	8	—



A = O.D.
B = Thickness
C = Thread size

DIMENSIONS

CATALOG NUMBER	A	B	C THD. SPEC.
1001	7/8"	5/32"	3/8"-18 NPT
1002	1-9/64"	5/32"	1/2"-14 NPT
1003	1-27/64"	11/64"	3/4"-14 NPT
1004	1-49/64"	13/64"	1"-11-1/2 NPT
1005	2-9/32"	7/32"	1-1/4"-11-1/2 NPT
1006	2-19/32"	7/32"	1-1/2"-11-1/2 NPT
1008	3-11/64"	15/64"	2"-11-1/2 NPT
1010	3-9/16"	3/8"	2-1/2"- 8 NPT
1012	4-1/4"	3/8"	3"- 8 NPT
1014	4-13/16"	3/8"	3-1/2"- 8 NPT
1016	5-13/32"	3/8"	4"- 8 NPT
1020	6-43/64"	1/2"	5"- 8 NPT
1024	7-15/16"	9/16"	6"- 8 NPT



RIGID AND IMC FITTINGS

POLYPROPYLENE - INSULATED BUSHINGS


Applications

- For use on threaded rigid/IMC conduit
- Bushings provide a smoothly rounded surface at the entrance of raceways

Product Feature

- Insulating bushings are made of high impact polypropylene that is temperature rated at 105° C

Compliances

-  - Standard 514B
-  - C22.2 #18



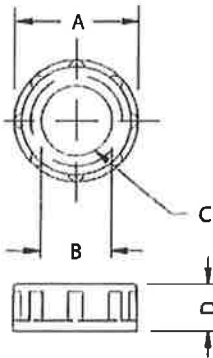
INSULATING BUSHINGS
POLYPROPYLENE

RACO COMMERCIAL
FITTINGS

ORDERING INFORMATION - DIMENSIONS

INSULATING BUSHINGS - POLYPROPYLENE

CATALOG NUMBER	TRADE SIZE	UNIT CTN. QTY.	SHIP CTN. QTY.	UPC BAR CODE
1402	1/2"	100	400	—
1403	3/4"	100	400	—
1404	1"	50	200	—
1405	1-1/4"	—	25	—
1406	1-1/2"	—	25	—
1408	2"	—	25	—
1410	2-1/2"	—	10	—
1412	3"	—	10	—
1414	3-1/2"	—	5	—
1416	4"	—	5	—
1420	5"	—	5	—
1424	6"	—	5	—



A = O.D.
B = I.D.
C = Thread size
D = Thickness

DIMENSIONS

CATALOG NUMBER	A	B	C THD. SPEC.	D
1402	1-1/16"	19/32"	1/2"-14 NPT	23/64"
1403	1-19/64"	25/32"	3/4"-14 NPT	13/32"
1404	1-5/8"	1"	1"-11-1/2 NPT	31/64"
1405	1-61/64"	1-9/64"	1-1/4"-11-1/2 NPT	31/64"
1406	2-3/16"	1-33/64"	1-1/2"-11-1/2 NPT	31/64"
1408	2-41/64"	1-61/64"	2"-11-1/2 NPT	35/64"
1410	3-1/4"	2-21/64"	2-1/2"- 8 NPT	5/8"
1412	3-29/32"	2-29/32"	3"- 8 NPT	11/16"
1414	4-13/32"	3-11/32"	3-1/2"- 8 NPT	11/16"
1416	4-15/16"	3-53/64"	4"- 8 NPT	11/16"
1420	5-63/64"	4-15/16"	5"- 8 NPT	49/64"
1424	7-1/16"	5-15/16"	6"- 8 NPT	49/64"





PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 4

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	2.01 (B)
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	Rasco
Respond by:		Manufacturer:	JM Eagle

This submittal contains the following:

Description: Plastic Conduit

- NO EXCEPTIONS NOTED
 - MAKE CORRECTIONS NOTED
 - REJECT REVISE AND RESUBMIT
 - SUBMIT SPECIFIED ITEM
- SIGNED: *[Signature]* DATE: 7 OCT 2011
 GEOSYNTEC CONSULTANTS

Submittal No:	4
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	2.01 (B)
Drawing No:	
Subcontractor:	R. Electric
Supplier:	Rasco
Manufacturer:	JM Eagle
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u><i>[Signature]</i></u> Date: <u>8.11.11</u> For: <u><i>Jeff Fisher</i></u>	

cc: File

ELECTRICAL CONDUIT



SUBMITTAL AND DATA SHEET

SCHEDULE 40 AND SCHEDULE 80 CONDUIT NSF NRTL* ANSI/UL 651 AND NEMA TC-2

RIGID NON-METALLIC CONDUIT FOR USE IN BOTH ABOVE GROUND AND UNDERGROUND INSTALLATIONS

SCHEDULE 40 CONDUIT ✓

Rated for 90°C Conductors ✓

SIZE	AVERAGE O.D.	NOM. I.D.	MIN. T.	APPROX. WT/100 FT
1/2	0.840	0.622	0.109	18
3/4	1.050	0.824	0.113	24
1	1.315	1.049	0.133	33
1-1/4	1.660	1.380	0.140	45
1-1/2	1.900	1.610	0.145	56
2	2.375	2.067	0.154	76
2-1/2	2.875	2.469	0.203	126
3	3.500	3.068	0.216	163
3-1/2	4.000	3.548	0.226	197
4	4.500	4.026	0.237	234
5	5.563	5.047	0.258	319
6	6.625	6.065	0.280	411
8 ::	8.625	7.942	0.322	622

Schedule 40 is furnished in standard 10' lengths with one bell end.

20' lengths are available upon request.

:: Non-UL or -NSF listed

SCHEDULE 80 CONDUIT ✓

Rated for 90°C Conductors ✓

SIZE	AVERAGE O.D.	NOM. I.D.	MIN. T.	APPROX. WT/100 FT
1/2	0.840	0.546	0.147	22
3/4	1.050	0.742	0.154	30
1	1.315	0.957	0.179	42
1-1/4	1.660	1.278	0.191	60
1-1/2	1.900	1.500	0.200	72
2	2.375	1.939	0.218	98
2-1/2	2.875	2.323	0.276	160
3	3.500	2.900	0.300	213
3 1/2	4.000	3.364	0.318	256
4	4.500	3.826	0.337	310
5	5.563	4.813	0.375	430
6	6.625	5.761	0.432	590

Schedule 80 is furnished in standard 10' lengths with one bell end.

20' lengths are available upon request.

* NATIONAL RECOGNIZED TESTING LABORATORY (NRTL) BY OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (OHSA)

ELECTRICAL CONDUIT

SUBMITTAL AND DATA SHEET

POWER AND COMMUNICATION DUCT FOR CONCRETE ENCASEMENT

TYPE EB20* : : 1

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
2	2.375	2.255	0.060	36
3	3.500	3.378	0.061	56
4	4.500	4.336	0.082	91
5	5.563	5.357	0.103	141
6	6.625	6.375	0.125	198

1 Type EB20 also complies with ANSI/UL 651 A

TYPE EB35* : : 1

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
3	3.500	3.348	0.076	68
4	4.500	4.300	0.100	109
5	5.563	5.311	0.126	168
6	6.625	6.321	0.152	235

* Based on 500,000 psi Modulus

:: Conduit furnished with one bell end per 20-foot length.

:: JM Eagle™ Type EB duct is designed for concrete encasement installations and complies with NEMA TC-6 & TC-8 and ASTM F512.

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness

ELECTRICAL CONDUIT

SUBMITTAL AND DATA SHEET

POWER AND COMMUNICATION DUCT FOR DIRECT BURIAL

TC-6 & TC-8 TYPE DB60* ::

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
2	2.375	2.255	0.060	36
3	3.500	3.316	0.092	79
4	4.500	4.258	0.121	129
5	5.563	5.259	0.152	197
6	6.625	6.261	0.182	279

* Based on 500,000 psi Modulus

TC-6 & TC-8 TYPE DB100* ::

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
3	3.500	3.276	0.112	91
3 1/2	4.000	3.744	0.128	120
4	4.500	4.212	0.145	152
5	5.563	5.207	0.179	231
6	6.625	6.201	0.213	328

* Based on 500,000 psi Modulus

TC-6 & TC-8 TYPE DB120* ::

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
1	1.315	1.195	0.060	20
1-1/2	1.900	1.780	0.060	29
2	2.375	2.221	0.077	44
3	3.500	3.264	0.118	97
4	4.500	4.192	0.154	160
5	5.563	5.181	0.191	245
6	6.625	6.171	0.227	347

* Based on 500,000 psi Modulus

:: Conduit furnished with one (1) bell end per 20' length.

:: JM Eagle™ Type DB duct is designed for direct burial installations and complies with NEMA TC-6 & 8 and ASTM F512.
400,000 psi Modulus available upon request.

ELECTRICAL CONDUIT

SUBMITTAL AND DATA SHEET

TELEPHONE DUCT

CAO 8546 TYPE C* : :

Rated for 90°C Cable

SIZE	AVERAGE O.D.	NOM. I.D.	*MIN. T.	APPROX. WT/100 FT
4	4.350	4.044	0.149	147

* Based on 500,000 psi Modulus

400,000 psi Modulus available upon request.

:: GTS - 8342 and HDPE Tele Duct available upon request

:: JM Eagle™ Type C PVC duct is designed for direct burial installations of telephone cables and complies with CAO 8546.

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness

ELECTRICAL CONDUIT

SUBMITTAL AND DATA SHEET

RIGID UTILITY CONDUIT

SCHEDULE 40 UTILITY

NORM. PIPE SIZ (IN)	O.D. (IN)	NOM. I.D. (IN)	*MIN. T. (IN)	APPROX. WEIGHT (WT/100FT)
2	2.375	2.05	0.154	82
3	3.500	3.04	0.216	174
4	4.500	4.00	0.237	242
5	5.563	5.02	0.258	336
6	6.625	6.03	0.280	462

Pipe color is gray. Other colors may be available on request.

Pipe is produced with integral solvent weld bells. Plain end conduit may be available on request.

Available in 20 foot lengths. 10 foot lengths may be available.

For direct earth burial and concrete encasement.

Specifically designed for power utility specifications.

Non UL or NSF Listed.

ELECTRICAL CONDUIT

SUBMITTAL AND DATA SHEET

“GAS SLEEVE” PIPE

SCHEDULE 40

NOM. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	APPROX. WEIGHT (LBS/FT)
1	1.315	1.03	0.133	0.35
1 - 1/2	1.900	1.59	0.145	0.57
2	2.375	2.05	0.154	0.77
3	3.500	3.04	0.216	1.59
4	4.500	4.00	0.237	2.27
6	6.625	6.03	0.280	3.99
8	8.625	7.94	0.322	6.01
10	10.750	9.98	0.365	8.51
12	12.750	11.89	0.406	11.26

SCHEDULE 26

NOM. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	APPROX. WEIGHT (LBS/FT)
1 - 1/4	1.660	1.52	0.064	0.23
1 - 1/2	1.900	1.75	0.073	0.30
2	2.375	2.18	0.091	0.47
3	3.500	3.21	0.135	1.02
4	4.500	4.13	0.173	1.68
6	6.625	6.08	0.255	3.65
8	8.625	7.92	0.332	6.18
10	10.750	9.87	0.413	9.59
12	12.750	11.71	0.490	13.49

Pipe color is yellow.

Pipe is produced with integral solvent weld bells.

Available in 20 foot lengths. 10 foot lengths may be available.

The function of the pipe is a sleeve pipe. No pressure rating implied.

The PVC “Gas Sleeve” pipe shall not be used for transmission of natural gas.

This data sheet does not purport to address all the safety problems associated with its use.

It is the responsibility of whoever uses the gas sleeve to consult and establish safety and health practices and to determine the applicability of regulatory limitations prior to use.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 5

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	LH Dottie

This submittal contains the following:

- Description:**
- Zinc Plated Tap Bolts
 - Zinc Plated Hex Nuts & Machine Screws
 - Zinc Plated Lock Washers
 - Universal Strut Clamps

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 24 Oct 2011

GEOSYNTEC CONSULTANTS

Submittal No:	5
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	LH Dottie
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u>[Signature]</u> Date: <u>8.11.11</u> FOR: <u>JEFF FISHER</u>	

cc: File



Hex Head Tap Bolts Zinc Plated - PC 4090

Fully threaded hex head tap bolts. Made from grade 2 low carbon steel. Length is determined from the base of the fastener head. Continuous thread allows for take up adjustment. (MACHINE BOLTS)

- Hex Head Tap Bolts
- Full Thread
- Grade 2
- Zinc Plated Steel

FASTENERS & HARDWARE > TAP BOLTS

CAT NO	UPC	SIZE	HEX SIZE	STD	MSTR	WT/STD	UNIT
MB1412	58700	1/4 x 1/2	7/16"	100	4000	1.18#	C
MB1434	58702	1/4 x 3/4	7/16"	100	3000	1.44#	C
MB141	58704	1/4 x 1	7/16"	100	3000	1.67#	C
MB14114	58706	1/4 x 1-1/4	7/16"	100	1000	2.01#	C
MB14112	58708	1/4 x 1-1/2	7/16"	100	1000	2.36#	C
MB142	58710	1/4 x 2	7/16"	100	1000	3.07#	C
MB14212	58712	1/4 x 2-1/2	7/16"	100	1000	3.75#	C
MB143	58714	1/4 x 3	7/16"	100	1000	4.35#	C
MB14312	58716	1/4 x 3-1/2	7/16"	100	1000	5.10#	C
MB144	58718	1/4 x 4	7/16"	100	1000	5.75#	C
MB14412	58720	1/4 x 4-1/2	7/16"	100	1000	6.36#	C
MB145	58722	1/4 x 5	7/16"	100	400	6.92#	C
MB14512	58724	1/4 x 5-1/2	7/16"	100	400	7.74#	C
MB146	58726	1/4 x 6	7/16"	100	400	8.39#	C
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MB51612	58750	5/16 x 1/2	1/2"	100	1000	1.95#	C
MB51634	58752	5/16 x 3/4	1/2"	100	1000	2.33#	C
MB5161	58754	5/16 x 1	1/2"	100	1000	2.74#	C
MB516114	58756	5/16 x 1-1/4	1/2"	100	1000	3.23#	C
MB516112	58758	5/16 x 1-1/2	1/2"	100	1000	3.82#	C
MB5162	58760	5/16 x 2	1/2"	100	1000	4.82#	C
MB516212	58762	5/16 x 2-1/2	1/2"	100	1000	5.95#	C
MB5163	58764	5/16 x 3	1/2"	100	1000	6.91#	C
MB516312	58766	5/16 x 3-1/2	1/2"	50	500	3.60#	C
MB5164	58768	5/16 x 4	1/2"	50	500	4.12#	C
MB516412	58770	5/16 x 4-1/2	1/2"	50	500	4.41#	C
MB5165	58772	5/16 x 5	1/2"	50	200	5.54#	C
MB516512	58774	5/16 x 5-1/2	1/2"	50	200	6.15#	C
MB5166	58776	5/16 x 6	1/2"	50	200	6.63#	C
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MB3812	58800	3/8 x 1/2	9/16"	100	1000	2.93#	C
MB3834	58802	3/8 x 3/4	9/16"	100	1000	3.55#	C
MB381	58804	3/8 x 1	9/16"	100	1000	4.03#	C
MB38114	58806	3/8 x 1-1/4	9/16"	100	1000	4.48#	C
MB38112	58808	3/8 x 1-1/2	9/16"	100	1000	5.54#	C
MB382	58810	3/8 x 2	9/16"	100	1000	6.94#	C
MB38212	58812	3/8 x 2-1/2	9/16"	100	500	7.80#	C
MB383	58814	3/8 x 3	9/16"	100	500	9.03#	C
MB38312	58816	3/8 x 3-1/2	9/16"	50	500	5.10#	C
MB384	58818	3/8 x 4	9/16"	50	500	6.53#	C
MB38412	58820	3/8 x 4-1/2	9/16"	50	500	7.21#	C
MB385	58822	3/8 x 5	9/16"	50	200	7.98#	C
MB38512	58824	3/8 x 5-1/2	9/16"	50	200	8.30#	C
MB386	58826	3/8 x 6	9/16"	50	200	8.74#	C
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MB1234	58850	1/2 x 3/4	3/4"	50	500	4.05#	C
MB121	58852	1/2 x 1	3/4"	50	500	4.36#	C
MB12114	58854	1/2 x 1-1/4	3/4"	50	500	4.69#	C
MB12112	58856	1/2 x 1-1/2	3/4"	50	500	6.50#	C
MB122	58858	1/2 x 2	3/4"	50	500	6.73#	C
MB12212	58860	1/2 x 2-1/2	3/4"	50	200	8.02#	C
MB123	58862	1/2 x 3	3/4"	50	200	9.37#	C
MB12312	58864	1/2 x 3-1/2	3/4"	50	200	10.75#	C
MB124	58866	1/2 x 4	3/4"	25	100	6.02#	C
MB12412	58868	1/2 x 4-1/2	3/4"	25	100	6.65#	C
MB125	58870	1/2 x 5	3/4"	25	100	7.40#	C
MB12512	58872	1/2 x 5-1/2	3/4"	25	100	8.10#	C
MB126	58874	1/2 x 6	3/4"	25	100	8.78#	C



Hex Nuts / Machine Screw & Finished PC 4100, 4010, 4300, 4015, 4018



Hex machine screw nuts are for screws smaller than 1/4" diameter. Finished hex nuts are heavier (thicker) and are furnished in sizes 1/4" and up.

- Zinc Plated - General Use
- Grade 5 - Medium Strength

- Stainless - Corrosion & Chemical Resistant
- Solid Brass Good Near Water & Salt Air

- Silicon Bronze: Harder Than Brass - Used In Direct Burial
- Invincibox™ Up To 1/2"

FASTENERS & HARDWARE > HEX NUTS

CAT NO	UPC		SIZE	STD	SLEEVE	MSTR	WT/STD	UNIT
Zinc Plated Steel - PC 4100								
HN632	17010		6-32	100	500	4000	0.21#	C
HN832	17015	Machine	8-32	100	500	4000	0.28#	C
HN1024	17020	Screw	10-24	100	500	4000	0.33#	C
HN1032	17025	Nuts	10-32	100	500	4000	0.33#	C
HN1224	17030		12-24	100	500	2000	0.56#	C
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HN14	17035		1/4-20	100	500	2000	0.68#	C
HNS16	17040		5/16-18	50	250	2000	0.51#	C
HN38	17045	Finished	3/8-16	50	250	2000	0.74#	C
HN12	17050	Hex	1/2-13	25	125	1000	0.90#	C
HN58	17055	Nuts	5/8-11	25	125	750	1.77#	C
HN34	17060		3/4-10	25	125	250	2.95#	C
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HNT14	17051	Tuff Pack	1/4-20	500		3000	3.70#	C
HNT38	17052		3/8-16	250		1500	3.86#	C
HNT12	17053		1/2-13	150		900	4.62#	C
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Stainless Steel - PC 4010								
HNS632	69776		6-32	100	500	4000	0.22#	C
HNS832	69878	Machine	8-32	100	500	4000	0.30#	C
HNS1024	69780	Screw	10-24	100	500	4000	0.33#	C
HNS1032	69872	Nuts	10-32	100	500	4000	0.32#	C
HNS1224	69784		12-24	100	500	2000	0.58#	C
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HNS14	69786		1/4-20	100	500	2000	0.72#	C
HNS16	69788		5/16-18	50	250	2000	0.55#	C
HN38	69790	Finished	3/8-16	50	250	2000	0.79#	C
HNS12	69792	Hex	1/2-13	25	125	1000	1.22#	C
HNS58	69794	Nuts	5/8-11	25	125	750	1.84#	C
HN34	69796		3/4-10	25	125	250	2.95#	C
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Solid Brass - PC 4300								
HNBR632	17110		6-32	100	500	4000	0.21#	C
HNBR832	17115	Machine	8-32	100	500	4000	0.28#	C
HNBR1024	17120	Screw	10-24	100	500	4000	0.33#	C
HNBR1032	17125	Nuts	10-32	100	500	4000	0.33#	C
HNBR1224	17150		12-24	100	500	4000	0.56#	C
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HNBR14	17135		1/4-20	100	500	4000	0.68#	C
HNBR516	17105	Finished	5/16-18	50	250	2000	0.51#	C
HNBR38	17140	Hex	3/8-16	50	250	2000	0.74#	C
HNBR12	17145	Nuts	1/2-13	25	125	1000	0.90#	C
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Silicon Bronze - PC 4015								
HNBZ632	17160		6-32	100	500	4000	0.21#	C
HNBZ832	17161	Machine	8-32	100	500	4000	0.28#	C
HNBZ1024	17162	Screw	10-24	100	500	4000	0.33#	C
HNBZ1032	17163	Nuts	10-32	100	500	4000	0.33#	C
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HNBZ14	17164		1/4-20	100	500	4000	0.68#	C
HNBZ516	17165	Finished	5/16-18	50	250	2000	1.02#	C
HNBZ38	17166	Hex	3/8-16	50	250	2000	0.75#	C
HNBZ12	17167	Nuts	1/2-13	25	125	1000	1.02#	C
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Grade 5 - Zinc Plated - PC 4018								
5HN14	13000		1/4-20	100	500	4000	0.68#	C
5HN38	13001	Finished	3/8-16	50	250	2000	0.75#	C
5HN12	13002	Hex	1/2-13	25	125	1000	0.90#	C
5HN58	13003	Nuts	5/8-11	25	125	750	1.85#	C
5HN34	13004		3/4-10	25	125	500	2.97#	C



- Zinc Plated Steel
- Stainless Steel
- Silicon Bronze
- Invincibox™ Up To 1/2"

Lock washers provide tight locking of screws and bolts. Zinc Plated Steel - general use; Stainless Steel - corrosion and chemical resistant; Silicon Bronze - high resistance to extreme temperatures.

CAT NO	UPC	SIZE	STD	SLEEVE	MSTR	WT/STD	UNIT
Zinc Plated Steel - PC 4110							
LW6	31010	#6	100	500	4000	0.03#	C
LW8	31015	#8	100	500	4000	0.05#	C
LW10	31025	#10 (3/16)	100	500	4000	0.07#	C
LW14	31030	1/4"	100	500	4000	0.22#	C
LW516	31035	5/16"	100	500	4000	0.42#	C
LW38	31040	3/8"	100	500	4000	0.60#	C
LW12	31045	1/2"	100	500	3000	1.30#	C
LW58	31050	5/8"	100		1000	2.43#	C
LW34	31055	3/4"	100		1000	4.00#	C
Stainless Steel - PC 4010							
LWS6	69966	#6	100	500	4000	0.03#	C
LWS8	69968	#8	100	500	4000	0.05#	C
LWS10	69970	#10 (3/16)	100	500	4000	0.10#	C
LWS14	69972	1/4"	100	500	4000	0.27#	C
LWS516	69974	5/16"	100	500	4000	0.42#	C
LWS38	69976	3/8"	100	500	4000	0.64#	C
LWS12	69978	1/2"	100	500	3000	1.98#	C
LWS58	69980	5/8"	100		1000	2.22#	C
LWS34	69982	3/4"	100		1000	4.23#	C
Silicon Bronze - PC 4015							
LWBZ6	31160	#6	100	500	4000	0.09#	C
LWBZ8	31161	#8	100	500	4000	0.10#	C
LWBZ10	31162	#10 (3/16)	100	500	4000	0.11#	C
LWBZ14	31163	1/4"	100	500	4000	0.40#	C
LWBZ516	31164	5/16"	100	500	4000	0.44#	C
LWBZ38	31165	3/8"	100	500	4000	0.66#	C
LWBZ12	31166	1/2"	100	500	3000	1.44#	C
LWBZ58	31167	5/8"	100		1000	2.50#	C
LWBZ34	31168	3/4"	100		1000	3.80#	C

TECH TALK

ZINC CHROMATE Plating is the most widely used plating. Zinc is popular as a fastener coating because it is the least expensive and can be applied to a broad range of thicknesses. It has good to excellent corrosion resistance and is relatively non toxic.

STAINLESS STEEL Is a family of ferrous alloys, each with a minimum chromium content of 12 percent. Chromium is a non-corrodible element; consequently, all stainless steels have a high degree of corrosion resistance. Generally, the higher the chromium content, the better the corrosion resistance.

BRASS Composed nominally of Copper & Zinc, is the most common Copper-base alloy. Its uses are myriad since it is relatively inexpensive. It is easily worked into any shape or form, and possesses strength, toughness and good corrosion resistance. Cold drawn brass has an even greater tensile strength than mild carbon steel.

SILICON BRONZE Has a high percentage of copper and small amounts of silicon, manganese or aluminum added for strength. Silicon Bronze possesses a high tensile strength superior to mild steel. It has a high resistance to corrosive influences such as extreme temperatures, atmospheric conditions, natural and sea water, gases and sewage. It is nonmagnetic and has excellent machining and working characteristics.

NYLON Precision molded or machined of Nylon 6/6 a highly crystalline, lightweight, high melting, thermoplastic resin. It has outstanding toughness; good thermal properties; abrasion, friction and chemical resistance.

Flat Washers PC 4110, 4010, 4300, 4015

Flat Washers Steel - general use; Stainless steel - corrosion and chemical resistant; Solid brass - good in water and salt air; Silicon bronze - harder than brass, marine use and high resistance to extreme temperatures; Hard alloy - used with grade 5 and 8 bolts.

- Zinc Plated Steel
- Stainless Steel
- Solid Brass
- Silicon Bronze
- Hard Alloy
- Invincibox™ Up To 1/2"

FASTENERS & HARDWARE > FLAT WASHERS

CAT NO	UPC	BOLT SIZE	INSIDE/OUTSIDE DIAMETER	THICKNESS	STD	SLEEVE	MSTR	WT/STD	UNIT
Zinc Plated Steel - PC 4110									
FW6	31060	#6	5/32" x 3/8"	3/64"	100	500	4000	0.12#	C
FW8	31065	#8	3/16" x 7/16"	3/64"	100	500	4000	0.17#	C
FW10	31075	#10 (3/16)	7/32" x 1/2"	3/64"	100	500	4000	0.23#	C
FW14	31080	1/4"	5/16" x 3/4"	1/16"	100	500	4000	0.67#	C
FW516	31085	5/16"	3/8" x 7/8"	1/16"	100	500	3000	0.86#	C
FW38	31090	3/8"	7/16" x 1"	1/16"	100	500	3000	1.49#	C
FW12	31095	1/2"	9/16" x 1-3/8"	3/32"	50	250	1500	1.93#	C
FW58	31100	5/8"	11/16" x 1-3/4"	3/32"	25	125	750	1.99#	C
FW34	31105	3/4"	13/16" x 2"	9/64"	25	125	250	2.75#	C
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FWT14	31096	Tuff Pack 1/4"	5/16" x 3/4"	1/16"	500		3000	7.53#	C
FWT38	31097	3/8"	7/16" x 1"	1/16"	250		1500	4.23#	C
FWT12	31098	1/2"	9/16" x 1-3/8"	3/32"	150		900	5.15#	C
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Stainless Steel - PC 4010									
FWS6	69880	#6	5/32" x 3/8"	3/64"	100	500	4000	0.10#	C
FWS8	69882	#8	3/16" x 7/16"	3/64"	100	500	4000	0.12#	C
FWS10	69884	#10 (3/16)	7/32" x 1/2"	3/64"	100	500	4000	0.17#	C
FWS14	69886	1/4"	5/16" x 3/4"	1/16"	100	500	4000	0.32#	C
FWS516	69888	5/16"	3/8" x 7/8"	1/16"	100	500	3000	0.43#	C
FWS38	69890	3/8"	7/16" x 1"	1/16"	100	500	3000	0.62#	C
FWS12	69892	1/2"	9/16" x 1-3/8"	3/32"	50	250	1500	0.82#	C
FWS58	69894	5/8"	11/16" x 1-3/4"	3/32"	25	125	750	0.77#	C
FWS34	69896	3/4"	13/16" x 2"	9/64"	25	125	250	1.62#	C
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Solid Brass - PC 4300									
FWBR6	31110	#6	5/32" x 3/8"	3/64"	100	500	4000	0.10#	C
FWBR8	31115	#8	3/16" x 7/16"	3/64"	100	500	4000	0.12#	C
FWBR10	31120	#10 (3/16)	7/32" x 1/2"	3/64"	100	500	4000	0.15#	C
FWBR14	31125	1/4"	5/16" x 3/4"	1/16"	100	500	4000	0.58#	C
FWBR516	31130	5/16"	3/8" x 7/8"	1/16"	100	500	3000	0.91#	C
FWBR38	31135	3/8"	7/16" x 1"	1/16"	100	500	3000	1.52#	C
FWBR12	31140	1/2"	9/16" x 1-3/8"	3/32"	50	250	1500	1.79#	C
FWBR58	31145	5/8"	11/16" x 1-3/4"	3/32"	25	125	750	1.88#	C
FWBR34	31127	3/4"	13/16" x 2"	9/64"	25	125	250	1.92#	C
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Silicon Bronze - PC 4015									
FWBZ6	30979	#6	5/32" x 3/8"	3/64"	100	500	4000	0.10#	C
FWBZ8	30980	#8	3/16" x 7/16"	3/64"	100	500	4000	0.12#	C
FWBZ10	30981	#10 (3/16)	7/32" x 1/2"	3/64"	100	500	4000	0.14#	C
FWBZ14	30982	1/4"	5/16" x 3/4"	1/16"	100	500	4000	0.42#	C
FWBZ516	30983	5/16"	3/8" x 7/8"	1/16"	100	500	3000	0.72#	C
FWBZ38	30984	3/8"	7/16" x 1"	1/16"	100	500	3000	0.99#	C
FWBZ12	30985	1/2"	9/16" x 1-3/8"	3/32"	50	250	1500	1.18#	C
FWBZ58	30986	5/8"	11/16" x 1-3/4"	3/32"	25	125	750	1.49#	C
FWBZ34	30987	3/4"	13/16" x 2"	9/64"	25	125	250	2.75#	C
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Hard Alloy - Zinc Plated (For Grade 5 & 8) - PC 4015									
FWHA14	30989	1/4"	5/16" x 3/4"	1/16"	100	500	2500	0.67#	C
FWHA516	30990	5/16"	3/8" x 7/8"	1/16"	100	500	1000	0.86#	C
FWHA38	30991	3/8"	7/16" x 1"	1/16"	100	500	1000	1.49#	C
FWHA12	30992	1/2"	9/16" x 1-3/8"	3/32"	50	250	500	1.93#	C
FWHA58	30993	5/8"	11/16" x 1-3/4"	3/32"	25	125	100	1.93#	C
FWHA34	30994	3/4"	13/16" x 2"	9/64"	25	125	100	2.75#	C

Wedge Anchors Full Thread Zinc Plated - PC 4540



- Wedge
- Full Thread
- Zinc Plated

- Available In Larger Diameters & Lengths

- Caution! Always Wear Eye Protection

Wedge anchors can be installed through the fixture. Assemble nut and washer until the nut is flush with the top of the anchor, insert into predrilled hole. Hammer anchor into hole until the washer is flush with surface of the fixture. Expand the anchor by tightening nut. Good shear values. ICC ESR-2502

CAT NO	UPC	ANCHOR HOLE DIA	OVERALL LENGTH	THREAD LENGTH	STD	MSTR	WT/STD	UNIT
W14134	59300	1/4-20	1-3/4"	3/4"	100	600	3.00#	C
W14214	59302	1/4-20	2-1/4"	1-1/4"	100	600	3.50#	C
W14314	59304	1/4-20	3-1/4"	2-1/4"	100	600	4.75#	C
W38214	59306	3/8-16	2-1/4"	1-1/4"	50	300	4.37#	C
W38234	59307	3/8-16	2-3/4"	1-5/8"	50	300	4.75#	C
W38300	59308	3/8-16	3"	1-7/8"	50	300	5.37#	C
W38334	59310	3/8-16	3-3/4"	2-5/8"	50	300	6.37#	C
W38500	59311	3/8-16	5"	3-7/8"	50	300	7.75#	C
W12234	59312	1/2-13	2-3/4"	1-3/8"	50	200	9.00#	C
W12334	59313	1/2-13	3-3/4"	2-3/8"	50	200	11.50#	C
W12400	59314	1/2-13	4-1/2"	3-1/8"	50	200	14.00#	C
W12512	59316	1/2-13	5-1/2"	4-1/8"	50	150	16.00#	C

The published length is the overall length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

Wedge Anchors Full Thread Stainless Steel PC 4310



- Wedge
- Full Thread
- Stainless Steel

- Available In Larger Diameters & Lengths

Stainless Steel Wedge Anchors resist corrosion and are ideal for applications where chemical resistance is required. Stainless can be mildly magnetic. ICC Approval (Pending).

CAT NO	UPC	ANCHOR HOLE DIA	OVERALL LENGTH	THREAD LENGTH	STD	MSTR	WT/STD	UNIT
WS14134	70310	1/4-20	1-3/4"	3/4"	100	600	3.00#	C
WS14214	70312	1/4-20	2-1/4"	1-1/4"	100	600	3.50#	C
WS14314	70314	1/4-20	3-1/4"	2-1/4"	100	600	4.75#	C
WS38214	70320	3/8-16	2-1/4"	1-1/4"	50	300	4.37#	C
WS38234	70322	3/8-16	2-3/4"	1-5/8"	50	300	4.75#	C
WS38300	70324	3/8-16	3"	1-7/8"	50	300	5.37#	C
WS38334	70326	3/8-16	3-3/4"	2-5/8"	50	300	6.37#	C
WS38500	70328	3/8-16	5"	3-7/8"	50	300	7.75#	C
WS12234	70340	1/2-13	2-3/4"	1-3/8"	50	200	9.00#	C
WS12334	70342	1/2-13	3-3/4"	2-3/8"	50	200	11.50#	C
WS12400	70344	1/2-13	4-1/2"	3-1/8"	50	200	14.00#	C
WS12512	70346	1/2-13	5-1/2"	4-1/8"	50	150	16.00#	C

The published length is the overall length of the anchor. Allow for fixture thickness plus one anchor diameter for the nut and washer thickness when selecting a length.

TECH TALK

Selection

A 3 turns of nut (approx. 1/2 bolt dia.) +

B Nut & washer thickness (approx. 1 bolt dia.) +

C Fixture thickness +

D Minimum embedment (min. 4:112 bolt dia.) =

Minimum Anchor Length
If minimum anchor length falls between 2 sizes, use longer size. The maximum recommended anchor embedment should be 80% of the base material thickness. If a concrete slab is 10" thick, an 8" depth would be the maximum recommended anchor embedment.

Installation

1. Use a carbide bit (ANSI B94 12) the same size as the bolt dia. Drill hole deeper than bolt embed (min. 4.5 dia.) Do not use core bits. Maintain accurate hole size.
2. Clean hole debris.
3. Add washer + thread nut flush with top of bolt. Drive bolt into hole through item to be fastened.
4. To set, tighten nut 3-4 full turns or consult chart for guide installation torque.

NOTE: Using in concrete cured less than 28 days will greatly reduce anchor strength.
WARNING: WEAR SAFETY GOGGLES

Terminology

Anchor Diameter (A): The diameter of the anchor.

Anchor Length (C): The total length of the anchor.

Thread Length (B): The length of the threaded portion of the anchor.

Pull Out: The force applied to pull the anchor out of the hole.

Shear: The force applied to cut through the anchor.



Universal Strut Clamps PC 5391

One tool is all you need with our Universal Strut Clamps thanks to the **welded stud** that allows for a quick and easy installation. Includes keps nut, and the clamps come assembled to make sure you never lose any parts. Electrogalvanized is the standard finish.

CAT NO	UPC	SIZE	DESCRIPTION	STD	MSTR	WT/STD	UNIT
SC50U	81707	1/2"	Universal Strut Clamps	50	50	5.5#	C
SC75U	81708	3/4"	Universal Strut Clamps	50	50	6.0#	C
SC100U	81709	1"	Universal Strut Clamps	50	50	7.5#	C
SC125U	81710	1-1/4"	Universal Strut Clamps	50	50	9.0#	C
SC150U	81711	1-1/2"	Universal Strut Clamps	50	50	10.0#	C
SC200U	81712	2"	Universal Strut Clamps	50	50	11.0#	C

E.M.T. Strut Clamps come assembled with a keps nut and slotted hex head bolt to make sure you never lose a part. Electrogalvanized is the standard finish.

CAT NO	UPC	SIZE	DESCRIPTION	STD	MSTR	WT/STD	UNIT
SC50E	81713	1/2"	E.M.T. Strut Clamps	100	100	11.0#	C
SC75E	81714	3/4"	E.M.T. Strut Clamps	100	100	12.0#	C
SC100E	81715	1"	E.M.T. Strut Clamps	100	100	15.0#	C
SC125E	81716	1-1/4"	E.M.T. Strut Clamps	50	50	7.5#	C
SC150E	81717	1-1/2"	E.M.T. Strut Clamps	50	50	14.5#	C
SC200E	81718	2"	E.M.T. Strut Clamps	50	50	16.5#	C

Rigid Strut Clamps come assembled with a keps nut and slotted hex head bolt to make sure you never lose a part. Electrogalvanized is the standard finish. Also available are Stainless Steel Ridge Strut Clamps Type 304 or 316, quoted upon request.

CAT NO	UPC	SIZE	DESCRIPTION	STD	MSTR	WT/STD	UNIT
SC50R	81719	1/2"	Rigid Strut Clamps	100	100	11.0#	C
SC75R	81720	3/4"	Rigid Strut Clamps	100	100	15.0#	C
SC100R	81721	1"	Rigid Strut Clamps	100	100	17.0#	C
SC125R	81722	1-1/4"	Rigid Strut Clamps	50	50	9.5#	C
SC150R	81723	1-1/2"	Rigid Strut Clamps	50	50	14.5#	C
SC200R	81724	2"	Rigid Strut Clamps	50	50	17.0#	C
SC250R	81725	2-1/2"	Rigid Strut Clamps	25	25	10.0#	C
SC300R	81726	3"	Rigid Strut Clamps	25	25	11.8#	C
SC350R	81727	3-1/2"	Rigid Strut Clamps	50	50	31.0#	C
SC400R	81728	4"	Rigid Strut Clamps	50	50	33.5#	C
SC500R	81729	5"	Rigid Strut Clamps	25	25	20.0#	C
SC600R	81730	6"	Rigid Strut Clamps	25	25	25.2#	C



Channel Nuts & U-Bolt Beam Clamps PC 5392

Channel Nuts are formed or stamped from steel bar stock and are case hardened after all forming and tapping operations have been completed. The nuts are then coated with zinc for an electrogalvanize finish. Sizes are also available in type 316 stainless steel, quoted upon request.

CAT NO	UPC	SIZE	DESCRIPTION	STD	MSTR	WT/STD	UNIT
SSN25	81731	1/4"	Standard Spring Nut	100	100	7.5#	C
SSN38	81732	3/8"	Standard Spring Nut	100	100	10.0#	C
SSN50	81733	1/2"	Standard Spring Nut	100	100	11.5#	C
SSN25S	81734	1/4"	Short Spring Nut	100	100	7.5#	C
SSN38S	81735	3/8"	Short Spring Nut	100	100	9.0#	C
SSN50S	81736	1/2"	Short Spring Nut	100	100	8.2#	C
SCN25	81737	1/4"	Channel Nut Without Spring	100	100	6.5#	C
SCN38	81738	3/8"	Channel Nut Without Spring	100	100	9.0#	C
SCN50	81739	1/2"	Channel Nut Without Spring	100	100	10.6#	C



U-Bolt Beam clamps are made from cold formed steel and conform to all tolerances listed in section 5.3 of the metal framing standards publication.

CAT NO	UPC	SIZE	DESCRIPTION	STD	MSTR	WT/STD	UNIT
SUB158	81767	1-5/8" x 1-5/8"	U-Bolt Beam Clamp for Strut	25	25	20.5#	C
SUB325	81768	1-5/8" x 3-1/4"	U-Bolt Beam Clamp for Strut	25	25	23.0#	C



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 6

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	Perma-Cote

This submittal contains the following:

Description: - Coated Conduit - ALUMINUM
 - Conduit Thread & Coupling

see p. 16050-3

WITH DRAWN

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: _____ DATE: _____
 GEOSYNTEC CONSULTANTS

Submittal No:	6
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	Perma-Cote
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <i>[Signature]</i> Date: 8.11.11 for: <i>Jeff Fisher</i>	

cc: File



COATED CONDUIT

Metric Size Designators	Pipe Size Inches	Catalog Number	Outside Wall Thickness Inches	Diameter With Coating Inches	Internal Inside Diameter Inches	Traverse Area Sq. Inches	Nominal Weight/100 ft.	Aluminum Catalog #
<input type="checkbox"/> 16	1/2"	050-CON	.104"	.920"	0.632"	0.314"	85	050-CON-A
<input type="checkbox"/> 21	3/4"	075-CON	.107"	1.130"	0.836"	0.549"	112	075-CON-A
<input type="checkbox"/> 27	1"	100-CON	.126"	1.395"	1.063"	0.887"	164	100-CON-A
<input type="checkbox"/> 35	1-1/4"	125-CON	.133"	1.740"	1.394"	1.526"	217	125-CON-A
<input type="checkbox"/> 41	1-1/2"	150-CON	.138"	1.980"	1.624"	2.071"	268	150-CON-A
<input type="checkbox"/> 53	2"	200-CON	.146"	2.455"	2.083"	3.408"	358	200-CON-A
<input type="checkbox"/> 63	2-1/2"	250-CON	.193"	2.955"	2.489"	4.866"	546	250-CON-A
<input type="checkbox"/> 78	3"	300-CON	.205"	3.580"	3.090"	7.499"	708	300-CON-A
<input type="checkbox"/> 91	3-1/2"	350-CON	.215"	4.080"	3.570"	10.010"	851	350-CON-A
<input type="checkbox"/> 103	4"	400-CON	.225"	4.580"	4.050"	12.882"	1009	400-CON-A
<input type="checkbox"/> 129	5"	500-CON	.245"	5.643"	5.073"	20.212"	1337	500-CON-A
<input type="checkbox"/> 155	6"	600-CON	.266"	6.705"	6.093"	29.158"	1993	600-CON-A

PERMA-COTE COATED NIPPLES

Factory threaded nipples save you time and money in the field. Electrical continuity is maintained across assembled joints.

*The exteriors of certain short nipples are coated with urethane in lieu of PVC. This is dictated by the manufacturing process as well as assembly considerations.

FEATURES

- 40 mil gray PVC exterior coating
- 2 mil green urethane interior and thread coating
- 12 trade sizes from 1/2" through 6"
- 11 standard lengths in available: Close, 2" to 12"
- Made to order lengths available - Call for quote
- Plastic thread protector caps are color coded for quick identification of conduit size.

Thread Protector Cap Colors:

- Black- for 1/2" sizes, 1/2", 1-1/2", 2-1/2", 3-1/2"
- Red- for 1/4" sizes, 3/4", 1-1/4"
- Blue- for even sizes, 1", 2", 3", 4", 5", 6"

COMPLIANCES

UL Listed, (Standard 6) with PVC as the primary corrosion protection for the steel conduit. The underlying zinc coating is a supplemental corrosion protection coating. Restricted for use with threaded fittings only.

(UL 6 is now used in lieu of WWC.581)

ETL VERIFIED: PERMA-COTE NIPPLES ARE MANUFACTURED FROM ETL-VERIFIED CONDUIT

EASY ORDERING

To order Perma-Cote coated nipples follow this simple formula to create your Perma-Cote catalog number.

Use the "Fraction Conversion" table to convert trade sizes to Perma-Cote decimal format.

NIP - SIZE X LENGTH -AL

Fraction Conversion
TRADE SIZE Perma-Cote CODE

1/2	050
3/4	075
1	100
1-1/4	125
1-1/2	150
2	200
2-1/2	250
3	300
3-1/2	350
4	400
5	500
6	600

The catalog number for a Perma-Cote coated steel 1/2" nipple with a length of 10": **NIP-050X10**

TRY IT!

Enter "NIP" Standard Nipple Prefix Enter Trade Size Code Enter Desired Nipple Length For Aluminum Add '-AL' suffix

NIP - [] X [] - AL

This number can be looked up in the listing of pricing to determine price and availability.

Call 903-843-4388 for custom orders, customer service and more information on Perma-Cote.

SUBMITTAL APPROVED BY:

(See online product submittal guide at www.permacote.com)



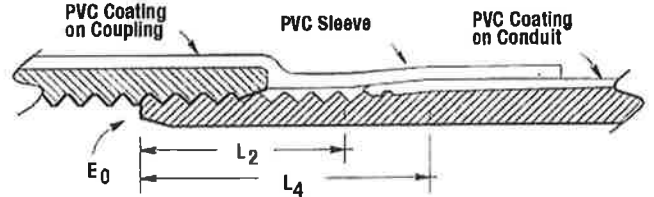
PVC coated rigid metal conduit couplings with green urethane interior coating connect coated conduit sections. Electrical continuity is maintained across assembled joints. PVC sleeves on couplings seal off on conduit PVC coating when assembled to prevent corrosive liquids and vapors from attacking threaded joints.

FEATURES

- 40 mil gray PVC exterior coating
- 2 mil green urethane interior coating over galvanized threads
- 12 trade sizes from 1/2" through 6"
- Sealing sleeves on both ends
- Molded external ribs on 1/2" - 4" to prevent tool damage during assembly
- Couplings are straight tapped

COMPLIANCES

- UL Listed Standard 6



All female pipe openings are provided with a PVC sleeve sized to fit tightly over the PVC coated conduit when assembled. This prevents corrosives from contacting threaded joints.

COUPLING

THREADS

Metric Size Designators	Pipe Size Inches	Steel Catalog #	Nominal Weight Per 100 (Pounds)	Outside Diameter With Ribs Inches	Threads Per Inch	Effective Length L_2	Total Length of Threads to Vanish Point L_4	Pitch At End of Thread 3/4 in. Taper E_0	Aluminum Catalog #
<input type="checkbox"/> 16	1/2"	CPL-050	19	1.344"	14	.5337"	.7815"	.7584"	CPL-050-A
<input type="checkbox"/> 21	3/4"	CPL-075	32	1.531"	14	.5457"	.7935"	.9677"	CPL-075-A
<input type="checkbox"/> 27	1"	CPL-100	40	1.781"	11-1/2	.6828"	.9845"	1.2136"	CPL-100-A
<input type="checkbox"/> 35	1-1/4"	CPL-125	50	2.156"	11-1/2	.7068"	1.0085"	1.5571"	CPL-125-A
<input type="checkbox"/> 41	1-1/2"	CPL-150	69	2.469"	11-1/2	.7235"	1.0252"	1.7961"	CPL-150-A
<input type="checkbox"/> 53	2"	CPL-200	93	2.969"	11-1/2	.7565"	1.0582"	2.2690"	CPL-200-A
<input type="checkbox"/> 63	2-1/2"	CPL-250	123	3.594"	8	1.1375"	1.5712"	2.7195"	CPL-250-A
<input type="checkbox"/> 78	3"	CPL-300	217	4.250"	8	1.2000"	1.6337"	3.3406"	CPL-300-A
<input type="checkbox"/> 91	3-1/2"	CPL-350	422	4.875"	8	1.2500"	1.6837"	3.8375"	CPL-350-A
<input type="checkbox"/> 103	4"	CPL-400	391	5.250"	8	1.3000"	1.7337"	4.3344"	CPL-400-A
<input type="checkbox"/> 129	5"	CPL-500	550	6.080"	8	1.4063"	1.8400"	5.3907"	CPL-500-A
<input type="checkbox"/> 155	6"	CPL-600	884	7.280"	8	1.5125"	1.9462"	6.4461"	CPL-600-A

SUBMITTAL APPROVED BY:

(See online product submittal guide at www.permacote.com)

Couplings are straight tapped.
Tolerance, thread length = ± 1 thread.
Plus or minus 1 turn is the maximum variation permitted from the gauging face of the working thread gauges.
This is equivalent to plus or minus 1 and 1-1/2 turns from the basic dimensions, since the variation of plus or minus 1/2 turn from basic dimension is permitted in working gauges.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 7

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	Plasti-Bond

This submittal contains the following:

Description: Sealing Fittings — ALUMINUM — WITHDRAWN

Submittal No:	7
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	Plasti-Bond
Contractor:	EARTHWORKS PACIFIC, INC.
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."</p> <p>Signature: <i>[Signature]</i> Date: 8.11.11</p> <p>for: Jeff Fisher</p>	

cc: File

Plasti-Bond REDH₂O[®]

Submittal Guide

Phone: 903/843-5591 • 1100 US Highway 271 South Gilmer, TX 75844 • www.plastibond.com

Sealing Fittings

Description:

Plasti-Bond Sealing Fittings are used in conduit runs to stop gasses, vapors or flames from migrating from one part of the conduit system to another. This limits the spread of any potential explosion, enhancing safety. The PVC and urethane coatings of the fittings protect them from corrosive atmospheres so they can continue to function in hazardous locations. These fittings are available in several different configurations and with optional breathers and drains to accommodate installation in a variety of locations and positions. The EY, EYM, EYD and EYDEF styles of fittings are for installation in vertical conduit runs. The EYA, EYAM and EYSEF style fittings are for installation in either vertical or horizontal runs. The EZS and EZDM style fittings may be used in any angle of conduit run. These Plasti-Bond sealing fittings should be used with a suitable system of sealing compound, such as Chico A, Chico X or Chico A-P from Crouse-Hinds. Follow the installation instructions included with the sealing compound.



EZD style

Selected Product Numbers:
PREY536

Features:

- 40 mil gray PVC exterior coating
- 2 mil red urethane interior coating
- 10 trade sizes from 1/2" through 4"
- Sealing sleeves on all conduit openings
- EYDX and EYSX seals have 40% wire fill capacity
- EYD and EZD fittings include a drain for condensate
- EZD fittings may be used at any conduit angle and include drain

Standards:

- EYS-1-3, 11-31, 16-36, 116-316
- Class I, Groups A, B, C, D
- Class II, Groups E, F, G
- Class III
- EYS-41-101, 416-1016
- EYSX-11-81
- EYD-11-101, 116-1016
- EYDX-11-81
- Class I, Groups B, C, D
- Class II, Groups E, F, G
- Class III
- EYS-29, 4-014, 46-0146
- EZS-1-8, 16-86
- EYSX-9-10
- EYD-1-10, 16-106
- EZD-10-60
- Class I, Groups C, D
- Class II, Groups E, F, G
- Class III
- UL Standard 886
- CSA Standard: C22.2 No 30

Product Technical Drawings:

Product Charts:

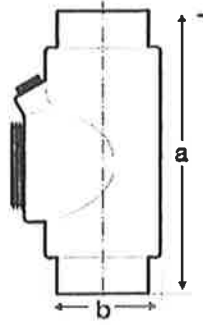
Use the check boxes to 'flag or note' your selections for quick reference. Click the Button "Update Selections" to reflect changes.

EYS - female hubs - for sealing in vertical positions only

Plasti-Bond REDH₂O[®]

Submittal Guide

Phone: 903/843-5591 • 1100 US Highway 271 South Gilmer, TX 75844 • www.plastibond.com



[Click Here To See Enlarged Drawing](#)

Edit Selection	Catalog Number	Size Inches	Turning Radius	A	B	Nominal Weight	Aluminum Catalog Number
	PREYS1	1/2"	1.63	4.28	1.33	1	PREYS1SA
	PREYS2	3/4"	1.91	5.25	1.58	1.5	PREYS2SA
	PREYS3	1"	2.38	6.31	1.83	2.1	PREYS3SA
	PREYS4	1-1/4"	1.72	7.56	2.27	2.7	PREYS4SA
	PREYS5	1-1/2"	2.06	8.5	2.52	3.7	PREYS5SA
	PREYS6	2"	2.31	10.25	3.08	4.7	PREYS6SA
	PREYS7	2-1/2"	2.69	11.5	3.58	10	PREYS7SA
	PREYS8	3"	3.31	12.5	4.33	11.2	PREYS8SA
	PREYS9	3-1/2"	3.44	13.19	4.83	14.5	PREYS9SA
	PREYS10	4"	3.69	13.75	5.33	16	PREYS10SA

PREYS - male/female hubs - for sealing in vertical positions only

Edit Selection	Catalog Number	Size Inches	Turning Radius	A	B	Nominal Weight	Aluminum Catalog Number
	PREYS16	1/2"	1.63	4.78	1.33	1.5	PREYS16SA
	PREYS26	3/4"	1.91	5.25	1.58	1.5	PREYS26SA
	PREYS36	1"	2.38	6.31	1.83	2.3	PREYS36SA

PREYS - female hubs- for sealing in vertical or horizontal positions

Edit Selection	Catalog Number	Size Inches	Turning Radius	A	B	Nominal Weight	Aluminum Catalog Number
	PREYS11	1/2"	1.16	4.69	1.33	1.3	PREYS11SA
	PREYS21	3/4"	1.25	5.19	1.58	1.1	PREYS21SA
	PREYS31	1"	1.38	6.31	1.83	2.2	PREYS31SA
	PREYS41	1-1/4"	1.72	7.56	2.27	3	PREYS41SA
	PREYS51	1-1/2"	2.06	8.5	2.52	3.8	PREYS51SA
	PREYS61	2"	2.31	10.25	3.08	5.5	PREYS61SA

PREYS - male/female hubs for sealing in vertical or horizontal positions

Edit Selection	Catalog Number	Size Inches	Turning Radius	A	B	Nominal Weight	Aluminum Catalog Number
	PREYS116	1/2"	1.16	5.19	1.33	1.5	PREYS116SA
	PREYS216	3/4"	1.25	5.19	1.58	1.2	PREYS216SA
	PREYS316	1"	1.38	6.31	1.83	2.6	PREYS316SA
	PREYS46	1-1/4"	1.72	7.56	2.27	2.8	PREYS46SA
	PREYS56	1-1/2"	2.06	8.5	2.52	3.7	PREYS56SA
	PREYS66	2"	2.31	10.25	3.08	5.6	PREYS66SA
	PREYS76	2-1/2"	2.69	11.5	3.58	13.2	PREYS76SA
	PREYS86	3"	3.31	12.5	4.33	11.2	PREYS86SA
	PREYS96	3-1/2"	3.44	13.19	4.83	14.5	PREYS96SA
	PREYS106	4"	3.69	13.75	5.33	15	PREYS96SA



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 8

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	2.01 (B)
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	PW Eagle

This submittal contains the following:

- Description:** - UL Coupling
 - Terminal Adapters
 - Elbows

*p. 16050-2
 see Submittal No. 4*

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: *Kindly* DATE: 7 OCT 2011
GEOSYNTEC CONSULTANTS

Submittal No:	8
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	2.01 (B)
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	PW Eagle
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature:	<u><i>Jeff Fisher</i></u> Date: <u>8-11-11</u>
for: <u>Jeff Fisher</u>	

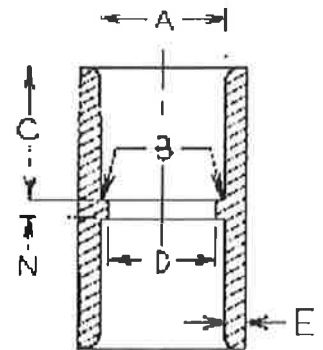
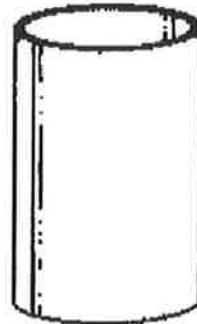
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PWEagle PVC Electrical Conduit Fittings and Accessories

UL Couplings

UL LISTED

All sizes conform to
UL 514B and NEMA TC 3

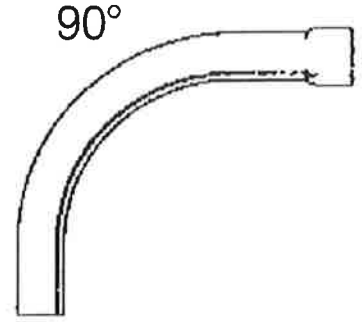
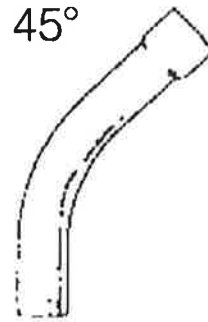


Item Number	Trade Size	Average A (Inches)	Average B (Inches)	Minimum C (Inches)	N (Inches)	Minimum D (Inches)	Minimum E (Inches)
6001 0050	1/2	0.852	0.836	0.652	3/32	0.630	0.095
6001 0075	3/4	1.064	1.046	0.719	3/32	0.834	0.095
6001 0100	1	1.330	1.310	0.875	3/32	1.059	0.100
6001 0125	1 1/4	1.677	1.655	0.938	3/32	1.392	0.120
6001 0150	1 1/2	1.918	1.894	1.062	3/32	1.622	0.120
6001 0200	2	2.393	2.369	1.125	3/32	2.079	0.130
6001 0250	2 1/2	2.890	2.868	1.469	3/16	2.484	0.165
6001 0300	3	3.515	3.492	1.594	3/16	3.083	0.216
6001 0350	3 1/2	4.015	3.992	1.687	3/16	3.598	0.226
6001 0400	4	4.515	4.491	1.750	3/16	4.076	0.237
6001 0500	5	5.593	5.553	1.937	3/16	5.097	0.258
6001 0600	6	6.658	6.614	2.125	1/4	6.115	0.280

PWEagle PVC Electrical Conduit Fittings and Accessories

Standard Radius Elbows Schedule 40

UL LISTED Conforms to UL 651, NEMA TC 3



45° Elbow

Plain End Item Number	Belled End Item Number	Trade Size
7145 0050	7545 0050	1/2
7145 0075	7545 0075	3/4
7145 0100	7545 0100	1
7145 0125	7545 0125	1 1/4
7145 0150	7545 0150	1 1/2
7145 0200	7545 0200	2
7145 0250	7545 0250	2 1/2
7145 0300	7545 0300	3
7145 0350	7545 0350	3 1/2
7145 0400	7545 0400	4
7145 0500	7545 0500	5
7145 0600	7545 0600	6

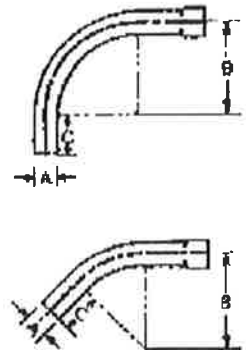
90° Elbow

Plain End Item Number	Belled End Item Number	Trade Size
7190 0050	7590 0050	1/2
7190 0075	7590 0075	3/4
7190 0100	7590 0100	1
7190 0125	7590 0125	1 1/4
7190 0150	7590 0150	1 1/2
7190 0200	7590 0200	2
7190 0250	7590 0250	2 1/2
7190 0300	7590 0300	3
7190 0350	7590 0350	3 1/2
7190 0400	7590 0400	4
7190 0500	7590 0500	5
7190 0600	7590 0600	6

Standard Radius Sweep Dimensions Schedule 40

Trade Size	A (Inches)	Minimum B (Inches)	Minimum C (Inches)
1/2	0.840	4.000	1.500
3/4	1.050	4.500	1.500
1	1.315	5.750	1.875
1 1/4	1.660	7.250	2.000
1 1/2	1.900	8.250	2.000
2	2.375	9.500	2.000

Trade Size	A (Inches)	Minimum B (Inches)	Minimum C (Inches)
2 1/2	2.875	10.500	3.000
3	3.500	13.000	3.125
3 1/2	4.000	15.000	3.250
4	4.500	16.000	3.375
5	5.563	24.000	3.625
6	6.625	30.000	3.750

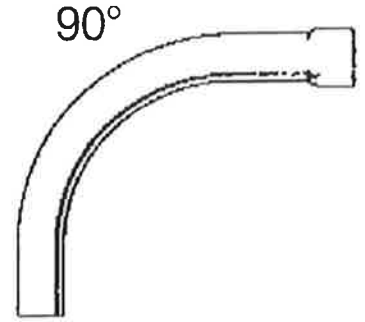
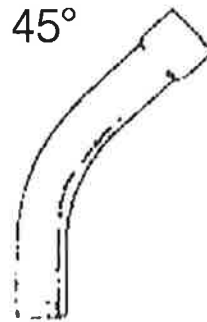


PWEagle PVC Electrical Conduit Fittings and Accessories

Standard Radius Elbows Schedule 80

UL LISTED Conforms to UL 651, NEMA TC 3

Belled end except as noted-*



45° Elbow

Item Number	Trade Size
7245 0050*	1/2
7245 0075*	3/4
7245 0100*	1
7245 0125*	1 1/4
7245 0150*	1 1/2
7245 0200*	2
7645 0250	2 1/2
7645 0300	3
7645 0400	4
7645 0500	5
7645 0600	6

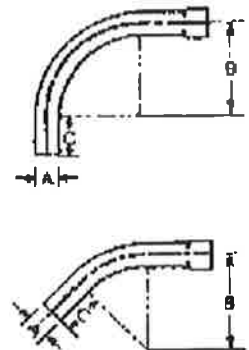
90° Elbow

Item Number	Trade Size
7290 0050*	1/2
7290 0075*	3/4
7290 0100*	1
7290 0125*	1 1/4
7290 0150*	1 1/2
7290 0200*	2
7690 0250	2 1/2
7690 0300	3
7690 0400	4
7690 0500	5
7690 0600	6

Standard Radius Sweep Dimensions Schedule 80

Trade Size	A (Inches)	Minimum B (Inches)	Minimum C (Inches)
1/2	0.840	4.000	1.500
3/4	1.050	4.500	1.500
1	1.315	5.750	1.875
1 1/4	1.660	7.250	2.000
1 1/2	1.900	8.250	2.000
2	2.375	9.500	2.000

Trade Size	A (Inches)	Minimum B (Inches)	Minimum C (Inches)
2 1/2	2.875	10.500	3.000
3	3.500	13.000	3.125
3 1/2	4.000	15.000	3.250
4	4.500	16.000	3.375
5	5.563	24.000	3.625
6	6.625	30.000	3.750



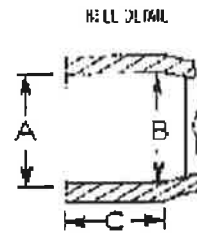
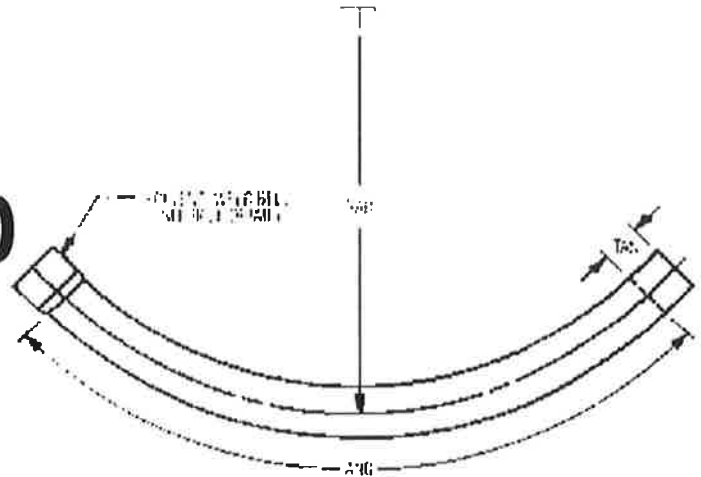
PWEagle PVC Electrical Conduit Fittings and Accessories

Special Radius Sweeps Schedule 40/80 Belled End

See price sheet for specific sizes offered.
Plain end available upon request

UL LISTED* Conforms to UL 651, NEMA TC 3

* Except elbows of less than 15° arc angle and/or elbows of more than 120 inches arc length.



Trade Size	Minimum Tangent (Inches)	Average A (Inches)	Average B (Inches)	Average C (Inches)
1	1.875	1.330	1.310	1.375
1 ¹ / ₄	2.000	1.677	1.655	1.500
1 ¹ / ₂	2.000	1.918	1.894	1.500
2	2.000	2.393	2.369	1.600
2 ¹ / ₂	3.000	2.890	2.868	2.500
3	3.125	3.515	3.492	2.625
3 ¹ / ₂	3.250	4.015	3.992	2.750
4	3.375	4.515	4.491	2.875
5	3.625	5.593	5.553	3.125
6	3.750	6.658	6.614	3.250



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 9

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	2.04 (A)
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	Southwire

This submittal contains the following:

Description: Wire & Cable

page 16050-4

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: *[Signature]* DATE: 24 OCT 2011

GEOSYNTEC CONSULTANTS

TO VERIFY PROPER GAUGE PRIOR TO INSTALLATION

cc: File

Submittal No:	9
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	2.04 (A)
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	Southwire
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature:	<u><i>[Signature]</i></u> Date <u>8/11/11</u>
for: <i>Jeff Fisher</i>	

SIMpull THHN®

600 Volts. Copper Conductor
Thermoplastic Insulation/SIM Nylon Sheath¹
Heat, Moisture, Gasoline, and Oil Resistant
Also Rated MTW and THWN-2
SIM Technology® for Easier Pulling



APPLICATIONS

Southwire SIMpull THHN® or THWN-2 conductors are primarily used in conduit and cable trays for services, feeders, and branch circuits in commercial or industrial applications as specified in the National Electrical Code. When used as Type THHN, or T90 Nylon conductor is suitable for use in dry locations at temperatures not to exceed 90 °C. When used as Type THWN-2 or TWN75, conductor is suitable for use in wet or dry locations at temperatures not to exceed 90 °C or not to exceed 75 °C when exposed to oil. When used as Type MTW, conductor is suitable for use in wet locations or when exposed to oil at temperatures not to exceed 60 °C or dry locations at temperatures not to exceed 90 °C (with ampacity limited to that for 75 °C conductor temperature per NFPA 79). Conductor temperatures not to exceed 105 °C in dry locations when rated AWM and used as appliance wiring material or when used as T90 Nylon. Voltage for all applications is 600 volts. This cable should be installed without application of pulling lubricant.

SPECIFICATIONS

Southwire SIMpull THHN® or THWN-2 or MTW (also AWM) meet or exceed:

- All applicable ASTM specifications
- UL Standard 83, 1581, and 1063(MTW)
- T90 Nylon/TWN75 sizes through 500 kcmil Standard C22.2 No. 75-08
- NOM-ANCE 90° C
- Federal Specification A-A-59544
- National Electrical Code, NFPA 70, 2011 Edition
- VW-1 - Sizes 14 through 1 AWG
- CT Use - UL 1685, Sizes 1/0 AWG and larger
- FT1 - Sizes through 500 kcmil
- RoHS/REACH Compliant
- Sunlight Resistant - Marked and listed in all colors sizes 2 AWG and larger
- NEMA WC 70 Construction Requirements

CONSTRUCTION

Southwire SIMpull THHN® or THWN-2 or MTW copper conductors are annealed (soft) copper, unilay compressed strand, insulated with a tough heat and moisture resistant polyvinyl chloride (PVC), over which a SIM (SLIKQWIK® Infused Membrane) nylon (polyamide) or UL Recognized equal jacket is applied. Available in black, white, red, blue, purple, green, yellow, brown, orange, and gray. Some colors standard, some subject to economic order quantity. THWN sizes 14 - 10 AWG. THWN-2 sizes 8 AWG and larger.

¹ Oil and gasoline resistant II as defined by Underwriters Laboratories.

SIMPull THHN

Conductor		Insulation Thickness (mils)	Jacket Thickness (mils)	Nominal O.D. (mils)	Approx. Net Weight Per 1000 ft. (lbs)	Allowable Ampacities +			Standard Package
Size (AWG or kcmil)	Num. Strands					60 °C	75 °C	90 °C	
14	1	15	4	102	15	15	15	DNF	
12	1	15	4	119	23	20	20	DQF	
10	1	20	4	150	36	20	20	30	DNF
14	19	15	4	109	16	15	15	15	DNG
12	19	15	4	128	24	20	20	20	DQF
10	19	20	4	161	38	30	30	30	F
8	19	30	5	213	63	40	50	55	E
6	19	30	5	249	95	55	65	75	C
4	19	40	6	318	152	70	85	95	BC
3	19	40	6	346	189	85	100	115	C
2	19	40	6	378	234	95	115	130	B
1	19	50	7	435	299	110	130	145	B
1/0	19	50	7	474	372	125	150	170	B
2/0	19	50	7	518	462	145	175	195	B
3/0	19	50	7	568	575	165	200	225	B
4/0	19	50	7	624	718	195	230	260	B
250	37	60	8	678	851	215	255	290	B
300	37	60	8	730	1012	240	285	320	B
350	37	60	8	777	1174	260	320	350	B
400	37	60	8	821	1334	280	335	380	B
500	37	60	8	902	1655	320	380	430	B
600	61	70	9	998	1987	350	420	475	C
750	61	70	9	1126	2464	400	475	535	C
1000	61	70	9	1275	3257	455	545	615	C

**Sizes 14 - 10 AWG not available with patented SIM Technology® No Lube® jacket. Sizes 8 and larger available with patented SIM Technology®. + Allowable ampacities shown are for general uses as specified by the National Electrical Code, 2011 Edition, section 310.15 unless the equipment is marked for use at higher temperatures the conductor ampacity shall be limited to the following. 60 °C - When terminated to equipment for circuits rated 100 amperes or less or marked for size 14 through 1 AWG conductors. MTW wet locations or when exposed to oil or coolant. 75 °C - When terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than size 1 AWG. THWN-2 when exposed to



SIMpull THHN

oil or coolant. MTW dry locations. 90 °C - THHN dry locations. THWN-2; wet or dry locations. For ampacity derating purposes. For derating purposes use Article 315 of the National Electrical Code.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 10

Job No:		Date:	August 11, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	R. Electric
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	Unistrut

This submittal contains the following:

Description: Channels & Supports - FOR MOUNTING CONTROL PANEL

WITHDRAWN

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 26 OCT 2011

GEOSYNTEC CONSULTANTS
PLEASE INDICATE WHICH
PRODUCT(S) ARE PROPOSED

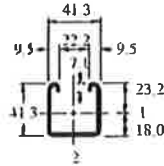
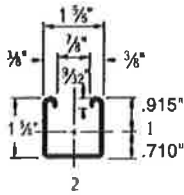
Submittal No:	10
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	
Drawing No:	
Subcontractor:	R. Electric
Supplier:	
Manufacturer:	Unistrut
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u>[Signature]</u> Date: 8-11-11 for: <u>Jeff Fisher</u>	

cc: File



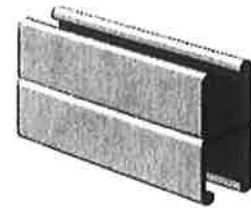
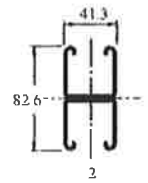
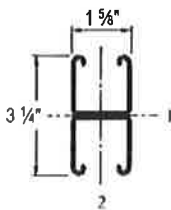
1 5/8" Channel

P1000®



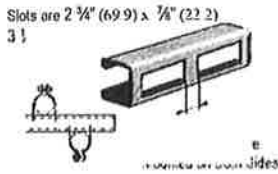
Wt/100 Ft: 189 Lbs (281 kg/100 m)
 Allowable Moment 5,070 In-Lbs (570 N·m)
 12 Gauge Nominal Thickness .105" (2.7mm)

P1001



Wt/100 Ft: 378 Lbs (562 kg/100 m)
 Allowable Moment 14,360 In-Lbs (1,620 N·m)
 12 Gauge Nominal Thickness .105" (2.7mm)

P1000 DS



Wt/100 Ft: 173 Lbs (257 kg/100 m)

P1000 H3



Wt/100 Ft: 175 Lbs (260 kg/100 m)

P1000 HS



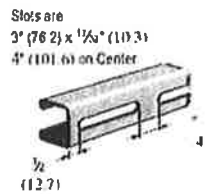
Wt/100 Ft: 185 Lbs (275 kg/100 m)

P1000 KO



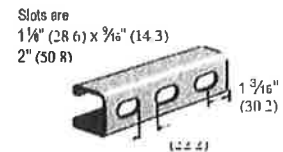
Wt/100 Ft: 190 Lbs (283 kg/100 m)

P1000 SL



Wt/100 Ft: 185 Lbs (275 kg/100 m)

P1000 T



Wt/100 Ft: 185 Lbs (275 kg/100 m)

CHANNEL NUTS (REFER TO HARDWARE SECTION FOR DETAILS)



P1006-0832
P1006-1024
P1006-1420
P1007
P1008
P1009
P1010



P1008T
P1006T1420
P1010T



P1024
P1012S
P1023S



P1012
P1023
P1024S



P3006-0832
P3006-1024
P3006-1420
P3007
P3008
P3009
P3010



P3016-0632
P3016-0832
P3016-1024
P3016-1420

Channel Finishes: PL, GR, HG, PG; Standard Lengths: 10' & 20'

P1000 - BEAM LOADING

Span In	Max. Allowable Uniform Load Lbs	Defl. at Uniform Load In	Uniform Loading at Deflection		
			Span/180 Lbs	Span/240 Lbs	Span/360 Lbs
24	1,690	0.06	1,690	1,690	1,690
36	1,130	0.13	1,130	1,130	900
48	850	0.22	850	760	500
60	680	0.35	650	480	320
72	560	0.50	450	340	220
84	480	0.68	330	250	160
96	420	0.89	250	190	130
108	380	1.14	200	150	100
120	340	1.40	160	120	80
144	280	2.00	110	80	60
168	240	2.72	80	60	40
192	210	3.55	60	50	NR
216	190	4.58	50	40	NR
240	170	5.62	40	NR	NR

P1001 - BEAM LOADING

Span In	Max. Allowable Uniform Load Lbs	Defl. at Uniform Load In	Uniform Loading at Deflection		
			Span/180 Lbs	Span/240 Lbs	Span/360 Lbs
24	3,500*	0.02	3,500*	3,500*	3,500*
36	3,190	0.07	3,190	3,190	3,190
48	2,390	0.13	2,390	2,390	2,390
60	1,910	0.20	1,910	1,910	1,620
72	1,600	0.28	1,600	1,600	1,130
84	1,370	0.39	1,370	1,240	830
96	1,200	0.51	1,200	950	630
108	1,060	0.64	1,000	750	500
120	960	0.79	810	610	410
144	800	1.14	560	420	280
168	680	1.53	410	310	210
192	600	2.02	320	240	160
216	530	2.54	250	190	130
240	480	3.16	200	150	100

P1000 - COLUMN LOADING

Unbraced Height In	Max. Allowable Load at Slot Face Lbs	Maximum Column Load Applied at C.G.			
		K = 0.65 Lbs	K = 0.80 Lbs	K = 1.0 Lbs	K = 1.2 Lbs
24	3,550	10,740	9,890	8,770	7,740
36	3,190	8,910	7,740	6,390	5,310
48	2,770	7,260	6,010	4,690	3,800
60	2,380	5,910	4,690	3,630	2,960
72	2,080	4,840	3,800	2,960	2,400
84	1,860	4,040	3,200	2,480	1,980
96	1,670	3,480	2,750	2,110	1,660
108	1,510	3,050	2,400	1,810	**
120	1,380	2,700	2,110	**	**
144	1,150	2,180	1,660	**	**

P1001 - COLUMN LOADING

Unbraced Height In	Max. Allowable Load at Slot Face Lbs	Maximum Column Load Applied at C.G.			
		K = 0.65 Lbs	K = 0.80 Lbs	K = 1.0 Lbs	K = 1.2 Lbs
24	6,430	24,280	23,610	22,700	21,820
36	6,290	22,810	21,820	20,650	19,670
48	6,160	21,410	20,300	18,670	16,160
60	6,000	20,210	18,670	15,520	12,390
72	5,620	18,970	16,160	12,390	8,950
84	5,170	16,950	13,630	9,470	6,580
96	4,690	14,890	11,190	7,250	5,040
108	4,170	12,850	8,950	5,730	3,980
120	3,690	10,900	7,250	4,640	**
144	2,930	7,630	5,040	**	**

P1000/P1001 - ELEMENTS OF SECTION

Parameter	P1000	P1001
Area of Section	0.555 In ²	1.111 In ²
Axis 1-1		
Moment of Inertia (I)	0.185 In ⁴	0.928 In ⁴
Section Modulus (S)	0.202 In ³	0.571 In ³
Radius of Gyration (r)	0.577 In	0.914 In
Axis 2-2		
Moment of Inertia (I)	0.236 In ⁴	0.471 In ⁴
Section Modulus (S)	0.290 In ³	0.580 In ³
Radius of Gyration (r)	0.651 In	0.651 In

Notes:

* Load limited by spot weld shear.

** KL/r > 200

NR = Not Recommended.

- Beam loads are given in total uniform load (W Lbs) not uniform load (w lbs/ft or w lbs/in).
- Beam loads are based on a simple span and assumed to be adequately laterally braced. Unbraced spans can reduce beam load carrying capacity. Refer to Page 56 for reduction factors for unbraced lengths.
- For pierced channel, multiply beam loads by the following factor:

"KO" Series .....95%	"T" Series .....85%
"HS" Series .....90%	"SL" Series .....85%
"H3" Series .....90%	"DS" Series .....70%
- Deduct channel weight from the beam loads.
- For concentrated midspan point loads, multiply beam loads by 50% and the corresponding deflection by 80%. For other load conditions refer to page 18.
- All beam loads are for bending about Axis 1-1.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 11

Job No:	_____	Date:	August 18, 2011
To:	COK - DPW	Spec Section:	_____
Attention:	Troy Tanigawa	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	8, 9, & 10
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	_____
Fax No:	808.241.6887	Manufacturer:	EPG Companies, Inc.
Respond by:	_____		_____

This submittal contains the following:

- Description:**
- EPG Pump Master Control Panel
 - Breakout Boxes
 - Pumps
 - Adapter
 - Level Sensors & Leak Detection Sensors for Wet Wells #1 & #2

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 26 OCT 2011

GEOSYNTEC CONSULTANTS
 PROVIDE GUIDEDAIL DRAWING DIMENSIONS FOR BOTH WET WET #1 & WET WELL #2

Submittal No:	11
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	
Spec Para:	
Drawing No:	8, 9, & 10
Subcontractor:	
Supplier:	
Manufacturer:	EPG Companies, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u>[Signature]</u> Date: 8-18-11 FOR: <u>Jeff Fisher</u>	

File

EPG Companies Inc.

SUBMITTAL

FOR

**Earthworks Pacific, Inc.
Kekaha Sanitary Landfill**

EPG Job #11-10293

EPG Companies Inc.

Submittal Index

Earthworks Pacific, Inc. – Kekaha Sanitary Landfill

Job #11-10293

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Drawing	05778-0000	Series 30 SurePump™
Drawing	05778-0040	Series 30 Size 6 Sump Drainer
Bulletin	0331d	Engineer's Specification EPG VSD SurePump™ Vertical Sump Drainer
Bulletin	0480f	Materials of Construction
Bulletin	0080b	Engineer's Specification EPG Series L950PT PumpMaster™ Controller
Form	117	Attachment to Bulletin 0080b
Drawing	10173-0250	L950PT Control Panel Schematics
Bulletin	0125	Engineer's Specification EPG LG & LGP Submersible Level Transmitters
Drawing	03626-0525	BJBP525 Duplex Breakout Junction Box for Motor Lead
Drawing	02523-0905	BJBO905B Breakout Junction Box for One Level, One Flow Sensor and One Leak Detection
Drawing	1 Page	Kekaha Sanitary Landfill Mechanical Submittal Drawing Duplex Force Main/DGRN Guide Rail System
Bulletin	3480c	Sensor Data Sheet EPG Leak Detector
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Bulletin	0170d	Flow Meter Operations
Bulletin	1005	Caution
Drawing	07765-0000C	3" PVC Flow Sensor with MNPT Ends
Bulletin	0200c	Limited Warranty
Form	127a	Submittal Acceptance Form

PROVIDE FOR WWT #2

EPG Companies Inc.

List of Equipment

Earthworks Pacific, Inc. – Kekaha Sanitary Landfill

EPG Job # 11-10293

- 1 each L950PT
EPG PumpMaster Control Panel, UL listed, 460V, 3PH, NEMA 4X stainless steel enclosure, to operate 2 ea. 5 HP submersible pump motors in lead/lag alternating mode, with LevelMaster level control meter and simulator, Variable Frequency Drives (VFDs), flow meter display for 3" SCH80 PVC flow sensor, high level alarm, red panel mounted alarm light and output, 4-20 mA output to second meter for low level alarm, red panel mounted alarm light and output, lagoon full shut down dry input contact with pass along output, red panel mounted alarm light, VFD fault output contacts, red panel mounted alarm lights, and red top mounted common alarm light. ✓
- 2 each VSD 30-2 ✓ 0V
EPG SurePump, patented, stainless steel Vertical Sump Drainer, size 4, with 5 HP, 460 V, 3PH motor, 25' of jacketed 12-4 CP motor lead, and 25' of 3/16" stainless steel suspension cable and clamps. ✓
- 1 each BJB525
EPG Breakout Box, NEMA 4X non-metallic enclosure for 2 ea. motor leads, includes connection terminals.
- 1 each BJBO905B
EPG Breakout Box, NEMA 4X non-metallic for 1 ea. level sensor, 1 ea. flow sensor, and 1 ea. leak detection sensor. Includes desiccant dryer, bellows, and connection terminals.
- 2 each DGRN3012174X17S
EPG 3" Guide Rail Disconnect System, for bottom mount, includes 1-SPDS5 disconnect, 1-standoff & 1-top bracket, 1-SD foot, fastner kit and 2 ea. 1.25" stainless steel guide rails 14.5' long. ✓
- 2 each DP300102W30E30
EPG Discharge Pipe, 3" stainless steel, 8.5' long, with FNPT inlet end, 90 deg. MNPT discharge end, and lifting bail.
- 1 each FMA30024M30M30B
EPG Duplex Force Main Adapter, 3" stainless steel, with 2 ea. check valves, 2 ea. ball valves, tee, and MNPT inputs, and 3" FNPT outlet.

VS.
VSD 5-3
in sheet 10
VSD 2-2
on sheet 8
REVISED BY
APPENDIX 2.

EPG Companies Inc.

- ✓ 1 each ASLD-YH25
EPG Leak Detection Sensor, 1/2" MNPT, stainless steel, with 25' lead.

- 1 each Stilling Well
EPG Stilling Well, 1.25" X 15' SCH40 PVC, with adaptor, bulkhead fitting, bushing, and cord restraint.

- 1 each LG-011C-025
EPG Submersible Level Sensor, 0-11', 4-20 mA, built-in lightning arrester, with 25' Hytrel lead.

- 1 each L950PT
EPG PumpMaster Control Panel, UL listed, 460V, 3PH, NEMA 4X stainless steel enclosure, to operate 2 ea. 5 HP submersible pump motors in lead/lag alternating mode, with LevelMaster level control meter and simulator, Variable Frequency Drives (VFDs), flow meter display for 3" SCH80 PVC flow sensor, high level alarm, red panel mounted alarm light and output, 4-20 mA output to second meter for low level alarm, red panel mounted alarm light and output, lagoon full shut down dry input contact with pass along output, red panel mounted alarm light, VFD fault output contacts, red panel mounted alarm lights, and red top mounted common alarm light.

- ✓ 2 each VSD 30-2
EPG SurePump, patented, stainless steel Vertical Sump Drainer, size 4, with 5 HP, 460 V, 3PH motor, 25' of jacketed 12-4 CP motor lead, and 25' of 3/16" stainless steel suspension cable and clamps.

- 1 each BJBP525
EPG Breakout Box, NEMA 4X non-metallic enclosure for 2 ea. motor leads, includes connection terminals.

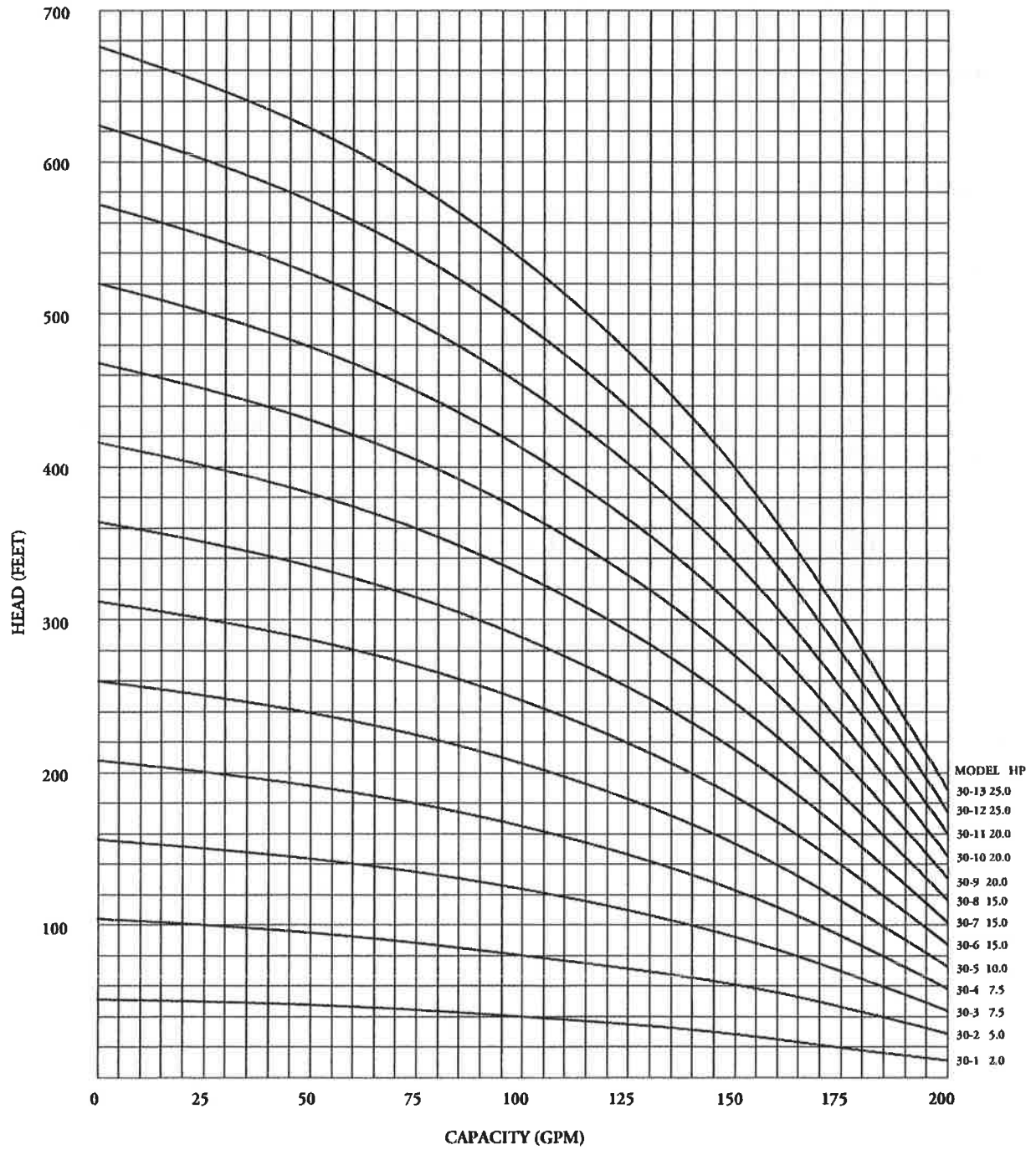
- 1 each BJBO905B
EPG Breakout Box, NEMA 4X non-metallic for 1 ea. level sensor, 1 ea. flow sensor, and 1 ea. leak detection sensor. Includes desiccant dryer, bellows, and connection terminals.

- 2 each DGRN3012144X17S
EPG 3" Guide Rail Disconnect System, for bottom mount, includes 1-SPDS5 disconnect, 1-standoff & 1-top bracket, 1-SD foot, fastner kit and 2 ea. 1.25" stainless steel guide rails 12' long.

EPG Companies Inc.

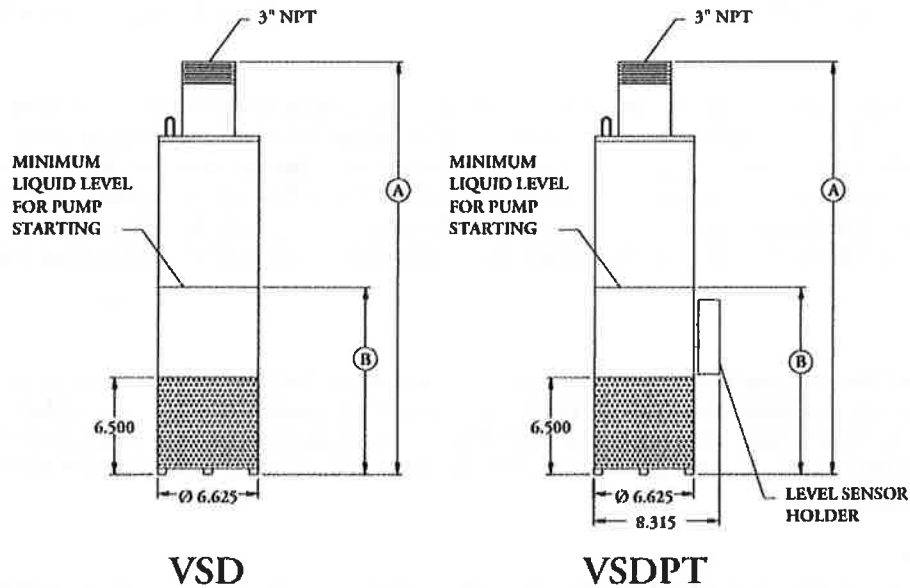
- 2 each DP300072W30E30
EPG Discharge Pipe, 3" stainless steel, 6' long, with FNPT inlet end, 90 deg. MNPT discharge end, and lifting bail.
- 1 each FMA30024M30M30B
EPG Duplex Force Main Adapter, 3" stainless steel, with 2 ea. check valves, 2 ea. ball valves, tee, and MNPT inputs, and 3" FNPT outlet.
- 1 each ASLD-YH25
EPG Leak Detection Sensor, 1/2" MNPT, stainless steel, with 25' lead. ✓
- 1 each Stilling Well
EPG Stilling Well, 1.25" X 12' SCH40 PVC, with adaptor, bulkhead fitting, bushing, and cord restraint.
- 1 each LG-011C-025
EPG Submersible Level Sensor, 0-11', 4-20 mA, built-in lightning arrestor, with 25' Hytrel lead.
- 2 each EP30P08M30M30S
EPG Flow Sensor, 3", SCH 80 PVC, MNPT ends, and paddlewheel sensor with 25' lead.

SERIES 30 SurePump™
 Flow Range 50-200 GPM
 60 Hz



DATA SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 30 SIZE 6 VERTICAL SUMP DRAINER



VSD

VSDPT

MODEL	HP	PHASE	A	B	*APPROX. SHIPPING WEIGHT*	
					VSD	VSDPT
30-1	2.00	1	42.54	31	106.13	111.13
30-1	2.00	3	41.04	30	101.50	106.50
30-2	5.00	1	60.84	46	150.93	155.93
30-2	5.00	3	54.84	40	144.43	149.43
30-3	7.50	3	58.82	40	201.74	206.74
30-4	7.50	3	62.62	40	207.85	212.85
30-5	10.00	3	67.62	41	223.26	228.26

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
 VSD: CRATE, 50' OF 12-4 MOTOR LEAD, 50' OF 3/16" SS CABLE.
 VSDPT: CRATE, 50' OF 12-4 MOTOR LEAD, 50' OF 3/16" SS CABLE,
 LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

EPG VSD SurePump™ Vertical Sump Drainer

Furnish 4 centrifugal submersible EPG VSD SurePump Vertical Sump Drainer(s) (U.S. patented), Model VSD 30 - 2 with 2 impeller stages. Each unit shall be suitable for vertical (or horizontal) installation. Each unit shall be equipped with a 5 HP, submersible electric motor for operation on 460 Volts, 3 phase, 60 Hertz service with 25 feet of power cable. Each SurePump Vertical Sump Drainer shall have a 3 inch MNPT threaded discharge nozzle and be capable of delivering 150 GPM at 60 feet of TDH. Each SurePump will be fitted with 25 feet of stainless steel lifting cable of sufficient strength to raise and lower the pump unit.

DESIGN

Each SurePump Vertical Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, condensate, and purge applications. The Sump Drainer shall permit "pump down" to within 10 inches of the sump or wet well bottom without any loss of performance or damage to the pump. External "priming" shall not be required nor allowed. The Sump Drainer shall be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS

Major components shall be made of 304 stainless steel. The seal rings and bearings are to be made of E-Glide™. In addition, all fasteners shall be 304 stainless steel.

CHECK VALVE

Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT

The shaft shall be of 304 stainless steel and rotate on E-Glide™ bearings that are product lubricated.

DIFFUSER CHAMBER

The diffuser chambers for each impeller shall be of 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS

The impeller(s) shall be closed and consist of 304 stainless steel.

MOTOR

The motor shall be a submersible, hermetically sealed Franklin motor in Sand Fighter construction. The motor shall be designed for continuous duty, capable of sustaining up to 100 starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in ½ HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE

The lead wire shall be no-splice with EPG's "CP" waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified.

Materials of Construction

EPG SurePump™

	STANDARD
Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Check Valve Seat	E-Glide™
Diffuser Chamber	304 Stainless Steel
Impeller Seal Ring	E-Glide™
Impeller	304 Stainless Steel
Motor Adapter	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Pump Shaft	304 Stainless Steel
Coupling	329/420/431 Stainless Steel
Fasteners	304 Stainless Steel
Bearings	E-Glide™

FRANKLIN ELECTRIC MOTORS

	1/3 to 2 HORSEPOWER	3 to 60 HORSEPOWER
End Bell Castings	304 Stainless Steel over Iron	304 Stainless Steel over Iron
Stator Shell	301 Stainless Steel	301 Stainless Steel
Shaft Extension	303 Stainless Steel	303 Stainless steel
Fasteners	316 Stainless Steel	300 Stainless Steel
Seal Cover	Tefzel	Sintered Bronze
Shaft Seal	Viton	Viton, Carbon, Ceramic Face Seal
Diaphragm	Viton	Nitrile Rubber
Diaphragm Plate	304 Stainless Steel	304 Stainless Steel
Diaphragm Spring	302 Stainless Steel	302 Stainless Steel
Diaphragm Cover	316 Stainless Steel	304 Stainless Steel
Slinger	Viton	Nitrile Rubber
Lead Sleeve	316 Stainless Steel	316 Stainless Steel
Lead Jam Nut	316 Stainless Steel	N/A
Lead Jam Clamp	N/A	300 Stainless Steel
Lead Potting	Epoxy	Epoxy
Lead Bushing	Viton	Viton

ENGINEER'S SPECIFICATION

EPG Series L950PT PumpMaster™ Controller 3Ø CONTROL PANEL

Furnish one EPG Companies Inc., UL listed 508A/698A, Series L950PT controller to alternate the operation of two pump motors and auxiliary equipment in manual or automatic mode. The control panel enclosure shall be NEMA type 4X Stainless Steel.

The enclosure shall be equipped with a window in the outer door, an inner door, a stainless steel drip shield, and a tamper resistant latch. The NEMA 4 (standard) enclosure is finished with polyester urethane paint. The NEMA 4X (optional) enclosure can be either stainless steel or non-metallic.

The control system will operate from a 460 Volt, 60 Hertz, three phase power supply. Pump control components will be sized to operate pump motors of specified horsepower.

The control panel shall include the following as standard features:

- * **Main Disconnect Switch:** The main disconnect switch shall be 40 Amp rated and will prevent opening of control panel while power is on, and includes 460 Volt, 20 & 20 Amp dual element fuses.
- * **"Hand-Off-Auto" Selector Switches:** Allow manual or automatic operation. The selector switches shall be heavy duty, oil tight, NEMA 4 rated switches mounted on the inner door. The hand position shall be momentary with a spring return.
- * **Motor Starters:** The motor starters shall be sized to the pump motor horsepower, and shall be equipped with built in single phasing protection and ambient compensated, quick trip adjustable thermal overloads.
- * **Control Transformer:** Transformer with fused primary shall isolate control circuit from power circuit and provide easier and safer field wiring of accessories. It shall lower incoming voltage to 120 Volts.
- * **Run Lights:** Indicate energization of motor circuit. They shall be heavy duty, oil tight, NEMA 4 rated and shall have LED lamps with 100,000 hour life. The lights shall be mounted on the inner door and will be green in color.
- * **Motor Overload Lights:** Indicate motor not running due to overload condition. They shall be heavy duty, oil tight, NEMA 4 rated and shall have LED lamps with 100,000 hour life. The lights shall be mounted on the inner door and will be red in color.
- * **Electronic Alternator:** The electronic alternator shall include lead/lag pump operation to equalize wear on pump motors by alternating successive starts. The lag pump shall start after the lead pump starts if the liquid level continues to rise above the pump start level set point and both pumps will continue to run until the liquid level decreases to the pump stop level set point as sensed by the pressure transmitter.
- * **LevelMaster™ Level Control:** The LevelMaster level control meter shall be mounted on the inner door. The meter shall have a digital readout and the capability to monitor and maintain pumping operations as well as output a high level alarm. It shall also provide a high-high level alarm fail-safe feature that shuts off the pump motors. The high-high level alarm may indicate level sensor failure or a problem with a pump(s). Level control shall be accurate to within 0.1 inch.
- * **Level Simulator:** The level simulator shall be mounted on the inner door. The level simulator is a built-in test circuit designed to simulate a 4-20 mA load to assist in level setup and troubleshooting.
- * **Intrinsically Safe Barriers:** The level sensor circuits shall be by protected by intrinsically safe barriers.

- * Heater with Adjustable Thermostat: A heater with adjustable thermostat shall promote even distribution of heat and elimination of hot spots and condensation. Heater element shall be mounted in the space between the sub-panel and the back of the enclosure and provide a minimum of 100 square inches of heating area.
- * Lightning Arrestor: Shall be grounded, metal-to-metal, to water strata.
- * Terminal Strip: Labeled and numbered terminal strip provides easy connection of external components.
- * Corrosion Inhibitor Emitter: Inclusion of an industrial corrosion inhibitor emitter shall protect internal components of control panel from corrosion for up to one year and shall be replaceable.
- * Options are available to meet specific needs.

SYSTEM LOGIC AND FUNCTION

The controller is designed to operate two pumps in lead/lag alternating mode. The electric alternator provides equalized wear and usage of each pump by alternating successive starts. The lead pump starts at the pump start level set point and continues to run until the liquid level decreases to the pump stop level set point as programmed in the LevelMaster level control meter. The lag pump will start after the lead pump starts if the liquid level continues to rise above the pump start level set point and both pumps will continue to run until the liquid level decreases to the pump stop level set point as sensed by the pressure transmitter. If the liquid level rises to the high level alarm set point, a high level alarm will be annunciated. If a motor trips while running due to an overload condition, the other pump will start automatically. The pressure transmitter level sensor shall have a range of 0 to 11 feet with a 4-20 mA output signal.

ATTACHMENT TO BULLETIN 0080b

ENGINEER'S SPECIFICATION

EPG L950PT Controller

3Ø Control Panel

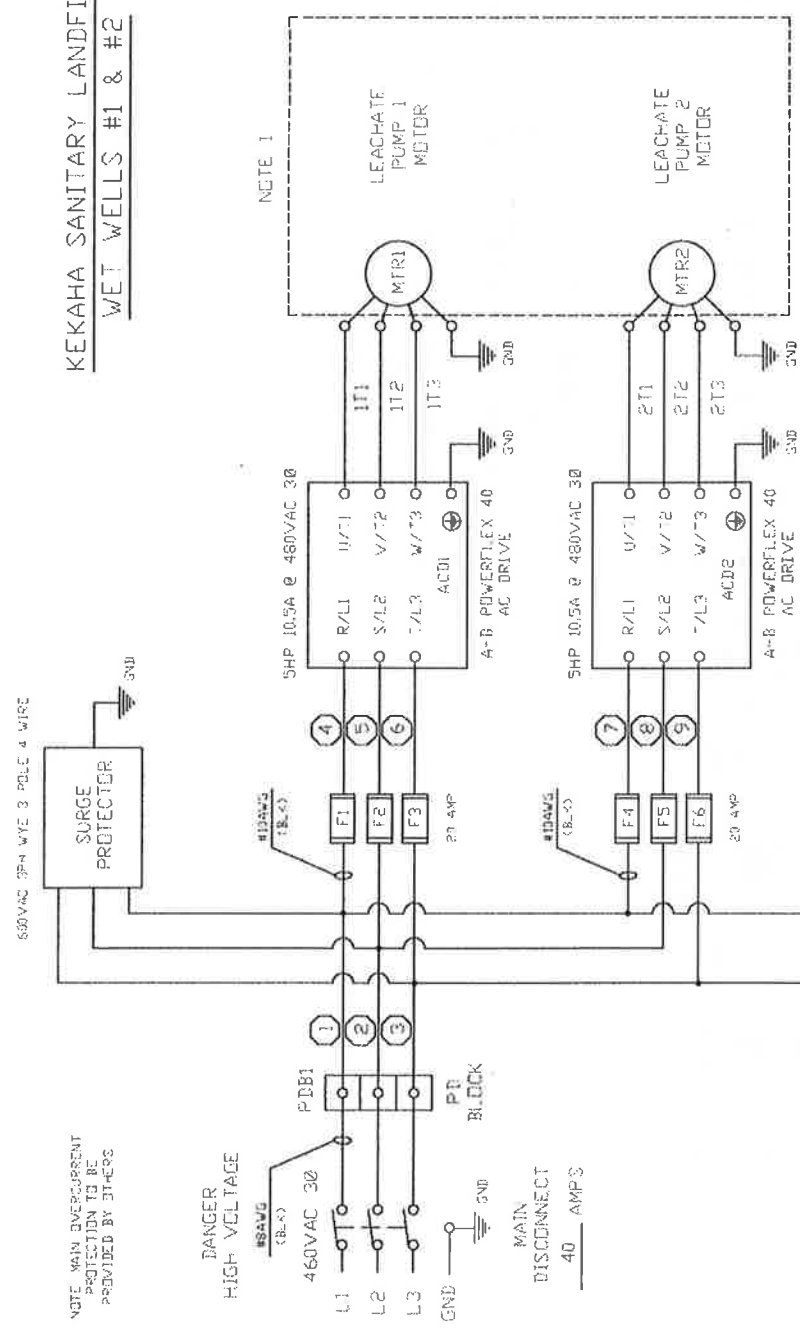
EPG Job #10-10293

These controllers include the following optional features:

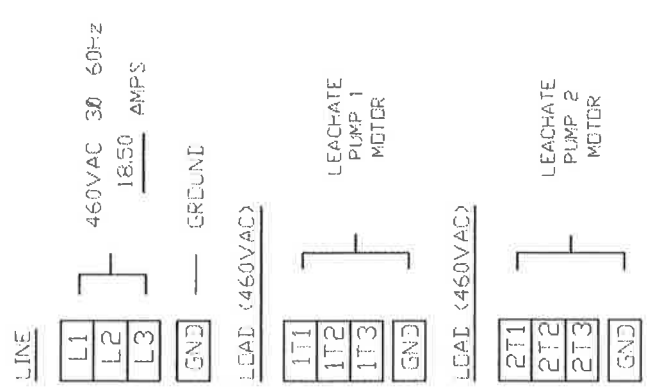
- Variable Frequency Drives (VFDs).
- Flow meter display for 3" SCH80 PVC flow sensor.
- High level alarm.
- Red panel mounted alarm light and output.
- 4-20 mA output to second meter for low level alarm.
- Red panel mounted alarm light and output.
- Lagoon full shut down dry input contact with pass along output.
- Red panel mounted alarm light.
- VFD fault output contacts.
- Red panel mounted alarm lights.
- Red top mounted common alarm light.

MOTOR	HP	VOLTAJE	FLA	FUSE SIZE
LEACHATE PUMP 1	5	460	8.0	20A
LEACHATE PUMP 2	5	460	8.0	20A

KEKAHA SANITARY LANDFILL WET WELLS #1 & #2



FIELD WIRING TERMINALS



IMPORTANT NOTE: SEE AC DRIVE USER'S MANUAL FOR MINIMUM MOUNTING CLEARANCES

FUSE	TYPE	RATING
F1-F3	LPJ-SP	20
F4-F6	LPJ-SP	20
F7-F8	LPJ-SP	1-B/10
F9	FNM	5
F10	MDL	1/4

FOR NOTES AND REVISIONS SEE SHEET 11

JOB No. 11-10293AB

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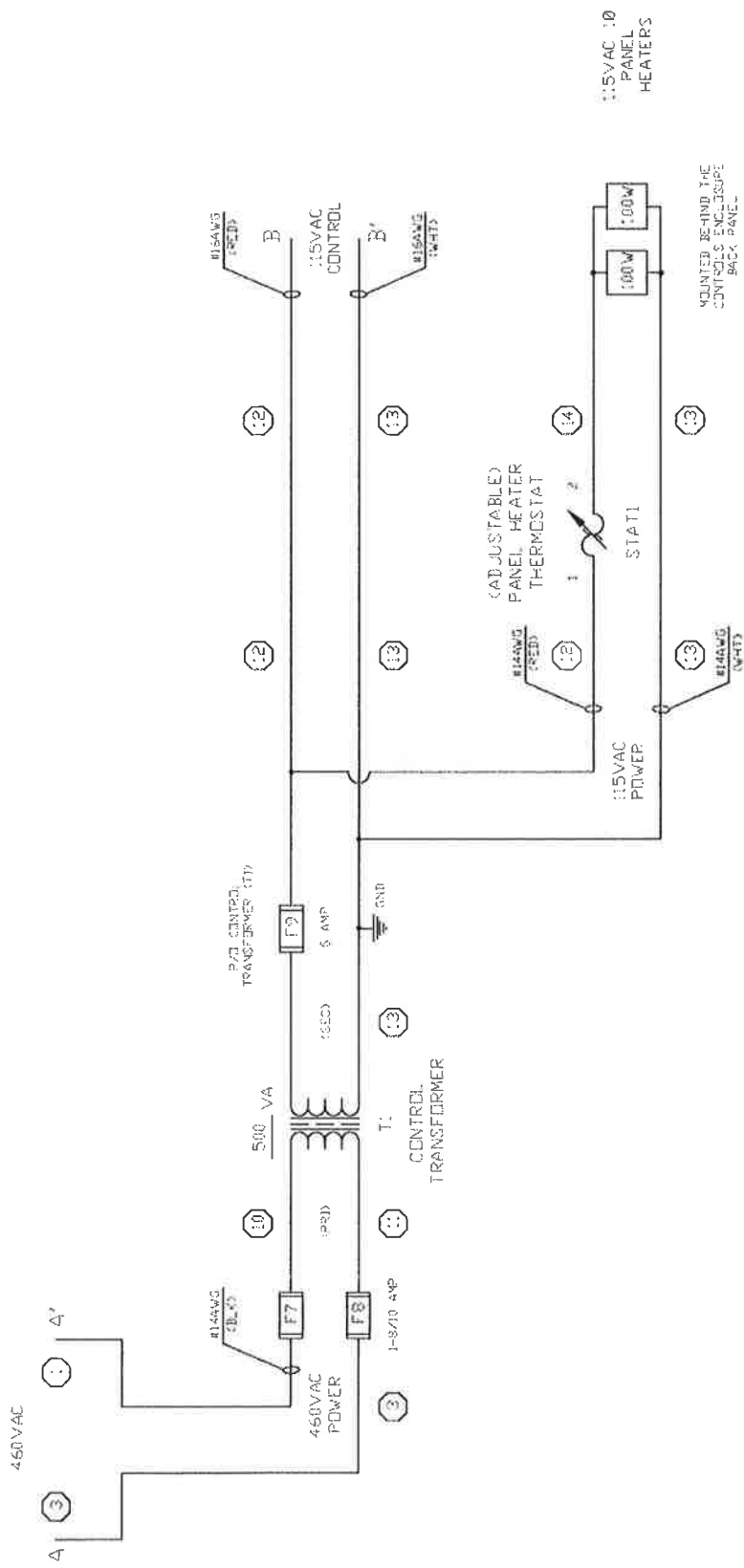
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EPC COMPANIES

1950PT. CONTROL PANEL
460VAC 3Ø SH 1 OF 11

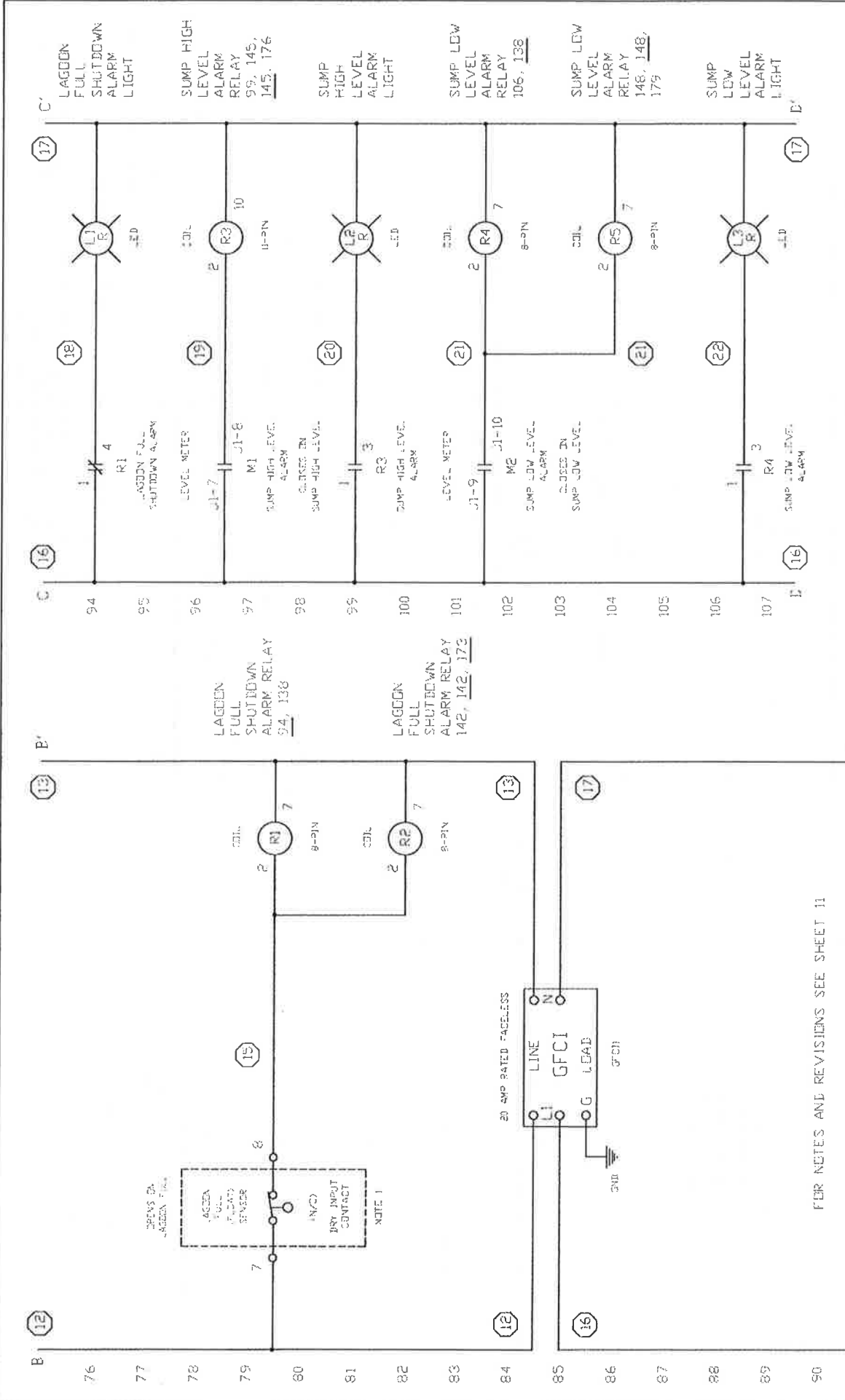
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PROJECT: 10.73-0250



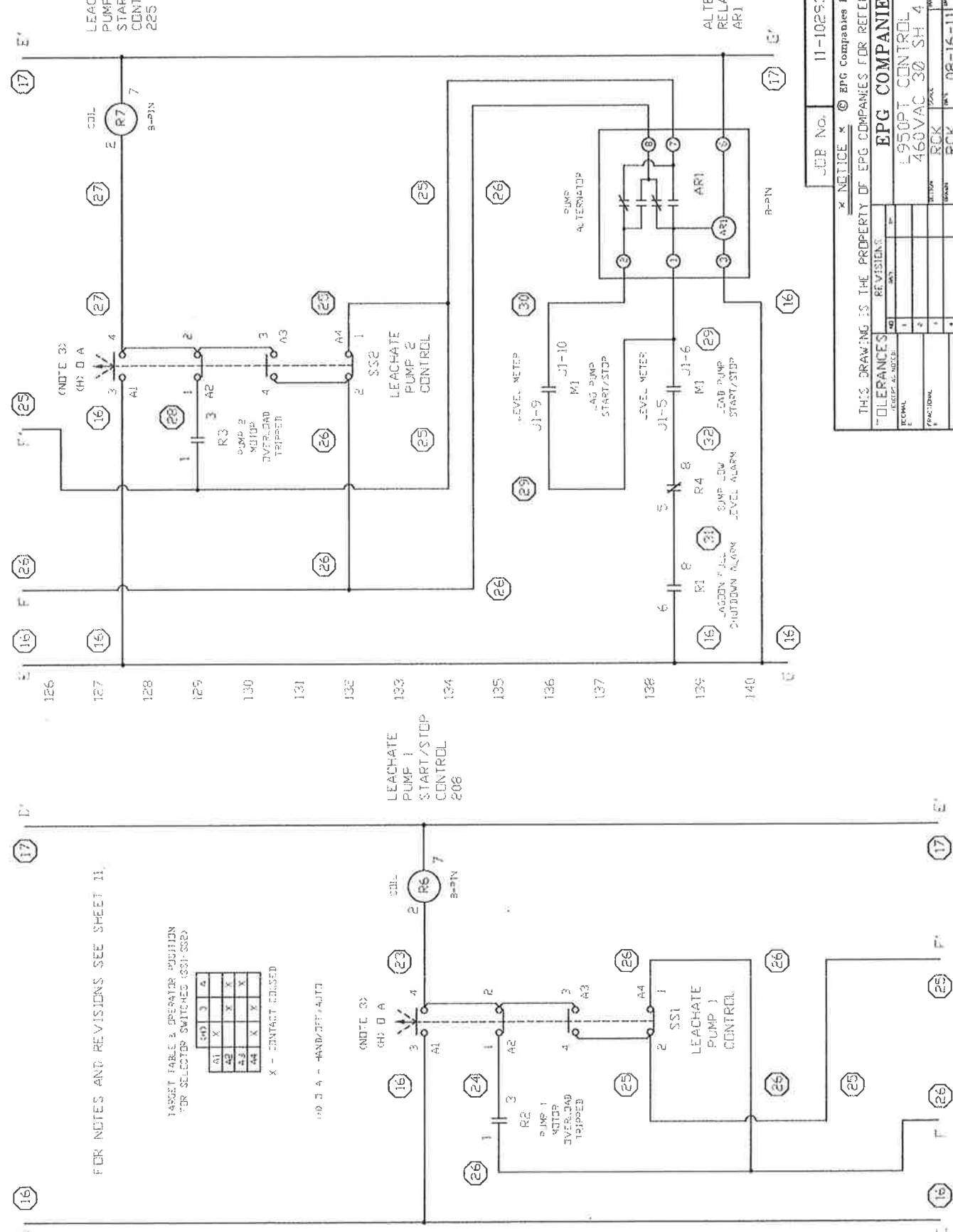
FOR NOTES AND REVISIONS SEE SHEET 11

JOB No.		11-10293AB	
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SHEET NO.		TOTAL SHEETS	
EPG COMPANIES 1950PT CONTROL PANEL 460VAC 3Ø SH 2 OF 11			
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PROJECT NO.		JOB NO.	
SHEET NO.		TOTAL SHEETS	
		10:73-0251	



FOR NOTES AND REVISIONS SEE SHEET 11

JOB No. 11-10293AB	
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EPG COMPANIES	
1950PT CONTROL PANEL	
460VAC 3Ø SH 3 OF 11	
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FOR NOTES AND REVISIONS SEE SHEET 11.

TABLE 1. OPERATOR POSITION FOR SELECTOR SWITCHES (SS1-SS2)

SS1	SS2	A
A1	X	X
A2	X	X
A3	X	X
A4	X	X

X - CONTACT CLOSED

NO 3 4 - HAND/OFF/AUTO

JOB NO. 11-10293AB

NOTICE: THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.

EPG COMPANIES
L950PT CONTROL PANEL
460VAC 3Ø SH. 4 OF 11

REVISIONS

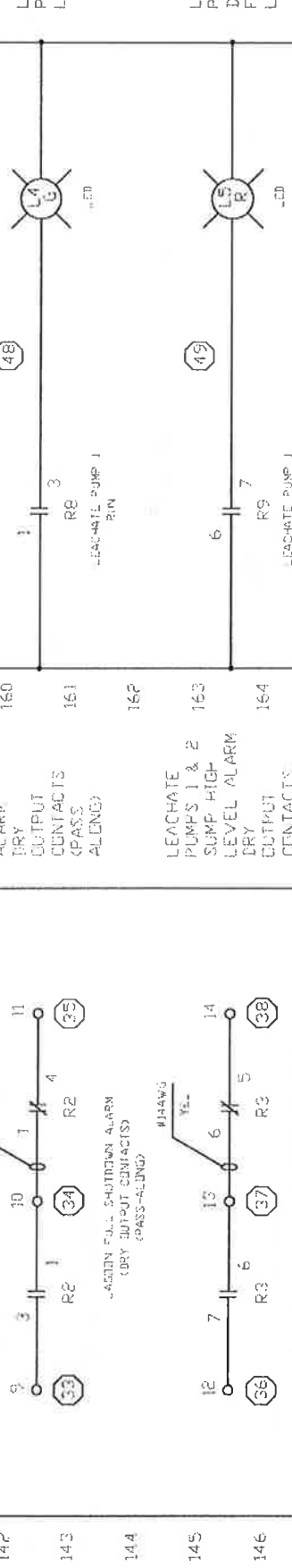
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TOLERANCES UNLESS OTHERWISE SPECIFIED:
 DIMENSIONAL: ±0.005
 HOLE: ±0.005
 MILL: ±0.005

DATE: 08-16-11
 DRAWN BY: WFP
 CHECKED BY: WFP
 PROJECT NO: 10173-0253

161 160 159 H 17 16 G

LEACHATE PUMP 1 RUN LIGHT
LEACHATE PUMP 1 AC DRIVE FAULT LIGHT
LEACHATE PUMP 2 RUN LIGHT
LEACHATE PUMP 2 AC DRIVE FAULT LIGHT



LEACHATE PUMP 1 RUN
LEACHATE PUMP 1 AC DRIVE FAULT
LEACHATE PUMP 2 RUN
LEACHATE PUMP 2 AC DRIVE FAULT

LEACHATE PUMP 1 RUN
LEACHATE PUMP 1 AC DRIVE FAULT
LEACHATE PUMP 2 RUN
LEACHATE PUMP 2 AC DRIVE FAULT

LEACHATE PUMP 1 RUN
LEACHATE PUMP 1 AC DRIVE FAULT
LEACHATE PUMP 2 RUN
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LEACHATE PUMP 1 RUN
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LEACHATE PUMP 1 RUN
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LEACHATE PUMP 1 RUN
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LEACHATE PUMP 2 AC DRIVE FAULT

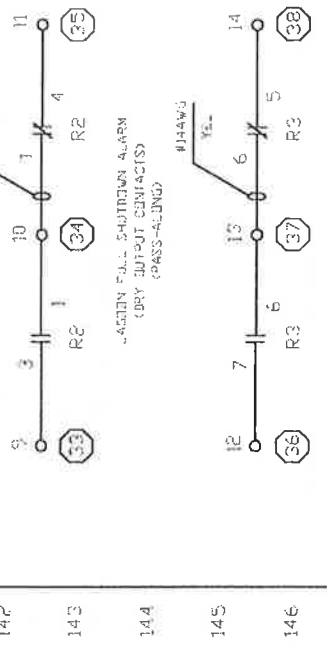
LEACHATE PUMP 1 RUN
LEACHATE PUMP 1 AC DRIVE FAULT
LEACHATE PUMP 2 RUN
LEACHATE PUMP 2 AC DRIVE FAULT

LEACHATE PUMP 1 RUN
LEACHATE PUMP 1 AC DRIVE FAULT
LEACHATE PUMP 2 RUN
LEACHATE PUMP 2 AC DRIVE FAULT

LEACHATE PUMP 1 RUN
LEACHATE PUMP 1 AC DRIVE FAULT
LEACHATE PUMP 2 RUN
LEACHATE PUMP 2 AC DRIVE FAULT

141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 G H 17 16

CAUTION YELLOW WIRES ARE SUPPLIED BY A FOREIGN VOLTAGE (SOURCE OUTSIDE THE ENCLOSURE)



LEACHATE PUMP 1 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 RUN (DRY OUTPUT CONTACTS)

LEACHATE PUMP 2 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

LEACHATE PUMP 1 RUN (DRY OUTPUT CONTACTS)

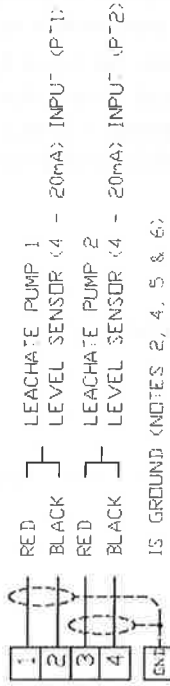
LEACHATE PUMP 1 AC DRIVE FAULT (DRY OUTPUT CONTACTS)

FOR NOTES AND REVISIONS SEE SHEET 11

JOB No.		11-10293AB	
NOTICE © EPC Companies Inc. 2011			
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TOLERANCES UNLESS NOTED OTHERWISE			
NO.	DATE	BY	REVISIONS
1			
2			
3			
4			
5			
EPC COMPANY		EPC COMPANIES	
1950PT CONTROL PANEL		1950PT CONTROL PANEL	
460VAC 3Ø SH 5 OF 17		460VAC 3Ø SH 5 OF 17	
DATE	SCALE	REVISED	BY
06-16-11	RCK	06-16-11	RCK
10173-0254			

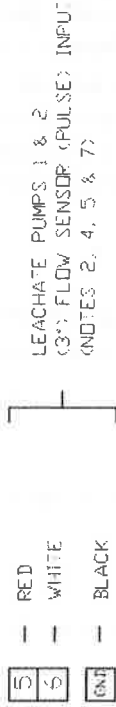
FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)

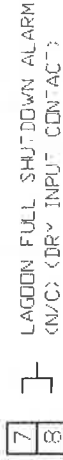


P - PRESSURE TRANSDUCER

FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



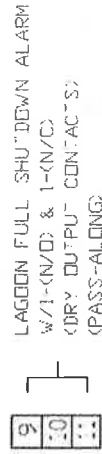
LEVEL SENSOR (DRY INPUT CONTACT)



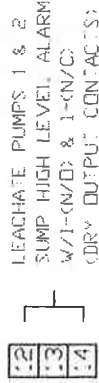
LOAD (115VAC)



TANK FULL ALARM (DRY OUTPUT CONTACTS)

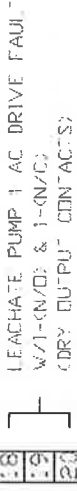
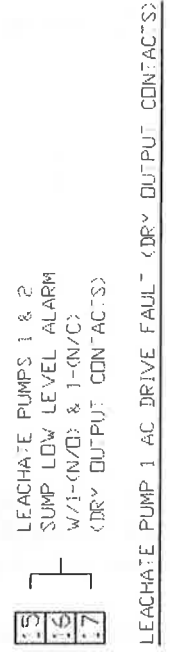


SUMP HIGH LEVEL ALARM (DRY OUTPUT CONTACTS)

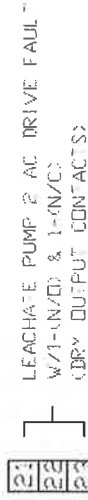


FIELD WIRING TERMINALS

SUMP LOW LEVEL ALARM (DRY OUTPUT CONTACTS)



LEACHATE PUMP 2 AC DRIVE FAULT (DRY OUTPUT CONTACTS)



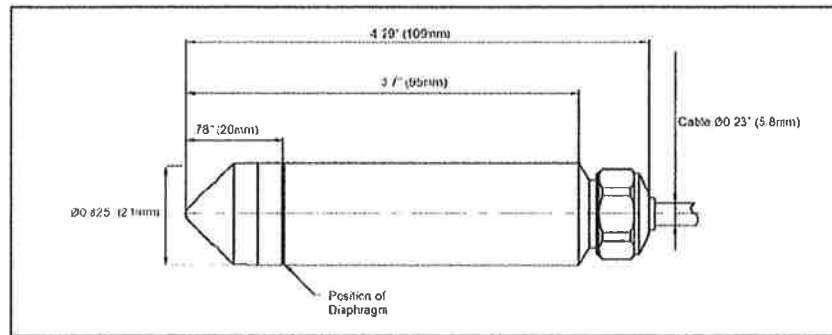
NOTES:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS HAZARDOUS LOCATIONS, ANSI/ISA-81.01-1987, SECTION 4.5.4
3. SELECTOR SWITCHES (SS1-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION
4. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
5. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
6. MAXIMUM CABLE LENGTH TO THE LEVEL SENSORS (PT1-PT2) IS 3000 FEET
7. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR (M3) IS 500 FEET

JOB No.		11-10293AE	
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TOLERANCES		REVISIONS	
UNLESS SPECIFIED	AS NOTED	NO	DATE
1			
2			
FUNCTION		BY	DATE
1		RCK	08-16-11
2		RCK	08-16-11
APPROVAL		DATE	TIME
			10:73-0260
EPG COMPANIES			
1950PT CONTROL PANEL			
460VAC 3Ø SH 11 OF 11			

ENGINEER'S SPECIFICATION

EPG LG & LGP Submersible Level Transmitters



GENERAL FEATURES

- * **Application:** The EPG LG & LGP transmitters are designed to work with the EPG SurePump™, but their durability, accuracy and weight make them the logical choice for stand alone level applications. The chemical resistant jacketed cable contains a vent tube for atmospheric pressure compensation and the sensor has built-in lightning protection with a lifetime warranty.
- * **Ranges Available:** 0-3' through 0-900' models are standard. Call EPG for other available ranges.
- * **Accuracy:** The LG & LGP transmitters have built-in temperature compensation as well as precise calibration giving an accuracy of $\pm 1.0\%$ and $\pm .5\%$ respectively.
- * **Fully Submersible:** The LG & LGP transmitters are fully submersible in any liquid compatible with 316L stainless steel and the chemical resistant polyester cable jacket. It is designed for submergence at depths greater than operating level without sustaining damage. Call EPG for more severe service.
- * **Superior Noise Immunity:** Designed for heavy duty use in hostile environments, the LG & LGP transmitters give outstanding noise immunity. Unlike transducers, whose signals may be distorted by outside interference, the LG & LGP transmitters utilize a conditioned compensated 4-20 mA output to maximize signal strength and accuracy. The transmitters also features shielded leads to help prevent signal disruption from outside sources.

PERFORMANCE

- * **Depth Range:** 0-3' thru 0-900' (0-2 PSI thru 0-390 PSI)
- * **Static Accuracy¹:** LG Model $\pm 1.0\%$ FS TEB / LGP Model $\pm .50\%$ FS TEB
- * **Proof Depth:** 2.0 X rated depth
- * **Resolution:** 0.002%FS

1. TEB: Total Error Band, Includes the combined effects of non-linearity, hysteresis and non-repeatability as well as thermal dependencies, over the entire compensated temperature range.

ELECTRICAL

- * **Excitation:** 10 to 28 VDC, Red = (+) excitation, Black = (-) excitation
- * **Input Current:** 20 mA maximum
- * **Output:** 4-20 mA (2 wire)

ELECTRICAL (cont.)

- * Zero offset (max): 4 mA, ±.10mA
- * Output impedance: <10 ohms
- * Insulation resistance: 100 megohms at 50VDC
- * Circuit protection: Polarity, surge, shorted output and lightning protection
- * Electrical termination: 2-24 AWG conductors in a shielded cable with sensor breather and polyester jacket

Addition of Option-009 or internal only protection (standard on all 4-20mA pressure transmitters) increases the minimum-required supply voltage, on account of internal resistance of the surge protectors. In addition, cable resistance* adds to the supply requirement. In order to insure proper system operation, calculate the minimum required supply voltage (at the source) as follows:

For two-part (internal + external) system (recommended):

$$\text{MINIMUM SUPPLY VOLTAGE} = 10.75 + 0.025 (\text{CABLE LENGTH} \times 0.07) \text{ VDC}$$

For internal only protector (standard with 4-20mA output):

$$\text{MINIMUM SUPPLY VOLTAGE} = 9.65 + 0.025 (\text{CABLE LENGTH} \times 0.07) \text{ VDC}$$

ENVIRONMENTAL

- * Compensated temp range: 0° to 60°C
- * Operating temp range: -10° to 80°C

PHYSICAL

- * Dimensions: Nominal diameter of .825" X 4.29" length
- * Weight: 7 oz. (not including cable)
- * Cable: Polyester jacketed shielded cable with vent tube (Tefzel available)
- * Wetted materials: 316L SS, Polyamide, Fluorocarbon
- * Mounting provision: Suspended by cable

MODEL

Part # shown indicates ±1.0% accuracy, 4-20 mA output. Call EPG for other available options – specify length (---)

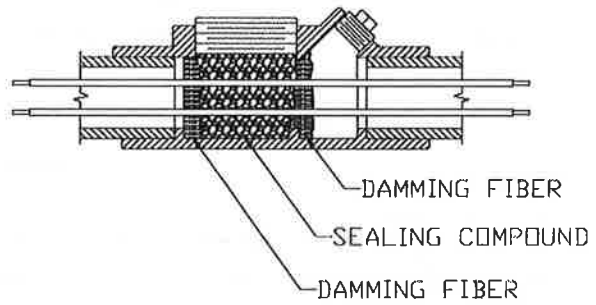
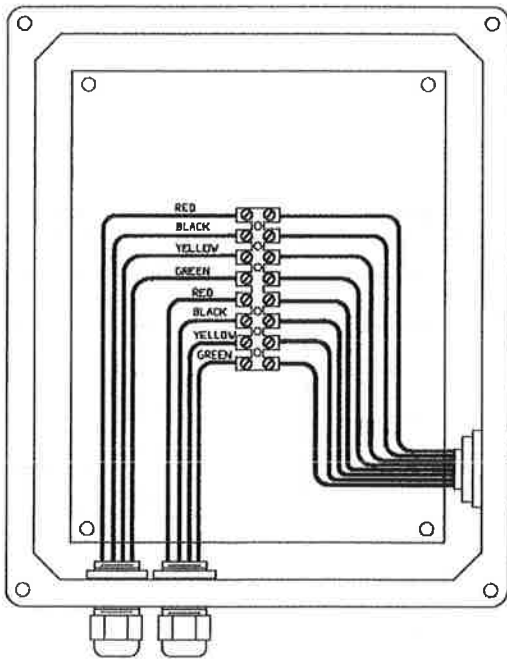
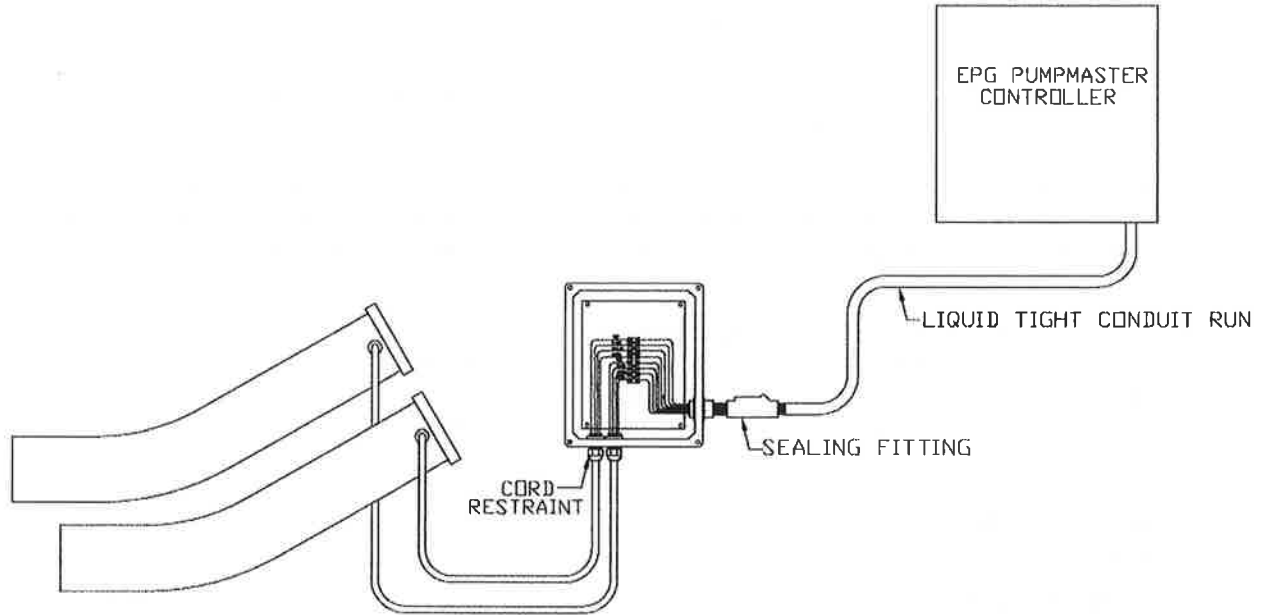
PART #	DESCRIPTION	RANGE
LG011C---	Submersible Level Transmitter	0-11'
LG016C---	" " "	0-16'
LG023C---	" " "	0-23'
LG035C---	" " "	0-35'
LG046C---	" " "	0-46'

OPTIONS

- * Drying Tube Assembly (Desiccant Dryer)
- * Bellows Assembly
- * Stabalizing Weight
- * Conduit Fitting
- * Breakout Junction Box

BJBP525

DUPLEX BREAKOUT JUNCTION BOX FOR MOTOR LEADS



3/4" FNPT

NOTE:

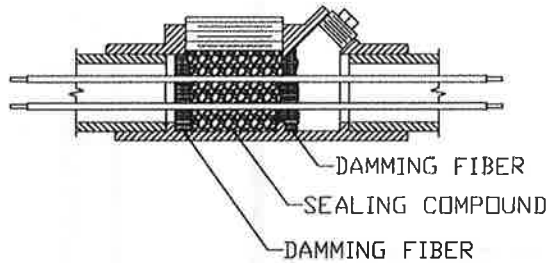
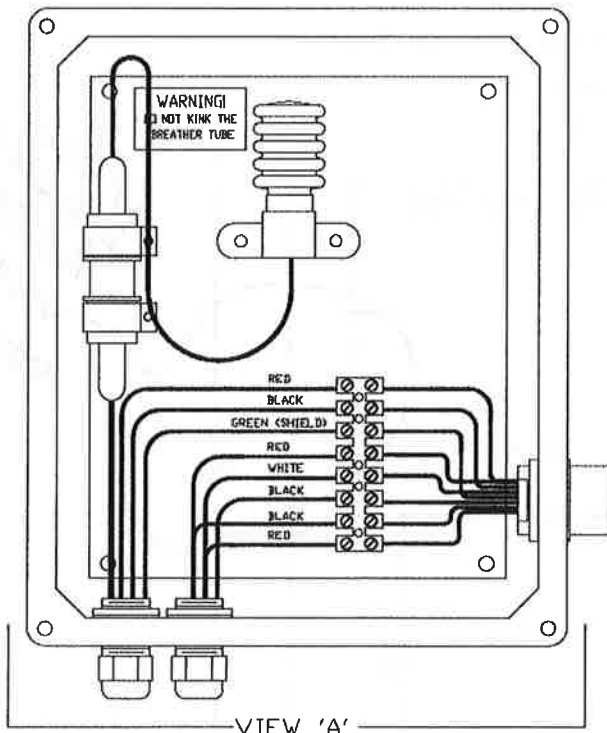
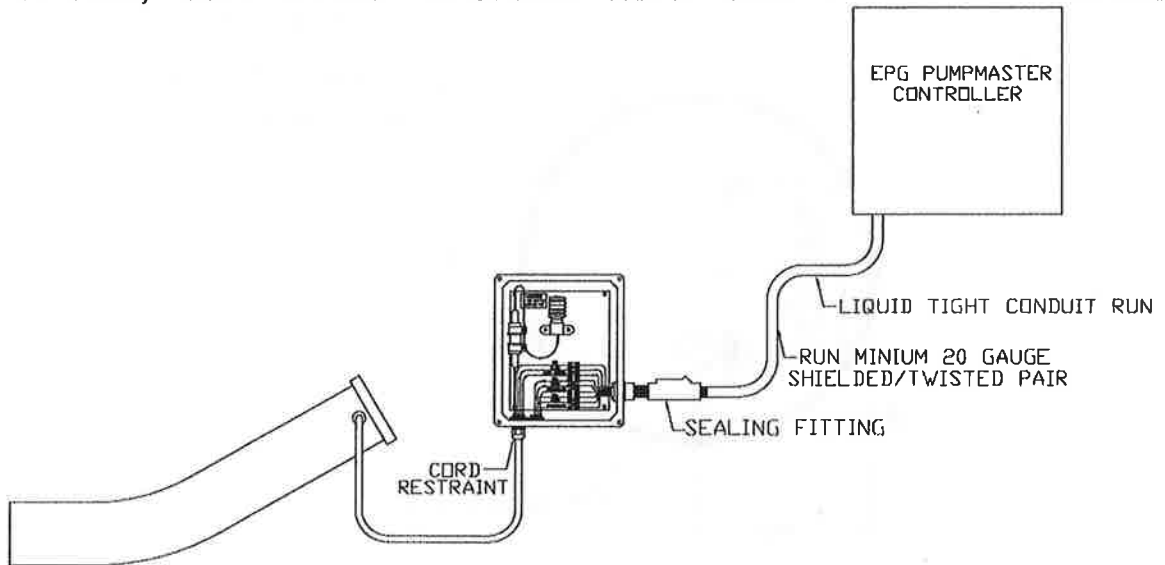
BOX DIMENSIONS (OUTER WALL):
10 3/4" X 8 3/4" X 6"

MOUNTING HOLES FOR 5/16" BOLT/SCREW,
12 1/8" X 6" CENTER TO CENTER, 4 PL.

* NOTICE * © EPG Companies Inc. 2002			
REFERENCE			
TOLERANCES		REVISIONS	
(EXCEPT AS NOTED)	NO.	DATE	BY
DECIMAL	1		
FRACTIONAL	2		
ANGULAR	3		
	4		
	5		
EPG COMPANIES		TYPICAL INSTALLATION	
DESIGN	R.C.C.	SCALE	NONE
DRAWN	R.C.C.	DATE	08/15/02
CHK'D		APP'D	
			DRAWING NO. 03626-0525

BJB0905B

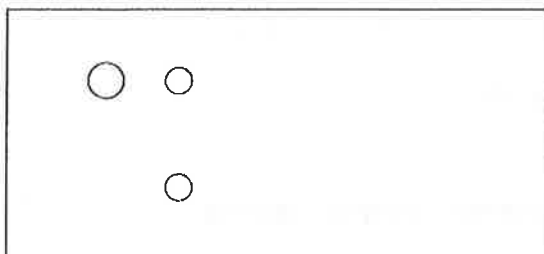
BREAKOUT JUNCTION BOX FOR
ONE LEVEL, ONE FLOW SENSOR AND ONE LEAK DETECTION



NOTE:

BOX DIMENSIONS (OUTER WALL):
10 3/4" X 8 3/4" X 6"

MOUNTING HOLES FOR 5/16" BOLT/SCREW,
12 1/8" X 6" CENTER TO CENTER, 4 PL.



* NOTICE * © EPG Companies Inc. 2002
REFERENCE

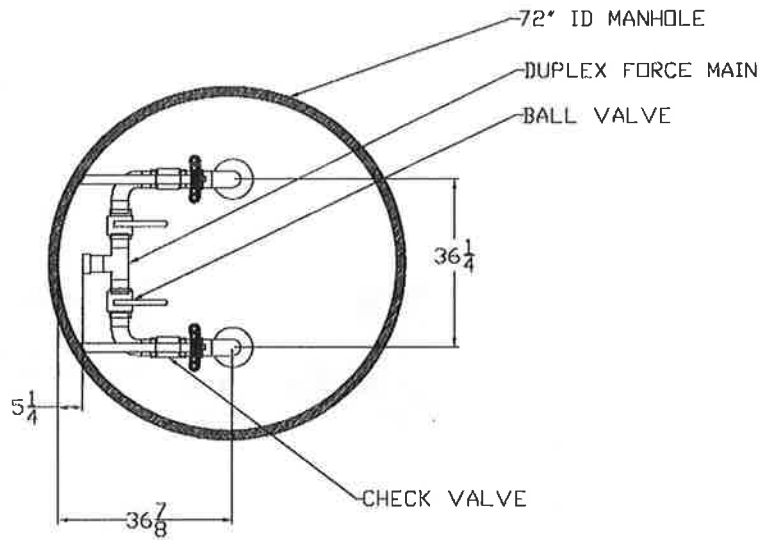
TOLERANCES (EXCEPT AS NOTED)	REVISIONS			EPG COMPANIES			
	NO.	DATE	BY	DESIGN	DRAWN	CHECKED	DATE
DECIMAL	1						
	2						
FRACTIONAL	3						
	4						
ANGULAR	5						

TYPICAL INSTALLATION

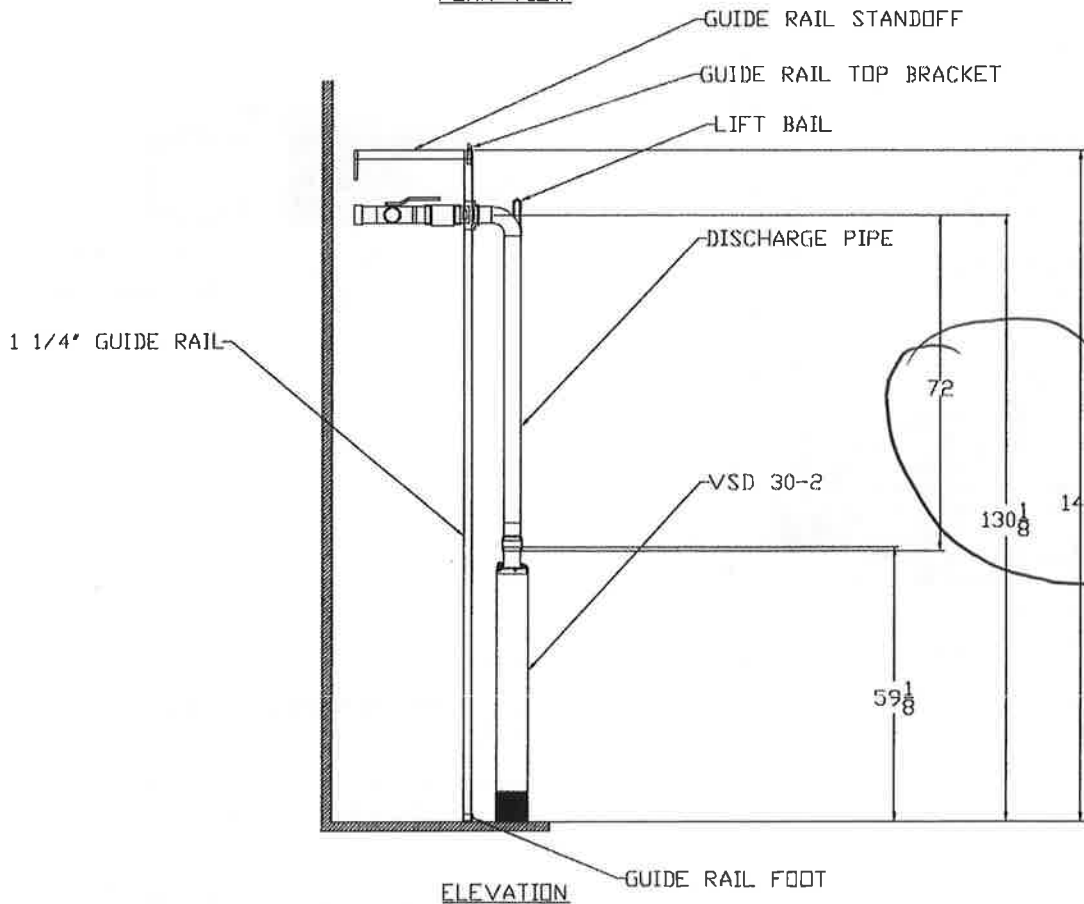
SCALE: NONE
DATE: 03/23/06
DRAWING NO: 02523-0905



KEKAHA SANITARY LANDFILL MECHANICAL SUBMITTAL DRAWING DUPLEX FORCE MAIN / DGRN GUIDE RAIL SYSTEM



PLAN VIEW



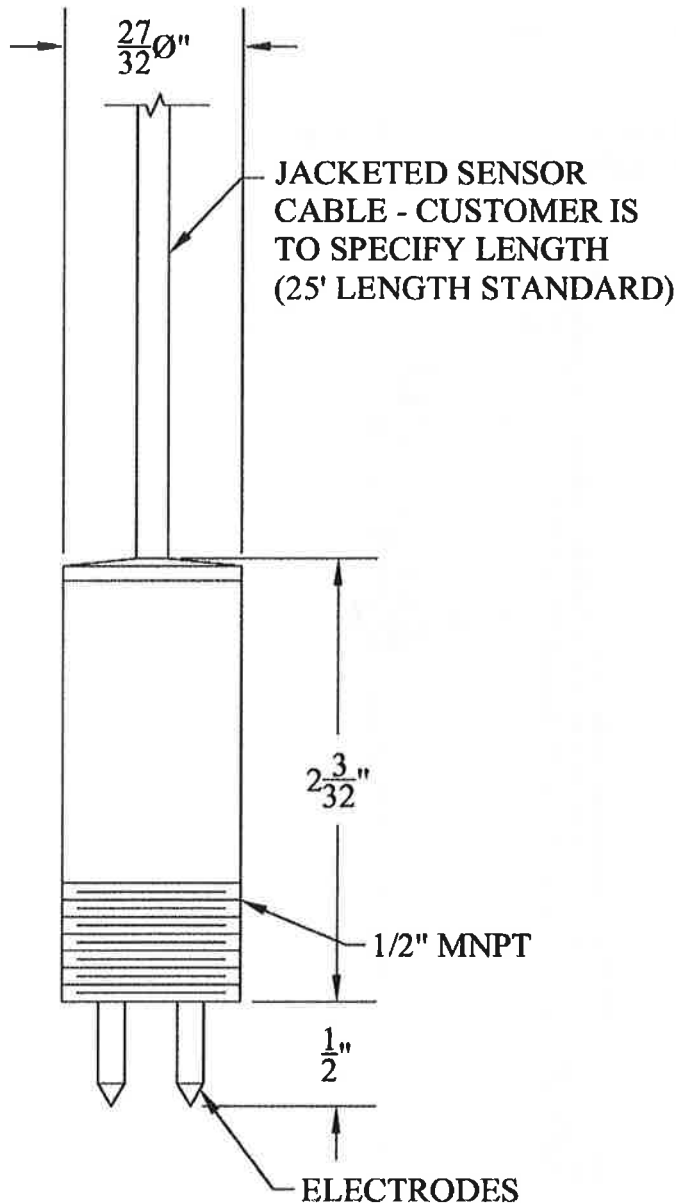
*PROVIDE
DIMENSIONS
FOR BOTH
WW#1 &
WW#2*

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Manufacturer of Specialty Pumps, Controls and Sensors.

SENSOR DATA SHEET

EPG Leak Detector



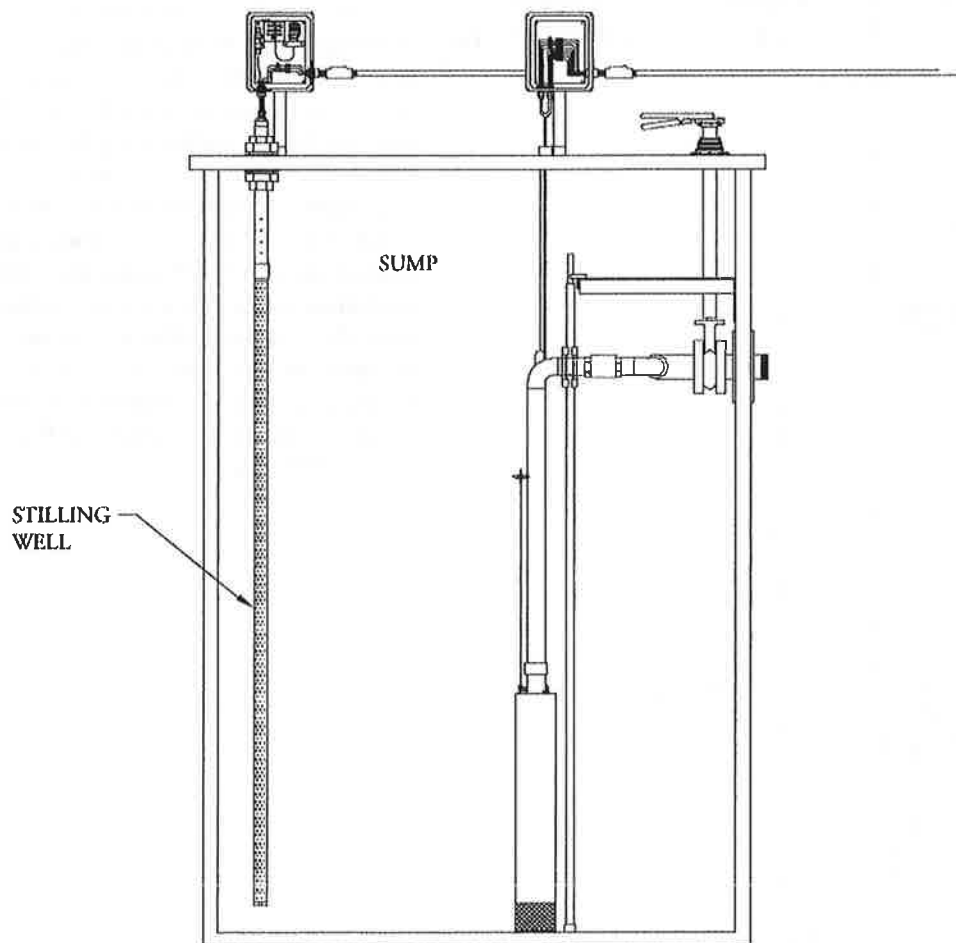
MODEL NO. ASLD-YH25

SENSOR LOGIC AND FUNCTION

EPG's leak detectors are stainless steel electrodes commonly used to detect the presence of conductive fluids. They are mounted in a small diameter stainless steel housing, which adds weight allowing sensor to be suspended in small annular space. Each sensor has 25' (standard) of yellow waterproof, gasoline, oil and chemical resistant outer jacket over a twisted pair of color-coded signal wire. The cable is marked in one foot increments. The sensor is set at the point where leakage is to be detected. Conductance is made from probe to probe through the liquid. Typically the sensor sends a signal to an intrinsically safe relay that can be used to annunciate the alarm condition or shut equipment down. This control circuit has an energy potential so low that it is incapable of causing ignition of flammable or combustible materials.

Stilling Well

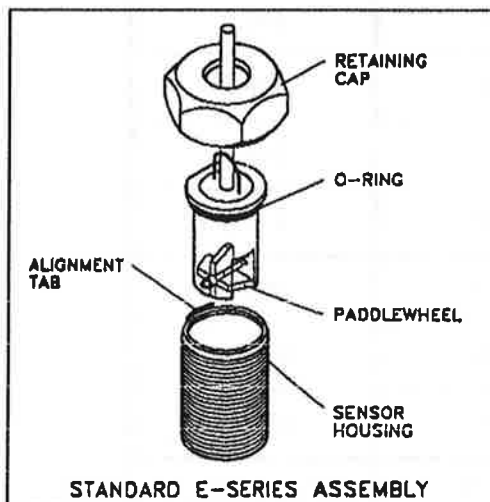
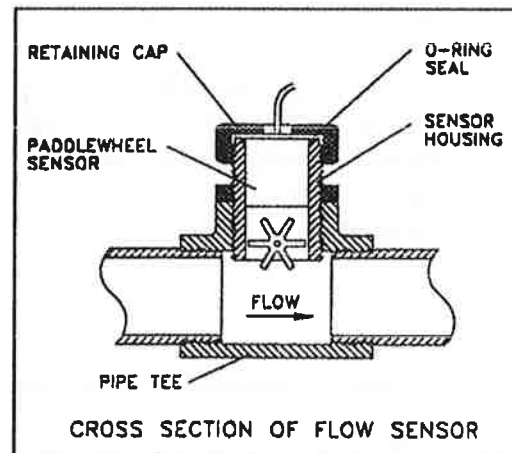
- Designed to be used with the EPG "PT" Series Submersible Level Sensors
- Simplifies installation of submersible level sensors in tanks, sumps, pits and other vessels
- Protects sensor during installation and operation
- Stays in place - not affected by turbulence, waves or foam
- Easy to install
- Available for any height tank
- Available with either 2" MNPT to thread into tank cover or 2" PVC flange
- PVC construction standard (other material available)



SENSOR DATA SHEET

EPG E-Series Liquid Flow Sensor

- * Low cost
- * High reliability
- * Wide range
2 – 10,000 GPM
- * Patented six blade, non-magnetic design
- * Available in DELRIN or KYNAR
- * One paddlewheel fits ALL SIZES
- * Transmits up to 1000 feet without the need for additional amplifiers
- * Direct logic pulse output
- * Flow velocities range of 1.5 to 27 fps
- * Operating pressure to 200 PSIG
- * Liquid temperatures to 250° F
- * 2 Year Warranty
- * High sensitivity
- * Pipe sizes from
3/4" - 14"



One major problem with most paddlewheel type flow sensors having magnets in the paddles is that metal particles tend to stick to the magnets. The collecting material then causes a change in the flow characteristics in the paddle. To eliminate this problem, EPG Companies flow sensor uses a special axle and dual magnet drum design that takes the magnets out of the paddles. This dual magnetic drum design with rapidly changing polarity, along with fluid velocity causes the metallic particles to drop off into the flow stream and are swept away.

INSTALLATION HINTS

1. Pipe must be full for accurate reading.
2. Minimum velocity is 1.5 ft./second. Recommended maximum velocity is 27 ft./second.
3. The flow must be uniform at the point where the flow sensor is installed or an incorrect reading will result. To accommodate a uniform flow allow at least ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the flow sensor. Non-uniform flow is often caused by elbows, partially open valves or an increase in pipe diameter.

Model Number	Nominal Pipe Size	Recommended Range	
		1.5 ft/sec Flow Rate GPM	27 ft/sec Flow Rate GPM
EP 075	¾"	2.0	37.2
EP 100	1"	3.7	66.2
EP 125	1¼"	5.7	103.4
EP 150	1½"	8.3	148.8
EP 200	2"	14.7	264.6
EP 250	2½"	23.0	413.4
EP 300	3"	33.1	595.4
EP 400	4"	58.8	1058.4
EP 500	5"	91.9	1653.8
EP 600	6"	132.3	2381.4

Flow Meter Operation

EPG's meter system is an 8 digit Flow Rate/Totalizer. The meter counts pulses from a flow sensor and converts this information into flow rate and total flow using programmed scaling factors.

The meter features menu driven programming to simplify meter set-up. The meter stores parameters entered into non-volatile memory. This memory retains the parameters even when power to the panel is shut off.

Figure 1 shows the meter display and keypad and gives a brief description of each key's function.

Two Line LCD Display - Shows totalizer and rate values when the unit is in the run mode. Displays programming information when the unit is in the program mode.

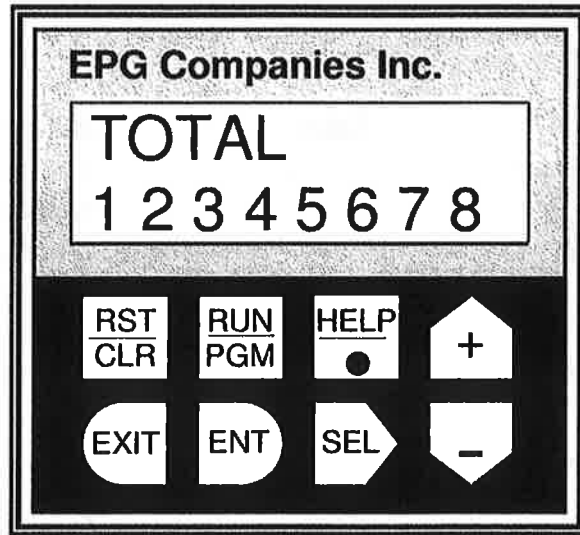


Figure 1. Meter Display and Keypad

Key Functions

<p>Reset/Clear Key - This key can be programmed to reset the totalizer when in the run mode. In the program mode it zeros numeric data that is selected for editing.</p>	<p>Exit Key - This key is used in the program mode to exit program changes that have been selected but not yet entered.</p>
<p>Run/Program Key - Press this key followed by the Enter key (ENT) to enter the program mode. Pressing this key while in the program mode returns the control to the run mode.</p>	<p>Enter Key - This key is used in the program mode to cause the displayed program changes to be entered.</p>
<p>Help Key - In the run mode this key causes the Help Screens to be displayed. In the program mode this key is used to set the decimal point positions for totalizer and rate scaler displays.</p>	<p>Select Key - This key is used in the program to move into more detailed menus and select the digits of numeric values needed for programming.</p>
<p>Up Arrow/Plus (+) Key - In the run mode this key is used to select one of the three different display screens. In the program mode this key is used to step vertically up through the menus and increment the value of selected digits when changing numeric values.</p>	<p>Down Arrow/Minus (-) Key - In the run mode this key is used to select one of the two different display screens. In the program mode this key is used to step vertically down through the menus and decrease the value of selected digits when changing numeric values.</p>

Program Scalers:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
C DEC PT	-----	Sets decimal point to the right of the last digit on the TOTAL Display.
R DEC PT	-----	Sets decimal point to the right of the last digit on the FLOW RATE Display.
C SCALER	See Below	Used to convert sensor pulses into Total Gallons.
R SCALER	See Below	Used to convert sensor pulses into Gallons/Minute.

Program Options:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
RST KEY	RST EDG	Reset Key will Clear Totalizer Count.

Tables 1 and 2 show the keystroke operations necessary to change scale parameters and "Reset Key" enable/disable function.

Flow meter setup procedures for scalers

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press - to scroll through main menu. Find "Program Scalers" on the meter display.
4	Press SEL to enter "SCALERS" menu.
5	Press - to scroll the "SCALERS" menu and bring up the "C SCALER" option on the meter display.
6	Press SEL to select the "C SCALER" and begin operation on the left most digit of the "C SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the meter displays the desired value for the "C SCALER"
7	Press ENT to enter the "C SCALER " value into non-volatile memory.
8	Press - to display the "C DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
9	Press ENT to enter this selection into memory.
10	Press - to bring up the "R SCALER" option on the meter display.
11	Press SEL to select the "R SCALER" and begin operation on the left most digit of the "R SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the desired value for the "R SCALER" is in the meter display. Also use the SEL and HELP/. Keys to position the decimal point to the desired position.
12	Press ENT to enter this value into the non-volatile memory.
13	Press - to display the "R DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
14	Press ENT to enter this selection into non-volatile memory.
15	Press EXIT to exit "Program" mode.
16	Press RUN/PGM to enter "Run" mode.

Table 1. Flow Meter Scaler Sequence

Flow meter setup procedures for reset key

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press + to scroll through main menu. Find "Program Options" on the meter display.
4	Press SEL to enter "OPTIONS" menu.
5	Press + to scroll the "OPTIONS" menu and bring up the "RST KEY" option on the meter display.
6	Press SEL to select the "RST KEY" menu.
7	Press + to display the desired key option. Options include: <div style="margin-left: 40px;"> RST KEY DISABLED This option prevents the reset key from clearing the totalizer count. RST KEY RST EDG This option allows clearing of the totalizer count using the reset key. </div>
8	Press ENT to select the desired option.
9	Press EXIT to exit "Program" mode.
10	Press RUN/PGM to enter "Run" mode.

Table 2. Reset Key Programming Sequence

The programmed scaling factors used are dependent upon the inside pipe diameter of the flow sensor tube. Tables 3 to 6 list the various scaling factors used for the different diameter (nominal O.D.) and schedule (wall thickness) of Stainless Steel and PVC pipes.

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

Table 3. Flow Meter Settings – Stainless Steel Schedule 40

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

Table 4. Flow Meter Settings – Stainless Steel Schedule 80

Pipe Size	C SCALER	R SCALER
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

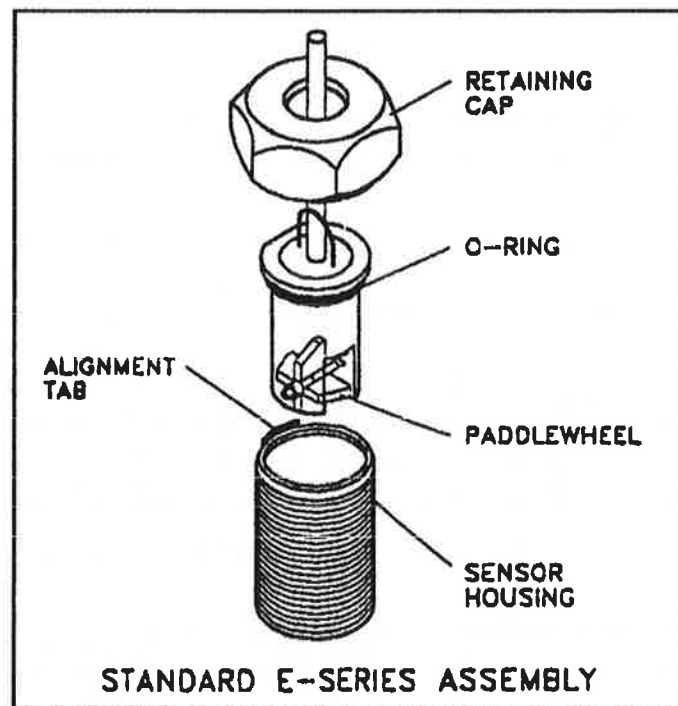
Table 5. Flow Meter Settings – PVC Schedule 40

Pipe Size	C SCALER	R SCALER
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

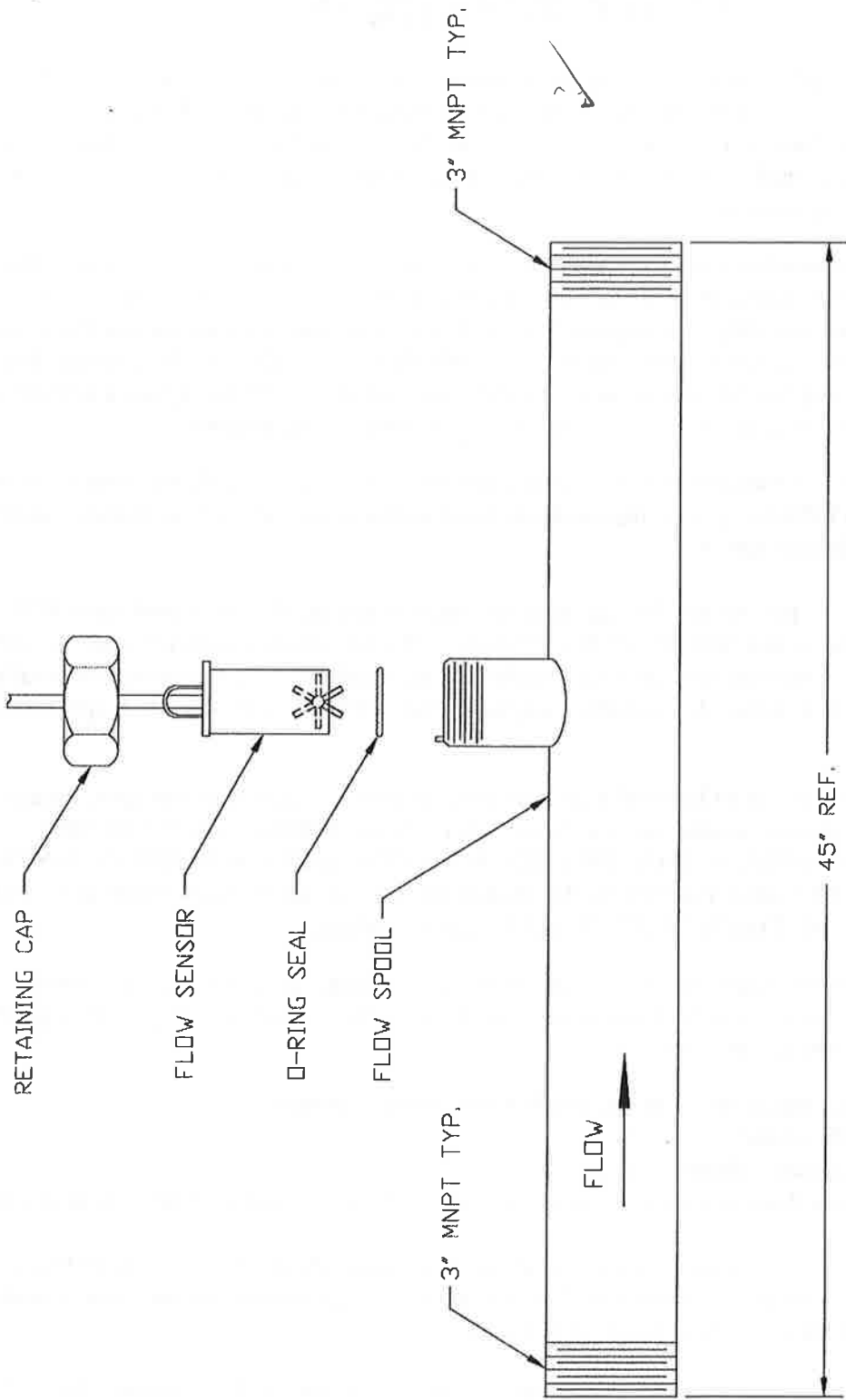
Table 6. Flow Meter Settings – PVC Schedule 80

CAUTION

DO NOT OVERTIGHTEN PADDLEWHEEL FLOW SENSOR NUT!



Damage can be caused to the paddlewheel sensor, o-ring, or sensor housing. Please hand tighten nut only!



* NOTICE * © EPG Companies Inc. 2006

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TOLERANCES		REVISIONS	
DECIMAL	FRACTIONAL	NO.	DATE
		1	
		2	
		3	
		4	
		5	

EPG COMPANIES

3" PVC FLOW SENSOR with MNPT ENDS

DESIGNER	DATE	BY
C.A.S.	08-17-10	
DRAWN		
E.J.H.		
CHECKED		
APPROVED		

07765-0000C

LIMITED WARRANTY

This agreement shall be deemed to have been entered into in the State of Minnesota, and shall be construed in accordance with the laws of the State of Minnesota, including Minnesota's enactment of the Uniform Commercial Code. Buyer hereby stipulates and agrees that Hennepin County, Minnesota shall be the proper jurisdiction for adjudicating all claims and controversies arising from this agreement.

Products manufactured by EPG Companies Inc. are warranted for a period of 12 months from date of installation or eighteen (18) months from date of manufacture* to be free from defects of materials and workmanship. It is expressly agreed that the exclusive remedy under this warranty is limited solely to the repair or replacement, at the sole discretion of EPG, of the part that failed. The cost of labor for any field repairs is not covered by this warranty. EPG Companies will not be liable for any damage or wear due to abnormal conditions or improper installation.

Products not manufactured by EPG Companies Inc. are covered by the original manufacturer's warranty, which EPG Companies passes through to the purchaser. The actual manufacturer will make warranty determination.

To have a defective part repaired or replaced, you must return the defective product to EPG Companies. Please call (800) 443-7426 or (763) 424-2613 to obtain a Return Goods Authorization (RGA) number. Send defective product (freight prepaid) with RGA #, description of installation, installation data and failure date to EPG Companies Inc., 19900 County Rd. 81, Maple Grove, MN 55311.

EPG Companies will not be held liable for any incidental or consequential damages, losses or expenses incurred from installation, use or any other reason. **THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF EITHER FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY, WHICH EXTEND BEYOND THOSE SPECIFICALLY LISTED HERE.**

If equipment is to be stored for a period greater than six months, proper storage precautions must be taken if the warranty is to be maintained. Please call EPG Companies for specific requirements regarding product storage.

The following is a partial list of items, which will void the warranty:

- Opening the motor for any reason.
- Using undersized electrical wire.
- Making unauthorized circuit changes. Please call EPG Companies before making any changes.
- Operating a three phase submersible motor from single phase power through a phase converter unless 3-leg ambient-compensated quick trip overload protectors are used and complete details are sent in writing to EPG Companies.

* To qualify for the delayed installation warranty you must contact EPG Companies Inc., at (800) 443-7426 or (763) 424-2613 within 60 days of purchase.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 11-R

Job No:		Date:	November 1, 2011
To:	COK - DPW	Spec Section:	
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	8, 9, & 10
Phone No:	808.241.4838	Subcontractor:	
Fax No:	808.241.6887	Supplier:	
Respond by:		Manufacturer:	EPG Companies, Inc.

This submittal contains the following:

Description: Guide Rail Drawings & Dimensions

Dimensions: Wet Well #1 - 14.5' rails
Wet Well #2 - 12' rails

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 16 Nov 2011

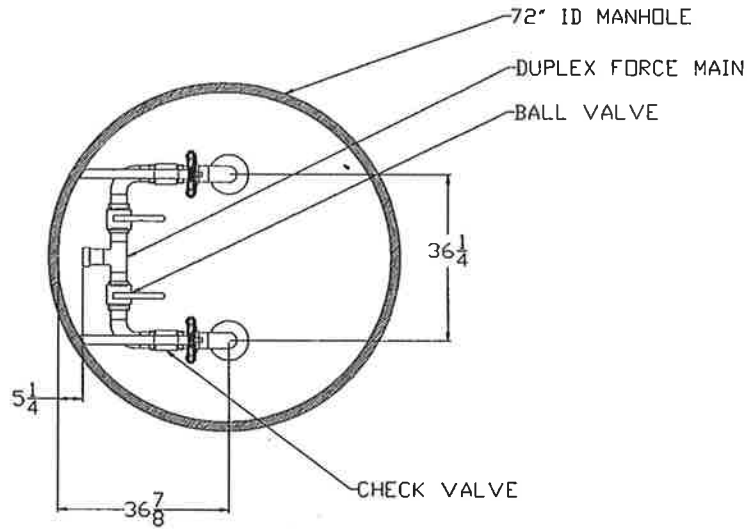
GEOSYNTEC CONSULTANTS

Submittal No:	11-R
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	
Spec Para:	
Drawing No:	8, 9, & 10
Subcontractor:	
Supplier:	
Manufacturer:	EPG Companies, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."</p> <p>Signature: <u>[Signature]</u> Date: <u>11/11</u></p> <p>for: <u>Jeff Fisk</u></p>	

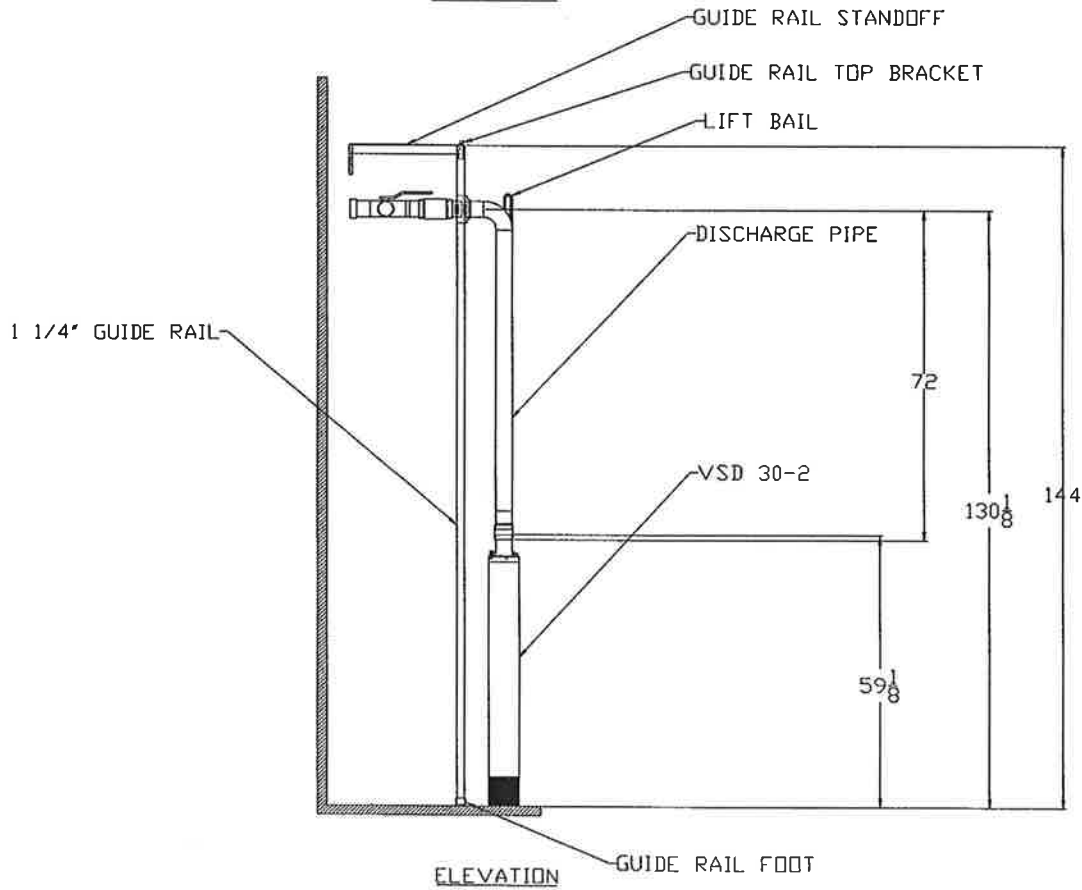
cc: File



KEKAHA SANITARY LANDFILL
MECHANICAL SUBMITTAL DRAWING
DUPLEX FORCE MAIN / DGRN GUIDE RAIL
SYSTEM

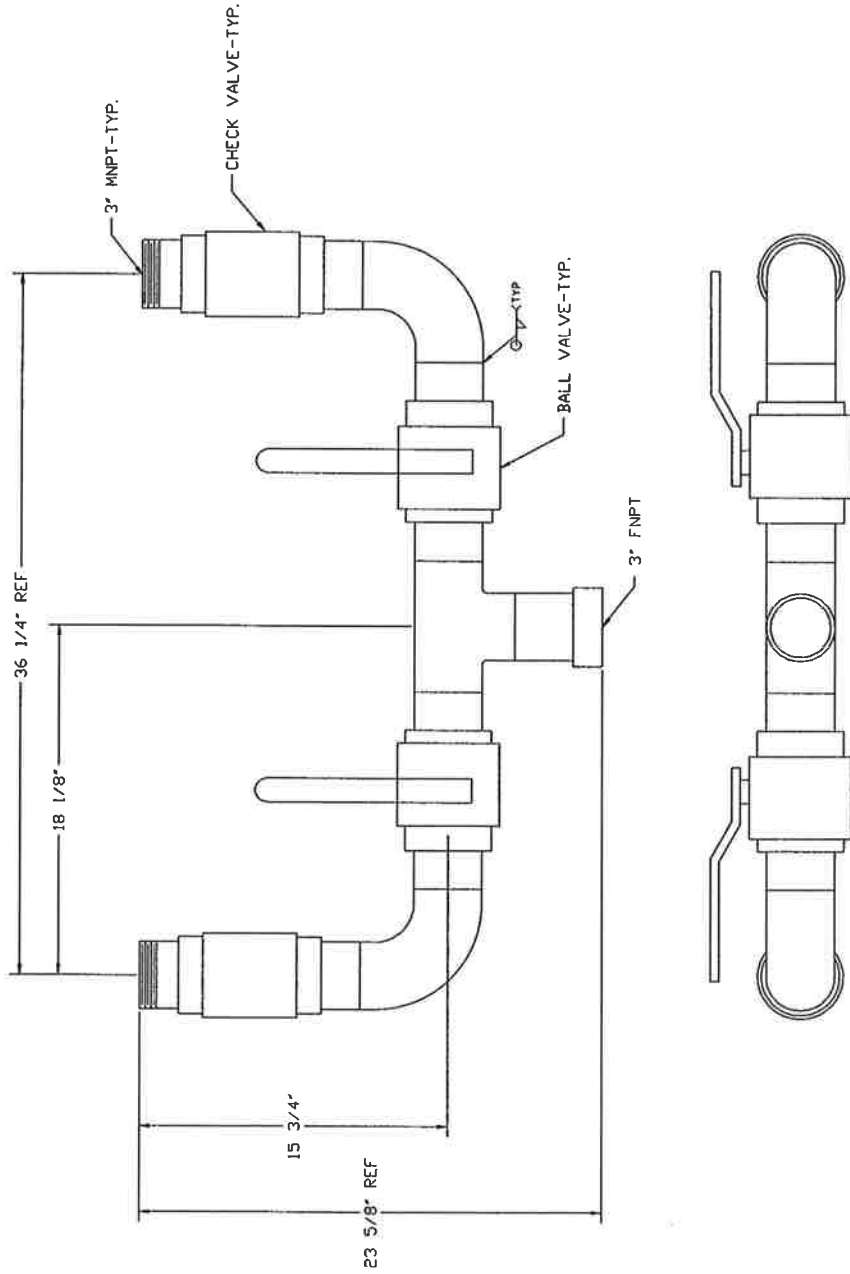


PLAN VIEW



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Manufacturer of Specialty Pumps, Controls and Sensors.



