

Section A - SPECIAL IRRIGATION SPECIFICATIONS

SPECIAL IRRIGATION SPECIFICATIONS - CONTENTS

1	ABOUT THESE SPECIFICATIONS	1
2	DESIGN INTENT.....	1
3	SCOPE OF WORKS	1
4	IRRIGATION PUMP STATIONS.....	3
5	TRANSFER PUMP STATIONS	4
6	MAINLINE - SPECIAL NOTES	5
7	IRRIGATION CONTROL SYSTEM - DECODER SATELLITE SYSTEM.....	5
8	IRRIGATION DRAWINGS.....	6
9	SPECIAL SKETCHES.....	6
10	ADDENDUM NO 1 DATED 13 AUGUST 2007	9

Copyright ©2007:

Reproduction and or transfer of this information to parties other than those to which the document is addressed is not permitted without written approval of Hydrogold Pty Ltd. Sighting of this document is evidence of acceptance of these conditions.

1 ABOUT THESE SPECIFICATIONS

These are the Special Irrigation Specifications that apply to this particular project.

Items in this Special Irrigation Specifications override the General Irrigation Specifications if there is a conflict. Refer to the section "Document Hierarchy" in the General Irrigation Specifications.

2 DESIGN INTENT

- 2.1 The design intent of this irrigation system is to water 27 golf-course holes and practice facilities from one Irrigation Pump Station drawing water from one irrigation lake. There will be two Booster Pump Stations for the higher elevations.
- 2.2 The system will be automatically controlled by an Irrigation Control System with a Computerised Central Controller.
- 2.3 The watering window is 8 hours.
- 2.4 A nominal 6.0 mm per day (1.65 inches per week) is applied over the watered area during the watering window.
- 2.5 Quick Coupling Valves (as shown on the drawings) will be used for supplemental hand watering including the rough and landscaped areas.

3 SCOPE OF WORKS

- 3.1 The works include, but are not necessarily limited to:
 - 3.1.1 The engineering design, supply and installation of the wet well structure and intake line to suit the pump station(s) selected.
 - 3.1.2 Supply, installation and commissioning of all items included in the scope of works as described in these specifications and associated drawings including (but not limited to):
 - a) Intake line, wet well and pump station pad as required for Pump Station(s)
 - b) Irrigation Pump Station
 - c) Booster Pump Stations
 - d) Transfer Pump Stations
 - e) All sprinklers, piping, valves and associated fittings
 - f) Irrigation control system
 - g) All wiring and associated fittings

- 3.1.3 The Contractor is to note that other contracts will be proceeding concurrently and the Contractor will allow in his tender the full cost for the liaison and coordination of his work with all other Contractors on the site.
- 3.1.4 The work will be done in accordance with the supplied plans and specifications.
- 3.1.5 Regardless of the items, quantities or descriptions contained in the Drawings, Bill of Quantities or Specifications, it is the Contractor's responsibility to ensure that they allow sufficient material and resources to successfully complete and commission the entire scope of works.
- 3.2 The following items mentioned in the General Irrigation Specifications are not to be installed on this project:
 - 3.2.1 Pressure-Reducing Valves
 - 3.2.2 Remote Control Valves
 - 3.2.3 Drainage (Scour) Valves
- 3.3 At the Employer's discretion, the following items listed in the Bill of Quantities may be omitted from the Contract during negotiations before award of the contract without affecting the rates for other items. If an item is omitted, the Contract Sum will be reduced by the supply and install rate for that item as submitted by the Contractor. These items include:
 - 3.3.1 Intake Lines, Wet Wells & Pump Station Slabs
 - 3.3.2 Irrigation Pump Station
 - 3.3.3 Filters and Fittings
 - 3.3.4 Fertigation Unit
 - 3.3.5 Transfer Pump Stations
 - 3.3.6 Booster Pump Stations
 - 3.3.7 Lightning Detection And Protection For Control System
 - 3.3.8 Weather Station including Communication Cable
 - 3.3.9 Spare Parts & Tools (either in full or in part)

4 IRRIGATION PUMP STATIONS

4.1 There will be 1 Irrigation Pump Station.

4.2 Pump Column Length and Relative Levels (Depths)

NOTE: The following levels are tentative and must be confirmed with the Employer prior to the ordering of the pump station.

