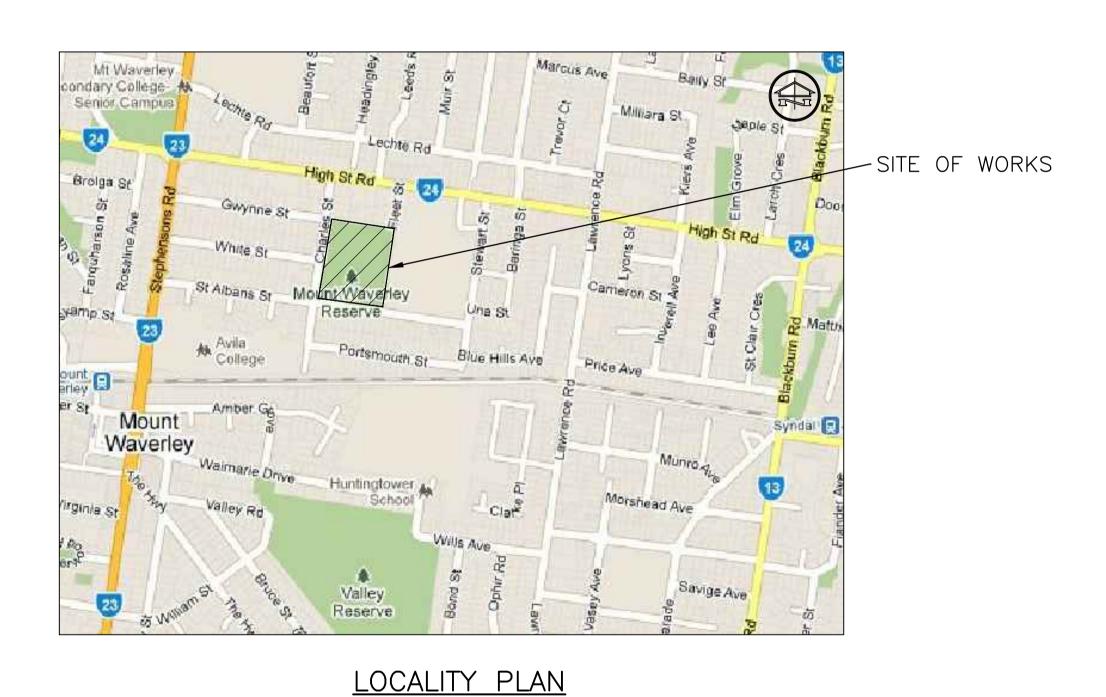
MT WAVERLEY RESERVOIR STORMWATER HARVESTING

DETAILED DESIGN



SHEET INDEX & REVISION DETAIL								
SHEET	DESCRIPTION							
C01	COVER SHEET	D						
P02	LAYOUT PLAN	D						
D03	DETAILS AND SECTIONS	D						
D04	DETAILS AND SECTIONS	С						
S05	SPECIFICATIONS	С						
S06	SPECIFICATIONS	С						

			Designed: G.JACK	Authorised:	R. WIESE			
		10.00.10	Checked: R. WIESE	Approved:	13.03.12	1		
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В	REVISED ISSUE FOR COUNCIL REVIEW GJ	22.12.11	Not to scale					
Α	REVISED ISSUE FOR REVIEW GJ	22.09.11				MELBOURNE		
Rev.	Revision Description Designed	Date	Original sheet size A1			SYDNEY		
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This drawing should be read in conjunction with all relevant contracts, specifications, reports & drawings.

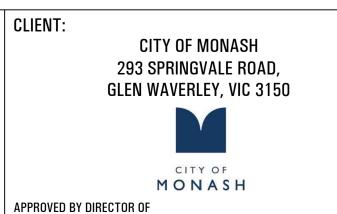


PO BOX 193, PYMBLE, NSW 2073

PO BOX 96, MORUYA NSW 2537

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P 03 9208 0111 P 02 9499 4333 P 02 4474 5573 SUITE 3, 31-33 HORTON ST, PORT MACQUARIE NSW 2444. P 02 6584 6470 INFRASTRUCTURE SERVICES:



MT WAVERLEY RESERVE

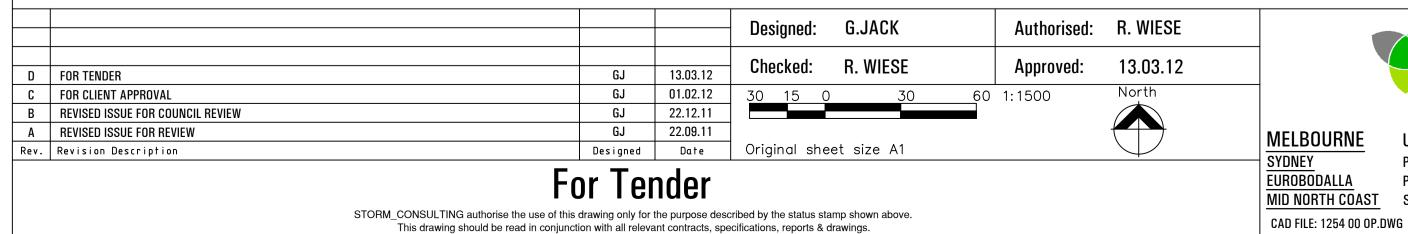
STORMWATER HARVESTING ST ALBANS RD, MOUNT WAVERLEY Locality Plan, Index

Date 13.03.2012 Drawing No. 1254 02 C01

Sheet 01 of 06



LAYOUT PLAN
SCALE 1:500





MELBOURNE
SYDNEY
EUROBODALLA
MID NORTH COAST

WELBOURNE
UNIT 7, 84 CHURCH ST, RICHMOND VIC 3121
PO BOX 193, PYMBLE, NSW 2073
PO BOX 96, MORUYA NSW 2537
SUITE 3, 31-33 HORTON ST, PORT MACQUARIE NSW 2444.

P 03 9208 0111
P 02 9499 4333
P 02 4474 5573
P 02 6584 6470

CLIENT: CITY OF MONASH 293 SPRINGVALE ROAD, GLEN WAVERLEY, VIC 3150

APPROVED BY DIRECTOR OF

INFRASTRUCTURE SERVICES:

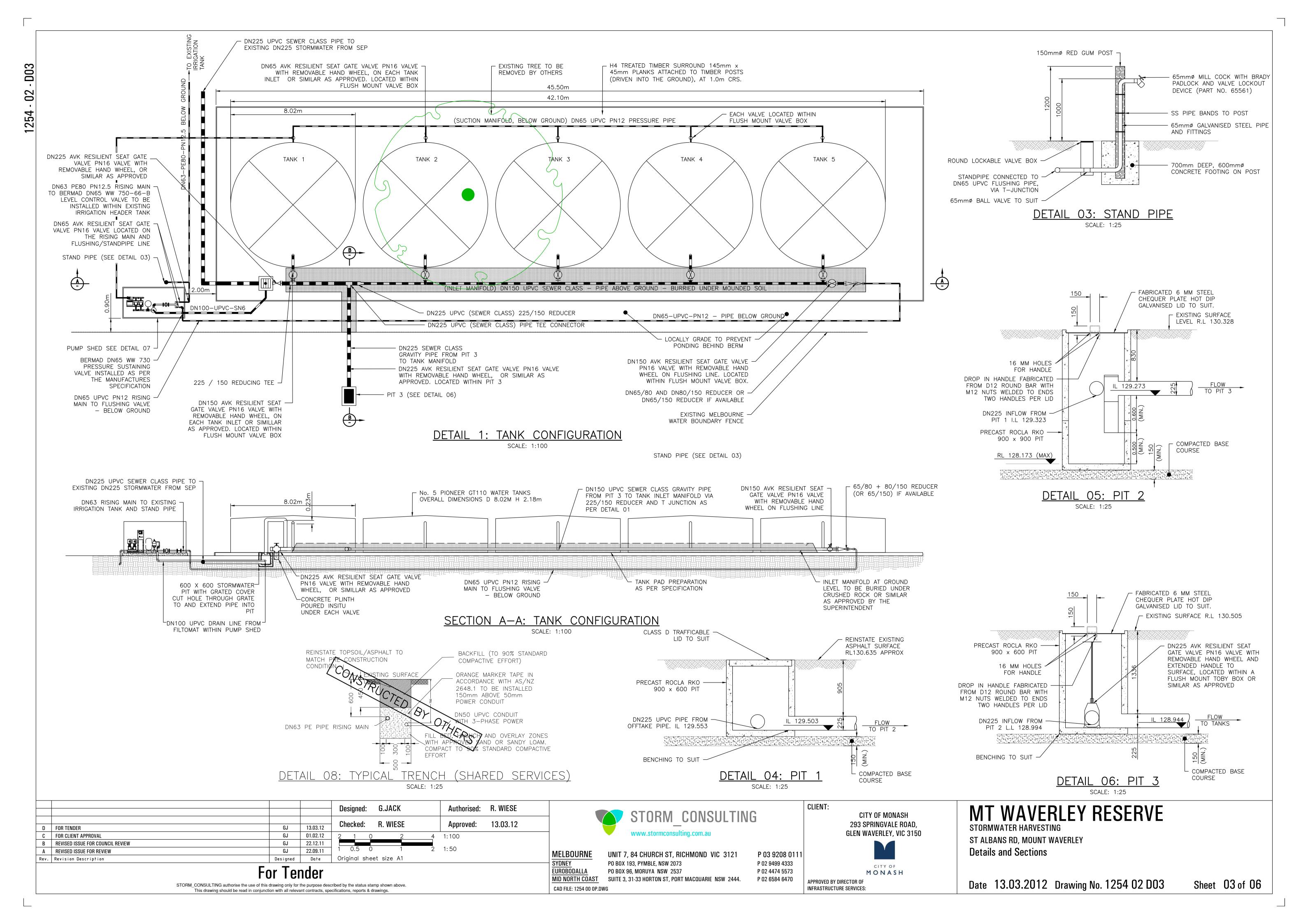
CITY OF MONASH

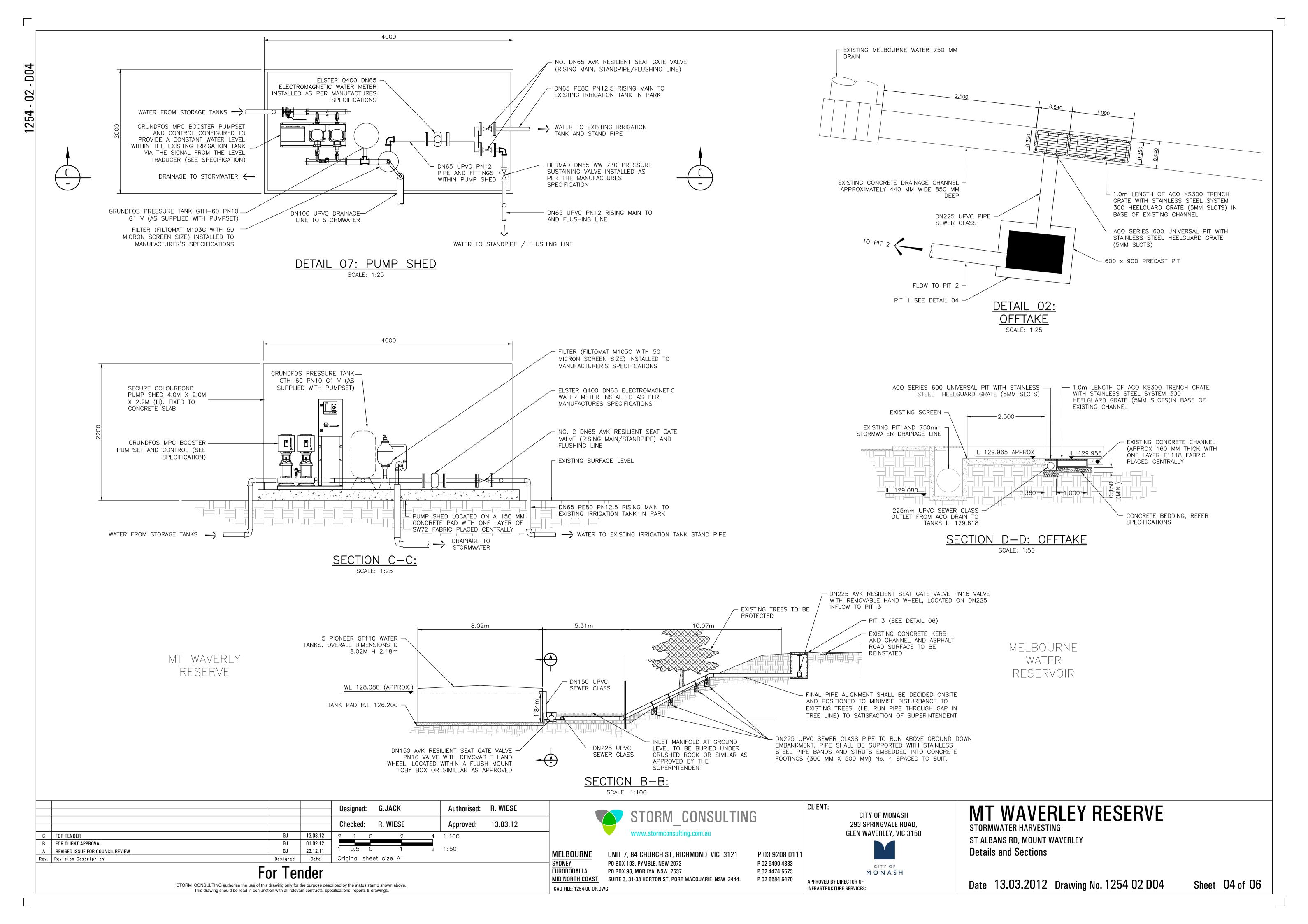
MT WAVERLEY RESERVE STORMWATER HARVESTING

STORMWATER HARVESTING
ST ALBANS RD, MOUNT WAVERLEY
Layout Plan

Date 13.03.2012 Drawing No. 1254 02 P02

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MT WAVERLEY STORMWATER HARVESTING SPECIFICATION

THIS TECHNICAL SPECIFICATION HAS BEEN PREPARED FOR THE CITY OF MONASH AND PROVIDES INFORMATION FOR THE CONSTRUCTION OF THE STORMWATER HARVESTING SYSTEM LOCATED AT THE MELBOURNE WATER MT WAVERLEY RESERVOIR AND THE STORAGE SYSTEM LOCATED IN THE ADJACENT MT WAVERLEY RESERVE.

1. PRELIMINARY AND GENERAL

1.1. EXTENT OF WORK

WORKS UNDER THIS CONTRACT COMPRISE THE SUPPLY OF LABOR, MATERIALS AND PLANT TO CONSTRUCT THE WORKS. IT INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING ITEMS OF CONSTRUCTION WHICH SHALL BE CARRIED OUT IN THEIR ENTIRETY AND IN STRICT ACCORDANCE WITH AND TO THE TRUE INTENT AND PURPOSE OF TECHNICAL SPECIFICATIONS AND THE DRAWINGS LISTED HEREIN, AND UNDER THE SUPERVISION OF THE SUPERINTENDENTS

NOTE: ALL WORK ON MELBOURNE WATER SITE SHALL BE CARRIED OUT BY A MELBOURNE WATER APPROVED CONTRACTOR/SUBCONTRACTOR.