NOTE: DEBURR BEFORE WELDING

NOTICE		© 2007 EPG Composite Inc.	
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.			
TOLERANCES UNLESS OTHERWISE SPECIFIED		EPG COMPANIES	
304SS DUPLEX FORCE MAIN			
3" MNPT x 3" MNPT x 3" FNPT			
DATE	1/16	BY	R.C.C.
SCALE	1" = 1'	APP'D	08-03-11
PROJECT		08031-0003	



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 12

Job No:		Date:	September 1, 2011
To:	COK - DPW	Spec Section:	15019
Attention:	Troy Tanigawa	Spec Para:	2.03A-2
Address:	4444 Rice Street, Ste 295	Drawing No:	
	Lihue, HI 96766	Subcontractor:	
Phone No:	808.241.4838	Supplier:	Pacific Pipe Co.
Fax No:	808.241.6887	Manufacturer:	Snook, Inc.
Respond by:			

This submittal contains the following:

Description: Flexible couplers for Leachate collection manholes

*p 15019-3 ✓
see Aug 13 (CCM #14, Section 2-2 as example)
and 14, 15*

- NO EXCEPTIONS NOTED
 - MAKE CORRECTIONS NOTED
 - REJECT REVISE AND RESUBMIT
 - SUBMIT SPECIFIED ITEM
- SIGNED: *Kirby* DATE: 7 OCT 2011
GEOSYNTEC CONSULTANTS

Submittal No:	12
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	15019
Spec Para:	2.03A-2
Drawing No:	
Subcontractor:	
Supplier:	Pacific Pipe Co.
Manufacturer:	Snook, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u><i>Jeffrey Fisher</i></u> Date: <u>9-1-11</u> for: <u>Jeffrey Fisher</u>	

File

**Landfill Gas Hose
Series LFG44**

used as coupler

Temperature Range: -65° to 325° F

- Two-ply silicone polyester fabric (.44 inch per ply)
- Reinforced with spring 302 stainless steel wire
- Nylon scuff strip over wire
- Bend radius: 1.5" times diameter
- Pressure: -5 PSIG/10 HG Negative
- Pipe size hose ID: 1.55" ID, 1.90" ID, 2.38" ID, 2.88" ID, 3.50" ID, 4.50" ID, 6.62" ID, 8.62" ID, 10.75" ID, and 12.75" ID
- Lengths: 12" to 48" long or longer for some applications. (contact us)
- Custom sized ID's are available up to 18"



Insulated Ducting

Insulated dryer duct and Environmental chamber ducting

BSS15 Dryer Duct

Temperature Range: -75° to 450° F

- Two-ply silicone fiberglass fabric
- Two inches of insulation with R Factor 8.33
- Outer cover and end cap are black neoprene fiberglass
- 11 foot stock lengths
- Custom lengths are available



**Black:
Insulated Dryer Duct
Series BSS15**

ENV CH-2 Environmental Chamber Duct

Temperature Range: -80° to 500° F (Intermittent to 600° F)

- Duct with two-ply silicone fiberglass
- Insulation of one to two inches with K Factor of .24
- Outer cover is one-ply silicone fiberglass
- Molded end caps at each end

**Orange:
Environmental
Chamber Duct Series
ENV-CH-2 and ENV-CH-3**

ENV CH-3 Environmental Chamber Duct

Temperature Range: -80° to 500° F (Intermittent to 600° F)

- Duct with three-ply silicone fiberglass with rubber liner
- Insulation of one to two inches with K Factor of .24
- Outer cover is one-ply silicone fiberglass
- Molded end caps at each end

Custom ID sizes and lengths available on all



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 13

Job No:	_____	Date:	September 1, 2011
To:	COK - DPW	Spec Section:	_____
Attention:	Troy Tanigawa	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	8, 10, 11, & 13
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	Pacific Pipe Co.
Fax No:	808.241.6887	Manufacturer:	Kuriyama of America, Inc.
Respond by:	_____		_____

This submittal contains the following:

- Description:** - Stainless steel quick connect coupling
 - Stainless steel dust caps for quick disconnect camloc

- NO EXCEPTIONS NOTED
 MAKE CORRECTIONS NOTED
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: Kirby Hui DATE: 7 OCT 2011
 GEOSYNTEC CONSULTANTS

Submittal No:	13
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	_____
Items Description:	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	_____
Spec Para:	_____
Drawing No:	8, 10, 11, & 13
Subcontractor:	_____
Supplier:	Pacific Pipe Co.
Manufacturer:	Kuriyama of America, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature:	<u>[Signature]</u> Date: <u>9.1.11</u>
for: <u>Jerry Fisher</u>	

cc: File

SS316 Stainless Steel Quick-Acting Couplings

Agriculture • Chemicals/Petroleum

Stainless Steel Part A Male Adapter x Female NPT

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-A050	1/2" X 1/2"	0.20	50
SS-A075	3/4"	0.26	25
SS-A100	1"	0.34	25
SS-A125	1 1/4"	0.62	36
SS-A150	1 1/2"	0.80	25
SS-A200	2"	1.12	20
SS-A250	2 1/2"	1.76	12
SS-A300	3"	2.16	8
SS-A400	4"	2.88	6
SS-A500	5"	4.30	4
SS-A600	6"	6.00	2



Stainless Steel Part E Male Adapter x Hose Shank

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-E050	1/2" X 1/2"	0.25	50
SS-E075	3/4"	0.36	25
SS-E100	1"	0.60	25
SS-E125	1 1/4"	0.95	25
SS-E150	1 1/2"	1.22	25
SS-E200	2"	1.98	20
SS-E250	2 1/2"	2.64	12
SS-E300	3"	3.90	8
SS-E400	4"	6.38	6
SS-E500	5"	9.10	4
SS-E600	6"	13.49	2



Stainless Steel Part B Female Coupler x Male NPT

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-B050‡	1/2" X 1/2"	0.30	50
SS-B075●	3/4"	0.42	25
SS-B100●	1"	0.64	25
SS-B125●	1 1/4"	1.32	20
SS-B150●	1 1/2"	1.50	20
SS-B200●	2"	1.92	20
SS-B250●	2 1/2"	2.68	12
SS-B300●	3"	3.20	8
SS-B400●	4"	6.58	6
SS-B500●	5"	6.80	4
SS-B600●	6"	10.98	2



Stainless Steel Part F Male Adapter x Male NPT

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-F050	1/2" X 1/2"	0.30	50
SS-F075	3/4"	0.40	25
SS-F100	1"	0.56	25
SS-F125	1 1/4"	1.06	25
SS-F150	1 1/2"	1.28	25
SS-F200	2"	1.82	20
SS-F250	2 1/2"	2.68	12
SS-F300	3"	3.92	8
SS-F400	4"	6.32	6
SS-F500	5"	8.26	4
SS-F600	6"	11.27	2



Stainless Steel Part C Female Coupler x Hose Shank

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-C050‡	1/2" X 1/2"	0.30	50
SS-C075●	3/4"	0.46	25
SS-C100●	1"	0.74	25
SS-C125●	1 1/4"	1.41	20
SS-C150●	1 1/2"	1.68	20
SS-C200●	2"	2.30	20
SS-C250●	2 1/2"	3.10	12
SS-C300●	3"	4.12	8
SS-C400●	4"	6.98	6
SS-C500●	5"	10.32	4
SS-C600●	6"	14.55	2



Stainless Steel Part DC Dust Cap

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-DC050‡	1/2" X 1/2"	0.25	50
SS-DC075●	3/4"	0.36	25
SS-DC100●	1"	0.54	25
SS-DC125●	1 1/4"	1.30	20
SS-DC150●	1 1/2"	1.46	25
SS-DC200●	2"	1.78	20
SS-DC250●	2 1/2"	2.38	12
SS-DC300●	3"	3.04	8
SS-DC400●	4"	5.02	6
SS-DC500●	5"	7.35	4
SS-DC600●	6"	9.92	2



Stainless Steel Part D Female Coupler x Female NPT

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-D050‡	1/2" X 1/2"	0.40	50
SS-D075●	3/4"	0.52	25
SS-D100●	1"	0.74	25
SS-D125●	1 1/4"	1.47	20
SS-D150●	1 1/2"	1.52	25
SS-D200●	2"	2.16	25
SS-D250●	2 1/2"	3.12	12
SS-D300●	3"	3.82	8
SS-D400●	4"	5.14	6
SS-D500●	5"	8.00	4
SS-D600●	6"	10.06	2



Stainless Steel Part DP Dust Plug

Part Number	Size	Weight Each (lbs.)	Standard Carton
SS-DP050	1/2" X 1/2"	0.15	50
SS-DP075	3/4"	0.20	25
SS-DP100	1"	0.28	25
SS-DP125	1 1/4"	0.60	25
SS-DP150	1 1/2"	0.72	25
SS-DP200	2"	0.96	20
SS-DP250	2 1/2"	1.47	12
SS-DP300	3"	1.94	8
SS-DP400	4"	3.36	6
SS-DP600	6"	9.08	2



Note: Dust Caps & Dust Plugs are **NOT DESIGNED FOR PRESSURE APPLICATIONS.**

- These couplers are supplied with locking feature . . . safety clips may be inserted to lock handles, preventing disconnection during product transfer.
- ‡ Size 1/2" x 1/2" supplied with one stainless steel handle.

See Material Specifications & Operating Pressure Charts on Pages 47 & 48

BECAUSE WE CONTINUALLY EXAMINE WAYS TO IMPROVE OUR PRODUCTS, WE RESERVE THE RIGHT TO ALTER SPECIFICATIONS WITHOUT PRIOR NOTICE.

Material Specifications

Aluminum Quick-Acting Couplings from pages 5, 6, 7, 8, 9, 10 and 11

	Body	Handles	Slot Pins	Pull Rings	Gaskets	Safety Clips
Aluminum	Aluminum alloy, specially designed for high tensile strength, lightness and rigidity.	Forged Brass	Zinc-plated Carbon Steel	Zinc-plated Carbon Steel	Buna-N	Zinc-plated Carbon Steel

All sizes except 5" and 8" are made to comply with MIL Spec A-A-59326 for interchangeability. † All 8" couplers supplied with 4 locking handles, safety clips, pull rings and chains at NO CHARGE.
 Sizes 5" & 8" comply with ASTM Specifications for interchangeability.
 1/2" X 1/2" are not specified under MIL Specs.

Brass Quick-Acting Couplings from page 15 and 16

	Body	Handles	Slot Pins	Pull Rings	Gaskets	Safety Clips
Brass	Brass alloy, specially designed for high tensile strength and rigidity.	Forged Brass	Type 304 Stainless Steel	Type 304 Stainless Steel	Buna-N	Zinc-plated Carbon Steel

All sizes except 5" are made to comply with MIL Spec A-A-59326 for interchangeability.
 5" size complies with ASTM F1122 Specifications for interchangeability.
 1/2" X 1/2" are not specified under MIL Specs.

Glass Reinforced Nylon Quick-Acting Couplings from page 17

	Body	Handles	Slot Pins	Pull Rings	Gaskets	Safety Clips
Glass Reinforced Nylon	Fiberglass-reinforced Nylon, for high tensile strength, light weight and rigidity	Type 304 LTW Stainless Steel	Type 304 Stainless Steel	Type 304 Stainless Steel	EPDM	Type 304 Stainless Steel

All sizes are made to comply with MIL Spec A-A-59326 for interchangeability.

Polypropylene Quick-Acting Couplings from pages 18 and 19

	Body	Handles	Slot Pins	Pull Rings	Gaskets	Safety Clips
Polypropylene	Polypropylene is glass-filled for added strength and durability	Type 304 Investment Cast Stainless Steel	Type 304 Stainless Steel	Type 304 Stainless Steel	EPDM	Type 304 Stainless Steel

All sizes are made to comply with MIL Spec A-A-59326 for interchangeability.
 1/2" X 1/2" are not specified under MIL Specs.

SS304 Stainless Steel Quick-Acting Couplings from page 12

	Body	Handles	Slot Pins	Pull Rings	Gaskets	Safety Clips
Stainless Steel	Stainless Steel Type 304 (ASTM A351 Grade CF-8). Every melt is analyzed for chemical composition. A Chemical Test Certificate showing the general composition is available upon request.	Type 304 Stainless Steel	Type 304 Stainless Steel	Type 304 Stainless Steel	Buna-N	Type 304 Stainless Steel

All sizes except 5" and 8" are made to comply with MIL Spec A-A-59326 for material and interchangeability.
 Sizes 5" & 8" comply with ASTM Specifications for material and interchangeability.
 1/2" X 1/2" are not specified under MIL Specs.

SS 316 Stainless Steel Quick-Acting Couplings from pages 13, 14 and 16

	Body	Handles	Slot Pins	Pull Rings	Gaskets	Safety Clips
Stainless Steel	Stainless Steel Type 316 (ASTM A351 Grade CF-8M). Every melt is analyzed for chemical composition. A Chemical Test Certificate showing the general composition is available upon request.	Type 304 Stainless Steel	Type 304 Stainless Steel	Type 304 Stainless Steel	Buna-N	Type 304 Stainless Steel

All sizes except 5" and 8" are made to comply with MIL Spec A-A-59326 for material and interchangeability.
 Sizes 5" & 8" comply with ASTM Specifications for material and interchangeability.
 1/2" X 1/2" are not specified under MIL Specs.

BECAUSE WE CONTINUALLY EXAMINE WAYS TO IMPROVE OUR PRODUCTS, WE RESERVE THE RIGHT TO ALTER SPECIFICATIONS WITHOUT PRIOR NOTICE.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 14

Job No:	_____	Date:	September 1, 2011
To:	COK - DPW	Spec Section:	_____
Attention:	Troy Tanigawa	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	8, 10, 11, & 13
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	Pacific Pipe Co.
Fax No:	808.241.6887	Manufacturer:	Specified Fittings
Respond by:	_____		

This submittal contains the following:

Description: 6"x4" HDPE reducer with 4" IPT male adapter for quick connect coupling

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 24 Oct 2011

GEOSYNTEC CONSULTANTS

Submittal No:	14
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	_____
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	_____
Spec Para:	_____
Drawing No:	8, 10, 11, & 13
Subcontractor:	_____
Supplier:	Pacific Pipe Co.
Manufacturer:	Specified Fittings
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature:	<u>[Signature]</u> Date <u>9.1.11</u>
for: <u>Jeffrey Fisher</u>	

c: File

COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MO'IKEHA BUILDING, SUITE 295
LIHUE, KAUAI, HAWAII 96766

SOLID WASTE

TRANSMITTAL

To: AECOM Technical Services , Inc.

Atten: Frank Cioffi

From: County of Kauai, Solid Waste Div.

Troy K. Tanigawa, Environmental Services

Management Engineer

Re: C8515 – Ph II Leachate Mgmt. Sys. Modification, **Pages:** Total of 7 pages/ set
Kekaha Sanitary Landfill: Submittal No. 12, 13, & 14
(3 sets of each)

Tel: (808) 523-8874

Date: May 8, 2008



**SPECIFIED
FITTINGS**

**164 WEST SMITH ROAD, PO BOX 28157
BELLINGHAM, WA 98228-0157**
**Toll-free telephone and fax
(888) 734-8846 (888) 734-8258 (F)**
e-mail: sales@specifit.com

**SIGNED DRAWINGS MUST ACCOMPANY PURCHASE ORDER OR
DIMENSIONS OF FITTINGS WILL NOT BE GUARANTEED**

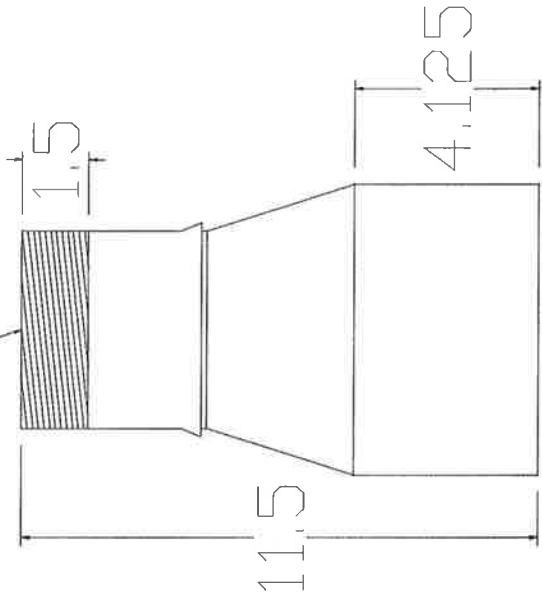
Specifications for HDPE

- All fittings for HDPE pipe meet or exceed the following specifications.
- ASTM F714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on outside diameter.
- ASTM D1248 Standard Specification for Polyethylene Plastic Molding and Extrusion
- ASTM D3350 Standard Specification for Polyethylene Plastic Pipe and Filling Material
- ASTM D3035 Standard Specifications for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on Controlled Outside Diameter.

DISCLAIMER - PLEASE READ

- 1) All dimensions approximate, subject to change without notice
--Angle tolerance is +/- 2 degrees
--All other dimensions to +/- 1"
- 2) This drawing only applicable if a copy is referenced at time of order.
--Without a copy of drawing, fitting construction may differ from that shown.
- 3) Subject to Specified Fittings Standard Terms and Conditions.

S.S. MIPT



Description:	CONCENTRIC REDUCER
Material:	HDPE
Size:	6X4
Configuration:	PE X MIPT



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 15

Job No:		Date:	September 8, 2011
To:	COK - DPW	Spec Section:	
Attention:	Troy Tanigawa	Spec Para:	
Address:	4444 Rice Street, Ste 295 Lihue, HI 96766	Drawing No:	
Phone No:	808.241.4838	Subcontractor:	
Fax No:	808.241.6887	Supplier:	Pacific Pipe Co.
Respond by:		Manufacturer:	Tripac Products & Services

This submittal contains the following:

Description: Shop Drawing U Bolt Installation

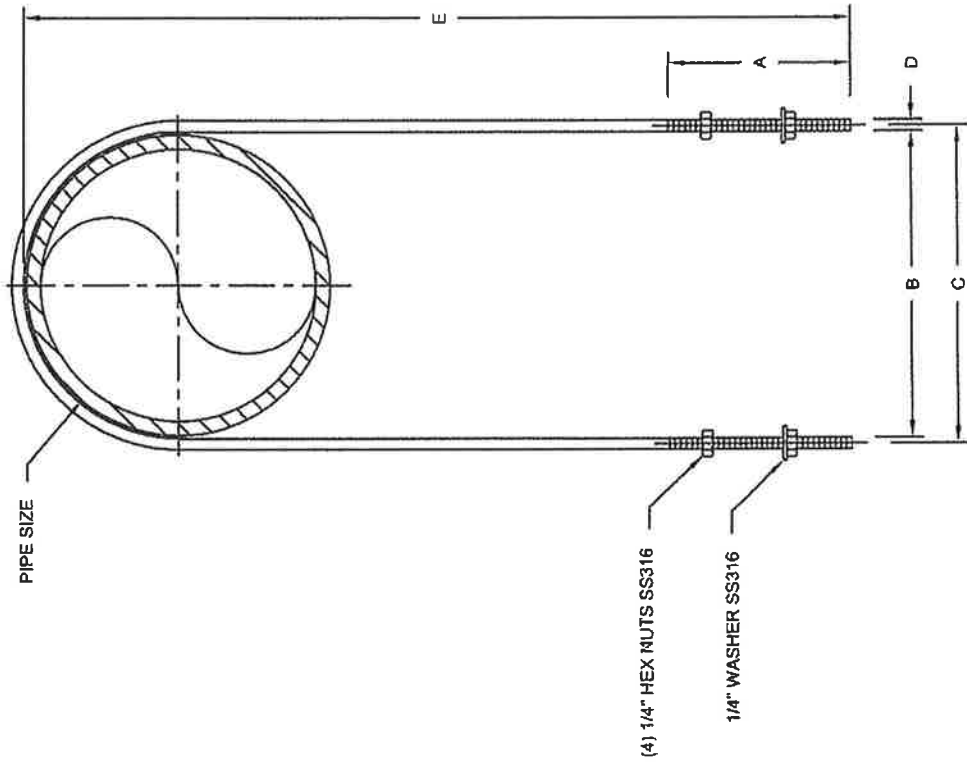
COPY

- NO EXCEPTIONS NOTED
 - MAKE CORRECTIONS NOTED
 - REJECT REVISE AND RESUBMIT
 - SUBMIT SPECIFIED ITEM
- SIGNED: *Kim Huph* DATE: 7 OCT 2011
 GEOSYNTEC CONSULTANTS

Submittal No:	15
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	
Spec Para:	
Drawing No:	
Subcontractor:	
Supplier:	Pacific Pipe Co.
Manufacturer:	Tripac Products & Services
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u><i>Jeff Fisher</i></u> Date: <u>9/8/11</u>	

cc: File

MARK	PIPE SIZE	QTY.	A	B	C	D	E	FINISH
1	6" SCH 40 (6.625" O.D.)	1	4"	6-3/4"	7"	1/4"	18"	SS316



PROJECT:	REF:	SHEET:
P.O.#	DWG #	1
TITLE:	PPC09111CD_01	OF
FOR:	DRAWN BY:	1
PACIFIC PIPE COMPANY	ED	DATE:
	SCALE:	09/01/11
	NTS	

TRIPAC
PRODUCTS AND SERVICES



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 16

Job No:	_____	Date:	<u>September 26, 2011</u>
To:	<u>COK - DPW</u>	Spec Section:	_____
Attention:	<u>Troy Tanigawa</u>	Spec Para:	_____
Address:	<u>4444 Rice Street, Ste 295</u>	Drawing No:	_____
	<u>Lihue, HI 96766</u>	Subcontractor:	_____
Phone No:	<u>808.241.4838</u>	Supplier:	<u>Vari-Tech</u>
Fax No:	<u>808.241.6887</u>	Manufacturer:	<u>Fernco</u>
Respond by:	_____		_____

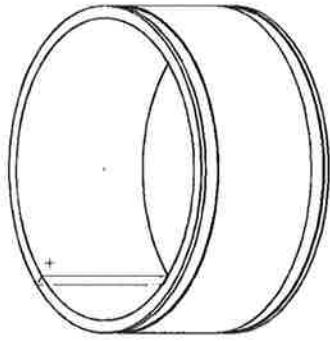
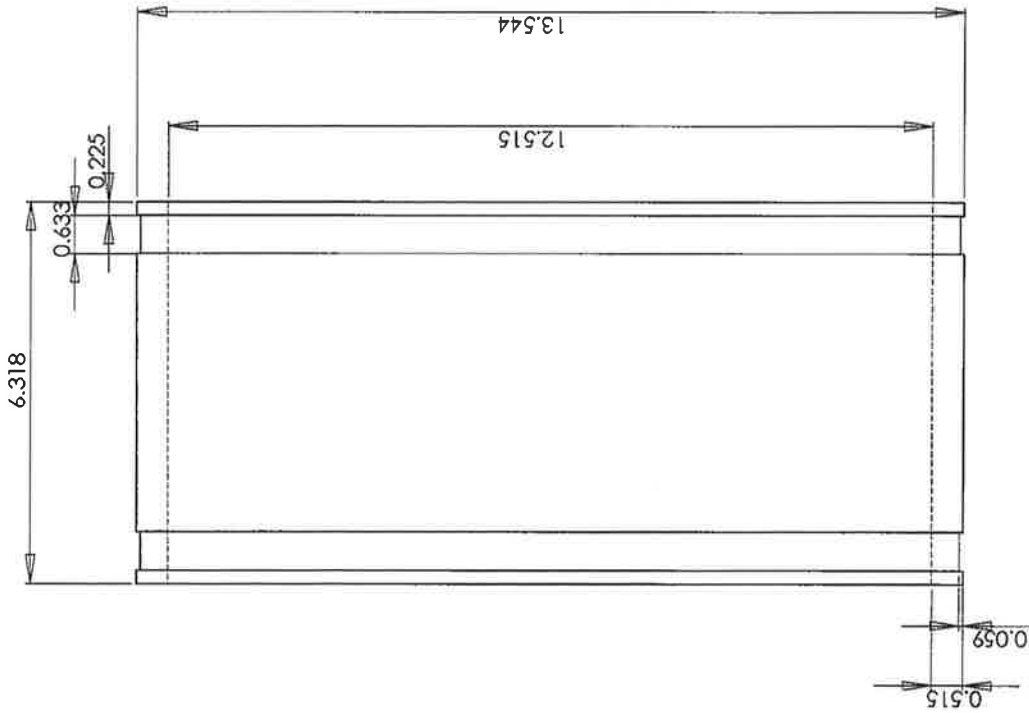
This submittal contains the following:

Description: - Fernco Coupling for 12" HDPE
 - Fernco Coupling for 18" HDPE

see p. 15019-2

Submittal No:	16
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	_____
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	_____
Spec Para:	_____
Drawing No:	_____
Subcontractor:	_____
Supplier:	<u>Vari-Tech</u>
Manufacturer:	<u>Fernco</u>
Contractor:	<u>EARTHWORKS PACIFIC, INC.</u>
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature	<u>[Signature]</u> Date <u>9-26-11</u>

cc: File



FERNCO
Manufacturing

300 S. DAYTON ST.
 DAVISON, MI 48423
 PH: 810-653-9626
 FAX: 810-654-2616

DESCRIPTION:
**Coupling 12' Plastic x 12"
 Plastic**

TOLERANCES:
 X= Fractional ±
 .XX= +.02
 .XXX= ±.030
 ANG.= ±0.5°
 UNLESS OTHERWISE SPECIFIED

1056-1212

Part Weight	6.46 lbs.
Min/Max Temp.	-30/140 Degrees F
Pressure Tested	4.3 PSI
Material	Flexible PVC
Installation Torque	60" Lbs.
Conforms to ASTM	D5926, C1173
Box Quantity	5
Clamps used	300 Series

UNITS: INCHES
 SIZE: A
 DESIGNER: D. Brady
 CHECKER: 1/31/2007
 DATE: 1/31/2007
 SCALE: not to scale
 SHEET 1 OF 1

DO NOT SCALE DRAWING

NOTES:
 -SOME HIDDEN LINES NOT SHOWN
 -ALL SHARP CORNERS TO BE ROUNDED
 -REFER ALL CHANGES TO WRITTEN PERMISSION OF FERNCO, INC.
 IS PROHIBITED.

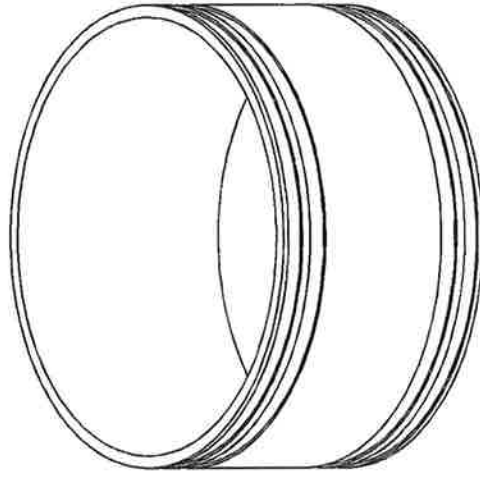
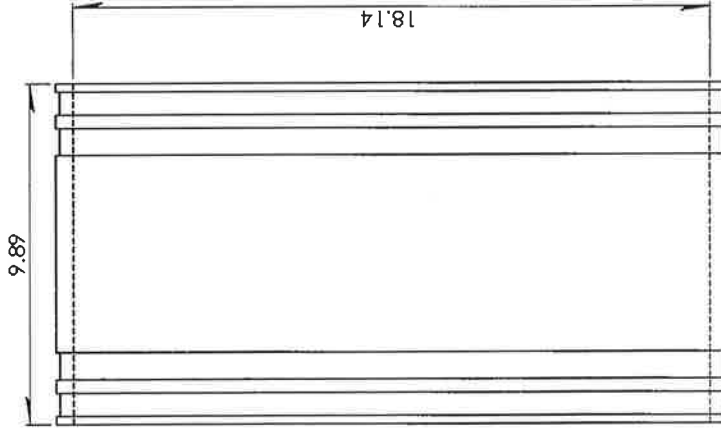
This Part requires two clamps, part number 212-300.
 See additional drawing for information on these clamps.



300 S. DAYTON ST.
 DAVISON, MI 48423
 PH: 810-653-9826
 FAX: 810-654-2616

1001-1515

DESCRIPTION: Coupling 15" Clay x 15" Clay



TOLERANCES:
 X = Fractional +
 .XX = ±.06
 ANG = +3°
 UNLESS OTHERWISE SPECIFIED

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60" Lbs. D5926, C1173		Installation Torque Conforms to ASTM	13.66 lbs. -30/140 Degrees F	Part Weight Min/Max Temp.	60" Lbs. D5926, C1173		UNITS: INCHES	DESIGNER: D. Brady	SCALE: not to scale
300 Series Stainless		Clamps used	4.3 PSI	Pressure Tested	300 Series Stainless		3RD ANGLE PROJECTION	DATE: 7/19/2011	SHEET 1 OF 1
3		Box Quantity	Flexible PVC 60 Duroid Shore A	Material	3		DO NOT SCALE DRAWING	CHECKER:	



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 17

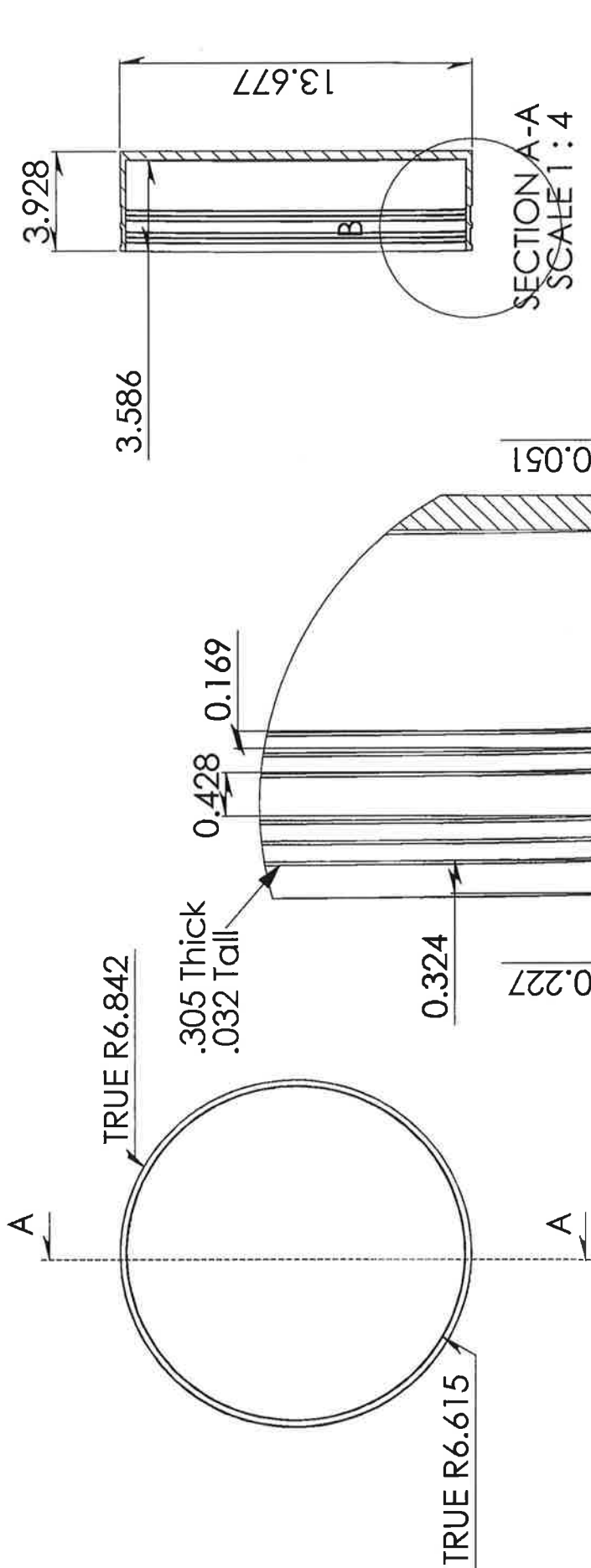
Job No:	_____	Date:	September 26, 2011
To:	COK - DPW	Spec Section:	_____
Attention:	Troy Tanigawa	Spec Para:	_____
Address:	4444 Rice Street, Ste 295	Drawing No:	_____
	Lihue, HI 96766	Subcontractor:	_____
Phone No:	808.241.4838	Supplier:	Vari-Tech
Fax No:	808.241.6887	Manufacturer:	Fernco
Respond by:	_____		_____

This submittal contains the following:

- Description:**
- Fernco 12" Cap
 - Fernco Reducer Bushing 12" x 6" HDPE
 - Fernco Reducer Bushing 15" x 6" HDPE
 - Fernco 12" Reducer Coupling
 - Fernco 18" x 15" Reducer Coupling

Submittal No:	17
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	_____
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	_____
Spec Para:	_____
Drawing No:	_____
Subcontractor:	_____
Supplier:	Vari-Tech
Manufacturer:	Fernco
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature	<i>[Signature]</i> Date 9/26/11

xc: File



SECTION A-A
SCALE 1 : 4

DETAIL B
SCALE 1 : 1

300 S. DAYTON ST.
DAVISON, MI 48423
PH: 810-653-9626
FAX: 810-654-2616



Part Weight	
Min/Max Temp.	-30/140 Degrees F
Pressure Tested	4.3 PSI
Material	Flexible PVC
Installation Torque	60" Lbs.
Conforms to ASTM	D8926
Box Quantity	40
Clamps used	300 Series

TOLERANCES:
X= Fractional ±
XX= ±.02
.XXX= ±.030
ANG = ±0.5°
UNLESS OTHERWISE SPECIFIED

DESCRIPTION: Cap 12" Plastic

QC-112

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NOTES:
-SOME HIDDEN LINES NOT
SHOWN
-BREAK ALL SHARP CORNERS
-REPORT ALL CHANGES TO
ENGINEERING

UNIT: INCHES
SCALE: not to scale

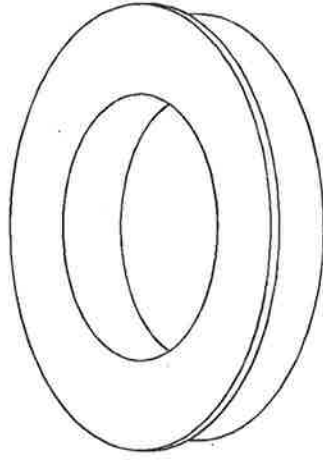
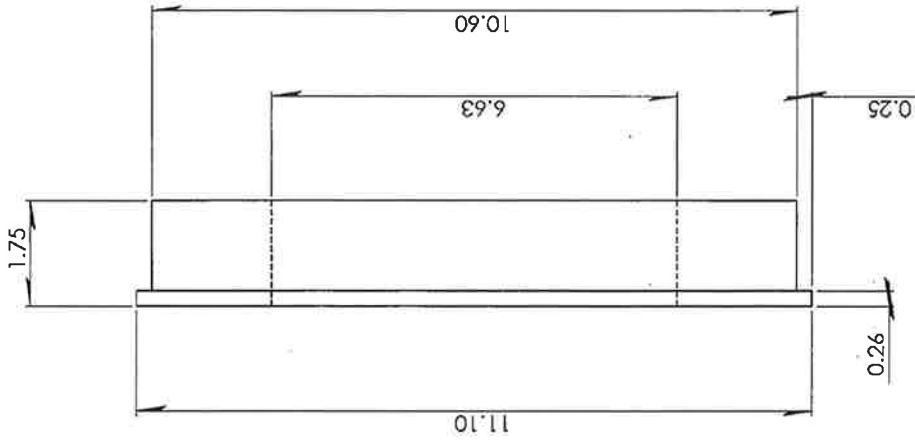
DATE: 8/3/2007

3RD ANGLE PROJECTION
DO NOT SCALE DRAWING

DESIGNER: D. Brady

CHECKER: A

SHEET 1 OF 1



300 S. DAYTON ST.
 DAVISON, MI 48423
 PH: 810-653-9626
 FAX: 810-654-2616

DESCRIPTION:

Reducer Bushing

10.600-6.625R

TOLERANCES:

- X= Fractional ±
- .XX = ±.060
- .XXX = ±.032
- ANG = ±0.5°

UNLESS OTHERWISE SPECIFIED

Part Weight	2.64 lbs.
Min/Max Temp.	-30/140 Degrees F
Pressure Tested	4.3 PSI
Material	Flexible PVC 60 Duro Grade A
Installation Torque	
Conforms to ASTM	D5926
Box Quantity	
Clamps used	

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UNITS: INCHES
 SEE: A
 DESIGNER: D. Brady
 3RD ANGLE PROJECTION
 DO NOT SCALE DRAWING

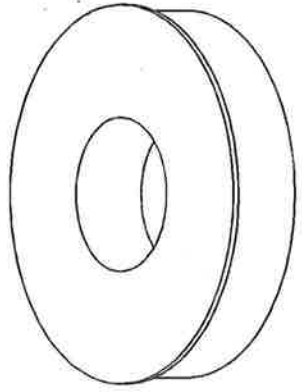
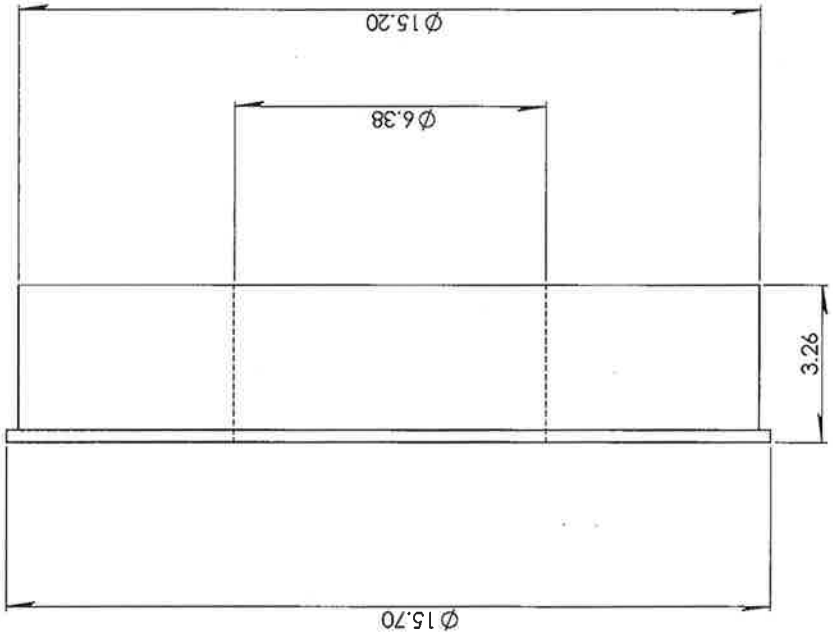
SCALE: not to scale
 DATE: 7/17/2009
 SHEET 1 OF 1



300 S. DAYTON ST.
 DAVISON, MI 48423
 PH: 810-653-9626
 FAX: 810-654-2616

15.200-6.380R

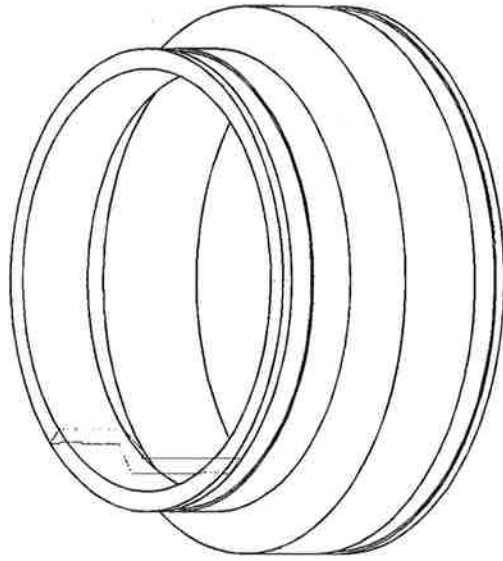
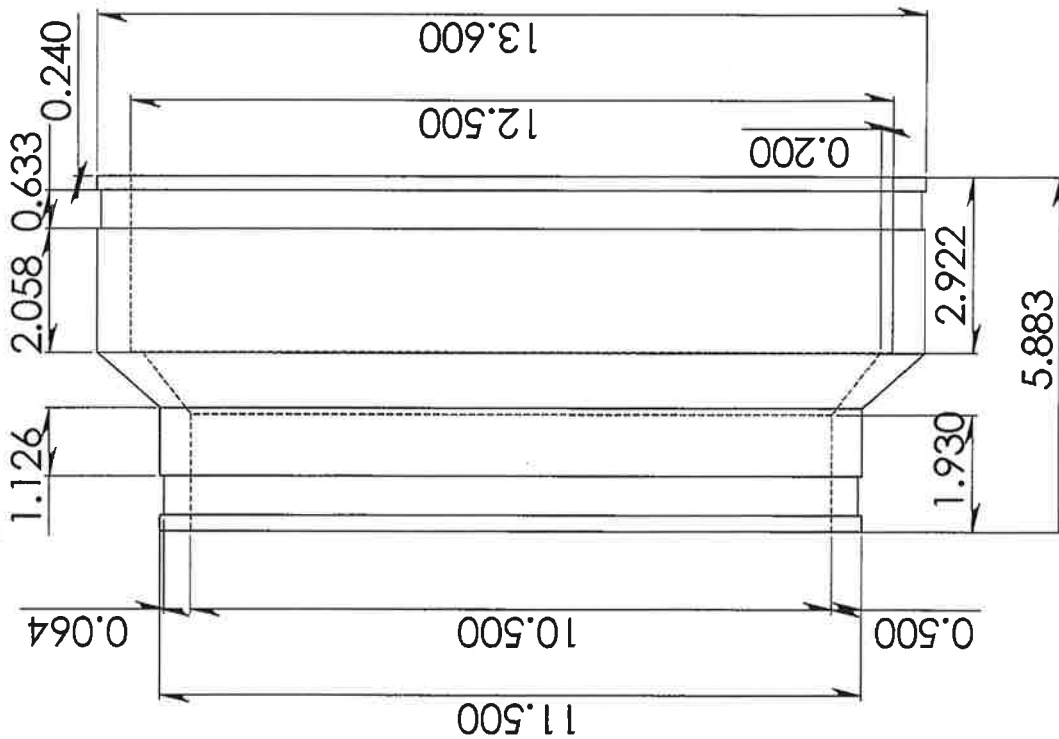
DESCRIPTION: Reducer 15.20 - 6.380



TOLERANCES: X= Fractional \pm .XX = $\pm .06$ ANG. = $\pm 3^\circ$ UNLESS OTHERWISE SPECIFIED		Part Weight Min/Max Temp. Pressure Tested Material	12.56 lbs. -30/140 Degrees F 4.3 PSI Placable PVC 60 Duro Shore A	Installation Torque Conforms to ASTM Clamps used Box Quantity	60" Lbs. D5926 300 Series Stainless	UNITS: INCHES SIZE: A 3RD ANGLE PROJECTION DO NOT SCALE DRAWING	DESIGNER: D. Brady DATE: 9/7/2011 CHECKER:	SCALE: not to scale SHEET 1 OF 1
--------------------------------------------------------------------------------------------------------------------	--	--------------------------------------------------------------------	-------------------------------------------------------------------------------	-------------------------------------------------------------------------------	-------------------------------------------	---------------------------------------------------------------------------------	--------------------------------------------------	-------------------------------------

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 DRAWING IS THE PROPERTY OF FERROCO,
 INC. ANY REPRODUCTION IN
 PART OR AS A WHOLE WITHOUT THE
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 IS PROHIBITED.

*This part requires two clamps, part numbers 184-300 and 212-300.
See additional drawings for information on these clamps.



300 S. DAYTON ST.
DAVISON, MI 48423
PH: 810-653-9626
FAX: 810-654-2616

DESCRIPTION:

Coupling 10" Clay x 10" PVC

1002-1010

TOLERANCES:

.X= Fractional ±
XX= +.02
.XXX= ±.030
ANG= +0.5°
UNLESS OTHERWISE SPECIFIED

Part Weight	4.25 lbs.
Min/Max Temp.	-30/140 Degrees F
Pressure Tested	4.3 PSI
Material	Flexible PVC
Installation Torque	60" Lbs.
Conforms to ASTM	D5926, C1173
Box Quantity	5
Clamps used	300 Series

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NOTES:
-SOME HIDDEN LINES NOT
SHOWN
-BREAK ALL SHARP CORNERS
-BREAK ALL DIMENSION LINES TO
ENGINEERING

UNITS: SEE DESIGNER

INCHES A

D. Brady

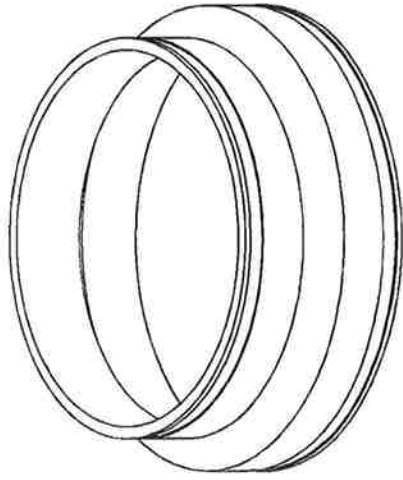
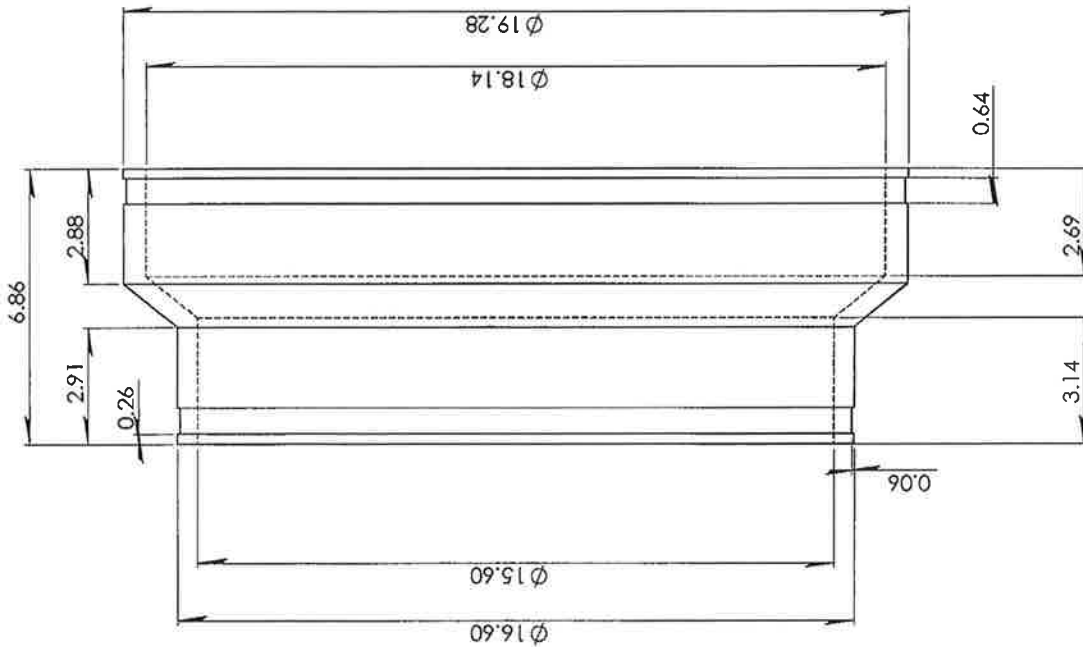
CHECKER:

DATE: 10/10/2007

SCALE not to scale

3RD ANGLE PROJECTION
DO NOT SCALE DRAWING

SHEET 1 OF 1



300 S. DAYTON ST.
 DAVISON, MI 48423
 PH: 810-653-9626
 FAX: 810-654-2616

Part Weight	10.00 lbs.
Min/Max Temp.	-30/140 Degrees F
Pressure Tested	4.3 PSI
Material	Flexible PVC-60 Duro Spec. A.
Installation Torque	60" Lbs.
Conforms to ASTM	D5926, C1173
Box Quantity	300 Series
Clamps used	

TOLERANCES:
 X= Fractional ±
 XX= ± 0.60
 .XXX= ± .032
 ANG.= ± 0.5°
 UNLESS OTHERWISE SPECIFIED

DESCRIPTION:
 Coupling 15" Clay x 15"
 Cast Iron/Plastic

1002-1515

UNITS: INCHES SEE DESCRIBE: SCALE: not to scale
 3RD ANGLE PROJECTION CHECKER: D. Brady DATE: 1/17/2011 SHEET 1 OF 1
 DO NOT SCALE DRAWING

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PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 18

Job No:		Date:	November 23, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	N/A
Address:	4444 Rice Street, Ste 295	Drawing No:	17
	Lihue, HI 96766	Subcontractor:	R. Electric
Phone No:	808.241.4838	Supplier:	Rasco
Fax No:	808.241.6887	Manufacturer:	Plastibond
Respond by:			

This submittal contains the following:

Description: Plastibond RedH2OT Coated Galvanized Rigid Conduit & Nipple

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: *[Signature]* DATE: 13 DEC 2011

GEOSYNTEC CONSULTANTS

REJECTED BASED ON AECOM'S
E-MAIL DATED 13 DEC 2011

cc: File

Submittal No:	18
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec. Section:	16050
Spec. Para:	N/A
Drawing No:	17
Subcontractor:	R. Electric
Supplier:	Rasco
Manufacturer:	Plastibond
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature:	<i>[Signature]</i> Date 11-23-11
for: <i>[Signature]</i>	

PLASTI-BOND REDH₂OT COATED GALVANIZED RIGID CONDUIT AND NIPPLES

COATED CONDUIT

Return To Index

Print This Page



PVC Coated Galvanized Rigid Conduit Specifications

PVC coated galvanized rigid conduit with red urethane interior coating protects conductors from mechanical damage and corrosive attack. Electrical continuity is maintained across assembled joints.

- 40 mil gray PVC exterior coating
- 2 mil red urethane interior coating
- PROTECH threads – A clear urethane coating over hot galvanized threads
- 12 trade sizes from 1/2" through 6"
- Shipped in 10' lengths
- Plastic thread protector caps are color coded for quick identification of conduit size.

Thread Protector Cap Colors:

Black- for 1/2" sizes, 1/2", 1-1/2", 2-1/2", 3-1/2"
Red- for 1/4" sizes, 3/4", 1-1/4"
Blue- for even sizes, 1", 2", 3", 4", 5", 6"

- UL Listed, (Standard 6) with PVC as the primary corrosion protection for the steel conduit. The underlying zinc coating is a supplemental corrosion protection coating. Restricted for use with threaded fittings only. (UL 6 is now used in lieu of WWC 581.)

ETL VERIFIED PVC-001: The PVC coating adhesion performance of this product has been ETL verified to the Intertek ETL SEMKO High Temperature H₂O PVC Coating Adhesion Test Procedure for 200 hours.



REDH₂OT PRODUCT FLASH

Plasti-Bond REDH₂OT... The Extra Distance in Protection from Corrosion

Thread Protection

As a closed system, a coated conduit installation is only as good as its threaded joints. Plasti-Bond offers you ProTech™ a unique technology of hot galvanizing our conduit threads. This new system provides two important benefits to the user. First, the zinc coating coverage is consistently uniform. Second, the threads are hot galvanized after the conduit is PVC coated. This means that nothing in the PVC coating process can damage the zinc coating on the threads, delivering a "virgin thread" to the user. These features offer much improved corrosion protection for the new threads. After hot galvanizing, we apply a clear urethane topcoat to ensure the threads remain corrosion free before and after installation.

APPROVAL STAMP

APPLICATION

FEATURES

COMPLIANCES

PLASTI-BOND REDH₂OT COATED CONDUIT AND NIPPLES

Coated Conduit Technical Data

COATED CONDUIT

Metric Size Designators	Pipe Size Inches	Catalog Number	Outside Wall Thickness Inches	Diameter With Coating Inches	Internal Inside Diameter Inches	Traverse Area Sq. Inches	Nominal Weight	Aluminum Catalog #
<input type="checkbox"/> 16	1/2"	PRHCONDUIT-1/2	.104"	.920"	0.632"	0.314"	85	PRCONDUIT-AL-1/2
<input type="checkbox"/> 21	3/4"	PRHCONDUIT-3/4	.107"	1.130"	0.836"	0.549"	112	PRCONDUIT-AL-3/4
<input type="checkbox"/> 27	1"	PRHCONDUIT-1	.126"	1.395"	1.063"	0.887"	164	PRCONDUIT-AL-1
<input type="checkbox"/> 35	1-1/4"	PRHCONDUIT-1-1/4	.133"	1.740"	1.394"	1.526"	217	PRCONDUIT-AL-1-1/4
<input type="checkbox"/> 41	1-1/2"	PRHCONDUIT-1-1/2	.138"	1.980"	1.624"	2.071"	268	PRCONDUIT-AL-1-1/2
<input type="checkbox"/> 53	2"	PRHCONDUIT-2	.146"	2.455"	2.083"	3.408"	358	PRCONDUIT-AL-2
<input type="checkbox"/> 63	2-1/2"	PRHCONDUIT-2-1/2	.193"	2.955"	2.489"	4.866"	546	PRCONDUIT-AL-2-1/2
<input type="checkbox"/> 78	3"	PRHCONDUIT-3	.205"	3.580"	3.090"	7.499"	708	PRCONDUIT-AL-3
<input type="checkbox"/> 91	3-1/2"	PRHCONDUIT-3-1/2	.215"	4.080"	3.570"	10.010"	851	PRCONDUIT-AL-3-1/2
<input type="checkbox"/> 103	4"	PRHCONDUIT-4	.225"	4.580"	4.050"	12.882"	1009	PRCONDUIT-AL-4
<input type="checkbox"/> 129	5"	PRHCONDUIT-5	.245"	5.649"	5.073"	20.212"	1337	PRCONDUIT-AL-5
<input type="checkbox"/> 155	6"	PRHCONDUIT-6	.266"	6.705"	6.093"	29.158"	1993	PRCONDUIT-AL-6

PLASTI-BOND REDH₂OT COATED NIPPLES

APPLICATION

PLASTI-BOND REDH₂OT factory threaded nipples save you time and money in the field. Electrical continuity is maintained across assembled joints.

*The exteriors of certain short nipples are coated with urethane in lieu of PVC. This is dictated by the manufacturing process as well as assembly considerations.

- 40 mil gray PVC exterior coating
- 2 mil red urethane interior and thread coating
- 12 trade sizes from 1/2" through 6"
- 11 standard lengths in available: Close, 2" to 12"
- Made to order lengths available – Call for quote
- Plastic thread protector caps are color coded for quick identification of conduit size.

Thread Protector Cap Colors:

- Black- for 1/2" sizes, 1/2", 1-1/2", 2-1/2", 3-1/2"
- Red- for 1/4" sizes, 3/4", 1-1/4"
- Blue- for even sizes, 1", 2", 3", 4", 5", 6"

FEATURES

UL Listed, (Standard 6) with PVC as the primary corrosion protection for the steel conduit. The underlying zinc coating is a supplemental corrosion protection coating. Restricted for use with threaded fittings only. (UL 6 is now used in lieu of WWC 581.)

ETL VERIFIED: Plasti-Bond Nipples are manufactured from ETL-verified conduit.

COMPLIANCES

Simple Steps To Ordering

To order PLASTI-BOND coated nipples follow these simple steps to create a catalog number:

- 1- Determine Proper Prefix.**
 - For steel conduit nipples use the prefix: **PRHNIP-**
 - For aluminum conduit nipples use the prefix: **PRNIP-AL-**
- 2- Add the conduit trade size needed to your catalog prefix.**
Example - 1/2" coated steel nipple: **PRHNIP-1/2**
- 3- Enter an "X" to represent "by" as in "2X4".**
Example - **PRHNIP-1/2X**
- 4- Enter the desired nipple length.**
Example - 10" **PRHNIP-1/2X10**

The catalog number for a Plasti-Bond coated steel, 1/2" nipple with a length of 10": **PRHNIP-1/2X10**

This number can then be looked up in the listing of pricing to determine price and availability.

Call 903-843-5591 for custom orders, customer service and more information on **Plasti-Bond REDH₂OT**.

APPROVAL STAMP

(See online product submittal guide at www.plastibond.com)

PLASTI-BOND REDH₂OT COATED ELBOWS

STANDARD RADIUS COATED ELBOWS

Print This Page

Return To Index



Coated Elbow Specifications

PLASTI-BOND REDH₂OT factory bent standard radius elbows are available and ready to ship. Factory bent elbows are more accurate, quicker to install and more economical, because they save field bending time and do not waste materials. Electrical continuity is maintained across assembled joints.

- 40 mil Gray PVC exterior coating
- 2 mil Red urethane interior and thread coating
- 12 trade sizes from 1/2" through 6"
- Available in 90°, 60°, 45°, and 30° bends
- Plastic thread protector caps are color coded for quick identification of conduit size.

Thread Protector Cap Colors:

Black- for 1/2" sizes, 1/2", 1-1/2", 2-1/2", 3-1/2"
Red- for 1/4" sizes, 3/4", 1-1/4"
Blue- for even sizes, 1", 2", 3", 4", 5", 6"

- UL Listed, (Standard 6) with the PVC as the primary corrosion protection for the steel conduit. The underlying zinc coating is a supplemental corrosion protection coating. Restricted for use with threaded fittings only. (UL 6 is now used in lieu of WWC 581.)

ETL VERIFIED: Plasti-Bond Elbows are manufactured from ETL-verified conduit.

APPLICATION

FEATURES

COMPLIANCES

Simple Steps To Ordering

To order the PLASTI-BOND coated elbows follow these simple steps to creating a catalog number:

- 1- Determine Proper Prefix.**
 - For steel conduit elbow use the prefix: **PRHELB-**
 - For aluminum conduit elbow use the prefix: **PRELB-AL-**
- 2- Add the conduit trade size needed to your catalog prefix.**
Example - 1/2" steel conduit elbow: **PRHELB-1/2**
- 3- Enter an "X" to represent "by" as in "2X4".**
Example - **PRHELB-1/2X**
- 4- Enter the desired elbow degree of bend.**
Example - 45°: **PRHELB-1/2X45**

For a coated steel, 1/2" elbow with a 45° bend, the catalog number would be: **PRHELB 1/2X45**

STEP 5 AND 6 FOR CONFIGURING CATALOG NUMBERS FOR LARGE RADIUS ELBOWS

- 5- Enter an "X" to represent "by" as in "2X4".**
Example - **PRHELB-1/2X45X**
- 6- Enter the desired elbow radius.**
Example - 30: **PRHELB-1/2X45X30**

For a coated steel, 1/2" elbow with a 45° bend, and a special radius of 30" the catalog number would be:
PRHELB-1/2X45X30

This number can then be looked up in the listing of pricing to determine price and availability.

Call 903-843-5591 for custom orders, customer service and more information on **Plasti-Bond REDH₂OT**.

APPROVAL STAMP

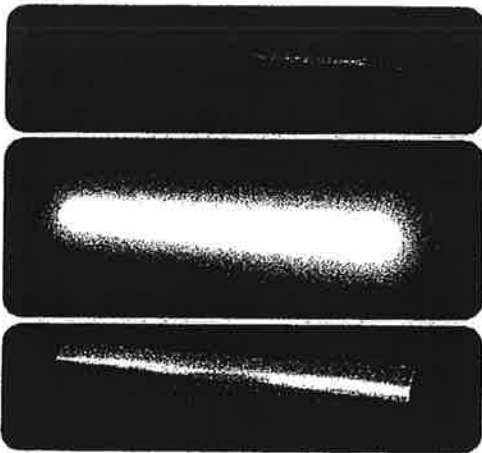
(See online product submittal guide at www.plastibond.com)

AEP™ ...Ensuring That Plasti-Bond REDH₂OT is Right...Right From The Start!

AEP™... Adhesion Enhancement Process...is a proprietary treatment system developed to provide an unequalled bond between our PVC and the hot-dipped galvanized conduit it protects.

Two Realities About Bonding

1. Surface preparation is the key to a good bond.
2. The quality of the bond determines the quality of the corrosion protection.



AEP...Plasti-Bond REDH₂OT's Answer To The Challenge Of Bonding

Our AEP process for Plasti-Bond REDH₂OT conduit and fittings prepares and controls the zinc coating so it will receive, and hold, the PVC coating.

This is accomplished with proprietary mechanical and chemical methods, as well a special primer coating that only Plasti-Bond REDH₂OT has. The end result is superior PVC bonding to the metal and the additional backup corrosion protection of zinc.

Plasti-Bond REDH₂OT outperforms other coated conduit brands because it was prepared right... right from the start.

ProTECH™ ...Nothing Can Touch Our Threads!

ProTECH™ is a system that provides our conduit threads with unsurpassed corrosion protection.

The ProTECH system represents an investment of almost \$2 million with a single goal of delivering to you the highest quality coated conduit thread possible.

After PVC coating of the conduit, the automated, computer controlled ProTECH process starts with a laser trimming operation to remove excess PVC from the conduit ends. Next is mechanical surface preparation of the previously cleaned conduit threads. This is critical because surface preparation is the key to a good bond. Next, the clean pipe threads are hot-galvanized using specially designed equipment, including 3-axis robotic arms. After hot-galvanizing, the threads are coated with a clear polyurethane spray, protecting the galvanized thread from corrosive attack. Nothing has touched the zinc coating of our threads!





PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 19

Job No:		Date:	November 23, 2011
To:	COK - DPW	Spec Section:	16050
Attention:	Troy Tanigawa	Spec Para:	N/A
Address:	4444 Rice Street, Ste 295	Drawing No:	10
	Lihue, HI 96766	Subcontractor:	R. Electric
Phone No:	808.241.4838	Supplier:	Rasco
Fax No:	808.241.6887	Manufacturer:	Cooper B-Line
Respond by:			

This submittal contains the following:

Description: Metal Framing Channels - FOR MOUNTING CONTROL PANEL

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 29 Nov 11

GEOSYNTEC CONSULTANTS

TO VERIFY PRODUCT DIMENSIONS PRIOR TO INSTALLATION

cc: File

Submittal No:	19
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	16050
Spec Para:	N/A
Drawing No:	10
Subcontractor:	R. Electric
Supplier:	Rasco
Manufacturer:	Cooper B-Line
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u>[Signature]</u> Date: <u>11-23-11</u>	

Metal Framing Channels

Channel

B-Line's metal framing channel is cold formed on our modern rolling mills from 12 Ga. (2.6mm), 14 Ga. (1.9mm), and 16 Ga. (1.5mm) low carbon steel strips. A continuous slot with inturned lips provides the ability to make attachments at any point.

Lengths

Standard lengths are 10' (3.05m) and 20' (6.09m) with length tolerance of $\pm 1/8"$ (+3.2mm). Custom lengths are available upon request.

Slots

B-Line's slotted series of channels offer full flexibility. A variety of pre-punched slot patterns eliminate the need for precise field measuring for hole locations. Slots offer wide adjustments in the alignment and bolt sizing.

Holes

A variety of pre-punched $9/16"$ (14.3 mm) diameter hole patterns are available in B-Line channels. These hole patterns provide an economical alternative to costly field drilling required for many applications.

Knockouts

When used with series B217-20 Closure Strips, B-Line's knockout channels can be used to provide an economical U.L. listed surface raceway. Channels are furnished with $7/8"$ (22.2 mm) knockouts on 6" (152 mm) centers, allowing for perfect fixture alignment on spans up to 20' (6.09 m).

Materials & Finishes (Unless otherwise noted)

Steel: Plain

12 Ga. (2.6), 14 Ga. (1.9) and 16 Ga. (1.5)

Steel: Pre-galvanized

12 Ga. (2.6), 14 Ga. (1.9) and 16 Ga. (1.5)

Finish Code	Finish	Specification
PLN	Plain	ASTM A1011, 33,000 PSI min. yield
GRN	Dura-Green	
GALV	Pre-Galvanized	ASTM A653 33,000 PSI min. yield
HDG	Hot-Dipped Galvanized	ASTM A123
YZN	Yellow Zinc Chromate	ASTM B633 SC3 Type II
SS4	Stainless Steel Type 304	ASTM A240
SS6	Stainless Steel Type 316	ASTM A240
AL	Aluminum	Aluminum 6063-T6

Note: A minimum order may apply on special material and finishes.

Design Load

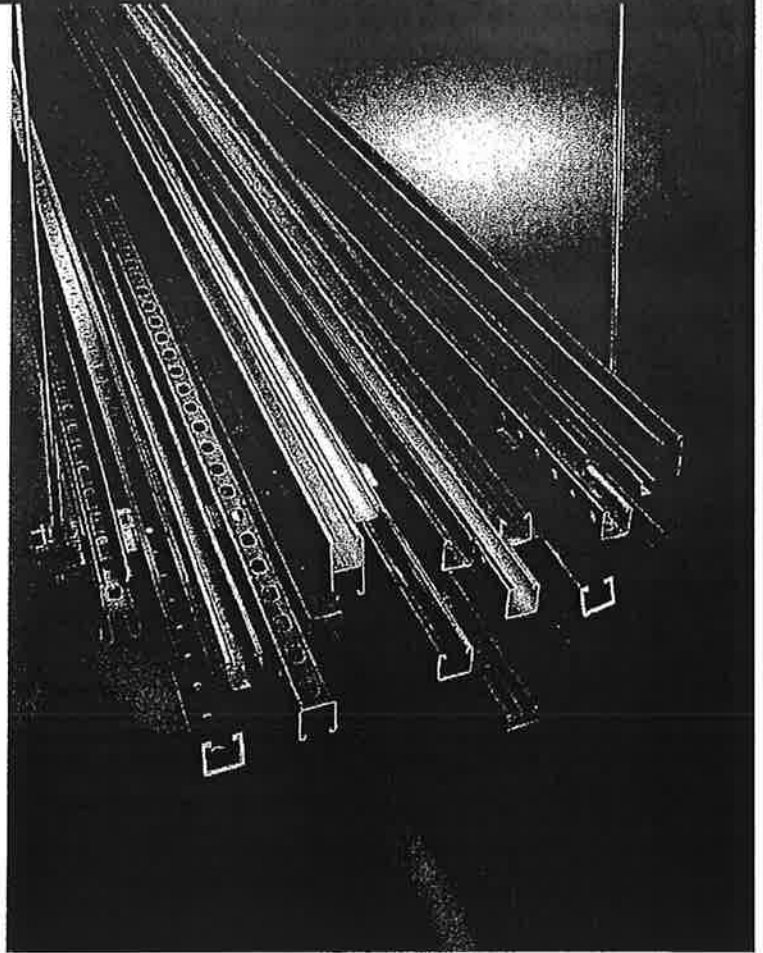
The design loads given for strut beam loads are based on a simple beam condition using an allowable stress of 25,000 psi. This allowable stress results in a safety factor of 1.68. This is based upon virgin steel minimum yield strength of 33,000 psi cold worked during rolling to an average yield stress of 42,000 psi.

Welding

Weld spacing is maintained between 2 1/2 inches (63.5 mm) and 4 inches (101.6 mm) on center. Through high quality control testing of welded channels and continuous monitoring of welding equipment, B-Line provides the most consistent combination channels available today.

Metric

Metric dimensions are shown in parentheses. Unless noted, all metric dimensions are in millimeters.



SELECTION CHART

for Channels, Materials and Hole Patterns

Channel Type	Channel Dimensions				Material & Thickness **				Channel Hole Pattern **				
	Height	Width	Stainless Steel		Steel	Alum.	Type 304	Type 316	SH	S	H17/8	TH	KO6
			Type 304	Type 316					9/16" x 1/8" slots on 2" centers	1 3/32" x 3/8" slots	9/16" diameter holes	9/16" diameter on 1 7/8" centers	7/8" diameter knockouts
1	2	3	4	1	2	3	4	1	2	3	4	1	2
B11	3 1/4"	(82.5)	1 5/8"	(41.3)	12 Ga.	-	-	-	1	1	1	-	1
B12	2 7/16"	(61.9)	1 5/8"	(41.3)	12 Ga.	.105	-	-	1 2	1	1 2	-	1 2
B22	1 5/8"	(41.3)	1 5/8"	(41.3)	12 Ga.	.105	12 Ga.	12 Ga.	1 2 3 4	1 3	1 2 3	1	1 2
B24	1 5/8"	(41.3)	1 5/8"	(41.3)	14 Ga.	.080	14 Ga.	14 Ga.	1 2 3 4	1	1 2 3	-	1 2
B26	1 5/8"	(41.3)	1 5/8"	(41.3)	16 Ga.	-	-	-	1	1	1	-	1
B32	1 3/8"	(34.9)	1 5/8"	(41.3)	12 Ga.	-	12 Ga.	-	1 3	1	1 3	-	1
B42	1"	(25.4)	1 5/8"	(41.3)	12 Ga.	-	12 Ga.	-	1 3	1	1 3	-	1
B52	1 3/16"	(20.6)	1 5/8"	(41.3)	12 Ga.	-	12 Ga.	-	1	1	1	-	1
B54	1 3/16"	(20.6)	1 5/8"	(41.3)	14 Ga.	.080	14 Ga.	14 Ga.	1 2 3 4	1	1 2 3 4	-	1 2
B56	1 3/16"	(20.6)	1 5/8"	(41.3)	16 Ga.	-	-	-	1	1	1	-	1
B62	1 3/16"	(20.6)	1 3/16"	(20.6)	18 Ga.	-	-	-	-	-	-	-	-
B72	1 3/32"	(10.3)	1 3/16"	(20.6)	18 Ga.	-	-	-	-	-	-	-	-
E7016	3/4"	(19.0)	5/8"	(15.9)	16 Ga.	-	-	-	-	-	-	-	-

The selection has been prepared to provide a reference for available channel, materials and hole patterns. Material types available for various hole patterns are defined by numbers 1 thru 4. Some stainless steel channels with hole patterns are available on special order only.

*Metric equivalent for thicknesses shown in chart.
 12 Ga. = 2.6 mm 18 Ga. = 1.2 mm
 14 Ga. = 1.9 mm .105 = 2.6 mm
 16 Ga. = 1.5 mm .080 = 2.0 mm

**1 - Steel
 2 - Aluminum
 3 - Type 304 Stainless Steel
 4 - Type 316 Stainless Steel

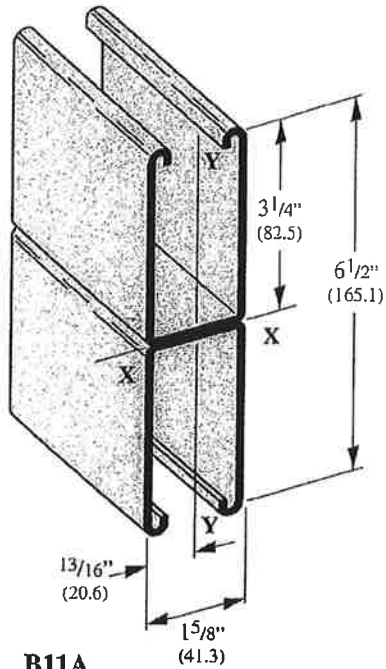
Properties may vary due to commercial tolerances of the material.

Channel Part Numbering			
Example:			
B22 SH SS4 120			
Channel Type	Hole Patterns	Material/Finish	Length
B11	SH (pg. 40)	GRN	120
B12	S (pg. 40)	GALV	240
B22 †	H178 (pg. 40)	HDG	
B24 †	TH (pg. 41)	YZN	
B26	KO6 (pg. 41)	SS4	
B32	SHA (pg. 41)	SS6	
B42	S58 (pg. 42)	AL	
B52 †	M (pg. 42)		
B54 †	H25 (pg. 43)		
B56	H112 † (pg. 42)		
B62	* Leave blank for no hole pattern		
B72			
E7016			

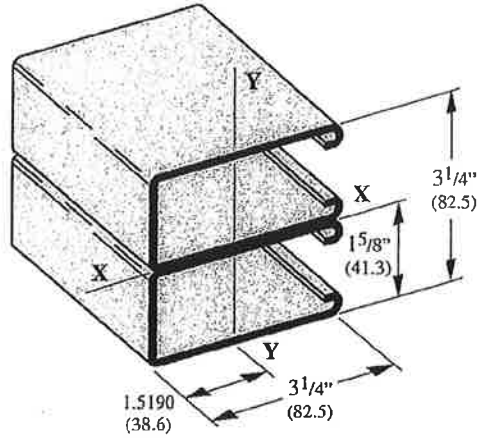
† BK style channel available in four (4) channel sizes and one (1) hole pattern only. (Example BK22H112)

Reference page 14 for general fitting and standard finish specifications.

B11 Beam & Column Loading Data



B11A
Wt. 6.10 Lbs./Ft. (9.08 kg/m)



B11B
Wt. 6.10 Lbs./Ft. (9.08 kg/m)

COLUMN LOADING

Unbraced Height	Channel Style	Max. Column Loading K = .80				Max. Column Loading (Loaded @ C.G.)					
		Loaded @ C.G.		Loaded @ Slot Face		K = .65		K = 1.0		K = 1.2	
		Lbs.	N	Lbs.	N	Lbs.	N	Lbs.	N	Lbs.	N
24	B11	8190	(36431)	4477	(19914)	8446	(37569)	7783	(34620)	7311	(32521)
	B11A	17701	(78738)	8267	(36773)	17778	(79080)	17572	(78164)	17416	(77470)
36	B11	7311	(32521)	4183	(18607)	7838	(34865)	6503	(28927)	5612	(24963)
	B11A	17416	(77470)	8189	(36426)	17590	(78244)	17127	(76184)	16774	(74614)
48	B11	6214	(27641)	3783	(16827)	7053	(31373)	4988	(22188)	3816	(16974)
	B11A	17016	(75691)	8079	(35937)	17327	(77074)	16503	(73409)	15876	(70620)
60	B11	4988	(22188)	3279	(14586)	6140	(27312)	3595	(15991)	2790	(12410)
	B11A	16503	(73409)	7727	(34371)	16988	(75566)	15701	(69841)	14721	(65478)
72	B11	3816	(16974)	2444	(10871)	5146	(22890)	2790	(12410)	2213	(9844)
	B11A	15876	(70620)	6160	(27401)	16574	(73724)	14721	(65482)	13310	(59206)
84	B11	3063	(13625)	1897	(8438)	4133	(18384)	2291	(10191)	1846	(8211)
	B11A	15135	(67324)	4961	(22067)	16084	(71545)	13563	(60331)	11642	(51786)
96	B11	2564	(11405)	1532	(6814)	3398	(15115)	1953	(8687)	1591	(7077)
	B11A	14279	(63516)	4045	(17993)	15520	(69036)	12226	(54384)	9717	(43223)
108	B11	2213	(9844)	1273	(5662)	2886	(12837)	1708	(7597)	1401	(6232)
	B11A	13310	(59206)	3337	(14844)	14880	(66189)	10712	(47649)	7725	(34362)
120	B11	1953	(8687)	1081	(4808)	2514	(11183)	1522	(6770)	1251**	(5565)
	B11A	12226	(54384)	2784	(12384)	14164	(63004)	9019	(40118)	6257**	(27832)
144	B11	1591	(7077)	816	(3630)	2011	(8945)	1251**	(5565)	1026**	(4564)
	B11A	9717	(43223)	1990	(8852)	12508	(55638)	6257**	(27832)	4345**	(19327)
168	B11	1347	(5992)	642	(2856)	1687	(7504)	1058**	(4706)	859**	(3821)
	B11A	7183	(31951)	1464	(6512)	10550	(46929)	4597**	(20448)	3192**	(14199)
192	B11	1167**	(5191)	519	(2308)	1459	(6490)	910**	(4048)	-	-
	B11A	5499**	(24461)	1121	(4986)	8330	(37053)	3520**	(15658)	-	-
216	B11	1026**	(4564)	429	(1908)	1285**	(5716)	-	-	-	-
	B11A	4345**	(19327)	885	(3936)	6582**	(29278)	-	-	-	-
240	B11	910**	(4048)	360	(1601)	1148**	(5106)	-	-	-	-
	B11A	3520**	(15658)	717	(3189)	5331**	(23713)	-	-	-	-

**Where the slenderness ratio $\frac{KL}{r}$ exceeds 200, and K = end fixity factor, L = actual length and r = radius of gyration.

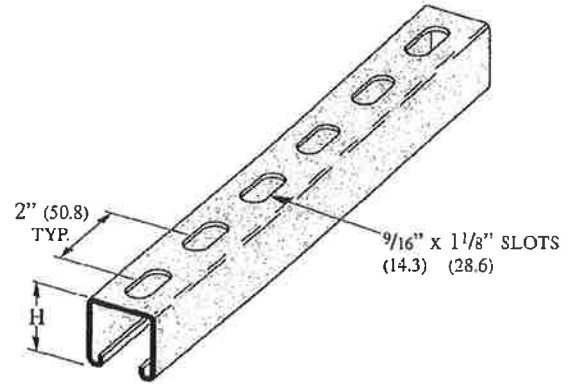
Reference page 14 for general fitting and standard finish specifications.

Channel Hole Patterns

B11SH THRU B56SH SH TYPE CHANNEL

•For beam loads use 90% of Channel Loading Chart

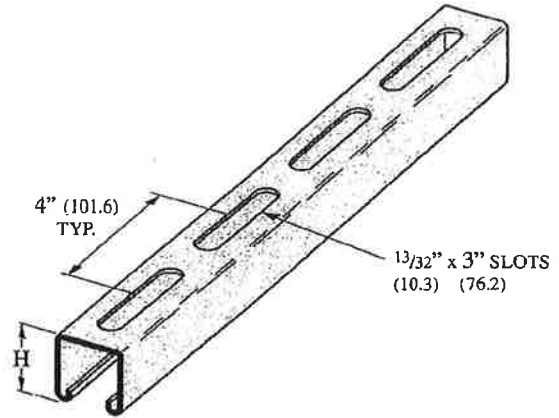
Part No.	Thickness		Height H		Weight	
			In.	mm	Lbs./Ft.	kg/m
B11SH	12 Ga.	(2.6)	3 1/4"	(82.5)	2.97	(4.42)
B12SH	12 Ga.	(2.6)	2 7/16"	(61.9)	2.39	(3.55)
B22SH	12 Ga.	(2.6)	1 5/8"	(41.3)	1.82	(2.71)
B24SH	14 Ga.	(1.9)	1 5/8"	(41.3)	1.34	(1.99)
B26SH	16 Ga.	(1.5)	1 5/8"	(41.3)	1.07	(1.59)
B32SH	12 Ga.	(2.6)	1 3/8"	(34.9)	1.62	(2.41)
B42SH	12 Ga.	(2.6)	1"	(25.4)	1.36	(2.02)
B52SH	12 Ga.	(2.6)	1 3/16"	(20.6)	1.19	(1.77)
B54SH	14 Ga.	(1.9)	1 3/16"	(20.6)	.91	(1.35)
B56SH	16 Ga.	(1.5)	1 3/16"	(20.6)	.80	(1.19)



B11S THRU B56S S TYPE CHANNEL

•For beam loads use 90% of Channel Loading Chart

Part No.	Thickness		Height H		Weight	
			In.	mm	Lbs./Ft.	kg/m
B11S	12 Ga.	(2.6)	3 1/4"	(82.5)	2.94	(4.37)
B12S	12 Ga.	(2.6)	2 7/16"	(61.9)	2.36	(3.51)
B22S	12 Ga.	(2.6)	1 5/8"	(41.3)	1.79	(2.66)
B24S	14 Ga.	(1.9)	1 5/8"	(41.3)	1.32	(1.96)
B26S	16 Ga.	(1.5)	1 5/8"	(41.3)	1.06	(1.58)
B32S	12 Ga.	(2.6)	1 3/8"	(34.9)	1.59	(2.36)
B42S	12 Ga.	(2.6)	1"	(25.4)	1.33	(1.98)
B52S	12 Ga.	(2.6)	1 3/16"	(20.6)	1.16	(1.72)
B54S	14 Ga.	(1.9)	1 3/16"	(20.6)	.89	(1.32)
B56S	16 Ga.	(1.5)	1 3/16"	(20.6)	.79	(1.17)

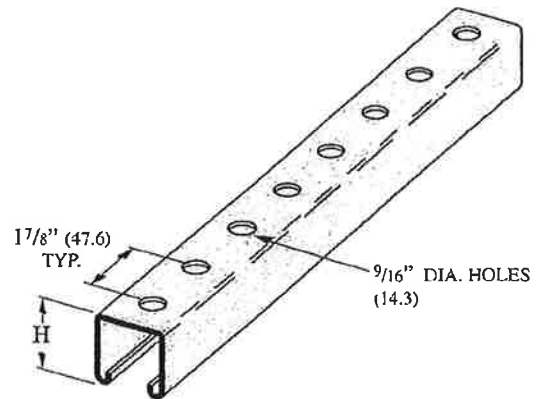


Channel & Combinations

B11H17/8 THRU B56H17/8 H17/8 TYPE CHANNEL

•For beam loads use 90% of Channel Loading Chart

Part No.	Thickness		Height H		Weight	
			In.	mm	Lbs./Ft.	kg/m
B11H17/8	12 Ga.	(2.6)	3 1/4"	(82.5)	3.00	(4.46)
B12H17/8	12 Ga.	(2.6)	2 7/16"	(61.9)	2.42	(3.60)
B22H17/8	12 Ga.	(2.6)	1 5/8"	(41.3)	1.85	(2.75)
B24H17/8	14 Ga.	(1.9)	1 5/8"	(41.3)	1.36	(2.02)
B26H17/8	16 Ga.	(1.5)	1 5/8"	(41.3)	1.09	(1.62)
B32H17/8	12 Ga.	(2.6)	1 3/8"	(34.9)	1.65	(2.45)
B42H17/8	12 Ga.	(2.6)	1"	(25.4)	1.39	(2.07)
B52H17/8	12 Ga.	(2.6)	1 3/16"	(20.6)	1.22	(1.81)
B54H17/8	14 Ga.	(1.9)	1 3/16"	(20.6)	.93	(1.38)
B56H17/8	16 Ga.	(1.5)	1 3/16"	(20.6)	.82	(1.22)



Reference page 14 for general fitting and standard finish specifications.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 21

Job No:		Date:	December 12, 2011
To:	Waste Management of HI	Spec Section:	
Attention:	Jesse Frey	Spec Para:	
Address:	92-460 Farrington Hwy Kapolei, HI 96707	Drawing No:	
Phone No:	808.250.0574	Subcontractor:	
Fax No:	808.668.1366	Supplier:	
Respond by:		Manufacturer:	Vari-Tech

This submittal contains the following:

- Description:**
- Pictures of existing LCM #1 thru #14 (looking down into manhole)
 - Shop drawings from Vari-Tech LCM #1 thru #14; Fabricated HDPE Tee Assembly
 - Existing invert elevations of inlet & outlets LCM #1 thru #14

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: *[Signature]* DATE: 22 DEC 11

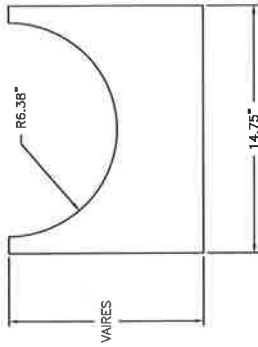
GEOSYNTEC CONSULTANTS

Submittal No:	21
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	
Spec Para:	
Drawing No:	
Subcontractor:	
Supplier:	
Manufacturer:	Vari-Tech
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature	<u><i>[Signature]</i></u> Date <u>12/12/11</u>
for:	<u><i>[Signature]</i></u>

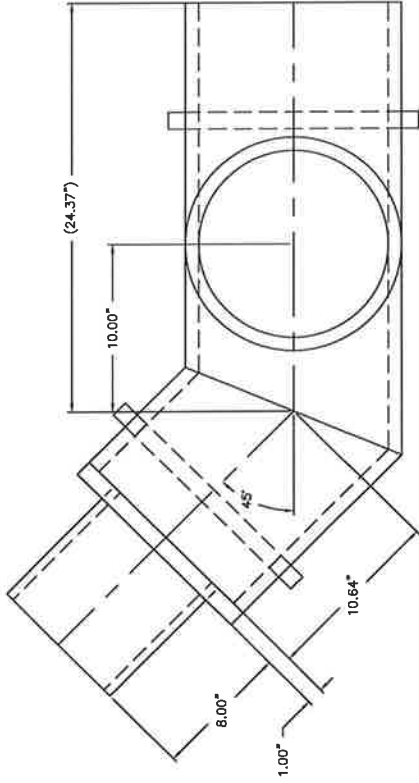
cc: File

Kekaha Sanitary Landfill

LCM #	Size of Pipe Inlet/Outlet	Rod Heights				Ht. from Bottom to Outlet Invert	Diff. Inlet to Outlet
		Bottom of Manhole	Invert @ Outlet	Invert @ Inlet	Invert @ 8" Landfill Inlet		
1.00	8"/12"	13.98	13.32	13.48	N/A	0.66 ✓	-0.16
2.00	12"	13.88	13.32	13.35	12.92	0.56	-0.03
3.00	12"	15.32	14.78	14.8	14.14	0.54	-0.02
4.00	12"	15.09	14.56	14.56	13.7	0.53	0.00
5.00	18"	14.41	13.88	13.85	13.00	0.53	0.03
6.00	18"	12.30	11.72	11.74	11.20	0.58	-0.02
7.00	18"	11.84	11.32	N/A	11.09	0.52	N/A
8.00	12"	11.76	11.30	N/A	11.06	0.46	N/A
9.00	12"	12.12	11.57	11.56	11.10	0.55	0.01
10.00	12"	12.56	12.02	12.01	11.22	0.54	0.01
11.00	18"	12.12	11.58	11.58	10.66	0.54	0.00
12.00	18"/12"	11.90	11.42	11.42	10.64	0.48	0.00
13.00	12"	11.62	11.14	11.13	10.66	0.48	0.01
14.00	12"	11.20	10.84	9.40	10.52	0.36	1.44

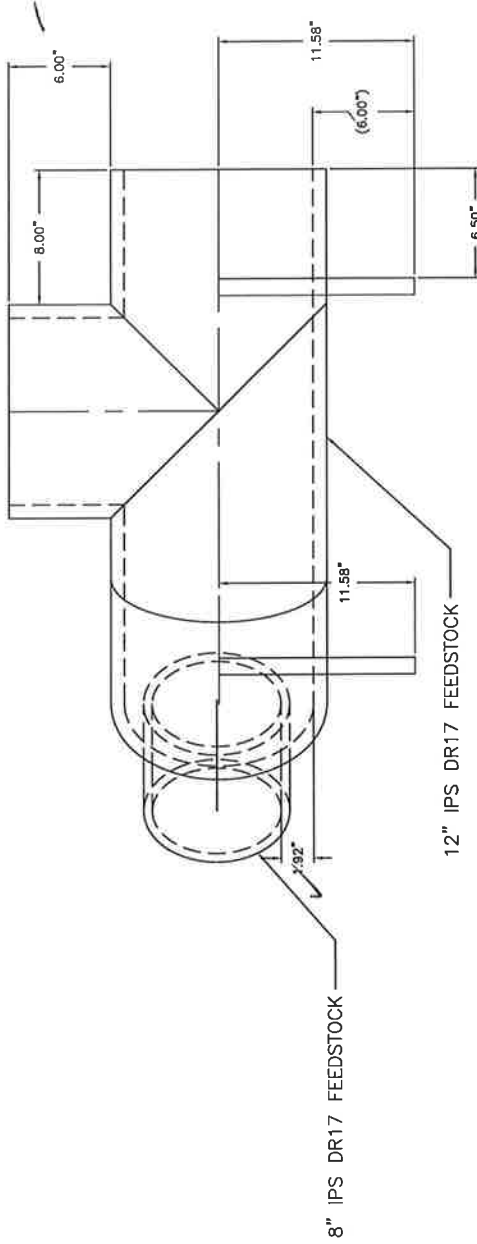


PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



LCM-1

12" IPS DR17 MITER TEE
REDUCING DOWN TO 8" IPS DR17
EXTRUDER WELDED LEG



REV.	DATE	DESCRIPTION	DWN.	DATE
4	12/12/11	Changes per Red-Lined Drawings	mlw	12/12/11
3	12/6/11	Changes per Red-Lined Drawings	mlw	12/6/11
2	9/19/11	Added gussets to Tees Made some elev adjustments	mlw	9/19/11

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vert-Tech
ORDER/QUOTE # | IFF-7125
APPROVED FOR FABRICATION

SIGNATURE: _____

DATE: _____

DEPT.	APPROVAL	DATE
MFG.	MFG_APP	MFG_DATE
MKT.	MKT_APP	MKT_DATE
TECH.	TECH_APP	TECH_DATE

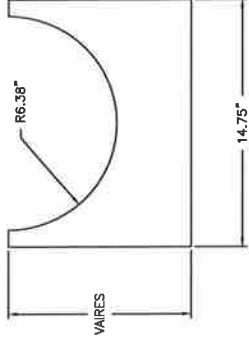
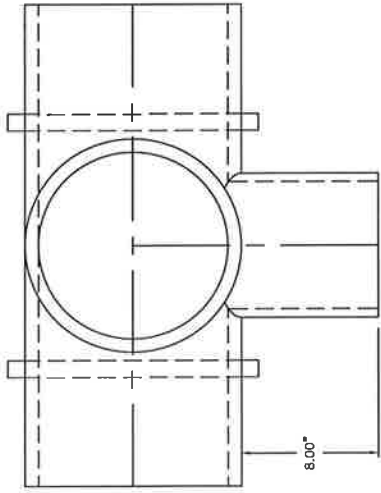
NOTE:
Slope created in Manhole
with supports.

Industrial Pipe Fittings, LLC

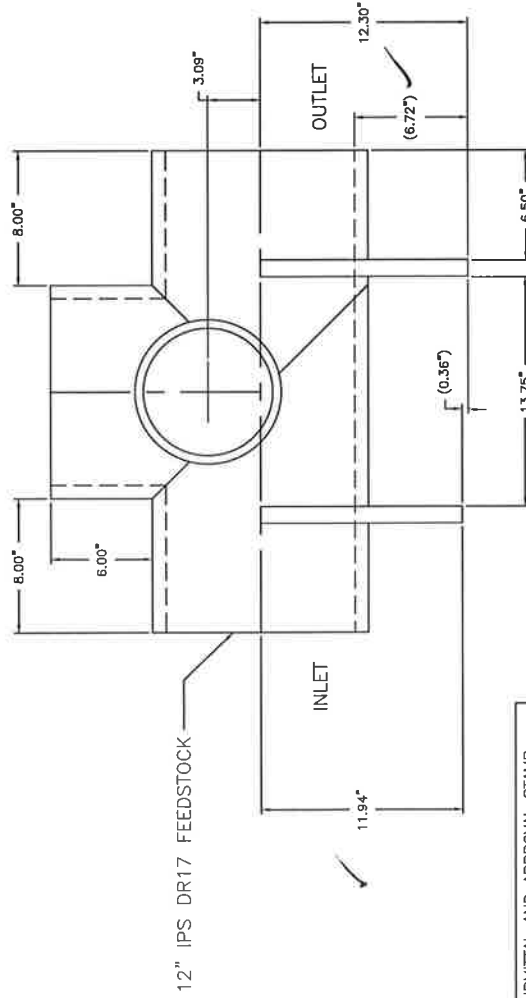
DRAWN BY:	MJW
DATE:	8-22-11
CHECKED BY:	TJT
SCALE:	NONE
TOLERANCES:	
DECIMAL:	.125
FRACTIONAL:	1/2"
ANGULAR:	±2°

Various Custom Extruder Welded Tees
Keokua Lt., Keokua, HI

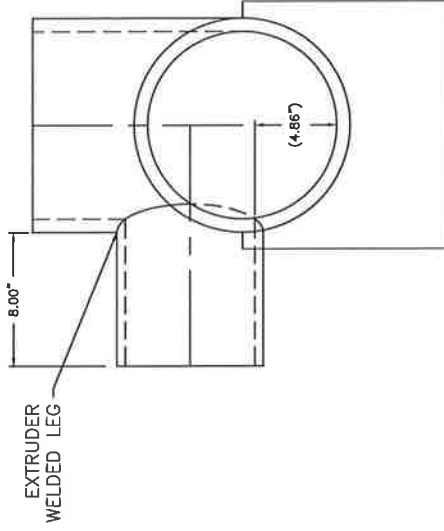
REVISION: 4
DRAWING NUMBER: C70186 SHT 1 OF 14



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



✓ LCM-2
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG



EXTRUDER
WELDED LEG

REV.	DATE	DESCRIPTION	DWN. DATE
4	12/12/11	Changes per Red-Lined Drawings	mjm
3	12/6/11	Changes per Red-Lined Drawings	mjm
2	9/19/11	Added gussets to Tees Made some elev adjustments	mjm

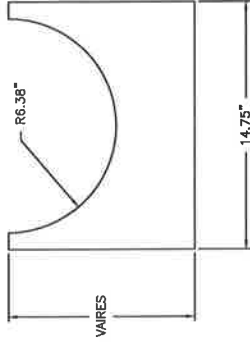
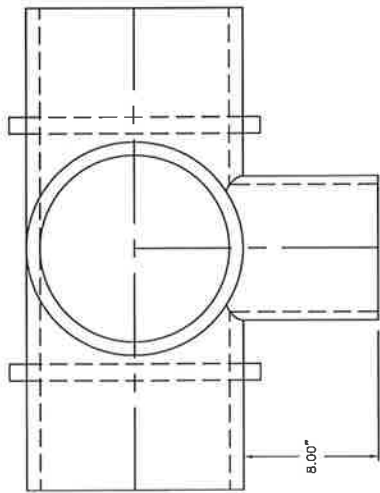
SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vert-Tech
ORDER/QUOTE #: IFF-7125
APPROVED FOR FABRICATION

NOTE:
Slope created in Manhole
with supports.

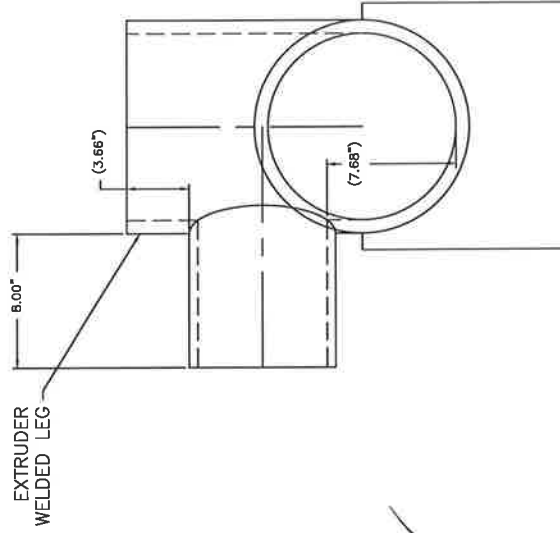
DEPT.	APPROVAL	DATE	DRAWN BY:
MFG.	MFG_APP	MFG_DATE	MJM
MKT.	MKT_APP	MKT_DATE	8-22-11
TECH.	TECH_APP	TECH_DATE	CHECKED BY: TVT

Industrial Pipe Fittings, LLC

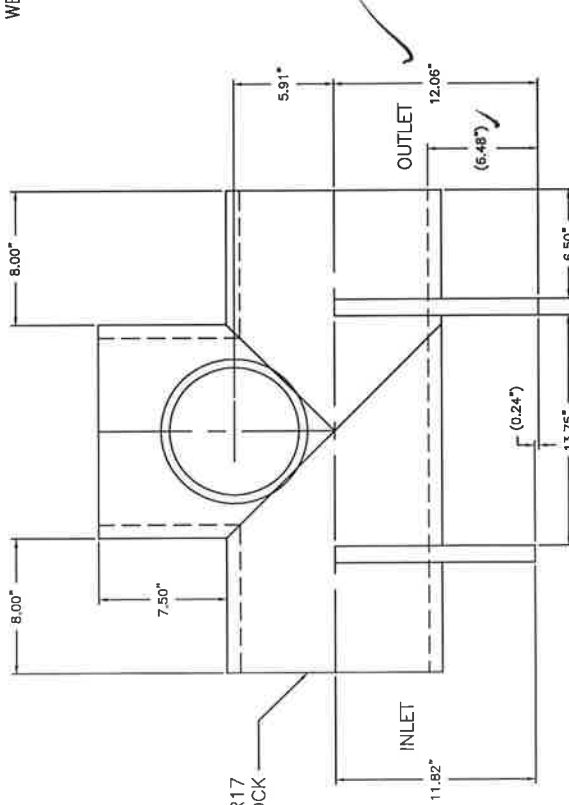
TITLE:	Various Custom Extruder Welded Tees	SCALE:	NONE
DRAWING NUMBER:	C70186	DECIMAL:	.52
SHEET:	2 OF 14	FRACTIONAL:	.52
REVISION:	4	ANGULAR:	.52



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



EXTRUDER
WELDED LEG



12" IPS DR17
FEEDSTOCK

INLET

OUTLET

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vgri-Tech
ORDER/QUOTE #: IPF-7125
APPROVED FOR FABRICATION

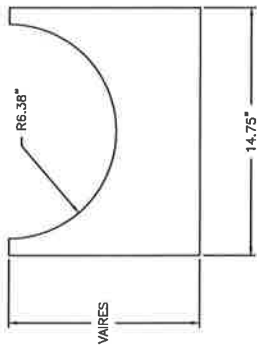
REV.	DATE	DESCRIPTION	DWN.	DATE
4	mjm	Changes per Red-Lined Drawings	mjm	12/12/11
3	mjm	Changes per Red-Lined Drawings	mjm	12/6/11
2	mjm	Added gussets to Tees Made some elev adjustments	mjm	9/19/11

LCM-3

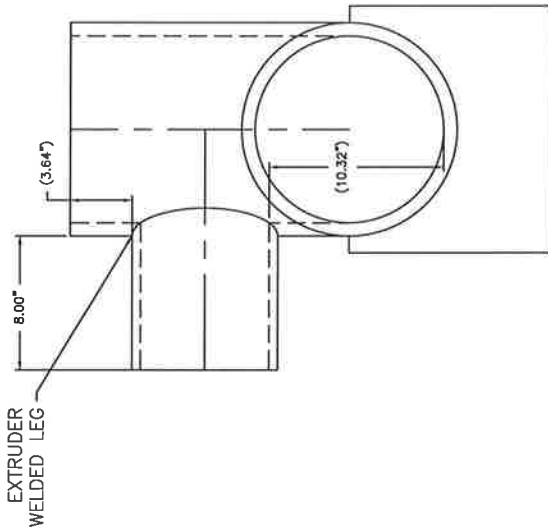
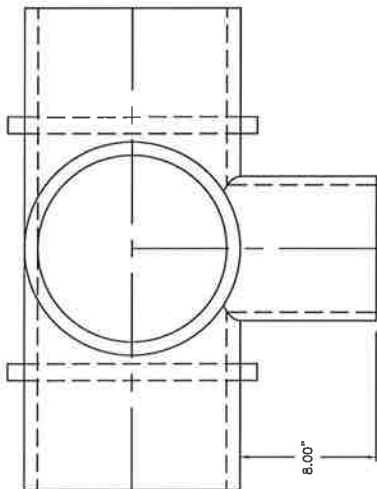
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

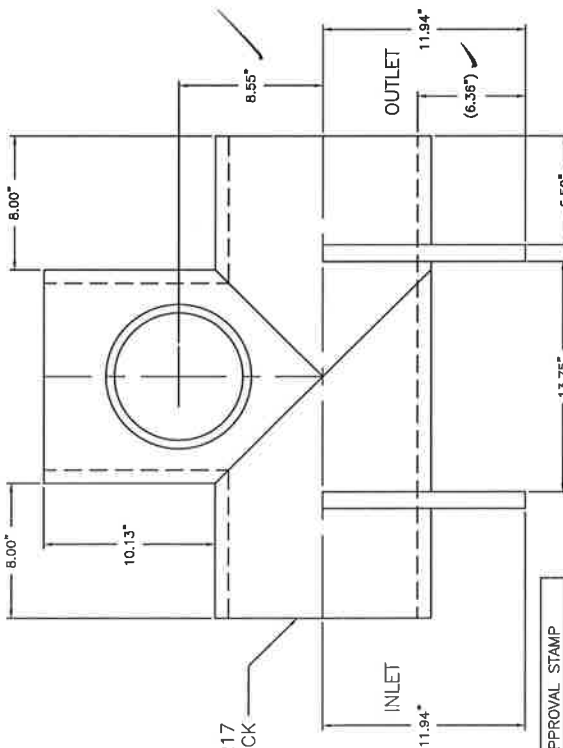
DRAWN BY: mjm		DATE: 8-22-11		CHECKED BY: WT		SCALE: NONE		TOLERANCES:	
INDUSTRIAL PIPE FITTINGS, LLC		MFG. DATE		MFG. APP		MKT. DATE		DECIMAL: 5.2	
Various Custom Extruder-Welded Tees		MFG.		MKT.		TECH.		FRACTIONAL: 5.2	
Keeking LP, Kougi, HI		MFG.		MKT.		TECH.		ANGULAR: 5.2	
TECH. DATE DRAWING NUMBER: C70186		MKT. DATE		TECH. DATE		REVISION: 4			
SHT 3 OF 14									



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



EXTRUDER
WELDED LEG



LCM-4
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vart-Tech
ORDER/QUOTE #: JPF-7125

APPROVED FOR FABRICATION

SIGNATURE: _____

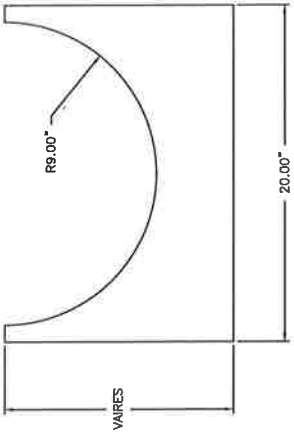
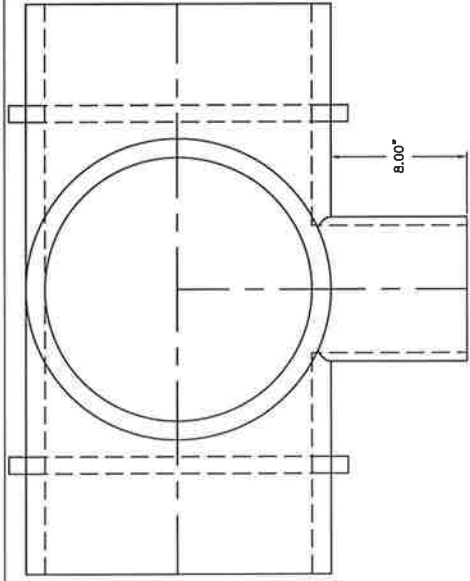
DATE: _____

REV.	DESCRIPTION	DATE
4	Changes per Red-Lined Drawings	12/12/11
3	Changes per Red-Lined Drawings	12/6/11
2	Added gussets to Tees Made some elev adjustments	9/19/11

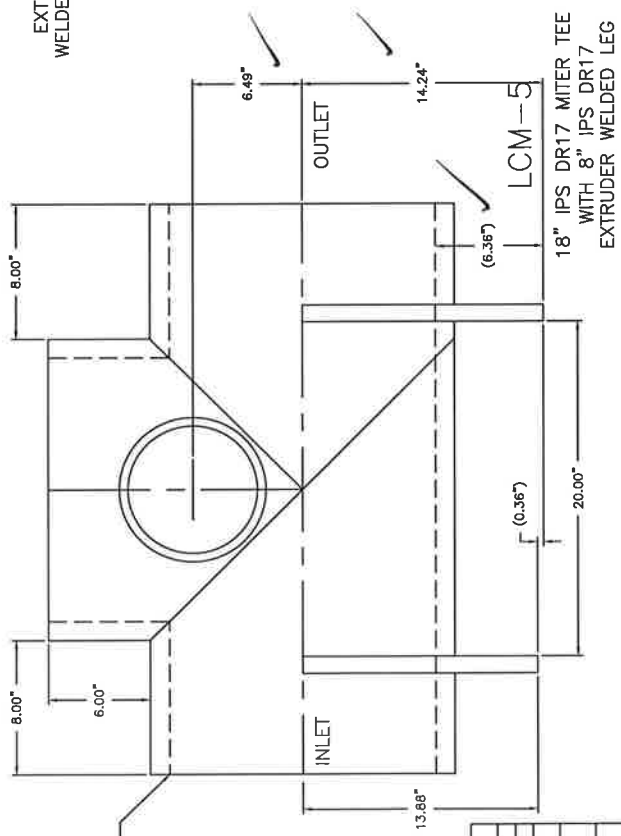
DEPT.	APPROVAL	DATE
MFG.	MFG_APP	MFG_DATE
MKT.	MKT_APP	MKT_DATE
TECH.	TECH_APP	TECH_DATE

INDUSTRIAL PIPE FITTINGS, LLC	DRAWN BY:	M.W.
Various Custom Extruder Welded Tees Keokauka Ln., Keokau, HI	DATE:	8-22-11
	CHECKED BY:	TJT
	SCALE:	NONE
TOLERANCES:	DECIMAL:	.2
FRACTIONAL:		1/2
ANGULAR:		1/4

NOTE:
Slope created in Manhole
with supports.



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



EXTRUDER
WELDED LEG

18" IPS DR17
FEEDSTOCK

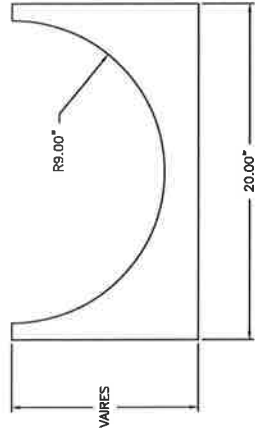
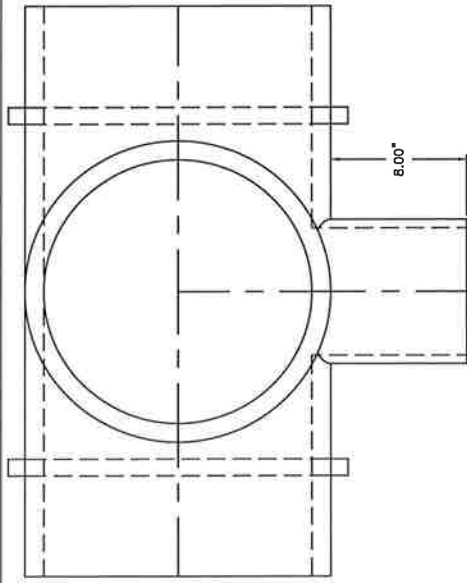
18" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

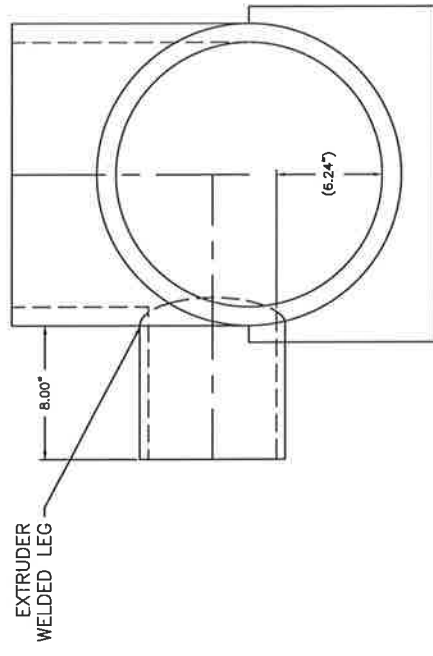
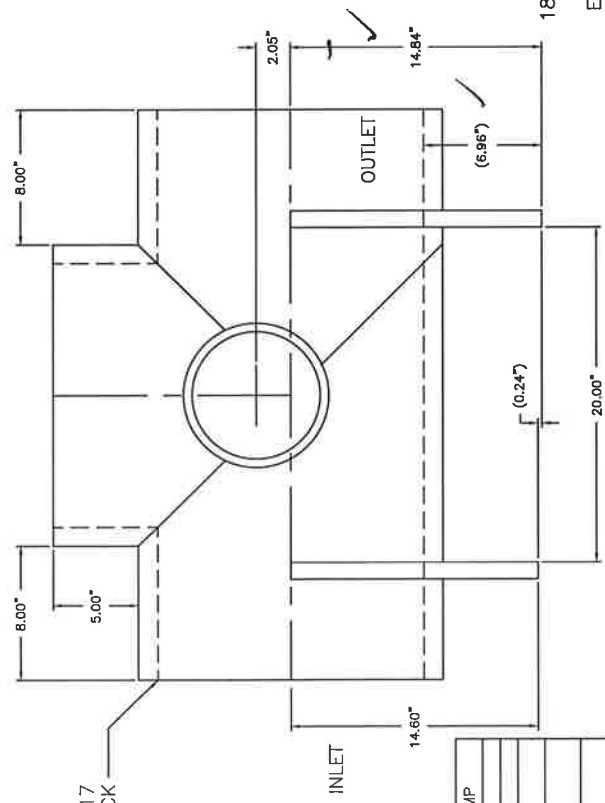
SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vgr-Tech
order/quote #: JPF-7125
APPROVED FOR FABRICATION

REV.	DATE	DESCRIPTION
4	12/12/11 mjw	Changes per Red-Lined Drawings
3	12/6/11 mjw	Changes per Red-Lined Drawings
2	9/19/11 mjw	Added gussets to Tees Made some elev adjustments

DATE	APPROVAL	DEPT.	DATE	DATE	MJW
	MFG_APP	MFG.	MFG_DATE	DATE	8-22-11
	MKT_APP	MKT.	MKT_DATE	CHECKED BY: TWT	
	TECH_APP	TECH.	TECH_DATE	SCALE: NONE	
Industrial Pipe Fittings, LLC					
Various Custom Extruder Welded Tees Keokoha LP, Keokuk, HI					
TOLERANCES: DECIMAL: .52 FRACTIONAL: 5/2 ANGULAR: .52					
DRAWING NUMBER: C70186 SHIT 5 OF 14 REVISION: 4					



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



LCM-6
18" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

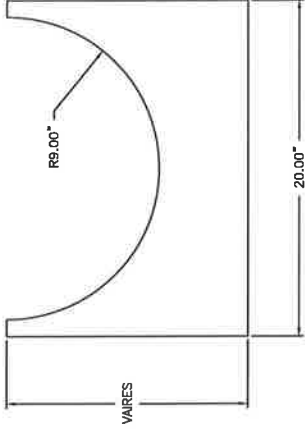
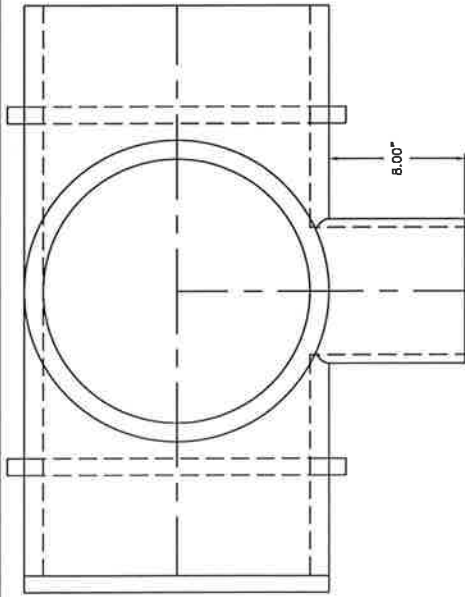
NOTE:
Slope created in Manhole
with supports.

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vert-Tech
ORDER/QUOTE #: IPP-7125
APPROVED FOR FABRICATION

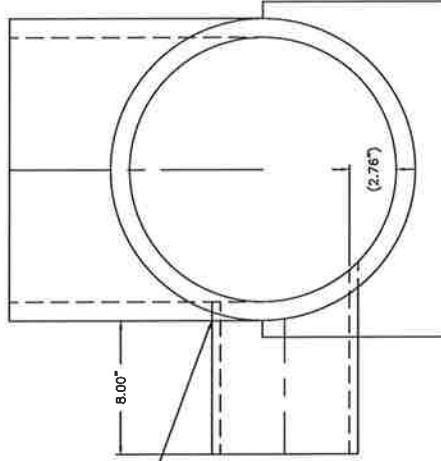
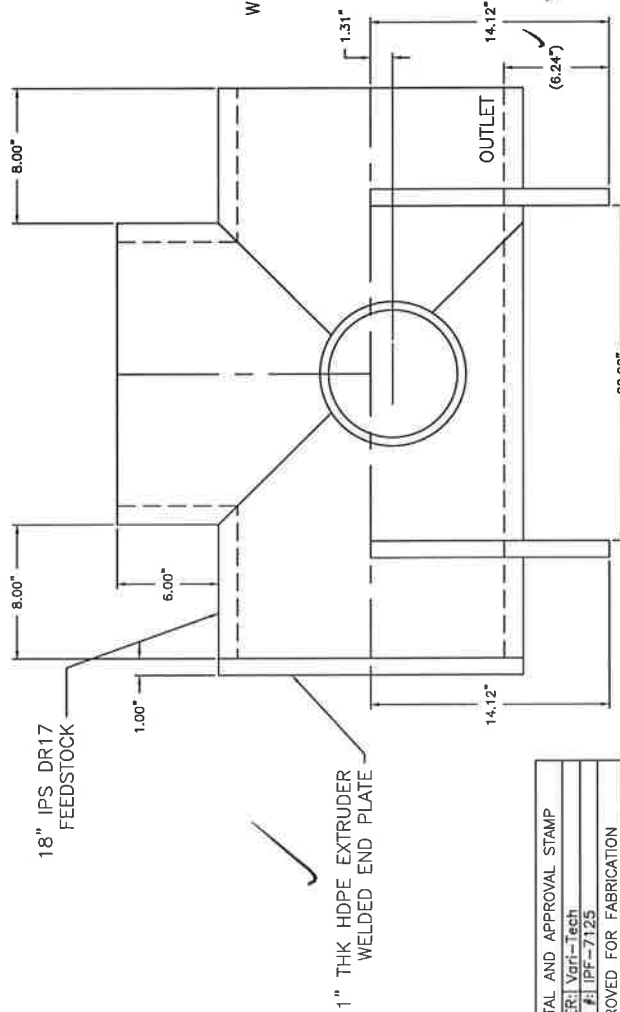
SIGNATURE: _____
DATE: _____

REV.	DESCRIPTION	DWN. DATE	DEPT.	APPROVAL	DATE
4	Changes per Red-Lined Drawings	12/12/11	MFG.	MFG_APP	MFG_DATE
3	Changes per Red-Lined Drawings	12/8/11	MKT.	MKT_APP	MKT_DATE
2	Added gussets to Tees Made some elev adjustments	9/19/11	TECH.	TECH_APP	TECH_DATE

INDUSTRIAL PIPE FITTINGS, LLC	VARIOUS CUSTOM EXTRUDER WELDED TEES
KEOKUHA, HI	KEOKUHA, HI
DRAWN BY: MAW	CHECKED BY: TYT
DATE: 8-22-11	SCALE: NONE
TOLERANCES:	DECIMAL: ±.2
FRACTIONAL: ±.2	ANGULAR: ±.2
REVISION: 4	SHT 6 OF 14
DRAWING NUMBER: C70186	



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



EXTRUDER WELDED LEG

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vari-Tech
ORDER/QUOTE #: IPF-7125
APPROVED FOR FABRICATION
SIGNATURE: _____
DATE: _____

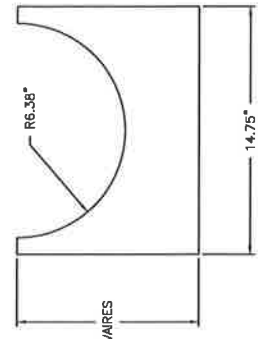
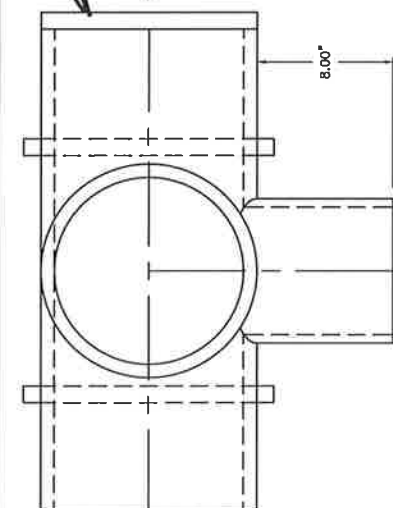
LCM-7
18" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

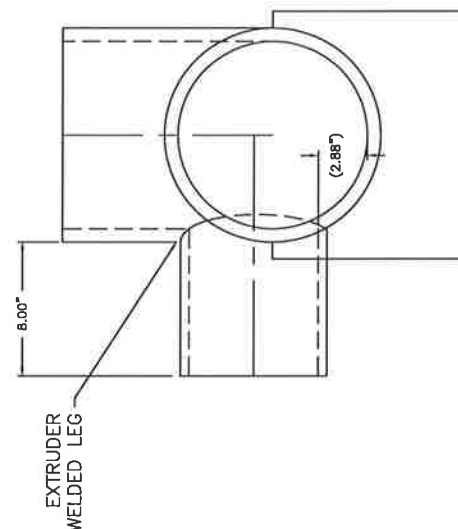
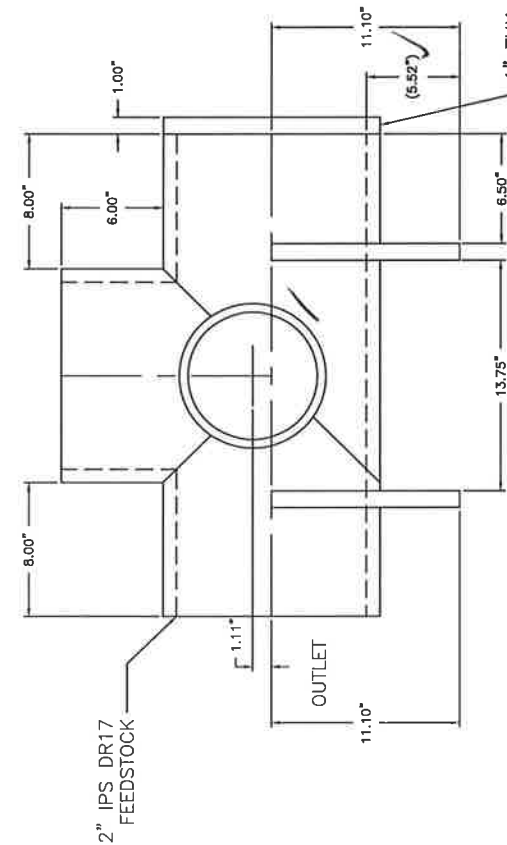
REV.	DESCRIPTION	OWN. DATE	DATE	DEPT.	APPROVAL	DATE	DATE
4	Changes per Red-Line Drawings	mlw	12/12/11	MFG.	MFG_APP	MFG_DATE	8-22-11
3	Changes per Red-Line Drawings	mlw	12/8/11	MKT.	MKT_APP	MKT_DATE	8-22-11
2	Added gussets to Tees Made some elev adjustments	mlw	9/19/11	TECH.	TECH_APP	TECH_DATE	8-22-11

Industrial Pipe Fittings, LLC		DRAWN BY: MJW	DATE: 8-22-11
		CHECKED BY: TWT	SCALE: NONE
		TOLERANCES:	DECIMAL: ±.2
		FRACTIONAL: ±.2	ANGULAR: ±.2
		TECH. TITLE: Various Custom Extruder Welded Tees	REVISION: 4
		TECH. DRAWING NUMBER: C70186	SHT 7 OF 14

1 1/2" THK HDPE EXTRUDER WELDED END



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



1" THK HDPE EXTRUDER WELDED END PLATE

REV.	DATE	DESCRIPTION
4	12/12/11	Changes per Red-Lined Drawings
3	12/8/11	Changes per Red-Lined Drawings
2	9/19/11	Added gussets to Tees Made some elev adjustments

DEPT.	APPROVAL	DATE
MFG.	MFG_APP	MFG_DATE
MKT.	MKT_APP	MKT_DATE
TECH.	TECH_APP	TECH_DATE

LCM-8

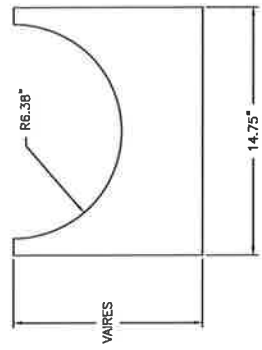
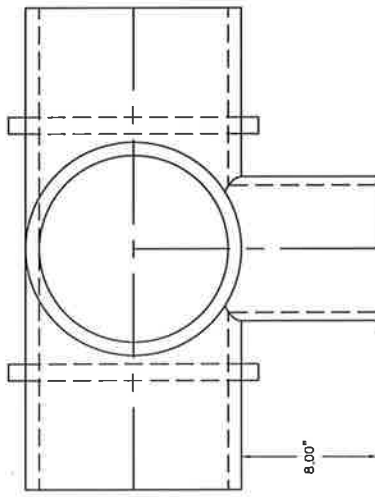
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

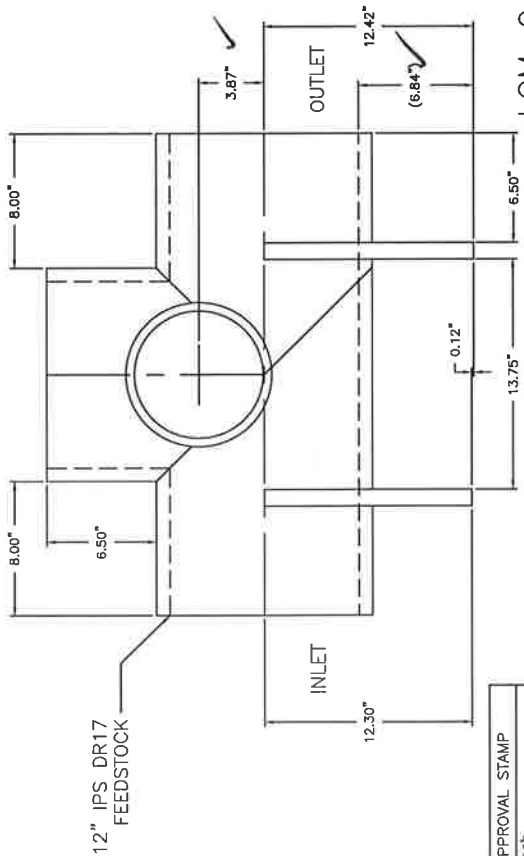
SUBMITTAL AND APPROVAL STAMP		DRAWN BY:	
CUSTOMER: Veri-Tech	DATE: 8-22-11	DATE: 8-22-11	SCALE: TVT
ORDER/QUOTE #: IPF-7125	APPROVED FOR FABRICATION	SIGNATURE:	TOLERANCES:
			DECIMAL: ±.2
			FRACTIONAL: ±.2
			ANGULAR: ±.2
			REVISION: 4

Industrial Pipe Fittings, LLC

Various Custom Extruder Welded Tees
Keekaha LF, Kaula, HI



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE

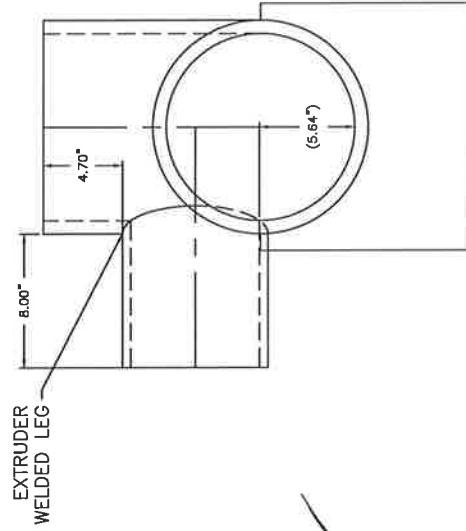


LCM-9

12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

REV.	DESCRIPTION	DATE	DATE	DATE
4	Changes per Red-Lined Drawings	12/12/11		
3	Changes per Red-Lined Drawings	12/6/11		
2	Added gaskets to Tees Made some elev adjustments	9/19/11		

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vari-Tech
ORDER/QUOTE #: IPF-7125
APPROVED FOR FABRICATION
SIGNATURE: _____
DATE: _____



DEPT.	APPROVAL	DATE
MFG.	MFG_APP	MFG_DATE
MKT.	MKT_APP	MKT_DATE
TECH.	TECH_APP	TECH_DATE

INDUSTRIAL PIPE FITTINGS, LLC	DATE	DATE
Various Custom Extruder Welded Tees	8-22-11	8-22-11
Keokaha LF, Kauai, HI	CHECKED BY: TWT	
	SCALE: NONE	
	TOLERANCES:	
	DECIMAL: ±.2"	
	FRACTIONAL: ±.2"	
	ANGULAR: ±.2°	

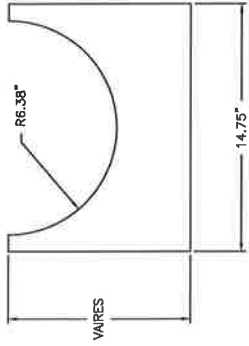
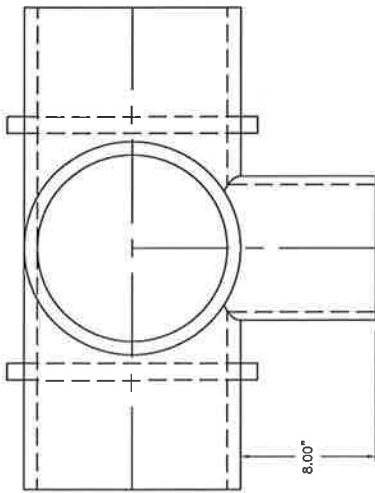
NOTE:
Slope created in Manhole
with supports.

INDUSTRIAL PIPE FITTINGS, LLC	DATE	DATE
Various Custom Extruder Welded Tees	8-22-11	8-22-11
Keokaha LF, Kauai, HI	CHECKED BY: TWT	
	SCALE: NONE	
	TOLERANCES:	
	DECIMAL: ±.2"	
	FRACTIONAL: ±.2"	
	ANGULAR: ±.2°	

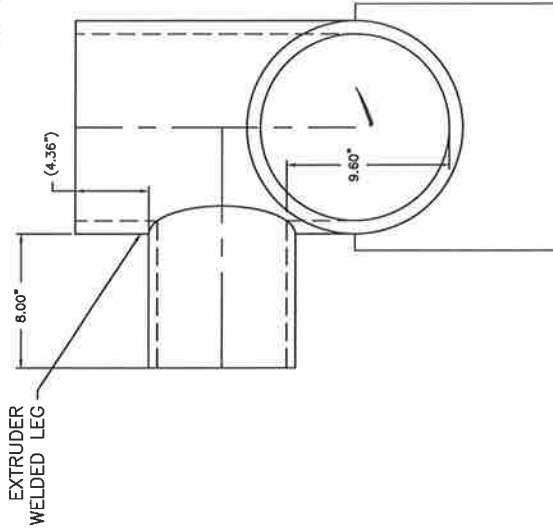
INDUSTRIAL PIPE FITTINGS, LLC	DATE	DATE
Various Custom Extruder Welded Tees	8-22-11	8-22-11
Keokaha LF, Kauai, HI	CHECKED BY: TWT	
	SCALE: NONE	
	TOLERANCES:	
	DECIMAL: ±.2"	
	FRACTIONAL: ±.2"	
	ANGULAR: ±.2°	

INDUSTRIAL PIPE FITTINGS, LLC	DATE	DATE
Various Custom Extruder Welded Tees	8-22-11	8-22-11
Keokaha LF, Kauai, HI	CHECKED BY: TWT	
	SCALE: NONE	
	TOLERANCES:	
	DECIMAL: ±.2"	
	FRACTIONAL: ±.2"	
	ANGULAR: ±.2°	

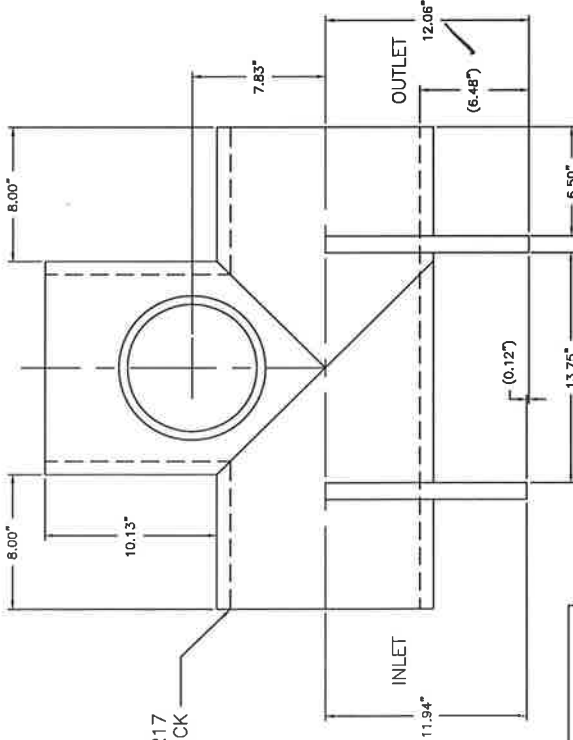
INDUSTRIAL PIPE FITTINGS, LLC	DATE	DATE
Various Custom Extruder Welded Tees	8-22-11	8-22-11
Keokaha LF, Kauai, HI	CHECKED BY: TWT	
	SCALE: NONE	
	TOLERANCES:	
	DECIMAL: ±.2"	
	FRACTIONAL: ±.2"	
	ANGULAR: ±.2°	



PIPE SUPPORT DETAIL
MADE FROM 1" THICK SHEET STOCK
TYP 2 PER TEE



EXTRUDER
WELDED LEG



12" IPS DR17
FEEDSTOCK

INLET

OUTLET

REV.	DESCRIPTION	DRN DATE	DATE
4	Changes per Red-Lined Drawings	12/12/11	12/12/11
3	Changes per Red-Lined Drawings	12/6/11	12/6/11
2	Added gaskets to Tees Made some oter adjustments	mww	9/19/11

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vari-Tech
ORDER/QUOTE #: IPF-7125
APPROVED FOR FABRICATION
SIGNATURE: _____
DATE: _____

LCM-10
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

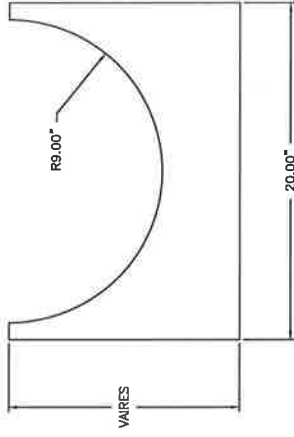
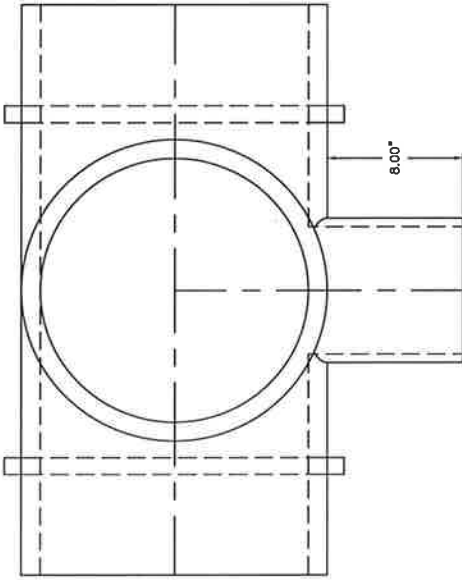
REV.	DESCRIPTION	DRN DATE	DATE	DEPT.	APPROVAL	DATE	DATE	DATE	DATE	DATE	DATE
4	Changes per Red-Lined Drawings	12/12/11	12/12/11	MFG.	MFG_APP	MFG_DATE	MFG_DATE	MFG_DATE	MFG_DATE	MFG_DATE	MFG_DATE
3	Changes per Red-Lined Drawings	12/6/11	12/6/11	MKT.	MKT_APP	MKT_DATE	MKT_DATE	MKT_DATE	MKT_DATE	MKT_DATE	MKT_DATE
2	Added gaskets to Tees Made some oter adjustments	mww	9/19/11	TECH.	TECH_APP	TECH_DATE	TECH_DATE	TECH_DATE	TECH_DATE	TECH_DATE	TECH_DATE

Industrial Pipe Fittings, LLC

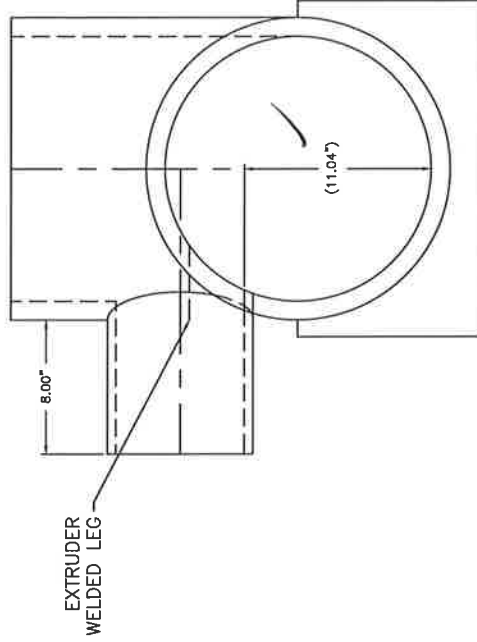
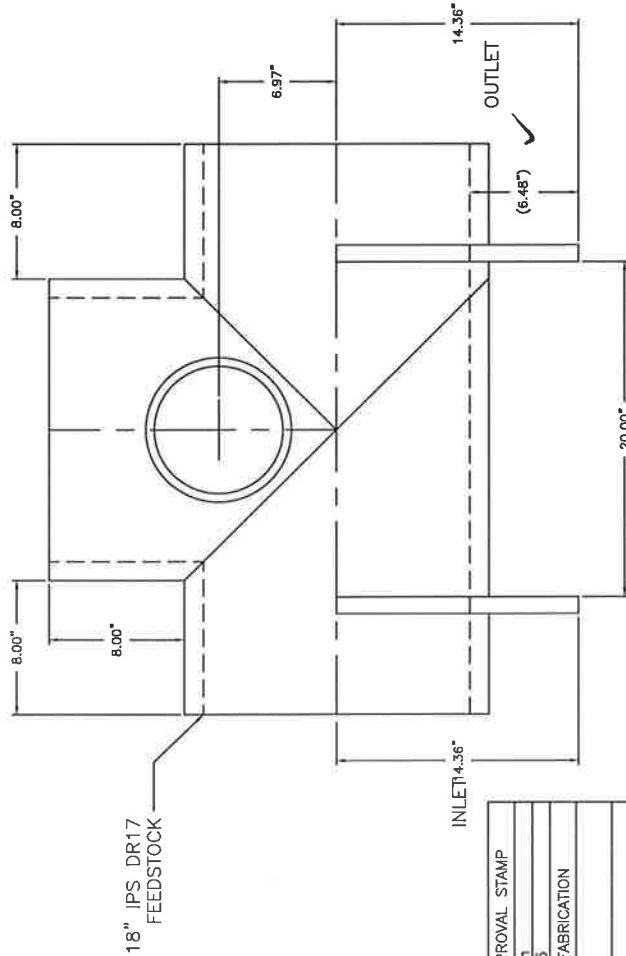
Various Custom Extruder Welded Tees
Keokua LI, Keokua, HI

DRAWN BY: MWW
DATE: 8-22-11
CHECKED BY: TVT
SCALE: NONE
TOLERANCES:
DECIMAL: #2
FRACTIONAL: #2
ANGULAR: #2

DRAWING NUMBER: C70186
SHT 10 OF 14
REVISION: 4



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



REV.	DATE	DESCRIPTION
4	12/12/11	Changes per Red-Lined Drawings
3	12/6/11	Changes per Red-Lined Drawings
2	9/19/11	Added gaskets to Tees Made some elev adjustments

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vari-Tech
ORDER/QUOTE #: IPF-7125
APPROVED FOR FABRICATION

SIGNATURE: _____
DATE: _____

LCM-11
18" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

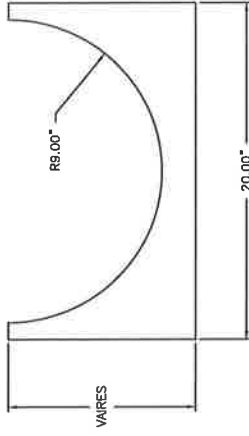
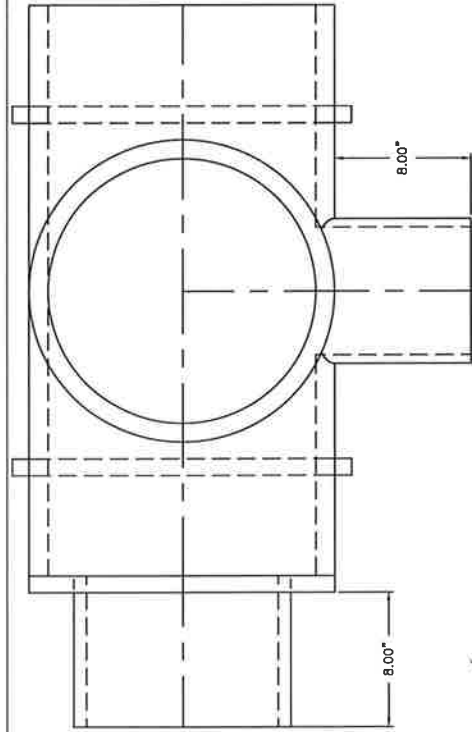
NOTE: Slope created in Manhole
with supports.

REV.	DATE	DESCRIPTION	DEPT.	APPROVAL	DATE	DRAWN BY:
						MW
						DATE: 6-22-11
						CHECKED BY: DT
						SCALE: NONE
						TOLERANCES:
						DECIMAL: 2
						FRACTIONAL: 1/2
						ANGULAR: 1/2

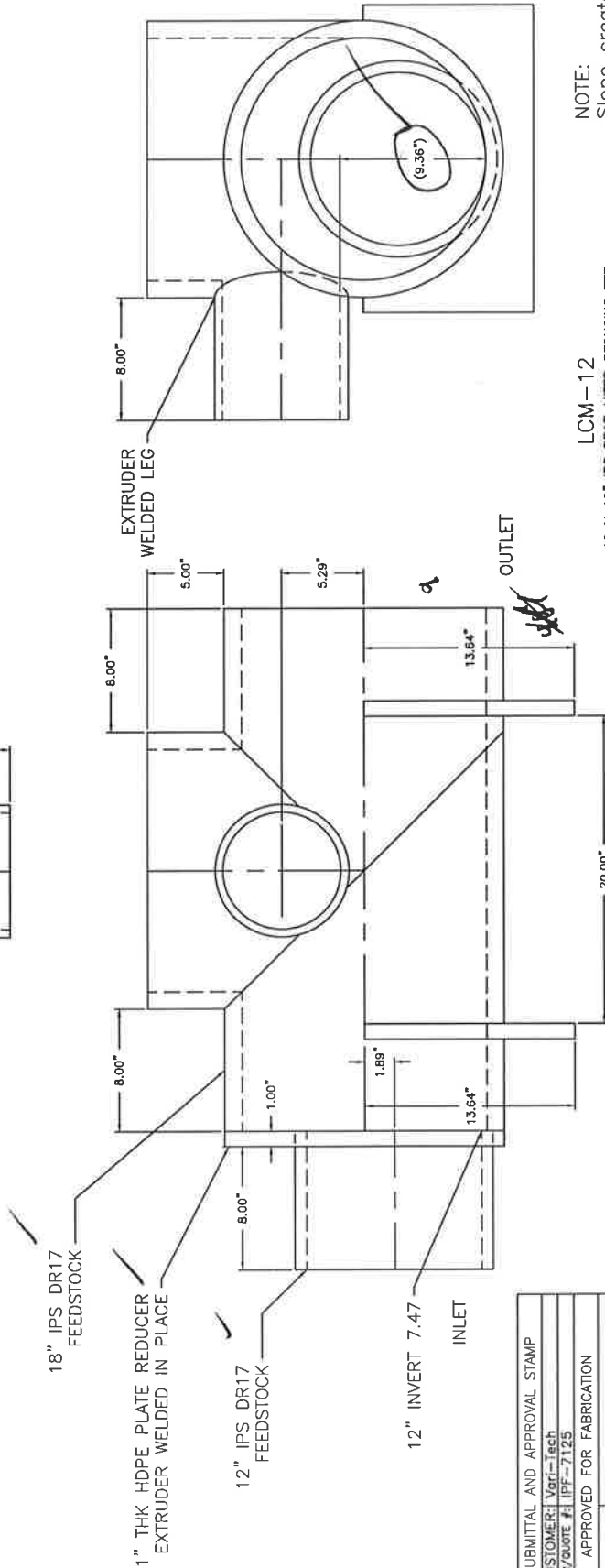
Industrial Pipe Fittings, LLC

Various Extruder Welded Tees
Kekaha Lī, Kauaī, HI

TECH_TITLE: Various Extruder Welded Tees
TECH_DATE: 11 OF 14
DRAWING NUMBER: C70186
REVISION: 4



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



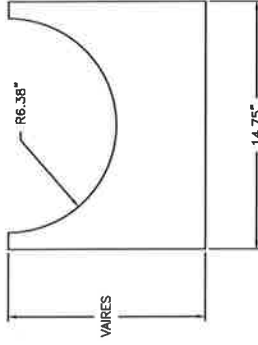
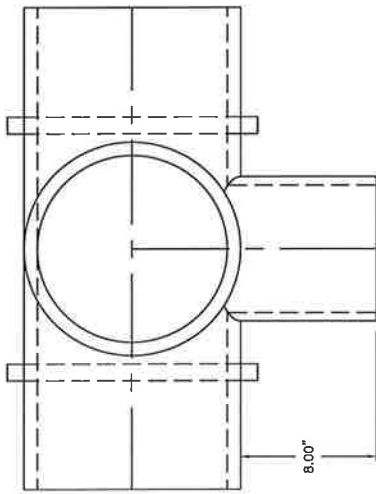
LCM-12
18 X 12" IPS DR17 MITER REDUCING TEE WITH 8" IPS DR17 EXTRUDER WELDED LEG
NOTE: Slope created in Manhole with supports.

REV.	DATE	DESCRIPTION
4	12/12/11	Changes per Red-Lined Drawings
3	12/6/11	Changes per Red-Lined Drawings
2	9/19/11	Added gussets to Tees Made some elev adjustments

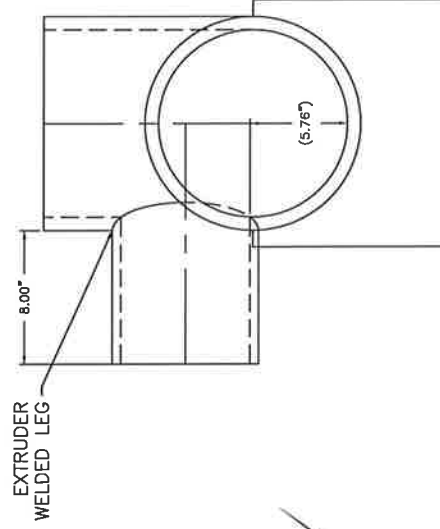
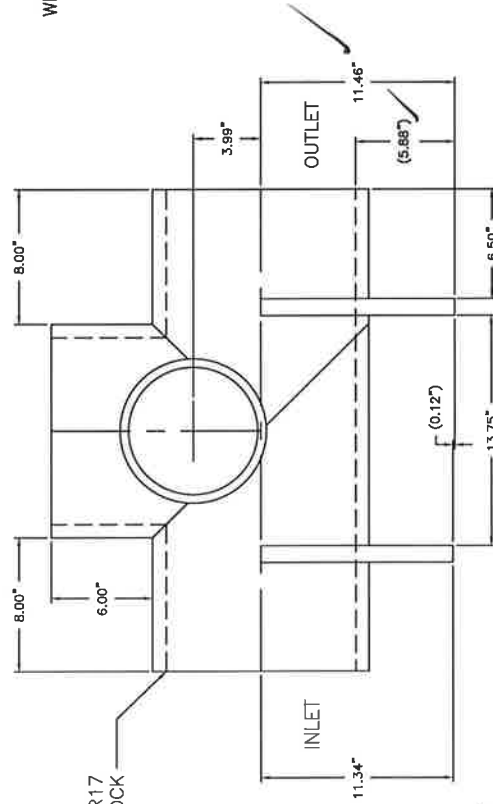
SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vari-Tech
ORDER/QUOTE #: IPPF-7125
APPROVED FOR FABRICATION
SIGNATURE: _____
DATE: _____

DEPT.	DATE	APPROVAL
MFG.	MFG_DATE	MFG_APP
MKT.	MKT_DATE	MKT_APP
TECH.	TECH_DATE	TECH_APP

INDUSTRIAL PIPE FITTINGS, LLC	DRAWN BY: MLW	DATE: 8-22-11
Various Custom Extruder Welded Tees	CHECKED BY: TWT	
Reckona Lt., Kona, HI	SCALE: NONE	
TECH_TITLE: Various Custom Extruder Welded Tees	TOLERANCES:	
TECH_DATE: 12 OF 14	DECIMAL: .2	
DRAWING NUMBER: C70186	FRACTIONAL: 1/2	
REVISION: 4	ANGULAR: ±2	



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



REV.	DESCRIPTION	OWN DATE	DATE
4	Changes per Red-Lined Drawings	12/12/11	12/12/11
3	Changes per Red-Lined Drawings	12/6/11	12/6/11
2	Added gussets to Tee Made some elev adjustments	9/19/11	9/19/11

SUBMITTAL AND APPROVAL STAMP
CUSTOMER: Vari-Tech
ORDER/QUOTE #: JPF-7125
APPROVED FOR FABRICATION
SIGNATURE: _____
DATE: _____

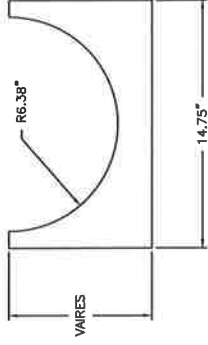
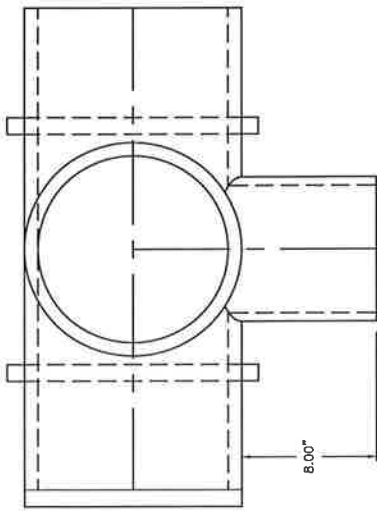
LCM-13
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

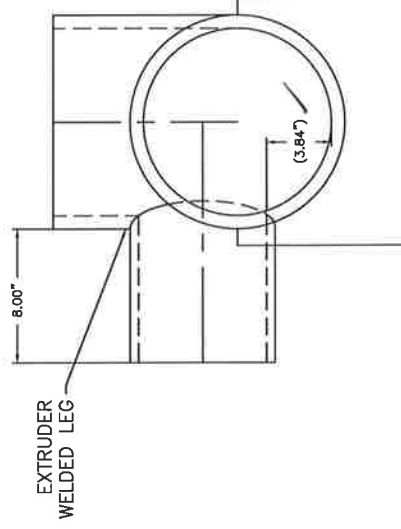
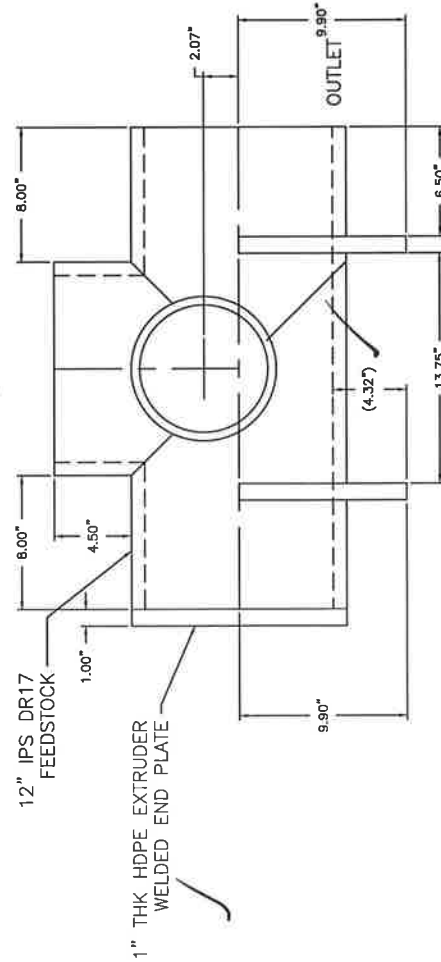
REV.	DATE	DESCRIPTION	DEPT.	APPROVAL	DATE	DATE
4	12/12/11	Changes per Red-Lined Drawings	MFG.	MFG_APP	MFG_DATE	8-22-11
3	12/6/11	Changes per Red-Lined Drawings	MKT.	MKT_APP	MKT_DATE	8-22-11
2	9/19/11	Added gussets to Tee Made some elev adjustments	TECH.	TECH_APP	TECH_DATE	8-22-11

Industrial Pipe Fittings, LLC
Custom Extruder Welded Tees
Kearna LF, Kouji, HI
TOLERANCES:
DECIMAL: ±.2
FRACTIONAL: ±.2
ANGULAR: ±.2

REVISION: 4
DRAWING NUMBER: C70186 SHT 13 OF 14



PIPE SUPPORT DETAIL
MADE FROM 1" THK SHEET STOCK
TYP 2 PER TEE



EXTRUDER
WELDED LEG

SUBMITTAL AND APPROVAL STAMP

CUSTOMER:	Veri-Tech
ORDER/QUOTE #:	JP7-7125
APPROVED FOR FABRICATION	
SIGNATURE:	
DATE:	

LCM-14
12" IPS DR17 MITER TEE
WITH 8" IPS DR17
EXTRUDER WELDED LEG

NOTE:
Slope created in Manhole
with supports.

REV.	DESCRIPTION	DWN. DATE	DEPT.	APPROVAL	DATE	INDUSTRIAL PIPE FITTINGS, LLC	DRAWN BY:
4	Changes per Red-Lined Drawings	12/12/11	MFG.	MFG_APP	MFG_DATE	Various Custom Extruder Welded Tees	MJW
3	Changes per Red-Lined Drawings	12/6/11	MKT.	MKT_APP	MKT_DATE	Keokcha LF, Kauchi, HI	8-22-11
2	Added gussets to Tees Made some elev adjustments	9/19/11	TECH.	TECH_APP	TECH_DATE	Various Custom Extruder Welded Tees	TYT

TOLERANCES:
 DECIMAL: ±.2
 FRACTIONAL: ±.2
 ANGULAR: ±.2

DRAWING NUMBER: C70186
 SHEET 14 OF 14
 REVISION: 4



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 22

Job No:		Date:	April 13, 2012
To:	Waste Management of HI	Spec Section:	15019
Attention:	Jesse Frey	Spec Para:	
Address:	92-460 Farrington Hwy	Drawing No:	8 & 10
	Kapolei, HI 96707	Subcontractor:	
Phone No:	808.250.0574	Supplier:	HISCO
Fax No:	808.668.1366	Manufacturer:	FRIATEC
Respond by:			

This submittal contains the following:

Description: 6", 8", 12", & 18" Electro Fuse Couplings for use in joining pipe & fittings during installation of Wetwells #1 & #2 and Valve Vaults

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM


SIGNED: [Signature] DATE: 30 APR 2012

GEOSYNTEC CONSULTANTS

Submittal No:	22
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	15019
Spec Para:	
Drawing No:	8 & 10
Subcontractor:	
Supplier:	HISCO
Manufacturer:	FRIATECH
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature	<u>[Signature]</u> Date <u>4.13.12</u>

cc: File

COUPLINGS

1/2" CTS through 28" IPS 

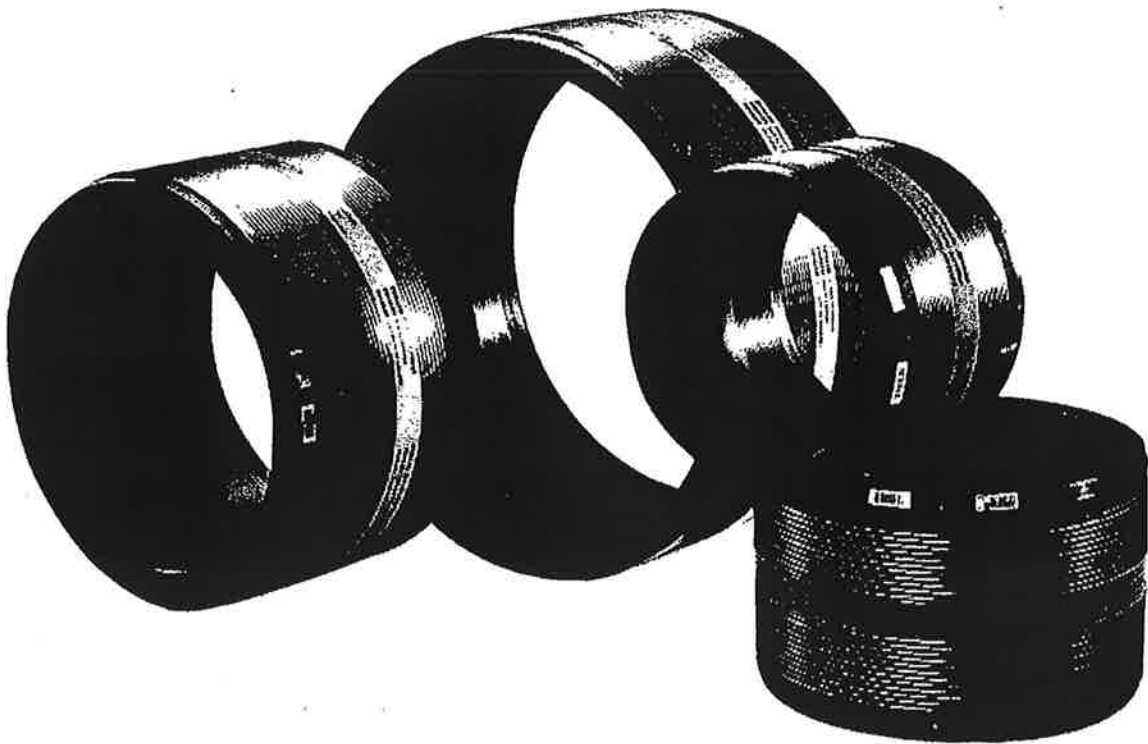
Our Couplings and Fittings deliver flexibility and reliability. No one offers a wider range of coupling sizes and every FRIATEC fitting is ASTM approved.

Short Designation MBI/UBI...0D

Field of Application Connections of PE Pipes 2406 and 3408/4710

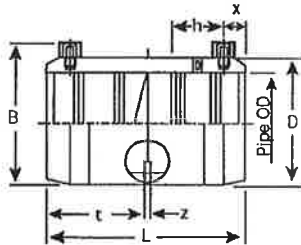
Range of Application Gas up to 100 psi and water up to 160 psi

For higher pressure ranges, contact IPEX at 800-463-9572

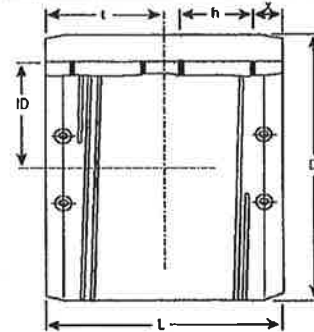


1/2" CTS through 28" IPS cont'd

1/2" - 6"

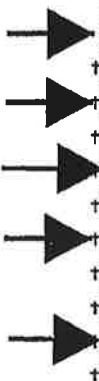


8" - 28"



Nominal Pipe OD CTS	Product SDR	Product Code	ID min	ID max	D	B	L	t	z	h	x	Fusion Time/Sec @ 73°F	Cooling Time/Min */**/**
1/2"	11	128031	0.622	0.634	1.102	1.732	2.283	1.142	0.079	0.591	0.23	27	05/08/10
1"	11	128027	1.122	1.134	1.654	2.244	3.071	1.535	0.079	0.787	0.31	28	05/08/10

Nominal Pipe OD IPS	Product SDR	Product Code	ID min	ID max	D	B	L	t	z	h	x	Fusion Time/Sec @ 73°F	Cooling Time/Min */**/**
3/4"	11	128026	1.047	1.059	1.575	2.165	2.598	1.260	0.079	0.728	0.27	28	05/08/10
1"	11	128024	1.311	1.323	1.850	2.460	3.071	1.496	0.079	0.787	0.31	28	05/08/10
1-1/4"	11	128025	1.654	1.679	2.244	2.835	3.346	1.634	0.079	0.945	0.39	34	10/15/25
1-1/2"	11	128033	1.902	1.917	2.480	3.130	3.858	1.870	0.079	1.060	0.46	34	10/15/25
2"	11	128028	2.374	2.390	3.142	3.657	4.449	2.205	0.079	1.205	0.51	54	10/15/25
3"	11	128029	3.496	3.516	4.606	4.980	5.472	2.717	0.079	1.417	0.59	100	10/30/40
4"	11	128030	4.492	4.516	5.827	6.173	6.260	3.110	0.079	1.689	0.67	151	10/30/40
6"	11	128032	6.610	6.634	8.543	8.740	7.992	3.976	0.079	2.295	0.79	440	20/60/75
8" monofit	11	128060	8.626	8.665	11.029	-	9.448	4.724	-	2.953	1.063	540	20/60/75
8" bifit	11	128023	8.626	8.665	11.022	-	9.448	4.724	-	2.953	1.063	554 ea side	20/60/75
10"	11	128061	10.748	10.787	13.975	-	11.811	5.275	-	3.149	1.063	500 ea side	30/75/100
12"	11	128062	12.748	12.787	15.746	-	11.219	5.610	-	2.679	1.142	550 ea side	30/75/100
14"	11	128064	13.976	14.016	17.716	-	11.811	5.905	-	3.500	1.260	580 ea side	30/75/100
16"	11	128063	15.969	16.008	19.685	-	12.598	6.299	-	3.748	1.260	870/730 ea side	45/95/120
18"	11	128065	17.969	18.008	22.047	-	13.386	6.693	-	3.346	1.260	870/870 ea side	45/95/120
20"	11	128176	19.961	20.016	24.803	-	14.173	7.086	-	3.622	1.260	870/720 ea side	45/95/120
22"	17	128066	21.961	22.016	24.803	-	14.566	7.283	-	3.291	1.260	870/720 ea side	45/95/120
24"	13.5	128067	24.000	24.039	27.952	-	15.748	7.874	-	4.095	1.420	870/850 ea side	45/95/120
28"	17	128068	27.992	28.031	31.496	-	15.748	7.874	-	6.062	1.614	850/850 ea side	60/80/120



FRIATEC Safety Fittings can be fused to all PE pipes within melt index groups 003-050 and pipe SDR range 9.33 through 17.6.

- * Pipe can be moved after indicated cooling time (handling)
- ** Pipe can be pressurized after indicated cooling time (pressure <90 psi)
- *** Pipe can be pressurized after indicated cooling time (pressure >90 psi)
- † FM 200 psi, Short Designation: MBI...OD



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 23

Job No:	_____	Date:	April 13, 2012
To:	Waste Management of HI	Spec Section:	39 (of Standard Specifications for Public Works Construction Sept. 1986)
Attention:	Jesse Frey	Spec Para:	_____
Address:	92-460 Farrington Hwy	Drawing No:	8 & 10
	Kapolei, HI 96707	Subcontractor:	_____
Phone No:	808.250.0574	Supplier:	Kauai Aggregates
Fax No:	808.668.1366	Manufacturer:	_____
Respond by:	_____		_____

This submittal contains the following:

Description: Concrete Anchors & Wetwell Inverts for Wetwells #1 & #2 and Meter Vaults

NO EXCEPTIONS NOTED SEE 19 APR 2012
 MAKE CORRECTIONS NOTED E-MAIL FROM AECOM (ATTACHED)
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: [Signature] DATE: 30 APR 2012
 GEOSYNTEC CONSULTANTS

Submittal No:	23
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description:	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	39 (of Standard Specifications for Public Works Construction Sept. 1986)
Spec Para:	
Drawing No:	8 & 10
Subcontractor:	
Supplier:	Kauai Aggregates
Manufacturer:	
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature:	<u>[Signature]</u> Date: 4/13/12

cc: File

Mix Design for Portland Cement Concrete

(Approval of mix design by Q.A. Engineer required prior to usage in concrete work)

TO: Quality Assurance Engineer
County of Kauai

Date: April 12, 2012

FROM: Earthworks Pacific (Contractor)

Project No. _____ Project: Kekaha Landfill Leachate Modifications, County of Kauai

Class County of Kauai Class B-S Concrete supplied by: O. Thronas, Inc.
Name of Supplier

Mix No. COK-BS

Design Weights per Cubic Yard

Material	Paste			Fine Aggregates		Coarse Aggregates		Total
	Cement	Water	Air	Sand*	Crushed Fine	3/8 Chips	3C	
Source	Type I/II	County	3%	Mana	Kauai Agg	Kauai Agg	Kauai Agg	
	Hawn Cem							
SSD Weight, Lbs.	517	300 lbs. 36.0 gal.		312	1398	748	871	4146
Specific Gravity	3.150	1.000		2.665	2.845	2.905	2.864	
Absolute Volume, ft ³	2.63	4.81	0.81	1.88	7.87	4.13	4.87	27.00
Moisture, %				8.0	6.7	3.5	3.5	
Absorption, %				3.4	4.0	3.3	3.3	
Correction, %				4.6	2.7	0.2	0.2	
Correction, Lbs.		-55		14	38	1	2	-
Batch Weight, Lbs.	517	245		326	1436	749	873	4146

Admixture(s) & Dosage:	Product	oz/cwt	oz/cy	Product	oz/cwt	oz/cy	Total Admixtures lbs. gal. 0.0 0.2
	WRDA-HA	5	26				

Design Data:
Slump (in.): 3" (+/-1") Air (%): 3 (+/-1%) Unit Weight (pcf): 153.56 W/C Ratio: 0.58

Remarks: Mix design subject to modification to maintain proper yield strength, workability, and setting time. Upon arrival at jobsite, up to 1 gallon of water per cubic yard may be added, once provided slump is not exceeded and within 90 minutes from time of batching (in accordance with ASTM C94).
* Contains no limestone or coral aggregate.

By Scott Pingrey By _____
Supplier's Representatives *Prime Contractor*



14224 KC
CERTIFICATE NUMBER

February 14, 2012
DATE

Laboratory Test Certificate

PORTLAND CEMENT - TYPE I/II

SUPPLIED TO: O. Thronas, Inc.

DESTINATION:

Chemical (C 114)

Item	Value	Limits
Silicon Dioxide (SiO ₂)	20.6	
Aluminum Oxide (Al ₂ O ₃)	4.6	
Ferric Oxide (Fe ₂ O ₃)	3.1	
Calcium Oxide (CaO)	63.2	
Magnesium Oxide (MgO)	2.8	6.0 Max
Sulfur Trioxide (SO ₃)	2.9	3.0 Max
Sodium Oxide (Na ₂ O)	0.10	
Potassium Oxide (K ₂ O)	0.60	
Loss on Ignition (LOI)	1.9	3.0 Max
Insoluble Residue	0.16	0.75 Max
C ₃ S	56.7	
C ₂ S	16.4	
C ₃ A	7.0	
C ₄ AF	9.5	
Alkali Equivalent (NaEq)	0.50	0.60 Max

Physical Properties

3 Day Strength	4290 psi (29.6 MPa)
7 Day Strength	5630 psi (38.8 MPa)
28 Day Strength	6560 psi (45.2 MPa)
Blaine Fineness:	3860 cm ² /gr
Air Content:	8.9 %
Gilmore Initial Set:	175 min.
Gilmore Final Set:	280 min.
Autoclave Expansion:	0.02 %
Paste False Set:	78 %

We hereby certify that this cement conforms with ASTM C 150-11, Type I/II, low alkali

Daniel K. Paaaina III
Chemist

Cement Division

Office: 99-1300 Halawa Valley Street
Aiea * Phone (808) 532-3400

April 12, 2012

Earthworks Pacific
4180 Hoala St
Lihue, Kauai, HI 96766

Regarding: Concrete Aggregates for Kekaha Landfill Leachate Modification

This letter is our certification that the aggregates designated as 3C, 3/8 Chips, and Crushed Fines on the concrete mix design form prepared by O. Thronas, Inc., for your above referenced project are manufactured by Kauai Aggregates at our Waiawa quarry.

The material designated as 3C meets the County of Kauai Standard Specifications for Road and Bridge Construction, Section 39, Coarse Aggregate No. 57. The No. 57 aggregate will be blended with our 3/8 Chips such that the resulting blend will meet the specifications for No. 67 coarse aggregate.

The material designated as Crushed Fines meets the aforementioned Standard Specifications requirements for Fine Aggregate.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Pingrey', with a stylized flourish at the end.

Scott Pingrey

April 12, 2012

Earthworks Pacific
4180 Hoala St
Lihue, Kauai, HI 96766

Regarding: Sand for Kekaha Landfill Leachate Modification Concrete

This letter is to certify that the material designated as Mana Sand on the O. Thronas, Inc., mix design form for your above referenced project is surface mined (above ground-water level) at Kawai'ele Bird Sanctuary on Kauai. The sand is processed by O. Thronas/Kauai Aggregates to meet the County of Kauai, Standard Specifications for Public Works Construction, Section 39, fine aggregates requirements for beach sand. The sand will be blended with crushed rock fines such that the resulting blend meets the gradation requirements for the above reference specification section.

The sand is not derived from limestone or coral.

The sand has been regularly used in similar O. Thronas concrete batches for a few months now, which have been sampled and tested by an O. Thronas certified ACI Concrete Field Technician Grade I. Test performed on concrete manufactured using the sand have had strengths that exceed the concrete grade being tested.

Sincerely,



Scott Pingrey



96 -1173 Waihona St. – Suite B-7 – Pearl City, HI 96782
 Phone (808) 455-1522 Fax (808) 455-1384
 Email- cel@hawaii.rr.com

O. Thronas, Inc.
 P.O. Box 269
 Lawai, HI 96765

Date: 11/16/11
 Report: 33938.001

TEST REPORT

Project: Aggregate Qualification	W.O. No. 33938
Client: O. Thronas, Inc.	Received: 10/06/11
Description of material: See Below	Tech: WP/RP/HL
Source: Kauai Quarry	Sample #: 33938

Sieve Analysis C136, C117	3C	Chips	4F
Screen	Result	Result	Result
1"	100		
¾"	98		
½"	28	100	
3/8"	3	97	100
#4	1	8	99
#8	0.4	1	73
#16			50
#30			34
#50			23
#100			16
#200	0.1	0.1	12
Sand Equivalent			74
Specific Gravity C127, C128	3C	Chips	4F
Apparent	3.055	3.100	3.074
SSD	2.864	2.905	2.845
Bulk Dry	2.772	2.813	2.735
Absorption %	3.3	3.3	4.0
LA Abrasion % C131	14.2	14.2	N/A
Fractures Faces %	100	100	N/A
Organic Impurities	N/A	N/A	None
Soundness Loss % C88	1.3	1.4	2.1

CONSTRUCTION ENGINEERING LABS, INC

By: Ronald A. Pickering II
 Its: President



96-1173 Waiihona St., Suite #B7
 Pearl City, HI 96782
 (808) 455-1522

Acct ID: O.Thronas Proj No.: OTHRONAS001
 Report Date: 07/20/2011
 Project: Aggregate Qualifications
 Location: Stockpile

Date Sampled: 07/15/2011
 Sampled By: WR
 By Order Of:
 Order Number:

Client: O. Thronas, Inc.
 REPORT: Sieve Analysis

LAB NO: 31142
 Test Method: See Below

TEST RESULTS

Report No: 31142
 Page 1 of 1

Material: Sand

<u>Sieve</u>	<u>% Passing</u>	<u>Target</u>	<u>+/-</u>
5 in			
4 in			
3 in			
2 in			
1 1/2 in			
1.00 in			
3/4 in			
1/2 in			
3/8 in			
No. 4	100		
No. 8	99		
No. 16	98		
No. 30	92		
No. 50	67		
No. 100	4		
No. 200	1.9		

Remarks: Specific Gravity (app)-2.823, Specific Gravity (ssd)-2.665, Specific Gravity (bulk dry)-2.578, Absorption-3.4%
 Test Method (As Applicable): ASTM C136 C117

Orig: O. Thronas, Inc. (Lawai, HI) (1-ec copy)
 1-cc Laboratory

Respectfully Submitted,
 Construction Engineering Labs



BONDED MATERIALS COMPANY
A STANDARD OF EXCELLENCE SINCE 1955

BONDED MATERIALS COMPANY
150 Puuhale Rd.
Honolulu, Hawaii 96819
Ph 808-832-1155 / Fax 808-832-1151

December 21, 2011

To whom it may concern:

CERTIFICATION

This is to inform you that BOMAT, LTD., d/b/a Bonded Materials Company, is an authorized distributor for W.R. Grace, GRACE Construction Products.

This is to certify that **WRDA-HA**, a water-reducing and retarding concrete admixture, is formulated to comply with the requirements of Specifications for Chemical Admixtures for Concrete, ASTM Designation C 494, Type A and D (AASHTO M 194, Types A & D).

No chlorides or halogens are added to **WRDA-HA** as functional ingredients during manufacture.

If you have any questions regarding this information, please contact me at (808)832-1155.

Sincerely,

Brian L. Deer
Vice President
Bomat Ltd.

State of Hawaii
City and County of Honolulu



Sworn and subscribed to before me the undersigned, this 21st day of December, 2011.

Lauren Tolentino

My commission expires on: March 18, 2015

SALES OFFICES

OAHU 150 Puuhale Rd., Honolulu, HI 96819

Ph 808-832-1155/Fax 808-832-1151

KONA 73-5568 Maiiau St., Bay 2 & 3, Kailua-Kona, HI 96740

Ph 808-326-2477/Fax 808-329-5181

GUAM Harmon Industrial Park, P.O. Box 7086, Tamuning, Guam 96931

Ph 671-648-7121/Fax 671-649-9338

SAIPAN P.O. Box 505894 C.K., Saipan, MP 96950-5894

Ph 670-322-3477/Fax 670-322-0305

PHOENIX 4430 N. 43rd Ave., Suite B-4, Phoenix, AZ 85031

Ph 623-873-0001/Fax 623-873-0007

WRDA HA

Water-reducing admixture

ASTM C494 Type A and D

Product Description

WRDA HA is a modified lignosulfonate based aqueous solution of complex organic compounds. WRDA HA is a ready-to-use low viscosity liquid which is factory pre-mixed in exact proportions to minimize handling, eliminate mistakes and guesswork. WRDA HA does not contain calcium chloride and weighs approximately 9.9 lbs/gal.

Uses

WRDA HA produces a concrete with lower water content (typically 8 to 10% reduction), greater plasticity and higher strength. It is used in ready-mix plants, block and concrete product plants, in lightweight and prestressed work wherever concrete is produced.

WRDA HA also performs especially well in concrete containing fly ash and other pozzolans.

Finishability

The cement paste, or mortar, in WRDA HA admixed concrete has improved trowelability. The influence of WRDA HA on the finishability of lean mixes has been particu-

larly noticeable. Floating and troweling, by machine or hand, imparts a smooth, close tolerance surface.

Addition Rates

The addition rate range of WRDA HA is 3 to 10 fl oz/100 lbs of cement. Trial batches are recommended to determine the appropriate addition rate for Type A and Type D performance. Optimum addition depends on the other concrete mixture components, job conditions, and desired performance characteristics.

Compatibility with Other Admixtures and Batch Sequencing

WRDA HA is compatible with most Grace admixtures as long as they are added separately to the concrete mix, usually through the water holding tank discharge line. In general, it is recommended that WRDA HA be added to the concrete mix near the end of the batch sequence for optimum performance. Different sequencing may be used if local testing shows

Product Advantages

- Consistent water reduction and set times
- Improves performance concrete containing supplementary cementitious materials
- Produces concrete that is more workable, easy to place and finish
- High compressive and flexural strengths



better performance. Please see Grace Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations. WRDA HA should not come in contact with any other admixture before or during the batching process, even if diluted in mix water.

Pretesting of the concrete mix should be performed before use, and as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air-entraining agent (such as Daravair® or Darex® product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance. Please consult your Grace representative for guidance.

Packaging & Handling

WRDA HA is available in bulk, delivered by metered tank trucks, and in 55 gal (210 L) drums. It will freeze at about 28°F (-2°C), but will return to full strength after thawing and thorough agitation.

Dispensing Equipment

A complete line of accurate, automatic dispensing equipment is available. WRDA HA may be introduced to the mix on the sand or in the water.

Specifications

Concrete shall be designed in accordance with *Standard Recommended Practice for Selecting Proportions for Concrete*, ACI 211.

The water-reducing (or water-reducing and retarding) admixture shall be WRDA HA, as manufactured by Grace Construction Products, or equal. The admixture shall not contain calcium chloride. It shall be used in strict accordance with the manufacturers' recommendations. The admixture shall comply with ASTM Designation C494, Type A water-reducing (or Type D water-reducing and retarding) admixtures. Certification of compliance shall be made available on request.

The admixture shall be considered part of the total water. The admixture shall be delivered as a ready-to-use liquid product and shall require no mixing at the batching plant or job site.

www.graceconstruction.com

North American Customer Service: 1-877-4AD-MIX1 (1-877-423-6491)

WRDA, Daravair and Darex are registered trademarks of W. R. Grace & Co.—Conn.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained. Please read all statements, recommendations or suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. W. R. Grace & Co.—Conn., 62 Whittemore Avenue, Cambridge, MA 02140. In Canada, Grace Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

This product may be covered by patents or patents pending.
CMD-366F Printed in U.S.A.

11/07

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FA/LI/1M

GRACE

Mike Minch

From: Bergschultz, Ken [KEN.BERGSCHULTZ@aecom.com]
Sent: Thursday, April 19, 2012 1:14 PM
To: Mike Minch; JFrey@wm.com
Cc: Chris Scott; Kim Huynh; Cioffi, Frank
Subject: RE: Kekaha Submittals

Importance: High

Everyone,

Scott gave me a call today to also ask about surveying the wet wells and what control datum to reference as well as if cylinders were needed of the concrete ballast of the wet wells.

For the survey datum, I want to confirm with Jesse that all site surveys completed by the WM surveyor are based upon the same reference plane of the topo? If this correct, then we will need to utilize the control panel info for the aerial survey OR establish elevation back to the referenced USGS marker and offset. Jesse what is the preferred process?

For the concrete ballast, no testing cylinders required. The ballast is pearly weight orientated. However given that the ballast is 2 feet wide and 3 feet thick, consideration as to letting the concrete cure prior to backfilling should be explored. This is a large mass of concrete that will be "green". I would suggest a minimum 72 hour period for curing prior to backfilling and applying a load. We want to avoid any potential for cracking.

Thank you for your time and input.

Kenneth J. Bergschultz, PE
Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM
4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: Bergschultz, Ken
Sent: Thursday, April 19, 2012 12:09 PM
To: 'MMinch@Geosyntec.com'; JFrey@wm.com
Cc: CScott@Geosyntec.com; KHuynh@Geosyntec.com; Cioffi, Frank
Subject: RE: Kekaha Submittals
Importance: High

Good morning everyone.

I took the proposed mix to our structural group this morning and based upon review of the information, AECOM concurs with the mix for the application. The only item of note is the water to cement ratio is higher than what we have typically seen, but if the is common for the island then all is well.

I also want to verify that the concrete collar is set to be 2 feet wide around the wet well and 3 feet high.

Good luck on the pour today.

Kenneth J. Bergschultz, PE

Operations Manager - Sheboygan/Green Bay
Waste Services Manager, Midwest Region
Environment
D 920.451.2452 C 920.918.3299
AECOM Cisco Extension 2112452
ken.bergschultz@aecom.com

AECOM

4135 Technology Parkway
Sheboygan, WI 53083
T 920.458.8711 F 920.458.0550
www.aecom.com

From: MMinch@Geosyntec.com [<mailto:MMinch@Geosyntec.com>]
Sent: Wednesday, April 18, 2012 10:43 PM
To: JFrey@wm.com; Bergschultz, Ken
Cc: CScott@Geosyntec.com; KHuynh@Geosyntec.com
Subject: FW: Kekaha Submittals

Jesse/Kenny

Geosyntec has reviewed Earthworks Pacific submittals for the concrete and bedding materials associated with the wet wells (attached).

The existing project specifications do not list requirements for these materials since EP's anchoring system was not part of AECOM's original design.

From Geosyntec's standpoint, the proposed materials meet the general "reasonableness" standard for the application particularly since the concrete is intended as ballast. However, we ask that AECOM also review these two submittals as the Design Engineer to verify that they also meet the design intent.

EP has informed us that they wish to pour the first batch of concrete tomorrow afternoon.

Sorry for the rush on this one. It snuck up rather quickly.

Thank you,

Michael J. Minch, P.E., G.E.

Associate

1111 Broadway, Sixth Floor
Oakland, California 94607
Phone: 510.285.2708
Mobile: 510.541.2126
Fax: 510.836.3036
www.geosyntec.com



engineers | scientists | innovators

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From: Frey, Jesse [<mailto:JFrey@wm.com>]
Sent: Monday, April 16, 2012 1:09 PM
To: Mike Minch; Kim Huynh; Chris Scott
Subject: Kekaha Submittals

All,

Please see the attached submittals from Earthworks Pacific pertaining to the wet well installations.

Mahalo,

Jesse Frey
Engineer
Waste Management of Hawaii
92-460 Farrington Hwy.
Kapolei, HI 96707
Ph: 808-250-0574
Fax: 808-668-1366

From: Kimi Matsuda [<mailto:kimi@earthworkspacific.com>]
Sent: Friday, April 13, 2012 4:41 PM
To: Frey, Jesse
Cc: bryan@earthworkspacific.com
Subject: Kekaha

Jesse

Please find attached submittals No. 22, 23 & 24 for your review.

Mahalo,

Kimi Matsuda

Earthworks Pacific, Inc.
P.O. Box 1326
Lihue, HI 96766
P: 808.246.8808
F: 808.246.8812
kimi@earthworkspacific.com

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 24

Job No:		Date:	April 13, 2012
To:	Waste Management of HI	Spec Section:	N/A
Attention:	Jesse Frey	Spec Para:	
Address:	92-460 Farrington Hwy Kapolei, HI 96707	Drawing No:	N/A
Phone No:	808.250.0574	Subcontractor:	
Fax No:	808.668.1366	Supplier:	Kauai Aggregates
Respond by:		Manufacturer:	

This submittal contains the following:

Description: Aggregate Certification for use at Wetwells #1 & #2 and Meter Vaults for bedding
(meets ASTM No. 67 requirements)

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 30 APR 2012

GEOSYNTEC CONSULTANTS

cc: File

Submittal No:	24
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	
Drawing No:	N/A
Subcontractor:	
Supplier:	Kauai Aggregates
Manufacturer:	
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature: <u>[Signature]</u> Date: <u>4.13.12</u> for: <u>Bryan Danks</u>	

April 12, 2012

Earthworks Pacific
4180 Hoala St
Lihue, Kauai, HI 96766

Regarding: Aggregates for Kekaha Landfill Leachate Modification

This letter is our certification that the aggregates provided by Kauai Aggregates for your above referenced project are manufactured by Kauai Aggregates at our Waiawa quarry.

We also certify that the material being referred to as 3B fine aggregate meets the quality and gradation requirements of the County of Kauai, Standard Specifications Crushed Rock section, designation (ASTM) No. 67, fine aggregate.

Sincerely,

A handwritten signature in black ink, appearing to be 'SP' with a large loop at the end.

Scott Pingrey



Merrill 1000 Series Stainless Steel Check Valves

Water wells need a check valve installed above the pump between lengths of drop pipe. The NO-SPIN POPPET is very important and the valve must also hold the weight and be corrosion resistant. A stainless steel check valve (with no lead) is the answer.

Order No.	UPC Bar Code (Qty. 1)	Pipe Size	Ctn. Qty.	Approx. Wt. / Lbs.	Master Ctn. Qty.
★CVS50	6 42367 57673 8	1/2"	10	0.4	100
★CVS100	6 42367 05127 3	1"	10	0.7	60
★CVS150	6 42367 57682 0	1-1/2"	5	1.4	30
★CVS300	6 42367 07200 1	3"	1	7.4	6
★CVMS1025	6 42367 06042 8	1" FIP x 1-1/4" MIP	10	0.8	60
★*CVSE50	6 42367 57674 5	1/2"	10	0.4	100
★*CVSE100	6 42367 57678 3	1"	10	0.7	60
★*CVSE150	6 42367 57684 4	1-1/2"	5	1.4	30
★*CVSE300	6 42367 07251 3	3"	1	7.4	6
★*CVMSE1025	6 42367 07067 0	1" FIP x 1-1/4" MIP	1	0.8	3



All dimensions are approximate. We warrant our products to be free from defects in material and workmanship under normal use and service. We do not warrant our products for use in applications not intended by us. We are not responsible for any damage or injury resulting from the use of our products in any manner not intended by us.



- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: EM DATE: 23 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 26 ✓

EPI Job No:	<u>176</u>	Date:	<u>October 21, 2014</u>
To:	<u>Waste Management of HI</u>	Spec Section:	<u>N/A</u>
Attention:	<u>Jesse Frey</u>	Spec Para:	<u>N/A</u>
Address:	<u>92-460 Farrington Hwy</u>	Drawing No:	<u>N/A</u>
	<u>Kapolei, HI 96707</u>	Subcontractor:	<u>N/A</u>
Phone No:	<u>808.250.0574</u>	Supplier:	<u>EPG Companies, Inc.</u>
Fax No:	<u>808.668.1366</u>	Manufacturer:	<u>N/A</u>
Respond by:	_____		_____

This submittal contains the following:

Description: EPG Model No. BJB425 Breakout Junction Box
 (used for added float system) ✓

Submittal No:	26
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	<u>N/A</u>
Spec Para:	<u>N/A</u>
Drawing No:	<u>N/A</u>
Subcontractor:	<u>N/A</u>
Supplier:	<u>EPG Companies, Inc.</u>
Manufacturer:	<u>N/A</u>
Contractor:	<u>EARTHWORKS PACIFIC, INC.</u>
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/21/14</u></p>	

cc: File

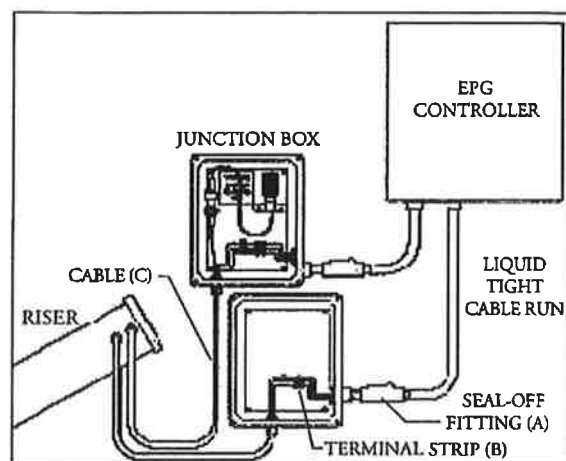
Breakout Junction Boxes

To simplify installation, maintenance and repair and increase the safety of the system, install EPG Breakout Junction Boxes between the pump station and control panel.

