# 1.0 IRRIGATION SYSTEM INSTALLATION

This contract is a build-only contract with the major components to achieve the design being Rain Bird as requested by Wellington City Council (WCC).

The quantities required to achieve the design are shown in the Schedule and a component declaration is also to be completed (Section 1.18).

## 1.1 GENERAL DESCRIPTION AND REQUIREMENTS

### 1.1.1 *Background*

This part of the Specification is for the supply and installation of a new irrigation system for the Prince of Wales Park as part of the Omāroro Reservoir development. As part of this irrigation system a new water connection (supplied by others), 80mm backflow preventer, booster pump will be installed. The specification includes all fittings, pipelines, isolating valves, valve boxes and sprinkler heads.

The Contractor is required to deliver a completed, commissioned, fully functional system which conforms to the design and performance criteria in all respects. Warranty support, as specified, is designed to be provided as part of the contract price.

Irrigation design plans form part of these documents and are the basis for the tender.

- Omāroro Reservoir V2
- Omāroro Reservoir V2 – Upper field
- Omāroro Reservoir V2 – Lower field
- Omāroro Reservoir V2 – Pump BF Layout

The design incorporates a block design sprinkler system, with zone layout as shown on the plans for the sports fields. Any tenderers wishing to offer alternative systems must first submit a conforming tender.

### 1.1.2 *Performance requirements*

Based on a square pattern sprinkler layout with sprinkler spacing of approx. 14.2 x 15.4m for the lower field and 14 x 15.4m for the upper field as per the design plan for the sports field areas, the installed system shall meet or exceed the following requirements:

□ Distribution Uniformity (DU) 85%
□ Scheduling Coefficient (SC) 1.3
□ Mean Precipitation Rate 11mm to 15mm per hour

All performance figures shall be achieved while operating the sprinklers within the manufacturers' recommended pressure range.

### 1.1.3 *Approved contractor*

The irrigation system shall be installed by a professional irrigation contractor with a proven track record. A list of successfully completed projects shall be supplied as an attachment to the tender documents.

### 1.1.4 *Approved brands*

All sprinklers, solenoid valves, actuators and controllers shall be manufactured by **Rain Bird** only unless otherwise agreed by the Engineers Representative.

### 1.1.5 *Warranty period*

Irrigation equipment shall have a non-pro-rated full replacement warranty for five years. All pipework and fittings shall have a ten year warranty. These warranties shall start after Practical Completion.

A 12 month installation warranty period shall commence from the final pressure test at Practical Completion. During the 12 month warranty period, the contractor shall provide on-site service at no charge to the Council for all warranty faults.

The 12 month installation warranty period shall cease one year after Practical Completion was issued.

Acts of vandalism are excluded.

### 1.1.6 *Timing of works*

Irrigation system installation shall occur subsequent to the field drainage lateral drains. The Council will not be held responsible for any delays or consequential losses due to failure of any contractor to coordinate their works.

### 1.1.7 *Suitability for direct burial*

All components used by the Contractor should be suitable for direct burial. As such all nuts, bolts, washers and threads are to be corrosion protected. However, there are a wide range of corrosion resistance options available and not all have proven to be suited to long-term exposure to Wellington's soil conditions. As such, the preference shall be for Teflon-coated stainless steel nuts, bolts, washers and threads or galvanised (not electro-plated) nuts, bolts, washers and threads on all fittings.

## 1.2 **SETTING OUT**

The entire irrigation system shall be marked out accurately as per the approved irrigation design plan prior to trenching. Marking out shall include the position of all sprinklers, pipelines and in-ground controls. Setting out accuracy shall be within 1% of plan positions as follows:

- A sprinkler spacing of approx. 14.2 x 15.4m for the lower field and 14 x 15.4m for the upper field Drawing.
- All submain irrigation pipes to be parallel to lateral drain pipes except for the part circle zones running along the field sidelines.
- No submain irrigation pipe to be located within 400mm of the lateral drain pipes without the approval of the Engineer.
- Solenoid valves to be located within 500mm of irrigation main.
- All solenoid valves to be located outside field perimeter where practical.

