# Specification number 04044-MEC-1.1A-GEN-2.01 for the supply of the GRIT CLASSIFIER M-340, M-341

**version 3.01**

## 1. General

For the Ashdod domestic waste water treatment plant an aerated grit removal system for the removal and handling of grit from municipal sewage shall be installed.

Two vortex grit removal systems shall be provided (see separate specification 04044-MEC-1.1-GEN-2.01). The grit removal system will discharge a watery grit stream that needs to be cleansed and dewatered.

The grit classifier is of the inclined gutter type. The gutter starts from the sump and ends above a grit container. A mechanical screw moves the grit from the lower end of the gutter towards the upper end which is positioned above water level.

In the submerged part of the gutter section, organic matter is washed out by the screw movement. In the section above water level, the remaining organic matter is washed out by a utility water spray system and the grit is drained. The grit is discharged into the container via the upper end of the gutter.

The equipment shall be suitable for operation in wastewater treatment installations under harsh conditions both for continuous long-term operation and for intermittent operation. The system shall be designed for maintenance free (except for routine maintenance, long life at 24-hour per day operation.

The grit classifier supplied shall be from the same manufacturer as the vortex grit removal equipment.

See P&ID drawing for details 04044-GEN-063-01

| | | | | |
|---|---|---|---|---|
| Quantity | | | : | 2 |
| Medium: | | | | |
| - | type | | : | raw sewage with high grit content (the sewage has passed a screen, with a bar-spacing of 3 mm) |
| - | temperature min./max. | °C | : | 16 - 34 |
| - | pH | | : | 6 – 9 |
| - | BOD concentration | $g/m^3$ | : | 450 |
| - | SS concentration | $g/m^3$ | : | 800 |
| - | Grit: | $g/m^3$ | : | up to 40 |
| - | Oil and grease: | $g/m^3$ | : | between 50 and 70 |
| - | density | $kg/m^3$ | : | 1,050 |
| Site conditions: | | | | |
| - | location | | : | adjacent the grit container |
| - | area classification | | : | non-explosive |
| - | ambient temperature min/max. | °C | : | 5 / 45 |

| | | | | |
|---|---|---|---|---|
| - | humidity | % | : | approx. 85 |
| - | sandstorm | | : | not applicable |
| - | site elevation | | : | 30 m above sea level |
| - | site location | | : | approx. 2.0 km from the Mediterranean Sea |

The whole drive system shall be designed for maintenance free (except for routine maintenance) long life at 24-hour per day operation.

Scope of supply:
- Grit classifiers
- Drive units
- Local electric board for classifier
- All documentation including but not limited to, shop drawings, O&M manuals, installation manuals etc.
- All parts required for on-site erection, ready for operation, including lubricants for three months
- Project engineering including submittal preparation, design drawings, reviewing the contractors detailed design in applying the manufacturer's equipment, preparing the FAT and SAT tests etc.
- Preparing and allocating all necessary resources for conducting a full FAT procedure in accordance with these specifications witnessed test by client and the manufacturer at the manufacturer's factory site.
- On-site supervision by a qualified representative of the manufacturer of the installation
- Providing approval that the equipment has been installed by the contractor in full accordance with the manufacturers specific instructions.
- The presence of the manufacturer's technician during the initial clean water commissioning at the Ashdod WWTP as required by this specification.
- The presence of the manufacturers technician during the initial wastewater water commissioning at the Ashdod WWTP as required by this specification.
- The presence of the manufacturer's technician 45 days after initial operation with wastewater for operation evaluation of the system.
- The presence of the manufacturer's or approved representative technician during the initial clean water commissioning at the Ashdod WWTP as required by this specification.
- The presence of the manufacturers technician or approved representative during the initial wastewater water commissioning at the -Ashdod WWTP as required by this specification.
- The presence of the manufacturer's technician or approved representative 45 days after initial operation with wastewater for operation evaluation of the system.
- The presence of the manufacturer's technician at the Ashdod site in case of a substantial malfunction as required by this specification.
- On-site training by the manufacturer's technician or approved representative required by this specification.
- On-site training by the manufacturer's technician

