Bid Title: Apalachicola Wastewater Collection System Upgrades

Scope:

Contractor shall furnish and install the below outlined equipment to upgrade the city's existing sewer and monitoring system. The project is a lump sum turnkey project and incudes supply and install of equipment per manufacturer's specifications. Including connecting and commissioning monitoring modules to communicate with the city's existing LoRa WAN Backbone.

The successful bidder must able to demonstrate previous expertise working on vacuum sewer systems including but not limited to 500 vacuum valves being replaced.

Furnish and Install

- **FMS Valve pit monitoring bundles** **QTY 207**
- **FMS Monitoring Install Kits (2-piece pit)** **QTY 207**
- **FMS Vacuum Sensor Kit – For use with remote mount controller** **Qty 20**
- **Dedicated Air Terminal** **QTY 330**
- **Controller Remote Mount Kit** **QTY 330**
- **FC Controller** **QTY 330**
- **3in Valve Install kit** **QTY 330**
- **3in FV Valve** **Qty 330**
- **All required Conduit and excavation/ restoration costs to complete the project.**

- **Project assumes conventional hand excavation in dirt or grass and restoration with native materials. Should site conditions require additional work—such as concrete cutting, core drilling, asphalt, concrete, or other specialized restoration—the costs for such work will be invoiced on a cost-plus basis**

Specifications for Sewerage Monitoring System, Valves, Controllers, Remote Mount

Specifications for Sewerage Monitoring System

1. General Overview

The objective of the Sewerage Monitoring System is to deploy a resilient, scalable Industrial Internet of Things (IIoT) communication infrastructure across the municipality's service area. The system shall enable seamless integration of an unlimited number of communication devices using both licensed and unlicensed wireless networks, including but not limited to LoRaWAN.

The monitoring system shall support a range of communication protocols, depending on the type of equipment monitored. This infrastructure will facilitate real-time and historical data collection from critical assets across the sewerage network, allowing for predictive maintenance, reduced operational disruptions, and enhanced response times. Two-way communication will further enable remote control of key equipment to improve performance and manage anomalies proactively.

2. Scope of Work

This is a turnkey project and the successful bidder shall:

- Furnish, install and connect 207 vacuum valve pits and designated equipment using a universal FMS (Field Monitoring System) module, integrating them with the city's existing LoRaWAN gateway(s).
- Include 20 vacuum sensors to be integrated in the FMS Monitoring System.
- Deliver data and alarms through a secure, cloud-based platform while simultaneously providing the municipality access to raw system data.
- Install and furnish 330 vacuum sewer valves and components.
- Install and furnish 330 FC model vacuum valve controllers through a remote mount system which resides inside the pedestal.
- Install and supply 330 pedestals for remote mount monitoring, breathers and controllers. Pedestals shall feature an open bottom to facility the option to house 1x 6in and 1x 3 in sch40 pipes above the 100-year flood level. Pedestals shall feature shall be direct burry and not rely on grommets to seal or support the equipment. The pedestal should feature a removable top for direct top-down access to the vent pipe and housed equipment. Additionally, pedestals shall have venting provisions to allow adequate air flow for valve pit activation. Pedestals as supplied by Flovac PN 1USFV0003
- Install and Furnish 2inch or larger Conduit for 220 pits for the installation process. 90 degree swept bend must be used. Grommet penetrations into the valve pit must be sealed.
- Provides a detailed report for Monitoring and Vacuum Valve installation for each pit, that tracks the serial number.

All hardware and software shall be provided by Flovac Inc. or an approved equivalent that meets the experience and system capability requirements outlined herein.

3. Experience Requirements

The selected manufacturer or solution provider shall:

- Demonstrate a minimum of 8 years' collective experience in the design, deployment, and maintenance of vacuum sewer monitoring systems utilizing LoRaWAN.
- Provide evidence of at least 10 fully deployed LoRaWAN-based vacuum sewer monitoring systems,
- Provide evidence of at least 5,000 vacuum sewer pits using a LoRaWan monitoring system.
- A monitoring system shall be provided by the valve manufacturer. No third-party interface applications will be accepted

4. Warranty

All monitoring equipment shall be covered by a minimum one-year warranty, commencing from the official date of commissioning.