Any variations between the constructed field layout and the design plan, which may affect the setting out of the irrigation system, shall be brought to the attention of the Engineer and/or its representative.

Underground services shall be marked out also at this time in any positions where conflict and/or damage may occur during installation. No existing services are to be disturbed or damaged by the irrigation installation.

The Contractor shall take all reasonable steps to determine the location of underground services so as to be able to avoid them. This shall include, where applicable, contacting the appropriate utility owner or operator. It shall be the Contractor's responsibility to obtain all such information.

**HOLD POINT I1 – SETTING OUT IRRIGATION**

## 1.3 CONNECTION TO WATER SUPPLY, INSTALL OF NEW BACKFLOW PREVENTER, WATER METER, BOOSTER PUMP AND POWER SUPPLY.

### 1.3.1 Water Connection

Connection for the irrigation system shall be made to a new 80mm flanged water supply (supplied by others) as per Drawing *Omāroro Reservoir V2*

### 1.3.2 *Water Meter*

The contractor shall need to liaise with Wellington Water to ensure the correct type of water meter is supplied and installed for this installation. Further details can be found within the *Wellington Regional Specification for Water Services section 6.2.16 Water Meters*. The location shown on the drawings is indicative only and will need to be confirmed by Wellington Water. A council / parks account will need to be set up for on-going water use charges.

### 1.3.3 *Backflow prevention*

A new 80mm RPZ Backflow Preventer with associated Wye Strainer and two 80mm Isolation Valves are to be installed inside the pavilion building garage as per Drawing *Omāroro Reservoir V2*. This will need to be installed with the inlet pipe feeding through the concrete floor of the building and the outlet joining into the booster pump inlet also enclosed in the building. It is the contractor's responsibility to ensure this is supplied and installed to WCC specifications and have it tested and certified by a registered IQP. A list of approved products can be found here https://www.wellingtonwater.co.nz/contractors/technical-information/approved-products-register/

**Note: Concrete cutting and reinstatement will be required.**

### 1.3.4 *Booster Pump*

A New Booster Pump capable of boosting the system by 5l/s @ 500kpa (lower field) and 650kpa (upper field) will be required to be installed as per Drawing *Omāroro Reservoir V2*.

The specified pump for this project is to be 1 x Lowara 15SV06 HPS - Single Hydropac Booster Set.

The Set includes the following:

- 1 x Lowara 15SV06F550T vertical multistage pump, complete with 5.5 kW, 2900 rpm, 3 phase, 50 Hz WEG W21 IP55 motor.
- 1 x 5.5 KW Hydrovar variable speed drive pump controller mounted directly on the pump motor.
- 1 x pressure transducer connected to the Hydrovar to ensure a constant pump discharge pressure.
- 1 x PDL 56 series 3-phase plug and 3 or 5 metre cable.
- 1 x 35 litre pressure tank.
- 1 x Aquastat thermal cut out, mounted on the pump to prevent pump overheating.
- 50 mm Dia. inlet/outlet stainless steel pump manifold
- Pressure gauge, isolating & check valve.

- All mounted on a stainless steel base.

Please contact Brown Brothers Engineers (03 364 6655 niall.fitzsimons@brownbros.co.nz) and reference NG907121311 to ensure the correct pump set is supplied.

This pump will swap between two different duty points depending on which field is being irrigated at that time. Therefore two Rain Bird FD-102 decoders will need to be wired into the pump via two relays and the irrigation control cable.

This pump will need to be installed on the concrete floor inside the building as per Drawing *Omāroro Reservoir V2.*The inlet pipe will need to connect to the new backflow also enclosed in the building and the outlet will need to exit through the concrete floor via the 90mm MD mainline pipe.

Three phase, 400 V power is to be supplied for pump operation as part of this contract to the location on the drawings. It is the contractor's responsibility to liaise with Wellington Electricity to ensure the necessary supply to site and pump shed location in order to meet the power supply requirements of the booster pump detailed in 1.3.3 and associated drawings.
It is the contractor's responsibility to connect into this supply for the pump and provide all electrical panels inside the shed.