## 2. Previous Experience

All equipment to be supplied shall be solely made in OECD countries.
Manufacturer shall be successful in the experience of manufacture, operation, and servicing of equipment of type, size, quality, performance, and reliability equal to that specified. The manufacturer shall submit evidence of experience:

a. having supplied in OECD countries (excluding Israel), at least twenty-five (25) installations of similar type and size that have been in successful operation for at least five (5) years.
b. having supplied in Israel, at least three (3) installations of grit classifiers of similar type and size that have been successful for at least 3 years in the last 5 years.

The Israeli supplier-representative shall show that the company operates a qualified service team in Israel with at least 5 qualified technicians with previous experience in servicing the proposed equipment for at least 2 years.

# 3. Main data

| | | | |
|---|---|---|---|
| Manufacturer | | : | Jacopa or approved equivalent by the Client's Designer |
| Process data: | | | |
| - input grit/water mixture | $m^3/h$ | : | 40 |
| - grit fraction of the input (drained volume) | % | : | 0.5 (by volume) |
| - estimated grit quantity | $m^3$/day | : | 6.0 (at 70,000 m3/day and 50% DS) |
| Gutter dimensions: | | | |
| - angle of inclination | ° | : | up to 27 |

Performance requirements:
- the screw clarifier shall guarantee producing a dry solids content of at least 40%.
- the quantity of organic matter in a sample taken from the grit container shall not amount more than 25% (the sample is dried before calcifying; residue after calcifying shall amount more than 80 % by weight of the dried sample)

| | | | |
|---|---|---|---|
| Screw diameter | mm | : | at least 350 |
| Screw flight thickness | mm | : | at least 20 |
| Screw type | | : | heavy duty shaftless |
| Hopper volume | | : | 2800 liter |
| Screw wear surface material | | : | carbon steel coated with pitch epoxide |

# 4. Drive

| | | | |
|---|---|---|---|
| Electric motor: | | | |
| speed | rpm | : | (≤ 1500) |
| power supply | V, Hz | : | 3 x 400, 50 |
| starting method | | : | direct on line |
| insulation rating | | : | H |
| protection rating | | : | IP 56 |
| Bottom bearing | | : | not acceptable |
| Gears | | : | helical (no worm gear) |
| Life time bearings ($L_{10h}$ according to ISO) | h | : | ≥ 100,000 |
| Lubrication | | : | oil |
| Number of poles | | : | 4 |
| Service factor | | : | 1.15 |

| | | |
|---|---|---|
| Duty type | : | S1 continuous operation |

Accessories:
- fill opening
- magnetic drain plug
- breather

## 5. Discharge chute

Purpose:
discharging sand from the sand washer gutter into the container without spill

| | | |
|---|---|---|
| Structure | : | folded plate, mounted at the discharge end of the sand washer gutter |
| Material | : | stainless steel AISI 316L |

## 6. Electrical installation

The two grit systems, the two blowers, three-way valve system, and the two classifiers shall be controlled by a single control unit. The control unit shall be installed in the isolated room adjacent to the headworks. See specific specification for grit removal system specification.

The control logic principles shall include (but not limited to) the following functions:

- Operate the system
- Cleaning cycle of the automatic grit washing and de-gritting process.
- Allow for emergency shut down
- Allow for maintenance shut down
- Provide status of all equipment components – such as (but not limited to): on/off, cleaning mode, fault, overload activated, high torque activated, number of minutes from last washing operation, total number of minutes operated per day, total number of cleaning cycles per day,
- Collect all alarms and provide history for all data of at least 24 months.
- Graphs showing number of cleaning cycles per hour, on/off of equipment

## 7. Protective coatings

All Stainless-steel components shall undergo a complete passivation - by immersion process. No spray treatment or painting shall be allowed. The internal process shall be documented.

All carbon steel surfaces shall be coated except for stainless steel surfaces.