PUMP STATION LEVELS & DEPTHS		
Description	Metres	Feet
Lake Floor Level	L. 44.0	L. 144.3
Low Water Level of Lake for Pumping (= Bottom Level or Invert of Intake Line)	L. 44.5	L. 146.0
High Water Level	L. 52.5	L. 172.2
** Maximum Flood Level	L. 52.5	L. 172.2
Maximum of High Water and Flood Level	L. 52.5	L. 172.2
Pump Station Pad (Skid) Level (Min. 1.0m above Max. of High Water & Flood Level)	L. 53.5	L. 175.5
Minimum Water over Tip (Bottom) of Pump Basket (Screen) - (Pump	1.1	3.6
Clearance between Tip (Bottom) of Pump Basket (Screen) and Wet Well Floor	0.5	1.6
Vertical Length of Pump Column	10.1	33.1
Depth of Wet Well	10.6	34.8
Maximum available Drawdown (from High Water Level)	8.0	26.2
Level at Tip (Bottom) of Pump Basket	L. 43.4	L. 142.4
Level at Bottom of Wet Well	L. 42.9	L. 140.7
Maximum Lift to Discharge Head	9.5	31.2
Note: The symbol 'L.' represents a level from the datum.		
** Note: Flood Level assumed to be same as High Water Level		

NOTE: ** *The flood level for the site needs to be confirmed* since we have not confirmed the actual flood level for the site. This may affect the level of the pump station slab.

NOTE: *It is the intention that the invert (bottom) of the Intake Line is 0.5 m above the floor of the lake* to ensure maximum drawdown of the useable water. *It is also intended that the pumps are able to drawdown to this level.* The actual depth of the wet well (and therefore the pump column length) depends on the Minimum Submergence and Minimum Clearance required (by the pump manufacturer) between the pump tip (base) and the bottom of the wet well. The above table may need to be modified to suit the particular pump manufacturer's requirements. Also the on site levels are likely to be different to the design levels assumed.

5 TRANSFER PUMP STATIONS

There will be 3 Transfer Pump Station, each conforming to the following:

5.1 Pump Column Length and Relative Levels (Depths)

5.1.1 Transfer Pump Station Nos 1 & 2

NOTE: The following levels are tentative and must be confirmed with the Employer prior to the ordering of the pump station.

PUMP STATION LEVELS & DEPTHS		
Description	Metres	Feet
Lake Floor Level	L. 48.0	L. 157.4
Low Water Level of Lake for Pumping (Bottom Level of Intake)	L. 48.5	L. 159.1
High Water Level	L. 51.0	L. 167.3
Note: The symbol 'L.' represents a level from the datum.		

5.1.2 Transfer Pump Station No 2

NOTE: The following levels are tentative and must be confirmed with the Employer prior to the ordering of the pump station.

PUMP STATION LEVELS & DEPTHS		
Description	Metres	Feet
Lake Floor Level	L. 51.0	L. 167.3
Low Water Level of Lake for Pumping (Bottom Level of Intake)	L. 51.5	L. 168.9
High Water Level	L. 57.2	L. 187.6
Note: The symbol 'L.' represents a level from the datum.		

5.2 Submersible Pumps

5.2.1 The pumps will be submersible pumps mounted on the lake floor.

5.2.2 Refer to sketch 674-A4 include in these Special Irrigation Specifications for the general arrangement of the pumps.

5.2.3 Since submersible pumps are being used, the intake line and wet well (section 7.4 and 7.5 of the General Irrigation Specifications) are not required. Also items 7.6.3 to 7.6.7 of the Manifold are not required.

