

MT WAVERLEY RESERVOIR STORMWATER HARVESTING DETAILED DESIGN



SITE OF WORKS

LOCALITY PLAN
NOT TO SCALE

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

Rev.	Revision Description	Designed	Date
D	FOR TENDER	GJ	13.03.12
C	FOR CLIENT APPROVAL	GJ	01.02.12
B	REVISED ISSUE FOR COUNCIL REVIEW	GJ	22.12.11
A	REVISED ISSUE FOR REVIEW	GJ	22.09.11

Designed: G.JACK
Checked: R. WIESE
Authorised: R. WIESE
Approved: 13.03.12

Not to scale

Original sheet size A1

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CLIENT:

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

APPROVED BY DIRECTOR OF
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

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LAYOUT PLAN
SCALE 1:500

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D	FOR TENDER	GJ	13.03.12
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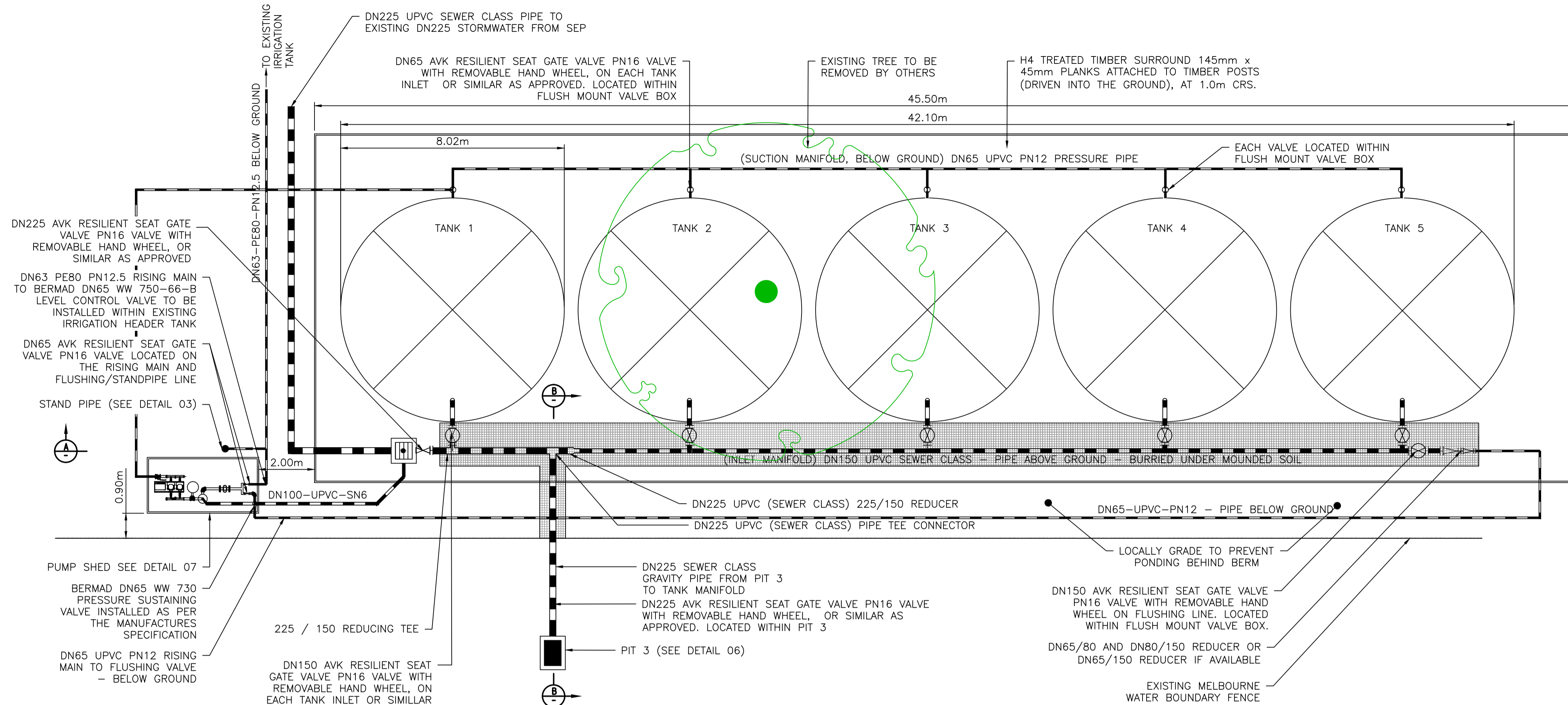
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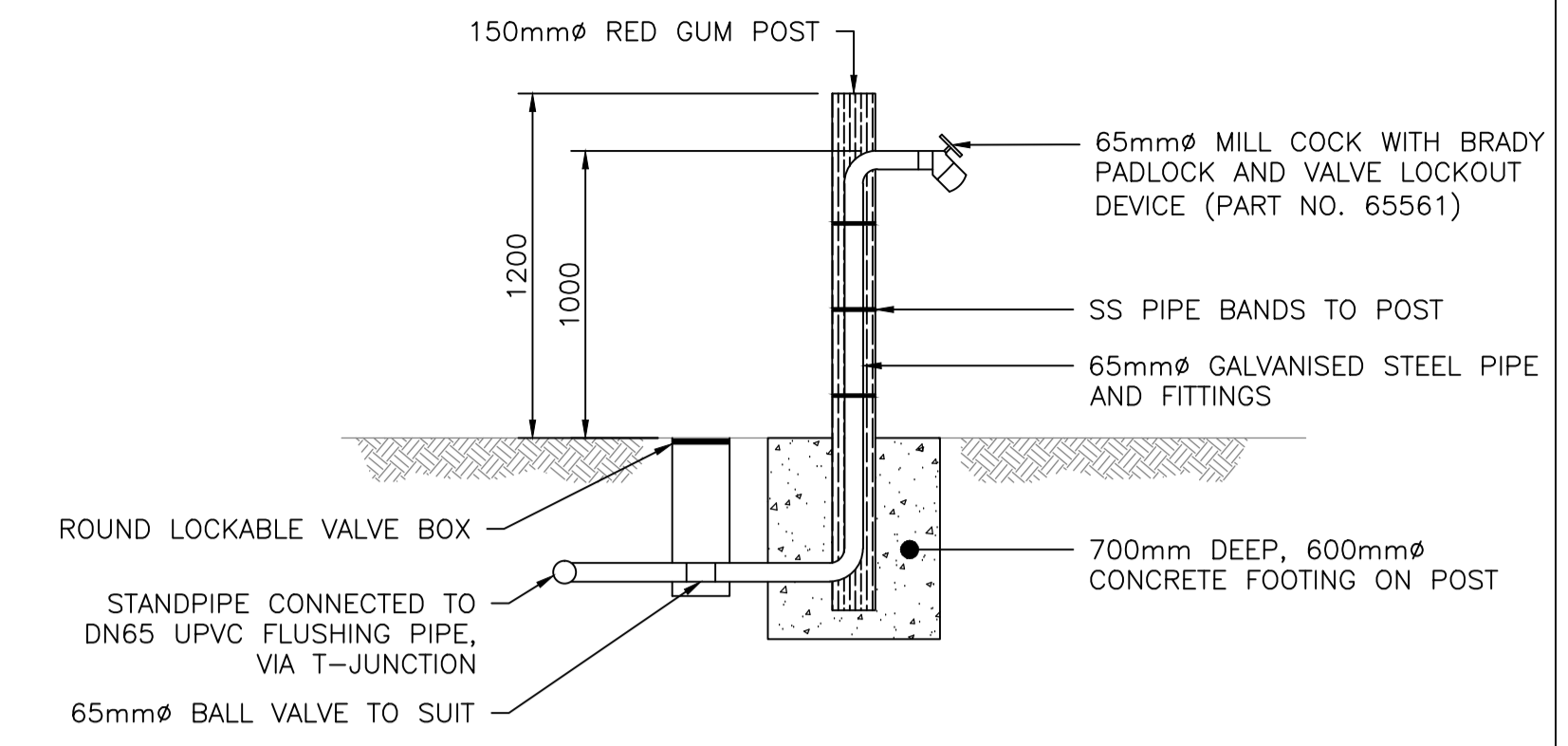
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ST ALBANS RD, MOUNT WAVERLEY
Layout Plan