5. Monitoring Interface & Connectivity

The system shall include a secure, cloud-hosted Software as a Service (SaaS) platform provided on a subscription basis. The software interface must adhere to enterprise-grade cybersecurity standards and include the following minimum capabilities:

5.1 User Access and Permissions

- Multiple user roles including Operator (read-only) and Manager (control access).
- Login tracking (date, time, IP location).
- Ability for users to define work hours and custom alarm notification preferences.
- Multi-language support, custom measurement units (e.g., KPa, inHg, Bar), and interface themes.
- Responsive design with seamless access across desktops, tablets, and smartphones.
- Data export in multiple formats: PNG, JPEG, PDF, CSV, XLS, and others via built-in API/webhooks—no additional programming required.

5.2 Interface Dashboard

- Customizable overview map and list view of monitored assets, with real-time status indicators and alarm notifications.
- Summary displays including:
    - Module type
    - Location
    - Alarms/alerts
    - Activation metrics
    - System health
- Vacuum trendlines overlaid across multiple stations with historical overlays.

- Rainfall and valve activations plotted alongside vacuum metrics for analytical comparison.

5.3 Individual Module Pages

Each module's detail page shall include:

- GPS-tagged location
- Associated station and sewer line
- Asset identifiers
- Real-time and historical alarms
- Signal strength and data transmission logs
- Configurable alarm and operational thresholds
- Vacuum pressure readings (if equipped)
- Time-based activation data and trends

6. Alarm Management

The system shall support comprehensive alarm configuration, including user-defined thresholds, global and per-module settings, and delivery via:

- SMS
- Email
- Voice Call
- HTTPS Endpoint
- API Integration

All alarms must include:

- Unique identifiers
- Time stamps
- Delivery logs
- Acknowledgment records

The manufacturer shall maintain in-house integration support for custom configurations with existing municipal platforms.

Alarm Conditions (at minimum):

- Communication failure
- Valve malfunction
- High/low vacuum pressure
- High sump level

- Pump runtimes
- Power loss
- Sensor faults

7. Reporting & Analytics

The platform shall support:

- Custom report generation in collaboration with the municipality.
- System-wide statistics as well as drill-down reports for specific stations or modules.
- Advanced analytics such as:
    - Vacuum profile analysis along each vacuum main (including static loss and vacuum level distribution).
    - Inflow & infiltration (I&I) mapping correlating valve activation to rainfall, with prioritization guidance for maintenance.

8. Automatic Air Injection (AAI) Control

The interface shall support full configuration and control of Flovac electronic vacuum valve controllers, both automatically and manually.

Automatic AAI logic shall be user-configurable based on:

- Vacuum levels at the station or remote sensor
- Activation intervals and durations
- Control window settings
- Custom rules (unlimited)

All AAI events must be logged, plotted against vacuum levels, and alarmed if execution fails.

9. Station Monitoring & Control

Real-time monitoring and control of vacuum and sewer pump stations shall include:

- Vacuum pump status, VFD control, current, temperature, and runtime
- Sewage pump monitoring with control logic and operating setpoints
- Vacuum pressure levels
- Tank levels and flow totalizers
- Power supply metrics (Phase, Voltage, Current)
- Air/liquid ratio monitoring
- Service log and alerts based on runtime or usage

10. Network Configuration & Administration

10.1 Network

- Gateway setup and monitoring
- Module configuration
- Site survey tools

10.2 Administration Panel

- User management and permissions
- Project and equipment setup
- Full audit trail of system and control changes
- Data grouping and database management

11. Vacuum Valve Pit Monitoring

The system shall monitor individual vacuum valve pits and buffer tanks for:

- Valve activation cycles
- Stuck valve alarms
- High wastewater levels
- Optional vacuum level monitoring
- Full support for remote operation of actuators and electronic controllers

All features must be universally available across all modules to ensure flexibility and system uniformity.

12. Hardware Specifications

12.1 LoRaWAN Gateway(s)

- IP67-rated enclosure
- 915MHz frequency
- LTE and Ethernet backhaul
- M2M and IoT support
- Listen-Before-Talk, Packet Forwarding
- Public/private network capabilities
- Node-B compatibility

12.2 Communication Modules

- LoRaWAN-enabled with minimum:
    - 4 digital inputs
    - 1 digital output

    - 1 analog input
    - UART support
- Potted, tamper-proof construction
- Factory-terminated UL-listed IP68 connectors (no field terminations)

12.3 Power Supplies

- **Battery Pack**: 3.6V, 38,000 mAh minimum, EPC sealed
- **Solar Option**: 3W panel with sealed power manager, 10-year life expectancy

12.4 Sensors & Auxiliary Hardware

- Valve sensor (reed/micro switch, IP68, no valve modifications required)
- High-level sump sensors (NO float, adjustable mount, non-invasive)
- Vacuum pressure sensors (connectable at any location, IP67/IP68)
- Electronic valve controllers (remote & automatic control, cycle-tested)
- Rain gauge (tipping bucket, pole-mounted, IP68)

12.5 Additional Monitoring Capabilities

Integration with:

- Grinder/wet well pumps

Each with relevant I/O, power backup, and monitoring capabilities.