**Note: Concrete cutting and reinstatement will be required.**

### 1.3.5 Backflow Preventer and Pump Shed.

The pump and backflow preventer are to be installed in the garage of the existing pavilion building as per Drawing *Omāroro Reservoir V2- Pump BF Layout*. This install shall meet or exceed the following:

- Concrete cutting and reinstatement (to the WCC building code) with allowance for the 90mm MD pipe to enter up stream of the back flow and exit downstream of the pump along with the 3 phase power supply and 2 x 25mm conduits for the irrigation control cable. Please advise the thickness of the existing concrete floor when installation is carried out
- The installation shall be checked to ensure that noise level at any location beyond the boundary of the park generated by the operating pumps shall not exceed the allowable limits for the residential zone in the District Plan." Consideration should also be given to installing rubber matting under the pump to reduce noise further. Contact Brown Brothers (pump supplier) for the correct material.
- A PDL 56 series 16 amp socket will need to be installed inside the building for the pump plug.

## 1.4 SUPPLY AND LAYING OF PIPES AND FITTINGS

| Item | Detail |
|---|---|
| Pipe grade | All mainline pipe to be PN12 rated and sub-main pipe to be minimum PN9, conforming AS/NZS 4130 for MDPE |

| | |
|---|---|
| Pipe depth | Pipe depth shall be sufficient to ensure 400mm cover at all times |
| Mainline criteria | Maximum water velocity: 1.5 $ms^{-1}$<br>Maximum pressure loss: 100 kpa |
| Sub-main criteria | Maximum water velocity: 2.0 $ms^{-1}$<br>Maximum pressure variation: 10% along its length |
| Pipe fittings | All Pipe fittings **75mm** and above must be **electrofusion** and all fittings **63mm** and below can be **compression** type fittings. Refer to https://www.wellingtonwater.co.nz/contractors/technical-information/approved-products-register/ for approved brands.<br>All pipe fittings to be minimum PN15 (1500 kpa) rated. |
| Thrust blocks | On pipeline sections with rubber ring joints, thrust blocks must be installed at all places where there is a change in pipe direction. Thrust blocks must be installed in accordance with NZS 7643:1979. |

- Total length of mainline pipe: 980m
- Total length of sub-main pipe: 1410m

Laying of pipelines and connection of fittings shall be in accordance with best trade practice and the recommendations of the pipe manufacturer. Pipes shall be laid with the markings facing upward, to enable their identification.

Pipes shall not be laid into any trenches that have an uneven surface or any rocks protruding. Any loose soil, rock, stones or other subsidence must be removed before pipe laying. All pipes shall be thoroughly flushed before any sprinklers or valves are fitted.

The schedule allows the Contractor to include a lump sum for all fittings, junctions, tapping bands, reducers etc.

### 1.4.1 *Trenching*

Trenching depth shall be such that there shall be a minimum of 400mm cover over all installed pipelines.

A redundant water pipe running between the upper and lower fields is to be used as a conduit for the mainline pipe and cable. If this is found to not be suitable trenching and backfilling of this section has been included as a provisional item.

Purpose-built continuous chain or rotating ‘wizzwheel-type’ trenchers with the capacity to elevate spoil via a conveyor belt system onto an adjacent vehicle shall be the preferred machines for trenching. Spoil shall not be allowed to fall adjacent to the trench or be deliberately placed on the surface prior to removal.

Trenching near trees and crossing of pathways may be required to connection to the exiting water supply. As such, the Contractor is to visit the site to familiarise themselves with the requirements.

### 1.4.2 *Backfilling*

Backfill shall be carefully placed over the pipe initially as a 200 mm depth layer. The soil shall be consolidated by foot tamping over the pipe. The balance of the trench shall then be backfilled. The trench shall be finished flush with the surrounding ground level and consolidated so that no subsequent settling occurs.