Date 13.03.2012 Drawing No. 1254 02 P02 Sheet 02 of 06

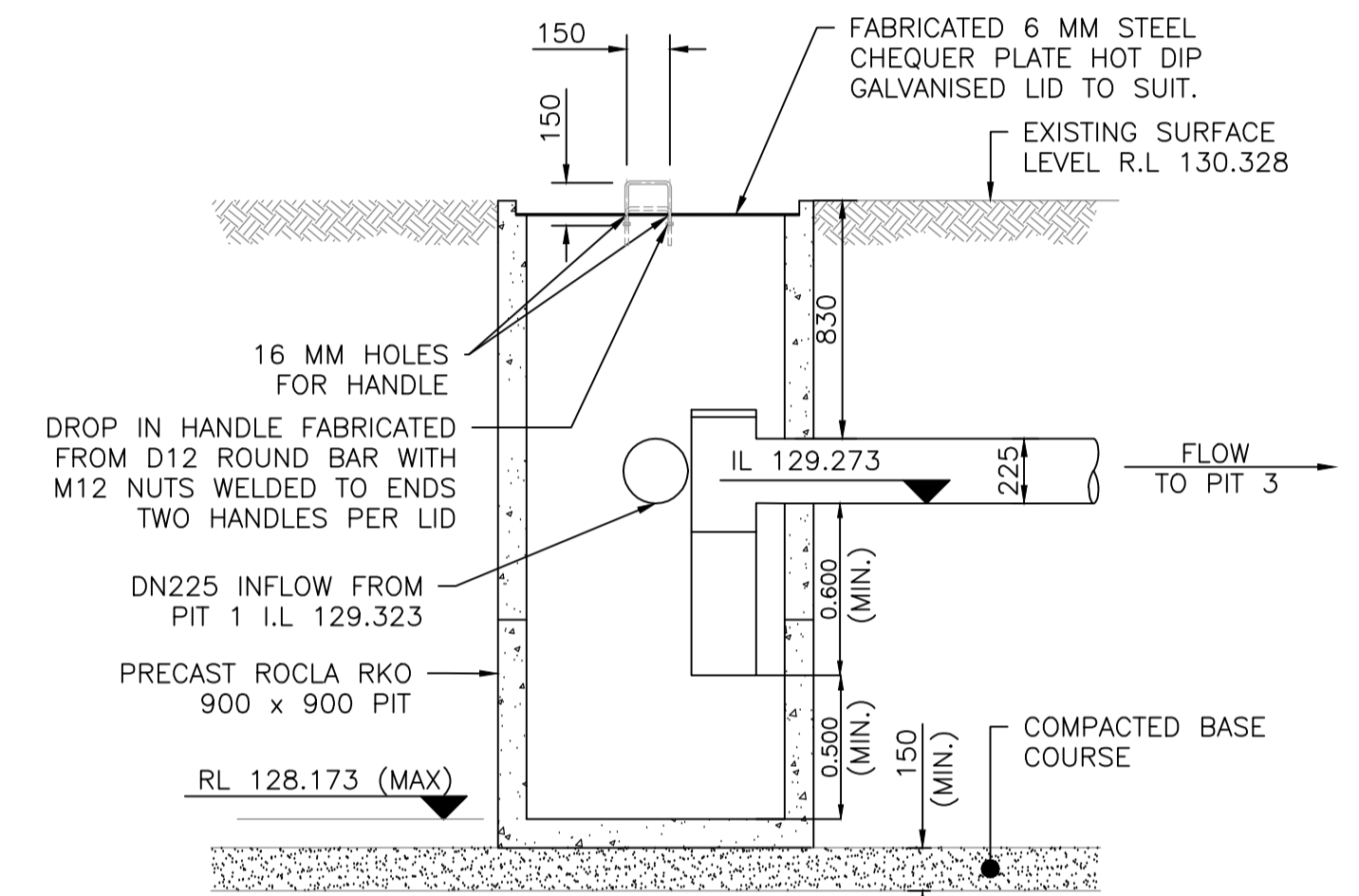
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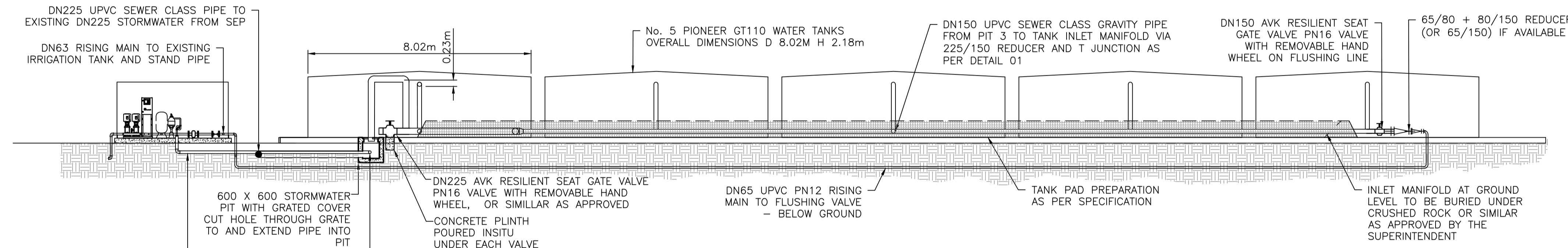
DETAIL 1: TANK CONFIGURATION
SCALE: 1:100



