For and on behalf of:

SOUTH AFRICAN NATIONAL SPACE AGENCY

TENDER NUMBER: XXXXXXX

CONSTRUCTION OF THE SANSA SPACE WEATHER CENTRE

ERVEN 252, 5298 & 5365 - HERMANUS

CIVIL WORKS SPECIFICATION

Internal Ref. No: 20005-SANSA-C-TenderSpec-001
Date: 2020-10-08
Rev: 00

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CIVIL ENGINEERING PROJECT SPECIFICATION

1 CONSTRUCTION

The latest SANS 1200 Standard Specifications for Civil Engineering Construction shall be applicable to this contract as well as the latest SANS 1058, Concrete paving blocks.

For the purpose of this Contract the following standardised specification sections of the SANS 1200 series and SANS 1058:2012 shall form part of the Contract Document (although not issued or bound in with the Tender Document):

SANS 1200	Title
A	General
AB	Engineer's Office
C	Site Clearance
D	Earthworks
DB	Earthworks (Pipe Trenches)
DM	Earthworks (Roads Subgrade)
GA	Concrete (Small Works)
L	Medium Pressure Pipelines
LB	Bedding (Pipes)
LC	Cable Ducts
LD	Sewers
LE	Stormwater Drainage
M	Roads (General)
ME	Subbase
MH	Asphalt Base and Surfacing
MF	Base
MJ	Segmented Paving
MK	Kerbing and Channeling
MM	Ancillary Roadworks

SANS 1058:2012	Title
Edition 2.1	Concrete Paving blocks

The successful contractor shall at his own cost issue all notices in respect of the installation to the Local Authorities and shall exempt the Administration from all losses, costs or expenditures which may arise as a result of the Contractor's negligence with the requirements of the regulations listed above.

2 EXISTING SERVICES

2.1 The Contractor shall note that although the drawings have been prepared using available information they show only the approximate positions of existing services where applicable.

2.2 The information is supplied in good faith but shall be used as a guide only and does not relieve the Contractor of his responsibility to exercise due caution when working in areas where existing services can reasonably be expected, nor his obligation to liaise with the authorities in this regard and the obtaining of the necessary work permits and wayleaves.

2.3 The Contractor shall be responsible to locate and safeguard any existing service he may encounter during construction. The Contractor shall be responsible for any damage to such existing services and works in the execution of this contract and shall reimburse the Employer, authority or the owner concerned for any repairs required following damages due to the Contractor's negligence.

2.4 The Contractor shall be responsible for immediately notifying the Engineer and the authorities concerned regarding any damage caused to public services and existing works.

2.5 Any alterations to public services shall be carried out by the Authority concerned unless the Contractor is instructed otherwise.

3 MINIMAL DISTURBANCE TO ENVIRONMENT

3.1 The site and surroundings are to be kept clean from building rubble, waste etc. throughout the duration of the Contract. Roads used for transporting material shall be kept clean and dirt free on a daily basis. No separate payment will be made for this and it will be deemed to be included in the rates tendered for the relevant items.

3.2 Stacking of cut-down trees and vegetation on-site is not allowed as this is a possible fire-hazard. Under no circumstances will the burning of rubble, trees or bush be allowed on site.

4 SITE MAINTENANCE

4.1 During the progress of the work as well as upon its completion, the site of the works shall be kept and left in a clean and orderly condition. The Contractor shall at all times store materials and equipment for which he is responsible in an orderly manner and shall keep the site free from debris and obstruction.

5 SPOIL MATERIAL

5.1 No indiscriminate spoiling of material on site or elsewhere will be allowed. All surplus or unsuitable material shall be spoiled at a site to be provided by the Contractor and approved by the Engineer. Such site shall meet with the approval of the local authority within whose area it falls and the spoiling shall comply with all the statutory and municipal regulations.

5.2 Refer to Clause 14, Transport of Materials regarding costs associated with transport of materials and/or spoil.

6 TESTING AND QUALITY CONTROL

6.1 The Contractor shall engage the services of an approved and independent testing laboratory for the testing of materials and the quality testing of layerworks to ensure that his work conforms to the specifications.