EPG Breakout Junction Boxes provide a simple and convenient way to disconnect power or sensor wires during maintenance and/or repair work. They also provide a gas-tight seal between your riser, well or sump and your control panel. Corrosive gases migrating through motor and sensor cable conduit to the controller is a major contributor to early control panel failure. Not only can these gases increase the chance for explosions, they also corrode contacts and make wires brittle. Give your system a break! Install an EPG Breakout Box close to the side slope riser or sump and then hardwire the breakout box to the controller.

EPG Breakout Junction Boxes - a break you need for optimum landfill operation!

- Seals off harmful gas migration (A)
- Equipped with FNPT waterproof exit hub
- Terminal strip to facilitate pump and sensor removal (B)
- Minimizes costs by running shorter motor or sensor cable (C)
- Available in a variety of configurations for one or more devices
- Weatherproof NEMA 4X enclosure with cord restraint, seal off and mounting hardware



continued on back

MODEL NUMBERS AND DESCRIPTION

BJBD100	Leak Detection
BJBF400	Float
BJBF425	Two (2) Floats ✓
BJBF440	Three (3) Floats
BJBF450	Four (4) Floats
BJBF460	Five (5) Floats
BJBF700	Flow Sensor
BJBF725	Two (2) Flow Sensors
BJBF750	Three (3) Flow Sensors
BJBS470	Four (4) Temperature Sensors
BJBL600B	Level Sensor*
BJBL600BT	Level Sensor* (Tank Gauging)
BJBL600BVA	Level Sensor* (Vacuum Application At Riser)
BJBL625B	Two (2) Level Sensors*
BJBO800B	Level Sensor & Flow Sensor*
BJBO800BT	Level Sensor & Float* (Tank Gauging)
BJBO815B	Level Sensor & Float*
BJBO825B	Two (2) Level & One (1) Flow Sensor*
BJBO850B	One (1) Level & Two (2) Flow Sensors*
BJBO900B	Two (2) Level & Two (2) Flow Sensors*

All Standard Models: NEMA 4X (Non-Metallic)

Also Available: NEMA 4X (Stainless Steel), NEMA 7/4 (Explosion-proof/weathertight)

* Each level sensor includes a desiccant dryer and bellows mounted inside the enclosure.

continued on next page

continued from previous page.

MODEL NUMBERS AND DESCRIPTION

BJBO905B	Level Sensor, Flow Sensor & Leak Detection Sensor*
BJBO925B	Two (2) Level & Two (2) Leak Detection Sensors*
BJBP300	Two (2) Probes
BJBP315	Three (3) Probes
BJBP325	Four (4) Probes
BJBP500	Motor Lead (14 to 10 AWG)
BJBP500KSB	Motor Lead (KSB Motor)
BJBP500SP	Motor Lead (Large Cables)
BJBP525	Two (2) Motor Leads (14 to 10 AWG)
BJBP550	Three (3) Motor Leads (14 to 10 AWG)

All Standard Models: NEMA 4X (Non-Metallic)

Also Available: NEMA 4X (Stainless Steel), NEMA 7/4 (Explosion-proof/weathertight)

* Each level sensor includes a desiccant dryer and bellows mounted inside the enclosure.



- NO EXCEPTIONS NOTED
 - MAKE CORRECTIONS NOTED
 - REJECT REVISE AND RESUBMIT
 - SUBMIT SPECIFIED ITEM
- SIGNED: BCU DATE: 23 JAN 2015
- GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 27 ✓

EPI Job No:	<u>176</u>	Date:	<u>October 21, 2014</u>
To:	<u>Waste Management of HI</u>	Spec Section:	<u>Electrical</u>
Attention:	<u>Jesse Frey</u>	Spec Para:	<u>1.03 (B)</u>
Address:	<u>92-460 Farrington Hwy</u>	Drawing No:	<u>N/A</u>
	<u>Kapolei, HI 96707</u>	Subcontractor:	<u>N/A</u>
Phone No:	<u>808.250.0574</u>	Supplier:	<u>EPG Companies, Inc.</u>
Fax No:	<u>808.668.1366</u>	Manufacturer:	<u>SymCom</u>
Respond by:	_____		_____

This submittal contains the following:

Description: SymCom Model 777-KW/HP-P2 Electronic Power Monitors
 (for installation in existing control panel to be used to monitor & protect each pump motor)

Submittal No:	<u>27</u>
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	<u>Electrical</u>
Spec Para:	<u>1.03 (B)</u>
Drawing No:	<u>N/A</u>
Subcontractor:	<u>N/A</u>
Supplier:	<u>EPG Companies, Inc.</u>
Manufacturer:	<u>SymCom</u>
Contractor:	<u>EARTHWORKS PACIFIC, INC.</u>
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."</p> <p align="center">Signature <u>Bryan Davidson</u> Date <u>10/21/14</u></p>	

cc: File



SymCom's Model 777-KW/HP-P2 Series is a family of fully programmable electronic power monitors. They are designed to monitor and protect any 3-phase, 200-480VAC motor drawing 2-800 full load amps (external CTs are required above 90 amps). They provide unsurpassed protection from faulty voltage, underload and overload conditions. The 777-KW/HP-P2 can be used in a variety of 3-phase applications and features a low power trip point (adjustable on the unit) that is desirable any time the current vs. load characteristic is non-linear or has little change. In general, this applies to small slow speed motors, small centrifugal motors and fractional horsepower motors. Low power protection can be used any time in place of undercurrent protection. The 777-KW/HP-P2 displays kilowatts and horsepower on the face of the unit.

The 777-KW/HP-P2 incorporates a 3-digit LED display that is used for programming, providing real-time operational information and displaying diagnostic codes to aid in troubleshooting a fault condition.

The 777-KW/HP-P2 can be used as a stand-alone product or used in a network to communicate with a PC, PLC, SCADA system, or SymCom's Solutions Software with the help of its built-in RS-485 communications port. The 777-KW/HP-P2, in conjunction with SymCom's CIO modules, supports several communication protocols including Modbus/RTU, Modbus/TCP, DeviceNet™ and Profibus. The units can also be connected to SymCom's remote monitors for a simple, cost-effective way to meet new requirements for arc-flash safety.

The unit's many features include enhanced trip classes beyond the NEMA standard trip classes. The settable trip class range is 2-60, with or without jam protection, and a secondary linear trip delay can be set with a range of 0-60 seconds. If both the trip class and linear trip delay are set, the 777-KW/HP-P2 will follow the faster trip time. Another feature is the automatic dry-well recovery timer that allows the unit to automatically select a restart delay based on the last cycle's run time. This allows the 777-KW/HP-P2 to optimize restart delay times.

The 777-KW/HP-P2 can be pre-programmed with a 9-volt battery prior to actual installation. This can save a lot of time during initial installations and avoid subsequent service calls when commissioning new projects.

Features:

- Protects 3-phase motors from:
 - High voltage
 - Low voltage
 - Voltage unbalance
 - Reverse-phase
 - Overcurrent
 - Underload (low power)
 - Current unbalance
 - Single-phase
 - Ground fault, Class II
- Network programmable
- Programmable with 9-volt battery prior to installation
- Automatic reset with three separate restart delay timers, or manual reset
- Tamper guard
- RS-485 communications port (communications module sold separately)
- 3-digit LED diagnostic display
- Last fault memory
- UL and ULC listed
- CE compliant
- CSA approved
- Surface or DIN rail mount
- 5-year warranty
- Made in USA

Auxiliary Products:

- Remote Displays (RM-1000/RM-2000)
- Communication Modules
- Remote Manual Reset Kit
- Solutions Software

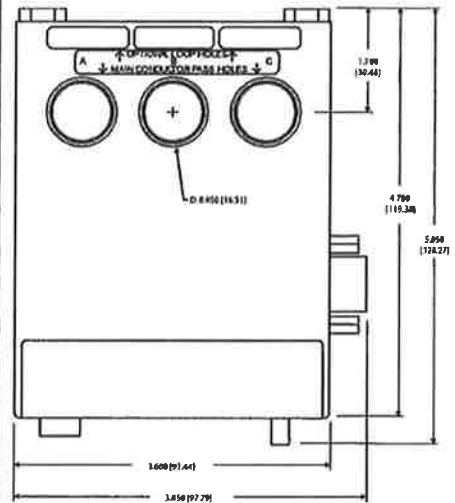
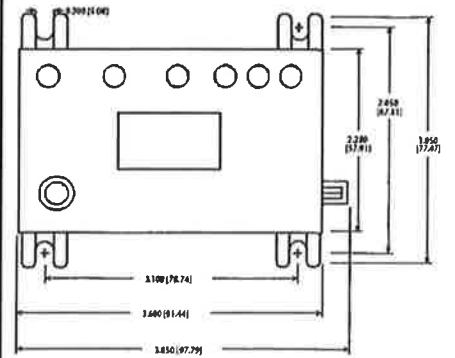


Specifications

Functional Specifications	
Programmable Operating Points LV-Low Voltage Threshold HV-High Voltage Threshold VUB-Voltage Unbalance Threshold MULT-# of Conductors or CT Ratio (xxx:5) OC-Overcurrent Threshold PWS-Power Scale LP-Low Power CUB-Current Unbalance Threshold TC-Overcurrent Trip Class RD1-Rapid Cycle Timer RD2-Restart Delay After All Faults Except Undercurrent (motor cool-down timer) RD3-Restart Delay After Undercurrent (dry-well recovery timer) #RU-Number of Restarts After Undercurrent ADDR-RS485 Address COM-Communication setting #RP-Number of Restarts After All Faults Except Undercurrent UCTD-Undercurrent Trip Delay ** GF-Ground Fault Current Threshold	170-524V 172-528V 2-25% or 999 (disabled) 1-10, 100, 150, 200, 300, 400, 500, 600, 700, 800 (20-100A) + MULT of 80-140% of CT Primary 1 = 0.01-0.99kW 5 = 0.01-1.32hp 2 = 1.00-9.95kW 6 = 1.34-13.3hp 3 = 10.0-99.5kW 7 = 13.4-133hp 4 = 100-650kW 8 = 134-871hp 0.01-650kW or 0.01-871hp or 0 (off); LP setting is dependent on PWS setting. PWS must be set prior to LP being set 2-50% or 999 (disable) 0-999 seconds 2-500 minutes 2-500 minutes, A (Automatic) 0, 1, 2, 3, 4, A (Automatic) A01-A99 C00-C07 0, 1, oc1, 2, oc2, 3, oc3, 4, oc4, A, ocA (Automatic) 5 seconds (default) (3-20A) + MULT or 12-40% of CT Primary or off
Input Characteristics	
Supply Voltage Frequency Motor Full Load Amp Range	200-480VAC 50/ 60Hz 2-20A, (looped conductors required); 20-90A (direct); 80-800A (external CTs required)
Output Characteristics	
Output Contact Rating - SPDT (Form C) Pilot Duty General Purpose Expected Life Mechanical Electrical	480VA@240VAC, B300 10A@240VAC 1 x 10 ⁶ operations 1 x 10 ⁶ operations at rated load
General Characteristics	
Operating Temperature Ambient Operating Ambient Storage Accuracy at 25° C (77° F) Voltage Current Timing Ground Fault Repeatability Voltage Current Maximum Input Power Pollution Degree Class of Protection Relative Humidity Terminal Torque Standards Passed Electrostatic Discharge (ESD) Radio Frequency Immunity (RFI), Conducted Radio Frequency Immunity (RFI), Radiated Fast Transient Burst Short Circuit Surge IEC ANSI/IEEE Hi-potential Test Vibration Shock Safety Marks UL CE Max Conductor Size through 777-P2 Dimensions Weight Mounting Method	-20° to 70° C (-4° to 158° F) -40° to 80° C (-40° to 176° F) ± 1% ± 3% (<100A direct) ± 0.5 second ± 15% (<100A) ± 0.5% of nominal voltage ± 1% (<100A direct) 10 W 3 IP20 10-95%, non-condensing per IEC 68-2-3 7 in.-lbs. IEC 61000-4-2, Level 3, 6kV contact, 8kV air IEC 61000-4-6, Level 3 10V IEC 61000-4-3, Level 3 10 V/m IEC 61000-4-4, Level 3, 3.5 kV input power 100kA 61000-4-5 Level 3, 2kV line-to-line; Level 4, 4kV line-to-ground C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line Meets UL508 (2 x rated V + 1000V for 1 minute) IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse UL508, UL1053 IEC 60947-1, IEC 60947-5-1 0.65" with insulation 3.05 H x 3.85 W x 5.05 D in. (77.47 x 97.79 x 128.27 mm) 1.2 lbs. (544.31 g) Surface mount (4 - #8 screws) or DIN Rail Mount

** Network adjustable only

Enclosure Dimensions



inches (millimeters)

How to order:

Part Number: 777-KW/HP-P2

SymCom
 222 Dusk Drive
 Rapid City, SD 57701
 www.SymCom.com

SSAC
 8242 Loop Rd
 Baldwinsville, NY 13027
 www.SSAC.com

CustomerService@SymCom.com • TechnicalSupport@SymCom.com
 800.843.8848 • 605.248.5580 • 605.318.5085 fax



NO EXCEPTIONS NOTED

MAKE CORRECTIONS NOTED

REJECT REVISE AND RESUBMIT

SUBMIT SPECIFIED ITEM

SIGNED: BCM DATE: 23 JAN 2015

GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 28 ✓

EPI Job No:	176	Date:	October 21, 2014
To:	Waste Management of HI	Spec Section:	N/A
Attention:	Jesse Frey	Spec Para:	N/A
Address:	92-460 Farrington Hwy Kapolei, HI 96707	Drawing No:	Figures 1 & 2, Note 7
Phone No:	808.250.0574	Subcontractor:	N/A
Fax No:	808.668.1366	Supplier:	Engineered Systems, Inc.
Respond by:		Manufacturer:	Siemens

This submittal contains the following:

Description: Siemens Model 9GEF (Mercury Free) Direct Acting Float Switch (B100)

Submittal No:	28
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2, Note 7
Subcontractor:	N/A
Supplier:	Engineered Systems, Inc.
Manufacturer:	Siemens
Contractor:	EARTHWORKS PACIFIC, INC.
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/21/14</u></p>	

cc: File

Water Technologies

9G-EF (Mercury Free) Direct Acting Float Switch (B100)

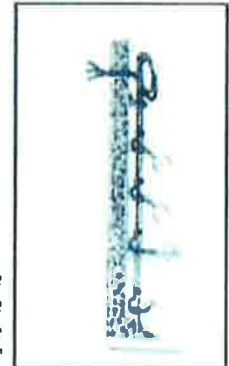
The 9G-EF is the most reliable non-mercury float switch. It is Teflon®-coated, non-differential float of Type 316 SS, measures 5.5" (14 cm) in diameter and is appropriate for a variety of applications, including sewage wet wells, storm water basins, water reservoirs, sludge tanks, irrigation canals and process sumps. The float operates reliably in even the most difficult environments. The 9G-EF can be used singly to sense an alarm level, but typically two or more switches are used in conjunction with our controllers to provide a float-based control system. The 9G-EF can be used as the redundant control sensor in larger automation installations.

TYPICAL SPECIFICATIONS

Float switch body shall be constructed of Teflon®-coated, 20 gauge 316 stainless steel housing measuring not less than 5 1/2" (14 cm) in diameter. A long life, high reliability, potted SPST magnetic reed switch rated for not less than 100 VA at up to 250 Volts shall be mounted inside the float and connected to a multi-stranded, 2 conductor plus ground, 16 gauge, CPE jacketed cable. The cord shall have fine strand conductors (not more than 34 gauge) made especially for heavy flexing service. The cable connection point shall be potted in epoxy providing a strong bond to the float and reed switch forming a water/moisture tight connection. A flexible Neoprene sleeve, not less than 1/8" (3.2 mm) thick, shall be provided over the CPE jacketed cable extending not less than 5" (12.7 cm) from the top of the mounting bracket extending down through the cable mounting bracket hinge point to the top of the float switch body, providing cable stress point relief and extended operational life.

A 316 stainless steel flanged cable mounting clamp assembly shall be supplied allowing pipe or cable mounting as specified below. The float cable-mounting bracket shall be flared on both sides providing hinge point stress relief to both sides of the cable.

SIEMENS



9G EF Floats provide reliable performance in "unbelievable surroundings."

The float switch assembly shall provide a minimum of two pounds of buoyancy in solutions with a specific gravity of 1.0 (water) and shall have an operating temperature rating of -31 to 194 degrees F (-35 to +90 degrees C).

The float switches shall be Model 9G-EF floats as manufactured by Siemens Water Technologies, Control Systems Products.

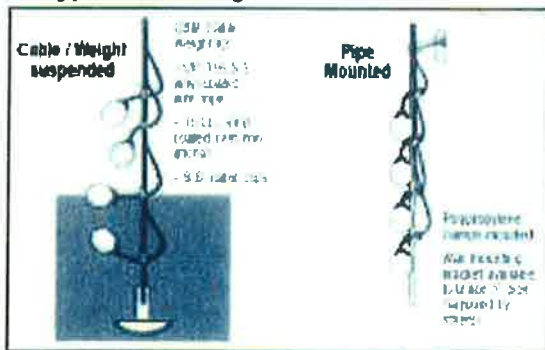


FEATURES

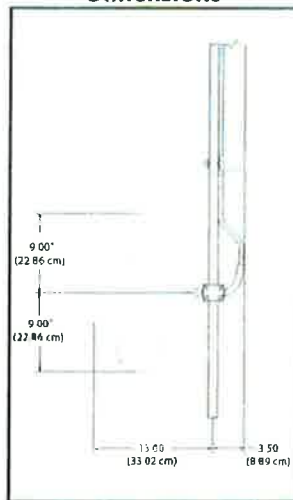
- Mercury Free – Magnetic Reed Switch
- Long life and reliable operation
- Non-oxidizing contacts allow low DC voltage signals for use with intrinsic safety devices
- Non-stick surface
- High buoyancy
- Pipe or suspension mounting
- 3 year factory warranty

DESCRIPTION	PART NO.
9G-EF (Mercury Free) NOTP Float Switch	
Teflon coated Stainless Steel Float Switch w/1 N.O. Contact & 30' (9.1m) Cable	6013520030
Teflon coated Stainless Steel Float Switch w/1 N.O. Contact & 60' (18.3 m) Cable	6013520060
9G-EF (Mercury Free) NCTP Float Switch	
Teflon coated Stainless Steel Float Switch w/1 N.C. Contact & 30' (9.1 m) Cable	6013530030
Teflon coated Stainless Steel Float Switch w/1 N.C. Contact & 60' (18.3 m) Cable	6013530060
Mounting Hardware & Accessories	
9G Float Cable Clamp Assembly	6012120001
9G Float 1" (2.54 cm) Pipe Clamp Assembly	6011840001
Stainless Steel cable suspension kit, 21' (6.4 m)	6014400020
Stainless Steel cable suspension kit, 31' (9.5 m)	6014400030
Stainless Steel cable suspension kit, 41' (12.5 m)	6014400040
Stainless Steel cable suspension kit, 61' (18.6 m)	6014400060
Stainless Steel cable suspension kit, 81' (24.7 m)	6014400080
Stainless Steel cable suspension kit, 101' (30.8 m)	6014400100
5 Float Suspension Mount, 2 piece bracket w/strain reliefs	8031340001
9G CL3 1" (2.54 cm) stainless steel pipe mount clamps (transducer or float mount)	6011340001
15# (6.8 kg) Anchor	xx-333-100
Float Cable/Anchor kit 30' (w/15lb (6.8 kg) anchor, 30' (9.1 m) SS cable, wall bracket, 5 cable clamp)	8032110003
Float Cable/Anchor kit 60' (w/15lb (6.8 kg) anchor, 60' (18.3 m) SS cable, wall bracket, 5 cable clamp)	8032110006
IS6 Six Circuit Intrinsically Safe (Switch Circuit) Barrier: 12-24V DC powered	6013160002
9G JCTF fiberglass junction box (supports up to XXXX floats)	6011020001

Typical Mounting



Pipe Mounting Dimensions



COMPLETE CONTROL CAPABILITIES

Siemens Water Technologies offers a single, high-quality source for everything from simple level sensors to telemetry systems involving complex system control engineering and software. Based in Vadnais Heights, Minnesota, Control Systems is part of the Siemens Water Technologies leading global provider of industrial, municipal and residential water and wastewater treatment systems, products and services. As a major manufacturer/integrator with an extensive selection of specialized product lines in the areas of SCADA and telemetry, power equipment integration, automation and measurement, Control Systems is uniquely positioned to provide cost effective, comprehensive solutions for water, wastewater and process control and telemetry applications.

The information provided in this literature contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of the contract.

Siemens
Water Technologies
1239 Willow Lake Boulevard
Vadnais Heights, MN 55110
800 224 9474 phone
651 766.2700 phone
651 766 2701 fax

CS-9GEFdr-DS-0407

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Subject to change without prior notice.

Measurement – Float Switches

9G Floats (Mercury Switch) *Specify pipe or cable clamp mounting at time of order



The 9G float is a Teflon coated 5-1/2" diameter, 20 gauge, type 316 stainless steel float switch with a mercury switch inside and flexibly supported by a PVC jacketed, heavy-duty cable. It's contact is rated at 20 amps at 115 VAC and 10 amps at 230 VAC. The float cable is type SO with two #14 AWG fine-stranded copper conductors. The 9G is ideal for applications such as wet wells, sludge tanks, water reservoirs, etc. The float can be mounted to a 1" pipe using type 316 stainless steel hardware or cable mounted.

Description

B100 9G NOTP Teflon Coated 316 SS Float Switch w/I-N.O. Contact & 30' Cable
 B100 9G NOTP Teflon Coated 316 SS Float Switch w/I N.O. Contact & 60' Cable
 B100 9G NCTP Teflon Coated 316 SS Float Switch w/I-N.C. Contact & 30' Cable
 B100 9G NCTP Teflon Coated 316 SS Float Switch w/I-N.C. Contact & 60' Cable

Old Part No.	New Part No.
6013400030	W2T295697
6013400060	W2T294140
6013500030	W2T295698
6013500060	W2T295700

9G –EF Floats (Non-Mercury Switch) *Specify pipe or cable clamp mounting at time of order



The 9G float is a Teflon coated 5-1/2" diameter, 20 gauge, type 316 stainless steel float switch with a non-mercury magnetic read switch inside and flexibly supported by a CPE jacketed, heavy-duty cable. It's contact is rated at no more than 100 VA at up to 250 volts. The float cable is type SO with two #16 AWG fine-stranded conductors. The 9G-EF is ideal for applications such as wet wells, sludge tanks, water reservoirs, etc. where mercury floats are not preferred or not allowed by local laws or ordinances. The float can be mounted to a 1" pipe using type 316 stainless steel hardware or cable mounted.

Description

B100 9G-EF NOTP Teflon Coated 316 SS Float Switch w/I-N.O. Contact & 30' Cable
B100 9G-EF NOTP Teflon Coated 316 SS Float Switch w/I-N.O. Contact & 60' Cable ✓
 B100 9G-EF NCTP Teflon Coated 316 SS Float Switch w/I-N.C. Contact & 30' Cable
B100 9G-EF NCTP Teflon Coated 316 SS Float Switch w/I-N.C. Contact & 60' Cable ✓

Old Part No.	New Part No.
6013520030	W2T295692
6013520060	W2T294202
6013530030	W2T296235
6013530060	W2T294168

LS Floats



The Model LS Float Switch is a simple, dependable, level-sensing automatic pump or alarm control device that operates reliably in sewage wet wells, sumps, ditches or process vats. The float body is of high-density polypropylene and the cable jacket is flexible PVC for outstanding performance in a wide range of corrosive environments. Single floats are used for alarm actuation. Two floats are used for differential control of pumps. Floats contain a Form C-type contact mercury switch, which provides one normally-open contact, one normally-closed contact, or one of each, depending on model. It is also available with or without an internal weight.

Description

B100 P30NO LSA Float switch (1 N.O.) w/30' cable, 2-wire
 B100 P60NO LSA Float switch (1 N.O.) w/60' cable, 2-wire
 B100 P30NC LSA Float switch (1 N.C.) w/30' cable, 2-wire
 B100 P60NC LSA Float switch (1 N.C.) w/60' cable, 2-wire
 B100 P30NONC LSC Float switch (1 N.O., 1-N.C.) w/30', 3-wire
 B100 P60NONC LSC Float switch (1-N.O., 1 N.C.) w/60', 3-wire
 B100 S30NO LSA Float Switch (1 N.O.) w/30' 2-wire (includes internal weight)
 B100 S60NO LSA Float Switch (1 N.O.) w/60' 2-wire (includes internal weight)
 B100 S30NC LSA Float Switch (1 N.C.) w/30' 2-wire (includes internal weight)
 B100 S60NC LSA Float Switch (1 N.C.) w/60' 2-wire (includes internal weight)
 B100 S30NONC LSC Float switch (1 N.O., 1-N.C.) w/30' cable, 3-wire (internal weight)
 B100 S60NONC LSC Float switch (1 NO, 1-NC) w/60' cable, 3-wire (internal weight)

Old Part No.	New Part No.
8031360030	W2T277360
8031360060	W2T277362
8031370030	W2T277369
8031370060	W2T292327
8031380030	W2T277372
8031380060	W2T277374
8031360031	W2T277361
8031360061	W2T277363
8031370031	W2T277370
8031370061	W2T277371
8031380031	W2T277373
8031380061	W2T277375

5 Float Suspension Mount, 2 piece bracket with strain relief



The 5 Float Suspension Mount Bracket allows for mounting of up to 5 LS style weighted floats. The float cables are fed through the strain relief grommets on the bracket and hang into the media. The bracket allows for easy retrieval of the floats for testing or cleaning.

Description

5 Float Suspension Mount, 2 piece bracket w/strain reliefs

Old Part No.	New Part No.
8031340001	W2T277359

15# Anchor



The 15# anchor is used the 1/8 inch Cable Suspension Kit listed above to suspend 9G and LS style floats.

Description

15# Anchor

Old Part No.	New Part No.
xx-333-100	W2T280921

Float Cable / Anchor Kit with 15# Anchor, Wall Bracket & 5 Cable Clamps



The Float Cable / Anchor Kit provides all the necessary equipment needed to suspend up to 5 LS or 9G / 9G-EF floats. It contains a 15# anchor, stainless steel coated cable with cable clips, wall bracket, and 5 universal float clamps.

Description

Float Cable/Anchor kit 30' (with 15lb anchor, 30' SS cable, wall bracket, 5 cable clamp)
 Float Cable/Anchor kit 60' (with 15lb anchor, 60' SS cable, wall bracket, 5 cable clamp)

Old Part No.	New Part No.
8032110003	W2T295021 ✓
8032110006	W2T295022

Model IS6 Six Circuit Intrinsically Safe (Switch Circuit) Barrier, 12-24 VDC Powered



The IS6 Intrinsic Safety Barrier is a six-circuit, shunt-diode barrier ON/OFF switch circuit interface that is used between Monitoring and Pump/Alarm Controller Equipment and its level sensor float switch circuitry to render such circuitry "intrinsically safe" and thus suited for installation in a hazardous location such as a sewage or freeway stormwater-handling pump station collection sump. The IS6 module is designed to make its associated switches and circuitry suited for Class I, Division 1 or 2, Groups A, B, C and D, and Class II, Division 1 or 2, Groups E, F, and G hazardous locations as defined by the NEC (National Electrical Code). The IS6 is ideally suited for applications requiring compliance with UL 913 procedures pertaining to electrical control panels with intrinsically safe extensions to hazardous areas. It includes LED indicators for power and circuit activation.

Description

Model IS6 Six Circ. Intrinsically Safe (Switch Circuit) Barrier 12-24v

Old Part No.	New Part No.
6013160002	W2T294110



- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: BAM DATE: 23 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 29

EPI Job No:	<u>176</u>	Date:	<u>October 21, 2014</u>
To:	<u>Waste Management of HI</u>	Spec Section:	<u>N/A</u>
Attention:	<u>Jesse Frey</u>	Spec Para:	<u>N/A</u>
Address:	<u>92-460 Farrington Hwy</u>	Drawing No:	<u>Figures 1 & 2</u>
	<u>Kapolei, HI 96707</u>	Subcontractor:	<u>N/A</u>
Phone No:	<u>808.250.0574</u>	Supplier:	<u>D&M Hydraulics</u>
Fax No:	<u>808.668.1366</u>	Manufacturer:	<u>Dixon Valve US</u>
Respond by:	_____		_____

This submittal contains the following:

- Description:** -3" Sch.40 316 Stainless Steel Cam & Groove 90degree Type B Coupler X Male NPT ✓
 (for use with supplemental drop-in pump)
- 3" 316 Stainless Steel Cam & Groove Type DP Dust Plug

Submittal No:	29
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	<u>N/A</u>
Spec Para:	<u>N/A</u>
Drawing No:	<u>Figures 1 & 2</u>
Subcontractor:	<u>N/A</u>
Supplier:	<u>D&M Hydraulics</u>
Manufacturer:	<u>Dixon Valve US</u>
Contractor:	<u>EARTHWORKS PACIFIC, INC.</u>
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/21/14</u>	

cc: File

Cam & Groove 90° Type B coupler x male NPT



Part Number	300B-90SS
Material	316 Stainless Steel
Seal	Buna-N
Size	3"
Maximum Operating Pressure	125 PSI
Optional Pkg/Box Qty	2
Weight	5.1850

Not a Distributor?
 Name a local distributor who should carry this product.
 or

 or

[+] Product Details

Applications

- Designed for use with liquids, consult Dixon for specific recommendations

Specifications

- Produced to interchange with all product produced to Commercial Item Description A-A-59326D

Construction

- Produced as a welded fabrication

How It works

- To make a connection, simply slide the adapter into the coupler and with normal hand pressure, press the cam levers down.
- Uncoupling is as quick and simple as coupling. Just lift the cam arms and remove the adapter.

Safety notes

- Under no circumstances should cam and groove couplings be used for compressed air or steam service!
- Pressure rating recommendations are based on the use of mating Dixon fittings at ambient temperature 70° with a standard seal installed. For use at elevated temperature or other unusual operating conditions, consult the factory.

Dixon/Boss-Lock Cam & Groove Type DP dust plug



Part Number	300-DP-SS
Material	316 Stainless Steel
Size	3"
Optional Pkg/Box Qty	10
Weight	1.7600

Not a Distributor?

Name a local distributor who should carry this product.

or

Add to

Wishlist

or

Request a

Quote

[+] Product Details

Specifications

- Produced to Interchange with all product produced to Commercial Item Description A-A-59326D

Safety notes

- Dust caps and dust plugs are not to be used in pressure applications for safety and environmental reasons.

[+] Product Resources

Catalog Page

[Catalog Page](#)

Brochure/Literature

[Cam & Groove](#)

Dimensional Specifications

[Dimensional Specifications](#)

Related Videos

[Procedure 3003: Inspecting Dixon Cam & Groove Couplings](#)



- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: BW DATE: 23 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 30

EPI Job No:	<u>176</u>	Date:	<u>October 21, 2014</u>
To:	<u>Waste Management of HI</u>	Spec Section:	<u>N/A</u>
Attention:	<u>Jesse Frey</u>	Spec Para:	<u>N/A</u>
Address:	<u>92-460 Farrington Hwy</u>	Drawing No:	<u>Figures 1 & 2</u>
	<u>Kapolei, HI 96707</u>	Subcontractor:	<u>N/A</u>
Phone No:	<u>808.250.0574</u>	Supplier:	<u>CWR Hawaii</u>
Fax No:	<u>808.668.1366</u>	Manufacturer:	<u>Rudong Chain Works / N/A</u>
Respond by:	_____		_____

This submittal contains the following:

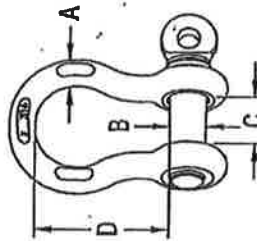
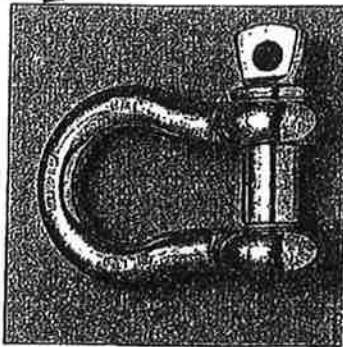
Description: -1/4" Type 316-NM Stainless Steel Anchor Shackle w/Oversize Screw Pin
 -3/16" Type 316L Stainless Steel Chain
 (for lifting pumps)

Submittal No:	30
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	<u>N/A</u>
Spec Para:	<u>N/A</u>
Drawing No:	<u>Figures 1 & 2</u>
Subcontractor:	<u>N/A</u>
Supplier:	<u>CWR Hawaii</u>
Manufacturer:	<u>Rudong Chain Works / N/A</u>
Contractor:	<u>EARTHWORKS PACIFIC, INC.</u>
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/21/14</u></p>	

cc: File

ANCHOR SHACKLE

316-NM STAINLESS STEEL
WITH OVERSIZE SCREW PIN



ITEM	A (size)	B	C	D	WLL (lb)	WT (lb)
S0116-FS05	3/16"	0.26"	0.41"	0.88"	650	0.05
S0116-FS07	1/4"	0.31"	0.47"	1.11"	1,000	0.10
S0116-FS08	5/16"	0.38"	0.53"	1.20"	1,300	0.17
S0116-FS10	3/8"	0.44"	0.66"	1.41"	1,500	0.30
S0116-FS12	7/16"	0.50"	0.72"	1.77"	2,000	0.50
S0116-FS13	1/2"	0.63"	0.82"	1.83"	3,000	0.71
S0116-FS16	5/8"	0.75"	1.02"	2.41"	4,000	1.39
S0116-FS20	3/4"	0.88"	1.25"	2.84"	6,000	2.31
S0116-FS22	7/8"	1.00"	1.48"	3.30"	8,000	3.64
S0116-FS25	1"	1.13"	1.70"	3.80"	10,000	5.18
S0116-FS32	1-1/4"	1.38"	2.03"	4.69"	14,000	9.88

NOTE: I/A/W FED SPEC RR-C-271D, TYPE IVA, CLASS 2, EXCEPT 316 STAINLESS. MARKED TO THE NEAREST FRACTIONAL TON.

RUDONG CHAIN WORKS ADD:CHAHE TOWN, RUDONG COUNTY, JIANGSU CHINA
 INSPECTION CERTIFICATE CONT.NO:JRC10N0987

DESCRIPTION OF GOODS	QUTY PCS	TOTAL LENGTH	SIZE			TENSILE TEST			CHEMICAL COMPOSITION								
			D mm	L mm	B mm	b mm	BREAKING LOAD (LBS)	PROOF LOAD (LBS)	WORKING LOAD (LBS)	ELONGATION %	C	Si	Mn	P	S	Cr	Ni
PO#02-00050539																	
G80 HDG LONG LINK CHAIN																	
1/2*500FT	40	20000'	13.0	80.4		24.5	35000	16500	8300	19	0.20	0.26	1.60	0.01	0.01	0.04	0.05
STAINLESS STEEL CHAIN T316 NACM-90																	
1/8*1200FT	2	2400'	4.0	23.2		7.2	1800	800	375		0.06	0.64	1.66	0.01	0.01	16.2	10.2
3/16*1600FT	4	6400'	5.5	24.5		10.0	3400	1600	800		0.06	0.64	1.66	0.01	0.01	16.2	10.2
1/4*1000FT	10	10000'	7.0	30.0		12.2	5600	2600	1300		0.06	0.64	1.66	0.01	0.01	16.2	10.2
5/16*550FT	6	3300'	8.4	32.6		13.4	8800	3800	1900		0.06	0.64	1.66	0.01	0.01	16.2	10.2
3/8*400FT	6	2400'	10.0	34.5		14.3	12000	5300	2650		0.06	0.64	1.66	0.01	0.01	16.2	10.2
1/2*200FT	2	400'	13.0	45.4		19.0	20000	9000	4500		0.06	0.64	1.66	0.01	0.01	16.2	10.2
G80																	

TEST RESULT: QUALIFIED

INSPECTOR: MR. PAN

INSPECTION DATE: Nov 16, 2010

如东县铁链厂有限公司
 RUDONG CHAIN WORKS
 CHINA

COMPANY HEADER

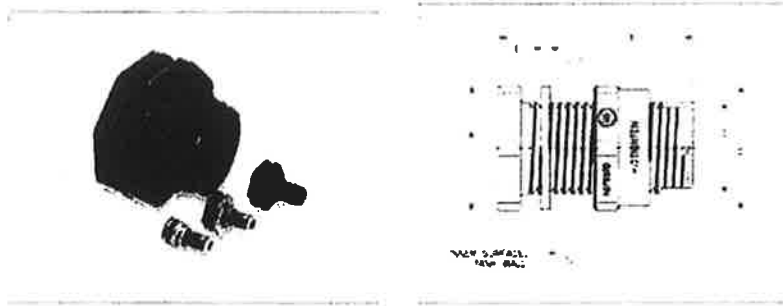
All Categories > Tank Accessories > BFA Series Bulkhead Fittings - Long Length with Standard Flange > Item # BFA1020TFS

Item # BFA1020TFS, 2" PVC Bulkhead Long Length Fitting/FPM Standard Flange Gasket; Threaded x Threaded

Easy Tank Connections

Hayward's BFA Series Industrial Bulkhead Fittings (Tank Adapters) easily permit safe, quick pipe connections to be made to plastic, metal or plastic tanks. Simply cut the proper size opening in the tank, slide the body of the fitting through it, and then just tighten the nut. The fitting is now ready to accept the piping connection.

150 psi at 70°F



Specifications

Size	2"
Body Material	PVC
Seals	FPM
End Connection	Threaded x Threaded
A - Across Flats	4.38 in
B	4.25 in
C - Installation Hole Size	3.25 in
D - Across Flats	4.38 in
E - Gasket Thickness	0.25 in

COMPANY FOOTER



- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: Bu DATE: 23 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 32

EPI Job No:	176	Date:	October 21, 2014
To:	Waste Management of HI	Spec Section:	N/A
Attention:	Jesse Frey	Spec Para:	N/A
Address:	92-460 Farrington Hwy Kapolei, HI 96707	Drawing No:	Figures 1 & 2
Phone No:	808.250.0574	Subcontractor:	N/A
Fax No:	808.668.1366	Supplier:	Home Depot
Respond by:		Manufacturer:	N/A

This submittal contains the following:

Description: 3/4" x 4 1/2" Stainless Steel Wedge Anchors
 (for attaching flygt at discharge connection to wetwll floor) ✓

Extra care shall be taken while drilling the holes for the anchors. The anchor holes shall not exceed the depth of the concrete floor.

Submittal No:	32
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2
Subcontractor:	N/A
Supplier:	Home Depot
Manufacturer:	N/A
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/21/14</u>	

cc: File

Simpson Strong-Tie Model # WA754144SS

3/4 in. x 4-1/2 In. Stainless-Steel Wedge-All Anchor (10-Piece per Pack)

[Write the First Review](#) [Ask a Question](#)

\$73.27 / package

Item cannot be shipped to the following state(s): AK, GU, HI, PR, VI

PRODUCT SOLD ONLINE ONLY



PRODUCT OVERVIEW Model # WA754144SS Internet # 205302277

The Wedge-All Anchor is a non-bottom bearing, wedge-style expansion Anchor for use in solid concrete or grout-filled concrete masonry. A 1-piece clip ensures uniform holding capacity that increases as tension is applied. The threaded stud version is available in eight diameters and multiple lengths. A single size tie-wire version is available for wire supported fixtures. Threaded studs are set by lightening the nut. Tie-wire Anchor is set with the claw end of a hammer.

- 1-piece wrap around clip
- Threaded end is chamfered for ease of starting nut
- Most sizes feature full thread for added versatility
- Quantity: 10
- 3/4 in. x 4-1/2 in.
- Stainless steel

SPECIFICATIONS

Assembled Depth (in.)	7.9 in	Assembled Height (in.)	3.5 in
Assembled Width (in.)	3.5 in	Fastener Diameter	3/4"
Fastener Head Style	N/A	Fastener Type	Masonry Anchor
Fastener length (in.)	4.5	Finish Family	Stainless Steel
Indoor/Outdoor	Indoor/Outdoor	Manufacturer Warranty	Visit our website at strongtie.com and type in warranty in the search box for detailed warranty information
Maximum Weight Capacity (lb.)	0	Measurement Standard	SAE
Package Quantity	10	Primary Use	For use in solid concrete or grout-filled concrete masonry
Product Weight (lb.)	0.65 lb	Returnable	90-Day

SHIPPING OPTIONS

Most orders process within 3 business days.

Please allow 3 to 5 business days for **Standard Shipping** in addition to order processing time, which varies by product. Items deliver by small parcel service.

If product is eligible for shipping to AK, HI and US Territories additional transit time and remote surcharges may apply.



NO EXCEPTIONS NOTED
 MAKE CORRECTIONS NOTED
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: PCU DATE: 21 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 33

EPI Job No 176
 To. Waste Management of HI
 Attention. Jesse Frey
 Address 92-460 Farrington Hwy
 Kapolei, HI 96707
 Phone No 808.250.0574
 Fax No 808.668.1366
 Respond by

Date October 23, 2014
 Spec Section: N/A
 Spec Para: N/A
 Drawing No Figures 1 & 2
 Subcontractor: N/A
 Supplier: Pacific Pipe
 Manufacturer: Smith-Cooper International

This submittal contains the following:

Description: Stainless Steel Fittings to be used as follows:

- 3" x 3" x 3" Tee for new discharge pipe
- 3" x 3" Union for connection between 3" stub out of wetwell wall & 3" x 3" x 3" tee for new discharge pipe (as needed)
- 3" Cap for top of 3" x 3" x 3" Tee for new discharge pipe
- 3" x 1" & 1" x 3/4" Bushings for top of tee for testing purposes

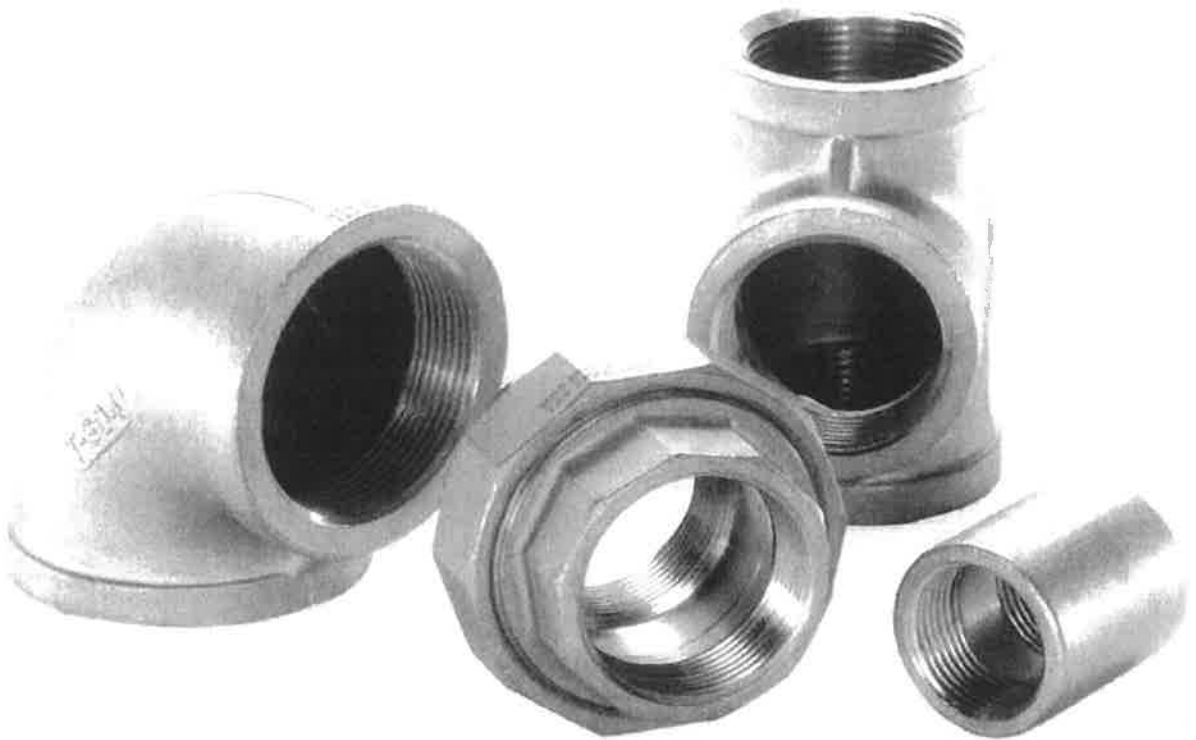
Submittal No:	33
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2
Subcontractor:	N/A
Supplier:	Pacific Pipe
Manufacturer:	Smith-Cooper International
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."	
Signature	<u>Bryan Davidson</u> Date <u>10/23/14</u>

cc File

SMITH-COOPER®

I N T E R N A T I O N A L

CORPORATE OFFICE TEL (800) 766-0076 LOCAL (323) 890-4455 FAX (323) 890-4456
WWW.SMITHCOOPER.COM



Stainless Steel 150# Fittings
Threaded & Socket Weld

SMITH-COOPER®

INTERNATIONAL



150# Stainless Fittings

Specifications

- Stainless Castings conform to ASTM A351
- Stainless Wrought Fittings conform to ASTM A182, Barstock to ASTM A479
- Stainless Fitting Dimensions conform to MSS SP-114 (except Wall & Bands)
- NPT Threads conform to ASME B1.20.1
- Stainless Fittings have SCI Trademark
- Manufacturing Facility is ISO 9001:2000
- Independent lab verification that fittings meet applicable chemical & physical properties

SCI Quality Plus

- Quality control inspections both at the overseas factory and our US warehouses
- Company engineer available at your request
- \$10,000,000 product liability insurance
- Pro Pak System makes products easier to handle and warehouse
- Orders shipped within 24 hours
- Fax confirmation of every order
- Knowledgeable customer service personnel

Warranty and Limitations of Liability

SMITH-COOPER INTERNATIONAL (SCI) warrants to its initial purchaser only, that its products which are delivered to this initial purchaser will be of the kind described in the order or price list and will be free of defects in workmanship or material for a period of five years from the date of delivery to our initial purchaser.

Should any failure to conform to this warranty appear within five years after the date of the initial delivery to our initial purchaser, SCI will, upon written notification thereof and substantiation that the goods have been stored, installed, maintained and operated in accordance with recognized engineering and piping practices and industry standards, correct such defects by suitable repair or replacement (which alternative shall be at the discretion of SCI) of product at SCI's own expense upon return of the defective part to SCI.

In the event that SCI elects to replace the defective product, SCI shall pay up to \$50 per defective product for total cost of replacement. In the event of multiple claims, such payment shall be no greater than \$1,000 for each installation project.

This warranty applies only during normal use that meets the above referenced conditions of installation and operation and is absolutely void if the product has been damaged after purchase or if it has been misused, repaired, altered or modified in any manner whatsoever. SCI shall not warranty any of its products if any portion of the product including without limitation, any component, gasket, housing or bolt has been modified, altered, remanufactured or replaced in any manner by any customer, user of the product or third party.

Correction of non-conformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of SCI to our initial purchaser, with respect to the goods, whether based on contract, negligence, strict tort, or otherwise. It is the intention of SCI that no warranty of any kind, whether expressed or implied shall pass through our initial purchaser to any other person or corporation.

No returns will be allowed unless prior written permission of SCI is first obtained. Buyers shall be responsible for all costs of transportation as well as a restocking charge.

This warranty is exclusively for the benefit of the initial purchaser of this product from SCI and, except to the extent prohibited by applicable law, the foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to warranties of fitness or merchantability.

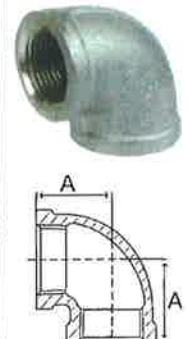
LIMITATIONS OF LIABILITY: SCI shall not under any circumstances be liable for special or consequential damages such as, but not limited to damage to loss of other property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, claims of customers of our initial purchaser, any labor cost for repair or replacement of the product or damage caused by the product.

The remedies of our initial purchaser, and all others, set forth herein are exclusive, and the liability of SCI with respect to same shall not, except as expressly provided herein, exceed the price of the SCI products on which such liability is based.



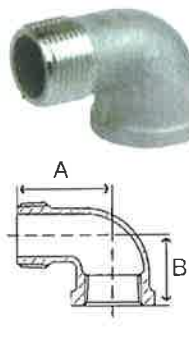
Stainless 150# Fittings Threaded

90° Elbow




Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.81	-	-	0.140
1/4	0.81	-	-	0.110
3/8	0.93	-	-	0.190
1/2	1.12	-	-	0.360
3/4	1.31	-	-	0.560
1	1.50	-	-	0.930
1-1/4	1.75	-	-	1.060
1-1/2	1.93	-	-	1.730
2	2.25	-	-	2.350
2-1/2	2.68	-	-	4.380
3	3.06	-	-	6.380
4	3.81	-	-	10.30

90° Street Elbow



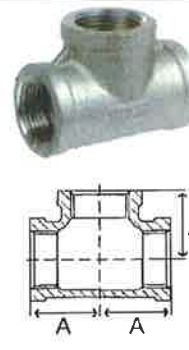
Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	1.06	0.81	-	0.090
1/4	1.18	0.81	-	0.140
3/8	1.43	0.93	-	0.200
1/2	1.62	1.12	-	0.320
3/4	1.87	1.31	-	0.500
1	2.12	1.50	-	0.860
1-1/4	2.50	1.75	-	1.280
1-1/2	2.75	1.93	-	1.580
2	3.25	2.25	-	2.390
2-1/2	3.87	2.68	-	5.760
3	4.50	3.06	-	7.860
4	5.68	3.81	-	15.23

45° Elbow




Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.69	-	-	0.120
1/4	0.69	-	-	0.090
3/8	0.81	-	-	0.120
1/2	0.87	-	-	0.310
3/4	1.00	-	-	0.560
1	1.12	-	-	0.770
1-1/4	1.31	-	-	1.120
1-1/2	1.43	-	-	1.560
2	1.68	-	-	2.060
2-1/2	1.93	-	-	3.800
3	2.18	-	-	5.870
4	2.62	-	-	9.540

Tee



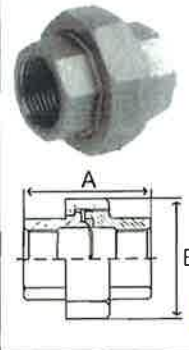
Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.69	-	-	0.200
1/4	0.69	-	-	0.140
3/8	0.81	-	-	0.260
1/2	0.87	-	-	0.530
3/4	1.00	-	-	0.740
1	1.12	-	-	1.230
1-1/4	1.31	-	-	2.030
1-1/2	1.43	-	-	2.180
2	1.68	-	-	3.480
2-1/2	1.93	-	-	5.910
3	2.18	-	-	9.370
4	2.62	-	-	16.01

Cross



Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.69	-	-	0.370
1/4	0.69	-	-	0.310
3/8	0.81	-	-	0.490
1/2	0.87	-	-	0.850
3/4	1.00	-	-	1.190
1	1.12	-	-	1.490
1-1/4	1.31	-	-	2.030
1-1/2	1.43	-	-	2.970
2	1.68	-	-	4.310
2-1/2	1.93	-	-	7.550
3	2.18	-	-	9.810
4	2.62	-	-	17.80

Union



Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	1.26	0.93	-	0.240
1/4	1.44	1.10	-	0.210
3/8	1.61	1.26	-	0.280
1/2	1.72	1.45	-	0.410
3/4	1.95	1.71	-	0.620
1	2.06	2.07	-	0.820
1-1/4	2.26	2.50	-	1.580
1-1/2	2.41	2.82	-	2.070
2	2.75	3.41	-	3.000
2-1/2	3.22	4.12	-	6.820
3	3.50	4.75	-	11.04
4	3.85	6.00	-	17.00

All Dimensions are to the MSS Standard


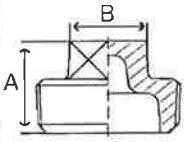
Threaded Fittings Class 150 conform to ASTM A351, ASME B1.20.1, MSS-SP-114 where applicable

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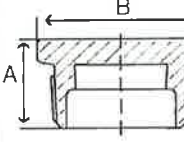
Stainless 150# Fittings Threaded

Square Head Plug


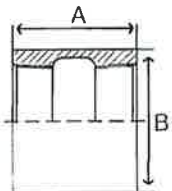
Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.61	9/32	-	0.020
1/4	0.72	3/8	-	0.030
3/8	0.79	7/16	-	0.060
1/2	0.94	9/16	-	0.110
3/4	1.07	5/8	-	0.240
1	1.25	13/16	-	0.370
1-1/4	1.36	15/16	-	0.670
1-1/2	1.45	1-1/8	-	0.880
2	1.56	1-5/16	-	1.110
2-1/2	1.81	1-1/2	-	1.580
3	1.93	1-11/16	-	2.400
4	2.22	2-1/4	-	5.000

Hex Head Plug


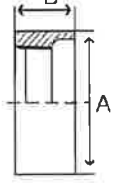
Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.51	0.50	-	0.030
1/4	0.58	0.62	-	0.050
3/8	0.64	0.68	-	0.090
1/2	0.75	0.87	-	0.150
3/4	0.85	1.20	-	0.260
1	1.00	1.43	-	0.470
1-1/4	1.08	1.76	-	0.930
1-1/2	1.14	2.00	-	1.240
2	1.22	2.48	-	2.260
2-1/2	1.44	2.98	-	2.580
3	1.53	3.86	-	3.610
4	1.72	4.62	-	7.200

Full Coupling


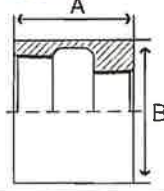
Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.75	1.00	-	0.050
1/4	0.84	1.00	-	0.080
3/8	1.01	1.12	-	0.100
1/2	1.20	1.38	-	0.170
3/4	1.46	1.50	-	0.260
1	1.77	1.62	-	0.410
1-1/4	2.15	2.00	-	0.500
1-1/2	2.43	2.12	-	0.860
2	2.96	2.50	-	1.330
2-1/2	3.31	2.87	-	2.290
3	4.00	3.18	-	3.310
4	5.06	3.68	-	5.370
6	7.39	4.10	-	13.44

Half Coupling


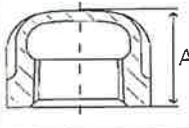
Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.75	0.50	-	0.030
1/4	0.84	0.50	-	0.040
3/8	1.01	0.56	-	0.050
1/2	1.20	0.69	-	0.090
3/4	1.46	0.75	-	0.140
1	1.77	0.81	-	0.220
1-1/4	2.15	1.00	-	0.260
1-1/2	2.43	1.06	-	0.440
2	2.96	1.25	-	0.680
2-1/2	3.31	1.43	-	1.160
3	4.00	1.59	-	1.690
4	5.06	1.84	-	2.700
6	7.39	2.01	-	3.577

Reducing Coupling

Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.75	1.00	-	0.060
1/4	0.84	1.00	-	0.100
3/8	1.01	1.12	-	0.130
1/2	1.20	1.38	-	0.220
3/4	1.46	1.50	-	0.330
1	1.77	1.62	-	0.530
1-1/4	2.15	2.00	-	0.650
1-1/2	2.43	2.12	-	1.110
2	2.96	2.50	-	1.730
2-1/2	3.31	3.25	-	2.980
3	4.00	3.68	-	4.300
4	5.06	4.38	-	6.980

Cap

Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.75	0.68	-	0.050
1/4	0.84	0.68	-	0.080
3/8	1.01	0.81	-	0.100
1/2	1.20	0.93	-	0.150
3/4	1.46	1.06	-	0.280
1	1.77	1.31	-	0.500
1-1/4	2.15	1.62	-	0.690
1-1/2	2.43	1.62	-	0.910
2	2.96	1.75	-	1.290
2-1/2	3.31	2.00	-	2.380
3	4.00	2.25	-	3.670
4	5.06	2.50	-	5.590

All Dimensions are to the MSS Standard

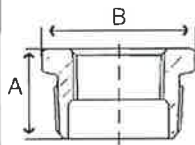
Threaded Fittings Class 150 conform to ASTM A351, ASME B1.20.1, MSS-SP-114 where applicable

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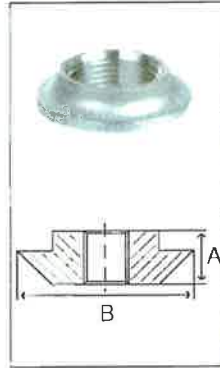
Stainless 150# Fittings Threaded

Hex Bushing



Size	Dimensions (in)		Weight (lb)
	A	B	
1/4 x 1/8	0.56	5/8	0.030
3/8 x 1/8	0.66	11/16	0.050
3/8 x 1/4	0.66	11/16	0.050
1/2 x 1/8	0.75	7/8	0.080
1/2 x 1/4	0.75	7/8	0.080
1/2 x 3/8	0.75	7/8	0.080
3/4 x 1/8	0.84	1-1/16	0.160
3/4 x 1/4	0.84	1-1/16	0.160
3/4 x 3/8	0.84	1-1/16	0.160
3/4 x 1/2	0.84	1-1/16	0.160
1 x 1/8	1.00	1-3/8	0.350
1 x 1/4	1.00	1-3/8	0.350
1 x 3/8	1.00	1-3/8	0.350
1 x 1/2	1.00	1-3/8	0.350
1 x 3/4	1.00	1-3/8	0.350
1-1/4x1/8	1.09	1-3/4	0.560
1-1/4x1/4	1.09	1-3/4	0.560
1-1/4x3/8	1.09	1-3/4	0.560
1-1/4x1/2	1.09	1-3/4	0.560
1-1/4x3/4	1.09	1-3/4	0.560
1-1/4x1	1.09	1-3/4	0.560
1-1/2x1/8	1.12	2	0.650
1-1/2x1/4	1.12	2	0.650
1-1/2x3/8	1.12	2	0.650
1-1/2x1/2	1.12	2	0.650
1-1/2x3/4	1.12	2	0.650
1-1/2x1	1.12	2	0.650
1-1/2x1-1/4	1.12	2	0.650
2x1/4	1.22	2-1/2	1.260
2x3/8	1.22	2-1/2	1.260
2x1/2	1.22	2-1/2	1.260
2x3/4	1.22	2-1/2	1.260
2x1	1.22	2-1/2	1.260
2x1-1/4	1.22	2-1/2	1.260
2x1-1/2	1.22	2-1/2	1.260
2-1/2x1/2	1.44	3	1.480
2-1/2x3/4	1.44	3	1.480
2-1/2x1	1.44	3	1.480
2-1/2x1-1/4	1.44	3	1.480
2-1/2x1-1/2	1.44	3	1.480
2-1/2x2	1.44	3	1.480
3x1/4	1.53	3-1/2	2.140
3x3/8	1.53	3-1/2	2.140
3x1/2	1.53	3-1/2	2.140
3x3/4	1.53	3-1/2	2.140
3x1	1.53	3-1/2	2.140
3x1-1/4	1.53	3-1/2	2.140
3x1-1/2	1.53	3-1/2	2.140
3x2	1.53	3-1/2	2.140
3x2-1/2	1.53	3-1/2	2.140
4x1	1.85	4-5/8	4.280
4x1-1/4	1.85	4-5/8	4.280
4x1-1/2	1.85	4-5/8	4.280
4x2	1.85	4-5/8	4.280
4x2-1/2	1.85	4-5/8	4.280
4x3	1.75	4-5/8	4.280

Weld Spud



Size	Dimensions (in)			Weight (lb)
	A	B	C	
1/8	0.421	1.375	-	0.026
1/4	0.500	1.500	-	0.055
3/8	0.500	1.625	-	0.066
1/2	0.594	1.750	-	0.154
3/4	0.656	1.937	-	0.176
1	0.781	2.187	-	0.253
1-1/4	0.750	2.687	-	0.370
1-1/2	0.875	3.000	-	0.451
2	0.937	3.500	-	0.661
2-1/2	1.000	4.062	-	1.102
3	1.000	4.625	-	1.322
4	1.125	5.815	-	2.645

All Dimensions are to the MSS Standard

Threaded Fittings Class 150 conform to ASTM A351, ASME B1.20.1, MSS-SP-114 where applicable

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NO EXCEPTIONS NOTED

MAKE CORRECTIONS NOTED

REJECT REVISE AND RESUBMIT

SUBMIT SPECIFIED ITEM

SIGNED: BCL DATE: 21 JAN 2015

GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 34

EPI Job No: 176
 To: Waste Management of HI
 Attention: Jesse Frey
 Address: 92-460 Farrington Hwy
 Kapolei, HI 96707
 Phone No: 808.250.0574
 Fax No: 808.668.1366
 Respond by:

Date: October 23, 2014
 Spec Section: N/A
 Spec Para: N/A
 Drawing No: Figure 1 & 2
 Subcontractor: N/A
 Supplier: Pacific Pipe
 Manufacturer: Smith-Cooper International

This submittal contains the following:

Description: Stainless Steel Nipples to be used as follows:

- 3" for discharge piping
- 2" for connection between float system breakout box and bulkhead fitting on top of wetwell

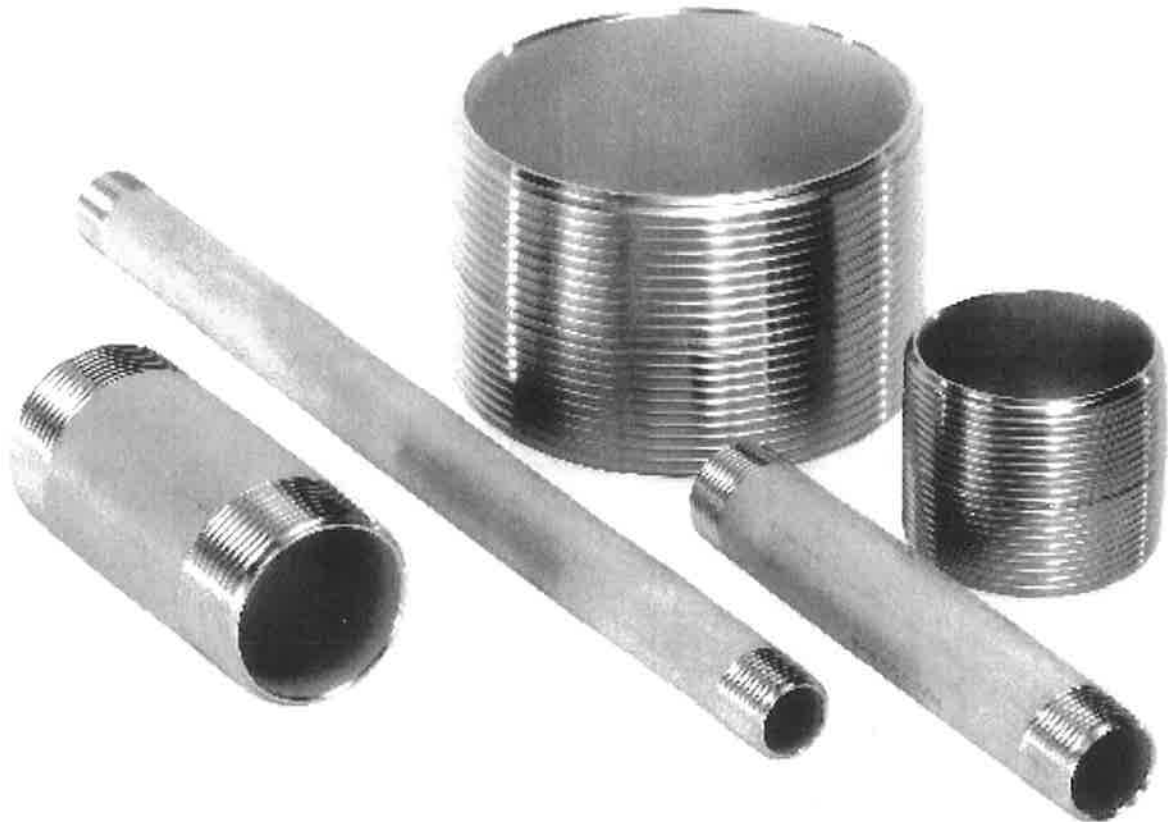
Submittal No:	34
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description:	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figure 1 & 2
Subcontractor:	N/A
Supplier:	Pacific Pipe
Manufacturer:	Smith-Cooper International
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/23/14</u>	

cc File

SMITH-COOPER[®]

I N T E R N A T I O N A L

CORPORATE OFFICE TEL (800) 766-0076 LOCAL (323) 890-4455 FAX (323) 890-4456
WWW.SMITHCOOPER.COM



Stainless Steel Nipples
Schedule 40 Welded & Schedule 80 Seamless

SMITH-COOPER®

INTERNATIONAL



Stainless Steel Nipples

Specifications

- Stainless Steel Nipple Material conforms to ASTM A312
- Stainless Steel Nipple Dimensions conform to ASTM A733 and ASME B36.19
- NPT Threads on Stainless Nipples conform to ASME B1.20.1
- Manufacturing Facility is ISO 9001:2000

Stainless Steel Nipples conform to ASTM A312, ASME B36.19, ASTM A733, ASME B1.20.1 where applicable

SCI Quality Plus

- Quality control inspections both at the overseas factory and our US warehouses
- Company engineer available at your request
- \$10,000,000 product liability insurance
- SCI 5/50 guarantee
- Pro Pak System makes products easier to handle and warehouse
- Orders shipped within 24 hours
- Fax confirmation of every order
- Knowledgeable customer service personnel

Warranty and Limitations of Liability

SMITH-COOPER INTERNATIONAL (SCI) warrants to its initial purchaser only, that its products which are delivered to this initial purchaser will be of the kind described in the order or price list and will be free of defects in workmanship or material for a period of five years from the date of delivery to our initial purchaser.

Should any failure to conform to this warranty appear within five years after the date of the initial delivery to our initial purchaser, SCI will, upon written notification thereof and substantiation that the goods have been stored, installed, maintained and operated in accordance with recognized engineering and piping practices and industry standards, correct such defects by suitable repair or replacement (which alternative shall be at the discretion of SCI) of product at SCI's own expense upon return of the defective part to SCI.

In the event that SCI elects to replace the defective product, SCI shall pay up to \$50 per defective product for total cost of replacement. In the event of multiple claims, such payment shall be no greater than \$1,000 for each installation project.

This warranty applies only during normal use that meets the above referenced conditions of installation and operation and is absolutely void if the product has been damaged after purchase or if it has been misused, repaired, altered or modified in any manner whatsoever. SCI shall not warrant any of its products if any portion of the product including without limitation, any component, gasket, housing or bolt has been modified, altered, remanufactured or replaced in any manner by any customer, user of the product or third party.

Correction of non-conformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of SCI to our initial purchaser, with respect to the goods, whether based on contract, negligence, strict tort, or otherwise. It is the intention of SCI that no warranty of any kind, whether expressed or implied shall pass through our initial purchaser to any other person or corporation.

No returns will be allowed unless prior written permission of SCI is first obtained. Buyers shall be responsible for all costs of transportation as well as a restocking charge.

This warranty is exclusively for the benefit of the initial purchaser of this product from SCI and, except to the extent prohibited by applicable law, the foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to warranties of fitness or merchantability.

LIMITATIONS OF LIABILITY: SCI shall not under any circumstances be liable for special or consequential damages such as, but not limited to damage to loss of other property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, claims of customers of our initial purchaser, any labor cost for repair or replacement of the product or damage caused by the product.

The remedies of our initial purchaser, and all others, set forth herein are exclusive, and the liability of SCI with respect to same shall not, except as expressly provided herein, exceed the price of the SCI products on which such liability is based.



Stainless Schedule 40 Welded Nipple Weights

304/304L Weights

Diameter	Wall Thickness	Length of Close	Close	1 1/2'	2'	2-1/2'	3'	3-1/2'	4'	4-1/2'	5'	5-1/2'	6'	7'	8'	9'	10'	11'	12'
1/8"	0.068	3/4"	0.012	0.026	0.036	0.048	0.058	0.068	0.078	0.086	0.106	0.112	0.120	0.146	0.164	0.180	0.206	0.224	0.2460
1/4"	0.088	7/8"	0.025	0.044	0.06	0.076	0.092	0.102	0.130	0.140	0.154	0.180	0.202	0.224	0.268	0.312	0.352	0.386	0.4200
3/8"	0.091	1"	0.034	0.06	0.078	0.1	0.122	0.150	0.176	0.196	0.222	0.230	0.264	0.307	0.350	0.456	0.476	0.506	0.5180
1/2"	0.109	1 1/8"	0.056	0.08	0.116	0.148	0.182	0.216	0.252	0.286	0.316	0.358	0.386	0.474	0.520	0.590	0.662	0.734	0.7980
3/4"	0.113	1 3/8"	0.096	0.112	0.158	0.198	0.242	0.288	0.340	0.380	0.426	0.466	0.524	0.645	0.725	0.818	0.910	1.000	1.0900
1	0.113	1 1/2"	0.148	-	0.22	0.252	0.356	0.396	0.470	0.526	0.624	0.660	0.774	0.885	1.005	1.142	1.280	1.413	1.5450
1 1/4"	0.140	1 5/8"	0.225	-	0.32	0.4	0.485	0.600	0.615	0.715	0.805	0.940	0.970	1.180	1.390	1.700	2.010	2.155	2.3000
1 1/2"	0.145	1 3/4"	0.295	-	0.32	0.465	0.560	0.680	0.795	0.940	0.995	1.095	1.270	1.370	1.650	1.970	2.070	2.250	2.4300
2"	0.154	2"	0.4	-	-	0.615	0.710	0.930	1.070	1.225	1.370	1.550	1.665	1.933	2.200	2.550	2.900	3.180	3.4600
2 1/2"	0.203	2 1/2"	0.73	-	-	-	0.950	1.350	1.450	1.795	2.040	2.160	2.375	2.135	3.150	3.546	4.050	4.575	5.1000
3"	0.216	2 5/8"	1.19	-	-	-	1.485	1.675	2.060	2.375	2.670	2.950	3.170	2.659	4.500	5.225	5.950	7.055	8.16
4"	0.237	2 7/8"	1.944	-	-	-	-	-	2.988	3.625	3.675	4.525	4.438	5.950	6.700	7.125	7.550	8.400	9.2500
6"	0.280	3 1/8"	4.69	-	-	-	-	-	-	-	-	-	9.010	10.512	12.014	-	-	-	18.0215

316/316L Weights

Diameter	Wall Thickness	Length of Close	Close	1 1/2'	2'	2-1/2'	3'	3-1/2'	4'	4-1/2'	5'	5-1/2'	6'	7'	8'	9'	10'	11'	12'
1/8"	0.068	3/4"	0.012	0.026	0.036	0.048	0.058	0.068	0.078	0.086	0.106	0.112	0.120	0.142	0.164	1.860	0.206	0.226	0.246
1/4"	0.088	7/8"	0.025	0.044	0.060	0.076	0.092	0.102	0.130	0.140	0.154	0.180	0.202	0.235	0.268	0.310	0.352	0.386	0.420
3/8"	0.091	1"	0.034	0.060	0.078	0.100	0.122	0.150	0.176	0.196	0.222	0.230	0.264	0.307	0.350	0.413	0.476	0.497	0.518
1/2"	0.109	1 1/8"	0.056	0.080	0.116	0.148	0.182	0.216	0.252	0.286	0.316	0.358	0.386	0.453	0.520	0.591	0.662	0.730	0.798
3/4"	0.113	1 3/8"	0.096	0.112	0.158	0.198	0.242	0.288	0.340	0.380	0.426	0.466	0.524	0.645	0.725	0.815	0.910	1.000	1.090
1	0.113	1 1/2"	0.148	-	0.220	0.252	0.356	0.396	0.470	0.526	0.624	0.660	0.774	0.885	1.005	1.143	1.280	1.413	1.545
1 1/4"	0.140	1 5/8"	0.225	-	0.320	0.400	0.485	0.600	0.615	0.715	0.805	0.940	0.970	1.180	1.390	1.700	2.010	2.211	2.300
1 1/2"	0.145	1 3/4"	0.295	-	0.320	0.465	0.560	0.680	0.795	0.910	0.995	1.095	1.270	1.460	1.650	1.970	2.070	2.250	2.430
2"	0.154	2"	0.400	-	-	0.615	0.710	0.930	1.070	1.225	1.370	1.550	1.665	1.933	2.200	2.550	2.900	3.180	3.460
2 1/2"	0.203	2 1/2"	0.730	-	-	-	0.950	1.350	1.450	1.795	2.040	2.160	2.375	2.763	3.150	3.546	4.050	4.575	5.100
3"	0.216	2 5/8"	1.190	-	-	-	1.485	1.675	2.060	2.375	2.670	2.950	3.170	3.835	4.500	5.225	5.950	6.375	6.800
4"	0.237	2 7/8"	1.944	-	-	-	-	-	2.988	3.625	3.675	4.057	4.438	5.950	6.325	6.700	7.550	8.400	9.250
6"	0.280	3 1/8"	4.69	-	-	-	-	-	-	-	-	-	9.010	10.512	12.014	-	-	-	18.0215

Stainless Steel Nipples conform to ASTM A312, ASME B36.19, ASTM A733, ASME B1.20.1 where applicable
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NO EXCEPTIONS NOTED
 MAKE CORRECTIONS NOTED
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: Bru DATE: 21 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 35

EPI Job No: 176
 To: Waste Management of HI
 Attention: Jesse Frey
 Address: 92-460 Farrington Hwy
 Kapolei, HI 96707
 Phone No: 808.250.0574
 Fax No: 808.668.1366
 Respond by:

Date: October 23, 2014
 Spec Section: N/A
 Spec Para: N/A
 Drawing No: Figures 1 & 2
 Subcontractor: N/A
 Supplier: Pacific Pipe
 Manufacturer: Romac Industries, Inc.

This submittal contains the following:

Description:

3" Dia. Fusion Epoxied Restrained Flanged Coupling Adapter w/ 316SS bolts & nuts for connection of 3" discharge pipe to 3" x 3" Flygt Discharge Connection.

Submittal No:	35
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2
Subcontractor:	N/A
Supplier:	Pacific Pipe
Manufacturer:	Romac Industries, Inc.
Contractor:	EARTHWORKS PACIFIC, INC.
<p>"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon."</p> <p align="center">Signature <u>Bryan Davidson</u> Date <u>10/23/14</u></p>	

cc: File



1-800-426-9341



RFCA (Restrained Flanged Coupling Adapter)

Material Specifications

Flange Body: Ductile (nodular) iron, meeting or exceeding ASTM A 536, Grade 65-45-12. Flange meets the dimensional requirements of ANSI Class 125 and 150 bolt circles.

Gaskets: Compounded for water and sewer service in accordance with ASTM D 2000 (Sizes 3 - 12" have flange O-Ring gasket). Other compounds available for petroleum, chemical, or high temperature service.

Gland: Romac RomaGrip™. See page 7-6.

Restraining Bolts: 7/8 - 9 roll thread, Ductile (nodular) iron, meeting or exceeding ASTM A 536.

Restraining Lugs: Ductile (nodular) iron, meeting or exceeding ASTM A 536. Heat treated using a proprietary process.

Lug Locators: Polyurethane, a thermal plastic.

T-bolts and Nuts: High strength low alloy steel T-head bolt. National coarse rolled thread and heavy hex nut. Steel meets AWWA C111 composition specifications. Stainless steel bolts and nuts available on request.

Coatings: Shop coat applied to cast parts for corrosion protection in transit. Fusion bonded epoxy available on request.

Use: Ductile Iron Pipe 3 - 24", cast iron pipe 3" - 24" (same OD's as ductile iron) and IPS size STD steel pipe 3 - 12".

To Order: Specify catalog number. **Example:** For a 12" RFCA Order: **RFCA - 13.20**

NOTE: 3" - 12" special Romac gasket works on both steel and D.I. ODs.



Not for use on PVC, HDPE pipe or plain-end mechanical joint fittings. For applications on PVC, please contact your Romac representative.

NOM. PIPE SIZE	GASKET RANGE	LENGTH	GLAND BOLTS QTY: SIZE	CATALOG NUMBER	LIST PRICE				WEIGHT (lbs.)
					Shopcoat w/Std. B&N	Shopcoat w/304 SS B&N	Fusion Epoxy w/Std. B&N	Fusion Epoxy w/316SS B&N	
3"	3.50-3.96	8.00"	4: 5/8" x 3"	RFCA - 3.96	\$145.45	\$157.56	\$165.10	\$177.20	21
4"	4.50-4.80	9.00"	4: 3/4" x 3 1/2"	RFCA - 4.80	183.32	209.43	207.88	233.99	29
6"	6.63-6.90	9.25"	6: 3/4" x 4"	RFCA - 6.90	233.85	273.01	267.10	306.26	40
8"	8.63-9.05	9.25"	6: 3/4" x 4"	RFCA - 9.05	315.59	354.75	355.82	394.98	53
10"	10.75-11.10	10.25"	8: 3/4" x 4"	RFCA - 11.10	581.96	634.17	669.69	721.91	83
12"	12.75-13.20	10.25"	8: 3/4" x 4"	RFCA - 13.20	632.13	684.34	739.86	792.07	110
14"	15.30	11.70"	10: 3/4" x 4 1/2"	RFCA - 15.30	882.79	947.37	1,020.54	1,085.12	170
16"	17.40	11.70"	12: 3/4" x 4 1/2"	RFCA - 17.40	1,225.93	1,302.91	1,410.23	1,487.21	200
18"	19.50	11.80"	12: 3/4" x 4 1/2"	RFCA - 19.50	1,346.63	1,423.60	1,546.13	1,623.10	217
20"	21.60	11.80"	14: 3/4" x 4 1/2"	RFCA - 21.60	1,521.19	1,611.94	1,772.94	1,863.69	256
24"	25.80	12.00"	16: 3/4" x 5"	RFCA - 25.80	1,845.38	1,959.61	2,130.38	2,244.61	305



Some initial axial movement may occur in lug style restraints as the lugs seat. Movement is directly related to the size of the piping system and the system pressure. In general terms movement of approximately 0.25" can be expected in restraints under 16". For larger sizes, movement of approximately 0.4" may be seen. If this is critical to your application please contact Romac Engineering for additional information



NO EXCEPTIONS NOTED
 MAKE CORRECTIONS NOTED
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: BW DATE: 21 JAN 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 36

EPI Job No. 176
 To: Waste Management of HI
 Attention: Jesse Frey
 Address: 92-460 Farrington Hwy
 Kapolei, HI 96707
 Phone No. 808.250.0574
 Fax No. 808.668.1366
 Respond by:

Date: October 23, 2014
 Spec Section: N/A
 Spec Para: N/A
 Drawing No: Figures 1 & 2
 Subcontractor: N/A
 Supplier: Pacific Pipe, Inc.
 Manufacturer: Smith-Cooper International

This submittal contains the following:

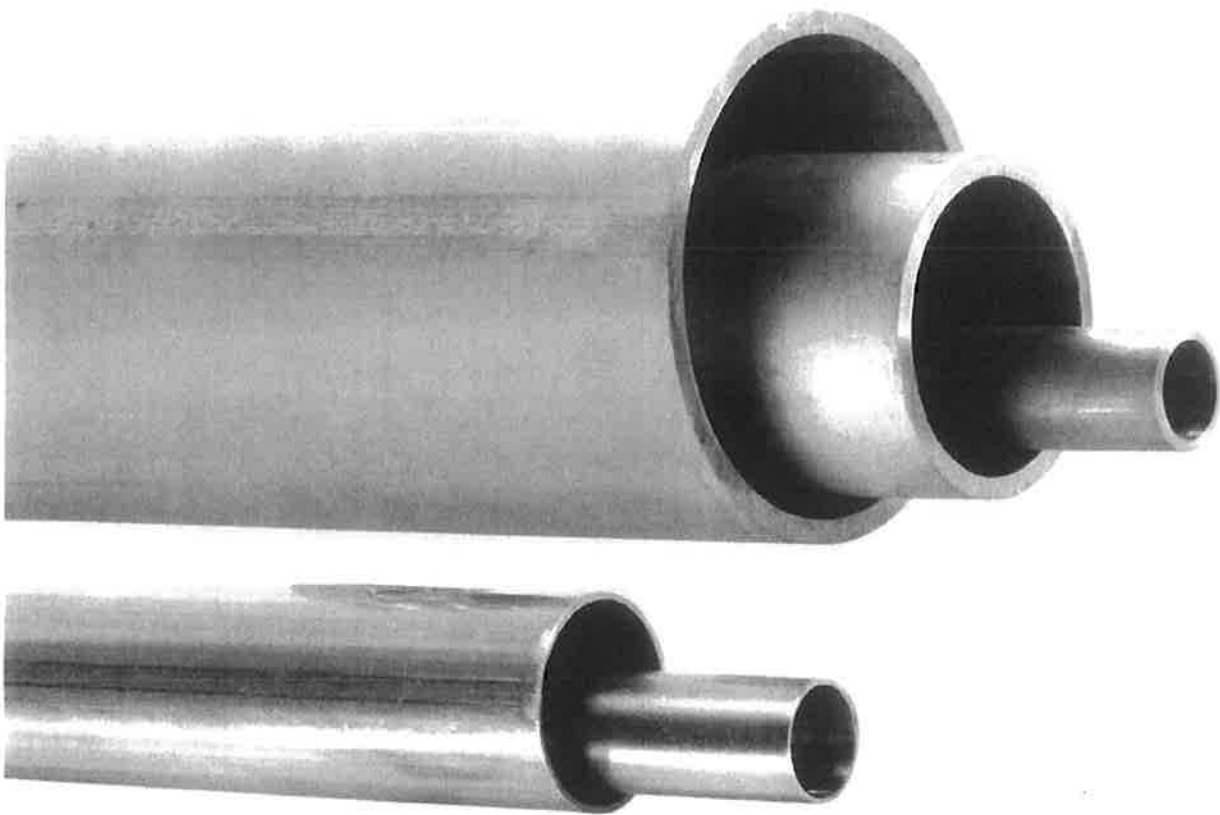
Description:

- 3" Type 304/L Sch. 40 welded pipe for discharge
- 2" Type 304/L Sch. 40 welded pipe for guide bars

Submittal No:	36
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2
Subcontractor:	N/A
Supplier:	Pacific Pipe, Inc.
Manufacturer:	Smith-Cooper International
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon " Signature <u>Bryan Davidson</u> Date <u>10/23/14</u>	

cc: File

Stainless Pipe & Tubing



SMITH-COOPER®
INTERNATIONAL

SMITH-COOPER[®]
INTERNATIONAL

Pipe & Tubing

Pipe Specifications

- Welded and seamless pipe material conforms to ASTM A312, ASTM A999; (ASTM A778 available on request)
- Stainless pipe dimensions conform to ASTM A999, ASME B36.19, ASME B36.10
- Manufacturing facility is ISO 9001:2000
- Pipe sold as single random lengths
- Cut-to-length, threading and grooving available

Instrumentation Tubing Specifications

- Instrumentation tubing dimensions and materials conform to ASTM A269 and ASTM A249

Sanitary Tubing Specifications

- Sanitary tubing dimensions and materials conform to ASTM A269 and ASTM A270 and 3-A Approved



Stainless Pipe - Welded Sch 10 & Sch 40



Fig. S6014WP & S6016WP - Sch 10 Welded Pipe

Diameter IN	Part Number		OD IN	Wall Thickness IN	Weight LB/FT
	304/L	316/L			
1/2	S6014WP004	S6016WP004	0.84	0.083	0.6
3/4	S6014WP006	S6016WP006	1.05	0.083	0.8
1	S6014WP010	S6016WP010	1.32	0.109	1.4
1-1/4	S6014WP012	S6016WP012	1.66	0.109	1.8
1-1/2	S6014WP014	S6016WP014	1.90	0.109	2.0
2	S6014WP020	S6016WP020	2.37	0.109	2.6
2-1/2	S6014WP024	S6016WP024	2.87	0.120	3.5
3	S6014WP030	S6016WP030	3.50	0.120	4.3
3-1/2	S6014WP034	S6016WP034	4.00	0.120	4.9
4	S6014WP040	S6016WP040	4.50	0.120	5.6
5	S6014WP050	S6016WP050	5.563	0.134	7.7
6	S6014WP060	S6016WP060	6.625	0.134	9.2
8	S6014WP080	S6016WP080	8.625	0.148	13.4
10	S6014WP100	S6016WP100	10.75	0.165	18.7
12	S6014WP120	S6016WP120	12.75	0.180	24.2

Fig. S6044WP & S6046WP - Sch 40 Welded Pipe

Diameter IN	Part Number		OD IN	Wall Thickness IN	Weight LB/FT
	304/L	316/L			
1/8	S6044WP001	S6046WP001	0.41	0.068	0.2
1/4	S6044WP002	S6046WP002	0.54	0.088	0.4
3/8	S6044WP003	S6046WP003	0.67	0.091	0.5
1/2	S6044WP004	S6046WP004	0.84	0.109	0.8
3/4	S6044WP006	S6046WP006	1.05	0.113	1.1
1	S6044WP010	S6046WP010	1.32	0.133	1.6
1-1/4	S6044WP012	S6046WP012	1.66	0.140	2.2
1-1/2	S6044WP014	S6046WP014	1.90	0.145	2.7
2	S6044WP020	S6046WP020	2.37	0.154	3.6
2-1/2	S6044WP024	S6046WP024	2.87	0.203	5.7
3	S6044WP030	S6046WP030	3.50	0.216	7.5
3-1/2	S6044WP034	S6046WP034	4.00	0.226	9.1
4	S6044WP040	S6046WP040	4.50	0.237	10.7
5	S6044WP050	S6046WP050	5.563	0.258	14.6
6	S6044WP060	S6046WP060	6.625	0.280	18.9
8	S6044WP080	S6046WP080	8.625	0.322	28.5
10	S6044WP100	S6046WP100	10.75	0.365	40.4
12	S6044WP120	S6046WP120	12.75	0.375	49.5

PIPE & TUBE



Stainless Pipe - Seamless Sch 40 & Sch 80



Fig. S6144SP & S6146SP - Sch 40 Seamless Pipe

Diameter IN	Part Number		OD IN	Wall Thickness IN	Weight LB/FT
	304/L	316/L			
1/4	S6144SP002	S6146SP002	0.54	0.088	0.4
3/8	S6144SP003	S6146SP003	0.67	0.091	0.5
1/2	S6144SP004	S6146SP004	0.84	0.109	0.8
3/4	S6144SP006	S6146SP006	1.05	0.113	1.1
1	S6144SP010	S6146SP010	1.32	0.133	1.6
1-1/4	S6144SP012	S6146SP012	1.66	0.140	2.2
1-1/2	S6144SP014	S6146SP014	1.90	0.145	2.7
2	S6144SP020	S6146SP020	2.37	0.154	3.6
2-1/2	S6144SP024	S6146SP024	2.87	0.203	5.7
3	S6144SP030	S6146SP030	3.50	0.216	7.5
3-1/2	S6144SP034	S6146SP034	4.00	0.226	9.1
4	S6144SP040	S6146SP040	4.50	0.237	10.7
5	S6144SP050	S6146SP050	5.563	0.258	14.6
6	S6144SP060	S6146SP060	6.625	0.280	18.9

Fig. S6184SP & S6186SP - Sch 80 Seamless Pipe

Diameter IN	Part Number		OD IN	Wall Thickness IN	Weight LB/FT
	304/L	316/L			
1/4	S6184SP002	S6186SP002	0.54	0.119	0.5
3/8	S6184SP003	S6186SP003	0.67	0.126	0.7
1/2	S6184SP004	S6186SP004	0.84	0.147	1.0
3/4	S6184SP006	S6186SP006	1.05	0.154	1.4
1	S6184SP010	S6186SP010	1.32	0.179	2.1
1-1/4	S6184SP012	S6186SP012	1.66	0.191	2.9
1-1/2	S6184SP014	S6186SP014	1.90	0.200	3.6
2	S6184SP020	S6186SP020	2.37	0.218	5.0
2-1/2	S6184SP024	S6186SP024	2.87	0.276	7.6
3	S6184SP030	S6186SP030	3.50	0.300	10.2
3-1/2	S6184SP034	S6186SP034	4.00	0.318	12.5
4	S6184SP040	S6186SP040	4.50	0.337	14.9
5	S6184SP050	S6186SP050	5.563	0.375	20.7
6	S6184SP060	S6186SP060	6.625	0.432	28.5

P I P E & T U B E

WARRANTY AND LIMITATIONS OF LIABILITY

SMITH-COOPER INTERNATIONAL (SCI) warrants to its initial purchaser only, that its products which are delivered to this initial purchaser will be of the kind described in the order or price list and will be free of defects in workmanship or material for a period of five years from the date of delivery to our initial purchaser.

Should any failure to conform to this warranty appear within five years after the date of the initial delivery to our initial purchaser, SCI will, upon written notification thereof and substantiation that the goods have been stored, installed, maintained and operated in accordance with recognized engineering and piping practices and industry standards, correct such defects by suitable repair or replacement (which alternative shall be at the discretion of SCI) of product at SCI's own expense upon return of the defective part to SCI.

In the event that SCI elects to replace the defective product, SCI shall pay up to \$50 per defective product for total cost of replacement. In the event of multiple claims, such payment shall be no greater than \$1,000 for each installation project.

This warranty applies only during normal use that meets the above referenced conditions of installation and operation and is absolutely void if the product has been damaged after purchase or if it has been misused, repaired, altered or modified in any manner whatsoever. SCI shall not warranty any of its products if any portion of the product including without limitation, any component, gasket, housing or bolt has been modified, altered, remanufactured or replaced in any manner by any customer, user of the product or third party.

Correction of non-conformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of SCI to our initial purchaser, with respect to the goods, whether based on contract, negligence, strict tort, or otherwise. It is the intention of SCI that no warranty of any kind, whether expressed or implied shall pass through our initial purchaser to any other person or corporation.

No returns will be allowed unless prior written permission of SCI is first obtained. Buyers shall be responsible for all costs of transportation as well as a restocking charge.

This warranty is exclusively for the benefit of the initial purchaser of this product from SCI and, except to the extent prohibited by applicable law, the foregoing warranty is in lieu of all other warranties, express or implied, including but not limited to warranties of fitness or merchantability.

LIMITATIONS OF LIABILITY: SCI shall not under any circumstances be liable for special or consequential damages such as, but not limited to damage to loss of other property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, claims of customers of our initial purchaser, any labor cost for repair or replacement of the product or damage caused by the product.

The remedies of our initial purchaser, and all others, set forth herein are exclusive, and the liability of SCI with respect to same shall not, except as expressly provided herein, exceed the price of the SCI products on which such liability is based.

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Industrial PVF

Malleable Iron
Cast Iron
Ductile Iron
Bronze Fittings
Flanged Fittings
Forged Steel Fittings
Merchant Steel
COOPLET[®]
Nipples
Lead Free

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Gate
Globe
Check
Butterfly
Straight Stops
Hose Bibbs/Sillcocks
Boiler Drains
Specialties

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150# Fittings
3000# Forged Fittings
Weld Fittings
Sanitary Fittings
Compression Fittings
Flanges
Nipples
Pipe & Tubing
Valves

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Couplings
Fittings
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COOPLET[®] Adapter Nipples

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SMITH-COOPER[®]
INTERNATIONAL
CERTIFICATE OF CONFORMANCE

PRODUCTS SOLD BY SMITH-COOPER INTERNATIONAL, LLC ARE
MANUFACTURED, CERTIFIED AND SUPPLIED IN ACCORDANCE WITH THE
FOLLOWING NATIONALLY RECOGNIZED SPECIFICATIONS AND STANDARDS:

CAST IRON FLANGED FITTINGS, CLASS 125 & 250

Grey Iron Castings conform to ASTM A126 and ASTM A48
Flanged Fitting Dimensions conform to ASME B16.1 and ANSI/AWWA C110/A21.10
CLASS 125 is **UL LISTED** through 12"
Manufacturing Facility is **ISO 9001:2000**

CAST IRON FLANGES, CLASS 125 & 250

Grey Iron Castings conform to ASTM A126 and ASTM A48
Flange Dimensions conform to ASME B16.1
Hot-Dipped Galvanized Flanges conform to ASTM A153
Flange Threads conform to ASME B1.20.1
Manufacturing Facility is **ISO 9001:2000**

CAST IRON THREADED FITTINGS

Grey Iron Castings conform to ASTM A126
Cast Iron Fitting Dimensions conform to ASME B16.4 Class 125
NPT Threads on fittings conform to ASME B1.20.1
Cast Iron Threaded Fittings are **UL LISTED and FM APPROVED** at 300psi
Manufacturing Facility is **ISO 9001:2000 and ISO 14001**
Cast Iron Fittings have SCI Trademark and are 100% Air Tested

DUCTILE IRON THREADED FITTINGS

Ductile Iron Castings conform to ASTM A536
Ductile Iron Fitting Dimensions conform to ASME B16.3, Class 150
Ductile Iron Bushings and Plugs conform to ASME B16.14
NPT Threads on all fittings conform to ASME B1.20.1
Ductile Iron Threaded Fittings are **UL LISTED and FM APPROVED** at 500psi
Ductile Iron Threaded Fittings are steam rated at 300psi saturated steam
Manufacturing Facility is **ISO 9001:2000 and ISO 14001**
Ductile Iron Fittings have SCI Trademark and are 100% Air Tested

MALLEABLE IRON THREADED FITTINGS, CLASS 150 & 300

Malleable Castings conform to ASTM A197
Hot-Dipped Galvanized Fittings conform to ASTM A153
Malleable Fitting Dimensions conform to ASME B16.3
Malleable Bushings, Plugs and Locknuts conform to ASME B16.14
Malleable Unions conform to ASME B16.39
NPT Threads on all fittings conform to ASME B1.20.1
Class 150 fittings are **UL listed and FM approved** at 300psi
Class 300 fittings are **UL listed**
Manufacturing Facility is **ISO 9001:2000 and ISO 14001**
CHINA fittings have SCI Trademark and are 100% Air Tested
***Galvanized Fittings are approved to ANSI/NSF 61-4 Annex G and CA AB1953 (<0.25% Lead)**

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Page 2

GROOVED COUPLINGS AND FITTINGS

Grooved Coupling Housing and Fitting material conform to ASTM A536
Groove dimensions conform to AWWA C606
Grooved Coupling Bolts conform to ASTM A183
Galvanized Couplings and Fittings conform to ASTM A153

MERCHANT STEEL STANDARD AND RECESSED COUPLINGS & FITTINGS

Merchant Coupling dimensions and materials conform to ASTM A865
Merchant Coupling threads conform to ASME B1.20.1.
Standard Couplings from 1/8" to 2" are NPSC (Straight Threads), 2-1/2" and larger are NPT (Tapered)
Recessed Couplings are API 5L style for extra heavy pipe, all sizes have NPT threads
Merchant Steel bushings and plugs conform to ASME B16.14

FORGED STEEL FITTINGS & OUTLETS

Forged Steel Fitting Material conforms to ASME SA105N, NORMALIZED
Forged Steel Fitting Dimensions conform to ASME B16.11
NPT threads on Forged Steel Fittings conform to ASME B1.20.1
Forged Steel Socket Weld Inserts conform to MSS-SP-79
Forged Steel Unions conform to MSS-SP-83
Forged Steel Outlet Fittings conform to MSS-SP-97
Manufacturing Facility is ISO 9001:2000

STEEL WELDED NIPPLES SCH 40 & SCH 80

Black and Hot-Dipped Galvanized Steel Pipe used conforms to ASTM A53
Welded Steel Nipples conform to ASTM A733
NPT threads on nipples conform to ASME B1.20.1
Manufacturing Facility is ISO 9001:2000 and ISO 14001
Import Nipples have SCI Trademark and tracking number
Domestic Nipples available upon request
***Galvanized Nipples are approved to ANSI/NSF 61-4 Annex G and CA AB1953 (<0.25% Lead)**

STEEL SEAMLESS NIPPLES SCH 40, SCH 80 & XXH

Seamless Steel Pipe used conforms to ASTM A106 Grade B
Seamless Steel Nipples conform to ASTM A733
NPT threads on nipples conform to ASME B1.20.1
Manufacturing Facility is ISO 9001:2000 and ISO 14001
Import Nipples have SCI Trademark and heat number
Domestic Nipples available upon request

BRONZE THREADED FITTINGS CLASS 125 & 250 (THAILAND and CHINA)

Bronze Fittings conform to AWWA C800
Bronze Castings conform to ASTM B62, UNS Alloy C83600
Bronze Fitting Dimensions conform to ASME B16.15
NPT Threads on all fittings conform to ASME B1.20.1
Bronze Unions conform to specification A-A-59617
Manufacturing Facilities are ISO 9001:2000
CHINA fittings have SCI Trademark and are 100% Air Tested

"NO LEAD" BRONZE THREADED FITTINGS CLASS 125

Bronze Fittings conform to AWWA C800
Bronze Castings conform to ASTM B584, UNS Alloy C89836
Bronze Fitting Dimensions conform to ASME B16.15
NPT Threads on all fittings conform to ASME B1.20.1
Bronze Unions conform to specification A-A-59617
Manufacturing Facilities are ISO 9001:2000
Fittings have SCI Trademark and are 100% Air Tested
***Approved to ANSI/NSF 61-4 Annex G and California AB 1953 (<0.25% Lead)**

CERTIFICATE OF CONFORMANCE

Page 3

BRONZE FLANGES CLASS 150 (THAILAND and CHINA)

Bronze Castings conform to ASTM B62, UNS Alloy C83600
Bronze Flange Dimensions conform to ASME B16.24
NPT Threads on all flanges conform to ASME B1.20.1
Manufacturing Facilities are ISO 9001:2000

SEAMLESS RED BRASS NIPPLES (Schedule 40)

Seamless Brass pipe conforms to ASTM B43
Seamless Brass Nipples conform to ASTM B687
NPT threads on nipples conform to ASME B1.20.1
*Approved to CA 1953 (<0.25% Lead)

STAINLESS STEEL THREADED FITTINGS, TYPE 304 & 316, CLASS 150 & 1000

Stainless Castings conform to ASTM A351
Stainless Wrought Fittings conform to ASTM A182, Barstock to ASTM A479
Stainless Fitting Dimensions conform to MSS SP-114 (except Wall & Bands)
NPT Threads conform to ASME B1.20.1
Stainless Fittings have SCI Trademark
Manufacturing Facility is ISO 9001:2000

STAINLESS STEEL FORGED FITTINGS & OUTLETS, TYPE 304 & 316

Forged Stainless Steel Material conforms to ASME A182
Forged Stainless Steel Fitting Dimensions conform to ASME B16.11
NPT Threads conform to ASME B1.20.1
Socket Fittings conform to ASME B16.11
Forged Stainless Union conform to MSS SP-83
Forged Stainless Outlets conform to MSS SP-97
Forged Stainless SW Inserts conform to MSS SP-79
Manufacturing Facility is ISO 9001:2000

STAINLESS STEEL FORGED FLANGES, TYPE 304 & 316, ALL CLASSES

Forged Stainless Steel Material conforms to ASME A182
Forged Stainless Steel Flange Dimensions conform to ASME B16.5
NPT Threads conform to ASME B1.20.1
Manufacturing Facility is ISO 9001:2000

STAINLESS STEEL PLATE FLANGES, TYPE 304 & 316

Plate Stainless Steel Flange Dimensions conform to ASME B16.5 Class 150
Plate Stainless Steel Flanges made from ASTM A240 Plate or cast in conformance with ASTM A351

STAINLESS STEEL WELD FITTINGS, TYPE 304 & 316, ALL SCHEDULES

Stainless Weld Fittings conform to ASTM A403, ASTM A960, MSS SP-43; (ASTM A774 available on request)
Stainless Weld Fitting Dimensions conform to ASTM B16.9 (except Wall) and MSS SP-43
Stainless Weld Fittings have SCI Logo
Manufacturing Facility is ISO 9001:2000

STAINLESS STEEL PIPE, WELDED & SEAMLESS, TYPE 304 & 316, ALL SCHEDULES

Welded & Seamless Pipe material conforms to ASTM A312, ASTM A999; (ASTM A778 available on request)
Stainless Pipe Dimensions conform to ASTM A999, ASME B36.19, ASME B36.10
Manufacturing Facility is ISO 9001:2000

STAINLESS STEEL NIPPLES, WELDED & SEAMLESS, TYPE 304 & 316, ALL SCHEDULES

Stainless Steel Nipple Material conforms to ASTM A312
Stainless Steel Nipple Dimensions conform to ASTM A733 and ASME B36.19
NPT Threads on Stainless Nipples conform to ASME B1.20.1
Manufacturing Facility is ISO 9001:2000

Stainless Steel Tubing, Welded & Seamless, Type 304 & 316

Stainless Steel tubing dimensions and materials conform to ASTM A269 and ASTM A249

Revision : 09/03/10



NO EXCEPTIONS NOTED
 MAKE CORRECTIONS NOTED
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: Blex DATE: 24 JAN 2015
GEDSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 37

EPI Job No. 176
 To: Waste Management of HI
 Attention: Jesse Frey
 Address: 92-460 Farrington Hwy
 Kapolei, HI 96707
 Phone No: 808.250.0574
 Fax No: 808.668.1366
 Respond by:

Date: October 27, 2014
 Spec Section: N/A
 Spec Para: N/A
 Drawing No: Figures 1 & 2
 Subcontractor: N/A
 Supplier: Hawaii Engineering Services, Inc.
 Manufacturer: Flygt/Xylem

This submittal contains the following:

Description:

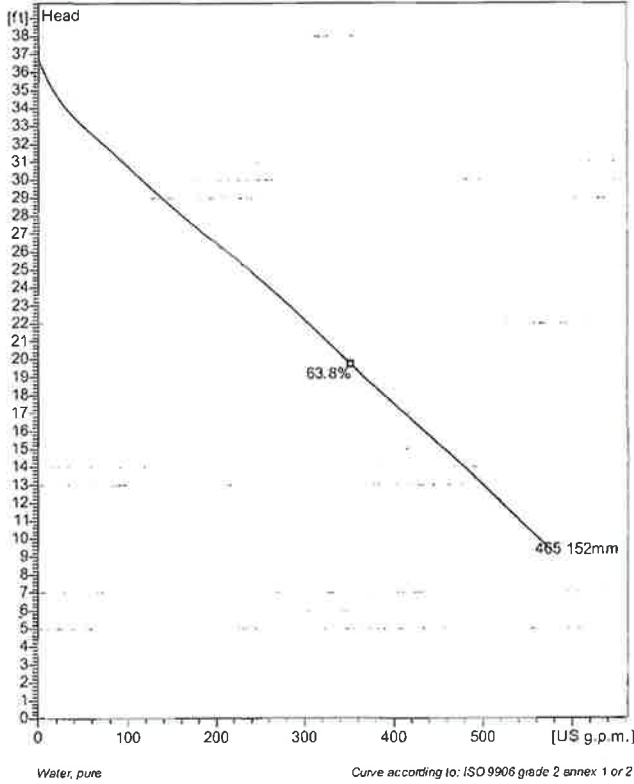
- 1.) Flygt NP 3085 092/ Cast Iron 465 MT, 3" Discharge, Explosion Proof 3 HP 460V
3 Ph w/ 50' Cable, Fluid Leakage Sensor (FLS)
- 2.) Flygt Discharge Connection, 3" x 3" CI , PN 4446805
- 3.) 2" Upper Guide Bar Bracket
- 4.) Flygt MINI-CAS II relay for leakage sensor

Please note that the performance curve for this pump indicates that it will pump 350 GPM @ a estimated 20 ft. of head. Is this correct for this application? Please confirm

Submittal No:	37
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description:	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2
Subcontractor:	N/A
Supplier:	Hawaii Engineering Services, Inc.
Manufacturer:	Flygt/Xylem
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>10/27/14</u>	

46. 1.2

NP 3085 MT 3~ 465
Technical specification



Note: Picture might not correspond to the current configuration.

General
Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

Pump

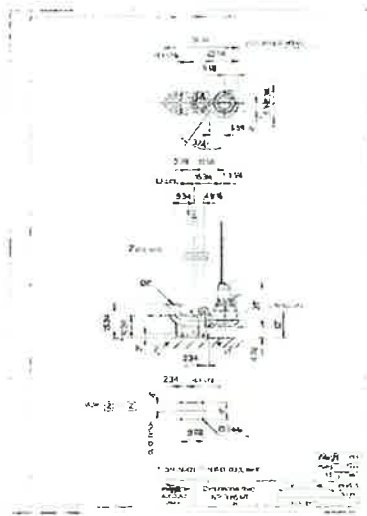
Impeller material	Hard-Iron™
Discharge Flange Diameter	3 1/8 inch
Suction Flange Diameter	80 mm
Impeller diameter	152 mm
Number of blades	2

Motor

Motor #	N3085.092 15-10-4AL-W 3hp
Stator variant	61
Frequency	60 Hz
Rated voltage	460 V
Number of poles	4
Phases	3~
Rated power	3 hp
Rated current	4.5 A
Starting current	25 A
Rated speed	1705 rpm
Power factor	
1/1 Load	0.81
3/4 Load	0.74
1/2 Load	0.62
Efficiency	
1/1 Load	77.5 %
3/4 Load	78.0 %
1/2 Load	76.0 %

Configuration

Installation: P - Semi permanent, Wet



Project
Hawaii Leachate

Project ID
2014 AECOM

Created by
JAMES JOHNSON

Created on
2014-05-19

Last update
2014-05-19

NP 3085 MT 3~ 465



Performance curve

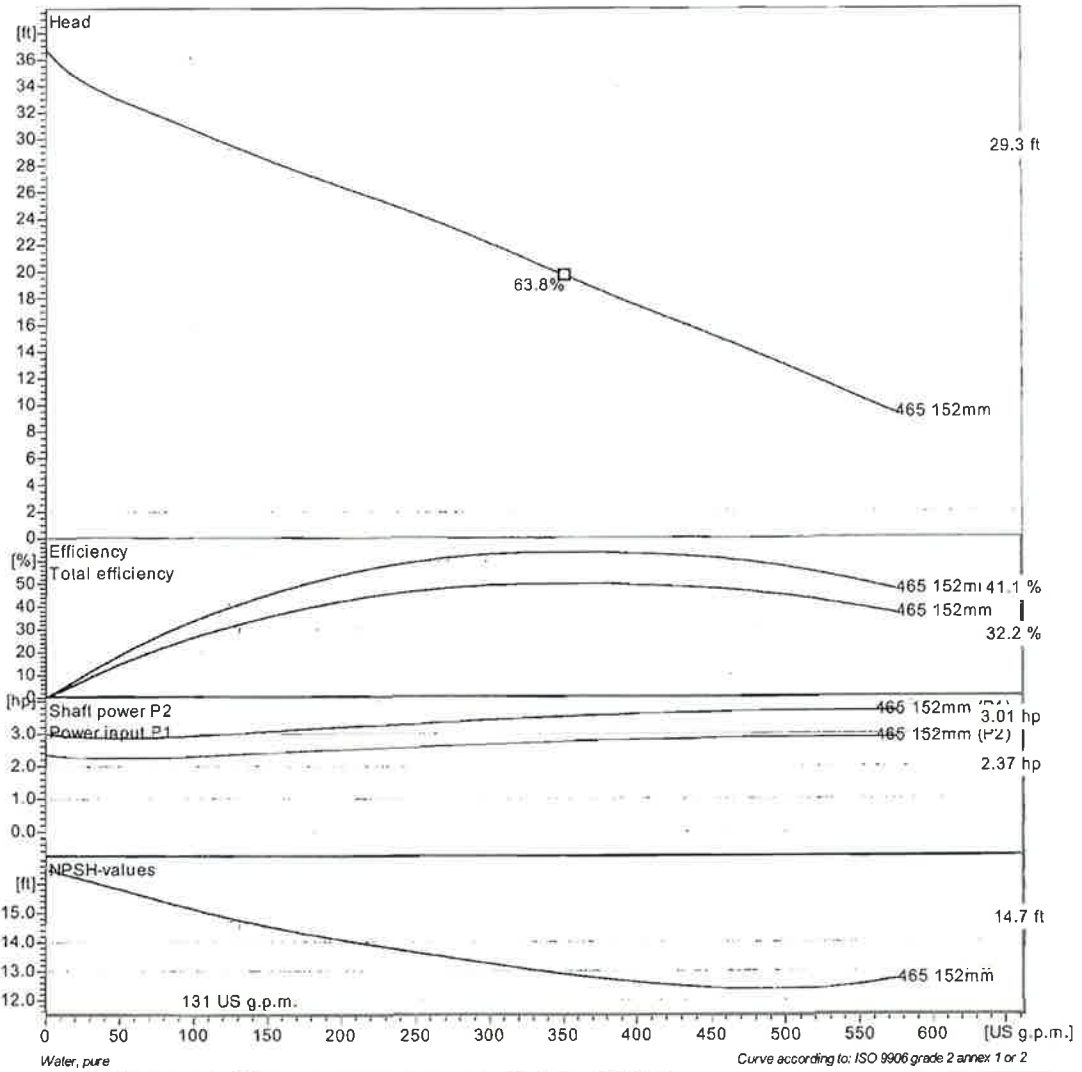
Pump

Discharge Flange Diameter 3 1/8 inch
Suction Flange Diameter 80 mm
Impeller diameter 6"
Number of blades 2

Motor

Motor # N3085.092 15-10-4AL-W 3hp
Stator variant 61
Frequency 60 Hz
Rated voltage 460 V
Number of poles 4
Phases 3~
Rated power 3 hp
Rated current 4.5 A
Starting current 25 A
Rated speed 1705 rpm

Power factor
1/1 Load 0.81
3/4 Load 0.74
1/2 Load 0.62
Efficiency
1/1 Load 77.5 %
3/4 Load 78.0 %
1/2 Load 76.0 %



Duty point		Guarantee	
Flow	Head	HI:2000	Grade
110 US g.p.m.	28 ft	No	Level A

Project
Hawaii Leachate

Project ID
2014 AECOM

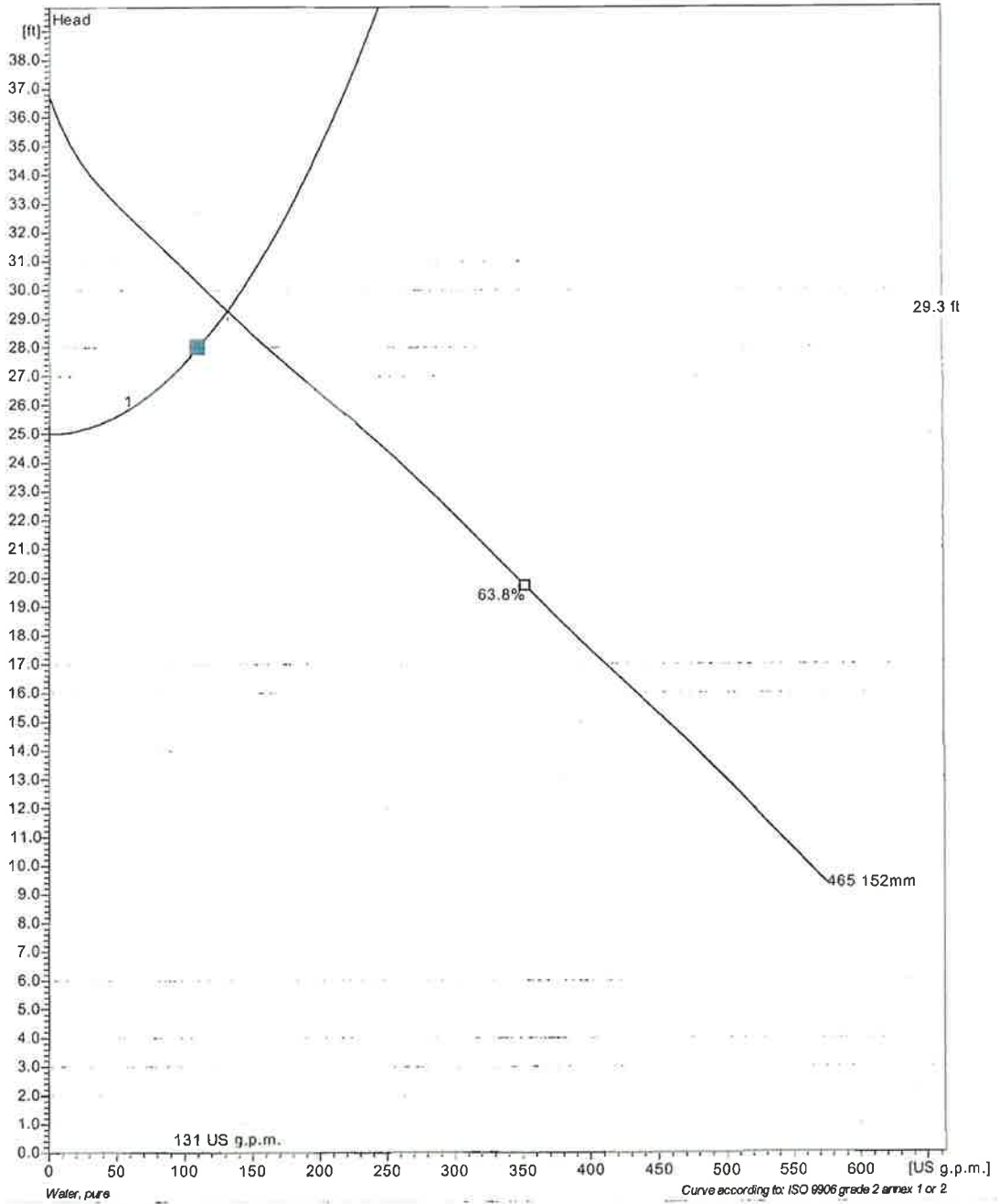
Created by
JAMES JOHNSON

Created on
2014-05-19

Last update
2014-05-19



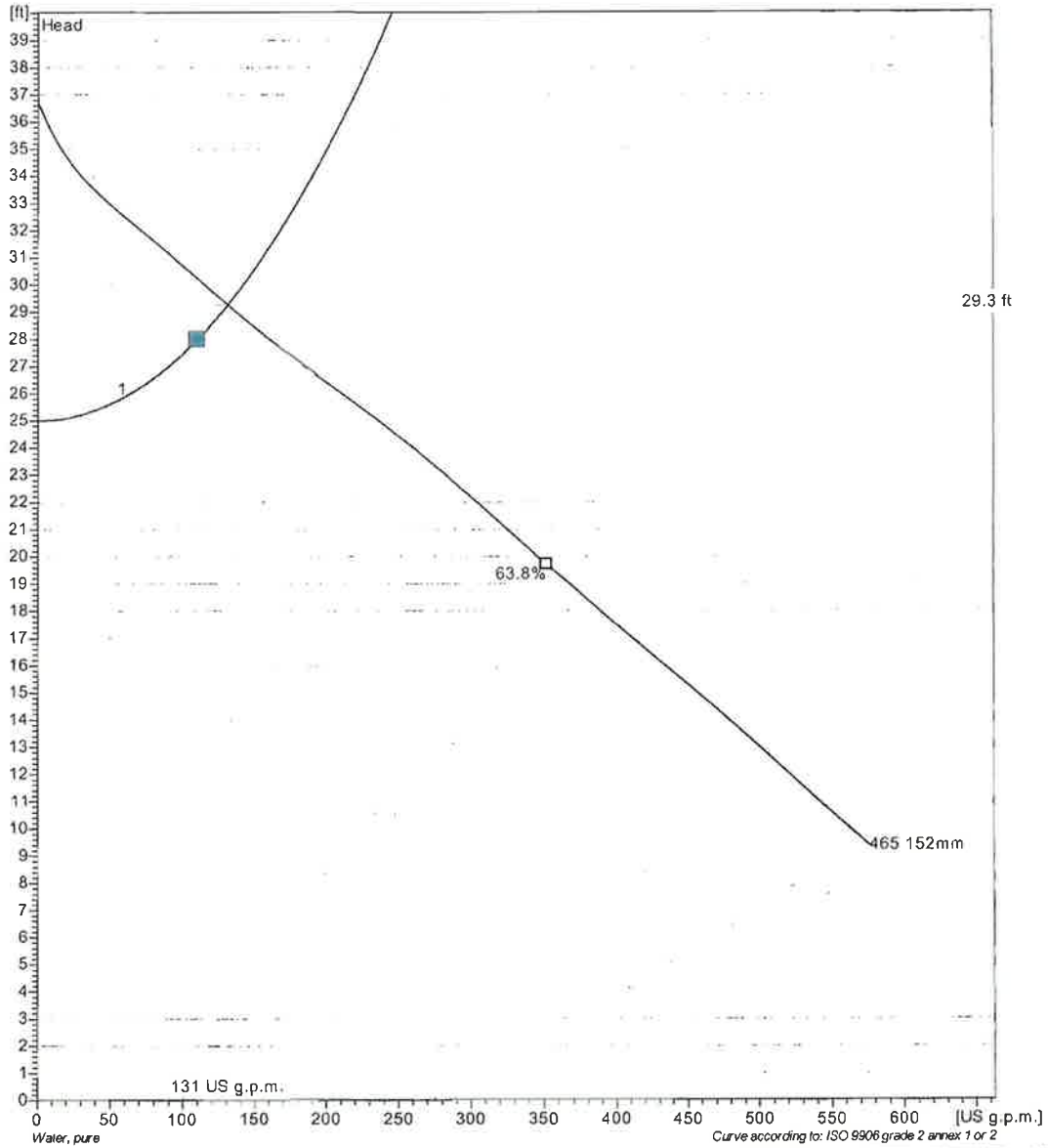
NP 3085 MT 3~ 465
Duty Analysis



Pumps running /System	Individual pump			Total			Hyd. eff.	Specific energy	NPSH _{re}
	Flow	Head	Shaft power	Flow	Head	Shaft power			
1	131 US g.p.m.	29.3 ft	2.37 hp	131 US g.p.m.	29.3 ft	2.37 hp	41.1 %	285 kWh/US MG	14.7 ft

Project	Project ID	Created by	Created on	Last update
Hawaii Leachate	2014 AECOM	JAMES JOHNSON	2014-05-18	2014-05-19

NP 3085 MT 3~ 465
VFD Analysis



Pumps running /System	Individual pump				Total				Specific energy	NPSHr
	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hyd. eff.		
1	60 Hz	131 US g.p.m.	29.3 ft	2.37 hp	131 US g.p.m.	29.3 ft	2.37 hp	41.1 %	285 kWh/US MG	14.7 ft
1	55 Hz	65.5 US g.p.m.	26.1 ft	1.66 hp	65.5 US g.p.m.	26.1 ft	1.66 hp	26 %	403 kWh/US MG	13.2 ft
1	50 Hz									
1	45 Hz									
1	40 Hz									

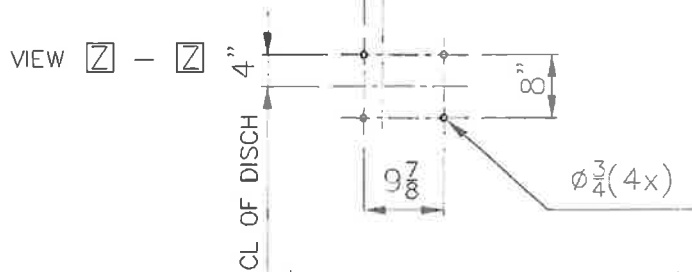
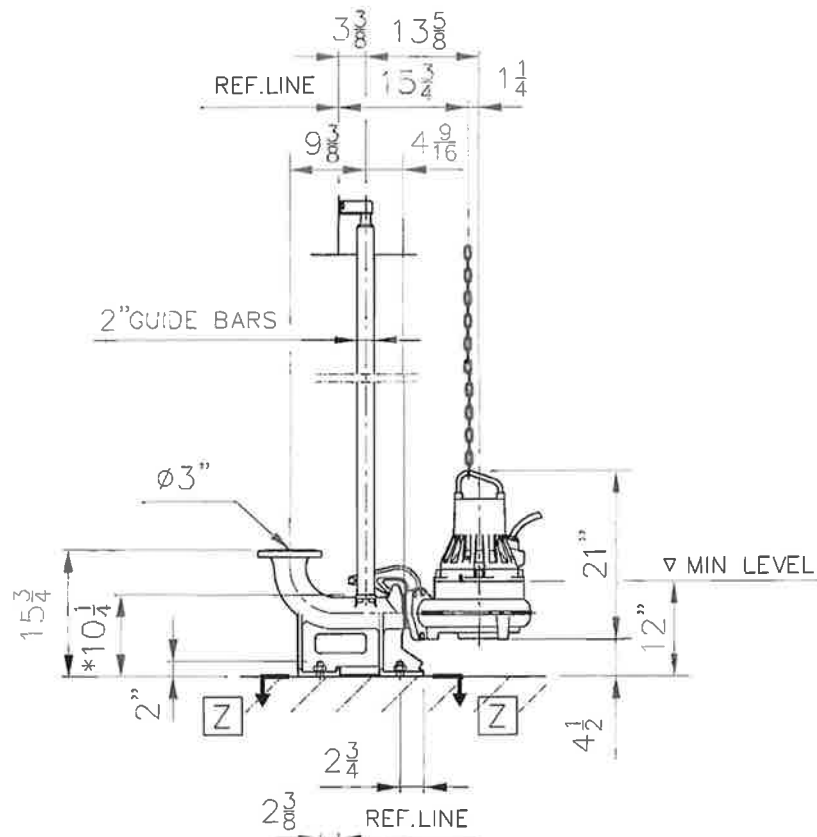
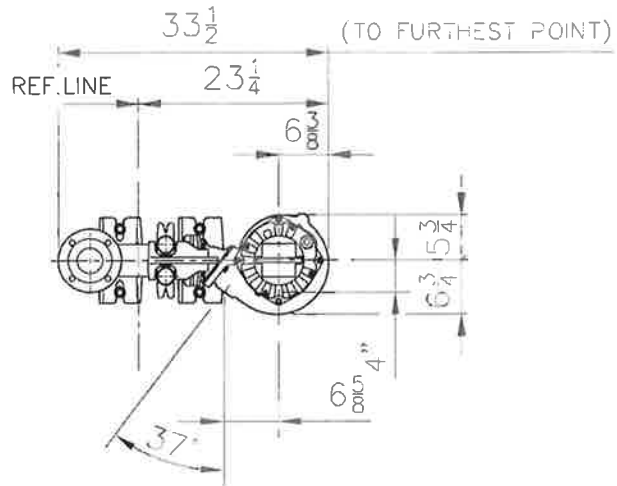
Project
Hawaii Leachate

Project ID
2014 AECOM

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JAMES JOHNSON

Created on
2014-05-19

Last update
2014-05-19



* DIMENSION TO ENDS OF GUIDE BARS

Weight (lbs)	
Pump	Disch
155	80

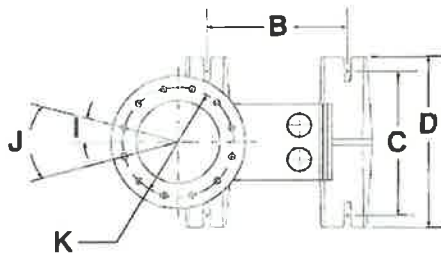
	Dimension Dimensional drwg NP 3085 MT ø 3"	Drawn by: NK Checked by: RB Date: 090515 Size: 1/4" x 3/8"	6601900 | 3
--	-----------------------------------------------------	---------------------------------------------------------------------	-------------

Standard CP/NP Discharge Connections (Cast Iron)

All dimensions (inches)

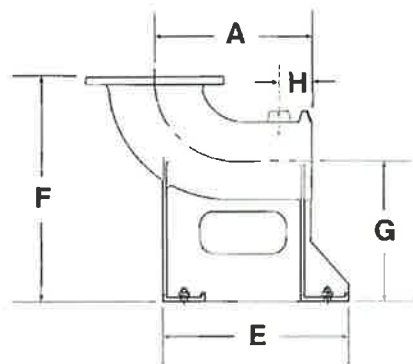
Pump Model	Part Number	Disch. Inlet	Disch. Outlet	A	B	C	D	E	F	G	H	I	J	K
2" - 3045, 3057, CP/FP-3068.	486 55 01	2"	2"-11 1/2 NPT	3 13/16	4	4 1/2	5 1/2	7 1/4	6 3/4	3 15/16	7/8	---	---	---
2 1/2" - DP/FP-3068.	493 17 06	2 1/2"	2 1/2"	11 5/8	7 7/8	4 3/4	7 7/8	11 7/16	9 7/8	6 1/2	4 9/16	45°	90° x 4	5 5/8
3" - 3045, 3057, CP-3068.	555 48 01	2"	3-8 NPT	6 3/4	5 1/2	4 1/8	5 1/2	10 3/4	6 3/4	3 15/16	7/8	---	---	---
3" - DP-3068, 3080, 3085, 3102, 3127, 3153.	444 68 05	3"	3"	14	9 7/8	8	10 5/8	15 3/8	15 3/4	7 7/8	4 9/16	45°	90° x 4	6
4" - 3080, 3085, 3102, 3127, 3153, 3171, 3202.	540 13 05	4"	4"	14 3/8	9 7/8	8	10 5/8	15 3/8	15 3/4	7 7/8	4 9/16	22.5°	45° x 8	7 1/2
6" - 3102, 3127(MT), 3153, 3171.	444 70 06	5 1/2"	6"	15 9/16	11	10	12 3/16	15 3/8	17 3/4	9 7/8	4 9/16	22.5°	45° x 8	9 1/2
6" - 3153, 3171, 3202.	602 33 06	5 1/2"	6"	15 9/16	11	10	12 3/16	15 15/16	17 3/4	9 7/8	4 9/16	22.5°	45° x 8	9 7/16
6" - R3231	388 25 06	6"	6"	20 11/16	19 3/4	15 3/4	19 3/4	23 5/8	15 3/4	7 7/8	6 7/8	22.5°	45° x 8	9 7/16
6" - 3127(LT), 3301, 3315.	604 56 06	6"	6"	15 9/16	11 1/8	10	12 3/16	15 15/16	18	10 1/8	4 9/16	22.5°	45° x 8	9 7/16

Note: Alternative discharge connections may be available, contact Flygt Application Engineering.



Caution:

Contact Flygt applications engineering department when making a pump/ discharge connection combination other than those paired in the chart above.



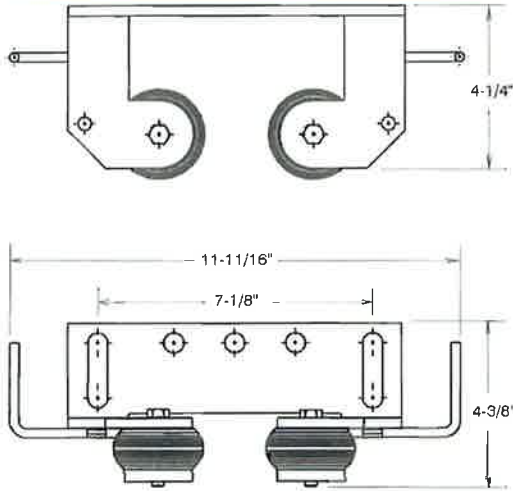
Note:

The discharge connection shown here is typical in appearance for most pumps.

Upper Guide Bar Bracket (for 3000, 5500 & 8000 Series Pumps)

2" UPPER GUIDE BAR BRACKET

613 68 00	Galvanized Steel
613 68 04	316 Stainless Steel



Note: use with 2" nominal guide bars

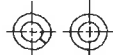
MOUNTING HARDWARE 14-59 00 00 (stainless steel)



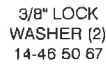
3/8" LATERAL NUT
14-46 37 05



HEX. HEAD BOLT (2),
3/8"-16 x 7/8"
14-46 20 25



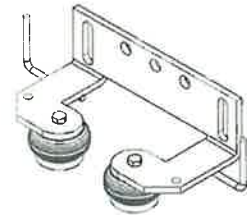
3/8" PLAIN WASHER (2)
14-46 50 07



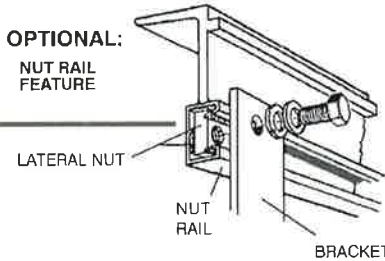
3/8" LOCK
WASHER (2)
14-46 50 67

Standard for the following pumps:

DP-3068
DP-3080
CP/DP/FP/NP-3085
CP/FP/NP-3102
CP/FP/NP-3127
NP/FP-3153
NP/FP-3171
HP-5520, 5530
DP-8050, 8053, 8056, 8058

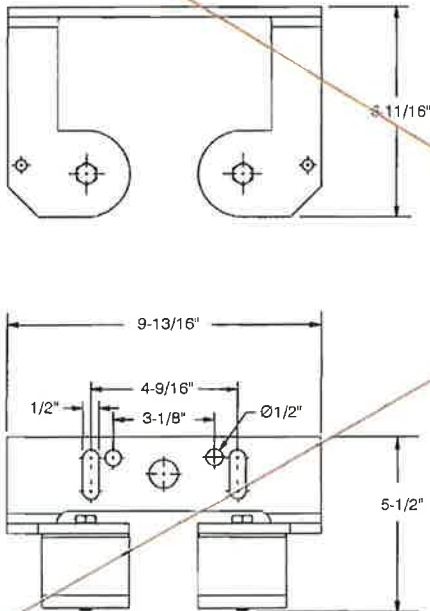


OPTIONAL:
NUT RAIL
FEATURE



3" UPPER GUIDE BAR BRACKET

661 54 00	Galvanized Steel
661 54 01	316 Stainless Steel



Note: use with 3" nominal guide bars

MOUNTING HARDWARE 14-59 00 00 (stainless steel)



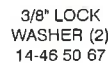
3/8" LATERAL NUT
14-46 37 05



HEX. HEAD BOLT (2),
3/8"-16 x 7/8"
14-46 20 25



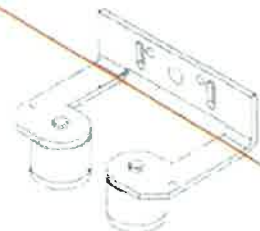
3/8" PLAIN WASHER (2)
14-46 50 07



3/8" LOCK
WASHER (2)
14-46 50 67

Standard for the following pumps:

NP/FP-3171 CP-3501
NP/FP-3202 CP-3531
CP/NP/RP-3231 CP-3602
CP-3240 CP-3800
NP-3301 HP-5570
CP/NP-3306
CP/NP-3312
NP-3315
CP-3351
CP/NP-3356
CP/NP-3400



MiniCAS

Description:

The Flygt MiniCAS modules are relays especially designed to simultaneously supervise pump motor thermal switches and Flygt pump leakage detectors FLS (Stator housing) and/or CLS (Water-in-oil) installed in each small to medium Flygt pump (Models 3085 through 3300) or mixer (Series 4600).

The MiniCAS is using only two wires for two or more sensors connected in series and actually includes two current sensitive mini-relays. The principle of operation is: a 12 VDC voltage is sent to the pump sensors and the current through the input circuit is fed through the current mini-relays. One mini-relay is an overcurrent relay, the other is an undercurrent relay.

- If a normally closed thermal switch, installed into the stator winding, opens due to overheating, or one of the connecting leads is broken, the undercurrent relay will de-energize, changing its contacts status. The MiniCAS will shut down the pump.

- If the Flygt leakage sensor (FLS or CLS) is activated, the current through the sensor will increase and the overcurrent relay will be energized, changing the status of its contacts. The MiniCAS will send a "Leakage" signal or shut down the pump, depending on the MiniCAS external connections.

Flygt MiniCAS relays are available in two interchangeable variants:

- MiniCAS II with external manual reset after an overtemperature tripping.
- MiniCAS II/FUS with a "Manual/Auto Reset" selector switch, which allows the pump to restart in "Auto Reset" position after the stator cools down and the thermal switches re-close. (See Technical Data next page).

MiniCAS II - Technical Data:

Operation Principle:	Current sensing
Environment:	0-50°C (32-123°F) max 90% RH
Supply Voltages:	20-30 VAC 50-60 Hz, or 120VAC 50-60 Hz
Relay Contact Rating:	8 Amps @ 250 VAC
Voltage to Sensor:	12 VDC ±5%
Values of Operation:	3 mA < I < 22 mA = OK conditions. I < 3 mA = High temp. (or broken wire). I > 22 mA = Leakage (or short circuit). (I = DC current measured by the MiniCAS II).
LED Indicators:	Yellow LED: for Supply Voltage presence indication. Red LED: for Overtemperature indication. Red LED: for Leakage indication.
Reset:	Manual - for Overtemperature by interrupting power supply or pushing external push-button (NO), connected between terminals 6 and 2 (not supplied with the unit). Automatic - for Leakage
Physical Size:	Width: 33mm (1.33") Height: 79mm (3.11") Depth: 75mm (2.95")
Part Number:	83 58 57 (MiniCAS II - 24V) 40-50 10 98 (MiniCAS II - 120V) 14-40 70 97 (Socket) - Optional

MiniCAS II/FUS-120 Technical Data

MiniCAS II/FUS-120 Technical Data:

Operation Principle:	Current sensing
Environment:	-20 to 65°C (-4 to 149°F)
Supply Voltage:	120 VAC 50-60 Hz $\pm 10\%$, 24 VAC $\pm 10\%$, 24 VDC $\pm 10\%$
Relay Contact Rating:	10 Amps @ 120 VAC
Voltage to Sensor:	12 VDC $\pm 10\%$
Values of Operation:	3.0 mA $< I < 22$ mA = OK conditions. $I \leq 3.0$ mA = High temp. $\pm 5\%$ (or interrupt). $I \geq 22.0$ mA = Leakage $\pm 5\%$ (or short circuit). (I = current measured by the MiniCAS II/FUS). Green LED On = Supply Voltage present. Green LED Off = No Supply Voltage present.

Leakage

Contact:	Form "C" 10 A @ 120 VAC (N.C. contact for interlocking)
Reset:	Automatic (N.O. contact for alarm)
LED Indicators:	Red LED On = Leakage indicated Red LED Off = No leakage indicated

Temperature

Contact:	Form "C" 10 A @ 120 VAC (N.C. contact for interlocking, N.O. contact for alarm)
Reset:	Manual - by interrupting the supply for 1 sec. or by setting the toggle switch in the "Manual" mode. Automatic - by setting the toggle switch in the "Auto Reset" mode.
LED Indicators:	Red LED On = Over-temperature indicated. Red LED Off = No Over-temperature indicated

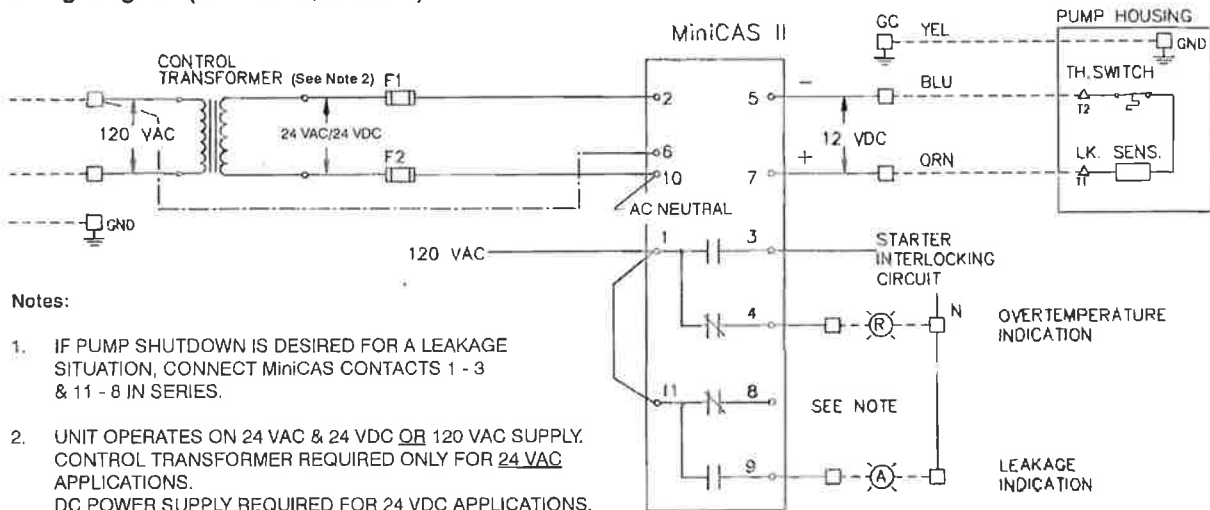
Physical Size:	Width: 2.125" Height: 4.250" Depth: 3.470" (+ socket depth)
----------------	-------------------------------------------------------------------

Part Number:	14-40 71 29 (MiniCAS II/FUS -120) 14-40 70 97 (Socket, 11-pin) - optional
--------------	------------------------------------------------------------------------------

Approvals:	UL - File E101681
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Wiring Diagram MiniCAS II/FUS-120

Wiring Diagram (MiniCAS II/FUS-120)



Mode of Operation

In normal conditions, when the MiniCAS - 120 is powered, the green LED is 'ON' and the relay contact status is as follows:

- Overtemperature relay contacts: 1-3 closed, 1-4 open;
- Leakage relay contacts: 11-8 closed, 11-9 open.

If an overtemperature condition occurs, the overtemperature Red LED will turn on, the unit will turn the pump off and lock it out.

Relay contact status:

- Overtemperature relay contacts: 1-3 open, 1-4 closed;
- Leakage relay contacts: 11-8 closed, 11-9 open.

The power to the pump can be restored after the stator temperature has decreased to a point of safe operation and the thermal switches are closed. When the overtemperature condition resets, the overtemperature Red LED will turn off. The MiniCAS-120 can be reset either manually or automatically.

Note:

When selecting the "Automatic Reset" mode, the control panel should include a latching type circuit for over-temperature alarm display. This circuit will retain the information that an overtemperature situation has occurred and the operator should check the possible cause for motor overtemperature.

If a leakage is detected, after a 5 sec. delay, an alarm will be activated or the pump will be shut down and the leakage Red LED will turn on. Relay contact status:

- Overtemperature relay contacts: 1-3 closed, 1-4 open;
- Leakage relay contacts: 11-8 open, 11-9 closed.

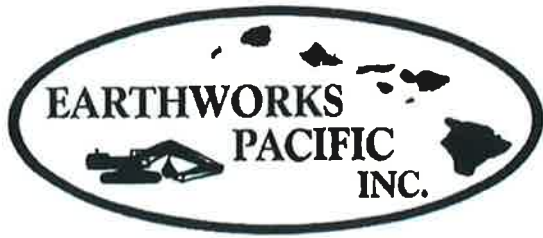
Once the leakage condition is removed, power is restored to the pump and the Leakage Red LED will turn off automatically, leakage relay contacts will be reset.

MiniCAS Specifications

Furnish and install one Flygt MiniCAS (Mini Control and Status) module to monitor the temperature and leakage detectors installed in each Flygt pump or mixer. The MiniCAS shall be capable of monitoring the thermal switches embedded in the stator end coils, the Flygt FLS (float switch type) water-in-stator-housing sensor, and the Flygt CLS (capacitive type) water-in-oil sensor. The MiniCAS shall monitor both the series connected thermal switches and leakage sensor(s) by outputting 12 VDC on a single two wire circuit. When both CLS and FLS leakage sensors are specified they shall be connected in parallel with each other and then in series with the thermal switches.

The MiniCAS circuitry shall operate on the current sensing principle whereby a change in temperature or leakage condition shall change the resistance of the associated sensor and thus alter the current in the sensing circuit. The MiniCAS shall contain two sets of form C dry contacts, one for overtemperature and one for leakage. The dry

contacts shall change status upon occurrence of an over temperature or leakage condition so as to indicate that condition to other control components in the pump control panel. In the case of an overtemperature, and in keeping with Flygt's warranty policy, the overtemperature dry contacts shall be used to trip the pump off line. The MiniCAS shall be designed to be plugged into a standard 11-pin circular socket. Detailed technical data and wiring connections shall be found in the MiniCAS Manual.



NO EXCEPTIONS NOTED
 MAKE CORRECTIONS NOTED
 REJECT REVISE AND RESUBMIT
 SUBMIT SPECIFIED ITEM
 SIGNED: BDM DATE: 6 APRIL 2015
 GEOSYNTEC CONSULTANTS

PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 37r1

EPI Job No:	176	Date:	April 6, 2015
To:	Waste Management of HI	Spec Section:	N/A
Attention:	Jesse Frey	Spec Para:	N/A
Address:	92-460 Farrington Hwy Kapolei, HI 98707	Drawing No:	Figures 1 & 2
Phone No:	808.250.0574	Subcontractor:	N/A
Fax No:	808.668.1366	Supplier:	Hawaii Engineering Services, Inc.
Respond by:		Manufacturer:	Flygt/Xylem

This submittal contains the following:

Description: Note: Revisions are shown in red, below.

- 1.) Flygt NP 3085.092/ Hard Iron 465 MT, 3" Discharge, Explosion Proof 3 HP, 460V 3 Ph w/ 50' Cable, Fluid Leakage Sensor (FLS), Drilled for Flush Valve (FV), **Internal & External Epoxy Coating (EPO), Zinc Anodes on Volute**
- 2.) Flygt Discharge Connection, 3" x 3" CI, PN 4446805
- 3.) 2" Upper Guide Bar Bracket
- 4.) Flygt MINI-CAS II relay for leakage sensor
- 5.) **E-mail string referring to the requested changes.**

Please note that the performance curve for this pump indicates that it will pump 120 GPM @ an estimated 30 ft. of head. Is this correct for this application?

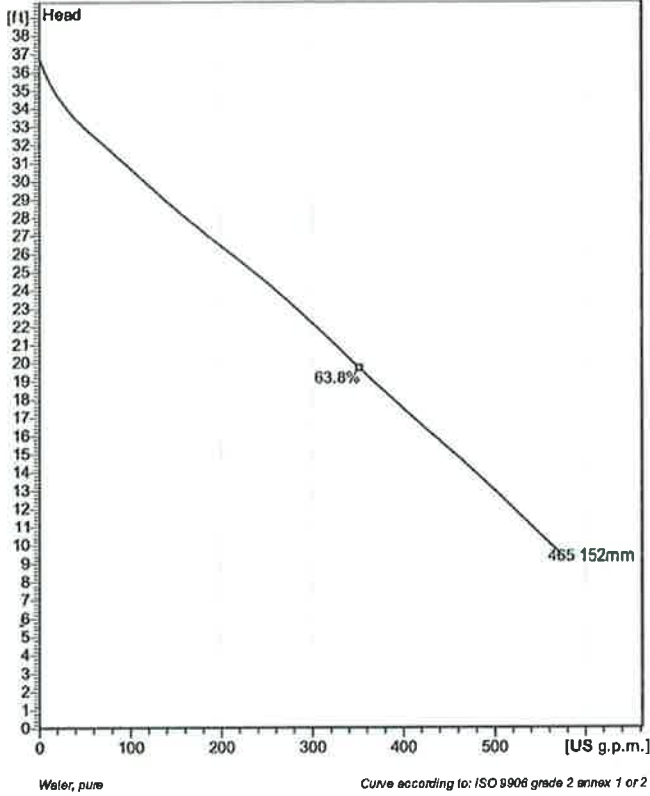
Submittal No:	37r1
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	Figures 1 & 2
Subcontractor:	N/A
Supplier:	Hawaii Engineering Services, Inc.
Manufacturer:	Flygt/Xylem
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>04/06/15</u>	

cc: File



NP 3085 MT 3~ 465

Technical specification



Note: Picture might not correspond to the current configuration.

General

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

Pump

Impeller material
Discharge Flange Diameter
Suction Flange Diameter
Impeller diameter
Number of blades

Hard-Iron™
3 1/8 inch
80 mm
152 mm
2

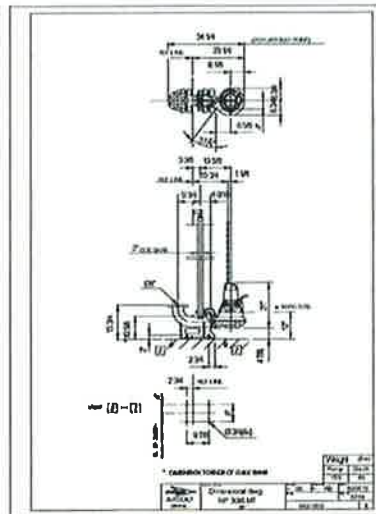
Motor

Motor # N3085.092 15-10-4AL-W 3hp ✓
Stator variant 61
Frequency 60 Hz ✓
Rated voltage 460 V ✓
Number of poles 4 ✓
Phases 3~ ✓
Rated power 3 hp ✓
Rated current 4.5 A ✓
Starting current 25 A ✓
Rated speed 1705 rpm ✓
Power factor
1/1 Load 0.81
3/4 Load 0.74
1/2 Load 0.62
Efficiency
1/1 Load 77.5 %
3/4 Load 78.0 %
1/2 Load 76.0 %

Configuration

Internal & External Epoxy Coating (EPO)
Zinc Anodes on Volute

Installation: P - Semi permanent, Wet





NP 3085 MT 3~ 465

Performance curve

Pump

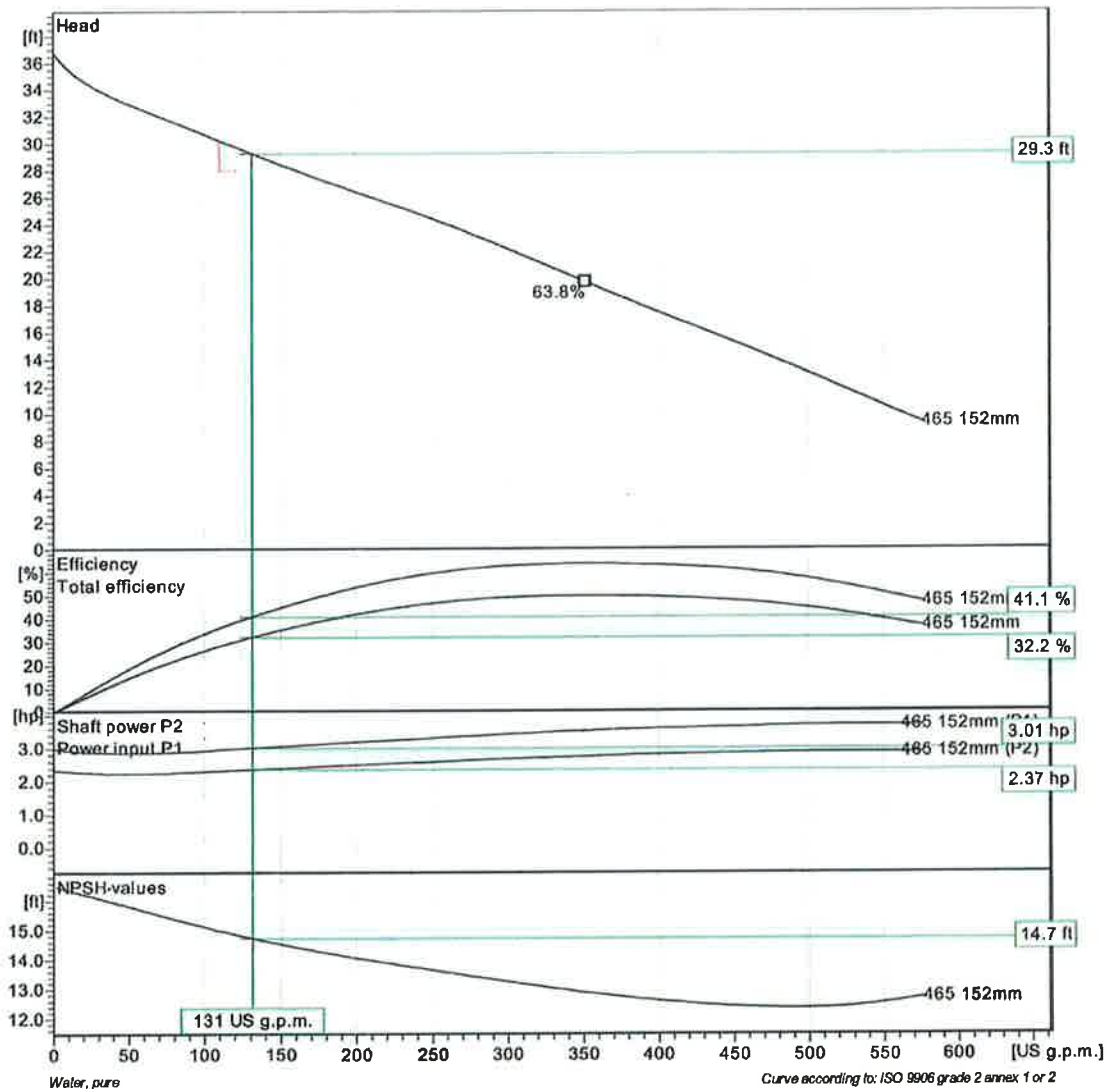
Discharge Flange Diameter 3 1/8 inch
Suction Flange Diameter 80 mm
Impeller diameter 6"
Number of blades 2

Motor

Motor # N3085.092 15-10-4AL-W 3hp
Stator variant 61
Frequency 60 Hz
Rated voltage 460 V
Number of poles 4
Phases 3~
Rated power 3 hp
Rated current 4.5 A
Starting current 25 A
Rated speed 1705 rpm

Power factor
1/1 Load 0.81
3/4 Load 0.74
1/2 Load 0.62

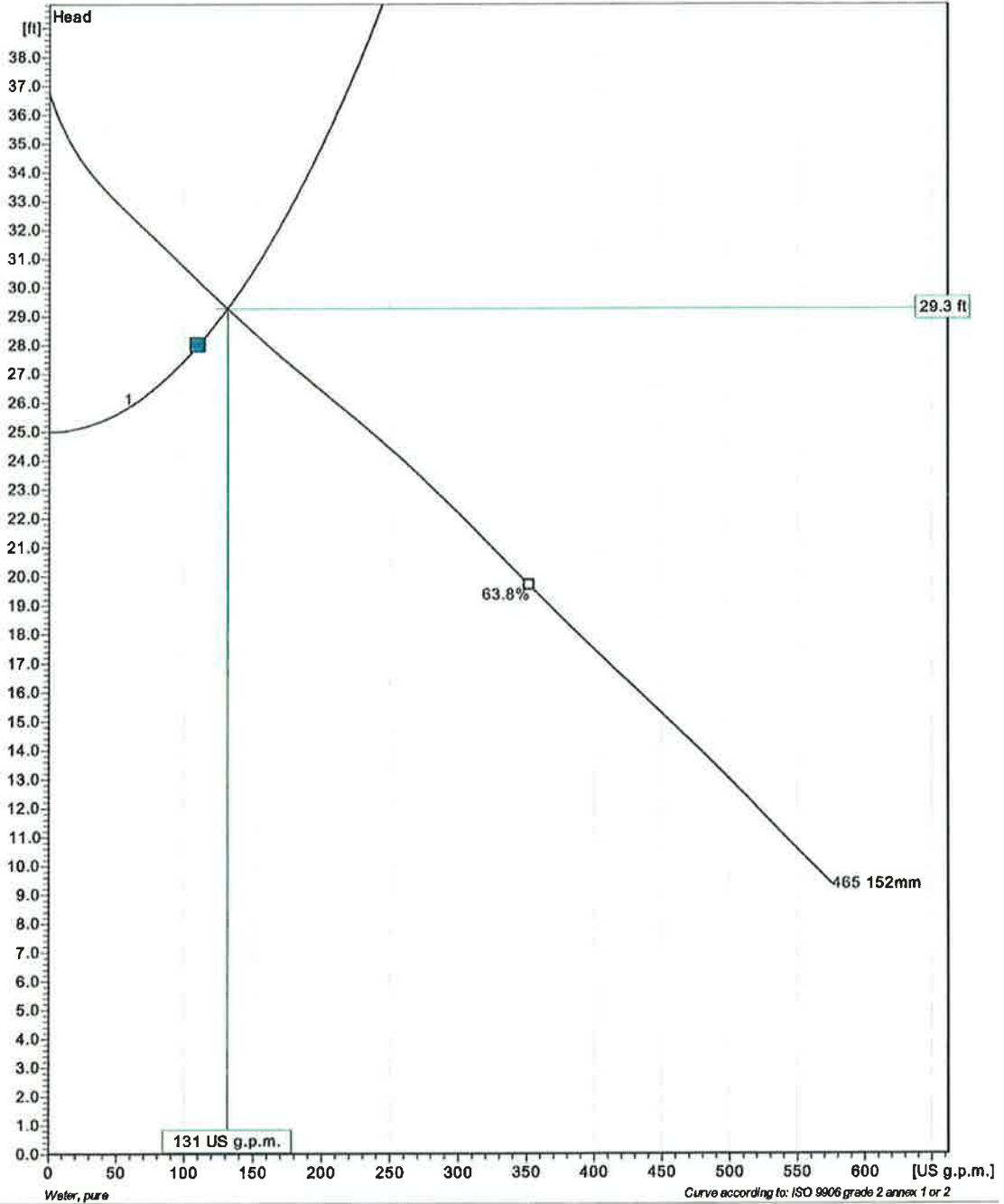
Efficiency
1/1 Load 77.5 %
3/4 Load 78.0 %
1/2 Load 76.0 %



Duty point	Guarantee		
Flow	Head	HI:2000	Grade
110 US g.p.m.	28 ft	No	Level A

Project	Project ID	Created by	Created on	Last update
Hawaii Leachate	2014 AECOM	JAMES JOHNSON	2014-05-19	2014-05-19

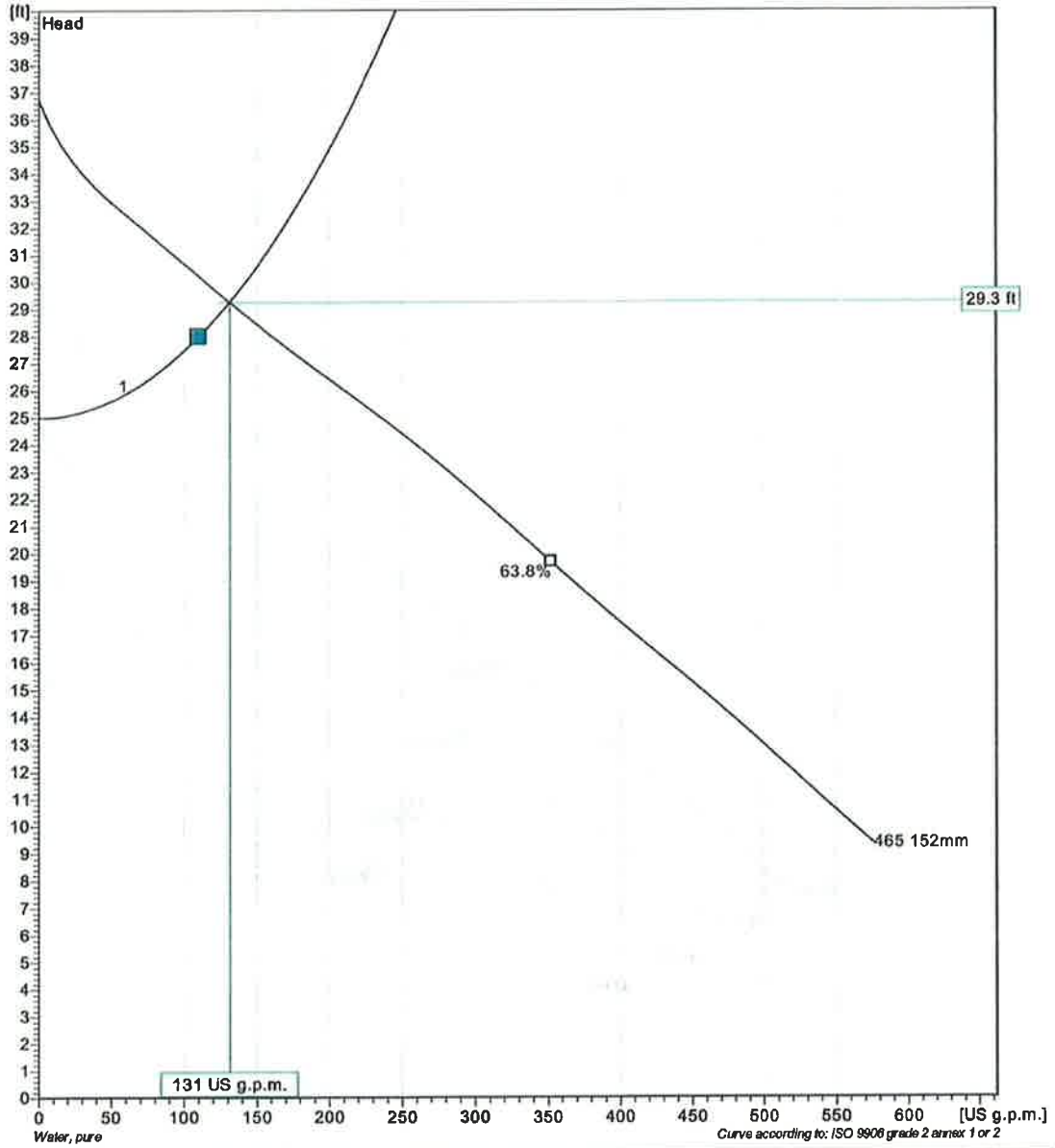
NP 3085 MT 3~ 465
Duty Analysis



Pumps running /System	Individual pump			Total					
	Flow	Head	Shaft power	Flow	Head	Shaft power	Hyd eff.	Specific energy	NPSHre
1	131 US g.p.m.	29.3 ft	2.37 hp	131 US g.p.m.	29.3 ft	2.37 hp	41.1 %	285 kWh/US MG	14.7 ft

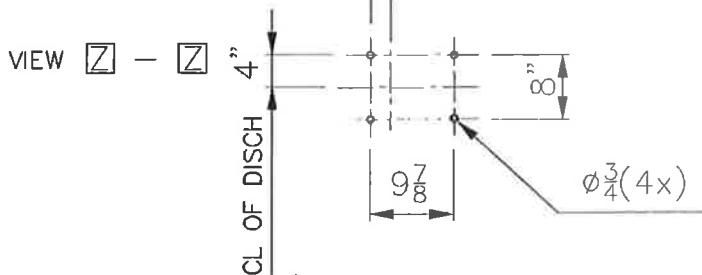
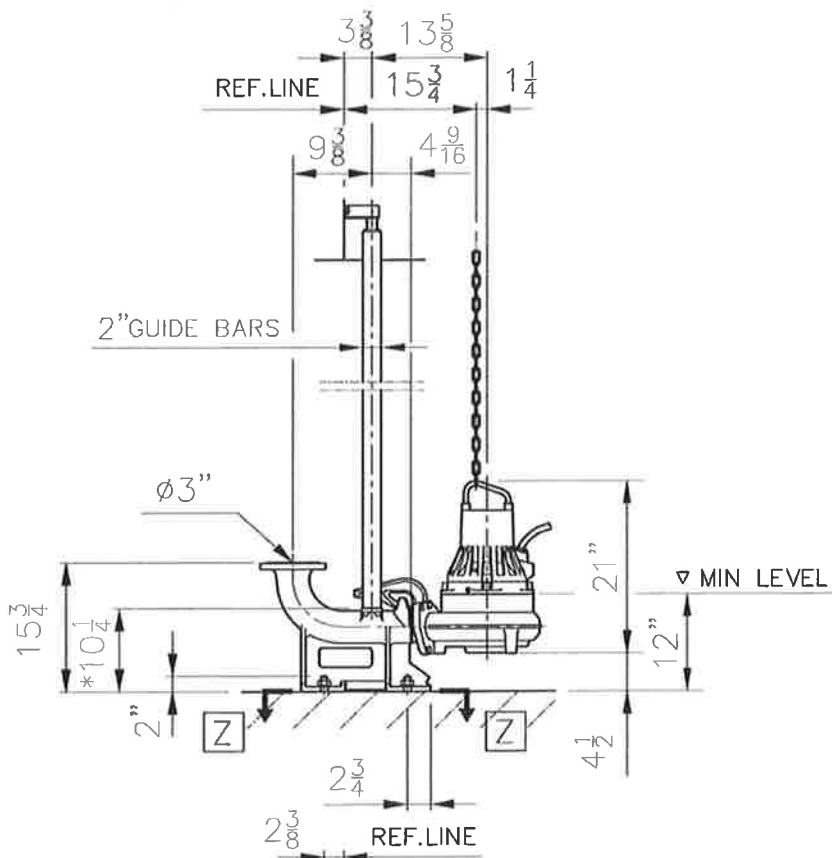
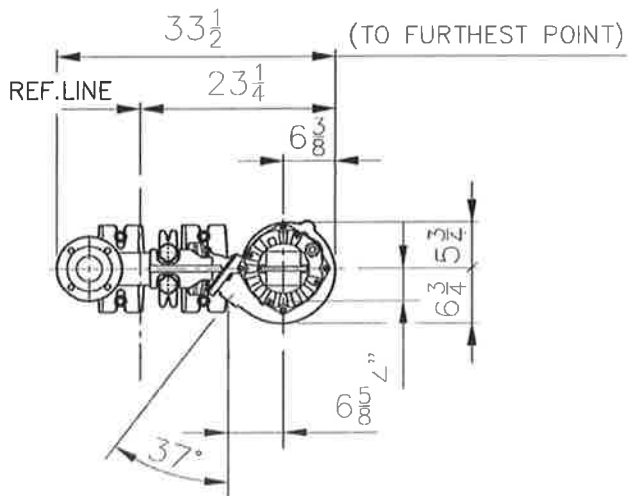
Project	Project ID	Created by	Created on	Last update
Hawaii Leachate	2014 AECOM	JAMES JOHNSON	2014-05-19	2014-05-19

NP 3085 MT 3~ 465
VFD Analysis



Pumps running /System	Individual pump				Total				Specific energy	NPSH _{re}
	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hyd. eff.		
1	60 Hz	131 US g.p.m.	29.3 ft	2.37 hp	131 US g.p.m.	29.3 ft	2.37 hp	41.1 %	285 kWh/US MG	14.7 ft
1	55 Hz	65.5 US g.p.m.	26.1 ft	1.66 hp	65.5 US g.p.m.	26.1 ft	1.66 hp	26 %	403 kWh/US MG	13.2 ft
1	50 Hz									
1	45 Hz									
1	40 Hz									

Project Hawaii Leachate	Project ID 2014 AECOM	Created by JAMES JOHNSON	Created on 2014-05-19	Last update 2014-05-19
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* DIMENSION TO ENDS OF GUIDE BARS

Weight (lbs)	
Pump	Disch
155	80

AUTOCAD DRAWING

Dimensional drwg
NP 3085 MT
Ø3"

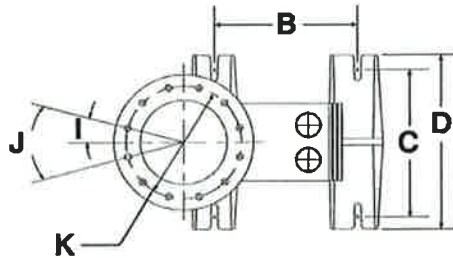
Drawn by NK	Checked by RB	Date 090515
Scale		Reg no 5399
6601900		3

Standard CP/NP Discharge Connections (Cast Iron)

All dimensions (inches)

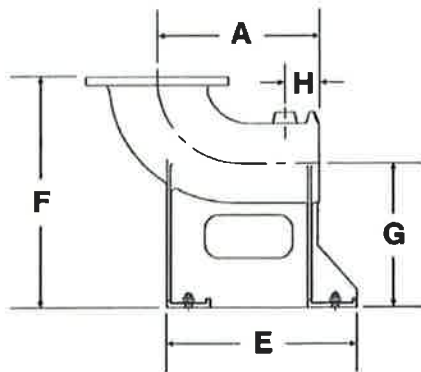
Pump Model	Part Number	Disch. Inlet	Disch. Outlet	A	B	C	D	E	F	G	H	I	J	K
2" - 3045, 3057, CP/FP-3068.	486 55 01	2"	2"-11 1/2 NPT	3 13/16	4	4 1/2	5 1/2	7 1/4	6 3/4	3 15/16	7/8	---	---	---
2 1/2" - DP/FP-3068.	493 17 06	2 1/2"	2 1/2"	11 5/8	7 7/8	4 3/4	7 7/8	11 7/16	9 7/8	6 1/2	4 9/16	45°	90° x 4	5 5/8
3" - 3045, 3057, CP-3068.	555 48 01	2"	3-8 NPT	6 3/4	5 1/2	4 1/8	5 1/2	10 3/4	6 3/4	3 15/16	7/8	---	---	---
3" - DP-3068, 3080, 3085, 3102, 3127, 3153.	444 68 05	3"	3"	14	9 7/8	8	10 5/8	15 3/8	15 3/4	7 7/8	4 9/16	45°	90° x 4	6
4" - 3080, 3085, 3102, 3127, 3153, 3171, 3202.	540 13 05	4"	4"	14 3/8	9 7/8	8	10 5/8	15 3/8	15 3/4	7 7/8	4 9/16	22.5°	45° x 8	7 1/2
6" - 3102, 3127(MT), 3153, 3171.	444 70 08	5 1/2"	6"	15 9/16	11	10	12 3/16	15 3/8	17 3/4	9 7/8	4 9/16	22.5°	45° x 8	9 1/2
6" - 3153, 3171, 3202.	602 33 06	5 1/2"	6"	15 9/16	11	10	12 3/16	15 15/16	17 3/4	9 7/8	4 9/16	22.5°	45° x 8	9 7/16
6" - R3231	388 25 06	6"	6"	20 11/16	19 3/4	15 3/4	19 3/4	23 5/8	15 3/4	7 7/8	6 7/8	22.5°	45° x 8	9 7/16
6" - 3127(LT), 3301, 3315.	604 56 06	6"	6"	15 9/16	11 1/8	10	12 3/16	15 15/16	18	10 1/8	4 9/16	22.5°	45° x 8	9 7/16

Note: Alternative discharge connections may be available, contact Flygt Application Engineering.



Caution:

Contact Flygt applications engineering department when making a pump/discharge connection combination other than those paired in the chart above.



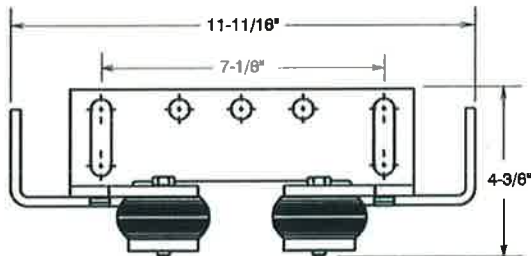
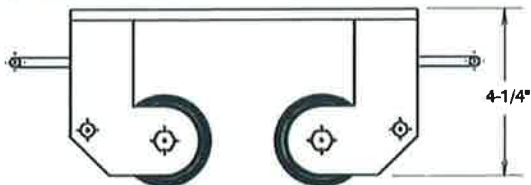
Note:

The discharge connection shown here is typical in appearance for most pumps.

Upper Guide Bar Bracket (for 3000, 5500 & 8000 Series Pumps)

2" UPPER GUIDE BAR BRACKET

613 68 00	Galvanized Steel
613 68 04	316 Stainless Steel



Note: use with 2" nominal guide bars

MOUNTING HARDWARE 14-59 00 00 (stainless steel)



3/8"-16 LATERAL NUT
14-46 37 05



HEX. HEAD BOLT (2),
3/8"-16 x 7/8"
14-46 20 25



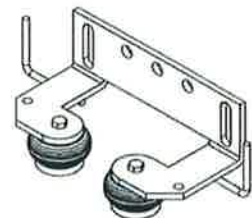
3/8" PLAIN WASHER (2)
14-46 50 07



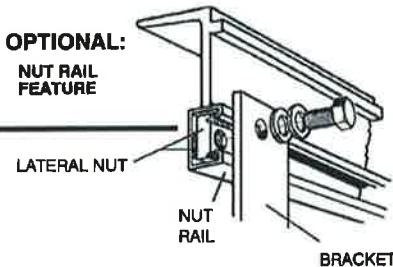
3/8" LOCK
WASHER (2)
14-46 50 67

Standard for the following pumps:

- DP-3068
- DP-3080
- CP/DP/FP/NP-3085
- CP/FP/NP-3102
- CP/FP/NP-3127
- NP/FP-3153
- NP/FP-3171
- HP-5520, 5530
- DP-8050, 8053, 8056, 8058

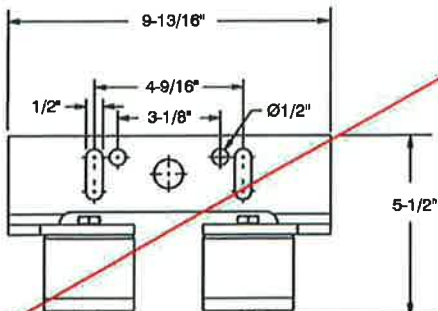
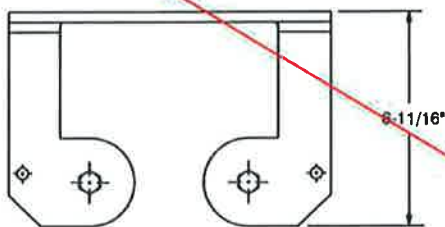


OPTIONAL:
NUT RAIL
FEATURE



3" UPPER GUIDE BAR BRACKET

661 54 00	Galvanized Steel
661 54 01	316 Stainless Steel



Note: use with 3" nominal guide bars

MOUNTING HARDWARE 14-59 00 00 (stainless steel)



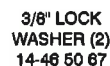
3/8"-16 LATERAL NUT
14-46 37 05



HEX. HEAD BOLT (2),
3/8"-16 x 7/8"
14-46 20 25



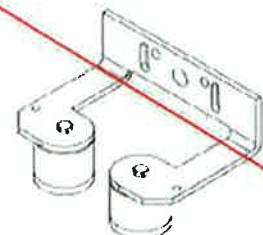
3/8" PLAIN WASHER (2)
14-46 50 07



3/8" LOCK
WASHER (2)
14-46 50 67

Standard for the following pumps:

- NP/FP-3171
- NP/FP-3202
- CP/NP/RP-3231
- CP-3240
- NP-3301
- CP/NP-3306
- CP/NP-3312
- NP-3315
- CP-3351
- CP/NP-3356
- CP/NP-3400
- CP-3501
- CP-3531
- CP-3602
- CP-3800
- HP-5570



MiniCAS

Description:

The Flygt MiniCAS modules are relays especially designed to simultaneously supervise pump motor thermal switches and Flygt pump leakage detectors FLS (Stator housing) and/or CLS (Water-in-oil) installed in each small to medium Flygt pump (Models 3085 through 3300) or mixer (Series 4600).

The MiniCAS is using only two wires for two or more sensors connected in series and actually includes two current sensitive mini-relays. The principle of operation is: a 12 VDC voltage is sent to the pump sensors and the current through the input circuit is fed through the current mini-relays. One mini-relay is an overcurrent relay, the other is an undercurrent relay.

- If a normally closed thermal switch, installed into the stator winding, opens due to overheating, or one of the connecting leads is broken, the undercurrent relay will de-energize, changing its contacts status. The MiniCAS will shut down the pump.
- If the Flygt leakage sensor (FLS or CLS) is activated, the current through the sensor will increase and the overcurrent relay will be energized, changing the status of its contacts. The MiniCAS will send a "Leakage" signal or shut down the pump, depending on the MiniCAS external connections.

Flygt MiniCAS relays are available in two interchangeable variants:

- MiniCAS II with external manual reset after an overtemperature tripping.
- MiniCAS II/FUS with a "Manual/Auto Reset" selector switch, which allows the pump to restart in "Auto Reset" position after the stator cools down and the thermal switches re-close. (See Technical Data next page).

MiniCAS II - Technical Data:

Operation Principle:	Current sensing
Environment:	0-50°C (32-123°F) max 90% RH
Supply Voltages:	20-30 VAC 50-60 Hz, or 120VAC 50-60 Hz
Relay Contact Rating:	8 Amps @ 250 VAC
Voltage to Sensor:	12 VDC ±5%
Values of Operation:	3 mA < I < 22 mA = OK conditions. I < 3 mA = High temp. (or broken wire). I > 22 mA = Leakage (or short circuit). (I = DC current measured by the MiniCAS II).
LED Indicators:	Yellow LED: for Supply Voltage presence indication. Red LED: for Overtemperature indication. Red LED: for Leakage indication.
Reset:	Manual - for Overtemperature by interrupting power supply or pushing external push-button (NO), connected between terminals 6 and 2 (not supplied with the unit). Automatic - for Leakage
Physical Size:	Width: 33mm (1.33") Height: 79mm (3.11") Depth: 75mm (2.95")
Part Number:	83 58 57 (MiniCAS II - 24V) 40-50 10 98 (MiniCAS II - 120V) 14-40 70 97 (Socket) - optional

MiniCAS II/FUS-120 Technical Data

MiniCAS II/FUS-120 Technical Data:

Operation Principle: Current sensing

Environment: -20 to 65°C (-4 to 149°F)

Supply Voltage: 120 VAC 50-60 Hz $\pm 10\%$, 24 VAC $\pm 10\%$, 24 VDC $\pm 10\%$

Relay Contact Rating: 10 Amps @ 120 VAC

Voltage to Sensor: 12 VDC $\pm 10\%$

Values of Operation: 3.0 mA < I < 22 mA = OK conditions.
 I \leq 3.0 mA = High temp. $\pm 5\%$ (or interrupt).
 I \geq 22.0 mA = Leakage $\pm 5\%$ (or short circuit).
 (I = current measured by the MiniCAS II/FUS).

 Green LED On = Supply Voltage present.
 Green LED Off = No Supply Voltage present.

Leakage

Contact: Form "C" 10 A @ 120 VAC (N.C. contact for interlocking)

Reset: Automatic (N.O. contact for alarm)

LED Indicators: Red LED On = Leakage indicated
 Red LED Off = No leakage indicated

Temperature

Contact: Form "C" 10 A @ 120 VAC (N.C. contact for interlocking, N.O. contact for alarm)

Reset: Manual - by interrupting the supply for 1 sec. or by setting the toggle switch in the "Manual" mode.
 Automatic - by setting the toggle switch in the "Auto Reset" mode.

LED Indicators: Red LED On = Over-temperature indicated.
 Red LED Off = No Over-temperature indicated

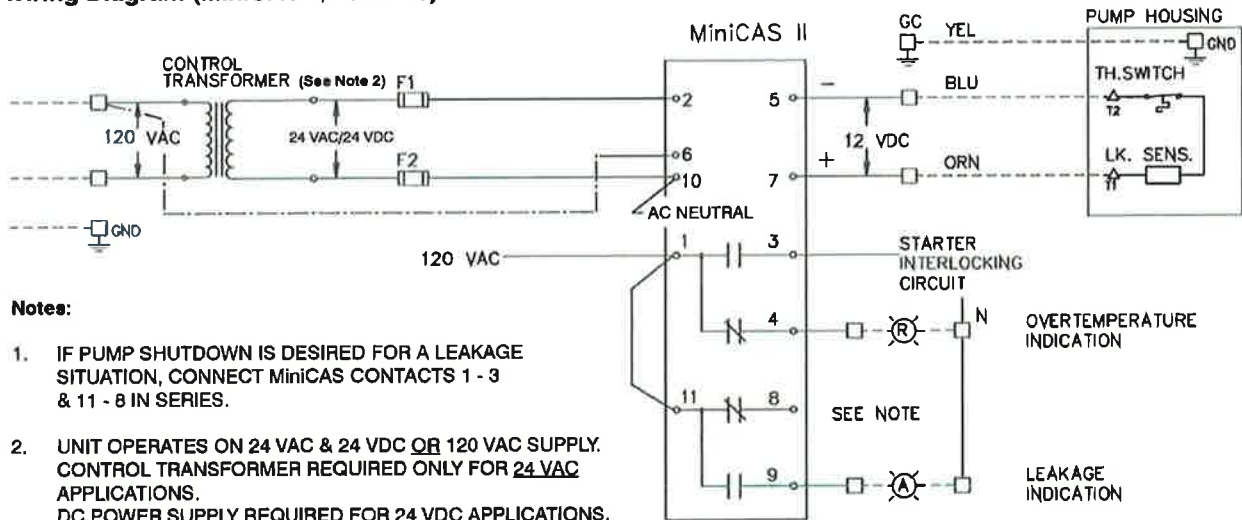
Physical Size: Width: 2.125"
 Height: 4.250"
 Depth: 3.470" (+ socket depth)

Part Number: 14-40 71 29 (MiniCAS II/FUS -120)
 14-40 70 97 (Socket, 11-pin) - optional

Approvals: UL - File E101681

Wiring Diagram MiniCAS II/FUS-120

Wiring Diagram (MiniCAS II/FUS-120)



Notes:

1. IF PUMP SHUTDOWN IS DESIRED FOR A LEAKAGE SITUATION, CONNECT MiniCAS CONTACTS 1 - 3 & 11 - 8 IN SERIES.
2. UNIT OPERATES ON 24 VAC & 24 VDC OR 120 VAC SUPPLY. CONTROL TRANSFORMER REQUIRED ONLY FOR 24 VAC APPLICATIONS. DC POWER SUPPLY REQUIRED FOR 24 VDC APPLICATIONS.

Mode of Operation

In normal conditions, when the MiniCAS - 120 is powered, the green LED is 'ON' and the relay contact status is as follows:

- Overtemperature relay contacts: 1-3 closed, 1-4 open;
- Leakage relay contacts: 11-8 closed, 11-9 open.

If an overtemperature condition occurs, the overtemperature Red LED will turn on, the unit will turn the pump off and lock it out.

Relay contact status:

- Overtemperature relay contacts: 1-3 open, 1-4 closed;
- Leakage relay contacts: 11-8 closed, 11-9 open.

The power to the pump can be restored after the stator temperature has decreased to a point of safe operation and the thermal switches are closed. When the overtemperature condition resets, the overtemperature Red LED will turn off. The MiniCAS-120 can be reset either manually or automatically.

Note:

When selecting the "Automatic Reset" mode, the control panel should include a latching type circuit for over-temperature alarm display. This circuit will retain the information that an overtemperature situation has occurred and the operator should check the possible cause for motor overtemperature.

If a leakage is detected, after a 5 sec. delay, an alarm will be activated or the pump will be shut down and the leakage Red LED will turn on. Relay contact status:

- Overtemperature relay contacts: 1-3 closed, 1-4 open;
- Leakage relay contacts: 11-8 open, 11-9 closed.

Once the leakage condition is removed, power is restored to the pump and the Leakage Red LED will turn off automatically, leakage relay contacts will be reset.

MiniCAS Specifications

Furnish and install one Flygt MiniCAS (Mini Control and Status) module to monitor the temperature and leakage detectors installed in each Flygt pump or mixer. The MiniCAS shall be capable of monitoring the thermal switches embedded in the stator end coils, the Flygt FLS (float switch type) water-in-stator-housing sensor, and the Flygt CLS (capacitive type) water-in-oil sensor. The MiniCAS shall monitor both the series connected thermal switches and leakage sensor(s) by outputting 12 VDC on a single two wire circuit. When both CLS and FLS leakage sensors are specified they shall be connected in parallel with each other and then in series with the thermal switches.

The MiniCAS circuitry shall operate on the current sensing principle whereby a change in temperature or leakage condition shall change the resistance of the associated sensor and thus alter the current in the sensing circuit. The MiniCAS shall contain two sets of form C dry contacts, one for overtemperature and one for leakage. The dry

contacts shall change status upon occurrence of an over temperature or leakage condition so as to indicate that condition to other control components in the pump control panel. In the case of an overtemperature, and in keeping with Flygt's warranty policy, the overtemperature dry contacts shall be used to trip the pump off line. The MiniCAS shall be designed to be plugged into a standard 11-pin circular socket. Detailed technical data and wiring connections shall be found in the MiniCAS Manual.