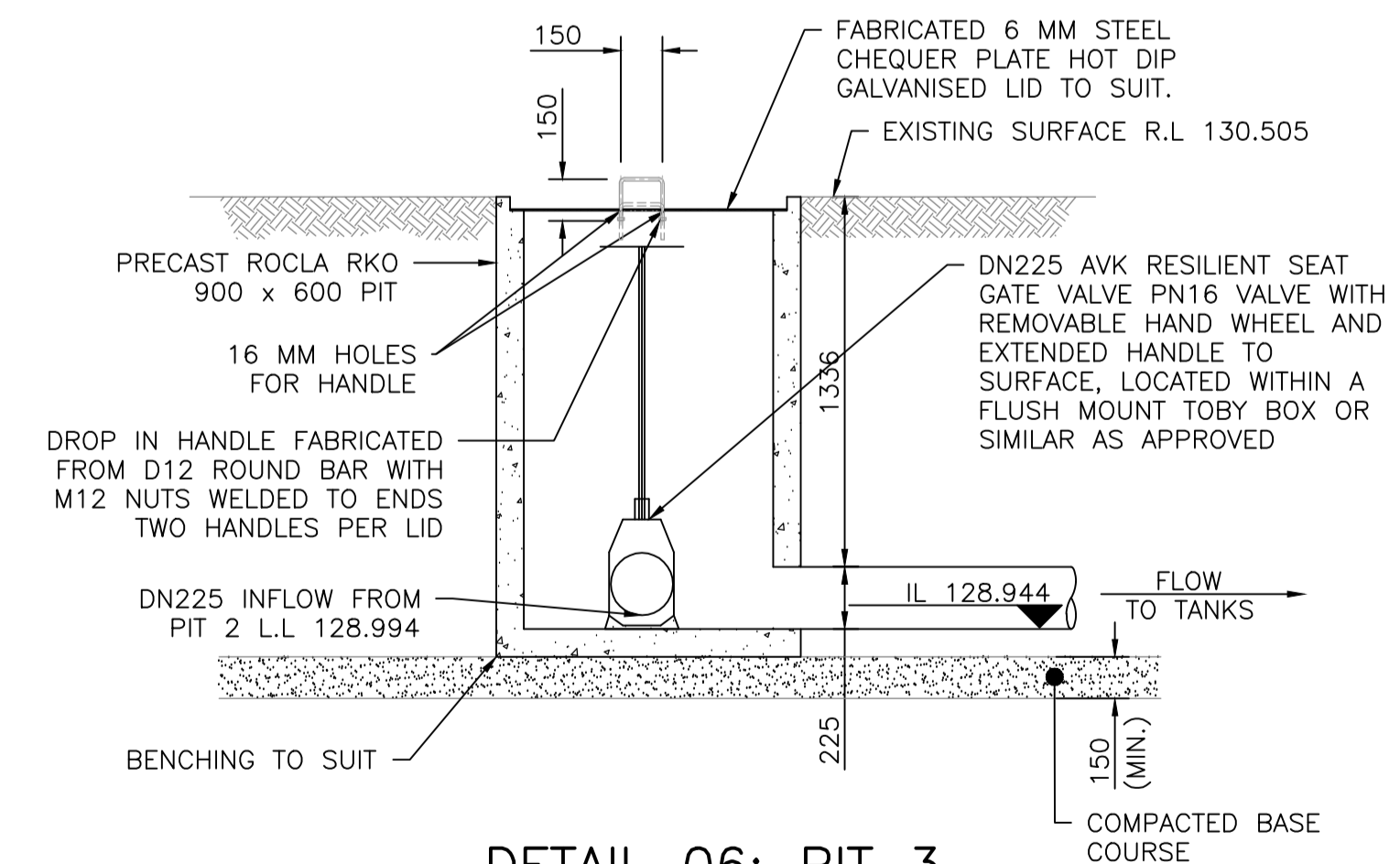
DETAIL 03: STAND PIPE
SCALE: 1:25



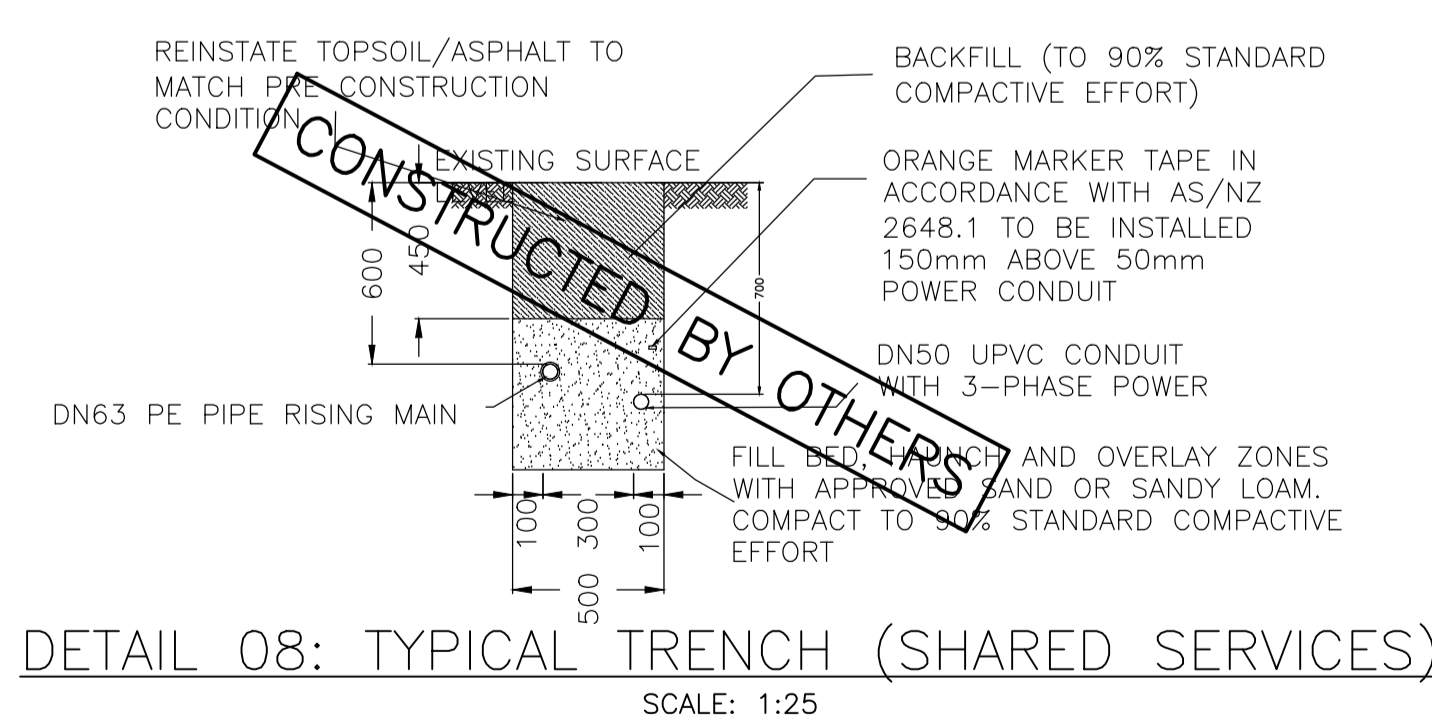