The final 150 mm of backfill shall be of approved topsoil quality. If it has not been possible to separate excavated topsoil for this purpose, imported and approved topsoil shall be used.

Backfilling around the pipe shall not cause displacement, deformation or excessive stress to the buried pipe or fittings.

All excavated spoil surplus to backfill requirements shall be disposed of at the Contractor's expense.

### 1.4.3 *Drainage system repairs*

Any drainage laterals or other underground services damaged by trenching for the irrigation system shall be repaired before backfilling occurs. Repair of drainage lateral pipes shall be made by way of a suitable repair coupling or other method approved by the field drainage contractor.

**HOLD POINT I2 – IRRIGATION PIPE TRENCHING, PIPE LAYING AND TRENCH BACKFILLING**

## 1.5 VALVES

### 1.5.1 *Ball valves*

A 25mm ball valve (pressure test point) is to be installed as indicated on Drawing *Omaroro Reservoir V2*. This is to be installed inside a 250mm round valve box.

### 1.5.2 *Solenoid control valves*

| Item | Detail |
|---|---|
| Minimum operating pressure | 1400 kPa |
| Max. pressure loss | 25 kPa |
| Physical requirements | Flow control.<br>Internal bleed manual control.<br>Valve bonnet to be secured with stainless steel nuts.<br>Industry standard 24VAC 2-watt solenoid. |

Approved solenoid valves include:

- Rainbird PEB

- Total number of solenoid valves required: 25
    - 25 x 40mm Rain Bird PEB

### 1.5.3 *Isolating valves*

Mainline valves are to resilient wedge gate valves. All mainline valves must incorporate a handle to allow valve operation without specialist tools.

Submain isolation valves shall be installed before each solenoid valve and shall correspond to the solenoid valve being used. These shall be either plastic ball valves or brass gate valves suitable for in ground service.

All isolating valves must have a minimum PN16 rating.

- Total number of 80mm mainline isolating valves required: 3
- Total number of 40mm submain isolating valves required: 25

### 1.5.4 *Installation*

- All valves shall be installed at the same level as the pipe work.
- No elbow arrangements at valve locations will be permitted.
- All valves to be installed in a way that simplifies future removal for replacement.

## 1.6 VALVE BOXES

All valve boxes shall be constructed from high impact plastic or galvanised steel. They must be able to support the weight of a vehicle without damage. Valve box lids shall be of the bolt-down type and be supplied with bolts fitted.

- All valve boxes to be installed either 50mm below finalised topsoil grade or at the surface pending the clients requirement.
- Thorough compacting of the soil around both the valve box and extension are required using a hand compacting tool.
- All installed valve boxes are to be marked by a flag or peg.

The base of each valve box shall be supported around the perimeter by bricks, pavers, H4 treated timber or other load bearing material. No part of the valve box or any of these materials shall rest on any pipes.

The bottom of the valve box shall contain a piece of geotextile fabric covering the full width of the box and then 100mm of drainage aggregate material placed on top. There shall be a minimum of 50mm clearance between the underside of any pipe or valve and the top of the aggregate level.

- Total number of valve boxes to be supplied: 30
    - 29 x Rectangular 430 x 300mm for mainline isolation valves, controller surge protection, sub-main isolation and solenoid valves.
    - 1 x 250mm Round for pressure test point.

## 1.7 SPRINKLERS

All sprinklers shall meet the following hydraulic performance criteria:

| Item | Detail |
|---|---|
| Design operating pressure | Ideal operating pressure: 482 kpa (70psi)<br>Minimum operating pressure: 450 kpa |
| Design radius of throw | Shall be 0.5m greater than sprinkler spacing |

| | |
|---|---|
| Coefficient of Uniformity | Minimum Coefficient of Uniformity: 85%<br>Scheduling Coefficient: 1.3 |
| Physical requirements | 25mm BSP sprinkler inlet<br>Minimum of 100mm pop-up height<br>Exposed diameter less than 75mm with a rubber cover<br>Stainless steel sheathed riser stem<br>Low head drainage valve<br>Full range of interchangeable nozzles<br>Part circle versions, if applicable, to have adjustable arc settings<br>Minimum five-year warranty |