6.2 No separate payment will be made for contracting the services of an approved laboratory and the costs for complying with this requirement will be deemed to be included in the Contractor's tendered rates for the various items of work requiring testing in accordance with the specifications.

6.3 The results of all tests performed during the course of the Contract will be made available to the Engineer as soon as these become available.

7 SAMPLES

7.1 The Contractor shall at his own cost supply all samples that may be required. Material or work not conforming to the approved samples shall be rejected. The Engineer reserves the right to submit samples to any tests to ensure that the material represented by the sample conforms to the requirements of the specifications.

8 PROPRIETARY MATERIALS

8.1 Where proprietary materials are specified and the contractor elects to propose an alternative, information shall be supplied to indicate the quality or type of materials or articles offered, and where the terms "or other approved" or "or approved equivalent" or "similar approved" or “equally approved” are used in connection with proprietary materials or articles, it is to be understood that the approval shall be at the sole discretion of the Engineer.

9 MANUFACTURERS INSTRUCTIONS

9.1 The recommendations of the manufacturers of patented materials must be strictly adhered to regarding the use, mixing, application, fastening, etc. thereof except when otherwise instructed in writing by the Engineer.

10 SETTING-OUT OF WORKS

10.1 Reference and level beacons will be shown to the Contractor by the Engineer at the commencement of the Contract and the Contractor will be responsible for transferring the datum to the Site of Works.

10.2 The Contractor shall check the condition and accuracy of all reference and level beacons and satisfy himself that they have not been disturbed and are true with regard to position and level. A beacon that has been disturbed shall not be used until its true position and level have been re-established and the new values have been certified by the Engineer. The Contractor shall thereafter be held entirely responsible for the protection of all reference and level beacons.

10.3 The Contractor shall employ a capable surveyor to set out the Works to the required lines and levels. The Engineer shall be informed immediately should any discrepancy be discovered between the levels or dimensions obtained by the Contractor and those shown on the drawings.

10.4 Where a beacon is likely to be disturbed during construction operations, the Contractor shall establish suitable reference beacons at locations where they will not be disturbed during construction. No beacons shall be covered over, disturbed or destroyed before accurate reference beacons have been established and details of the positions and levels of such beacons have been submitted to the Engineer. The Contractor's reference beacons shall be of at least the same accuracy and sturdiness of construction as the existing beacons.

10.5 The Contractor shall submit the method of setting out he proposes to employ to the Engineer. Accurate control of line and level shall be provided by the Contractor at all stages of construction.

10.6 Work set out by the Contractor may be checked by the Engineer and any errors found shall be rectified by the Contractor at his own expense. The Contractor shall supply any instrument, equipment, material and labour required by the Engineer for this survey work. Any assistance, including checking given to the Contractor by the Engineer or any setting out done by the Engineer for Contractor shall not be held as relieving the Contractor of his responsibility for the accurate construction of the Works.

10.7 The Contractor's survey instruments and survey equipment shall be suitable for the accurate setting out of the Works and shall be subject to the approval of the Engineer. They shall furthermore be checked and correctly adjusted by the authorized agents before the commencement of the contract and subsequently when required by the Engineer and when otherwise necessary.

10.8 Survey work shall not be measured and paid for directly and compensation for the work involved in setting out shall be deemed to be covered by the rates tendered and paid for the various items of work included under the contract.

11 NOTICES, SIGNS, BARRICADES & ADVERTISEMENTS

11.1 The Contractor shall erect the necessary signs, notices and barricades for the duration of the contract in order to safeguard both the Works and the public.

11.2 Notices, signs and barricades as well as advertisements may be used only upon approval by the Engineer and the Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

11.3 The Engineer shall have the right to have any sign, notice or advertisement moved to another position or to have it removed from the site of the works should it in any way prove to be unsatisfactory, inconvenient or dangerous to the general public.

11.4 The standard name board of the South African Association of Consulting Engineers is specified, the cost of which shall be included in the rates tendered under Section 1200 A of the Schedule of Quantities.