DETAIL 05: PIT 2
SCALE: 1:25



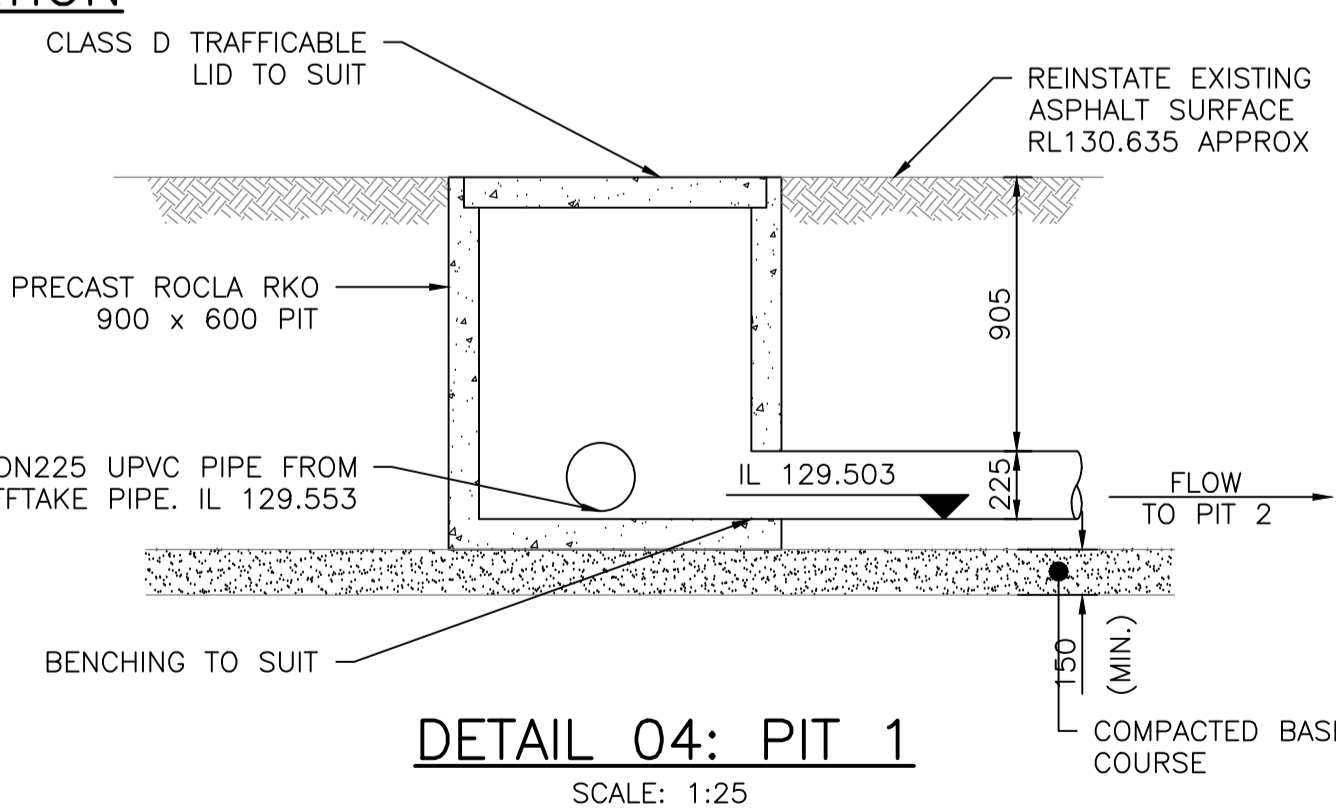
SECTION A-A: TANK CONFIGURATION
SCALE: 1:100