From: [Cioffi, Frank](#)
To: [Bryan Davidson](#); [Frey, Jesse](#)
Cc: [Donald Fujimoto](#); [Troy Tanigawa](#); [Wright, Nancy](#); [Pirrung, Don](#); MMinch@Geosyntec.com
Subject: RE: Kekaha Landfill - submittal #37 - REVISED
Date: Thursday, March 12, 2015 10:25:44 AM

Hi Bryan,

Yes, this pump is the correct pump for the application. The head condition is approximately 30 feet. The flow rate at 30 feet of head is just where we want it to be. We will not be pumping 350 gpm because we do not have 20 feet of head.

It is approved with the stipulation that the pump we originally specified (NP3085.092) be used, along with appropriate piping as noted. The pump needs to be explosion proof and epoxy coated inside and out.

Mahalo,

Frank Cioffi, P.E.
Senior Engineer
Environment, West Region, Pacific District
D 808.356.5380 M. 808.223.7168
frank.cioffi@aecom.com

AECOM
Bishop Square, American Savings Bank Tower
1001 Bishop Street, Suite 1600
Honolulu, HI 96813
T 808.523.8874 F 808.523.8950
www.aecom.com

From: Bryan Davidson [<mailto:bryan@earthworkspacific.com>]
Sent: Thursday, March 12, 2015 9:48 AM
To: Cioffi, Frank; Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa; Wright, Nancy; Pirrung, Don; MMinch@Geosyntec.com
Subject: RE: Kekaha Landfill - submittal #37 - REVISED

Frank-

Does that mean that Submittal #37 is approved by AECOM, taking into consideration our original comments, along with Geosyntec's comments?

Thanks,

Bryan

From: Cioffi, Frank [<mailto:Frank.Cioffi@aecom.com>]
Sent: Thursday, March 12, 2015 9:20 AM
To: Bryan Davidson; Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa; Wright, Nancy; Pirrung, Don
Subject: RE: Kekaha Landfill - submittal #37 - REVISED

Bryan,

Thanks – we agree. There is no reason that we need to go with the 5hp pump. The pump we originally

specified (NP3085.092) will meet the needs of the system. So, the original pump and piping is fine. It needs to be explosion proof and epoxy coated inside and out.

Mahalo,

Frank Cioffi, P.E.
Senior Engineer
Environment, West Region, Pacific District
D 808.356.5380 M. 808.223.7168
frank.cioffi@aecom.com

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www.aecom.com

From: Bryan Davidson [<mailto:bryan@earthworkspacific.com>]
Sent: Wednesday, March 11, 2015 9:33 AM
To: Cioffi, Frank; Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa; Wright, Nancy; Pirrung, Don
Subject: RE: Kekaha Landfill - submittal #37

Frank-

In doing some quick research, the NP 3102.095 pump is higher horsepower (5HP vs 3 HP) and has an even greater pumping capacity than the NP3085.092 that you had specified on the plans. The discharge is also larger (4" vs. 3"), which would require changes to the piping configuration that you had drawn up. The flow rate will be approximately 400 GPM. My initial concern, and the reason for my comments on the original submittal, was that the 3085.092 pump was too large for the pumping requirements on this project. Please advise.

Thank-you,
Bryan

From: Cioffi, Frank [<mailto:Frank.Cioffi@aecom.com>]
Sent: Wednesday, March 11, 2015 9:00 AM
To: Bryan Davidson; Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa; Wright, Nancy; Pirrung, Don
Subject: RE: Kekaha Landfill - submittal #37

Hi Bryan, sorry for the delay.

AECOM recommends a Flygt NP3102.095/Hard Iron 465 MT, 4" Discharge, Explosion Proof 5HP, 460V 3Ph, 50FT Cable, Internal & External Epoxy Coating (EPO), **Zinc Anodes on Volute**, Fluid Leakage Sensor (FLS), Drilled for Flush Valve (FV), Guide Pin (GPH).

Mahalo,

Frank Cioffi, P.E.
Senior Engineer
Environment, West Region, Pacific District
D 808.356.5380 M. 808.223.7168
frank.cioffi@aecom.com

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1001 Bishop Street, Suite 1600
Honolulu, HI 96813
T 808.523.8874 F 808.523.8950
www.aecom.com

From: Bryan Davidson [<mailto:bryan@earthworkspacific.com>]
Sent: Tuesday, February 24, 2015 7:05 PM
To: Cioffi, Frank; Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa; Wright, Nancy; Pirrung, Don
Subject: RE: Kekaha Landfill - RFI #24

Frank-

Please see attached submittal #37 and provide AECOM's stamp of approval, and respond to the questions/comments/requests that were poised by Mike Minch at Geosyntec in his email, attached, and myself on the submittal cover sheet regarding pump capacity and pump material.

Please also see attached submittal #27 for the Motor Savers. Our submittal is for a different model than what was originally specified. This is because they are already on-site, as provided under a previous change order, and the intent was to incorporate the ones that we have installed for this new scope of work.

In general, I would like AECOM's review and approval of each of the submittals that were provide for this scope of work. This is the standard procedure for most projects, and is especially important on this one where there have been so many different issues. Please advise if this is not possible.

Thank-you,
Bryan

From: Cioffi, Frank [<mailto:Frank.Cioffi@aecom.com>]
Sent: Tuesday, February 24, 2015 3:03 PM
To: Frey, Jesse
Cc: Donald Fujimoto; Troy Tanigawa; Bryan Davidson; Wright, Nancy; Pirrung, Don
Subject: RE: Kekaha Landfill - RFI #24

Hi Jesse,

In accordance with the drawings we provided (attached), we recommend ordering:

SUBMERSIBLE XYLEM/FLYGT MODEL NP-3085.092



PH II Leachate Management System Modification, Kekaha Sanitary Landfill

SUBMITTAL NO: 38-R1

EPI Job No:	176	Date:	May 18, 2015
To:	Waste Management of HI	Spec Section:	N/A
Attention:	Jesse Frey	Spec Para:	N/A
Address:	92-460 Farrington Hwy Kapolei, HI 96707	Drawing No:	N/A
Phone No:	808.250.0574	Subcontractor:	EPG Companies
Fax No:	808.668.1366	Supplier:	EPG Companies
Respond by:		Manufacturer:	EPG Companies

This submittal contains the following:

Description: Responses to review comments and revised electrical drawings for the L950P Control Panels for Wetwells #1 & #2, incorporating comments received May 7, 2015, for review and approval.

- NO EXCEPTIONS NOTED
- MAKE CORRECTIONS NOTED
- REJECT REVISE AND RESUBMIT
- SUBMIT SPECIFIED ITEM

SIGNED: [Signature] DATE: 2 JUNE 2015
 GEOSYNTEC CONSULTANTS

Submittal No:	38-R1
Project Name:	PH II Leachate Management System Modification, Kekaha Sanitary Landfill
Project No.:	
Items Description	<input checked="" type="checkbox"/> Submittal Conforms to Specifications <input type="checkbox"/> Exceptions to Drawings & Specs as specifically noted
Spec Section:	N/A
Spec Para:	N/A
Drawing No:	N/A
Subcontractor:	EPG Companies
Supplier:	EPG Companies
Manufacturer:	EPG Companies
Contractor:	EARTHWORKS PACIFIC, INC.
"I certify that the items indicated in this submittal are those proposed to be incorporated into the Work. I further certify that the submitted items have been reviewed in detail and are correct and in strict compliance with the Contract Documents except as specifically indicated otherwise thereon." Signature <u>Bryan Davidson</u> Date <u>05/18/15</u>	

cc: File

Mike Minch

From: Mike Minch
Sent: Friday, May 29, 2015 8:43 AM
To: Bryan Davidson
Cc: Frey, Jesse; Chris Scott; Troy Tanigawa
Subject: Re: Kekaha Submittal #38 - Wiring Diagrams

Thank you Bryan,

Our electrical subcontractor DTN has reviewed this submittal and the revision addresses their previous comments adequately.

Please proceed.

I will issue the signed approval of this submittal to everyone on Monday.

With best regards,

Mike

On May 18, 2015, at 1:42 PM, Bryan Davidson <bryan@earthworkspacific.com> wrote:

All-

Please see attached resubmittal No. 38-R1, Panel Wiring diagrams, modified per comments received, for your review and approval.

Thank-you,
Bryan

From: Mike Minch [<mailto:MMinch@Geosyntec.com>]
Sent: Thursday, May 07, 2015 12:43 PM
To: Frey, Jesse
Cc: Bryan Davidson; Chris Scott
Subject: Kekaha Submittal #38 - Wiring Diagrams

Jesse,

Please find attached review comments on Submittal #38. As mentioned, we enlisted Diep Nguyen from DTN to help with this review. Some comments are minor. Most importantly through, a revision is needed to incorporate the new float switches requested by AECOM.

Please let me know if you have any questions.

Thanks,

Michael J. Minch, P.E.
Associate

<image002.jpg>

1111 Broadway, Sixth Floor
Oakland, California 94607
Phone: 510.285.2708
Mobile: 510.541.2126
Fax: 510.836.3036
www.geosyntec.com

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ew

This electronic mail message contains information that (a) is or may be LEGALLY PRIVILEGED, CONFIDENTIAL, PROPRIETARY IN NATURE, OR OTHERWISE PROTECTED BY LAW FROM DISCLOSURE, and (b) is intended only for the use of the Addressee(s) named herein. If you are not the intended recipient, an addressee, or the person responsible for delivering this to an addressee, you are hereby notified that reading, using, copying, or distributing any part of this message is strictly prohibited. If you have received this electronic mail message in error, please contact us immediately and take the steps necessary to delete the message completely from your computer system.

Comment Responses and Revised Panel Wiring Diagrams.pdf>

Bryan Davidson

From: Chris Riddle <criddle@epgco.com>
Sent: Monday, May 11, 2015 4:59 AM
To: Bryan Davidson
Subject: RE: Kekaha Submittal #38 - Wiring Diagrams

Bryan,

Here are my responses to the resubmittal comments. My responses are shown in red.

1. On sheet 1 of 12:

a. In the revision block on top of the page, letters “A”, “B” and “C” should be in triangle symbol to match with the designated changes. EPG will make this change on the drawing.

b. “460V AC” should be changed to “480V AC” to match with the original design documents and existing power system voltage. EPG will make this change on the drawing. Note that we use 460V since that is what is stamped on the motor. 480V and 460V are the same, one comes from the power company while the other is used by the motor manufacturers.

c. There should be a note to indicate the new overload heaters to be sized based on FLA (full load amp) of the new 3hp pump. The description at the top of the drawing shows the 3 HP and FLA for the new pump.

d. There should be a note to indicate that the existing MPD1 to be reprogrammed to protect the new pump’s motor based on its rated FLA. The reprogramming is described in the instructions that will be sent along with the drawings and new panel components. We do not include any programming notes on original panel schematics, and therefore do not feel that it is appropriate for this notation to be on the revised panel drawings. The drawings should only include the wiring and components within the panel.

2. On sheet 4 of 12:

a. There should be a note with a pointer on line 140 to indicate that the existing level controller i.e. contact M1 must be reprogrammed to start and stop the new pump based on new level set points. The reprogramming is described in the instructions that will be sent along with the drawings and new panel components.

3. On sheet 11 of 12:

a. “CAS1” should be replaced with “MINI CAS II” to match with the correct name of the module provided by the pump manufacturer. The CAS1 is an abbreviation call out, just like M1 is the call out for the level controller. The full name for the part is shown elsewhere in the drawing. These abbreviations are used as references in other locations on the drawings and for internal use on the Bill of Materials.

b. It appears that all devices shown on this drawing are new, and thus should have revision “C” attached to each device to be consistent. This panel has been modified previously. Not all devices shown on these drawings are new. All new devices will be marked with revision “C” for clarity.

4. It is EPG tradition to provide a layout of the inner door of the panel to show

each door mounted devices and nameplates. (See attached photo as an example). Because of the modifications and additions, there are new devices and unused existing devices being deleted. It is recommended that a new inner door layout with appropriate nameplates be submitted for review and approval. It will help avoid confusion to the Owner's Operators or Maintenance Staff. Most importantly, this inner door layout and the modified control schematic diagrams will become "as-builts" and will be part of the O&M Manual. **We do not provide a panel layout drawings for field modifications made to an existing panel. Components are to be added where space allows and final location is up to the installer in the field. A photo of the inner door and back panel will be included as part of the as-built package, and are to be added to the existing O&M Manual. Layout drawings will not be included as part of the submittal package.**

5. In Figures 1 and 2 of the original design drawings, the Engineer requires two non-mercury floats located in the wet well as back up for the level controller. These floats and associated intrinsically safe relays are missing in these control wiring diagrams. They should be provided as intended. ~~These float controls were not included as part of the originally marked up panel drawings provided for the project. Please confirm that the 2 floats are to indicate low and high alarm conditions, and that the low-low alarm will shut down the pump per the Note 7 on Figure 1. The drawing shows contradictory information as the Level-Float Switch drawing in the upper left hand corner shows 3 floats, and the Additional Wet Well #1 detail in the lower right hand corner shows only a single float.~~

← This comment is incorrect per RFI #025.

OTHER COMMENTS

6. As per Figure 1 and Figure 2 of the original design documents, the wet well is a hazardous location, and thus there shall be "EYS" seals installed in the conduits (power and control) to prevent both corrosive gas and flammable gas from entering the control panel(s) thru the conduits. It is recommended that the installation Contractor to provide seals (not shown on the design drawings) to comply with the National Electrical Code. **This is beyond EPG's scope of work. Potted seal offs should be used to prevent migration of landfill gas into the control panel.**

EPI Response-

The EYS's will be installed in accordance with the project plans and specifications. Please contact me with questions or provide a revised purchase order with the additional items (installation fees, check valve, etc.) to be included as part of this order. Thank you.

Chris Riddle
EPG Companies Inc.
19900 County Road 81
Maple Grove, MN 55311
Phone: 763-424-2613
Fax: 763-493-4812
criddle@epgco.com
www.epgco.com

Check out EPG Companies new line for Fugitive Gas & Odor Control Systems.
<http://www.epgco.com/solar-spark-flares.html> or <http://www.epgco.com/ltl-flares.html>



ENGINEERS, INC.
Oakland, San Francisco, Orange County, CA

INTEROFFICE MEMO

From: Diep Nguyen
To: Mike Minch, PE, GeoSyntec Consultants
Date: 5-7-2015
Subject: Kekaha Sanitary Landfill- Phase II
Shop drawing Sub. 38 Review

Hi Mike,

As per your instructions, we have reviewed the referenced submittal dated 4/29/2015 submitted by Earthworks Pacific Inc. and had the following review comments:

1. On sheet 1 of 12:
 - a. In the revision block on top of the page, letters "A", "B" and "C" should be in triangle symbol to match with the designated changes.
 - b. "460V AC" should be changed to "480V AC" to match with the original design documents and existing power system voltage.
 - c. There should be a note to indicate the new overload heaters to be sized based on FLA (full load amp) of the new 3hp pump.
 - d. There should be a note to indicate that the existing MPD1 to be reprogrammed to protect the new pump's motor based on its rated FLA.
2. On sheet 4 of 12:
 - a. There should be a note with a pointer on line 140 to indicate that the existing level controller ie contact M1 must be reprogrammed to start and stop the new pump based on new level set points.
3. On sheet 11 of 12:
 - a. "CAS1" should be replaced with "MINI CAS II" to match with the correct name of the module provided by the pump manufacturer.
 - b. It appears that all devices shown on this drawing are new, and thus should have revision "C" attached to each device to be consistent.
4. It is EPG tradition to provide a layout of the inner door of the panel to show each door mounted devices and nameplates. (See attached photo as an example). Because of the modifications and additions, there are new devices

Submittal No. 38 Comments

and unused existing devices being deleted. It is recommended that a new inner door layout with appropriate nameplates be submitted for review and approval. It will help avoid confusion to the Owner's Operators or Maintenance Staff. Most importantly, this inner door layout and the modified control schematic diagrams will become "as-builts" and will be part of the O&M Manual.

5. In Figures 1 and 2 of the original design drawings, the Engineer requires two non-mercury floats located in the wet well as back up for the level controller. These floats and associated intrinsically safe relays are missing in these control wiring diagrams. They should be provided as intended.

OTHER COMMENTS

6. As per Figure 1 and Figure 2 of the original design documents, the wet well is a hazardous location, and thus there shall be "EYS" seals installed in the conduits (power and control) to prevent both corrosive gas and flammable gas from entering the control panel(s) thru the conduits. It is recommended that the installation Contractor to provide seals (not shown on the design drawings) to comply with the National Electrical Code.

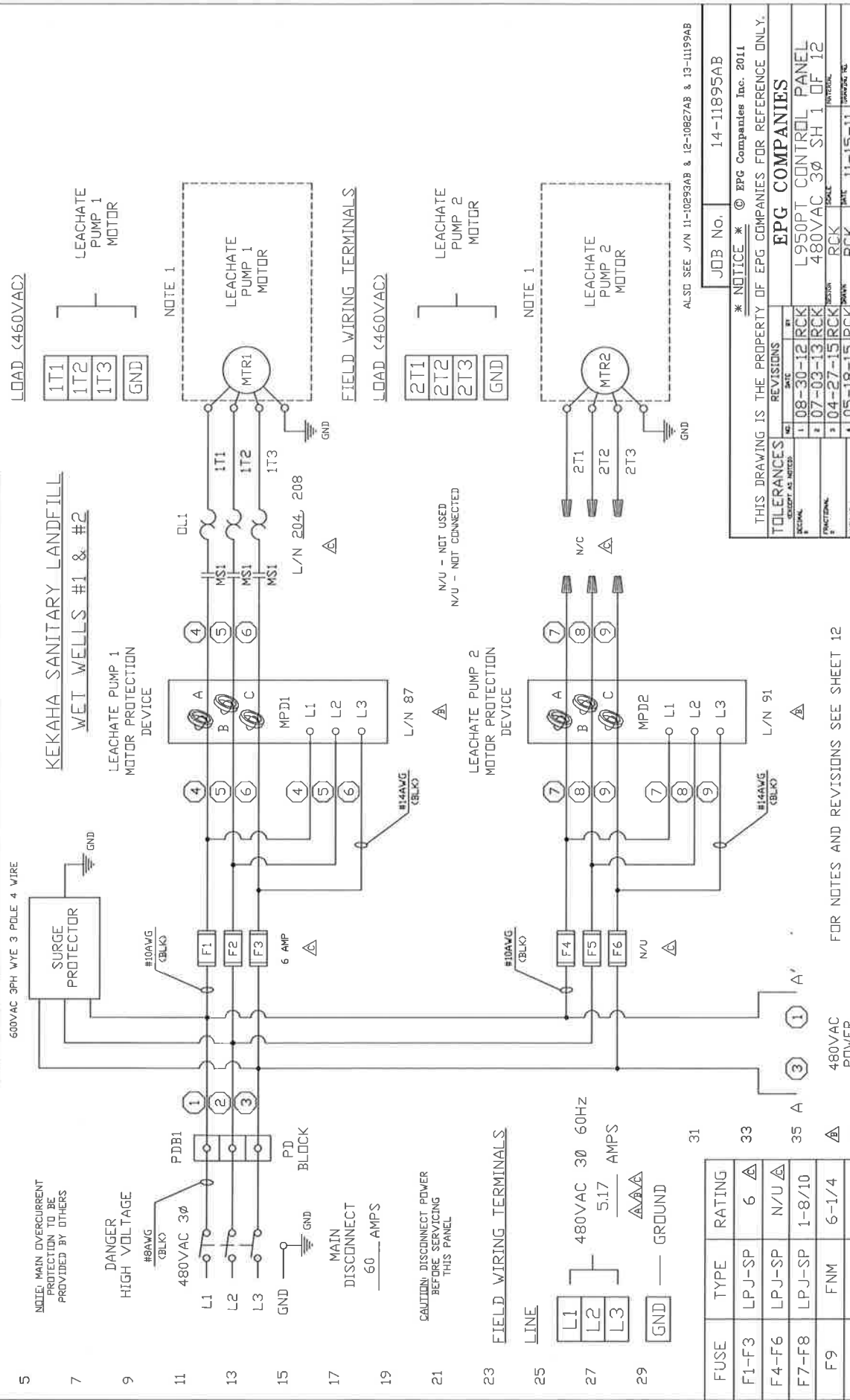
While all of the above comments are self-explanatory, we recommend "Revise and Resubmit" on this submittal.

Please feel free to contact me if there are any questions (510) 267-0441 ext 27 or Dnguyen@dtnegrs.com .

Thank you so much for using our professional services.

Attachment: Example of inner door of an EPG Control Panel.

NO	DATE	BY	DESC
1	08/12	RCK	ADD IS LEAK DETECT ALARM TO EXISTING CONTROLS
2	07/13	RCK	ADD MOTOR PROTECTION DEVICES TO EXISTING CONTROLS
3	05/15	RCK	REMOVE VFD'S & PWR SUPPLY CHG TO PUMP 1 CNTL ONLY
4	05/15	RCK	CHG PUMP 1 HP ADD MINICAS RELAY W/CNTLS & PILOT LIGHTS
5	05/15	RCK	ADD INTRINSICALLY SAFE HIGH & LOW LEVEL ALARM FLOATS



REVISION	DESC
1	ADD IS LEAK DETECT ALARM TO EXISTING CONTROLS
2	ADD MOTOR PROTECTION DEVICES TO EXISTING CONTROLS
3	REMOVE VFD'S & PWR SUPPLY CHG TO PUMP 1 CNTL ONLY
4	CHG PUMP 1 HP ADD MINICAS RELAY W/CNTLS & PILOT LIGHTS
5	ADD INTRINSICALLY SAFE HIGH & LOW LEVEL ALARM FLOATS

MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
LEACHATE PUMP 1	3	460	4.5	6A
LEACHATE PUMP 2	N/U	460	N/U	N/U

NO	DATE	BY	DESC
1	08-30-12	RCK	L 950PT CONTROL PANEL
2	07-03-13	RCK	480VAC 3Ø SH 1 OF 12
3	04-27-15	RCK	ROCK
4	05-18-15	RCK	DATE 11-15-11
5			10173-0250

FOR NOTES AND REVISIONS SEE SHEET 12

480VAC POWER

600VAC 3PH WYE 3 PLE 4 WIRE

NOTE: MAIN OVERCURRENT PROTECTION TO BE PROVIDED BY OTHERS

DANGER HIGH VOLTAGE

CAUTION: DISCONNECT POWER BEFORE SERVICING THIS PANEL

FIELD WIRING TERMINALS

LOAD (460VAC)

FIELD WIRING TERMINALS

LOAD (460VAC)

NOTE 1

NOTE 1

N/U - NOT USED

N/U - NOT CONNECTED

480VAC 3Ø 60Hz 5.17 AMPS

GROUND

480VAC POWER

KEKAHA SANITARY LANDFILL WET WELLS #1 & #2

LEACHATE PUMP 1 MOTOR PROTECTION DEVICE

LEACHATE PUMP 2 MOTOR PROTECTION DEVICE

MPD1

MPD2

L/N 204 208

L/N 87

L/N 91

1T1, 1T2, 1T3

2T1, 2T2, 2T3

MTR1

MTR2

LEACHATE PUMP 1 MOTOR

LEACHATE PUMP 2 MOTOR

LEACHATE PUMP 1 MOTOR

LEACHATE PUMP 2 MOTOR

480VAC 3Ø SH 1 OF 12

DATE 11-15-11

10173-0250

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EPG COMPANIES

14-11895AB

ALSO SEE J/N 11-10293AB & 12-10627AB & 13-11199AB

JOB No. 14-11895AB

REVISIONS

TOLERANCES UNLESS AS NOTED

DATE

BY

NO

DESCRIPTION

DATE

BY

NO

DESCRIPTION

DATE

BY

NO

DESCRIPTION

DATE

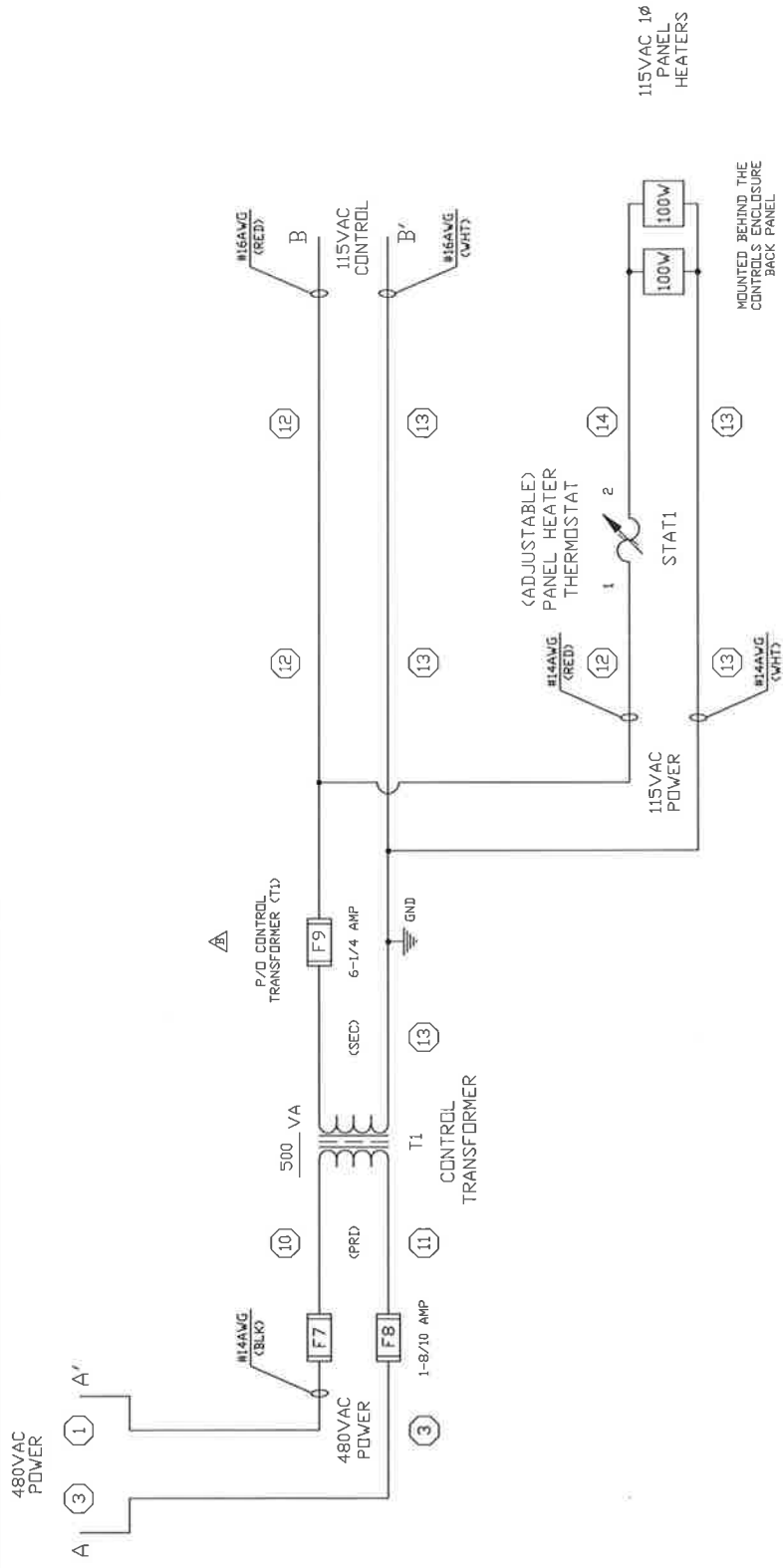
BY

NO

DESCRIPTION

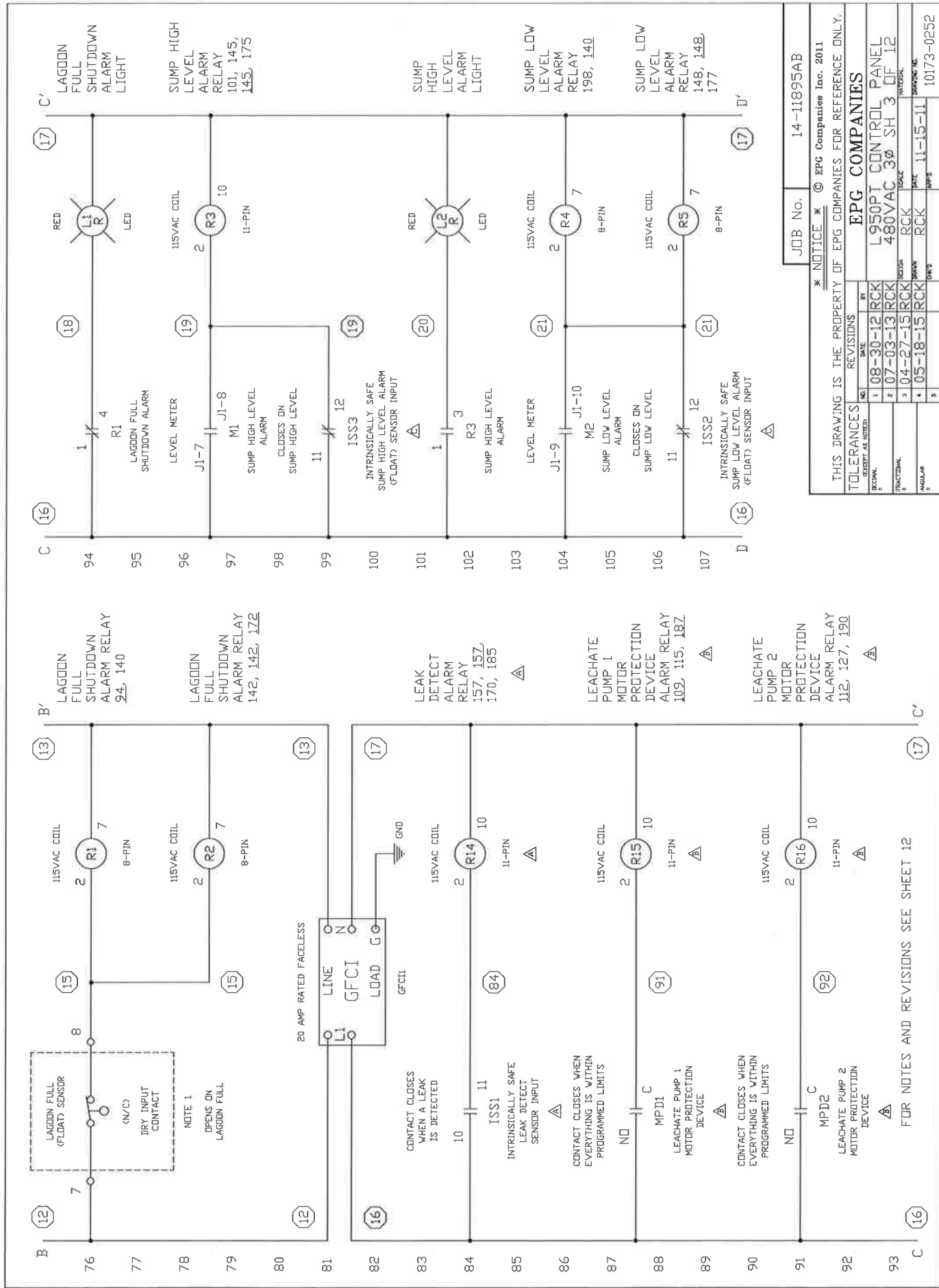
DATE

BY



FOR NOTES AND REVISIONS SEE SHEET 12

JOB No.		14-11895AB	
* NOTICE * © EPG Companies Inc. 2011			
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.			
TOLERANCES		REVISIONS	
UNLESS	EXCEPT AS NOTED	NO.	DATE
1	07-03-13 RCK	BY	
2	04-27-15 RCK	DATE	
FRACTIONAL		DESCRIPTION	REVISION
3		RCK	
4		BOOK	
5		DATE	11-15-11
6		DR'S	
		SCALE	100%
		PROJECT	10173-0251
		COMPANY	EPG COMPANIES
		PROJECT	L950PT CONTROL PANEL
		REV	3 OF 12
		DATE	04-27-15



10173-0252

TOLERANCES		REVISIONS	
DECIMAL	FRACTIONAL	NO.	DATE
0.0005	1/32"	1	08-30-12 RCK
0.001	1/64"	2	07-03-13 RCK
0.002	1/32"	3	04-27-15 RCK
0.005	1/16"	4	05-18-15 RCK

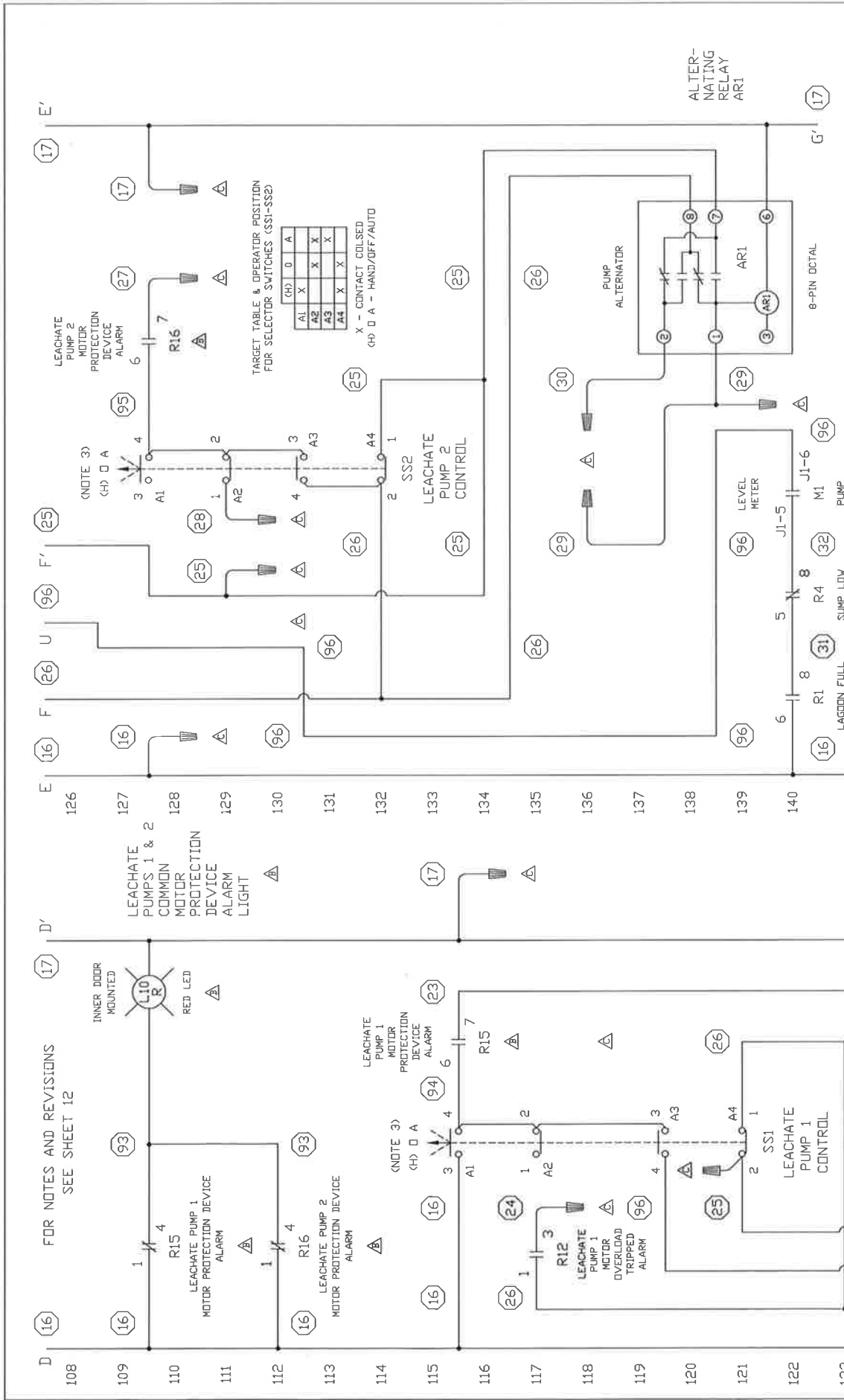
THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.
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JOB No. 14-11895AB

EPG COMPANIES
 L950FT CONTROL PANEL
 480VAC 3Ø SH 3 OF 12

DATE: 11-15-11
 BY: JMS
 CHECKED: JMS
 APPROVED: JMS

FOR NOTES AND REVISIONS SEE SHEET 12



JOB No. 14-11895AB

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NO.	DATE	BY
1	07-03-13	RCK
2	04-27-15	RCK
3	105-18-15	RCK

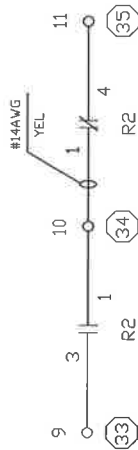
EPG COMPANIES
L950PT CONTROL PANEL
480VAC 3Ø SH 4 OF 12

NO.	DATE	BY	REASON
1	07-03-13	RCK	ISSUED
2	04-27-15	RCK	REVISION
3	105-18-15	RCK	REVISION

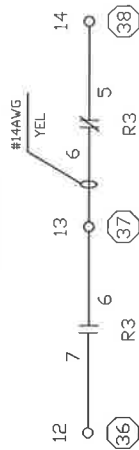
TOLERANCES
DIMENSIONAL
FRACTIONAL
DECIMAL

DATE: 11-15-11
DRAWN: RCK
CHECKED: RCK
JOB NO: 10173-0253

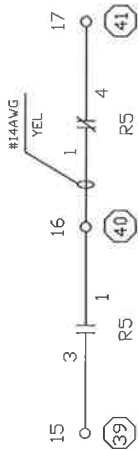
CAUTION: YELLOW WIRES ARE SUPPLIED BY A FOREIGN VOLTAGE (SOURCED OUTSIDE THE ENCLOSURE)



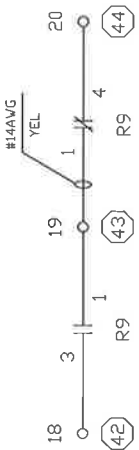
LAGOON FULL SHUTDOWN ALARM (DRY OUTPUT CONTACTS) (PASS-ALONG)



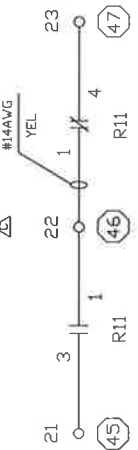
LEACHATE PUMPS 1 & 2 SUMP HIGH LEVEL ALARM (DRY OUTPUT CONTACTS)



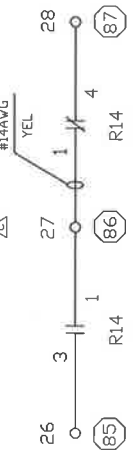
LEACHATE PUMPS 1 & 2 SUMP LOW LEVEL ALARM (DRY OUTPUT CONTACTS)



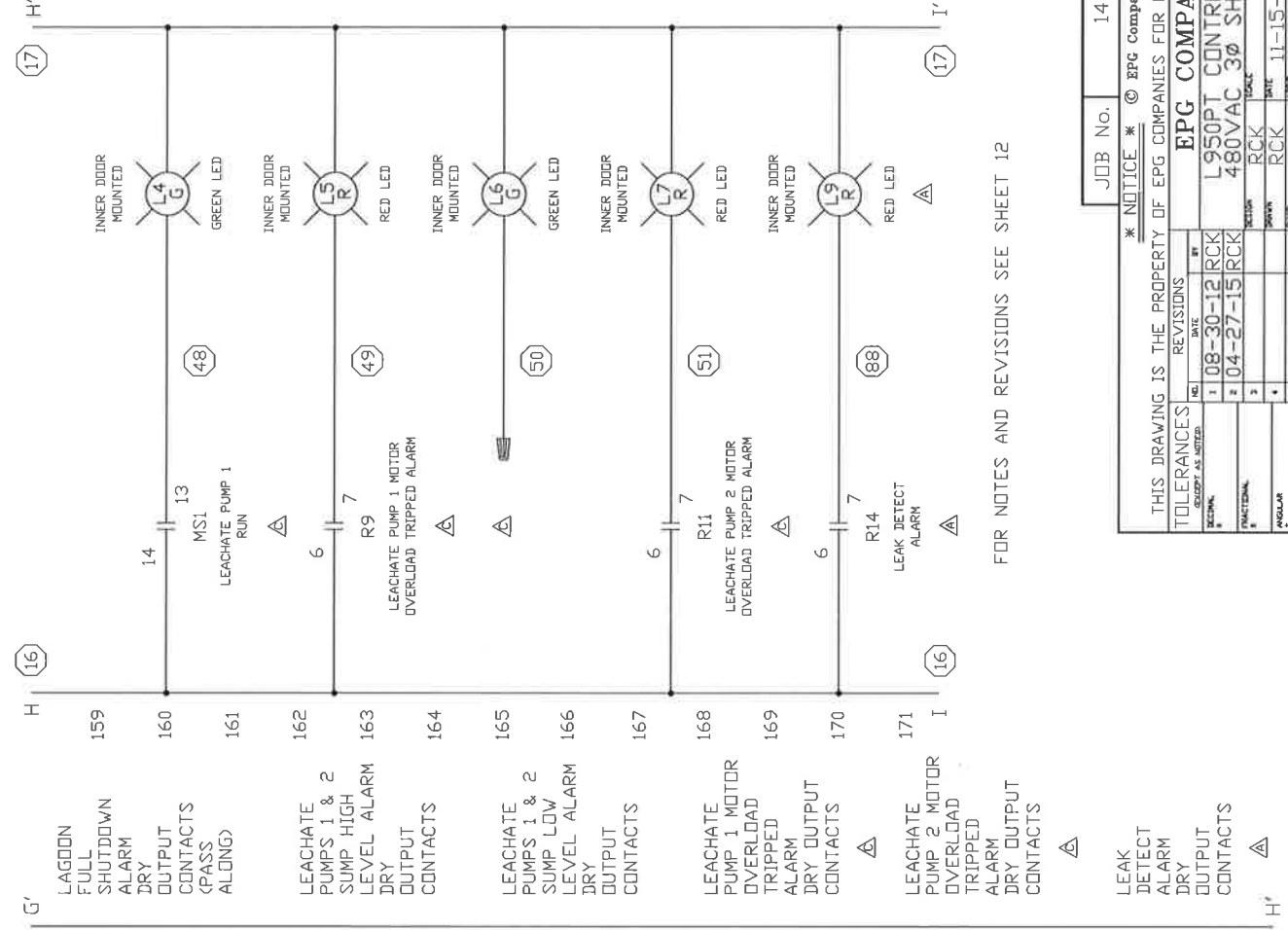
LEACHATE PUMP 1 MOTOR OVERLOAD TRIPPED ALARM (DRY OUTPUT CONTACTS)



LEACHATE PUMP 2 MOTOR OVERLOAD TRIPPED ALARM (DRY OUTPUT CONTACTS)



LEAK DETECT ALARM (DRY OUTPUT CONTACTS)



INNER DOOR MOUNTED

L4 G GREEN LED

MS1 LEACHATE PUMP 1 RUN

INNER DOOR MOUNTED

L5 R RED LED

R9 LEACHATE PUMP 1 MOTOR OVERLOAD TRIPPED ALARM

INNER DOOR MOUNTED

L6 G GREEN LED

R11 LEACHATE PUMP 2 MOTOR OVERLOAD TRIPPED ALARM

INNER DOOR MOUNTED

L7 R RED LED

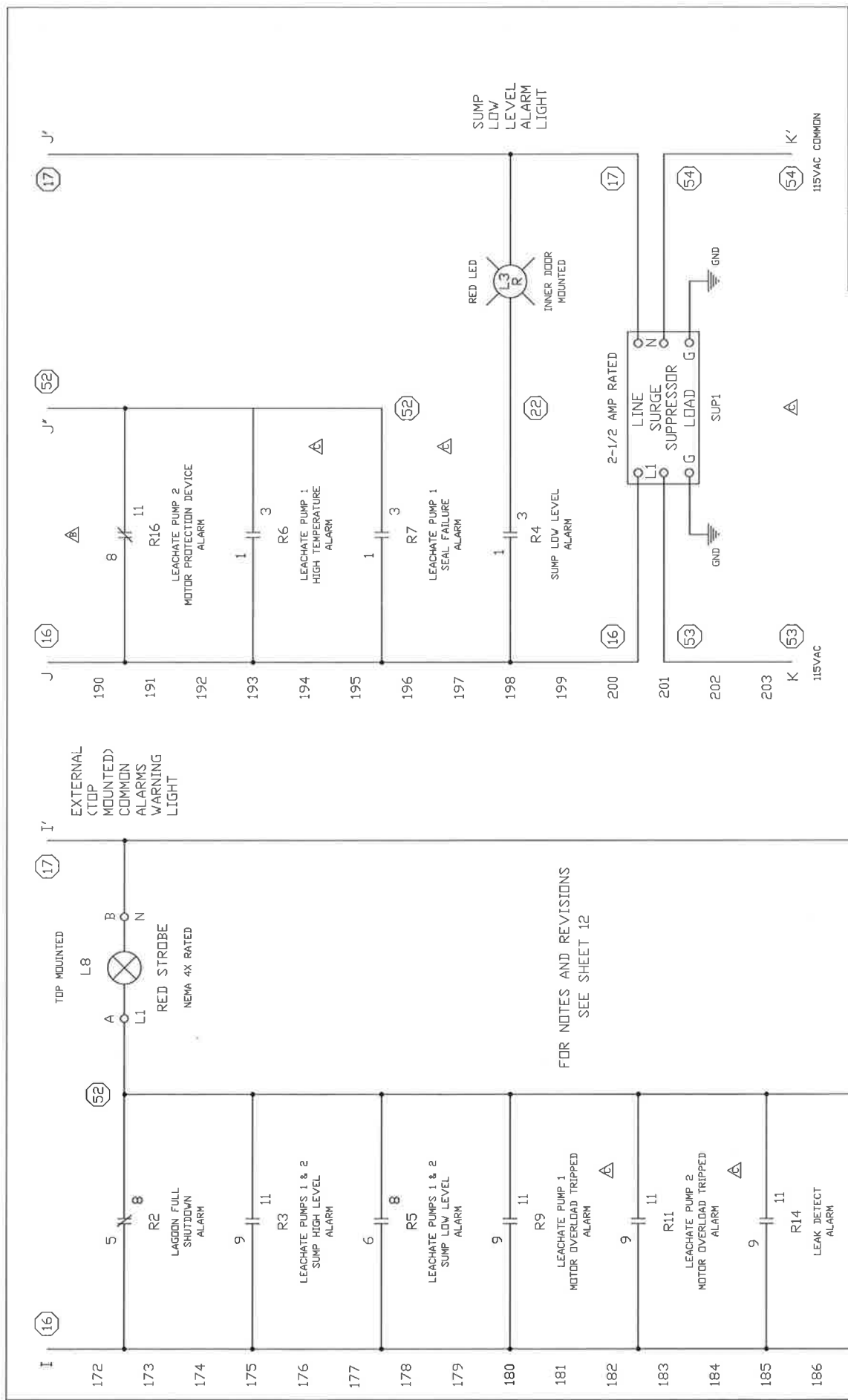
R14 LEAK DETECT ALARM

INNER DOOR MOUNTED

L9 R RED LED

FOR NOTES AND REVISIONS SEE SHEET 12

JOB No.		14-11895AB	
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TOLERANCES		REVISIONS	
1	AS NOTED	NO.	DATE
2	08-30-12 RCK	1	08-30-12 RCK
3	04-27-15 RCK	2	04-27-15 RCK
4		3	
5		4	
6		5	
EPC COMPANIES L950PT CONTROL PANEL 480VAC 3Ø SH 5 OF 12		DATE 11-15-11	
DRAWN RCK		CHECKED RCK	
DESIGNED RCK		APP'D RCK	
PROJECT NO. 10173-0254			



EXTERNAL
(TOP
MOUNTED)
COMMON
ALARMS
WARNING
LIGHT

FOR NOTES AND REVISIONS
SEE SHEET 12

JOB No.		14-11895AB	
* NOTICE * © EPG Companies Inc. 2011			
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TOLERANCES		REVISIONS	
NO.	DATE	BY	
1	08-30-12	RCK	
2	07-03-13	RCK	
3	04-27-15	RCK	
FRAC TIONAL		RCK	
ANGULAR		RCK	
DATE		11-15-11	
SCALE		1:1	
SHEET NO.		10173-0255	
TOTAL SHEETS		1	

EPG COMPANIES
L950PT CONTROL PANEL
480VAC 3Ø SH 6 OF 12

14-11895AB

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TOLERANCES

REVISIONS

NO. DATE BY

1 08-30-12 RCK

2 07-03-13 RCK

3 04-27-15 RCK

FRAC TIONAL

ANGULAR

DATE

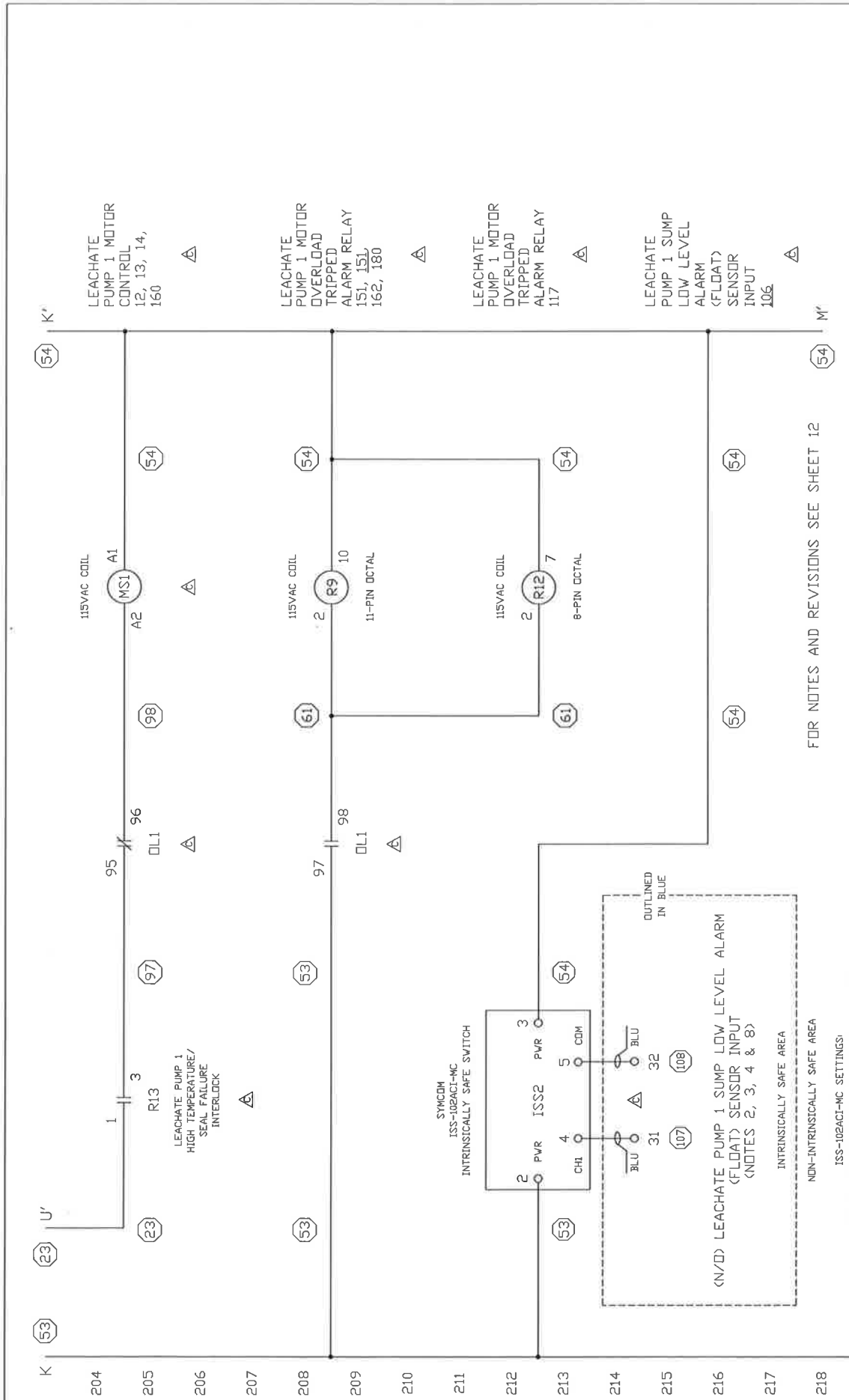
SCALE

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TOTAL SHEETS

10173-0255

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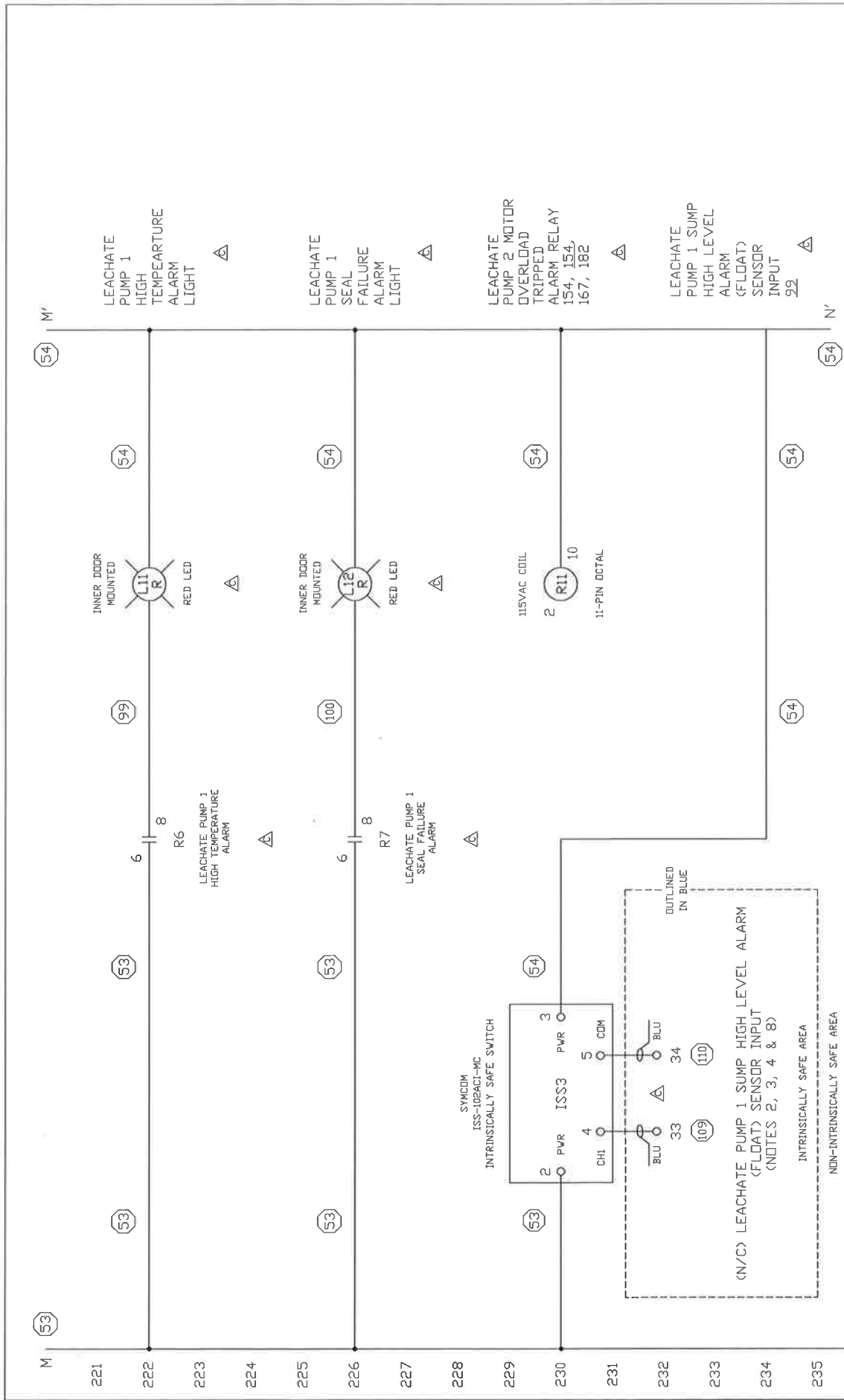


FOR NOTES AND REVISIONS SEE SHEET 12

JOB No.		14-11895AB	
* NOTICE * © EPG Companies Inc. 2011 THIS DRAWING IS THE PROPERTY OF EPG COMPANIES FOR REFERENCE ONLY.			
EPG COMPANIES			
L950PT CONTROL PANEL		480VAC 3Ø SH 7 OF 12	
REVISIONS	NO	DATE	BY
1	07-03-13	RCK	
2	04-27-15	RCK	
3	05-18-15	RCK	
4			
5			

TOLERANCES		DECIMAL		FRACTIONAL		ANGULAR	
1	±0.005	1	±0.005	1	±0.005	1	±0.005
2	±0.010	2	±0.010	2	±0.010	2	±0.010
3	±0.015	3	±0.015	3	±0.015	3	±0.015
4	±0.020	4	±0.020	4	±0.020	4	±0.020
5	±0.025	5	±0.025	5	±0.025	5	±0.025

NOTE: DE-BOUNCE IS SET TO 2 SECONDS



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NO.	DATE	BY	REVISIONS
1	07-03-13	RCK	
2	04-27-15	RCK	
3	05-18-15	RCK	
4			
5			

TOLERANCES
 DECIMAL
 FRACTIONAL
 ANGULAR

EPG COMPANIES
 L950PT CONTROL PANEL
 480VAC 3Ø SH 8 OF 12

DATE: 11-15-11
 DRAWING NO: 10173-0257

FOR NOTES AND REVISIONS SEE SHEET 12

SYNCOM
 INTRINSICALLY SAFE SWITCH
 ISS-102ACT-MC

ISS-102ACT-MC SETTINGS:
 SET FOR SINGLE-CHANNEL SWITCH (INPUT) MODE
 W/DIRECT LOGIC

DIP SWITCH SETTINGS:
 SW1 - DN
 SW2 - DFF
 SW3 - DFF
 SW4 - DN

NOTE: DE-BOUNCE IS SET TO 2 SECONDS

INTRINSICALLY SAFE AREA
 NON-INTRINSICALLY SAFE AREA

(N/C) LEACHATE PUMP 1 SUMP HIGH LEVEL ALARM
 (FLOAT) SENSOR INPUT
 (NOTES 2, 3, 4 & 8)

OUTLINED IN BLUE

LEACHATE PUMP 1 HIGH TEMPERATURE ALARM LIGHT

LEACHATE PUMP 1 SEAL FAILURE ALARM LIGHT

LEACHATE PUMP 1 SUMP HIGH LEVEL ALARM (FLOAT) SENSOR INPUT

LEACHATE PUMP 2 MOTOR OVERLOAD TRIPPED ALARM RELAY 154, 154, 167, 182

115VAC COIL 2 R11 10 11-PIN OCTAL

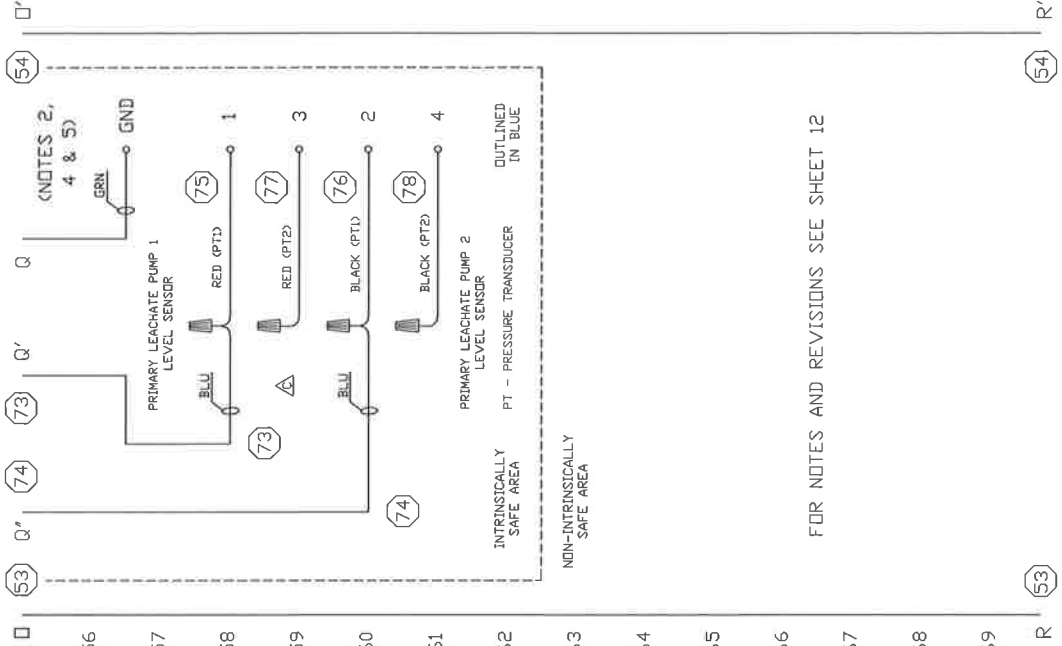
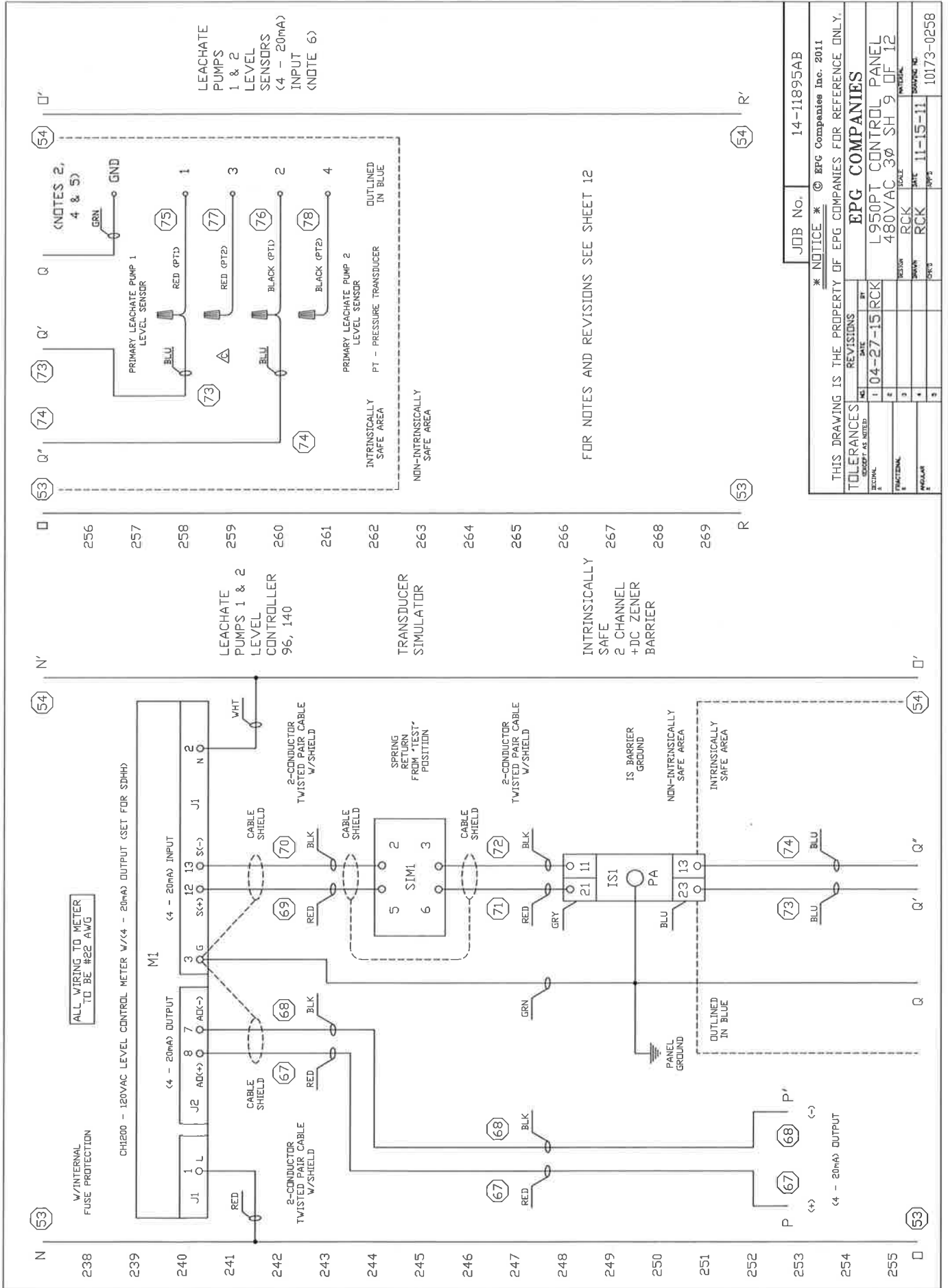
INNER DOOR MOUNTED RED LED

INNER DOOR MOUNTED RED LED

LEACHATE PUMP 1 HIGH TEMPERATURE ALARM

LEACHATE PUMP 1 SEAL FAILURE ALARM

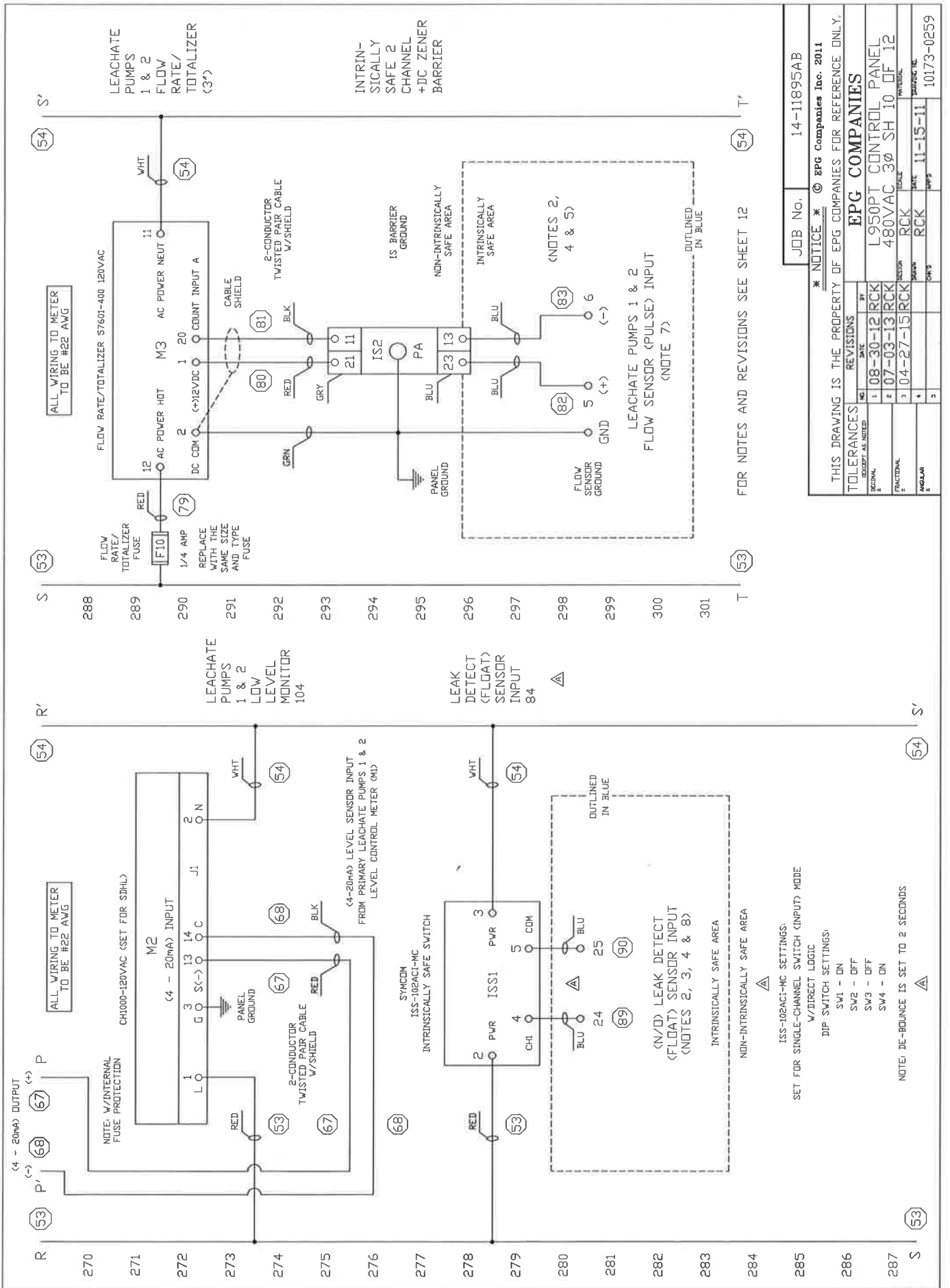
JOB No. 14-11895AB



FOR NOTES AND REVISIONS SEE SHEET 12

JOB No.		14-11895AB	
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EPG COMPANIES			
L950PT CONTROL PANEL			
480VAC 3Ø SH 9 OF 12			
REVISION	NO.	DATE	BY
1	04-27-15	RCK	
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10173-0258



JOB No. 14-11895AB

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TOLERANCES	
DECIMAL	±0.005
FRACTIONAL	±0.0005
ANGULAR	±0.005

REVISIONS		
NO.	DATE	BY
1	08-30-12	RCK
2	07-03-13	RCK
3	04-27-15	RCK
4		
5		

EPG COMPANIES

L950PT CONTROL PANEL

480VAC 3Ø SH 10 OF 12

DATE 11-15-11

DWG# 10173-0259

LEACHATE PUMPS 1 & 2 LOW LEVEL MONITOR 104

LEAK DETECT (FLOAT) SENSOR INPUT 84

NOTE: DE-BOUNCE IS SET TO 2 SECONDS

ISS-102ACT-MC SETTINGS:

SET FOR SINGLE-CHANNEL SWITCH (INPUT) MODE

W/DIRECT LOGIC

DIP SWITCH SETTINGS:

- SW1 - ON
- SW2 - OFF
- SW3 - OFF
- SW4 - ON

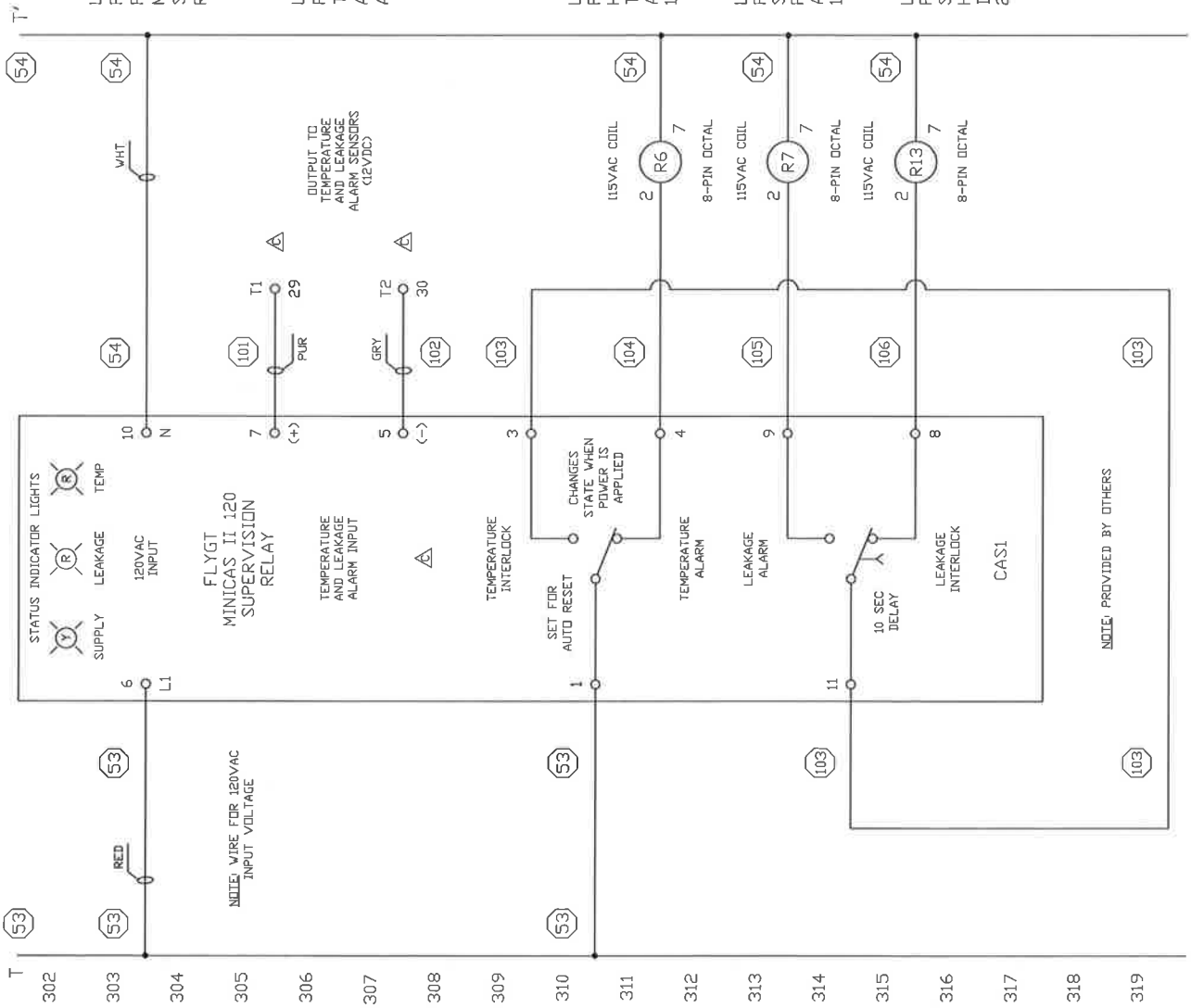
INTRINSICALLY SAFE AREA

NON-INTRINSICALLY SAFE AREA

OUTLINED IN BLUE

NOTE: DE-BOUNCE IS SET TO 2 SECONDS

NOTE: ALSO SEE THE MINICAS OPERATION AND INSTALLATION MANUAL



LEACHATE PUMP 1 FLYGT MINICAS II 120 SUPERVISION RELAY

LEACHATE PUMP 1 TEMPERATURE AND LEAKAGE ALARM INPUT

LEACHATE PUMP 1 HIGH TEMPERATURE ALARM RELAY 193, 222

LEACHATE PUMP 1 SEAL FAILURE ALARM RELAY 195, 226

LEACHATE PUMP 1 SEAL FAILURE/ HIGH TEMPERATURE INTERLOCK RELAY 204

FOR NOTES AND REVISIONS SEE SHEET 12

LAST WIRE NUMBER USED: 110

WIRE NUMBERS REMOVED: 55, 56, 57, 58,

59, 60, 62, 63, 64, 65, 66

△△△

JOB No. 14-1189SAB

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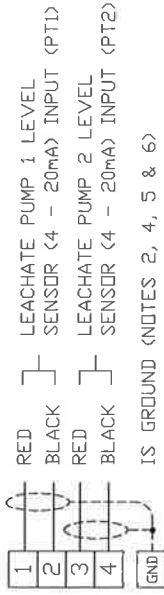
TOLERANCES	
DECIMAL	FRACTIONAL
0.0005	0.0005
0.001	0.001
0.002	0.002
0.005	0.005
0.01	0.01
0.02	0.02
0.05	0.05
0.1	0.1
0.2	0.2
0.5	0.5
1	1
2	2
5	5
10	10
20	20
50	50
100	100
200	200
500	500
1000	1000

NOTE: PROVIDED BY OTHERS

10173-0260

FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



PT - PRESSURE TRANSDUCER

FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (DRY INPUT CONTACT)



LOAD (115VAC)

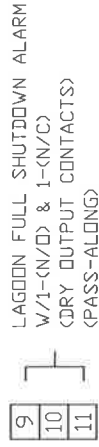


NOTES:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. SELECTOR SWITCHES, (SSI-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION
4. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
5. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
6. MAXIMUM CABLE LENGTH TO THE LEVEL SENSORS (PT1-PT2) IS 3000 FEET
7. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR (M3) IS 500 FEET
8. MAXIMUM CABLE LENGTH TO THE INTRINSICALLY SAFE SWITCH, (ISS1-ISS3) IS 10,000 FEET

FIELD WIRING TERMINALS

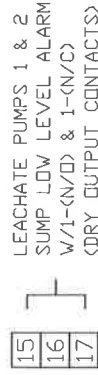
TANK FULL ALARM (DRY OUTPUT CONTACTS)



SUMP HIGH LEVEL ALARM (DRY OUTPUT CONTACTS)



SUMP LOW LEVEL ALARM (DRY OUTPUT CONTACTS)



PUMP 1 MTR OL ALARM (DRY OUTPUT CONTACTS)



FIELD WIRING TERMINALS

PUMP 2 MTR OL ALARM (DRY OUTPUT CONTACTS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



LEAK DETECT ALARM (DRY OUTPUT CONTACTS)



LEACHATE PUMP 1 SENSORS (12VDC OUTPUT)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



JOB No. 14-11895AB

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TOLERANCES		REVISIONS	
NO.	DATE	BY	REVISIONS
1	08-30-12	RCK	1-950PT CONTROL PANEL
2	04-27-15	RCK	480VAC 3Ø SH 12 OF 12
3	05-18-15	RCK	SCALE
4		RCK	DATE
5		RCK	DATE

EPG COMPANIES
L950PT CONTROL PANEL
480VAC 3Ø SH 12 OF 12

SCALE: 11-15-11
DATE: 10173-0261

Appendix D
Daily Field Reports



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 001

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 16

MONTH: February

YEAR: 2012

WEATHER: Sunny and warm during the day.

0730	<p>Mike Minch (Geosyntec Project Engineer) and I arrived on site. Both Mike and I attend the Kekaha Landfill site specific training course.</p> <p>Mark McCarty (Compliance Solutions) is onsite and will be providing the training and certifications upon completion of the course.</p>
	<p>Keith Perry (Earthworks Pacific's Project Manager) and crew are onsite to attend the two day confined space training course.</p> <p>The following is a list of attendees for the confined space training and are on site;</p> <ol style="list-style-type: none"> 1. Mike Minch, Geosyntec Consultants 2. Chris Scott, Geosyntec Consultants 3. Keith Perry, Earthworks Pacific 4. Delayne Pai, Earthworks Pacific 5. Dave Abreu, Earthworks Pacific 6. Tyrus Tupou, Earthworks Pacific 7. Sean Fisher, Earthworks Pacific 8. Robert Hammond, Earthworks Pacific <p>The above attendees were present for the CFR1910.146 Confined Space; Confined Space Supervisor, Confined Space Entry and Rescue.</p>
1530	Mike and I leave the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 002

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday DATE: DAY: 17 MONTH: February YEAR: 2012

WEATHER: Sunny and warm during the day.

0730	<p>Mike Minch (Geosyntec Project Manager) and I arrived on site. Both Mike and I attend the Kekaha Landfill site specific training course.</p> <p>Mark McCarty (Compliance Solutions) is onsite to continue the training.</p>
	<p>Keith Perry (Earthworks Pacific Project Manager) and crew are onsite to attend the two day confined space training course.</p> <p>The same attendees present yesterday were onsite today for the completion of the CFR1910.146 Confined Space; Confined Space Supervisor, Confined Space Entry and Rescue training.</p> <p>In addition to the classroom training, we completed respirator fit tests for the crew for the Draeger supplied-air respirators, practiced filling out the confined space permit, conducted atmospheric testing, practiced entry and extraction from a the new valve box built as part of Cell 1 (similar in configuration to the confined spaces for the actual work but without the atmospheric hazards), and refined the OSHA confined space permit based on the work-flow of the simulation.</p>
1000	<p>The Kauai Fire Department arrived on site with a representative from Kauai fire battalions 1, 2, and 3 of the local fire departments.</p> <p>The visit was requested by Earthworks Pacific to familiarize the local fire depart with the work to be performed, the location, the hazards, and the roles in a rescue in the event of the an accident</p> <p>During the site visit, the Kauai Fire Captain requested that the local Waimea Fire Station is contacted daily by phone at 808 338-1931 before any confined space work begins and also to send an email to the following addresses KFD1@kauai.gov; KFD2@kauai.gov, KFD3@Kauai.gov, battalion1@kauai.gov, battalion2@kauai.gov, battalion3@kauai.gov.</p>
1100	<p>Jesse Frey (WMH Construction Manager) is onsite to observe the training activities and rescue training.</p>
1530	<p>Mike and I leave the site.</p>

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 003

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 20

MONTH: February

YEAR: 2012

WEATHER: Overcast and cool day.

No work today in observance of President's Day.

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 004

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 21

MONTH: February

YEAR: 2012

WEATHER: Sunny and warm during the day

0730	I arrived on site. Keith Perry (Earthworks Pacific Superintendent) contacted me to inform me that he would be onsite today in preparation for construction activities.
	Keith Perry (Earthworks Pacific) arrive onsite to review the construction activities with his subcontractor ITC.
	Keith and Bill left the site.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 005

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 22

MONTH: February

YEAR: 2012

WEATHER: Sunny and warm during the day.

0730

I arrived on site.

Earthworks is not onsite today.

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 006

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 23

MONTH: February

YEAR: 2012

WEATHER: Sunny and warm during the day.

0730

I arrived on site.

Earthworks Pacific is not onsite today

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 007

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 24

MONTH: February

YEAR: 2012

WEATHER: Sunny and warm during the day.

0730

I arrived on site.

Earthworks Pacific is not onsite today

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 008

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 27

MONTH: February

YEAR: 2012

WEATHER: Sunny and warm during the day.

0700	I arrived on site.
0730	Keith Perry (Earthworks Pacific Superintendent) and crew of (3) three operators are on site.
	Equipment arrived on site: Komatsu BH106 Backhoe
1000	I attended weekly pre-construction meeting.
1100	Returned from weekly construction meeting
	The contractor is working to clear the area around the manholes to LCMs 1 thru 14 and install signage around the site for access and traffic control.
	Based on the conversations during the weekly construction, no fittings for the modification are available for installation until later this week
1500	Keith Perry has informed me that during excavation to expose LCM 1 the operator encountered the containment system for Unit 1. I have requested that the contractor expose the limits of damage to ensure that the area is limited to the anchor trench and does not extend into the slope of the liner system. Based on visual observations the containment system was only damaged within the anchor trench. Below is the coordinates of the damaged location which were surveyed using the site's GPS system; Point 1 (crest of AT) Northing; 54893.25 Easting; 1557467.97 El: 17.74 Point 2 (crest of AT) Northing; 54888.85 Easting; 1557467.95 El: 17.62 Point 3 (back side of AT) Northing; 54894.65 Easting; 1557470.82 El: 17.36
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 009

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 28

MONTH: February

YEAR: 2012

WEATHER: Overcast and cloudy with light rain today.

0700	I arrived on site.
0730	Earthworks Pacific's crew is off site today waiting for parts
	Sean Fisher (Earthworks Pacific Foreman) arrived on site to drop off traffic control barriers in preparation for construction around the LCMs.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 010

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 29

MONTH: February

YEAR: 2012

WEATHER: Overcast and cloudy with light rain today.

0700	I arrived on site.
0730	Keith Perry (Earthworks Pacific Superintendent) and crew of 3 operators are on site.
	Equipment on site: Komatsu BH106 Backhoe
	Keith Perry initiates the confined space permit to begin construction on Leachate Collection Manhole 3 (LCM 3). The initial gas readings indicate that the Lower Explosive Limit (LEL) inside the well was substantially higher than the permit-allowed 25% of the LEL. The contractor began positive pressure ventilation inside the LCM and over several hours could not maintain a safe environment for entry. Therefore, the work was stopped and the permit was terminated without entry.
1100	Donald Fujimoto (County of Kauai) arrived on site. During a site safety inspection, Donald has requested that Earthworks Pacific improve several safety protocols while working along the shoulder of the access road. The following measures were requested before work continues; <ul style="list-style-type: none"> • All personal working on site shall obtain and wear bright reflective shirts or vest to improve visibility during all construction activities; • Earthworks to use more delineation traffic cones to divert traffic around construction area - primarily along the shoulder of the access road to the landfill and around the scale house; • If possible, provide traffic control personnel during shoulder work along the access road; and • Install additional traffic signs "Construction Work" to improve awareness of personal along the access road.
	Keith initiated a conference call with Jesse Frey (Waste Management's Construction Manager) and me to discuss site conditions and the additional site safety control requested by the County. Jesse agreed with Donald's request for additional traffic control and also reiterated the need for insuring that "No Smoking" policy is enforced by the contractor. Keith and I both agree.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 011

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE: DAY: 1

MONTH: March

YEAR: 2012

WEATHER: Overcast with light scattered light rain during the day

0700	I arrived on site.
0730	Keith Perry (Earthworks Pacific Superintendent) is on site today. However, due to the site conditions the crew is not onsite.
	Equipment on site: Komatsu BH106 Backhoe
1000	Joe Whelan and Jesse Frey (Waste Management of Hawaii) are on site to attend site a County safety meeting for the Project.
1100	Donald Fujimoto; Troy Tanigawa and Rick Renaud (County of Kauai) arrive on site for the safety meeting.
1115	I attend construction safety meeting.
1215	I return from safety meeting.
	Jesse, Joe and I toured the site to brief Joe of the current construction activities and review the project details.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 012

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE: DAY: 2

MONTH: March

YEAR: 2012

WEATHER: Overcast with light scattered light rain during the day

0700	I arrived on site.
	Earthworks Pacific is not on site today. The contractor is waiting for a mini excavator to arrive on site and no construction activities are performed.
	Equipment on site: Komatsu BH106 Backhoe

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 013

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 5

MONTH: March

YEAR: 2012

WEATHER: Overcast with rain during the day

0700	I arrived on site.
0730	Keith Perry (Earthworks Pacific Superintendent) called me phone to inform me that due to the weather conditions, EPI will not be on site today.
	Equipment on site: Komatsu BH106 Backhoe

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 014

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 6 MONTH: March YEAR: 2012

WEATHER: Sunny no rain today

0700	I arrived on site.
0730	Keith Perry (Earthworks Pacific Superintendent) called me to inform me that due to the recent rain event, the site conditions are too wet to resume construction at the site.
	Equipment on site: Komatsu BH106 Backhoe; Caterpillar 305C "mini" excavator.

Chris Scott

Printed Name

Signature

cc: **Mike Minch**



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 015

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 7

MONTH: March

YEAR: 2012

WEATHER: Sunny no rain today

0700	I arrived on site.
0730	Keith Perry (Earthworks Pacific Superintendent) and the operators are on site.
	Equipment on site: Komatsu BH106 Backhoe; Caterpillar 305C "mini" excavator.
	I attended the Earthworks Pacific, Inc. (EPI) weekly tailgate safety meeting conducted by Keith Perry. Several safety issues pertaining to general wellness and site-specific confined space entry were discussed. No issues arose after the meeting.
	EPI has begun to excavate the soil around LCM1. Once the entire exterior of the manhole reducing "bell" structure was exposed the contractor removed the access lid, and placed two positive pressure ventilator hoses into the manhole to attempt to clear the hazardous atmosphere within the manhole. Air monitoring using a hand held Photo Ionizing Detector (PID) indicate that the methane levels exceeded 100% LEL which is above the maximum 25% LEL required for access into the manhole. Therefore, the contractor will continue to ventilate LCM 1 while working to excavate the soil around the exterior of manhole LCM 2. After several hours of positive pressure ventilation using two ventilators, the atmosphere was again evaluated using the PID. The PID indicates that the levels have decreased to 30% LEL, however; the concentrations are still above the allowable concentration for entry. To provide for additional access and better venation of the manhole, EPI attempted to remove the upper reducing "bell" structure of the manhole. Due to a seal weld placed on the inside of the manhole structure that secures the reducing "bell" structure to the 48 inch riser section of the manhole the upper section could not be removed without cutting the weld. The contractor will discuss additional options with the design engineer during this week's construction meeting. The contractor placed safety barricades around both LCM1 and LCM2 and cleaned up for the day.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 016

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 8

MONTH: March

YEAR: 2012

WEATHER: Sunny no rain today

0700	I arrived on site.
0900	Keith Perry (Earthworks Pacific Superintendent) is on site however, due to site conditions the crew is not on site.
	Equipment on site: Komatsu BH106 Backhoe; Caterpillar 305C "mini" excavator.
0930	Jesse Frey (Waste Management) is on site to conduct the weekly construction meeting.
1000	I attend the weekly construction meeting The following issues were discussed during the weekly meeting: <ul style="list-style-type: none"> • LEL concentration exceeded the confined space "permit required" allowable limit for entry and the forced air ventilation does not improve the hazardous atmosphere enough to allow entry. • Earthworks Pacific will prepare and submit to the design engineer a Request for Information (RFI) regarding this issue. The RFI will also provide EP's recommendations for improving the hazardous atmosphere and other possible recommendations. • Waste Management / County / and Earthworks Pacific are reviewing the contract documents to clarify how the contract addresses the hazards of the confined space. After tomorrow, Geosyntec will temporarily leave the project until above issue are resolved and construction resumes.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 017

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday DATE: DAY: 9 MONTH: March YEAR: 2012

WEATHER: Sunny, no rain today

0700	I arrived on site.
0900	Keith Perry (Earthworks Pacific Superintendent) is on site. However, due to site conditions the crew is not on site.
	Equipment on site: Komatsu BH106 Backhoe; Caterpillar 305C "mini" excavator.
1100	I left the site to return to California

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 018

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 29

MONTH: March

YEAR: 2012

WEATHER: Sunny no rain today

0700	I arrived on site.
0900	Keith Perry (Earthworks Pacific Superintendent) and Bryan Davidson (Earthworks Pacific Project Manager) are on site. However, due to the current site conditions the crew is not on site.
	Equipment on site: Komatsu BH106 Backhoe; Caterpillar 305C "mini" excavator.
	Jesse Frey (Waste Management's Construction Manager) and Kenny J. Bergschultz (AECOM's Design Engineer) are on site to attend weekly construction meeting.
1100	The weekly construction meeting was conducted in the field to address key issue in the construction of the LCM modifications. Earthworks Pacific raises two issues for consideration: <ul style="list-style-type: none"> • Several of the pre-fabricated, custom HDPE pipe tees and transition connections do not fit into the existing 24-inch manhole openings, and • The removal of the upper "Bell" manhole transition reducer will require removal in order to complete the leachate system modification. <p>Kenny Bergschultz has provided a recommendation for plugging the landfill gas system to reduce the release of methane into the LCMs. During the meeting today, one inflatable plug was inserted into the 8-inch leachate collection pipe which extends from the landfill into LCM5. The configuration provided by AECOM appears to provide a means to temporarily block landfill gas migration into the LCM's. Bryan will purchase additional inflatable plugs for the remaining LCMs.</p>
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 019

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE: DAY: 16 MONTH: April

YEAR: 2012

WEATHER: Sunny and warm mid 70's to low 80's

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and a crew of three are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
0730	I attended the weekly "tailgate" safety meeting conducted by Bryan Davidson. All of the Earthworks Pacific crew members are in attendance for the meeting. No questions or concerns were voiced during the meeting.
	Earthworks is working to clear and grub the area around Wet Wells 1 and 2 in preparation for removal.
1000	Chad Mano'i and Kirkjon Peters of R Electric, Inc., located in Lihue are on site to inspect the electrical system in preparation for the electrical component of the Phase II Leachate System Modifications.
1230	Earthworks has requested that Pastor Wayne perform a blessing for the upcoming work activities at the site. Several of the site personal and construction crew were in attendance during the blessing.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 020

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 17 MONTH: April YEAR: 2012

WEATHER: Sunny and warm mid 70's to low 80's

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
0700	I attended the morning pre-construction meeting conducted by Bryan Davidson (Earthworks Pacific Superintendent).
	Earthworks is working to assemble the trench box shoring in preparation for removal and installation of the new wet wells.
1000	Both valve boxes and Wet Wells 1 and 2 arrived on a low-bed transfer trailer today. The Wet Wells have plumbing fittings for the interstitial space but no test gauge to verify integrity of the fittings and interstitial space. Visual inspection of the structures indicated that the structures were not damage during shipping. Both of the wet wells structures and valve boxes were unloaded from the low bed trailer safety using the excavator and no damage was observed during handling.
	<p><u>Wet Well #2</u></p> <p>Earthworks is working to remove the existing Wet Well #2 concrete structure and associated valve box.</p> <p>The following construction activities were completed before exposing the concrete structure:</p> <ul style="list-style-type: none"> • Wet Well #3 was pumped down to 22.3 inches above the bottom of the well to provide addition storage capacity before shutting down the LCRS system. <i>(Note: during shutdown of the Wet Well #3 LCRS system, the contractor will manage the leachate level manually)</i> • Wet Well #3 was placed into a Lock Out / Tag Out to prevent accidental operation. • Wet Well #2 discharge piping thru the valve box two was de-watered to prevent liquid discharge. • R-Electric implemented a Lock Out / Tag Out procedure for the Wet Well #2 pumping system. • R-Electric cleared the electrical utilities adjacent to the Wet Well #2 excavation. <p>Earthworks then exposed the upper section of the Wet Well #2 concrete structure and the entire valve box structure. The atmosphere was cleared using a multi-gas Photo Ionizing Detector (PID) to verify the atmosphere is acceptable for entry. Once the area was cleared, the Wet Well # 2 valve box and associated piping was cut from the existing system and removed.</p>

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

PROJECT: Phase II Leachate Management System Modification

LOCATION: Kekaha Landfill

PROJECT NO.: WG1548

DAY/DATE: 17 April 2012

	Earthworks disconnected the Wet Well #2 pump and associated piping and removed them from the concrete structure in preparation for decommission of the existing wet well.
	<u>CQA Sampling and Laboratory Testing</u> During excavation of the Wet Well #2 structure, the excavated soil was stockpiled. I collected a sample (EF-01) for laboratory geotechnical testing. The sample was delivered to Hirata Laboratories in Lihue for testing.
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 021

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 18

MONTH: April

YEAR: 2012

WEATHER: Sunny and warm mid 70's to low 80's

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
0700	I attended the morning pre-construction meeting conducted by Bryan Davidson (Earthworks Pacific Superintendent).
	<p><u>Wet Well #2</u></p> <p>The contractor is working to remove the existing Wet Well #2 concrete structure.</p> <p>Bryan visually inspected the Wet Well #3 LCRS system water level and manually operated the pump to maintain the LCRS level below 66 inches (High Level), The liquid inside Wet Well #3 was pump to Leachate Collection Manhole (LCM) 14. The level inside LCM14 is below the discharge and does not require pumping.</p> <p>Before excavating the Wet Well #2 structure, both the inlet and discharge from the adjacent LCM piping systems were plugged using inflatable plugs. Wet Well #2 was de-watered with a suction pump and discharged into LCM6.</p> <p>Earthworks has excavated the existing soil around Wet Well #2 and then installed a 14-ft by 14-ft trench box to facilitate the removal of the supply and discharge sections of the Wet Well. A scan of the atmosphere using a hand held PID indicates that no hazardous atmosphere is present.</p> <p>Once all of the pumping was disconnected, the concrete structure was broken in several pieces and then lifted out of the excavation using the excavator.</p> <p>The excavation was secured using caution tape and portable chain-link fencing for safety and to prevent unauthorized entry.</p>
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 022

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 19 MONTH: April

YEAR: 2012

WEATHER: Sunny and warm mid 70's to low 80's

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
0700	I attended the morning safety meeting conducted by Bryan Davidson.
	<u>Wet Well #2</u> Earthworks is preparing the subgrade to receive the new wet well and concrete ballast system. During excavation to remove the existing wet well structure, groundwater was encountered. The underlying ground surface was over-excavated and the standing water was pumped down using a 3-inch suction pump. Once the area was de-watered an 8- to 12-inch layer of 1½-minus (3B course) well graded gravel was placed at the bottom of the excavation and graded to receive the new wet well structure. The new wet well structure was the lowered into placed using the excavator. The new wet well plumbing connections were aligned to the existing 12 inch and 18 inch HDPE inlet piping systems from adjacent LCMs. Once all of the pre-fitting of the plumbing was completed, the contractor began to prepare form boards for the concrete ballast system.
1430	Earthworks received 13 cubic yards of ready mix concrete from O. Thronas, Inc. located in Lawai. The concrete was delivered in two loads and dumped directly into the prepared form boards. The concrete structure at the base of Wet Well #2 was measured to be 3-ft thick and extended 2-ft around the entire structure in accordance with the project requirements. I have advised Bryan that the required cure time for the concrete material is 72 hours before backfill above the placed concrete.
	<u>CQA Sampling and Testing</u> Earthworks Pacific, Inc. tested the interstitial space of Wet Well #2 in accordance with email correspondence between AECOM and Waste Management on 13 December 2011. The air pressure test indicates that the interstitial space does not leak. See tests report.
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 023

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 20

MONTH: April

YEAR: 2012

WEATHER: Sunny and warm mid 70's to low 80's

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
0700	I attended the morning pre-construction meeting conducted by Bryan Davidson.
	<u>Wet Well #2</u> Earthworks has removed the form boards around the Wet Well #2 concrete ballast system. To manage the LCRS system, Earthworks has pumped down Wet Well #3 and de-watered LCMs 6 and 9. All liquids were discharge into the LCRS pond using the existing system. The Wet Well #3 pump station indicates that the leachate level was 22 inches above the bottom of the wet well.
	Earthworks' HDPE pipe welding subcontractor, ITC, is on site to fabricate and test the new plumbing fixtures for the new leachate management system. In preparation for testing, all of the piping external segments for Wet Wells #1 and #2 were joined together to enable the contractor to prepare the segments for one 1-hour air pressure test instead of multiple 1-hour tests. ITC has installed all plumbing and tests fitting to tests the plumbing segments. The air test was initiated at 10 psig and over 30 minutes the air pressure dropped to 8 psig. The test was terminated. I contacted Bryan and informed him of the failing tests results. Bryan indicated to me that the test will be repeated on Monday.
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 024

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 23

MONTH: April

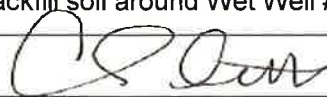
YEAR: 2012

WEATHER: Sunny and warm mid 70's to low 80's

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
0700	I attended the morning safety "tailgate meeting conducted by Bryan Davidson. No question or concerns arose during the meeting.
	<p><u>Wet Well #2</u></p> <p>To manage the LCRS system Earthworks has pumped down Wet Well #3 and de-watered LCMs 6 and 9. All liquids discharge into the LCRS pond using the existing Wet Well #1 system. Wet Well #3's pump station indicates that the leachate level was 25 inches above the bottom of the wet well.</p> <p>Earthworks Pacific's, Inc. HDPE pipe welding subcontractor (ITC) is on site to fabricate and test the new plumbing fixtures for the new leachate management system. ITC has installed the following fittings as shown on the Construction Drawings for Wet Well #2;</p> <ul style="list-style-type: none"> • 18-inch to 6-inch HDPE reducer; • 12-inch to 6-inch HDPE reducer; • two 6-inch HDPE sweeps; • two 6-inch riser sections with-4 inch reducer and cam lock quick disconnect fitting; and • two 6-inch couplers to connect to new Wet Well #2. <p>In preparation for testing all of the external piping segments for Wet Well's 1 and 2 were joined together to enable one 1-hour air pressure test instead of multiple 1-hour tests. All field connections were completed using electro-fusion couplers. All of the above pre-fabricated connections and fittings were air pressure tested as a segment component before installation. Visual observation during fusion indicated that the connections were completed in accordance standard practice.</p> <p>ITC tests all pipe segments at 10 psig for 1 hour and no pressure loss was observed. Therefore the tests passed.</p> <p>Earthworks begins to backfill soil around Wet Well #2.</p>

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

PROJECT: Phase II Leachate Management System Modification

PROJECT NO.: WG1548

LOCATION: Kekaha Landfill

DAY/DATE: 23 April 2012

	<p><u>CQA Sampling and Testing</u></p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2074; MS 586) were measured to be within the calibration range for the instrument.</p> <p>The contractor has begun to backfill the space around Wet Well #2 using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a Komatsu PC 200 excavator with a vibratory plate attachment and a pad footed "jumping jack" compactor.</p> <p>Several field density tests using the nuclear gauge indicate that the compaction effort meets the project requirements.</p>
	<p><u>Survey</u></p> <p>Charles Soriano (Esaki Party Chief) is on site to provide as built survey of the installed Wet Well #2 structure; piping connections and alignment.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 025

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 24

MONTH: April

YEAR: 2012

WEATHER: Overcast mid 70's during the day

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site. I attended the morning pre-construction meeting conducted by Bryan
	Equipment on site: Caterpillar 950H loader; and a Komat'su 200 PC Excavator.
	<p><u>Wet Well #2 and Valve Box</u></p> <p>To manage the LCRS system at the site Earthworks has pumped down Wet Well #3 and de-watered LCMs 6 and 9. All liquids were discharged into the LCRS pond using the existing system. The Wet Well #3 pump station indicates that the leachate level was 25 inches above the bottom of the wet well.</p> <p>Earthworks continues to backfill the excavation around Wet Well #2. The backfill around Wet Well #2 was temporarily suspended at elevation 13 ft msl and began to excavate the subgrade in preparation for the Wet Well #2 valve box installation.</p> <p>The valve box subgrade was over-excavated and compacted using a walk-behind vibratory plate and a "jumping jack" compactor. Once the prepared subgrade was compacted, I conducted field density tests using a portable Troxler nuclear moisture/density gauge. I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2090; MS 589) were measured to be within the calibration range for the instrument. All tests indicate that the earthfill meets the project requirements.</p> <p>Earthworks then places a 6-inch layer of course well-graded gravel (3B course) above the prepared subgrade for installation of the Wet Well #2 valve box. Field density tests using the nuclear gauge indicate that the compaction effort meets the project requirements. Earthworks then installs the valve box</p> <p>Earthworks resumes backfilling the space around Wet Well #2 using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using the excavator with a vibratory plate attachment, a walk-behind vibratory plate compactor, and a "jumping jack" compactor.</p>
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 026

PROJECT: Kekaha Sanitary Landfill
 LOCATION: Kekaha, Kauai, Hawaii PROJECT NO.: WG1548 TASK NO.: 2.3
 DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.
 DAY OF WEEK: Wednesday DATE: DAY: 25 MONTH: April YEAR: 2012
 WEATHER: Overcast mid 70's during the day

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site. I attended the morning pre-construction meeting conducted by Bryan
	Equipment on site: Caterpillar 950H loader; and a Komat'su 200 PC Excavator.
	<p><u>Wet Well #2 and Valve Box</u></p> <p>To manage the LCRS system, Earthworks pumps down Wet Well #3 and de-watered LCMs 6 and 9. All liquids were discharged into the LCRS pond using the existing Wet Well #1 pumping system. The Wet Well #3 pump station indicates that the leachate level was 32 inches above the bottom of the wet well.</p> <p>Earthworks installs form boards around the Wet Well #2 valve box in preparation for the concrete ballast system. The forms are measured to be 24 inches around the entire structure and 20 inches above the bottom of the valve box. O. Thronas, Inc. delivers 4 yards of ready mix lean which is poured directly into the prepared form boards to construct the Wet Well #2 valve box ballast.</p> <p>After the valve box ballast was installed, Earthworks continues backfilling the space around Wet Well #2 using on site sand. The fill was placed in 6- to 8-inch loose lifts, moisture conditioned, and compacted using the excavator with a vibratory plate attachment, a walk-behind vibratory plate compactor, and a "jumping jack" compactor.</p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2090; MS 589) were measured to be within the calibration range for the instrument. Several field density tests using the nuclear gauge indicates that the compaction effort meets the project requirements.</p>
	<p><u>Piping and Testing</u></p> <p>ITC has installs all plumbing and tests the fitting to connect Wet Well #2 to Valve Box #2. The new piping system was isolated from the exiting 6-inch discharge pipe until the air pressure tests were completed. The new plumbing segments from Wet Well #2 to Valve Box #2 were tested in accordance with the project requirement. The tests results indicate that the pipe segments do not leak.</p> <p>ITC connects the new system to the existing 6-inch HDPE discharge piping using an electro-fusion coupler. Visual observation during fusion indicates that the weld was completed in accordance with standard practice.</p>
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 027

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE: DAY: 26 MONTH: April

YEAR: 2012

WEATHER: Sunny and warm mid 70's in the morning to low 80's during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site. I attended the morning pre-construction meeting conducted by Bryan.
	Equipment on site: Caterpillar 950H loader; and a Komat'su 200 PC Excavator.
1000-1100	I attended the weekly construction meeting.
	<p><u>Wet Well #2</u></p> <p>To manage the LCRS system, Earthworks pumps down Wet Well #3 and de-watered LCMs 6 and 9. All liquids were discharged into the LCRS pond using the existing Wet Well #1 pumping system. The Wet Well #3 pump station indicates that the leachate level was 44 inches above the bottom of the wet well.</p> <p>The contractor is working to install the pumping system inside Wet Well #2. Two Sure Pumps were fitted for installation. The following documentation was obtained from the label on the pumps:</p> <p>SurePump #1 Serial # 11-10293A; Model # VSD, Series 302, Volts 460, Amps 80, Horsepower 5.</p> <p>SurePump #2 Serial # 11-10293C; Model # VSD, Series 302, Volts 460, Amps 80, Horsepower 5.</p> <p>Earthworks anchors the pipe support system at the bottom of the wet well and installs the guide rail system installed in accordance with the Construction Drawings. During installation of the pumping system fittings, Bryan identified a conflict. The discharge shut-off valve and 3-inch check valve assembly together as shown do not fit into the wet well, due to an obstruction of the HDPE pipe support at the top of the wet well. I advised Bryan to submit a Request for Information (RFI) to address the deficient condition.</p> <p>Earthworks continues to backfill the space around Wet Well #2 using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned, and then compacted using the excavator with a vibratory plate attachment, a walk-behind vibratory plate compactor, and a "jumping jack" compactor.</p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2090; MS 589) were measured to be within the calibration range for the instrument. Several field density tests using the nuclear gauge indicate that the compaction effort meets the project requirements.</p> <p>R Electric is on site to install the electrical conduits and control panel for the operation of the new Wet Well #2</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 028

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE: DAY: 27 MONTH: April

YEAR: 2012

WEATHER: Overcast and cool with light rains throughout the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site. I attended the morning pre-construction meeting conducted by Bryan.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<u>Wet Well #2</u> To manage the LCRS system at the site, Earthworks pumps down Wet Well #3 and LCMs 6 and 9. All liquids were discharge into the LCRS pond using the existing Wet Well #1 pumping system. The Wet Well #3 pump station indicates that the leachate level was 23 inches above the bottom of the wet well. The contractor is working to install the pumping system inside Wet Well #2. R Electric is on site to continue installing the electrical conduits and control panel for the operation Wet Well #2
	<u>Wet Well #1</u> Earthworks has installed test fittings to pressure test the interstitial space of Wet Well #1. The space was pressure tested to 3 psig for 1 hour duration. During testing, no pressure loss was detected.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 029

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 30

MONTH: April

YEAR: 2012

WEATHER: Sunny and warm today mid 70's to low 80's throughout the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today. Since the construction activities today are primarily related to electrical, the EP crew is offsite.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	Wet Well #2 The Wet Well #3 pump station indicates that the leachate level is 53 inches above the bottom of the wet well. Bryan was informed of the leachate level and after manually operating the Wet Well # 3 pump, the level was reduced to 23 inches. R Electric is on site to install the electrical conduits and control panel for the operation of the new Wet Well #2. R Electric completed the following: <ul style="list-style-type: none"> • the EPG master control panel was bolted to the two 3-inch galvanized pipe supports; • the bulkhead penetration was installed in the top of the wet well for the installation of the stilling well conduit, and • the stilling well conduit was installed.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 030

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE: DAY: 1 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm today mid 70's to low 80's throughout the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today. Since the construction activities today are primarily related to electrical, the EP crew is offsite.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<p>Wet Well #2</p> <p>To manage the LCRS system, Earthworks pumps down Wet Well #3 and de-waters LCMs 6 and 9. All liquids were discharged into the LCRS pond using the existing Wet Well #1 pumping system. The Wet Well #3 pump station indicates that the leachate level was 33 inches above the bottom of the wet well.</p> <p>R Electric is on site to install the electrical conduits and control panel for the operation of the new Wet Well #2. R Electric completes the following:</p> <ul style="list-style-type: none"> installing the 1.5-inch PVC power supply conduit from the exiting electrical box to the new EPG master control panel; installing the 1-inch PVC conduit from the power control junction box to the EPG master control panel; installing the 1-inch PVC conduit from the sensor control junction box to the EPG master control panel; and installing the 1-inch PVC conduit from the Wet Well # 2 valve box to the EPG master control panel for power control to the totalizing flow meter. <p>During inspection of the junction boxes installed on top of the new wet well, excessive moisture inside both junction boxes was observed. The contractor will submit a Request for Information (RFI) to address the issue of excessive moisture.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 031

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE: DAY: 2 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm today mid 70's to low 80's throughout the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #2</u></p> <p>To manage the LCRS system, Earthworks pumps down Wet Well #3 and de-waters LCMs 6 and 9. All liquids were discharge into the LCRS pond using the existing Wet Well #1 pumping system. The Wet Well #3 pump station indicates that the leachate level is 41 inches above the bottom of the well.</p> <p>R Electric is on site to install the electrical components for the new Wet Well #2. R Electric completed the following:</p> <ul style="list-style-type: none"> • Pulled existing 460v electrical power supply into master control panel. The existing three phase supply wires are all one color (white) and R Electric used the existing wire and color coded the three phases with brown, orange, and yellow tape; • Installed new control wire into master control panel, and • Installed new control wire from master control panel to both of the wet well pump power supplies and to the sensor control junction boxes; and • Backfilled new electrical conduit using a walk behind "jumping jack" pad footed compactor. <p>Jimmy Iloreta (Electric Inspector from the County of Kauai Department of Public Works) was on site to evaluate the construction permit requested by R Electric for the Wet Well # 2 electrical installation. Mr. Iloreta has approved the completed activities to date and left the site.</p>
	<p><u>Survey</u></p> <p>Charles Soriano (Esaki Party Chief) is on site to survey the following locations:</p> <ul style="list-style-type: none"> • existing power conduit to new master control panel; master control panel to power control junction box; master control panel to sensor control junction box; and master control panel to Wet Well # 2 valve box for totalizing flow meter conduit.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 032

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE: DAY: 3 MONTH: May

YEAR: 2012

WEATHER: Overcast and cool with light rain showers throughout the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today. EP's crew is offsite. R Electric is also not on site today. They will return on Friday to complete the electrical to Wet Well #2.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<u>Wet Well #2</u> To manage the LCRS system Earthworks pumps down Wet Well #3 and de-waters LCMs 6 and 9. All liquids were discharged into the LCRS pond using the existing Wet Well #1 pumping system. The Wet Well #3 pump station indicates that the leachate level was 46 inches above the bottom of the wet well.
1030-1145	I attended the weekly construction meeting.
	Bryan and I worked on a sketch for flow meter piping configuration and components needed for installation. Bryan will submit the sketch to AECOM for evaluation.
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 033

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE: DAY: 4 MONTH: May

YEAR: 2012

WEATHER: Overcast and cool with light rain showers throughout the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today. Since the construction activities today are primarily related to electrical, the EP crew is offsite.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	Wet Well #2 R Electric is on site to complete the electrical hook-up and wiring to operate the Wet Well #2. During construction today, the following deficient conditions were identified: <ul style="list-style-type: none"> • Interstitial leak detection sensor was installed into the wet well, however the master control panel does not have a means to monitor the sensor output; • R Electric inspected the existing leachate pond master control panel for installation of the Wet Well #2 pumping system high level shut off. This feature ensures that when the pond is in high level; the Wet Well #2 pumping system does not overflow the pond. During inspection of the existing pond master control panel; the panel does not have power and is in need of repair. I contacted John Ruiz (Waste Management District Manager) and informed him of the electrical issue. • During startup testing of Wet Well #2 pumping system, Howard Lester (EPG Technician hlester.epgco.com) was contacted via cell phone to troubleshoot the system operation. After a series of test were performed, Howard identified the pump 1 variable speed control module as defective. He recommends removing the variable speed control module from the Wet Well # 1 master control panel. R Electric installed the Wet Well #1 module into the Wet Well #2 master control panel, which resolved the issue. EP will work with EPG to obtain a replacement variable speed control module.
	Once the repairs were completed, the Wet Well # 2 sump was filled with water using a water truck to operate the system. The EPG technician was available via cell phone to confirm that the system was functioning properly. Upon completion of the preliminary system operation tests it was determined by EPG that the system was performing as designed. (See Start up Demonstration Report, below)
	After the Wet Well # 2 operational tests was completed, EP removed all of the inflatable plugs used to control the leachate during the Wet Well # 2 modification and restored Wet Well #3 to operational status by removing the lock out / tag out system. John Ruiz was informed of the LCRS system status.
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**



Leachate Management System
New Wet Well # 2 System Demonstration Test Report

Date: 3 May 2012

Project: Phase II Leachate Management System Modification

Project Number: WG1548

New Wet Well #2 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric.

EP installed the following: Wet Well #2 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, two Surepump VSD 30-2 submersible pumps with support brackets and guild rail system, 3/16-inch stainless steel support cables, two 3-inch stainless steel discharge pipes, two stainless steel shut-off ball valves, and the Wet Well #2 valve box structure.

R Electric installed the following: 100 feet of 1-inch PVC electrical conduit; EPG L950PT PumpMaster control panel, motor lead breakout junction box, high level sensor, low level sensor, low level shut off sensor and sensor breakout junction box, leak detection conduit and control, and all parts and fitting to provide electrical power to the system.

The primary power for the system was connected to the existing control panel at the New Leachate Evaporation Pond (NLEP).

During construction today new Wet Well #2 was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented;

- High level alarm activates at 50 inches above the floor of the wet well (Elevation 7.85);
- Pump # 1 activates 30 inches above the floor of the wet well (Elevation 6.21),
- Pump # 2 activates 40 inches above the floor of the wet well (Elevation 7.09),
- Both pumps 1 and 2 shut-off 9 inches above the floor of the wet well (Elevation 4.57),
- Low level alarm activates 7 inches above the floor of the wet well (Elevation 4.33),
- Both pumps 1 and 2 vents are installed and operational,
- Voltage measured and recorded as 460v, and
- EPG PumpMaster control panel is operational
- Leak detection sensor (note; no verification performed as RFI is required for completion)

The above items apply to Wet Well #2 and do not reflex all of the components required for operations of the full LCRS.

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.:

Date: 5-4-12

R Electric:

Date: 5/4/12

Geosyntec Consultants, Inc.:

Date: 4 MAY 2012

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 034

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Saturday DATE: DAY: 5 MONTH: May YEAR: 2012

WEATHER: Sunny and warm throughout the day.

1030	I arrived on site.
	<p>John Ruiz (Waste Management District Manager) and I inspected the operation of the LCRS;</p> <ul style="list-style-type: none"> • Wet Well # 1 depth-to-water was measured to be 14.40 feet below top of structure; • Wet Well # 2 depth-to-water was measured to be 11.15 feet below top of structure and the level sensor indicates that the water level is 11.2 inches above the bottom of the well; and • Wet Well # 3 depth-to-water was measured to be 14.02 feet below top of structure and the level sensor indicates that the water level is 62.5 inches above the bottom of the well. <p>Based on the results of today's inspections, the system was appears to function normally and is in compliance with the site requirements.</p>
1200	I left the site.

Chris Scott
Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 035

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 7

MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the weekly "tailgate" safety meeting conducted by Bryan. The topic of discussion pertained to fall protection while suspended 8-ft above the ground. Bryan covered items related to typical fall protection; as well as, issued specifically related to our work here at the site.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<u>Wet Well #2</u> Earthworks is working to clean up the area around the Wet Well #2 structure. Earthworks grades the area adjacent to the access road and replaces the 8-inch layer of 3B fine material beneath the section of roadway previously removed. The 3B fine material is moisture conditioned using a water hose and then compacted using a walk behind vibratory plate compactor. The remainder of the surface completion with additional protective covering is pending approval from the County of Kauai.
	<u>Wet Well #1</u> The contractor's electrical subcontractor (R-Electric) is on site to lock out / tag out pump station 1 in preparation for removal and installation of the new Wet Well # 1 system. R Electric completes the following tasks; <ul style="list-style-type: none"> • Lockout / Tag out of pump station 1; • Pulling existing 460v 3 phase wire from master control panel; and • Removal of the existing pump station master control panel and supports. <p>The contractor has set up a leachate bypass system to manage the site leachate during construction.</p> <p>A 2-inch PVC conduit was routed from Leachate Collection Manhole (LCM) 4 and discharges into LCM 8. The leachate will be managed using an electrical submersible pump once the area has been isolated and vented of hazardous atmospheres.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 036

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 8 MONTH: May YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended EP's morning "tailgate" construction meeting.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>The contractor has set up a leachate bypass system to manage the leachate during construction. A 2-inch PVC conduit was routed from Leachate Collection Manhole 4, (LCM) and discharges into LCM 8. The leachate will be managed using an electrical submersible pump once the area has been isolated and vented of hazardous atmospheres.</p> <p>Earthworks is working to remove the existing pump station #1. During construction today, the following task were completed:</p> <ul style="list-style-type: none"> • safety barricades around the excavation area were set up; • all existing electrical wiring and conduits were removed; • the liner termination was exposed to minimize damage; • the pump and associated hardware from the pump station structure were removed, and • the existing valve box was removed. <p>Upon completion of construction activities today, Earthworks has secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>Wet Well #2</u></p> <p>I visually observed the control panel and inside of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 037

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 9

MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning "tailgate" construction meeting conducted by Bryan.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Earthworks manages the leachate bypass system from LCM4 to LCM 8 using an electrical submersible pump. Inflatable plugs were installed into the 6-inch force main; 12 and 18 inch LCM inlet pipes to prevent leachate flow during system modification.</p> <p>Earthworks is working to remove the existing pump station #1 and completes the following:</p> <ul style="list-style-type: none"> • exposed the 6-inch HDPE discharge pipe, the 8-inch HDPE storm water discharge pipe, the 12-inch HDPE inlet pipe from LCM 4, and the 18 inch HDPE inlet pipe from LCM 5; • installed a trench box to access the exposed piping and cut existing piping for removal; • removed existing pump station and associated piping; • installed inflatable plugs to prevent leachate flow into the area; and • pumped groundwater into the onsite surface water infiltration pond. <p>During removal of the exiting pump station, Earthworks identified a deficient condition with the existing 18 inch HDPE inlet piping which connects the pump station to LCM 5. The design elevation for the invert of LCM 5 into the new wet well is 6.50 feet. A field measurement using a benchmark provided by Esaki Surveying and a laser level indicates the as-built elevation is 6.91 feet. The existing elevation is 0.41 feet higher than plan. EP has prepared a Request for Information (RFI) and submitted to Jesse Frey (WMH) to address the issue.</p> <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 038

PROJECT: Kekaha Sanitary Landfill
 LOCATION: Kekaha, Kauai, Hawaii PROJECT NO.: WG1548 TASK NO.: 2.3
 DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.
 DAY OF WEEK: Thursday DATE: DAY: 10 MONTH: May YEAR: 2012
 WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning "tailgate" construction meeting conducted by Bryan Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
1000	I attended weekly construction meeting.
1100	I returned from weekly construction meeting
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were installed into the 6-inch HDPE force main and the 12- and 18-inch-HDPE inlet pipes, to prevent leachate flow into Wet Well #1.</p> <p>During construction today, Earthworks completed following tasks:</p> <ul style="list-style-type: none"> • installed two sections of 14-ft square trench box shoring; • installed a 3-inch suction pump to remove groundwater, • excavated subgrade 8 to 10 inches below the design grade, • placed 3B well graded gravel to the design elevation of approximately 2 feet. <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>Wet Well #2</u></p> <p>During construction today, I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 039

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE: DAY: 11 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning "tailgate" construction meeting conducted by Bryan.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were maintained in the 6-inch HDPE force main and the 12- and 18-inch HDPE inlet pipes to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today, Earthworks completes the following tasks:</p> <ul style="list-style-type: none"> placed 3-inch suction pump in the bottom of the wet well excavation and de-watered the lower section in preparation for concrete ballast; installed the new wet well structure onto the prepared subgrade; prepared form boards 2 feet around the structure and 3 feet from the bottom; and placed 10 cubic yards of lean ready mix concrete directly into prepared form boards. <p>ITC (Earthworks' pipe welding subcontractor) is on site to inspect the plumbing fit up before ballast installation to ensure proper alignment.</p> <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>Wet Well #2</u></p> <p>During construction today, I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 040

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

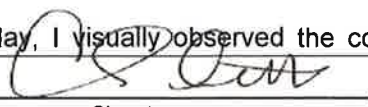
DAY OF WEEK: Monday DATE: DAY: 14 MONTH: May YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning safety "tailgate" meeting. The topic of discussion is Personal Protection Equipment (PPE). Bryan reviews the safety requirements and issues pertaining to PPE while working on the job.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were maintained in the 6-inch HDPE force main and the 12- and 18-inch HDPE inlet pipes to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today, Earthworks completes the following in accordance with the project requirements:</p> <ul style="list-style-type: none"> • operated the 3-inch suction pump in the bottom of the wet well excavation to manage the groundwater, in preparation for form removal and backfill; • removed the wooden form boards and metal staking; • backfilled to the top of the concrete ballast using 3B well graded gravel; • installed 12-inch HDPE coupler to the 6-inch HDPE cleanout which connects LCM 4 to Wet Well #1; • installed 18 inch HDPE coupler to the 6-inch HDPE cleanout which connects LCM 5 to Wet Well #1; and • connected the existing 8-inch HDPE storm drain to Wet Well #1 using electro fusion couplers. <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>Survey</u></p> <p>Charles Soriano (Esaki Party Chief) is on site to provide as built survey of the installed Wet Well #1 structure; piping connections and alignment.</p>
	<p><u>Wet Well #2</u></p> <p>During construction today, I visually observed the control panel and the interior of the new wet well. The</p>

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

PROJECT: Phase II Leachate Management System Modification
LOCATION: Kekaha Landfill

PROJECT NO.: WG1548
DAY/DATE: 14 May 2012

	system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 041

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE: DAY: 15 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) informed me that EP is off site today due to mandatory training of his labor crew.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
	<u>Wet Well #1</u> No work today due to training.
	<u>Wet Well #2</u> I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 042

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday DATE: DAY: 16 MONTH: May YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning "tailgate" construction meeting conducted by Bryan.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were maintained in the 6-inch HDPE force main and the 12-and 18-inch HDPE LCM inlet pipes, to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today, Earthworks completes the following task:</p> <ul style="list-style-type: none"> • began backfilling above the Wet Well #1 concrete ballast system using on-site sand. <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>CQA Sampling and Testing</u></p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2064; MS 596) were measured to be within the calibration range for the instrument.</p> <p>The backfill was placed in 6- to 8-inch loose lifts, moisture conditioned, and then compacted using a walk behind vibratory plate compactor and a "jumping jack" compactor. Several field density tests using the nuclear gauge indicate that the compaction effort meets the project requirements.</p>
	<p><u>Wet Well #2</u></p> <p>During construction today, I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 043

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE: DAY: 17 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning "tailgate" construction meeting conducted by Bryan. Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
1000	I attended the weekly construction meeting
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were maintained in the 6-inch HDPE force main and the 12- and 18-inch HDPE inlet pipes to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today, Earthworks completes the following tasks:</p> <ul style="list-style-type: none"> • continued to backfill around the Wet Well #1 structure; • prepared subgrade beneath the Wet Well # 1 valve box and placed 6 to 8 inches of 3B fine base rock above prepared subgrade; and • installed the Wet Well #1 valve box. <p>ITC welded the 3 inch inlet and discharge lines from Wet Well #1 to existing 6 inch HDPE discharge pipe,</p> <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>CQA Sampling and Testing</u></p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2080; MS 593) were measured to be within the calibration range for the instrument.</p> <p>The backfill was placed in 6- to 8-inch loose lifts, moisture conditioned, and then compacted using a walk behind vibratory plate compactor and a "jumping jack" compactor. Several field density tests using the nuclear gauge indicate that the compaction effort meets the project requirements.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 044

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE: DAY: 18 MONTH: May

YEAR: 2012

WEATHER: Overcast and warm with light rain in the morning.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended the morning "tailgate" construction meeting.
	Equipment on site: Caterpillar 950H loader and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were maintained in the 6-inch HDPE force main and the 12- and 18-inch HDPE inlet pipes to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today, Earthworks completed the following tasks:</p> <ul style="list-style-type: none"> • continued to backfill around the Wet Well #1 structure; • installed form boards 2 feet high, 2 feet around Wet Well # 1 valve box; • poured 4 yards of ready mix lean concrete from O Thronas directly into the prepared Wet Well #1 form boards to construct the wet well ballast; and • installed fittings and pressure gauge to test the Wet Well #1 plumbing connections which were installed by ITC. The plumbing connecting were pressurized to 10 psig for 1 hour. No leaks were observed. <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>CQA Sampling and Testing</u></p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2081; MS 596) were measured to be within the calibration range for the instrument.</p> <p>The backfill was placed in 6- to 8-inch loose lifts, moisture conditioned, and then compacted using a walk behind vibratory plate compactor and a "jumping jack" compactor. Several field density tests using the nuclear gauge indicate that the compaction effort meets the project requirements</p>
	<p><u>Wet Well #2</u></p> <p>During construction today, I visually observed the control panel and the interior of the new wet well. The</p>

Chris Scott 

cc: Mike Minch

Printed Name

Signature

PROJECT: Phase II Leachate Management System Modification
LOCATION: Kekaha Landfill

PROJECT NO.: WG1548
DAY/DATE: 18 May 2012

	system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 045

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday DATE: DAY: 21 MONTH: May YEAR: 2012

WEATHER: Sunny and warm

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is off site today. However, ITC and R Electric are on site.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Inflatable plugs were maintained in the 12 and 18 inch HDPE LCM inlet pipes to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today the following task were competed:</p> <ul style="list-style-type: none"> • ITC removed the force main inflatable plug; • ITC installed the final electro fusion coupler which connects the 3 inch HDPE discharge from the new wet well, to the existing 6 inch HDPE leachate pond discharge pipe. • R-Electric is working to install the electrical conduits and master control panel support system. <p>Upon completion of construction activities today the contractor secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>Wet Well #2</u></p> <p>I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 046

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 22 MONTH: May YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site. R Electric is also on site today. I attended the morning pre-construction "tailgate" meeting.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
	<u>Wet Well #1</u> Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit. Inflatable plugs were maintained in the 12 and 18 inch HDPE LCM inlet pipes to prevent leachate flow during Wet Well #1 system modification. During construction today the following task were performed: <ul style="list-style-type: none"> • R-Electric continued to install the electrical conduits and master control panel support system. R Electric installed the 1 ½ PVC power supply conduit which connects the existing pull box to the new master control panel, and two 1 inch PVC conduits which connect the control wires from the master control panel to the new Wet Well #1 structure. R-Electric also installed the 1 inch PVC conduit from the flow meter valve box to the master control panel, and • EP completed the installation of the pump #1 and #2 rail system and support brackets in preparation for the Surepump installation. <p>Upon completion of construction activities today EP secured the work area around the excavation using temporary fencing and caution tape.</p>
	<u>Wet Well #2</u> I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure..
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 047

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 23 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is off site this morning and will return later today. R Electric is onsite today.
	Equipment on site: Caterpillar 950H loader; and a Komatsu 200 PC Excavator.
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>Inflatable plugs were maintained in the 12 and 18 inch HDPE LCM inlet pipes, to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today the following task were completed:</p> <ul style="list-style-type: none"> • R-Electric placed the ready mix lean concrete around the master control panel support system in preparation for installation of the panel; • R-Electric installed the power supply and power control junction boxes located at the top of Wet Well #1 structure. <p>Upon completion of construction activities today, Earthworks secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>Survey</u></p> <p>Charles Soriano (Esaki Party Chief) is on site to perform the as built survey of the buried electrical conduit.</p>
	<p><u>Wet Well #2</u></p> <p>I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 048

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE: DAY: 24 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site. I attended morning "tailgate" pre-construction meeting. R Electric is also on site today
	Equipment on site: Caterpillar 950H loader The Komatsu 200 PC Excavator was removed from the site today.
	<p><u>Wet Well #1</u></p> <p>Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit.</p> <p>The inflatable plugs were maintained in the 12 and 18 inch HDPE LCM inlet pipes, to prevent leachate flow during Wet Well #1 system modification.</p> <p>During construction today the following task were performed:</p> <ul style="list-style-type: none"> • R-Electric completes the installation of the underground electrical conduits and EP works to backfill the remainder of the excavation, including the electrical conduit trenches; • EP installed both "Surepump" submersible pumps into Wet Well #1. The following information was obtained from the name plate attached to the pumps: SUREPUMP Serial # 11-10293B, and 11-10293D, Model VSD, Series 302, Volts 460, 3 phase 5 HP. <p>The pumps were supplied by EPG Companies Inc. phone number 800 443-7426</p> <p>Upon completion of construction activities today, EP secured the work area around the excavation using temporary fencing and caution tape.</p>
	<p><u>CQA Sampling and Testing</u></p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2073; MS 591) were measured to be within the calibration range for the instrument.</p>

Chris Scott

Printed Name



Signature

cc: Mike Minch

PROJECT: Phase II Leachate Management System Modification
LOCATION: Kekaha Landfill

PROJECT NO.: WG1548
DAY/DATE: 24 May 2012

	<p>Earthworks continues to backfill the space around Wet Well #1 and the electrical conduits using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a walk behind vibratory plate compactor; and a "jumping jack" compactor.</p> <p>Several field density tests using the Troxler nuclear gauge indicate that the compaction effort meets the project requirements.</p>
	<p><u>Wet Well #2</u></p> <p>I visually observed the control panel and the interior of the new wet well. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 049

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday DATE: DAY: 25 MONTH: May YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Earthworks Pacific, Inc. is not on site today. However, R Electric is on site today
	Equipment on site: Caterpillar 950H loader
	<u>Wet Well #1</u> R Electric continues the installation of the electrical component which will operate Wet Well #1. Today, R-Electric completes the installation of the master control panel and is working to pull the new power supply wires and control wires into the panel. Upon completion of construction activities today, R Electric secures the work area around the excavation using temporary fencing and caution tape.
	<u>Wet Well #2</u> I visually observed the control panel and the interior of new Wet Well #2. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: **Mike Minch**



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 050

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 29

MONTH: May

YEAR: 2012

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific, Inc.) is on site. R Electric is also on site
	Equipment on site: Caterpillar 950H loader
	Wet Well #1 Once the area has been vented of hazardous atmospheres, Earthworks manages the leachate bypass system. The system consists of an electric submersible pump which discharges leachate from LCM 4 to LCM 8 via a 2-inch PVC conduit. Inflatable plugs were maintained in the 12 and 18 inch HDPE LCM inlet pipes, to prevent leachate flow during Wet Well #1 system modification. R Electric is on site and continues the installation of the electrical component which will operate Wet Well #1. R-Electric completes the wiring of the new master control panel with exception to the control wires from the existing system which operates the High Level Alarm (HLA) within the leachate pond. EP has submitted a RFI and associated change order to address the issue. Upon completion of construction activities today the contractor secured the work area around the excavation using temporary fencing and caution tape.
	Wet Well #2 I visually observed the control panel and the interior of new Wet Well #2. The system appears to be operating normally and is maintaining the leachate level between 9 and 30 inches above the bottom of the wet well structure.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 051

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday DATE: DAY: 30 MONTH: May YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today. EP's crew is offsite. R Electric is on site
	Equipment on site: Caterpillar 950H loader.
	<u>Wet Well #1</u> R Electric installs the interstitial leak detection sensor. However, the master control panel does not have a means to monitor the sensor output; EP has submitted an RFI for direction.
	Once the final programming was completed to the Wet Well #1 master control panel, EP filled the sump with water using the site water truck. An EPG technician was contacted via phone to run through the start up and verify that the system was functioning properly. Upon completion of the preliminary system operation test, it was determined that the system was performing as designed. (See Start up Demonstration Report, below)
	After the Wet Well # 1 operational test was completed, EP removed all of the inflatable plugs used to control the leachate and restored the system to operational status by removing the lock out / tag out system. John Ruiz (Waste Management District Manager) was informed of the LCRS status.
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Leachate Management System
New Wet Well # 1 System Demonstration Test Report

Date: 30 May 2012

Project: Phase II Leachate Management System Modification

Project Number: WG1548

New Wet Well #1 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric.

EP installed the following: Wet Well #1 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, two Surepump VSD 30-2 submersible pumps with support brackets and guild rail system, 3/16-inch stainless steel support cables, two 3-inch stainless steel discharge pipes, two stainless steel shut-off ball valves, and the Wet Well #1 valve box structure.

R Electric installed the following: 100 feet of 1-inch PVC electrical conduit; EPG L950PT PumpMaster control panel, motor lead breakout junction box, high level sensor, low level sensor, low level shut off sensor and sensor breakout junction box, leak detection conduit and control, and all parts and fitting to provide electrical power to the system.

The primary power for the system was connected to the existing control panel at the New Leachate Evaporation Pond (NLEP).

During construction today new Wet Well #1 was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented;

- High level alarm activates at 50 inches above the floor of the wet well (Elevation 7.32);
- Pump # 1 activates 30 inches above the floor of the wet well (Elevation 5.66) ,
- Pump # 2 activates 40 inches above the floor of the wet well (Elevation 6.49),
- Both pumps 1 and 2 shut-off 9 inches above the floor of the wet well (Elevation 3.91),
- Low level alarm activates 7 inches above the floor of the wet well (Elevation 3.74),
- Both pumps 1 and 2 vents are installed and operational,
- Voltage measured and recorded as 460v, and
- EPG PumpMaster control panel is operational
- Leak detection sensor (note; no verification performed as RFI is required for completion)

The above items apply to Wet Well #1 and do not reflect all of the components required for operations of the full LCRS.

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.: _____

R Electric: _____

Geosyntec Consultants, Inc.: _____

Date: 5-30-12

Date: May 30, 2012

Date: 30 May 2012

DAILY FIELD REPORT

Report Sequence No.: 052

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE: DAY: 31 MONTH: May

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today. The EP crew is offsite. R Electric is onsite.
	Equipment on site: Caterpillar 950H loader.
	<p><u>System Alarm Control</u></p> <p>Bryan (EP) was provided a copy of the Dynatek electrical drawing which identifies how the existing alarm controls panel was constructed. R-Electric is on site to review the existing electric drawing and connect the new Wet Well 1 and 2 control panels to the existing alarm control panel inside the administration building.</p> <p>While tracing the existing LCRS alarm control system, R Electric has identified the following areas of concern which prohibit interface between the existing control panel and the newly installed Wet Well 1 and 2 control panels:</p> <ul style="list-style-type: none"> • The leachate pond panel was modified by others the high alarm for the pond terminates inside the panel located adjacent to the pond; • The pond high alarm system does not interface with the alarm control panel in the administration building; and • The alarm control panel inside the administration building has a "Generator Fault" which trips an audible alarm. The alarm was canceled by removing a safety fuse. The fuse terminates power to the alarm but does not resolve the generator fault. <p>At this time R Electric is currently unable to provide support with the system in its current condition.</p>
1000	I attended the weekly construction meeting.
1100	I returned from the weekly meeting
	Jesse and I walked the site to review the site conditions and current construction activities.
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 053

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 1

MONTH: June

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) is on site today.
	Equipment on site: Caterpillar 950H loader.
	<u>Leachate Collection Manhole 14</u> Earthworks Pacific and the HDPE pipe welder subcontractor ITC are onsite to evaluate the modifications required for LCM14 and the various components required.
1430	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 054

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday DATE: DAY: 2 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Bryan.
	Equipment on site: Caterpillar "mini" Excavator arrived on site today; the Caterpillar Loader was removed from the site
1100	I attended weekly construction meeting.
1145	Returned from weekly construction meeting.
	<p>Construction activities observed today;</p> <p>During construction today, Earthworks completed the following modifications to Leachate Collection Manholes (LCM) 1-7:</p> <ul style="list-style-type: none"> • Installed 8-inch inflatable isolation plugs into the inlet collection pipe for LCMs 1 thru 7; • Vented each LCM using a positive pressure blower and then cleared the space using a grab air Photo Ionizing Detector (PID) to ensure no hazardous atmospheres were present; • Excavated the soil around LCM 2 thru 7 to expose the upper HDPE reducing bell section; • Removed the upper reducing bell sections for LCMs 2 thru 5; • Once the reducing bell section was removed, the subgrades were graded to receive the ready mix lean concrete footing; • Installed reinforcing rebar within the prepared subgrade footing; and • Covered the opening using plywood and barricaded the excavation.
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 055

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 3

MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and four technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Bryan..
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today; During construction today the following modifications to Leachate Collection Manholes (LCM) 1-7 were completed: <ul style="list-style-type: none"> • Re-installed 8-inch inflatable isolation plugs into the inlet collection pipe for LCM's 1 thru 7; • Vented each LCM using a positive pressure blower and then cleared the spaces using a grab air Photo Ionizing Detector (PID) to ensure no hazardous atmospheres were present; • Excavated the soil around LCM 6 and 7 to expose the upper HDPE reducing bell section; • Removed the upper reducing bell section from LCMs 6; • Once the reducing bell section of LCM 6 was removed, the subgrade was graded to received ready mix lean concrete footing; • Installed reinforcing rebar within the prepared subgrade footing; • Installed moisture barrier "water stop" strip around the top of the HDPE riser section; • Poured ready mix lean concrete directly into the prepared foundation footing around LCMs 2 thru 6; and • Covered the opening using plywood and barricaded the excavation.
1800	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 056

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday DATE: DAY: 6 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and four technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Bryan. The topic for discussion was related to confined space entry.
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today; During construction today the following modifications to Leachate Collection Manholes (LCM) 3 and 4 were completed: <ul style="list-style-type: none"> • Initiated confined space permits # 5 and 6, for entry into LCMs 4 and 3 respectively; • Reviewed permit and cleared the confined space for entry; • Set up confined space safety perimeters and air monitoring equipment; • Modified LCM 4 and 3 in accordance with the project requirements; • Closed out confined space permits; and • Secured work area and clean up the work area.
1800	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 057

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii


PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 7 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and four technicians are on site today. I attended morning "tailgate" safety meeting conducted by Bryan (EP)..
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today; During construction today the following modifications to Leachate Collection Manholes (LCM) 2 and 5 were completed; <ul style="list-style-type: none"> • Initiated confined space permits # 7 and 8 for entry into LCMs 2 and 5 respectively; • Reviewed permit and cleared the confined space for entry; • Set up confined space safety perimeters and air monitoring equipment; • Modified LCM 2 in accordance with the project requirements, work will continue on LCM 5 in the morning; • Closed out confined space permits; and • Secured work area and clean up the work area. The remaining confined space permits 8 thru 10 were terminated.
	LCM Concrete Cover Epoxy Coating Honolulu Industrial Coating Company, Inc. (HICCI) is working to coat the underside of the concrete LCM lids. Mark Stiglmeier (EICCI Superintendent) and two technicians are on site today to prep the surface and coat the underside of each of the 12 LCM concrete covers.
1800	I left the site.

Chris Scott 
Printed Name Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 058

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday DATE: DAY: 8 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and four technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Bryan.
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today; During construction today the following modifications to Leachate Collection Manholes (LCM) 5, 6 and 7 were completed: <ul style="list-style-type: none"> • Initiated confined space permits # 11, 12 and 13 for entry into LCM's 5, 6 and 7 respectively; • Reviewed permit and cleared the confined space for entry; • Set up confined space safety perimeters and air monitoring equipment; • Modified LCM 5, 6 and 7 in accordance with RFI 17 and the project requirements; • Closed out confined space permits; and • Secured work area and clean up the work area. Confined space permit 14 was terminated due to non-entry.
1800	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 059

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 9

MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Supervisor) and three technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" Excavator
	<p>Construction activities observed today:</p> <ul style="list-style-type: none"> • EP backfilled around LCM 1 to bring the soil around the manhole structure to grade; • Initiated confined space permits # 16 and 17 for entry into LCM's 4 and 3 respectively; • Set up confined space safety perimeters and air monitoring equipment; • Reviewed permit and cleared the confined space for entry; • Removed 6 inch inflatable isolation plugs from LCM 3 and 4 and installed permanent Fernco caps to complete the system modifications within these two locations; • Closed out confined space permits; and • Secured work area and clean up the work area. <p>Confined space permits 18, 19, 20 and 21 were terminated due to non-entry.</p>
	<p><u>CQA Sampling and Testing</u></p> <p>The contractor backfilled the space around LCM 1 using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor</p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2054; MS 586) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort meets the project requirements.</p>
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 060

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday DATE: DAY: 10 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Supervisor) and three technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" Excavator
	<p>Construction activities observed today:</p> <ul style="list-style-type: none"> • Earthworks initiated confined space permits # 22, 23, 24, 25 and 26 for entry into LCM's 1, 2 5, 6 and 7 respectively; • Set up confined space safety perimeters and air monitoring equipment; • Reviewed permit and cleared the confined space for entry; • Installed HDPE fitting and cleanout riser within LCM 1 in accordance with RFI 17 and the project requirements, then removed 6-inch inflatable isolation plug and installed 3 inch fitting with dust cap; • Removed 6-inch isolation plugs from LCM's 2, 5 and 6 and installed permanent Fernco caps; • Installed HDPE fitting and cleanout riser within LCM 7 in accordance with RFI 17 and the project requirements, then removed 6-inch inflatable isolation plug and installed 3 inch fitting with dust cap; • Closed out confined space permits; and • Secured work area and clean up the work area. <p>All of the inflatable plugs within LCMs 1 thru 7 were removed and permanent Fernco caps were installed.</p>
	<p>Survey</p> <p>Charles Soriano (Esaki Party Chief) is on site to conduct the as built survey of existing liner limits adjacent to LCM 1 thru 7; top of the manhole structures at LCM 2 thru 7, as well as the cleanout risers for LCMs 1 and 7.</p>
1800	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 061

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE: DAY: 13 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Supervisor) and three technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks installed pre-cast reinforced concrete lids for LCMs 2,3,4,and 6 which were sealed using Ram-Nek joint sealant; and • Backfilled LCMs 3 and 4 using on site sand.
	<u>CQA Sampling and Testing</u> Earthworks backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor. I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2060; MS 594) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort meets the project specifications.
1800	I left the site.

Chris Scott
Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 062

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 14 MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Supervisor) and three technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today: <ul style="list-style-type: none">• Earthworks around backfilled LCMs 4 and 6 using on site sand.
	<u>CQA Sampling and Testing</u> Earthworks backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor and a walk-behind vibratory plate compactor. I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2069; MS 593) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort meets the project specifications.
1800	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 063

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 15 MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Supervisor) and two technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" Excavator
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks installed 8 inch inflatable isolation plugs into the leachate collection piping which run from the landfill into LCMs 8, 9, 10, 11, 12 and 13 to manage the leachate and landfill gas during the leachate system modification; and. • Began to excavate to expose the bell reducers at LCMs 8, 9, 10, 11, 12 and 13.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 064

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday DATE: DAY: 16 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Supervisor) and two technicians are on site today. I attended the morning "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" Excavator
1100	I attended weekly construction meeting.
1200	Returned from weekly construction meeting
	<p>Construction activities observed today:</p> <ul style="list-style-type: none"> • Earthworks maintained the air pressure in the 8 inch inflatable isolation plugs which were installed into the leachate collection piping at LCMs 8, 9, 10, 11, 12 and 13 to manage the landfill gas and leachate; and • Removed the 48 inch to 24 inch bell reducers at LCM's 8, 9, 10, 11, and 12 in preparation for modifications.
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 065

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 17

MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

	The contactor is off site today due to the holiday

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 066

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 20

MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, and a Caterpillar loader.
	<p>Construction activities observed today:</p> <ul style="list-style-type: none"> • Earthworks installed 8-inch inflatable isolation plugs into the inlet collection pipe for LCMs 8 thru 13, • vented each LCM using a positive pressure blower and then cleared using a grab air Photo Ionizing Detector (PID) to ensure no hazardous atmospheres were present; • removed the upper reducing bell sections from LCMs 12 and 13; • graded the subgrade around LCMs 8 thru 13 to receive the ready mix lean concrete footing; • installed reinforcing rebar within the prepared subgrade footing; • installed moisture barrier "water stop" strip around the top of the HDPE riser section; • poured ready mix lean concrete directly into the prepared foundation footing around LCMs 7 thru 13; • • nstalled pre-cast reinforced concrete lid for LCM 5 which was sealed using Ram-Nek joint sealant; • backfilled LCM 5 using on site sand; and • covered the opening using plywood and barricaded the excavation.
	<p><u>CQA Sampling and Testing</u></p> <p>The contactor backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor.</p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2060; MS 593) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort meets the project specifications.</p>
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 067

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE: DAY: 21 MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean (EP) No questions of concerns.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today; <ul style="list-style-type: none"> • Earthworks initiated confined space permits # 28 and 29 for entry into LCM's 8 and 9 respectively; • reviewed permit and cleared the confined space for entry; • set up confined space safety perimeters and air monitoring equipment; • modified LCM 8 and 9 in accordance with RFI 3 and the project requirements; • closed out confined space permits, • backfilled LCM 7 using on site sand; and • secured work area.
	Survey Charles Soriano (Esaki Party Chief) and one assistant are on site to conduct the as built survey of existing liner limits adjacent to LCM 8 thru 13 and the top of the manhole structures at LCM 8 thru 13.
	CQA Sampling and Testing The contractor backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a pad footed "jumping jack" walk behind compactor and a walk behind vibratory plate compactor I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2058; MS 591) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicate that the compaction effort meets the project specifications.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 068

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 22 MONTH: August

YEAR: 2012

WEATHER: Sunny and warm today.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader.
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks initiated confined space permits # 30 and 31 for entry into LCMs 10 and 11 respectively; • reviewed permit and cleared the confined space for entry; • set up confined space safety perimeters and air monitoring equipment; • modified LCM 10 and 11 in accordance with RFI 3, 18 and the project requirements; • closed out confined space permits; • initiated confined space permit # 32 for entry into LCM 12. The permit was terminated without completing the work as the shift ended; and • secured work area and clean up the work area.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 069

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday DATE: DAY: 23 MONTH: August YEAR: 2012

WEATHER: Sunny and warm today.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator and a Caterpillar loader.
1100	I attended the weekly construction meeting.
1200	Returned from weekly construction meeting.
	<p>Construction activities observed today:</p> <ul style="list-style-type: none"> • Earthworks initiated confined space permits # 32 and 33 for entry into LCMs 12 and 13 respectively; • reviewed permit and cleared the confined space for entry; • set up confined space safety perimeters and air monitoring equipment; • modified LCM 12 and 13 in accordance with RFIs 3 and 18 and the project requirements; • closed out confined space permits; • initiated confined space permit # 34, 35 and 36 for entry into LCM 8, 9 and 10 respectively; • reviewed permit and cleared the confined space for entry; • set up confined space safety perimeters and air monitoring equipment; • removed the temporary inflatable isolation plugs and installed the permanent Fernco caps to seal the leachate collection system; • closed out confined space permits; and • secured the work area.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 070

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday DATE: DAY: 24 MONTH: August YEAR: 2012

WEATHER: Overcast and warm with rain in the afternoon.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks backfilled LCM 8 using onsite sand; and • backfilled around LCM 9 using a combination of onsite sand in the lower 3 to 4 feet, and 3B fines (course gravel) in the upper 2 feet.
	<u>CQA Sampling and Testing</u> The contractor backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor and a walk behind vibratory plate compactor. I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2071; MS 592) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort met the project specifications.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 071

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday DATE: DAY: 27 MONTH: August YEAR: 2012

WEATHER: Sunny and warm.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, Bomag BW-90AD2 dual steel drum roller, and a water truck
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks backfilled above LCM 10 using onsite sand
	<u>CQA Sampling and Testing</u> Earthworks backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor and a walk behind vibratory plate compactor. I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2069; MS 587) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort met the project specifications.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 072

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 28 MONTH: August YEAR: 2012

WEATHER: Sunny and warm.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, Bomag BW-90AD2 dual steel drum roller, and a water truck
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks initiated confined space permits # 39 and 40 for entry into LCMs 11 and 12 respectively; • reviewed permit and cleared the confined space for entry; • set up confined space safety perimeters and air monitoring equipment; • removed temporary inflatable isolation plugs and installed permanent Fernco cap within LCM 11 and 12 in accordance with the project requirements; • closed out confined space permits; and • secured work area.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 073

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday DATE: DAY: 29 MONTH: August YEAR: 2012

WEATHER: Sunny and warm.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean (EP) No questions of concerns.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, Bomag BW-90AD2 dual steel drum roller, and a water truck
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks installed pre-cast reinforced concrete lids for LCM 11 and 12 which were sealed using Ram-Nek joint sealant; • Backfilled around LCM 11 and 12 using on site sand.
	<u>CQA Sampling and Testing</u> The contractor backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor. I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2069; MS 598) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort met the project specifications.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 074

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 30

MONTH: August

YEAR: 2012

WEATHER: Sunny and warm.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, Bomag BW-90AD2 dual steel drum roller, and a water truck
1030	Mike Minch (Geosyntec Consultants) arrived on site to attend weekly construction meeting.
1100	Mike and I attended weekly construction meeting.
1200	Returned from weekly construction meeting.
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks installed the totalizing flow meter into the Wet Well #1 valve box; and • installed the totalizing flow meter into the Wet Well #2 valve box. Both totaling flow meters were configured as shown in RFI 006 R1 construction detail.
1500	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 075

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 31

MONTH: August

YEAR: 2012

WEATHER: Sunny and warm.

0600	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, Bomag BW-90AD2 dual steel drum roller, and a water truck
	Construction activities observed today: <ul style="list-style-type: none"> • Earthworks completed the surface completion around Wet Well #1 and #2; • replaced level transducer in Wet Well 2 and returned system to operational condition; and • installed ecology blocks to barricade around Wet Well 1.
1530	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 076

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday DATE: DAY: 4 MONTH: September YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, Bomag BW-90AD2 dual steel drum roller, and a water truck
	Construction activities observed today During construction today Earthworks began to modify LCM 14 in accordance with RFI 14-R1. The following activities were completed: <ul style="list-style-type: none"> • Earthworks manually pumped Wet Well #3 to 25 inches of water and implemented lock out/tag out of Wet Well #3 pumping system to I prevent flow into LCM 14 during system modifications; • installed concrete barriers along the access road to prevent access during construction; • installed inflatable isolation plugs into LCM 13, LCM 14 and Cell 1D to prevent landfill gas and leachate from entering work space; • excavated the soil around LCM 14 upper bell section; and • protected work area and cleaned up site.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 077

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday DATE: DAY: 5 MONTH: September YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck Equipment removed from the site; Bomag BW-90AD2 dual steel drum roller
	Construction activities observed today Earthworks continues working to modify LCM 14 in accordance with RFI 14-R1. The following activities were completed: <ul style="list-style-type: none"> • Earthworks monitored Wet Well #3 to maintain levels within the operation range and continued the lock out/tag out procedures to prevent flow into LCM 14 during system modifications; • removed the LCM 14 upper 48 inch to 24 inch HDPE bell section; • fit up lower HDPE tee section to connect the system together; and • protected work area and cleaned up site. ITC (HDPE Pipe Welding Subcontractor) was onsite and measured the HDPE tee fitting for modifications and removed the HDPE tee section to complete the tee modification off site.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 078

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 6

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific Superintendent) and three technicians are on site today.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
1100	I attended weekly construction meeting.
1200	Returned from weekly construction meeting.
	<p>Construction activities observed today:</p> <p>Earthworks continues working to modify LCM 14 in accordance with RFI 14-R1. The following activities were performed:</p> <ul style="list-style-type: none"> • Earthworks monitored Wet Well #3 to maintain levels within the operation range and continued the lock out/tag out procedures to prevent flow into LCM 14 during system modifications; • maintained the inflatable isolation plugs into LCM 13, LCM 14 and Cell 1D to prevent landfill gas and leachate from entering work space; • continued working to modify LCM 14 pipe sections in accordance with RFI 14-R1; • installed "Confined Space Do Not Enter" signs along the access road adjacent to LCMs 1 thru 12, and • protected work area and cleaned up site
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 079

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 7

MONTH: September

YEAR: 2012

WEATHER: Overcast and cool with light rain during the morning.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Sean. ITC is also onsite.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today: Earthworks continues working to modify LCM 14 in accordance with RFI 14-R1. The following activities were performed: <ul style="list-style-type: none"> • Earthworks monitored Wet Well #3 to maintain levels within the operation range and continued the lock out/tag out procedures to prevent flow into LCM 14 during system modifications; • backfilled the excavation around LCM 14 riser section using 3B (Course poorly graded gravel); • entered LCM 14 under permit required confined space permit #44, and installed various fitting and connections to modify the system in accordance with RFI 14R1; • terminated CSP permit #44; and • protected work area and cleaned up site. ITC welded the 48 inch HDPE barrel section to the existing LCM 14 48 inch HDPE lower riser section.
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 080

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE: DAY: 10 MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Bryan Davidson (Earthworks Pacific Superintendent) and three technicians are on site today. I attended weekly "tailgate" safety meeting conducted by Bryan. R Electric is also onsite today.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	<p>Construction activities observed today:</p> <p>Earthworks continues working to modify LCM 14 in accordance with RFI 14-R1. The following activities were performed:</p> <ul style="list-style-type: none"> • Earthworks monitored Wet Well #3 to maintain levels within the operation range and continued the lock out/tag out procedures to prevent flow into LCM 14 during system modifications; • initiated confined space permit #46 for entry into LCM 14; • cleared the confined space of hazardous atmosphere using a ventilator and monitored the space with a Photo Ionizing Detector (PID); • entered LCM 14 removed the temporary inflatable isolation plugs and installed permanent pipe connections and fittings to complete the LCM 14 system modifications in accordance with RFI 14-1-R1; • terminated confined space permit #46; and • removed the log out/tag out from Wet Well #3 and restored the system to normal operations. <p>R-Electric (Subcontractor) is on site to complete the installation of the totalizing flow meters, and interstitial space control within Wet Wells 1 and 2.</p>
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 081

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 11

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific) is on site.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	No work was completed by Earthworks today
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 082

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 12

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific) is on site. R Electric is also onsite today.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today: R Electric works to install the interstitial space control modification in Wet Well 1 and 2.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 083

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 13

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific) is on site. R Electric is also onsite today
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
1100	I attended weekly construction meeting.
1200	Returned from weekly construction meeting
	Construction activities observed today: R Electric continues to install the interstitial space control modification in Wet Well 1 and 2.
1630	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 084

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 14

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Sean Fisher (Earthworks Pacific) is on site. R Electric is also onsite today
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today: R Electric continues to install the interstitial space control modification in Wet Well 1 and 2.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 085

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 17

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Earthwork Pacific is not on site today. R Electric is onsite today
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today: R Electric continues to install the interstitial space control modification in Wet Well 1 and 2
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 086

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 18

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Bryan Davidson (Earthwork Pacific) is on site today. R Electric is also onsite today.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Construction activities observed today: <ul style="list-style-type: none"> R Electric completes the installation of the the interstitial space control modification for Wet Well 1 and 2. A field tests was conducted to verify that the control system for the interstitial space is working correctly. R Electric removed the interstitial space sensor from both Wet Wells 1 and 2 and then placed the sensors in water to activate the alarm. Once the alarm was verified to be operational the sensor was restored. The system demonstration tests verified that the alarms for the interstitial space control were working correctly.
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 087

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday DATE: DAY: 19 MONTH: September YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Earthwork Pacific is not on site today
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
	Earthworks does not complete any work onsite today
1630	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 088

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 20

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

1030	I arrived on site.
	Bryan Davidson (Earthwork Pacific) is already on site
	Hari Sharma and Mike Minch (Geosyntec) are on site to attend the weekly construction meeting and review the final, completed system for certification.
	Equipment on site: Caterpillar "mini" excavator, Caterpillar loader, and a water truck
1100	Hari, Mike and I attend weekly construction meeting and discuss the completed system, and the remaining items/punch list.
1200	Returned from meeting
1330	Left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 089

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 21

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
	Bryan Davidson Earthwork Pacific is not on site today.
	Earthworks does not complete any onsite work today.
1330	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 090

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 24

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
	Bryan Davidson Earthwork Pacific is not on site today.
	Earthworks does not complete any work on site today.
1630	Left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 091

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 22

MONTH: September

YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
	Bryan Davidson Earthwork Pacific and two technicians are on site today
	<p>Construction activities observed today:</p> <ul style="list-style-type: none"> • Earthworks initiated confined space permit # 48 for entry into LCM 13; • reviewed permit and cleared the confined space for entry; • set up confined space safety perimeters and air monitoring equipment; • removed temporary inflatable isolation plugs and installed permanent Fernco cap within LCM 13 in accordance with the project requirements; • closed out confined space permits, and • secured work area. <p>EP received the submersible pump from EPG today, which was sent back for repair and then installed into Wet Well #1. Howard Lester from EPG is due to be onsite and will verify correct operations.</p>
	<p><u>CQA Sampling and Testing</u></p> <p>Earthworks backfilled above the pre-cast concrete lids using on site sand. The fill was placed in 6 to 8 inch loose lifts; moisture conditioned then compacted using a "jumping jack" compactor.</p> <p>I calibrated the Troxler nuclear moisture/density gauge using a standard block; both readings (DS 2062; MS 591) were measured to be within the calibration range for the instrument. Several field density tests using the Troxler nuclear gauge indicated that the compaction effort met the project specifications.</p>
1630	Left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 092

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 26

MONTH: September

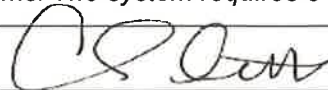
YEAR: 2012

WEATHER: Sunny and warm.

0630	I arrived on site.
	Bryan Davidson Earthwork Pacific and one technician are on site today
0800	<p>Howard Lester (EPG Technician) is on site today to inspect and certify the Wet Well 1 and 2 pumping system installation and operation. The inspection findings were:</p> <p><u>Wet Well # 1</u></p> <ul style="list-style-type: none"> • System controls and electrical panel installation meet or exceed manufacture's requirements, requirements, with exception to ground. <i>(Note: ground was measured in the field to be 45 to 50 ohms. The system requires 3 ohms for normal operation)</i> EPG recommends correct grounding issue and reduce the ground to 3 ohms, • Pump 1 damaged and EPG recommends replacement, • Pump 2 damaged and EPG recommends replacement, • Visual inspection for the installation of pump 1 and 2 indicates that the screen inlet within the pump shroud should always be submerged to prevent air from entering the pump intake, • EPG recommends changing the low level pump shut off from design set point of 9 inches above the bottom of the wet well to 14 inches, this will maintain the water level above the screen • During inspection of totalizing flow meter control, a fuse was found to be defective within the panel, a new fuse devise was installed which corrected the flow meter operation. <i>(Note: this condition could be a result of the high ground issue noted above)</i> • Totalizing flow meter was set to the system requirements for 3 inch discharge and to measure gallons per minute and also record the total gallons pumped. • EPG inspected the interstitial space control modification and found no exceptions. Interstitial space operation was previously tested by R Electric and verified by me.
	<p><u>Wet Well # 2</u></p> <ul style="list-style-type: none"> • System controls and electrical panel installation meets or exceeds manufacture's requirements, with exception to ground. <i>(Note: ground was measured in the field to be 65 to 70 ohms. The system requires 3 ohms for normal operation),</i>

Chris Scott

Printed Name



Signature

cc: Mike Minch

PROJECT: Phase II Leachate Management System Modification
LOCATION: Kekaha Landfill

PROJECT NO.: WG1548
DAY/DATE: 26 September 2012

	<ul style="list-style-type: none">• EPG recommends correct grounding issue and reduce the ground to 3 ohms,• Pump 1 and 2 show normal operation pumping 200+ gpm,• Visual inspection of the installation of pump 1 and 2 indicates that the screen inlet within the pump shroud should always be submerged to prevent air from entering the pump intake,• EPG recommends changing the low level pump shut off from design set point of 9 inches above the bottom of the wet well to 14 inches, this will maintain the water level above the screen• Totalizing flow meter was set to the system requirements for 3 inch discharge and to measure gallons per minute and also record the total gallons pumped.• EPG inspected the interstitial space control modification and found no exceptions. Interstitial space operation was previously tested by R Electric and verified by me.
1730	Left the site.

Chris Scott _____
Printed Name Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 093

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTORS: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 5

MONTH: February

YEAR: 2013

WEATHER: Sunny and warm.

0700	I arrived on site.
1400	Bryan Davidson Earthwork Pacific is on site to maintenance Wet Well 2 and check system operating perimeters for both Wet Wells 1 and 2.
	<p>During System operation of Wet Well #1 the following perimeters were tested and verified:</p> <ul style="list-style-type: none"> Adjusted all operational system set points in accordance with email which was provided by AECOM dated 10 December 2012. All levels were adjusted 1.25 inches which reflects the difference between the floor of the wet well and the bottom of the sump strainer. Verified that new electrical control wires were installed to meet the project requirements, and Verified that the system ground was installed from the exiting main control power inside the maintenance to the Wet Well #1 control panel.
	<p>During System operation of Wet Well #2 the following perimeters were tested and verified:</p> <ul style="list-style-type: none"> Installed new operation system level transducer, adjusted offset of the transducer to compensate for the water level based on the difference between the floor of the wet well and the bottom of the level transduce. (approximately 8 inches) Adjusted all operational system set points in accordance with email which was provided by AECOM dated 10 December 2012. All levels were adjusted 1.25 inches which reflectss the difference between the floor of the wet well and the bottom of the sump strainer, and Verified that new electrical control wires were installed to meet the project requirements, Verified that the system ground was installed from the exiting main control power inside the maintenance to the Wet Well #1 control panel.
1630	Left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 094

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE: DAY: 29 MONTH: April

YEAR: 2013

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	Bryan Davidson of Earthwork Pacific is on site to implement system operation tests per Paul Wintheiser's (AECOM) e-mail dated 25 April 2013 and to replace one leachate pump in each Wet Well #1 and #2.
	<p>Wet Well #1</p> <p>Per AECOM's email, the following system test procedures were performed:</p> <ul style="list-style-type: none"> Installed a pressure gauge (Pasco 2-1/2" 60-psi liquid filled gauge) with a 1/4" brass connection at the high point of the discharge line. The pressure gauge fitting was equipped with a tee and an air bleed valve as described in Section 4B of AECOM's email. Removed the existing level transducer and replaced with a new level transducer. Once the new level transducer was installed, Bryan Davidson contacted Joe (EPG Service Technician) to calibrate transducer. The offset was adjusted to read -36.8 with an offset scale adjusted to 0.8660 as requested by Joe. Once the calibration was completed, the level transducer was placed into a bucket of water. The water level in the bucket was measured to be 8.5 inches. After the adjustments were made and the calibration was completed, the control panel was energized and the readout display indicated that the water level in the bucket was 8.7 inches. Joe confirmed that the transducer was operating within its normal accuracy. Once the level transducer was calibrated the level transducer was then offset 7 inches from the bottom of the wet well while still providing an actual water level inside the wet well as requested by Paul. This adjustment will keep silt from accumulating on the level transducer Once the calibration was completed, Earthworks removed the defective pump and motor within Wet Well #1 and replaced with a new pump (Franklin Electric Model #2343278802 5HP). In addition to a new pump and motor, a new vent valve and hose were installed. <p>Wet Well #2</p> <ul style="list-style-type: none"> Earthworks then replaced the defective pump in Wet Well #2 with a new one (Franklin Electric. Model #2343278802 5HP). In addition to a new pump and motor a new vent valve and hose were installed.
1630	Left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch

Written by: Cyrus Scott

Date: ___/___/___
DD MM YY

Reviewed by: _____

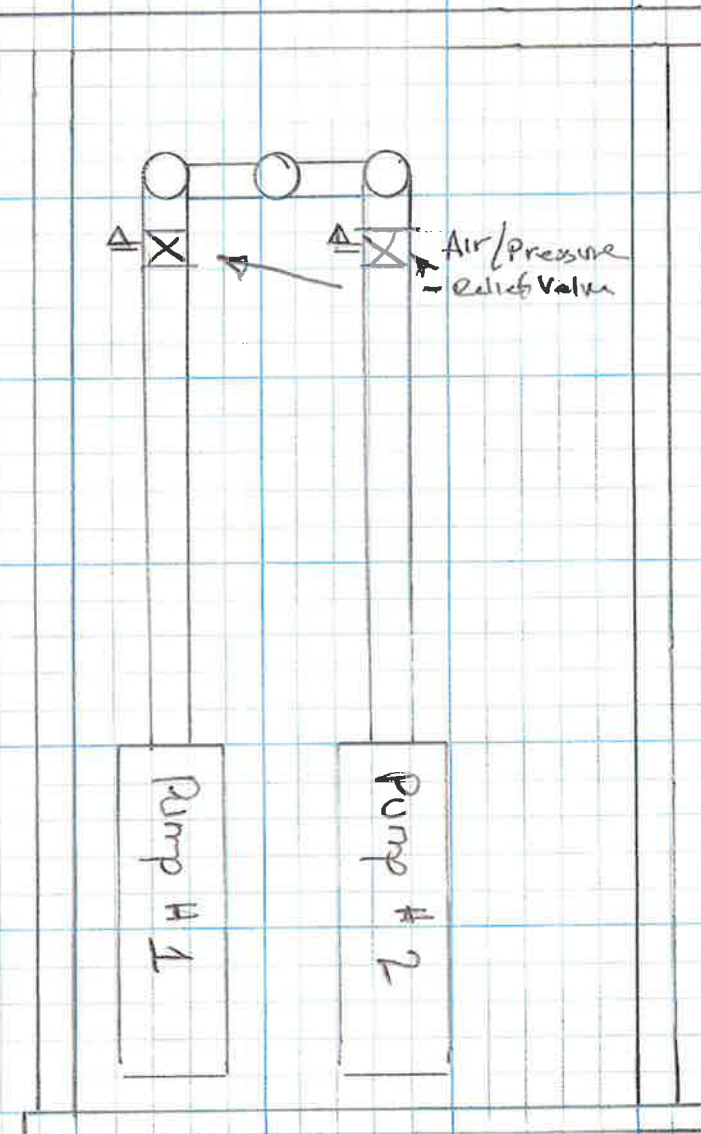
Date: ___/___/___
DD MM YY

Client: WM

Project: KEKANA

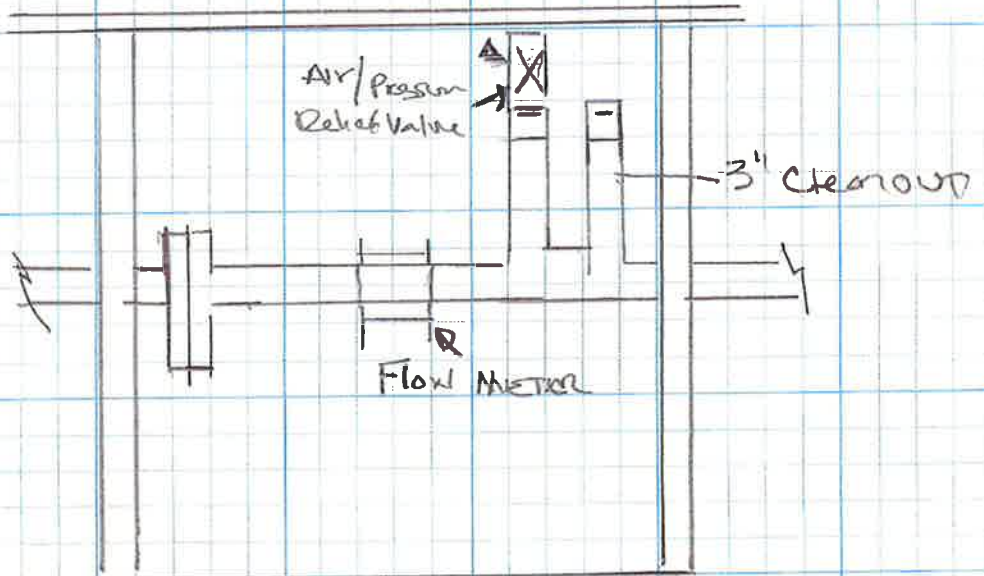
Project/Proposal No. _____

Task No. _____



WET Well # 1 & 2
N.T.S

Written by: CHRIS S WOOD Date: ____ / ____ / ____ Reviewed by: _____ Date: ____ / ____ / ____
DD MM YY DD MM YY
Client: NYM Project: Kekaha Project/Proposal No. _____ Task No. _____



VALVE BOX 1 & 2
NJS



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 095

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 30

MONTH: April

YEAR: 2013

WEATHER: Sunny and warm.

0630

I arrived on site. Bryan Davidson of Earthwork Pacific is already on site to continue system operation tests per Paul Wintheiser's (AECOM) e-mail dated 25 April 2013

Wet Well #1

Per AECOM's email, the following system test procedures were performed:

- During inspection of the control panel, I requested that Ryan (EPG Service Technician) review the set points within the totalizing flow meter. Upon his review of the set points, Ryan determined that the totalizing flow meter required additional adjustment to properly read the flow. Once the C-Scaler and R-Scaler were adjusted, the totalizing flow meter was set to read gallons per minute (gpm) and configured for the 3-inch schedule 80 PVC pipe as installed.
- Once the control panel set points were re-set, Ryan walked Bryan through the process of adjusting the set points of the variable frequency drive (VFD) which will operate the SurePump control from 60 hertz to 40 hertz, as requested in section 4A of AECOM's 25 April.
- After both the level transducer (calibrated yesterday), totalizing flow meter, and VFD set points were calibrated and adjusted the following system parameters were documented during the startup tests:

Operating Parameters:

- Per Section 4B of AECOM's email, a pressure gauge with a tee was installed at the high point of the discharge piping and a bleed valve installed at one end of the tee.

Pump #1 was energized and the partially-opened bleed valve discharged air for less than 3 seconds. The air was forced out of the valve followed by water. With the bleed valve closed, the pressure gauge then indicated that the pump was operating at 4 psi and the totalizing flow meter at the control panel indicates a flow of 130 gpm. The totalizing flow meter at the new leachate evaporation pond (NLEP) indicates that Pump #1 discharges at 126 gpm. The Pump #1 operating system voltage measurements from the VFD display were 313 volts and 5.20 amps. Once all of the tests were completed, the pump was de-energized.

Pump #2 was energized and the partially-opened bleed valve discharged air for less than 3 seconds. The air was forced out of the valve followed by water. With the bleed valve closed, the pressure gauge indicated that the pump was operating at 4 psi and the totalizing flow meter at the control panel indicates a flow of 128 gpm. The totalizing flow meter at the NLEP indicates that Pump #2 discharges at 123 gpm. The Pump #2 operating system voltage measurements from the VFD display were 315 volts and 5.53 amps. Once all of the tests were completed, the pump was de-energized.

Both Wet Well # 1; pumps 1 and 2 were energized at the same time and the flow readings were measured to be 215 gpm at the control panel and 186 gpm at the NLEP.

Chris Scott

Printed Name

Signature

cc: Mike Minch

	<p>During system operational tests, an air-lock was then observed in the discharge line of the pumping system. This prevented Pump #1 from pumping water, but allowed the pump to free spin. Upon removal of the air pressure gauge, the trapped air was released and the pump resumed operation.</p> <p>Upon completion of today's Wet Well #1 system test, all of the system operation tests results were discussed with Paul Wintheiser via telephone conversation.</p> <p><u>Wet Well #2</u></p> <ul style="list-style-type: none">• With the new pump installed into Wet Well #2, Bryan removed the Wet Well #2 level transducer to clean and calibrate it. Bryan contacted Ryan of EPG to calibrate transducer. The offset was adjusted to read -36.8 with an offset scale adjusted to 0.8660 as requested by Ryan. Once the calibration was completed, the level transducer was placed into a bucket of water. The water level in the bucket was measured to be 8.0 inches. After the adjustments were made and the calibration was completed, the control panel was energized and the readout display indicated that the water level in the bucket was 8.0 inches. Ryan confirmed that the transducer was operating within its normal accuracy. Once the level transducer was calibrated the level transducer was then installed 7 inches from the bottom of the wet well while still providing an actual water level inside of the wet well, as requested by Paul. This adjustment is intended to keep silt from accumulating on the body of the transducer.• During inspection to the control panel, I requested that Ryan review the set points within the totalizing flow meter. Upon his review of the set points, Ryan determined that the totalizing flow meter was set to read gallons per minute (gpm) and configured for 3 inch schedule 80 PVC pipe as installed.• With the control panel set points were completed, Ryan walked Bryan through the process of adjusting the set points of the variable frequency drive (VFD) which will operate the SurePump control from 60 hertz to 40 hertz, as requested in Section 4A of AECOM's email.• During operational tests of Wet Well #2, a short within the ACD2 VFD prevented further testing. Bryan then works to find a replacement Power Flex 40 VFD
1630	Left the site.

Chris Scott
Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 096

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
 Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 1

MONTH: May

YEAR: 2013

WEATHER: Sunny and warm.

0700	<p>I arrived on site. Bryan Davidson of Earthworks Pacific is off site and is in the process of acquiring a new variable frequency drive.</p> <p><u>Miscellaneous:</u></p> <ul style="list-style-type: none"> I contacted Paul Wintheiser (AECOM) via telephone. Paul's review of the previous tests results confirms the need to install air and vacuum (a/v) relief valves on the both of the 3 inch discharge pipes. The recommendation was made to incorporate the a/v relief valves for both Wet Wells 1 and 2. Based on Paul's recommendation, I contacted Bryan and requested that a submittal be prepared for approval. Bryan is working to locate the requested a/v relief valves and prepare a submittal. Paul has also requested that leachate level measurements within Wet Wells 1 and 2 be obtained from the level transducer control panel display. Paul will use the levels to estimate the flow rate from the landfill into the Wet Wells. <p>I collected the following information today:</p> <table border="1"> <thead> <tr> <th>Date:</th> <th>Time:</th> <th>Wet Well:</th> <th>Leachate Level:</th> </tr> </thead> <tbody> <tr> <td>1 May 2013</td> <td>1115</td> <td>1</td> <td>36.0 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1215</td> <td>1</td> <td>36.1 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1315</td> <td>1</td> <td>36.2 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1415</td> <td>1</td> <td>36.4 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1116</td> <td>2</td> <td>46.8 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1216</td> <td>2</td> <td>46.9 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1316</td> <td>2</td> <td>47.0 inches</td> </tr> <tr> <td>1 May 2013</td> <td>1416</td> <td>2</td> <td>47.2 inches</td> </tr> </tbody> </table> <p>In addition to the above actual readings, I obtained the following measurements from site personnel taken at the beginning and end of the month. These readings were collected from the totalizing flow meter located on the discharge piping into the New Leachate Evaporation Pond. (NLEP). The readings were collected and documented by the site and are representative of the cumulative leachate flow from Wet Wells 1, 2 and 3 during 2013.</p> <table border="1"> <tbody> <tr> <td>1 Jan 2013 – 3,780,002 gallons;</td> <td>31 January 2013 – 3,794,884 gallons</td> <td>14,882 gallons for Jan 2013</td> </tr> <tr> <td>1 Feb 2013 – 3,794,884 gallons;</td> <td>28 February 2013 – 3,802,688 gallons</td> <td>7,804 gallons for Feb 2013</td> </tr> <tr> <td>1 Mar 2013 – 3,802,688 gallons;</td> <td>31 March 2013 – 3,811,911 gallons</td> <td>9,223 gallons for Mar 2013</td> </tr> <tr> <td>1 Apr 2013 – 3,811,911 gallons;</td> <td>30 April 2013 – 3,818,460 gallons</td> <td>6,549 gallons for Apr 2013</td> </tr> </tbody> </table>	Date:	Time:	Wet Well:	Leachate Level:	1 May 2013	1115	1	36.0 inches	1 May 2013	1215	1	36.1 inches	1 May 2013	1315	1	36.2 inches	1 May 2013	1415	1	36.4 inches	1 May 2013	1116	2	46.8 inches	1 May 2013	1216	2	46.9 inches	1 May 2013	1316	2	47.0 inches	1 May 2013	1416	2	47.2 inches	1 Jan 2013 – 3,780,002 gallons;	31 January 2013 – 3,794,884 gallons	14,882 gallons for Jan 2013	1 Feb 2013 – 3,794,884 gallons;	28 February 2013 – 3,802,688 gallons	7,804 gallons for Feb 2013	1 Mar 2013 – 3,802,688 gallons;	31 March 2013 – 3,811,911 gallons	9,223 gallons for Mar 2013	1 Apr 2013 – 3,811,911 gallons;	30 April 2013 – 3,818,460 gallons	6,549 gallons for Apr 2013
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1630	<p>Left the site.</p>																																																

Chris Scott

Printed Name

Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 097

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 2

MONTH: May

YEAR: 2013

WEATHER: Sunny and warm.

0600	I arrived on site to begin taking water level measurements as requested by AECOM.																																				
0700	Bryan Davidson of Earthwork Pacific arrives on site implement system operation tests per Paul Wintheiser's (AECOM) e-mail dated 25 April 2013, and to install a new variable frequency drive (VFD) within the Wet Well 2 control panel to replace the one which shorted during testing on Tuesday.																																				
0745	Tommy (R-Electric Electrician) is on site to install the new VFD and to verify that additional electrical components inside the Wet Well 2 control panel were not damaged due to the electrical short.																																				
	<p><u>Miscellaneous:</u></p> <ul style="list-style-type: none"> Paul had requested that leachate levels within Wet Wells 1 and 2 be measured using the level transducer control panel display. The information will be used to establish a flow rate from the landfill into the wet wells. <p>I collected the following information today:</p> <table border="1"> <thead> <tr> <th>Date:</th> <th>Time:</th> <th>Wet Well:</th> <th>Leachate Level:</th> </tr> </thead> <tbody> <tr> <td>2 May 2013</td> <td>0615</td> <td>1</td> <td>39.6 inches</td> </tr> <tr> <td>2 May 2013</td> <td>0715</td> <td>1</td> <td>39.6 inches</td> </tr> <tr> <td>2 May 2013</td> <td>0815</td> <td>1</td> <td>39.6 inches</td> </tr> <tr> <td>2 May 2013</td> <td>0915</td> <td>1</td> <td>39.8 inches</td> </tr> <tr> <td>2 May 2013</td> <td>1015</td> <td>1</td> <td>39.9 inches</td> </tr> <tr> <td>2 May 2013</td> <td>1115</td> <td>1</td> <td>40.1 inches</td> </tr> <tr> <td>2 May 2013</td> <td>1215</td> <td>1</td> <td>40.1 inches</td> </tr> <tr> <td>2 May 2013</td> <td>1315</td> <td>1</td> <td>40.2 inches</td> </tr> </tbody> </table> <p>Due to system repairs and electrical shut down, no readings were collected at Wet Well #2 today.</p>	Date:	Time:	Wet Well:	Leachate Level:	2 May 2013	0615	1	39.6 inches	2 May 2013	0715	1	39.6 inches	2 May 2013	0815	1	39.6 inches	2 May 2013	0915	1	39.8 inches	2 May 2013	1015	1	39.9 inches	2 May 2013	1115	1	40.1 inches	2 May 2013	1215	1	40.1 inches	2 May 2013	1315	1	40.2 inches
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1000	I attended the weekly conference call to discuss construction activities to date.																																				
	<p><i>Wet Well #2</i></p> <ul style="list-style-type: none"> During installation of the new VFD, several problems arose which required R-Electric, Earthworks Pacific, EPG, and the VFD supplier to conference call in order to work out the electrical malfunction during installation. After blowing several 20 amp slow-blow fuses inside the main control panel, a wiring issue was resolved to allow power to the VFD and service to the SurePump control system. Once the electrical issue was resolved, Howard (EPG's Technician) provided technical guidance by phone in programming the VFD to operate within the system parameters. With the factory settings for the VFD adjusted, Pump 																																				

Chris Scott

Printed Name



Signature

cc: Mike Minch

PROJECT: Phase II Leachate Management System Modification
LOCATION: Kekaha Landfill

PROJECT NO.: WG1548
DAY/DATE: 2 May 2013

	<p>#1 was activated and confirmed to pump leachate to the New Leachate Evaporation Pond (NLEP). Pump #1 was de-energized and Pump #2 was activated. The pump was observed to energize but would not pump leachate. Upon inspection of the pump and control panel, no deficiencies were visually observed. Following EPG's recommendation, Earthworks Pacific called a service truck to the site to remove the pump and discharge piping and then "jiggle" the pump to possibly dislodge the internal check valve. This procedure was ineffective in resolving the issue.</p> <p>After several attempts to operate the pump failed, Earthworks Pacific pulled the pump from the wet well and disassembled the pump only to find no visual defects in the pumping system. Earthworks then reassembled the pump (while then entire operation was witnessed by EPG via streaming video) without the outer shroud the pump was loaded into the wet well, submerging the entire pump assembly. The pump was energized the pump discharge, a large volume of water directly into the wet well. After cycling the pump several times the pump was removed deemed repaired and operational.</p> <p>The Earthworks Pacific mechanic re-assembled the outer shroud and installed the pump into the system. When Pump #2 was energized the pump again spun but would not pump leachate.</p> <p>The entire process was repeated a second time (again under the supervision of EPG) with the same results.</p> <p>Upon leaving the site this evening, the pump was not working and no explanation was suggested by EPG to explain why the pump works in absence of the shroud and does not perform with the shroud installed and connected to the pumping system.</p> <p>No additional system operation tests were performed today.</p>
1730	Left the site.