5.3 Spillway at Discharge Point

At the discharge point, a spillway will be provided by the Contractor to prevent erosion of the embankment. The spillway will be:

5.3.1 3 m (10 Feet) wide

5.3.2 It will extend from 0.5 m (20 inches) above the high water level to 0.5 m (20 inches) below low water level.

5.3.3 The spillway will consist of 100 to 200 mm (4 to 8 inch) rocks set into a 150 mm (6 inch) thick reinforced concrete base.

NOTE: Transfer Pump Station Nos 1 & 2 may share the same spillway.

6 MAINLINE - SPECIAL NOTES

6.1 Crossing Under Waterway

6.1.1 Between Hole 18 and Hole 4, the mainline is shown crossing a waterway.

6.1.2 At this point the Contractor will use 4 Cast Iron, 45 degree bends with thrust blocks to go under the drainage channel. It is not acceptable to bend the pipe or deepen the trench leading up to the waterway. Refer to sketch 274-A4 enclosed.

6.2 Booster Pump Mainline

Generally this is the same class as the other mainlines. However, there are 2 special situations (as indicated on the drawings for holes 14 and 16 as well as reflected in the Bill of Quantities) where the class of pipe will need to be increased to British Class F, US Class 315 or PN 16.

This is due to the higher pressures below the 75 m elevation.

7 IRRIGATION CONTROL SYSTEM - DECODER SATELLITE SYSTEM

7.1 The Irrigation Control System will use:

7.1.1 Rain Bird Cirrus Computerised Central Controller

7.1.2 Rain Bird Par+ES Decoder Controllers (Satellites)

7.1.3 Rain Bird Decoders (FD-101, FD-102, FD-202, FD-401 and FD-601).

7.2 Communication Cable

There will be 2 separate runs of "Maxi" Cable (size and colours as per the Bill of Quantities):

7.2.1 From the Computerised Central Controller to the Satellites
There will be no decoders installed on this line.

7.2.2 From the Satellites to the Decoders

The decoders, LSP-1 and earthing grid will be connected to these communication cables.

7.3 Installation of Decoders

Decoders will be installed in the lateral isolation valve boxes.

7.4 LSP-1 Surge Arresters

These will be installed along the communication cable from the Satellite to the VIH Sprinklers at:

7.4.1 Dead Ends

7.4.2 Along the wire path such that:

- a) There are no more than eight (8) decoders between two (2) LSP-1 surge arresters.
- b) There is no more than 152 m (500 feet) between the LSP-1's

whichever is less.

It is noted that the FD-601 or FD-401 decoders contain a built in a LSP-1. These will be considered an acceptable substitute for the LSP-1.

7.5 Grounding Grid

7.5.1 All LSP-1 surge arrestors, FD-601 and FD-401 decoders will be grounded with 16 mm (5/8") copper-plated earth rods which are 2.4 m (8 feet) long. An earth resistance of 25 Ohms or less will be achieved.

7.5.2 All grounding rods will be connected by a 10 mm² (#6) bare copper cable. This will form an interconnected earth grid over the entire system.

8 IRRIGATION DRAWINGS

(Not Bound with this Document)

1075-A0 IRRIGATION - OVERALL LAYOUT (1 Sheet)