12 CONSTRUCTION IN LIMITED AREAS

12.1 In certain cases working space may be limited. The method of construction in these restricted areas will depend largely on the Contractor's plant. However, the Contractor must note that measurement and payment will be according to the specified cross-sections and dimensions irrespective of the method used to achieve these cross-sections and dimensions and that the rates and prices tendered shall be deemed to include full compensation for any difficulty encountered while working in limited areas and narrow widths and that no extra payment will be made, nor will any claim for payment due to these difficulties be considered.

13 LENGTH OF TRENCHES

13.1 Where no limitations are imposed by construction stages and unless otherwise permitted in writing by the Engineer, not more than 100 m of trench in any one place shall be opened in advance of pipe laying operations.

13.2 No trench may be left open outside of working hours unless suitably protected and safeguarded and so approved by the Engineer.

14 TRANSPORT OF MATERIAL

14.1 All costs of transporting material, including overhaul, shall be included in the applicable tendered rates. All references in the specifications to transport, overhaul and haul distances shall be deleted irrespective of whether or not the deletion is included in these project specifications.

15 GENERAL NOTES

15.1 All civil drawings to be read in conjunction with the drawings showing the standard details, the project specifications and the relevant SABS specifications.
15.2 The Engineer is to be given the opportunity to inspect all pipes before backfilling commences.
15.3 The position of all existing services as shown on the drawings is only schematic. The Contractor is responsible for locating and protecting all existing services.
15.4 Assistance from the various local authorities to be obtained to assist with the identification and location of all existing services.
15.5 All reinstatement of road crossings are to be backfilled with 3% cement stabilized backfill material.
15.6 Compaction of backfill to trenches to be confirmed by in-situ Nuclear Density tests at a rate of 1 test per 10m of trench.
15.7 Sand replacement test for calibration purposes is to be done every 50m.

16 EARTHWORKS

16.1 All earthworks to be carried out in accordance with SANS 1200 D 1988.
16.2 Selected layer (on reduced bulk excavation bed) in accordance with SANS 1200 DM.
16.3 Small works in accordance with SANS 1200 D.
16.4 Pipe trenches in accordance with SANS 1200 DB.
16.5 Site clearance and grubbing operations shall be carried out in accordance with SANS 1200 C.
16.6 The contractor to identify and expose, where relevant, all underground services on site. He should liaise with all relevant authorities for the location and protection of these services.
16.7 All unsuitable materials i.e. roots, concrete pipes, old foundations, building rubble etc. shall be disposed of to a suitable dumping site and the rate must include transport to dumping site as well as all dumping charges if applicable.
16.8 Top soil only to be stockpiled on instruction by the engineer.
16.9 The rate for Cut to Spoil of excavated material must include the transport and spoil to an approved site of the contractors choice.
16.10 All approved material to be stockpiled separately, and later be re-used as per Architects/Engineers instructions.
16.11 The Contractor is to use only approved fill material as specified by the Engineer.
16.12 All exposed reduced excavation beds and areas to receive fill shall be cleared, ripped, wetted and compacted to 93% MOD AASHTO. to a depth of 150mm unless noted otherwise.
16.13 All areas in cut shall be ripped, scarified to a depth of 150mm and re-compacted to 93% MOD AASHTO (or 100% Mod AASHTO for sand).
16.14 The Contractor shall timeously submit field and laboratory test results of relative compaction densities, CBR indicator tests or any other test results as required, to the Engineer.
16.15 Field Density Tests:

- Field density tests should be carried out at a rate of 1 test per 150 m^2 per layer.
- The position of tests and layers tested to be indicated on a key plan and submitted with the results to the Engineer.
- Tests to be done by an independent laboratory approved by the Engineer.
- Position of tests to be approved by the Engineer.
- One of the density tests should be a sand replacement test / 10 Troxler tests and evenly spread over all layers.

16.16 The contractor should make provision for stormwater control and keeping all excavations dry.
16.17 Maximum cut slopes to be 1:1 and fill slopes to be 1:2 unless otherwise stated.
16.18 As built survey information (x, y & z) to be handed to the Engineer after completion of earthworks.

17 LEVEL TOLERANCE

17.1 All level tolerances for earthworks to be degree of accuracy II (SANS 1200 D) but the smoothness tolerance on the excavation/filled up terrace platforms shall be such that no unevenness will be greater than 50mm over 4m.