Chris Scott
Printed Name


Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 098

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 2

MONTH: May

YEAR: 2013

WEATHER: Overcast and warm with rain..

0800	I arrived on site. Bryan Davidson of Earthwork Pacific is offsite picking up the air and vacuum (a/v) relief valves.
1000	Due to the system malfunctions during yesterday's system tests, Donald Fujimoto (County of Kauai) has requested that all available representatives from County of Kauai, AECOM, EPG, Waste Management, and Geosyntec attend a 10 AM conference call to discuss the system tests and how to repair the malfunction. I attend the conference call. During the meeting, Joe (EPG) agrees to ship a new replacement pump to the site (via next day air) in order to get the system operational. Joe also recommends that the newly installed VFD be crossed-checked to verify that the new VFD is not defective.
	<p><i>Wet Well #1</i></p> <ul style="list-style-type: none"> Earthworks Pacific installs two new a/v relief valves within Wet Well #1. The air and vacuum valves are installed using a 3-inch ROMAC pipe saddle on the 3-inch stainless steel discharge pipe, approximately 6 inches below the 90 degree elbow. <p><i>Wet Well #2</i></p> <ul style="list-style-type: none"> Earthworks Pacific wires Pump #2 (the operational pump) to the newly installed VFD. The pump is energized and during testing, the pump is observed to operate in a normal fashion. Therefore, the newly installed VFD is probably not defective and does seem to function normally. Earthworks Pacific installs two new a/v relief valves within Wet Well #2. The a/v valves are installed directly into the 3/8-inch pipe tap used to install the temporary vent holes in the discharge piping. Once ROMAC pipe saddles become available, Earthworks Pacific will replace the 3/8-inch fittings with 3/4-inch pipe saddle fittings. After the a/v valves are installed, Pump #1 is energized and is found to be spinning but not pumping water. The system is de-energized and the system test is terminated until a new pump can be installed.
1730	Left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 099

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE:

DAY: 6

MONTH: May

YEAR: 2013

WEATHER: Sunny and warm.

0800	I arrived on site. Bryan Davidson of Earthwork Pacific is offsite until AECOM has complete there evaluation of the current system operation and provides system set point recommendations. Bryan is also awaiting the arrival of the replacement pump from EPG which will replace the defective pump in Wet Well 2 identified during testing.
1000	Due to the sensitivity of the current construction status; Donald Fujimoto (County of Kauai) has requested that all available representatives from County of Kauai; AECOM, EPG, Waste Management, and Geosyntec attended a 10 AM conference call to discuss the system tests and how to repair the malfunction. I attended the conference call.
1600	Left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 100

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
 Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 7

MONTH: May

YEAR: 2013

WEATHER: Sunny and warm.

0700	I arrived on site.
1200	Bryan Davidson of Earthwork Pacific is on site to modify the control system operating set points and test the system.
	<p><i>Wet Well 1:</i></p> <ul style="list-style-type: none"> Bryan modified the wet well control system set points as recommended by Paul Wintheiser. Both pumps 1 and 2 were cycled using the test switch located on the control panel and were verified to operate. The system was energized and is now operational utilizing Pump 1. The recommended system control modification to alternate Pumps 1 and 2 (as per AECOM's email dated 6 May 2013) will require additional wiring and a panel modification to complete. In the interim, the system is set to operate using only one pump in the automated position as discussed during yesterday's conference call. The other pump will be placed in the "off" position until the system control modification can be completed.
	<p><i>Wet Well 2:</i></p> <ul style="list-style-type: none"> Bryan informed me that the new EPG replacement pump for Wet Well 2 was received via UPS today. EP will have a mechanic on site Wednesday morning to install the new pump and test. Per section 4B of AECOM's email dated 25 April a pressure gauge with a tee was installed at the high point of the discharge piping and a bleed valve installed at one end of the tee; and Bryan adjusted the set points of the Variable Frequency Drive (VFD) which will operate the SurePump control from 60 hertz to 40 hertz, as requested in section 4A of AECOM's email. <p><i>Pump #1:</i> was energized and the partially opened bleed valve discharged air for less than 3 seconds before the air was forced out of the valve with water. Once the bleed valve was closed, the pressure gauge indicated that the pump was operation at 4 psi and the totalizing flow meter at the control panel indicated that the flow was 115 GPM. The totalizing flow meter at the New Leachate Evaporation Pond (NLEP) indicates that Pump #1 discharged 117 GPM, which is similar to the control panel reading. Pump #1's operating system voltage and current were measured at the VFD display at 299 volts and 1.95 amps. Once all of the tests were completed, the pump was de-energized.</p> <ul style="list-style-type: none"> Bryan modified the wet well control system set points as recommended by Paul Wintheiser. Pump #1 was cycled using the test switch located on the control panel and verified to operate. The system was energized and is now operational utilizing Pump 1. The recommended system modification to alternate Pumps 1 and 2 (as per AECOM's email dated 6 May 2013) will require additional wiring and a panel

Chris Scott
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 Signature

cc: Mike Minch

PROJECT: Phase II Leachate Management System Modification
LOCATION: Kekaha Landfill

PROJECT NO.: WG1548
DAY/DATE: 7 May 2013

	<p>modification to complete. In the interim, the system will operate using only one pump in the automated position as discussed during yesterday's conference call. The other pump will be placed in the "off" position until the system control modification can be completed.</p> <ul style="list-style-type: none">• Pump #2 will be installed and then testing by EP on Wednesday.
1400	Donald Fujimoto (County of Kauai) arrives on site to inspect the system operation.
1600	Left the site.

Chris Scott

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cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 101

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE: DAY: 8 MONTH: May

YEAR: 2013

WEATHER: Sunny and warm.

0630	I arrived on site.
0700	<p>Bryan Davidson of Earthwork Pacific is already on site to install the new EPG pump to replace the defective pump in Wet Well #2 and to modify the control system operating set points as recommended by AECOM in an email dated 6 May 2013.</p> <p>Earthworks Pacific's electrical sub contractor (R-Electric), working with EPG, has modified the control system set points in both Wet Well 1 and 2 as recommended by Paul Wintheiser (AECOM). The pair of pumps in the each Wet Well is programmed to operate in alternating mode as opposed to lead/lag as previously designed</p>
	<p><i>Wet Well 2:</i></p> <ul style="list-style-type: none"> • Bryan Davidson (EP) and one mechanic are on site to install the new EPG replacement pump for Wet Well #2. The defective pump; was removed from Wet Well #2 and disassembled as recommended by EPG. The new pump was installed onto the existing SurePump Franklin motor assembly and then secured into the pump shroud using a new o ring provided by EPG. The shroud O-ring seal was tested by placing the pump and shroud assembly into a 15 gallon drum of water, which forced air to the top of the shroud. Once the pump head was submerged, soapy water was applied to the fittings around the outside of the shroud, a leak was observed at the 5/16" bots which secure the pump head to the shroud. The pump shroud was disassembled and the O-ring was found to be damaged. The O-ring was replaced and the shroud was assembled to the pump. The test was repeated and no leaks were observed. Once the test was completed all of the tests fitting were removed and a new shroud vent valve assembly and tubing was installed on the pump shroud extending to the top of the discharge pipe and then secured using nylon cable ties. The entire pump and shroud assembly was lowered into the wet well and connected to the existing discharge pipe using a new O-ring provided by EPG. Once the pump was installed, the pump was tested. • Per section 4B of AECOM's 25 April email dated a pressure gauge with a tee was installed at the high point of the discharge piping and a bleed valve installed at one end of the tee. Bryan adjusted the set points of the Variable Frequency Drive (VFD) which will operate the SurePump control from 60 hertz to 40 hertz, as requested in Section 4A of AECOM's 25 April email. <p>Pump #2 was energized and the partial opened bleed valve discharged air for less than 3 seconds before the air was forced out of the valve with water. Once the bleed valve was secure the pressure gauge indicated that the pump was operation at 6 psi and the totalizing flow meter at the control panel indicates the flow was measured to be 115 GPM. The totalizing flow meter at the Lagoon indicates that the Pump #2 discharged 117 GPM, which is consistent with the control panel. Pump #2 operating system voltage measurements were obtained from the VFD and were measured to be 299 volts and</p>

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	1.95 amps on display. Using a "clip on" amp meter provided by R Electric, motor leads read 5.0 amps on each lead. This is consistent with the other measurements from Wet Well 2 Pump 1 and Wet Well 1 Pumps 1 and 2. Once all of the tests were completed the pump was de-energized.
0945	Donald Fujimoto (County of Kauai) arrives on site to inspect the system operation.
	<p>Pumps 1 and 2 in both Wet Wells 1 and 2 are operational and have been tested in accordance with AECOM's recommendations. EPG was also advised of how the system functioned and EPG confirmed that the system was operating within the tolerance of the pump assembly.</p> <p>Donald Fujimoto has requested that the system operational tests include several cycles of each pump to verify that the system will function as designed with repeatability.</p> <p>The following information was obtained during Wet Well 1 and 2 startup testing;</p> <p><u>Wet Well #1</u></p> <p><u>First Test</u></p> <p>0947 Wet Well #1 was filled using a water truck;</p> <p>0950 Pump #2 activated at 47.3 inches pumping 128 gpm (5.5 amps)</p> <p>0953 Pump #2 de-activated at 19.8 inches totalizing flow meter reads 42,731 gallons</p> <p>0955 Wet Well #1 was filled using a water truck</p> <p>1000 Pump #1 activated at 47.3 inches pumping 127 gpm (5.5 amps)</p> <p>1004 Pump #1 de-activated at 19.8 inches totalizing flow meter reads 43,236 gallons</p> <p><u>Second Test</u></p> <p>1048 Wet Well #1 was filled using a water truck;</p> <p>1053 Pump #2 activated at 47.3 inches pumping 128 gpm (5.5 amps)</p> <p>1058 Pump #2 de-activated at 19.8 inches totalizing flow meter reads 43,832 gallons</p> <p>1059 Wet Well #1 was filled using a water truck</p> <p>1104 Pump #1 activated at 47.3 inches pumping 127 gpm (5.5 amps)</p> <p>1108 Pump #1 de-activated at 19.8 inches totalizing flow meter reads 44,368 gallons</p> <p><u>Third Test</u></p> <p>1109 Wet Well #1 was filled using a water truck;</p> <p>1114 Pump #2 activated at 47.3 inches pumping 128 gpm (5.5 amps)</p> <p>1124 Pump #2 de-activated at 19.8 inches totalizing flow meter reads 44,833 gallons</p> <p>1130 Wet Well #1 was filled using a water truck</p> <p>1135 Pump #1 activated at 47.3 inches pumping 128 gpm (5.5 amps)</p> <p>1139 Pump #1 de-activated at 19.8 inches totalizing flow meter reads 45,299 gallons.</p>

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	<p>Upon completion of the System test for Wet Well #1 no leaks were observed and the system worked as designed (See Operational Test Report Dated 8 May 2013)</p> <p><u>Wet Well #2</u></p> <p><u>First Test</u></p> <p>1010 Wet Well #2 was filled using a water truck;</p> <p>1014 Pump #2 activated at 47.3 inches pumping 118 gpm (5.3 amps)</p> <p>1020 Pump #2 de-activated at 19.8 inches totalizing flow meter reads 40,072 gallons</p> <p>1025 Wet Well #2 was filled using a water truck</p> <p>1032 Pump #1 activated at 47.3 inches pumping 115 gpm (5.0 amps)</p> <p>1039 Pump #1 de-activated at 19.8 inches totalizing flow meter reads 40,910 gallons</p> <p><u>Second Test</u></p> <p>1145 Wet Well #2 was filled using a water truck;</p> <p>1153 Pump #2 activated at 47.3 inches pumping 117 gpm (5.3 amps)</p> <p>1200 Pump #2 de-activated at 19.8 inches totalizing flow meter reads 41,729 gallons</p> <p>1202 Wet Well #2 was filled using a water truck</p> <p>1211 Pump #1 activated at 47.3 inches pumping 115 gpm (5.0 amps)</p> <p>1218 Pump #1 de-activated at 19.8 inches totalizing flow meter reads 42,552 gallons</p> <p><u>Third Test</u></p> <p>1225 Wet Well #2 was filled using a water truck;</p> <p>1234 Pump #2 activated at 47.3 inches pumping 115 gpm (5.0 amps)</p> <p>1242 Pump #2 de-activated at 19.8 inches totalizing flow meter reads 43,459 gallons</p> <p>1243 Wet Well #2 was filled using a water truck</p> <p>1253 Pump #1 activated at 47.3 inches pumping 114 gpm (5.0 amps)</p> <p>1301 Pump #1 de-activated at 19.8 inches totalizing flow meter reads 44,291 gallons.</p> <p>Upon completion of the System test for Wet Well #2 no leaks were observed and the system worked as designed (See Operational Test Report Dated 8 May 2013)</p>
1600	Left the site.

Chris Scott

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cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 102

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Monday

DATE: DAY: 31 MONTH: August

YEAR: 2015

WEATHER: Overcast and warm with light rain through the day.

0630	I arrived on site.
	Due to the recent rain received at the site, work has been delayed until tomorrow.
	Equipment arrived on site: One Caterpillar "mini" backhoe
	Bryan Davidson (Earthworks Pacific Superintendent) invited me to the Earthworks Pacific office located in Lihue. EPI would like to review the construction drawings; shop drawing and equipment purchase to complete this phase of construction.
1230	I traveled from the Kekaha Landfill to Earthwork Pacific office located in Lihue to review the project scope and materials need to complete the construction.
1400	Arrived in Lihue meet with Bryan and the Earthwork crew working on the project.
1600	Left Lihue for the afternoon.

Chris Scott

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Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 103

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 1

MONTH: September

YEAR: 2015

WEATHER: Cloudy and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and three operators are on site
	Equipment on site: One Caterpillar "mini" backhoe
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI employees were present for the meeting. In addition, EPI invited the County of Kauai, Waimea Fire Department to the site and reviewed health and safety concerns, and also review the confined space procedures required during this phase of construction.
0800	EPI using rubber inflatable plugs isolated the leachate collection discharge pipes that direct leachate flow into the wet wells. The isolation plugs also secure the wet wells from migration of landfill gas into the structures. Once the discharge lines were isolated, the County of Kauai used a vacuum truck and cleaned out the sediment and water from Wet Well #1 before beginning construction activities.
	Electrical EPI's subcontractor R-Electric is onsite to install a new electrical conduit from the panel to the wet wells required to operate the new pumps and control systems as required in construction drawings. (AECOM dated May 2014).
1300	Nancy Bice (Geosyntec Consultants Office Manager) is on site to review Geosyntec's health and safety plan and procedures, and to review the confined space program implemented for the Phase II LCRS system modifications.
	Confined Space EPI prepared and provided notification 24 hours in advance of entry for confined space permit number #49 – Wet Well #1 Pumping System Install. The permit notification was emailed to all respective parties which includes; the County of Kauai Waimea Fire Department. Due to time constraints confined space permit #49 was closed out and no entry was initiated.
1730	I left the site.

Chris Scott

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Signature

cc: **Mike Minch**



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 104

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
 Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 2

MONTH: September

YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and three operators are on site.
	Equipment on site: One Caterpillar "mini" backhoe
	<p>Health and Safety</p> <p>Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI employees were present for the meeting. In addition, due to change of shift for the Waimea Fire Department EPI invited Waimea Fire Department to the site and reviewed health and safety concerns, and also review the confined space procedures with the new shift Captain.</p> <p>During construction this morning Bryan Davidson using a fit test kit formed a fit test using the site specific respirators. All authorized entrant and rescue personnel listed on the confined space permit were fit tested.</p>
0800	EPI checked the previously installed rubber inflatable plugs, which isolated the leachate collection discharge pipes that direct leachate flow into the wet wells. The isolation plugs also secure the wet well from migration of landfill gas into the structures. EPI was able to clean the bottom of Wet Well #1 yesterday. After lunch this afternoon the County of Kauai will use the vacuum truck to clean out Wet Well #2
	<p>Confined Space</p> <p>EPI prepared and provided notification 24 hours in advance of entry for confined space permit number #50 – Wet Well #1 Pumping System Install and number #51 – Wet Well #2 Pumping System Install. The permit notifications were emailed to the County of Kauai and Waimea Fire Department.</p> <p>Wet Well #1 was ventilated using a blower and the atmosphere was monitored for 30 minutes and confirmed to be safe for entry; with no change in readings confined space permit #50 was initiated at 9:30. The confined space permit was close out at 3:15 with no incident.</p> <p>Due to time constraints confined space permit #51 – Wet Well #2 was closed out and no entry was initiated.</p>
	<p>Wet Well #1</p> <p>EPI removed both existing pumps and support rails from wet well #1 and began construction to install the new FLYGT pump as shown on Figure 1 AECOM Construction Drawings dated May 2014.</p>
1730	I left the site.

Chris Scott

Printed Name

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cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 105

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 3

MONTH: September

YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and three operators are on site
	Equipment on site: One Caterpillar "mini" backhoe
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI employees were present for the meeting. No questions or concerns arose during the meeting.
0800	EPI checked the previously installed rubber inflatable plugs which isolated the leachate collection discharge pipes that direct leachate flow into the wet wells. The isolation plugs also secure the wet wells from migration of landfill gas into the structures.
	Confined Space Permits EPI prepared and provided notification 24 hours in advance of entry for confined space permit number #52 – Wet Well #2 Pumping System Install and confined space permit number #53 – Wet Well #1 Pumping System Install. The permit notifications were emailed to the County of Kauai and Waimea Fire Department. Wet Well #1 was ventilated using a blower and the atmosphere was monitored for 30 minutes and space was confirmed to be safe for entry; with no change in readings confined space permit #53 was initiated at 8:10. The confined space permit was close out at 2:30 with no incident. Due to time constraints confined space permit #52 – Wet Well #2 was closed out and no entry was initiated.
	Wet Well #1 During construction today EPI installed the new FLYGT pump support mount foundation and secured the foundation to the floor of the wet well using 4 each 5/8 inch diameter by 3 ½ inch long "red head" concrete anchor bolts. The anchor bolts were secured using two part epoxy into the pre-drilled holes before securing the fasteners. Once the foundation was secure the FLYGT pump; 3 inch discharge pipe, and check valve was installed and connected to the existing discharge pipe as shown on Figure 1 AECOM Construction Drawings dated May 2014. In addition, a new three inch diameter check valve and cam log fitting was fixed to the auxiliary backup discharge line.
1630	I left the site.

Chris Scott

Printed Name



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cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 106

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 4

MONTH: September

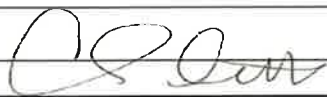
YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and three operators are on site
	Equipment on site: One Caterpillar "mini" backhoe
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI employees were present for the meeting. No questions or concerns arose during the meeting.
0700	EPI checked the previously installed rubber inflatable plugs which isolated the leachate collection discharge pipes that direct leachate flow into the wet wells. The isolation plugs also secure the wet wells from migration of landfill gas into the structures.
	Confined Space Permits EPI prepared and provided notification 24 hours in advance of entry for confined space permit number #54 – Wet Well #1 Pumping System Install and confined space permit number #55 – Wet Well #2 Pumping System Install. The permit notifications were emailed to the County of Kauai and Waimea Fire Department. Wet Well #1 was ventilated using a blower and the atmosphere was monitored for 30 minutes and space was confirmed to be safe for entry; with no change in readings confined space permit #54 was initiated at 7:55. The confined space permit was close out at 10:07 with no incident. Wet Well #2 was ventilated using a blower and the atmosphere was monitored for 30 minutes and space was confirmed to be safe for entry; with no change in readings confined space permit #55 was initiated at 11:39. The confined space permit was close out at 15:45 with no incident.
	Wet Well #1 During construction today EPI installed the guide rails and support bracket and lifting chain to the new pump assembly and secured the guide rail to the existing wet well structure as shown on Figure 1 of the AECOM Construction Drawings dated May 2014. Once the pump and guide rail assembly were installed, the manhole cover was installed and a stainless steel wire rope was secured to the bottom side of the manhole access lid structure. The stainless steel wire rope will support the on/off float switches that activate the FLYGT pumps.
	Wet Well #2

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PROJECT: Phase II Leachate Management System Modification

PROJECT NO.: WG1548

LOCATION: Kekaha Landfill

DAY/DATE: 4 Sept 2015

	<p>During construction today EPI removed the two existing EPG "SurePumps" and related discharge piping. Once the pumps were removed, the bottom of the wet well structure was cleaned using a portable vacuum pump in preparation for the installation of the new FLYGT pump. The new FLYGT pump foundation and pumping assembly were then lowered into the wet well structure and secured using 4 each 5/8 inch diameter by 3 1/2 inch long "red head" concrete anchor bolts. The anchor bolts were secured using two-part epoxy into the pre-drilled holes before securing the fasteners. Once the foundation was secure the FLYGT pump; 3 inch discharge pipe, and check valve was installed and connected to the existing discharge pipe as shown on Figure 1 of the AECOM Construction Drawings dated May 2014. In addition, a new three inch diameter check valve and cam log fitting was fixed to the auxiliary backup discharge line.</p>
	<p>Electrical</p> <p>EPI's subcontractor R Electric is on site and has completed the installation of the additional junction boxes and electrical conduit required for the new pumping system rough electrical installation. The electrical system will be completed after both new pumps are installed and EPG completes the final operating system installation.</p>
1730	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 107

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Tuesday

DATE:

DAY: 8

MONTH: September

YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and three operators are on site
	Equipment on site: One Caterpillar "mini" backhoe
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI employees were present for the meeting. No questions or concerns arose during the meeting.
0700	EPI checked the previously installed rubber inflatable plugs which isolated the leachate collection discharge pipes that direct leachate flow into the wet wells. The isolation plugs also secure the wet wells from migration of landfill gas into the structures.
	Confined Space Permits EPI prepared and provided notification 24 hours in advance of entry for confined space permit number #56 – Wet Well #2 Pumping System Install and confined space permit number #57 – Wet Well #1 Pumping System Install. The permit notifications were emailed to the County of Kauai and Waimea Fire Department. Wet Well #2 was ventilated using a portable blower and the atmosphere was monitored for 30 minutes. The space was confirmed to be safe for entry with no change in readings. Confined space permit #56 was initiated at 8:07. The confined space permit was close out at 11:30 with no incident. Wet Well #1 was ventilated using a portable blower the atmosphere was monitored for 30 minutes and the space was confirmed to be safe for entry with no change in readings. Confined space permit #57 was initiated at 12:35. The confined space permit was close out at 13:45 with no incident.
	Wet Well #1 EPI identified a leak in one of the plumbing connections within the discharge piping for the newly installed pump. Confined space permit #57 was initiated and EPI entered the wet well structure and tightened the loose fastener to secure the discharge line. Once the fastener was tightened, and inflatable plugs removed the confined space permit was closed out.
	Wet Well #2 During construction today EPI completed the installation of the new FLYGT pump components and support brackets to secure the new pump in the wet well. Once all of the temporary blind flanges and plugs were

Chris Scott

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cc: Mike Minch

PROJECT: Phase II Leachate Management System Modification

LOCATION: Kekaha Landfill

PROJECT NO.: WG1548

DAY/DATE: 8 Sept 2015

	removed the confined space permit #56 was closed out.
	Electrical EPG (Leachate collection system manufacturer) will be on site in the morning to complete the final control panel modifications to operate the newly installed FLYGT pumps.
1700	I left the site.

Chris Scott

Printed Name



Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 108

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Wednesday

DATE:

DAY: 9

MONTH: September

YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and one operators are on site
	Tim Hasslen (EPG Companies) is on site to begin installation of the control system modifications for Wet Wells 1 and 2 as required to operate the new FLYGT pumps. Tim Hasslen's contact information: thasslen@epgco.com
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI and EPG employees were present for the meeting. No questions or concerns arose during the meeting.
	Wet Well #1 EPG is working to install components and control to operate the system.
	Wet Well #2 No work in this area today
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 109

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Thursday

DATE:

DAY: 10

MONTH: September

YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and one operators are on site
	Tim Hasslen (EPG Companies) is on site to continue the installation of the control system modifications for Wet Wells 1 and 2 as required to operate the new FLYGT pumps.
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI and EPG employees were present for the meeting. No questions or concerns arose during the meeting.
	Wet Well #1 EPG is working to install components and control to operate the system.
	Wet Well #2 EPG is working to install components and control to operate the system.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: Mike Minch



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 110

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 11

MONTH: September

YEAR: 2015

WEATHER: Sunny and warm during the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and one operators are on site
	Tim Hasslen (EPG Companies) is on site to continue the installation of the control system modifications for Wet Wells 1 and 2 as required to operate the new FLYGT pumps.
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI and EPG employees were present for the meeting. No questions or concerns arose during the meeting.
	Wet Well #1 EPG is working to install components and control to operate the system.
	Wet Well #2 EPG is working to install components and control to operate the system.
1500	Troy Tanigawa and Keith Suga (County of Kauai) are on site to observe the wet well system demonstration test to complete the installation of the new FLYGT pumps. However, due to the complexity of the system modifications EPG has not completed the control panel and therefore was unable to operate the system.
1700	I left the site.

Chris Scott

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Signature

cc: Mike Minch



**Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii**

DAILY FIELD REPORT

Report Sequence No.: 111

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Saturday

DATE:

DAY: 12

MONTH: September

YEAR: 2015

WEATHER: Heavy rain throughout the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and one operators are on site
	Tim Hasslen (EPG Companies) is on site to continue the installation of the control system modifications for wet wells 1 and 2 as required to operate the new FLYGT pumps.
	Health and Safety Bryan Davidson (Earthworks Pacific Superintendent) conducted the onsite safety tailgate meeting. All EPI and EPG employees were present for the meeting. No questions or concerns arose during the meeting.
	Wet Well #1 EPG is working to install components and control to operate the system.
	Wet Well #2 EPG is working to install components and control to operate the system.
1200	Troy Tanigawa (County of Kauai) is on site to observe the wet well system demonstration test, to complete the installation of the new FLYGT pumps. However; due to the complexity of the system modifications EPG has not completed the control panel and therefore was unable to operate the system.
1700	I left the site.

Chris Scott

Printed Name

Signature

cc: **Mike Minch**



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 112

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications
CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Sunday

DATE:

DAY: 13

MONTH: September

YEAR: 2015

WEATHER: Heavy rain throughout the day.

0630	I arrived on site.
	Earthworks Pacific is off site today.
	Tim Hasslen (EPG Companies) is on site to continue the installation of the control system modifications for wet wells 1 and 2 as required to operate the new FLYGT pumps.
	Wet Well #1 EPG is working to install components and control to operate the system.
	Wet Well #2 EPG is working to install components and control to operate the system.
	EPG has not completed the control panel and therefore was unable to operate the system. Based on the last few days of construction Tim is going to recommend that the control panels are shipped back to EPG's shop to perform troubleshooting, and modifications.
1200	I left the site.

Chris Scott

Printed Name

Signature

cc: **Mike Minch**

DAILY FIELD REPORT

Report Sequence No.: 113

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548 TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Monday DATE: DAY: 14 MONTH: September YEAR: 2015

WEATHER: Sunny and warm throughout the day.

0630	I arrived on site.
	Bryan Davidson (Earthworks Pacific Superintendent) and one operators are on site
	Tim Hasslen (EPG Companies) is on site to continue the installation of the control system modifications for wet wells 1 and 2 as required to operate the new FLYGT pumps.
	Due to the system control panel modification difficulties; Bryan Davidson has requested a conference call to review options for completing this task of work.
10:30	<p>I attended a conference call and the following recommendations were reviewed:</p> <p><i>Email Bryan Davidson EP dated 15 Sept 2015</i></p> <p>As a follow-up to our phone conference yesterday, we have removed the “inner workings” of the control panels, in preparation of sending them back to EPG’s shop for repair and testing. EPG’s commitment is:</p> <ol style="list-style-type: none"> 1.) EPG will remove all wires/relays/components not necessary for Wet Wells #1 & 2 to function as currently specified. 2.) EPG will correctly rebuild the panels as necessary, to simplify, and provide better long-term operation of the systems. 3.) The panels will not leave EPG’s shop until they have been fully tested and they are 100% confident that they operate as intended. This will include testing all input/outputs for proper functionality and testing a similar Flygt pump to ensure that the panel will work as intended with our specific model of pumps. 4.) EPG will update the electrical drawings to accurately reflect the final panel configuration. Reduced-sized copies will be mounted inside the inner door of the control panel. 5.) EPG will modify/update all labeling as necessary 6.) As requested, EPG will check to see that the interstitial leak detection sensors still function as intended. 7.) EPG has estimated that it will take approximately two days for their shop to complete the necessary modifications, and a third day to test the two panels, after they have received the panels. 8.) FYI, the panels are being FedEx air-shipped out, as Tim’s airline rejected them after he and Forrest had packaged them for return with Tim last night. 9.) EPG has agreed to return for reinstallation, start-up and testing, not to exceed two days, total.

Chris Scott
Printed Name



Signature

cc: Mike Minch

PROJECT: Phase II Leachate Management System Modification

LOCATION: Kekaha Landfill

PROJECT NO.: WG1548

DAY/DATE: 14 Sept 2015

	Earthworks will pack and ship the control panels to EPG's shop in Minnesota. Once ready to return, Earthworks will notify all parties.
1330	I left the site and arrange travel to the mainland.

Chris Scott

Printed Name



Signature

cc: Mike Minch

DAILY FIELD REPORT

Report Sequence No.: 114

PROJECT: Kekaha Sanitary Landfill
 LOCATION: Kekaha, Kauai, Hawaii PROJECT NO.: WG1548 TASK NO.: 2.3
 DESCRIPTION: Phase II Leachate Management System Modifications CONTRACTOR: Earthworks Pacific, Inc.
 DAY OF WEEK: Thursday DATE: DAY: 24 MONTH: September YEAR: 2015
 WEATHER: Warm and sunny with occasional rain

0400	I leave Oakland, California.	
1100	<p>I arrive onsite. Bryan Davidson and Forrest Downing of Earthworks Pacific and Tim Hasslen of EPG are already onsite. No heavy equipment is onsite. Control panels for both Wet Well #1 and Wet Well #2 had been removed and re-wired in EPG's shop in Maple Grove, MN, and then shipped back to Kaua'i. Tim has re-installed both panels and is making the final connections.</p> <p>I review the design control points with Tim, Bryan, and Forrest. Per the Construction Drawings for both wells, the High Alarm is to be set 6 in. below the lowest inlet pipe invert, the Pump On level is 18 in. below the lowest inlet pipe invert. The Pump Off 12 in. above the wet well invert, and the Low Alarm is 11 in. above the wet well invert.</p> <p>Physical measurements of the depth of the two wet wells and distance to the inlet pipes were taken and used to compute the distance (to the nearest inch) of each level relative to a single datum, the wet well floor elevation. The measurements were as follows:</p>	
	<p style="text-align: center;">Wet Well #1</p> <p>Total well depth, rim to floor = 178 in. Depth to lowest inlet pipe crown = 132 in. Computed pipe invert (6-in SDR 17) = 138 in. Computed ht. from well invert to pipe invert = 40 in.</p> <p>Set points computed above wet well floor: High Alarm = 34 in. Pump On = 22 in. Pump Off = 12 in. Low Alarm = 11 in.</p>	<p style="text-align: center;">Wet Well #2</p> <p>Total well depth, rim to floor = 149 in. Depth to lowest inlet pipe crown = 103 in. Computed pipe invert (6-in SDR 17) = 109 in. Computed ht. from well invert to pipe invert = 40 in.</p> <p>Set points computed above wet well floor: High Alarm = 34 in. Pump On = 22 in. Pump Off = 12 in. Low Alarm = 11 in.</p>
1145	Bryan leaves the site. Forrest removes the temporary pumps, extension cords, and PVC discharge piping from both wells. These pumps have been used to evacuate the wet wells until the permanent system is functioning.	
	<p>Wet Well #2</p> <p>After setting the control panel for WW#2, the transducer readout is adjusted until the readout matches a physical measurement of fluid level using a tape measure. All readings and set points are measured as the height above the floor of the wet well as listed above. The County's water truck is used to fill the wet well with water to test the system in automatic mode. The pump starts at a transducer reading of 22.8 in., and with a pump rate ranging from 105 to 114 gpm, evacuates the water in 1 minute and 38 seconds. The pump shuts off at 12 in. and the low level alarm comes on. This process is repeated with similar results. During pumping, the</p>	

Mike Minch

Printed Name



Signature

cc: File

PROJECT: Phase II Leachate Management System Modification

PROJECT NO.: WG1548

LOCATION: Kekaha Landfill

DAY/DATE: 24 September 2015

	water surface is visibly agitated; however, no vortex or bubbles are seen. The agitation of the water surface likely triggers the low alarm as the pumping nears the 12 in. mark. The Pump Off elevation will be increased to 13 in. tomorrow to minimize the triggering of the alarm as part of normal operation. Two hours after pumping, the transducer reads 19.1 in., gaining about 7 in. due to leachate inflow.
	Wet Well #1 The GCFI on the WW#1 panel continues to trip. After many hours of troubleshooting, Tim discovers that one of the motor temperature sensor wires is faulty. This wire goes from the breakout junction box atop the WW#1 cover, through the underground conduit to the panel and is one of the original wires previously installed for the two EPG pumps. At 1700, extension cord wires are used to connect the T1 and T2 temperature sensor wires from the junction box to the panel as an interim measure. The system appears to be functional and is set to run in automatic through the night at the set points listed above. No water was added to WW#1 today.
1500	Bryan, Forrest, and I call Troy Tanigawa of the County of Kaua'i to discuss the progress. Based on the current status, tomorrow's planned start up demonstration is postponed from 0900 to 1300. Troy plans to attend.
1730	I called John Ruiz of WM to inform him that both wells are set to automatically pump through the night. Tomorrow, the float switches will be installed and adjusted. I left the site.

Mike Minch

Printed Name



Signature

cc: File



Kekaha Sanitary Landfill
Kekaha, Kauai, Hawaii

DAILY FIELD REPORT

Report Sequence No.: 115

PROJECT: Kekaha Sanitary Landfill

LOCATION: Kekaha, Kauai, Hawaii

PROJECT NO.: WG1548

TASK NO.: 2.3

DESCRIPTION: Phase II Leachate Management System
Modifications

CONTRACTOR: Earthworks Pacific, Inc.

DAY OF WEEK: Friday

DATE:

DAY: 25

MONTH: September

YEAR: 2015

WEATHER: Warm and sunny with occasional rain

0700	I arrive onsite. Forrest Downing of Earthworks Pacific and Tim Hasslen of EPG are already onsite. No heavy equipment is onsite.
	<p>Wet Well #1</p> <p>Forrest and Tim pull two new 14 gauge wires to replace the extension cord wire for the T1 and T2 temperature sensor wires. The new wires are pulled to the new breakout junction box installed for the floats switches and then routed through a new flexible conduit to the breakout junction box for the motor leads.</p> <p>The float switch system is assembled and consists of one normally open and one normally closed float switch attached to a stainless steel cable with stainless steel clamps and fasteners. An offset bracket made of stainless all-thread is used to position the lower float switch away from the anchor at the bottom of the cable. The float switches are designed as redundant high alarm and low alarm switches as a backup for the transducer. Through iterations of filling and pumping the well with water, observing the high and low alarm light elevations, and adjusting the float brackets on the cable, the floats are installed to trigger at the design levels (High Alarm = 34 in. and Low Alarm = 11 in.)</p>
	<p>Wet Well #2</p> <p>A similar float switch assembly is placed in Wet Well #2 and adjusted in the same manner.</p>
1230	Bryan Davison of Earthworks Pacific arrives onsite.
1330	<p>Troy Tanigawa from the County of Kaua'i arrives onsite to observe the system demonstration test. Earthworks Pacific complete test procedures as follows:</p> <ul style="list-style-type: none"> • Place the system in automatic mode; • Fill the wet well using the water truck until the pump starts; • Record the pump-on level, pump rate, pump cycle duration, volume pumped, and pump-off level; • Run the pump on manually and record the low alarm level; • Turn the pump off and fill the wet well until the high alarm comes on; • Place the pump in automatic mode for operation; and • Remove the leak detection sensor and submerge in a container of water to verify the leak detection light is illuminated. <p>The results of the system start up testing are attached. At the end of the testing, the control panels, pumps, transducer, and floats are verified to function as designed</p>
1500	Troy leaves the site. Earthworks and EPG clean up the work area.
1630	I discuss the results of the testing with John Ruiz of Waste Management. Earthworks, EPG, and Geosyntec leave the site.

Mike Minch

Printed Name

Signature

cc: File

Appendix E
Laboratory Soil Test Results



Hirata & Associates

Geotechnical
Engineering

Hirata & Associates, Inc.

99-1443 Koaha Pl
Aiea, HI 96701
tel 808.486.0787
fax 808.486.0870

MEMORANDUM

April 26, 2012
W.O. 12-5332

TO: Mr. Chris Scott
Geosyntec Consultants Inc.
via email: cscott@geosyntec.com

FROM: David Kitamura 

RE: Laboratory Test Results for Onsite Soils - Sample EF 001
Kekaha Landfill: Phase II Leachate System Modifications
Kekaha, Kauai, Hawaii

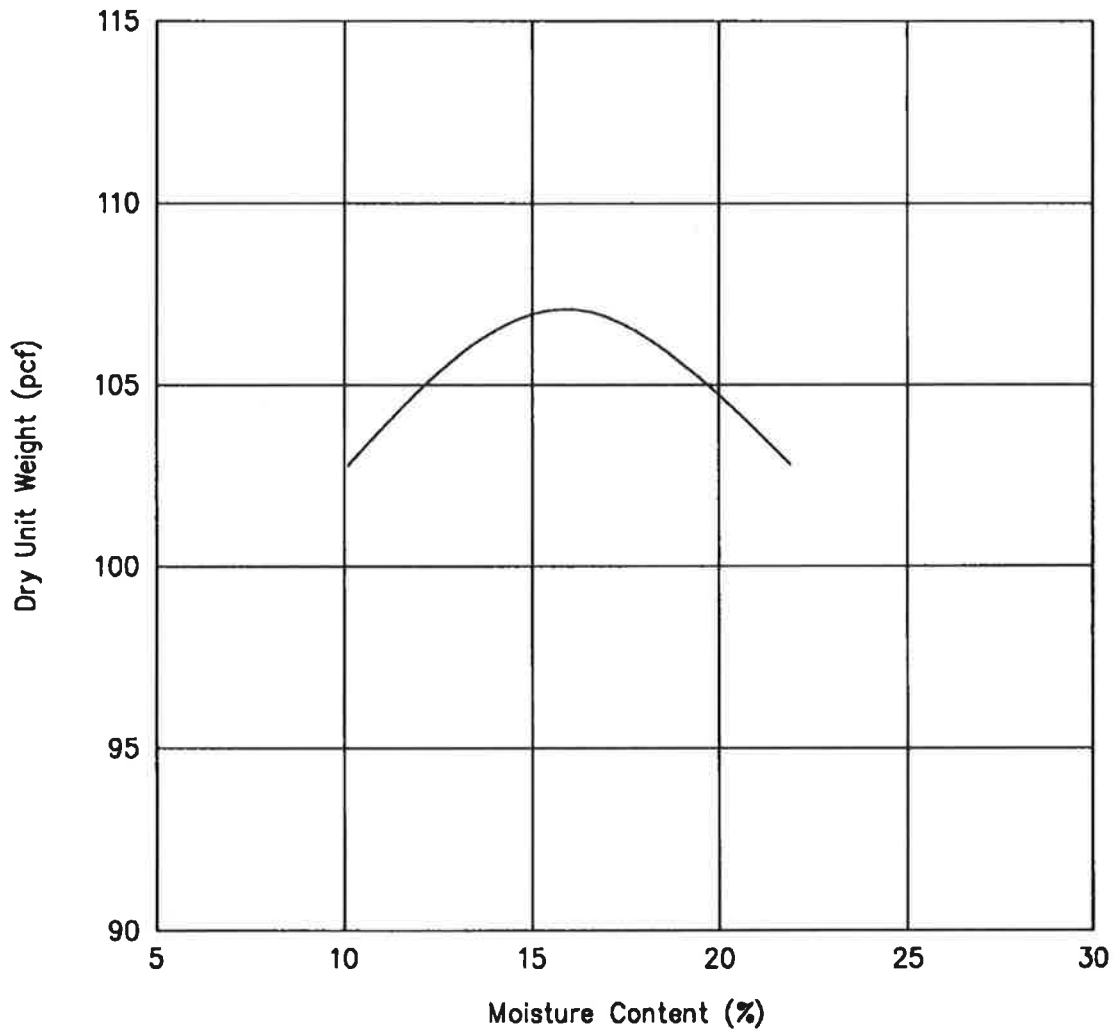
As requested, laboratory testing was performed on the onsite soils for the above referenced project. Geosyntec provided a bulk soil sample from the project site. Visually, the onsite soils consisted of a tannish brown silty sand with coral fragments and gravel. As discussed, laboratory testing would only consist of a maximum density test (modified Proctor). This memo presents the results for the maximum density test, summarized below and presented in the graph on the next page.

<u>Test</u>	<u>Result</u>
Modified Proctor (ASTM D1557)	Maximum density = 107.0 pcf Optimum moisture content = 16.5%

Feel free to call us if you have any questions.

DMK: 5332m.001

enc: Modified Proctor Curve (Plate A1)



Soil Data

Bag No.: 1
 Location: EF001 – onsite
 Description: Tannish brown silty sand with coral fragments and gravel

Test Results

Maximum Dry Density: 107.0 pcf
 Optimum Moisture Content: 16.5%

W.O. 5332.0	Kekaha Landfill Leachate System Modification – Phase II
Hirata & Associates, Inc.	<p style="text-align: center;">MODIFIED PROCTOR CURVE</p> <p style="text-align: right;">Plate A1</p>

Appendix F
Nuclear Density and Moisture Test Results



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.:
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 23-Apr-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)				
23/Apr	FDT-01	Wet Well #2 EL: 13 bgs	EF-01	107	16.5			6-inch	119.6	102.5	16.7	95.8	Pass		CAS
23/Apr	FDT-02	Wet Well #2 EL: 12 bgs	EF-01	107	16.5			6-inch	122.1	105.4	15.9	98.5	Pass		CAS
23/Apr	FDT-03	Wet Well #2 EL: 11 bgs	EF-01	107	16.5			6-inch	120.9	103.4	17.0	96.6	Pass		CAS
23/Apr	FDT-04	Wet Well #2 EL: 11 bgs	EF-01	107	16.5			6-inch	122.2	104.0	17.5	97.2	Pass		CAS

bgs=below ground surface

SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** _____
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 24-Apr-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil **MOISTURE RANGE:** +/- _____
% COMPACTION: 95% **NUCLEAR GAUGE SERIAL NO.:** 20877
NUCLEAR GAUGE TYPE: Troxler 3440

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
24/Apr	FDT-05	Wet Well #2 EL: 10 bgs	EF-01	107	16.5				6-inch	114.0	96.8	17.8	90	Fail	FDT-07	CAS
24/Apr	FDT-06	Wet Well #2 EL: 9 bgs	EF-01	107	16.5				6-inch	119.0	101.8	16.9	95	Pass		CAS
24/Apr	FDT-07	Wet Well #2 EL: 8 bgs	EF-01	107	16.5				6-inch	120.2	103.5	16.1	97	Pass		CAS
24/Apr	FDT-08	Wet Well #2 EL: 7 bgs	EF-01	107	16.5				6-inch	117.9	101.7	15.9	95	Pass		CAS
24/Apr	FDT-09	Wet Well #2 EL: 7 bgs	EF-01	107	16.5				6-inch	119.4	102.9	16.0	96	Pass		CAS
24/Apr	FDT-10	Wet Well #2 EL: 6 bgs	EF-01	107	16.5				6-inch	119.6	103.3	15.8	97	Pass		CAS
24/Apr	FDT-11	Wet Well #2 EL: 5 bgs	EF-01	107	16.5				6-inch	117.1	101.6	15.4	95	Pass		CAS
24/Apr	FDT-12	Wet Well #2 Valve Box subgrade	EF-01	107	16.5				6-inch	122.8	105.4	16.6	99	Pass		CAS

bgs=below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.:
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 25-Apr-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)	PERCENT COMPACT (%)			
25/Apr	FDT-13	Wet Well #2 EL: 4 bgs	EF-01	107	16.5			6-inch	126.7	106.6	18.9	100	Pass		CAS
25/Apr	FDT-14	Wet Well #2 EL: 3 bgs	EF-01	107	16.5			6-inch	122.9	104.6	17.5	98	Pass		CAS

bgs=below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.:
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 26-Apr-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
26/Apr	FDT-15	Wet Well #2 EL: 2 bgs	EF-01	107	16.5			6-inch	124.3	104.8	18.7	98	Pass		CAS	
26/Apr	FDT-16	Wet Well #2 EL: 1 bgs	EF-01	107	16.5			6-inch	117.6	101.6	15.8	95	Pass		CAS	

bgs=below ground surface

SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** _____
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 16-May-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil **MOISTURE RANGE:** +/- _____
% COMPACTION: 95% **NUCLEAR GAUGE SERIAL NO.:** 20877
NUCLEAR GAUGE TYPE: Troxler 3440

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
16/May	FDT-17	Wet Well #1 EL: 16 bgs	EF-01	107	16.5			6-inch	122.5	106.5	15.1	100	Pass		CAS	
16/May	FDT-18	Wet Well #1 EL: 16 bgs	EF-01	107	16.5			6-inch	122.9	107.1	14.8	100	Pass		CAS	
16/May	FDT-19	Wet Well #1 EL: 15 bgs	EF-01	107	16.5			6-inch	117.9	102.3	15.3	96	Pass		CAS	
16/May	FDT-20	Wet Well #1 EL: 15 bgs	EF-01	107	16.5			6-inch	118.1	102.1	15.7	95	Pass		CAS	
16/May	FDT-21	Wet Well #1 EL: 15 bgs	EF-01	107	16.5			6-inch	124.4	106.7	16.6	100	Pass		CAS	
16/May	FDT-22	Wet Well #1 EL: 14 bgs	EF-01	107	16.5			6-inch	117.5	102.3	14.8	96	Pass		CAS	
16/May	FDT-23	Wet Well #1 EL: 14 bgs	EF-01	107	16.5			6-inch	114.6	98.3	16.3	92	Fail	FDT-24	CAS	
16/May	FDT-24	Wet Well #1 EL: 14 bgs	EF-01	107	16.5			6-inch	126.2	107.8	17.1	101	Pass		CAS	
16/May	FDT-25	Wet Well #1 EL: 13 bgs	EF-01	107	16.5			6-inch	119.8	103.4	15.9	97	Pass		CAS	
16/May	FDT-26	Wet Well #1 EL: 12 bgs	EF-01	107	16.5			6-inch	126.0	108.6	16.0	101	Pass		CAS	
16/May	FDT-27	Wet Well #1 EL: 12 bgs	EF-01	107	16.5			6-inch	120.9	105.4	14.8	99	Pass		CAS	

bgs=below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** _____
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 17-May-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
% COMPACTION: 95% **MOISTURE RANGE:** +/- _____
NUCLEAR GAUGE TYPE: Troxler 3440 **NUCLEAR GAUGE SERIAL NO.:** 20877

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS					PERCENT COMPACT	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
17/May	FDT-28	Wet Well #1 EL: 11 bgs	EF-01	107	16.5			6-inch	119.0	102.4	16.3	96	Pass		CAS	
17/May	FDT-29	Wet Well #1 EL: 11 bgs	EF-01	107	16.5			6-inch	120.2	103.1	16.6	96	Pass		CAS	
17/May	FDT-30	Wet Well #1 EL: 10 bgs	EF-01	107	16.5			6-inch	125.4	106.7	17.6	100	Pass		CAS	
17/May	FDT-31	Wet Well #1 EL: 10 bgs	EF-01	107	16.5			6-inch	117.5	102.3	14.9	96	Pass		CAS	
17/May	FDT-32	Wet Well #1 EL: 9 bgs	EF-01	107	16.5			6-inch	116.9	101.6	15.1	95	Pass		CAS	
17/May	FDT-33	Wet Well #1 EL: 9 bgs	EF-01	107	16.5			6-inch	119.3	102.5	16.4	96	Pass		CAS	

bgs=below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** 2.3
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 18-May-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
% COMPACTION: 95% **MOISTURE RANGE:** +/-
NUCLEAR GAUGE TYPE: Troxler 3440 **NUCLEAR GAUGE SERIAL NO.:** 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
18/May	FDT-34	Wet Well #1 EL: 8 bgs	EF-01	107	16.5			6-inch	122.2	104.6	16.9	98	Pass		CAS	
18/May	FDT-35	Wet Well #1 EL: 8 bgs	EF-01	107	16.5			6-inch	125.3	107.1	17.0	100	Pass		CAS	
18/May	FDT-36	Wet Well #1 EL: 7 bgs	EF-01	107	16.5			6-inch	123.0	106.5	15.5	100	Pass		CAS	
18/May	FDT-37	Wet Well #1 EL: 7 bgs	EF-01	107	16.5			6-inch	120.8	104.3	15.9	97	Pass		CAS	
18/May	FDT-38	Wet Well #1 EL: 6 bgs	EF-01	107	16.5			6-inch	119.4	102.5	16.5	96	Pass		CAS	
18/May	FDT-39	Wet Well #1 EL: 6 bgs	EF-01	107	16.5			6-inch	118.6	102.3	16.0	96	Pass		CAS	

bgs=below ground surface

SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** 2.3
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 23-May-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil **MOISTURE RANGE:** +/-
% COMPACTION: 95% **NUCLEAR GAUGE SERIAL NO.:** 20877
NUCLEAR GAUGE TYPE: Troxler 3440

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS		TYPE OF TEST		FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID		
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)					F.M.C. (%)	
23/May	FDT-40	Wet Well #1 EL: 5 bgs	EF-01	107	16.5				6-inch	118.6	103.3	14.9	97	Pass		CAS
23/May	FDT-41	Wet Well #1 EL: 4 bgs	EF-01	107	16.5				6-inch	122.9	107.4	14.5	100	Pass		CAS
23/May	FDT-42	Wet Well #1 EL: 3 bgs	EF-01	107	16.5				6-inch	121.0	105.0	15.3	98	Pass		CAS
23/May	FDT-43	Wet Well #1 EL: 2 bgs	EF-01	107	16.5				6-inch	123.7	106.2	16.5	99	Pass		CAS
23/May	FDT-44	Wet Well #1 EL: 1 bgs	EF-01	107	16.5				6-inch	118.4	103.1	14.9	96	Pass		CAS

bgs= below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.: 2.3
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 9-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil MOISTURE RANGE: +/-
 % COMPACTION: 95% NUCLEAR GAUGE SERIAL NO.: 20877
 NUCLEAR GAUGE TYPE: Troxler 3440

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS					PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
09/Aug	FDT-40	LCM 1 4 ft bgs	EF-01	107	16.5			10-inch	124.9	105.7	18.3	99	Pass		CAS	
09/Aug	FDT-41	LCM 1 3 ft bgs	EF-01	107	16.5			10-inch	127.8	108.8	17.5	102	Pass		CAS	
09/Aug	FDT-42	LCM 1 2 ft bgs	EF-01	107	16.5			10-inch	122.7	106.2	15.6	99	Pass		CAS	
09/Aug	FDT-43	LCM 1 1 ft bgs	EF-01	107	16.5			10-inch	121.7	104.9	16.1	98	Pass		CAS	

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.: 2.3
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 13-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PERCENT COMPACT	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
13/Aug	FDT-44	LCM 2 4 ft bgs	EF-01	107	16.5			10-inch	121.0	101.7	19.0	95	Pass		CAS	
13/Aug	FDT-45	LCM 2 3 ft bgs	EF-01	107	16.5			10-inch	121.4	102.5	18.5	96	Pass		CAS	
13/Aug	FDT-46	LCM 2 2 ft bgs	EF-01	107	16.5			10-inch	121.3	104.2	16.5	97	Pass		CAS	
13/Aug	FDT-47	LCM 2 1 ft bgs	EF-01	107	16.5			10-inch	119.2	103.6	15.1	97	Pass		CAS	
13/Aug	FDT-48	LCM 3 4 ft bgs	EF-01	107	16.5			10-inch	113.0	99.0	15.0	93	Fail	FDT-49	CAS	
13/Aug	FDT-49	LCM 3 4 ft bgs	EF-01	107	16.5			10-inch	120.4	103.6	16.3	97	Pass		CAS	
13/Aug	FDT-50	LCM 3 3 ft bgs	EF-01	107	16.5			10-inch	119.2	101.6	17.4	95	Pass		CAS	
13/Aug	FDT-51	LCM 3 2 ft bgs	EF-01	107	16.5			10-inch	119.7	103.5	15.7	97	Pass		CAS	

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.: 2.3
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 14-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PASS/FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)	PERCENT COMPACT (%)			
14/Aug	FDT-52	LCM 3 1 ft bgs	EF-01	107	16.5			10-inch	118.8	102.0	16.5	95	Pass		CAS
14/Aug	FDT-53	LCM 3 @ surface	EF-01	107	16.5			10-inch	127.4	108.6	17.4	101	Pass		CAS
14/Aug	FDT-54	LCM 4 4 ft bgs	EF-01	107	16.5			10-inch	128.0	110.2	16.2	103	Pass		CAS
14/Aug	FDT-55	LCM 4 3 ft bgs	EF-01	107	16.5			10-inch	120.8	101.9	18.6	95	Pass		CAS
14/Aug	FDT-56	LCM 4 3 ft bgs	EF-01	107	16.5			10-inch	124.5	107.6	15.9	101	Pass		CAS
14/Aug	FDT-57	LCM 4 2 ft bgs	EF-01	107	16.5			10-inch	125.0	106.5	17.4	100	Pass		CAS
14/Aug	FDT-58	LCM 4 2 ft bgs	EF-01	107	16.5			10-inch	120.0	103.2	16.3	96	Pass		CAS
14/Aug	FDT-59	LCM 4 1 ft bgs	EF-01	107	16.5			10-inch	120.8	104.3	15.9	97	Pass		CAS
14/Aug	FDT-60	LCM 6 4 ft bgs	EF-01	107	16.5			10-inch	120.0	101.2	18.5	95	Pass		CAS
14/Aug	FDT-61	LCM 6 3 ft bgs	EF-01	107	16.5			10-inch	123.0	104.8	17.4	98	Pass		CAS
14/Aug	FDT-62	LCM 6 2 ft bgs	EF-01	107	16.5			10-inch	121.2	105.9	14.5	99	Pass		CAS
14/Aug	FDT-63	LCM 6 1 ft bgs	EF-01	107	16.5			10-inch	124.1	106.9	16.1	100	Pass		CAS
14/Aug	FDT-64	LCM 6 @ surface	EF-01	107	16.5			10-inch	118.0	102.5	15.2	96	Pass		CAS

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** 2.3
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 20-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
% COMPACTION: 95% **MOISTURE RANGE:** +/-
NUCLEAR GAUGE TYPE: Troxler 3440 **NUCLEAR GAUGE SERIAL NO.:** 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS					PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
20/Aug	FDT-65	LCM 5 4 ft bgs	EF-01	107	16.5			10-inch	119.2	101.5	17.5	95	Pass		CAS	
20/Aug	FDT-66	LCM 5 3 ft bgs	EF-01	107	16.5			10-inch	124.3	104.9	18.5	98	Pass		CAS	
20/Aug	FDT-67	LCM 5 2 ft bgs	EF-01	107	16.5			10-inch	124.0	105.0	18.1	98	Pass		CAS	
20/Aug	FDT-68	LCM 5 1 ft bgs	EF-01	107	16.5			10-inch	126.0	110.1	14.5	103	Pass		CAS	
20/Aug	FDT-69	LCM 5 @ surface	EF-01	107	16.5			10-inch	123.2	104.8	17.6	98	Pass		CAS	

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification **PROJECT NO.:** WG1548
LOCATION: Kekaha Landfill **TASK NO.:** 2.3
CONTRACTOR: Earthworks Pacific, Inc. (EPI) **DATE:** 21-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
% COMPACTION: 95% **MOISTURE RANGE:** +/-
NUCLEAR GAUGE TYPE: Troxler 3440 **NUCLEAR GAUGE SERIAL NO.:** 20877

DATE OF TEST (day/mo)	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST			FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
21/Aug	FDT-70	LCM 7 4 ft bgs	EF-01	107	16.5			10-inch	122.1	103.5	18.0	97	Pass		CAS	
21/Aug	FDT-71	LCM 7 3 ft bgs	EF-01	107	16.5			10-inch	122.9	105.8	16.2	99	Pass		CAS	
21/Aug	FDT-72	LCM 7 2 ft bgs	EF-01	107	16.5			10-inch	128.5	111.7	15.1	104	Pass		CAS	
21/Aug	FDT-73	LCM 7 1 ft bgs	EF-01	107	16.5			10-inch	121.8	106.3	14.6	99	Pass		CAS	
21/Aug	FDT-74	LCM 7 @ surface	EF-01	107	16.5			10-inch	121.2	103.2	17.5	96	Pass		CAS	

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.: 2.3
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 24-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS					PERCENT COMPACT (%)	PASS/FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
24/Aug	FDT-75	LCM 8 4 ft bgs	EF-01	107	16.5			10-inch	118.2	103.2	14.6	96	Pass		CAS	
24/Aug	FDT-76	LCM 8 3 ft bgs	EF-01	107	16.5			10-inch	127.2	107.6	18.3	101	Pass		CAS	
24/Aug	FDT-77	LCM 8 2 ft bgs	EF-01	107	16.5			10-inch	120.6	103.3	16.8	97	Pass		CAS	
24/Aug	FDT-78	LCM 8 1 ft bgs	EF-01	107	16.5			10-inch	118.5	102.3	15.9	96	Pass		CAS	
24/Aug	FDT-79	LCM 9 @ 4 ft bgs	EF-01	107	16.5			10-inch	123.7	104.9	18.0	98	Pass		CAS	
24/Aug	FDT-80	LCM 8 @ 3 ft bgs	EF-01	107	16.5			10-inch	127.3	108.0	17.9	101	Pass		CAS	
24/Aug	FDT-81	LCM 8 @ 2 ft bgs	EF-01	107	16.5			10-inch	125.7	106.3	18.3	99	Pass		CAS	

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekaha Landfill TASK NO.: 2.3
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 27-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil MOISTURE RANGE: +/-
 % COMPACTION: 95% NUCLEAR GAUGE SERIAL NO.: 20877
 NUCLEAR GAUGE TYPE: Troxler 3440

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS				PERCENT COMPACT (%)	PASS/ FAIL	RETEST NO.	QA ID	
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
27/Aug	FDT-82	LCM 10 4 ft bgs	EF-01	107	16.5			107.8	97.4	11.6	107.8	97.4	91	Fail	FDT-83	CAS
27/Aug	FDT-83	LCM 10 4 ft bgs	EF-01	107	16.5			121.2	105.3	15.1	121.2	105.3	98	Pass		CAS
27/Aug	FDT-84	LCM 10 3 ft bgs	EF-01	107	16.5			123.5	107.6	14.8	123.5	107.6	101	Pass		CAS
27/Aug	FDT-85	LCM 10 2 ft bgs	EF-01	107	16.5			121.1	104.0	16.4	121.1	104.0	97	Pass		CAS
27/Aug	FDT-86	LCM 10 1 ft bgs	EF-01	107	16.5			125.3	105.5	18.8	125.3	105.5	99	Pass		CAS
27/Aug	FDT-87	LCM 10 @ surface	EF-01	107	16.5			120.8	104.3	15.9	120.8	104.3	97	Pass		CAS
																CAS
																CAS

bgs = below ground surface



SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification
 LOCATION: Kekaha Landfill
 CONTRACTOR: Earthworks Pacific, Inc. (EPI)

PROJECT NO.: WG1548
 TASK NO.: 2.3
 DATE: 29-Aug-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS					PERCENT COMPACT	PASS/ FAIL	RETEST NO.	QA ID
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)					
29/Aug	FDT-88	LCM 11 4 ft bgs	EF-01	107	16.5			10-inch	120.2	104.5	15.1	98	Pass		CAS	
29/Aug	FDT-89	LCM 11 3 ft bgs	EF-01	107	16.5			10-inch	109.9	98.5	11.6	92	Fail	FDT-90	CAS	
29/Aug	FDT-90	LCM 11 3 ft bgs	EF-01	107	16.5			10-inch	124.3	106.0	17.3	99	Pass		CAS	
29/Aug	FDT-91	LCM 11 2 ft bgs	EF-01	107	16.5			10-inch	119.6	103.3	15.8	97	Pass		CAS	
29/Aug	FDT-92	LCM 11 1 ft bgs	EF-01	107	16.5			10-inch	122.5	105.1	16.6	98	Pass		CAS	
29/Aug	FDT-93	LCM 11 @ surface	EF-01	107	16.5			10-inch	119.2	101.9	17.0	95	Pass		CAS	
29/Aug	FDT-90	LCM 12 4 ft bgs	EF-01	107	16.5			10-inch	119.8	103.6	15.7	97	Pass		CAS	
29/Aug	FDT-91	LCM 12 3 ft bgs	EF-01	107	16.5			10-inch	127.0	107.4	18.3	100	Pass		CAS	
29/Aug	FDT-92	LCM 12 2 ft bgs	EF-01	107	16.5			10-inch	120.5	105.1	14.7	98	Pass		CAS	
29/Aug	FDT-93	LCM 12 1 ft bgs	EF-01	107	16.5			10-inch	125.2	106.5	17.6	100	Pass		CAS	
29/Aug	FDT-94	LCM 12 @ Surface	EF-01	107	16.5			10-inch	121.4	103.5	17.3	97	Pass		CAS	

bgs = below ground surface

SUMMARY OF FIELD DENSITY TEST

PROJECT: Phase II Leachate Modification PROJECT NO.: WG1548
 LOCATION: Kekeha Landfill TASK NO.: 2.3
 CONTRACTOR: Earthworks Pacific, Inc. (EPI) DATE: 24-Sep-12

SPECIFICATION REQUIREMENTS

SOURCE: On site excavated soil
 % COMPACTION: 95% MOISTURE RANGE: +/-
 NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO.: 20877

DATE OF TEST	TEST NO.	TEST LOCATION	LAB RESULTS			TYPE OF TEST		FIELD TEST RESULTS				PASS/FAIL	RETEST NO.	QA ID	
			SAMPLE NO.	MAX UNIT WT (pcf)	O.M.C. (%)	ASTM D-2922	ASTM D-1556	DEPTH/ELEV (ft)	WET UNIT WT (pcf)	DRY UNIT WT (pcf)	F.M.C. (%)				PERCENT COMPACT (%)
24/Sep	FDT-95	LCM 13 4 ft bgs	EF-01	107	16.5			10-inch	121.1	103.2	17.4	96	Pass		CAS
24/Sep	FDT-96	LCM 13 3 ft bgs	EF-01	107	16.5			10-inch	116.0	101.3	14.6	95	Pass	FDT-97	CAS
24/Sep	FDT-97	LCM 13 3 ft bgs	EF-01	107	16.5			10-inch	123.9	107.0	15.8	100	Pass		CAS
24/Sep	FDT-98	LCM 13 2 ft bgs	EF-01	107	16.5			10-inch	123.7	104.9	18.0	98	Pass		CAS
24/Sep	FDT-99	LCM 13 1 ft bgs	EF-01	107	16.5			10-inch	117.8	102.6	14.9	96	Pass		CAS
24/Sep	FDT-100	LCM 13 @ surface	EF-01	107	16.5			10-inch	122.6	106.1	15.6	99	Pass		CAS

bgs = below ground surface

Appendix G
Pressure Test Results

**ATTACHMENT 1
FORM
PE PIPE PRESSURE TEST REPORT**

PROJECT NAME/NO: <u>KEKONA LANDFILL</u>	TIME: <u>1500</u>
CONTRACTOR: <u>EARTHWORKS Pacific INC.</u>	DATE: <u>27 April 2012</u>
PERSON PERFORMING TESTS: <u>Bryan Davidson (EPC)</u>	
DESCRIPTION/LOCATION OF TEST SEGMENT (Pipe Diameter, Length, and SDRs): <u>WET WELL #1 INTERSTITIAL SPACE</u>	

- T_i = Initial temperature in °C = _____ °C
- P_i = Initial test pressure in psig = 3 psig
- P_c = Initial pressure in psig corrected for temperature (T_i) at time 't'
- t = Time in minutes from initiation of test
- T_t = Temperature in °C at time 't'
- P_t = Test pressure in psig at time 't'
- P_c = $\frac{(P_t + 14.7)(T_i + 273)}{(T_t + 273)} - 14.7$


Percent Pressure Drop = $\frac{(P_c - P_t)}{P_c} \times 100$

TIME (min.)	P _c TEMP READING (EC)	T _t GAUGE READING (psig)	P _t CORRECTED PRESSURE (psig)	P _c PRESSURE DROP (%)
0	N/A	3		0
20	N/A	3		0
30	N/A	3		0
40	N/A	3		0
50	N/A	3		0
60	N/A	3		0

PASS/FAILURE: PASS RETEST (yes/no): No

DESCRIPTION/NATURE OF LEAKS AND REPAIRS OF RETEST SEGMENT:

PASS


 Bryan Davidson
 Earthworks Pacific
 4/27/12

**ATTACHMENT 1
FORM
PE PIPE PRESSURE TEST REPORT**

PROJECT NAME/NO: KEVATA LANDFILL TIME: 0900
 CONTRACTOR: EARTHWORKS Pacific INC DATE: 19 April 2012
 PERSON PERFORMING TESTS: BRYAN DAVIDSON (EPE)
 DESCRIPTION/LOCATION OF TEST SEGMENT (Pipe Diameter, Length, and SDRs):
WET WELL # 2 INTERSTITIAL SPACE

- T_i = Initial temperature in °C = _____ °C
- P_i = Initial test pressure in psig = 5 psig
- P_c = Initial pressure in psig corrected for temperature (T_i) at time 't'
- t = Time in minutes from initiation of test
- T_t = Temperature in °C at time 't'
- P_t = Test pressure in psig at time 't'
- P_c = $\frac{(P_i + 14.7)(T_t + 273)}{(T_i + 273)} - 14.7$

Percent Pressure Drop = $\frac{(P_c - P_t)}{P_c} \times 100$

TIME (min.)	P_c TEMP READING (EC)	T_t GAUGE READING (psig)	P_t CORRECTED PRESSURE (psig)	P_c PRESSURE DROP (%)
0	N/A	5		0
20	N/A	5		0
30	N/A	5		0
40	N/A	5		0
50	N/A	5		0
60	N/A	5		0

PASS/FAILURE: PASS RETEST (yes/no): No

DESCRIPTION/NATURE OF LEAKS AND REPAIRS OF RETEST SEGMENT:

Pass



Bryan Davidson
Earthworks Pacific 4/20/12

**ATTACHMENT 1
FORM
PE PIPE PRESSURE TEST REPORT**

PROJECT NAME/NO: **Kekaha Landfill - WG1548** TIME: **9:00:00 AM**
 CONTRACTOR: **Earthworks Pacific / ITC** DATE: **23 April 2012**
 PERSON PERFORMING TESTS: **Bryan Davidson**

DESCRIPTION / LOCAION OF TEST Segment (Pipe Diameter. Length. And SDRs):
18 inch reducer; 12 inch reducer, to 6 inch sweep for both Wet Well's 1 and 2. All connected together for single 1 hour test duration.

Ti = Initial Temperature in deg C = 31.20 deg C
 Pi = Initial test pressure in psig = 10.00 psig
 Pc = Initial pressure in psig corrected for temperature (Tt) at time 't'
 t = Time in minutes from initiation of test
 Tt = Temperature in deg C at time 't'
 Pt = Test pressure in psig at time 't'

$$Pc = ((Pi + 14.7) (Tt + 273) / (Ti + 273)) - 14.7$$


$$\text{Percent Pressure Drop} = ((Pc - Pt) / Pc) \times 100$$

t	Tt	Pt	Pc	Pd
TIME (min)	TEMP READING (deg C)	GAUGE READING (psig)	CORRECTED PRESSURE (psig)	PRESSURE DROP (%)
0	31.2	10.00	10.00	0.00
20	33.8	10.30	10.21	-0.87
30	34.9	10.30	10.30	0.00
40	34.5	10.30	10.27	-0.31
50	34.3	10.20	10.25	0.50
60	34.2	10.30	10.24	-0.55

PASS / FAILURE: **Pass** RETEST (yes / no): **Yes**

DESCRIPTION / NATURE OF LEAKS AND REPAIRS OF RETEST SEGMENT:
First test failed / sealed test fitting re-test passed

**ATTACHMENT 1
FORM
PE PIPE PRESSURE TEST REPORT**

PROJECT NAME/NO: Kekaha Landfill - WG1548	TIME: 1:45:00 PM
CONTRACTOR: Earthworks Pacific / ITC	DATE: 25 April 2012
PERSON PERFORMING TESTS: Bryan Davidson 	4/25/12
DESCRIPTION / LOCAION OF TEST Segment (Pipe Diameter, Length, And SDRs): Wet Well # 2 3-in HDPE discharge thru valve box connecting to existng 6-in HDPE discharge	

Ti = Initial Temperature in deg C = **35.10** deg C
 Pi = Initial test pressure in psig = **10.00** psig
 Pc = Initial pressure in psig corrected for temperature (Tt) at time 't'
 t = Time in minutes from initiation of test
 Tt = Temperature in deg C at time 't'
 Pt = Test pressure in psig at time 't'

$$Pc = ((Pi + 14.7) (Tt + 273) / (Ti + 273)) - 14.7$$

$$\text{Percent Pressure Drop} = ((Pc - Pt) / Pc) \times 100$$

t	Tt	Pt	Pc	Pd
TIME (min)	TEMP READING (deg C)	GAUGE READING (psig)	CORRECTED PRESSURE (psig)	PRESSURE DROP (%)
0	35.1	10.00	10.00	0.00
20	35.4	10.00	10.02	0.24
30	35.4	10.00	10.02	0.24
40	36.1	10.00	10.08	0.80
50	36.0	10.10	10.07	-0.28
60	36.3	10.00	10.10	0.95

PASS / FAILURE: Pass	RETEST (yes / no): Yes
-----------------------------	-------------------------------

DESCRIPTION / NATURE OF LEAKS AND REPAIRS OF RETEST SEGMENT:

**ATTACHMENT 1
FORM
PE PIPE PRESSURE TEST REPORT**

PROJECT NAME/NO: **Kekaha Landfill - WG1548** TIME: **1:45:00 PM**

CONTRACTOR: **Earthworks Pacific / ITC** DATE: **5/18/2012**

PERSON PERFORMING TESTS: **Bryan Davidson**

DESCRIPTION / LOCAION OF TEST Segment (Pipe Diameter. Length. And SDRs):
Wet Well # 1 3-in HDPE discharge thru valve box connecting to existng 6-in HDPE discharge

Ti = Initial Temperature in deg C = **32.20** deg C
 Pi = Initial test pressure in psig = **10.00** psig
 Pc = Initial pressure in psig corrected for temperature (Tt) at time 't'
 t = Time in minutes from initiation of test
 Tt = Temperature in deg C at time 't'
 Pt = Test pressure in psig at time 't'

$$Pc = ((Pi + 14.7) (Tt + 273) / (Ti + 273)) - 14.7$$

$$\text{Percent Pressure Drop} = ((Pc - Pt) / Pc) \times 100$$

t	Tt	Pt	Pc	Pd
TIME (min)	TEMP READING (deg C)	GAUGE READING (psig)	CORRECTED PRESSURE (psig)	PRESSURE DROP (%)
0	32.2	10.00	10.00	0.00
20	32.1	10.00	9.99	-0.08
30	32.4	10.00	10.02	0.16
40	32.5	10.00	10.02	0.24
50	31.4	10.10	9.94	-1.66
60	30.1	10.00	9.83	-1.73

PASS / FAILURE: **Pass** RETEST (yes / no): **Yes**

DESCRIPTION / NATURE OF LEAKS AND REPAIRS OF RETEST SEGMENT:

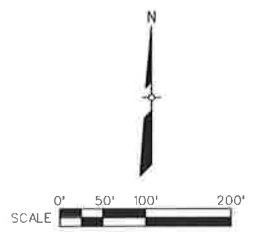
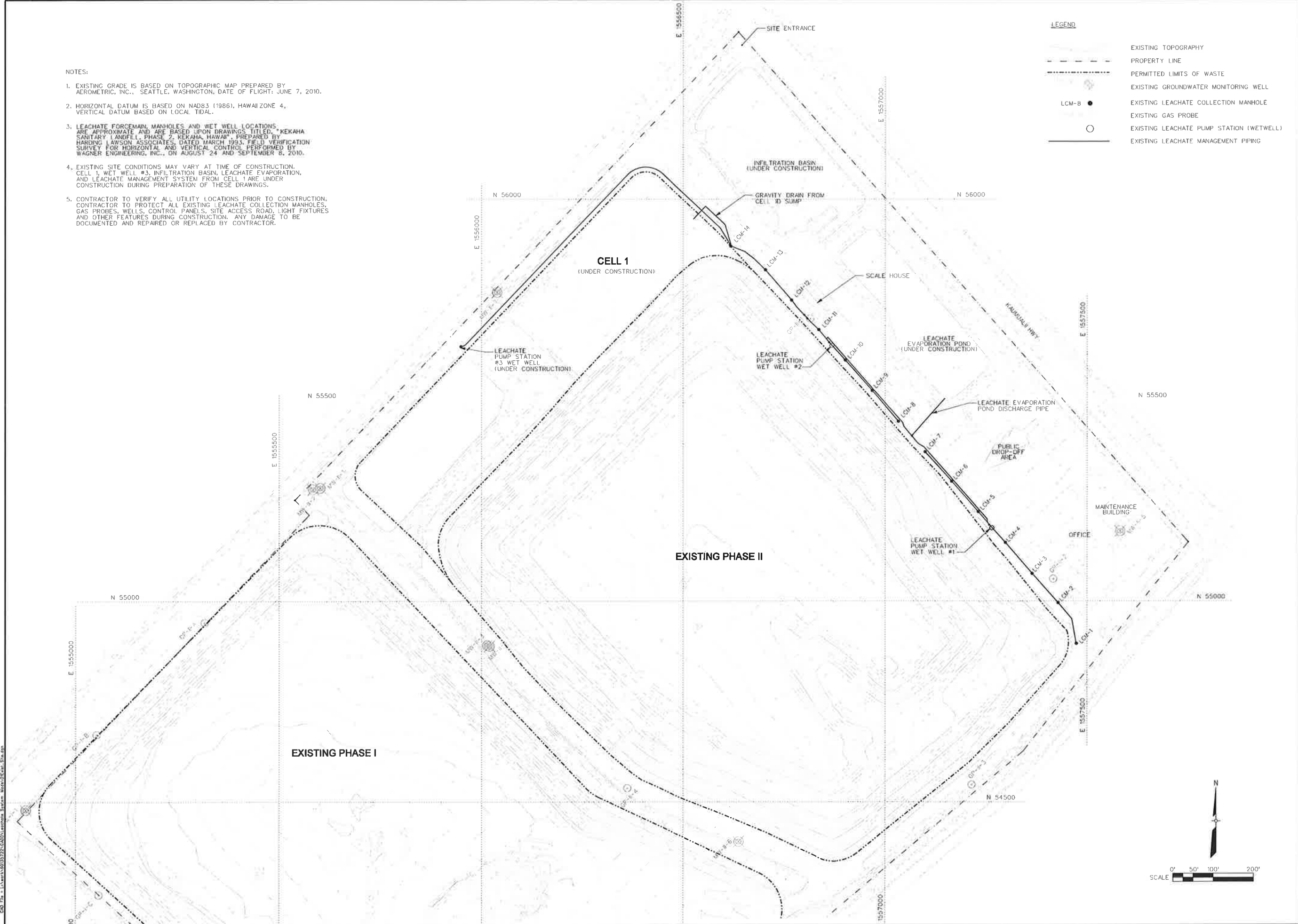
Appendix H
Red-Lined Construction Drawings

NOTES:

- EXISTING GRADE IS BASED ON TOPOGRAPHIC MAP PREPARED BY AEROMETRIC, INC., SEATTLE, WASHINGTON, DATE OF FLIGHT: JUNE 7, 2010.
- HORIZONTAL DATUM IS BASED ON NAD83 (1986), HAWAII ZONE 4, VERTICAL DATUM BASED ON LOCAL TIDAL.
- LEACHATE FORCE MAIN MANHOLES AND WET WELL LOCATIONS ARE APPROXIMATE AND ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993, FIELD VERIFICATION SURVEY FOR HORIZONTAL AND VERTICAL CONTROL PERFORMED BY WAGNER ENGINEERING, INC., ON AUGUST 24 AND SEPTEMBER 6, 2010.
- EXISTING SITE CONDITIONS MAY VARY AT TIME OF CONSTRUCTION. CELL 1, WET WELL #3, INFILTRATION BASIN, LEACHATE EVAPORATION, AND LEACHATE MANAGEMENT SYSTEM FROM CELL 1 ARE UNDER CONSTRUCTION DURING PREPARATION OF THESE DRAWINGS.
- CONTRACTOR TO VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT ALL EXISTING LEACHATE COLLECTION MANHOLES, GAS PROBES, WELLS, CONTROL PANELS, SITE ACCESS ROAD, LIGHT FIXTURES AND OTHER FEATURES DURING CONSTRUCTION. ANY DAMAGE TO BE DOCUMENTED AND REPAIRED OR REPLACED BY CONTRACTOR.

LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- PERMITTED LIMITS OF WASTE
- EXISTING GROUNDWATER MONITORING WELL
- EXISTING LEACHATE COLLECTION MANHOLE
- EXISTING GAS PROBE
- EXISTING LEACHATE PUMP STATION (WETWELL)
- EXISTING LEACHATE MANAGEMENT PIPING



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SHEET NO. APRIL 30, 2012
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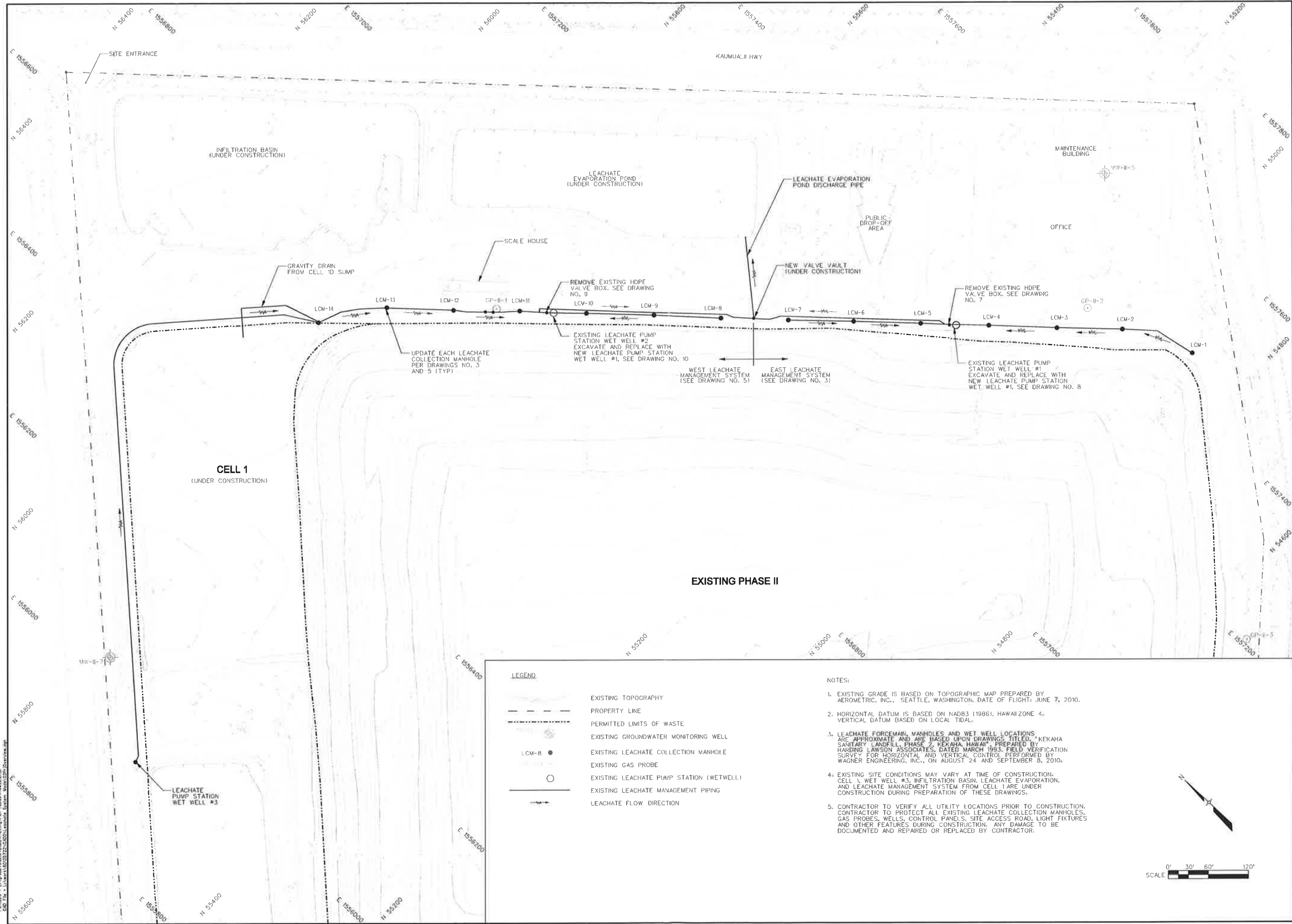
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DRAFT CONSTRUCTION DRAWINGS
 DRAFT LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
 PHASE III LEACHATE MANAGEMENT SYSTEM LANDFILL
 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII

EXISTING SITE CONDITIONS

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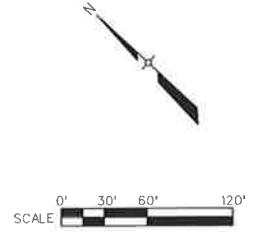
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LEGEND

	EXISTING TOPOGRAPHY
	PROPERTY LINE
	PERMITTED LIMITS OF WASTE
	EXISTING GROUNDWATER MONITORING WELL
	EXISTING LEACHATE COLLECTION MANHOLE
	EXISTING GAS PROBE
	EXISTING LEACHATE PUMP STATION (WETWELL)
	EXISTING LEACHATE MANAGEMENT PIPING
	LEACHATE FLOW DIRECTION

- NOTES:**
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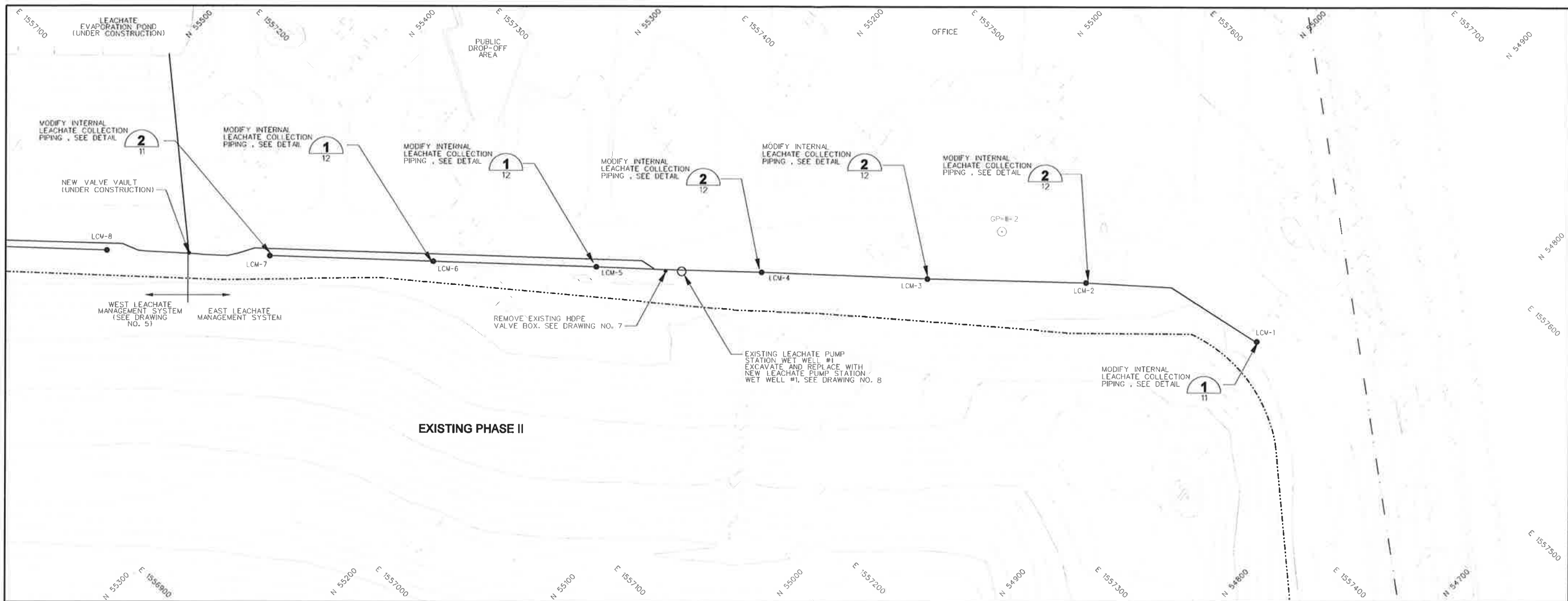
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DRAFT CONSTRUCTION DRAWINGS
PHASE III LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

PROJECT OVERVIEW

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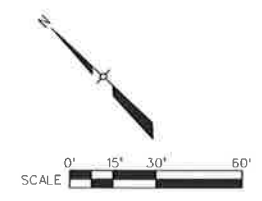


LEGEND

- EXISTING TOPOGRAPHY
- PROPERTY LINE
- PERMITTED LIMITS OF WASTE
- EXISTING GROUNDWATER MONITORING WELL
- EXISTING LEACHATE COLLECTION MANHOLE
- EXISTING GAS PROBE
- EXISTING LEACHATE PUMP STATION (WETWELL)
- EXISTING LEACHATE MANAGEMENT PIPING

NOTES:

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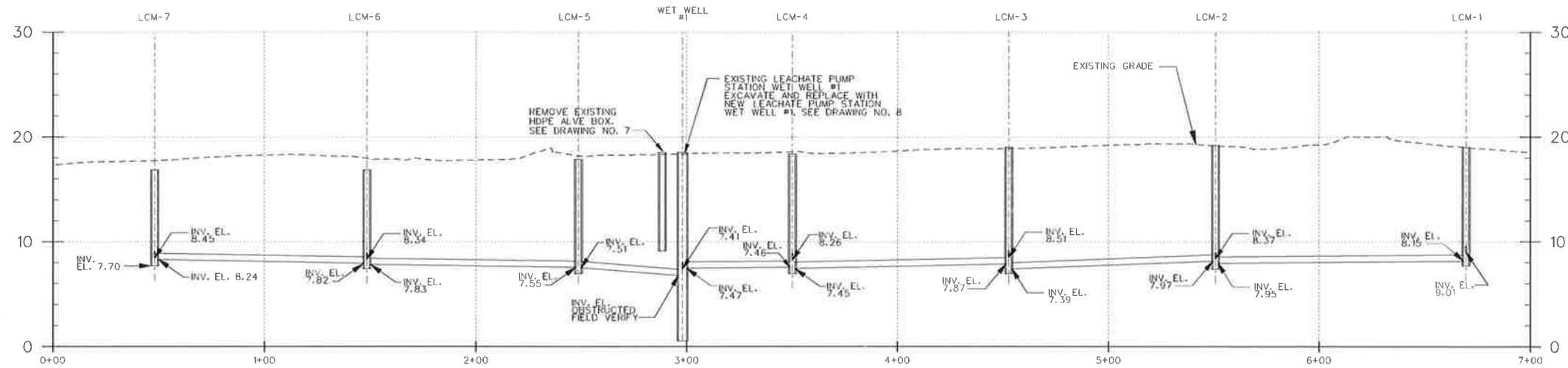
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 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII
EAST LEACHATE MANAGEMENT SYSTEM

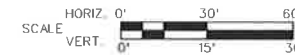
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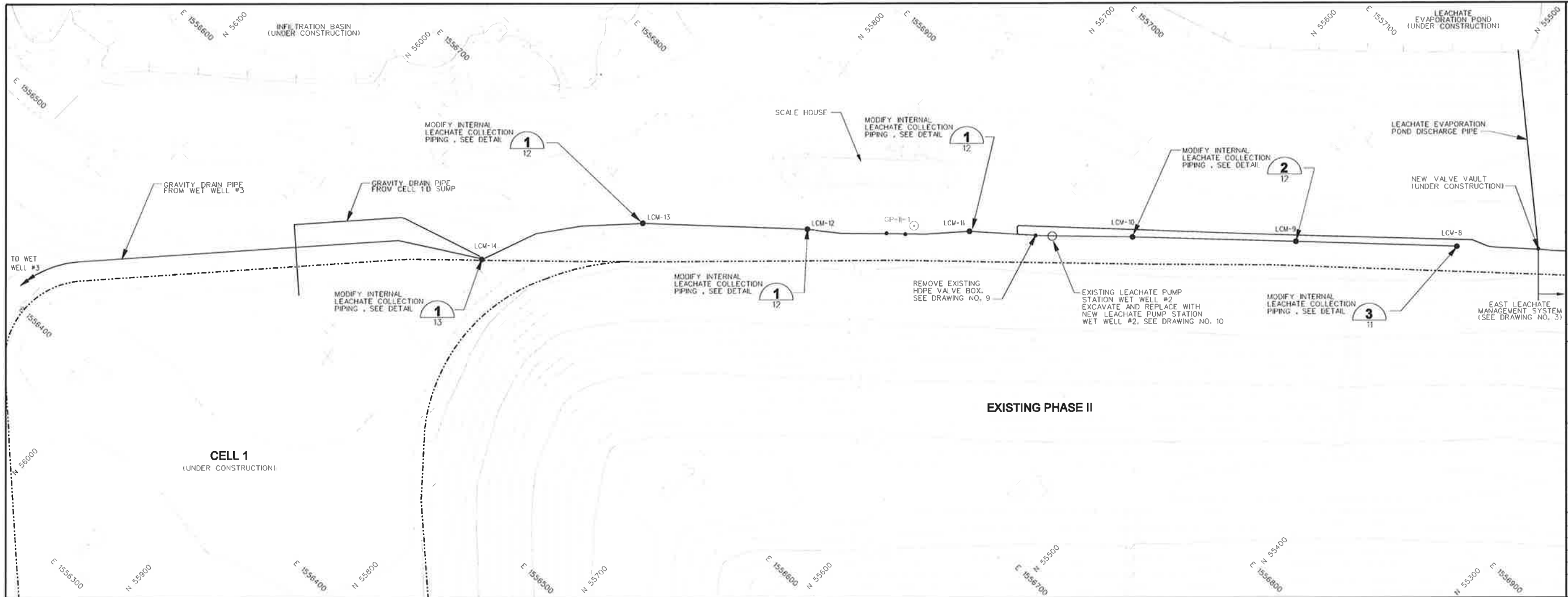
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KENNETH J. BERNSCHULZ
 LICENSED PROFESSIONAL ENGINEER
 No. 12109-C
 HAWAII, U.S.A.

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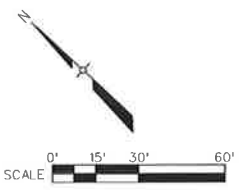
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- LEGEND**
- EXISTING TOPOGRAPHY
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 - PERMITTED LIMITS OF WASTE
 - EXISTING GROUNDWATER MONITORING WELL
 - EXISTING LEACHATE COLLECTION MANHOLE
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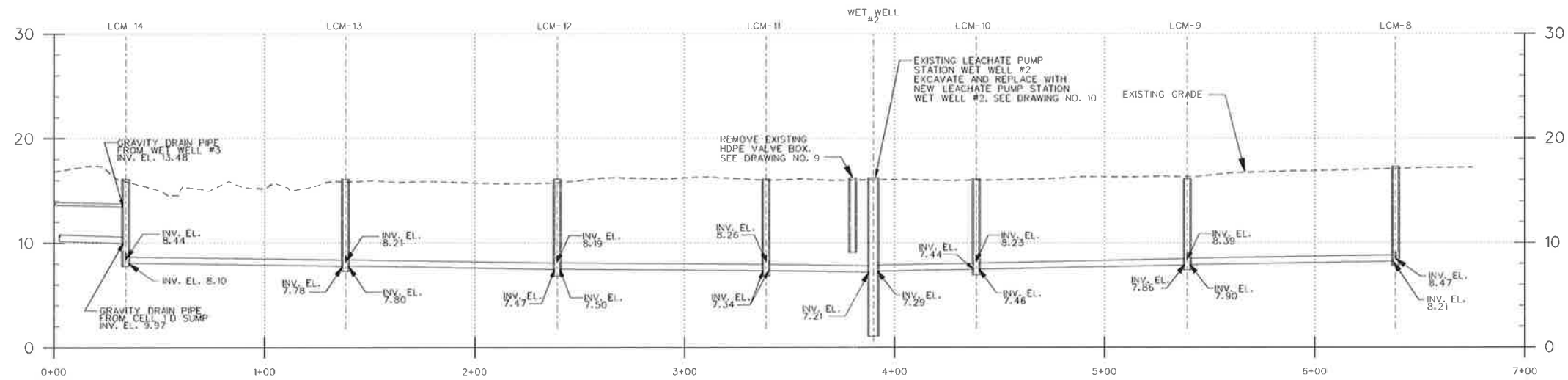
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 PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII

WEST LEACHATE MANAGEMENT SYSTEM

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NOTES:

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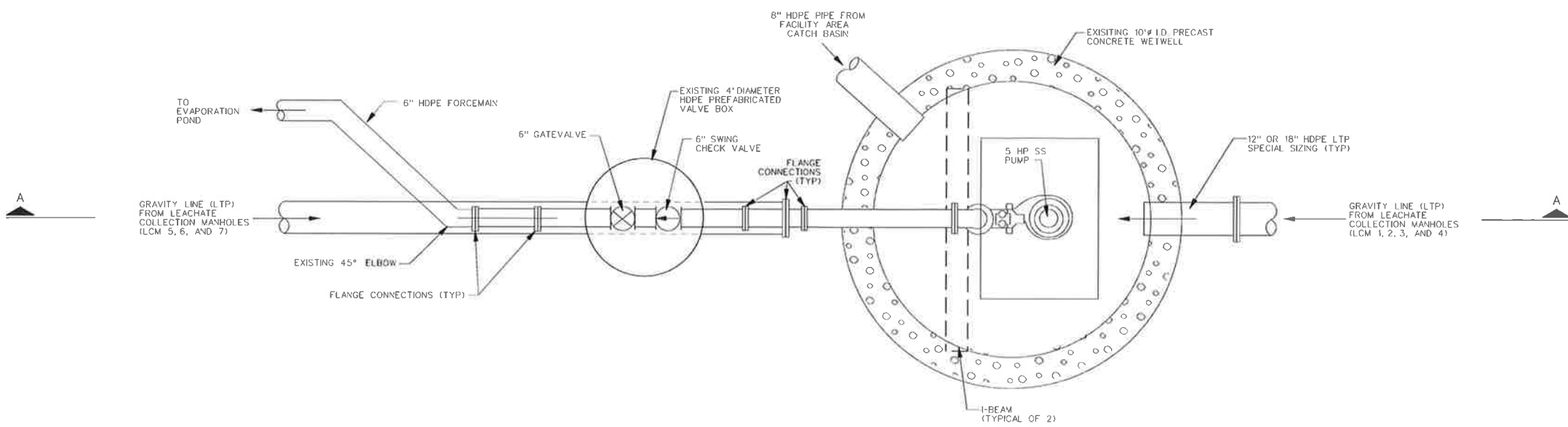
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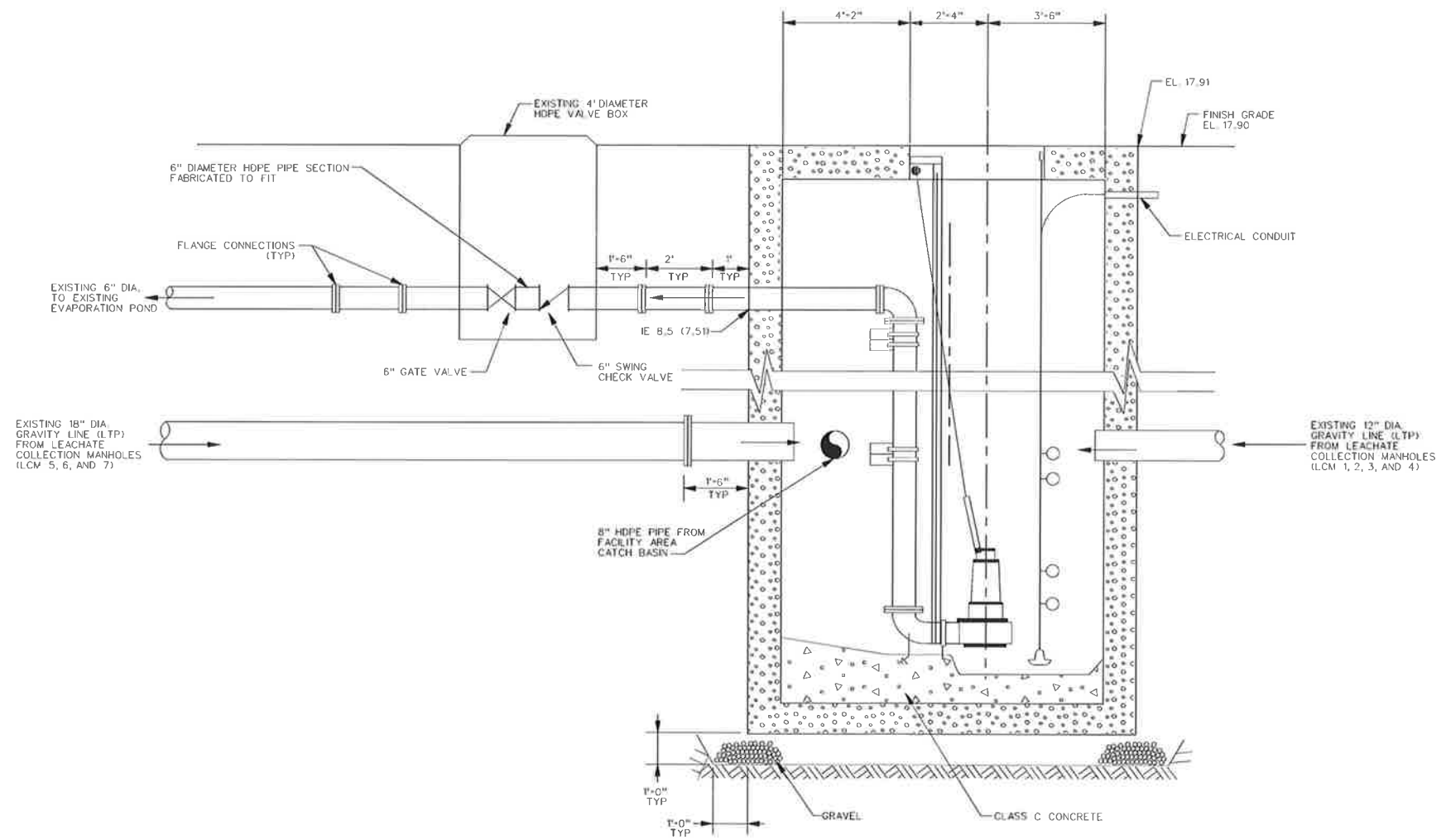
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 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII
WEST LEACHATE MANAGEMENT SYSTEM PROFILE

DATE	OCTOBER 2010
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FILENAME	06Profile.dwg
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DRAWING NO	6



PLAN



SECTION A-A

EXISTING WET WELL #1
NTS

GENERAL NOTE:

- EXISTING DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, REKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993. ACTUAL CONFIGURATION OF WET WELL AND VALVE BOX MAY VARY. CONTRACTOR TO VERIFY EXISTING STRUCTURES PRIOR TO COSTING CONSTRUCTION EFFORT.
- CONTRACTOR TO MAINTAIN LEACHATE FLOW TO THE LEACHATE EVAPORATION POND WHILE WET WELL IS REMOVED, REPLACED, AND APPROVED FOR OPERATION.
- CONTRACTOR TO FIELD VERIFY ALL PIPE INVERTS OF THE EXISTING WET WELL AND VALVE BOX PRIOR TO REMOVAL FOR INCORPORATION INTO SHOP DRAWINGS FOR NEW STRUCTURES AND DOCUMENTATION OF INSTALLATION.

NO	REVISIONS	DRN	CHK	DATE

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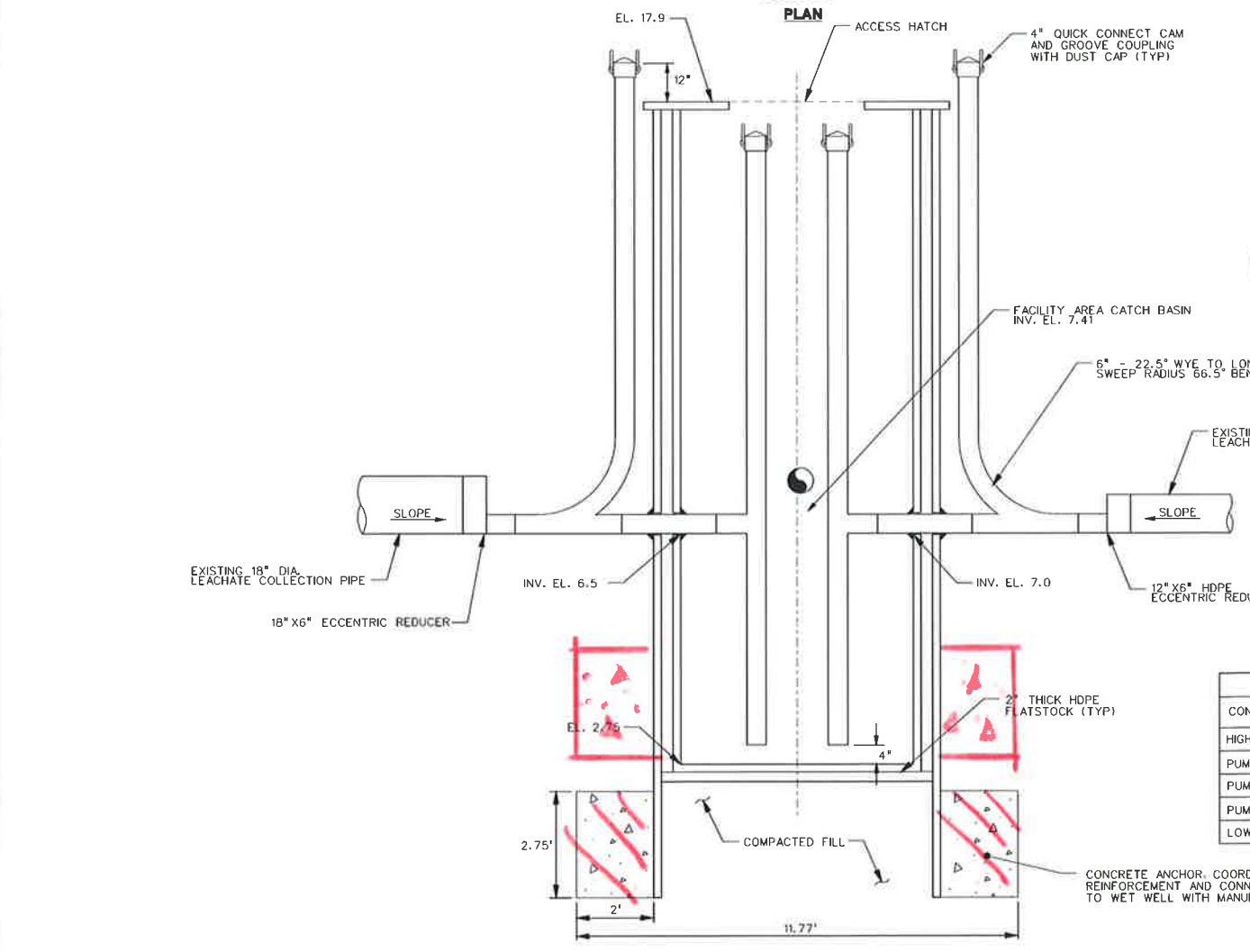
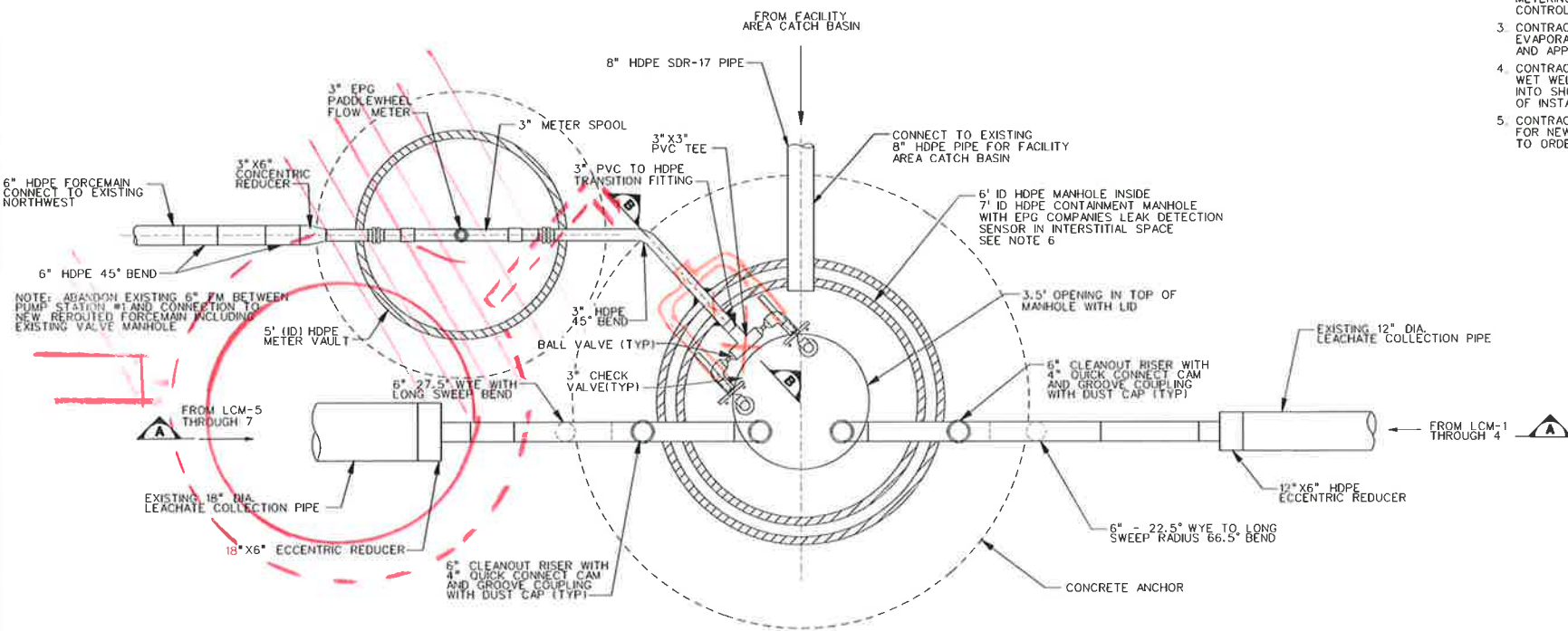
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 PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII

EXISTING WET WELL #1 DETAILS

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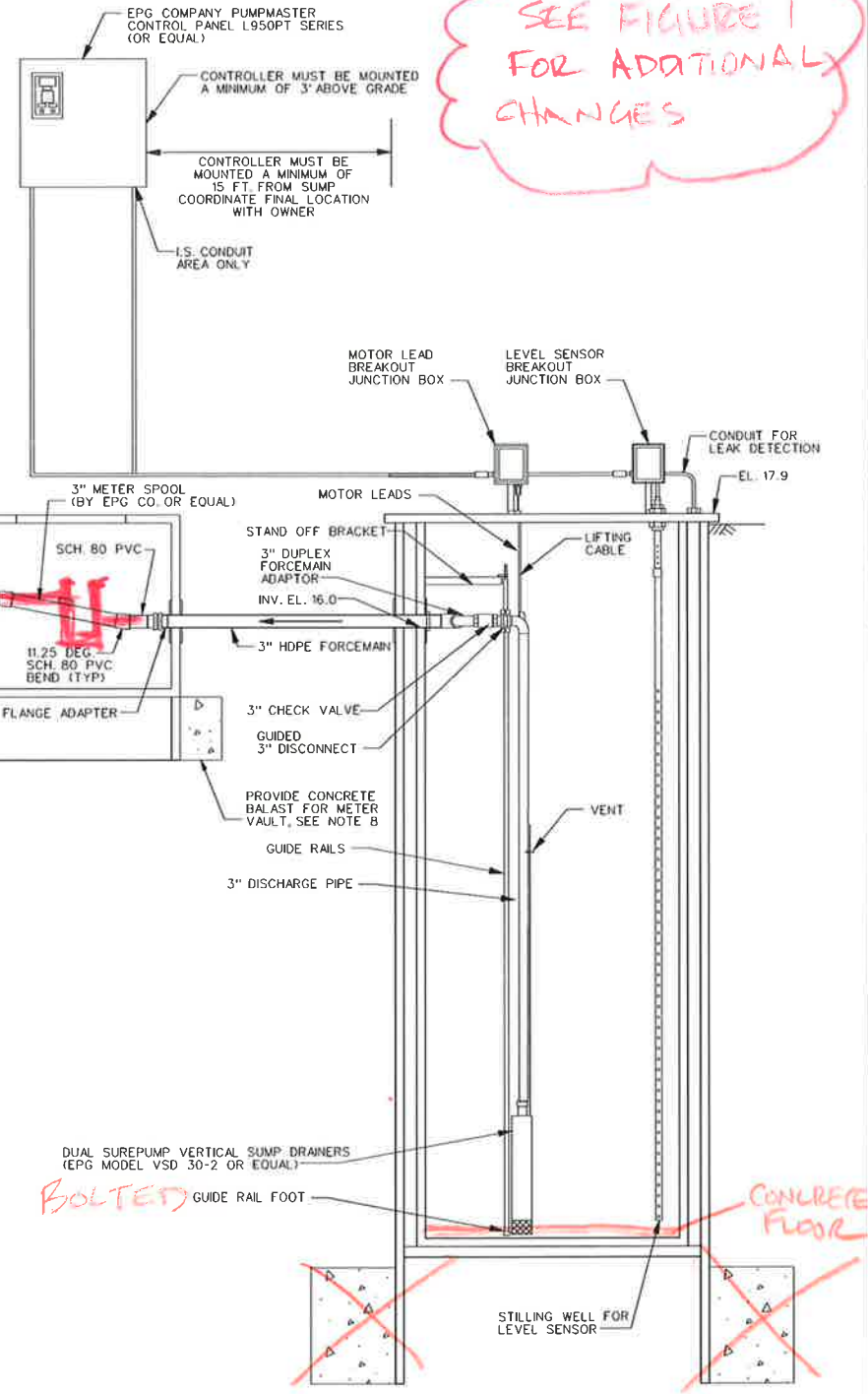
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- NOTES:
1. ALL REQUIRED COMPONENTS FOR FOLLOWING PARTS AND SYSTEMS BY EPG COMPANY (OR EQUAL).
 2. PUMPING AND WET WELL CONTROL SYSTEMS TO INCLUDE VERTICAL DISCHARGE PUMPS, CABLES, MOTOR LEADS, GUIDERAIL SYSTEM, DISCONNECTS, LEVEL SENSORS, LEAK DETECTION SYSTEM, FLOW METERING SYSTEM, AND CONTROLLER TO RECORD, MONITOR AND CONTROL SYSTEMS AND ALARM/ALERT OPERATOR, AS NECESSARY.
 3. CONTRACTOR TO MAINTAIN LEACHATE FLOW TO THE LEACHATE EVAPORATION POND WHILE WET WELL IS REMOVED, REPLACED, AND APPROVED FOR OPERATION.
 4. CONTRACTOR TO FIELD VERIFY ALL PIPE INVERTS OF THE EXISTING WET WELL AND VALVE BOX PRIOR TO REMOVAL FOR INCORPORATION INTO SHOP DRAWINGS FOR NEW STRUCTURES AND DOCUMENTATION OF INSTALLATION.
 5. CONTRACTOR TO GAIN OWNER APPROVAL OF ALL SHOP DRAWINGS FOR NEW STRUCTURES (WET WELLS AND METER MANHOLE) PRIOR TO ORDERING.
 6. WET WELL ASSEMBLY COMPRISED OF A 6 FOOT INSIDE DIA. PIPE (MANHOLE) INSIDE OF A 7 FOOT INSIDE DIA. PIPE (CONTAINMENT MANHOLE) PIPES TO BE MCHOLITE POLYETHYLENE PIPE WITH RING STIFFNESS CLASS 250 OR EQUAL. WET WELL COVER AND FLOOR/BASE ARE 2 INCH THICK HDPE FLATSTOCK WELDED TO THE PIPES. COORDINATE WITH MANUFACTURER REINFORCEMENT AND SECURING OF CONCRETE ANCHOR TO BASE.
 7. TERMINATE LEVEL SENSOR VENT TUBE WITH BELLOWS. LOCATE BELLOWS IN LEVEL SENSOR CABLE JUNCTION BOX.
 8. PROVIDE 18.5 CUBIC FEET OF CONCRETE BALAST FOR EACH 1 VERTICAL FOOT OF METER VAULT DEPTH.
 9. EPG PUMPMASTER CONTROL PANEL SERIES L950PT AND EPG PUMPS MODEL 30-2 SHALL BE CAPABLE OF VARIABLE FREQUENCY DRIVE (VFD) OPERATION. THE VFD FOR EACH PUMP SHALL BE CAPABLE OF OPERATING FROM 60 GPM AT 18 FT. TDH TO 144 GPM AT 40 FT. TDH.



WET WELL #1 PUMP CONTROLS		
CONTROL ACTION	HEIGHT ABOVE FLOOR OF #1 WET WELL	ELEVATION FEET ABOVE MSL
HIGH LEVEL ALARM	50"	6.92
PUMP 2 ON	40"	6.08
PUMP 1 ON	30"	5.25
PUMP(S) OFF	9"	3.50
LOW LEVEL ALARM	7"	3.33

NEW WET WELL #1
NTS



SEE FIGURE 1 FOR ADDITIONAL CHANGES

NO.	REVISIONS	DRN	CHK	DATE
1	MODIFIED PUMP SIZE, DISCHARGE AND METER PIPING, METER MANHOLE AND GENERAL NOTES.	DRB	KJB	05/16/11

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APRIL 30, 2012
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Sheboygon, Wisconsin
DRN: DRB
DES: NKW/TCR
CHK: PJW
APP: KJB

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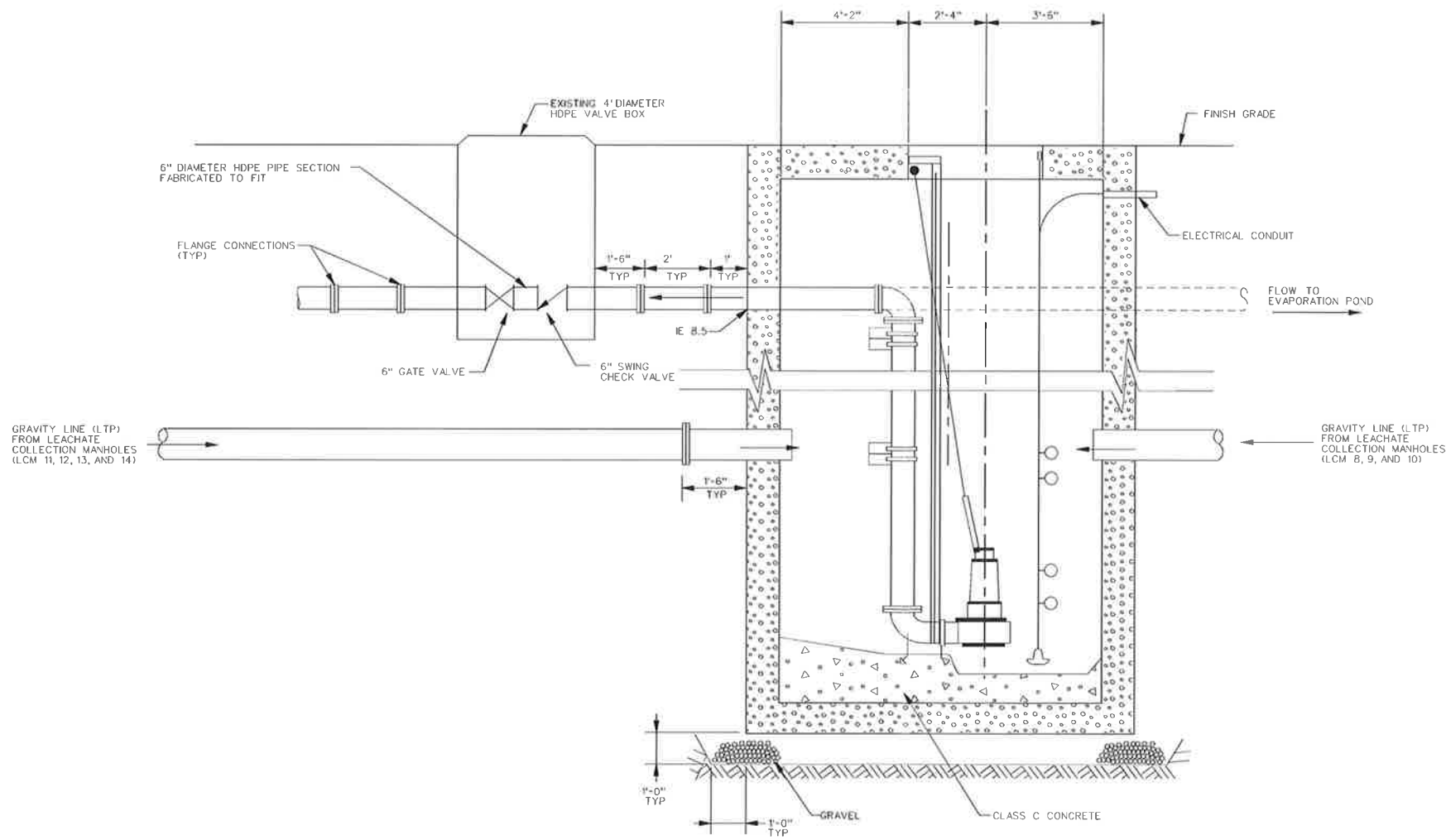
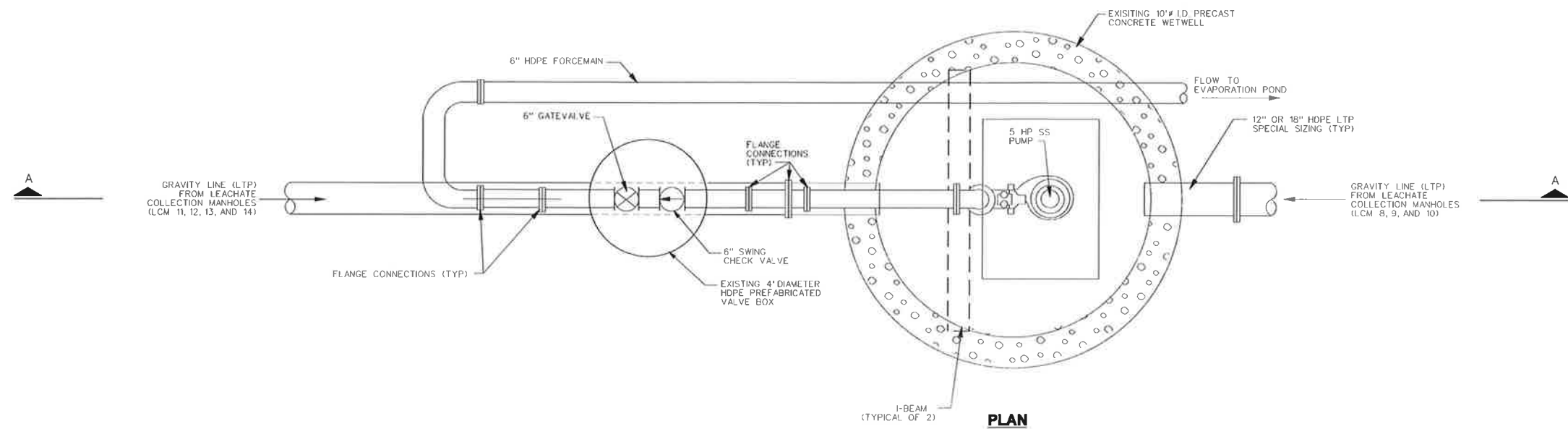
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PHASE III LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA, SANTARY LANDFILL
KAUAI, HAWAII

NEW WET WELL #1 DETAILS

DATE	OCTOBER 2010
PROJECT NO	60135722
FILENAME	DRdetails.dgn
SHEET NO	
DRAWING NO	8

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SECTION A-A

EXISTING WET WELL #2
NTS

GENERAL NOTE:

- EXISTING DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993. ACTUAL CONFIGURATION OF WET WELL AND VALVE BOX MAY VARY. CONTRACTOR TO VERIFY EXISTING STRUCTURES PRIOR TO COSTING CONSTRUCTION EFFORT.
- CONTRACTOR TO MAINTAIN LEACHATE FLOW TO THE LEACHATE EVAPORATION POND WHILE WET WELL IS REMOVED, REPLACED, AND APPROVED FOR OPERATION.
- CONTRACTOR TO FIELD VERIFY ALL PIPE INVERTS OF THE EXISTING WET WELL AND VALVE BOX PRIOR TO REMOVAL FOR INCORPORATION INTO SHOP DRAWINGS FOR NEW STRUCTURES AND DOCUMENTATION OF INSTALLATION.

NO.	REVISIONS	DRN	CHK	DATE

LICENSED PROFESSIONAL ENGINEER
 No. 12105-C
 HAWAII, U.S.A.

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CHK	PJW
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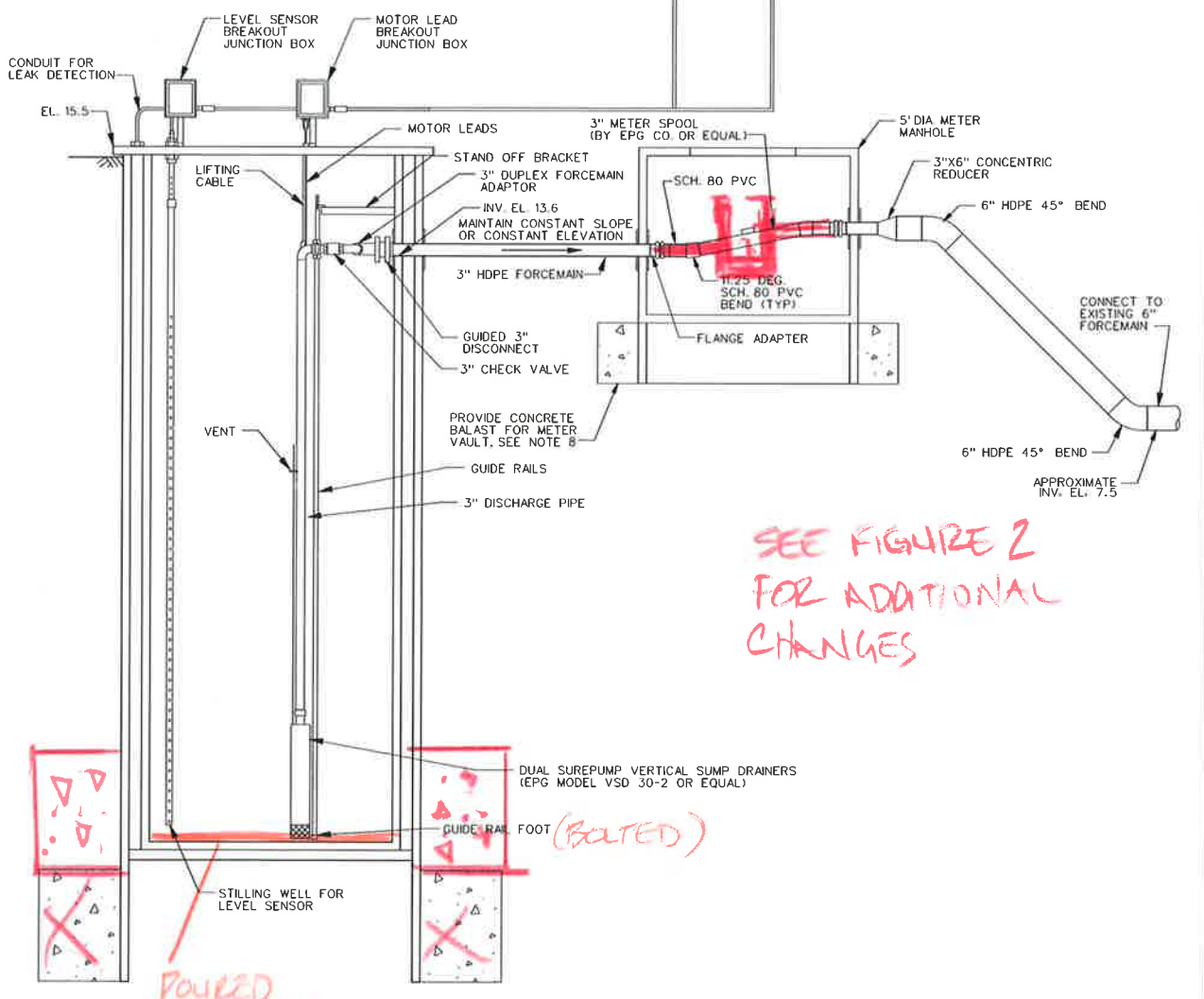
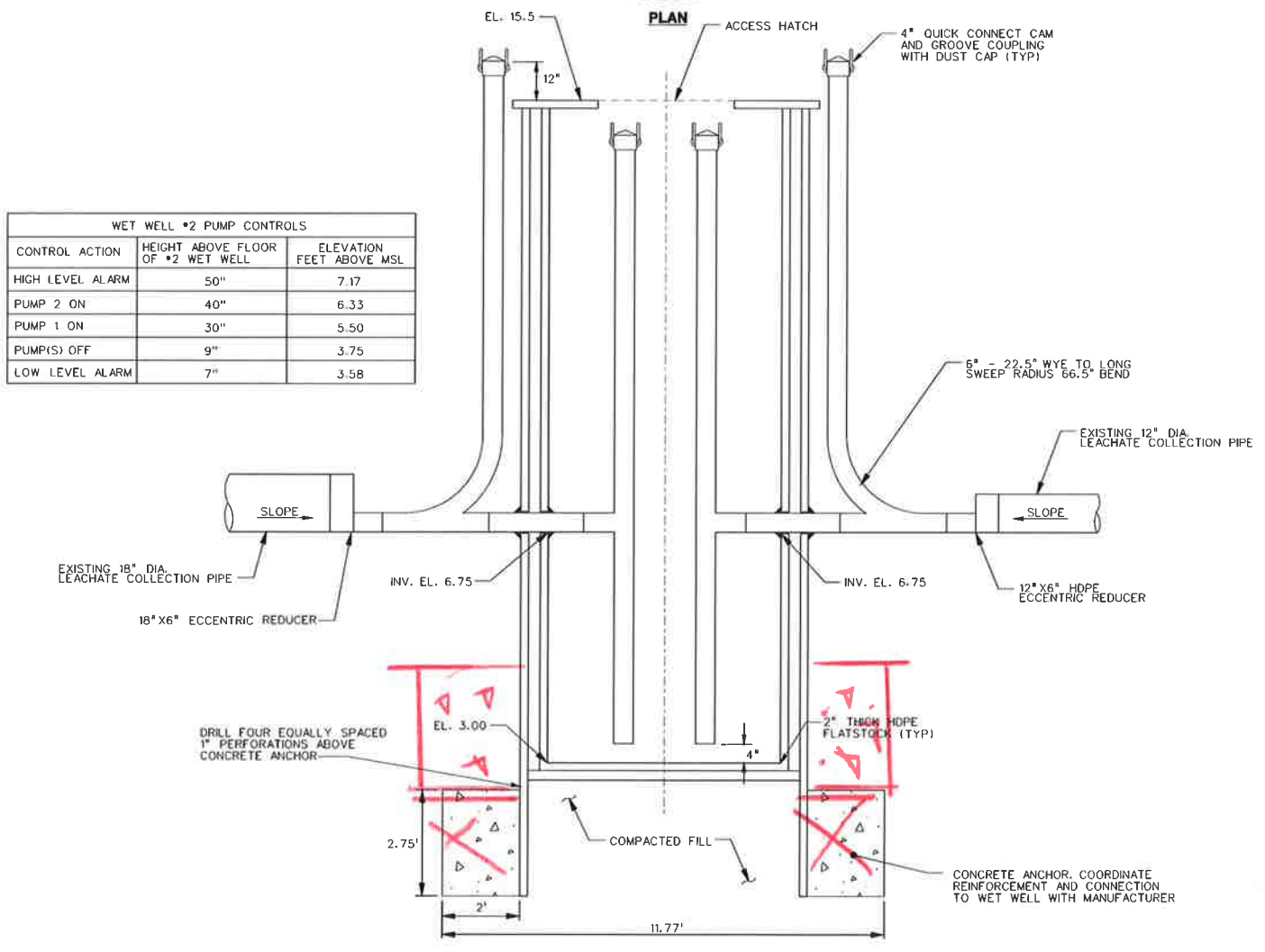
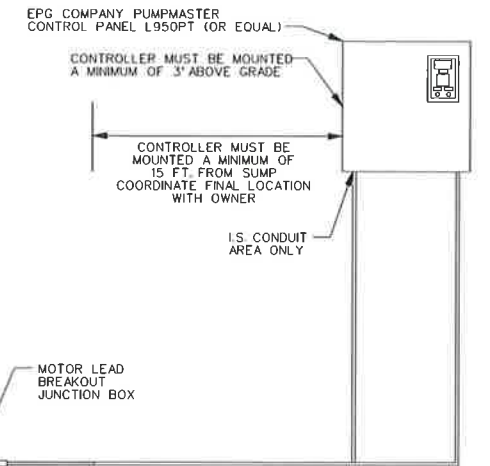
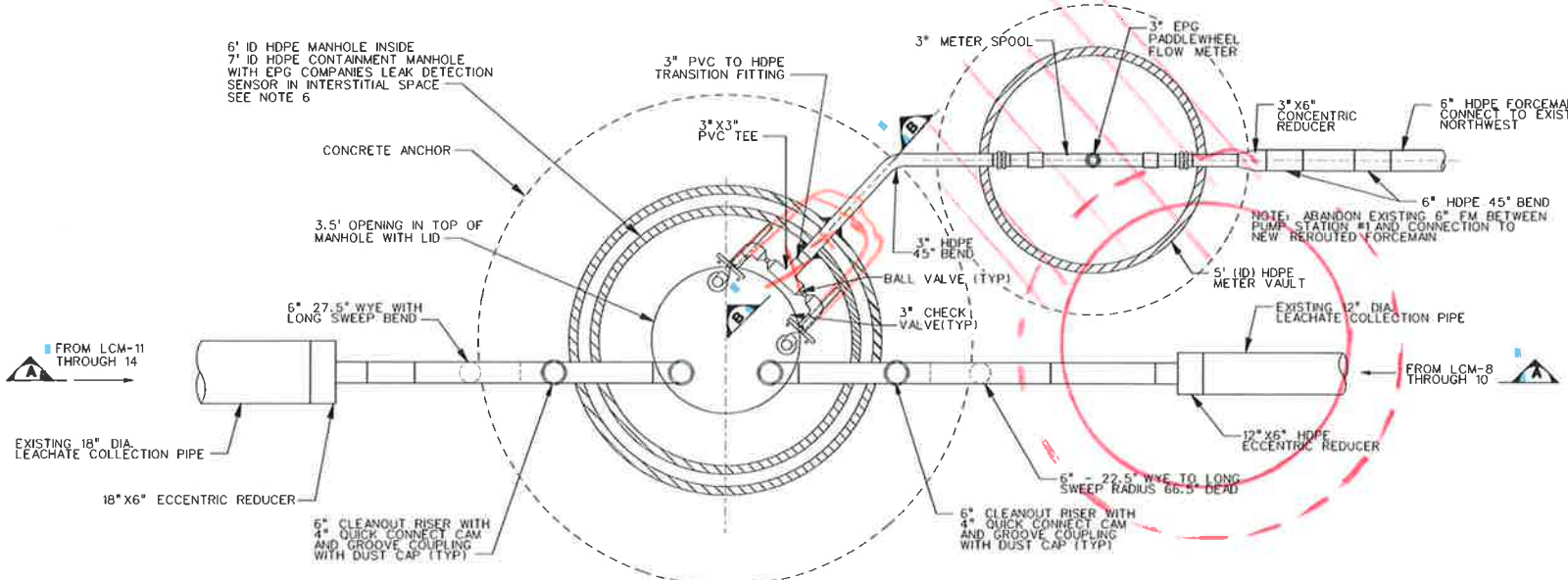
DRAFT CONSTRUCTION DRAWINGS
 PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII

EXISTING WET WELL #2 DETAILS

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DRAWING NO	

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- NOTES:
- ALL REQUIRED COMPONENTS FOR FOLLOWING PARTS AND SYSTEMS BY EPG COMPANY (OR EQUAL).
 - PUMPING AND WET WELL CONTROL SYSTEMS TO INCLUDE VERTICAL DISCHARGE PUMPS, CABLES, MOTOR LEADS, GUIDERAIL SYSTEM, DISCONNECTS, LEVEL SENSORS, LEAK DETECTION SYSTEM, FLOW METERING SYSTEM, AND CONTROLLER TO RECORD, MONITOR AND CONTROL SYSTEMS AND ALARM/ALERT OPERATOR, AS NECESSARY.
 - CONTRACTOR TO MAINTAIN LEACHATE FLOW TO THE LEACHATE EVAPORATION POND WHILE WET WELL IS REMOVED, REPLACED, AND APPROVED FOR OPERATION.
 - CONTRACTOR TO FIELD VERIFY ALL PIPE INVERTS OF THE EXISTING WET WELL AND VALVE BOX PRIOR TO REMOVAL FOR INCORPORATION INTO SHOP DRAWINGS FOR NEW STRUCTURES AND DOCUMENTATION OF INSTALLATION.
 - CONTRACTOR TO GAIN OWNER APPROVAL OF ALL SHOP DRAWINGS FOR NEW STRUCTURES (WET WELLS AND METER MANHOLE) PRIOR TO ORDERING.
 - WET WELL ASSEMBLY COMPRISED OF A 6 FOOT INSIDE DIA PIPE (MANHOLE) INSIDE OF A 7 FOOT INSIDE DIA PIPE (CONTAINMENT MANHOLE). PIPES TO BE WHELITOLITE POLYETHYLENE PIPE WITH RING STIFFNESS CLASS 250 OR EQUAL. WET WELL COVER AND FLOOR/BASE ARE 2 INCH THICK HDPE FLATSTOCK WELDED TO THE PIPES. COORDINATE WITH MANUFACTURER REINFORCEMENT AND SECURING OF CONCRETE ANCHOR TO BASE.
 - TERMINATE LEVEL SENSOR VENT TUBE WITH BELLOWS, LOCATE BELLOWS IN LEVEL SENSOR CABLE JUNCTION BOX.
 - PROVIDE 18.5 CUBIC FEET OF CONCRETE BALAST FOR EACH 1 VERTICAL FOOT OF METER VAULT DEPTH.
 - EPG PUMPMASTER CONTROL PANEL SERIES L950PT AND EPG PUMPS MODEL 30-2 SHALL BE CAPABLE OF VARIABLE FREQUENCY DRIVE (VFD) OPERATION. THE VFD FOR EACH PUMP SHALL BE CAPABLE OF OPERATING FROM 64 GPM AT 18 FT TDH TO 145 GPM AT 40 FT TDH.



SEE FIGURE 2
FOR ADDITIONAL
CHANGES

WET WELL #2 PUMP CONTROLS		
CONTROL ACTION	HEIGHT ABOVE FLOOR OF #2 WET WELL	ELEVATION FEET ABOVE MSL
HIGH LEVEL ALARM	50"	7.17
PUMP 2 ON	40"	6.33
PUMP 1 ON	30"	5.50
PUMP(S) OFF	9"	3.75
LOW LEVEL ALARM	7"	3.58

DATE	OCTOBER 2010
PROJECT NO	60135722
FILENAME	10detail.dgn
SHEET NO	
DRAWING NO	10

DATE 05/16/11
DRN KJB
CHK
NO

MODIFIED PUMP SIZE, DISCHARGE AND METER PIPING, METER MANHOLE AND GENERAL NOTES.

REVISIONS

NO

KEENETH J. BEROSCHITZ
LICENSED PROFESSIONAL ENGINEER
No. 12105-C
HAWAII, U.S.A.

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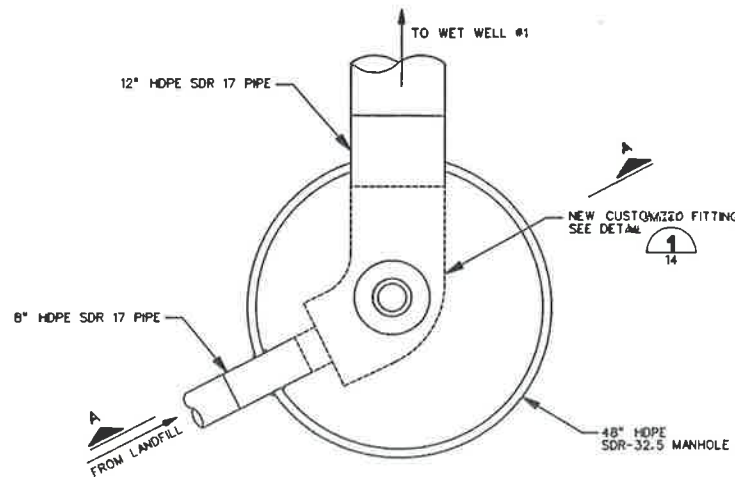
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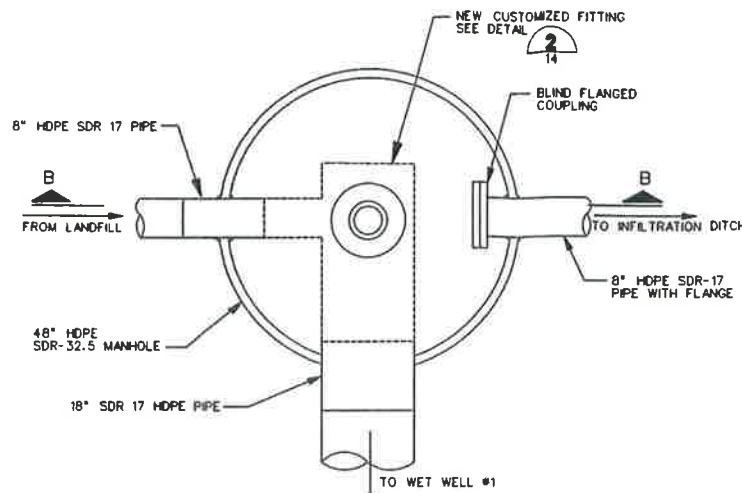
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PHASE I LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

NEW WET WELL #2 DETAILS

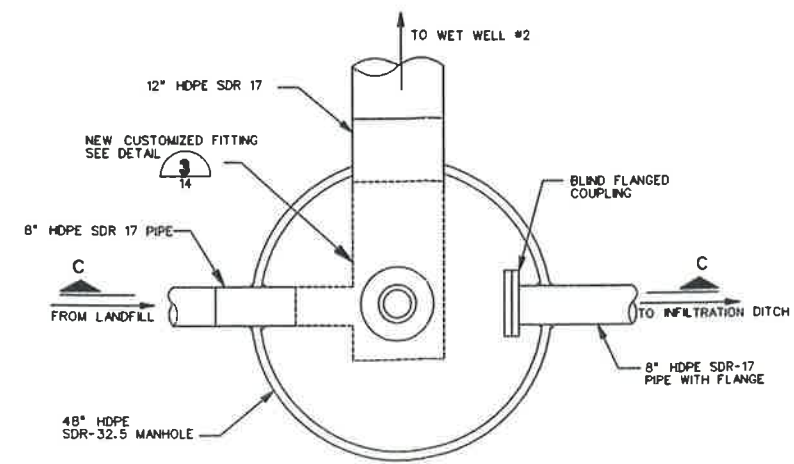
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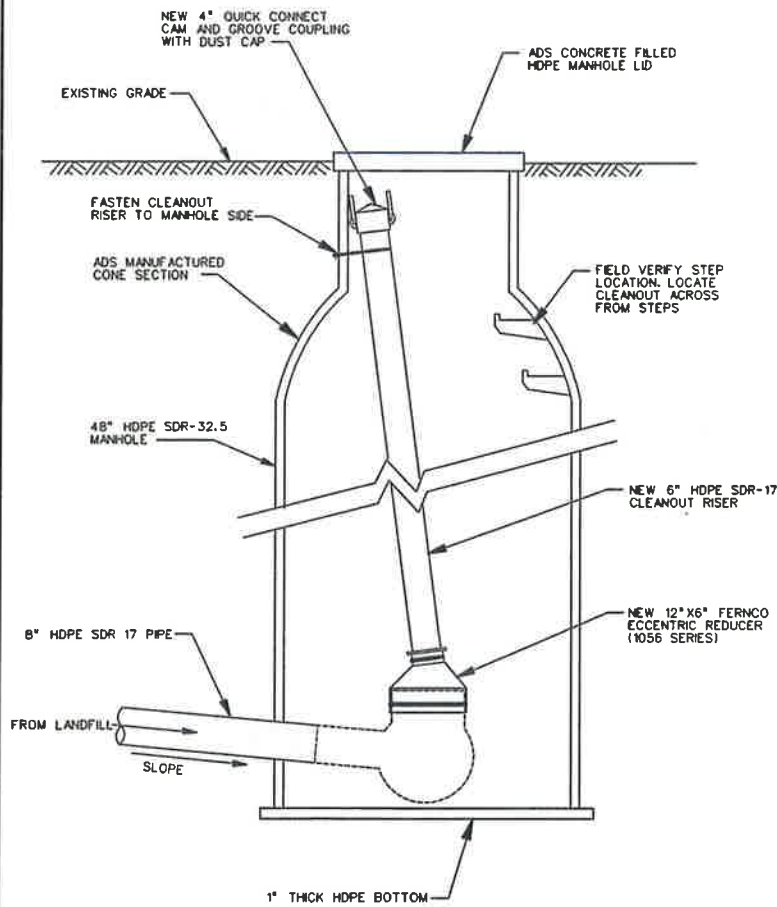
PLAN
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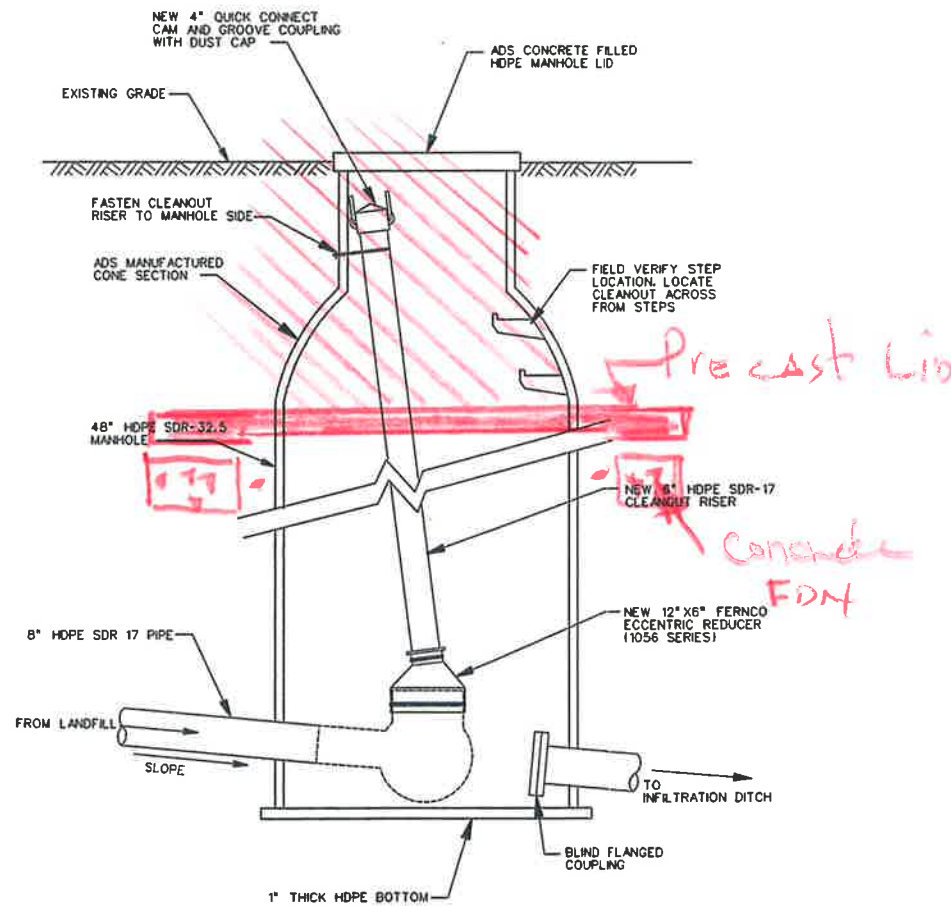
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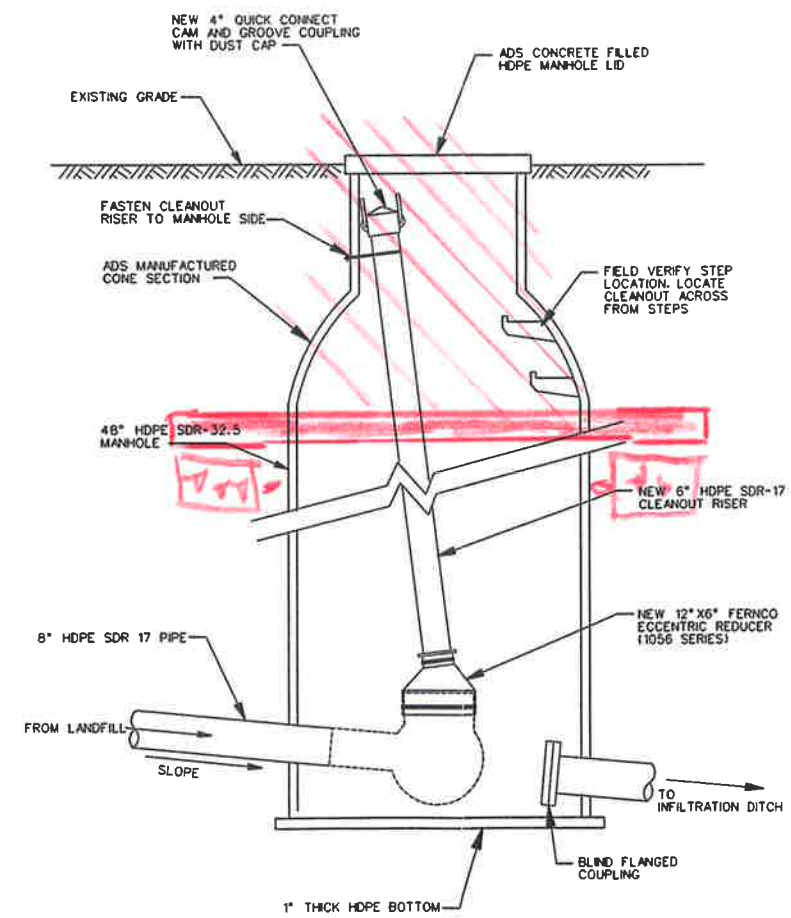
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SECTION A-A
NTS



SECTION B-B
NTS



SECTION C-C
NTS

LEACHATE COLLECTION MANHOLE LCM-1 1
NTS

LEACHATE COLLECTION MANHOLE LCM-7 2
NTS

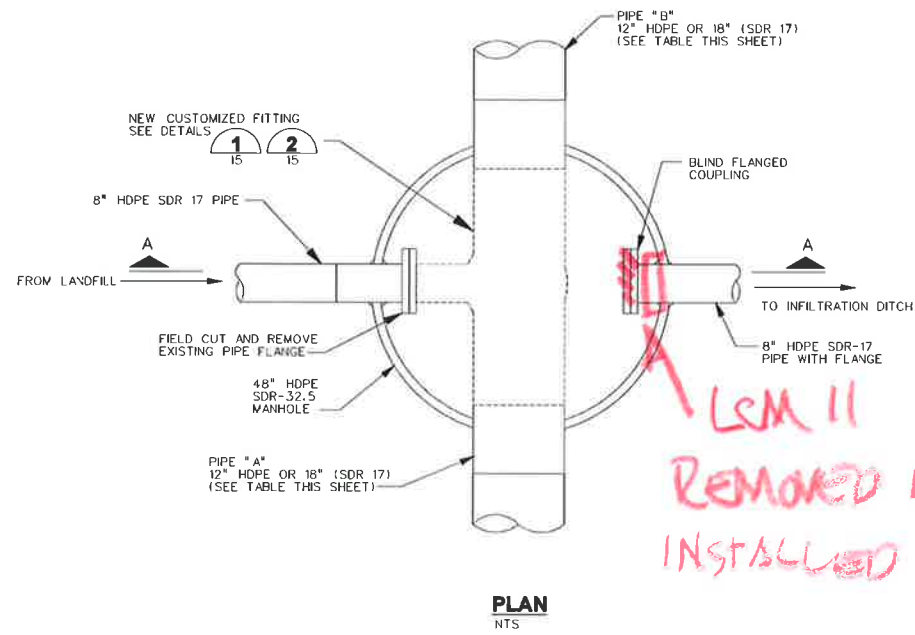
LEACHATE COLLECTION MANHOLE LCM-8 3
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GENERAL NOTES:

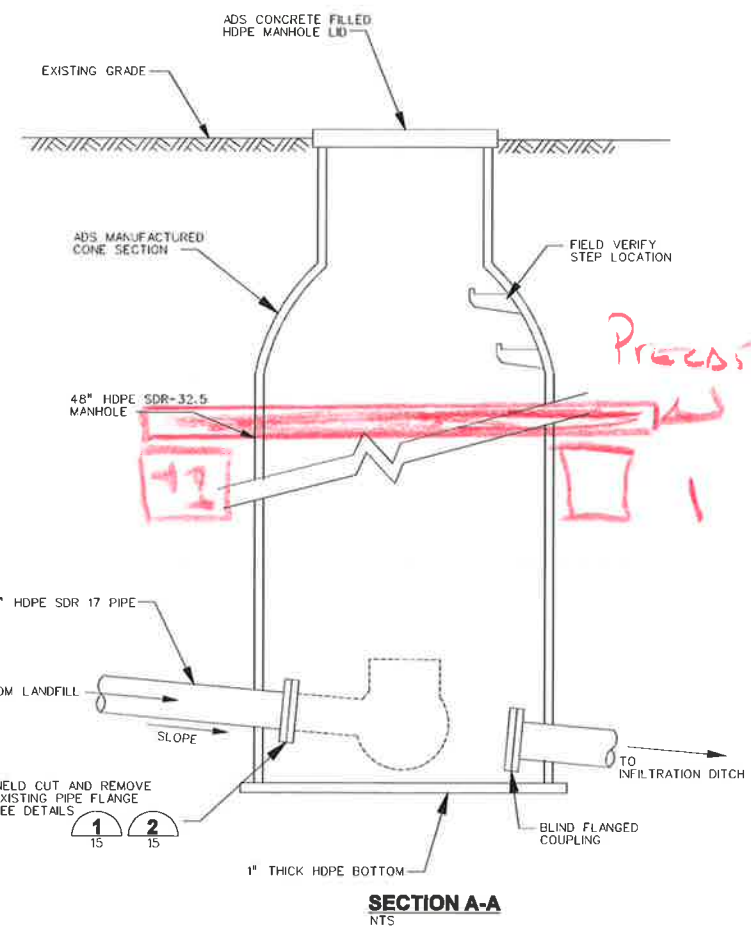
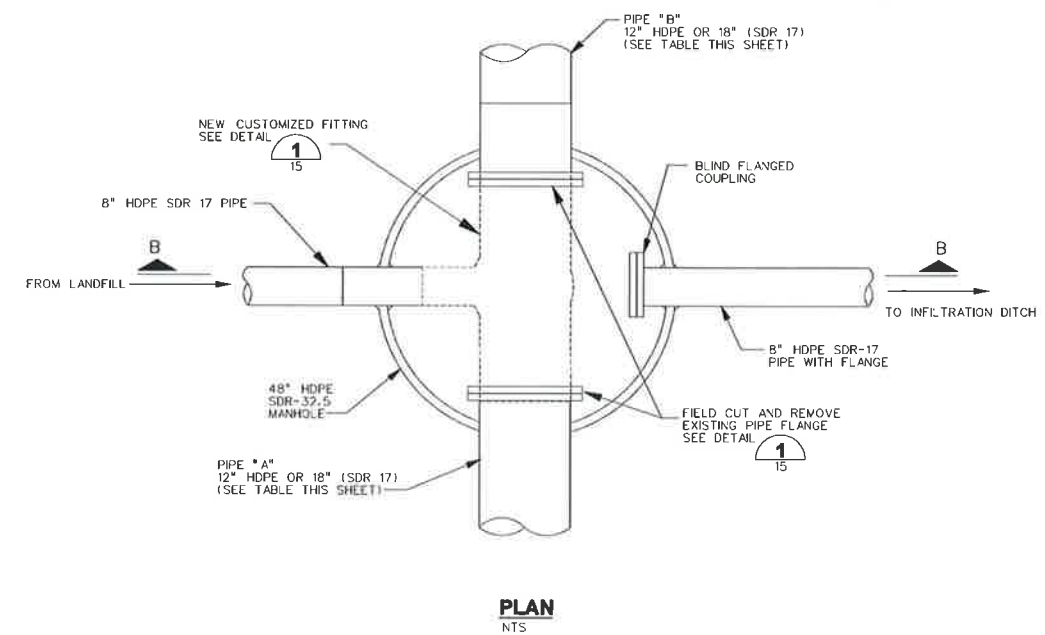
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2. REFER TO PROJECT SPECIFICATIONS FOR FLEXIBLE COUPLER BAND TORQUE REQUIREMENTS.
3. FITTING INSTALLATION SHALL BE COORDINATED TO MINIMIZE THE AMOUNT OF TIME EACH PIPE INLET IS TEMPORARILY BLOCKED TO PROMOTE CLEAN AND LIQUID FREE INSTALLATION OF FITTING AND COUPLERS. FLOW FROM PHASE II AND CELL 1 SHOULD NOT BE BLOCKED FOR TIME PERIODS THAT WOULD RESULT IN LEACHATE HEAD IN THE SUMPS TO EXCEED PERMIT CONDITIONS.
4. IN LIEU OF FABRICATED TEES SHOWN IN DETAILS, CONTRACTOR MAY PROPOSE BRANCH SADDLE REDUCING TEES.

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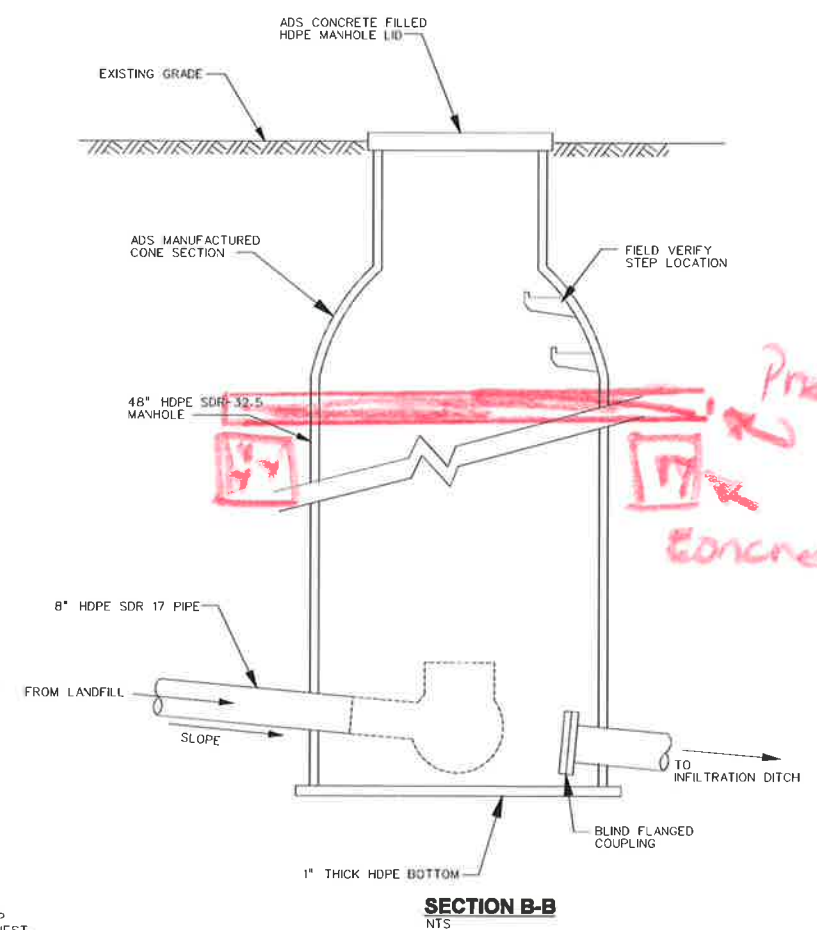
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. Signature: <i>[Signature]</i> DATE: APRIL 30, 2012 OFFICIAL TITLE: SUPERVISOR			
Sheboygan, Wisconsin			
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PREPARED BY: PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS KEKAHA SANITARY LANDFILL KAUAI, HAWAII			
LCM-1, AND 8 MODIFICATION DETAILS			
DATE: OCTOBER 2010			
PROJECT NO: 60135722			
FILENAME: 10a10a.dgn			
SHEET NO:			
DRAWING NO: 11			



LCM 11
 REMOVED FLANGE
 INSTALLED FIBERGLASS CAP



Precast Lid
 11
 1



Precast Lid
 17
 Concrete Form

LCM PIPE SIZE TABLE		
MANHOLE #	A	B
2	12	12
3	12	12
4	12	12
5	18	18
6	18	18
9	12	12
10	12	12
11	18	18
12	12	18
13	12	12

- GENERAL NOTES:
- LEACHATE COLLECTION MANHOLE CONFIGURATIONS BASED UPON 1993 SHOP DRAWINGS PROVIDED BY WASTE MANAGEMENT. SHOP DRAWINGS MAY BE MADE AVAILABLE TO CONTRACTOR BY REQUEST.
 - REFER TO PROJECT SPECIFICATIONS FOR FLEXIBLE COUPLER BAND TORQUE REQUIREMENTS.
 - FITTING INSTALLATION SHALL BE COORDINATED TO MINIMIZE THE AMOUNT OF TIME EACH PIPE INLET IS TEMPORARILY BLOCKED TO PROMOTE CLEAN AND LIQUID FREE INSTALLATION OF FITTING AND COUPLERS. FLOW FROM PHASE II AND CELL 1 SHOULD NOT BE BLOCKED FOR TIME PERIODS THAT WOULD RESULT IN LEACHATE HEAD IN THE SUMPS TO EXCEED PERMIT CONDITIONS.
 - IN LIEU OF FABRICATED TEES SHOWN IN DETAILS, CONTRACTOR MAY PROPOSE BRANCH SADDLE REDUCING TEES.

EXISTING LEACHATE COLLECTION MANHOLE LCM-5,6,11,12, AND 13 1

EXISTING LEACHATE COLLECTION MANHOLE LCM-2,3,4,9, AND 10 2

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NO	REVISIONS	CHK	DATE

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 LICENSED PROFESSIONAL ENGINEER
 No. 12105-C
 HAWAII, U.S.A.

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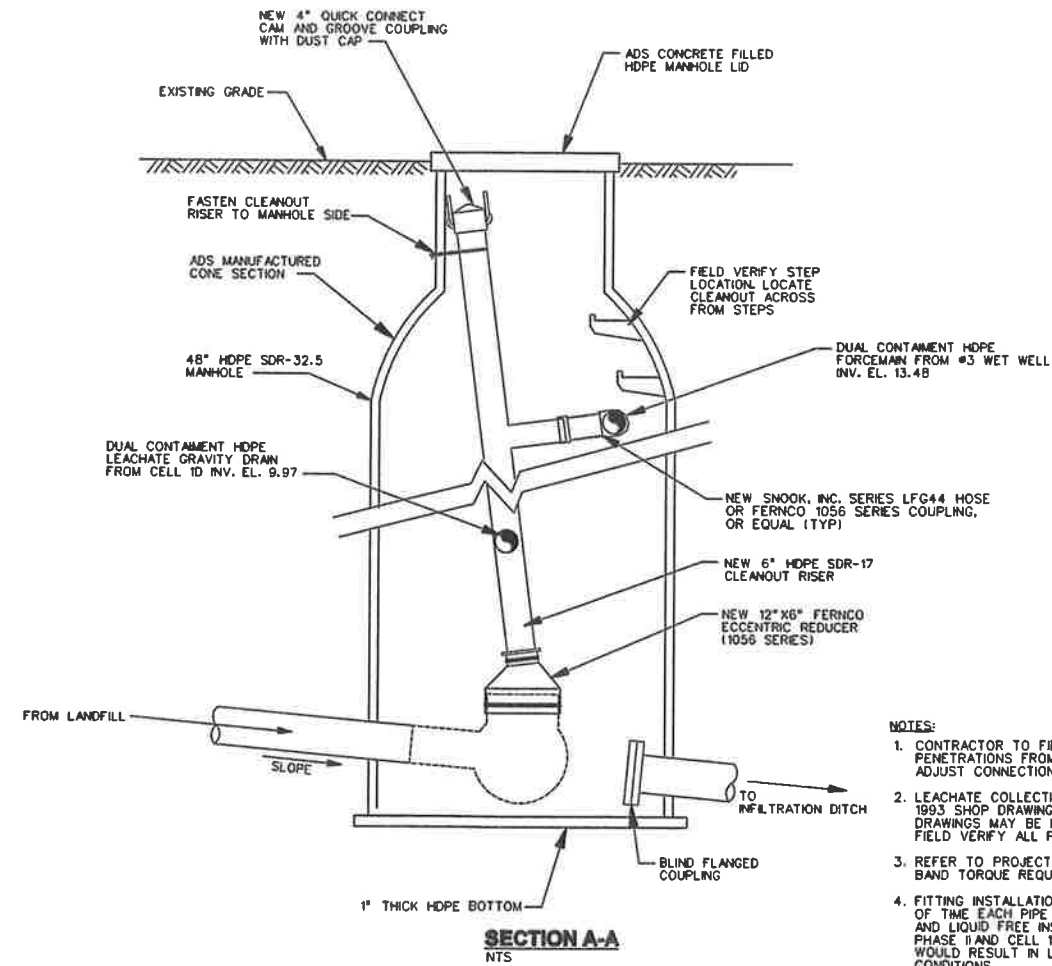
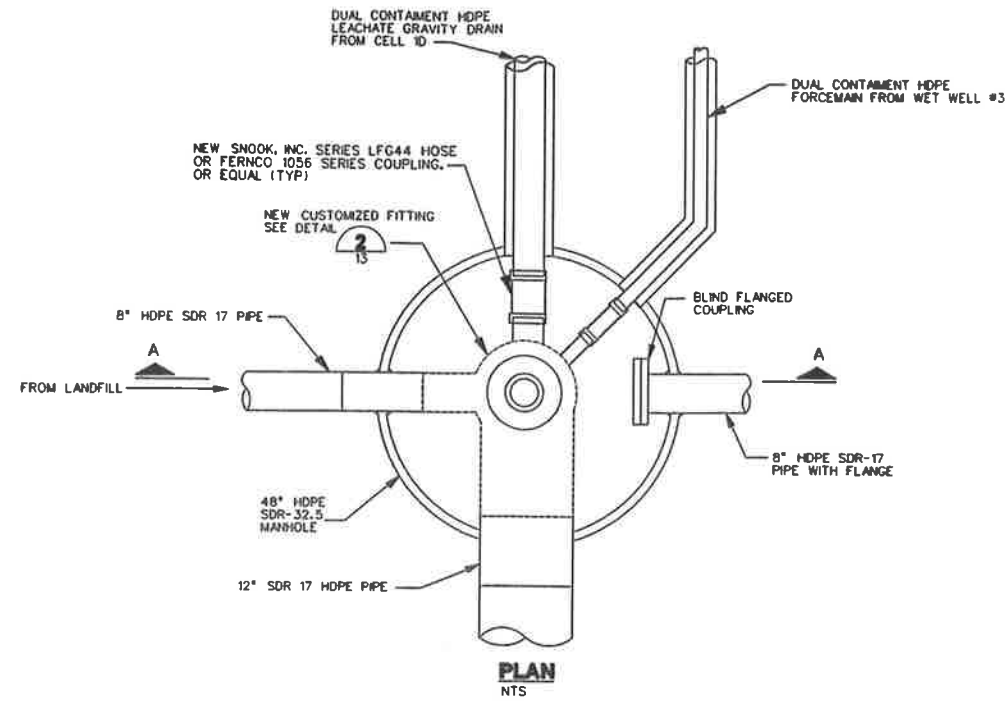
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DRAFT CONSTRUCTION DRAWINGS
 PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII

LCM MODIFICATION DETAILS

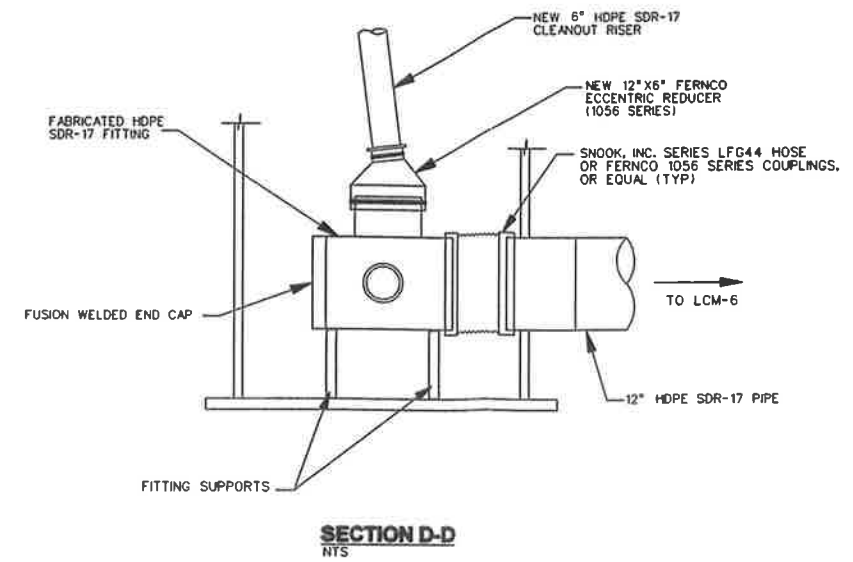
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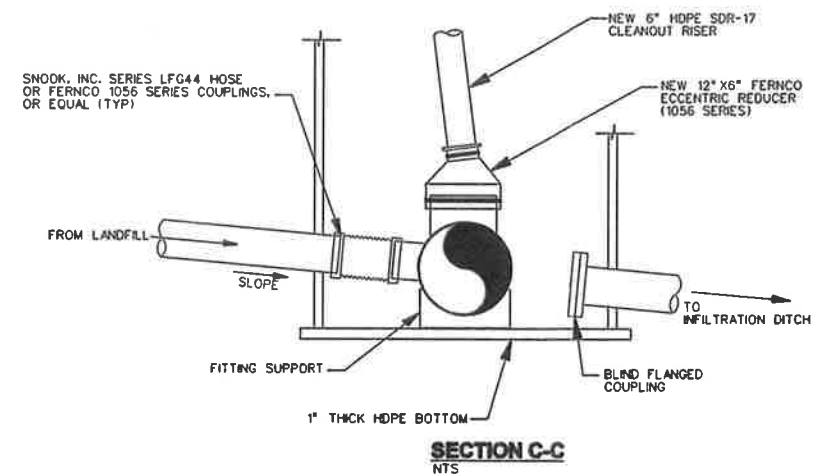
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NTS

NOTES:

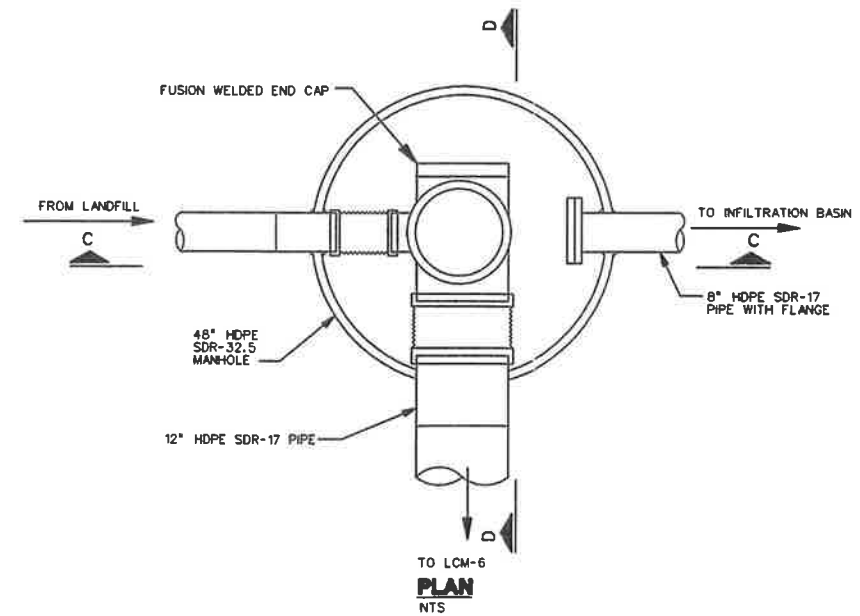
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2. LEACHATE COLLECTION MANHOLE CONFIGURATION BASED UPON 1993 SHOP DRAWINGS PROVIDED BY WASTE MANAGEMENT. SHOP DRAWINGS MAY BE MADE AVAILABLE TO CONTRACTOR BY REQUEST. FIELD VERIFY ALL PIPE DIAMETERS.
3. REFER TO PROJECT SPECIFICATIONS FOR FLEXIBLE COUPLER BAND TORQUE REQUIREMENTS.
4. FITTING INSTALLATION SHALL BE COORDINATED TO MINIMIZE THE AMOUNT OF TIME EACH PIPE INLET IS TEMPORARILY BLOCKED TO PROMOTE CLEAN AND LIQUID FREE INSTALLATION OF FITTING AND COUPLERS. FLOW FROM PHASE 1 AND CELL 1 SHOULD NOT BE BLOCKED FOR TIME PERIODS THAT WOULD RESULT IN LEACHATE HEAD IN THE SUMPS TO EXCEED PERMIT CONDITIONS.
5. IN LIEU OF FABRICATED TEES SHOWN IN DETAILS, CONTRACTOR MAY PROPOSE BRANCH SADDLE REDUCING TEES.



SECTION D-D
NTS



SECTION C-C
NTS



LCM-14 PIPE FITTING
NTS

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DRAFT CONSTRUCTION DRAWINGS

 PHASE 1 LEACHATE MANAGEMENT SYSTEM MODIFICATIONS

 KEKAHA, SANITARY LANDFILL

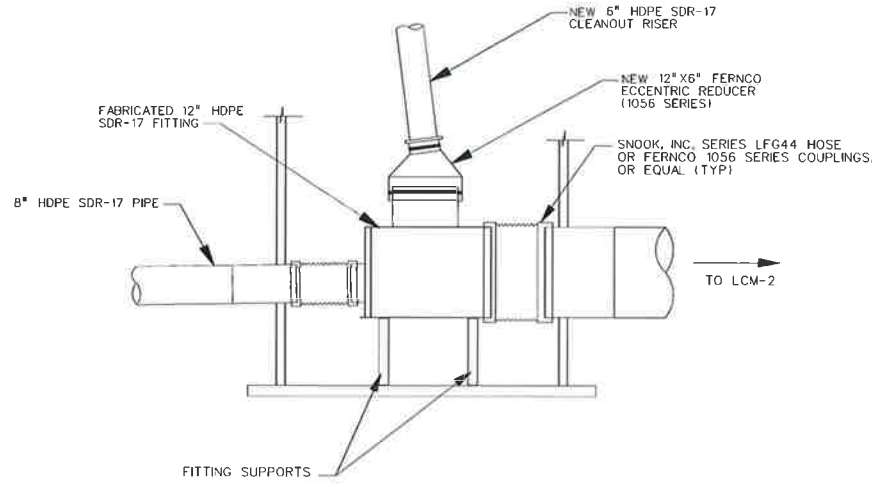
 KAUAI, HAWAII

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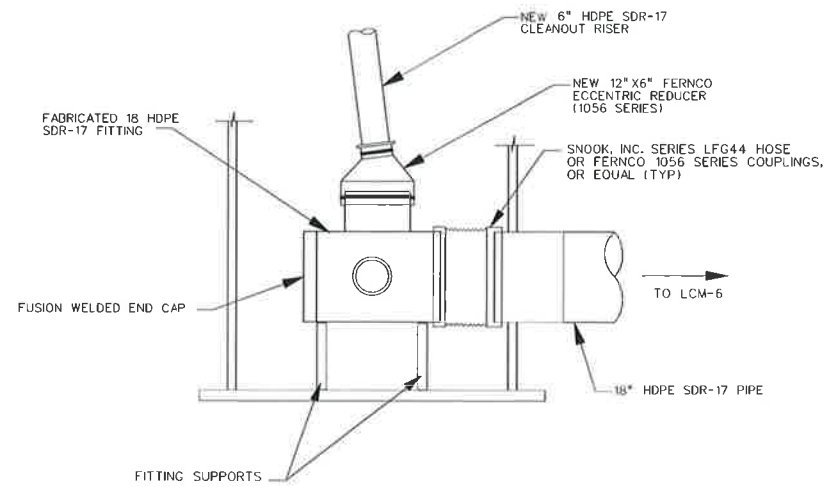
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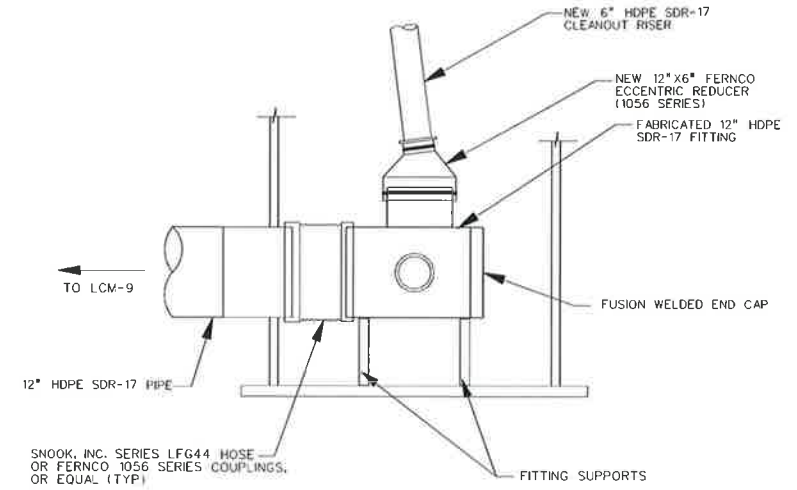
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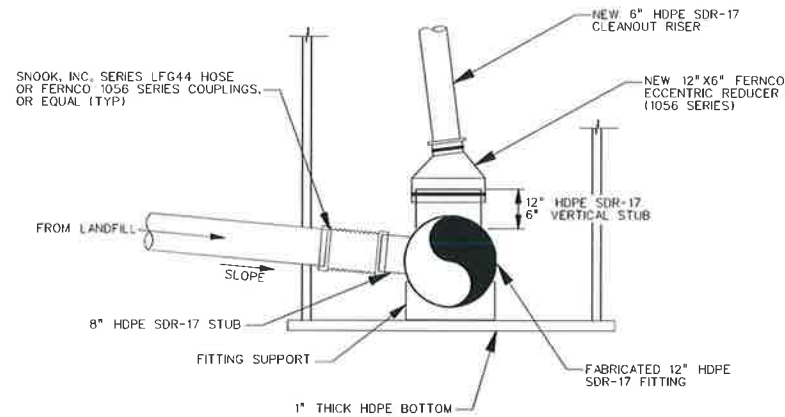
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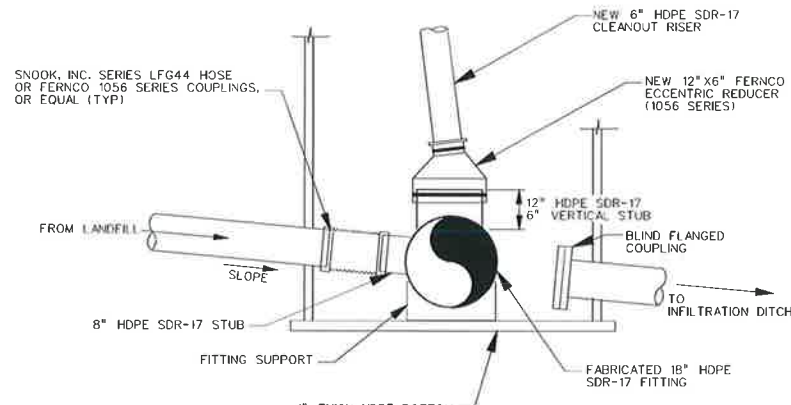
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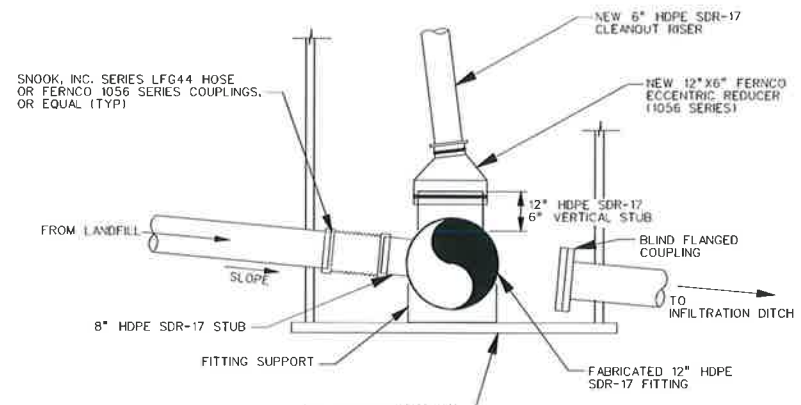
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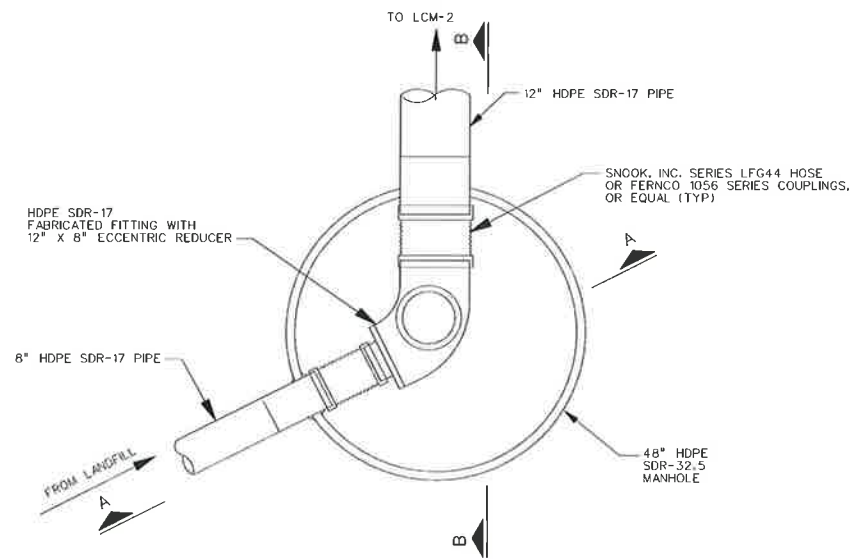
SECTION A-A
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SECTION C-C
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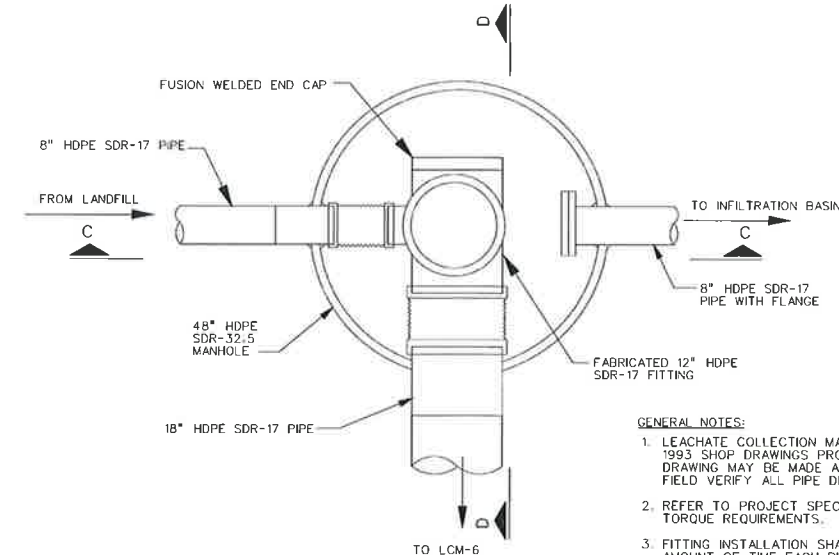


SECTION E-E
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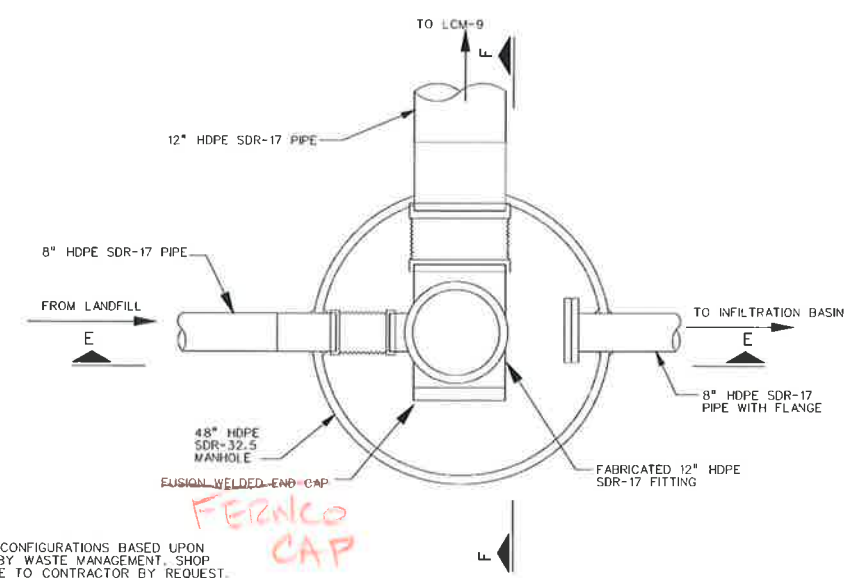
PLAN
NTS

LCM-1 PIPE FITTING 1
NTS



PLAN
NTS

LCM-7 PIPE FITTING 2
NTS



PLAN
NTS

LCM-7 PIPE FITTING 2
NTS

GENERAL NOTES:

1. LEACHATE COLLECTION MANHOLE CONFIGURATIONS BASED UPON 1993 SHOP DRAWINGS PROVIDED BY WASTE MANAGEMENT. SHOP DRAWING MAY BE MADE AVAILABLE TO CONTRACTOR BY REQUEST. FIELD VERIFY ALL PIPE DIAMETERS.
2. REFER TO PROJECT SPECIFICATIONS FOR FLEXIBLE COUPLER BAND TORQUE REQUIREMENTS.
3. FITTING INSTALLATION SHALL BE COORDINATED TO MINIMIZE THE AMOUNT OF TIME EACH PIPE INLET IS TEMPORARILY BLOCKED TO PROMOTE CLEAN AND LIQUID FREE INSTALLATION OF FITTING AND COUPLERS. FLOW FROM PHASE II AND CELL 1 SHOULD NOT BE BLOCKED FOR TIME PERIODS THAT WOULD RESULT IN LEACHATE HEAD IN THE SUMPS TO EXCEED PERMIT CONDITIONS.
4. IN LIEU OF FABRICATED TEES SHOWN IN DETAILS, CONTRACTOR MAY PROPOSE BRANCH SADDLE REDUCING TEES.