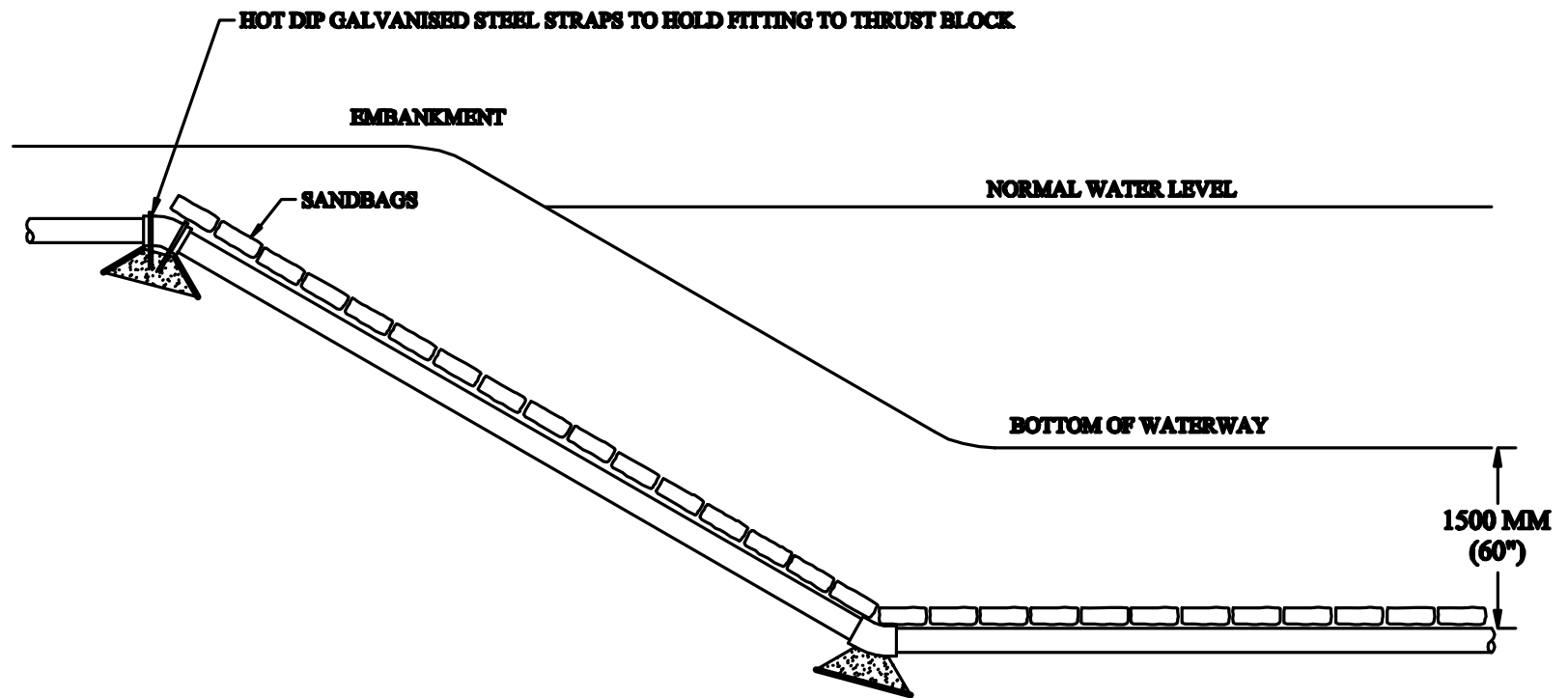
1076-A0 IRRIGATION - HYDRAULIC LAYOUT (4 Sheets)

1077-A0 IRRIGATION - ELECTRICAL LAYOUT - RAIN BIRD (1 Sheet)