1.2. DRAWINGS

THE GENERAL CHARACTER, EXTENT AND LOCATION OF THE WORKS ARE SHOWN ON DRAWINGS NUMBERED WITH THE PREFIX 1254-02 THE INDIVIDUAL DRAWINGS ARE LISTED BELOW:

DRAWING LIST: TITLE:

1254-02-C01 LOCALITY PLAN, INDEX

1254-02-P02 LAYOUT PLAN

1254-02-D03 DETAILS AND CROSS SECTIONS

1254-02-D04 DETAILS AND CROSS SECTIONS

1254-02-S05 SPECIFICATIONS

1254-02-S06 SPECIFICATIONS

1.3. EXISTING SERVICES

CONTRACTOR TO VERIFY LOCATIONS PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL PUBLIC UTILITY MAINS AND CONSUMER SERVICES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED, THE REPAIR OF THE DAMAGE, AND PAYMENT OF ALL CHARGES ASSOCIATED THEREWITH.

DURING THE EXCAVATION OF WORKS, THE CONTRACTOR SHALL TAKE EVERY PRECAUTION THAT IS NECESSARY, IN THE OPINION OF THE SUPERINTENDENT, TO SECURE EXISTING GAS, WATER OR DRAINAGE PIPES, SEWERS, ELECTRIC CONDUITS OR OTHER EXISTING WORKS, WHEREVER MET WITH BOTH UNDERGROUND AND OVERHEAD, OR THAT ARE ADJACENT TO THESE WORKS, FROM INJURY AND SHALL MAINTAIN THE SAME UNTIL IN THE OPINION OF THE SUPERINTENDENT, THE BACKFILLING OF EXCAVATION AND THE GENERAL PROGRESS OF THE WORKS RENDER FURTHER PRECAUTIONS UNNECESSARY.

THE CONTRACTOR SHALL COMPLY WITH THE STATUTORY REQUIREMENTS FOR MAINTAINING SAFE WORKING CLEARANCE TO OVERHEAD ELECTRICAL SERVICES.

DAMAGE TO EXISTING WATER, GAS OR DRAINAGE PIPES, SEWERS, ELECTRIC CONDUIT OR OTHER EXISTING WORKS OR SERVICES, SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE SUPERINTENDENT AND THE RELEVANT AUTHORITY AT THE CONTRACTOR'S COST.

THE CONTRACTORS ATTENTION IS DRAWN TO THE EXISTING UNDERGROUND POWER WHICH RUNS FROM THE EXISTING LAMP STANDARD TO THE SOUTH WEST OF THE RESERVOIR OVER THE DRIVEWAY AT ROUGHLY 45 DEGREES AND THEN RUNS PARALLEL TO THE KERB AND CHANNEL AT APPROXIMATELY 1.0 M BEHIND THE KERB (IN THE SAME ALIGNMENT A THE DN225 PIPELINE). THIS IS A LIVE SERVICE AND WAS NOT IDENTIFIED ON SERVICE PLANS. THE LOCATION SHOWN ON THESE PLANS IS APPROXIMATE ONLY AND THE CONTRACTOR SHALL LOCATE THIS CABLE ONSITE PRIOR TO ANY EXCAVATION OCCURRING.

1.4. HOURS AND DAYS OF WORK

THE HOURS OF WORKING AT THE SITE UNDER THE CONTRACT IS RESTRICTED TO THE HOURS BETWEEN 7.00 AM AND 6.00 PM MONDAY TO FRIDAY INCLUSIVE, 8 AM TO 1 PM ON SATURDAYS AND AT NO TIMES ON SUNDAYS OR PUBLIC HOLIDAYS. NO WORK AT THE SITE, OTHER THAN ROUTINE MAINTENANCE ON THE CONTRACTOR'S PLANT WILL BE PERMITTED OUTSIDE OF THESE HOURS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE SUPERINTENDENT.

1.5. CLEANING UP

THE CONTRACTOR IS TO ENSURE THAT AT ALL TIMES THE WORKS ARE KEPT CONSISTENTLY CLEARED OF RUBBISH AND ARE MAINTAINED IN A SAFE AND TIDY CONDITION.

1.6. OCCUPATIONAL HEALTH AND SAFETY

THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE LATEST OCCUPATIONAL HEALTH AND SAFETY ACT AND ALL REGULATIONS UNDER THE ACT AND THE CODES OR DRAFT CODES OF PRACTICE AND REGULATIONS WHICH ARE RELEVANT UNDER THE CONTRACT.

1.7. REINSTATEMENT OF FENCING

IF EXISTING FENCING ON THE PRINCIPAL'S PROPERTY (OR MELBOURNE WATERS PROPERTY) IS CUT OR ALTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL REINSTATE THE FENCING TO ORIGINAL CONDITION OR BETTER.

1.8. TEMPORARY FENCING

B FOR CLIENT APPROVAL

Rev. Revision Description

A REVISED ISSUE FOR COUNCIL REVIEW

THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY FENCING TO THE SATISFACTION OF THE SUPERINTENDENT DURING THE CONTRACT TO PREVENT UNAUTHORISED ENTRY INTO THE SITE. THE CONTRACTOR SHALL ALSO REMOVE TEMPORARY FENCING ON COMPLETION OF THE WORK.

2. EARTHWORKS AND MATERIAL STOCKPILES

THE CONTRACTOR'S RESPONSIBILITY FOR CARE OF THE WORKS SHALL INCLUDE THE PROTECTION OF EARTHWORKS.

2.1. EROSION AND SEDIMENTATION CONTROL

THE CONTRACTOR SHALL INSTALL EFFECTIVE EROSION AND SEDIMENTATION CONTROL MEASURES TO THE SATISFACTION OF THE SUPERINTENDENT PRIOR TO COMMENCING EARTHWORKS AND SHALL MAINTAIN THESE CONTROL MEASURES FOR THE DURATION OF THE CONTRACT.

2.2. DRAINAGE OF WORKING AREAS

ADEQUATE DRAINAGE OF ALL WORKING AREAS SHALL BE MAINTAINED THROUGHOUT THE PERIOD OF CONSTRUCTION TO ENSURE RUN-OFF OF WATER WITHOUT PONDING, EXCEPT WHERE PONDING FORMS PART OF AN APPROVED EROSION AND SEDIMENTATION CONTROL SYSTEM.

2.3. WET WEATHER PRECAUTIONS

WHEN RAIN IS LIKELY OR WHEN WORK IS NOT PROPOSED TO CONTINUE IN A WORKING AREA ON THE FOLLOWING DAY, PRECAUTIONS SHALL BE TAKEN TO MINIMISE INGRESS OF ANY EXCESS WATER INTO EARTHWORKS MATERIAL.

2.4. ADDITIONAL STOCKPILE SITES

THE CONTRACTOR SHALL OBTAIN THE WRITTEN CONSENT OF THE SUPERINTENDENT FOR THE USE OF ANY STOCKPILE SITE WHICH IS NOT SHOWN ON THE DRAWINGS. PROPOSALS IN THIS REGARD SHALL BE SUBMITTED AT LEAST THREE WORKING DAYS BEFORE STOCKPILING IS DUE TO COMMENCE AND SHALL SPECIFY THE MAXIMUM DIMENSIONS OF THE PROPOSED STOCKPILE.