FERNCO CAP

NO.	REVISIONS	CHK	DATE

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 Signature: _____

 APRIL 30, 2012

 SHEBOYGAN, WISCONSIN

AECOM

PREPARED BY: _____

 DRAFT CONSTRUCTION DRAWINGS

 PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS

 KEKAHA SANITARY LANDFILL

 KAUAI, HAWAII

LCM MODIFICATION DETAILS

DATE: OCTOBER 2010

 PROJECT NO: 60135722

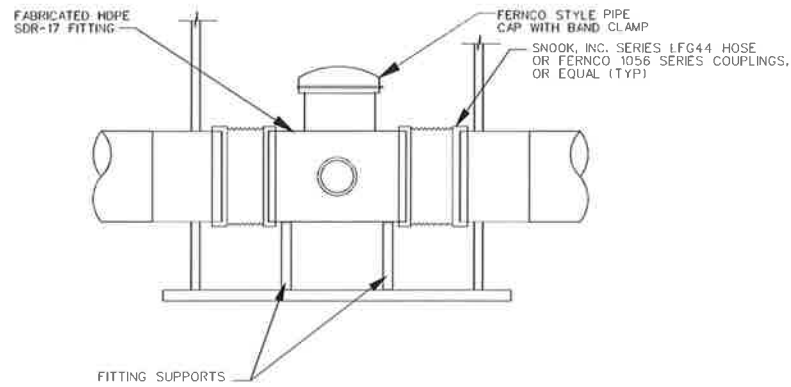
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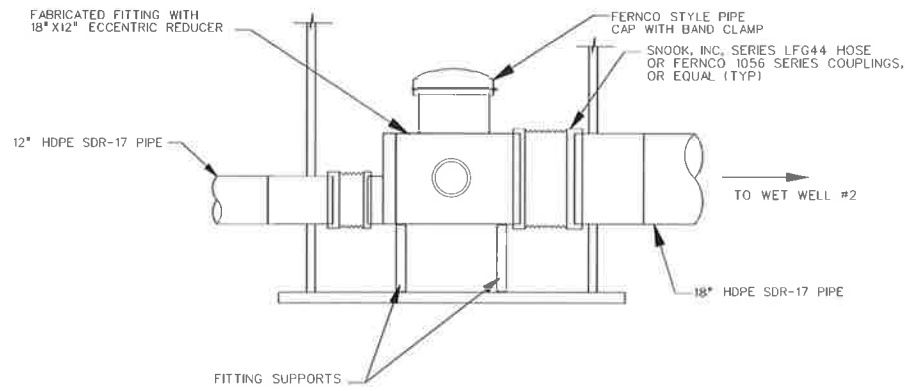
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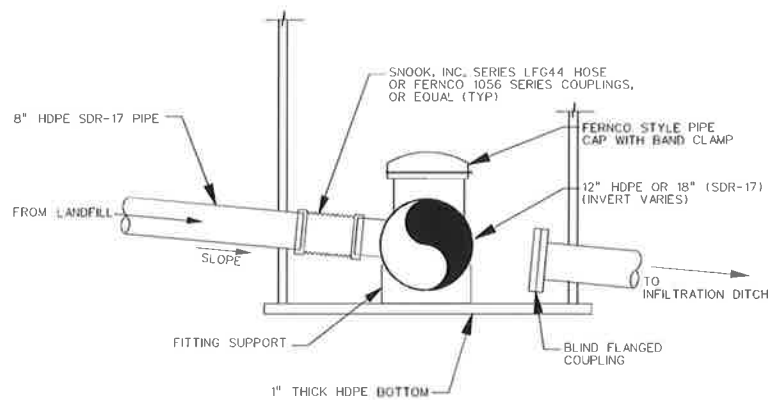
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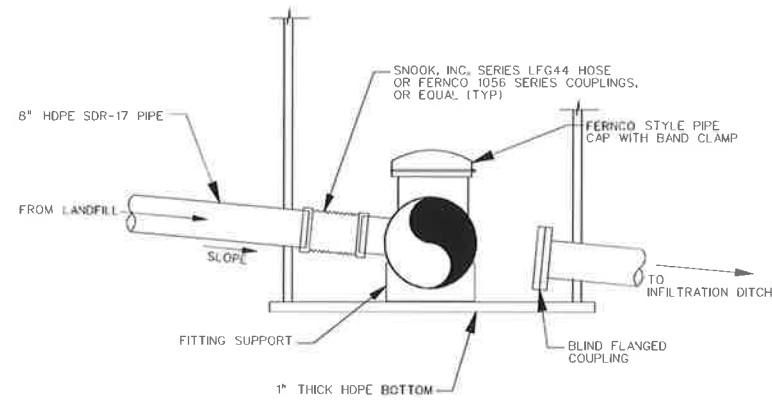
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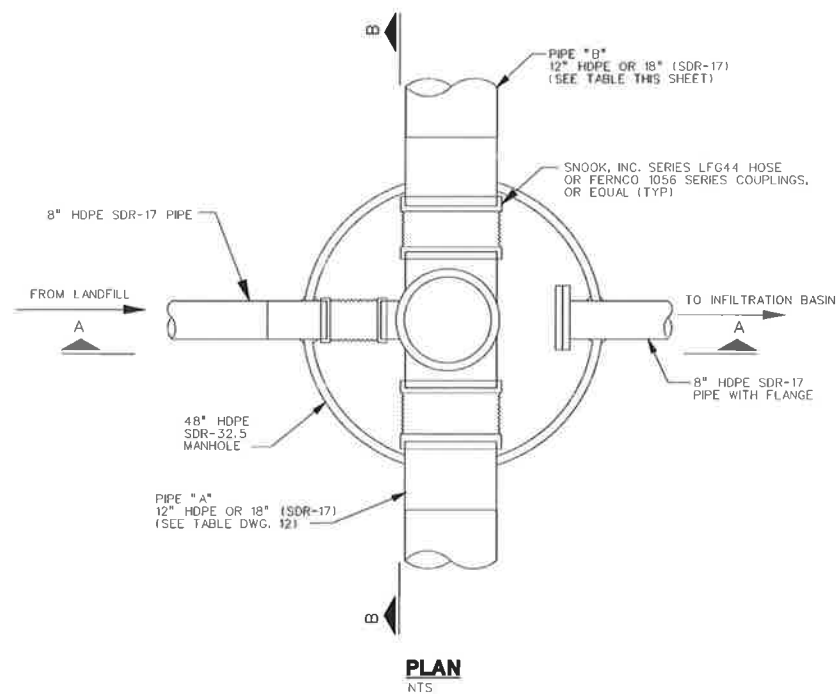
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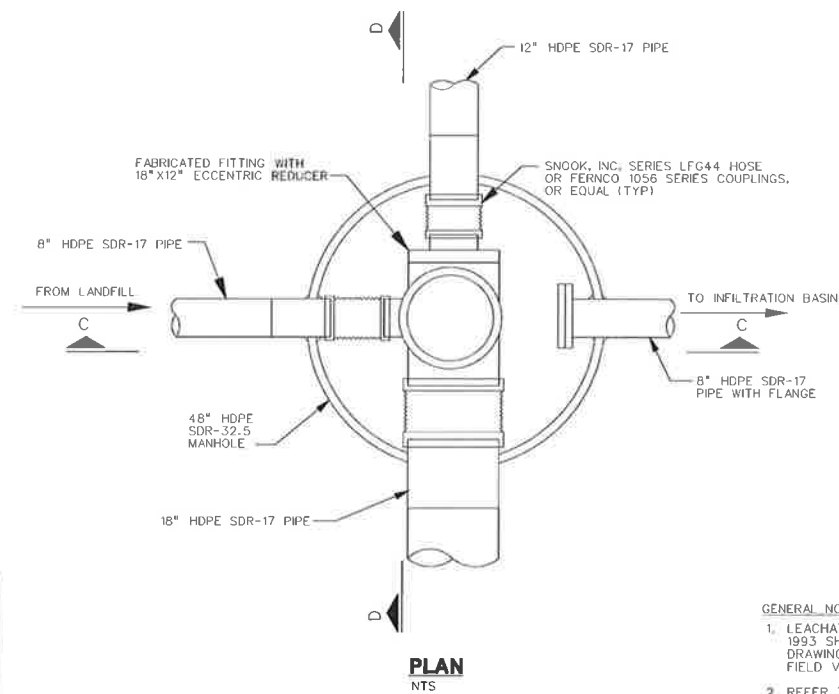
SECTION A-A
NTS



SECTION C-C
NTS



PLAN
NTS



PLAN
NTS

LCM PIPE SIZE TABLE		
MANHOLE #	A	B
2	12	12
3	12	12
4	12	12
5	18	18
6	18	18
9	12	12
10	12	12
11	18	18
12	12	18
13	12	12

LCM PIPE FITTING FOR LCMS 2, 3, 4, 5, 6, 9, 10, 11, AND 13 1
NTS

LCM-12 PIPE FITTING 2
NTS

GENERAL NOTES:

- LEACHATE COLLECTION MANHOLE CONFIGURATIONS BASED UPON 1993 SHOP DRAWINGS PROVIDED BY WASTE MANAGEMENT. SHOP DRAWING MAY BE MADE AVAILABLE TO CONTRACTOR BY REQUEST. FIELD VERIFY ALL PIPE DIAMETERS.
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- IN LIEU OF FABRICATED TEES SHOWN IN DETAILS, CONTRACTOR MAY PROPOSE BRANCH SADDLE REDUCING TEES.



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APRIL 30, 2012
EXPIRATION DATE OF THE LICENSE

Sheboygan, Wisconsin

DRN	DRB
DES	NKW/TCR
CHK	PJW
APP	KJB

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PREPARED BY
AECOM

DRAFT CONSTRUCTION DRAWINGS
PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII
LCM MODIFICATION DETAILS

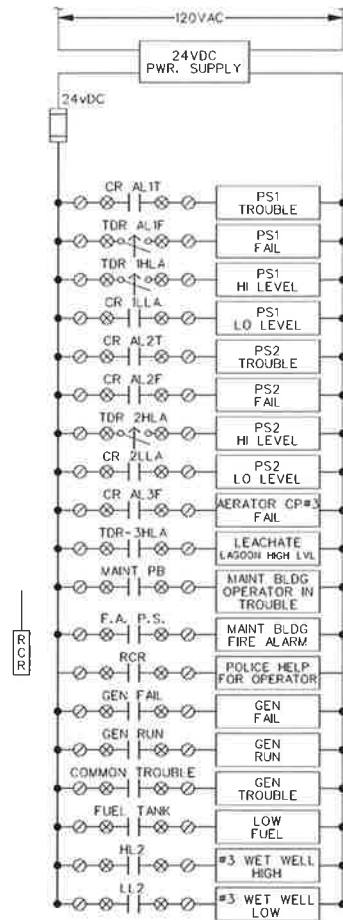
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PROJECT NO	60135722
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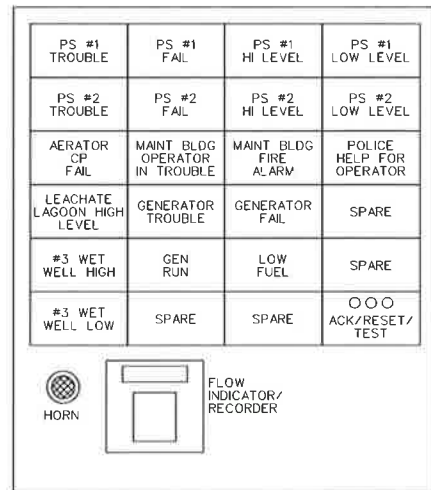
KEKAHA CONDUIT & WIRE SCHEDULE				
TAG	CONDUIT	CABLE	FROM	TO
1A	1-1" C	3#12 & 1#12 G	PS NO.1 PNL	P1
1B	1-1" C	4#14 & 1#14 G	PS NO.1 PNL	HH
1C	1-1" C	8#14 & 1#14 G	PS NO.1 PNL	HH
1G	1-1/2" C	1#8 G	PS NO.1 PNL	GROUND
2A	1-1" C	3#12 & 1#12 G	PS NO.2 PNL	P2
2B	1-1" C	4#14 & 1#14 G	PS NO.2 PNL	HH
2C	1-1" C	8#14 & 1#14 G	PS NO.2 PNL	HH
2G	1-1/2" C	1#8 G	PS NO.2 PNL	GROUND
C1	1-1/2" PVC	10#14	PS NO.1	CAP
C2	1-1/2" PVC	10#14	PS NO.2	CAP
CFM	1-1" PVC	2#16 TWSP	FLOWMETER	CAP
E1	1-1 1/2" PVC	3#6 & 1#8 G	EDP	PS NO.1
E2	1-1 1/2" PVC	3#6 & 1#8 G	EDP	PS NO.2
EL2A	1-3/4" C	2#12 & 1#12 G	PNL EL2	FM

DEMAND LOAD MAIN BLDG SERVICE					
STATION	LOAD	HP	KVA	DF	KVA (DEMAND)
LAGOON AERATION	A1	5	5.4	1.25	6.75
	A2	5	5.4	1	5.4
	A3	5	5.4	1	5.4
	MISC	-	2.0	1	2.0
PUMP STATION NO.1	P1	5	5.4	1.25	6.75
	MISC	-	2	1	2
PUMP STATION NO.2	P2	5	5.4	1.25	6.75
	MISC	-	2	1	2
MAINT. BLDG.	PNL EL	-	45	1	45
	CRANE	3	4	1	4
	PNL L	-	9	1	9
	AIR COMP	3	4	1	4
	BAY LTG OUT LTG	-	2	1.25	3
OFFICE	PNL PP1	-	25	1	25
TOTAL					130

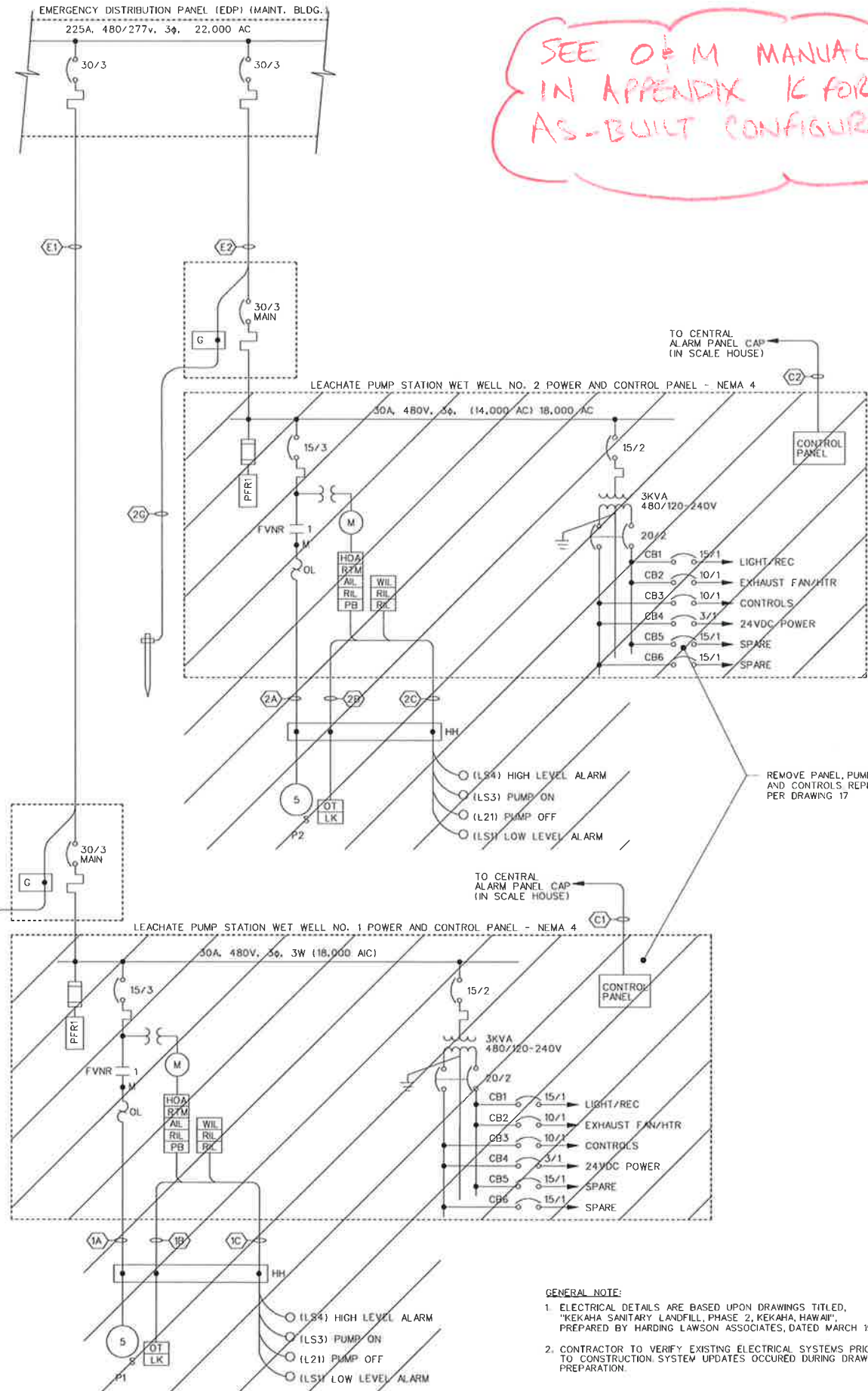
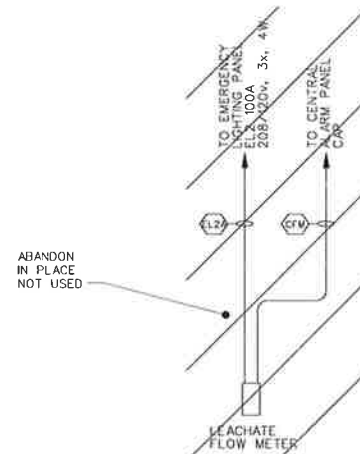
480v, 3φ @ 156.4 AMPS



CENTRAL ALARM PANEL WIRING DIAGRAM 1
NTS



CENTRAL ALARM PANEL ARRANGEMENT DIAGRAM 2
NTS



ELECTRICAL ONE-LINE DIAGRAM 3
NTS

SEE O & M MANUAL IN APPENDIX K FOR AS-BUILT CONFIGURATION

GENERAL NOTE:
1. ELECTRICAL DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
2. CONTRACTOR TO VERIFY EXISTING ELECTRICAL SYSTEMS PRIOR TO CONSTRUCTION. SYSTEM UPDATES OCCURRED DURING DRAWING PREPARATION.

DATE	OCTOBER 2010
PROJECT NO	60135722
FILENAME	16Delials.dgn
SHEET NO	
DRAWING NO	16

PREPARED BY: SHEBOYGAN, WISCONSIN
DES: NKW/TCR
CHK: PUJ
APP: KJB

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AECOM

PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

EXISTING ELECTRICAL DETAILS

REVISIONS

NO	DATE	CHK	DRN

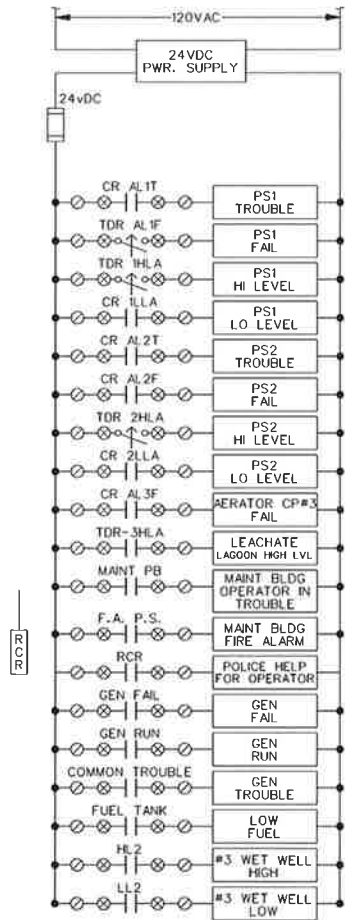
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
SIGNATURE: [Signature]
EXPIRATION DATE OF THE LICENSE: APRIL 30, 2012
LICENSED PROFESSIONAL ENGINEER No. 12105-C
KAWAII, U.S.A.

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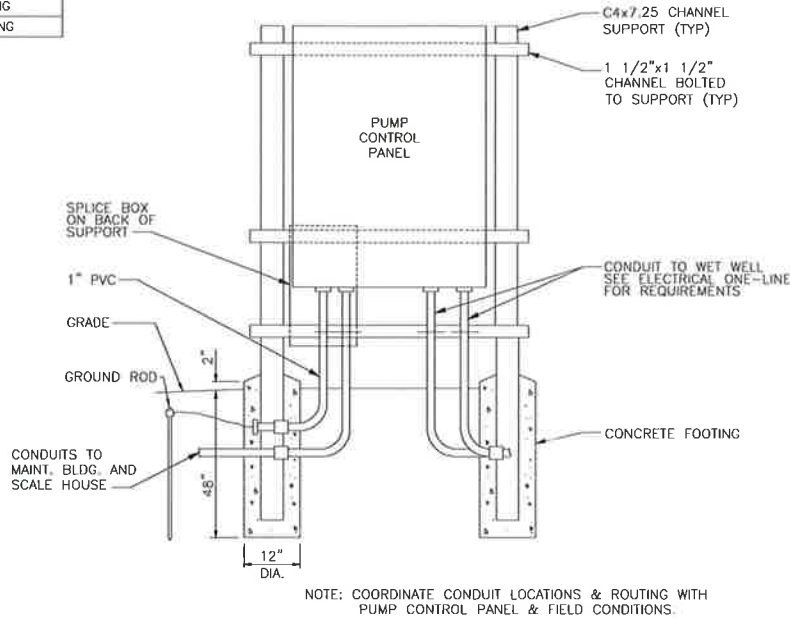
KEKAHA CONDUIT & WIRE SCHEDULE				
TAG	CONDUIT	CABLE	FROM	TO
1A	1-1" C	3#12 & 1#12 G VFD CABLE	PS NO.1 PNL	P1A, BELDEN NO. 29502
1B	1-1" C	3#12 & 1#12 G VFD CABLE	PS NO.1 PNL	P1B, BELDEN NO. 29502
1C	1-1" C	8#14 & 1#14 G	PS NO.1 PNL	HH
1G	1-1/2" C	1#6 G	PS NO.1 PNL	GROUND
2A	1-1" C	3#12 & 1#12 G VFD CABLE	PS NO.2 PNL	P2A, BELDEN NO. 29502
2B	1-1" C	3#12 & 1#12 G VFD CABLE	PS NO.2 PNL	P2B, BELDEN NO. 29502
2C	1-1" C	4#14 & 1#14 G	PS NO.2 PNL	HH
2G	1-1" C	8#14 & 1#14 G	PS NO.2 PNL	HH
2G	1-1/2" C	1#6 G	PS NO.2 PNL	GROUND
C1	1-1/2" PVC	10#14	PS NO.1	CAP
C2	1-1/2" PVC	10#14	PS NO.2	CAP
LT	1-1" PVC	2#16 TWSP	LT/FM	CAP
E1	1-1 1/2" PVC	3#4 & 1#6 G	EDP	PS NO.1 (EXISTING) CONDUIT EXISTING
E2	1-1 1/2" PVC	3#2 & 1#4 G	EDP	PS NO.2 (EXISTING) CONDUIT EXISTING

DEMAND LOAD MAIN BLDG SERVICE					
STATION	LOAD	HP	KVA	DF	KVA (DEMAND)
LAGOON AERATION	A1	5	5.4	1.25	6.75
	A2	5	5.4	1	5.4
	A3	5	5.4	1	5.4
	MISC	-	2.0	1	2.0
PUMP STATION NO.1	P1A	7.5	8.35	1.25	10.4
	P1B	7.5	8.35	-	10.4
	MISC	-	2	1	2
PUMP STATION NO.2	P2A	7.5	8.35	1.25	10.4
	P2B	7.5	8.35	-	10.4
	MISC	-	2	1	2
MAINT. BLDG.	PNL EL	-	45	1	45
	CRANE	3	4	1	4
	PNL L	-	9	1	9
	AIR COMP	3	4	1	4
	BAY LTC	-	2	1.25	3
	OUT LTC	-	2	1.25	3
OFFICE	PNL PP1	-	25	1	25
TOTAL					158.2

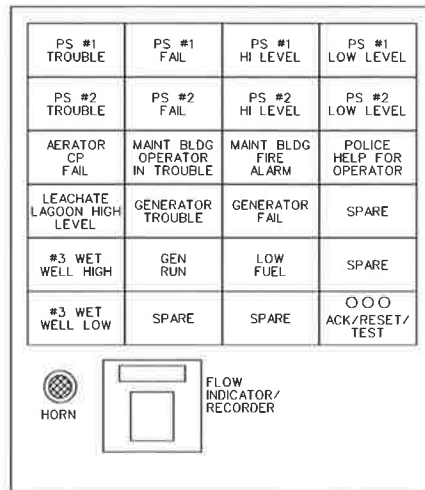
● 480v, 3φ = 190.2 AMPS



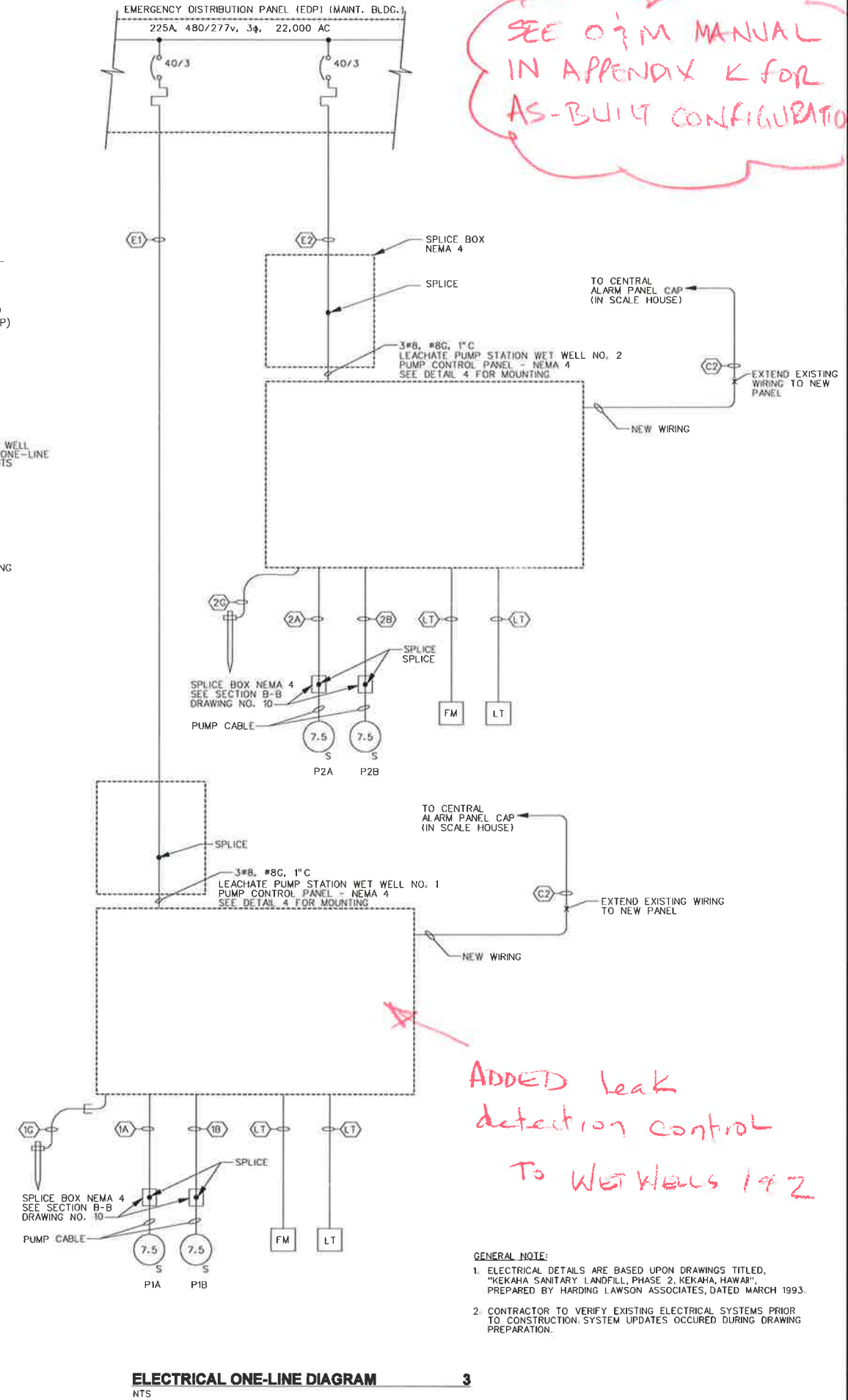
CENTRAL ALARM PANEL WIRING DIAGRAM 1
NTS



PUMP CONTROL PANEL MOUNTING DETAIL 4
NTS



CENTRAL ALARM PANEL ARRANGEMENT DIAGRAM 2
NTS



ELECTRICAL ONE-LINE DIAGRAM 3
NTS

GENERAL NOTE:
1. ELECTRICAL DETAILS ARE BASED UPON DRAWINGS TITLED, "KEKAHA SANITARY LANDFILL, PHASE 2, KEKAHA, HAWAII", PREPARED BY HARDING LAWSON ASSOCIATES, DATED MARCH 1993.
2. CONTRACTOR TO VERIFY EXISTING ELECTRICAL SYSTEMS PRIOR TO CONSTRUCTION. SYSTEM UPDATES OCCURRED DURING DRAWING PREPARATION.

DATE	OCTOBER 2010
PROJECT NO	60135722
FILENAME	17Details.dgn
SHEET NO	
DRAWING NO	17

PREPARED BY
AECOM

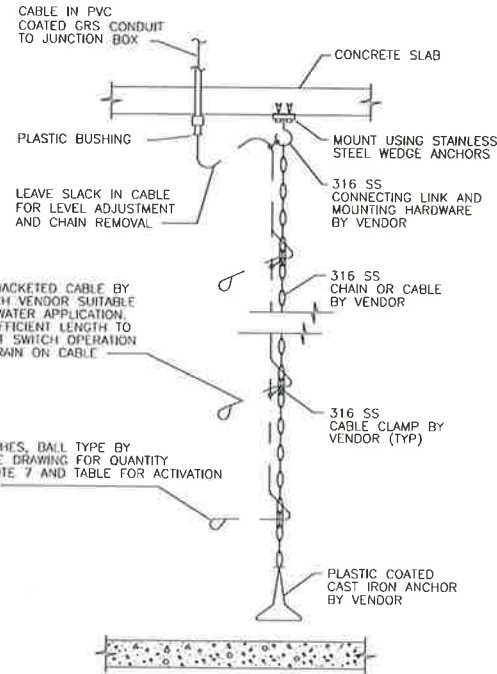
DRAFT CONSTRUCTION DRAWINGS
PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA SANITARY LANDFILL
K.A.U.A.I., HAWAII

REVISIONS

NO.	DESCRIPTION	DATE
1	MODIFIED ELECTRICAL WIRING FOR INCREASED PUMP SIZING	05/16/2011

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
[Signature]
APRIL 30, 2012
EXPIRATION DATE OF THE LICENSE
Sheboygan, Wisconsin
DRN DRB
DES NKW/TCR
CHK PJW
APP KJB
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REGISTERED PROFESSIONAL ENGINEER
No. 12105-C
HAWAII, U.S.A.



LEVEL-FLOAT SWITCH, CHAIN SUPPORT

NOTES:

- 1. MOUNT 50 FLOATS DO NOT CONTACT STILLING WELL DURING OPERATION.
- 2. FLOAT FOR "LOW LEVEL PUMP CUT-OFF AND ALARM" TO INCLUDE "LATCH" SUCH THAT ONCE ACTIVATED, SIGNAL REMAINS ON UNTIL RESET BY "PUMP ON" SIGNAL.

WET WELL #1 PUMP CONTROLS		
CONTROL ACTION	HEIGHT ABOVE FLOOR OF #1 WET WELL	DISTANCE BELOW LOWEST LEACHATE INLET PIPE INVERT
HIGH LEVEL ALARM	--	6"
PUMP ON	--	18"
PUMP OFF	12" 13'	--
LOW LEVEL PUMP CUT-OFF AND ALARM	11"	--

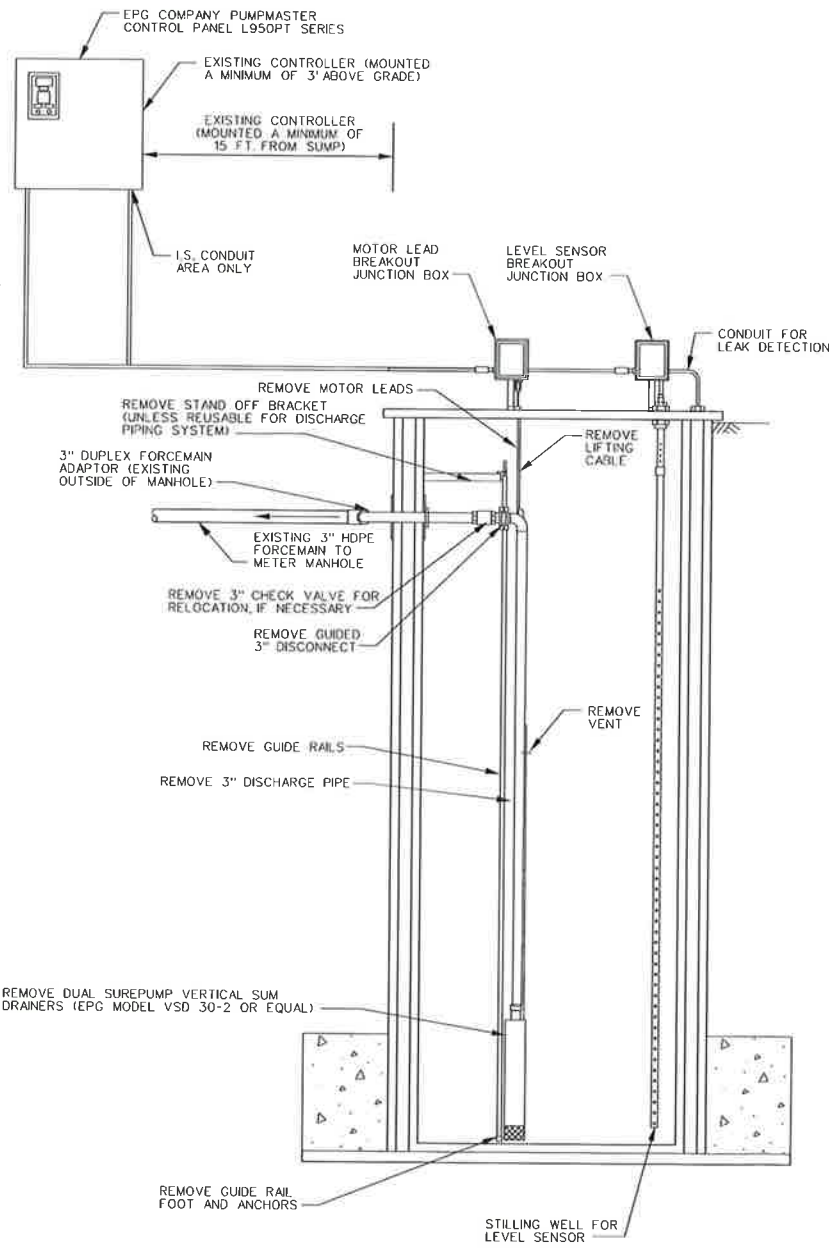
* CONTROL ACTION TO TAKE PLACE BASED ON SIGNAL FROM EITHER TRANSDUCER OR FLOAT SWITCH.

NOTES:

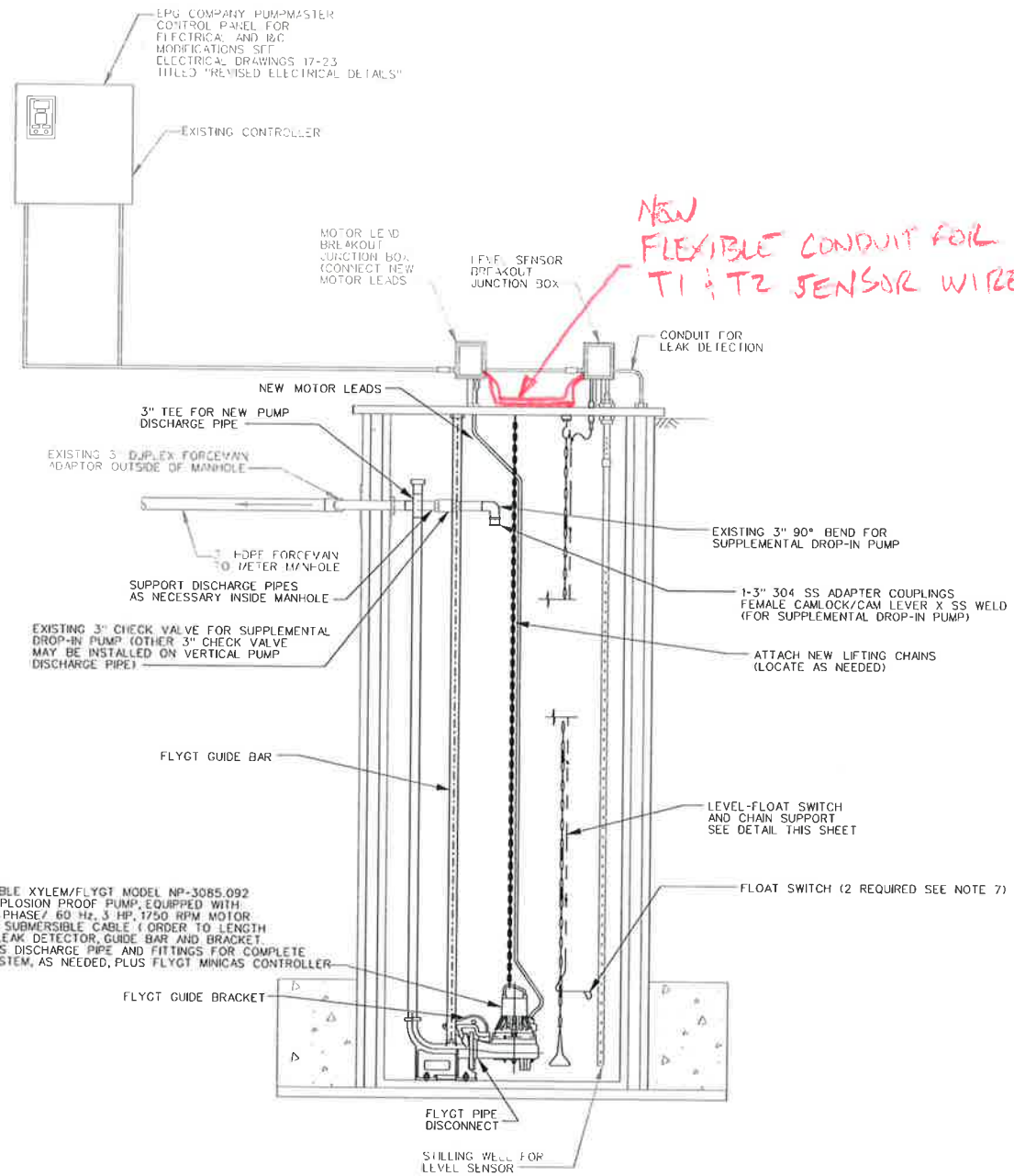
- 1. CONTRACTOR TO MAINTAIN LEACHATE FLOW TO LEACHATE EVAPORATION POND WHILE WETWELL IS MODIFIED AND APPROVED FOR OPERATION.
- 2. REMOVE FOLLOWING COMPONENTS OF EXISTING PUMPING SYSTEM: VERTICAL DISCHARGE PUMPS, CABLES, MOTOR LEADS, COMPLETE GUIDERAIL SYSTEM, AND DISCONNECTS.
- 3. CONTRACTOR VERIFY EXISTING EQUIPMENT, MATERIALS, AND CONNECTION TYPES PRIOR TO PLACING ORDERS AND PRIOR TO REMOVALS.
- 4. PROVIDE SHOP DRAWING SUBMITTAL FOR NEW PUMP, GUARDRAIL AND DISCONNECT SYSTEM ANCHORED TO FLOOR. VERIFY CLEARANCE FOR PUMP INSTALLATION AND MODIFY PIPING IF NECESSARY TO FIT.
- 5. CONTRACTOR TO REUSE EXISTING EPG LEVEL TRANSDUCER.
- 6. VERIFY THAT LEVEL SENSOR VENT TUBE IS TERMINATED WITH BELLOWS IN LEVEL SENSOR CABLE JUNCTION BOX.
- 7. ADD 2 NEW FLOAT SWITCHES AS BACKUP WATER LEVEL INDICATORS FOR CONTROLS. FLOAT SWITCHES TO BE:
 - A. MANUFACTURERS:
 - 1. CONSOLIDATED OEEF
 - 2. ANCHOR SCIENTIFIC-GP
 - 3. OR EQUAL
 - B. FLOAT: 316 STAINLESS STEEL
 - C. PROVIDE SUFFICIENT LENGTH OF INTRILE PVC JACKETED CABLE.
 - D. FOR CLASS I DIVISIONS 1 OR 2, HAZARDOUS AREAS, PROVIDE INTRINSICALLY SAFE RELAYS IN CORRESPONDING CONTROL PANEL.
 - E. MOUNTING HARDWARE: 316 STAINLESS STEEL
 - F. SWITCH: NON-MERCURY TILT TYPE SWITCH WITH MINIMUM RATING OF 10 MILLION CYCLES

B. RESET CONTROL LEVELS AS INDICATED ON TABLE.

- 9. SEE ELECTRICAL DRAWINGS FOR MODIFICATIONS TO EXISTING EPG CONTROL PANELS DRAWINGS 17, 18, 19, 20, 21, 22 AND 23 TITLED "REVISED ELECTRICAL DETAILS. REFER TO PROVIDED MOTOR SAVER INSTALLATION INSTRUCTION MANUAL FOR REVISION SETTINGS ON EXISTING MOTOR PROTECTIVE DEVICES.
- 10. PROVIDE TIE-OFF RINGS IN WET WELL TOP AND CONNECTING RINGS FOR CONNECTING LIFTING/SAFETY CABLE TO PUMP.
- 11. REMOVE 2 AIR RELEASE VALVES. CHECK OPERATION OF AIR RELEASE VALVE IN METER MANHOLE. IF EXISTING VALVE IS AT HIGH POINT OF PIPING AND IS WORKING IT SHOULD NOT NEED TO BE SUPPLEMENTED.
- 12. PROVIDE COMPLETE SET OF AS-BUILT DRAWINGS.



REMOVALS WET WELL #1 1



ADDITIONS WET WELL #1 2

NO.	REVISIONS	DATE

Sheboygan, Wisconsin
 DWN CFF 6/4/2014
 DES NKW 6/4/2014
 CHK PCM 6/4/2014
 APP PJW 6/4/2014

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PUMPING SYSTEM MODIFICATIONS
 PHASE III LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
 KEKAHA SANITARY LANDFILL
 KAUAI, HAWAII

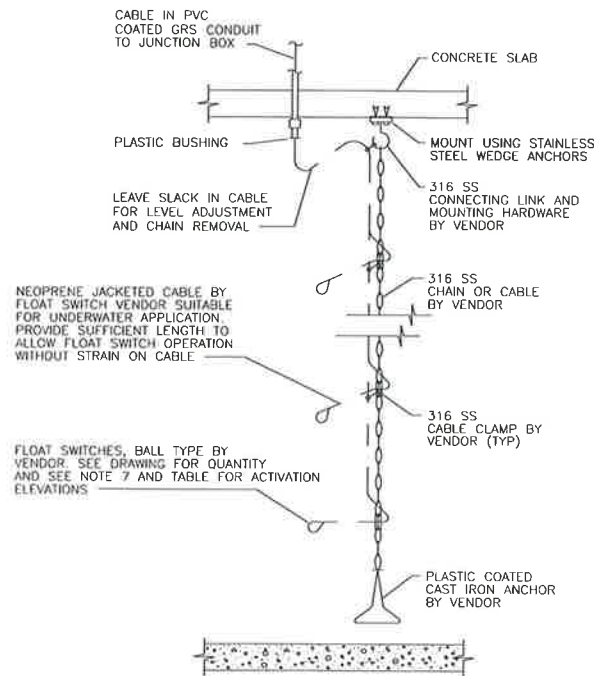
**WET WELL #1 DETAIL
 MODIFICATIONS**

DATE MAY 2014
 PROJECT NO 60135722
 FILENAME
 SHEET NO FIGURE 1.DGN

FIGURE 1

6/16/2014 10:51 AM

L:\Group\asid\PROJ\KCS\Kekaha Sanitary Landfill\Figure 1.dgn



LEVEL-FLOAT SWITCH, CHAIN SUPPORT

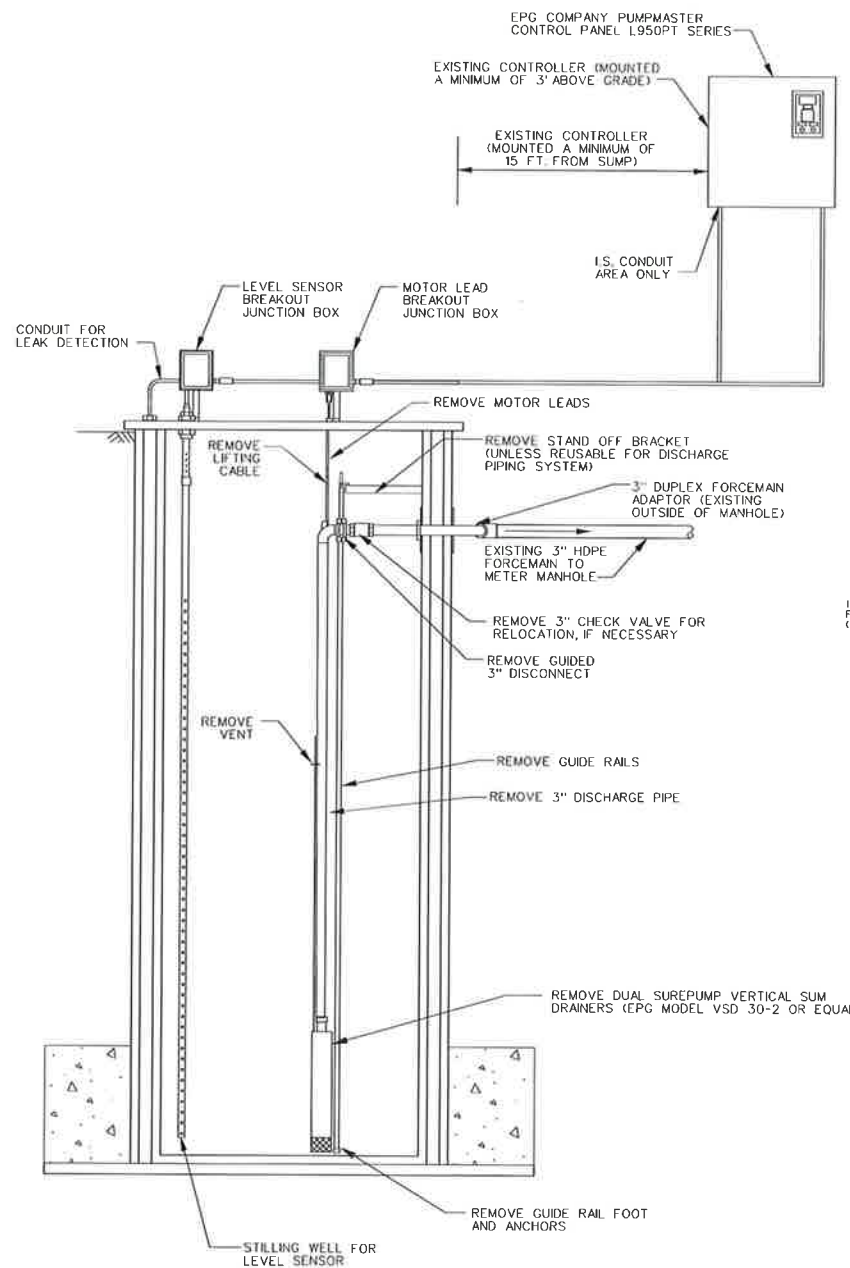
- NOTES:
- MOUNT SO FLOATS DO NOT CONTACT STILLING WELL DURING OPERATION.
 - FLOAT FOR "LOW LEVEL PUMP CUT-OFF AND ALARM" TO INCLUDE "LATCH" SUCH THAT ONCE ACTIVATED, SIGNAL REMAINS ON UNTIL RESET BY "PUMP OFF" SIGNAL.

WET WELL #2 PUMP CONTROLS		
CONTROL ACTION	HEIGHT ABOVE FLOOR OF #2 WET WELL	DISTANCE BELOW LOWEST LEACHATE INLET PIPE INVERT
HIGH LEVEL ALARM *	--	6"
PUMP ON	--	18"
PUMP OFF	13"	--
LOW LEVEL PUMP * CUT-OFF AND ALARM	11"	--

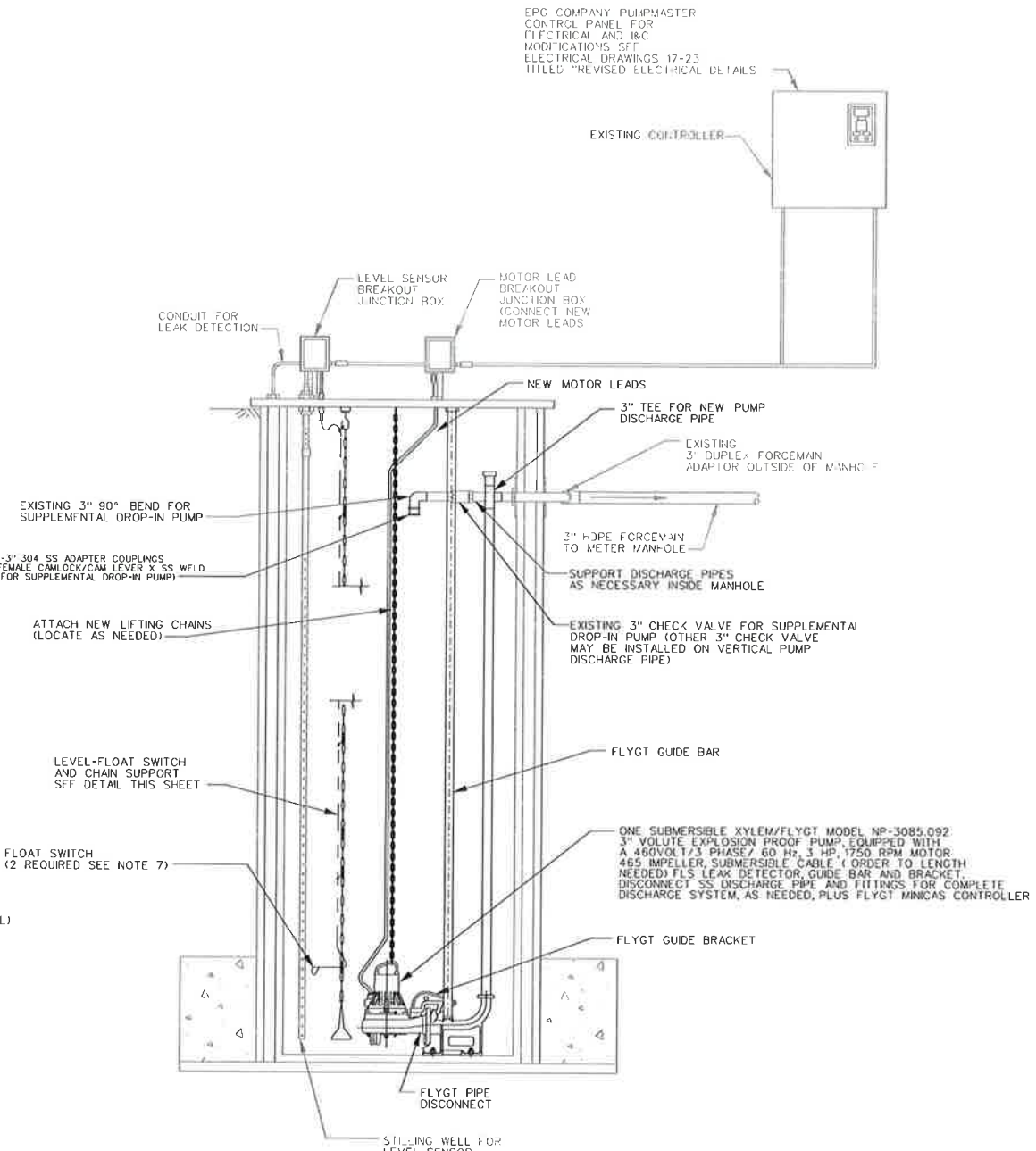
* CONTROL ACTION TO TAKE PLACE BASED ON SIGNAL FROM EITHER TRANSDUCER OR FLOAT SWITCH.

NOTES:

- CONTRACTOR TO MAINTAIN LEACHATE FLOW TO LEACHATE EVAPORATION POND WHILE WETWELL IS MODIFIED AND APPROVED FOR OPERATION.
- REMOVE FOLLOWING COMPONENTS OF EXISTING PUMPING SYSTEM: VERTICAL DISCHARGE PUMPS, CABLES, MOTOR LEADS, COMPLETE GUIDERAIL SYSTEM, AND DISCONNECTS.
- CONTRACTOR VERIFY EXISTING EQUIPMENT MATERIALS, AND CONNECTION TYPES PRIOR TO PLACING ORDERS AND PRIOR TO REMOVALS.
- PROVIDE SHOP DRAWING SUBMITTAL FOR NEW PUMP, GUIDERAIL AND DISCONNECT SYSTEM ANCHORED TO FLOOR. VERIFY CLEARANCE FOR PUMP INSTALLATION AND MODIFY PIPING IF NECESSARY TO FIT.
- CONTRACTOR TO REUSE EXISTING EPG LEVEL TRANSDUCER.
- VERIFY THAT LEVEL SENSOR VENT TUBE IS TERMINATED WITH BELLOWS IN LEVEL SENSOR CABLE JUNCTION BOX.
- ADD 2 NEW FLOAT SWITCHES AS BACKUP WATER LEVEL INDICATORS FOR CONTROLS. FLOAT SWITCHES TO BE:
 - MANUFACTURERS:
 - CONSOLIDATED 9GEF.
 - ANCHOR SCIENTIFIC-GP.
 - OR EQUAL.
 - FLOAT: 316 STAINLESS STEEL.
 - PROVIDE SUFFICIENT LENGTH OF NITRILE PVC JACKETED CABLE.
 - FOR CLASS I, DIVISIONS 1 OR 2, HAZARDOUS AREAS, PROVIDE INTRINSICALLY SAFE RELAYS IN CORRESPONDING CONTROL PANEL.
 - MOUNTING HARDWARE: 316 STAINLESS STEEL.
 - SWITCH: NON-MERCURY TILT TYPE SWITCH WITH MINIMUM RATING OF 10 MILLION CYCLES.
 - FLOAT SWITCH ACTIVATION LEVELS
 - HIGH LEVEL ALARM
 - LOW LEVEL PUMP CUT-OFF AND ALARM
- RESET CONTROL LEVELS AS INDICATED ON TABLE.
- SEE ELECTRICAL DRAWINGS FOR MODIFICATIONS TO EXISTING EPG CONTROL PANELS, DRAWINGS 17, 18, 19, 20, 21, 22 AND 23 TITLED REVISED ELECTRICAL DETAILS, REFER TO PROVIDED MOTOR SAVER INSTALLATION INSTRUCTION MANUAL FOR REVISING SETTINGS ON EXISTING MOTOR PROTECTIVE DEVICES.
- PROVIDE TIE-OFF RINGS IN WET WELL TOP AND CONNECTING RINGS FOR CONNECTING LIFTING/SAFETY CABLE TO PUMP.
- REMOVE 2 AIR RELEASE VALVES, CHECK OPERATION OF AIR RELEASE VALVE IN METER MANHOLE, IF EXISTING VALVE IS AT HIGH POINT OF PIPING AND IS WORKING IT SHOULD NOT NEED TO BE SUPPLEMENTED.
- PROVIDE COMPLETE SET OF AS-BUILT DRAWINGS.



REMOVALS WET WELL #2 1



ADDITIONS WET WELL #2 2

NO.	REVISIONS	DATE

Sheboygan, Wisconsin			
DRN	OFF	6/4/2014	
DES	NKW	6/4/2014	
CHK	PCM	6/4/2014	
APP	PJW	6/4/2014	

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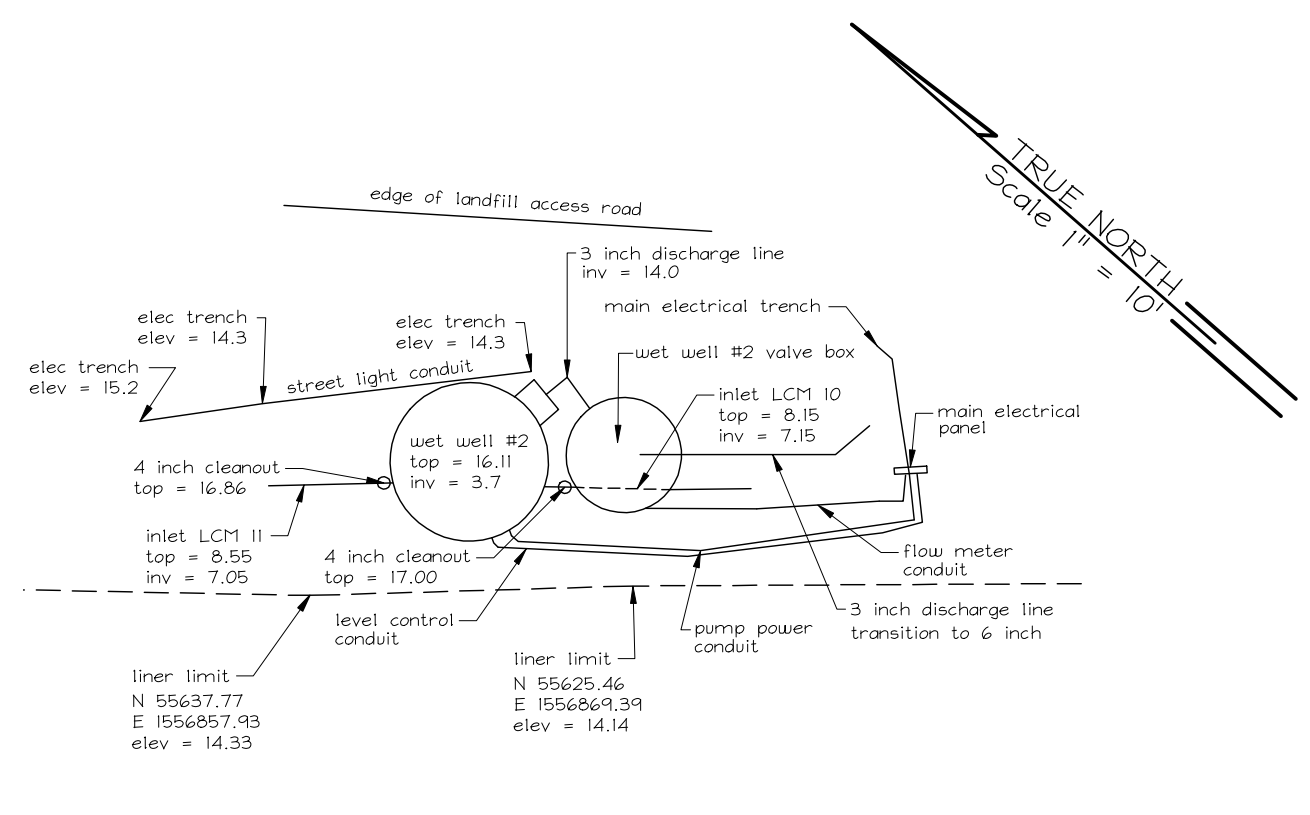
PUMPING SYSTEM MODIFICATIONS
PHASE II LEACHATE MANAGEMENT SYSTEM MODIFICATIONS
KEKAHA SANITARY LANDFILL
KAUAI, HAWAII

**WET WELL #2 DETAIL
MODIFICATIONS**

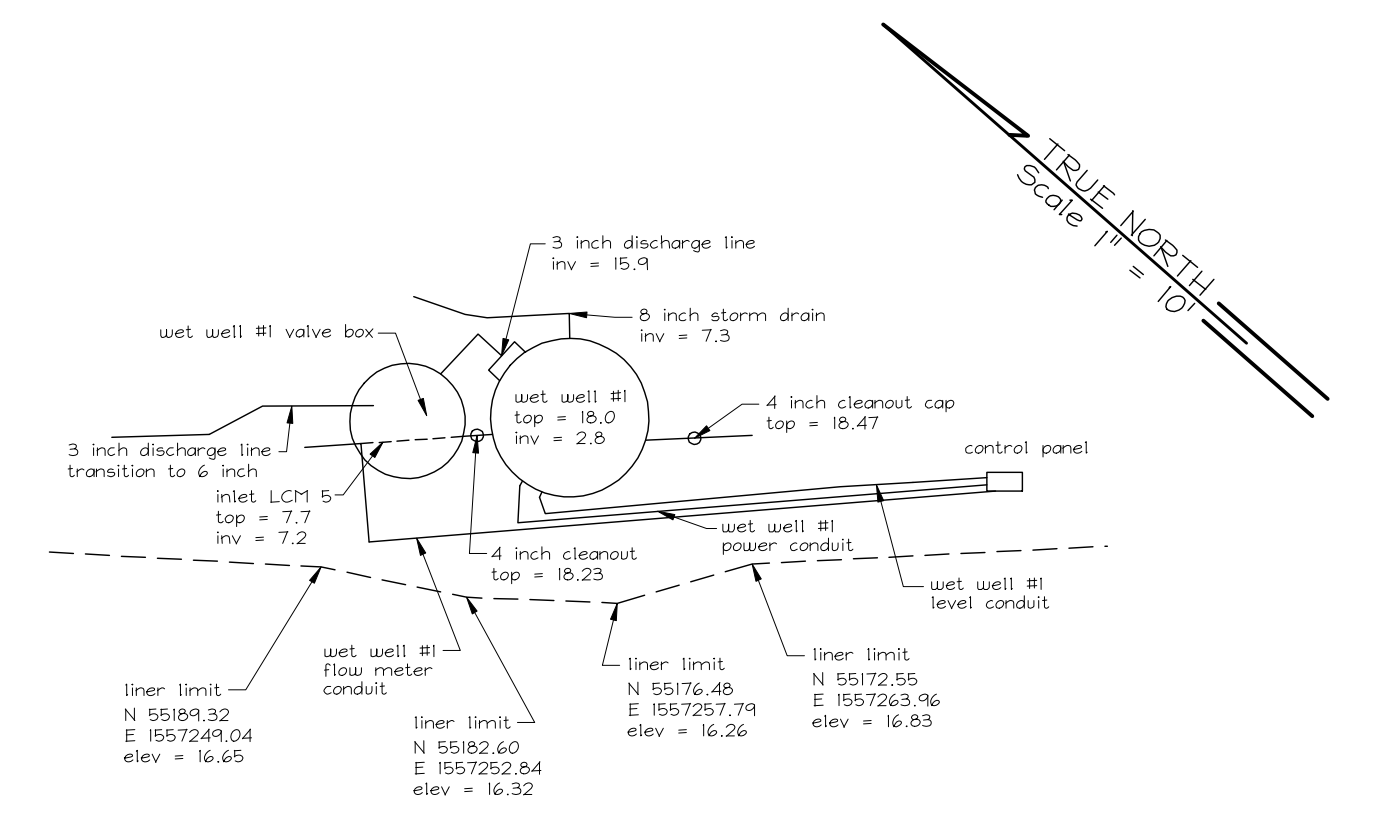
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PROJECT NO	
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FILENAME	
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SHEET NO	

FIGURE 2

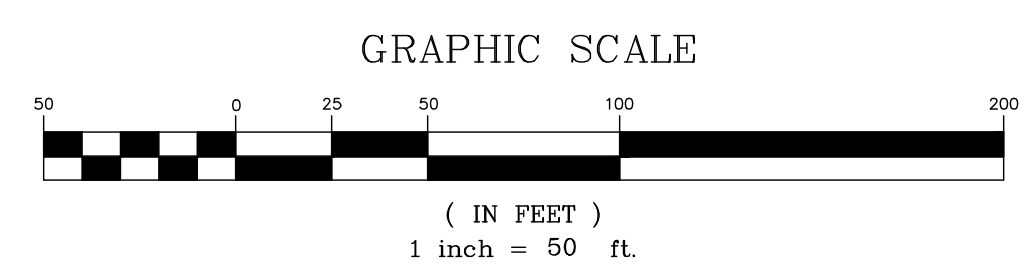
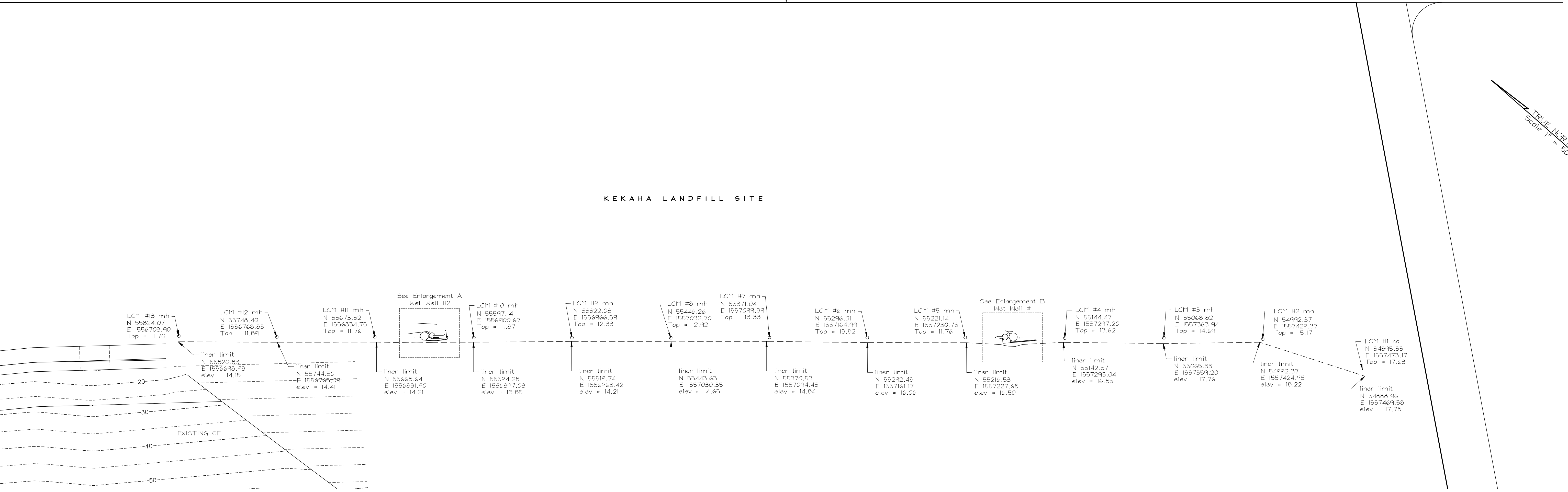
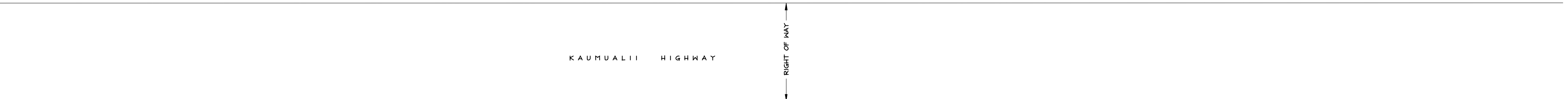
Appendix I
As Built Record Survey



**ENLARGEMENT A
WET WELL #2**
SCALE: 1 IN = 10 FT



**ENLARGEMENT B
WET WELL #1**
SCALE: 1 IN = 10 FT



**PRELIMINARY
MAP SHOWING
KEKAHA LANDFILL AS-BUILT**
DATES OF SURVEY - APRIL 27,
JULY 18,
AUGUST 10, 2012
KEKAHA, KAUAI, HAWAII
TMK: (4) 1-2-02: portion 1
Prepared For: Waste Management of Hawaii

11-19(9.19).txt

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 1512,1556881.983294,55617.790460,13.607262,fmc pipe 1
 1513,1556883.076108,55618.585385,13.615737,fmc pipe 1
 1514,1556884.019236,55618.955064,12.973894,main power 2
 1515,1556887.572949,55622.461444,13.058087,main power
 1516,1556887.158963,55623.099560,12.961443,main power 2
 1517,1556884.081531,55618.114611,13.398478,main power
 1518,1557263.960201,55172.550158,16.831785,liner lmt
 1519,1557257.793601,55176.481619,16.260572,liner lmt
 1520,1557252.842253,55182.597786,16.316043,liner lmt
 1521,1557249.039328,55189.319990,16.651901,liner lmt
 1522,1557269.844154,55175.296608,8.047672,top 12" -12"inv
 1523,1557265.502339,55180.904716,7.540268,top 6" -.5' inv
 1524,1557268.981275,55176.972853,7.567391,top 6" -.5' inv
 1525,1557267.488154,55188.312114,8.031957,top 8" sdrn
 1526,1557264.481602,55191.383522,7.640805,top 8" sdrn
 1527,1557263.867998,55192.362604,7.667971,top 8" sdrn
 1528,1557262.793245,55194.969532,7.931816,top 8" sdrn
 1529,1557254.810639,55194.906081,8.572632,top 18" lcm tie
 1530,1557255.664844,55193.083531,8.548378,top 18" lcm tie
 1531,1557256.256996,55191.974161,7.674852,top 6" -.5' inv
 1532,1557257.306258,55191.420781,7.639600,top 6" -.5' inv
 1533,1557258.179990,55190.001219,6.982462,top 6" -.5' inv
 1534,1557259.813712,55187.069334,7.022855,top 6" -.5' inv
 1535,1557263.417953,55184.710937,17.994278,top wetwlel-1
 1536,1557262.969353,55185.085513,2.782190,floor wetwell
 1537,1557279.942211,55208.529518,18.141589,ck

11-19(9.19).txt

1538,1557246.921915,55201.956764,10.250421,top 6" -.5' inv
 1539,1557252.019781,55198.459828,16.493727,top 3" -3" inv
 1540,1557253.317272,55197.147783,16.504856,top 3" -3" inv
 1541,1557257.362132,55192.582323,16.255744,top 3" -3" inv
 1542,1557258.410912,55191.439223,16.187558,top 3" -3" inv
 1543,1557263.795200,55191.162590,16.141522,top 3" -3" inv
 1544,1557263.493859,55189.506957,16.170755,top 3" -3" inv
 1545,1557266.895116,55179.139319,18.472036,4"co top cap
 1546,1557259.529974,55187.739680,18.227346,4"co top cap
 1547,1557273.218257,55175.392094,15.478841,1.5" supply
 1548,1557270.389887,55171.606062,15.819114,1.5" supply
 1549,1557272.688354,55169.049829,15.681089,1.5" supply
 1550,1557275.761969,55165.954725,15.869777,1.5" supply
 1551,1557273.212568,55175.495212,15.466367,1" control
 1552,1557269.990885,55171.772328,15.838240,1" control
 1553,1557272.661480,55169.060934,15.680570,1" control
 1554,1557275.954321,55165.802898,15.883922,1" control
 1555,1557259.262212,55183.172203,15.941756,wetwell control
 1556,1557258.823124,55182.396618,16.034447,wetwell control
 1557,1557275.867203,55165.797770,15.866334,wetwell control
 1558,1557259.043861,55184.341935,15.887670,wetwell 1 power
 1559,1557257.767310,55183.337001,15.903556,wetwell 1 power
 1560,1557275.973687,55165.770730,15.917475,wetwell 1 power
 1561,1557255.234963,55191.999845,15.846684,flow mtr cntrl
 1562,1557256.004929,55186.157209,15.371334,flow mtr cntrl
 1563,1557276.318851,55165.626589,15.937148,flow mtr cntrl
 1564,1557266.855773,55179.253466,18.448131,wetwell 1 co
 1565,1557259.559593,55187.841674,18.274267,wetwell 1 co
 1566,1557279.988465,55208.572229,18.190592,+ on curb
 1567,1556876.188512,55647.176153,15.185043,nail
 1568,1556881.539713,55640.304006,15.243734,nail
 1569,1557473.170853,54895.552514,17.628299,lcm1 @ co
 1570,1557469.579506,54888.957512,17.776339,liner limit lcm1
 1571,1557429.373886,54992.366774,15.168615,lcm2 top mh
 1572,1557424.945141,54992.374268,18.216563,liner limit lcm2
 1573,1557363.940696,55068.815421,14.689592,lcm3 top mh
 1574,1557359.201446,55065.334315,17.763539,liner limit lcm3
 1575,1557297.199039,55144.469552,13.616943,lcm4 top mh
 1576,1557293.043917,55142.566842,16.851012,liner limit lcm4
 1577,1557230.749582,55221.135012,13.670841,lcm5 top mh
 1578,1557227.681145,55216.525513,16.501317,liner limit lcm5
 1579,1557164.981476,55296.010617,13.821668,lcm6 top mh
 1580,1557161.169979,55292.484383,16.061516,liner limit lcm6
 1581,1557099.539213,55371.174653,11.586732,lcm7 @ co
 1582,1557099.386955,55371.037589,13.330871,lcm7 top mh
 1583,1557094.452672,55370.531577,14.841805,liner limit lcm7
 1584,1557032.703923,55446.263960,12.921382,lcm 8 top mh
 1585,1557030.354236,55443.634589,14.645818,liner limit lcm8
 1586,1556966.587909,55522.017526,12.332173,lcm 9 top mh
 1587,1556963.424763,55519.740739,14.207839,liner limit lcm9
 1588,1556900.674071,55597.141083,11.873410,lcm 10 top mh
 1589,1556897.031016,55594.282569,13.854620,liner limit lcm
 1590,1556834.752392,55673.519597,11.761175,lcm 11 top mh
 1591,1556831.896790,55668.638467,14.212779,liner limit lcm
 1592,1556768.826734,55748.398421,11.888533,lcm 12 top mh
 1593,1556765.092227,55744.497186,14.409350,liner limit lcm
 1594,1556703.903504,55824.074619,11.704202,lcm 13 top mh
 1595,1556698.925385,55820.833193,14.148912,liner limit lcm

11-19ab(4.24).txt

1474,1556845.445546,55707.688780,16.766052,ck bm x 19.83
1475,1556876.192292,55647.170601,15.262890,epi-1
1476,1556881.528365,55640.279286,15.301321,epi-2
1477,1556865.293940,55638.250744,7.621639,top 6" -.5' inv
1478,1556862.060033,55641.793152,8.552166,top 18" -18"inv
1479,1556873.333818,55628.629808,8.149490,top 12" -12"inv
1480,1556864.871912,55638.744329,16.861842,4" co
1481,1556870.914755,55631.530332,17.004293,4" co
1482,1556868.629506,55636.123462,16.113608,top mh
1483,1556873.905307,55635.425719,14.367826,top 3" discharge
1484,1556869.389974,55625.458796,14.139832,liner lmt
1485,1556857.934892,55637.767967,14.333999,liner lmt
1486,1556870.322709,55632.177028,7.604056,top 6" -.5' inv
1487,1557279.988465,55208.572229,18.190592,+ bm set
1488,1557279.965543,55208.550871,18.167869,vr

11-19ab(4.30).txt

1474,1556845.445546,55707.688780,16.766052,ck bm x 19.83
1475,1556876.192292,55647.170601,15.262890,epi-1
1476,1556881.528365,55640.279286,15.301321,epi-2
1477,1556865.293940,55638.250744,7.621639,top 6" -.5' inv
1478,1556862.060033,55641.793152,8.552166,top 18" -18"inv
1479,1556873.333818,55628.629808,8.149490,top 12" -12"inv
1480,1556864.871912,55638.744329,16.861842,4" co
1481,1556870.914755,55631.530332,17.004293,4" co
1482,1556868.629506,55636.123462,16.113608,top mh
1483,1556873.905307,55635.425719,14.367826,top 3" discharge
1484,1556869.389974,55625.458796,14.139832,liner lmt
1485,1556857.934892,55637.767967,14.333999,liner lmt
1486,1556870.322709,55632.177028,7.604056,top 6" -.5' inv
1487,1557279.988465,55208.572229,18.190592,+ bm set
1488,1557279.965543,55208.550871,18.167869,vr
1489,1556889.788449,55618.886363,10.789857,top 12" -12"inv
1490,1556881.043840,55621.752022,14.598176,top 6" -.5' inv
1491,1556874.779112,55629.698670,14.373736,top 3" -3" inv
1492,1556875.295943,55635.209767,14.216665,top 3" -3" inv
1493,1556885.432178,55621.063771,14.554529,elec trench
1494,1556887.175853,55624.130506,14.317853,elec trench
1495,1556874.287406,55636.816214,14.311479,elec trench
1496,1556863.798627,55646.214824,14.273029,elec trench
1497,1556858.907765,55650.409423,15.170968,elec trench 1"so

11-19ab(5.2).txt

1474,1556845.445546,55707.688780,16.766052,ck bm x 19.83
1475,1556876.192292,55647.170601,15.262890,epi-1
1476,1556881.528365,55640.279286,15.301321,epi-2
1477,1556865.293940,55638.250744,7.621639,top 6" -.5' inv
1478,1556862.060033,55641.793152,8.552166,top 18" -18"inv
1479,1556873.333818,55628.629808,8.149490,top 12" -12"inv
1480,1556864.871912,55638.744329,16.861842,4" co
1481,1556870.914755,55631.530332,17.004293,4" co
1482,1556868.629506,55636.123462,16.113608,top mh
1483,1556873.905307,55635.425719,14.367826,top 3" discharge
1484,1556869.389974,55625.458796,14.139832,liner lmt
1485,1556857.934892,55637.767967,14.333999,liner lmt
1486,1556870.322709,55632.177028,7.604056,top 6" -.5' inv
1487,1557279.988465,55208.572229,18.190592,+ bm set
1488,1557279.965543,55208.550871,18.167869,vr
1489,1556889.788449,55618.886363,10.789857,top 12" -12"inv
1490,1556881.043840,55621.752022,14.598176,top 6" -.5' inv
1491,1556874.779112,55629.698670,14.373736,top 3" -3" inv
1492,1556875.295943,55635.209767,14.216665,top 3" -3" inv
1493,1556885.432178,55621.063771,14.554529,elec trench
1494,1556887.175853,55624.130506,14.317853,elec trench
1495,1556874.287406,55636.816214,14.311479,elec trench
1496,1556863.798627,55646.214824,14.273029,elec trench
1497,1556858.907765,55650.409423,15.170968,elec trench 1"so
1498,1556867.187290,55631.926996,16.295344,tower j-box
1499,1556867.181810,55631.469614,13.805688,conduit 1
1500,1556873.097720,55624.027847,13.768959,conduit 1
1501,1556881.076773,55617.208845,13.914002,conduit 1
1502,1556883.245682,55618.460037,13.294077,conduit 1
1503,1556866.292602,55632.375350,16.244056,sensor cntrl jbx
1504,1556866.275912,55632.056955,13.791124,conduit 2
1505,1556872.432407,55624.344406,13.694957,conduit 2
1506,1556880.042563,55617.513948,13.955878,conduit 2
1507,1556881.828248,55616.324112,13.880967,conduit 2
1508,1556883.515382,55618.161733,13.455231,conduit 2
1509,1556876.160680,55623.824965,16.653467,flow mtr cntrl
1510,1556876.659240,55623.252845,14.068024,fmc pipe 1
1511,1556881.149760,55618.732749,13.956282,fmc pipe 1
1512,1556881.983294,55617.790460,13.607262,fmc pipe 1
1513,1556883.076108,55618.585385,13.615737,fmc pipe 1
1514,1556884.019236,55618.955064,12.973894,main power 2
1515,1556887.572949,55622.461444,13.058087,main power
1516,1556887.158963,55623.099560,12.961443,main power 2
1517,1556884.081531,55618.114611,13.398478,main power

11-19ab(5.22).txt

1474,1556845.445546,55707.688780,16.766052,ck bm x 19.83
1475,1556876.192292,55647.170601,15.262890,epi-1
1476,1556881.528365,55640.279286,15.301321,epi-2
1477,1556865.293940,55638.250744,7.621639,top 6" -.5' inv
1478,1556862.060033,55641.793152,8.552166,top 18" -18"inv
1479,1556873.333818,55628.629808,8.149490,top 12" -12"inv
1480,1556864.871912,55638.744329,16.861842,4" co
1481,1556870.914755,55631.530332,17.004293,4" co
1482,1556868.629506,55636.123462,16.113608,top mh
1483,1556873.905307,55635.425719,14.367826,top 3" discharge
1484,1556869.389974,55625.458796,14.139832,liner lmt
1485,1556857.934892,55637.767967,14.333999,liner lmt
1486,1556870.322709,55632.177028,7.604056,top 6" -.5' inv
1487,1557279.988465,55208.572229,18.190592,+ bm set
1488,1557279.965543,55208.550871,18.167869,vr
1489,1556889.788449,55618.886363,10.789857,top 12" -12"inv
1490,1556881.043840,55621.752022,14.598176,top 6" -.5' inv
1491,1556874.779112,55629.698670,14.373736,top 3" -3" inv
1492,1556875.295943,55635.209767,14.216665,top 3" -3" inv
1493,1556885.432178,55621.063771,14.554529,elec trench
1494,1556887.175853,55624.130506,14.317853,elec trench
1495,1556874.287406,55636.816214,14.311479,elec trench
1496,1556863.798627,55646.214824,14.273029,elec trench
1497,1556858.907765,55650.409423,15.170968,elec trench 1"so
1498,1556867.187290,55631.926996,16.295344,tower j-box
1499,1556867.181810,55631.469614,13.805688,conduit 1
1500,1556873.097720,55624.027847,13.768959,conduit 1
1501,1556881.076773,55617.208845,13.914002,conduit 1
1502,1556883.245682,55618.460037,13.294077,conduit 1
1503,1556866.292602,55632.375350,16.244056,sensor cntrl jbx
1504,1556866.275912,55632.056955,13.791124,conduit 2
1505,1556872.432407,55624.344406,13.694957,conduit 2
1506,1556880.042563,55617.513948,13.955878,conduit 2
1507,1556881.828248,55616.324112,13.880967,conduit 2
1508,1556883.515382,55618.161733,13.455231,conduit 2
1509,1556876.160680,55623.824965,16.653467,flow mtr cntrl
1510,1556876.659240,55623.252845,14.068024,fmc pipe 1
1511,1556881.149760,55618.732749,13.956282,fmc pipe 1
1512,1556881.983294,55617.790460,13.607262,fmc pipe 1
1513,1556883.076108,55618.585385,13.615737,fmc pipe 1
1514,1556884.019236,55618.955064,12.973894,main power 2
1515,1556887.572949,55622.461444,13.058087,main power
1516,1556887.158963,55623.099560,12.961443,main power 2
1517,1556884.081531,55618.114611,13.398478,main power
1518,1557263.960201,55172.550158,16.831785,liner lmt
1519,1557257.793601,55176.481619,16.260572,liner lmt
1520,1557252.842253,55182.597786,16.316043,liner lmt
1521,1557249.039328,55189.319990,16.651901,liner lmt
1522,1557269.844154,55175.296608,8.047672,top 12" -12"inv
1523,1557265.502339,55180.904716,7.540268,top 6" -.5' inv
1524,1557268.981275,55176.972853,7.567391,top 6" -.5' inv
1525,1557267.488154,55188.312114,8.031957,top 8" sdrn
1526,1557264.481602,55191.383522,7.640805,top 8" sdrn
1527,1557263.867998,55192.362604,7.667971,top 8" sdrn
1528,1557262.793245,55194.969532,7.931816,top 8" sdrn
1529,1557254.810639,55194.906081,8.572632,top 18" lcm tie
1530,1557255.664844,55193.083531,8.548378,top 18" lcm tie
1531,1557256.256996,55191.974161,7.674852,top 6" -.5' inv
1532,1557257.306258,55191.420781,7.639600,top 6" -.5' inv
1533,1557258.179990,55190.001219,6.982462,top 6" -.5' inv
1534,1557259.813712,55187.069334,7.022855,top 6" -.5' inv
1535,1557263.417953,55184.710937,17.994278,top wetwel-1
1536,1557262.969353,55185.085513,2.782190,floor wetwell

11-19ab(5.25).txt

1538,1557246.921915,55201.956764,10.250421,top 6" -.5' inv
 1539,1557252.019781,55198.459828,16.493727,top 3" -3" inv
 1540,1557253.317272,55197.147783,16.504856,top 3" -3" inv
 1541,1557257.362132,55192.582323,16.255744,top 3" -3" inv
 1542,1557258.410912,55191.439223,16.187558,top 3" -3" inv
 1543,1557263.795200,55191.162590,16.141522,top 3" -3" inv
 1544,1557263.493859,55189.506957,16.170755,top 3" -3" inv
 1545,1557266.895116,55179.139319,18.472036,4"co top cap
 1546,1557259.529974,55187.739680,18.227346,4"co top cap
 1547,1557273.218257,55175.392094,15.478841,1.5" supply
 1548,1557270.389887,55171.606062,15.819114,1.5" supply
 1549,1557272.688354,55169.049829,15.681089,1.5" supply
 1550,1557275.761969,55165.954725,15.869777,1.5" supply
 1551,1557273.212568,55175.495212,15.466367,1" control
 1552,1557269.990885,55171.772328,15.838240,1" control
 1553,1557272.661480,55169.060934,15.680570,1" control
 1554,1557275.954321,55165.802898,15.883922,1" control
 1555,1557259.262212,55183.172203,15.941756,wetwell control
 1556,1557258.823124,55182.396618,16.034447,wetwell control
 1557,1557275.867203,55165.797770,15.866334,wetwell control
 1558,1557259.043861,55184.341935,15.887670,wetwell 1 power
 1559,1557257.767310,55183.337001,15.903556,wetwell 1 power
 1560,1557275.973687,55165.770730,15.917475,wetwell 1 power
 1561,1557255.234963,55191.999845,15.846684,flow mtr cntrl
 1562,1557256.004929,55186.157209,15.371334,flow mtr cntrl
 1563,1557276.318851,55165.626589,15.937148,flow mtr cntrl
 1564,1557266.855773,55179.253466,18.448131,wetwell 1 co
 1565,1557259.559593,55187.841674,18.274267,wetwell 1 co

11-19ab(5.25).txt

1475,1556876.192292,55647.170601,15.262890,epi-1
 1476,1556881.528365,55640.279286,15.301321,epi-2
 1477,1556865.293940,55638.250744,7.621639,top 6" -.5' inv
 1478,1556862.060033,55641.793152,8.552166,top 18" -18"inv
 1479,1556873.333818,55628.629808,8.149490,top 12" -12"inv
 1480,1556864.871912,55638.744329,16.861842,4" co
 1481,1556870.914755,55631.530332,17.004293,4" co
 1482,1556868.629506,55636.123462,16.113608,top mh
 1483,1556873.905307,55635.425719,14.367826,top 3" discharge
 1484,1556869.389974,55625.458796,14.139832,liner lmt
 1485,1556857.934892,55637.767967,14.333999,liner lmt
 1486,1556870.322709,55632.177028,7.604056,top 6" -.5' inv
 1487,1557279.988465,55208.572229,18.190592,+ bm set
 1488,1557279.965543,55208.550871,18.167869,vr
 1489,1556889.788449,55618.886363,10.789857,top 12" -12"inv
 1490,1556881.043840,55621.752022,14.598176,top 6" -.5' inv
 1491,1556874.779112,55629.698670,14.373736,top 3" -3" inv
 1492,1556875.295943,55635.209767,14.216665,top 3" -3" inv
 1493,1556885.432178,55621.063771,14.554529,elec trench
 1494,1556887.175853,55624.130506,14.317853,elec trench
 1495,1556874.287406,55636.816214,14.311479,elec trench
 1496,1556863.798627,55646.214824,14.273029,elec trench
 1497,1556858.907765,55650.409423,15.170968,elec trench 1"so
 1498,1556867.187290,55631.926996,16.295344,tower j-box
 1499,1556867.181810,55631.469614,13.805688,conduit 1
 1500,1556873.097720,55624.027847,13.768959,conduit 1
 1501,1556881.076773,55617.208845,13.914002,conduit 1
 1502,1556883.245682,55618.460037,13.294077,conduit 1
 1503,1556866.292602,55632.375350,16.244056,sensor cntrl jbx
 1504,1556866.275912,55632.056955,13.791124,conduit 2
 1505,1556872.432407,55624.344406,13.694957,conduit 2
 1506,1556880.042563,55617.513948,13.955878,conduit 2
 1507,1556881.828248,55616.324112,13.880967,conduit 2
 1508,1556883.515382,55618.161733,13.455231,conduit 2
 1509,1556876.160680,55623.824965,16.653467,flow mtr cntrl
 1510,1556876.659240,55623.252845,14.068024,fmc pipe 1
 1511,1556881.149760,55618.732749,13.956282,fmc pipe 1
 1512,1556881.983294,55617.790460,13.607262,fmc pipe 1
 1513,1556883.076108,55618.585385,13.615737,fmc pipe 1
 1514,1556884.019236,55618.955064,12.973894,main power 2
 1515,1556887.572949,55622.461444,13.058087,main power
 1516,1556887.158963,55623.099560,12.961443,main power 2
 1517,1556884.081531,55618.114611,13.398478,main power
 1518,1557263.960201,55172.550158,16.831785,liner lmt
 1519,1557257.793601,55176.481619,16.260572,liner lmt
 1520,1557252.842253,55182.597786,16.316043,liner lmt
 1521,1557249.039328,55189.319990,16.651901,liner lmt
 1522,1557269.844154,55175.296608,8.047672,top 12" -12"inv
 1523,1557265.502339,55180.904716,7.540268,top 6" -.5' inv
 1524,1557268.981275,55176.972853,7.567391,top 6" -.5' inv
 1525,1557267.488154,55188.312114,8.031957,top 8" sdrn
 1526,1557264.481602,55191.383522,7.640805,top 8" sdrn
 1527,1557263.867998,55192.362604,7.667971,top 8" sdrn
 1528,1557262.793245,55194.969532,7.931816,top 8" sdrn
 1529,1557254.810639,55194.906081,8.572632,top 18" lcm tie
 1530,1557255.664844,55193.083531,8.548378,top 18" lcm tie
 1531,1557256.256996,55191.974161,7.674852,top 6" -.5' inv
 1532,1557257.306258,55191.420781,7.639600,top 6" -.5' inv
 1533,1557258.179990,55190.001219,6.982462,top 6" -.5' inv
 1534,1557259.813712,55187.069334,7.022855,top 6" -.5' inv
 1535,1557263.417953,55184.710937,17.994278,top wetwlel-1
 1536,1557262.969353,55185.085513,2.782190,floor wetwell
 1537,1557279.942211,55208.529518,18.141589,ck

Appendix J
System Start-up Testing



SUPERSEDED

Leachate Management System
New Wet Well # 2 System Demonstration Test Report

Date: 3 May 2012

Project: Phase II Leachate Management System Modification

Project Number: WG1548

New Wet Well #2 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric.

EP installed the following: Wet Well #2 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, two Surepump VSD 30-2 submersible pumps with support brackets and guild rail system, 3/16-inch stainless steel support cables, two 3-inch stainless steel discharge pipes, two stainless steel shut-off ball valves, and the Wet Well #2 valve box structure.

R Electric installed the following: 100 feet of 1-inch PVC electrical conduit; EPG L950PT PumpMaster control panel, motor lead breakout junction box, high level sensor, low level sensor, low level shut off sensor and sensor breakout junction box, leak detection conduit and control, and all parts and fitting to provide electrical power to the system.

The primary power for the system was connected to the existing control panel at the New Leachate Evaporation Pond (NLEP).




During construction today new Wet Well #2 was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented;

- High level alarm activates at 50 inches above the floor of the wet well (Elevation 7.85);
- Pump # 1 activates 30 inches above the floor of the wet well (Elevation 6.21) ,
- Pump # 2 activates 40 inches above the floor of the wet well (Elevation 7.09),
- Both pumps 1 and 2 shut-off 9 inches above the floor of the wet well (Elevation 4.57),
- Low level alarm activates 7 inches above the floor of the wet well (Elevation 4.33),
- Both pumps 1 and 2 vents are installed and operational,
- Voltage measured and recorded as 460v, and
- EPG PumpMaster control panel is operational
- Leak detection sensor (note; no verification performed as RFI is required for completion)

The above items apply to Wet Well #2 and do not reflex all of the components required for operations of the full LCRS.

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.:		Date: <u>5-4-12</u>
R Electric:		Date: <u>5/4/12</u>
Geosyntec Consultants, Inc.:		Date: <u>4 MAY 2012</u>



SUPERSEDED

Leachate Management System
New Wet Well # 1 System Demonstration Test Report

Date: 30 May 2012

Project: Phase II Leachate Management System Modification

Project Number: WG1548

New Wet Well #1 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric.

EP installed the following: Wet Well #1 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, two Surepump VSD 30-2 submersible pumps with support brackets and guild rail system, 3/16-inch stainless steel support cables, two 3-inch stainless steel discharge pipes, two stainless steel shut-off ball valves, and the Wet Well #1 valve box structure.

R Electric installed the following: 100 feet of 1-inch PVC electrical conduit; EPG L950PT PumpMaster control panel, motor lead breakout junction box, high level sensor, low level sensor, low level shut off sensor and sensor breakout junction box, leak detection conduit and control, and all parts and fitting to provide electrical power to the system.

The primary power for the system was connected to the existing control panel at the New Leachate Evaporation Pond (NLEP).

During construction today new Wet Well #1 was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented;

- High level alarm activates at 50 inches above the floor of the wet well (Elevation 7.32);
- Pump # 1 activates 30 inches above the floor of the wet well (Elevation 5.66) ,
- Pump # 2 activates 40 inches above the floor of the wet well (Elevation 6.49),
- Both pumps 1 and 2 shut-off 9 inches above the floor of the wet well (Elevation 3.91),
- Low level alarm activates 7 inches above the floor of the wet well (Elevation 3.74),
- Both pumps 1 and 2 vents are installed and operational,
- Voltage measured and recorded as 460v, and
- EPG PumpMaster control panel is operational
- Leak detection sensor (note; no verification performed as RFI is required for completion)

The above items apply to Wet Well #1 and do not reflect all of the components required for operations of the full LCRS.

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.: _____
 R Electric: _____
 Geosyntec Consultants, Inc.: _____

Date: 5-30-12
 Date: May 30, 2012
 Date: 30 May 2012



SUPERSEDED

Leachate Management System
New Wet Well # 1 System Demonstration Test Report

Date: 8 May 2013

Project: Phase II Leachate Management System Modification

Project Number: WG1548

New Wet Well #1 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric.

EP installed the following: Wet Well #1 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, two Surepump VSD 30-2 submersible pumps with support brackets and guild rail system, 3/16-inch stainless steel support cables, two 3-inch stainless steel discharge pipes, two stainless steel shut-off ball valves, and the Wet Well #1 valve box structure.

R Electric installed the following: 100 feet of 1-inch PVC electrical conduit; EPG L950PT PumpMaster control panel, motor lead breakout junction box, high level sensor, low level sensor, low level shut off sensor and sensor breakout junction box, leak detection conduit and control, three new AWG 6 electrical wires for 3-Phase power and one new AWG 4 ground lead, all parts and fitting to provide electrical power to the system.

During construction today new Wet Well #1 was set to reflect AECOM's recommendations, provided in their e-mail dated 6 May 2013 and tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented:

- High level alarm activates at elevation: 7.60 ft.
- Pump 1 on activates at elevation 7.10 ft. (alternates with Pump 2)
- Pump 2 on activates at elevation 7.10 ft. (alternates with Pump 1)
- Pump off de-energizes at elevation 4.81ft.
- Low level alarm activates at elevation 4.31ft.
- Both pumps 1 and 2 vents are installed and operational,
- Both pumps 1 and 2 air and vacuum (a/v) relief valves are installed,
- Voltage measured and recorded as 460v, and
- EPG PumpMaster control panel is operational. and
- Leak detection sensor is operational.

- Set point 53.3 inches;
- Set point 47.3 inches;
- Set point 47.3 inches;
- Set point 19.8 inches;
- Set point 13.8 inches;

Notes:

1. Level transducer was measured to be 7 inches from the bottom of the wet well structure; therefore the offset was adjusted from -34.6 (standard) to -30.6 to compensate for the actual water level in the sump.
2. Distance from the bottom of the wet well structure and the sump strainer was field measured to be 1.25 inches. Therefore all operating levels were adjusted to meet the actual system operating perimeters.
3. Top of Wet Well #1 manhole was measure by Esaki Land Surveyors to be 17.99 feet. (msl) The depth of Wet Well #1 is 14.83 feet. All set points are based on these measurements to achieve design elevations

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.: _____

Date: 5-8-13

Geosyntec Consultants, Inc.: Clean Chan Sun

Date: 8 May 2013

County of Kauai: _____

Date: 5/8/13



SUPERSEDED

Leachate Management System
New Wet Well # 2 System Demonstration Test Report

Date: 8 May 2013

Project: Phase II Leachate Management System Modification

Project Number: WG1548

New Wet Well #2 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric.

EP installed the following: Wet Well #2 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, two Surepump VSD 30-2 submersible pumps with support brackets and guild rail system, 3/16-inch stainless steel support cables, two 3-inch stainless steel discharge pipes, two stainless steel shut-off ball valves, and the Wet Well #2 valve box structure.

R Electric installed the following: 100 feet of 1-inch PVC electrical conduit; EPG L950PT PumpMaster control panel, motor lead breakout junction box, high level sensor, low level sensor, low level shut off sensor and sensor breakout junction box, leak detection conduit and control, three new AWG 2 electrical wires for 3-Phase power and one new AWG 4 ground lead. All parts and fitting to provide electrical power to the system.

During construction today, new Wet Well #2 was set to reflect AECOM's recommendations, provided in their e-mail dated 6 May 2013, and was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test, the following system checks were performed and documented:

- High level alarm activates at elevation 8.13ft.
- Pump 1 on activates at elevation 7.63ft (alternates with Pump 2)
- Pump 2 on activates at elevation 7.63ft (alternates with Pump 1)
- Pump off de-energizes at elevation 5.34ft.
- Low level alarm activates at elevation 4.84ft.
- Both pumps 1 and 2 vents are installed and operational,
- Both pumps 1 and 2 air and vacuum (a/v) relief valves are installed,
- Voltage measured and recorded as 460v,
- EPG PumpMaster control panel is operational, and
- Leak detection sensor is operational.

- Set point 53.3 inches;
- Set point 47.3 inches;
- Set point 47.3 inches;
- Set point 19.8 inches;
- Set point 13.8 inches.

Notes:

1. Level transducer was measured to be 7 inches from the bottom of the wet well structure, therefore the offset was adjusted from -34.6 (standard) to -30.7 to compensate for the actual water level in the sump.
2. Distance from the bottom of the wet well structure and the sump strainer was field-measured to be 1.25 inches. Therefore, all operating levels were adjusted to meet the actual system operating perimeters.
3. Top of Wet Well #2 manhole was measure by Esaki Land Surveyors to be 16.11 feet (msl). The depth of Wet Well #2 is 12.42 feet. All set points are based on these measurements to achieve the design elevations.

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.:

Date: 5-8-13

Geosyntec Consultants, Inc.:

Date: 8 May 2013

County of Kauai.:

Date: 5/8/13

Leachate Management System
New Wet Well # 1 System Demonstration Test Report

Date: 25 September 2015

Project Number: WG1548

New Wet Well #1 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric, with the system control modifications completed by EPG Companies.

EP installed the following: Wet Well #1 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, one NP 3085.092 submersible FLYGT pump with support brackets and guild rail system, lifting chain, one 3-inch stainless steel discharge pipe, one stainless steel shut-off ball valve, two back-up float level switches, and the Wet Well #1 valve box structure.

R Electric installed the following: 1-inch PVC electrical conduit; motor lead breakout junction box, stilling well with level sensor, sensor breakout junction box, leak detection conduit and control, three new AWG 6 electrical wires for 3-Phase power and one new AWG 4 ground lead, and all parts and fittings to provide electrical power to the system.

EPG installed the control panel and all associated leachate components.

During construction today new Wet Well #1 was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented;

System test

- Voltage measured and recorded as 480 v;
- EPG PumpMaster control panel is operational;
- Leak detection sensor operational.

Operation test using transducer readings:

- High level alarm activates at 6 inches below the lowest leachate system inlet pipe invert
- FLYGT pump activates 18 inches below the lowest leachate system inlet pipe invert
- FLYGT pump shut-off 13 inches² above the bottom of the wet well structure.
- Low level alarm activates 11 inches above the bottom of the wet well invert

Set point 34 inches;
Set point 22 inches;
Set point 13 inches;
Set point 11 inches.

Operations testing the float switches:

- High level alarm activates at 6 inches below the lowest leachate system inlet pipe invert .
- Low level alarm activates 11 inches above the bottom of the wet well invert .

Transducer reading 34 inches.
Transducer reading 11 inches.

Pump Performance;

- Pump flow rate
- Pump on time
- Pumped fluid volume from flowmeter totalizer

102 to 124 gpm
1 min. 43 sec
184 gallons

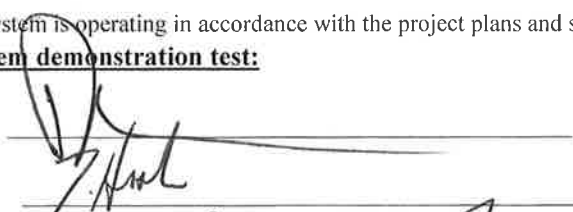
Notes:

1. The level transducer is located above the invert of the wet well. Manual measurements of water depth above the wet well floor invert were used to set the following transducer offset reading 32.0. Therefore the transducer readings reflect the actual water level in the wet well as measured from the floor invert.
2. Original design lists 12 inches. The off level was adjusted up by 1 inch to minimize interference seen during initial testing with low level alarm.

The undersigned verify the system is operating in accordance with the project plans and specifications.

Signatures verifying system demonstration test:

Earthworks Pacific, Inc.:



Date: 9-25-15

EPG Companies:



Date: 25/sep/15

Geosyntec Consultants, Inc.:



Date: 25 SEP 15

Leachate Management System
New Wet Well # 2 System Demonstration Test Report

Date: 25 September 2015

Project Number: WG1548

New Wet Well #2 was installed by Earthworks Pacific, Inc. (EP) and the electrical components were installed by EP's subcontractor, R Electric, with the system control modifications completed by EPG Companies.

EP installed the following: Wet Well #1 structure, two 6-inch HDPE cleanouts fitted with quick disconnect cam and grove couplings and dust caps, one NP 3085.092 submersible FLYGT pump with support brackets and guild rail system, lifting chain, one 3-inch stainless steel discharge pipe, one stainless steel shut-off ball valve, two back-up float level switches, and the Wet Well #2 valve box structure.

R Electric installed the following: 1-inch PVC electrical conduit; motor lead breakout junction box, stilling well with level sensor, sensor breakout junction box, leak detection conduit and control, three new AWG 6 electrical wires for 3-Phase power and one new AWG 4 ground lead, and all parts and fittings to provide electrical power to the system.

EPG installed the control panel and all associated components.

During construction today new Wet Well #2 was tested in accordance with System Demonstration Section 01814 of the Project Specifications. Upon completion of the test the following system checks were performed and documented;

System test

- Voltage measured and recorded as 480 v;
- EPG PumpMaster control panel is operational;
- Leak detection sensor operational.

Operation test using transducer readings:

- High level alarm activates at 6 inches below the lowest leachate system inlet pipe invert
- FLYGT pump activates 18 inches below the lowest leachate system inlet pipe invert
- FLYGT pump shut-off 13 inches² above the bottom of the wet well structure.
- Low level alarm activates 11 inches above the bottom of the wet well invert

Set point 34 inches;
Set point 22 inches;
Set point 13 inches;
Set point 11 inches.

Operations testing the float switches:

- High level alarm activates at 6 inches below the lowest leachate system inlet pipe invert
- Low level alarm activates 11 inches above the bottom of the wet well invert

Transducer reading 34 inches.
Transducer reading 11 inches.

Pump Performance;

- Pump flow rate
- Pump on time
- Pumped fluid volume from flowmeter totalizer

105 to 118 gpm
1 min, 35 sec
203 gallons

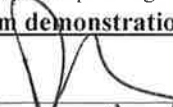
Notes:

1. The level transducer is located above the invert of the wet well. Manual measurements of water depth above the wet well floor invert were used to set the following transducer offset reading 25. Therefore the transducer readings reflect the actual water level in the wet well as measured from the floor invert.
2. Original design lists 12 inches. The off level was adjusted up by 1 inch to minimize interference seen during initial testing with low level alarm.

The undersigned verify the system is operating in accordance with the project plans and specifications.


Signatures verifying system demonstration test:

Earthworks Pacific, Inc.:



Date: 9-25-15

EPG Companies:



Date: 25/sep/15

Geosyntec Consultants, Inc.:



Date: 25 SEP 15

Appendix K
Operations and Maintenance Manual

Earthworks Pacific, Inc

**Operations & Maintenance
Manual**

FOR

**County of Kauai,
Kekaha Sanitary Landfill**

EPG Job #11-10293

EPG Job #14-11895

Earthworks Pacific, Inc.

Operations and Maintenance Index

Earthworks Pacific, Inc. – Kekaha Sanitary Landfill

EPG Job # 11-10293, modified #14-11895

Bulletin	1055 d)	List of Equipment
Drawing	6601900	Dimensional Drawing NP 3085 MT,ddia.3''''
Test Rept.	63-465-00-5306 (2ea))	Test Report - S/N 3085.092-1530108 Test Report - S/N 3085.092-1530109
Bulletin	0331d	Engineer's Specification Submersible Pump
Flygt	3085	Installation, Operation, and Maintenance Manual
Flygt	MiniCas	Modules Technical Data, Wiring Diagram, Specifications
Symcom	777-KW/HP-P2	Electronic Power Monitors Overview, Specs, Installation
Bulletin	0790	Test Equipment
Bulletin	0380d	Flygt Pump Installation Record
Form	200	Flygt Pump Installation Record
Bulletin	0610	Installation Guide EPG SurePump™ Pumping System
Bulletin	0620	Start Up Checklist EPG SurePump™ Pumping System
Bulletin	0080b	Engineer's Specification EPG Series L950PT PumpMaster Controller
Form	117	Attachment to 0080b
Drawings	10173-025X	L950PT Control Panel Schematics. 14-11895 (12 sheets)
Information	4 Pages	Meter Default Settings, DDHX, SDHL
Bulletin	3360	Caution
Bulletin	8000a	EPG Controllers With Intrinsically Safe Circuit(s) Field Installation Instructions
Bulletin	0125	Engineer's Specification EPG LG & LGP Submersible Level Transmitters
Bulletin	0690c	EPG LevelMaster™ Level Sensor Operation & Maintenance Instructions
Bulletin	0580	EPG LevelMaster Level Meter Model CH1000-SDHH Operations & Set Up Instructions
Bulletin	0585	EPG LevelMaster Level Meter Model CH1000-DDHX Operations & Set Up Instructions
Bulletin	6160	S3070-PT Transducer Simulator Operation
Bulletin	6165	S3070-PT Transducer Simulator Test Procedure

Earthworks Pacific, Inc.

Information	2 Pages	Siemens 9G-EF (Mercury Free) Direct Acting Float Switch (B100)
Drawing	03626-0525	BJBP525 Duplex Breakout Junction Box for Motor Lead
Drawing	02523-0905	BJBO905B Breakout Junction Box for One Level, One Flow Sensor and One Leak Detection
Bulletin	3480C	Sensor Data Sheet EPG Leak Detector
Bulletin	8155	Stilling Well
Bulletin	1010c	Sensor Data Sheet E-Series Liquid Flow Sensor
Bulletin	0170d	Flow Meter Operations
Bulletin	1005	Caution
Drawing	07765-0000C	3" PVC Flow Sensor with MNPT Ends
Information	D-040LP	Combination Air Valve Specifications and Maintenance.
Photo	A	Front Panel Layout
Photo	B	Revised Inner Door Layout
Photo	C	Back Panel Layout
Photo	D	Back offInner Door Layout
Flygt	13-11079	WARRANTY Xylem Water Solutions USA, Inc.

Earthworks Pacific, Inc.

List of Equipment

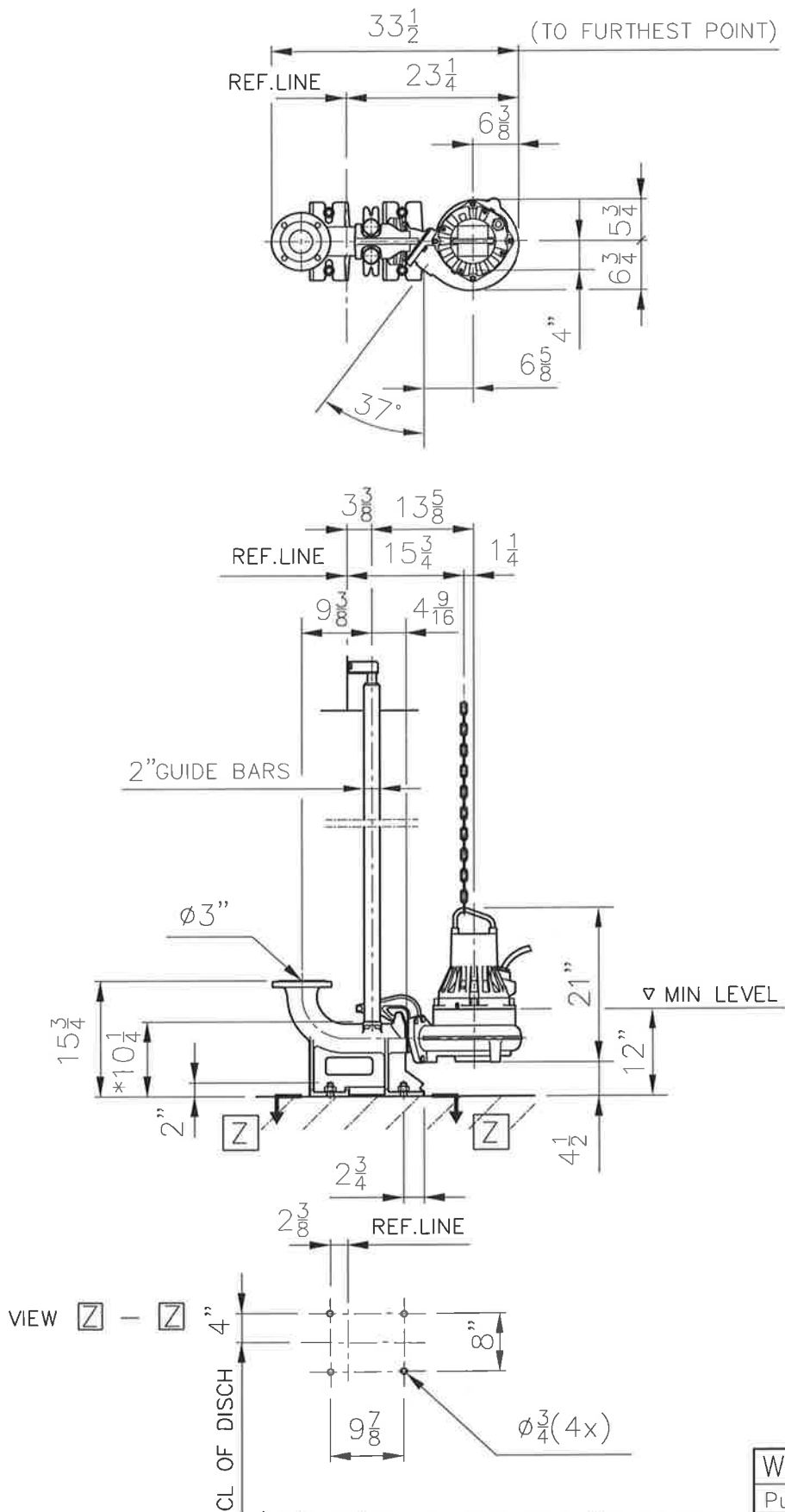
Earthworks Pacific, Inc. – Kekaha Sanitary Landfill

EPG Job # 11-10293 and #14-11895

- 2 each L950PT
EPG PumpMaster Control Panel, UL listed, 460V, 3PH, NEMA 4X stainless steel enclosure, to operate 1 ea. 3 HP submersible pump motor, with LevelMaster level control meter and simulator, Flow meter display for 3" SCH80 PVC flow sensor, high level alarm, red panel mounted alarm light and output, 4-20 mA output to second meter for low level alarm, red panel mounted alarm light and output, lagoon full shut down dry input contact with pass along output, red panel mounted alarm light, red panel mounted alarm lights, red top mounted common alarm light, and two ea additional floats for back-up use in activating warning lights for high and low leachate levels.
- 2 each 3085.092
Flygt submersible pumps, with 3 HP, 460 V, 3PH motor, 50' of jacketed SUBCAB motor lead, and 200' of 1 1/4" stainless steel suspension chain and attachments.
- 2 each BJB525
EPG Breakout Box, NEMA 4X non-metallic enclosure for 2 ea. motor leads, includes connection terminals.
- 2 each BJBO905B
EPG Breakout Box, NEMA 4X non-metallic for 1 ea. level sensor, 1 ea. flow sensor, and 1 ea. leak detection sensor. Includes desiccant dryer, bellows, and connection terminals.
- 2 each BJBF425
EPG Breakout Box. Nema 4X non-metallic for 2 ea. floats. Includes connectors and 3/4" EYS.
- 2 each AASLD-YH25
EPG leak Detection Sensor. 1-1/2" MNMP, stainless steel, with 25' lead.
- 2 each Submersible Pump to Force Main Assembly
Includes 3" Romac Flange Coupling Adapter, 3" Sch. 40 SS pipe w/ MIPT, 3" SS Check Valve, 3" Sch. 40 SS FIP Tee, 3" x 1" SS reducer bushing, 1" Combination Air Valve, 3"x 6" long Sch. 40 SS nipple, 3" FIP Union, 3" SS Ball Valve, FIP

Earthworks Pacific, Inc.

- 2 EA Alternate Pump Connection
 3" Sch. 40 SS 90 EL, FIPxFemale Cam-Lock, 3" SS Cam-lock Cap, 3" SS Check Valve
- 2 each Stilling Well
 EPG Stilling Well, 1.25" X 15' SCH40 PVC, with adaptor, bulkhead fitting,
 bushing, and cord restraint.
- 1 each LG-011C-025
 EPG Submersible Level Sensor, 0-11', 4-20 mA, built-in lightning arrestor, with
 25' Hytrel lead.
- 2 each EP30P08M30M30S
 EPG Flow Sensor, 3", SCH 80 PVC, MNPT ends, and paddlewheel sensor with 25' lead.



* DIMENSION TO ENDS OF GUIDE BARS

Weight (lbs)	
Pump	Disch
155	80

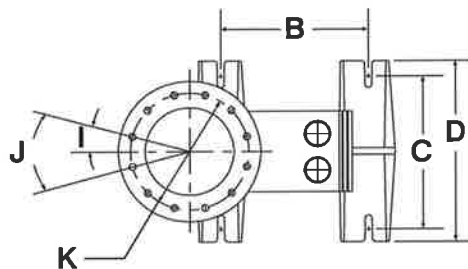
 AUTOCAD DRAWING	Denomination Dimensional drwg NP 3085 MT $\phi 3$ "	Drawn by NK Scale	Checked by RB	Date 090515 Reg no 5399
	6601900			3

Standard CP/NP Discharge Connections (Cast Iron)

All dimensions (inches)

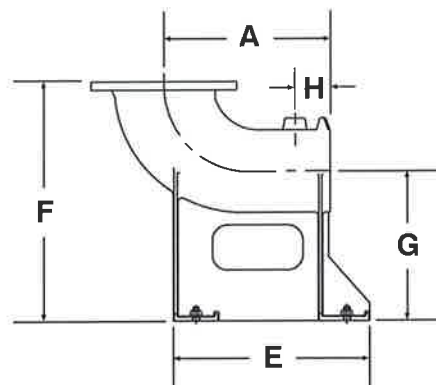
Pump Model	Part Number	Disch. Inlet	Disch. Outlet	A	B	C	D	E	F	G	H	I	J	K
2" - 3045, 3057, CP/FP-3068.	486 55 01	2"	2"-11 1/2 NPT	3 13/16	4	4 1/2	5 1/2	7 1/4	6 3/4	3 15/16	7/8	---	---	---
2 1/2" - DP/FP-3068.	493 17 06	2 1/2"	2 1/2"	11 5/8	7 7/8	4 3/4	7 7/8	11 7/16	9 7/8	6 1/2	4 9/16	45°	90° x 4	5 5/8
3" - 3045, 3057, CP-3068.	555 48 01	2"	3-8 NPT	6 3/4	5 1/2	4 1/8	5 1/2	10 3/4	6 3/4	3 15/16	7/8	---	---	---
3" - DP-3068, 3080, 3085, 3102, 3127, 3153.	444 68 05	3"	3"	14	9 7/8	8	10 5/8	15 3/8	15 3/4	7 7/8	4 9/16	45°	90° x 4	6
4" - 3080, 3085, 3102, 3127, 3153, 3171, 3202.	540 13 05	4"	4"	14 3/8	9 7/8	8	10 5/8	15 3/8	15 3/4	7 7/8	4 9/16	22.5°	45° x 8	7 1/2
6" - 3102, 3127(MT), 3153, 3171.	444 70 06	5 1/2"	6"	15 9/16	11	10	12 3/16	15 3/8	17 3/4	9 7/8	4 9/16	22.5°	45° x 8	9 1/2
6" - 3153, 3171, 3202.	602 33 06	5 1/2"	6"	15 9/16	11	10	12 3/16	15 15/16	17 3/4	9 7/8	4 9/16	22.5°	45° x 8	9 7/16
6" - R3231	388 25 06	6"	6"	20 11/16	19 3/4	15 3/4	19 3/4	23 5/8	15 3/4	7 7/8	6 7/8	22.5°	45° x 8	9 7/16
6" - 3127(LT), 3301, 3315.	604 56 06	6"	6"	15 9/16	11 1/8	10	12 3/16	15 15/16	18	10 1/8	4 9/16	22.5°	45° x 8	9 7/16

Note: Alternative discharge connections may be available, contact Flygt Application Engineering.



Caution:

Contact Flygt applications engineering department when making a pump/ discharge connection combination other than those paired in the chart above.



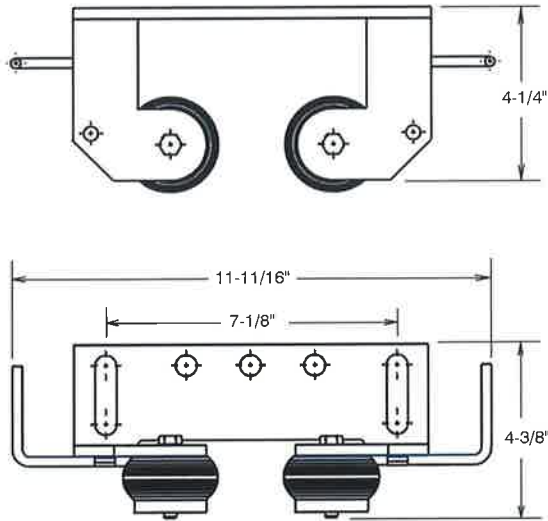
Note:

The discharge connection shown here is typical in appearance for most pumps.

Upper Guide Bar Bracket (for 3000, 5500 & 8000 Series Pumps)

2" UPPER GUIDE BAR BRACKET

613 68 00	Galvanized Steel
613 68 04	316 Stainless Steel



Note: use with 2" nominal guide bars

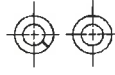
MOUNTING HARDWARE 14-59 00 00 (stainless steel)



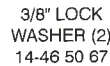
3/8"-16 LATERAL NUT
14-46 37 05



HEX. HEAD BOLT (2),
3/8"-16 x 7/8"
14-46 20 25



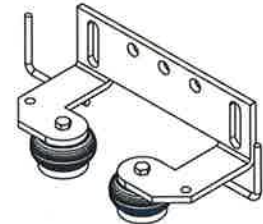
3/8" PLAIN WASHER (2)
14-46 50 07



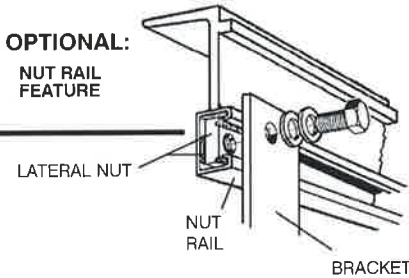
3/8" LOCK
WASHER (2)
14-46 50 67

Standard for the following pumps:

- DP-3068
- DP-3080
- CP/DP/FP/NP-3085
- CP/FP/NP-3102
- CP/FP/NP-3127
- NP/FP-3153
- NP/FP-3171
- HP-5520, 5530
- DP-8050, 8053, 8056, 8058

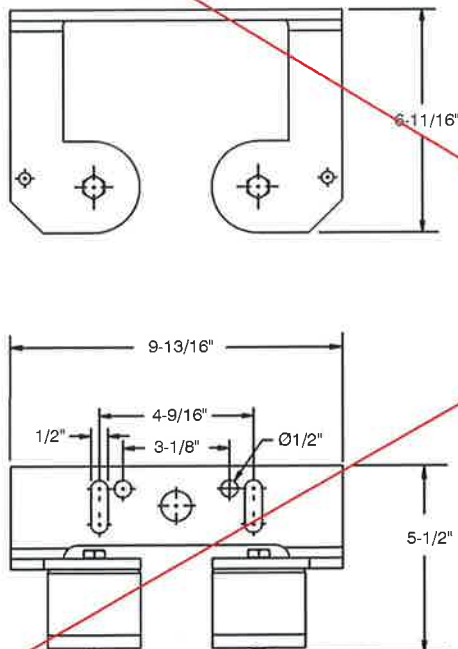


OPTIONAL: NUT RAIL FEATURE



3" UPPER GUIDE BAR BRACKET

661 54 00	Galvanized Steel
661 54 01	316 Stainless Steel



Note: use with 3" nominal guide bars

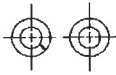
MOUNTING HARDWARE 14-59 00 00 (stainless steel)



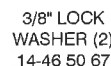
3/8"-16 LATERAL NUT
14-46 37 05



HEX. HEAD BOLT (2),
3/8"-16 x 7/8"
14-46 20 25



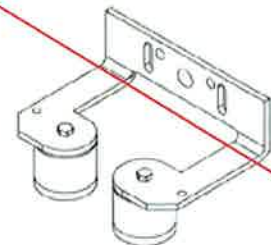
3/8" PLAIN WASHER (2)
14-46 50 07



3/8" LOCK
WASHER (2)
14-46 50 67

Standard for the following pumps:

- NP/FP-3171
- NP/FP-3202
- CP/NP/RP-3231
- CP-3240
- NP-3301
- CP/NP-3306
- CP/NP-3312
- NP-3315
- CP-3351
- CP/NP-3356
- CP/NP-3400
- CP-3501
- CP-3531
- CP-3602
- CP-3800
- HP-5570





TEST REPORT

PRODUCT

Serial No 3085.092 1530108		Performance curve No 63- 465-00-5306	Motor module/type 145	Voltage (V) 460
Base module 006	Impeller No 733 20 23		Imp diam/Blade angle 152	Water temp °C 19.2

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
35.02	0.0	2.23	459	3.8	0.00
31.68	59.6	2.17	459	3.7	16.41
28.44	135.4	2.25	459	3.8	32.26
24.69	222.2	2.38	459	3.9	43.52
21.46	305.6	2.53	458	4.1	48.88
16.90	406.6	2.63	459	4.2	49.26
13.47	476.8	2.66	459	4.2	45.63

Accepted after HI	Test facility Emmaboda Sweden	Test date LCU 15-05-21	Time 08:41	Chief tester 2460 2353
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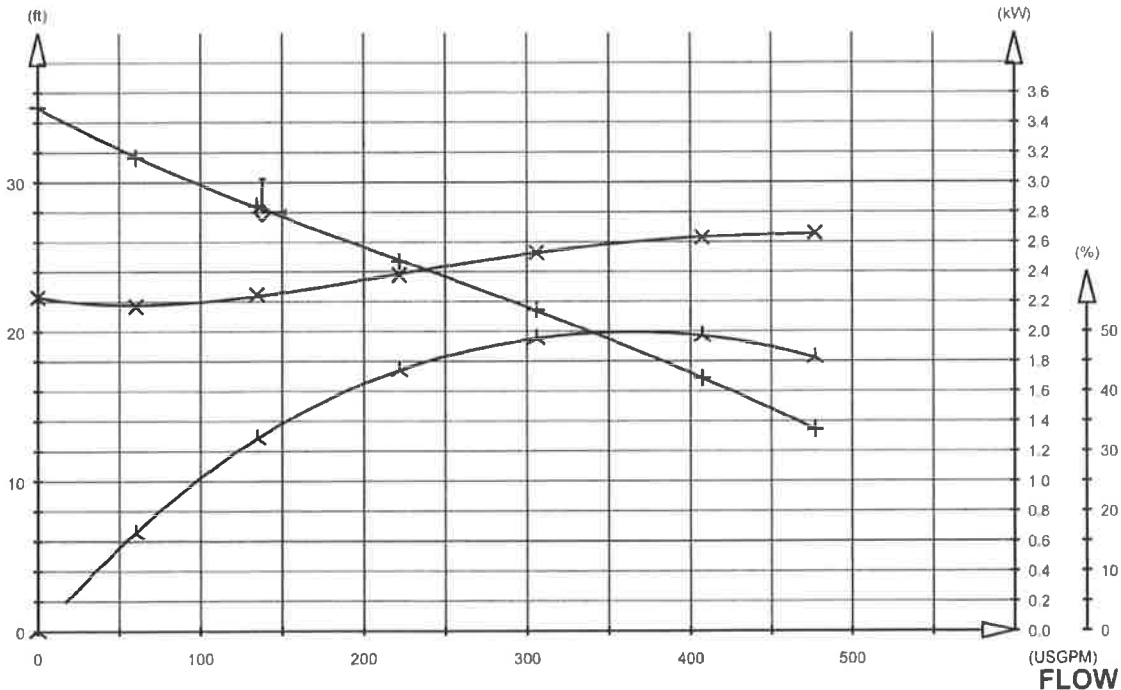
ORDERNR 787969 POS 1

PLOTTED TEST RESULTS Measured point: + = Q/H, X = Q/P, Duty point: ◇ = Q/H, □ = Q/P, Calculated point: △ = Q/ETA overall, 6

TOTAL HEAD

Duty point: Q = 138.00
H = 28.0
E =

INPUT POWER





TEST REPORT

PRODUCT

Serial No. 3085.092		1530109		Performance curve No. 63- 465-00-5306		Motor module/type 145		Voltage (V) 460	
Base module 006		Impeller No. 733 20 23				Imp diam/Blade angle 152		Water temp °C 19.2	

TEST RESULTS

Pump total head H (ft)	Volume rate of flow Q (USGpm)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
36.02	0.0	2.26	459	3.8	0.00
31.23	58.4	2.10	461	3.6	16.35
28.34	134.6	2.17	461	3.7	33.21
24.69	222.2	2.28	461	3.8	45.38
21.54	307.1	2.44	460	4.0	51.23
18.14	377.3	2.51	460	4.1	51.38
14.30	464.1	2.56	459	4.1	48.91

Accepted after HI	Test facility Emmaboda Sweden	Test date LCU 15-05-21	Time 08:56	Chief tester 2353
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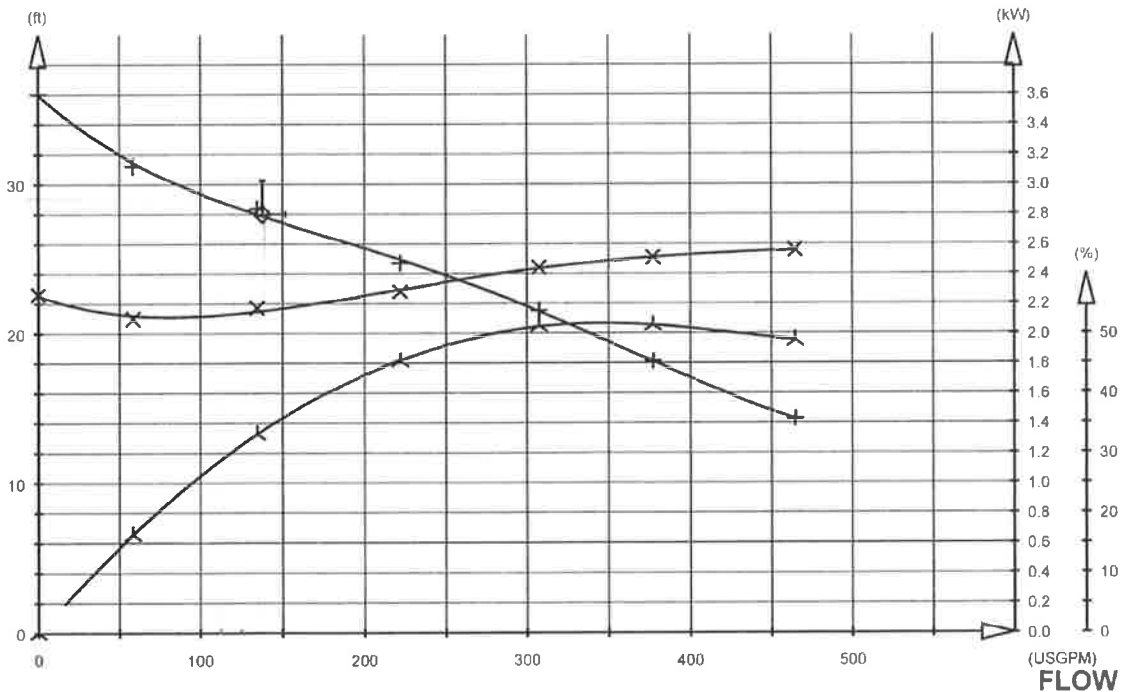
ORDERNR 787969 POS 1

PLOTTED TEST RESULTS Measured point: + = Q/H X = Q/P Duty point: \diamond = Q/H \square = Q/P \triangle = Q/ETA overall
 Calculated point: \wedge = Q/ETA overall 6

TOTAL HEAD

Duty point: Q = 138.00
 H = 28.0
 E =

INPUT POWER



ENGINEER'S SPECIFICATION

Submersible Pump

REQUIREMENTS

Furnish and install 1 Ea. submersible non-clog Wastewater pump in each Wetwell, (Total 2 Ea. Each pump shall be equipped with a 3 HP, submersible electric motor connected for operation on 460 volts, 3 phase, 60 hertz, with 50 feet of submersible cable SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. Pump shall be rated explosion proof.

PUMP DESIGN CONFIGURATION (Wet pit installation)

The pump shall be supplied with a mating cast iron 3 inch discharge connection and be capable of delivering 250 DPM at 20 FT. Total head. The pumps shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. Sealing off the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing off the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with 20 feet of stainless steel lifting chain. The working load of the lifting system shall be 50% greater than the pump unit weight, min.

PUMP CONSTRUCTION

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI Type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with an epoxy coating on the interior and exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact on four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease, or other devices shall be used.

CABLE ENTRY SEAL

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal.

MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and the pump shall be produced by the same manufacturer.

The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

The motor shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

BEARINGS

The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. Single row lower bearings are not acceptable. The minimum L10 bearing life shall be 50,000 hours at any usable portion of the pump curve.

MECHANICAL SEAL

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide seal ring.

Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

The following seal types shall not be considered acceptable or equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

Where a seal cavity is present in the seal chamber, the area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

Seal lubricant shall be non-hazardous.

PUMP SHAFT

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be stainless steel – ASTM A479 S43100-T.

IMPELLER (Adaptive)

The impeller(s) shall be cast of ASTM A-48, Class 35B grey iron, dynamically balanced, semi-open, multi-vane, back-swept, non-clog design. The impeller vane leading edges shall be mechanically self-cleaned upon each rotation as they pass across a spiral groove located on a replaceable insert ring.

The impeller shall have vanes hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in waste water. The screw shape of the impeller inlet shall provide an inducing effect for the handling of sludge and rag-laden wastewater. The impeller shall be capable of momentarily moving axially upwards a distance of 15mm/0.6-in. to allow larger debris to pass through and immediately return to normal operating position.

The pump volute shall be a single piece grey cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall have a guide pin integral to the casting and shall be cast

of (ASTM A-48, Class 35B grey iron and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

PROTECTION

All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125°C (260°F), stop the motor and activate an alarm.

A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote. USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125°C (260°F) SHALL NOT BE ALLOWED.

The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

OPTIONS

1. Pump shall be internally and externally coated with epoxy coating.
2. Pump shall be additionally protected with external zinc anodes.

Installation, Operation,
and Maintenance Manual



Flygt 3085

FLYGT
a xylem brand

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Introduction and Safety

Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance



CAUTION:

Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.

NOTICE:

Save this manual for future reference, and keep it readily available at the location of the unit.

Safety



WARNING:

- The operator must be aware of safety precautions to prevent physical injury.
 - Operating, installing, or maintaining the unit in any way that is not covered in this manual could cause death, serious personal injury, or damage to the equipment. This includes any modification to the equipment or use of parts not provided by Xylem. If there is a question regarding the intended use of the equipment, please contact a Xylem representative before proceeding.
 - Do not change the service application without the approval of an authorized Xylem representative.
-
-



CAUTION:

You must observe the instructions contained in this manual. Failure to do so could result in physical injury, damage, or delays.




Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Hazard levels

Hazard level	Indication
 <p>DANGER:</p>	A hazardous situation which, if not avoided, will result in death or serious injury
 <p>WARNING:</p>	A hazardous situation which, if not avoided, could result in death or serious injury
 <p>CAUTION:</p>	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

Hazard categories

Hazard categories can either fall under hazard levels or let specific symbols replace the ordinary hazard level symbols.

Electrical hazards are indicated by the following specific symbol:



Electrical Hazard:

These are examples of other categories that can occur. They fall under the ordinary hazard levels and may use complementing symbols:

- Crush hazard
- Cutting hazard
- Arc flash hazard

Magnetic hazard

Magnetic hazards are indicated by a specific symbol that replaces the typical hazard level symbols:



CAUTION:

Environmental safety

The work area

Always keep the station clean.

Waste and emissions regulations

Observe these safety regulations regarding waste and emissions:

- Appropriately dispose of all waste.
- Handle and dispose of the processed liquid in compliance with applicable environmental regulations.

- Clean up all spills in accordance with safety and environmental procedures.
- Report all environmental emissions to the appropriate authorities.



CAUTION: Radiation Hazard

Do NOT send the product to Xylem if it has been exposed to nuclear radiation, unless Xylem has been informed and appropriate actions have been agreed upon.

Electrical installation

For electrical installation recycling requirements, consult your local electric utility.

Recycling guidelines

Always recycle according to these guidelines:

1. Follow local laws and regulations regarding recycling if the unit or parts are accepted by an authorized recycling company.
2. If the first guideline is not applicable, then return the unit or parts to your local sales and service representative.

User safety**General safety rules**

These safety rules apply:

- Always keep the work area clean.
- Pay attention to the risks presented by gas and vapors in the work area.
- Avoid all electrical dangers. Pay attention to the risks of electric shock or arc flash hazards.
- Always bear in mind the risk of drowning, electrical accidents, and burn injuries.

Safety equipment

Use safety equipment according to the company regulations. Use this safety equipment within the work area:

- Hard hat
- Safety goggles, preferably with side shields
- Protective shoes
- Protective gloves
- Gas mask
- Hearing protection
- First-aid kit
- Safety devices

NOTICE:

Never operate a unit unless safety devices are installed. Also see specific information about safety devices in other chapters of this manual.

Electrical connections

Electrical connections must be made by certified electricians in compliance with all international, national, state, and local regulations. For more information about requirements, see sections dealing specifically with electrical connections.

Hazardous liquids

The product is designed for use in liquids that can be hazardous to your health. Observe these rules when you work with the product:

- Make sure that all personnel who work with biologically hazardous liquids are vaccinated against diseases to which they may be exposed.
- Observe strict personal cleanliness.

Wash the skin and eyes

Follow these procedures for chemicals or hazardous fluids that have come into contact with your eyes or your skin:

Condition	Action
Chemicals or hazardous fluids in eyes	<ol style="list-style-type: none"> 1. Hold your eyelids apart forcibly with your fingers. 2. Rinse the eyes with eyewash or running water for at least 15 minutes. 3. Seek medical attention.
Chemicals or hazardous fluids on skin	<ol style="list-style-type: none"> 1. Remove contaminated clothing. 2. Wash the skin with soap and water for at least 1 minute. 3. Seek medical attention, if necessary.

Ex-approved products

Follow these special handling instructions if you have an Ex-approved unit.

Personnel requirements

These are the personnel requirements for Ex-approved products in potentially explosive atmospheres:

- All work on the product must be carried out by certified electricians and Xylem authorized mechanics. Special rules apply to installations in explosive atmospheres.
- All users must know about the risks of electric current and the chemical and physical characteristics of the gas, the vapor, or both present in hazardous areas.
- Any maintenance for Ex-approved products must conform to international and national standards (for example, IEC/EN 60079-17).

Xylem disclaims all responsibility for work done by untrained and unauthorized personnel.

Product and product handling requirements

These are the product and product handling requirements for Ex-approved products in potentially explosive atmospheres:

- Only use the product in accordance with the approved motor data.
- The Ex-approved product must never run dry during normal operation. Dry running during service and inspection is only permitted outside the classified area.
- Before you start work on the product, make sure that the product and the control panel are isolated from the power supply and the control circuit, so they cannot be energized.
- Do not open the product while it is energized or in an explosive gas atmosphere.
- Make sure that thermal contacts are connected to a protection circuit according to the approval classification of the product, and that they are in use.
- Intrinsically safe circuits are normally required for the automatic level-control system by the level regulator if mounted in zone 0.
- The yield stress of fasteners must be in accordance with the approval drawing and the product specification.
- Do not modify the equipment without approval from an Ex-approved Xylem representative.
- Only use parts that are provided by an Ex-approved Xylem representative.
- The thermal detectors fitted to the stator windings shall be connected into the motor control circuit in such a manner as to disconnect the supply to the motor in order to prevent the Temperature Class T3.
- The width of flameproof joints is more than the values specified in the tables of the IEC 60079-1 standard.
- The gap of flameproof joints is less than the values specified in Table 1 of the IEC 60079-1 standard.
- The equipment must be submerged during normal operation.

Guidelines for compliance

Compliance is fulfilled only when you operate the unit within its intended use. Do not change the conditions of the service without the approval of an Ex-approved Xylem representative. When you install or maintain explosion proof products, always comply with the directive and applicable standards (for example, IEC/EN 60079-14).

Minimum permitted liquid level

See the dimensional drawings of the product for the minimum permitted liquid level according to the approval for explosion proof products. If the information is missing on the dimensional drawing, the product must be fully submerged. Level-sensing equipment must be installed if the product can be operated at less than the minimum submersion depth.

Monitoring equipment

For additional safety, use condition-monitoring devices. Condition-monitoring devices include but are not limited to the following:

- Level indicators
- Temperature detectors

Product warranty

Coverage

Xylem undertakes to remedy defects in products from Xylem under these conditions:

- The faults are due to defects in design, materials, or workmanship.
- The faults are reported to a local sales and service representative within the warranty period.
- The product is used only under the conditions that are described in this manual.
- The monitoring equipment that is incorporated in the product is correctly connected and in use.
- All service and repair work that is done by Xylem authorized personnel.
- Genuine Xylem parts are used.
- Only Ex-approved spare parts and accessories that are authorized by an Ex-approved Xylem representative are used in Ex-approved products.

Limitations

The warranty does not cover defects that are caused by these situations:

- Deficient maintenance
- Improper installation
- Modifications or changes to the product and installation that are made without consulting a Xylem authorized representative
- Incorrectly executed repair work
- Normal wear and tear

Xylem assumes no liability for these situations:

- Bodily injuries
- Material damages
- Economic losses

Warranty claim

Xylem products are high-quality products with expected reliable operation and long life. However, should the need for a warranty claim arise, contact your local sales and service representative.

Spare parts

Xylem guarantees that spare parts will be available for 15 years after the manufacture of this product has been discontinued.

Transportation and Storage

Inspect the delivery

Inspect the package

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
If the product has been picked up at a distributor, make a claim directly to the distributor.

Inspect the unit

1. Remove packing materials from the product.
Dispose of all packing materials in accordance with local regulations.
2. Inspect the product to determine if any parts have been damaged or are missing.
3. If applicable, unfasten the product by removing any screws, bolts, or straps.
For your personal safety, be careful when you handle nails and straps.
4. Contact the local sales representative if there is any issue.

Transportation guidelines

Precautions



DANGER: Crush Hazard

Moving parts can entangle or crush. Always disconnect and lock out power before servicing to prevent unexpected startup. Failure to do so could result in death or serious injury.

Position and fastening

The unit can be transported either horizontally or vertically. Make sure that the unit is securely fastened during transportation, and cannot roll or fall over.

Lifting



Always inspect the lifting equipment and tackle before starting any work.

WARNING: Crush Hazard

1) Always lift the unit by its designated lifting points. 2) Use suitable lifting equipment and ensure that the product is properly harnessed. 3) Wear personal protective equipment. 4) Stay clear of cables and suspended loads.

NOTICE:

Never lift the unit by its cables or hose.

Lifting equipment

Lifting equipment is always required when handling the unit. It must fulfill the following requirements:

- The minimum height (contact your local sales and service representative for information) between the lifting hook and the floor must be sufficient to lift the unit.
- The lifting equipment must be able to hoist the unit straight up and down, preferably without the need for resetting the lifting hook.
- The lifting equipment must be securely anchored and in good condition.

- The lifting equipment must support the weight of the entire assembly and must only be used by authorized personnel.
- Two sets of lifting equipment must be used to lift the unit for repair work.
- The lifting equipment must be dimensioned to lift the unit with any remaining pumped media in it.
- The lifting equipment must not be oversized.

**CAUTION: Crush Hazard**

Over-dimensioned lifting equipment can lead to injury. A site-specific risk analysis must be done.

Temperature ranges for transportation, handling and storage

Handling at freezing temperature

At temperatures below freezing, the product and all installation equipment, including the lifting gear, must be handled with extreme care.

Make sure that the product is warmed up to a temperature above the freezing point before starting up. Avoid rotating the impeller/propeller by hand at temperatures below the freezing point. The recommended method to warm the unit up is to submerge it in the liquid which will be pumped or mixed.

NOTICE:

Never use a naked flame to thaw the unit.

Unit in as-delivered condition

If the unit is still in the condition in which it left the factory - all packing materials are undisturbed - then the acceptable temperature range during transportation, handling and storage is: -50°C (-58°F) to $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$).

If the unit has been exposed to freezing temperatures, then allow it to reach the ambient temperature of the sump before operating.

Lifting the unit out of liquid

The unit is normally protected from freezing while operating or immersed in liquid, but the impeller/propeller and the shaft seal may freeze if the unit is lifted out of the liquid into a surrounding temperature below freezing.

Units equipped with an internal cooling system are filled with a mixture of water and 30% glycol. This mixture remains a flowing liquid at temperatures down to -13°C (9°F). Below -13°C (9°F), the viscosity increases such that the glycol mixture will lose its flow properties. However, the glycol-water mixture will not solidify completely and thus cannot harm the product.

Follow these guidelines to avoid freezing damage:

1. Empty all pumped liquid, if applicable.
2. Check all liquids used for lubrication or cooling, both oil and water-glycol mixtures, for the presence of water. Change if needed.

Storage guidelines

Storage location

The product must be stored in a covered and dry location free from heat, dirt, and vibrations.

NOTICE:

- Protect the product against humidity, heat sources, and mechanical damage.
- Do not place heavy weights on the packed product.


Long-term storage

If the unit is stored more than six months, then the following apply:

- Before operating the unit after storage, it must be inspected with special attention to the seals and the cable entry.
- The impeller/propeller must be rotated every other month to prevent the seals from sticking together.

Product Description

Products included



Pump	Non-explosion proof drive unit	Explosion proof drive unit	High Efficiency motor (LSPM)	C hydraulic	D hydraulic	F hydraulic	G hydraulic	M hydraulic (Grinder)	N hydraulic (Hard Iron)	Adaptive-N hydraulic
3085.092		X		X	X	X	X		X	
3085.100	X									X
3085.172	X							X		
3085.103	X			X	X	X	X		X	
3085.190		X								Y
3085.760	X									X*
3085.770		X								X*
3005.800	X		X	X						
3085.810		X	X	X						
3005.820	X		X						X	
3005.830		X	X						X	
3005.891		X						X		
3005.900	X		X							X
3085.910		X	X							X
3005.960	X		X							X*
3005.970		X	X							X*

* Stainless steel Adaptive-N hydraulics

Pump-specific information

For the specific weight, current, voltage, power ratings, and speed of the pump, see the data plate of the pump.

Pump design

The pump is submersible, and driven by an electric motor.

For a list of pump version and corresponding motor type, see [Motor data](#) (page 72).

Intended use

The product is intended for moving wastewater, sludge, raw and clean water. Always follow the limits that are given in [Application limits](#) (page 72). If there is a question regarding the intended use of the equipment, please contact a local sales and service representative before proceeding.



DANGER: Explosion/Fire Hazard

Special rules apply to installations in explosive or flammable atmospheres. Do not install the product or any auxiliary equipment in an explosive zone unless it is rated explosion-proof or intrinsically-safe. If the product is EN/ATEX-, MSHA- or FM-approved, then see the specific EX information in the Safety chapter before taking any further actions.

NOTICE:

Do NOT use the pump in highly corrosive liquids.

Spare parts

- Modifications to the unit or installation should only be carried out after consulting with Xylem.
- Original spare parts and accessories that are authorized by Xylem are essential for compliance. The use of other parts can invalidate any claims for warranty or compensation. For more information contact your Xylem representative.

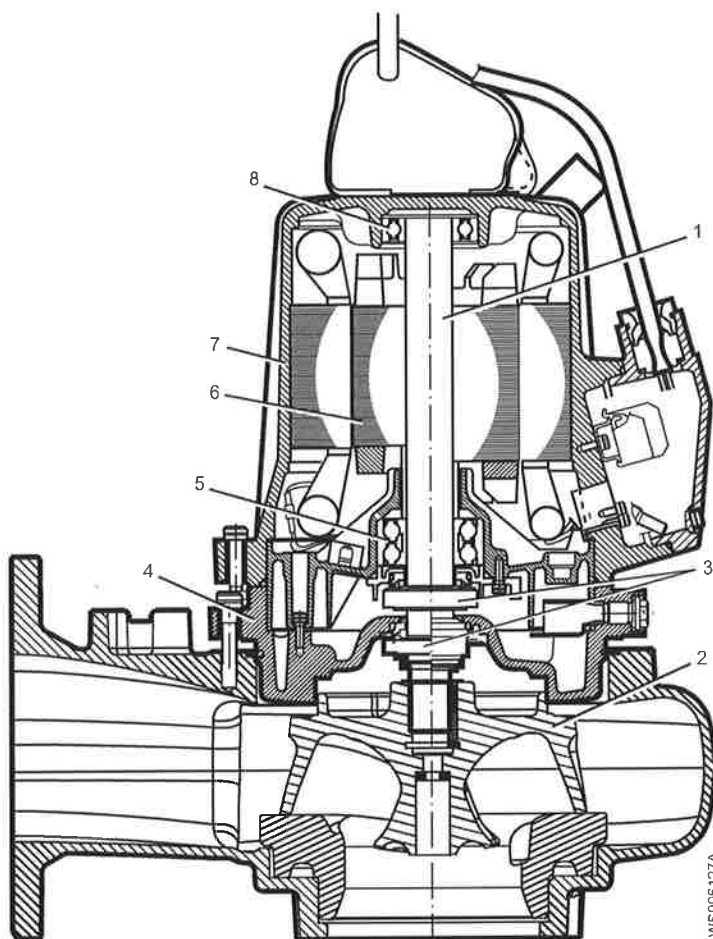
Pressure class

LT	Low head
MT	Medium head
HT	High head
SH	Super high head

Experior® product concept

Experior® is a product concept including N-technology, Premium efficiency motor, and the intelligent control SmartRun®.

Parts



Position	Denomination	Description
1	Shaft	The shaft is made of stainless steel, with an integrated rotor.
2	Impeller	There are multiple types of impellers. For information about the pumps impellers, see Parts List.
3	Mechanical seals	One inner and one outer seal in a combination of materials: <ul style="list-style-type: none"> • Aluminium oxide Al_2O_3 • Silicon carbide RSiC • Corrosion-resistant cemented carbide WCCR For information about the pumps mechanical seals, see Parts List.
4	Oil housing	The oil housing includes a coolant that lubricates and cools the seals; the housing acts as a buffer between the pumped fluid and the drive unit.
5	Main bearing	The bearing consisting of a two-row angular contact ball bearing.
6	Motor	For information about the motor, see <i>Motor data</i> (page 72)..
7	Stator housing	The pump is cooled by the ambient liquid/air.
8	Support bearing	The bearing consisting of a single-row ball bearing.

Monitoring equipment

The following applies to the monitoring equipment of the pump:

- The stator incorporates three thermal contacts connected in series that activate the alarm and stops the pump at overtemperature
- The thermal contacts open at 125°C (257°F).
- Ex-approved pumps must have thermal contacts connected to the control panel.

- The sensors must be connected to either the MiniCAS II monitoring equipment or an equivalent equipment.
- The monitoring equipment must be of a design that makes automatic restart impossible.
- Information in the junction box shows if the pump is equipped with optional sensors.

Optional sensors

FLS FLS is a miniature float switch for detection of liquid in the stator housing. Due to its design it is best suited for pumps in a vertical position. The FLS sensor is installed in the bottom of the stator housing.

CLS CLS is a sensor for detection of water in the oil housing. The sensor initiates an alarm when the oil contains approximately 35% water. The sensor is installed in the bearing housing/bearing holder with its sensing part in the oil housing. The CLS sensor is not applicable to Ex-approved pumps.

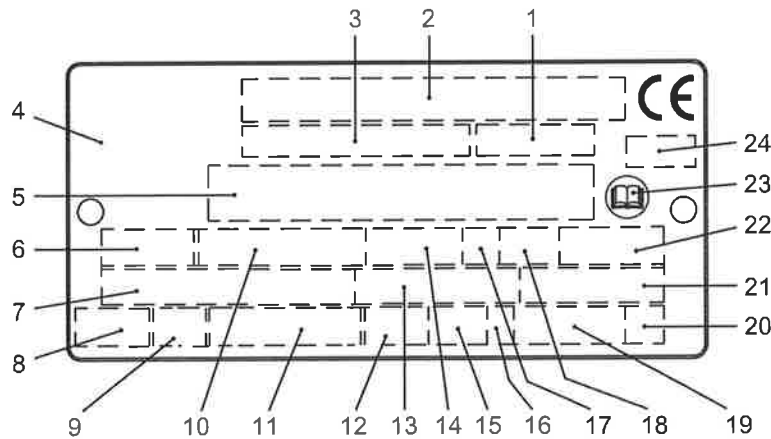
NOTICE:

The CLS sensor body is made of glass. Handle the sensor with care.

One CLS and one FLS sensor can be used in the same pump, if they are connected in parallel.

The data plate

The data plate is a metal label that is located on the main body of the products. The data plate lists key product specifications. Specially approved products also have an approval plate.



W5006257A



1. Curve code or Propeller code
2. Serial number, see *Product denomination* (page 16)
3. Product number
4. Country of origin
5. Additional information
6. Phase; type of current; frequency
7. Rated voltage
8. Thermal protection
9. Thermal class
10. Rated shaft power
11. International standard
12. Degree of protection
13. Rated current
14. Rated speed
15. Maximum submergence
16. Direction of rotation: L=left, R=right
17. Duty class
18. Duty factor
19. Product weight
20. Locked rotor code letter
21. Power factor
22. Maximum ambient temperature

- 23. Read installation manual
- 24. Notified body, only for EN-approved Ex products

Figure 1: The data plate

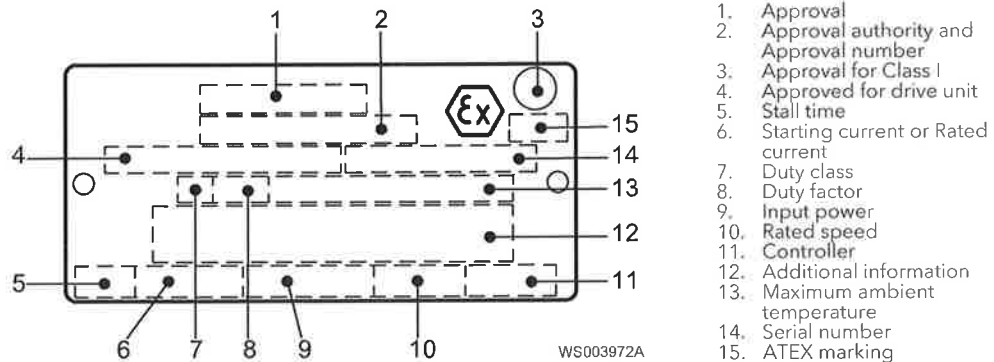
Approvals

Product approvals for hazardous locations

Pump	Approval
<ul style="list-style-type: none"> • 3085.092 • 3085.190 • 3085.770 • 3085.810 • 3085.830 • 3085.891 • 3085.910 • 3085.970 	<p>European Norm (EN)</p> <ul style="list-style-type: none"> • ATEX Directive • EN 60079-0:2009, EN 60079-1:2007, EN 13463-1:2009, EN 13463-5:2011 •  II 2 G c Ex d IIB T4 Gb
	<p>EN approval for cable entry:</p> <ul style="list-style-type: none"> • Certificate number: INERIS 02ATEX9008 U •  II 2 G Ex d IIC Gb or I M2 Ex d I Mb
	<p>IEC</p> <ul style="list-style-type: none"> • IECEx scheme • IEC 60079-0, IEC 60079-1 • Ex d IIB T4
	<p>FM (FM Approvals)</p> <ul style="list-style-type: none"> • Explosionproof for use in Class I, Div. 1, Group C and D • Dust ignition proof for use in Class II, Div. 1, Group E, F and G • Suitable for use in Class III, Div. 1, Hazardous Locations

EN approval plate

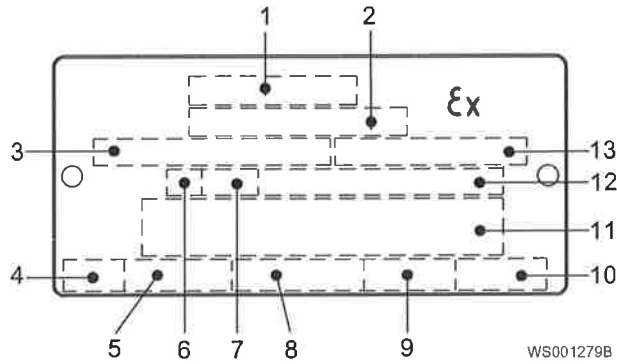
This illustration describes the EN approval plate and the information that is contained in its fields.



IEC approval plate

This illustration describes the IEC approval plate and the information that is contained in its fields.

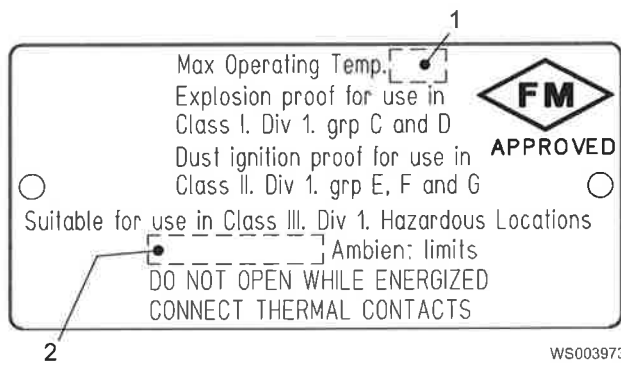
International Norm; not for EU member countries.



1. Approval
2. Approval authority and Approval number
3. Approved for drive unit
4. Stall time
5. Starting current or Rated current
6. Duty class
7. Duty factor
8. Input power
9. Rated speed
10. Controller
11. Additional information
12. Maximum ambient temperature
13. Serial number

FM approval plate

This illustration describes the FM approval plate and the information that is contained in its fields.



1. Temperature class
2. Maximum ambient temperature

Product denomination

Reading instruction

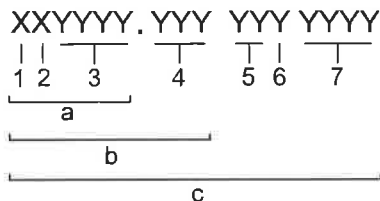
In this section, code characters are illustrated accordingly:

X = letter

Y = digit

The different types of codes are marked up with a, b and c. Code parameters are marked up with numbers.

Codes and parameters



WS006265B

Type of Callout	Number	Indication
Type of code	a	Sales denomination
	b	Product code
	c	Serial number

Type of Callout	Number	Indication
Parameter	1	Hydraulic end
	2	Type of installation
	3	Sales code
	4	Version
	5	Production year
	6	Production cycle
	7	Running number

Installation

Install the pump

Before starting work, make sure that the safety instructions in the chapter *Introduction and Safety* (page 3) have been read and understood.



DANGER: Electrical Hazard

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.



DANGER: Inhalation Hazard

Before entering the work area, make sure that the atmosphere contains sufficient oxygen and no toxic gases.



WARNING: Electrical Hazard

The permanent-magnet motor generates voltage when the shaft rotates, even if power sources are disconnected. Never perform any electrical work if the shaft could rotate.

Hazardous atmospheres



DANGER: Explosion/Fire Hazard

Special rules apply to installations in explosive or flammable atmospheres. Do not install the product or any auxiliary equipment in an explosive zone unless it is rated explosion-proof or intrinsically-safe. If the product is EN/ATEX-, MSHA- or FM-approved, then see the specific EX information in the Safety chapter before taking any further actions.



WARNING: Explosion/Fire Hazard

Do not install CSA-approved products in locations that are classified as hazardous in the National Electric Code(TM), ANSI/NFPA 70-2005.

General requirements

These requirements apply:

- Use the pump dimensional drawing in order to ensure proper installation.

Before installing the pump, do the following:

- Provide a suitable barrier around the work area, for example, a guard rail.
 - Make sure that equipment is in place so that the unit cannot roll or fall over during the installation process.
 - Check the explosion risk before you weld or use electric hand tools.
 - Check that the cable and cable entry have not been damaged during transport.
 - Always remove all debris and waste material from the sump, inlet piping, and discharge connection, before you install the pump.
 - If the unit has a permanent magnet motor, then ensure that you have read and understood all safety instructions regarding permanent magnet motors.
-

NOTICE:

- Do not run the pump dry.
 - Never force piping to make a connection with a pump.
-

Authority regulation

Vent the tank of a sewage station in accordance with local plumbing codes.

Fasteners

- Only use fasteners of the proper size and material.
- Replace all corroded fasteners.
- Make sure that all fasteners are properly tightened and that there are no missing fasteners.

Install with P-installation

In the P-installation, the pump is installed on a stationary discharge connection, and operates either completely or partially submerged in the pumped liquid. These requirements and instructions only apply when the installation is made according to the dimensional drawing.

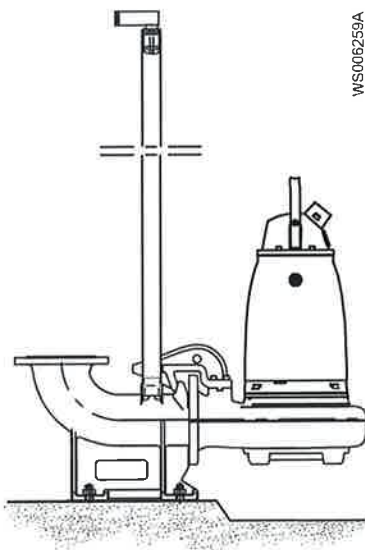


Figure 2: P-installation

These items are required:

- Guide bars
 - Guide bar bracket for attaching the guide equipment to the access frame or to the upper part of the sump
 - Cable holder for holding the cable
 - Access frame (with covers) to which the upper guide bar bracket and cable holder can be attached
 - Discharge connection for connecting the pump to the discharge line
The discharge connection has a flange which fits the pump housing flange and a bracket for attaching the guide equipment.
 - Fasteners for the discharge connection
 - Anchor bolts
1. Install the access frame:
 - a) Place the access frame in position and align it horizontally.
 - b) Grout the frame in place.
 2. Grout the anchor bolts in place.
Be careful when you align and position the discharge connection in relation to the access frame.
 3. Place the discharge connection in position, and tighten the nuts.

4. Install the guide bars:
 - a) Secure the guide bars in the bracket.
 - b) Check that the guide bars are placed vertically. Use a level or a plumb line.
5. Connect the discharge pipe to the discharge connection.
6. Lower the pump along the guide bars.
When it reaches the bottom position, the pump automatically connects to the discharge connection.
7. Secure the motor cable:
 - a) Fasten the permanent lifting device to the pump and to the access frame. For example, you can use a stainless-steel lifting chain with shackles.
 - b) Fasten the cable to the cable holder.
Make sure that the cable cannot be sucked into the pump inlet or that it is neither sharply bent, or pinched. Support straps are required for deep installations.
 - c) Connect the motor cable and the starter and monitoring equipment according to the separate instructions.
Make sure that the impeller rotation is correct. For more information, see [Check the impeller rotation](#) (page 37).

Clean all debris from the sump before starting the pump.

Install with S-installation

In the S-installation, the pump is transportable and intended to operate either completely or partially submerged in the pumped liquid. The pump is equipped with a connection for hose or pipe and stands on a base stand.

These requirements and instructions only apply when the installation is made according to the dimensional drawing. For information about the different installation types, see [Parts List](#).

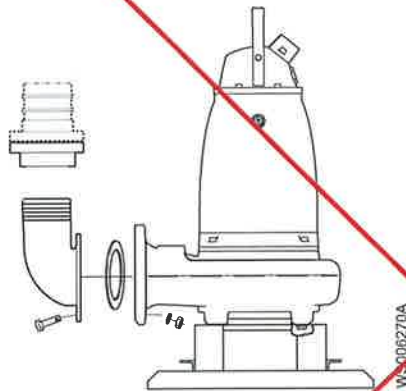


Figure 3: S-installation

1. Run the cable so that it has no sharp bends. Make sure that it is not pinched, and cannot be sucked into the pump inlet.
2. Connect the discharge line.
3. Lower the pump into the sump.
4. Place the pump on the base and make sure it cannot fall over or sink.
Alternatively, the pump can be suspended with a lifting chain just above the sump bottom. Make sure that the pump cannot rotate at startup or during operation.
5. Connect the motor cable and the starter and monitoring equipment according to the separate instructions.
Make sure that the impeller rotation is correct. For more information, see [Check the impeller rotation](#) (page 37).

Install with T/Z-installation

This installation is not applicable for these versions:

- .172
- .891

In the T-installation, the pump is installed in a vertical position in a dry well next to the wet sump. These requirements and instructions only apply when the installation is made according to the dimensional drawing.

In the Z-installation, the pump is installed in a horizontal position on a support stand in a dry well next to the wet sump. The following requirements and instructions are for Z-installations that comply to the dimensional drawing.

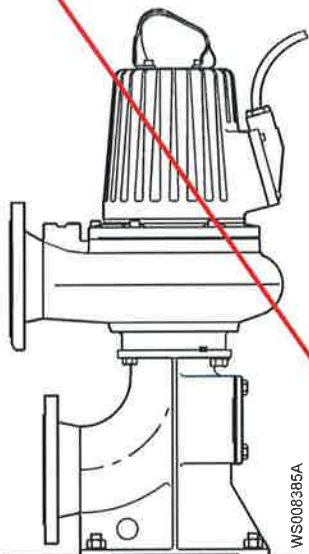


Figure 4: T-installation

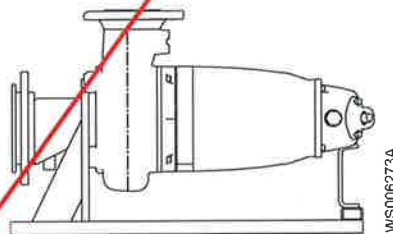
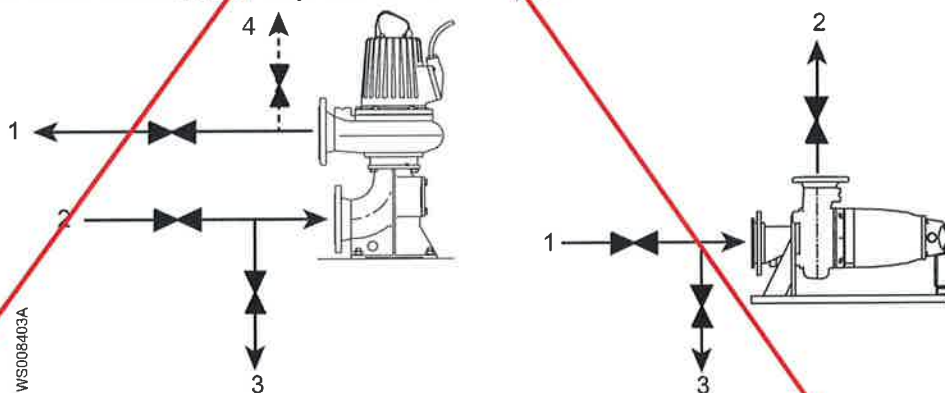


Figure 5: Z-installation

These items are required:

- Anchor bolts for anchoring the pump to a base.
- Shut-off valves that allow you to remove the pump from service



1. Outlet line
2. Inlet line
3. Line to drain
4. Air vent

Figure 6: T-, Z-installation shutoff and air vent valves (generic pumps shown)

NOTICE:

The risk of freezing is particularly high in T- or Z-installations.

1. Fasten the pump:
 - a) Bolt the stationary suction connection to the concrete base.
 - b) Bolt the pump to the suction connection.
2. Make sure that the pump is vertical for the T-installation or horizontal for the Z-installation.
3. Connect the suction line and discharge line.
4. Connect the motor cable and the starter and monitoring equipment according to the separate instructions.

Make sure that the impeller rotation is correct. For more information, see [Check the impeller rotation](#) (page 37).
5. Make sure that the weight of the pump does not put strain on the piping.

Install with F-installation

In the F-installation, the pump is free standing and installed primarily in a small sump on a firm surface. The pump is intended to operate completely or partially submerged in the pumped liquid. The pump is equipped with a connection for hose or pipe and with supporting legs and/or a strainer. These requirements and instructions are for F-installations that comply to the dimensional drawing.

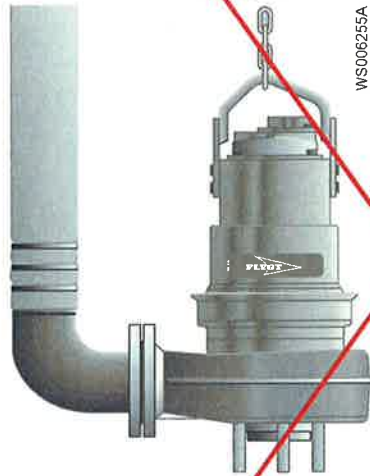


Figure 7: F-installation

These items are required:

- Nipple pipe/Flange/Coupling
 - Pipe or hose
1. Run the cable so that it has no sharp bends, is not pinched, and cannot be sucked into the pump inlet.
 2. Fit the nipple pipe/flange/coupling.
 3. Lower the pump into the sump.
 4. Place the pump on the sump bottom and make sure it cannot fall over.
 5. Connect the motor cable and the starter and monitoring equipment according to the separate instructions.

Make sure that the impeller rotation is correct. For more information, see [Check the impeller rotation](#) (page 37).

Install with H-installation

This installation is only applicable for the following versions:

- 172
- 891

In the H-installation, the pump is installed with a permanent, quick-connection, suspended arrangement that incorporates an integral non-return valve. The pump is intended to operate completely or partially submerged in the pumped liquid. These requirements and instructions are for H-installations that comply to the dimensional drawing.

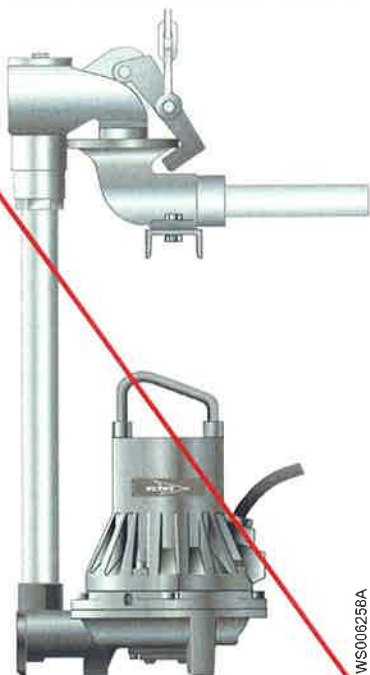


Figure 8: H-installation

These items are required:

- Discharge connection
 - Pipe
1. Run the cable so that it has no sharp bends, is not pinched, and cannot be sucked into the pump inlet.
 2. Fit the pipe and connect the discharge connection.
 3. Lower the pump into the sump.
 4. Make sure that the pump is hanging just above the sump bottom.
 5. Connect the motor cable and the starter and monitoring equipment according to the separate instructions.

Make sure that the impeller rotation is correct. For more information, see [Check the impeller rotation](#) (page 37).

Clean all debris from the sump before you start the pump.

Install with X-installation

In the X-installation, the pump has no pre-determined mechanical connection. The flange is drilled.

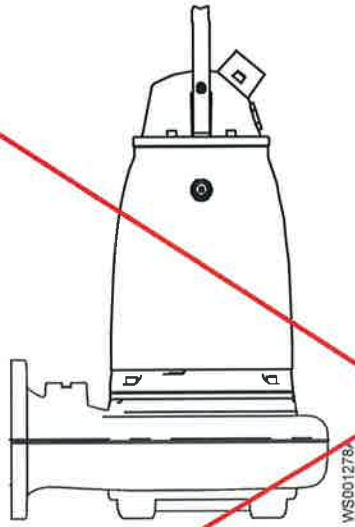


Figure 9: X-installation

NOTICE:

A pump prepared for X-installation is only approved to be used in P- or S-installation. Never use it in T- or Z-installation

For installation instructions, see appropriate mechanical accessories.

Make the electrical connections

General precautions



DANGER: Electrical Hazard

Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.



DANGER: Explosion/Fire Hazard

Special rules apply to installations in explosive or flammable atmospheres. Do not install the product or any auxiliary equipment in an explosive zone unless it is rated explosion-proof or intrinsically-safe. If the product is EN/ATEX-, MSHA- or FM-approved, then see the specific EX information in the Safety chapter before taking any further actions.



WARNING: Electrical Hazard

Risk of electrical shock or burn. A certified electrician must supervise all electrical work. Comply with all local codes and regulations.



WARNING: Electrical Hazard

There is a risk of electrical shock or explosion if the electrical connections are not correctly carried out, or if there is fault or damage on the product. Visually inspect equipment for damaged cables, cracked casings or other signs of damage. Make sure that electrical connections have been correctly made.



WARNING: Electrical Hazard

The permanent-magnet motor generates voltage when the shaft rotates, even if power sources are disconnected. Never perform any electrical work if the shaft could rotate.

**WARNING: Crush Hazard**

Risk of automatic restart.

**CAUTION: Electrical Hazard**

Prevent cables from becoming sharply bent or damaged.

NOTICE:

Leakage into the electrical parts can cause damaged equipment or a blown fuse. Keep the cable ends dry at all times.

Requirements

These general requirements apply for electrical installation:

- The supply authority must be notified before installing the pump if it will be connected to the public mains. When the pump is connected to the public power supply, it may cause flickering of incandescent lamps when started.
- The mains voltage and frequency must agree with the specifications on the data plate. If the pump can be connected to different voltages, then the connected voltage is specified by a yellow sticker close to the cable entry.
- The fuses and circuit breakers must have the proper rating, and the pump overload protection (motor protection breaker) must be connected and set to the rated current according to the data plate and if applicable the cable chart. The starting current in direct-on-line start can be up to six times higher than the rated current.
- The fuse rating and the cables must be in accordance with the local rules and regulations.
- If intermittent operation is prescribed, then the pump must be provided with monitoring equipment supporting such operation.
- If stated on the data plate, then the motor is convertible between different voltages.
- The thermal contacts/thermistors must be in use.
- For FM-approved pumps, a leakage sensor must be connected and in use in order to meet approval requirements.

Cables

These are the requirements to follow when you install cables:

- The cables must be in good condition, not have any sharp bends, and not be pinched.
- The sheathing must not be damaged and must not have indentations or be embossed (with markings, etc.) at the cable entry.
- The cable entry seal sleeve and washers must conform to the outside diameter of the cable.
- The minimum bending radius must not be below the accepted value.
- If using a cable which has been used before, a short piece must be peeled off when refitting it so that the cable entry seal sleeve does not close around the cable at the same point again. If the outer sheath of the cable is damaged, then replace the cable. Contact a local sales and service representative.
- The voltage drop in long cables must be taken into account. The drive unit's rated voltage is the voltage measured at the cable connection point in the pump.
- The screened cable must be used according to the European CE requirements if a Variable Frequency Drive (VFD) is used. For more information, contact your local sales and service representative (VFD-supplier).
- Make sure that the cable is long enough for maintenance work.
- For SUBCAB™ cables, the twisted pair copper foil must be trimmed.