13. Vacuum Sewer Valves & Controller Specifications:

13.1 Vacuum Sewer Valves:

Valve specifications must meet the following criteria:

- Rated flow: 4 GPM and 237 Cv
- Independent testing certifications:
    - EN-16932-3
    - 500,000-cycle test
    - Submergence resistance test
    - Blockage resistance test
    - 50-year design life
- Rebuild interval: Every 10 years
- Potted magnet in piston cup and microswitch in lower housing with m12 4pin connector wired to interface with existing Flovac monitoring system for valve position.
- 1x 5/8 and 1x 3/8 lower breather hose connection

- All steel parts are to be 316SS
- Valves as supplied by Flovac PN 2FL0FV0003

13.2 Vacuum Valve Controller:

Valve- Controller specifications must meet the following.

- Flovac FC transparent model for enhanced operator visibility and diagnostics PN 3FL0FC0002
- Water processing capability
- Tuning range: Adjustable between 1–20 seconds
- Trigger accuracy: Activates reliably at vacuum levels up to 50% lower than other systems
- Consistent timing adjustments for optimized performance

14. Air Terminal Pedestal and Remote Mount Controller Arrangement

- Remote mount controller mounting plate must feature slip key to secure controller in place. Twist lock will not be allowed.
- All hoses are to be vacuum service rated and color coded for operator ease- Silicone hose is not allowed. As provided by Flovac or equal.
- Air terminal Pedestals shall feature an open bottom to facility the option to house of 1X6inch and 1x3 in sch40 pipes above the 100 year flood level.
- Air Terminal Pedestals shall be directly buryand not rely on grommets to seals or support the equipment.
- The pedestal should feature a complete removable lid for direct top down access to the vent pipe and housed equipment.
- Air Terminal pedestals shall have venting provisions to allow adequate air flow for valve Pit activation. Air terminal pedestals design basis supplied by FLOVAC PN 1USFV0003
- 6inch vent pipe shall fall towards the pit
- 2 or 2 inch communication conduit shall fall towards the valve pit where possible and may not have sags or belly's greater than 12 inch's.

QUALITY ASSURANCE

A. Manufacturer's Experience: The vacuum system manufacturer shall have a minimum of five (5) years of experience in the manufacture of vacuum. Provide verification at the request of the ENGINEER.

B. Acceptable vacuum system manufacturers: Flovac, (Basis of design and manufacturer to be used in base bid) "or approved equal".

C. Alternate vacuum sewer system manufacturers: Proposals for alternative manufacturers shall include but not limited to the following:

1. A complete set of plans specifications and detailed descriptive material of proposed products. This information shall identify all technical and performance requirements stated in this specification.
2. A list showing materials of construction of all components.
3. A list of manufacturer's recommended spares.

4. Information detailing field assembly and installation of proposed equipment.

5. Detailed documentation with discussion of all deviations from criteria included within this specification.

6. A list of all installations with references where proposed equipment is in use.

7. The costs of having the project ENGINEER redesign the vacuum collection system using alternative manufacturer's design criteria.

8. All labor, material, and restoration costs associated with installation of the revised vacuum sewer system based on alternative manufacturer's design criteria.

9. Cost of acquisition of additional easements (if any) required to accommodate alternative design.

10. Electrical and mechanical revisions required at the vacuum station.

11. The CONTRACTOR shall have the sole responsibility of presenting to both the OWNER and the ENGINEER that the alternative product meets all outlined specifications. This must occur no later than fifteen (15) working days prior to the bid date to allow the ENGINEER time for review and subsequent approval or rejection of said proposal.

12. The ENGINEER will, at date no later than five (5) working days before the bid, notify the CONTRACTOR and OWNER in writing of approval or rejection of such alternate and outline such reasons.