2.5. TOPSOIL

TOPSOIL THROUGHOUT THE AREAS IS TO BE CUT AND FILLED, AND SHALL BE REMOVED AND STOCKPILED SEPARATELY CLEAR OF THE WORK WITH CARE TAKEN TO AVOID CONTAMINATION BY OTHER MATERIALS.

2.6. COMPACTION REQUIREMENTS:

COHESIVE SOILS: 95% MINIMUM DRY DENSITY RATIO (STANDARD COMPACTION) TO AS 1289.5.4.1

COHESIONLESS SOILS: 70% MINIMUM DRY DENSITY RATIO INDEX TO AS 1289.5.6.1

EXCAVATED AND STRIPPED GROUND SURFACE: AFTER EXCAVATION AND/OR STRIPPING, COMPACT THESE SURFACES IN CONFORMANCE WITH THE COMPACTION REQUIREMENT TO A MINIMUM DEPTH OF 150MM.

MAXIMUM ROCK AND LUMP SIZE IN LAYER AFTER COMPACTION: 2/3 COMPACTED LAYER THICKNESS

3. WATER TANKS

THE WORK TO BE EXECUTED UNDER THIS WORKSECTION COMPRISES THE SUPPLY AND INSTALLATION OF FIVE PIONEER GT110 WATER TANKS. INCLUDING:

- PREPARATION OF THE SITE AND CONSTRUCTION OF THE TANK PAD TO SUPPORT THE TANKS:
- SUPPLY AND INSTALLATION OF THE TANKS;
- COMMISSIONING OF TANKS.

THE ABOVE ITEMS SHALL BE CARRIED OUT ACCORDING TO MANUFACTURER'S METHODOLOGY AND SPECIFICATION AS APPROVED BY THE SUPERINTENDENT. CERTIFICATION BY THE SUPPLIER MUST BE SUBMITTED TO THE SUPERINTENDENT STATING THAT THE WORKS WERE UNDERTAKEN TO SPECIFICATION.

NOTWITHSTANDING THE TANK SUPPLIER'S SPECIFICATION, THE CONTRACTOR SHALL, AT A MINIMUM, CARRY OUT THE FOLLOWING TANK PAD PREPARATION:

- STRIP AND REMOVE TOPSOIL TO A MINIMUM DEPTH OF 200 MM SO EXPOSE THE UNDERLYING SUBSOIL BENEATH TANK PAD AREA AND 1.0 M BEYOND THE TANK PAD EXTENT;
- CARRY OUT TESTING TO DETERMINE THE UNDERLYING SUBSOIL HAS A MINIMUM BEARING CAPACITY OF 150KPA;
- AFTER CONFIRMING THE BEARING CAPACITY (AS ABOVE) THE CONTRACTOR SHALL SUPPLY AND PLACE A 150 MM THICK LAYER OF CRUSHED ROCK OVER THE EXTENT OF THE TANK PAD AND COMPACT IT TO 95% STANDARD COMPACTIVE EFFORT:
- CONSTRUCT A TREATED TIMBER TANK PAD SURROUND (H4 TREAT TIMBER PLANKS 145 MM X 45 MM) SECURED TO GROUND WITH TREATED TIMBER POSTS ON 1.0 M CENTERS DRIVE INTO GROUND/PLACED CRUSHED ROCK ABOVE;
- SUPPLY AND PLACE A MINIMUM 100 MM THICK LAYER OF LIGHTLY COMPACTED COARSE SAND TO BED THE TANKS.
- REINSTATE THE AREA AROUND THE TANK PAD TO EXISTING CONDITION USING SITE SOILS
- REMOVE EXCESS SITE SOILS FROM THE TANK PAD EXCAVATION FROM SITE.
- 4. PIT AND PIPE WORK DRAINAGE AND WATER SUPPLY

4.1 SCOPE PIPES

THE WORK TO BE EXECUTED UNDER THIS WORKSECTION CONSISTS OF SUPPLY OF PIPES, ALL PIPE FITTINGS, TRENCHING, BEDDING, INSTALLATION AND BACKFILLING FOR THE FOLLOWING:

- DN225 UPVC SEWER GRADE DRAINAGE LINE FROM THE OFF TAKE TO THE TANK INLET MANIFOLD INCLUDING ALL PITS AND FITTINGS:
- DN150 UPVC SEWER GRADE INLET MANIFOLD TO THE WATER STORAGE TANKS INCLUDING ALL FITTINGS AND VALVES AS SHOWN IN THE DRAWINGS;
- DN65 UPVC PN12 OUTLET MANIFOLD AND SUCTION LINE TO THE PUMP INCLUDING ALL FITTINGS AND VALVES AS SHOWN IN THE DRAWINGS:
- DN65 UPVC PN12 FLUSHING LINE TO INLET MANIFOLD AND STAND PIPE;
- DN63 PE80 PN12.5 RISING MAIN FROM THE PUMP STATION (ADJACENT TO NEW WATER STORAGE TANKS) TO THE EXISTING IRRIGATION HEADER TANK LOCATED NEAR THE PAVILION, INCLUDING CONNECTION TO EXISTING TANKS AND ALL FITTINGS AND VALVES; RISING MAIN PIPE BY OTHERS.
- DN100 UPVC DWV DRAIN FROM PUMP SHED/FILTER TO THE STORMWATER PIT ADJACENT TO THE TANK PAD;
- DN225 UPVC STORMWATER PIPE TO CONNECT TO EXISTING COUNCIL SEP LOCATED ADJACENT TO THE THE OVAL.

SHARED TRENCHES MAY BE UTILISED FOR ELECTRICAL AND TELEMETRY.

4.2 REFERENCED DOCUMENTS

THE FOLLOWING DOCUMENTS REFERRED TO IN THIS WORKSECTION SHALL BE DEEMED AS THE LATEST EDITION OF THE AUSTRALIAN STANDARDS, INCLUDING AMENDMENTS AND SUPPLEMENTS.

STANDARDS

AS 1657 FIXED PLATFORMS, WALKWAYS, STAIRWAYS AND LADDERS — DESIGN, CONSTRUCTION AND INSTALLATION

AS 2129 FLANGES FOR PIPES, VALVES AND FITTINGS

AS/NZS 4129(INT) FITTINGS FOR POLYETHYLENE (PE) PIPES FOR PRESSURE APPLICATIONS.

AS 1477 UNPLASTICISED PVC (UPVC) PIPES AND FITTINGS FOR PRESSURE APPLICATION

AS 2032 CODE OF PRACTICE FOR INSTALLATION OF UPVC PIPE SYSTEMS

AS 3500 PLUMBING AND DRAINAGE

POLYETHYLENE (PE) COMPOUNDS FOR PRESSURE PIPES AND FITTINGS AS/NZS 4131

4.3 EXCAVATION DRAINAGE

THE CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO DRAIN THE EXCAVATION TO ALLOW THE FOUNDATION, THE BEDDING AND ANY BACKFILLING TO BE COMPACTED TO THE SPECIFIED RELATIVE COMPACTION.