Grounding (earthing)

Grounding (earthing) must be done in compliance with all local codes and regulations.



DANGER: Electrical Hazard

All electrical equipment must be grounded (earthed). Test the ground (earth) lead to verify that it is connected correctly. Frequently inspect electrical systems to ensure that the path to ground is continuous.



WARNING: Electrical Hazard

If the motor cable is jerked loose by mistake, then the ground (earth) conductor should be the last conductor to come loose from its terminal. Make sure that the ground (earth) conductor is longer than the phase conductors. This applies to both ends of the motor cable.

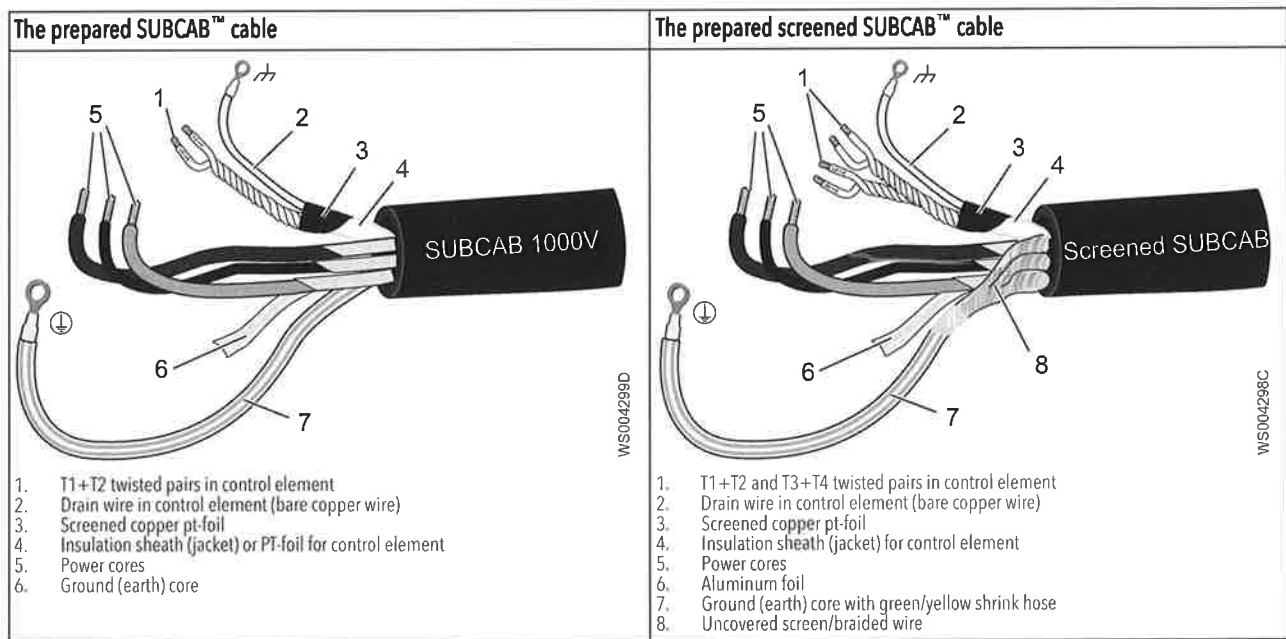


WARNING: Electrical Hazard

Risk of electrical shock or burn. You must connect an additional ground- (earth-) fault protection device to the grounded (earthed) connectors if persons are likely to come into contact with liquids that are also in contact with the pump or pumped liquid.

Prepare the SUBCAB™ cables

This section applies to SUBCAB™ cables with twisted-pair control cores.



1. Peel off the outer sheath at the end of the cable.
2. Prepare the control element:
 - a) Peel the sheath (if applicable) and the copper foil.
 The copper foil is a screen and is conductive. Do not peel more than necessary, and remove the peeled foil.

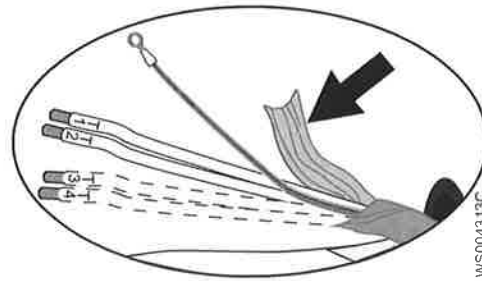


Figure 10: Copper foil on control element.

- b) Put a white shrink hose over the drain wire and the cable terminal.
 - c) Fit a cable lug on the drain wire.
 - d) Twist T1+T2 and T3+T4.
 - e) Put a shrink hose over the control element.
- Make sure that the conductive copper foil and drain wire is covered.
3. Prepare the ground (earth) core for SUBCAB™ cable:
 - a) Peel the yellow-green insulation from the ground (earth) core.
 - b) Check that the ground (earth) core is at least 10% longer than the phase cores in the cabinet.
 - c) If applicable, put a cable lug on the ground core.
 4. Prepare the ground (earth) core for screened SUBCAB™ cable:
 - a) Untwist the screens around the power cores.
 - b) Put a yellow-green shrink hose over the ground (earth) core.
Leave a short piece uncovered.
 - c) If applicable, put a cable lug on the screened ground core.
 - d) Twist all power core screens together to create a ground (earth) core and fit a cable terminal to the end.
 - e) Check that the ground (earth) core is at least 10% longer than the phase cores in the cabinet.
 5. How is the connection to ground (earth) made?
 - Screw: Fit cable terminals to the ground (earth) core and the power cores.
 - Terminal block: Leave the core ends as they are.
 6. Prepare the main leads:
 - a) Remove the aluminum foil around each power core.
 - b) Peel the insulation from each power core.

Connect the motor cable to the pump

NOTICE:

Leakage into the electrical parts can cause damaged equipment or a blown fuse. Keep the end of the motor cable dry at all times.

1. Remove the entry gland screw from the stator housing.
2. Remove the stator housing.
This provides access to the terminal board/closed end splices.
3. Remove the terminal board.
4. Check the data plate to see which connections are required for the power supply.
5. Arrange the connections on the terminal board/closed end splices in accordance with the required power supply.
6. Connect the mains leads (L1, L2, L3, and ground (earth)) according to applicable cable chart.

- The ground (earth) lead must be 50 mm (2.0 in.) longer than the phase leads in the junction box of the unit.
7. Make sure that the pump is correctly connected to ground (earth) .
 8. Make sure that any thermal contacts incorporated in the pump are properly connected to the terminal block/closed end splices.
 9. Install the stator housing.
 10. Install the entry gland screw.

Connect the motor cable to the starter and monitoring equipment



DANGER: Explosion/Fire Hazard

Special rules apply to installations in explosive or flammable atmospheres. Do not install the product or any auxiliary equipment in an explosive zone unless it is rated explosion-proof or intrinsically-safe. If the product is EN/ATEX-, MSHA- or FM-approved, then see the specific EX information in the Safety chapter before taking any further actions.

NOTICE:

- Thermal contacts are incorporated in the pump.
- Thermal contacts must never be exposed to voltages higher than 250 V, breaking current maximum 4 A. It is recommended that they are connected to 24 V over separate fuses to protect other automatic equipment.

The single phase pumps must be equipped with a starter which has start and run capacitors.

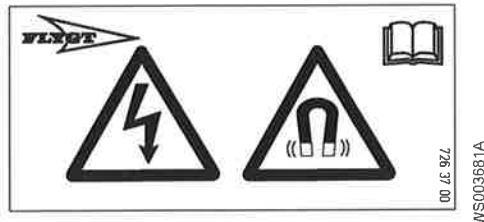
A specially Flygt designed starter is required for the operation of single phase pumps. The connection of the motor cable to the starter is shown in the wiring diagram.

1. If thermal contacts are included in the pump installation, then connect the T1 and T2 control conductors to the monitoring equipment.
If the temperature of the pumped liquid is above 40°C (104°F), do not connect the T1 and T2 leads to thermal contacts.

NOTICE:

Ex-approved products must always have the thermal contacts connected irrespective of the ambient temperature.

2. Connect the mains leads (L1, L2, L3, and ground (earth)) to the starter equipment. For information about the phase sequence and the color codes of the leads, see *Cable charts* (page 29).
3. Applicable for permanent magnet motor; ensure that the warning label is attached to the cable end. In case the label is missing, attach the spare label to the cable end. The label is delivered with the pump.

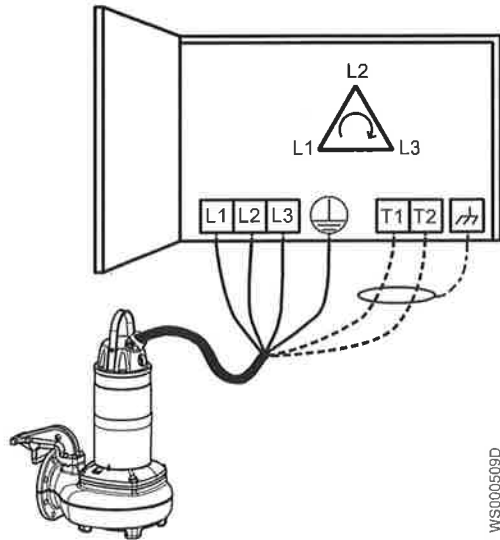


4. Check the functionality of the monitoring equipment:
 - a) Check that the signals and the tripping function work properly.
 - b) Check that the relays, lamps, fuses, and connections are intact.
 Replace any defective equipment.

Cable charts

Description

This topic contains general connection information. It also provides cable charts that show connection alternatives for use with different cables and power supply.

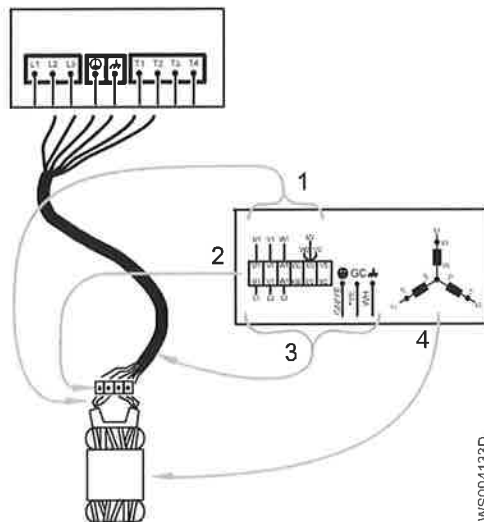


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Figure 11: Phase sequence

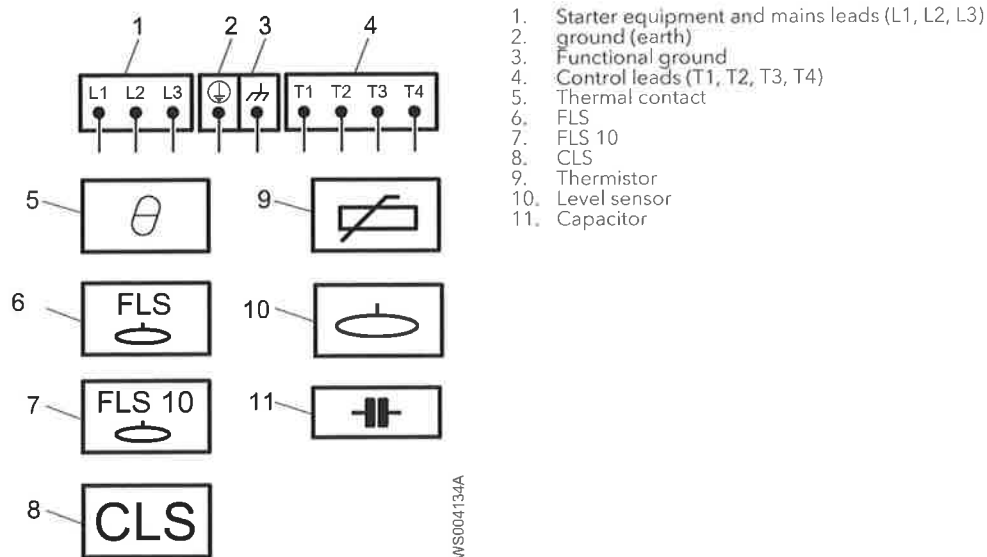
Connection locations

The figures in this section illustrate how to interpret the connection strip symbols.



WS004133D

1. Stator leads
2. Terminal board
3. Power cable leads
4. Stator (internal connection illustrated)



Color code standard

Code	Description
BN	Brown
BK	Black
WH	White
OG	Orange
GN	Green
GNYE	Green-Yellow
RD	Red
GY	Grey
BU	Blue
YE	Yellow

Colors and markings of leads

Motor connection		Mains		SUBCAB 7GX	SUBCAB 4GX	SUBCAB AWG	SUBCAB
		1~	3~	Screenflex 7GX	Screenflex 4GX		Screened
Colours and marking of main leads COLOUR STANDARD BN=Brown BK=Black WH=White OG=Orange GN=Green GNYE=Green-Yellow RD=Red GY=Grey BU=Blue YE=Yellow *SUBCAB AWG ** Ground Conductor is stranded around cores GC=Ground Check 772 17 00/1	STATOR LEADS						
	1	L1	BK 1	BN	RD	BN	
	2	L2	BK 2	BK	BK	BK	
	3	L3	BK 3	GY	WH	GY	
		L1	BK 4	-	-	-	
		L2	BK 5	-	-	-	
		L3	BK 6	-	-	-	
		GN/YE	GN/YE	GN/YE	**Screen/PE from cores		
		Screen (WH)	Screen (WH)	-	Screen (WH)		
	GC	-	-	YE	-		

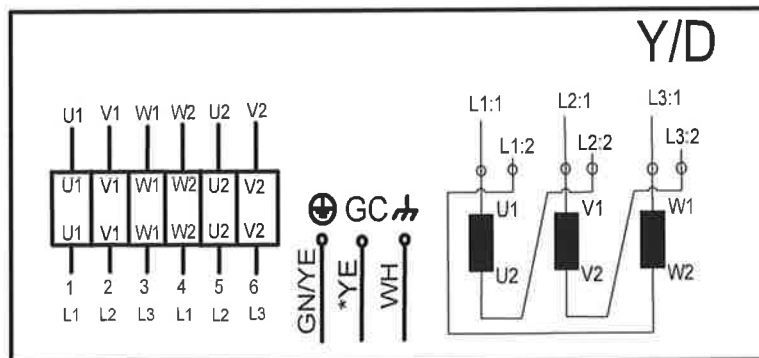
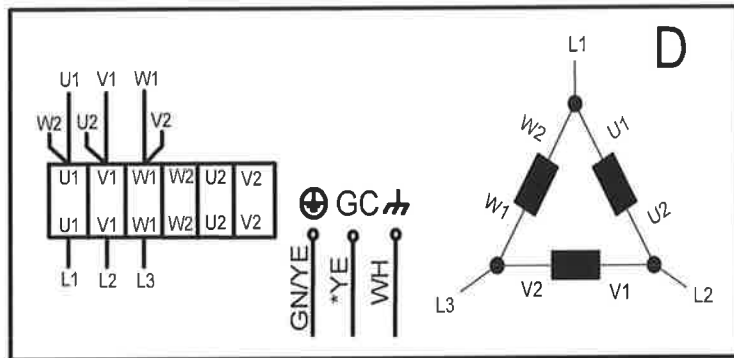
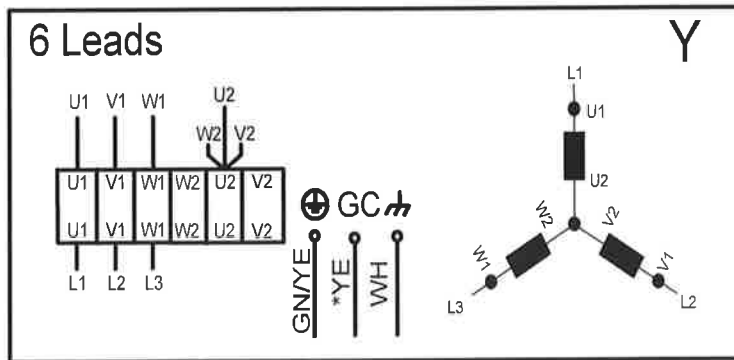
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For markings on sensor leads, see *Sensors connection* (page 35).

Connections included

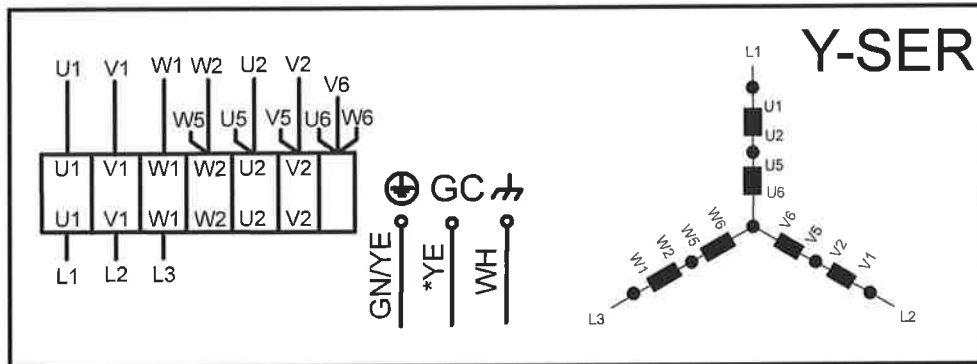
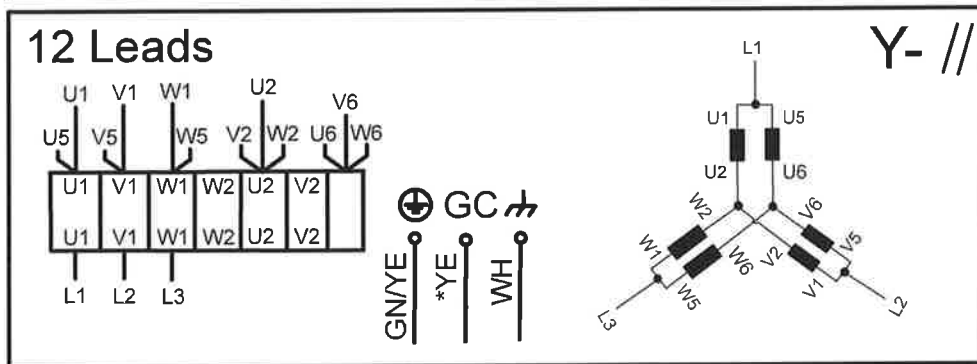
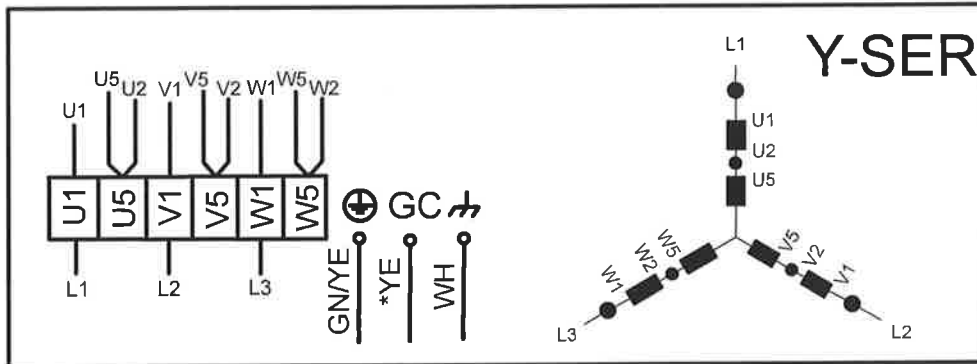
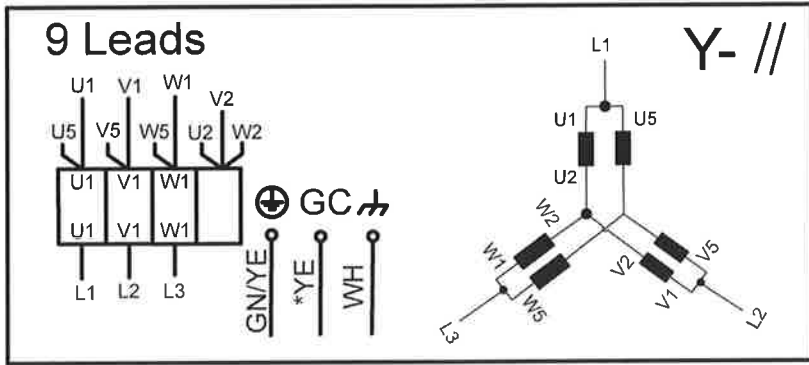
- 3-phase connection (page 31)
- 1-phase connection (page 33)
- Sensors connection (page 35)
- Screened cable connection (page 34)

3-phase connection



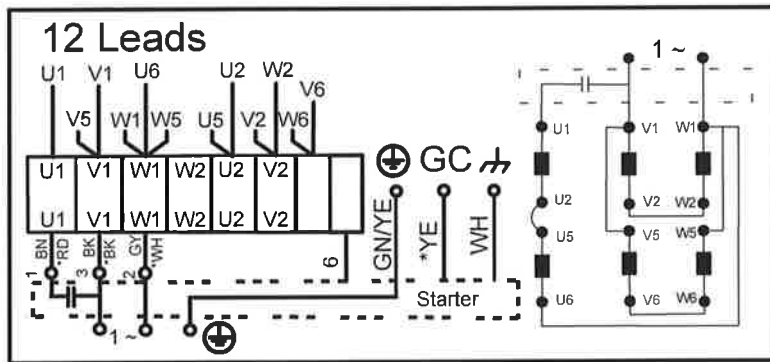
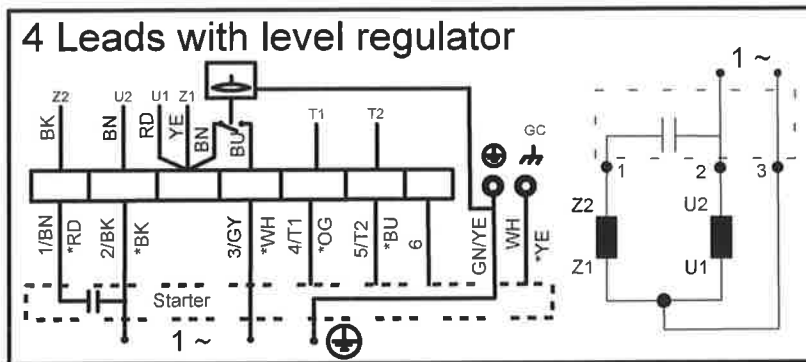
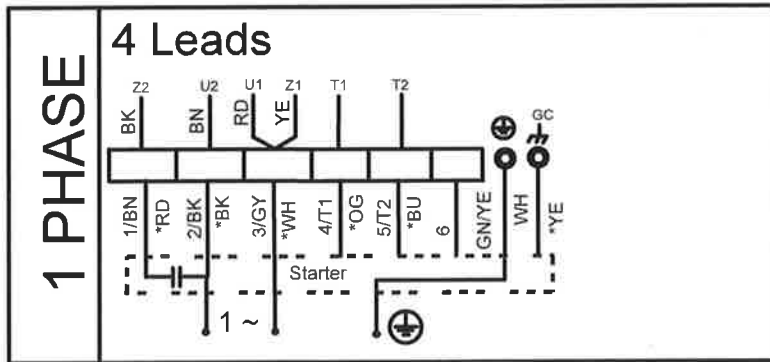
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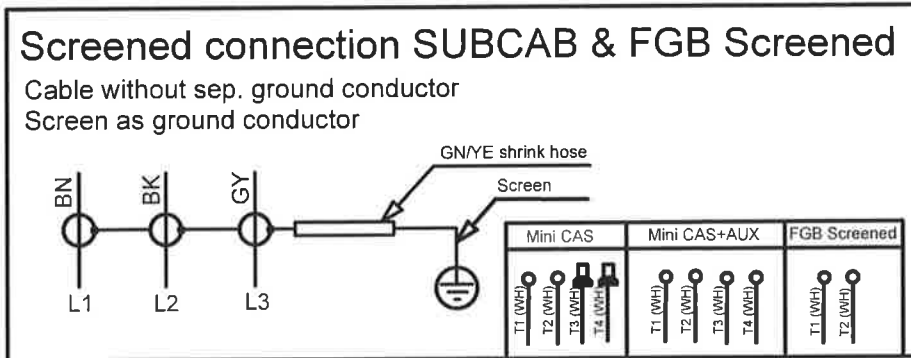
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1-phase connection

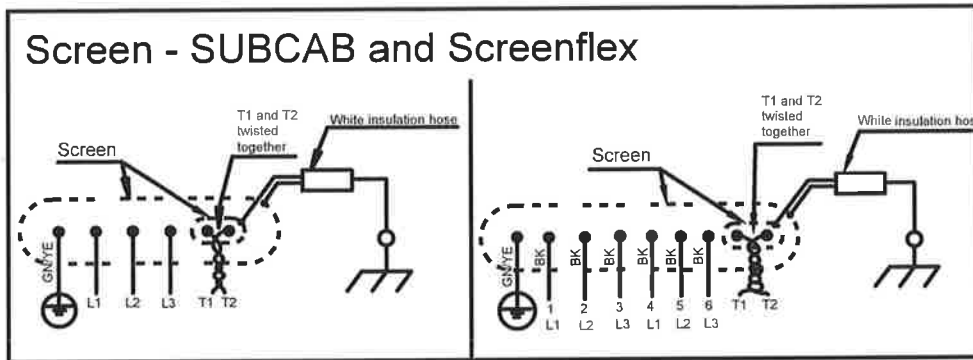


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Screened cable connection

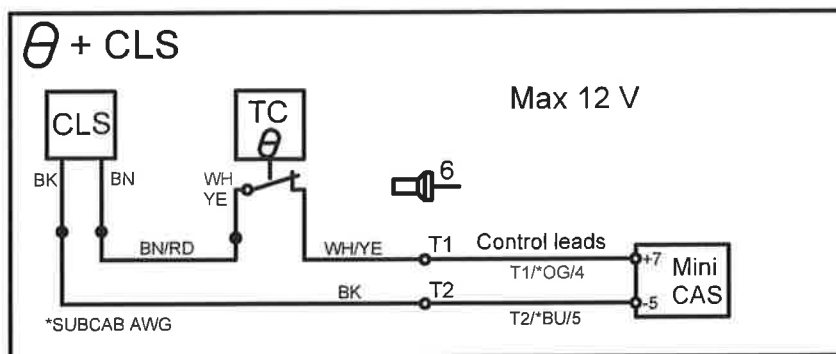
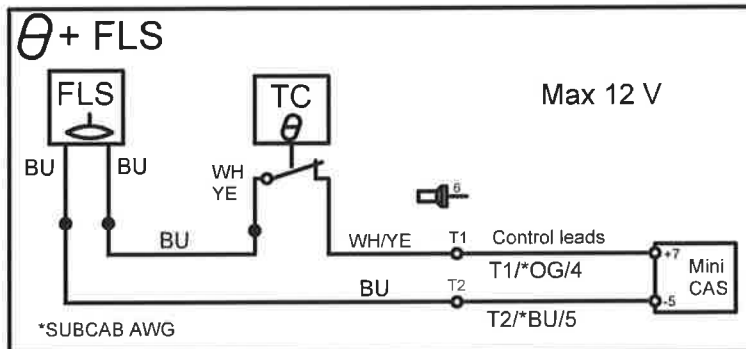
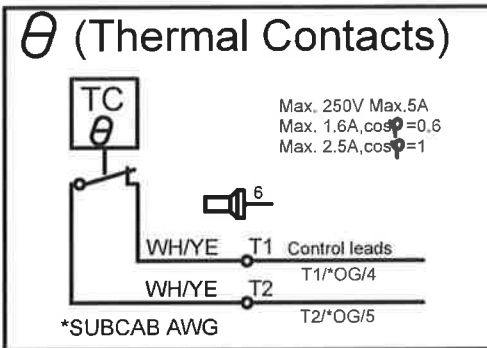


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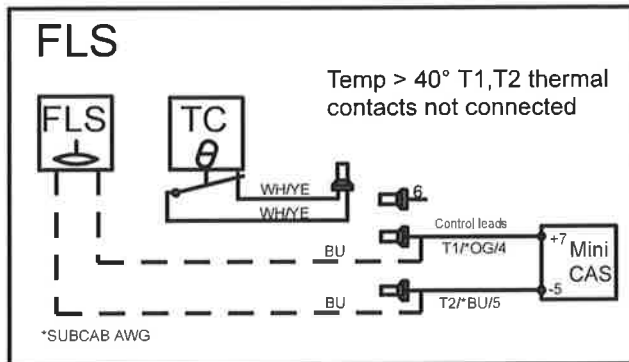
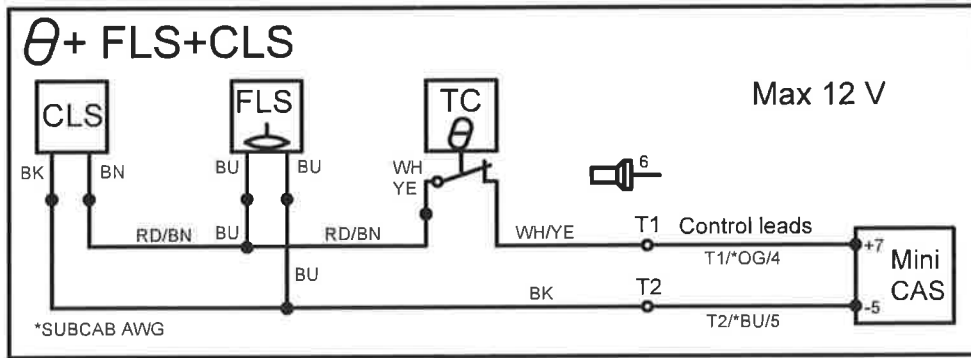


Sensors connection

SENSORS	Control	SUBCAB 7GX & 4GX Screenflex	SUBCAB AWG	SUBCAB screened
	T1	WH T1	OG	WH T1
	T2	WH T2	BU	WH T2
	T3	-	-	WH T3
	T4	-	-	WH T4



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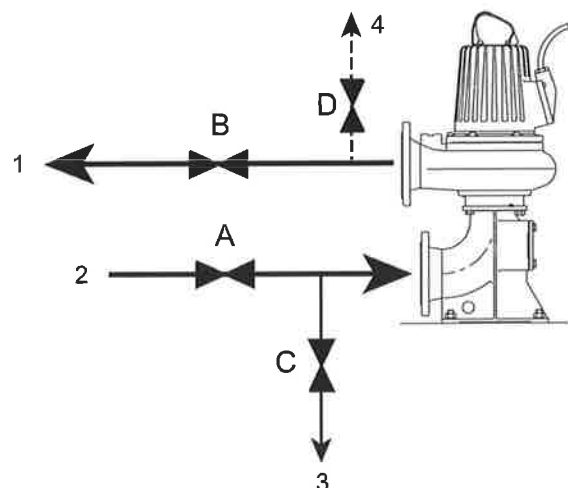
Sensor connection characteristics

The values have a 10 % tolerance.

Sensors	Value (mA)	Definition
FLS and thermal contact	0	Overtemperature
	7.8	OK
	36	Leakage
CLS and thermal contact	0	Overtemperature
	5.5	OK
	29	Leakage (5 seconds delay)
CLS, FLS and thermal contact	0	Overtemperature
	13.3	OK
	36-42	Leakage (0/5 seconds delay)

T-installation: Bleed air before starting pump

1. Open valve D and bleed out the air. See the following figure.



W5C06391B

1. Outlet line
2. Inlet line
3. Line to drain
4. Air vent

Figure 12: T-installation, valves A–D

2. Close valve D before the pump is started.

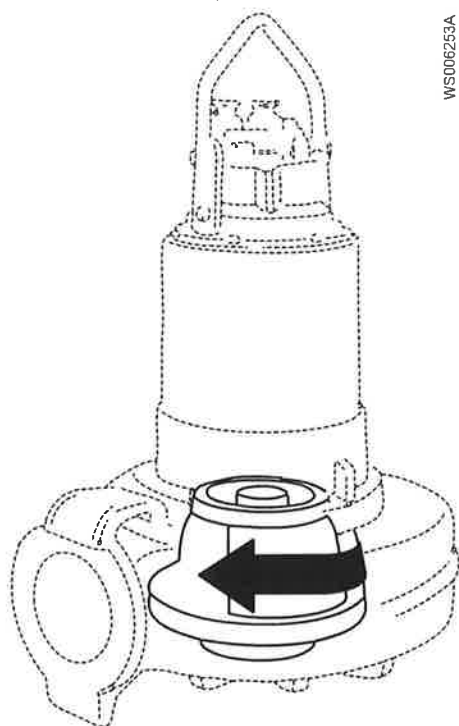
Check the impeller rotation



CAUTION: Crush Hazard

The starting jerk can be powerful. Make sure nobody is close to the unit when it is started.

1. Start the motor.
2. Stop the motor after a few seconds.
3. Check that the impeller rotates according to this illustration.



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The correct direction of impeller rotation is clockwise when you look at the pump from above.

4. If the impeller rotates in the wrong direction, then do one of these steps:
 - If the motor has a 1-phase connection, then contact the local sales and service representative.
 - If the motor has a 3-phase connection, then transpose two phase leads and do this procedure again.

Operation

Precautions

Before taking the unit into operation, check the following:

- All recommended safety devices are installed.
- The cable and cable entry have not been damaged.
- All debris and waste material has been removed.

NOTICE:

Never operate the pump with the discharge line blocked, or the discharge valve closed.



WARNING: Crush Hazard

Risk of automatic restart.

Distance to wet areas



WARNING: Electrical Hazard

Risk of electrical shock or burn. You must connect an additional ground- (earth-) fault protection device to the grounded (earthed) connectors if persons are likely to come into contact with liquids that are also in contact with the pump or pumped liquid.



CAUTION: Electrical Hazard

Risk of electrical shock or burn. The equipment manufacturer has not evaluated this unit for use in swimming pools. If used in connection with swimming pools then special safety regulations apply.

Noise level

NOTICE:

The noise level of the product is lower than 70 dB. However, the noise level of 70 dB may be exceeded in some installations and at certain operating points on the performance curve. Make sure that you understand the noise level requirements in the environment where the product is installed. Failure to do so may result in hearing loss or violation of local laws.

Estimate zinc anode replacement intervals

The mass and surface area of the zinc anodes are designed to protect the pump surface for 1 year in sea water with an average temperature of 20°C (68°F). Shorter inspection intervals and anode replacement can be required, depending upon the water temperature and the chemical composition as well as the presence of other metals in the vicinity of the pump.

The rate of zinc consumption, and the appropriate inspection intervals, can be estimated by measuring how much zinc is consumed during the first two months following installation.

Anodes are replaced when the anode mass is reduced to a selected fraction of its initial mass. The recommended interval for the selection fraction is 0.25-0.50 (25-50%).

1. Remove, weigh, and reinstall one or more of the exterior zinc anodes before starting up the pump.
2. After two months, remove and weigh the same zinc anode or anodes again.

3. Divide the lapsed time in days (between steps 1 and 2) by the anode weight loss in grams to get the calculated anode consumption rate (days/gram).
If multiple anodes were weighed, then use the anode which has lost the most weight for this calculation.
4. Calculate future replacement intervals so that they occur when the selected fraction of zinc is remaining.

Start the pump



CAUTION: Crush Hazard

The starting jerk can be powerful. Make sure nobody is close to the unit when it is started.

NOTICE:

Make sure that the rotation of the impeller is correct. For more information, see Check the impeller rotation.

1. Check the oil level in the oil housing.
 2. Remove the fuses or open the circuit breaker, and check that the impeller can be rotated freely.
-



WARNING: Crush Hazard

Never put your hand into the pump housing.

3. Conduct insulation test phase to ground. To pass, the value must exceed 5 megaohms.
4. Check that the monitoring equipment works.
5. Start the pump.

Maintenance

Precautions

Before starting work, make sure that the safety instructions in the chapter *Introduction and Safety* (page 3) have been read and understood.



DANGER: Crush Hazard

Moving parts can entangle or crush. Always disconnect and lock out power before servicing to prevent unexpected startup. Failure to do so could result in death or serious injury.



WARNING: Biological Hazard

Infection risk. Rinse the unit thoroughly with clean water before working on it.



CAUTION: Crush Hazard

Make sure that the unit cannot roll or fall over and injure people or damage property.

Make sure that you follow these requirements:

- Check the explosion risk before you weld or use electrical hand tools.
- Allow all system and pump components to cool before you handle them.
- Make sure that the product and its components have been thoroughly cleaned.
- Do not open any vent or drain valves or remove any plugs while the system is pressurized. Make sure that the pump is isolated from the system and that pressure is relieved before you disassemble the pump, remove plugs, or disconnect piping.

Ground continuity verification

A ground (earth) continuity test must always be performed after service.

Maintenance guidelines

During the maintenance and before reassembly, always remember to perform these tasks:

- Clean all parts thoroughly, particularly O-ring grooves.
- Change all O-rings, gaskets, and seal washers.
- Lubricate all springs, screws, O-rings with grease.

During the reassembly, always make sure that existing index markings are in line.

The reassembled drive unit must always be insulation-tested and the reassembled pump must always be test-run before normal operation.

Torque values

All screws and nuts must be lubricated to achieve correct tightening torque. Screws that are screwed into stainless steel must have the threads coated with suitable lubricants to prevent seizing.

If there is a question regarding the tightening torques, please contact the local sales and service representative.

Screws and nuts

Table 1: Stainless steel, A2 and A4, torque Nm (ft-lbs)

Property class	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
50	1.0(0.74)	2.0(1.5)	3.0(2.2)	8.0(5.9)	15(11)	27(20)	65(48)	127(93.7)	220(162)	434(320)
70, 80	2.7(2)	5.4(4)	9.0(6.6)	22(16)	44(32)	76(56)	187(138)	364(268)	629(464)	1240(915)
100	4.1(3)	8.1(6)	14(10)	34(25)	66(49)	115(84.8)	248(183)	481(355)	-	-

Table 2: Steel, torque Nm (ft-lbs)

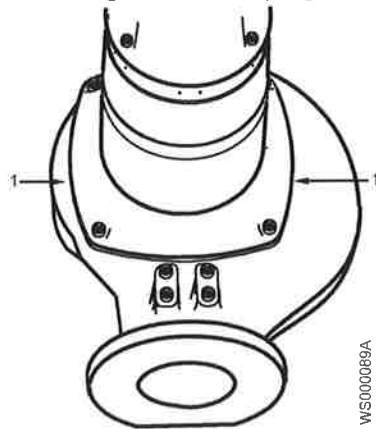
Property class	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
8.8	2.9(2.1)	5.7(4.2)	9.8(7.2)	24(18)	47(35)	81(60)	194(143)	385(285)	665(490)	1310(966.2)
10.9	4.0(2.9)	8.1(6)	14(10)	33(24)	65(48)	114(84)	277(204)	541(399)	935(689)	1840(1357)
12.9	4.9(3.6)	9.7(7.2)	17(13)	40(30)	79(58)	136(100)	333(245)	649(480)	1120(825.1)	2210(1630)

Hexagon screws with countersunk heads

For hexagon socket head screws with countersunk head, maximum torque for all property classes must be 80% of the values for property class 8.8 above.

Change the oil

This image shows the plugs that are used to change the oil.



1. Oil plug

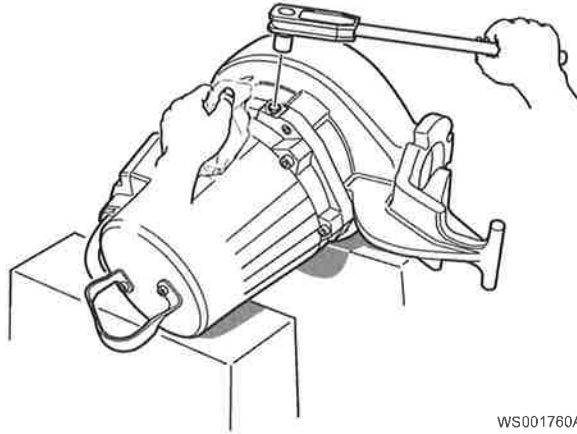
Empty the oil



CAUTION: Compressed Gas Hazard

Air inside the chamber may cause parts or liquid to be propelled with force. Be careful when opening. Hold a rag over the plug to prevent liquid from spraying out.

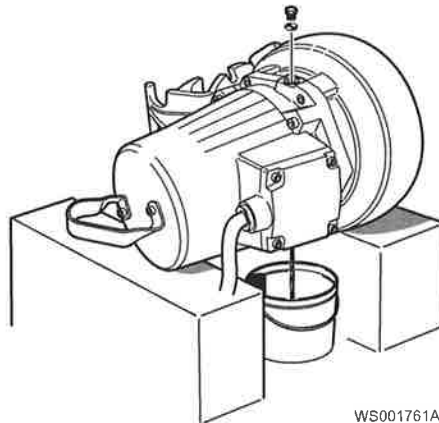
1. Place the pump in a horizontal position and unscrew the oil plug.
If the pump has a hole with the markings "oil out" it is important that this hole is used for drainage.



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2. Place a container under the pump and turn the pump.
3. Unscrew the other oil plug.

If this hole has the markings "oil in", raise the pump upright for a short period of time during drainage in order to drain all the oil.

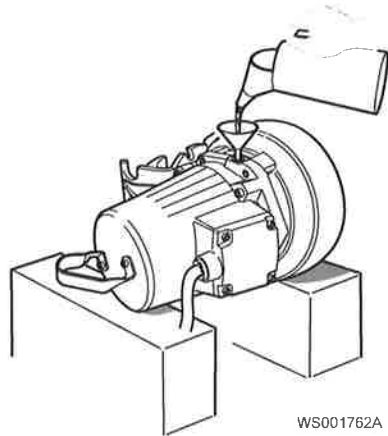


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Fill with oil

The oil should be a medical white oil of paraffin type that fulfills FDA 172.878 (a) and viscosity close to VG32.

1. Replace the O-rings of the oil plugs.
2. Refit an oil plug in the hole that faces downwards or is marked "oil out", and tighten.
Tightening torque: 10-40 Nm (7.5-29.5 ft-lb)
3. Fill with oil through the hole on the opposite side or the hole marked "oil in".
If the hole is marked "oil in", slightly tilt the pump and lower it again in order to fill the pump with the correct quantity.
Quantity: approximately 1.0 L (1.1 qt).



4. Refit the oil plug and tighten.
Tightening torque: 10-40 Nm (7.5-29.5 ft-lb).

Service the pump

Type of service	Purpose	Inspection interval
Initial inspection	To make a check up of the pump condition by a Xylem authorized service representative and, based on the result and findings from these measures, to determine the intervals for periodical inspection and major overhaul for the specific installation.	Within the first year of operation.
Periodical inspection	To prevent operational interruptions and machine breakdown. Measures to secure performance and pump efficiency are defined and decided for each individual application. It can include such things as impeller trimming, wear part control and replacement, control of zinc-anodes and control of the stator.	Up to every year Applies to normal applications and operating conditions at media (liquid) temperatures <40°C (104°F).
Major overhaul	To secure a long operating lifetime for the product. It includes the replacement of key components and the measures that are taken during an inspection.	Up to every 3 year Applies to normal applications and operating conditions at media (liquid) temperatures <40°C (104°F).

NOTICE:

Shorter intervals may be required when the operating conditions are extreme, for example with very abrasive or corrosive applications or when the liquid temperatures exceed 40°C (104°F).

Inspection

Service item	Action
Cable	<ol style="list-style-type: none"> 1. If the outer jacket is damaged, replace the cable. 2. Check that the cables do not have any sharp bends and are not pinched.
Connection to power	Check that the connections are properly tightened.
Electrical cabinets	Check that they are clean and dry.
Impeller	<ol style="list-style-type: none"> 1. Check the impeller clearance. 2. Adjust the impeller, if necessary.
Stator housing	<ol style="list-style-type: none"> 1. Drain all liquid, if any. 2. Check the resistance of the leakage sensor. Normal value approximately 1500 ohms, alarm approximately 430 ohms.

Service item	Action
Insulation	Use a megger maximum 1000 V. 1. Check that the resistance between the ground (earth) and phase lead is more than 5 megaohms. 2. Conduct a phase-to-phase resistance check.
Junction box	Check that it is clean and dry.
Lifting device	Check that local safety regulations are followed.
Lifting handle	1. Check the screws. 2. Check the condition of the lifting handle. 3. Replace if necessary.
O-rings	1. Replace the oil plug O-rings. 2. Replace the O-rings at the entrance or junction cover. 3. Grease the new O-rings.
Overload protection and other protections	Check the correct settings.
Personnel safety devices	Check the guard rails, covers, and other protections.
Rotation direction	Check the impeller rotation.
Oil housing	Fill with new oil, if necessary.
Terminal block/closed end splice	Check that the connections are properly tightened.
Thermal contacts	Normally closed circuit; interval 0–1 ohm.
Voltage and amperage	Check the running values.

Major overhaul

For a major overhaul, do the following in addition to the tasks listed under Inspection.

Service item	Action
Support and main bearing	Replace the bearings with new bearings.
Mechanical seal	Replace with new seal units.

Service in case of alarm

For information about indication values for sensors, see *Sensors connection* (page 35).

Alarm source	Action
CLS	Check for water in the oil housing. If the oil contains too much water, then do the following: 1. Drain the oil and water. 2. Replace with new oil.
FLS	1. Check for liquid in the stator housing. 2. Drain all liquid, if any. 3. Check the mechanical seal unit, the O-rings, and the cable entry, if liquid was found.
Thermal contact	Check the start and stop levels.
The overload protection	Check that the impeller can rotate freely.

Replace the impeller

Required tools:

- 6 mm hexagon bit adapter with an extension of at least 125 mm (4.92 in.)
- Impeller puller

If applicable, contact your local sales and service representative for correct type and size.

- Rod (wood or copper) for locking the impeller in place, if applicable.
- Two crowbars, if applicable



CAUTION: Cutting Hazard

Worn parts can have sharp edges. Wear protective clothing.

NOTICE:

When laying the pump on its side, do not allow the weight of the pump to rest on any portion of the impeller. The impeller must not be allowed to make contact with the concrete floor or other hard and rough surfaces.

If you fail with the impeller installation, then you must redo the installation procedure from the beginning.

Replace the C-, D-, or L-impeller

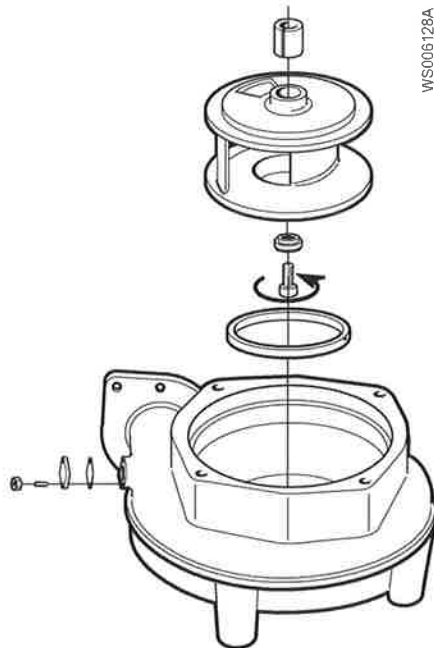


Figure 13: C-Impeller

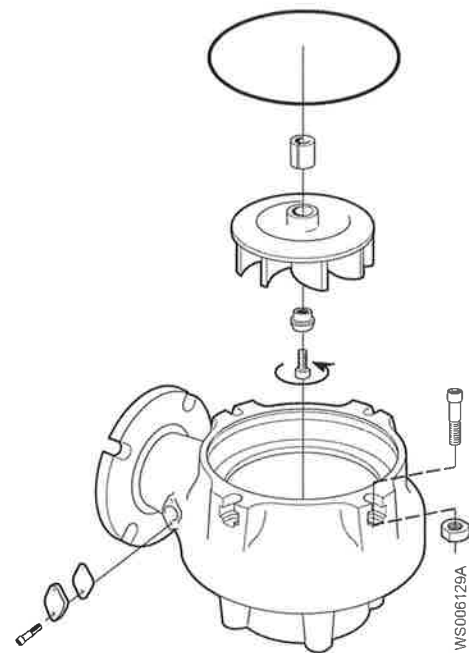


Figure 14: D-impeller

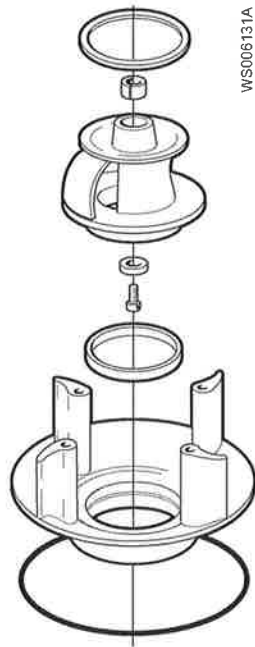


Figure 15: L-impeller

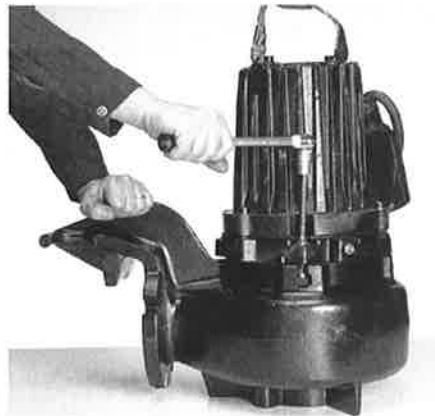
Remove the C-, D-, or L-impeller



CAUTION: Cutting Hazard

Worn parts can have sharp edges. Wear protective clothing.

1. Remove the pump housing.



WS001966A

2. Remove the impeller screw.
If applicable, use the rod.



WS001986A



WS001982A

Figure 16: C-impeller

Figure 17: D-impeller

3. For the L- and some C-impellers, remove the washer.
4. Remove the impeller.
Use the impeller puller or the crowbars.



WS001978A

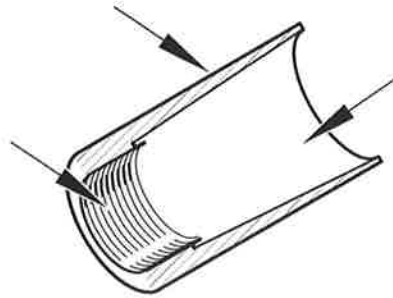
5. Remove the conical sleeve.

Install the C-, D-, or L-impeller

1. Prepare the shaft:
 - a) Polish off any flaws with a fine emery cloth.
The end of the shaft must be clean and free from burrs.
 - b) Coat the inner conic, the outer cylindrical surfaces, and the thread of the conical sleeve with a thin layer of grease.
The proper lubrication is grease for bearings, for example Exxon Mobil Unirex N3, Mobil Mobilith SHC 220 or equivalent.

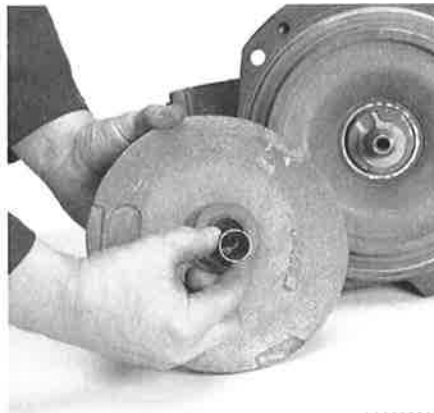
NOTICE:

Surplus grease can cause the impeller to become loose. Remove surplus grease from conical and/or cylindrical surfaces of shafts and/or sleeves.



WS006885A

2. Mount the impeller:
 - a) Fit the conical sleeve onto the shaft.



WS002022A

- b) Lubricate the impeller screw threads and contact surface.
Ensure that all parts are clean.
 - c) For the L- and some C-impellers, fit the washer on the lubricated screw.
 - d) Press the impeller onto the shaft with the impeller screw.
3. Tighten the impeller screw.
Tightening torque: 34 Nm (25 ft-lb).
Tighten a further 1/8 turn, 45° after tightening to the correct torque.
If applicable, use the rod.



WS001941A

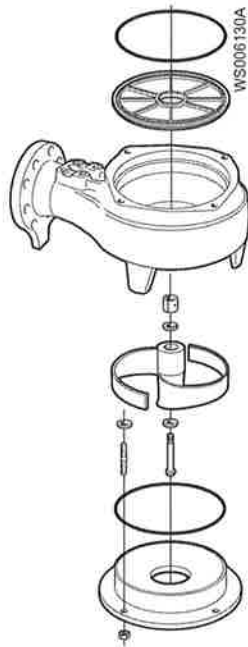
Check that the impeller can rotate freely.

4. Mount the pump housing:
 - a) Fit the pump housing.
 - b) Fit and tighten the lubricated screws.

Tightening torque: 57 Nm (42 ft-lb).



Replace the F-impeller



Remove the F-impeller



CAUTION: Cutting Hazard

Worn parts can have sharp edges. Wear protective clothing.

1. Remove the suction cover.
2. Remove the impeller screw, the ring, and the washers.
If applicable, use the rod.



WS001976A

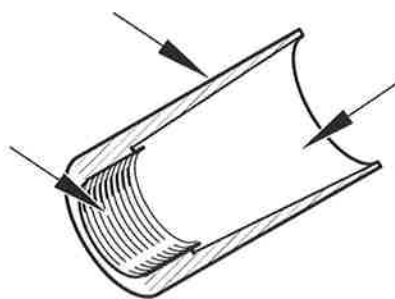
3. Remove the impeller.
Use the impeller puller or the crowbars.
4. Remove the conical sleeve.

Install the F-impeller

1. Prepare the shaft:
 - a) Polish off any flaws with a fine emery cloth.
The end of the shaft must be clean and free from burrs.
 - b) Coat the inner conic, the outer cylindrical surfaces, and the thread of the conical sleeve with a thin layer of grease.
The proper lubrication is grease for bearings, for example Exxon Mobil Unirex N3, Mobil Mobilith SHC 220 or equivalent.

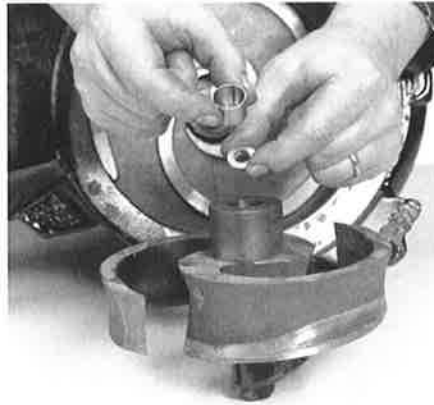
NOTICE:

Surplus grease can cause the impeller to become loose. Remove surplus grease from conical and/or cylindrical surfaces of shafts and/or sleeves.



WS006895A

2. Mount the impeller:
 - a) Fit the conical sleeve onto the shaft.
 - b) Fit one adjustment washer with a thickness of 0.25 mm (0.01 in) and two adjustment washers with a thickness of 1 mm (0.04 in) onto the impeller.



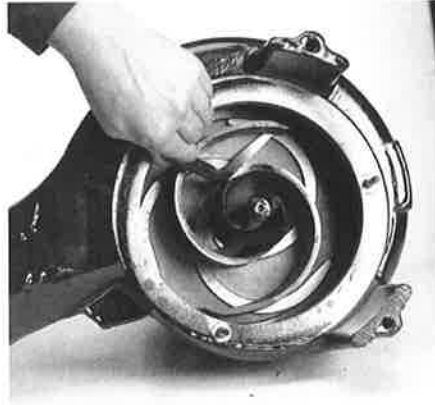
WS002021A

- c) Lubricate the impeller screw threads and contact surface.
Ensure that all parts are clean.
- d) Press the impeller onto the shaft with the impeller screw.
- 3. Fasten the impeller:
 - a) Prevent the impeller from rotating by inserting the rod through the pump housing outlet.
 - b) Tighten the impeller screw.
If applicable, use the rod.
Tightening torque: 30 Nm (22 ft-lb).
Tighten a further 1/8 turn, 45° after tightening to the correct torque.



WS001940A

- Check that the impeller can rotate freely.
- 4. Adjust the impeller:
 - a) Measure the distance between the edge of the impeller and the pump housing cover.
The correct distance should be 0.5-1.5 mm (0.02-0.06 in). Add or remove the appropriate number of adjusting washers in order to achieve correct distance.



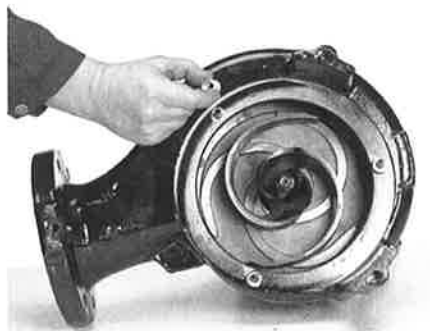
WS002107A

- b) Tighten the impeller screw.
If applicable, use the rod.
Tightening torque: 30 Nm (22 ft-lb).
Tighten a further 1/8 turn, 45° after tightening to the correct torque.
Check that the impeller can rotate freely.
5. Fit a new lubricated O-ring to the into the groove in the pump housing.



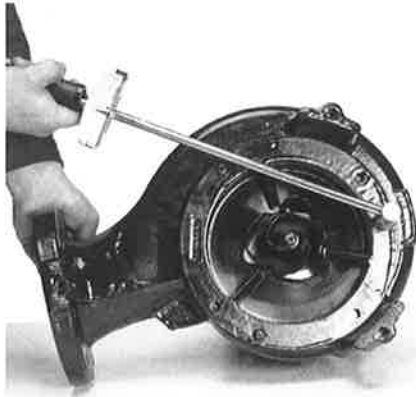
WS002080A

6. Mount the suction cover:
 - a) Fit the studs on the pump housing.
Use Loctite 603 locking liquid in order to secure the studs.
 - b) Fit two adjustment washers with a thickness of 1 mm (0.04 in) and six adjustment washers with a thickness of 0.25 mm (0.01 in) onto each stud.



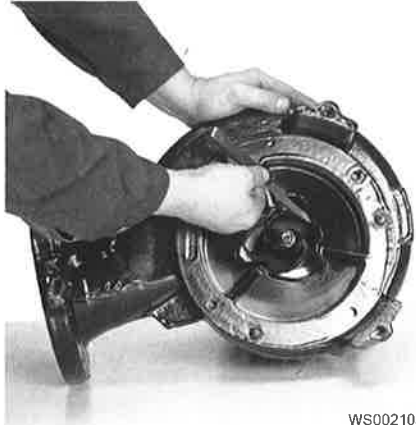
WS002014A

- c) Fit the suction cover to the studs.
 - d) Fit the lock nuts onto the studs.
 - e) Tighten the nuts.
- Tightening torque: 17 Nm (13 ft-lb)



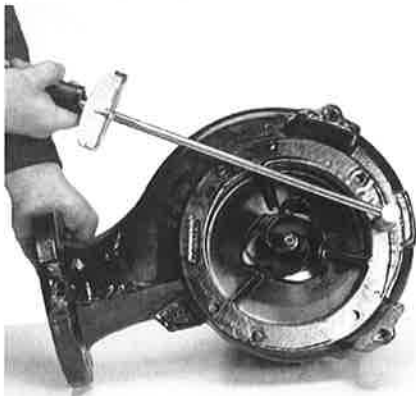
WS001937A

- 7. Adjust the suction cover:
 - a) Measure the distance between the impeller and the suction cover.
The correct distance should be 0.5-1 mm (0.02-0.04 in). Add or remove the appropriate number of adjusting washers in order to achieve the correct distance.



WS002105A

- b) Tighten the nuts.
Tightening torque: 17 Nm (13 ft-lb),



WS001937A

- 8. Raise the pump to a vertical position.

Check that the impeller can rotate freely.

Replace the M-impeller

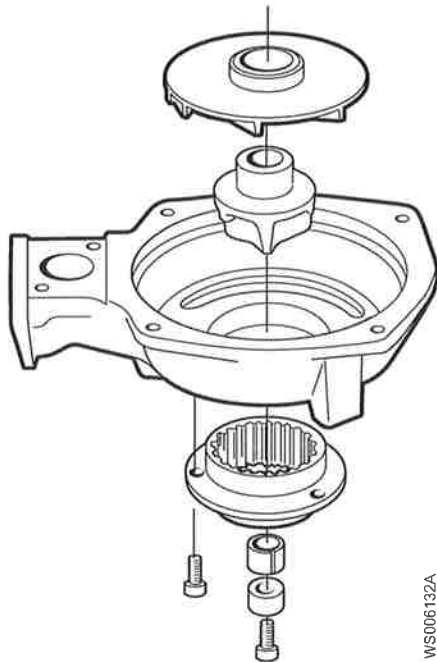


Figure 18: M-impeller

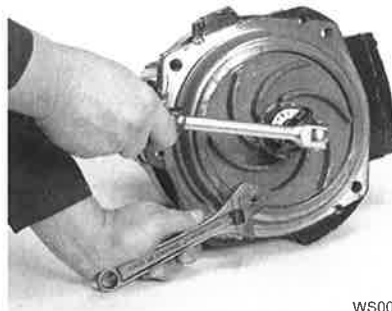
Remove the M-impeller



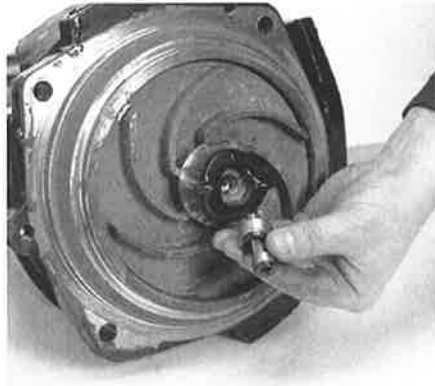
CAUTION: Cutting Hazard

Worn parts can have sharp edges. Wear protective clothing.

1. Remove the pump housing.
2. Remove the impeller screw and outer sleeve.
If applicable, use the rod.



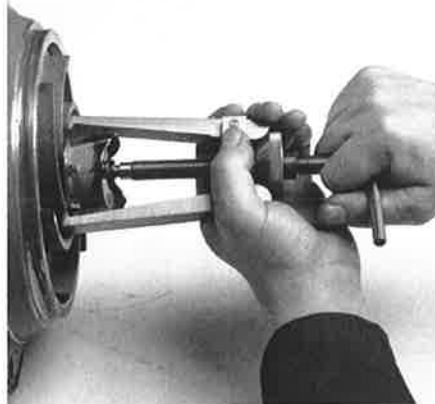
3. Refit the impeller screw.



WS001993A

4. Fit the impeller puller and pull off the impeller and cutter wheel. Place a protector between the screw head and the impeller puller.

WS002006A



5. Remove the conical sleeve.



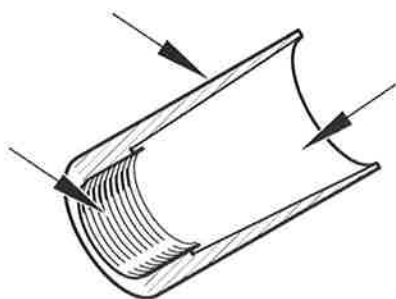
WS001987A

Install the M-impeller

1. Prepare the shaft:
 - a) Polish off any flaws with a fine emery cloth.
The end of the shaft must be clean and free from burrs.
 - b) Coat the inner conic, the outer cylindrical surfaces, and the thread of the conical sleeve with a thin layer of grease.
The proper lubrication is grease for bearings, for example Exxon Mobil Unirex N3, Mobil Mobilith SHC 220 or equivalent.

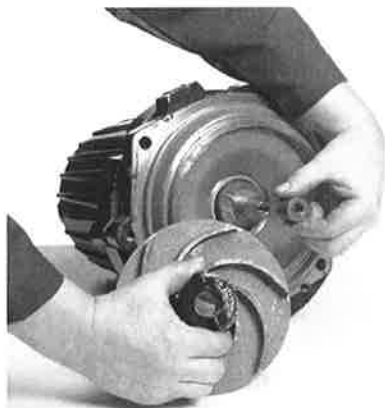
NOTICE:

Surplus grease can cause the impeller to become loose. Remove surplus grease from conical and/or cylindrical surfaces of shafts and/or sleeves.



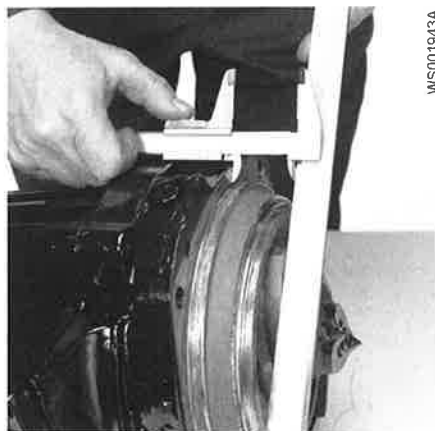
WS006895A

2. Mount the impeller:
 - a) Fit the conical sleeve onto the shaft.



WS002081A

- b) Fit the cutter wheel into the impeller.
 - c) Fit the outer sleeve onto the lubricated impeller screw.
 - d) Fit the impeller with the cutter wheel onto the shaft with the impeller screw.
Do not tighten the impeller screw.
3. Adjust the impeller:
 - a) Use a straightedge and a vernier to measure the distance between the vanes of the impeller and the shoulder for the pump housing on the oil housing bottom.
The correct distance for pressure class LT and HT is 43.5 ± 0.3 mm (1.71 ± 0.01 in.).
 - b) Slide the impeller on to the shaft until you reach the correct distance.



WS001943A

4. Tighten the impeller screw.
If applicable, use the rod.
Tightening torque: 34 Nm (25 ft-lbs)



WS001939A

Check that the impeller can rotate freely.

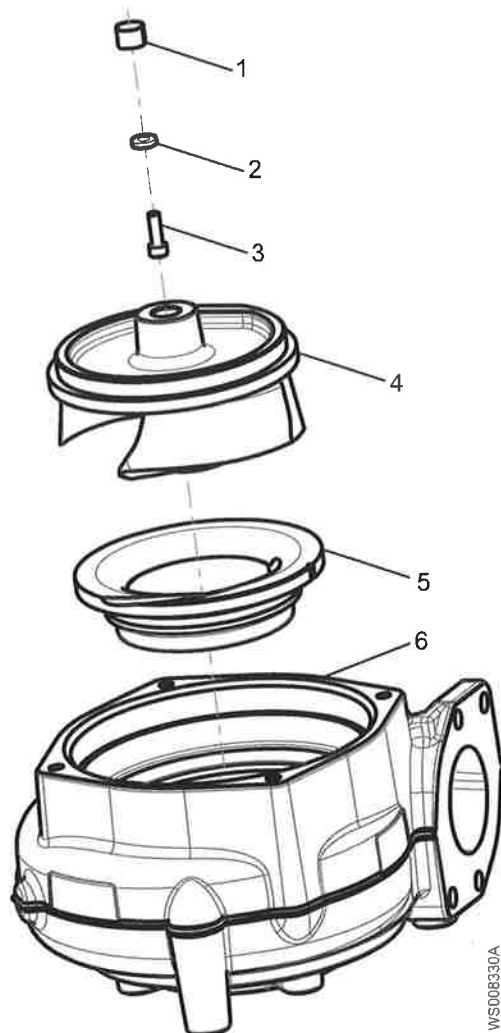
5. Mount the pump housing:
 - a) Fit the pump housing.
 - b) Fit and tighten the lubricated screws.Tightening torque: 57 Nm (42 ft-lb).



WS002018A

Replacing the N-impeller

This section is not applicable for Adaptive-N impellers. To see which pumps are Adaptive-N, see *Product Description* (page 11).



1. Conical sleeve
2. Washer
3. Impeller screw
4. Impeller
5. Insert ring
6. Pump housing



CAUTION: Cutting Hazard

Worn parts can have sharp edges. Wear protective clothing.

NOTICE:

When laying the pump on its side, do not allow the weight of the pump to rest on any portion of the impeller. The impeller must not be allowed to make contact with the concrete floor or other hard and rough surfaces.

Prepare the pump for removal: T-, Z-installations

The pump must be removed from the installation in order to change the impeller.

1. Close valves A and B on the inlet and outlet lines.
See the following figures.

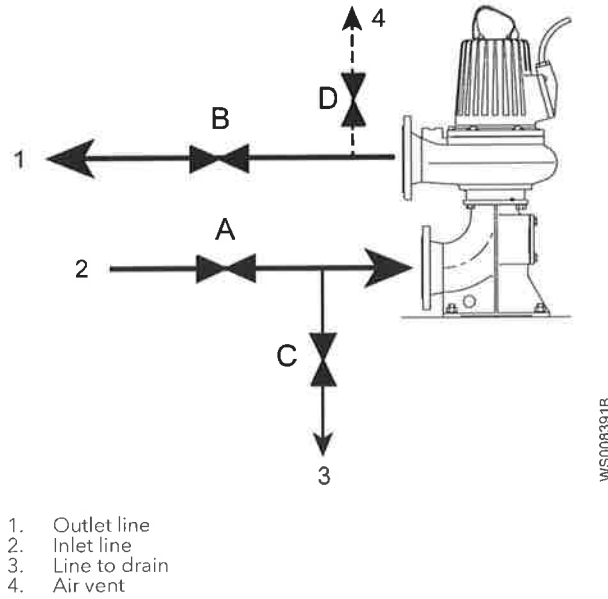


Figure 19: Valves A-D for T-installation (generic pump shown)

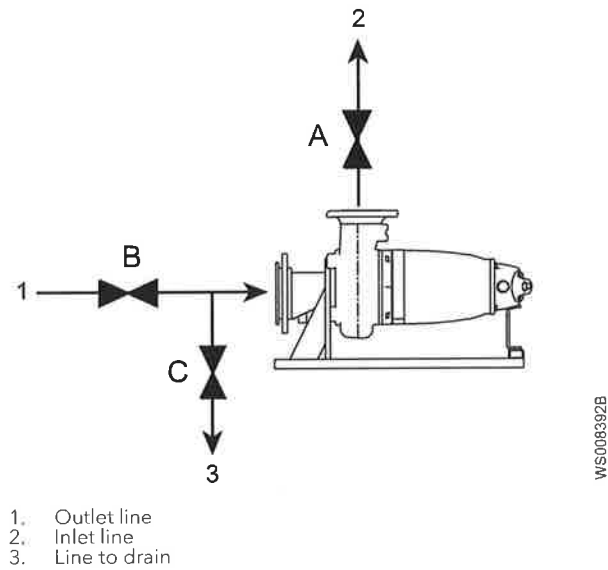


Figure 20: Valves A-C for Z-installation (generic pump shown)

2. Drain the pump by opening valve C on the drain line.
3. Remove the pump from the installation.

Remove the N-impeller: P, S, T, Z installations

This section is not applicable for Adaptive-N impellers. To see which pumps are Adaptive-N, see *Product Description* (page 11).

1. Remove the pump housing.
2. Loosen the impeller screw.
3. Remove the impeller.
Use the impeller puller or the crowbars.
4. Remove the impeller screw, the washer and the conical sleeve.

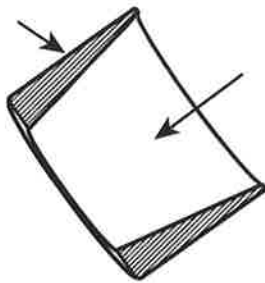


WS008326B

Install the N-impeller: P, S, T, Z installations

This section is not applicable for Adaptive-N impellers. To see which pumps are Adaptive-N, see *Product Description* (page 11).

1. Prepare the shaft:
 - a) Polish off any flaws with a fine emery cloth.
The end of the shaft must be clean and free from burrs.
 - b) Coat the inner conic and the outer cylindrical surfaces with a thin layer of grease.



WS008329A

The proper lubrication is grease for bearings, for example Exxon Mobil Unirex N3, Mobil Mobilith SHC 220 or equivalent.

NOTICE:

Surplus grease can cause the impeller to become loose. Remove surplus grease from conical and/or cylindrical surfaces of shafts and/or sleeves.

2. Mount the impeller:
 - a) Fit the conical sleeve onto the shaft.
 - b) Lubricate the impeller screw threads, washer and contact surface.
Ensure that all parts are clean.
 - c) Fit the washer and impeller screw.
 - d) Fit the impeller to the shaft.

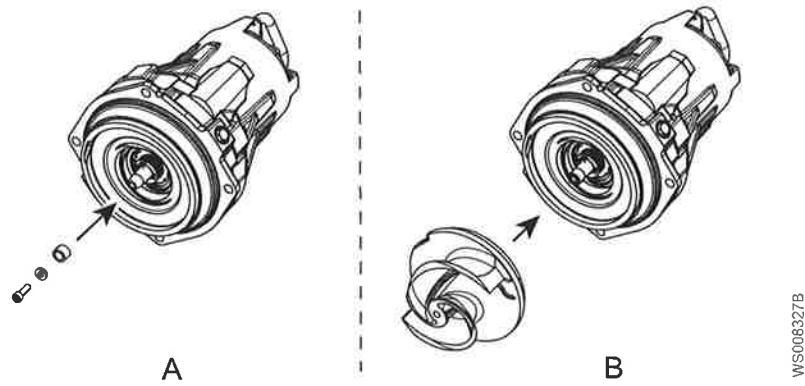


Figure 21: Fitting conical sleeve, washer and screw on shaft (A), and fitting impeller on shaft (B).

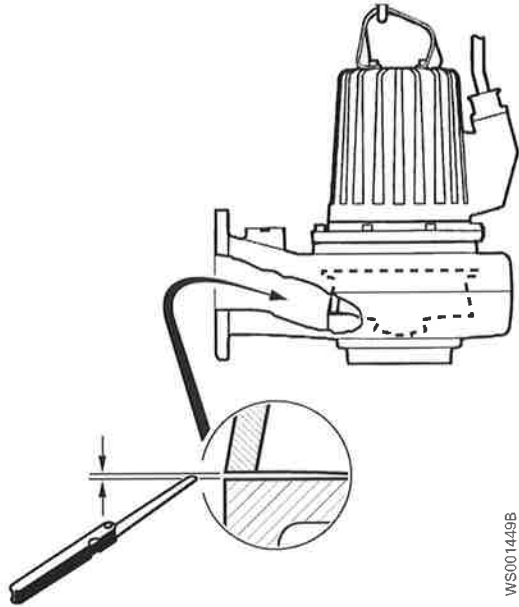
- e) Hand-tighten the impeller screw, with washer, enough to prevent the impeller from falling off.
3. Mount the pump housing:
 - a) Fit the new O-ring to the pump housing.
 - b) Fit and tighten the lubricated screws.
4. Adjust the impeller:
 - a) Lift up the pump.
 - b) Check that the impeller is in contact with the insert ring.
 - c) Lock the impeller with a rod through the outlet.
 - d) Tighten the impeller screw.
Tightening torque: 34 Nm (25 ft-lb).
Tighten a further 1/8 turn, 45°, after tightening to the correct torque.
 - e) Check that the impeller can rotate freely.



WARNING: Crush Hazard

Beware of the pinch point hazard between the rotating impeller and the guide pin.

- f) Check with an extended feeler gauge that the impeller clearance is 0.1 - 0.3 mm

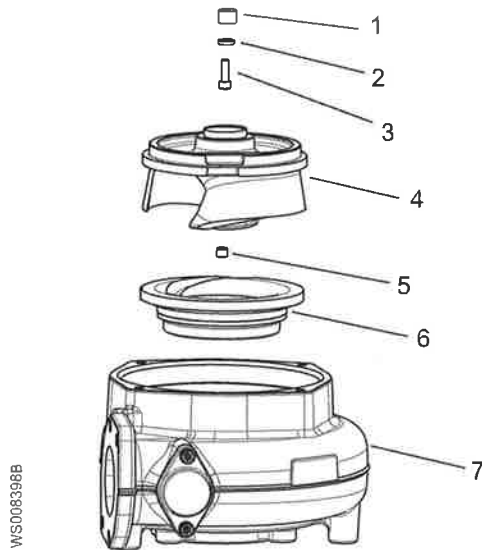


WS001449B

5. Re-install the pump.
T-installations: See the instructions in *T-installation: Bleed air before starting pump* (page 36).

Replacing the Adaptive N-impeller

To see which pumps are Adaptive-N, see *Product Description* (page 11).



WS008398B

1. Conical sleeve
2. Washer
3. Impeller screw
4. Impeller
5. Plug
6. Insert ring
7. Pump housing



CAUTION: Cutting Hazard

Worn parts can have sharp edges. Wear protective clothing.

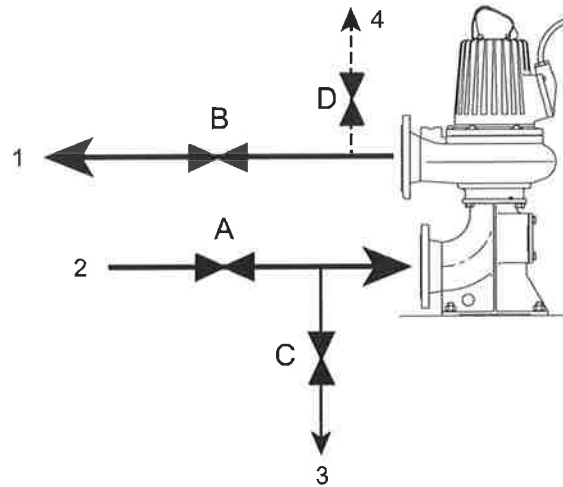
NOTICE:

When laying the pump on its side, do not allow the weight of the pump to rest on any portion of the impeller. The impeller must not be allowed to make contact with the concrete floor or other hard and rough surfaces.

Prepare the pump for removal: T-, Z-installations

The pump must be removed from the installation in order to change the impeller.

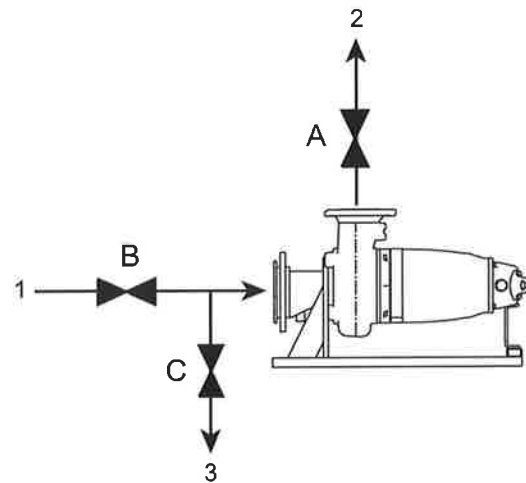
1. Close valves A and B on the inlet and outlet lines.
See the following figures.



WS006391B

1. Outlet line
2. Inlet line
3. Line to drain
4. Air vent

Figure 22: Valves A-D for T-installation (generic pump shown)



WS006392B

1. Outlet line
2. Inlet line
3. Line to drain

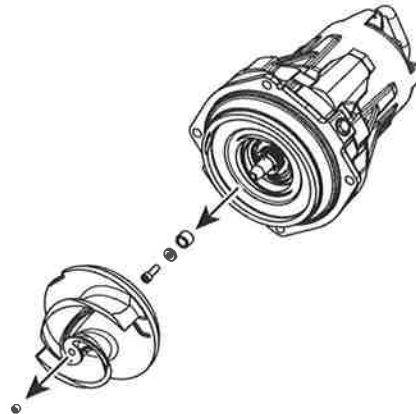
Figure 23: Valves A-C for Z-installation (generic pump shown)

2. Drain the pump by opening valve C on the drain line.
3. Remove the pump from the installation.

Remove the Adaptive-N impeller: P, S, T, Z installations

To see which pumps are Adaptive-N, see *Product Description* (page 11).

1. Remove the pump housing.
2. Remove the impeller.
 - a) Remove the plug.
 - b) Loosen the impeller screw.
 - c) Remove the impeller.
Use the impeller puller or the crowbars.
 - d) Remove the impeller screw, the washer and the conical sleeve.

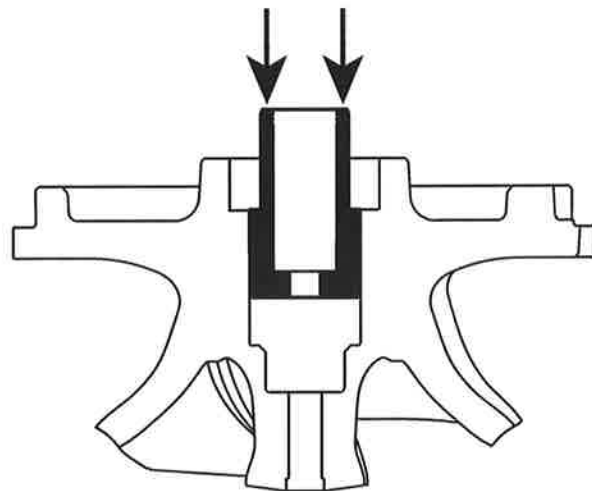


WS008400A

Install the Adaptive-N impeller: P, S, T, Z installations

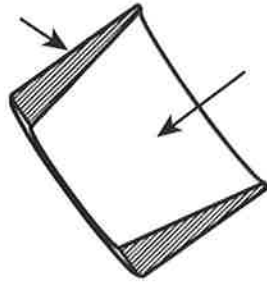
To see which pumps are Adaptive-N, see *Product Description* (page 11).

1. Before mounting the impeller, check that the sleeve moves freely up and down by pushing on it. See the following figure.
When the sleeve is released, it should be fully pushed out again. If the sleeve does not move freely, or does not come fully out, then replace the impeller unit.



WS008396A

2. Prepare the shaft:
 - a) Polish off any flaws with a fine emery cloth.
The end of the shaft must be clean and free from burrs.
 - b) Coat the inner conic and the outer cylindrical surfaces with a thin layer of grease.



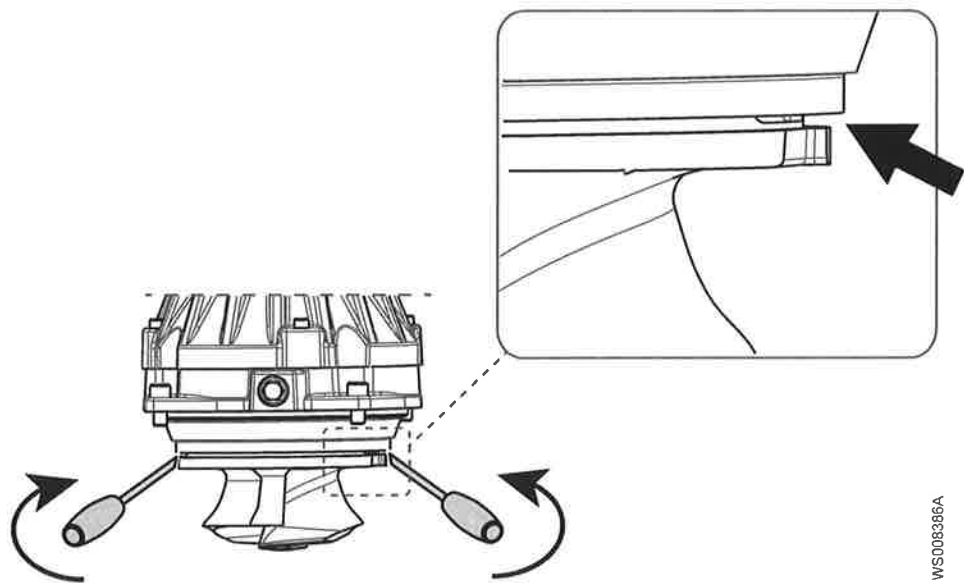
WS0008329A

The proper lubrication is grease for bearings, for example Exxon Mobil Unirex N3, Mobil Mobilith SHC 220 or equivalent.

NOTICE:

Surplus grease can cause the impeller to become loose. Remove surplus grease from conical and/or cylindrical surfaces of shafts and/or sleeves.

3. Mount the impeller sleeve and impeller, and secure the impeller in place with the screw.
4. Check that the impeller is in its lowest position:
 - a) Insert two screwdrivers as shown in the following figure, and push the impeller downwards.



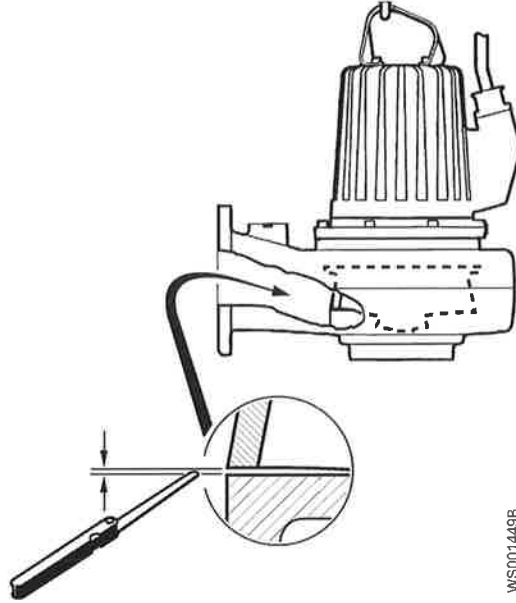
WS0008386A

5. Mount the pump housing:
 - a) Fit the pump housing.
 - b) Fit and tighten the lubricated screws.
Tightening torque: 57 Nm (42 ft-lb).
6. Loosen the impeller screw and make sure that the impeller moves down towards the insert ring until they are in contact.
7. Tighten the impeller screw.
Tightening torque: 34 Nm (25 ft-lb).
Tighten a further 1/8 turn, 45°, after tightening to the correct torque.
8. Check that the impeller can rotate freely.

**WARNING: Crush Hazard**

Beware of the pinch point hazard between the rotating impeller and the guide pin.

9. Check with an extended feeler gauge that the impeller clearance is 0.1 - 0.3 mm.



10. Fit the lubricated plug and tighten it.
Tightening torque: 15-30 Nm (11-22 ft-lb).
11. Re-install the pump.
T-installations: See the instructions in *T-installation: Bleed air before starting pump* (page 36).

Troubleshooting

Introduction



DANGER: Electrical Hazard

Troubleshooting a live control panel exposes personnel to hazardous voltages. Electrical troubleshooting must be done by a qualified electrician.

Follow these guidelines when troubleshooting:

- Disconnect and lock out the power supply except when conducting checks that require voltage.
- Make sure that no one is near the unit when the power supply is reconnected.
- When troubleshooting electrical equipment, use the following:
 - Universal instrument multimeter
 - Test lamp (continuity tester)
 - Wiring diagram

The pump does not start



DANGER: Crush Hazard

Moving parts can entangle or crush. Always disconnect and lock out power before servicing to prevent unexpected startup. Failure to do so could result in death or serious injury.



WARNING: Electrical Hazard

The permanent-magnet motor generates voltage when the shaft rotates, even if power sources are disconnected. Never perform any electrical work if the shaft could rotate.

NOTICE:

Do NOT override the motor protection repeatedly if it has tripped. Doing so may result in equipment damage.

Cause	Remedy
An alarm signal has been triggered on the control panel.	Check that: <ul style="list-style-type: none"> • The impeller rotates freely. • The sensor indicators do not indicate an alarm. • The overload protection is not tripped. If the problem still persists: Contact the local sales and service representative.
The pump does not start automatically, but can be started manually.	Check that: <ul style="list-style-type: none"> • The start level regulator is functioning. Clean or replace if necessary. • All connections are intact. • The relay and contactor coils are intact. • The control switch (Man/Auto) makes contact in both positions. Check the control circuit and functions.

Cause	Remedy
The installation is not receiving voltage.	Check that: <ul style="list-style-type: none"> • The main power switch is on. • There is control voltage to the start equipment. • The fuses are intact. • There is voltage in all phases of the supply line. • All fuses have power and that they are securely fastened to the fuse holders. • The overload protection is not tripped. • The motor cable is not damaged.
The impeller is stuck.	Clean: <ul style="list-style-type: none"> • The impeller • The sump in order to prevent the impeller from clogging again.

Always state the serial number of your product, see *Product Description* (page 11).

The pump does not stop when a level sensor is used



DANGER: Crush Hazard

Moving parts can entangle or crush. Always disconnect and lock out power before servicing to prevent unexpected startup. Failure to do so could result in death or serious injury.



WARNING: Electrical Hazard

The permanent-magnet motor generates voltage when the shaft rotates, even if power sources are disconnected. Never perform any electrical work if the shaft could rotate.

Cause	Remedy
The pump is unable to empty the sump to the stop level.	Check that: <ul style="list-style-type: none"> • There are no leaks from the piping and/or discharge connection. • The impeller is not clogged. • The non-return valve(s) are functioning properly. • The pump has adequate capacity. For information: Contact the local sales and service representative.
There is a malfunction in the level-sensing equipment.	<ul style="list-style-type: none"> • Clean the level regulators. • Check the functioning of the level regulators. • Check the contactor and the control circuit. • Replace all defective items.
The stop level is set too low.	Raise the stop level.

Always state the serial number of your product, see *Product Description* (page 11).

The pump starts-stops-starts in rapid sequence

Cause	Remedy
The pump starts due to back-flow which fills the sump to the start level again.	Check that: <ul style="list-style-type: none"> • The distance between the start and stop levels is sufficient. • The non-return valve(s) work(s) properly. • The length of the discharge pipe between the pump and the first non-return valve is sufficiently short.

Cause	Remedy
The self-holding function of the contactor malfunctions.	Check: <ul style="list-style-type: none"> • The contactor connections. • The voltage in the control circuit in relation to the rated voltages on the coil. • The functioning of the stop-level regulator. • Whether the voltage drop in the line at the starting surge causes the contactor's self-holding malfunction.

Always state the serial number of your product, see *Product Description* (page 11).

The pump runs but the motor protection trips



DANGER: Crush Hazard

Moving parts can entangle or crush. Always disconnect and lock out power before servicing to prevent unexpected startup. Failure to do so could result in death or serious injury.



WARNING: Electrical Hazard

The permanent-magnet motor generates voltage when the shaft rotates, even if power sources are disconnected. Never perform any electrical work if the shaft could rotate.

NOTICE:

Do NOT override the motor protection repeatedly if it has tripped. Doing so may result in equipment damage.

Cause	Remedy
The motor protection is set too low.	Set the motor protection according to the data plate and if applicable the cable chart.
The impeller is difficult to rotate by hand.	<ul style="list-style-type: none"> • Clean the impeller. • Clean out the sump. • Check that the impeller is properly trimmed.
The drive unit is not receiving full voltage on all three phases.	<ul style="list-style-type: none"> • Check the fuses. Replace fuses that have tripped. • If the fuses are intact, then notify a certified electrician.
The phase currents vary, or they are too high.	Contact the local sales and service representative.
The insulation between the phases and ground in the stator is defective.	<ol style="list-style-type: none"> 1. Use an insulation tester. With a 1000 V DC megger, check that the insulation between the phases and between any phase and ground is > 5 megaohms. 2. If the insulation is less, then do the following: Contact the local sales and service representative.
The density of the pumped fluid is too high.	Make sure that the maximum density is 1100 kg/m ³ (9.2 lb/US gal) <ul style="list-style-type: none"> • Change the impeller, or • Change to a more suitable pump • Contact the local sales and service representative.
There is a malfunction in the overload protection.	Replace the overload protection.

Always state the serial number of your product, see *Product Description* (page 11).

The pump delivers too little or no water



DANGER: Crush Hazard

Moving parts can entangle or crush. Always disconnect and lock out power before servicing to prevent unexpected startup. Failure to do so could result in death or serious injury.



WARNING: Electrical Hazard

The permanent-magnet motor generates voltage when the shaft rotates, even if power sources are disconnected. Never perform any electrical work if the shaft could rotate.

NOTICE:

Do NOT override the motor protection repeatedly if it has tripped. Doing so may result in equipment damage.

Cause	Remedy
The impeller rotates in the wrong direction.	<ul style="list-style-type: none"> • If it is a 3-phase pump, then transpose two phase leads. • If it is a 1-phase pump, then do the following: Contact the local sales and service representative.
One or more of the valves are set in the wrong positions.	<ul style="list-style-type: none"> • Reset the valves that are set in the wrong position. • Replace the valves, if necessary. • Check that all valves are correctly installed according to media flow. • Check that all valves open correctly.
The impeller is difficult to rotate by hand.	<ul style="list-style-type: none"> • Clean the impeller. • Clean out the sump. • Check that the impeller is properly trimmed.
The pipes are obstructed.	To ensure a free flow, clean out the pipes.
The pipes and joints leak.	Find the leaks and seal them.
There are signs of wear on the impeller, pump, and casing.	Replace the worn parts.
The liquid level is too low.	<ul style="list-style-type: none"> • Check that the level sensor is set correctly. • Depending on the installation type, add a means for priming the pump, such as a foot valve.

Always state the serial number of your product, see *Product Description* (page 11).

Technical Reference

Motor data

Feature	Description
Motor type	<ul style="list-style-type: none"> 3085.092/.160/.172/.183/.190/.760/.770/.891: Squirrel-cage induction motor 3085.800/.810/.820/.830/.900/.910/.960/.970: Line-started, permanent-magnet synchronous motor
Frequency	50 or 60 Hz
Supply	1-phase or 3-phase
Starting method	<ul style="list-style-type: none"> Direct on-line Star-delta Soft starter Star-delta
Maximum starts per hour	30 evenly spaced starts per hour
Code compliance	IEC 60034-1
Voltage variation without overheating	±10%, provided that it does not run continuously at full load
Voltage imbalance tolerance	2%
Stator insulation class	H (180°C [360°F])

Application limits

Data	Description
Liquid temperature	40°C (104°F) maximum The pump can be operated at full load only if at least half the stator housing is submerged. Warm-liquid version: 70°C (158°F) maximum (3085.160, 3085.183, 3085.760) Ex-approved pumps: 40°C (104°F) maximum
Liquid density	1100 kg/m ³ (9.2 lb per US gal) maximum
pH of the pumped media (liquid)	5.5-14
Depth of immersion	20 m (65 ft) maximum
Other	For the specific weight, current, voltage, power ratings, and speed of the pump, see the data plate of the pump.

Xylem |'zīləm|

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- 2) A leading global water technology company

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Refer to www.xylemwatersolutions.com/contacts/ for contact details of your local sales and service representative.



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<http://tpi.xylem.com>

Visit our Web site for the latest version of this document and more information

The original instruction is in English. All non-English instructions are translations of the original instruction.

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MiniCAS

Description:

The Flygt MiniCAS modules are relays especially designed to simultaneously supervise pump motor thermal switches and Flygt pump leakage detectors FLS (Stator housing) and/or CLS (Water-in-oil) installed in each small to medium Flygt pump (Models 3085 through 3300) or mixer (Series 4600).

The MiniCAS is using only two wires for two or more sensors connected in series and actually includes two current sensitive mini-relays. The principle of operation is: a 12 VDC voltage is sent to the pump sensors and the current through the input circuit is fed through the current mini-relays. One mini-relay is an overcurrent relay, the other is an undercurrent relay.

- If a normally closed thermal switch, installed into the stator winding, opens due to overheating, or one of the connecting leads is broken, the undercurrent relay will de-energize, changing its contacts status. The MiniCAS will shut down the pump.
- If the Flygt leakage sensor (FLS or CLS) is activated, the current through the sensor will increase and the overcurrent relay will be energized, changing the status of its contacts. The MiniCAS will send a "Leakage" signal or shut down the pump, depending on the MiniCAS external connections.

Flygt MiniCAS relays are available in two interchangeable variants:

- MiniCAS II with external manual reset after an overtemperature tripping.
- MiniCAS II/FUS with a "Manual/Auto Reset" selector switch, which allows the pump to restart in "Auto Reset" position after the stator cools down and the thermal switches re-close. (See Technical Data next page).

MiniCAS II - Technical Data:

Operation Principle:	Current sensing
Environment:	0-50°C (32-123°F) max 90% RH
Supply Voltages:	20-30 VAC 50-60 Hz, or 120VAC 50-60 Hz
Relay Contact Rating:	8 Amps @ 250 VAC
Voltage to Sensor:	12 VDC ±5%
Values of Operation:	3 mA < I < 22 mA = OK conditions. I < 3 mA = High temp. (or broken wire). I > 22 mA = Leakage (or short circuit). (I = DC current measured by the MiniCAS II).
LED Indicators:	Yellow LED: for Supply Voltage presence indication. Red LED: for Overtemperature indication. Red LED: for Leakage indication.
Reset:	Manual - for Overtemperature by interrupting power supply or pushing external push-button (NO), connected between terminals 6 and 2 (not supplied with the unit). Automatic - for Leakage
Physical Size:	Width: 33mm (1.33") Height: 79mm (3.11") Depth: 75mm (2.95")
Part Number:	83 58 57 (MiniCAS II - 24V) 40-50 10 98 (MiniCAS II - 120V) 14-40 70 97 (Socket) - optional

MiniCAS II/FUS-120 Technical Data

MiniCAS II/FUS-120 Technical Data:

Operation Principle: Current sensing

Environment: -20 to 65°C (-4 to 149°F)

Supply Voltage: 120 VAC 50-60 Hz \pm 10%, 24 VAC \pm 10%, 24 VDC \pm 10%

Relay Contact Rating: 10 Amps @ 120 VAC

Voltage to Sensor: 12 VDC \pm 10%

Values of Operation: 3.0 mA < I < 22 mA = OK conditions.
I \leq 3.0 mA = High temp. \pm 5% (or interrupt).
I \geq 22.0 mA = Leakage \pm 5% (or short circuit).
(I = current measured by the MiniCAS II/FUS).

Green LED On = Supply Voltage present.
Green LED Off = No Supply Voltage present.

Leakage

Contact: Form "C" 10 A @ 120 VAC (N.C. contact for interlocking)

Reset: Automatic (N.O. contact for alarm)

LED Indicators: Red LED On = Leakage indicated
Red LED Off = No leakage indicated

Temperature

Contact: Form "C" 10 A @ 120 VAC (N.C. contact for interlocking, N.O. contact for alarm)

Reset: Manual - by interrupting the supply for 1 sec. or by setting the toggle switch in the "Manual" mode.
Automatic - by setting the toggle switch in the "Auto Reset" mode.

LED Indicators: Red LED On = Over-temperature indicated.
Red LED Off = No Over-temperature indicated

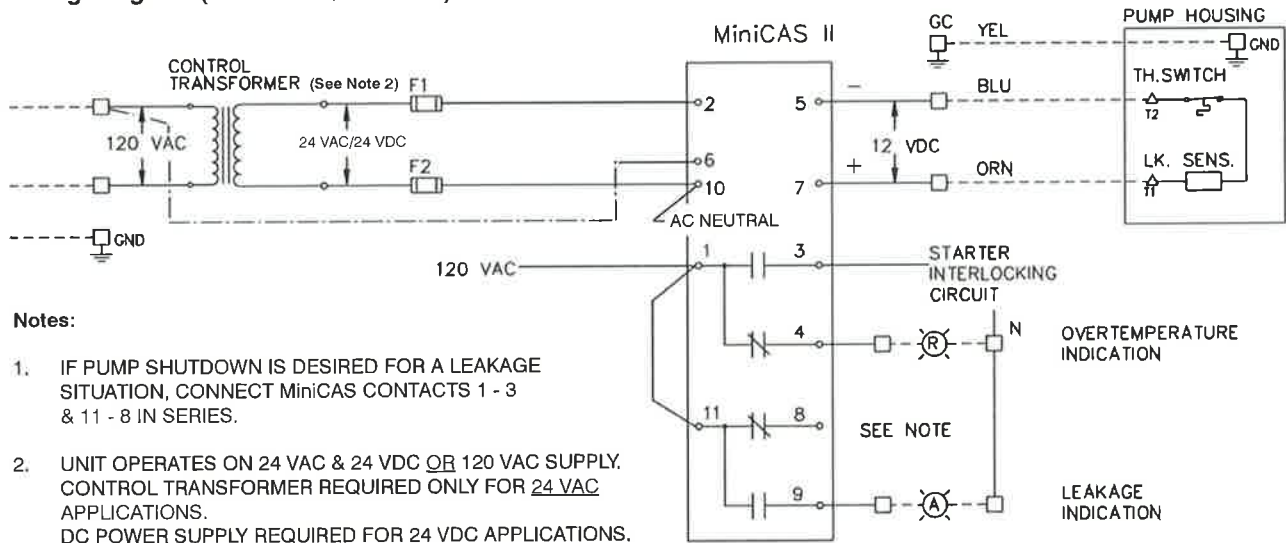
Physical Size: Width: 2.125"
Height: 4.250"
Depth: 3.470" (+ socket depth)

Part Number: 14-40 71 29 (MiniCAS II/FUS -120)
14-40 70 97 (Socket, 11-pin) - optional

Approvals: UL - File E101681

Wiring Diagram MiniCAS II/FUS-120

Wiring Diagram (MiniCAS II/FUS-120)



Notes:

- IF PUMP SHUTDOWN IS DESIRED FOR A LEAKAGE SITUATION, CONNECT MiniCAS CONTACTS 1 - 3 & 11 - 8 IN SERIES.
- UNIT OPERATES ON 24 VAC & 24 VDC OR 120 VAC SUPPLY. CONTROL TRANSFORMER REQUIRED ONLY FOR 24 VAC APPLICATIONS. DC POWER SUPPLY REQUIRED FOR 24 VDC APPLICATIONS.

Mode of Operation

In normal conditions, when the MiniCAS - 120 is powered, the green LED is 'ON' and the relay contact status is as follows:

- Overtemperature relay contacts: 1-3 closed, 1-4 open;
- Leakage relay contacts: 11-8 closed, 11-9 open.

If an overtemperature condition occurs, the overtemperature Red LED will turn on, the unit will turn the pump off and lock it out.

Relay contact status:

- Overtemperature relay contacts: 1-3 open, 1-4 closed;
- Leakage relay contacts: 11-8 closed, 11-9 open.

The power to the pump can be restored after the stator temperature has decreased to a point of safe operation and the thermal switches are closed. When the overtemperature condition resets, the overtemperature Red LED will turn off. The MiniCAS-120 can be reset either manually or automatically.

Note:

When selecting the "Automatic Reset" mode, the control panel should include a latching type circuit for over-temperature alarm display. This circuit will retain the information that an overtemperature situation has occurred and the operator should check the possible cause for motor overtemperature.

If a leakage is detected, after a 5 sec. delay, an alarm will be activated or the pump will be shut down and the leakage Red LED will turn on. Relay contact status:

- Overtemperature relay contacts: 1-3 closed, 1-4 open;
- Leakage relay contacts: 11-8 open, 11-9 closed.

Once the leakage condition is removed, power is restored to the pump and the Leakage Red LED will turn off automatically, leakage relay contacts will be reset.

MiniCAS Specifications

Furnish and install one Flygt MiniCAS (Mini Control and Status) module to monitor the temperature and leakage detectors installed in each Flygt pump or mixer. The MiniCAS shall be capable of monitoring the thermal switches embedded in the stator end coils, the Flygt FLS (float switch type) water-in-stator-housing sensor, and the Flygt CLS (capacitive type) water-in-oil sensor. The MiniCAS shall monitor both the series connected thermal switches and leakage sensor(s) by outputting 12 VDC on a single two wire circuit. When both CLS and FLS leakage sensors are specified they shall be connected in parallel with each other and then in series with the thermal switches.

The MiniCAS circuitry shall operate on the current sensing principle whereby a change in temperature or leakage condition shall change the resistance of the associated sensor and thus alter the current in the sensing circuit. The MiniCAS shall contain two sets of form C dry contacts, one for overtemperature and one for leakage. The dry

contacts shall change status upon occurrence of an over temperature or leakage condition so as to indicate that condition to other control components in the pump control panel. In the case of an overtemperature, and in keeping with Flygt's warranty policy, the overtemperature dry contacts shall be used to trip the pump off line. The MiniCAS shall be designed to be plugged into a standard 11-pin circular socket. Detailed technical data and wiring connections shall be found in the MiniCAS Manual.



SymCom's Model 777-KW/HP-P2 Series is a family of fully programmable electronic power monitors. They are designed to monitor and protect any 3-phase, 200-480VAC motor drawing 2-800 full load amps (external CTs are required above 90 amps). They provide unsurpassed protection from faulty voltage, underload and overload conditions. The 777-KW/HP-P2 can be used in a variety of 3-phase applications and features a low power trip point (adjustable on the unit) that is desirable any time the current vs. load characteristic is non-linear or has little change. In general, this applies to small slow speed motors, small centrifugal motors and fractional horsepower motors. Low power protection can be used any time in place of undercurrent protection. The 777-KW/HP-P2 displays kilowatts and horsepower on the face of the unit.

The 777-KW/HP-P2 incorporates a 3-digit LED display that is used for programming, providing real-time operational information and displaying diagnostic codes to aid in troubleshooting a fault condition.

The 777-KW/HP-P2 can be used as a stand-alone product or used in a network to communicate with a PC, PLC, SCADA system, or SymCom's Solutions Software with the help of its built-in RS-485 communications port. The 777-KW/HP-P2, in conjunction with SymCom's CIO modules, supports several communication protocols including Modbus/RTU, Modbus/TCP, DeviceNet™ and Profibus. The units can also be connected to SymCom's remote monitors for a simple, cost-effective way to meet new requirements for arc-flash safety.

The unit's many features include enhanced trip classes beyond the NEMA standard trip classes. The settable trip class range is 2-60, with or without jam protection, and a secondary linear trip delay can be set with a range of 0-60 seconds. If both the trip class and linear trip delay are set, the 777-KW/HP-P2 will follow the faster trip time. Another feature is the automatic dry-well recovery timer that allows the unit to automatically select a restart delay based on the last cycle's run time. This allows the 777-KW/HP-P2 to optimize restart delay times.

The 777-KW/HP-P2 can be pre-programmed with a 9-volt battery prior to actual installation. This can save a lot of time during initial installations and avoid subsequent service calls when commissioning new projects.

Features:

- Protects 3-phase motors from:
 - High voltage
 - Low voltage
 - Voltage unbalance
 - Reverse-phase
 - Overcurrent
 - Underload (low power)
 - Current unbalance
 - Single-phase
 - Ground fault, Class II
- Network programmable
- Programmable with 9-volt battery prior to installation
- Automatic reset with three separate restart delay timers, or manual reset
- Tamper guard
- RS-485 communications port (communications module sold separately)
- 3-digit LED diagnostic display
- Last fault memory
- UL and ULC listed
- CE compliant
- CSA approved
- Surface or DIN rail mount
- 5-year warranty
- Made in USA

Auxiliary Products:

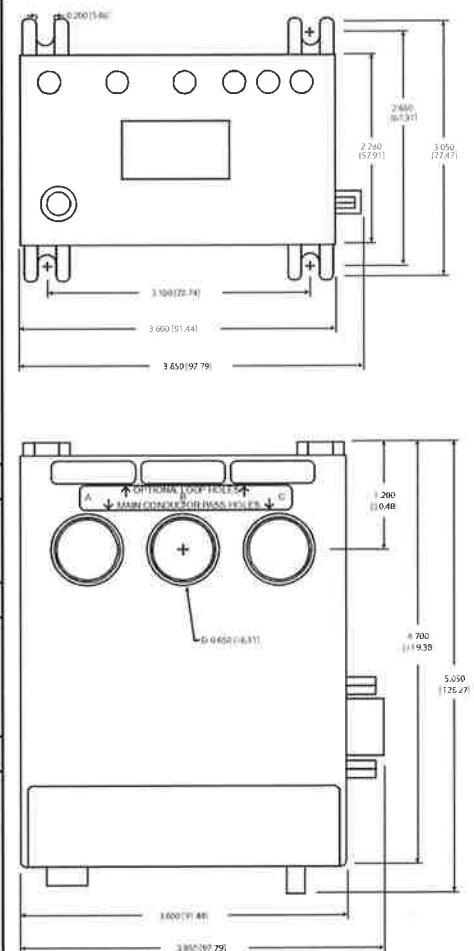
- Remote Displays (RM-1000/RM-2000)
- Communication Modules
- Remote Manual Reset Kit
- Solutions Software

Specifications

Functional Specifications	
Programmable Operating Points LV-Low Voltage Threshold HV-High Voltage Threshold VUB-Voltage Unbalance Threshold MULT-# of Conductors or CT Ratio (xxx:5) OC-Overcurrent Threshold PWS-Power Scale LP-Low Power CUB-Current Unbalance Threshold TC-Overcurrent Trip Class RD1-Rapid Cycle Timer RD2-Restart Delay After All Faults Except Undercurrent (motor cool-down timer) RD3-Restart Delay After Undercurrent (dry-well recovery timer) #RU-Number of Restarts After Undercurrent ADDR-RS485 Address COM-Communication setting #RF-Number of Restarts After All Faults Except Undercurrent UCTD-Undercurrent Trip Delay ** GF-Ground Fault Current Threshold	170-524V 172-528V 2-25% or 999 (disabled) 1-10, 100, 150, 200, 300, 400, 500, 600, 700, 800 (20-100A) + MULT of 80-140% of CT Primary 1 = 0.01-0.99kW 5 = 0.01-1.32hp 2 = 1.00-9.95kW 6 = 1.34-13.3hp 3 = 10.0-99.5kW 7 = 13.4-133hp 4 = 100-650kW 8 = 134-871hp 0.01-650kW or 0.01-871hp or 0 (off); LP setting is dependent on PWS setting. PWS must be set prior to LP being set 2-50% or 999 (disable) 2-60, J2-J60, L00-L60, oFF 0-999 seconds 2-500 minutes 0, 1, 2, 3, 4, A (Automatic) A01-A99 C00-C07 0, 1, oc1, 2, oc2, 3, oc3, 4, oc4, A, ocA (Automatic) 5 seconds (default) (3-20A) + MULT or 12-40% of CT Primary or oFF
Input Characteristics	
Supply Voltage Frequency Motor Full Load Amp Range	200-480V AC 50/60Hz 2-20A, (looped conductors required); 20-90A (direct); 80-800A (external CTs required)
Output Characteristics	
Output Contact Rating - SPDT (Form C) Pilot Duty General Purpose Expected Life Mechanical Electrical	480V A@240V AC, B300 10A@240V AC 1 x 10 ⁶ operations 1 x 10 ⁶ operations at rated load
General Characteristics	
Operating Temperature Ambient Operating Ambient Storage Accuracy at 25° C (77° F) Voltage Current Timing Ground Fault Repeatability Voltage Current Maximum Input Power Pollution Degree Class of Protection Relative Humidity Terminal Torque Standards Passed Electrostatic Discharge (ESD) Radio Frequency Immunity (RFI), Conducted Radio Frequency Immunity (RFI), Radiated Fast Transient Burst Short Circuit Surge IEC ANSI/IEEE Hi-potential Test Vibration Shock Safety Marks UL CE Max Conductor Size through 777-P2 Dimensions Weight Mounting Method	-20° to 70° C (-4° to 158° F) -40° to 80° C (-40° to 176° F) ± 1% ± 3% (<100A direct) ± 0.5 second ± 15% (<100A) ± 0.5% of nominal voltage ± 1% (<100A direct) 10 W 3 IP20 10-95%, non-condensing per IEC 68-2-3 7 in.-lbs. IEC 61000-4-2, Level 3, 6kV contact, 8kV air IEC 61000-4-6, Level 3 10V IEC 61000-4-3, Level 3 10 V/m IEC 61000-4-4, Level 3, 3.5 kV input power 100kA 61000-4-5 Level 3, 2kV line-to-line; Level 4, 4kV line-to-ground C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line Meets UL508 (2 x rated V + 1000V for 1 minute) IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse UL508, UL1053 IEC 60947-1, IEC 60947-5-1 0.65" with insulation 3.05 H x 3.85 W x 5.05 D in. (77.47 x 97.79 x 128.27 mm) 1.2 lbs. (544.31 g) Surface mount (4 - #8 screws) or DIN Rail Mount

** Network adjustable only

Enclosure Dimensions



inches (millimeters)

How to order:

Part Number: 777-KW/HP-P2

SymCom
 222 Disk Drive
 Rapid City, SD 57701
 www.SymCom.com

SSAC
 8242 Loop Rd
 Baldwinsville, NY 13027
 www.SSAC.com

CustomerService@SymCom.com • TechnicalSupport@SymCom.com
 800.843.8848 • 605.348.5580 • 605.348.5685 fax



ENGINEERING SPECIFICATION

SYMCOM MODELS 777-KW/HP-P2, 777-575-KW/HP-P2, 777-HVR-KW/HP-P2, 777-LR-KW/HP-P2

Power Monitor

PART 1 GENERAL

1.1 REFERENCES

- A. UL 508 Industrial Control Equipment – Underwriters Laboratories
- B. IEC 60947 Low Voltage Switchgear and Controlgear – International Electrotechnical Commission
- C. CSA C22.2 No. 14 Industrial Control Equipment – Canadian Standards Association
- D. ANSI/IEEE C62.41 – American National Standards Institute/Institute of Electrical & Electronics Engineers
- E. MODBUS over Serial Line Specification and Implementation Guide V1.02
- F. UL 1053 Ground-Fault Sensing and Relaying Equipment – Underwriters Laboratories

1.2 WARRANTY

- A. **Manufacturer Warranty:** The manufacturer shall guarantee the equipment to be free from material and workmanship defects for a period of five years from the date of manufacture when installed and operated according to the manufacturer's requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

For 777-KW/HP-P2

The equipment specified shall be the Model 777-KW/HP-P2, manufactured by SymCom, Inc.

For 777-575-KW/HP-P2

The equipment specified shall be the Model 777-575-KW/HP-P2, manufactured by SymCom, Inc.

For 777-HVR-KW/HP-P2

The equipment specified shall be the Model 777-HVR-KW/HP-P2, manufactured by SymCom, Inc.

For 777-LR-KW/HP-P2

The equipment specified shall be the Model 777-LR-KW/HP-P2, manufactured by SymCom, Inc.

2.2 DESCRIPTION

- A. **Regulatory Requirements:**
 1. The equipment shall be UL Listed as type NKCR—Industrial Control Equipment-Motor Controllers-Auxiliary Devices.
 2. The equipment shall be ULC Listed as type NKCR7—Industrial Control Equipment-Motor Controllers-Auxiliary Devices Certified for Canada.
 3. The equipment shall be CE marked for use in the European Union and evaluated against IEC 60947 Low Voltage Switchgear and Controlgear.
 4. The equipment shall be CSA certified as class 3211-03—Industrial Control Equipment-Motor Controllers-Auxiliary Devices.

2.3 PERFORMANCE/DESIGN CRITERIA: 3-PHASE ELECTRONIC OVERLOAD RELAY

- A. **Protective Relay Functions**
 1. The equipment shall provide protection against the following conditions:
 - a. Voltage single-phase/phase loss
 - b. Phase reversal
 - c. Low voltage
 - d. High voltage
 - e. Voltage unbalance
 - f. Rapid cycling
 - g. Undercurrent
 - h. Overcurrent
 - i. Current unbalance
 - j. Current single-phase/phase loss
 - k. Low control voltage
 - l. Ground fault
 - m. Contact failure
 - n. Low power
 - o. High power



B. Communication Capabilities

1. The equipment shall provide the following communications capabilities when combined with the appropriate SymCom network communications modules (Visit www.symcom.com for the current list of communication modules):
 - a. Modbus RTU
 - b. Modbus TCP
 - c. DeviceNet™
 - d. Profibus
2. The equipment interface shall have the capability of connecting to the following systems:
 - a. HMI (Human-Machine Interface)
 - b. SCADA (Supervisory Control and Data Acquisition)
 - c. DCS (Distributed Control System)
 - d. PLC (Programmable Logic Controllers)
 - e. SymCom Model RM-1000 Modbus remote display
 - f. SymCom Model RM-2000 Modbus remote display
3. The equipment shall support the following communication parameters:
 - a. 9600 baud, Even parity, and 1 stop bit
 - b. 9600 baud, Odd parity, and 1 stop bit
 - c. 9600 baud, No parity, and 1 stop bit
 - d. 19200 baud, Even parity, and 1 stop bit
 - e. 19200 baud, Odd parity, and 1 stop bit
 - f. 19200 baud, No parity, and 1 stop bit
4. The equipment shall provide setpoints that are readable and writable via the Modbus RTU, Modbus TCP and DeviceNet™ interfaces.
5. The equipment shall provide the ability to energize and de-energize the relay via the Modbus RTU, Modbus TCP, Profibus and DeviceNet™ interfaces.
6. The equipment shall provide a Modbus network watchdog with a 10-second trip delay to trip the relay when Modbus communication is lost.
7. The equipment shall provide two programmable Modbus assemblies for reading large blocks of data.
8. The equipment shall provide configurable bus pre-bias/pre-polarization and post-bias/post -polarization on either side of the RS-485 transmission eliminating the need for a biasing terminator.
9. The equipment shall provide an 8 bit Modbus memory map.
10. The equipment shall provide a 16 bit Modbus memory map.

C. Network Capabilities

1. The equipment shall provide registers to read the following real-time values:
 - a. L1-L2 line voltage
 - b. L2-L3 line voltage
 - c. L3-L1 line voltage
 - d. Average line voltage
 - e. Phase A current
 - f. Phase B current
 - g. Phase C current
 - h. Average phase current
 - i. Voltage unbalance
 - j. Current unbalance
 - k. Current scale factor
 - l. Power factor
 - m. Ground fault current
 - n. Restart Delay 1 (RD1) time remaining
 - o. Restart Delay 2 (RD2) time remaining
 - p. Restart Delay 3 (RD3) time remaining
 - q. Power in KW
 - r. Trip status of the following:
 - 1) Manual reset status
 - 2) Network off command status
 - 3) Contact failure
 - 4) Undercurrent
 - 5) Overcurrent
 - 6) Ground fault
 - 7) Current unbalance
 - 8) Current single-phase
 - 9) Low control voltage
 - 10) Low power
 - 11) High power
 - s. Status of the following:
 - 1) Low voltage pending



- 2) High voltage pending
 - 3) Voltage unbalance pending
 - 4) Undercurrent pending
 - 5) Reverse-phase pending
 - 6) Current unbalance pending
 - 7) Voltage single-phase pending
 - 8) Current single-phase pending
 - 9) Overcurrent pending
 - 10) Ground fault pending
 - 11) Low control voltage pending
 - 12) ABC/CBA phase rotation
 - 13) Global warning
 - 14) Relay status
 - 15) Low power pending
 - 16) High power pending
 - t. Last fault 1
 - u. Last fault 2
 - v. Last fault 3
 - w. Last fault 4
 - x. Last fault 5
 - y. Last fault 6
 - z. Last fault 7
 - aa. Last fault 8
 - bb. Last fault 9
 - cc. Last fault 10 (oldest fault)
 - dd. Unit ID
 - ee. Model code
 - ff. Software revision
 - gg. Thermal capacity remaining
 - hh. Start count
 - ii. Start duration 1
 - jj. Start duration 2
 - kk. Start duration 3
 - ll. Start duration 4
 - mm. Warning status of the following:
 - 1) Low voltage warning
 - 2) High voltage warning
 - 3) Voltage unbalance warning
 - 4) Overcurrent warning
 - 5) Undercurrent warning
 - 6) Current unbalance warning
 - 7) Ground fault warning
 - 8) Low frequency warning
 - 9) High frequency warning
 - 10) High power warning
 - 11) Low power warning
 - nn. Line frequency
 - oo. OC Time to trip
2. The equipment shall provide the following readable/writable setpoints:
- a. Low voltage trip point
 - b. High voltage trip point
 - c. Voltage unbalance trip point
 - d. Current multiplier, used to scale the current reading properly when Current Transformers (CTs) are used
 - e. Current divisor, used to scale the current reading properly when amp turns are used
 - f. Overcurrent trip point
 - g. Undercurrent trip point
 - h. Current unbalance trip point
 - i. Trip class setpoint
 - j. Restart Delay 1 setpoint
 - k. Restart Delay 2 setpoint
 - l. Restart Delay 3 setpoint
 - m. Number of restarts after an undercurrent fault (#RU) setpoint
 - n. Number of restarts after a fault other than undercurrent (#RF) setpoint
 - o. Undercurrent trip delay setpoint
 - p. Ground fault trip point
 - q. Modbus address setpoint
 - r. Network status setpoint to enable the following features:
 - 1) Network watchdog
 - 2) Network program disable
 - 3) Front panel lock



- s. Communication parameters setpoint to set the following:
 - 1) 9600 baud, Even parity, and 1 stop bit
 - 2) 9600 baud, Odd parity, and 1 stop bit
 - 3) 9600 baud, No parity, and 1 stop bit
 - 4) 19200 baud, Even parity, and 1 stop bit
 - 5) 19200 baud, Odd parity, and 1 stop bit
 - 6) 19200 baud, No parity, and 1 stop bit
 - 7) Enable/disable front porch
 - 8) Enable/disable back porch
- t. Trip enable setpoint to enable the following:
 - 1) Ground fault trip
 - 2) Voltage unbalance trip
 - 3) Current unbalance trip
 - 4) Undercurrent trip
 - 5) Overcurrent trip
 - 6) Low power trip
 - 7) High power trip
- u. Motor run hours
- v. Low control voltage trip delay
- w. Low control voltage trip percentage
- x. Configuration control setpoint to set the following options:
 - 1) Undercurrent Trip Delay in minutes or seconds
 - 2) Restart Delay 1 in minutes or seconds
 - 3) Restart Delay 2 in minutes or seconds
 - 4) Restart Delay 3 in minutes or seconds
 - 5) High power trip delay in minutes or seconds
 - 6) Zero L2 and L3 voltage readings
 - 7) Single-phase voltage monitoring
 - 8) Single-phase current monitoring
 - 9) Disabled reverse-phase protection
 - 10) Enable low control voltage trips
 - 11) Enable stall 1
 - 12) Enable stall 2
 - 13) CBA phase rotation is not a fault
 - 14) RD1 is loaded on power-up
 - 15) RD1 is loaded on current loss
 - 16) Enable emergency run
- y. Linear overcurrent trip delay
- z. Current unbalance trip delay
- aa. Motor acceleration enable setpoint for the following faults:
 - 1) Contact failure
 - 2) Undercurrent/low power
 - 3) Ground fault
 - 4) Current unbalance
 - 5) Current single-phase
 - 6) Low control voltage
 - 7) High power
- bb. Motor acceleration trip delay
- cc. Hot overcurrent percentage, increases the thermal capacity consumption rate by this percentage, 1 minute after motor start-up.
- dd. Command line to respond to the following commands:
 - 1) Network program enable
 - 2) Network program disable
 - 3) Clear run hours
 - 4) Clear fault history
 - 5) Enable network watchdog
 - 6) Disable network watchdog
 - 7) Start the motor
 - 8) Stop the motor
- ee. Modbus back door address
- ff. Warning enable setpoint to enable the following warnings:
 - 1) Low voltage warning
 - 2) High voltage warning
 - 3) Voltage unbalance warning
 - 4) Overcurrent warning
 - 5) Undercurrent warning
 - 6) Current unbalance warning
 - 7) Ground fault warning
 - 8) Low frequency warning
 - 9) High frequency warning



- 10) High power warning
- 11) Low power warning
- gg. Warning level setpoint to set the desired warning level:
 - 1) Low voltage warning level
 - 2) High voltage warning level
 - 3) Voltage unbalance warning level
 - 4) Overcurrent warning level
 - 5) Undercurrent warning level
 - 6) Current unbalance warning level
 - 7) Ground fault warning level
 - 8) Low power warning level
 - 9) High power warning level
 - 10) High frequency warning level
 - 11) Low frequency warning level
- hh. Warning delay enable setpoint to enable the following warning delay:
 - 1) Low voltage warning delay
 - 2) High voltage warning delay
 - 3) Voltage unbalance warning delay
 - 4) Overcurrent warning delay
 - 5) Undercurrent warning delay
 - 6) Current unbalance warning delay
 - 7) Ground fault warning delay
 - 8) Low power warning delay
 - 9) High power warning delay
- ii. Stall 1 trip delay
- jj. Stall 1 trip inhibit delay
- kk. Stall 1 trip percentage
- ll. Stall 2 trip delay
- mm. Stall 2 trip inhibit delay
- nn. Stall 2 trip percentage
- oo. Ground fault trip delay
- pp. Voltage faults enable setpoint for the following faults:
 - 1) Low voltage enable
 - 2) High voltage enable
 - 3) Voltage unbalance enable
 - 4) Reverse-phase enable
 - 5) Voltage single-phase enable
- qq. Ground fault scale factor
- rr. Fault count
- ss. Modbus assembly 500 words 1-37
- tt. Modbus assembly 501 words 1-23

D. Capabilities and Features

1. Inputs

For the 777-KW/HP-P2, 777-575-KW/HP-P2, 777-HVR-KW/HP-P2

- a. The equipment shall require no external CT's for motors with full load current ratings between 1 and 90 Amps.
- b. The equipment shall require external CT's for motors with full load current ratings greater than 90 Amps.

For the 777-LR-KW/HP-P2

- a. The equipment shall require no external CT's for motors with full load current ratings between 1 and 9 Amps.
- b. The equipment shall require external CT's for motors with full load current ratings between 10 and 800 Amps.

For All Models

- c. The equipment shall require a 3-phase input voltage of:
 - 1) 200-480VAC for the 777-KW/HP-P2
 - 2) 500-600VAC for the 777-575-KW/HP-P2
 - 3) 340-480VAC for the 777-HVR-KW/HP-P2
 - 4) 200-480VAC for the 777-LR-KW/HP-P2
- d. The equipment shall require a 3-phase 50/60 Hz input voltage.
- e. The equipment shall provide a connection to an optional external remote reset switch.
- f. The equipment shall provide a connection to a 9V battery used for programming without line power.

3. Outputs

For the 777-KW/HP-P2, 777-575-KW/HP-P2, 777-LR-KW/HP-P2

- a. The equipment shall include SPDT output relay contacts pilot duty rated 480VA @ 240VAC.
- b. The equipment shall include SPDT output relay contacts general purpose rated 10A @ 240VAC.

For the 777-HVR-KW/HP-P2

- a. The equipment shall include SPDT output relay contacts pilot duty rated 470VA @ 600VAC

4. The equipment shall include the following front panel setpoint ranges:

For the 777-KW/HP-P2



- a. an adjustable low voltage (LV) setpoint range of 170-524VAC
- b. an adjustable high voltage (HV) setpoint range of 172-528VAC

For the 777-575-KW/HP-P2

- a. an adjustable low voltage (LV) setpoint range of 450-649VAC
- b. an adjustable high voltage (HV) setpoint range of 451-660VAC

For the 777-HVR-KW/HP-P2

- a. an adjustable low voltage (LV) setpoint range of 340-523VAC
- b. an adjustable high voltage (HV) setpoint range of 341-528VAC

For the 777-LR-KW/HP-P2

- a. an adjustable low voltage (LV) setpoint range of 170V-524VAC
- b. an adjustable high voltage (HV) setpoint range of 172-528VAC

For the 777-KW/HP-P2, 777-575-KW/HP-P2, and 777-HVR-KW/HP-P2

- c. an adjustable multiplier (MULT) setpoint range of 1-10, 100, 150, 200, 300, 400, 500, 600, 700, 800
- d. an adjustable overcurrent (OC) setpoint range of (20-100A) + MULT or 80-140% of CT Primary
- e. an adjustable low power (LP) setpoint range of 0.01-650kW or 0.01-871hp or 0 (off).
- f. an adjustable ground fault current (GF) setpoint range of either (3-20A) + MULT or 12-40% of CT Primary or OFF

For the 777-LR-KW/HP-P2

- c. an adjustable multiplier (MULT) setpoint range of 1-2, 25, 50, 75, 100, 150, 200, 300, 400, 500, 600, 700, 800
- d. an adjustable overcurrent (OC) setpoint range of (2.0-10.0A) + MULT or 80-140% of CT Primary
- e. an adjustable low power (LP) setpoint range of 0.01-650kW or 0.01-871hp or 0 (off).
- f. an adjustable ground fault current (GF) setpoint range of either (0.3-2.0A) + MULT or 12-80% of CT Primary, OFF

For All Models

- g. an adjustable voltage unbalance (VUB) setpoint range of 2-25% or 999 (disabled)
 - h. an adjustable current unbalance (CUB) setpoint range of 2-50% or 999 (disabled)
 - i. an adjustable trip class (TC) setpoint range of 02-60 or J2-J60 and L00-L60, or off
 - j. an adjustable rapid-cycle timer 1 (RD1) of 0-999 seconds or 0 to 546 minutes
 - k. an adjustable motor cool-down timer (RD2) of 2-500 minutes or 2-500 seconds
 - l. an adjustable undercurrent restart delay timer (RD3) of 2-500 minutes or 2-500 seconds or A (automatic)
 - m. an adjustable number of restarts after undercurrent (#RU) setpoint range of 0-4, A (automatic)
 - n. an adjustable device communication address (ADDR) setpoint range of A01-A99
 - o. an adjustable number of restarts after all other faults (#RF) setpoint range of 0, 1, oc1, 2, oc2, 3, oc3, 4, oc4, A, or ocA, where an oc prefix means that overcurrent trips are included in the restart counts, otherwise overcurrent is not included.
 - p. an adjustable communications parameter (COMM) set to C00-C07
3. The equipment shall provide ground fault protection that meets UL1053 requirements.
 4. The equipment shall provide three independent adjustable restart delays, one for power-up and rapid-cycle protection, one for overcurrent, current unbalance, current single-phasing, low control voltage and high power faults and another one for undercurrent and low power faults.
 5. The equipment shall provide RD1 to be configured as follows:
 - a. RD1 is rapid-cycle and power-up timer
 - b. RD1 is only a power-up timer
 - c. RD1 is only a rapid-cycle timer
 - d. RD1 is disabled
 6. The equipment shall provide an undercurrent/low power trip delay.
 7. The equipment shall provide an overcurrent trip delay.
 8. The equipment shall provide a current unbalance trip delay.
 9. The equipment shall provide a higher power trip function.
 10. The equipment shall provide a configurable high power trip delay.
 11. The equipment shall provide a configurable ground fault trip delay.
 12. The equipment shall provide for manual or automatic restart after a fault.
 13. The equipment shall display the last trip fault.
 14. The equipment shall provide two independent jam/stall timers that trip the relay providing overcurrent protection in the case of jam or stall events.
 - a. Each timer shall have an independent adjustable inhibit time.
 - b. Each timer shall have an independent adjustable trip delay.
 - c. Each timer shall have an independent adjustable overcurrent trip level.
 15. The equipment shall provide a motor acceleration delay to prevent tripping on motor startup for the following faults:
 - a. Contact failure
 - b. Undercurrent/low power
 - c. Ground fault
 - d. Current unbalance
 - e. Current single-phase
 - f. Low control voltage
 - g. High power



16. The equipment shall provide a motor start counter.
17. The equipment shall provide a fault counter.
18. The equipment shall store the last 10 motor faults.
19. The equipment shall record the duration of the last four motor run times in minutes.
20. The equipment shall provide a linear overcurrent trip delay.
21. The equipment shall provide a method to enable/disable the following trip conditions:
 - a. Ground fault
 - b. Voltage unbalance
 - c. Current unbalance
 - d. Undercurrent
 - e. Overcurrent
 - d. Low Power
 - f. High Power
22. The equipment shall provide a motor run hour meter.
23. The equipment shall provide a front panel tamper guard, to prevent accidental setpoint changes.
24. The equipment shall provide the ability to clear the last fault using the front panel.
25. The equipment shall provide a hot overcurrent percentage, which increases the thermal capacity consumption rate by this percentage, 1 minute after motor start-up.
26. The equipment shall provide the ability to set the communication parameters using the front panel.
27. The equipment shall provide an indication of the time left before tripping on an overcurrent fault.
28. The equipment shall provide automatic restart timing after undercurrent when RD3 is set to A as follows:
 - a. Run time >1 hr the next restart delay will be 6 minutes
 - b. Run time 30-59.99 minutes the next restart delay will be 15 minutes
 - c. Run time 15-29.99 minutes the next restart delay will be 30 minutes
 - d. Run time <15 minutes the next restart delay will be 60 minutes
29. The equipment shall provide warning indication for the following conditions:
 - a. Low voltage
 - b. High voltage
 - c. Voltage unbalance
 - d. Overcurrent
 - e. Undercurrent
 - f. Current unbalance
 - g. Ground fault
 - h. Low frequency
 - i. High frequency
 - j. High power
 - k. Low power
30. The equipment shall provide independent warning levels for the following warnings:
 - a. Low voltage warning
 - b. High voltage warning
 - c. Voltage unbalance warning
 - d. Overcurrent warning
 - e. Undercurrent warning
 - f. Current unbalance warning
 - g. Ground fault warning
 - h. Low frequency warning
 - i. High frequency warning
 - j. High power
 - k. Low power
31. The equipment shall provide independent warning delays for the following warnings:
 - a. Low voltage warning
 - b. High voltage warning
 - c. Voltage unbalance warning
 - d. Overcurrent warning
 - e. Undercurrent warning
 - f. Current unbalance warning
 - g. Ground fault warning
 - h. High power
 - i. Low power
32. The equipment shall provide line frequency measurements.
33. The equipment shall provide a method to disable the following voltage faults:
 - a. Low voltage enable
 - b. High voltage enable
 - c. Voltage unbalance enable



- d. Reverse-phase enable
 - e. Voltage single-phase enable
34. The equipment shall be able to set either ABC or CBA phase rotation as a fault..
- E. Timing Requirements
- 2. The equipment shall provide a ground fault trip delay that follows an inverse time curve with a maximum trip time of 8 seconds and a minimum trip time of 2 seconds.
 - 3. The equipment shall provide a current unbalance trip delay that follows an inverse time curve with a maximum trip time of 30 seconds and a minimum trip time of 2 seconds.
 - 4. The equipment shall provide an overcurrent trip delay time that follows an inverse time trip curve.
- F. Accuracy Requirements
- 2. The equipment shall provide a timing accuracy on all timers of ± 0.5 second.
 - 3. The equipment shall provide a current measurement accuracy of $\pm 3\%$ for currents < 100 amps direct for A, B, C phase currents.
 - 4. The equipment shall provide a voltage measurement accuracy of $\pm 1\%$.
 - 5. The equipment shall provide a ground fault measurement accuracy of $\pm 15\%$ ($< 100A$).
- G. Human Interface Features
- 2. The equipment shall provide an adjustment dial to set the following setpoints:
 - a. Low Voltage (LV)
 - b. High Voltage (HV)
 - c. Voltage Unbalance (VUB)
 - d. Multiplier (MULT)
 - e. Overcurrent (OC)
 - f. Low Power (LP)
 - g. Current Unbalance (CUB)
 - h. Trip Class (TC)
 - i. Rapid-Cycle Timer (RD1)
 - j. Motor Cool Down Timer (RD2)
 - k. Undercurrent Restart Delay Timer (RD3)
 - l. Number Of Restarts After Undercurrent (#RU)
 - m. Device Communication Address (ADDR)
 - n. Number Of Restarts After Other Faults (#RF)
 - o. Communications setting (COM)
 - p. Power Scale (PWS)
 - q. Ground Fault (GF)
 - 3. The equipment shall provide an adjustment dial to view the following runtime information:
 - a. L1-L2 line voltage
 - b. L2-L3 line voltage
 - c. L3-L1 line voltage
 - d. Measured voltage unbalance
 - e. A phase current
 - f. B phase current
 - g. C phase current
 - h. Measured current unbalance
 - i. Measured ground fault current
 - j. Kilowatt (KW)
 - k. Horsepower (HP)
 - 4. The equipment shall provide a 3-digit 7-segment display for viewing operating parameters of the device.
 - 5. The equipment shall provide a push button switch for the following functions:
 - a. Programming the device
 - b. Viewing the last fault
 - c. Resetting the device after a fault
 - d. Resetting the device during a restart delay
 - e. Activate emergency run
- H. Electromagnetic Compatibility
- 2. The equipment shall be immune to electrostatic discharge per IEC 61000-4-2, Level 3, 6kV contact discharge and 8kV air discharge.
 - 3. The equipment shall be immune to radiated radio frequency emissions per IEC 61000-4-3, Level 3. Specified limits shall be 10V/m.
 - 4. The equipment shall be immune to conducted radio frequency emissions per IEC 61000-4-6, Level 3. Specified limits shall be 10V.



5. The equipment shall be immune to electrical fast transient bursts exceeding IEC 61000-4-4, Level 3. Specified limits shall be 3.5kV input power.
 6. The equipment shall be immune to electrical surges per IEC 61000-4-5, Level 3. Specified limits shall be 2kV line-to-line and Level 4, 4kV line-to-ground.
 7. The equipment shall be immune to surge and ring wave per ANSI/IEEE C62.41. Specified limits shall be 6kV line-to-line.
- I. Vibration/Shock Requirements
2. The equipment shall withstand vibrations per IEC 68-2-6. Specified limits shall be 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis.
 3. The equipment shall withstand shocks per IEC 68-2-27. Specified limits shall be 30g, 3 axis, 11ms duration, half-sine pulse.
- J. Enclosure Class of Protection: The equipment shall provide IEC IP20 (finger-safe) protection.
- K. Short Circuit Requirements
2. The equipment shall provide a short circuit rating of 100kA.
- L. Environmental Requirements
2. The equipment shall operate continuously without derating in ambient temperatures of -20° to 70°C (-4° to 158°F).
 3. The equipment shall operate continuously without derating in relative humidity of up to 95% non-condensing per IEC 68-2-3.
 4. The equipment shall operate properly after storage in ambient temperatures of -40° to 80°C (-40° to 176°F).
- M. Dimensions: The equipment dimensions shall not exceed 3.0" in height X 3.6" in width X 5.1" in depth.
- N. Mounting:
2. The equipment shall be mountable on standard 35mm DIN rail.
 3. The equipment shall be surface mountable.
- O. Conformal coating:
2. The equipment shall contain harsh environment conformal coating to help extend product life and to protect from hostile environments including moisture, temperature variations, salt spray, organic attack (fungus), and aggressive chemicals and vapors.

End of Section

INSTALLATION INSTRUCTIONS

Revision A1
Rapid City, SD, USA, 01/2010

MODEL 777-KW/HP-P2 777-575-KW/HP-P2 POWER MONITOR



II-777-KWHP-P2-B

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DANGER!



HAZARDOUS VOLTAGES MAY BE PRESENT DURING INSTALLATION.

Electrical shock can cause death or serious injury.

Installation should be done by qualified personnel following all national, state and local electrical codes.



**BE SURE POWER IS DISCONNECTED PRIOR TO INSTALLATION!
FOLLOW NATIONAL, STATE AND LOCAL CODES.
READ THESE INSTRUCTIONS ENTIRELY BEFORE INSTALLATION.**

WARNING!

Hazardous Voltage. Failure to follow these instructions can result in death, serious injury, or equipment damage.

Power must be disconnected prior to attaching and/or using the battery cable.

Damage to the device or serious injury may occur if the battery programming feature is used while power is applied. Always follow proper safety procedures for removing and securing the power source before connecting the battery cable.

The battery cable cannot be used when power is applied to the device. To program the device when it is powered, the user must utilize a network programming option.

The 777-KW/HP-P2 is a power monitor that is fully programmable for customized protection. The 777-KW/HP-P2 is designed to protect 3-phase systems with operating voltages of 200-480VAC (500-600VAC for the Model 777-575-KW/HP-P2). The output relay is a Form C contact, which can control a contactor or other device within the output relay contact rating. It has advantages over current monitors in low speed motor applications (less than 1800 rpm), lower power applications and in lightly loaded applications.

The 777-P2 can be safely programmed prior to installation by supplying power with a 9V battery. See Figure 4 in the PROGRAMMING section. DO NOT connect the battery to the unit when line voltage is present. The 777-KW/HP-P2 **cannot** be tested for proper operation or communications using a 9V battery. For testing purposes, 3-phase power must be used with a minimum voltage of 200VAC (500VAC for the Model 777-575-KW/HP-P2). Follow all safety warnings when dealing with hazardous voltages.

CONNECTIONS

1. Disconnect power and verify line and control power are off.
2. Using the four corner tabs or the DIN rail mount, install the 777-KW/HP-P2 directly above or below the contactor. To mount on a DIN rail, hook the top clips first then apply downward pressure until the lower clips snap onto the rail.
3. a) For amperages from 20-90 amps, insert the motor conductors through the holes marked A, B, and C. Ensure the motor phase conductors correspond with the round hole designations, i.e. the A phase conductor should go through the round hole marked "A". See Figure 1 for a typical wiring diagram.

b) For amperages less than 20 amps, loop the motor conductors according to Table 1. Figure 2 shows an example of the looping required for current ranging from 12-20 amps (MULT=2).

c) For amperages greater than 90 amps, external CTs (current transformers) are required. SymCom recommends using CTs with terminal connections for easier installation. All CT secondaries must make five passes through the round holes on the MotorSaver®Plus. See Figure 3 for a typical wiring diagram using external CTs.

NOTE: Pay close attention to the wiring diagrams to eliminate any errors when communicating power factor information over a network. The L2 phase conductor must pass through the B current measurement hole for proper operation.

4. Connect the 3-phase power from the line side of the contactor to L1, L2, and L3 terminals using 12-18 AWG copper wire. These should be tightened to 7 in.-lbs., max.
5. Connect the control circuit wires to the appropriate terminals. The relay is designed for fail-safe operation; the NO (normally open) contact should be in series with the coil on the contactor for motor control (see Figure 1). For alarm circuits, the NC (normally closed) contact is in series with the alarm circuitry.

Recommended Full Load Amps	OC Range (Amps)	# of Passes through each Window	MULT (CT Ratio)
2-2.5	2-10	10	10
2.5-3	2.2-11.1	9	9
3-3.5	2.5-12.5	8	8
3.5-4	2.8-14.3	7	7
4-5	3.3-16.7	6	6
5-6	4-20.1	5	5
6-8	5-25.1	4	4
8-12	6.6-33.5	3	3
12-20	10-50.3	2	2
20-90	20-100	1	1
80-110	80-140	5	100 (100:5)
110-160	120-210	5	150 (150:5)
160-220	160-280	5	200 (200:5)
220-320	240-420	5	300 (300:5)
320-420	320-560	5	400 (400:5)
400-520	400-700	5	500 (500:5)
480-600	480-840	5	600 (600:5)
540-700	560-980	5	700 (700:5)
560-800	640-992/FFF	5	800 (800:5)

Table 1: Wiring Configuration Based on Motor Full Load Amps

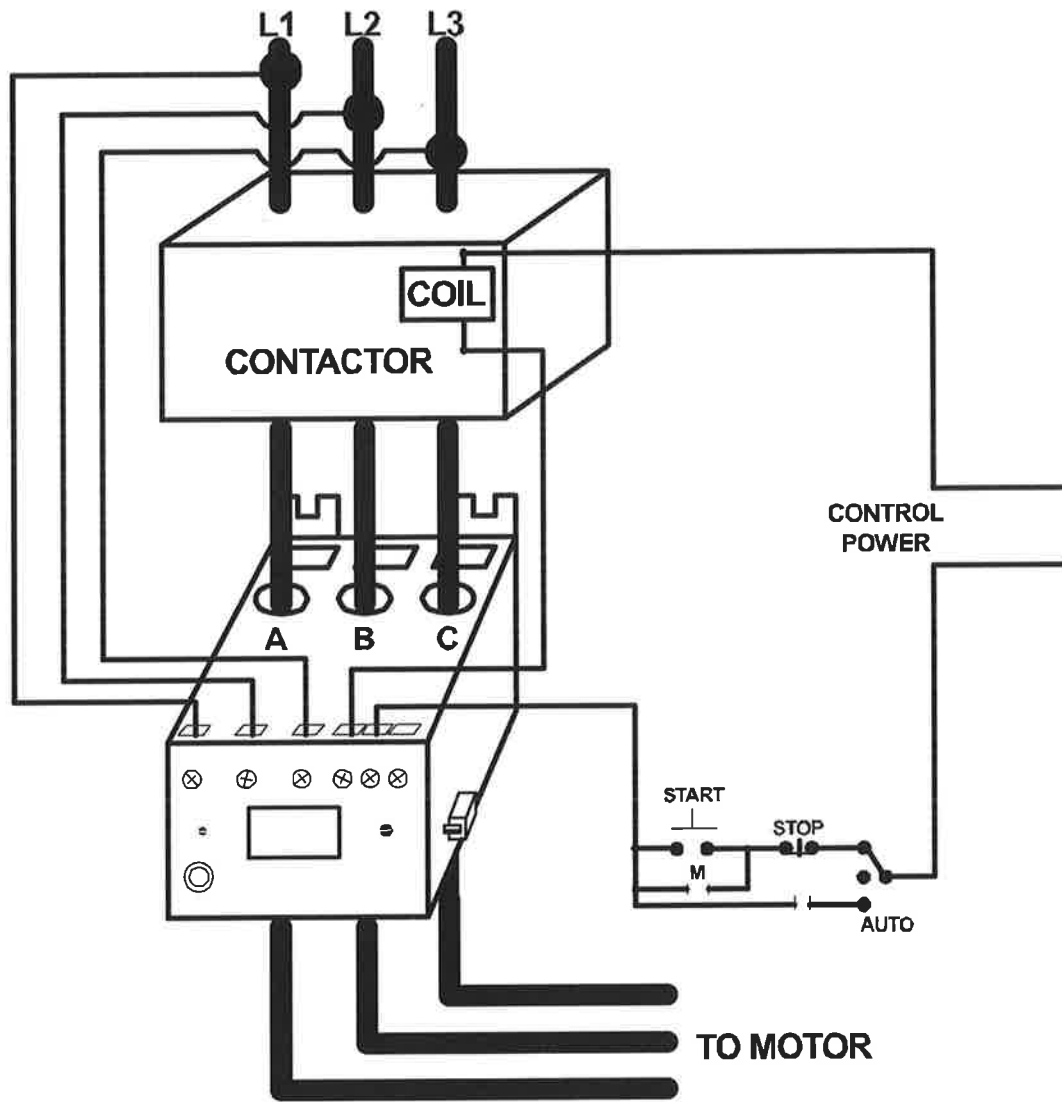


Figure 1: Typical Wiring Diagram

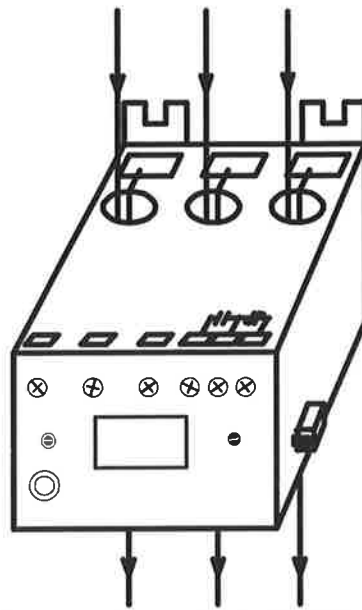


Figure 2: Looping Example for 12-20A, MULT = 2

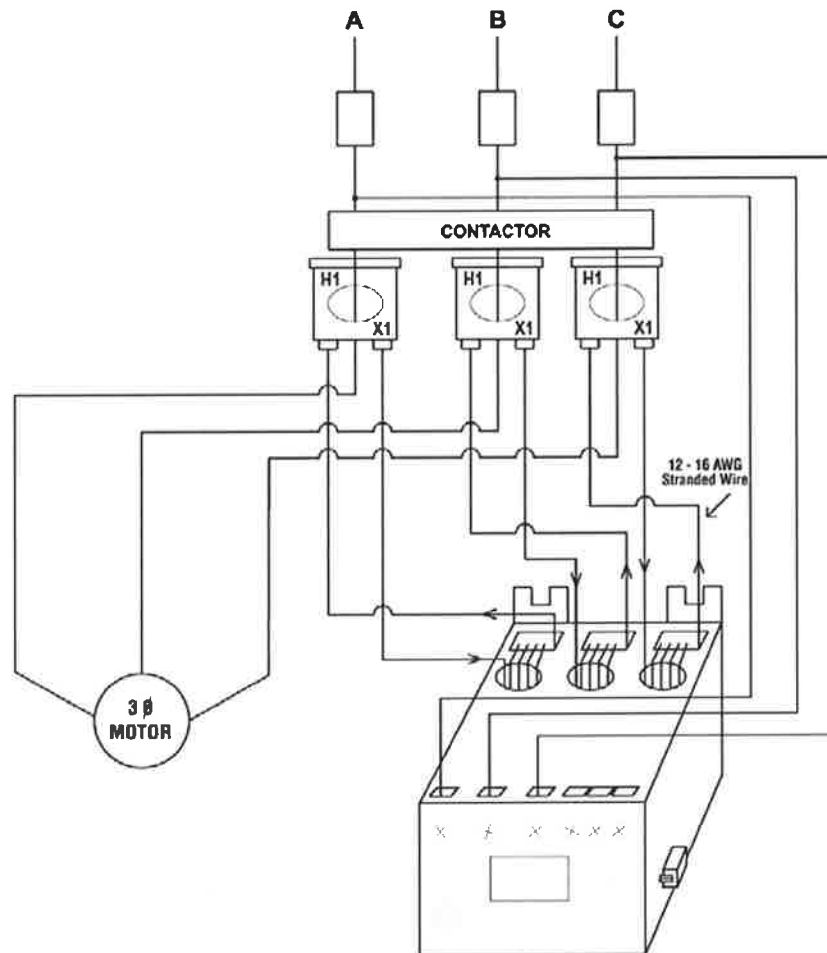


Figure 3: Typical Wiring Using External CTs¹

¹ All CTs must face the same direction, and all CT secondaries must be wired identically, i.e. all X1 terminals enter the main (round) window and return to H1 terminal after exiting the loop conductor window (rectangle). Every CT secondary must make 5 passes through the corresponding main conductor window. SymCom recommends using CTs with terminals to simplify installation.

PROGRAMMING

To program prior to installation, connect the 9V battery cable to the pins on the left side of the unit (when looking at the display), and then attach a standard 9V battery to the cable. See Figure 4. The 9V battery cable is keyed for proper installation. If the cable is connected improperly, the 777-KW/HP-P2 will not power the display. **DO NOT** connect the battery when line voltage is present. The 777-KW/HP-P2 **cannot** be tested for proper operation or communications using a 9V battery. For testing purposes, 3-phase power must be used with a minimum voltage of 200VAC (500VAC for the Model 777-575-KW/HP-P2). Follow all safety warnings when dealing with hazardous voltages.

1. Rotate the MODE SELECT switch to the parameter to be programmed. It is recommended that PWS be programmed first.
2. Press and hold the RESET/PROGRAM button.
3. While holding the RESET/PROGRAM button, rotate the DISPLAY/PROGRAM knob until the proper setting for the parameter that is being programmed is displayed.
4. Release the RESET/PROGRAM button. This stores the new parameter in the nonvolatile memory. If the number changes back to what it was before programming, then the tamper guard is on and will need to be unlocked before programming can be completed (see Tamper Guard).
5. Continue steps 1-4 until all parameters are programmed.

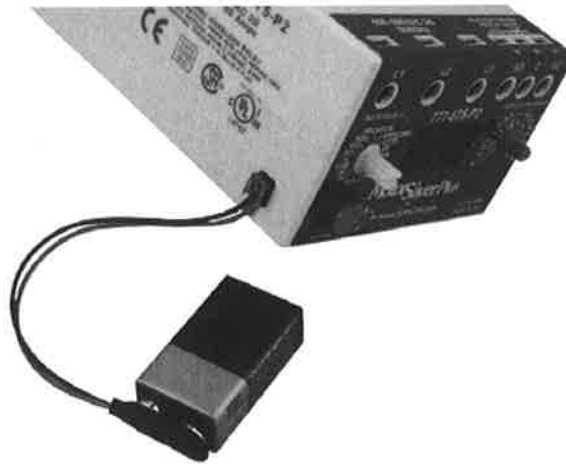


Figure 4: Proper Position of the Battery Cable

PROGRAMMABLE PARAMETERS

The following settings **MUST** be programmed by the user in order to provide proper protection for the application. Settings vary by situation and application and should be selected and tested for each unique installation. All parameters are actual values except for the VUB and CUB settings; these are programmed as percentages. The range each parameter can be programmed is found in the electrical specifications table. See Programming Example for sample setup instructions. Failure to program all setpoints could result in nuisance tripping or prevent the device from protecting the motor. Always use the proper CTs for the motor full load amperage (FLA).

LV/HV - Low Voltage/High Voltage. The recommended settings for LV (low voltage) and HV (high voltage) according to the NEMA MG1 standard are $\pm 10\%$ of the motor's nameplate voltage. Generally, the motor manufacturer should be contacted to verify these limits. High and low voltage trips are based on average voltage measured. Never set LV higher than HV.

Example: Nameplate voltage = 230 V
LV = $90\% \times 230 = 207$ V
HV = $110\% \times 230 = 253$ V

VUB - Voltage Unbalance. The NEMA MG1 standard says a motor should not be operated above a 1% voltage unbalance without derating the motor. Most utility supplied power sources have a difficult time sustaining a 1% VUB. The motor manufacturer should be consulted for an exact VUB setting. Setting VUB to 999 will disable voltage unbalance protection, but will not disable voltage single-phase protection. Voltage unbalance is calculated as follows:

$\% \text{Voltage Unbalance} = [(\text{Maximum deviation from the average}) / \text{Average}] \times 100\%$

Example: Measured line-line voltages = 203, 210, and 212. The average = $(203+210+212)/3 = 208.3$. The maximum deviation from the average is the greatest difference between the average voltage (208.3) and any one voltage reading: $212 - 208.3 = 3.7$, $210 - 208.3 = 1.7$ and $208.3 - 203 = 5.3$. The maximum deviation from the average is 5.3, thus voltage unbalance = $5.3/208.3 \times 100 = 2.5\%$.

MULT - MULT (multiplier) setting is found in Table 1. The MULT setting is determined by the number of passes of the motor leads or the size of external CTs and the full load amps of the motor the unit will be monitoring. MULT sets the trip point range for overcurrent and ground fault current faults. Set MULT first, then set OC and GF.

OC - Overcurrent. Is typically set to the service factor amperage (SFA) of the motor or 100-135% of motor full-load amps (FLA), which are determined by the motor manufacturer. If any one leg exceeds the OC setting, the 777-KW/HP-P2 will trip according to the Trip Class (TC) settings.

NOTE: When using external CTs, do not set OC greater than the thermal rating of the CTs

LP - LP (low power) setting is used to shut down the motor or pump on an underload condition (that is based on power instead of solely on current). LP can be set in either kilowatts (kW) or horsepower (hp) as determined by the PWS setting. Setting LP to 0 disables the underload trip feature.

NOTE: PWS must be set before setting LP.

CUB - Current Unbalance. SymCom recommends contacting the motor manufacturer for a specific setting. Current unbalance is calculated the same way voltage unbalance is calculated (see formula above). Setting CUB to 999 will disable current unbalance and current single-phase protection.

TC - Trip Class. Determines how quickly the 777-KW/HP-P2 will trip when an overcurrent (overload) condition is detected. TC is a dual-function setting—both a thermal trip class (NEMA standard) and a linear trip delay (in seconds) can be set.

While the standard trip classes are 5, 10, 15, 20, and 30, TC can be set from 2–60, with or without jam protection. The trip class setpoint is the time in seconds that the device will take to trip when any phase current is greater than or equal to 600% of the OC setpoint. These

additional “non-standard” trip classes allow the unit to follow a trip curve in-between the “standard” trip class curves shown in Figure 5.

Trip classes 2–60 can be set from approximately the 7 o'clock to 10 o'clock position with the DISPLAY/PROGRAM knob. Trip classes J02–J60, which include jam protection, can be set from approximately the 10 o'clock to 1 o'clock position. This additional jam protection feature, when enabled, is initiated 1 minute after the motor starts and provides a 2-second trip delay for motors exceeding 400% of the OC setting.

The linear overcurrent trip delay can be set from approximately the 1 o'clock to 5 o'clock position from 0–60 seconds (L00–L60) or to “OFF.” If TC is set to L00, the 777-KW/HP-P2 will trip off within 1 second after motor current reaches the OC setpoint. If both trip class and linear trip delay settings are programmed, the 777-KW/HP-P2 will follow the faster trip time. For example, TC is set to J15 and L20, and the amperage is 200% of the OC setting. Following the trip class 15 curve, the 777-KW/HP-P2 will trip off in approximately 100 seconds. Thus the 777-KW/HP-P2 will follow the linear trip delay setting, because it is faster, and will trip off in 20 seconds.

The motor manufacturer should be contacted for an exact TC setting. Table 3 describes the trip classes, and Figure 5 shows the trip class curves.

- RD1** - Restart Delay One. Rapid-cycle timer, in seconds (default). The purpose of this timer is to provide protection against short cycling and to allow adequate cool down time between motor starts. This timer is initiated when power is first applied to the unit. If no voltage fault conditions exists, the output relay will energize (the NO will close and the NC will open) as soon as RD1 timer expires. In most cases, this is set to 20-30 seconds. This should provide adequate protection for successive power outages or short cycling caused by other motor controls. This timer is also initiated when motor current goes to zero. Setting RD1 to zero will turn off this feature and ensure that when an alarm circuit is used, an alarm will sound only when there is a fault or power to the unit is lost.
- RD2** - Restart Delay Two. Referred to as a motor cool-down timer, in minutes (default). RD2 is used to restart the motor after a trip due to a current unbalance, current single-phasing, or an overcurrent condition. A setting of 5-10 minutes will give most motors adequate time to cool down after an overcurrent condition. The motor manufacturer should be contacted for an exact value.
- RD3** - Restart Delay Three. This timer, in minutes (default), only initiates after a low power trip and is referred to as a dry-well recovery timer in pumping applications. This is set according to the time it takes for the well to recharge after pumping dry. This setting varies widely by application and there is no typical setting. RD3 can be set from 2-500 minutes or to A to enable the automatic Dry-Well Recovery Calculator.

The Automatic Dry-Well Recovery Calculator allows the 777-KW/HP-P2 to automatically select a restart delay based on the run time of the last run cycle before tripping on a low power fault. Table 2 shows the next restart delay vs. run time. In general, a longer run time produces a shorter restart delay. This feature allows the 777-KW/HP-P2 to optimize running and rest times automatically.

Run Time	Next Restart Delay (minutes)	Starts/Hr
> 1Hr	6	10
30 min.- 59.99 min.	15	4
15 min.- 29.99 min.	30	2
< 15 min.	60	1

TABLE 2: Automatic Dry-Well Recovery Timer

#RU/ADDR - Restart Attempts (Underload/Address. The #RU/ADDR is a dual-function setting. #RU settings are displayed and selected by turning the DISPLAY/PROGRAM dial from approximately the 7 o'clock to 12 o'clock position. ADDR settings are displayed and selected by turning the DISPLAY/PROGRAM dial from approximately the 12 o'clock to 5 o'clock position.

#RU is the number of restarts the 777-KW/HP-P2 will attempt after a low power fault before the unit locks out and requires a manual reset. #RU can be set to 0, 1, 2, 3, 4, or A. This counter is cleared one minute after restarting if the 777-KW/HP-P2 does not trip again on low power.

If #RU is set to "0", the 777-KW/HP-P2 will require manual resetting after all low power faults.

If #RU is set to "A", the 777-KW/HP-P2 will always automatically restart after low power faults, once the RD3 timer expires.

ADDR is the RS-485 address of the 777-KW/HP-P2 and is only used when communicating with any external communication device. The address can be set from A01–A99.

#RF/COM - Restart Attempts (other faults)/ Communications Settings. The #RF settings are displayed and selected by turning the DISPLAY/PROGRAM dial from approximately the 7 o'clock to 12 o'clock position. COM settings are displayed and selected by turning the DISPLAY/PROGRAM dial from approximately the 12 o'clock to 5 o'clock position.

#RF is the number of restarts the 777-KW/HP-P2 will attempt after current unbalance or current single-phase faults before the unit locks out and requires a manual reset. This counter will be cleared one minute after start-up if the unit does not trip again for the same fault condition. Available settings are 0, 1, 2, 3, 4 and A, or to include overcurrent faults, #RF can be set to oc1, oc2, oc3, oc4 or ocA.

If #RF is set to "0", the 777-KW/HP-P2 will require manual resetting after all current unbalance, current single-phase and overcurrent faults.

If #RF is set to "A", the 777-KW/HP-P2 will always restart automatically after current unbalance and current single-phase faults, once the RD2 timer expires. Overcurrent faults will require a manual reset.

If #RF is set to "ocA", the 777-KW/HP-P2 will always restart automatically after current unbalance, current single-phase and overcurrent faults, once the RD2 timer expires.

COM determines the baud rate, even/odd parity, and stop bit. COM can be set to C00-C07. C00 and C04 are duplicates provided for backward compatibility.

- C00 = 9600 baud, No parity, and 1 stop bit
- C01 = 9600 baud, Odd parity, and 1 stop bit
- C02 = 9600 baud, No parity, and 1 stop bit
- C03 = 9600 baud, Even parity, and 1 stop bit
- C04 = 19200 baud, No parity, and 1 stop bit
- C05 = 19200 baud, Odd parity, and 1 stop bit
- C06 = 19200 baud, No parity, and 1 stop bit
- C07 = 19200 baud, Even parity, and 1 stop bit

PWS - Power Scale. The range setting for the LP setting. Settings 1-4 will allow the LP setting to display in kW. Settings 5-8 will allow the LP setting to display in hp.

PWS Setting	LP Range
1	0.01 - 0.99 kW
2	1.00 - 9.95 kW
3	10.0 - 99.5 kW
4	100 - 650 kW
5	0.01 - 1.30 hp
6	1.34 - 13.3 hp
7	13.4 - 133.0 hp
8	134 - 871 hp

GF - Ground Fault. The maximum allowable current that can flow to ground before the 777-KW/HP-P2 de-energizes its relay. This is a residual, class II ground fault system and should not be used for personnel safety. A typical setting for GF is 10-20% of motor FLA (in amps). GF may be set to OFF if this feature is not desired. The GF test procedure in this installation instruction manual must be conducted before the device is brought online.

OPERATION

The relay operation of the Model 777-KW/HP-P2 is designed to be fail-safe. This means when the voltage is within the programmed limits, the relay will energize—the NO contact will close and the NC contact will open. When the unit loses power or senses a fault condition, the relay will de-energize and contacts will return to their original state. Once the unit has been installed and programmed, the unit is ready to operate. Turn MODE SELECT to the RUN position. The display will show “run” alternating with a number (the number displayed will be the number corresponding to where the DISPLAY/PROGRAM knob is pointed). It will do this for the restart delay time programmed into RD1. Once the timer expires, the relay will energize—the NO contact will close and the NC contact will open. If something other than this is displayed, see the troubleshooting section for more information. If MODE SELECT is taken out of RUN, the 777-KW/HP-P2’s relay will de-energize.

Trip Class	Application Description
5	Small fractional horsepower motors where acceleration times are almost instantaneous or where extremely quick trip times are required
10	(Fast Trip) Hermetic refrigerant motors, compressors, submersible pumps and general-purpose motors that reach rated speed in less than 4 seconds
15	Specialized applications
20	(Standard Trip) Most NEMA-rated general-purpose motors will be protected by this setting
30	(Slow Trip) Motors with long acceleration times (>10 seconds) or high inertia loads
J Prefix (Jam Protection)	Programming any of the trip classes with the J prefix will enable jam protection. This additional protection is enabled 1 minute after the motor starts and provides a 2 second trip time for motors exceeding 400% of the OC setting
Non-Standard Trip Classes	Trip time in seconds when any phase current is 600% of OC. Time is approximately 90% of the TC setting

Table 3: Trip Class Descriptions

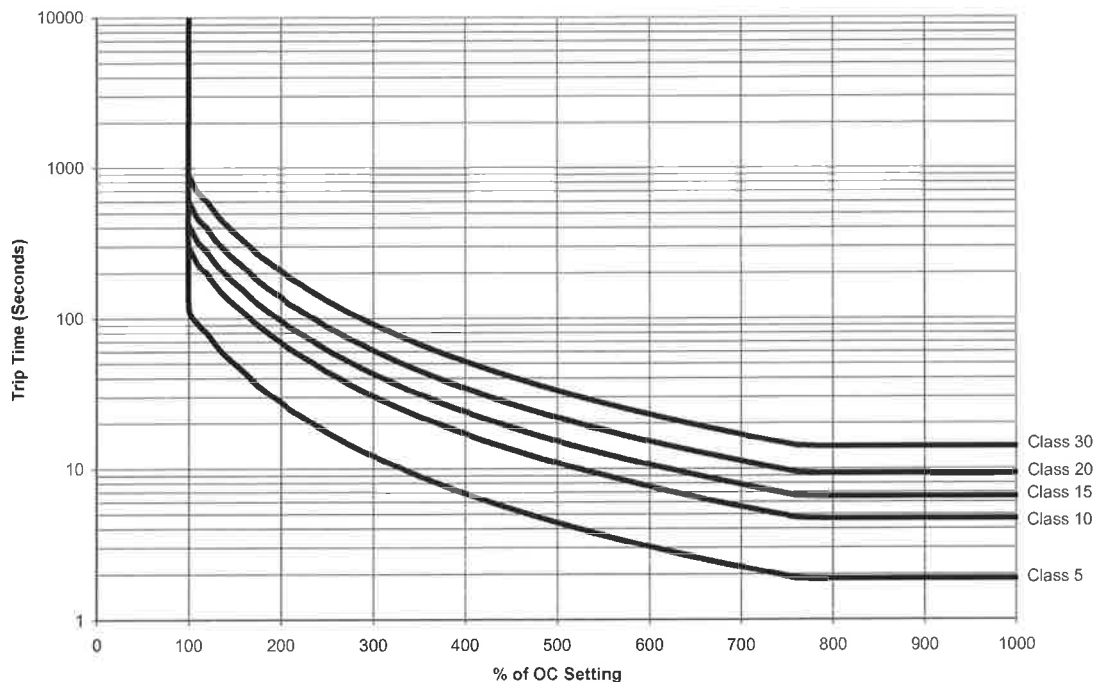


Figure 5: Overload Trip Curves

PROGRAMMING EXAMPLE

Motor to be protected: 3-phase, 460 Volt, 20hp / 15KW submersible pump with a full load amperage rating of 26.9A and maximum service factor amps of 30.3A. Use the following calculations and reasoning to determine the appropriate settings for this application.

LV- $460 \times 0.90 = 414$

HV- $460 \times 1.10 = 506$

VUB- Motor manufacturer suggests 3

MULT- From Table 1 = 1

OC- Service Factor Amperage = 30.3

LP- Normal pumping operation reads 15kW

Pump with a momentarily restricted flow (deadhead) reads 10.5kW; therefore set LP slightly above that point; LP = 11.5kW

CUB- Motor manufacturer suggests 6

TC- Submersible pump motor, TC = 10. No linear trip delay is desired, TC also = oFF.

RD1- To protect the pump for accidental rapid cycling, RD1 = 20 seconds.

RD2- Because the motor may be hot from running in an unbalance or single-phase condition, a motor cool-down time of 10 minutes, RD2 = 10, should be appropriate.

RD3- Set to 50 minutes. Testing shows that the well will recharge in 50 minutes.

#RU- Because an underload (low power) would signal a deadhead or dry-well situation, #RU should be set to 3 for this application.

#RF- Because an overload (overcurrent) fault signals a serious problem in this application (e.g., worn bearings), "oc" should not be included in the #RF setting so that a manual reset after an overload fault is required. A #RF=1 will give the system 1 chance to recover from an unbalance or single-phasing problem before manual reset is required.

PWS- The name plate rating for this pump is 15kW, therefore PWS = 3 (10.0-99.5kW)

GF- A ground fault setting of 15% of full load amps will be a significant indicator that the motor should be evaluated for repair or replacement. Therefore, GF = $26.9A \times .15 = 4$.

Note: Since no network communications are connected to this unit, there are no setting changes needed for ADDR or COM.

SYSTEM DISPLAY

On power up, the 777-KW/HP-P2 will show the current software revision. For example if the software revision is 33.04, the 777-KW/HP-P2 will show 033 followed by 004.

The output display can show one of the following parameters when MODE SELECT is in RUN: L1-L2, L2-L3, and L3-L1 line voltage; %VUB; A, B, and C phase current; %CUB; measured GF current, KW, HP. The display is used for programming the operating parameters of the device and also identifies what caused the unit to de-energize its relay or what is keeping the unit from energizing its relay, and under normal operating conditions, what the last fault was. The last fault can be displayed by pressing and holding the RESET/PROGRAM button while MODE SELECT is in RUN. When the unit trips off or is holding the motor off, the current fault condition will be shown in the display without pressing the button (CAUTION: pressing the reset button at this time will reset the unit). Table 4 lists the fault codes the unit could display.

Displayed Message	Meaning
oc	Tripped on overcurrent
SP	Tripped on current single-phasing or unit won't start because the voltage is single-phased
ub	Tripped on current unbalance or unit won't start because the voltage is unbalanced
uc	Tripped on undercurrent
CF	Tripped on contactor failure (due to faulty contacts or connections on the load side)
GrF	Tripped on ground fault
HI	A high voltage condition exists (won't allow motor to start)
Lo	A low voltage condition exists (won't allow motor to start)
rP	Incoming phases have been reversed, the motor may run backwards if started
oFF	A stop command was issued from a remote source
HPr	Tripped on high power
LPr	Tripped on low power
CLo	Tripped on low control voltage
clr	No previous faults
Pro	Shown when programming using the battery in the RUN position
FFF	Displayed value is greater than 999 (can be due to incorrect MULT setting)

Table 4: Fault Codes

TROUBLESHOOTING

The 777-KW/HP-P2 will display a fault code alternating with a number or with "run" when it has tripped. If the unit is showing a fault code alternating with "run," it is timing down the restart delay. If the fault code is alternating with a number (voltage reading or zero), the unit will not allow the motor to start because there is a problem with the incoming voltage. If the display is showing just a fault code, the unit is in a manual reset mode. This could be because the number of restarts (#RF, #RU) has expired or is not allowed. If the display reads "oFF," a stop command was issued through the communications network or a remote monitor.

PROBLEM	SOLUTION
The unit will not start. Display alternates "rP" with the DISPLAY/PROGRAM parameter value.	The voltage inputs are reverse-phased. If this is the initial start-up, swap any two of the leads connected to L1, L2, or L3 on the 777-KW/HP-P2 to correct the problem. If the unit has been previously running, the power system has been reverse-phased. Check the phase sequence of the incoming power lines. Note: L1 must be tapped from conductor Phase A, L2 from B, and L3 from C for correct power factor measurements on remote communications.
The unit will not start. Display alternates "SP", "ub", "HI", or "Lo" with the DISPLAY/ PROGRAM parameter value.	The incoming voltage is not within the limits programmed in the VUB, HV, and LV settings. Turn the DISPLAY / PROGRAM knob to read each incoming line voltage value. Correct the incoming power problem and check programmed limits by turning the MODE SELECT knob. Compare incoming values for HV, LV, and VUB to setpoints to verify they are correct.
Display alternates "SP", "ub", or "oc" with "run."	The unit has tripped on the fault shown on the display and is timing down RD2 before restarting. No further action is required.
Display alternates "uc" with "run." ²	The unit has tripped on undercurrent and is counting down RD3 before restarting. If undercurrent is not a normal condition for this installation, check for broken shafts, broken belts, etc.
Display is showing a solid "SP", "ub", or "oc."	The unit has tripped on the fault shown and a manual reset is required because of the programmed setting in #RF. Check the system for problems that would produce the single-phase, overcurrent or current unbalance fault, such as a jam.
Display is showing a solid "uc." ²	The unit has tripped on undercurrent and a manual reset is required because of the setting in #RU. Check the system for problems that would produce a loss of load such as a broken belt or a lack of liquid to pump.
Display is showing a solid "CF."	The unit has tripped on current single-phasing, but was not single-phased by the incoming voltage. Check for damaged contacts or loose or corroded wiring connections.
Display is showing a solid "GrF."	A ground fault current greater than the programmed GF value has been detected. Check the motor for insulation breakdown. A manual reset is required to clear this message. Press the RESET button to perform a manual reset.
Display alternates "LPr" with "RUN"	The unit has tripped on low power (LPr) and is timing down RD3 before restarting. If LPr is not a normal condition for this installation, check for loss of liquid, closed valves, broken belts, etc.

PROBLEM	SOLUTION
Display is showing a solid "LPr"	The unit has tripped on low power and a manual reset is required because of the setting in #RU. Check the system for problems that would produce a loss of load like a broken belt or a pump is out of liquid. Press the RESET button to perform a manual reset.
Display alternates "HPr" ² with "RUN"	The unit has tripped on high power and is timing down RD2. Check for a high power condition.
Display is showing solid "HPr" ²	The unit has tripped on high power and requires a manual reset because of the setting in #RF. Press the RESET button to perform a manual reset.
Display alternates "CLo" ² with "RUN"	The unit has tripped on low control voltage (CLo) and is timing down RD2 before restarting.
Display is showing solid "CLo" ²	The unit has tripped on low control voltage and a manual reset is required because of the setting in #RF. Verify system voltage is correct. Press the RESET button to perform a manual reset.

CLEARING LAST FAULT

The last fault stored can be cleared on the 777-KW/HP-P2 by following these steps:

1. Rotate the MODE SELECT switch to GF.
2. Press and hold the RESET/PROGRAM button. Adjust the DISPLAY/PROGRAM knob until "cLr" appears on the display. Release the RESET/PROGRAM button.

To verify the last fault was cleared, place the MODE SELECT switch in the RUN position. Then press and hold the RESET/PROGRAM button; "cLr" should be on the display.

TAMPER GUARD

The 777-KW/HP-P2 setpoints can be locked to protect against unauthorized program changes.

1. Rotate the MODE SELECT switch to GF.
2. Press and hold the RESET button. Adjust the DISPLAY/PROGRAM knob until "Loc" appears on the display.
3. Release the RESET button.
4. Turn MODE SELECT switch to RUN.

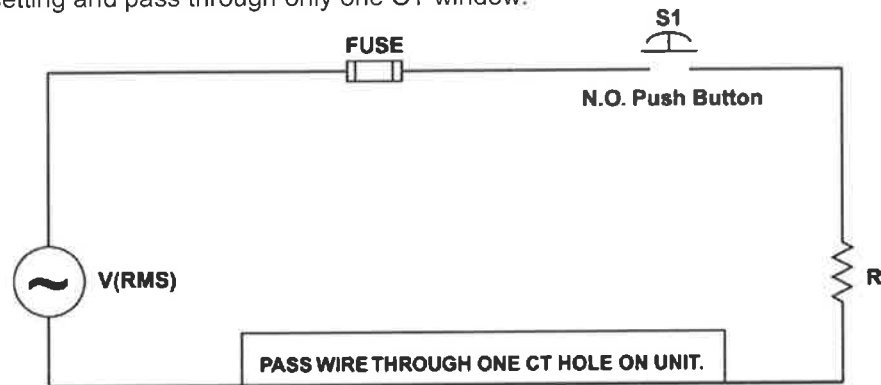
The program is now locked, but all settings can be viewed. The unit can be unlocked by following the same steps except adjust the DISPLAY/PROGRAM knob to "unL" in step 2.

² uc, HPr, and CLo are enabled only from a network master via a communications module.

GROUND FAULT TESTING PROCEDURE

A ground fault test must be performed before installing the 777-KW/HP-P2 as required by UL1053 and NEC, ANSI/NFPA 70.

1. Disconnect power.
2. Hook up the three line voltages to L1, L2, and L3 as required by the installation instructions.
3. Program the desired parameters into the unit. For test purposes, set MULT to 1 and GF to the minimum allowed setting.
4. Construct the circuit, using an AC power supply. This circuit simulates a ground fault condition by generating a current in one of the phases. Alternate test circuits may be used. The only requirement is the current through the current transformer must be between 115% and 150% of the GF setting and pass through only one CT window.



5. The values of V and R will be determined by the current required to generate a GF trip condition: $I = V_{rms}/R$, where $I = 115\%$ of GF setting.
6. Place the unit in the RUN position, apply 3-phase power and allow the NO contact to close.
7. Energize the test circuit by pushing and holding the test pushbutton until the unit trips (within 8.5 seconds). The display should show "GrF" and the NO contacts should be open. Release the NO pushbutton.
8. The results of the test are to be recorded on the test form provided below. The form should be kept by those in charge of the building's electrical installation in order to be available to the authority having jurisdiction.
9. Confirm programmed parameters and proceed with installation instructions.

GROUND FAULT TEST RESULTS*

Date	Performed by	Results	Location
------	--------------	---------	----------

*A copy of this form should be retained by the building's electrical foreman.

777-KW/HP-P2 SPECIFICATIONS

Functional Specifications	
Programmable Operating Points	
LV- Low Voltage Threshold	170–524V (450–649)*
HV- High Voltage Threshold	172–528V (451–660V)*
VUB- Voltage Unbalance Threshold	2-25% or 999 (disable)
MULT- # of Conductors or CT Ratio (XXX:5)	1–10, 100, 150, 200, 300, 400, 500, 600, 700, 800
OC- Overcurrent Threshold **	(20–100A) ÷ MULT or 80–140% of CT Primary
PWS- Power Scale	1 = 0.01–0.99kW 5 = 0.01–1.32hp 2 = 1.00–9.95kW 6 = 1.34–13.3hp 3 = 10.0–99.5kW 7 = 13.4–133hp 4 = 100–650kW 8 = 134–871hp
LP – Low Power**	0.01–650kW or 0.01–871hp or 0 (off); LP setting is dependent upon PWS setting. PWS setting must be programmed prior to programming LP setting.
CUB- Current Unbalance Threshold	2–50% or 999 (disable)
TC- Overcurrent Trip Class ³	2-60, J2-J60, L00-L60, oFF
RD1- Rapid Cycle Timer	0-999 seconds
RD2- Restart Delay After All Faults Except Undercurrent (motor cool-down timer)	2–500 minutes
RD3- Restart Delay After Undercurrent (dry-well recovery timer)	2–500 minutes, A (Automatic)
#RU- Number of Restarts After Undercurrent	0, 1, 2, 3, 4, A (Automatic)
ADDR- RS485 Address	A01–A99
#RF-Number of Restarts After All Faults Except Undercurrent ⁴	0, 1, oc1, 2, oc2, 3, oc3, 4, oc4, A, ocA (Automatic)
COM- Communication setting	C00-C07
UCTD- Undercurrent Trip Delay ***	5 seconds (default)
GF- Ground Fault Current Threshold**	(3–20A) ÷ MULT or 12–40% of CT Primary or oFF
Trip Times	
Ground Fault Trip Time	Trip time
101%-200% of Setpoint	8 seconds ±1 second
201%-300% of Setpoint	4 seconds ±1 second
301%-400% of Setpoint	3 seconds ±1 second
401% or Greater	2 seconds ±1 second
Current Unbalance Trip Times	
<u>% Over Setpoint</u>	<u>Trip time</u>
0%	30 seconds
1%	15 seconds
2%	10 seconds
3%	7.5 seconds
4%	6 seconds
5%	5 seconds
6%	4 seconds
11%	3 seconds
15%	2 seconds
Input Characteristics	
Input Voltage (3-phase)	200–480VAC (Model 777-KW/HP-P2) 500–600VAC (Model 777-575-KW/HP-P2)
Frequency	50/60 Hz
Motor Full Load Amp Range	
3-phase, (looped conductors required)	2–20A
3-phase (direct)	20–90A

³ If a "J" is included in the trip class (TC) setting, jam protection is enabled.

⁴ If "oc" is displayed in the #RF setting, overcurrent and high power will be included as an automatic restart after RD2 expires. Otherwise, a manual reset is required after an OC and HPr fault.

3-phase (external CTs required)	80–800A
Output Characteristics	
Output Contact Rating SPDT (Form C)	Pilot duty rating: 480VA @ 240VAC, B300 General purpose: 10A @ 240VAC
Expected Life	
Mechanical	1 x 10 ⁶ operations
Electrical	1 x 10 ⁵ operations at rated load
General Characteristics	
Environmental	
Temperature Range	Ambient Operating: -20° to 70°C (-4° to 158°F) Ambient Storage: -40° to 80°C (-40° to 176°F)
Pollution Degree	3
Class of Protection	IP20 (Finger Safe)
Relative Humidity	10-95%, non-condensing per IEC 68-2-3
Accuracy at 25°C (77°F)	
Voltage	±1%
Current	±3% (<100A direct)
Timing	±0.5 second
Ground Fault	±15% (< 100A)
Repeatability	
Voltage	±0.5% of nominal voltage
Current	±1% (<100A direct)
Maximum Input Power	10 W
Safety Marks	
UL	UL508, UL1053
CE	IEC 60947-1, IEC 60947-5-1
Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity (RFI), Conducted	IEC 61000-4-6, Level 3 10V
Radio Frequency Immunity (RFI), Radiated	IEC 61000-4-3, Level 3 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5kV input power
Surge	
IEC	61000-4-5 Level 3, 2kV line-to-line; Level 4, 4kV line-to-ground
ANSI/IEEE	C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line
Hi-potential Test	Meets UL508 (2 x rated V +1000V for 1 minute)
Vibration	IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis
Shock	IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse
Mechanical	
Dimensions	3.0" H x 3.6" W x 5.1" D
Terminal Torque	7 in.-lbs.
Enclosure Material	Polycarbonate
Weight	1.2 lbs
Maximum Conductor Size Through 777-KW/HP-P2	0.65" with insulation

NOTE: The 777-KW/HP-P2 can be programmed prior to installation by connecting a 9V battery. Disconnect power prior to using the battery cable and follow all safety warnings.