9 SPECIAL SKETCHES

274-A4 Mainline Crossing: Under Waterway

674-A4 Transfer Pump - Submersible De-Watering Pump



WWW.HYDROGOLD.COM.AU

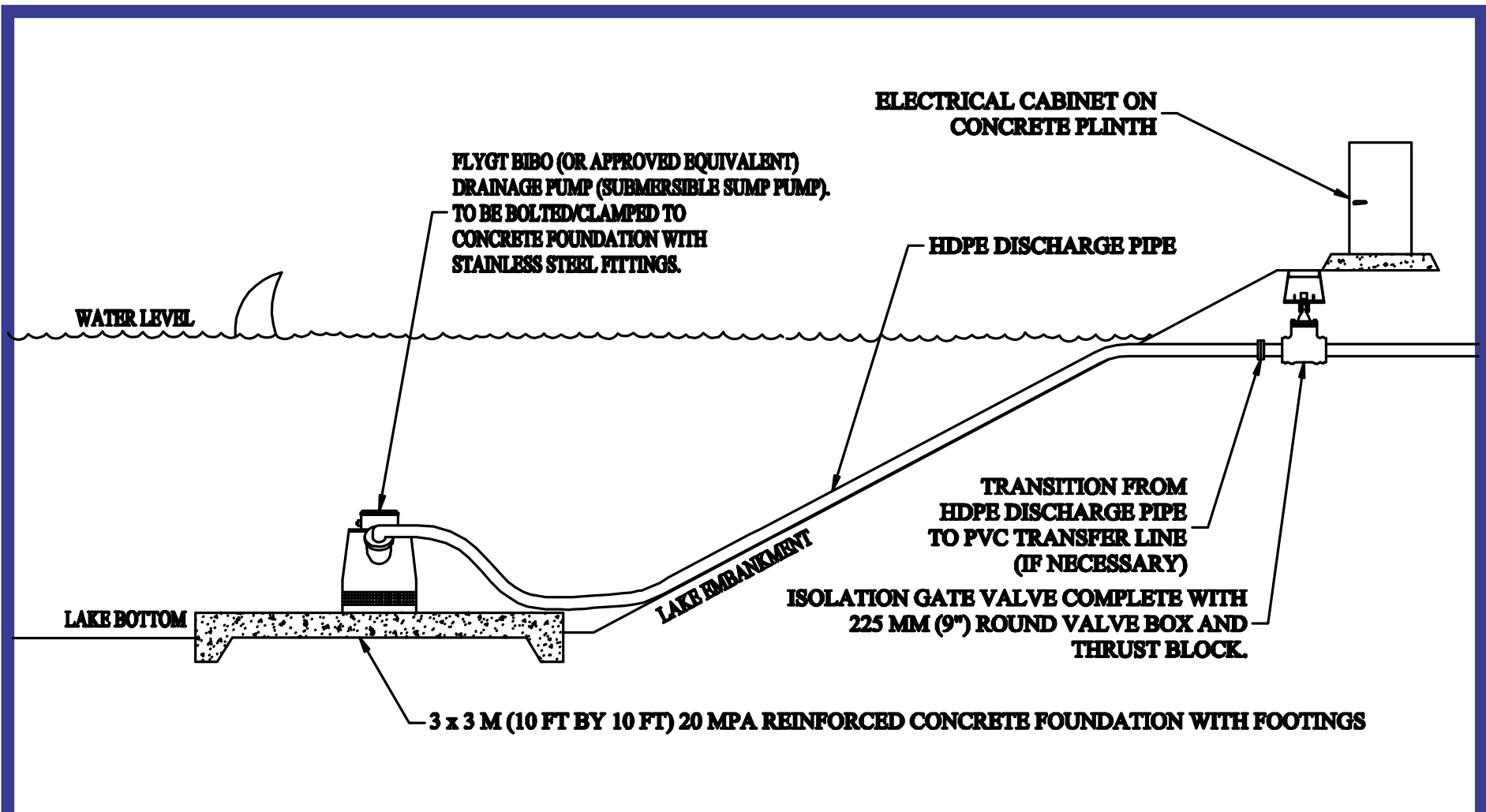
COPYRIGHT (C) 2007
HYDROGOLD PTY LTD

NOT TO SCALE

FILE: SK_GOLF

DRAWING No 274-A4

**MAINLINE CROSSING:
UNDER WATERWAY**



10 ADDENDUM No 1 dated 13 August 2007

- 10.1 Satellites 6, 7 and 9 relocated.
- 10.2 Drawings and sketches re-issued.
- 10.3 No changes to the drawings that significantly affect the quantity of materials.