4.4 EXCAVATION AND BACKFILLING FOR RING MAIN

EXCAVATION AND BACKFILLING FOR RISING MAIN, AND OTHER SERVICES IF THE TRENCH IS SHARED, SHALL BE UNDERTAKEN IN A SAFE MANNER AND IN ACCORDANCE WITH ALL RELEVANT STATUTORY REQUIREMENTS

4.5 SEPARATION OF SERVICES IN SHARED TRENCH

THE CONTRACTOR MUST SUBMIT SHARED TRENCH PROFILE ARRANGEMENT TO SUPERINTENDENT SHOWING SEPARATION AND MARKING OF SERVICES. THE SEPARATION SHALL BE TO THE RELEVANT STANDARDS OR MINIMUM OF 100MM CLEAR SPACING TO ALL SERVICES EXCEPT WATER WHERE THE MINIMUM SEPARATION IS 300MM.

4.6 WATER SUPPLY PIPES AND FITTINGS

WATER SUPPLY PIPES AND FITTINGS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS AND SHALL BE APPROVED BY THE SUPERINTENDENT.

ALL PIPEWORK SHALL BE CLEARLY AND PERMANENTLY IDENTIFIED 'RECYCLED OR RECLAIMED WATER - DO NOT DRINK' AND COLOURED PURPLE. ALL BURIED RECYCLED OR RECLAIMED WATER PIPE SHALL BE CLEARLY IDENTIFIED BY INSTALLING 75MM WIDE WARNING TAPE ON TOP OF THE PIPE. THE TAPE SHALL STATE 'RECYCLED OR RECLAIMED WATER — DO NOT DRINK.

4.7 U.P.V.C PIPE AND FITTINGS

U.P.V.C PIPE SHALL BE UNPLASTICISED POLYVINYL CHLORIDE (U.P.V.C) SOLVENT WELDED JOINTED (SWJ), CLASS 12, COMPLYING WITH THE AUSTRALIAN STANDARDS FOR WATER SUPPLY AS 3500.1-1998

U.P.V.C SOLVENT WELD PRESSURE FITTINGS FOR USE WITH U.P.V.C PRESSURE PIPE SHALL BE CLASSIFIED AS CLASS 18 IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS FOR WATER SUPPLY AS 3500.1-1998

JOINTS FOR U.P.V.C PRESSURE PIPE SHALL BE SOLVENT WELDED USING TYPE P GREEN SOLVENT CEMENT FOR PRESSURIZED INSTALLATIONS COMPLYING WITH THE AUSTRALIAN STANDARDS FOR WATER SUPPLY AS 3500.1-1998.

4.8 POLYETHYLENE (PE)

POLYETHYLENE (PE) PIPE SHALL BE PN 12.5 HDPE TO AUSTRALIAN STANDARD 4130. FITTINGS FOR USE WITH POLYETHYLENE SHALL BE METRIC COMPRESSION 'PLASSON' TYPE. ALL TREADED FITTINGS SHALL HAVE FEMALE THREADS AND STAINLESS STEEL REINFORCING RINGS.

TAPPING SADDLES SHALL BE 'PLASSON' TYPE COMPLETE WITH STAINLESS STEEL REINFORCING RINGS AND STAINLESS STEEL

4.9 VALVES

THE FOLLOWING VALVES (OR APPROVED EQUIVALENTS) SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR:

2 X DN225 AVK RESILIENT SEAT GATE VALVE PN16 VALVE;

- 1 X ADJACENT TO PIT 3
- 1 X INLET MANIFOLD SLUICING VALVE
- 6 X DN150 AVK RESILIENT SEAT GATE VALVE PN16 VALVES:
- 5 X TANK INLETS
- 1 X INLET MANIFOLD FLUSHING LINE (FROM STANDPIPE LINE)

7 X DN65 AVK RESILIENT SEAT GATE VALVE PN16 VALVES

- 5 X TANK OUTLETS
- 1 X RISING MAIN TO IRRIGATION TANK
- 1 X STANDPIPE LINE
- 1 X BERMAD DN65 WW 730 PRESSURE SUSTAINING VALVE (LOCATED ON THE STANDPIPE LINE)
- 1 X DN65 MILL COCK VALVE WITH BRADY PADLOCK AND LOCKOUT DEVICE (STAND PIPE OUTLET)
- 1 X BERMAD WW 750-66-B LEVEL CONTROL VALVE (LOCATED WITHIN EXISTING IRRIGATION HEADER TANK)

ALL MANUALLY OPERATED VALVES WHICH ARE INSTALLED IN THE OPEN SHALL BE CONFIGURED TO PREVENT UNAUTHORISED OPERATION. AT A MINIMUM, THIS SHALL COMPRISE FITTING THE VALVE WITH A REMOVABLE HAND WHEEL

ALL VALVES WHICH ARE INSTALLED AT OR BELOW GROUND LEVEL SHALL BE INSTALLED WITHIN A SUITABLE HEAVY DUTY FLUSH MOUNTED VALVE BOX WITH COVER.

Authorised: R. WIESE Designed: G.JACK Checked: R. WIESE Approved: 13.03.12 13.03.12 C FOR TENDER

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Date



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P 03 9208 0111 P 02 9499 4333 P 02 4474 5573 P 02 6584 6470

CLIENT: CITY OF MONASH 293 SPRINGVALE ROAD. **GLEN WAVERLEY, VIC 3150**

CITY OF MONASH APPROVED BY DIRECTOR OF **INFRASTRUCTURE SERVICES:**

MT WAVERLEY RESERVE

STORMWATER HARVESTING ST ALBANS RD. MOUNT WAVERLEY Specifications

Date 13.03.2012 Drawing No. 1254 02 S05

Sheet 05 of 06

ALL VALVES ARE TO BE FITTED WITH ISO PN16 FLANGE FITTINGS. ALL FLANGES SHALL BE WRAPPED WITH DENSO TAPE.

4.10. MINIMUM COVER OF SERVICES

ALL SERVICES SHALL BE INSTALLED WITH THE MINIMUM TOTAL COVER FROM FINISHED SOIL LEVEL AS FOLLOWS:

A MINIMUM COVER OF 600MM PIPES SHALL BE PROVIDED FOR SERVICES UNDER ROADS AND A MINIMUM COVER OF 400MM UNDER PATHWAYS;

A MINIMUM TOTAL COVER OF 450MM SHALL BE PROVIDED FOR ALL RISING MAIN

A MINIMUM TOTAL COVER OF 600MM SHALL BE PROVIDED FOR ALL POWER SUPPLY CABLES.

THE MINIMUM EXCAVATED TRENCH DEPTH SHALL BE SUCH THAT THE MINIMUM COVER OVER THE PIPE IS ACHIEVED WHILST STILL ENSURING THE SPECIFIED MINIMUM BEDDING UNDERLAY DEPTH BENEATH THE PIPES, CONDUIT OR CABLE.

THE MINIMUM EXCAVATED TRENCH WIDTH FOR MAINLINE PIPEWORK SHALL BE EQUAL TO THE NOMINAL PIPE DIAMETER PLUS 100MM (EG. FOR 100MM DIA. MAINLINE THE MINIMUM EXCAVATED TRENCH WIDTH SHALL BE 200MM).

THE MINIMUM EXCAVATED TRENCH WIDTH FOR SPRINKLER LATERAL PIPEWORK SHALL BE 100MM.

4.11. BEDDING MATERIAL & TRENCH BACKFILL

ALL TRENCHES SHALL BE INSPECTED BY THE SUPERINTENDENT AND SHOULD SANDING BE DEEMED NECESSARY THE CONTRACTOR SHALL PROVIDE 75MM WASHED SAND AS UNDERLAY, OVERLAY AND SIDE PACKING. RATES SHALL BE INCLUDED FOR THIS PROCESS INCLUDING REMOVAL OF ALL EXCESS SPOIL. ALL TRENCHES SHALL BE BACKFILLED AND WHEEL ROLLED TO ACHIEVE CONSOLIDATION. TRENCHES SHOULD BE LEFT 'PROUD' SO AS TO ALLOW FINAL CONSOLIDATION.