*575 Volt Model

** Do not program the unit above the thermal rating for the CTs.

*** Network programmable feature. See the Programming Guide.

TEST EQUIPMENT

To insure proper installation, EPG recommends the following instruments. When working with electrical circuits, use caution to avoid electrical shock.

- Megohmmeter:** To measure insulation value of motor and motor leads to ground. The higher the reading, the better.
- Ohmmeter:** (Must be able to read less than 1 ohm) To measure resistance winding to winding in motor, check quality of any connections made in motor circuit to test coils of relays and continuity of circuits.
- Volt Meter:** To verify correct supply voltage and measure system requirements when running.
- Clamp on Amp Meter:** To measure current draw in system.

Earthworks Pacific, Inc.

Flygt Pump Installation Record

Form Completed by: Bryan Davidson Installation Date: 99-24-15
 Company: Earthworks Pacific, Inc. Flygt Serial #: 3085.092-1530108, 3085.02-15301099

PUMPS, CONTROLS AND POWER SUPPLY

Installer: Earthworks Pacific, Inc.	Address: 4180 Hoala Street Lihue, HI 96766	Installation Location: Kekaha Sanitary Landfill, Wetwells 1&2
Motor Model N3085.092 15-10-4AL-W	HP 3	Volts: 460V, 3Ph
		Max Amps Rating: 25A Starting Current , 4.5 A, Running Current
Pump Model: NP 3085 MT 3 ph 465 V		
Power Supply Transformers: Number Used: KVA Each:	N/A	Hertz: 60 H
		Comments:
Pump Control Panel: Mfg. & Model #:	Motor Starter Size: N/A	Overload Heater Part or setting range: 10 amps
EPG Companies, Inc. Panel - L950 PTA		IEC Starters: None
Lightning Arrestors: Yes Mfg. & Model: Ferraz Shamu STT26003PYG	Surge Capacitors: Yes _____ No <u>X</u>	Disconnect Fuse or Circuit Breaker Amp Rating:
Primary Flow Control Devices: (Low Level Control, Flow Control, Valve, System Back Pressure, etc.) Paddlewheel Liquid Flow Sensor CH1000 Level Sensor		

OPERATING DATA (Measurements at Control Panel)

PUMP CONDITIONS: 115 GPM	VOLTS	AMPS
Pump Not Running 0	R-Y __ 480 R-B 480 _ B-Y 480	
Open Discharge	R-Y __ 480 R-B 480 __ B-Y 480	R _3.5__ Y _3.5_ B _3.5_
Normal Operation Run Time <u>1 min. 30 sec. /-</u> Off Time <u>Varies</u>	R-Y __ 480 R-B 480 __ B-Y 480	R _3.6__ Y _3.5_ B _3.5_

INSTALLATION DATA

Earthworks Pacific, Inc.

Discharge Line Size: 3 inch	Discharge Pressure: N/A	Pump Submergence: Varies	Fluid Temp: N/A °F _____ °C
External Check Valve Used? Yes, 3" Merrill CVSE300SS	Location: In-Line	Cable Length & Size: 50 LF SUBCAB 7 core	Ground Resistance WW #1 - 0.97 Ohms WW #2 - 1.06 Ohms
Insulation Megohm Readings:	Before Installation: N/A	After Installation: N/A	After 30 min. Run: N/A

SENSORS

Type of Level Sensor: EPG Level Master Level Meter Model CH 1000-DDHX PN LG-011-C	Seimens 9G-EF Floats P/N W2T294202 N.O. P/N W2T294168 N.C.	Transmitter Serial Number: N/A
Pressure Transmitter <input checked="" type="checkbox"/> Load Monitor _____ Floats _____ Other _____		
Length of Sensor Lead: EPG - 25'. Seimens - 60'	Ohm Readings Across I.S. Barrier: 230 Ohms	
mA Readings on Transmitter Lead: N/A	Voltage Reading Entering Level Meter: 125.6 VAC Voltage Leaving Level Meter: N/A VAC	
Are Flow Sensors Used: Yes <input checked="" type="checkbox"/> No _____	Flow Spool Made of: Sch. 80 PVC	

Comments: _____

Place one copy of this record in the control panel, return one copy to EPG, and retain original for your records.

In case of problems or questions, contact EPG Companies Inc., 19900 County Road 81, Maple Grove, MN 55311. Phone: 800-762-8418 FAX: 763-493-4812

Pump Installation Record

EPG Job No. 14-11895

Installer's Name Earthworks Pacific

Address 4180 Hoala Street

City Lihue State HI

Zip 96766

Phone 808-246-8808

Fax 808-246-8812

Contact name Bryan Davidson

Owner's Name County of Kekaha

Address 4444 Rice Street Suite 275

City _____ State HI

Zip 96766

Phone 808-241-4992

Fax 808-241-4992

Contact name Troy Tanigawa

Sump Name/ ID Wet well #1

Date Installed 9/24/15

Leachate or Condensate Temp na °F Or °C

Pump:

Model No. 3085.092-5537 S/N's 3085.092 - 150108, 3085.092 - 15301099

Rating: 115 GPM@ 30'+/- Ft. TDH

HP 3 Voltage 460 Phase 3

Actual Pump Delivery 115+ GPM@ N/A PSI

Operating Cycle 1.5 mi ON (Min/Hr) n/a OFF (Min/Hr)

(Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

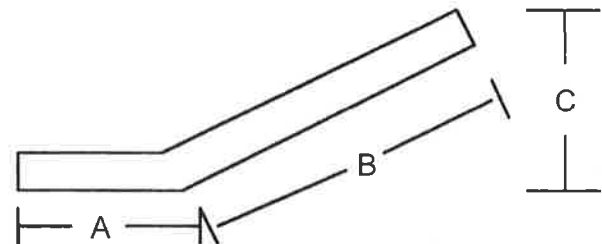
Slope N/A :1

Length of riser Pipe (A+B) N/A ft.

Vertical Distance = Sump to Top of Riser Pipe (C) 6.0 ft.

Riser ID 3" SDR Sch 40

Distance From Top of Riser Pipe to Controller 25 ft.



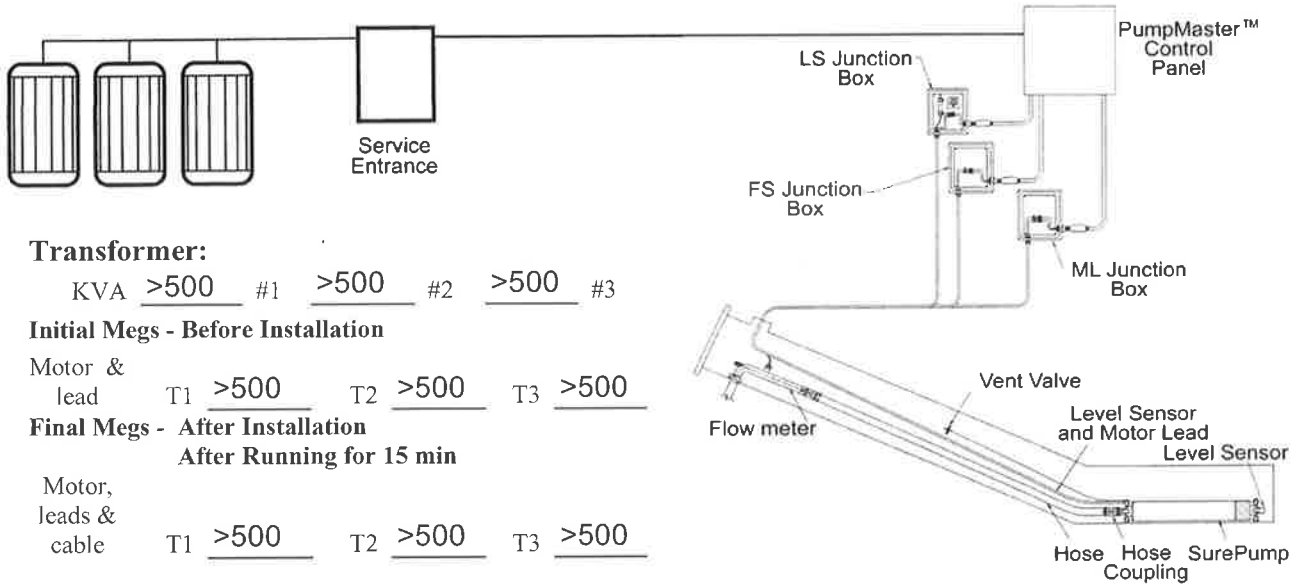
Power Supply:

Cable: Service Entrance to Control Distance WW #1 - 500' WW #2 - 1000' Wire Size WW #1 - #4 WW #2 - #2 AWG/MCM

Copper Jacketed _____ Aluminum _____ Individual conductors

Cable: Control to Motor 50 ft 12 AWG/MCM

Copper _____ Jacketed



Transformer:

KVA >500 #1 >500 #2 >500 #3

Initial Megs - Before Installation

Motor & lead T1 >500 T2 >500 T3 >500

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 >500 T2 >500 T3 >500

Incoming Voltage:

No Load	L1-L2	<u>480</u>	L2-L3	<u>480</u>	L1-L3	<u>480</u>
Full Load	L1-L2	<u>480</u>	L2-L3	<u>480</u>	L1-L3	<u>480</u>

Running Amps:

Hookup:1

Full Load L1 3.5 L2 3.5 L3 3.5 % unbalanced _____

Hookup:2

Full Load L1 3.6 L2 3.5 L3 3.5 % unbalanced _____

Hookup:3

Full Load L1 _____ L2 _____ L3 _____ % unbalanced _____

Ground wire size WW #1 - #6
 WW #2 - #4 **AWG/MCM** WW #1 - 0.97
 DC Ground Current .727 mA Ground Test WW #2 - 1.06 Ohms

Motor Surge Protection X Yes _____ No

Control Panel:

Model # L950-PT

Short Circuit Device

Circuit Breaker X Rating _____ Setting _____
 Fuses LPJ Type 6 Rating _____
 _____ Standard X Time Delay _____

Controls are Grounded to:

_____ Motor
 _____ Rod
X _____ Power Supply

Start Overloads:

Set at 4.5 amps

Name: Tim Hasslen

Company EPG Companies

Date 9/25/15

INSTALLATION GUIDE

- 1. Verify that equipment and supply voltage match.
- 2. Inspect equipment, look for shipping damage, dirt, and rough handling
- 3. Control panel should be mounted in a secure way at least 15' from riser or sump and 36" above grade to bottom of control panel.
- 4. Inspect inside of control panel. Look for items which might have come loose during shipping
- 5. Test level sensor in bucket of water. Does it return back to zero? Control panel needs to be installed and have power to it.
-
- 7. Install suspension chain
- 8. Fasten motor lead and sensor cable to discharge line every 5' to 7' with straps or plastic wire ties. It's best if they are on separate sides of line; use padding between cables and any metal straps.
- 9. Run pump down riser slowly using stainless steel suspension chain as hold back. Make sure motor lead and sensor cable are slack as you lower pump.
- 10. Take ohm reading of each motor lead wire to wire and compare the values in the Flygt Installation, Operation, and Maintenance Manual.
- 11. Check insulation resistance as pump is lowered down riser. Resistance may drop gradually as pump and cable enter the liquid, but any sudden drop indicates a problem.
- 12. Run sensor leads and power cables in separated conduits to control panel. It is a good idea to use breakout junction boxes. See Design Guide 05644.
- 13. If you have to remove dryer from end of transducer cable to pull cable through fittings or conduit. Seal end of the vent tube with a piece of tape. Reinstall dryer as soon as possible. See Bulletin 0550a.
- 14. Megger motor leads. Resistance must be 1 megohm or greater.
- 15. Connect pump to control panel complying with local and national codes. Controller terminal strips, motor leads, and sensor leads are all labeled and/or color coded to simplify connections.
- 16. Inspect wire connections. Are they the correct colors? Are they tight?
- 17. If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- 18. Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.

- 19. Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- 20. Compare these reading to voltage listed on drawing and label in control panel.
- 21. Review equipment list and drawings for any accessory circuits. If present, run volt and ohm test.
- 22. Check and make sure all hand switches are in the off position. If you have a water level indicator verify leachate level in sump or riser.
- 23. Turn on power at panel main disconnect.
- 24. Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- 25. If level and flow meter do not light up check GFCI, reset if necessary.
- 26. Are any indicator lights on?
- 27. Should they be on?
- 28. Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site. See meter data sheet for factory settings and meter instructions.
- 29. Bump pump by turning switch to hand two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
- 30. Verify correct rotation of pump by checking flow rate.
- 31. When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- 32. Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.
- 33. After 15 minutes of running time measure volts and amperage to see if they are stable. Are they as specified?
- 34. After pump and level sensor have been tested pot seal offs.
- 35. Complete Form 200.

START UP CHECKLIST

QUESTIONS FOR CONTRACTOR OR INSTALLER

- A: Were sensor and power cable tied or strapped to discharge line?
- B: On what kind of spacing?
- C: What is the as built length of riser and sump? Were cables long enough? There should be 3 or more feet of slack in the cables.
- D: What size cable was run for supply power?
- E: What is the distance from power supply transformer to pump control panel?
- F: How did they verify that pump is down into sump?
- G: Did they test level sensor prior to installing?
- H: Did they test pump prior to installing or prior to your arrival?
- I: Do they have any questions or concerns?
- J: Complete form 200

PHYSICAL INSPECTION OF CONTROL PANEL

- A: Is the control panel located 15' from sump or riser and 36" above grade to bottom of panel.
- B: Are power and sensor cable run in separate conduit? If not, stop work and have this corrected.
- C: Are seal offs installed in both sensor and power runs? If not, suggest breakout junction boxes or have seal off installed.
- D: Are seal offs potted? If not, stop work and have them potted.
- E: Will inner and outer door of enclosure open and close freely? If not loosen enclosure mounting bolts and shim until it is level and square. Then retighten mounting bolts.
- F: Make sure ground wire is in place between outer door and enclosure.

PRIOR TO ENERGIZING CONTROL PANEL

- A: Measure resistance to ground. It must be less than 25 ohms. If greater stop work and report to owner. It should be 1 ohm or less to protect electronic equipment.
- B: Measure voltage prior to control panel or at entrances to control panel. Measure and record voltage line to line and line to ground.
- C: Compare these reading to voltage listed on drawing and label in control panel.
- D: Megger motor leads resistance must be 1 megohm or greater.
- E: Take ohm reading of each motor lead wire to wire and compare these to values in Table 13 of the Franklin Electric motor manual for 1Ø and Table 21 for 3Ø. Be sure to add wire resistance value to value from table 13& 21. See page 39 for wire resistance.
- F: Inspect inside of control panel. Look for items which may have come loose during shipping
- G: Inspect wire connections. Are they the correct colors? Are they tight?
- H: If color-coded wires were not continued from sump or riser you need to ohm out each circuit.
- I: Review equipment list and drawings from any accessory circuits. If present, run volt and ohm test.
- J: Check and make sure all hand switches are in off position. If you have a water level indicator verify leachate level in sump or riser.

POWER UP

- A: Turn on power at panel main disconnect.
- B: Level meters display should light up. Record displayed reading. How does this reading compare to your measured level reading?
- C: If level and flow meter do not light up check GFCI, reset if necessary.
- D: Are any indicator lights on?
- E: Should they be on?
- F: Make sure pump is turned off. Using built in or hand held simulator, verify level meter settings are correct for this site.
- G: Bump pump by turning hand switch two or three times to make sure pump has reached its resting point. You should have minimum of 3' of slack in the cables.
- H: Verify correct rotation of pump by checking flow rate.

- I: If there is liquid in sump with level about pump start set point and below 150". Then turn pump selector switch to AUTO. Run pump through one complete cycle.
- J: When pump is running measure and record amperage and voltage. Check 3Ø systems for current balance within 5% of average.
- K: Verify that starting, running and stopping causes no significant vibration or hydraulic shocks.

ENGINEER'S SPECIFICATION

EPG Series L950PT PumpMaster™ Controller 3Ø CONTROL PANEL

Furnish one EPG Companies Inc., UL listed 508A/698A, Series L950PT controller to alternate the operation of two pump motors and auxiliary equipment in manual or automatic mode. The control panel enclosure shall be NEMA type 4X Stainless Steel.

The enclosure shall be equipped with a window in the outer door, an inner door, a stainless steel drip shield, and a tamper resistant latch. The NEMA 4 (standard) enclosure is finished with polyester urethane paint. The NEMA 4X (optional) enclosure can be either stainless steel or non-metallic.

The control system will operate from a 460 Volt, 60 Hertz, three phase power supply. Pump control components will be sized to operate pump motors of specified horsepower.

The control panel shall include the following as standard features:

- * **Main Disconnect Switch:** The main disconnect switch shall be 60 Amp rated and will prevent opening of control panel while power is on, and includes 460 Volt, 20 & 20 Amp dual element fuses.
- * **"Hand-Off-Auto" Selector Switches:** Allow manual or automatic operation. The selector switches shall be heavy duty, oil tight, NEMA 4 rated switches mounted on the inner door. The hand position shall be momentary with a spring return.
- * **Motor Starters:** The motor starters shall be sized to the pump motor horsepower, and shall be equipped with built in single phasing protection and ambient compensated, quick trip adjustable thermal overloads.
- * **Control Transformer:** Transformer with fused primary shall isolate control circuit from power circuit and provide easier and safer field wiring of accessories. It shall lower incoming voltage to 120 Volts.
- * **Run Lights:** Indicate energization of motor circuit. They shall be heavy duty, oil tight, NEMA 4 rated and shall have LED lamps with 100,000 hour life. The lights shall be mounted on the inner door and will be green in color.
- * **Motor Overload Lights:** Indicate motor not running due to overload condition. They shall be heavy duty, oil tight, NEMA 4 rated and shall have LED lamps with 100,000 hour life. The lights shall be mounted on the inner door and will be red in color.
- * **Electronic Alternator:** The electronic alternator shall include lead/lag pump operation to equalize wear on pump motors by alternating successive starts. The lag pump shall start after the lead pump starts if the liquid level continues to rise above the pump start level set point and both pumps will continue to run until the liquid level decreases to the pump stop level set point as sensed by the pressure transmitter.
- * **LevelMaster™ Level Control:** The LevelMaster level control meter shall be mounted on the inner door. The meter shall have a digital readout and the capability to monitor and maintain pumping operations as well as output a high level alarm. It shall also provide a high-high level alarm fail-safe feature that shuts off the pump motors. The high-high level alarm may indicate level sensor failure or a problem with a pump(s). Level control shall be accurate to within 0.1 inch.
- * **Level Simulator:** The level simulator shall be mounted on the inner door. The level simulator is a built-in test circuit designed to simulate a 4-20 mA load to assist in level setup and troubleshooting.
- * **Intrinsically Safe Barriers:** The level sensor circuits shall be protected by intrinsically safe barriers.

- * Heater with Adjustable Thermostat: A heater with adjustable thermostat shall promote even distribution of heat and elimination of hot spots and condensation. Heater element shall be mounted in the space between the sub-panel and the back of the enclosure and provide a minimum of 100 square inches of heating area.
- * Lightning Arrestor: Shall be grounded, metal-to-metal, to water strata.
- * Terminal Strip: Labeled and numbered terminal strip provides easy connection of external components.
- * Corrosion Inhibitor Emitter: Inclusion of an industrial corrosion inhibitor emitter shall protect internal components of control panel from corrosion for up to one year and shall be replaceable.
- * Options are available to meet specific needs.

SYSTEM LOGIC AND FUNCTION

The controller is designed to operate two pumps in lead/lag alternating mode. The electric alternator provides equalized wear and usage of each pump by alternating successive starts. The lead pump starts at the pump start level set point and continues to run until the liquid level decreases to the pump stop level set point as programmed in the LevelMaster level control meter. The lag pump will start after the lead pump starts if the liquid level continues to rise above the pump start level set point and both pumps will continue to run until the liquid level decreases to the pump stop level set point as sensed by the pressure transmitter. If the liquid level rises to the high level alarm set point, a high level alarm will be annunciated. If a motor trips while running due to an overload condition, the other pump will start automatically. The pressure transmitter level sensor shall have a range of 0 to 11 feet with a 4-20 mA output signal.

ATTACHMENT TO BULLETIN 0080b

ENGINEER'S SPECIFICATION

EPG L950PT Controller

3Ø Control Panel

EPG Job #10-10293

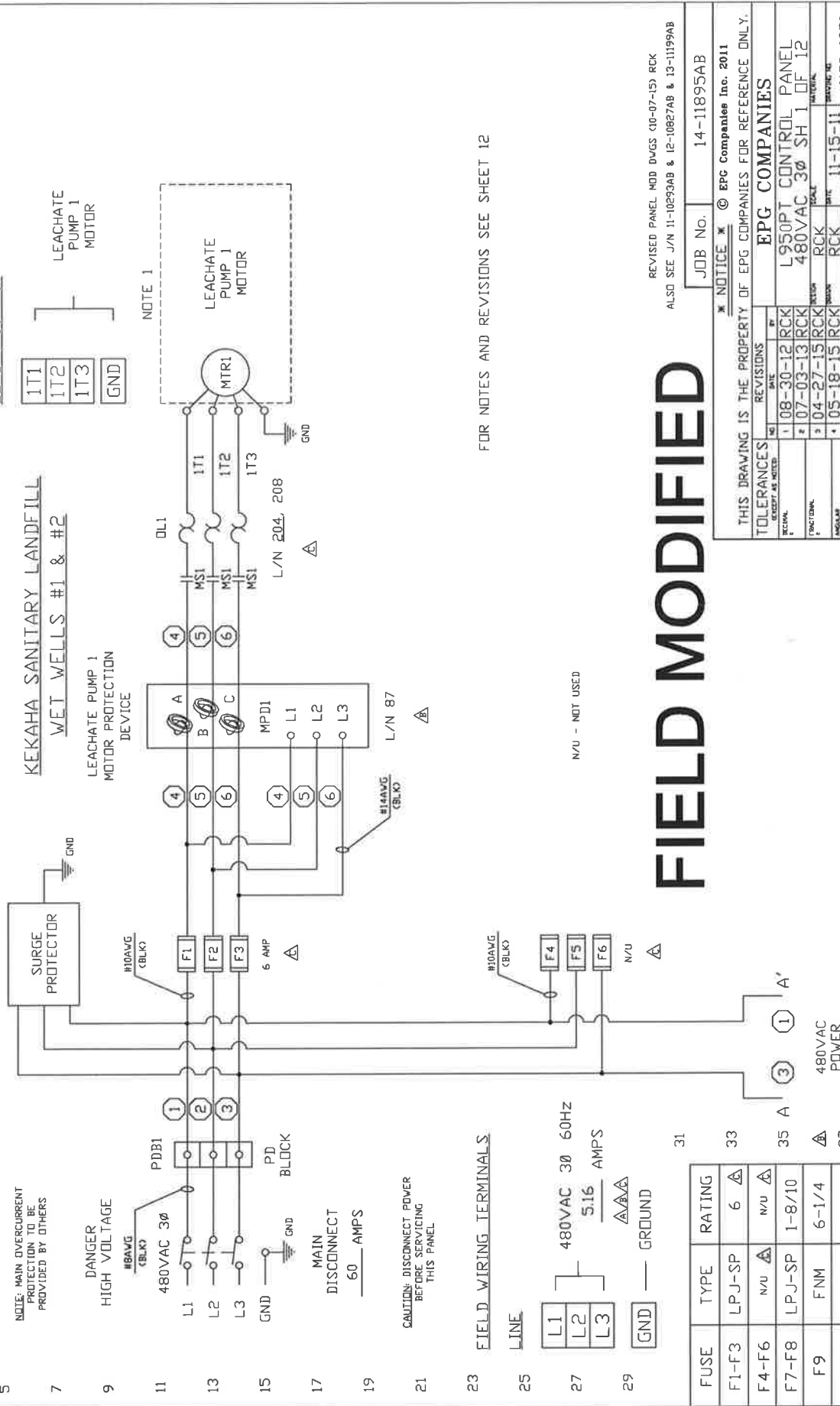
These controllers include the following optional features:

- ~~Variable Frequency Drives (VFDs).~~
- Flow meter display for 3" SCH80 PVC flow sensor.
- High level alarm.
- Red panel mounted alarm light and output.
- 4-20 mA output to second meter for low level alarm.
- Red panel mounted alarm light and output.
- Lagoon full shut down dry input contact with pass along output.
- Red panel mounted alarm light.
- ~~VFD fault output contacts.~~
- Red panel mounted alarm lights.
- Red top mounted common alarm light.
- Symcom Model 7KW-77/HP-P2 Motor Protection Devices

NO	DATE	BY	REVISION	DESC	MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
					LEACHATE PUMP 1	3	460	4.5	6A

- 1 ADD IS LEAK DETECT ALARM TO EXISTING CONTROLS
- 2 ADD MOTOR PROTECTION DEVICES TO EXISTING CONTROLS
- 3 REMOVE VFD'S & PWR SUPPLY CHG TO PUMP 1 CNTL ONLY
- 4 CHG PUMP 1 HP ADD MINICAS RELAY W/CNTLS & PILOT LIGHTS
- 5 ADD INTRINSICALLY SAFE HIGH & LOW LEVEL ALARM FLOATS

FIELD WIRING TERMINALS
LOAD (460VAC)



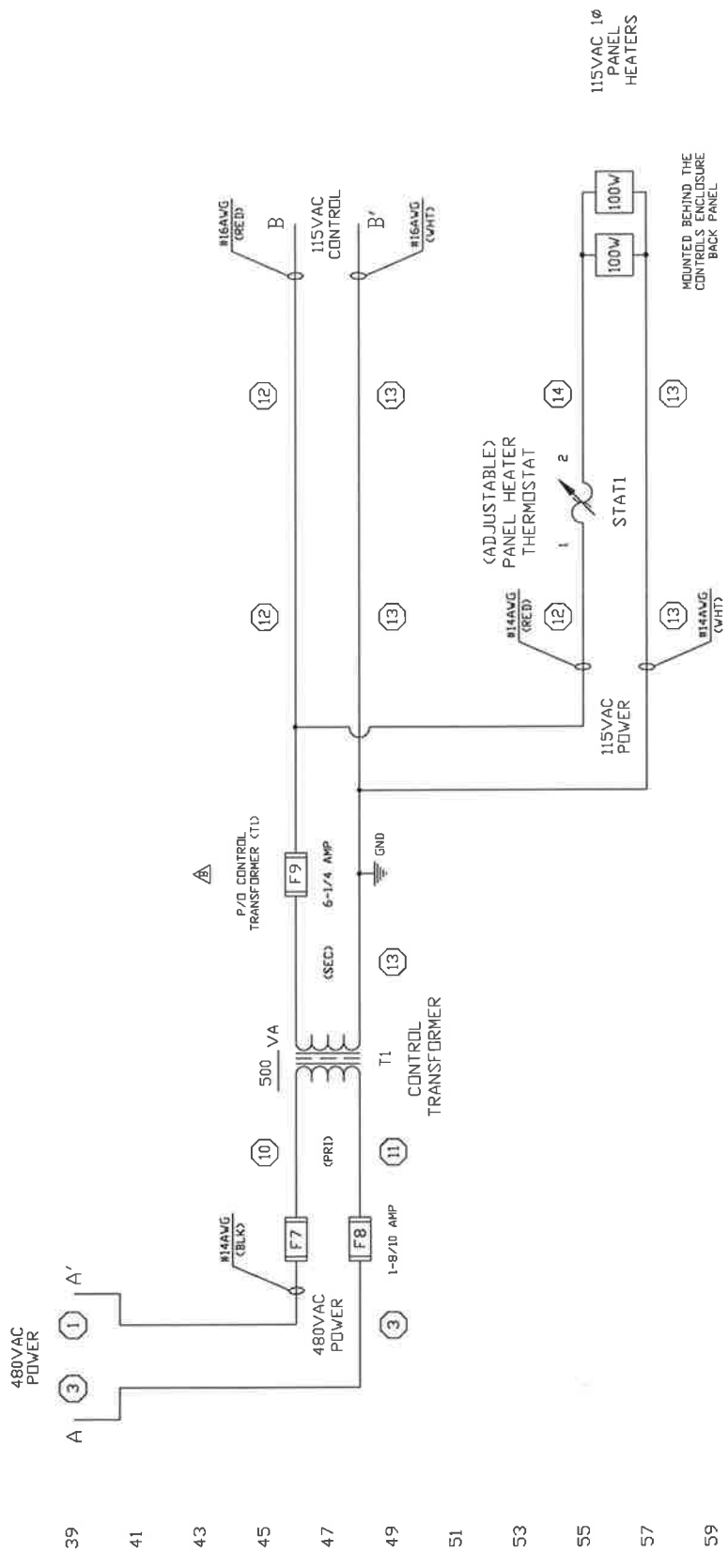
FOR NOTES AND REVISIONS SEE SHEET 12

REVISED PANEL MOD DWGS (10-07-15) RCK
ALSO SEE J/N 11-10293AB & 12-10827AB & 13-11199AB

JOB No.		14-11895AB	
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EPG COMPANIES			
L950PT CONTROL PANEL			
480VAC 3Ø SH 1 OF 12			
TOLERANCES UNLESS OTHERWISE SPECIFIED			
DECIMAL	FRACTIONAL	ANGULAR	WELDING
±0.005	±0.005	±0.005	±0.005
±0.002	±0.002	±0.002	±0.002
±0.001	±0.001	±0.001	±0.001
±0.0005	±0.0005	±0.0005	±0.0005

FIELD MODIFIED

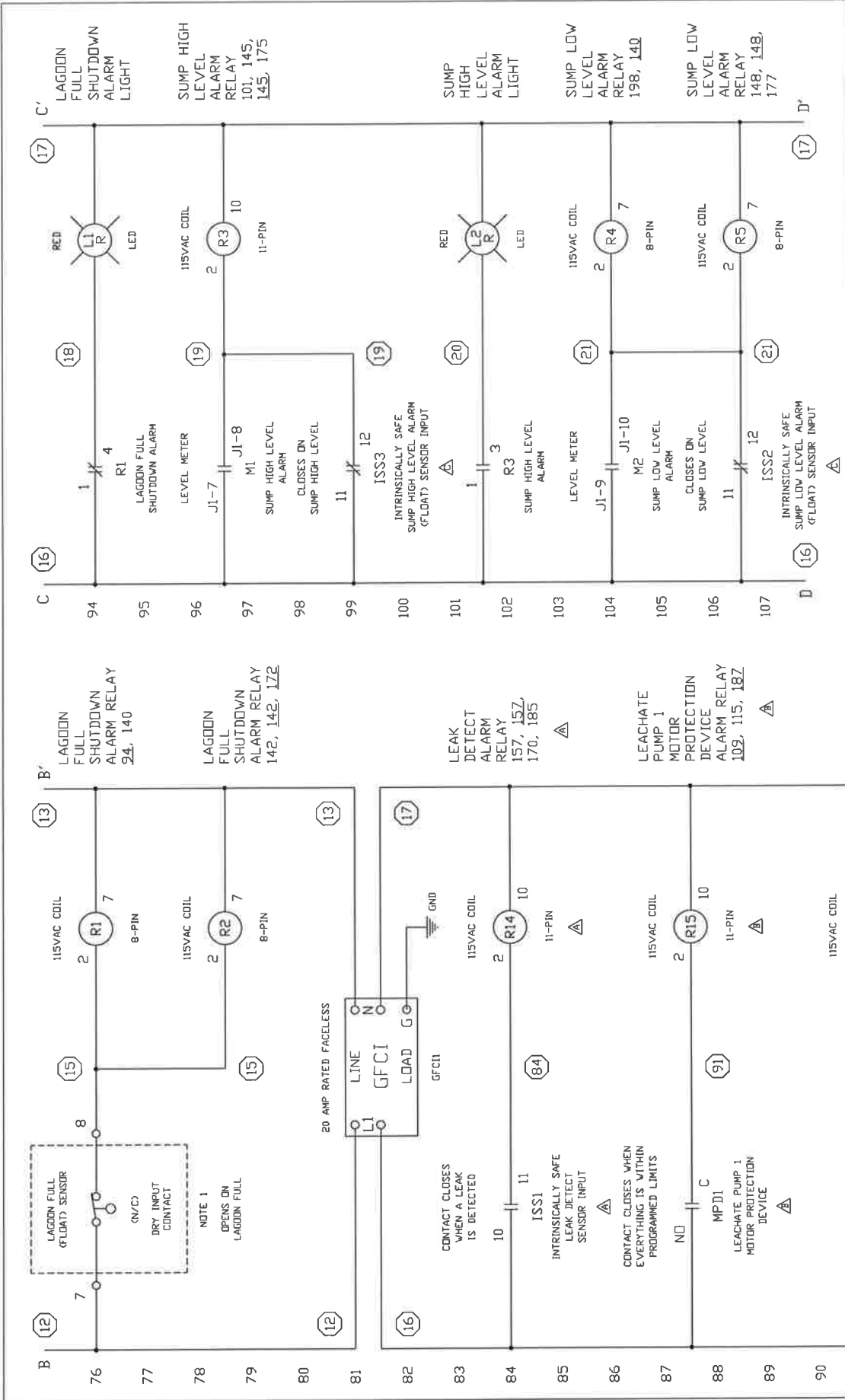
FUSE	TYPE	RATING
F1-F3	LPJ-SP	6 A
F4-F6	N/U	N/U
F7-F8	LPJ-SP	1-8/10 A
F9	FNM	6-1/4 A
F10	MDL	1/4 A



FOR NOTES AND REVISIONS SEE SHEET 12

FIELD MODIFIED

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TOLERANCES EXCEPT AS NOTED		REVISIONS	
NO.	DATE	BY	DESCRIPTION
1	07-03-13	RCK	L950PT CONTROL PANEL
2	04-27-15	RCK	480VAC 3Ø SH 2 OF 12
FUNCTIONAL		TESTED	DATE
REGULAR		DATE	11-15-11
		DATE	10173-0251

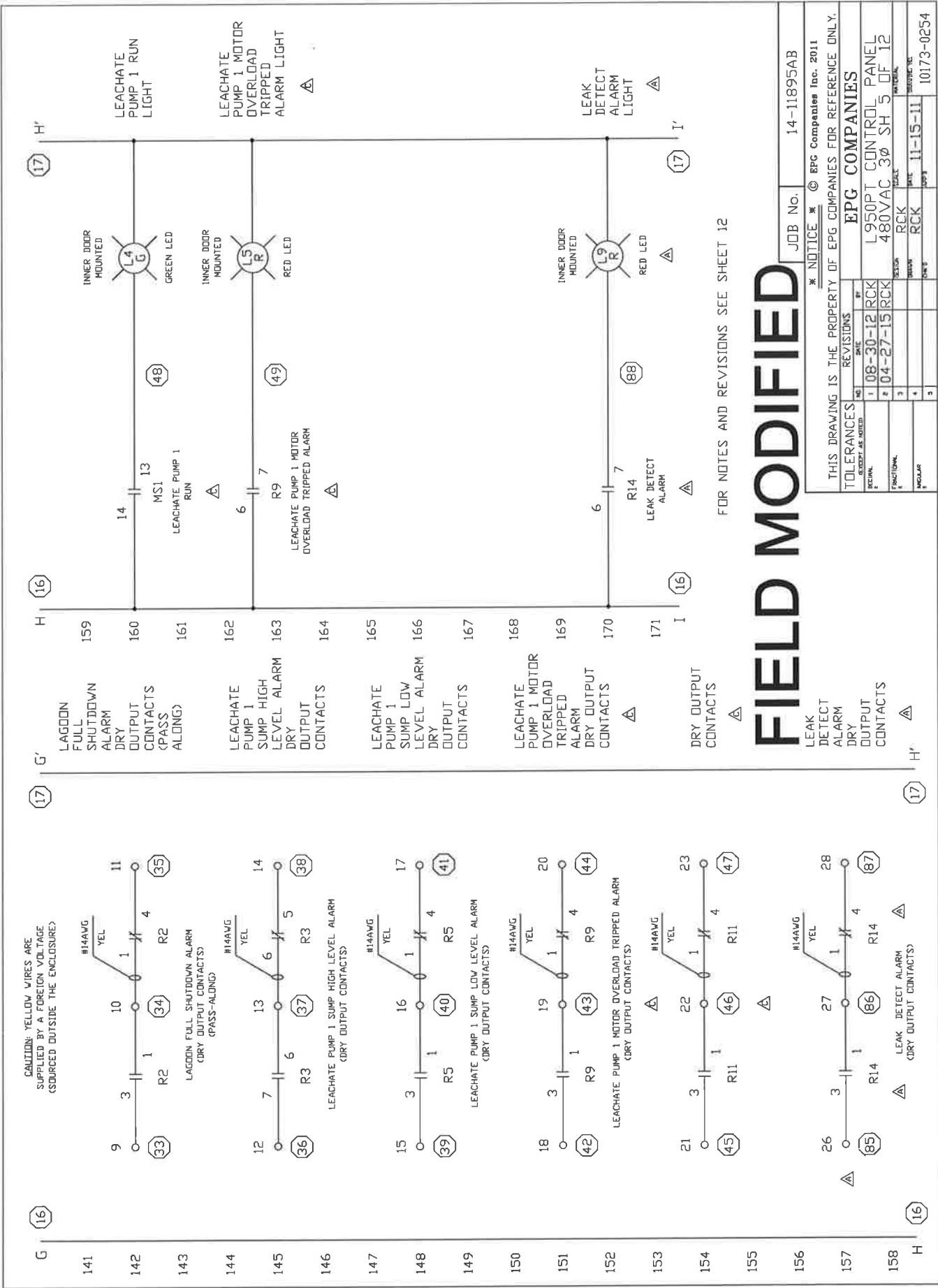


TOLERANCES		REVISIONS	
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±0.005 AS NOTED		1	08-30-12 RCK
		2	07-03-13 RCK
		3	04-27-15 RCK
		4	05-18-15 RCK

JOB No.		14-11895AB	
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BY		EPG COMPANIES	
DATE		L950PT CONTROL PANEL	
DRAWN		480VAC 3Ø SH 3 OF 12	
CHECKED		RCK	
APPROVED		RCK	
DATE		11-15-11	
JOB NO.		10173-0252	

FIELD MODIFIED

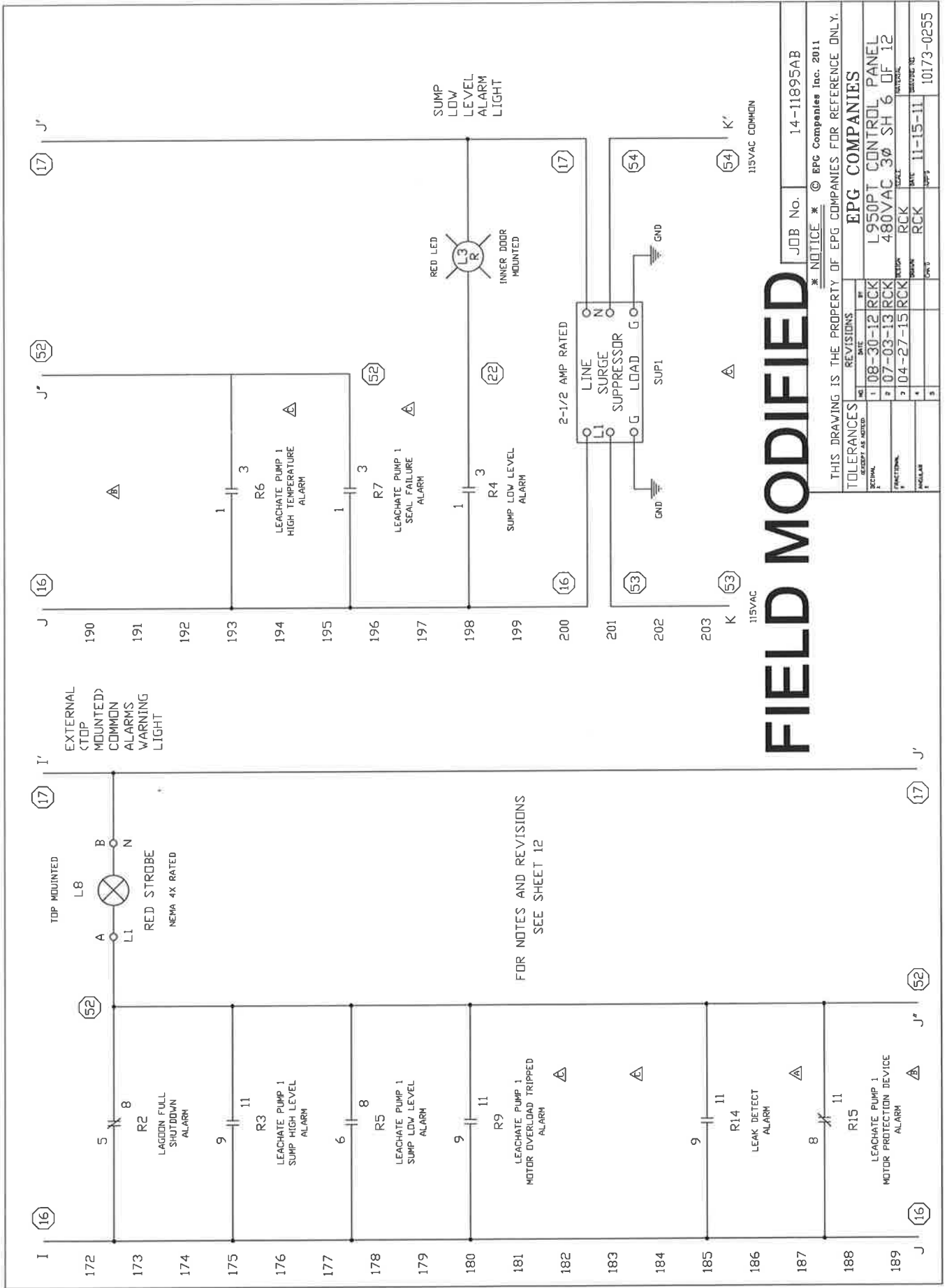
FOR NOTES AND REVISIONS SEE SHEET 12



FOR NOTES AND REVISIONS SEE SHEET 12

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TOLERANCES		REVISIONS	
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		2	04-27-15 RCK
		3	
		4	
		5	
EPC COMPANIES		L950PT CONTROL PANEL	
L950PT CONTROL PANEL		480VAC 3Ø SH 5 OF 12	
RCK		RCK	
DATE		DATE	
11-15-11		11-15-11	
JOB#		JOB#	
		10173-0254	



FOR NOTES AND REVISIONS
SEE SHEET 12

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JOB No. 14-11895AB

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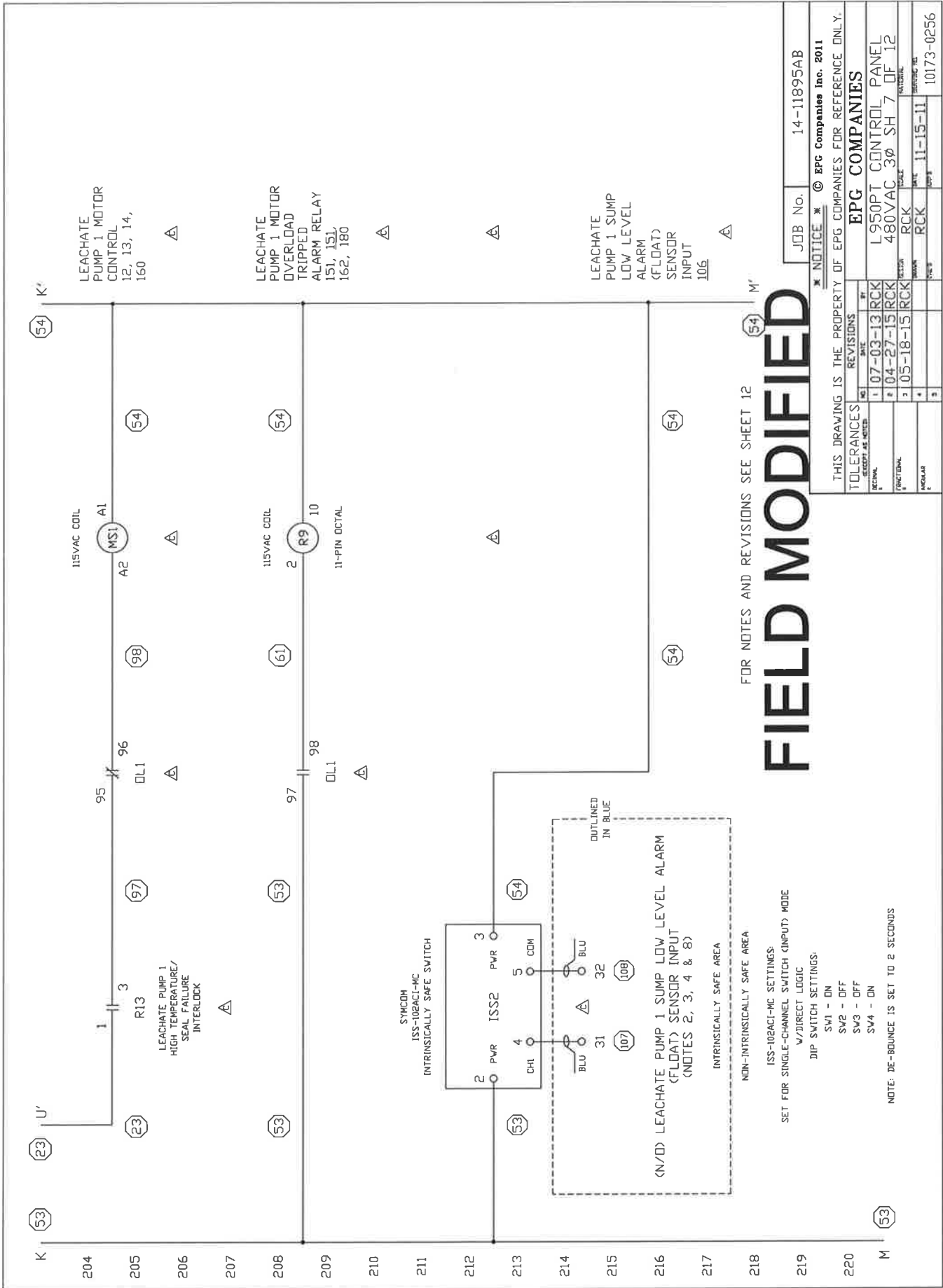
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2	07-03-13	RCK	
3	04-27-15	RCK	
4			
5			

EPG COMPANIES
L950PT CONTROL PANEL
480VAC 3Ø SH 6 OF 12

DATE	11-15-11	DESIGNED BY	
ISSUED		CHECKED	
DATE		DATE	
BY		BY	

10173-0255



FOR NOTES AND REVISIONS SEE SHEET 12

FIELD MODIFIED

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TOLERANCES EXCEPT AS NOTED		REVISIONS	
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2	04-27-15	RCK	RCK
3	05-18-15	RCK	RCK
4			
5			

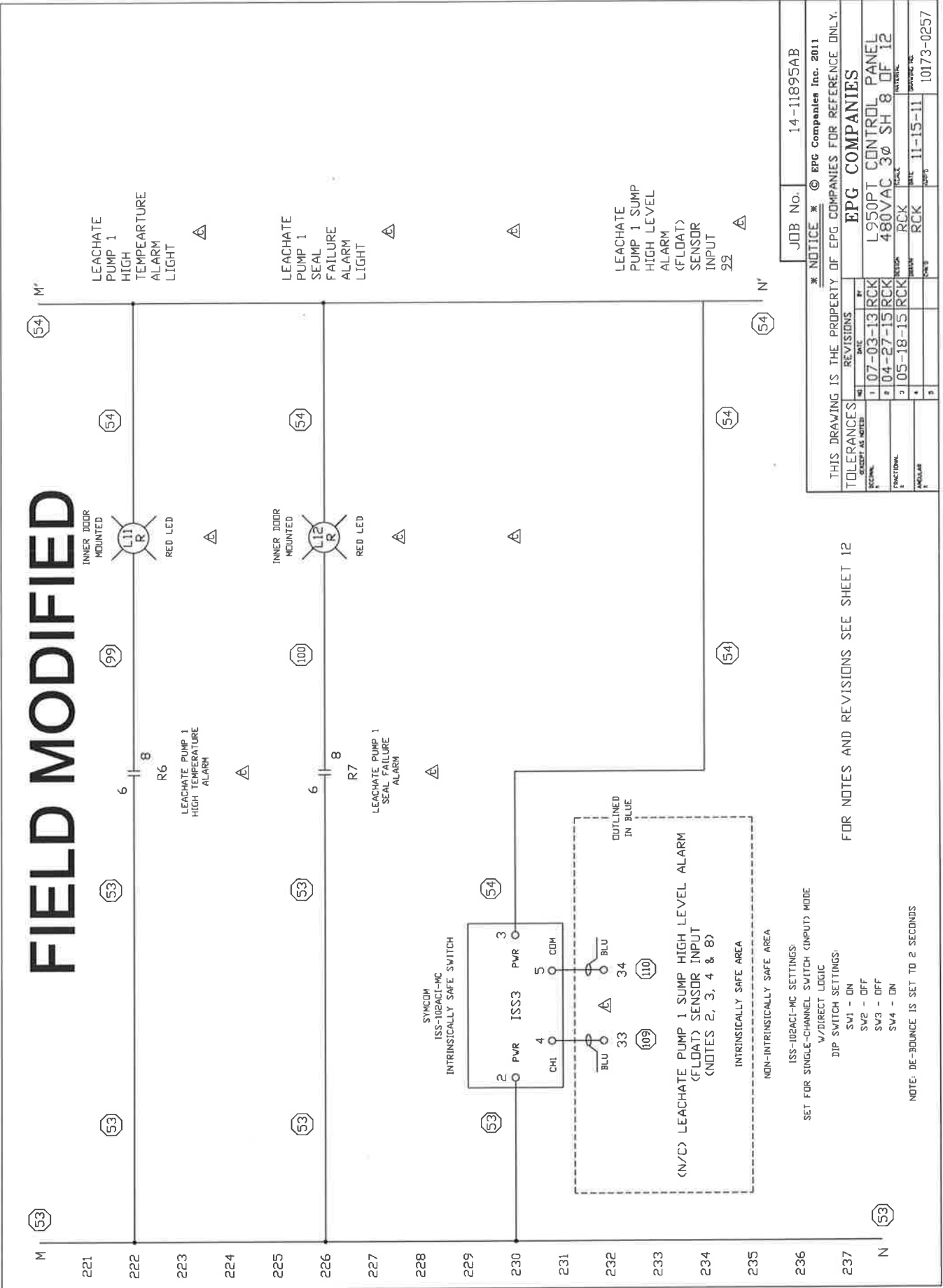
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EPG COMPANIES

L950PT CONTROL PANEL
480VAC 3Ø SH 7 OF 12

RCK
DATE 11-15-11
JOB# 10173-0256

FIELD MODIFIED



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NO.	REVISIONS	DATE	BY
1	07-03-13	RCK	
2	04-27-15	RCK	
3	05-18-15	RCK	

TOLERANCES UNLESS OTHERWISE SPECIFIED AS NOTED

SECTION	BY	DATE
1	07-03-13	RCK
2	04-27-15	RCK
3	05-18-15	RCK

EPG COMPANIES
L950PT CONTROL PANEL
480VAC 3Ø SH 8 OF 12

NO.	REVISED	DATE	BY
1	11-15-11	RCK	
2			
3			

JOB No. 14-11895AB

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FOR NOTES AND REVISIONS SEE SHEET 12

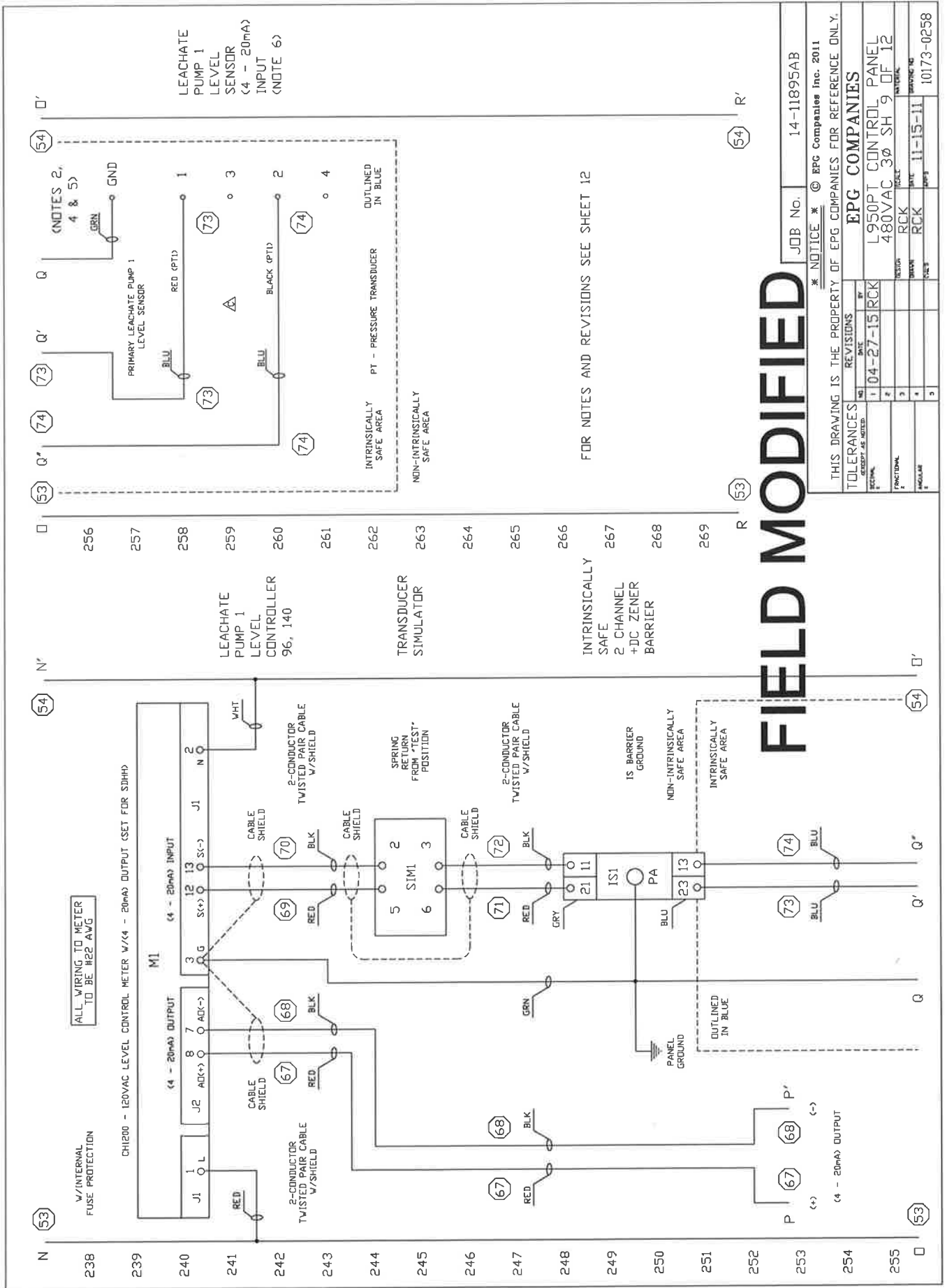
SYMBOL
ISS-102ACT-MC
INTRINSICALLY SAFE SWITCH

SET FOR SINGLE-CHANNEL SWITCH (INPUT) MODE
W/DIRECT LOGIC

DIP SWITCH SETTINGS:
SW1 - ON
SW2 - OFF
SW3 - OFF
SW4 - ON

NOTE: DE-BOUNCE IS SET TO 2 SECONDS

10173-0257



FOR NOTES AND REVISIONS SEE SHEET 12

NO.	REVISIONS	DATE	BY
1	04-27-15	RCK	
2			
3			
4			

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TOLERANCES UNLESS OTHERWISE SPECIFIED AS NOTED

SECTION: L950PT CONTROL PANEL 480VAC 3Ø SH 9 OF 12

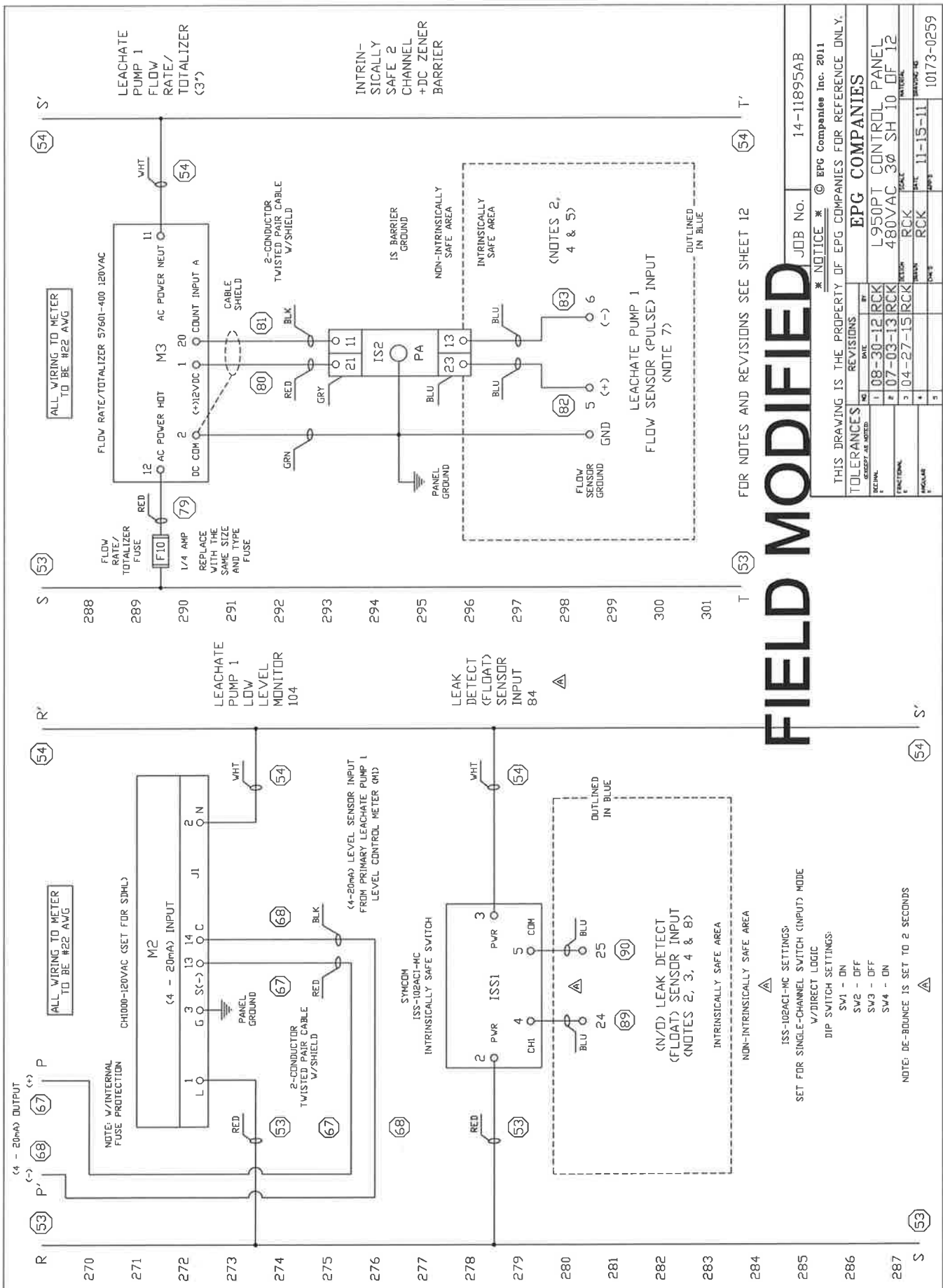
FRAC: RCK

DATE: 11-15-11

PROJECT: 10173-0258

JOB No. 14-11895AB

FIELD MODIFIED



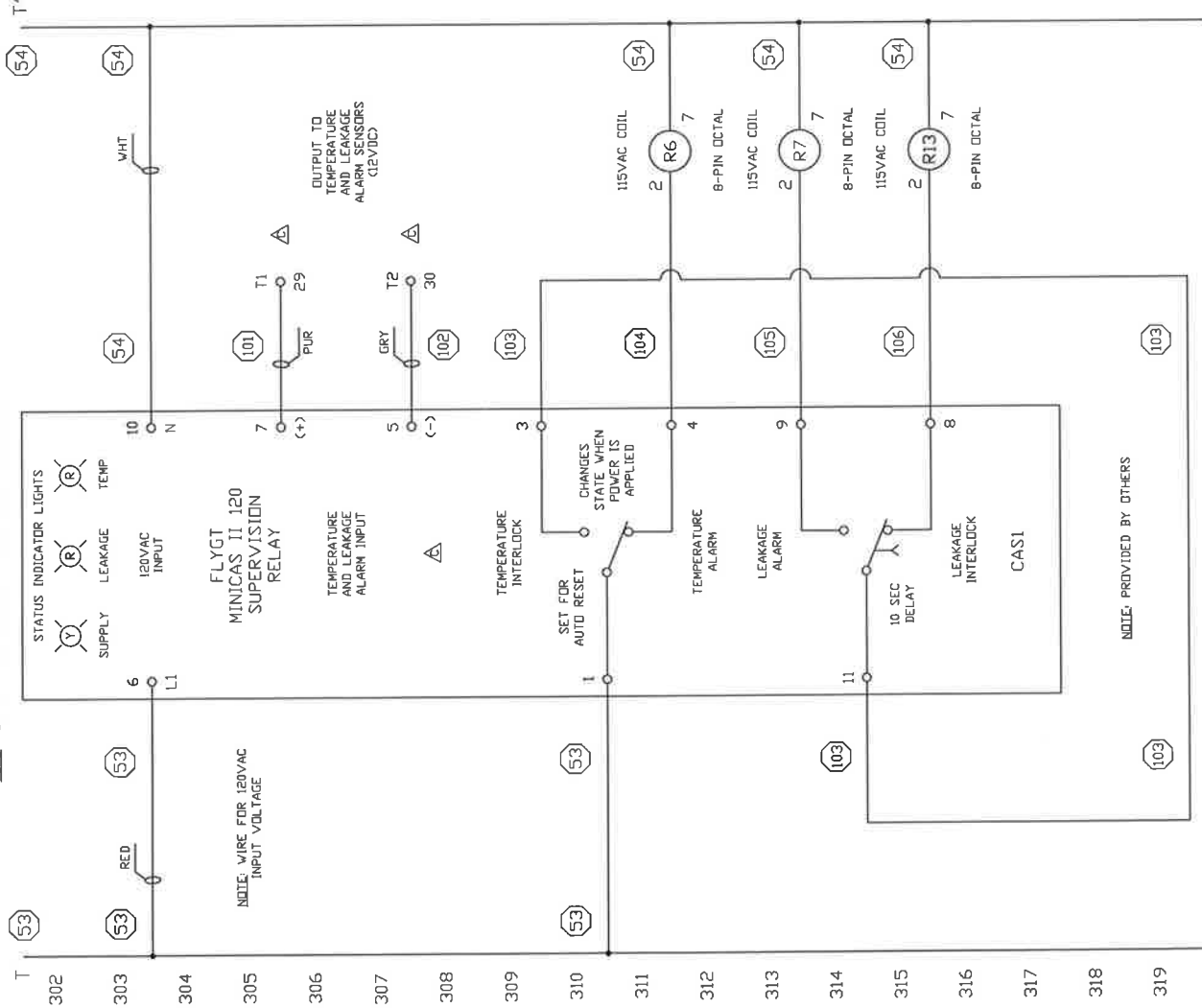
FOR NOTES AND REVISIONS SEE SHEET 12

FIELD MODIFIED

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JOB No. 14-11895AB	
EPG COMPANIES	
L950PT CONTROL PANEL	
480VAC 3Ø SH 10 OF 12	
DATE	11-15-11
SCALE	RCK
REVISIONS	DATE
1	08-30-12
2	07-03-13
3	04-27-15
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10173-0259

NOTE: ALSO SEE THE MINICAS OPERATION AND INSTALLATION MANUAL.



LEACHATE PUMP 1 FLYGT MINICAS II 120 SUPERVISION RELAY

LEACHATE PUMP 1 TEMPERATURE AND LEAKAGE ALARM INPUT

LEACHATE PUMP 1 HIGH TEMPERATURE ALARM RELAY 193, 222

LEACHATE PUMP 1 SEAL FAILURE ALARM RELAY 195, 226

LEACHATE PUMP 1 SEAL FAILURE/ HIGH TEMPERATURE INTERLOCK RELAY 204

FOR NOTES AND REVISIONS SEE SHEET 12

LAST WIRE NUMBER USED: 110

WIRE NUMBERS REMOVED:

- 7, 8, 9, 24, 25, 26, 27, 28, 29, 30,
- 50, 51, 55, 56, 57, 58, 59, 60, 62,
- 63, 64, 65, 66, 75, 76, 92, 95

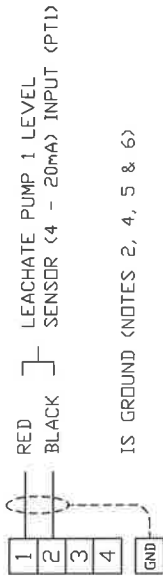
AAA

FIELD MODIFIED

JOB No.		14-1189SAB	
* NOTICE * © EPG Companies Inc. 2015			
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TOLERANCES (UNLESS AS NOTED)		REVISIONS	
NO.	DATE	BY	DESCRIPTION
1	04-27-15	RCK	L950PT CONTROL PANEL
2	05-18-15	RCK	480VAC 3Ø SH 11 OF 12
3			
4			
5			
DRAWN BY		DATE	
RCK		04-27-15	
CHECKED BY		DATE	
RCK		04-27-15	
APPROVED BY		DATE	
		10173-0260	

FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)

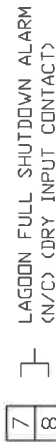


PT - PRESSURE TRANSDUCER

FLOW SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (DRY INPUT CONTACT)



LOAD (115VAC)

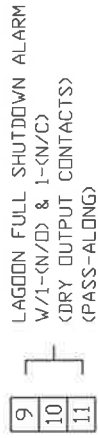


NOTES:

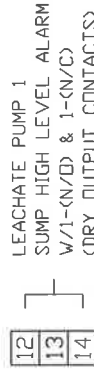
1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. SELECTOR SWITCHES (SS1-SS2) WILL SPRING RETURN FROM THE "HAND" POSITION
4. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
5. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
6. MAXIMUM CABLE LENGTH TO THE LEVEL SENSORS (PT1-PT2) IS 3000 FEET
7. MAXIMUM CABLE LENGTH TO THE FLOW SENSOR (M3) IS 500 FEET
8. MAXIMUM CABLE LENGTH TO THE INTRINSICALLY SAFE SWITCH, (ISS1-ISS3) IS 10,000 FEET

FIELD WIRING TERMINALS

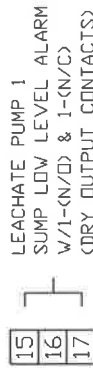
TANK FULL ALARM (DRY OUTPUT CONTACTS)



SUMP HIGH LEVEL ALARM (DRY OUTPUT CONTACTS)



SUMP LOW LEVEL ALARM (DRY OUTPUT CONTACTS)



PUMP 1 MTR. OL ALARM (DRY OUTPUT CONTACTS)



FIELD WIRING TERMINALS

DRY OUTPUT CONTACTS



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



LEAK DETECT ALARM (DRY OUTPUT CONTACTS)



LEACHATE PUMP 1 SENSORS (12VDC OUTPUT)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)



FIELD MODIFIED

JOB No.		14-11895AB	
* NOTICE * © EPG Companies Inc. 2011			
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TOLERANCES		EPG COMPANIES	
AS SHOWN	UNLESS OTHERWISE SPECIFIED		
REVISIONS			
NO.	DATE	BY	
1	08-30-12	RCK	L-950PT CONTROL PANEL
2	04-27-15	RCK	480VAC 3Ø SH 12 OF 12
3	05-18-15	RCK	
4			
5			
DRAWING		DATE	11-15-11
SCALE		APP'D	10173-0261

EPG LevelMaster Pump controller

Panel S/N: 11-10293A

Meter S/N: 120711-04

Leachate Pumps 1 & 2 Level Control Meter

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M1

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr H1	53	Turns Lead Pump on when level on meter reads <u>18"</u> below lowest leachate pipe invert
Pr H2	59	Turns Lag Pump on when level on meter reads <u>N/A</u> "
Pr Lo	19	Turns Lead/lag Pump off when level on meter reads <u>12"</u> below lowest leachate pipe invert
Al Hi	65	Turns High Level Light on when meter reads <u>17"</u> below lowest leachate inlet pipe invert.
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5 PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 11-10293A

Meter S/N: 120811-01

Leachate Pumps 1 & 2 Sump Low Level Monitor

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M2

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	N/A	Turns Pump on when level on meter reads <u> N/A </u> ".
Pr Lo	N/A	Turns Pump off when level on meter reads <u> N/A </u> ".
AL Hi	N/A	Turns High Level Light on when meter reads <u> N/A </u> ".
Hy Hi	N/A	Keeps High Level Light on until level drops <u> N/A </u> " below AL Hi
AL Lo	18	Turns Low Level Light on when meter reads <u> 18 </u> ".
Hy Lo	1	Keeps Low Level Light on until level rises <u> 1 </u> " above AL Lo

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 11-10293B

Meter S/N: 121311-04

Leachate Pumps 1 & 2 Level Control Meter

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M1

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr H1	53	Turns Lead Pump on when level on meter reads <u>18" below</u> lowest leachate inlet pipe invert
Pr H2	59	Turns Lag Pump on when level on meter reads <u>N/A</u> ".
Pr Lo	19	Turns Lead/lag Pump off when level on meter reads <u>12</u> ".
Al Hi	65	Turns High Level Light on when meter reads <u>17" below</u> lowest leachate inlet pipe invert.
Hy Hi	1	Keeps High Level Light on until level drops <u>1</u> " below AL Hi.

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5 PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

EPG LevelMaster Pump controller

Panel S/N: 11-10293B

Meter S/N: 121211-01

Leachate Pumps 1 & 2 Sump Low Level Monitor

Default setting - Operating Parameters - Setup Code 35

Meter Designation(s): M2

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
Pr Hi	N/A	Turns Pump on when level on meter reads <u> N/A </u> ".
Pr Lo	N/A	Turns Pump off when level on meter reads <u> N/A </u> ".
AL Hi	N/A	Turns High Level Light on when meter reads <u> N/A </u> ".
Hy Hi	N/A	Keeps High Level Light on until level drops N/A " below AL Hi
AL Lo	18	Turns Low Level Light on when meter reads <u> 11 </u> ".
Hy Lo	1	Keeps Low Level Light on until level rises <u> 1 </u> " above AL Lo

Default Settings - Sensor Parameters - Setup Code 25 (0 - 5PSI)

<u>Parameter</u>	<u>Value</u>	<u>Operation</u>
dp	8888.8	Sets Meter to read in 0.1"
OFFSET	-34.6	Provides a "0" reading when sensor inputs 4.0ma
SCALE	0.8656	Converts current input into inches - 1.0ma = 8.656 inches.

AS BUILT

CAUTION

EPG submersible level sensors are designed for rugged use. However, care should be taken to protect these devices from over pressure and sudden impact. When lowering the level sensor into a liquid, penetrate the surface slowly and only to the depth that the unit is designed for. Do not drop or wash with high pressure since this may damage the unit.

EPG Controllers With Intrinsically Safe Circuit(s)

Field Installation Instructions

PURPOSE: Provide instructions to install EPG control panels with Intrinsically Safe (IS) Circuits wired to EPG Level Sensors, EPG Flow Sensors, and Single and Dual Level Float Sensors.

PROCEDURE:

Familiarize yourself with the electrical components and the panel electrical schematics. Read these instructions thoroughly before attempting installation of intrinsically safe circuits. Reference: Installation of intrinsically safe instrument systems in CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.

Install in accordance with Article 504 of the National Electrical Code.

This control panel and its intrinsically safe circuit(s) must be connected to a ground system with very low impedance (1 OHM or less) per NEC 504-50 and 250-50.

See control panel drawings for device wiring. Only simple apparatus (NEC 504-2) and those specifically called out in the controller drawing are to be connected to the intrinsically safe circuit(s). The attached drawings show specific device wiring for level, flow, single level float and dual level float sensors

Where intrinsically safe circuits enter or exit a hazardous (classified) area, a means must be provided to prevent the passage of gases or vapors per NEC 501-5. A seal device must be installed to conduit entering the enclosure and then filled with appropriate sealant.

Wiring of intrinsically safe circuits shall be physically separated from non-intrinsically safe circuits per NEC 504. Do not run intrinsically safe and non-intrinsically safe circuits in the same conduit.

Do not exceed maximum cable lengths stated in the control panel drawings.

Field wiring supplied by others is to have 600 Volt insulation rating.

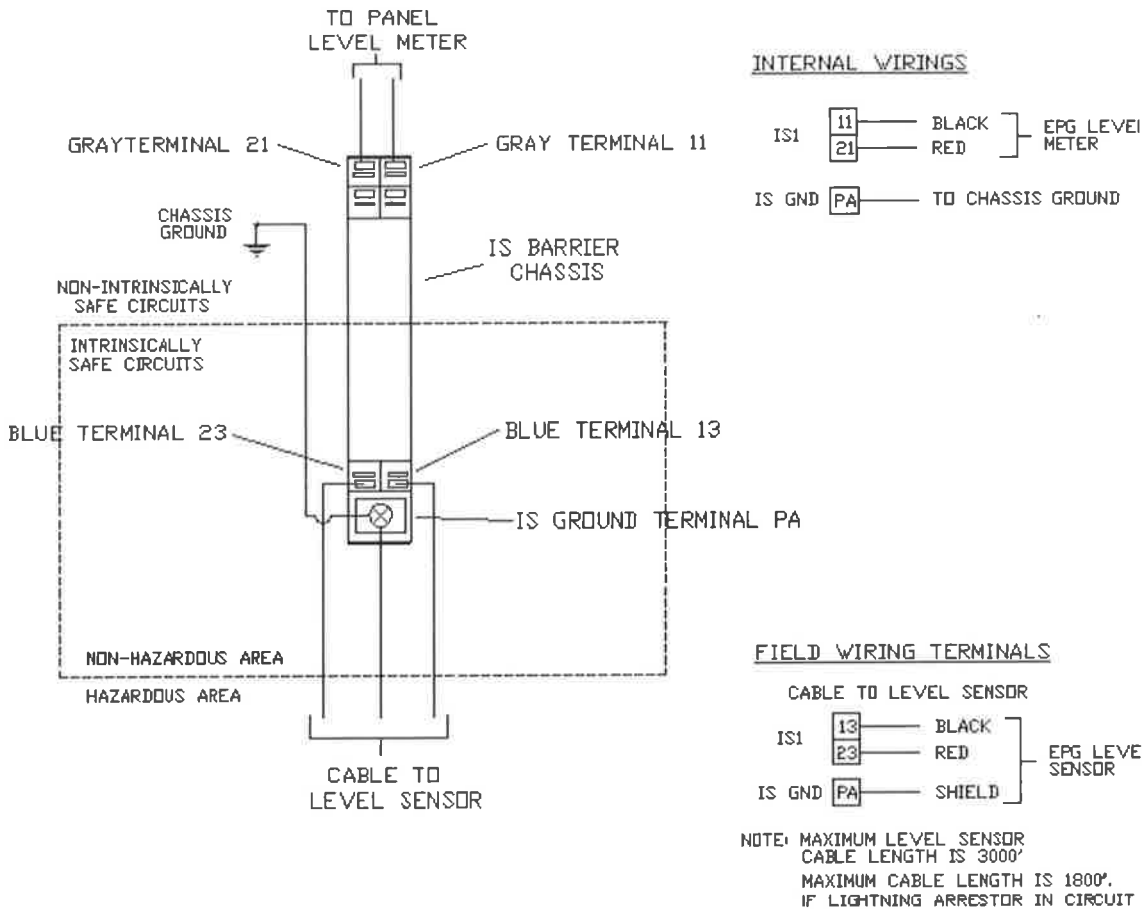
Conductors of intrinsically safe circuits must be separated by at least 5" from conductors of any non-intrinsically safe circuits

If field wiring is terminated in field supplied junction boxes there must be a minimum of 8" between intrinsically safe and non-intrinsically safe field wiring terminals.

Do not substitute parts. Use only the same make, model and part number as originally supplied.

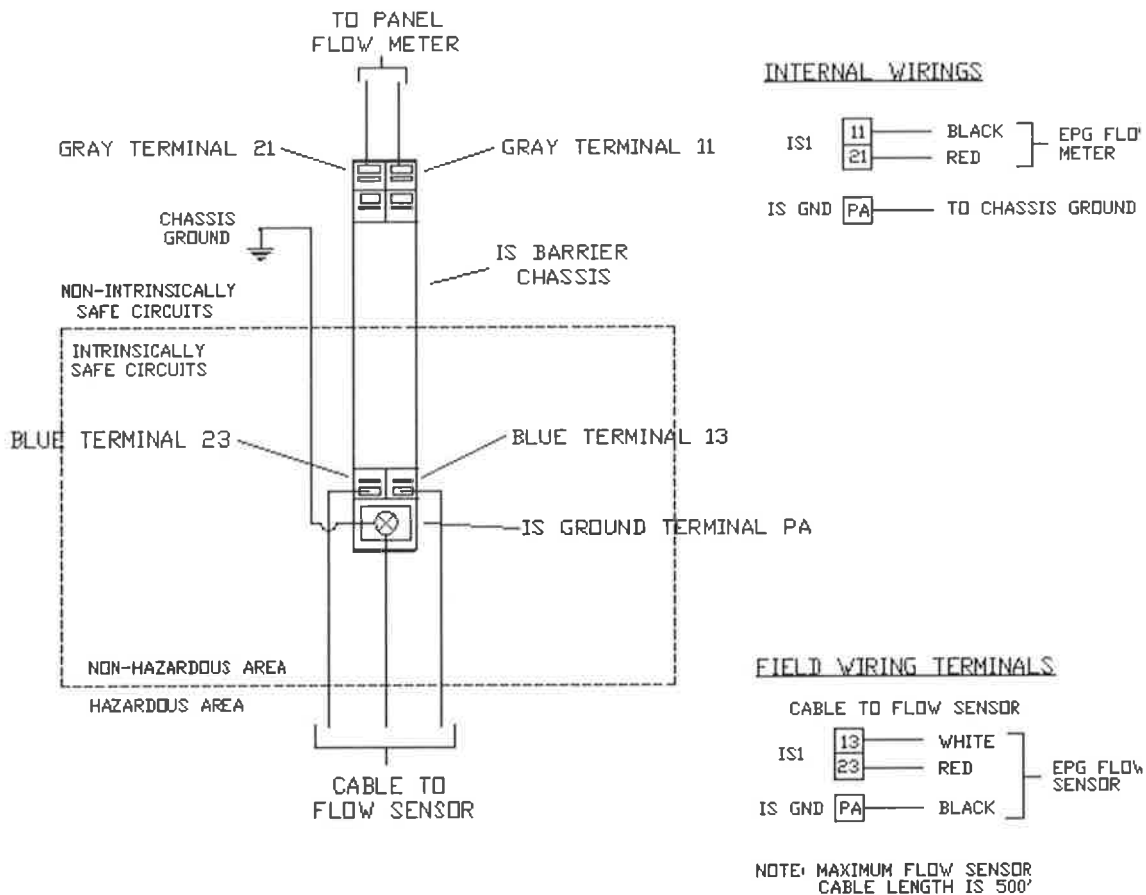
Replace fuses only with fuses of same type and rating.

I.S. BARRIER - LEVEL SENSOR



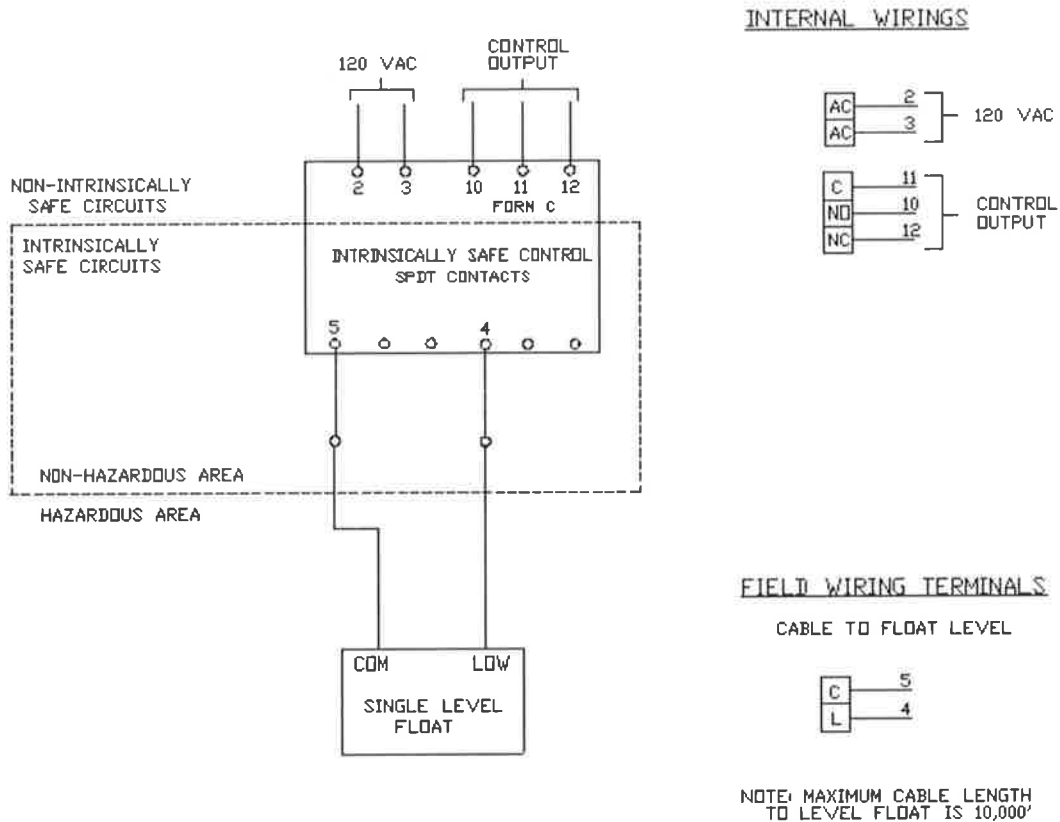
- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS C & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000.
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
5. MAXIMUM CABLE LENGTH TO EPG LEVEL SENSOR IS 3000 FEET.
 MAXIMUM LENGTH IS 1800 FEET IF LIGHTNING ARRESTOR IN LEVEL SENSOR CIRCUIT.

I.S. BARRIER - FLOW SENSOR



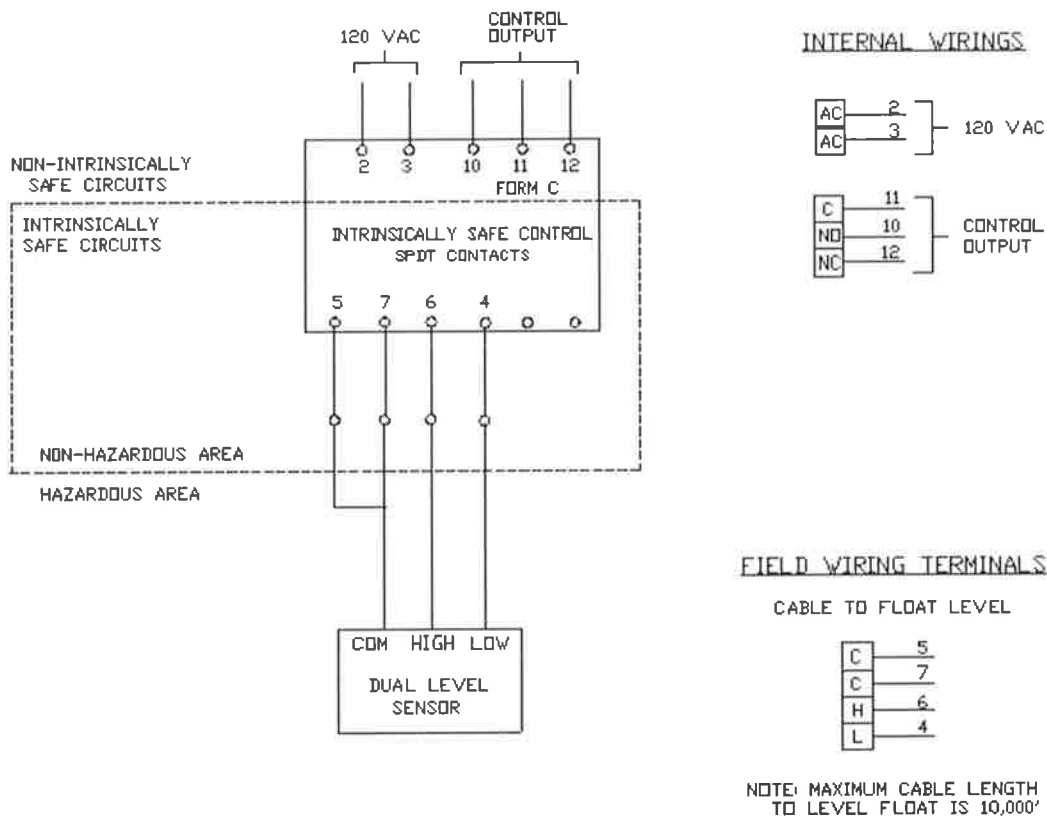
- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS C & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000.
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4.
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
5. MAXIMUM CABLE LENGTH TO EPG FLOW SENSOR IS 500 FEET.

I.S. RELAY BARRIER - SINGLE LEVEL



- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS A, B, C, & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000a
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/NFPA 70
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504, 2011 OF THE NATIONAL ELECTRICAL CODE
5. MAXIMUM CABLE LENGTH TO LEVEL FLOAT SENSOR IS 10,000 FEET

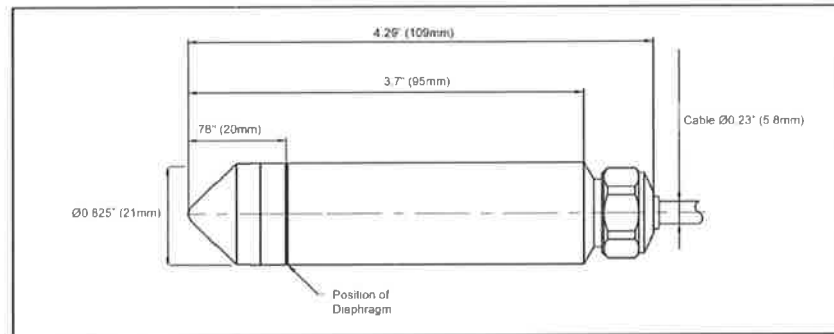
I.S. RELAY BARRIER - DUAL LEVEL



- NOTE: 1. PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS 1 GROUPS A, B, C, & D HAZARDOUS LOCATIONS WHEN CONNECTED PER EPG BULLETIN 8000a
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS 1 HAZARDOUS LOCATIONS, ANSI/NFPA 70
3. WARNING SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
4. INSTALL IN ACCORDANCE WITH ARTICLE 504, 2011 OF THE NATIONAL ELECTRICAL CODE
5. MAXIMUM CABLE LENGTH TO LEVEL FLOAT SENSOR IS 10,000 FEET

ENGINEER'S SPECIFICATION

EPG LG & LGP Submersible Level Transmitters



GENERAL FEATURES

- * **Application:** The EPG LG & LGP transmitters are designed to work with the EPG SurePump™, but their durability, accuracy and weight make them the logical choice for stand alone level applications. The chemical resistant jacketed cable contains a vent tube for atmospheric pressure compensation and the sensor has built-in lightning protection with a lifetime warranty.
- * **Ranges Available:** 0-3' through 0-900' models are standard. Call EPG for other available ranges.
- * **Accuracy:** The LG & LGP transmitters have built-in temperature compensation as well as precise calibration giving an accuracy of $\pm 1.0\%$ and $\pm 5\%$ respectively.
- * **Fully Submersible:** The LG & LGP transmitters are fully submersible in any liquid compatible with 316L stainless steel and the chemical resistant polyester cable jacket. It is designed for submergence at depths greater than operating level without sustaining damage. Call EPG for more severe service.
- * **Superior Noise Immunity:** Designed for heavy duty use in hostile environments, the LG & LGP transmitters give outstanding noise immunity. Unlike transducers, whose signals may be distorted by outside interference, the LG & LGP transmitters utilize a conditioned compensated 4-20 mA output to maximize signal strength and accuracy. The transmitters also features shielded leads to help prevent signal disruption from outside sources.

PERFORMANCE

- * **Depth Range:** 0-3' thru 0-900' (0-2 PSI thru 0-390 PSI)
- * **Static Accuracy¹:** LG Model $\pm 1.0\%$ FS TEB / LGP Model $\pm .50\%$ FS TEB
- * **Proof Depth:** 2.0 X rated depth
- * **Resolution:** 0.002%FS

1. TEB: Total Error Band; Includes the combined effects of non-linearity, hysteresis and non-repeatability as well as thermal dependencies, over the entire compensated temperature range.

ELECTRICAL

- * **Excitation:** 10 to 28 VDC, Red = (+) excitation, Black = (-) excitation
- * **Input Current:** 20 mA maximum
- * **Output:** 4-20 mA (2 wire)

ELECTRICAL (cont.)

- * Zero offset (max): 4 mA, ±.10mA
- * Output impedance: <10 ohms
- * Insulation resistance: 100 megohms at 50VDC
- * Circuit protection: Polarity, surge, shorted output and lightning protection
- * Electrical termination: 2-24 AWG conductors in a shielded cable with sensor breather and polyester jacket

Addition of Option-009 or internal only protection (standard on all 4-20mA pressure transmitters) increases the minimum-required supply voltage, on account of internal resistance of the surge protectors. In addition, cable resistance* adds to the supply requirement. In order to insure proper system operation, calculate the minimum required supply voltage (at the source) as follows:

For two-part (internal + external) system (recommended):
MINIMUM SUPPLY VOLTAGE = 10.75 + 0.025 (CABLE LENGTH x 0.07) VDC

For internal only protector (standard with 4-20mA output):
MINIMUM SUPPLY VOLTAGE = 9.65 + 0.025 (CABLE LENGTH x 0.07) VDC

ENVIRONMENTAL

- * Compensated temp range: 0° to 60°C
- * Operating temp range: -10° to 80°C

PHYSICAL

- * Dimensions: Nominal diameter of .825" X 4.29" length
- * Weight: 7 oz. (not including cable)
- * Cable: Polyester jacketed shielded cable with vent tube (Tefzel available)
- * Wetted materials: 316L SS, Polyamide, Fluorocarbon
- * Mounting provision: Suspended by cable

MODEL

Part # shown indicates ±1.0% accuracy, 4-20 mA output. Call EPG for other available options – specify length (---)

PART #	DESCRIPTION	RANGE
LG011C---	Submersible Level Transmitter	0-11'
LG016C---	" " "	0-16'
LG023C---	" " "	0-23'
LG035C---	" " "	0-35'
LG046C---	" " "	0-46'

OPTIONS

- * Drying Tube Assembly (Desiccant Dryer)
- * Bellows Assembly
- * Stabalizing Weight
- * Conduit Fitting
- * Breakout Junction Box

EPG LevelMaster™ Level Sensor

OPERATION & MAINTENANCE INSTRUCTIONS

Characteristics of the LevelMaster Level Sensor

EPG Companies Inc. LevelMaster level sensor is a submersible pressure transmitter. The pressure transmitter is a precision measurement device that incorporates isolated diaphragm sensors that are specifically designed for use with hostile fluids and gases. The sensor utilizes a silicon pressure cell that has been fitted into a stainless steel package with a stainless steel barrier diaphragm. The sensor assembly is housed in a rugged 316 stainless steel case.

The device features a high performance internal signal conditioning. Standard output is 4 to 20 mA. All units have surge and reverse polarity protection.

All EPG transmitters are permanently etched with wiring information, part number (P/N), serial number (S/N), date of manufacture (DOM), range, excitation, and output.

All EPG transmitters are designed for rugged use. However, care should be taken to protect these devices from overpressure and sharp impact. When lowering submersible pressure transmitters into a liquid, penetrate the surface slowly and only to the depth necessary. Do not drop the unit from above the surface. All transmitters can be cleaned by rinsing them in mild detergent. Do not pressure wash.

Vent Filter / Water Vapor Trap

The vent filter and water vapor trap is a replaceable vent tube dehumidifier intended for use with the submersible pressure transmitters. This device is specifically designed to protect sensitive electronic components from mildew, corrosion, rust, and other forms of deterioration while at the same time preventing the formation of a liquid column.

Vent filters should be changed when they are 85% spent. Do not remove the old filter until a new one is available. The number one failure mode is moisture and corrosion damage due to lack of maintenance of the vent filter. The vent filter connects to the existing vent tube as it exits the cable at the junction box via a tube.

Replacement vent filters can be ordered by calling EPG at 800-443-7426. The vent filter and water vapor trap can be exposed to air, industrial gases, refrigerants, organic liquids, and solvents. However, they should not be used when ammonia is present.

Specifications

Most installations of submersible pressure transmitters connect the cable directly to the control panel or to a breakout box (junction box). From this breakout box, end users must run cable to the required

instrumentation. Specifications for the polyurethane or Tefzel jacketed cable is as follows:

- * Excitation: 10 to 40 VDC, Red = (+) excitation, Black = (-) excitation
- * Input Current: 20 mA maximum
- * Output: 4-20 mA (2 wire)
- * Zero offset (max): 4-20 mA, \pm .12mA
- * Output impedance: <10 ohms
- * Insulation resistance: 100 megohms at 50VDC
- * Circuit protection: Polarity, surge & shorted output
- * Power supply rejection: < \pm .05% FSO/VDC (mA output)
- * Electrical termination: 2-24 AWG conductors in a shielded cable with sensor breather, water block, and polyurethane jacket
- * Compensated temp range: 0° to 50°C
- * Operating temp range: -20° to 70°C
- * Dimensions: Nominal diameter of 1.0" X 4.15" length
- * Weight: 7 oz. (not including cable)
- * Cable: Polyurethane jacketed shielded cable with polyethylene vent tube and Kevlar tension members
- * Wetted materials: 316 SS, Viton
- * Mounting provision: Suspended by cable

Polyurethane Cable

The standard cable is polyurethane and will handle most environments and has a self-sealing feature. If a cut occurs in the outer jacket of the cable, a water block feature below the outer jacket will self-seal in most cases to guard against the incursion of water.

Chemical Resistance of Polyurethane

Potable Water, Waste Water, Borax, Butane, Animal Fat, Carbonic Acid, Citric Acid, Cod Liver Oil, Corn Oil, Glycerin, Glycol, Mineral Oils, Potassium Nitrate, Potassium Sulfate, Silicone Oils, Stoddard Solvent, Tannic Acid (10), Tartaric Acid, Turbine Oil, and most Leachate.

Tefzel® Cable

Optional Tefzel cable is recommended for use in highly corrosive environments. It offers additional resistance in corrosive environments over the standard polyurethane cable.

Chemical Resistance of Tefzel

Acetic Acid (Glacial), Acetic Anhydride, Acetone, Aluminum Chloride, Anti-Freeze, Bromine, Calcium Chloride, Calcium Hydroxide, Chlorine, Copper Chloride, Ferrous Chloride, Hydrochloric Acid, Ketones, Lacquer Thinners, Leachate, and Sulfuric Acid.

Cable Lengths

The maximum length of cable to be used with the submersible pressure transmitter is up to 10,000 feet.

OPTIONS

- * Titanium Housing: Used for highly corrosive environments
- * Lightning Protection: Protects against transient voltages and lightning associated surges up to 20,000 amperes
- * Temperature Sensor: A sensor with 4-20 mA output for temperature (0-50°C) is available –
Excitation: 9-30 VDC, White = (+) excitation, Green = (-) excitation.

EPG LevelMaster™ Level Meter

Model CH1000-SDHH

OPERATION & SET UP INSTRUCTIONS

The EPG LevelMaster system uses a submersible pressure transmitter to detect changes in fluid levels and a programmable meter featuring a digital LED display and front panel keypad to monitor and control fluid levels. The user can program the desired control parameters for a single pump and one other high level control function. The LevelMaster display is in inches unless otherwise programmed. During a pumping and/or an alarm condition, the display alternates between the message and the current liquid level reading. The message indicates which function is active (see below).

GENERAL SETUP OPERATIONS

IMPORTANT: During setup, if three (3) minutes elapse without a keypad entry the meter automatically returns to the run mode without the entered changes being stored. **DO NOT USE FINGERNAIL OR OTHER SHARP OBJECT TO PROGRAM METER. DAMAGE TO KEYPAD MAY RESULT.**

DISPLAY	INSTRUCTION
SETUP	At this prompt, enter the lockout code (35) in order to enter the set point setup mode.
Pr HI	At this prompt, followed by the current setting, select the Pump Relay High set point. This is the pump ON set point.
Pr Lo	At this prompt, followed by the current setting, select the Pump Relay Low set point. This is the pump OFF set point.
AL Hi	At this prompt, followed by the current setting, select the Alarm High Relay set point. This is the high level alarm set point.
Hy Hi	At this prompt, followed by the current setting, select the hysteresis for the Alarm High Relay set point. This value, when subtracted from the high level alarm set point, sets the shut off point for the high level alarm .
AL H2	At this prompt, followed by the current setting, select the Alarm High-High Relay set point. This is the high-high alarm level set point and is factory set.
Hy H2	At this prompt, followed by the current setting, select the hysteresis for the Alarm High-High Relay set point. This value, when subtracted from the high-high level alarm set point, sets the shut off point for the high-high level alarm and is factory set.

DISPLAY	MESSAGE
P	Pump activated. "P" and the current level reading will alternate on the display.
HiP	High alarm & pump activated. "HiP" and the current level reading will alternate on the display.
HiPH2	High-High alarm & pump deactivated. "HiPH2" and the current level reading will alternate on the display.

SET UP PROCEDURES FOR SIMPLEX OPERATION – SDHH METER

STEP NO.	ACTION
1	Push SETUP/ENTER button. Wait for the meter to display 0.
2	Push arrow buttons to set a value of 35 on meter display. Push SETUP/ENTER.
3	Meter shows Pr HI (pump ON set point) followed by current value.
4	Push arrow buttons to set the desired level for pump ON. Push SETUP/ENTER button.
5	Meter shows Pr Lo (pump OFF set point) followed by current value.
6	Push arrow buttons to set the desired pump OFF level. Push SETUP/ENTER button.
7	Meter shows AL Hi (High Level Alarm) followed by current value.
8	Press arrow buttons to set desired high level alarm point. Push SETUP/ENTER button.
9	Meter shows Hy Hi . Press arrow buttons to select how far below the high level point the alarm will shut off. Push SETUP/ENTER button.
10	Meter shows AL H2 (High-High level alarm set point) followed by current value. Factory setting is 150.0". NOTE: This fail safe feature shuts off the pump if the level sensor fails and <u>should not be changed in the field.</u>
11	Meter shows Hy H2 . Press arrow buttons to select value of 0.0". Not used.
12	Push SETUP/ENTER button. Meter returns to normal operation.

EXAMPLE:

If the desired levels for the pump were:

Pump ON	18.0"
Pump OFF	12.0"
High Level Alarm	30.0"
High Level Alarm Hys.	1.0"

Complete steps 1 – 3 above.

Select **18.0** with arrow buttons for the **Pr HI** value. Push SETUP/ENTER.

Pr Lo is displayed, select **12.0** with the arrow buttons for the Pump OFF value. Push SETUP/ENTER.

AL Hi is displayed, select **30.0** with the arrow buttons for the High Alarm value. Push SETUP/ENTER.

Hy Hi is displayed, select **1.0** with the arrow buttons for the High Level Alarm OFF value (value determined by subtracting from high-level-alarm set-point). Push SETUP/ENTER.

INSTALLATION NOTES AND TROUBLESHOOTING

BACKGROUND: Numerous installations of the EPG LevelMaster system have proven its long-term reliability. The majority of malfunctions of the LevelMaster system are the result of improper installation and handling of the pressure transmitter sensor. During new installations, be certain to check for any shipping damage, loose controller connections or parts that may have come loose during shipment.

CAUTION

Do not use any other programming codes other than setup code (35).

SYMPTOM / DISPLAY	PROBABLE CAUSES	HOW TO CORRECT
Continuous above full scale reading (above 139"), or Continuous reading.	If pump has been off for a long period of time, liquid level may actually be quite high. Loose connections in circuit. Short circuit in sensor lead wire or connector or circuit. Faulty sensor.	Reprogram meter if above 150" or pull pump up slightly to initiate pump start. Repair connections in controller. Inspect for shorted connections at breakout box (junction box) and at controller. If connections are good, replace sensor. Replace sensor.
-34.6 reading.	Lead wire damaged or reversed connections. Open circuit in sensor lead wire or controller connections. Faulty power supply in meter.	Check schematic, repair connections. Replace sensor and lead wire. Test IS barrier and meter with simulator. Replace meter.
Erratic readings.	Damaged sensor lead wire. Improper connections. Faulty meter.	Check schematic, repair connections. Replace sensor and lead wire. Test meter with simulator. If faulty meter, replace meter.

Pump starts at normal reading, runs for a few seconds and stops.	Low liquid recovery rate. Screen on pump may be clogged.	Remove pump and clean screen. May also need to disassemble pump and clean pump impellers.
	Sump clogged or plugged.	Remove pump and clean out sump.

FACTORY SETTINGS

LevelMaster Model SDHH Meter

Panel S/N: _____

Meter S/N: _____

Meter Designation: _____

Operating Parameters – Setup Code 35

PARAMETER	VALUE	OPERATION
Pr Hi	inches	Turns Pump ON when level on meter reads ____
Pr Lo	"	Turns Pump OFF when level on meter reads ____
AL Hi	"	Turns High Level Light ON when level on meter reads ____
Hy Hi	"	Keeps High Level Light ON until level drops ____ below AL Hi
AL H2	"	Turns Pump OFF when level meter reads <u>150.0</u> Greater indicates a probable level sensor failure.
Hy H2	0.0	Not used

NOTE: If the up arrow is pressed any time that the meter is operating, the highest level that the meter has observed since power was applied will be displayed.

EPG LevelMaster™ Level Meter

Model CH1000-DDHX

OPERATION & SET UP INSTRUCTIONS

The EPG LevelMaster system uses a submersible pressure transmitter to detect changes in fluid levels and a programmable meter featuring a digital LED display and front panel keypad to monitor and control fluid levels. The user can program the desired control parameters for duplex pump operation and high level alarm. The LevelMaster display is in inches unless otherwise programmed. During a pumping and/or an alarm condition, the display alternates between the message and the current liquid level reading. The message indicates which function is active (see below).

GENERAL SETUP OPERATIONS

IMPORTANT: During setup, if three (3) minutes elapse without a keypad entry the meter automatically returns to the run mode without the entered changes being stored. **DO NOT USE FINGERNAIL OR OTHER SHARP OBJECT TO PROGRAM METER. DAMAGE TO KEYPAD MAY RESULT.**

DISPLAY	INSTRUCTION
SETUP	At this prompt, enter the lockout code (35) in order to enter the set point setup mode.
Pr HI	At this prompt, followed by the current setting, select the Pump 1 Relay High set point. This is the pump 1 ON set point.
Pr Lo	At this prompt, followed by the current setting, select the Pump 1 Relay Low set point. This is the pump 1 OFF set point.
PrHI2	At this prompt, followed by the current setting, select the Pump 2 Relay High set point. This is the pump 2 ON set point.
PrLo2	At this prompt, followed by the current setting, select the Pump 2 Relay Low set point. This is the pump 2 OFF set point.
AL Hi	At this prompt, followed by the current setting, select the Alarm High Relay set point. This is the high level alarm set point.
Hy Hi	At this prompt, followed by the current setting, select the hysteresis for the Alarm High Relay set point. This value, when subtracted from the high level alarm set point, sets the shut off point for the high level alarm.

DISPLAY	MESSAGE
P	Pump 1 activated. "P" and the current level reading will alternate on the display.
P2	Pump 2 activated. "P2" and the current level reading will alternate on the display.
PP2	Both pumps activated. "PP2" and the current level reading will alternate on display.
HiPP2	High level alarm and both pumps activated. "HiPP2" and current level reading will alternate on display.

SET UP PROCEDURES FOR DUPLEX OPERATION – DDHX METER

STEP NO.	ACTION
1	Push SETUP/ENTER button. Wait for the meter to display 0.
2	Push arrow buttons to set a value of 35 on meter display. Push SETUP/ENTER.
3	Meter shows Pr HI (pump 1 ON set point) followed by current value.
4	Push arrow buttons to set the desired level for pump 1 ON. Push SETUP/ENTER button.
5	Meter shows Pr Lo (pump 1 OFF set point) followed by current value.
6	Push arrow buttons to set the desired pump 1 OFF level. Push SETUP/ENTER button.
7	Meter shows PrHI2 (pump 2 ON set point) followed by current value.
8	Press arrow buttons to set the desired level for pump 2 ON. Push SETUP/ENTER button.
9	Meter shows PrLo2 . Push arrow buttons to set the desired pump 2 OFF level. Push SETUP/ENTER button.
10	Meter shows AL Hi (High level alarm set point) followed by current value. Press arrow buttons to set desired high level alarm point. Push SETUP/ENTER button.
11	Meter shows Hy Hi . Press arrow buttons to select how far below the high level point the alarm will shut off.
12	Push SETUP/ENTER button. Meter returns to normal operation.

EXAMPLE:

If the desired levels for the pump were:

Pump 1 ON	18.0"
Pump 1 OFF	12.0"
Pump 2 ON	25.0"
Pump 2 OFF	15.0"
High Level Alarm	30.0"
High Level Alarm Hys.	1.0"

Complete steps 1 – 3 above.

Pr HI is displayed, select **18.0** with the arrow buttons for the Pump 1 ON value. Push SETUP/ENTER.

Pr Lo is displayed, select **12.0** with the arrow buttons for the Pump 1 OFF value. Push SETUP/ENTER.

PrHI2 is displayed, select **25.0** with the arrow buttons for the Pump 2 ON value. Push SETUP/ENTER.

PrLo2 is displayed, select **15.0** with the arrow buttons for the Pump 2 OFF value. Push SETUP/ENTER.

AL Hi is displayed, select **30.0** with the arrow buttons for the High Alarm value. Push SETUP/ENTER.

Hy Hi is displayed, select **1.0** with the arrow buttons for the High Level Alarm OFF value (value determined by subtracting from high-level-alarm set-point). Push SETUP/ENTER.

INSTALLATION NOTES AND TROUBLESHOOTING

BACKGROUND: Numerous installations of the EPG LevelMaster system have proven its long-term reliability. The majority of malfunctions of the LevelMaster system are the result of improper installation and handling of the pressure transmitter sensor. During new installations, be certain to check for any shipping damage, loose controller connections or parts that may have come loose during shipment.

CAUTION

Do not use any other programming codes other than setup code (35).

SYMPTOM / DISPLAY	PROBABLE CAUSES	HOW TO CORRECT
Continuous above full scale reading (above 139"), or Continuous reading.	If pump has been off for a long period of time, liquid level may actually be quite high. Loose connections in circuit. Short circuit in sensor lead wire or connector or circuit. Faulty sensor.	Reprogram meter if above 150" or pull pump up slightly to initiate pump start. Repair connections in controller. Inspect for shorted connections at breakout box (junction box) and at controller. If connections are good, replace sensor. Replace sensor.
-34.6 reading.	Lead wire damaged or reversed connections. Open circuit in sensor lead wire or controller connections. Faulty power supply in meter.	Check schematic, repair connections. Replace sensor and lead wire. Test IS barrier and meter with simulator. Replace meter.

Erratic readings.	Damaged sensor lead wire. Improper connections. Faulty meter.	Check schematic, repair connections. Replace sensor and lead wire. Test meter with simulator. If faulty meter, replace meter.
Pump starts at normal reading, runs for a few seconds and stops.	Low liquid recovery rate. Screen on pump may be clogged. Sump clogged or plugged.	Remove pump and clean screen. May also need to disassemble pump and clean pump impellers. Remove pump and clean out sump.

FACTORY SETTINGS

LevelMaster Model DDHX Meter

Panel S/N: _____

Meter S/N: _____

Meter Designation: _____

Operating Parameters – Setup Code 35

PARAMETER	VALUE	OPERATION
Pr Hl	inches	Turns Pump 1 ON when level on meter reads _____
Pr Lo	"	Turns Pump 1 OFF when level on meter reads _____
PrH12	"	Turns Pump 2 ON when level on meter reads _____
PrLo2	"	Turns Pump 2 OFF when level on meter reads _____
AL Hi	"	Turns High Level Light ON when level on meter reads _____
Hy Hi	"	Keeps High Level Light ON until level drops ____ below AL Hi

NOTE: If the up arrow is pressed any time that the meter is operating, the highest level that the meter has observed since power was applied will be displayed.

S3070-PT TRANSDUCER SIMULATOR

Operation

The model 3070-PT Transducer Simulator is a device designed for testing an EPG LevelMaster™ level controller circuit while temporarily bypassing the existing level sensor.

In the “Run” (normal operation) mode liquid level in the sump applies pressure on the level sensor. The sensor converts that force into an electrical signal. The electrical signal is transmitted by the sensor cable to the level meter where it is converted into a liquid level display.

The “Test” mode simulates a level sensor signal. Rotating the potentiometer changes the electrical signal forcing the system to function as if a level sensor were in the circuit. Varying the electrical signal changes the level meter display in the same manner in which the level sensor signal would effect the system. By turning the simulator knob slowly clockwise from top to bottom the meter will display each set point such as start, stop and alarms. With the toggle switch turned back to the “Run” position the potentiometer is removed from the circuit and the level sensor controls according to the set points. Meter values register actual liquid level.

“**CAUTION**”, care must be taken when using this device in “Test” mode to avoid damaging the motor by running it dry. In normal test mode the pump switch should be turned to OFF.

S3070-PT TRANSDUCER SIMULATOR
Test Procedure

1. When the toggle switch is in the "Run" position the controls should function normally.
2. When the toggle switch is in the "Test" position (pressure transducer temporarily removed from the control circuit) the level meter should display the liquid level. By turning the simulator knob slowly clockwise from top to bottom the meter will display each set point such as start, stop, and alarms. Care must be taken when using this device in the "Test" mode to avoid damaging the motor by running it dry. In normal test mode the pump switches should be off.
3. Make sure that the potentiometer has full travel (270 degrees maximum) in both clockwise and counter-clockwise directions.
4. Make sure that all of the wires on the rear of the simulator (wires 200, 201, 202, 203) are connected in the proper position.
5. Replace the transducer simulator if it does not function as described above.

Water Technologies

9G-EF (Mercury Free) Direct Acting Float Switch (B100)

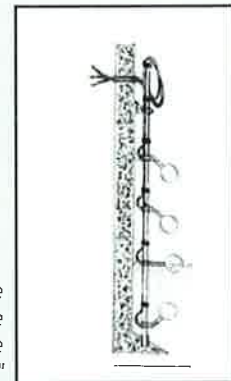
Arguably the best non-mercury float switch available, this Teflon®-coated non-differential float of Type 316 stainless steel measures 5.5" in diameter. It is appropriate for a variety of applications, including sewage wet wells, storm water basins, water reservoirs, sludge tanks, irrigation canals and process sumps. The float operates reliably in even the most difficult environments. The 9G-EF can be used singly to sense an alarm level, but typically two or more switches are used in conjunction with our controllers to provide a float-based control system. The 9G-EF can be used as the redundant control sensor in larger automation installations.

TYPICAL SPECIFICATIONS

Float switch body shall be constructed of Teflon®-coated, 20 gauge, 316 stainless steel housing measuring not less than 5 1/2" in diameter. A long life, high reliability, potted SPST magnetic reed switch rated for not less than 100 VA at up to 250 Volts shall be mounted inside the float and connected to a multi-stranded, 2 conductor plus ground, 16 gauge, CPE jacketed cable. The cord shall have fine strand conductors (not more than 34 gauge) made especially for heavy flexing service. The cable connection point shall be potted in epoxy providing a strong bond to the float and reed switch forming a water/moisture tight connection. A flexible Neoprene sleeve, not less than 1/8" thick, shall be provided over the CPE jacketed cable extending not less than 5" from the top of the mounting bracket extending down through the cable mounting bracket hinge point to the top of the float switch body, providing cable stress point relief and extended operational life.

A 316 stainless steel flanged cable mounting clamp assembly shall be supplied allowing pipe or cable mounting as specified below. The float cable-mounting bracket shall be flared on both sides providing hinge point stress relief to both sides of the cable.

SIEMENS



9G EF Floats provide reliable performance in "unbelievable surroundings."

The float switch assembly shall provide a minimum of two pounds of buoyancy in solutions with a specific gravity of 1.0 (water) and shall have an operating temperature rating of -35 to +90 degrees C.

The float switches shall be Model 9G-EF floats as manufactured by Siemens Water Technologies, Control Systems Products.

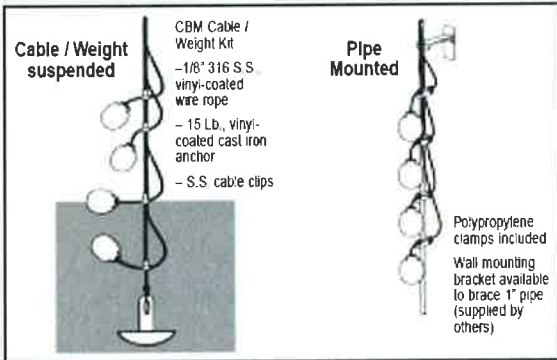


FEATURES

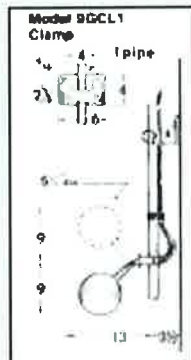
- Mercury Free – Magnetic Reed Switch
- Long life and reliable operation
- Non-oxidizing contacts allow low DC voltage signals for use with intrinsic safety devices
- Non-stick surface
- High buoyancy
- Pipe or suspension mounting
- 3 year factory warranty

DESCRIPTION	PART NO.
9G-EF (Mercury Free) NOTP Float Switch	
Teflon coated 316 SS Float Switch w/1 N.O. Contact & 30' Cable	6013520030
Teflon coated 316 SS Float Switch w/1 N.O. Contact & 60' Cable	6013520060
9G-EF (Mercury Free) NCTP Float Switch	
Teflon coated 316 SS Float Switch w/1 N.C. Contact & 30' Cable	6013530030
Teflon coated 316 SS Float Switch w/1 N.C. Contact & 60' Cable	6013530060
Mounting Hardware & Accessories	
9G Float Cable Clamp Assembly	6012120001
9G Float 1" Pipe Clamp Assembly	6011840001
316 SS cable suspension kit, 21'	6014400020
316 SS cable suspension kit, 31'	6014400030
316 SS cable suspension kit, 41'	6014400040
316 SS cable suspension kit, 61'	6014400060
316 SS cable suspension kit, 81'	6014400080
316 SS cable suspension kit, 101'	6014400100
5 Float Suspension Mount, 2 piece bracket w/strain reliefs	8031340001
9G CL3 1" stainless steel pipe mount clamps (transducer or float mount)	6011340001
15# Anchor	xx-333-100
Float Cable/Anchor kit 30' (w/15lb anchor, 30' SS cable, wall bracket, 5 cable clamp)	8032110003
Float Cable/Anchor kit 60' (w/15lb anchor, 60' SS cable, wall bracket, 5 cable clamp)	8032110006
IS6 Six Circuit Intrinsically Safe (Switch Circuit) Barrier: 12-24V DC powered	6013160002
9G JCTF fiberglass junction box (supports up to XXXX floats)	6011020001

Typical Mounting



Pipe Mounting Dimensions



COMPLETE CONTROL CAPABILITIES

Siemens Water Technologies, Control Systems Products, offers a single, high-quality source for everything from simple level sensors to telemetry systems to complex system control engineering and software. Based in St. Paul, Minnesota, Control Systems is part of the leading global provider of industrial, municipal and residential water and wastewater treatment systems, products and services. As a major manufacturer/integrator with an extensive selection of specialized product lines in the areas of SCADA and telemetry, power equipment integration, automation and measurement, Control Systems is uniquely positioned to provide cost effective, comprehensive solutions for water, wastewater, and process control and telemetry applications.

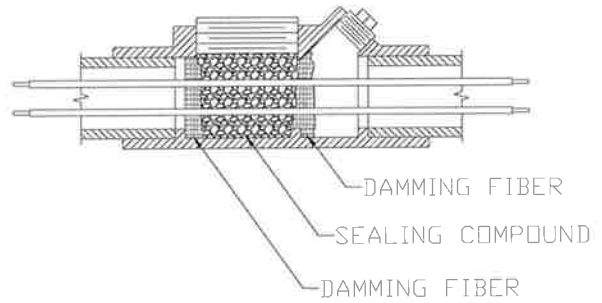
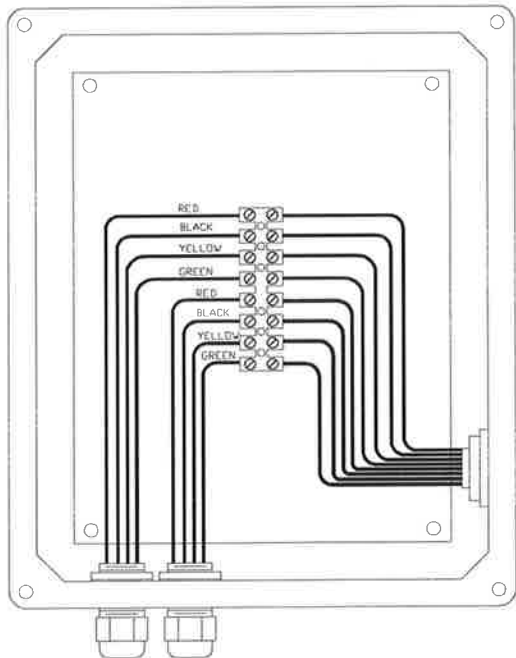
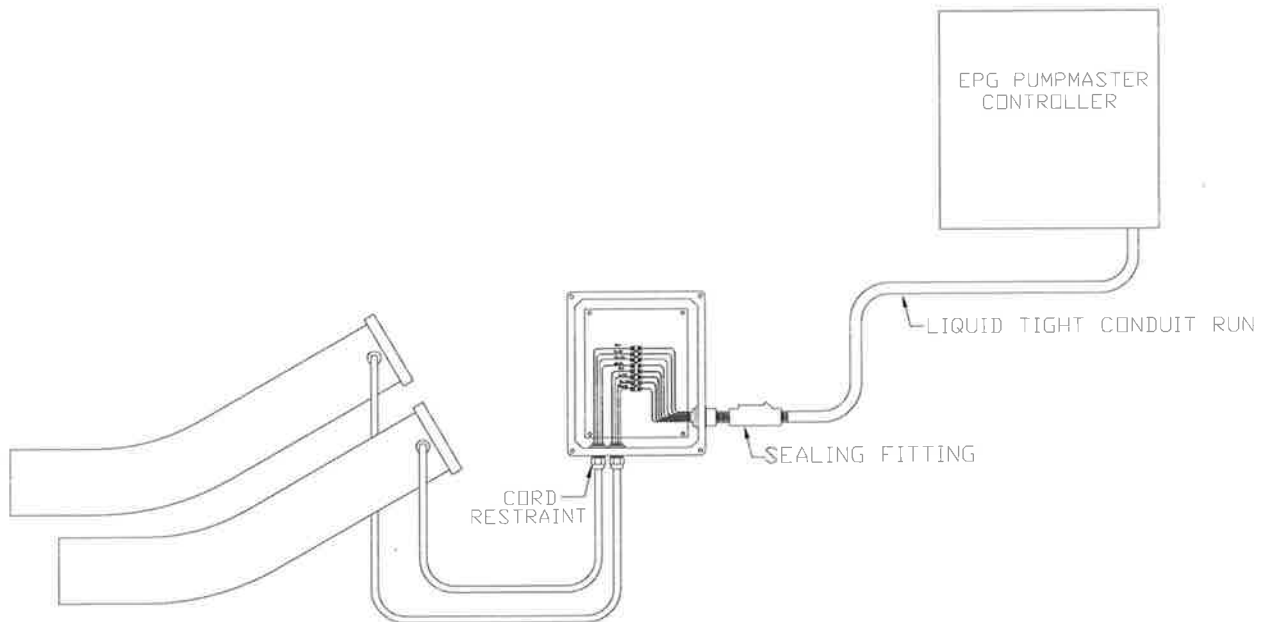
The information provided in this literature contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of the contract.

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BJBP525

DUPLEX BREAKOUT JUNCTION BOX FOR MOTOR LEADS



NOTE:

BOX DIMENSIONS (OUTER WALL):
10 3/4" X 8 3/4" X 6"

MOUNTING HOLES FOR 5/16" BOLT/SCREW,
12 1/8" X 6" CENTER TO CENTER, 4 PL.

* NOTICE * © EPG Companies Inc. 2002

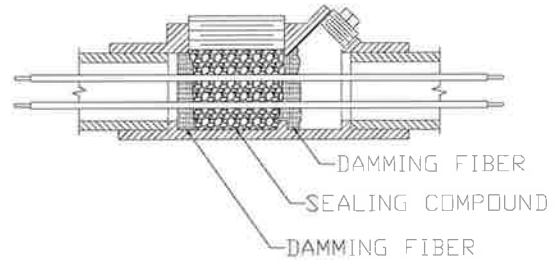
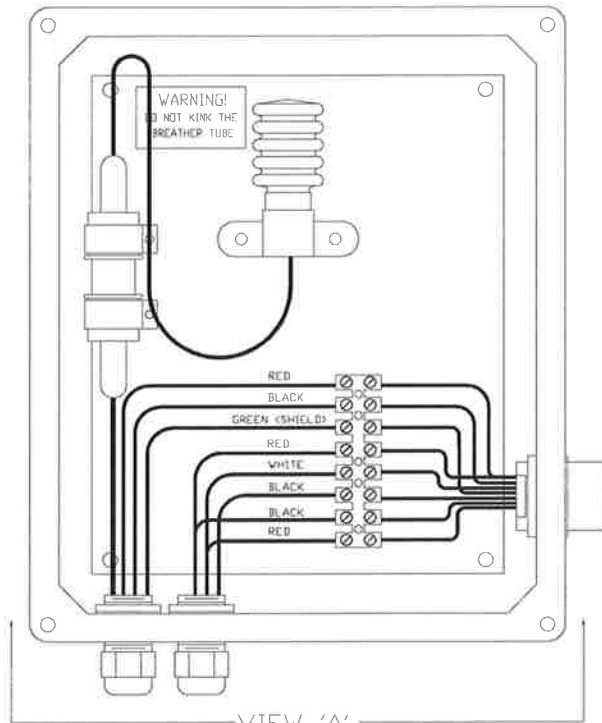
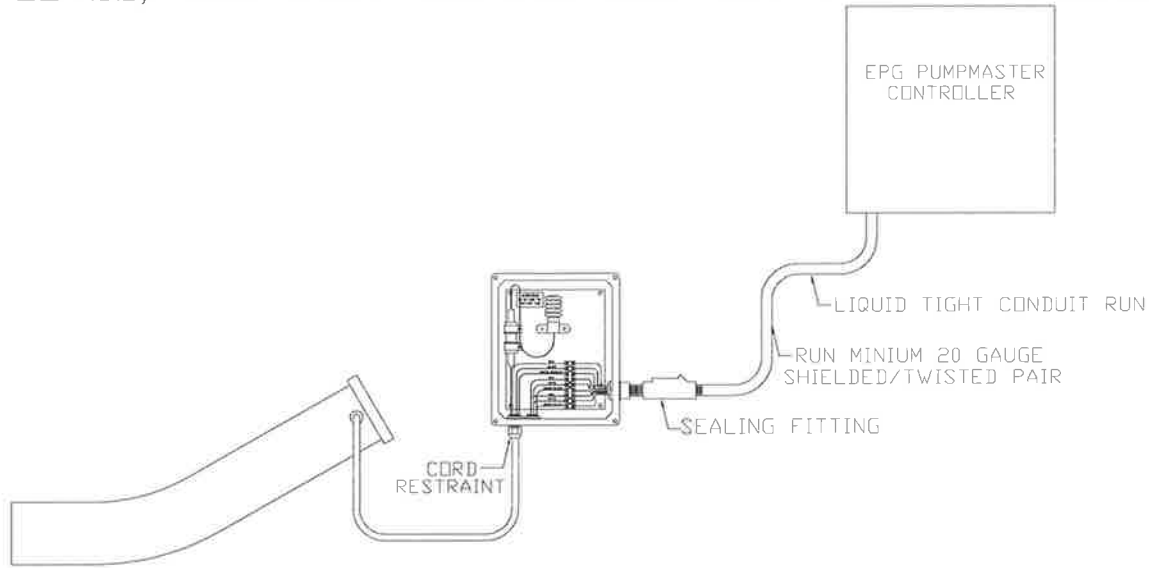
REFERENCE

TOLERANCES		REVISIONS		EPG COMPANIES			
(EXCEPT AS NOTED)		NO.	DATE	BY	DESIGN	SCALE	MATERIAL
DECIMAL		1			R.C.C.	NONE	
FRACTIONAL		2			R.C.C.	08/15/02	
ANGULAR		3					
		4					
		5					

03626-0525

BJB0905B

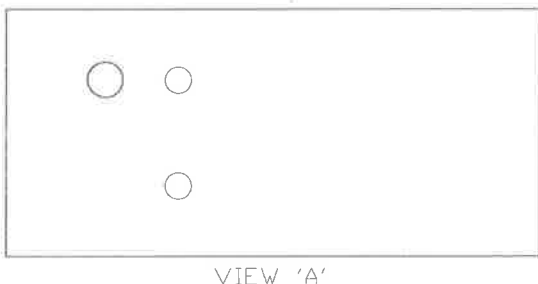
BREAKOUT JUNCTION BOX FOR ONE LEVEL, ONE FLOW SENSOR AND ONE LEAK DETECTION



NOTE:

BOX DIMENSIONS (OUTER WALL):
10 3/4" X 8 3/4" X 6"

MOUNTING HOLES FOR 5/16" BOLT/SCREW,
12 1/8" X 6" CENTER TO CENTER, 4 PL.

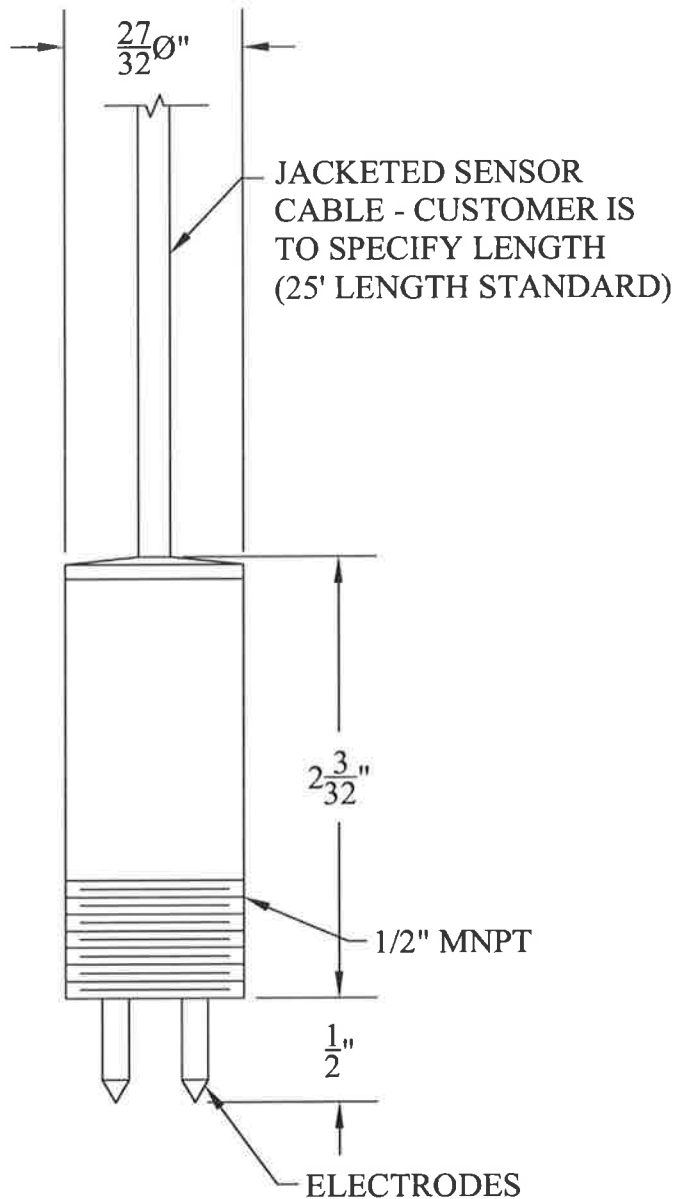


* NOTICE * © EPG Companies Inc. 2002
REFERENCE

TOLERANCES		REVISIONS		EPG COMPANIES		
UNLESS AS NOTED		NO.	DATE	BY	SCALE	REVISION
DECIMAL	#	1				
FRACTIONAL	#	2			NONE	
ANGULAR	#	3			DATE	03/23/06
		4			APP'D	
		5				02523-0905

SENSOR DATA SHEET

EPG Leak Detector



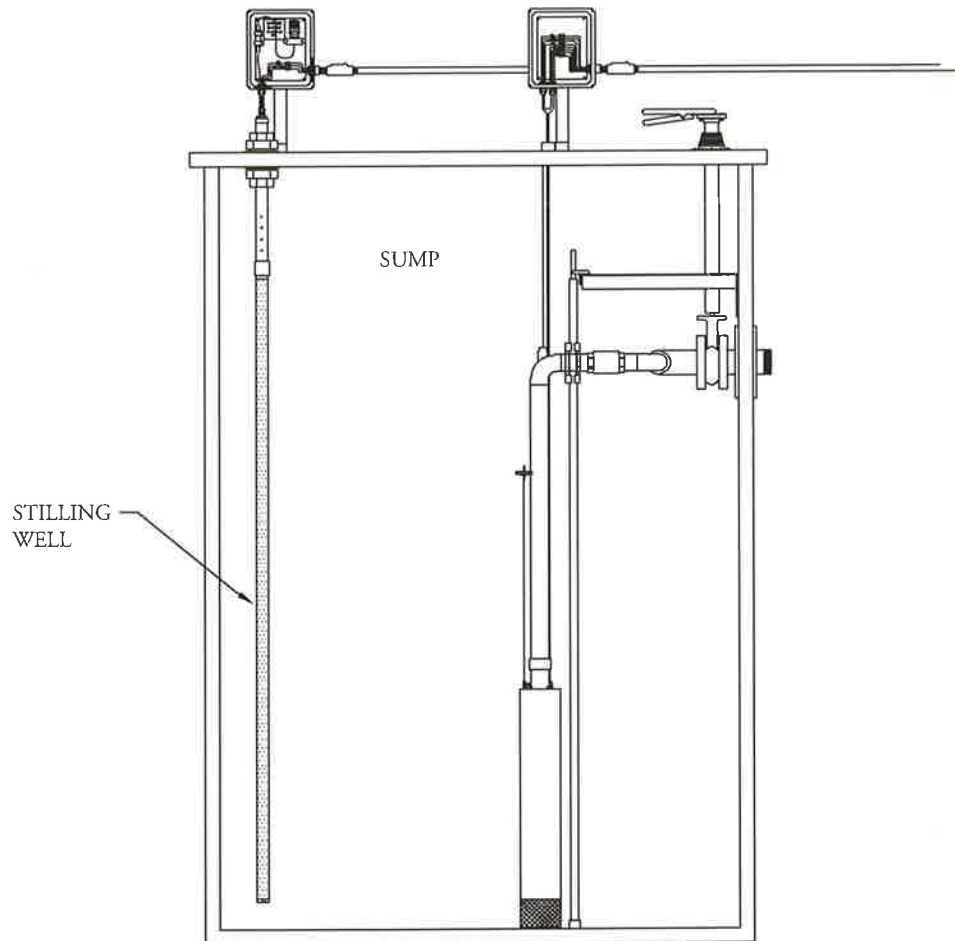
MODEL NO. ASLD-YH25

SENSOR LOGIC AND FUNCTION

EPG's leak detectors are stainless steel electrodes commonly used to detect the presence of conductive fluids. They are mounted in a small diameter stainless steel housing, which adds weight allowing sensor to be suspended in small annular space. Each sensor has 25' (standard) of yellow waterproof, gasoline, oil and chemical resistant outer jacket over a twisted pair of color-coded signal wire. The cable is marked in one foot increments. The sensor is set at the point where leakage is to be detected. Conductance is made from probe to probe through the liquid. Typically the sensor sends a signal to an intrinsically safe relay that can be used to annunciate the alarm condition or shut equipment down. This control circuit has an energy potential so low that it is incapable of causing ignition of flammable or combustible materials.

Stilling Well

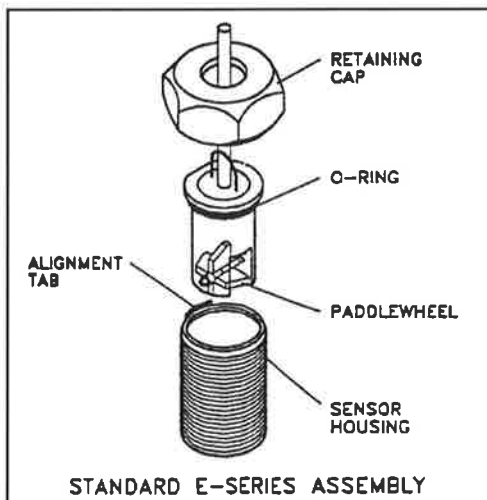
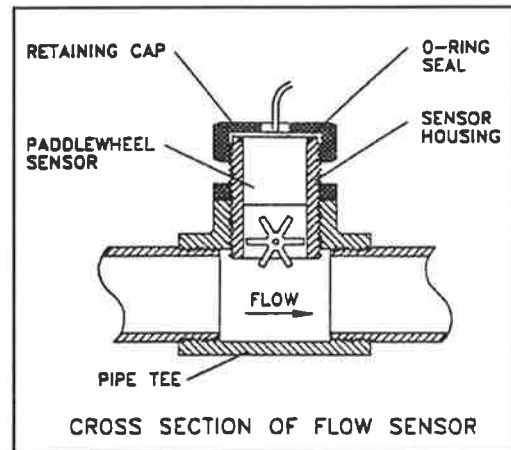
- Designed to be used with the EPG "PT" Series Submersible Level Sensors
- Simplifies installation of submersible level sensors in tanks, sumps, pits and other vessels
- Protects sensor during installation and operation
- Stays in place - not affected by turbulence, waves or foam
- Easy to install
- Available for any height tank
- Available with either 2" MNPT to thread into tank cover or 2" PVC flange
- PVC construction standard (other material available)



SENSOR DATA SHEET

EPG E-Series Liquid Flow Sensor

- * Low cost
- * High reliability
- * Wide range
2 – 10,000 GPM
- * Patented six blade, non-magnetic design
- * Available in DELRIN or KYNAR
- * One paddlewheel fits ALL SIZES
- * Transmits up to 1000 feet without the need for additional amplifiers
- * Direct logic pulse output
- * Flow velocities range of 1.5 to 27 fps
- * Operating pressure to 200 PSIG
- * Liquid temperatures to 250° F
- * 2 Year Warranty
- * High sensitivity
- * Pipe sizes from
3/4" - 14"



One major problem with most paddlewheel type flow sensors having magnets in the paddles is that metal particles tend to stick to the magnets. The collecting material then causes a change in the flow characteristics in the paddle. To eliminate this problem, EPG Companies flow sensor uses a special axle and dual magnet drum design that takes the magnets out of the paddles. This dual magnetic drum design with rapidly changing polarity, along with fluid velocity causes the metallic particles to drop off into the flow stream and are swept away.

INSTALLATION HINTS

1. Pipe must be full for accurate reading.
2. Minimum velocity is 1.5 ft./second. Recommended maximum velocity is 27 ft./second.
3. The flow must be uniform at the point where the flow sensor is installed or an incorrect reading will result. To accommodate a uniform flow allow at least ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the flow sensor. Non-uniform flow is often caused by elbows, partially open valves or an increase in pipe diameter.

Model Number	Nominal Pipe Size	Recommended Range	
		1.5 ft/sec Flow Rate GPM	27 ft/sec Flow Rate GPM
EP 075	¾"	2.0	37.2
EP 100	1"	3.7	66.2
EP 125	1¼"	5.7	103.4
EP 150	1½"	8.3	148.8
EP 200	2"	14.7	264.6
EP 250	2½"	23.0	413.4
EP 300	3"	33.1	595.4
EP 400	4"	58.8	1058.4
EP 500	5"	91.9	1653.8
EP 600	6"	132.3	2381.4



Flow Meter Operation

EPG's meter system is an 8 digit Flow Rate/Totalizer. The meter counts pulses from a flow sensor and converts this information into flow rate and total flow using programmed scaling factors.

The meter features menu driven programming to simplify meter set-up. The meter stores parameters entered into non-volatile memory. This memory retains the parameters even when power to the panel is shut off.

Figure 1 shows the meter display and keypad and gives a brief description of each key's function.

Two Line LCD Display - Shows totalizer and rate values when the unit is in the run mode. Displays programming information when the unit is in the program mode.

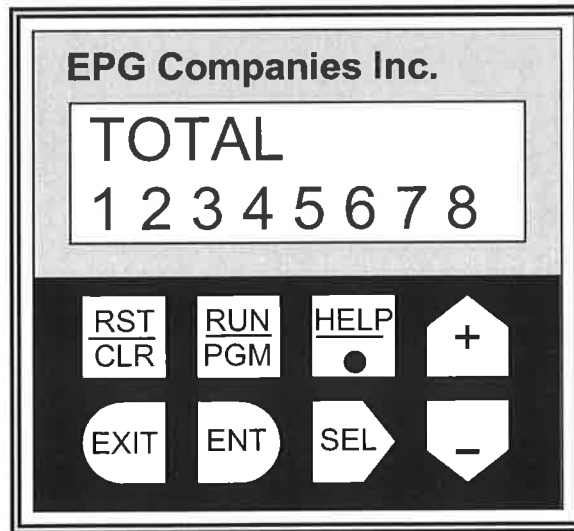


Figure 1. Meter Display and Keypad

Key Functions

Reset/Clear Key - This key can be programmed to reset the totalizer when in the run mode. In the program mode it zeros numeric data that is selected for editing.

Run/Program Key - Press this key followed by the Enter key (ENT) to enter the program mode. Pressing this key while in the program mode returns the control to the run mode.

Help Key - In the run mode this key causes the Help Screens to be displayed. In the program mode this key is used to set the decimal point positions for totalizer and rate scaler displays.

Up Arrow/Plus (+) Key - In the run mode this key is used to select one of the three different display screens. In the program mode this key is used to step vertically up through the menus and increment the value of selected digits when changing numeric values.

Exit Key - This key is used in the program mode to exit program changes that have been selected but not yet entered.

Enter Key - This key is used in the program mode to cause the displayed program changes to be entered.

Select Key - This key is used in the program to move into more detailed menus and select the digits of numeric values needed for programming.

Down Arrow/Minus (-) Key - In the run mode this key is used to select one of the two different display screens. In the program mode this key is used to step vertically down through the menus and decrease the value of selected digits when changing numeric values.

Program Scalers:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
C DEC PT	-----	Sets decimal point to the right of the last digit on the TOTAL Display.
R DEC PT	-----	Sets decimal point to the right of the last digit on the FLOW RATE Display.
C SCALER	See Below	Used to convert sensor pulses into Total Gallons.
R SCALER	See Below	Used to convert sensor pulses into Gallons/Minute.

Program Options:

<u>Setting</u>	<u>Value</u>	<u>Function</u>
RST KEY	RST EDG	Reset Key will Clear Totalizer Count.

Tables 1 and 2 show the keystroke operations necessary to change scale parameters and "Reset Key" enable/disable function.

Flow meter setup procedures for scalers

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press - to scroll through main menu. Find "Program Scalers" on the meter display.
4	Press SEL to enter "SCALERS" menu.
5	Press - to scroll the "SCALERS" menu and bring up the "C SCALER" option on the meter display.
6	Press SEL to select the "C SCALER" and begin operation on the left most digit of the "C SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the meter displays the desired value for the "C SCALER"
7	Press ENT to enter the "C SCALER " value into non-volatile memory.
8	Press - to display the "C DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
9	Press ENT to enter this selection into memory.
10	Press - to bring up the "R SCALER" option on the meter display.
11	Press SEL to select the "R SCALER" and begin operation on the left most digit of the "R SCALER" value. Use the + and - keys to increase or decrease the digit to achieve the desired number. Press SEL to enter this digit and move to the next digit. Repeat this step until the desired value for the "R SCALER" is in the meter display. Also use the SEL and HELP/. Keys to position the decimal point to the desired position.
12	Press ENT to enter this value into the non-volatile memory.
13	Press - to display the "R DEC PT" option. Use the SEL key to select the last dash on the right as displayed on the meter. Use the HELP/. key to place the decimal point to the right of this position (decimal point will not be visible).
14	Press ENT to enter this selection into non-volatile memory.
15	Press EXIT to exit "Program" mode.
16	Press RUN/PGM to enter "Run" mode.

Table 1. Flow Meter Scaler Sequence

Flow meter setup procedures for reset key

STEP NO.	ACTION
1	Press Run/PGM to exit "Run" mode.
2	Press ENT to enter "Program" mode.
3	Press + to scroll through main menu. Find "Program Options" on the meter display.
4	Press SEL to enter "OPTIONS" menu.
5	Press + to scroll the "OPTIONS" menu and bring up the "RST KEY" option on the meter display.
6	Press SEL to select the "RST KEY" menu.
7	Press + to display the desired key option. Options include: RST KEY DISABLED This option prevents the reset key from clearing the totalizer count. RST KEY RST EDG This option allows clearing of the totalizer count using the reset key.
8	Press ENT to select the desired option.
9	Press EXIT to exit "Program" mode.
10	Press RUN/PGM to enter "Run" mode.

Table 2. Reset Key Programming Sequence

The programmed scaling factors used are dependent upon the inside pipe diameter of the flow sensor tube. Tables 3 to 6 list the various scaling factors used for the different diameter (nominal O.D.) and schedule (wall thickness) of Stainless Steel and PVC pipes.

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

Table 3. Flow Meter Settings – Stainless Steel Schedule 40

Pipe Size	C SCALER	R SCALER
1.0" Low Flow	.01808	1.0849
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

Table 4. Flow Meter Settings – Stainless Steel Schedule 80

Pipe Size	C SCALER	R SCALER
1.00	.02996	1.7973
1.25	.05184	3.1105
1.50	.07056	4.2338
2.00	.11631	6.9784
2.50	.16595	9.9567
3.00	.25623	15.374
4.00	.44124	26.474
6.00	1.0014	60.081
8.00	1.7340	104.04

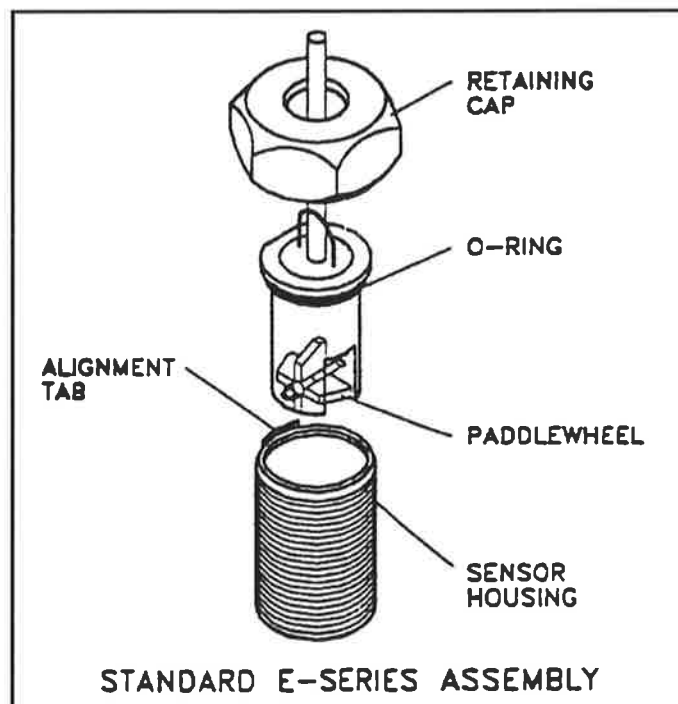
Table 5. Flow Meter Settings – PVC Schedule 40

Pipe Size	C SCALER	R SCALER
1.00	.02493	1.4959
1.25	.04446	2.6677
1.50	.06125	3.6750
2.00	.10235	6.1409
2.50	.14690	8.8140
3.00	.22894	13.736
4.00	.39849	23.909
6.00	.90348	54.209
8.00	1.5827	94.963

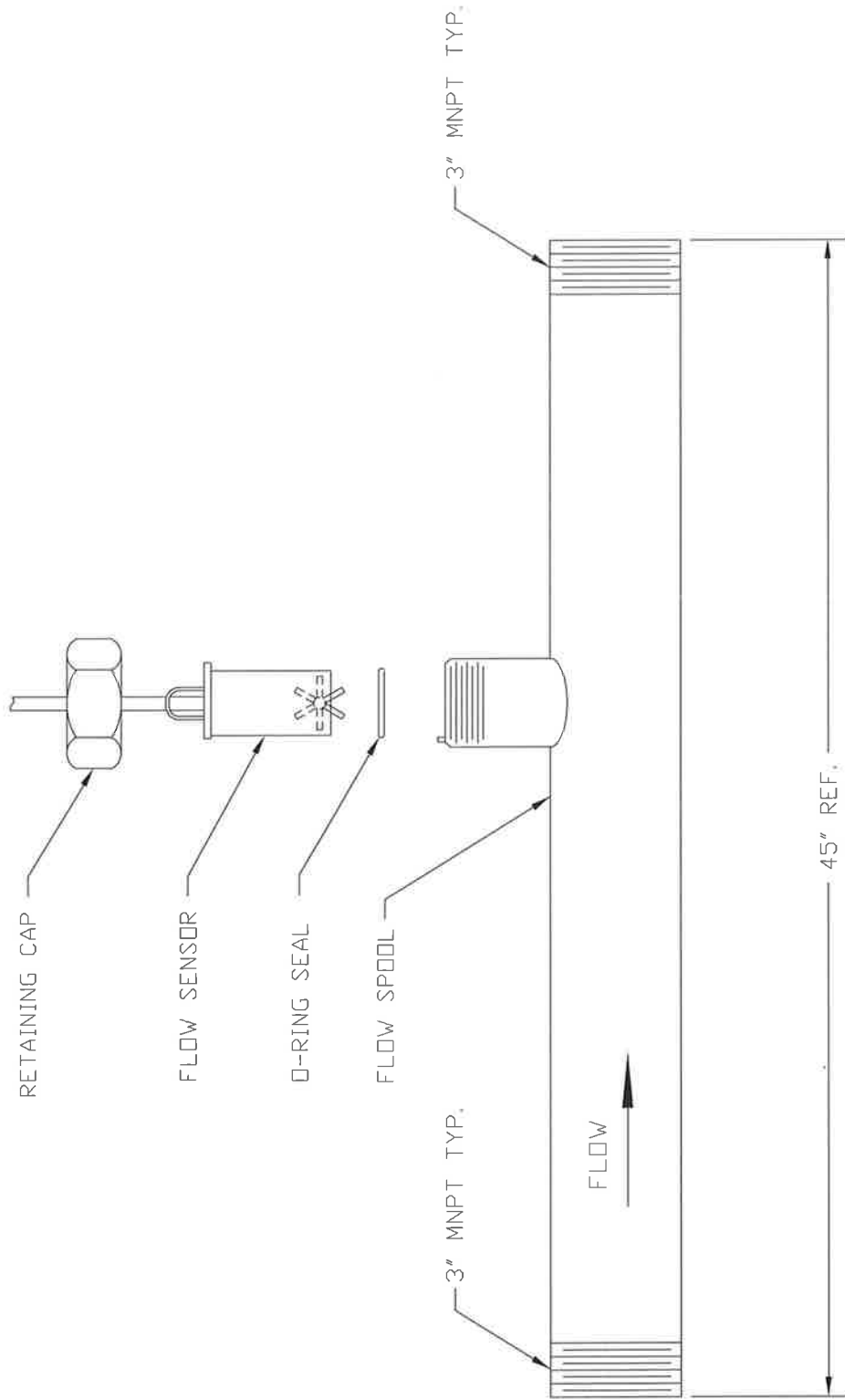
Table 6. Flow Meter Settings – PVC Schedule 80

CAUTION

DO NOT OVERTIGHTEN PADDLEWHEEL FLOW SENSOR NUT!



Damage can be caused to the paddlewheel sensor, o-ring, or sensor housing. Please hand tighten nut only!



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TOLERANCES		REVISIONS	
DECIMAL	FRACTIONAL	NO.	DATE
0.005	1/32	1	
0.010	1/16	2	
0.020	1/8	3	
0.050	1/4	4	
0.100	1/2	5	

EPG COMPANIES

3" PVC FLOW SENSOR	DATE	08-17-10
with MNPT ENDS	BY	
C.A.S.	DRAWN	
E.J.H.	CHECKED	
	DATE	
	BY	

07765-0000C

D-040 LP PN 6



Combination Air Valve for Low Pressure

What is a low pressure air valve?

The low pressure air valve sealing mechanism is built with a very soft and sensitive seal. On one hand, it enables the full and effective discharge of air and, on the other hand, the air valve will close and seal tightly when water fills the valve, even if the water pressure is particularly low. Most other air valves are built so that it takes a higher minimum sealing pressure to effectively seal the valve. The A.R.I. air valve requires a minimum water pressure of just 0,2 bar to effectively seal. Low pressure air valves are designed to prevent water leaks through the discharge orifice of the air valve.

Description

The D-040 LP series Combination Air Valve has the features of both an air release valve and an air & vacuum valve. The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure. The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

Applications

The D-040 LP is designed for installation on:

1. Outlets from storage ponds and reservoirs.
2. Topographic high points where water pressures are lower than 2 meters.
3. Points on a pipeline of variable pressures, where pressures can drop below 2 meters.
4. Topographical points on a pipeline that are close to the hydraulic grade line pressure.
5. The top of water tanks

Operation

The air & vacuum component, with the large orifice, discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during its drainage and at water column separation.

High velocity air will not blow the float shut. Water will lift the float, which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system. The smooth discharge of air reduces pressure surges and other destructive phenomena.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused

by water column separation. Air entry is essential to efficiently drain the system. The air release component releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances: :

- Restriction of effective flow due to a throttling effect as would a partially closed valve. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a high-energy burst of compressed air.
- Inaccuracies in flow metering.

As the system starts to fill, the valve functions according to the following stages:

1. Entrapped air in the pipeline is discharged by the valve.
2. Liquid enters the valve, lifting the float which pushes the sealing mechanism to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The float will immediately drop down, opening the air & vacuum and air release orifices.
2. Air will enter the system.

Main Features

- Working pressure range: 0.05 - 6 bar.
- Testing pressure: 10 bar.
- Maximum working temperature: 60° C.
- Maximum intermittent temperature: 90° C.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high velocity air discharge while preventing premature closure.
- Lightweight, small dimensions, simple and reliable structure.
- The drainage outlet enables removal of excess fluids.
- The large size of the automatic air release orifice relative to the air valve body:
 - Discharges air at high flow rates.

D-040 LP



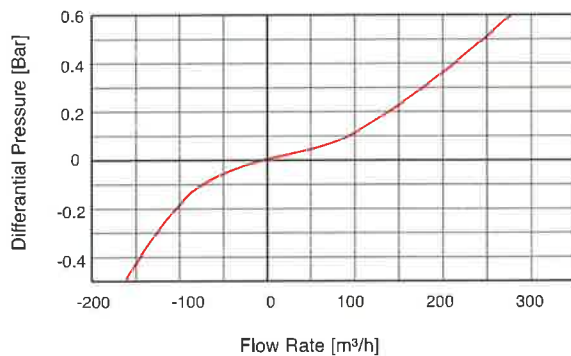
- Lessens the danger of its obstruction by debris.
- Enables the usage of the patented rolling seal mechanism, making it less sensitive to pressure differentials than a direct float seal.
- The body is made of high-strength composite materials and all operating parts are made of specially selected, corrosion-resistant materials.
- Due to its light weight, the valve may be installed on plastic piping systems, as well as other lightweight piping systems.

Valve Selection

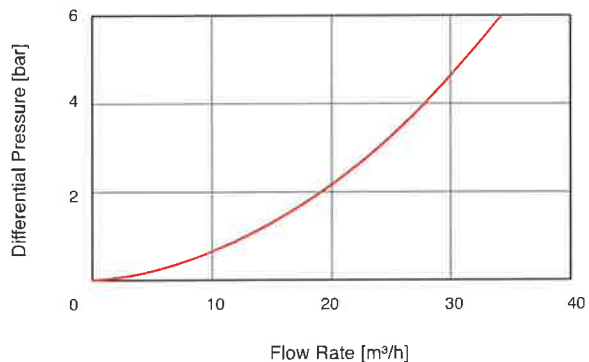
- Diameter: 2"
- The air valve is available with:
 - NPT or BSPT threaded male connections,
 - Optional ball valve tap, BSPT or NPT male connection.

Upon ordering, please specify: model, size, working pressure, threads standard and type of liquid.

AIR & VACUUM FLOW RATE



AUTOMATIC AIR RELEASE FLOW RATE



DIMENSIONS AND WEIGHTS

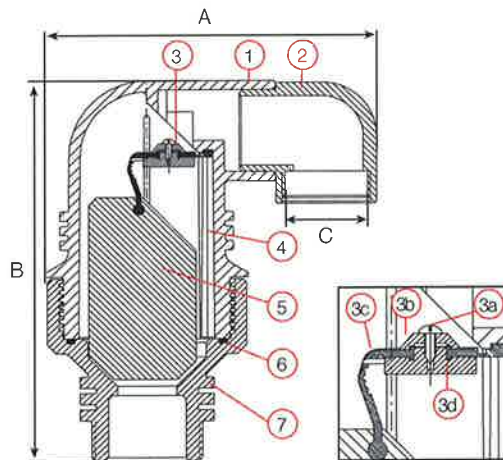
Nominal Size	Dimensions mm		Connection C	Weight Kg.	Orifice Area mm ²	
	A	B			Auto.	A / V
2"	183	215	1½" BSP Female	1.1	12	804

PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Body	Polypropylene / Reinforced Nylon
2.	Discharge Outlet	Polypropylene
3.	2" Rolling Seal Assembly:	
3a.	Screws	Stainless Steel
3b.	Plug Cover	Reinforced Nylon / Polypropylene
3c.	Rolling Seal	Silicone
3d.	Plug	Reinforced Nylon / Polypropylene
4.	Clamping Stem	Reinforced Nylon / Polypropylene
5.	Float	Foamed Polypropylene
6.	O-Ring	BUNA-N
7.	Base	Polypropylene / Reinforced Nylon

Optional

Ball valve Brass ASTM-B-124, Nickel plated



A.R.I. FLOW CONTROL ACCESSORIES Ltd. www.arivalves.com ari@ari.co.il Tel: 972-4-6761988

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MAINTENANCE INSTRUCTIONS



COMBINATION AIR VALVE BARAK, MODEL D-040 2"



GENERAL INSTRUCTIONS

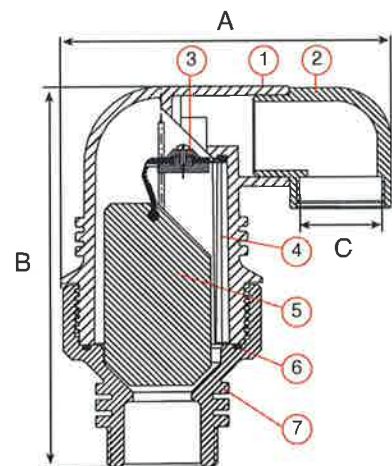
- Routine service is an integral part of the standard procedure for maintenance of a water supply system.
- Recommended routine maintenance— once or twice a year, according to the quality and type of the fluids in the system.

PROCEDURE

1. Close the service valve under the valve base before servicing.
2. Turn the valve body (1) counterclockwise, release and remove.
3. Remove the clamping stem (4) from inside the valve body (1) and carefully pull out the float (5) with the attached rolling seal (3).
4. Check the soundness of the rolling seal (3) by washing it with water and examining it. Note: Replace the rolling seal (3) in case it is torn.
5. Wash the body (1) and the float (5) with clean water and examine for damage. Note: Replace the float (5) if it is damaged.
6. Clean the drainage elbow (2) to remove insects and debris.
7. Return the float (5) with the attached rolling seal (3) to its original position in the valve body (1) and lock them into place with the clamping stem (4).
8. Return the valve body (1) to the base (7) and close by turning it clockwise. Note: First make sure the O-ring (6) is seated properly in the base of the valve (7).
9. Remember to open the service valve after the servicing.

PARTS SPECIFICATION

NO.	DESCRIPTION	MATERIAL
1.	Body	Reinforced Nylon
2.	Drainage Elbow	Polypropylene
3.	Rolling Seal Assembly	
4.	Clamping Stem	Reinforced Nylon
5.	Float	Foamed Polypropylene
6.	O-Ring	BUNA-N
7.	Base	Reinforced Nylon / Brass

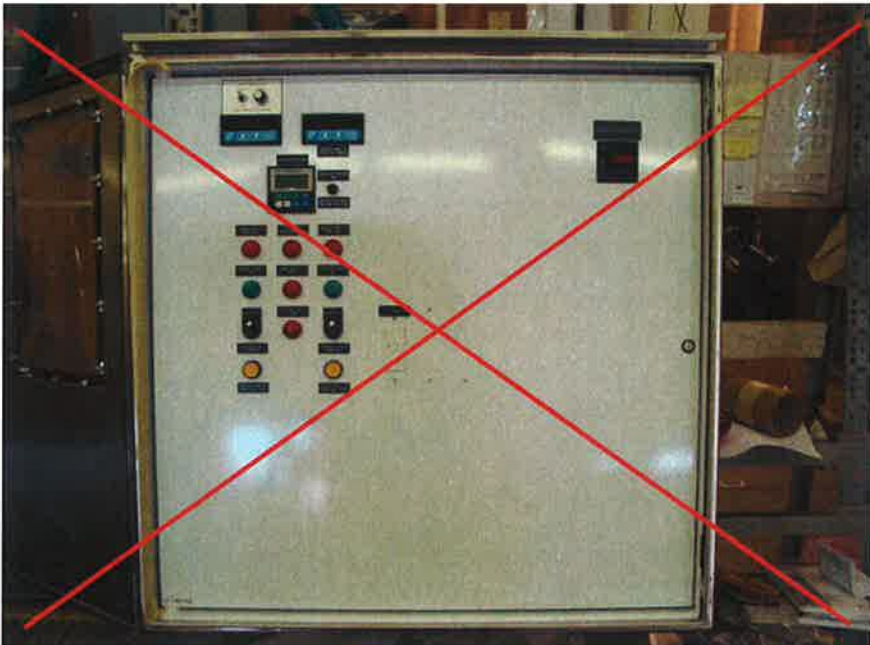


TROUBLESHOOTING

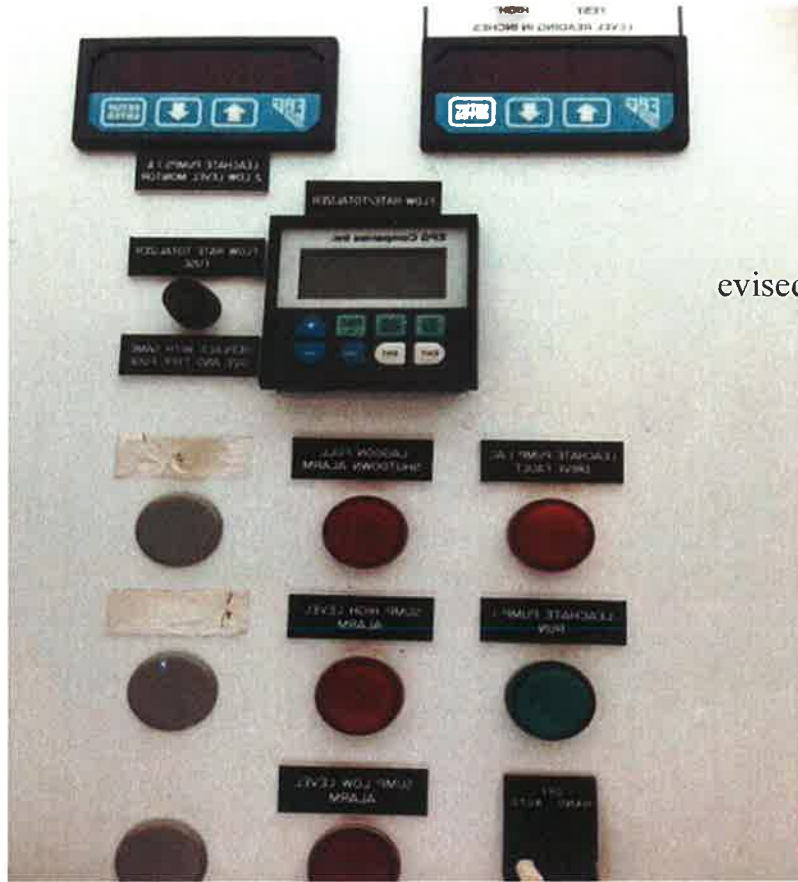
SYMPTOM	CAUSE	CORRECTIVE ACTION
Right angle outlet is broken.	Valve was hit or mishandled.	Easy to replace: gently pry off the outlet with screwdriver Pressure insert the new right angle using a plastic hammer. Replacement part can be ordered from A.R.I. Note: The part is not mandatory for the function of the valve.
Outlet thread size needed in order to attach a drainage hose.	End user needs to connect a drainage pipe from the valve outlet in order to drain excess water.	D-040 has 3/8" female thread. 2" D040 has 1 1/4" female thread. End of pipe must be left open in order for valve to function.
Built-in plastic screen is not accepted by health department.	This is an above ground installation.	ARI offers an approved 316 stainless screen that threads into the 2" valve. GSM in California has made one for the 1" valve.
Plastic body and/or base not acceptable.	A change in product spec. A change in designer preference.	Offer the cast iron or stainless steel body. Also offer the bronze or stainless steel base.
Valve spits water.	This is normal at start up and during pressure test. Could be debris in the sealing mechanism.	Open the valve. Clean and check integrity of the sealing mechanism and O-ring seals.
Valve is continuously leaking.	Line pressure issues (inadequate pressure) or debris lodged in seal or o-rings.	Check line pressure. It needs at least 3 psi to seal tight. Is the valve on a booster pump? Can be installation issue if valve is level with the water level in a tank - there is no pressure to seal. Open valve and clean sealing mechanism, check the rolling seal and o-rings for wear or tear. Replace if necessary.
Valve leaks from threads.	Plastic threads stripped.	Check for cross-threading. Replace bottom of valve or offer the cast metal base.



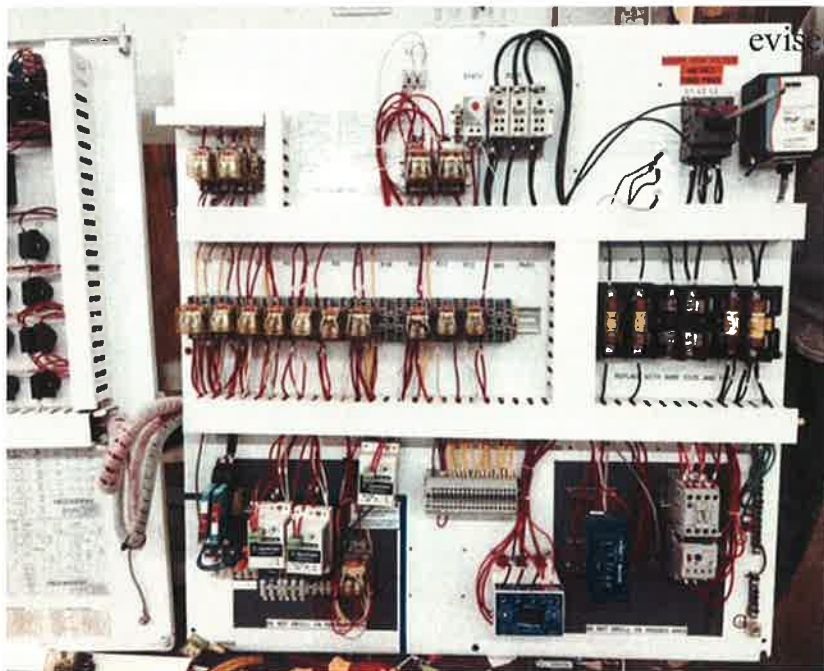
EPG Companies Inc.



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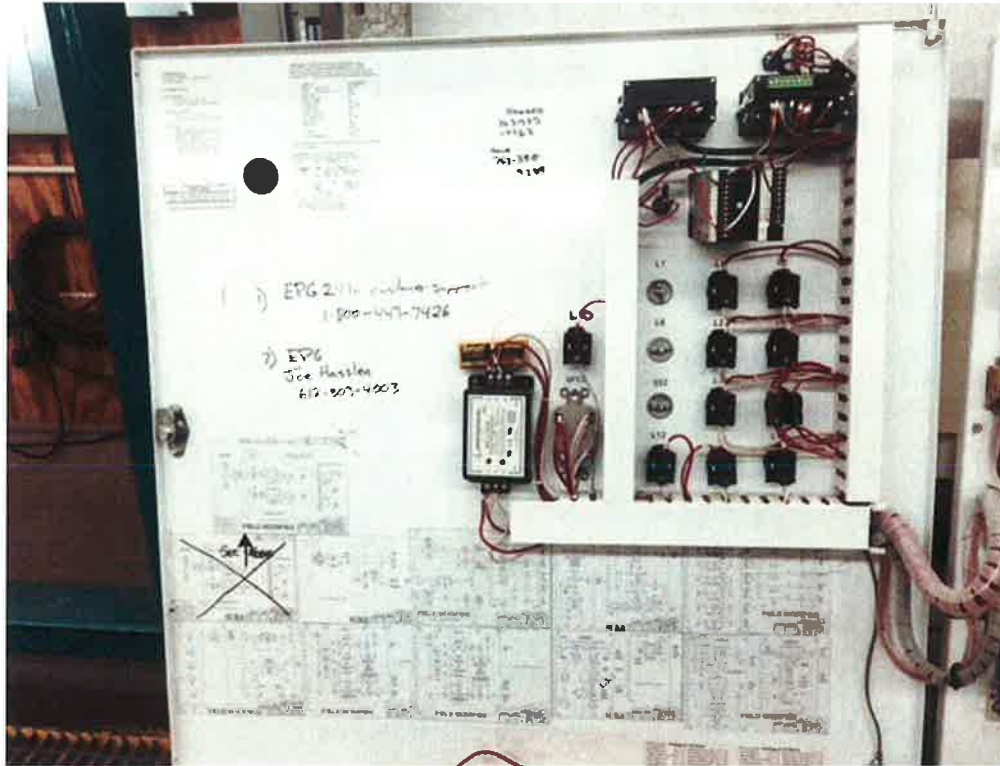


revised control panel.



revised control panel.

EPG Companies Inc.





WARRANTY

Xylem Water Solutions USA, Inc.

For the period defined, Xylem Water Solutions USA, Inc. offers a commercial warranty to the original End Purchaser against defects in workmanship and material on Flygt Products. Warranty covers Flygt parts and labor as outlined in **ADDENDUM – A**.

COVERAGE:

Xylem Water Solutions USA, Inc. will pay the cost of parts and labor during the warranty period, provided that the Flygt product, with cable attached, is returned prepaid to a Xylem Water Solutions USA, Inc. Authorized Service Facility for Flygt Product repairs. Coverage for Flygt parts and labor will be provided for the period shown in **ADDENDUM - A**. The warranty period will begin from date of shipment or date of a valid Start-up (For permanently installed pumps only). In cases where the Start-up date is used as the beginning of the warranty on a permanently installed Flygt pump, a Start-up Report completed by an approved service technician from a Xylem Water Solutions USA, Inc. Authorized Service Facility for Flygt products must be received by the Xylem Water Solutions USA, Inc. Area Service Manager for Flygt Products within thirty (30) days of the initial onset of the unit placed into service. If not received, the beginning of the warranty coverage will default to the Flygt product ship date. A Start-up for a permanently installed Flygt pump must occur within one (1) year from the date of shipment from a Xylem Water Solutions USA, Inc. authorized facility for Flygt Products or warranty will automatically default to ship date as start of warranty. (See **STORAGE** section) When using the start-up date as the beginning of the warranty, a copy of the Start-up Report will be required to support any Warranty Claims. Warranty on Flygt Dewatering pumps will begin with ship date only. No other date on Flygt Dewatering pumps will be considered.

Xylem Water Solutions USA, Inc.'s sole obligation under this Warranty for Flygt Products shall be to replace, repair or grant credit for Flygt Products upon Xylem Water Solutions USA, Inc.'s exclusive determination that the Flygt Product does not conform to the above warranty. In the event that the Flygt product is replaced, warranty on the replacement product will be equal to the balance remaining on the original product or ninety (90) days, which ever is greater.

MISUSE:

This Warranty shall not apply to any Flygt product or part of Flygt product which (i) has been subjected to misuse, misapplication, accident, alteration, neglect, or physical damage (ii) has been installed, operated, used and/or maintained in a manner which is in an application that is contrary to Xylem Water Solutions USA, Inc.'s printed instructions as it pertains to installation, operation and maintenance of Flygt Products, including but without limitation to (iii) operation of equipment without being connected to monitoring devices supplied with specific products for protection; or (iv) damaged due to a defective power supply, improper electrical protection, faulty installation or repair, ordinary wear and tear, corrosion or chemical attack, an act of God, an act of war or by an act of terrorism; or (v) has been damaged resulting from the use of accessory equipment not sold by Xylem Water Solutions USA, Inc. or not approved by Xylem Water Solutions USA, Inc. in connection with Flygt products.

WEAR PARTS:

This warranty does not cover costs for standard and/or scheduled maintenance performed, nor does it cover Flygt parts that, by virtue of their operation, require replacement through normal wear (aka: Wear Parts), unless a defect in material or workmanship can be determined by Xylem Water Solutions USA, Inc.. Wear Parts are defined as Cutters, Cutting Plates, Impellers, Agitators, Diffusers, Wear Rings (Stationary or Rotating), Volutes (when used in an abrasive environment), oil, grease, cooling fluids and/or any items deemed necessary to perform and meet the requirements of normal maintenance on all Flygt equipment.



WARRANTY

Xylem Water Solutions USA, Inc.

DISCLAIMERS:

(i) Xylem Water Solutions USA, Inc.'s warranties are null and void when Flygt Products are exported outside of the United States of America without the knowledge and written consent of Xylem Water Solutions USA, Inc.; (ii) Xylem Water Solutions USA, Inc. makes no independent warranty or representation with respect to parts or products manufactured by others and provided by Xylem Water Solutions USA, Inc. (however, Xylem Water Solutions USA, Inc. will extend to the Purchaser any warranty received from Xylem Water Solutions USA, Inc.'s supplier for such parts or products).

LIMITATIONS:

XYLEM WATER SOLUTIONS USA, INC. NEITHER ASSUMES, NOR AUTHORIZES ANY PERSON OR COMPANY TO ASSUME FOR XYLEM WATER SOLUTIONS USA, INC., ANY OTHER OBLIGATION IN CONNECTION WITH THE SALE OF ITS FLYGT EQUIPMENT. ANY ENLARGEMENT OR MODIFICATION OF THIS WARRANTY BY A FLYGT PRODUCT DISTRIBUTOR, OR OTHER SELLING AGENT SHALL BECOME THE EXCLUSIVE RESPONSIBILITY OF SUCH ENTITY.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, CONDITIONS OR TERMS OF WHATEVER NATURE RELATING TO FLYGT PRODUCT(S), INCLUDING AND WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED. PURCHASER'S EXCLUSIVE REMEDY AND XYLEM WATER SOLUTIONS USA, INC.'S AGGREGATE LIABILITY FOR BREACH OF ANY OF THE FOREGOING WARRANTIES IS LIMITED TO REPAIRING OR REPLACING FLYGT PRODUCTS AND SHALL IN ALL CASES BE LIMITED TO THE AMOUNT PAID BY THE PURCHASER HEREUNDER. IN NO EVENT IS XYLEM WATER SOLUTIONS USA, INC. LIABLE FOR ANY OTHER FORM OF DAMAGES, WHETHER DIRECT, INDIRECT, LIQUIDATED, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY OR LOSS OF REPUTATION.

XYLEM WATER SOLUTIONS USA, INC. WILL NOT BE HELD RESPONSIBLE FOR TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR'S FEES, OR ANY EXPENSES ASSOCIATED WITH A FLYGT PRODUCT REPAIR SHOP NOT AUTHORIZED BY XYLEM WATER SOLUTIONS USA, INC. U.S.A., INC. REIMBURSEMENT COSTS FOR CRANES AND/OR ANY SPECIAL EQUIPMENT USED IN CONJUNCTION FOR THE REMOVAL AND/OR REINSTALLATION OF ANY FLYGT EQUIPMENT IS NOT COVERED UNDER THIS WARRANTY.

ANY UNAUTHORIZED ALTERATIONS TO SUPPLIED FLYGT EQUIPMENT USED WITHOUT XYLEM WATER SOLUTIONS USA, INC. SUPPLIED FLYGT BRAND CABLE OR CONTROLS WILL NOT BE COVERED UNDER THIS WARRANTY, UNLESS IT CAN BE PROVEN SUCH ANCILLARY EQUIPMENT IS SUITABLE FOR THE PURPOSE AND EQUAL TO XYLEM WATER SOLUTIONS USA, INC. SUPPLIED FLYGT BRAND CABLES OR CONTROLS THAT WOULD ORIGINALLY HAVE BEEN SUPPLIED WITH THE TYPE OF EQUIPMENT IN USE.

REQUIREMENTS:

A copy of Electrical System Schematics of the Control used (including a Control's Bill of Material) could be required to support a Warranty Claim when a non Flygt Brand Control is used. In addition, a written record, hereby known as "the log", will be associated with each unit serial number and must be maintained by the organization having product maintenance responsibility. The log must record each preventative maintenance activity and any repair activity during the life of the warranty or verification that a Xylem Water Solutions USA, Inc. authorized Service Contract for Flygt Products is in force and must be available for review and/or auditing. Failure to meet these conditions could render this warrant null and void. Such logs could be required to determine warranty coverage.



WARRANTY

Xylem Water Solutions USA, Inc.

STORAGE:

Should a delay occur between ship date and the date of start-up, maintenance as outlined in Xylem Water Solutions USA, Inc.'s Care & Maintenance Manual for Flygt Products must be performed by the "CONTRACTOR" and/or "OWNER" during any such period of storage. Documentation providing proof and outlining what maintenance was performed must be provided to Xylem Water Solutions USA, Inc. or its Flygt Products representative within thirty (30) days of said maintenance, or the Xylem Water Solutions USA, Inc. warranty for Flygt Products could be considered void.

CONTROLS:

Warranty coverage for permanently installed controls will start for the end purchaser on the date of shipment. This warranty does not apply to controls that have been damaged due to a defective and/or improper input power supply, improper electrical protection, accidental damage, improper or unauthorized installation and/or repair, unauthorized alteration, negligence, environmental corrosion or chemical attack, improper maintenance or storage of control, any act of God, an act of war, an act of terrorism or damage resulting from the use of accessory equipment not approved by Xylem Water Solutions USA, Inc.. Further, this warranty does not apply in the event an adjustment is found to correct the alleged defect.

Solid state devices will be covered for a period of one (1) year. Electrical control panels containing controllers, PLC's, drives, soft starts, and other computerized equipment will require Transient Voltage Surge Suppression (TVSS) protection in order to satisfy the requirements of this warranty. The protection equipment associated with the control must be kept in working condition during the life of the warranty. Auxiliary equipment supplied with the control (air-conditioners etc.) is limited by the respective original equipment manufacturer's warranty offered. Consumable items such as: light bulbs, fuses, and relays are covered under normal operating conditions. Electrical surges experienced during startups and/or during normal operating use of the control panel will cause the consumable items not to be covered under this warranty policy. Components not supplied by Xylem Water Solutions USA, Inc. will not be covered by this warranty.

TOP (The Optimum Pump Station)

Xylem Water Solutions USA, Inc. will warrant the Flygt TOP pre-engineered fiberglass pump station components against defects in material and workmanship for a period of one (1) year from date of start-up or eighteen (18) months from date of shipment and is valid only to the original owner of the station. Warranty shall cover the cost of labor and materials required to correct any warrantable defect, excluding any removal and reinstallation costs, FOB Xylem Water Solutions USA, Inc.'s authorized warranty service location for Flygt's TOP.

Flygt Products contained within a TOP pre-engineered fiberglass pump station will carry the standard Xylem Water Solutions USA, Inc. warranty for Flygt products and/or accessories installed in the TOP pre-engineered fiberglass pump station.

All Flygt Product restrictions and/or limitations as outlined and described within the context of this warranty are germane to all sections of this Xylem Water Solutions USA, Inc. Warranty document.

Xylem Water Solutions USA, Inc.
National Quality Assurance - US Corporate



WARRANTY
Xylem Water Solutions USA, Inc.

ADDENDUM – WARRANTY COVERAGE BY PRODUCT

PRODUCT	PRODUCT SERIES AND CONFIGURATION	Months	Months	Months	Months	Months	Months
		1 - 12	13 - 18	19 - 24	25 - 36	37 - 39	40 - 60
Axial Flow/ Mixed Flow/ Centrifugal Pumps & Mixers	3000 Series (CP, NP, DP, CT, NT, CZ, NZ, LL) 4000 Series (SR, PP) 7000 Series (PL)	100%			50%		25%
ETO Electrical Control Panels	Engineered to Order, Xylem Manufactured Control Panels (permanently installed) - 3 Years	100% - 1 YR	LIMITED - 2 - YR				
Grinder Pumps	3000 Series (MP, MF, MH)	100% - 2 YR (From Ship Date)		3 YR (From Date of Manufacture)			
Abrasion/Corrosion Resistant & Chopper Pumps	3000 Series (FP, FS, FT, HP, HS) 5000 Series (HP, HS) 8000.280 Series (DP, DZ, DT, DS, DF)	100%					
	2000 Series (BS, KS) 3000 Series (CS, NS, DS) 8000.280 Series (DS, DF)	100% (From Ship Date)					
TOPS	Fiberglass Pump Station	100% (From Ship Date)					
Accessories	Permanent / Portable	100% (From Ship Date)					
Hydro ejectors/ Aerators	HE, JA	100%					
Portable Pump Controls TOPS Control Panels	Control Boxes (Nolta, MSHA etc.) TOPS control panels (permanently installed)	100% (From Ship Date)					
Small Pumps	3045, 3057, SX	100% (From Ship Date)					
Parts - *	All new Flygt parts (mechanical & electrical)	100% (From Ship Date)					

* - Parts that fail where used in a repair are warranted for one (1) year from the date of the repair for the failed part only – no labor; This includes Flygt pump controllers, Flygt supervision equipment, Flygt submersible level transducers, etc.