DETAIL 06: PIT 3
SCALE: 1:25



DETAIL 08: TYPICAL TRENCH (SHARED SERVICES)
SCALE: 1:25



DETAIL 04: PIT 1
SCALE: 1:25

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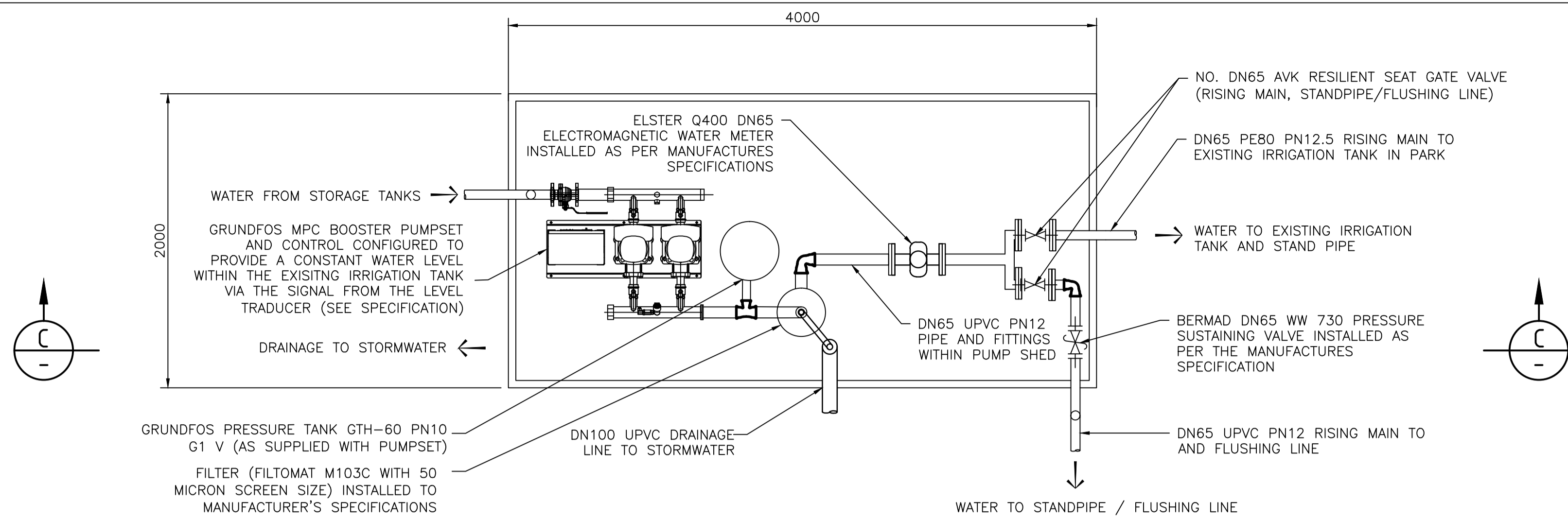
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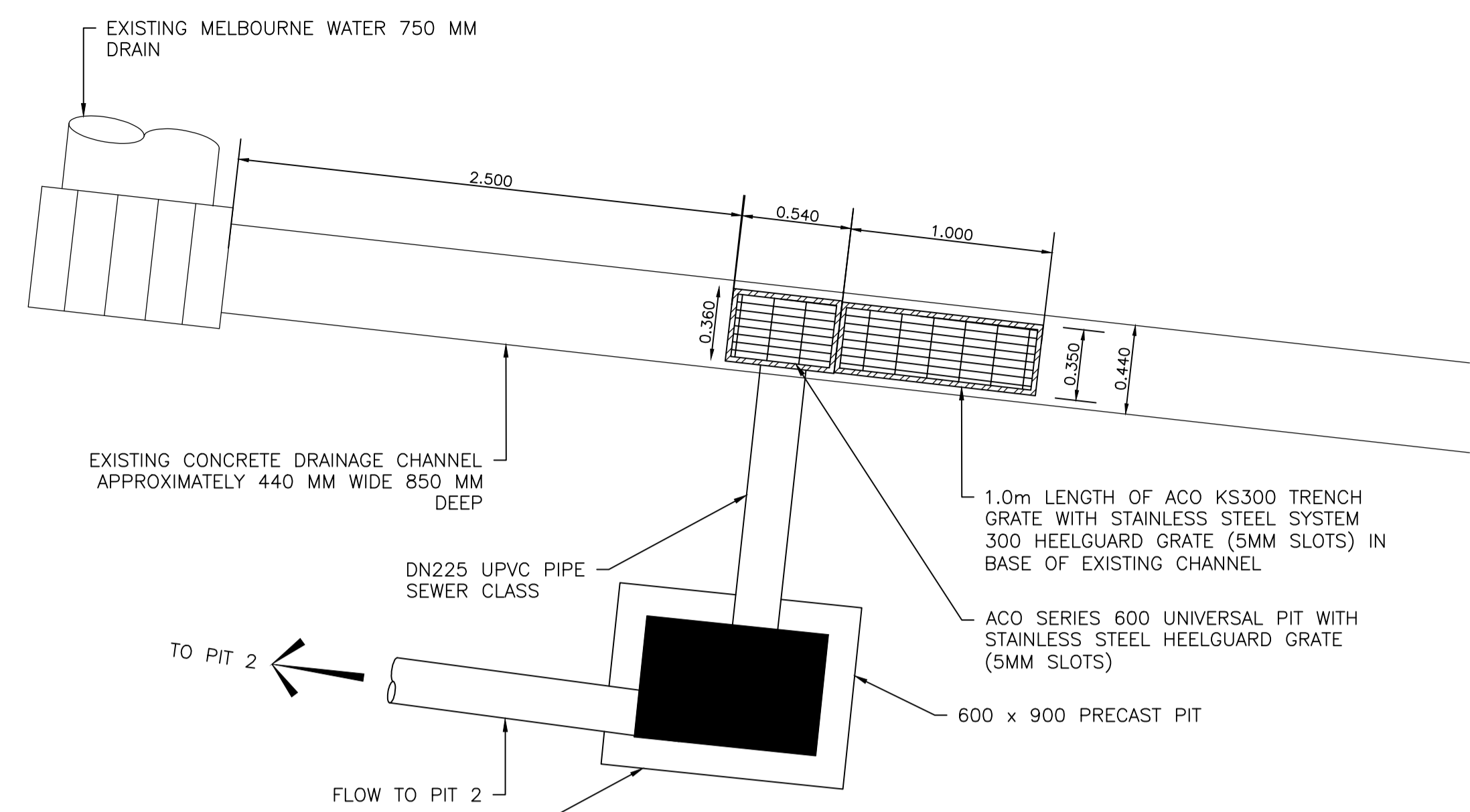
MT WAVERLEY RESERVE
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ST ALBANS RD, MOUNT WAVERLEY
Details and Sections