ALL IRRIGATION MAINLINE PIPEWORK SHALL BE BACKFILLED WITH A MARKER TAPE INSTALLED 150MM BELOW FINISHED LEVEL.

WHERE INSTALLED ABOVE IRRIGATION MAINLINE PIPEWORK AND IRRIGATION LATERAL PIPEWORK, THE TAPE SHALL BE COLOURED "BLUE" AND WITH PRINTED WARNING: "DANGER - BURIED IRRIGATION MAIN BELOW".

WHERE INSTALLED ABOVE THE ELECTRICAL CONDUIT (NOT WITHIN MAINLINE TRENCH), THE TAPE SHALL BE COLOURED "ORANGE" AND WITH PRINTED WARNING: "DANGER - BURIED ELECTRICITY MAIN BELOW".

NO EXCAVATIONS SHALL BE LEFT OPEN OVERNIGHT OR UNATTENDED UNLESS FULLY PROTECTED WITH BARRIER MESH OR SIMILAR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL EXCAVATIONS ARE SUITABLY PROTECTED FROM PUBLIC ACCESS.

4.12. PRIMING AND JOINTING OF PIPE WORK

THE JOINTING METHOD SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS FOR WATER SUPPLY AS 3500.1-1998. PRIOR TO SOLVENT WELDING, ALL JOINTS SHALL BE SUITABLY PREPARED AND CLEANED USING AN APPROVED COLOURED (RED) PRIMING FLUID. JOINTING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION WITH COLOURED (GREEN) PRESSURE SOLVENT CEMENT.

ENSURE ALL PIPE IS CUT SQUARE AND 'BURRS' REMOVED PRIOR TO JOINTING. OBSERVE MANUFACTURES SPECIFICATION REGARDING MOVEMENT OF JOINT AND PRESSURIZING OF PIPEWORK FOLLOWING INSTALLATION.

PROVIDE A MINIMUM OF 300MM BETWEEN FITTINGS. SETOUT PIPING NETWORK SO CORRECT ANGLED FITTINGS ARE INSTALLED WITHOUT STRAINING OR MISALIGNING PIPE AND FITTING JOINTS. WHERE MAINLINE 'T'S (@ 400MM DEPTH) ARE INSTALLED TO SERVICE SOLENOID VALVE ASSEMBLIES (@ 300MM DEPTH) PROVIDE 2 X 45 DEGREE ELBOWS TO FACILITATE CHANGES IN HEIGHT ENSURING 300MM LENGTH FROM MAINLINE TO ELBOW AND 300MM FROM ELBOW TO VALVE ASSEMBLY. 2 X 90 DEGREE ELBOWS MAY BE USED FOR THIS PURPOSE IF LIMITATIONS REQUIRE.

4.13. FLUSHING OF PIPE WORK

AFTER THE INSTALLATION OF A SECTION OF PIPING AND RISERS, AND PRIOR TO INSTALLATION OF SPRINKLER HEADS ALL CONTROL VALVES SHALL BE OPENED AND WATER USED TO FLUSH OUT THE SYSTEM.

5. PUMPSET (INCLUDING PRESSURE VESSEL)

THE CONTRACTOR SHALL SUPPLY AND INSTALL 1 X HYDRO MPC-E 2XCRIE10-03 1.10KW 1PH (BSC) WITH THE FOLLOWING:

-GRUNDFOS DEDICATED CU351

-ETHERNET CONNECTION ON CONTROLLER

-SYSTEM FAULT RELAY -REMOTE START/STOP INPUT

-INTEGRATED VARIABLE SPEED DRIVES FOR EACH PUMP

-MAINS ISOLATOR

-STAINLESS STEEL BASE

-2" STAINLESS MANIFOLD

-304 WETTED CONSTRUCTION ON PUMPS (97943754)

- PRESSURE TANK GT-H-60 PN10 G1 V (96528341)

THE PUMPSET SHALL BE CONFIGURED AS DESCRIBED IN SECTION 6.2 BELOW.

6. CONTROLS METERS AND SENSORS

6.1 SCOPE AND GENERAL

THE WORK TO BE EXECUTED UNDER THIS WORKSECTION CONSISTS OF THE INSTALLATION OF ALL CONTROLS AND METERS RELATED TO THE STORMWATER HARVESTING SYSTEM.

6.2 PUMP CONTROL AND COMMISSIONING

THE PUMP CONTROL WILL COMPRISE THE CONTROL UNIT WHICH IS SUPPLIED WITH THE GRUNFOS HYDRO MPC-E 2XCRIE10-03 PUMP SET ABOVE AND SHALL BE INSTALLED AS PER THE MANUFACTURERS SPECIFICATION WITHIN THE PUMP

THE PUMP CONTROL SHALL BE CONFIGURED TO PROVIDE A CONSTANT PRESSURE WITHIN THE RISING MAIN AND STANDPIPE LINE. THE PUMP SHALL ALSO ACCEPT A SIGNAL FROM A FLOAT SWITCH LOCATED IN THE WATER STORAGE TANK WHICH WILL DEACTIVATE THE PUMP WHEN THIS LEVEL IS LOW TO PREVENT DRY PUMPING. ALL COMMISSIONING SHALL BE CARRIED OUT BY A GRUNDFOS COMMISSIONING ENGINEER OR OTHER SUITABLY COMPETENT ENGINEER.

6.3 FLOAT SWITCH

GRUNDFOS FLOAT SWITCH, 5 AMP, IP68 RATING. 415 V NO/NC CONTACT SHALL BE INSTALLED WITHIN THE WATER STORAGE TANK AS PER THE MANUFACTURES SPECIFICATION TO PROVIDE A LOW LEVEL CUT OUT TO THE GRUNFOS HYDRO MPC-E CRIE 10-3 PUMP SET.

6.4 WATER METER

Rev. Revision Description

THE WATER METER SHALL BE INSTALLED ON THE RISING MAIN MANIFOLD WITHIN THE PUMP SHED. THE WATER METER SHALL COMPRISE A ELSTER Q400 DN65 MAGNETIC METER INSTALLED AS PER THE MANUFACTURES SPECIFICATIONS, WITH PARTICULAR ATTENTION TO THE "STRAIGHT LINE PIPE REQUIREMENT" TEN TIMES THE PIPE DIAMETER STRAIGHT PIPE UPSTREAM AND FIVE TIMES THE PIPE DIAMETER STRAIGHT PIPE DOWNSTREAM.

7. ELECTRICAL

7.1. GENERAL

ELECTRICAL WIRING SHALL COMPLY WITH THE CURRENT WIRING REGULATIONS AND TO THE SATISFACTION OF THE CONSUMERS INSTALLATION SUPERINTENDENT OF THE APPROPRIATE POWER AUTHORITY.

THE CONTRACTOR SHALL ALLOW FOR THE SUPPLY AND INSTALLATION OF ALL MATERIALS, CONNECTIONS AND APPROVALS. THE INSTALLATION OF ALL ELECTRICAL WIRING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT RULES AND REGULATIONS OF THE SUPPLY AUTHORITY AND SHALL CONFORM TO THE REQUIREMENTS OF ANY AUTHORITY HAVING JURISDICTION OVER THE WORKS UNDER THIS CONTRACT. ALL ELECTRICAL WORKS SHALL COMPLY WITH:

AS 3000 ELECTRICAL INSTALLATIONS - BUILDING STRUCTURES AND PREMISES (KNOWN AS THE SAA WIRING RULES);

ALL ELECTRICAL WIRING WORKS ARE TO BE INSTALLED IN ACCORDANCE WITH THE STATE ELECTRICITY COMMISSION WIRING REGULATIONS 1992; ANDANY ASSOCIATED OR REFERENCED STANDARDS.