Welding details between parts shall be conducted in accordance with best practices as outlined in chapter 5.5 “Geometric Considerations” given in Design of Municipal Wastewater Treatment Plants – Manual of Practice #8 fifth edition.

All welds shall be cleaned before passivation.

No field welds shall be allowed.

Any ferrous metal surfaces that are not SS shall be coated. The coatings shall be completely shop applied (no field finishing) and shall be verified by the following ISO standards tests or any other equivalent standard approved by the client:

| | | | |
|---|---|---|---|
| - | Painting layers adhesion | : | ISO 2409:2007 – Cross cut test<br>ISO 4624:2016 – Pull of test for adhesion |
| - | Preparation of steels before painting | : | ISO 8501-1:2007 - preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness<br><br>ISO 8503-1:2012 - Preparation of steel substrates before application of paints and related products - Surface<br><br>ISO 8503-1- 5:2012 - Preparation of steel substrates Before application of paints and related products – surface roughness characteristics of blast-cleaned steel substrates |

# 8. Fastening materials

| | | | |
|---|---|---|---|
| Flanges | | : | DIN |
| Bolts | | | |
| - | Thread type | : | M |
| - | Bolt head type | : | Hex |
| - | Identification | : | in accordance with ISO 3506-1 |
| - | Length | : | thread shall protrude at least 2 thread pitches and no more than three thread pitches. |
| - | Material | : | SS316L |
| Nuts | | | |
| - | Style of nuts | : | Hex |
| - | Identification | : | in accordance with ISO 3506-2 |
| - | Material | : | SS316 |
| Washers - material | | : | SS316 |
| Spring washers - material | | : | SS316 |

# 9. Nameplates

- a stainless steel 316 identification nameplate shall be fixed to the equipment.
- all information provided shall be engraved (not printed)
- the nameplate shall include the following information:

    - Manufacturer's name
    - Model number
    - Serial number
    - Tag number from P&ID
    - Date of manufacture
    - Power supply
    - Protection rating
    - Amperage
    - Speed
    - Rated capacity
    - All other pertinent data

- motor data shall include in addition:

    - Number of poles
    - Electrical connection
    - Efficiency
    - Isolation class
    - Service factor

# 10. Spare parts

Spare parts to be supplied within the scope of supply shall adhere to the following:

- All spare parts shall be identical and interchangeable with the original parts.
- All spare parts shall be properly packed and clearly labelled separately and packed in containers.
- Each container will be labelled showing the contents of the container.
- Suitable provisions shall be made to protect the spare parts against corrosion.

# 11. Submittals

To obtain approval from the Client's Designer, submittal documents shall be prepared. The submittal shall provide standard documentation for easy reference. Submittals that are not in accordance with this requirement will be automatically disqualified. All submitted documents shall be in English only.

**Document 1:** First page:

a. Equipment Name
b. Tag number (or numbers) in accordance with the P&ID drawings
c. Manufacturer's name
d. Model Number
e. Equipment country of origin
f. Supplier's signature
g. Contractor's signature
h. Date
i. Version number

**Document 2: Signed documents by manufacturer** - Tender specification, the relevant P&ID and the specific drawings that pertain to the specific equipment shall be signed on each page by the manufacturer stating that the proposed equipment is in full compliance with all the tender and this specification requirements.

**Document 3: Technical data** - Technical data that verifies full compliance with this specification. The data shall be submitted in the following manner, and shall include (but not limited to) the following:

- **Document 3A**: technical data sheets, including the manufacturer's technical offer
- **Document 3B**: electrical wiring drawings, control configuration, proposed software, proposed communications protocol, power requirements, electrical standards adopted, etc.
- **Document 3C**: brochures,
- **Document 3D**: performance curves and calculations (as required in the specification),
- **Document 3E**: drawings of proposed equipment (detailing dimensions and proposed installation),
- **Document 3F**: standard installation manual and O&M manuals.