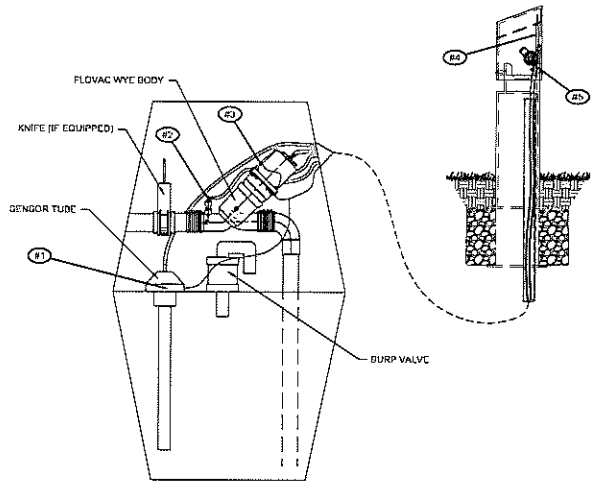
13. Alternates will be considered if and only if said alternate is demonstrated to conform to all pertinent specification sections. Failure to meet these specifications or deadlines in part or whole will constitute sufficient reason for rejection of the bid proposal. The ENGINEER shall be the sole authority for determining conformance of a proposed substitute and will not be required to justify the decision to accept or reject a proposal.

14. The ENGINEER will record time required to evaluate a proposed substitution and submit an appropriate invoice. The CONTRACTOR shall reimburse the owner for all charges associated with this evaluation whether accepted or rejected.

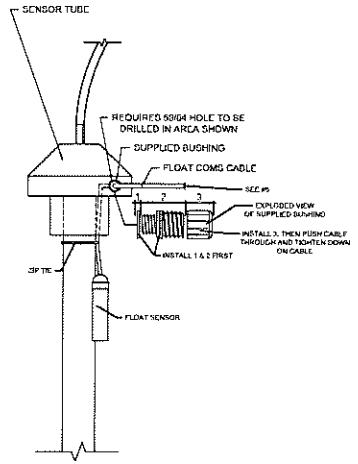
Install and Standard Details

FLOVAC TELEMETRY - EXISTING PIT

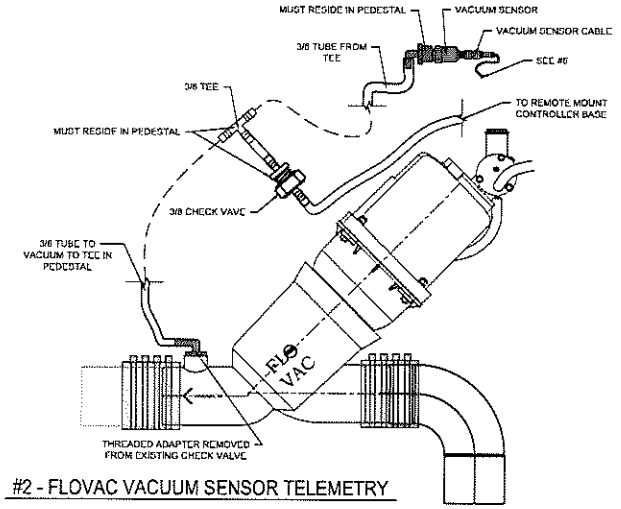
PEDISTAL W/ BREATHER & REMOTE MOUNT CONTROLLER)