Pre-approved sprinklers include:

- Rain Bird 8005

### 1.7.1 *Installation*

- All sprinklers are to be installed in straight lines at the spacing specified, unless express permission is obtained from the Client's representative.
- Sprinklers are to be installed upright, with the top of the sprinklers 10mm below the finished grade of the field.
- Thorough compaction of soil around, and at the base, of the sprinkler is required using a hand compacting tool.
- All installed sprinklers are to be indicated by a marking flag or peg.

- Total number of sprinklers required: 100.
    - 100 x Rain Bird 8005 Stainless Steel adjustable part/full circle sports field sprinklers

## 1.8 SWING JOINTS

### 1.8.1 *Swing joint specifications*

All swing joints shall be:

- High pressure with double O-ring.
- 25 mm diameter with BSP thread.
- Minimum riser length of 300 mm.

### 1.8.2 *Installation*

- All swing joints shall come off the same side of the submain pipe.
- All swing joints shall be installed at no more than 45 degrees to the submain pipe.

- Total number of swing joints required: 100

## 1.9 CONTROL CABLING

At this site the system will be controlled by a Rain Bird ESP-LXD decoder controller.

The decoder cabling is to be 2-core 2.5mm **Maxi** cable.

All new control cabling shall be polyethylene sheathed and suitable for direct burial (

- A minimum decoder cable conductor size of 2.5 $mm^2$ shall be utilised.
- No cable joints are acceptable between control valve and the controller.
- All cable connections shall be made with wire-nut style waterproof connectors suitable for direct burial and conforming to the controller's specifications.
- All cable under sealed paths or roadways shall be housed in conduit.
- Sufficient cable shall be provided at each valve and cable joint location to allow cable connections to be elevated at least 300 mm above finished ground level.
- Cable shall be bundled and secured every 5m and laid underneath the pipework. If no pipework is present, then cables shall be buried to 450 mm depth, 100 mm below electrical warning tape.
- 2 -core 2.5mm **Maxi** cable required: 1040m

## 1.10 CONTROLLER

| Item | Detail |
|---|---|
| Controller | • The controller is to be a Rain Bird ESP-LXD with an IQ cartridge for remote access.<br>• This is to be installed inside the existing building on site as per *Drawing Omaroro Reservoir V1.* All cable inside the building is to be run inside conduit.<br>• A Rain Bird WR-2 rain sensor is to be installed on the existing building |
| Decoders | • Rain Bird FD-101 decoders are to be used for each solenoid valve.<br>• Rain Bird FD-102 decoders are to be used for the pump to switch between duty points.<br><br><u>Decoders required:</u><br>• FD-101 x 25<br>• FD-102 x 2 |
| Surge Protection and Earthing | • A surge pipe and plate is to be installed directly outside the building on the cable path. This is to be installed inside a rectangular valve box.<br>• 2 x Rain Bird LSP-1 surge protection devices are to be installed inside a solenoid valve box at each end of each field.<br><br><u>Surge Devices required</u>:<br>• Rain Bird Surge pipe and plate x 1<br>• Rain Bird LSP-1 x 4<br>• (5 earth rods and clamps will also be required) |

**HOLD POINT I3 – VALVE AND SPRINKLER INSTALLATION**

## 1.11 SYSTEM PRESSURE TEST

It shall be Contractor's responsibility to demonstrate two successful pressure tests: The first at sign-off immediately following installation completion and the second following grow-in completion, prior to project handover.

This will involve first isolating all points of connection to previously existing pipe where they are present.

Pressure testing shall be done in conjunction with the Engineer. The line will be retested until satisfactory. It shall be the Contractor's responsibility to provide all equipment required for the pressure test and provide suitable connection ports. At the point where the system can be pressurised, a 25mm ball valve shall be installed to enable the connection to be made without depressurising the system.