**Document 4: Bill of Materials** – A Bill of Materials of all components to be supplied. The bill of materials shall be provided in a table format as detailed below:

| No. | Name of component | Weight Static/dynamic/wet [kg] | Sub-component | Sub-component manufacturers part number | Required sub-component material of construction in tender documents | Proposed sub-component material of construction | Quantity |
|---|---|---|---|---|---|---|---|
| 1 | TTTTTTTT | XXX/YYY/ZZZ | AAAAAA | GGG-HHH-FFF | JJJJJJ | SSSSSS | |
| | | | BBBBBB | GGG-HHH-FFF | JJJJJJ | SSSSSS | |
| | | | CCCCCC | GGG-HHH-FFF | JJJJJJ | SSSSSS | |
| | | | DDDDDD | GGG-HHH-FFF | JJJJJJ | SSSSSS | |
| | | | FFFFFFF | GGG-HHH-FFF | JJJJJJ | SSSSSS | |
| | | | GGGGGG | GGG-HHH-FFF | JJJJJJ | SSSSSS | |

**Note**: Capitalized letters are to be replaced by actual information

**Document 5: Previous Experience –**

- **Document 5A:** Manufacturers list of previous installations in OECD countries (not including Israel) – the list shall be in the following format:

| No. | Year of installation | WWTP name | Country | Design capacity of WWTP [m3/day] | Model type of installed equipment | Contact name, telephone, e-mail |
|---|---|---|---|---|---|---|
| 1 | | | | | | |

- **Document 5B:** Manufacturers list of previous installations in Israel) – the list shall be in the following format:

| No. | Year of installation | WWTP name | Country | Design capacity of WWTP [m3/day] | Model type of installed equipment | Contact name, telephone, e-mail |
|---|---|---|---|---|---|---|
| 1 | | | | | | |

- **Document 5C:** Name list of the service team in Israel – a list shall be in the following format:

| No. | Name of qualified technician (first and last name) | Number for years working on equipment from the specific manufacturer | Number of years' experience | Contact name, telephone, e-mail |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |

If the submittal is not accepted, the contractor shall revise the submittal in accordance with the Client's designer's remarks.

The resubmittal shall include the entire submittal package and all changes shall be marked (using "Track Changes"). The re-submittal shall be designated with an updated revision number.

Revised submittals that are not marked and with updated revision numbers shall not be checked and shall be handed back to the contractor and shall not be approved.

The contractor must use the approved submittal as the official document for procurement.

# 12. Factory Acceptance Test

After complete manufacturing of the system the manufacturer shall notify the client that the entire scope of equipment supply has been completed and is ready for the factory acceptance test.

Sixty (60) days prior to the factory visit, the supplier shall send the following:

**Updated submittal documents (1 through 5)** as required above in a final version, stamped with “final version”, with no marked changes on it.

**Document 6: Certified installation drawings** – certified final drawings of the equipment including dimension prints detailing equipment dimensions, installation details including but not limited to all required anchor bolt locations, weights, grove locations, openings, access areas and channel connection details etc. All drawings will be also provided in electronic files – CAD 2025 format. The electronic file drawings shall be both in 2D and 3D.

**Document 7: Electrical drawings** – The following technical data shall be provided:

- **Document 7A:** Complete wiring diagrams for the all the components supplied,
- **Document 7B:** Complete P&ID drawings of the equipment including the required control diagrams
- **Document 7C:** Control Narrative for Process Control
- **Document 7D:** Complete I/O lists and other process related information
- **Document 7E:** Detailed communication tables. These communication tables shall include but not limited to addresses and data for all types of events, motor status, instrumentation information, valve positions, motor speeds, power consumption, input and output discrete and analog raw data.