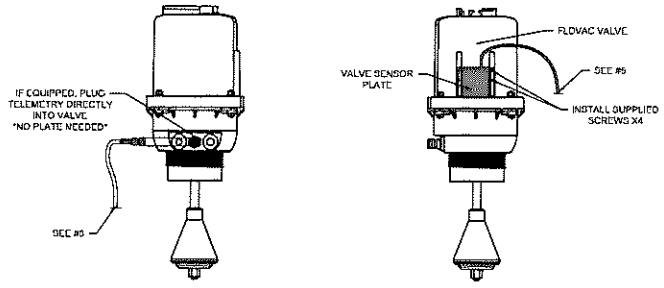
EXISTING PIT / NEW FLOVAC COMPONENTS



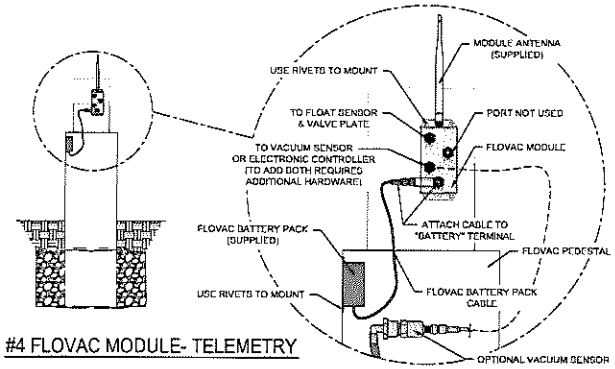
#1 - FLOVAC FLOAT TELEMETRY



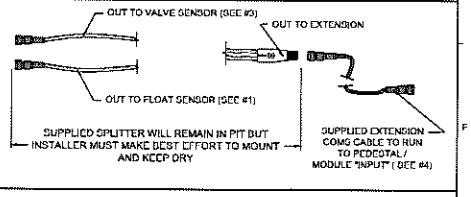
#2 - FLOVAC VACUUM SENSOR TELEMETRY

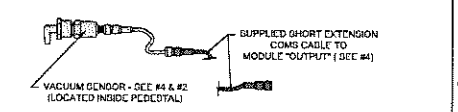


#3 FLOVAC VALVE SENSOR PLATE - TELEMETRY



#4 FLOVAC MODULE- TELEMETRY





#5 FLOVAC TELEMETRY WIRING

ISSUE	DATE	CHKD	REVISION	DRN	REC	APPD

DESIGN SURVEY - - -
ADCON SURVEY - - -
VERTICAL DATUM -
COORDINATE SYS -
DES REF -
DES CALC -
DES CHKD -
DRN -
D.C. CHKD CHKD'N

NORTH POINT

CLIENT.

VACUUM SEWERAGE SPECIALIST.
FLOVAC SYSTEMS
FLOVAC VACUUM SEWERAGE SYSTEMS PTY LTD

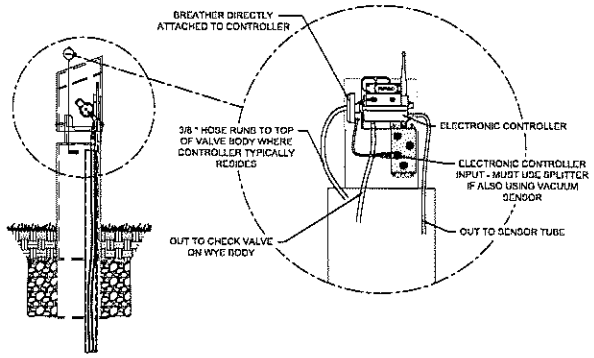
FLOVAC TELEMETRY DETAILS

FILE -
PROJECT
DRAWING NO. FLOVAC TELEMETRY - EXISTING PIT
ISSUE -

ORIGINAL SHEET SIZE
A1
SCALE AS NOTED

FLOVAC TELEMETRY - EXISTING PIT

PEDISTAL W/ BREATHER AND REMOTE MOUNT CONTROLLER



#5 - FLOVAC ELECTRONIC CONTROLLER

ISSUE	DATE	ORD	REVISION	DRN	HLC	APPD

DESIGN SURVEY: -
VERTICAL DATUM: -
DES CALC: -
COORDINATE SYS: -
DES CHD: -
ASCON SURVEY: -
DES REF: -
DRN: -
QC CHD: -
CHKN: -

NORTH POINT

CLIENT:

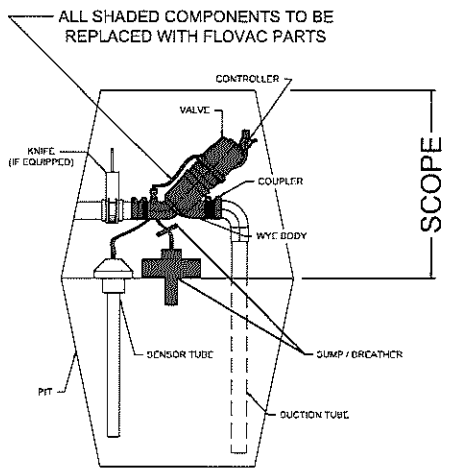
VACUUM SEWERAGE SPECIALIST:
FLOVAC SYSTEMS
FLOVAC VACUUM SEWERAGE SYSTEMS PTY LTD