### 1.11.1 *MDPE Pressure Test Procedure*

a) Ensure pipe is adequately anchored
b) Remove all air from the pipeline
c) Pressurise the pipe at 1200 kPa, and maintain the pressure at that level for 30 minutes by additional pumping as required. Inspect for leaks.
d) Rapidly reduce the pressure by bleeding water from the system down to nominal 200 kPa at the test gauge.
e) Isolate the installation again.
f) Record the pressure reading over the following intervals:

- Between 0 & 10 minutes, record pressure every two minutes
- Between 10 & 30 minutes, record pressure every five minutes
- Between 30 & 90 minutes, record pressure every ten minutes

The pressure reading will rise due to the contraction of the pipe once the pressure is reduced to 200 kpa. It will then level off. If it falls after levelling off there is a leak within the system and the pressure test fails.

Where the initial pressure test fails, the cost to the Council of supervising subsequent tests shall be deducted from the payments.

Where an irrigation system fails the pressure test and yet the leak is unable to be detected by the Contractor, the Contractor shall be required to pay for a professional leak detection service.

**Note:** Weld testing of the MDPE joins may be required for WCC sign-off on the system. As such, MPDE weld testing certification is included as a provisional item.

**HOLD POINT I4 – PRESSURE TESTING**

## 1.12 AS-BUILT PLANS

The Contractor is to liaise with the Engineer and nominated surveyors, to ensure the location of all system components are captured accurately. The following information shall be required:

- The location and depths of all pipe, sprinklers, valves (solenoid and isolation) valve boxes, cabling, cable joints, controller, and rain switch (if applicable).
- The make and model information of all products, including those in the headworks which may already be present (e.g. backflow preventer and water meter).
- Any cable/tubing joint not within a solenoid valve box.
- The size, type and pressure rating of all pipe work.

- Any areas where the drainage system is damaged and repairs made to enable location of the repaired drain to within 0.5 m at a future date.
- Any service locations found outside of the originally documented locations.
- Changes in mainline pipe direction and dimensions and offset measurements for all pipes and pipe junctions.
- Co-ordinates of all structures in terms of New Zealand Transverse Mercator

The as-built plan shall clearly illustrate with respect to permanent landmarks, based on dimensioned triangulation from at least two fixed above ground permanent points.

The as-built plan shall be made available in a PDF format optimised for A3 printing and also supplied in .DWG for uploading to the WCC GIS viewer.

## 1.13 COMMISSIONING AND HANDOVER

The system shall be test-run and the correct operation of all components checked. Sprinkler zones should be verified to conform to the approved plan. Once commissioning is complete, arrangement shall be made to demonstrate the system to representatives of the Council and/or the Engineer.

Two operations manuals for the sprinklers, valves and fittings shall be provided to the Engineer and a laminated copy of the irrigation as-built plans is to be placed inside the control box. The plans should identify each station for ease of operation.

The operations manual shall include:

- Details of the process to follow in the event of a warranty claim.
- The expiration date of the warranty for every item.
- Make, model, size, specification, and date codes of all products.
- Operation manuals or brochures on the valves and sprinklers.
- Spare parts data.
- Trouble shooting information.
- Testing information.
- Successful pressure test certification.
- IQP certification of backflow preventer (if applicable).

All of the above information is to be provided in a PVC 3-ring or 4-ring binder. All loose sheets are to be laminated. The name and address of the installing Contractor and that of the company supplying the product (if different) is to be included on the front page of the binder.

The 'as-built' plan, operations manual and commissioning are required for practical completion.

The Contractor is to complete and submit to the Engineer the Council's 'asset data information sheet'.

**HOLD POINT I5 – SYSTEM SIGN-OFF AND HANDOVER**

## 1.14 SYSTEM ADJUSTMENT

During the 12 month installation warranty period, the contractor shall return and adjust all sprinklers to the correct height to grade after sand carpet and turf establishment. Pricing shall allow for one adjustment.