**Document 8:** Manufacturer's recommended procedures for jobsite storage and handling of equipment.

**Document 9:** Dedicated Installation, Operation and Maintenance Manuals: Prior to delivery of equipment and updated as required during installation of the equipment, the manufacturer shall furnish complete and detailed installation, operation and maintenance manuals which shall include the following information as a minimum requirement:

1) A description of each equipment and item, normal operating characteristics and limiting conditions including but not limited to performance curves, engineering data etc.
2) Assembly, installation and adjustment instructions.
3) Electrical diagrams, control philosophy and shop drawings for installation
4) Complete descriptive literature of all materials and components furnished.
5) Erection drawings with equipment mark numbers
6) Guide for trouble shooting with easy to read tables and charts
7) Lifting instructions
8) Field test protocols inline with the specification tests
9) Start-up instructions
10) Operating instructions
11) Routine maintenance and preventive maintenance schedule instructions
12) Control software documentation
13) Malfunction detection instructions
14) Safety instructions

15) Spare parts list and ordering procedure, including recommended quantities of spare parts to be stored onsite.

**Document 10:** Complete part list of the equipment to be tested. This shall be identical to what is required to be supplied by the manufacturer.

**Document 11:** Copy of the internal quality acceptance tests to be performed by the manufacturer

**Document 12:** Written approval of the supplier that the equipment fully complies with all that required in the tender specifications and has passed all internal quality acceptance.

The factory acceptance test shall proceed only after the documentation has been approved by the Client.

In case the local control panel is manufactured in Israel, the manufacturer shall conduct the FAT test with the specific equipment at manufacturer's factory with manufacturer's control panel that has identical functional hardware and software to what will be provided for the Ashdod project.

The factory acceptance test shall be witnessed by the client's representative.

The factory acceptance test shall include but not limited to:

a. Verifying that the equipment has passed the manufacturers acceptance test procedure and a report of compliance has been provides proof of this.
b. Visual inspection that the equipment is of high quality as detailed below:
    1) no damages or flaws are seen.
    2) no corrosion is seen.
    3) all critical sizes including – screw diameter, thickness, length, width conform to the specifications
    4) access doors are operational with smooth operation and appropriate door sealings that prevent odour emission have been included.
    5) all materials provided are accordance with specifications this shall be conducted by proof of material tracing and using a hand held calibrated spectrometers that shall be on-site and operational during the FAT.
    6) complete passivation on stainless steel components has been conducted and proper internal documentation has been provided.
    7) no non-similar metals have been connected
    8) all fastening equipment has been provided
    9) motors plates are in accordance with specs and what has been offered
    10) plastic/rubber parts are new and not cracked
    11) name plate is identical to what was required
c. Conducting five (5) non-destructive welding tests based on colour penetrating tests based on ISO-3452. The location of the tests to be conducted shall be determined by the client representative. If one out of the tests fails, the entire grit classifiers shall not pass.
d. Dry operation of the grit classifier for a period of 30 minutes without mechanical failures. The operation shall be smooth, and the following measurements shall be monitored and checked to be identical or better than what was offered:
    1) Number of rotations and their frequency

2) Voltage
3) Amperage
4) Test duration
5) Vibration measurements that the equipment does not vibrate more than 4.5 mm/sec

e. Show that all the protective switches are operational.

After completion of the factory acceptance test, a test report shall be completed by a certified engineer and signed by the grit classifier manufacturer. This report shall record all the necessary information on the procedure and the results of the tests. It shall specify the following:

1. Full documentation of the visual inspection as required above.

2. A summary of the non-destructive welding tests including location of welds tested and the test results.

3. Documentation of the dry run tests including the test data, the place of the test and the names of the supervisor and other participants and the following technical data:
   a. for the grit classifier:
      i. the owner, site and purpose of installation, manufacturer,
      ii. the type and serial number,
      iii. the year of manufacture, and
      iv. a short technical description giving operational data, auxiliaries and their drive and any other specific features;
   b. for the driving unit, generally the same items specified for the grit classifier, but in particular those which are essential for establishing the specified performance;

   In addition, the documentation shall include:

   a. The program of the procedure and diagram of the test arrangement indicating location of measuring points, instruments used and their calibration records;

   b. a record of the test run together with a table of the average values of the important readings and the time they were taken. If possible, a record of the maximum and minimum readings. Copies of the log sheets and of any readouts from an automatic recorder etc;

   c. An indication of any unscheduled occurrence which was noted during the test;

   d. A comparison of the actual performance with the guaranteed values or data and a statement of whether the contract values have been met or not.