FLOVAC STANDARD DETAILS

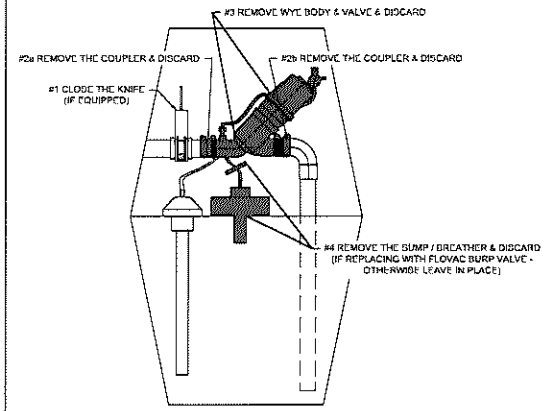
FILE: -
PROJECT:
DRAWING NO.: FLOVAC TELEMETRY - EXISTING PIT
ISSUE: —

ORIGINAL SHEET SIZE
2 of 2
SCALE AS NOTED

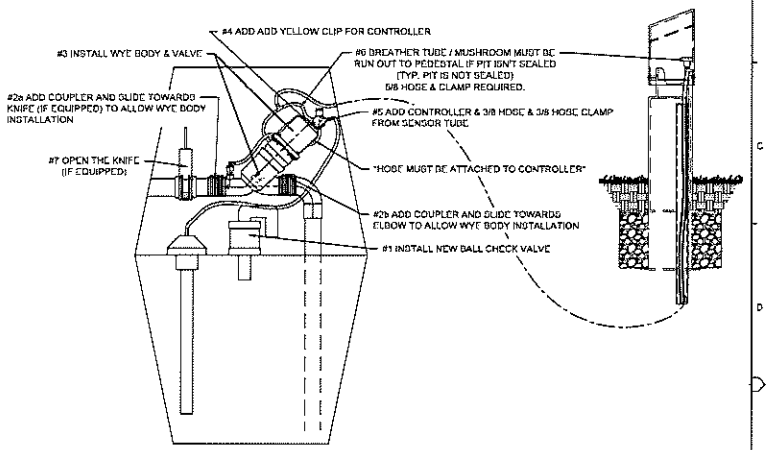
FLOVAC COMPONET SWAP



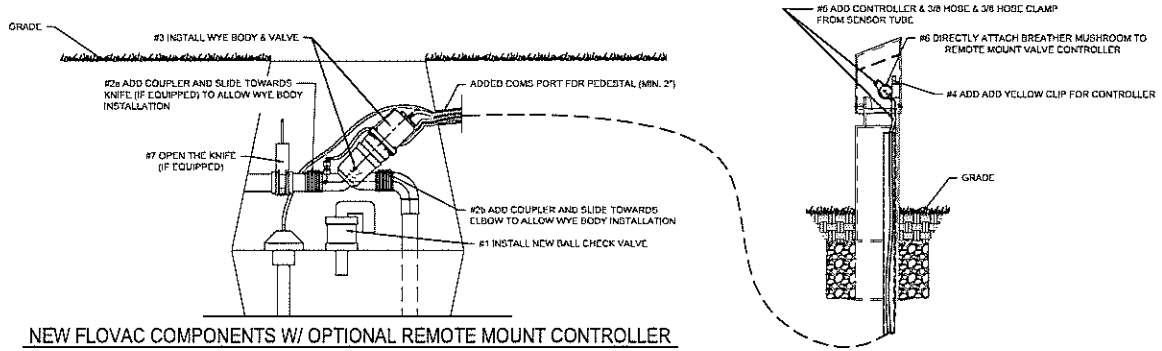
EXISTING PIT / COMPONENTS



EXISTING PIT / REMOVE COMPONENTS



EXISTING PIT / NEW FLOVAC COMPONENTS



NEW FLOVAC COMPONENTS W/ OPTIONAL REMOTE MOUNT CONTROLLER

ISSUE	DATE	CHKD	REVISION	DRN	REC	APPD

DESIGN SURVEY: - | VERTICAL DATUM: - | DES CALC: -
COORDINATE SYS: - | DES CHD: -
ADDEN SURVEY: - | DES REF: - | DRN: -
O.C. CHD: - | CHKD: -

NORTH POINT

CLIENT

VACUUM SEWERAGE SPECIALIST.
FLOVAC SYSTEMS
FLOVAC VACUUM SEWERAGE SYSTEMS PTY LTD

FLOVAC STANDARD DETAILS

FILE: -
PROJECT:
DRAWING NO.: FLOVAC COMPONET SWAP
ISSUE: —

ORIGINAL SHEET SIZE: A1
1 of 1
SCALE: AS NOTED