Date 13.03.2012 Drawing No. 1254 02 D03 Sheet 03 of 06

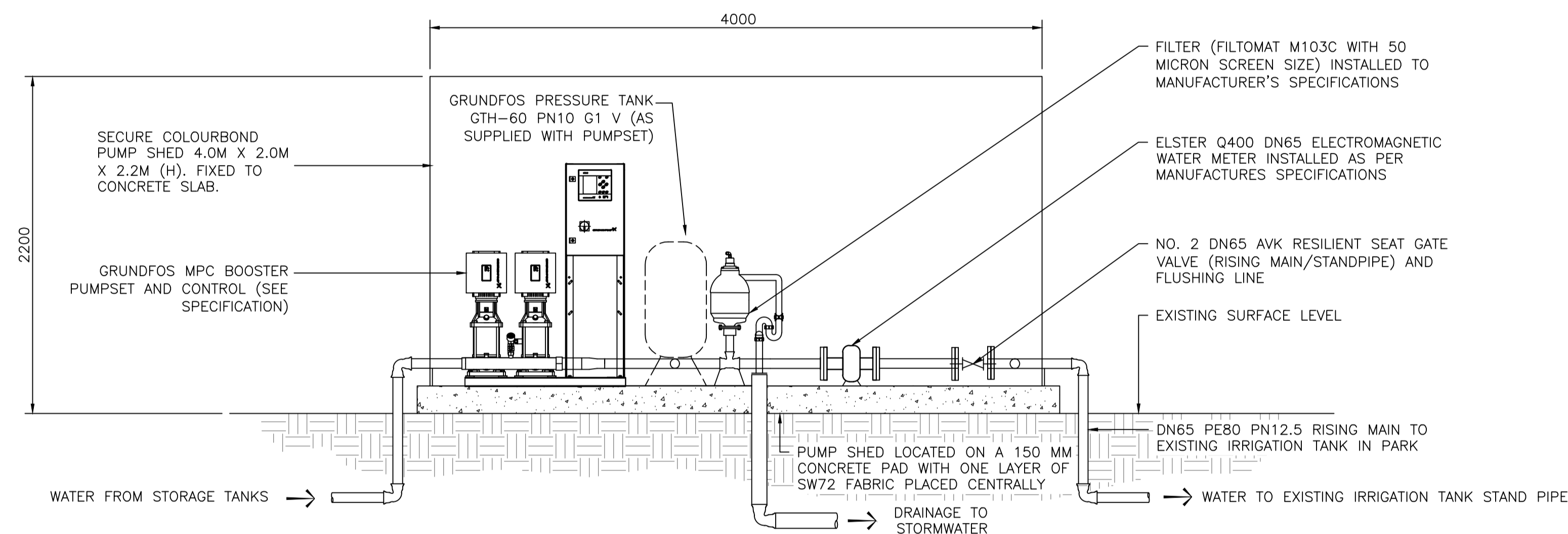
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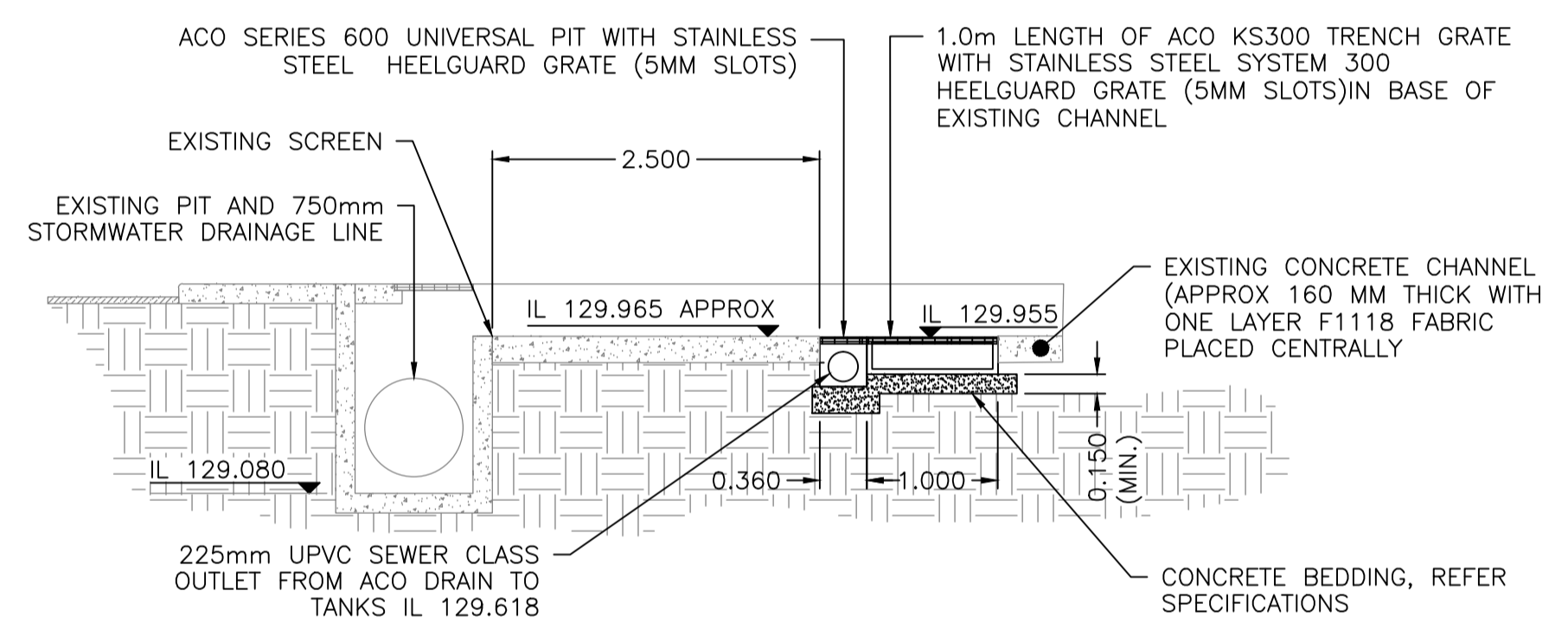
DETAIL 07: PUMP SHED
SCALE: 1:25