**Positive acceptance** – All the grit classifiers must pass the above-mentioned tests

**Negative acceptance** - if after a second set of tests show non-compliance, the entire scope of supply shall be annulled.

# 13. Site Acceptance Test (SAT)

## *13.1 General*

The site acceptance tests shall include:

a. Conducting and approved completion of the dry-running tests
b. Conducting and approved completion of specific equipment performance tests
c. Conducting and approved completion of clean water tests
d. Conducting and approved completion of wastewater tests

## *13.2 Dry-running tests*

Dry-running tests shall only be performed on equipment that allows dry-running, such as electric boards, blowers, some instruments, etc.

Complete I/O tests shall be conducted and simulation of the process will be accomplished.

No dry-running tests may be performed on equipment that must be operated with water, such as pumps, etc.

The supplier shall provide the client, manufacturers written approval that supplied equipment is in accordance with the manufacturer's instructions.

## *13.3 Specific Equipment Performance Tests*

The specific performance tests shall be carried out along the complete designed operating range of each specific piece of equipment.

The performance tests shall be carried out in the presence of both the client's representative and the supplier's authorized representative.

The duration of the performance tests shall be in accordance with the manufacturer's specific instructions. At the end of each performance test the manufacturer's representative shall sign a document stating the equipment have been installed in according to the manufacturer's recommendations, the equipment has passed all performance tests for the specific equipment and that the equipment is entitled to have the extended warranty as required by the tender.

## *13.4 Clean Water Tests*

Prior to operating the entire wastewater treatment with clean water for a 30-day period, the following documentation from the manufacturer shall be provided:

- Complete equipment submittals – Documents 1 through 12 – in 5 copies in colour prints and in electronic file – PDF, DWG and WORD files
- Written approval from the manufacturer that the equipment is ready for operation

After successfully commissioning with clean water, the supplier will notify the client that the plant is ready for the clean water site acceptance test.

During the clean water site acceptance test period, equipment shall be operated by recycling clean water (defined as either tap water or reclaimed effluent with a TSS concentration of no more than 10 mg/l)

The equipment under this specification shall participate in the clean water tests.

The manufacturer's technician or an authorised local technical representative must be present at the initial clean water commissioning at the Ashdod WWTP during testing, and shall provide written certification confirming that the equipment is functioning in full compliance with the manufacturer's instructions.

The equipment shall operate during the 30-day "Clean Water Tests" test with no substantial equipment malfunctions due to defects in design, workmanship, material of the equipment and installation. A substantial equipment malfunction is defined as:

- The equipment has been inoperable for a period of more than 24 hours and requires a qualified technician from the manufacturer/supplier to mitigate the problem.

- The equipment has been inoperable for more than 3 times and required a qualified technician from the manufacturer/supplier to mitigate the problem regardless of the down-time period.

- The accumulative down-time for all types of malfunctions (with or without the assistance of a qualified technician of the manufacturer or supplier) shall be no more than 36 hours.

In the event of a significant malfunction, the clean test period will be restarted.

A senior manufacturers engineer (together with the local supplier's technician) shall be present at the Ashdod WWTP site in the following circumstances:

a. **Scenario A** - The contractor has not been capable of passing the 30 day wastewater test within 80 days.
b. **Scenario B** -A serious event has occurred where the new screen causes an issue that leads to a cascade of malfunctions, resulting in the existing screens also failing. In such circumstances, the entire wastewater treatment plant would be affected.

In Scenario A, a senior manufacturer's engineer will arrive on site within one month.

In Scenario B, a local technician will arrive within 4 hours, while the manufacturer's senior engineer is expected on-site within one week of the incident.

The cost for the manufacturer's senior, all local technical representatives and all related tests and works done shall be solely borne by the contractor.

**Positive acceptance** – pass the 30-day test with no substantial equipment malfunction.

**Negative acceptance** - if after 120 days the equipment does not pass the Clean Water Tests the entire equipment

package shall be considered non-compliant as defined in the contract.