UPON COMPLETION AND TESTING OF THE ELECTRICAL WORKS, THE CONTRACTOR SHALL SUBMIT CERTIFICATES OF ELECTRICAL SAFETY FOR ELECTRICAL WORKS UNDER THE CONTRACT.

7.2. ELECTRICAL SUPPLY TO PUMP SHED

THE CONTRACTOR SHALL PROVIDE POWER TO THE PUMP SHED FROM THE OVAL PAVILION. THE POWER CABLE TO THE PUMP SHED SHALL BE RUN WITHIN THE RISING MAIN TRENCH. THE POWER SUPPLY TO THE PUMP SET SHALL COMPRISE 3 PHASE POWER TO THE PUMP MANUFACTURERS SPECIFICATIONS: - BY OTHERS

ALL BELOW GROUND ELECTRICAL CABLE SHALL BE RUN WITHIN DN50 PVC ELECTRICAL CONDUIT

7.3. ELECTRICAL CABLE CONDUIT

ELECTRICAL CONDUIT SHALL BE ORANGE HEAVY-DUTY P.V.C PIPE COMPLYING WITH AS 205-1984, NON-METALLIC CONDUITS AND FITTINGS. LONG RADIUS ELBOWS, INSPECTION 'T'S AND INSPECTION ELBOWS SHALL BE PROVIDED AT INTERSECTIONS AND CHANGES IN DIRECTION. FLEXIBLE ELECTRICAL CONDUIT SHALL BE PROVIDED FROM INSPECTION 'T'S TO VALVE ASSEMBLIES. EXPOSED CONDUITS SHALL BE HEAVY-DUTY GALVANISED STEEL COMPLYING WITH AS 2052-1977, METALLIC CONDUITS AND FITTINGS. — BY OTHERS

8. FILTER

THE FILTER TO BE INSTALLED IS A HYDRAULIC ACTIVATED 'FILTOMAT' MODEL M103C, DN80 WITH A 50 MICRON SCREEN. THE CONTRACTOR SHALL SUPPLY AND INSTALL FITTINGS AS REQUIRED TO REDUCE THE INLET AND OUTLET (DN80) TO SUIT THE UPVC DN65 PIPEWORK WITHIN THE PUMP SHED. THE FILTER SHALL BE SUPPORTED WITH HEAVY DUTY STEEL GALVANISED SUPPORT BRACKETS. THE FILTER BACKWASH LINE SHALL BE TO MANUFACTURER'S SPECIFICATION

THE DRAIN FROM THE BACK WASH LINE SHALL BE CONNECTED TO THE DN100 DRAINAGE LINE TO THE NEW STORMWATER PIT LOCATED AT THE SOUTHERN END OF THE TANK PAD.

9. PUMP SHED

THE CONTRACTOR SHALL SUPPLY A HEAVY DUTY COLOUR BOND STEEL SHED TO HOUSE THE PUMPS AND ASSOCIATED VALVES, FLOW METERS AND CONTROL EQUIPMENT. THE SHED SHALL BE APPROXIMATELY 4.0 M X 2.0 M AND 2.2 M HIGH AS SHOWN IN DETAIL 07 AND SECTION C-C. THE SHED SHALL BE SECURE AND LOCKABLE AND OF DURABLE CONSTRUCTION. THE SHED SHALL BE MOUNTED ON TOP OF A 150 MM THICK CONCRETE PAD (WITH ONE LAYER OF F118 FABRIC PLACED CENTRALLY).

10. PITS

10.1 PITS SCOPE

THE CONTRACTOR SHALL SUPPLY AND INSTALL THE FOLLOWING PITS;

PRECAST 600 X 900 PIT AND RISER AS REQUIRED, FITTED WITH CLASS D TRAFFICABLE LID AND COVER AS SHOWN IN DETAIL 04 LOCATED ADJACENT TO THE OFFTAKE;

PIT 2: PRECAST 900 X 900 PIT AND RISER AS REQUIRED, FITTED WITH PVC SUBMERGED OUTLET, LID AND

GALVANISED STEEL COVER AS SHOWN IN DETAIL 05.

PIT 3: PRECAST 900 X 600 PIT AND RISER AS REQUIRED, FITTED WITH GALVANISED STEEL COVER AND GATE VALVE AS SHOWN IN DETAIL 06.

STORMWATER PIT: PRECAST 600 X 600 PIT WITH GRATED COVER AS SHOWN IN SECTION A-A

10.2 CONSTRUCTION

ALL NEW PITS, INCLUDING ACCESS COVERS, GULLY GRATES AND FRAMES COMPLYING WITH AS 3996, SHALL BE CONSTRUCTED TO THE DETAILS SHOWN ON THE DRAWINGS AND TO THE REQUIREMENTS OF THE MANUFACTURER

10.3 STEP IRONS

STEP IRONS SHALL BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS. STEPS ARE TO BE GALVANISED IRON.

STEP IRONS SHALL BE EITHER FIXED FIRMLY IN THE FORMWORK PRIOR TO POURING THE CONCRETE FOR THE PIT WALLS OR BY USING BLOCKOUT FORMERS TO MAKE RECESSES IN THE CONCRETE TO RECEIVE THE ARMS OF THE STEP IRONS OR ALTERNATIVELY, INSTALLED AT A LATER DATE BY DRILLING THE PIT WALL.

HOLES MAY ONLY BE DRILLED USING A ROTARY MASONRY BIT OR SIMILAR. PERCUSSION TOOLS SHALL NOT BE USED TO FORM THE HOLE FOR THE STEP IRON.

WHERE THE STEP IRONS ARE INSTALLED IN RECESSES OR DRILL HOLES AFTER THE CONCRETE WALL IS POURED, THE STEP IRONS SHALL BE FIXED IN POSITION BY USING AN EPOXY RESIN IN ACCORDANCE WITH THE STEP IRON AND EPOXY RESIN MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS.

THE CONTRACTOR SHALL ENSURE THAT NO MOVEMENT OF THE STEP IRONS OCCURS UNTIL THE EPOXY RESIN HAS REACHED THE SPECIFIED STRENGTH.

10.4 INLET AND OUTLET PIPES

INLET AND OUTLET PIPES SHALL BE CORED FROM THE PRECAST PITS. THE PIPES PENETRATIONS THROUGH THE PIT WALLS SHALL BE SEALED WITH EPOXY MORTAR.

11. STORMWATER HARVESTING OFF TAKE

SYDNEY

EUROBODALLA

CAD FILE: 1254 00 OP.DWG

11.1 OFF TAKE PIT SCOPE

Authorised: R. WIESE

Approved: 13.03.12

G.JACK

THE CONTRACTOR SHALL SUPPLY AND INSTALL THE ACO KS300 TRENCH GRATE AND ACO UNIVERSAL JUNCTION PIT OFFTAKE IN THE MELBOURNE WATER DRAINAGE CHANNEL LOCATED ON THE SOUTHERN SIDE OF THE WATER RESERVOIR AS SHOWN IN DETAIL 02 AND SECTION D-D.