This item includes the Contractor returning to the site as often as required (likely to be at least twice assuming they are at the correct level at commissioning) during the defects liability period to inspect and carry out the following:

- Keep the sprinklers at their optimum level, orientation and arc adjustment.
- Return valve boxes to their optimum level.
- Raise the levels of any areas of subsidence in trenches, around valves, or sprinklers.
- Ensure the correct operation of all valves and sprinklers.
- Ensure the correct operation of the rain switch and flow switch (if applicable).

When correcting subsidence greater than 200 mm on turfed areas, the turf must be lifted prior to adjustment. The type of material used to correct the subsidence shall be the same as the material surrounding it at that particular depth.

Where defects with the above items are brought to the attention of the Contractor, during the defects liability period, they shall be attended to within 10 working days.

These items must all be properly adjusted and checked prior to the final release of retentions. Each check must be documented and a copy forwarded to the Engineer describing the date of the visit, who made it and what work was carried out.

## 1.15 INSTALLATION WARRANTY

The installation contractor shall provide a full 12-month warranty from the date of practical completion, where all defects (excluding vandalism or damage by a third party) will be repaired at no charge to the Council.

The Contractor shall carry out repairs or warranty call outs within 24 hours at no charge to the client.

## 1.16 KEY INSPECTION RECORD- IRRIGATION

To be signed off by the Contractor, Engineer and Engineer's Representative.

Contract Name:

Engineer: TBA

Project Manager: TBA

Engineers Representative: TBA

Construction Monitoring: TBA

The following are the stages of this contract where inspection is to be undertaken and this form signed off and dated:

| Key Inspection/Hold Points | Signed and dated by:<br><br>(Contractor) | Signed and dated by:<br><br>(Construction monitor) | Signed and dated by:<br><br>(Engineer) |
|---|---|---|---|
| **I1. Setting out-irrigation** | | | |
| **I2. Irrigation pipe trenching, pipe laying and trench backfilling** | | | |
| **I3. Valve and sprinkler installation** | | | |
| **I4. Pressure testing** | | | |
| **I5. System sign-off and handover** | | | |

## 1.17 HOLD POINT DETAILS

☑ When Completed

**I1. Setting out irrigation**

- □ Setting out of mains, laterals, and the positions of valves and sprinklers.
- □ Agreement on trenching machinery and methodology.
- □ Identification of existing services and pipe work.
- □ Agreement on stockpile locations and traffic management.
- □ Approval of construction materials.
- □ Identification and agreement on connection points to headworks.
- □ Identification and agreement on connection point to controller
- □ Approval of 3 phase power supply installation and connection.

**I2. Irrigation pipe trenching and laying**

- □ Approval of depth of trenching.
- □ Approval of backfilling.
- □ Approval of backfill consolidation.

**I3. Valve and sprinkler installation**

- □ Approval of valve and sprinkler types.
- □ Approval of installation methodology.

**I4. Pressure testing**

- □ Confirmation that at least 90% of starting system pressure remains after a 24 hour test period.

**I5. System sign-off and handover**

- □ Approval of as-built plan information.
- □ Approval of operations manual and its contents.
- □ Approval of irrigation system performance via demonstration to Engineer.

## 1.18 APPENDIX 2 –IRRIGATION SYSTEM COMPONENT DECLARATION

| | |
|---|---|
| Sprinkler<br>Manufacturer<br>Model<br>Nozzle<br>Spacing | |
| Radius (m) | |
| Minimum DU at above conditions: | |
| SC at above conditions: | |
| Swing Joints<br>Manufacturer<br>Pressure rating | |
| MDPE PE80 or PE100 Pipe<br>Manufacturer<br>Pressure rating | <br><br>12.5 bar (main)<br>9 bar (submain PE80 only) |
| MDPE Fittings<br>Manufacturer<br>Pressure rating | |
| Isolating Valves<br>Manufacturer | |
| Control Valves<br>Manufacturer<br>Model | |
| Low Voltage Cabling - Manufacturer | |
| Pipe Manufacturer's Warranty (years) | |
| Fittings Manufacturer's Warranty (years) | |
| Installation Warranty Period | |
| | |
| | |