## *13.5 Wastewater Tests*

Operating the plant with wastewater shall not commence until the clean water tests have been completed and approved.

After successfully commissioning with wastewater, the supplier will notify the client that the plant is ready for the wastewater site acceptance test.

A manufacturer's technician or authorised local representative must be present within three days of starting the "Wastewater Tests." If they arrive later, the test period will begin only upon their arrival.

The equipment shall operate during the 30-day “Wastewater Test” with no substantial equipment malfunctions due to defects in design, workmanship, material of the equipment and installation. A substantial equipment malfunction is defined as:

- The equipment has been inoperable for a period of more than 24 hours and requires a qualified technician from the manufacturer/supplier to mitigate the problem.

- The equipment has been inoperable for more than 3 times and required a qualified technician from the manufacturer/supplier to mitigate the problem regardless of the down-time period.

- The accumulative down-time for all types of malfunctions (with or without the assistance of a qualified technician of the manufacturer or supplier) shall be no more than 36 hours.

Should a substantial malfunction occur, the clean test period will be reset. In all cases, the manufacturer's local representative is required to arrive on site within 6 hours of the incident during standard weekday working hours, and within 24 hours during weekends or outside of regular work hours.

A senior manufacturers engineer (together with the local supplier’s technician) shall be present at the Ashdod WWTP site in the following circumstances:

a. **Scenario A** - The contractor has not been capable of passing the 30 day wastewater test within 80 days.
b. **Scenario B** – A serious event has occurred where the new screen causes an issue that leads to a cascade of malfunctions, resulting in the existing screens also failing. In such circumstances, the entire plant would be affected.

In Scenario A, a senior manufacturer's engineer will arrive on site within one month.

In Scenario B, a local technician will arrive within 4 hours, while the manufacturer’s senior engineer is expected on-site within one week of the incident.

The contractor shall be fully responsible for all expenses associated with the manufacturer’s senior personnel (including work, travel, accommodations, etc.), as well as costs related to local technical representatives, testing, tasks, and any other necessary expenditures required to address malfunctions and equipment non-compliance

issues.

**Positive acceptance** – pass the 30-day test with no substantial equipment malfunction.

**Negative acceptance** - if after 120 days the equipment does not pass the Wastewater Tests the entire equipment package shall be considered non-compliant as defined in the contract.

# 14. Warranty

The grit classifiers system package provided under this Specification will carry a warranty for **one (1) year, starting from the date the equipment passes the wastewater acceptance test**.

The manufacturer shall provide the client the manufacturer's warranty made in favor of the client, that the equipment supplied shall be warranted by the manufacturer to be free from defects in design, workmanship, and material for the duration of the Manufacturers warrantee period.

The manufacturer shall provide specific instructions on how to store the equipment until installation and from installation until continuous operation. The manufacturer's representative shall from time to time visit the storage facilities and update project management on the storage conditions. If the manufacturer's representative sees that the storage conditions are not satisfactory, due notice must be given promptly.

Equipment shall be tested in accordance with the manufacturer's instructions. The manufacturer shall provide documentation approving the installation and operation of the equipment.

If any part of the equipment supplied under this Specification should fail during the warranty period, the defective part shall be replaced immediately at the manufacturers' expense. All work associated with fixing the equipment will also be borne by the manufacturer. If for any reason the same equipment breaks down consecutively with the same malfunction, the manufacturer's technician shall provide a site visit for evaluation on the manufacturers' expense. If the equipment continues to malfunction (over a period of 5 months) the manufacturer shall replace the entire package at the manufacturers expense. If the malfunction continues to other units as well, the manufacturer shall replace all the packages in their entirety on the manufacturers expense. If despite all the replacements, the system continues to malfunction, the manufacturer shall rebate the client the complete cost of the system and pay all damages as a result of the equipment failure.

In addition, the manufacturer shall guarantee the following:

1. The equipment that is offered is represented in Israel and technical assistance shall be given locally for a period of at least 7 years.
2. The equipment manufacturer shall guarantee the availability of spare parts for 7 years from the day of commissioning.