THE CONTRACTOR SHALL INSTALL THE OFF-TAKE AS FOLLOWS:

- EXCAVATE AND REMOVE THE EXISTING ASPHALT, KERB AND CHANNEL, AND FOOTPATH IN AN AREA EXTENDING APPROXIMATELY 0.5 — 1.0 M EITHER SIDE OF THE PROPOSED OFF—TAKE (ALL CUTS IN EXISTING ASHPHALT, KERB AND CHANNEL AND FOOTPATH SHALL BE SAW CUT);
- DO NOT DISTURB THE EXISTING VERTICAL SECTION OF WALL AND PROVIDE ANY TEMPORARY SUPPORT AS MAY BE REQUIRED;

- EXCAVATED UNDER THE EXISTING WALL OVER THE EXTENT OF THE PROPOSED OFF-TAKE TO EXPOSE THE UNDERSIDE OF THE EXISTING CHANNEL (CONTRACTOR TO PROVIDE TEMPORARY SUPPORT OF THE WALL OVER THIS SECTION AS REQUIRED);

- CUT THE BASE OF THE EXISTING CHANNEL FROM ABOVE USING HAND HELD CONCRETE SAWS (SOME TIDYING AND TRIMMING MAY BE REQUIRED WITH SMALL GRINDER);
- THE ACO PIT AND CHANNEL SHALL BE INSTALLED WITH A FINISHED LEVEL 10 MM BELOW THE EXISTING INVERT LEVEL OF THE CHANNEL. THE PIT STALL BE SET IN PLACE WITH CONCRETE TO A MINIMUM DEPTH OF 150 MM UNDER THE CHANNEL AND A MINIMUM 50 MM AROUND ALL SIDES. THE CONCRETE FILL AROUND THE SIDE WILL DEPEND ON THE EXTENT OF EXISTING CONCRETE REMOVED TO INSTALL.
- THE SURFACE FINISH ON THE CONCRETE WITHIN THE CHANNEL SHALL BE A SMOOTH TOWELLED FINISHED AND THE 10 MM REBATE TO THE CHANNEL/GRATE SHALL BE FINISHED WITH A CHAMFER.
- AFTER THE INSTALLATION AND CONNECTION TO THE OFF TAKE DRAINAGE THE EXCAVATION SHALL BE BACKFILLED AND COMPACTED. THE SURFACE SHALL BE REINSTATED TO A CONDITION EQUAL TO OR BETTER THAN THE EXISTING STANDARD (ASPHALT, K&C AND FOOTPATH).

12. MINOR CONCRETE WORK

12.1 SCOPE

THE WORK TO BE EXECUTED UNDER THIS WORKSECTION CONSISTS OF THE SUPPLY AND PLACEMENT OF CONCRETE, INCLUDING SPRAYED CONCRETE, AND ANCILLARY REQUIREMENTS LIKE EXCAVATION, PREPARATION OF FOUNDATIONS, FORMING UP, PLACEMENT OF REINFORCEMENT, CONSTRUCTION OF THE OFFTAKE, CORE HOLE IN PRECAST UNITS AND BACKFILLING FOR WORK SHOWN ON THE DRAWINGS BUT NOT HAVING INDIVIDUAL SPECIFICATIONS.

THESE WORKS INCLUDE DRAINAGE PITS AND OTHER SUPPLEMENTARY STRUCTURES, FOOTINGS AND WORKS OF A SIMILAR NATURE.

ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 20 MPA AND ALL UNFORMED SURFACES SHALL HAVE A SMOOTH TOWELLED FINISH. ALL CONCRETE WORK SHALL COMPLY WITH THE BELOW STANDARDS

12.2 REFERENCED STANDARDS

THE FOLLOWING DOCUMENTS REFERRED TO IN THIS WORKSECTION SHALL BE DEEMED AS THE LATEST EDITION OF THE AUSTRALIAN STANDARDS, INCLUDING AMENDMENTS AND SUPPLEMENTS.

METHODS OF TESTING CONCRETE

AS 1012.1 SAMPLING FRESH CONCRETE

AS 1012.3.1 DETERMINATION OF PROPERTIES RELATED TO THE CONSISTENCY OF CONCRETE -- SLUMP TEST

AS 1012.8.1 METHOD OF MAKING AND CURING CONCRETE -- COMPRESSION AND INDIRECT TENSILE TEST SPECIMENS

AS 1012.9 DETERMINATION OF THE COMPRESSIVE STRENGTH OF CONCRETE SPECIMENS

AS 1012.14 METHOD FOR SECURING AND TESTING CORES FROM HARDENED CONCRETE FOR COMPRESSIVE STRENGTH METHODS FOR TESTING AND SAMPLING AGGREGATES

AS 1141

AS 1141.14 PARTICLE SHAPE BY PROPORTIONAL CALLIPER AS 1141.21 AGGREGATE CRUSHING VALUE

AS 1141.23 LOS ANGELES VALUE

AS 1141.24 AGGREGATE SOUNDNESS——EVALUATION BY EXPOSURE TO SODIUM SULPHATE SOLUTION

METHODS OF TESTING SOILS FOR ENGINEERING PURPOSES

AS 1289.3.3.1 SOIL CLASSIFICATION TESTS—CALCULATION OF THE PLASTICITY INDEX OF A SOIL

AS 1289.5.4.1 SOIL COMPACTION AND DENSITY TESTS -- COMPACTION CONTROL TEST -- DRY DENSITY RATIO, MOISTURE VARIATION AND MOISTURE RATIO

SPECIFICATION AND SUPPLY OF CONCRETE AS 1379

AS 1478 CHEMICAL ADMIXTURES FOR CONCRETE, MORTAR AND GROUT

AS 1478.1 ADMIXTURES FOR CONCRETE

STRUCTURAL STEEL WELDING AS 1554

WELDING OF REINFORCING STEEL AS 1554.3

AS 2082 TIMBER--HARDWOOD--VISUALLY STRESS-GRADED FOR STRUCTURAL PURPOSES

AS 2758 AGGREGATES AND ROCK FOR ENGINEERING PURPOSES

AS 2758.1 CONCRETE AGGREGATES

AS 3600 CONCRETE STRUCTURES

AS 3610 FORMWORK FOR CONCRETE AS 3799 LIQUID MEMBRANE-FORMING CURING COMPOUNDS FOR CONCRETE

AS 3972 PORTLAND AND BLENDED CEMENTS

AS/NZS 1859 (VARIOUS) RECONSTITUTED WOOD-BASED PANELS AS/NZS 2271 PLYWOOD AND BLOCKBOARD FOR EXTERIOR USE

AS/NZS 4671 STEEL REINFORCING MATERIALS

Designed: Checked: R. WIESE GJ 13.03.12 C FOR TENDER B FOR CLIENT APPROVAL GJ 01.02.12 A REVISED ISSUE FOR COUNCIL REVIEW GJ 22.12.11

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Designed

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Date

www.stormconsulting.com.au MELBOURNE

UNIT 7, 84 CHURCH ST, RICHMOND VIC 3121 PO BOX 193, PYMBLE, NSW 2073 PO BOX 96. MORUYA NSW 2537 MID NORTH COAST SUITE 3, 31-33 HORTON ST, PORT MACQUARIE NSW 2444.

STORM CONSULTING

P 03 9208 0111 P 02 9499 4333 P 02 4474 5573 P 02 6584 6470

CLIENT: CITY OF MONASH 293 SPRINGVALE ROAD. **GLEN WAVERLEY, VIC 3150**

CITY OF MONASH APPROVED BY DIRECTOR OF **INFRASTRUCTURE SERVICES:**

MT WAVERLEY RESERVE

STORMWATER HARVESTING ST ALBANS RD. MOUNT WAVERLEY **Specifications**

Date 13.03.2012 Drawing No. 1254 02 S06

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