DETAIL 02: OFFTAKE
SCALE: 1:25

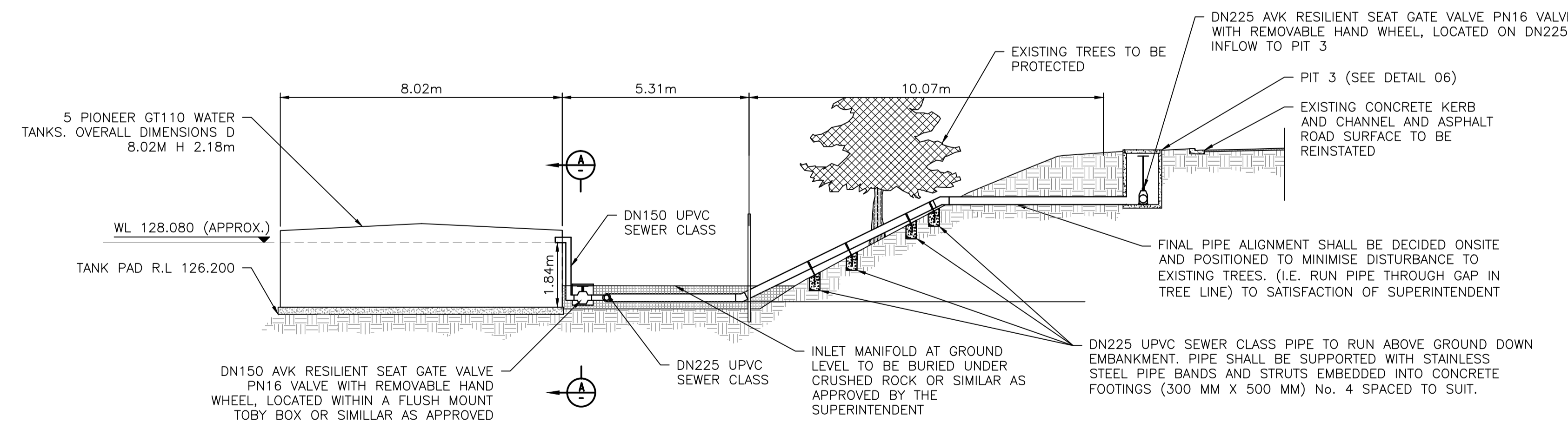


SECTION C-C:
SCALE: 1:25



SECTION D-D: OFFTAKE
SCALE: 1:50

MT WAVERLEY RESERVE



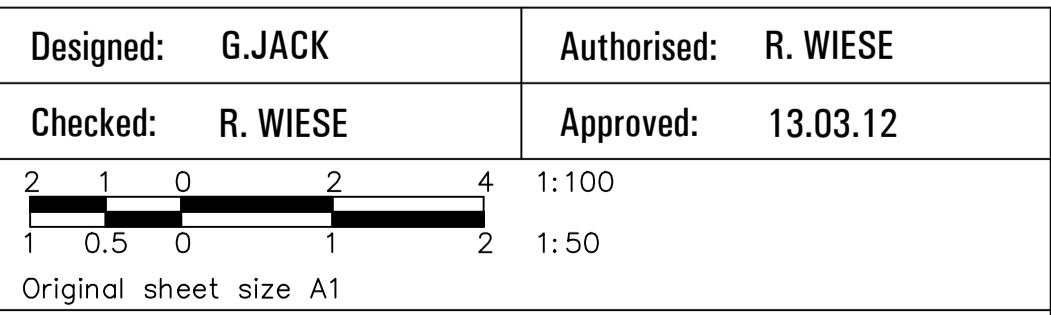
SECTION B-B:
SCALE: 1:100

MELBOURNE WATER RESERVOIR

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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 MANUFACTURERS 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 SHED. 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

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; AND ANY 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;

- PIT 1: 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

11.1 OFF TAKE PIT SCOPE

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 ASPHALT, 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 SHALL 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.

Table listing standards such as AS 1012 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, etc.

Table with columns for Designed (G.JACK), Authorised (R. WIESE), Checked (R. WIESE), and Approved (13.03.12). Includes revision table and 'For Tender' stamp.

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