18 CONCRETE BLOCK PAVING

18.1 Construction of roads and paving to comply with the specification of SANS MJ.
18.2 All horizontal dimensions are to paving face of kerbs.
18.3 All concrete block and brick paving to be laid in herringbone pattern unless otherwise specified.
18.4 All edges of block paving to be cut to suit line of kerbs and grouted solid.
18.5 Haunching behind kerbs to be inspected by the Engineer prior to backfilling.
18.6 Each layer of road construction to be tested by an independent laboratory at the rate of one test per 150 sq m.
18.7 Paving must be installed as per the Concrete Manufacturers Association, Concrete Block Paving Book 3 and 4.
18.8 Paving must join the channels with a 10mm step so that the water will drain freely into the direction as designed.
18.9 Sand cement infill must be used only under down pipes and paved water channels.

19 ROADWORKS

19.1 This clause to be read in conjunction with Special Notes on Drawing number 20005-SANSA-C-SW001.
19.2 Construction of roads to comply with the relevant specification of SANS M.
19.3 All horizontal dimensions are to the face of kerbs.
19.4 Haunching behind kerbs to be inspected by the Engineer prior to backfilling.
19.5 Each layer of road construction to be tested by an independent laboratory at the rate of one test per 150m².

20 SEWER SYSTEM

20.1 This clause to be read in conjunction with Special Notes on Drawing number 20005-SANSA-C-FS001.
20.2 Manholes are to be finished flush with final ground levels unless otherwise shown.
20.3 Manholes outside of trafficked areas and walkways are to protrude 50mm above final ground levels unless otherwise shown.
20.4 Sewer reticulation network to be pressure tested to SANS 1200 LD specifications.
20.5 All pipes to be 160mm diameter uPVC Class 34 Heavy Duty Pipes to SANS 791 unless otherwise shown.
20.6 Backfill around manholes to be cement stabilized to the Engineers specification.
20.7 Compaction of backfill to trenches to be confirmed by in-situ compaction tests at a rate of 1 test/layer/5m of trench.
20.8 As built survey information (x, y & z) to be handed to the Engineer after completion of The Works.

21 STORMWATER SYSTEM

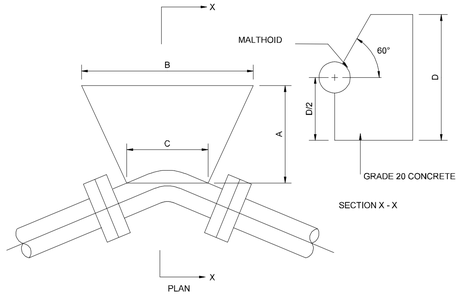
21.1 This clause to be read in conjunction with Special Notes on Drawing number 20005-SANSA-C-SW001.
21.2 Backfill around manholes to be cement stabilized to the Engineer's specification.
21.3 All pipes to be class 100D concrete spigot and socket type unless otherwise shown.
21.4 All pipes to be inspected by the Engineer before backfilling.
21.5 Compaction of backfill to trenches to be confirmed by in-situ compaction tests at a rate of one test/layer/5m of trench.
21.6 As built survey information (x, y & z) to be handed to the Engineer after completion of The Works.

22 WATER RETICULATION

22.1 This clause to be read in conjunction with Special Notes on Drawing number 20005-SANSA-C-PW001.
22.2 Thrust blocks of Grade 20/19 MPa concrete to be provided at all T pieces, valves and bends.
22.3 All mild steel fittings are to be protected with copon.
22.4 Pipe bedding to comply with SABS 1200 LB.
22.5 All backfill material to be compacted to 95% MOD AASHTO.
22.6 Pipe fittings and thrust blocks to be inspected by the Engineer before backfilling commences.
22.7 Water reticulation network to be pressure tested to the Engineer's specifications.
22.8 All Tees to be ductile iron.
22.9 All flanges to be mild steel welded on and drilled to SABS 1123: tables 10, 15, 25.
22.10 As built survey information (x, y & z) to be handed to the Engineer after completion of The Works.

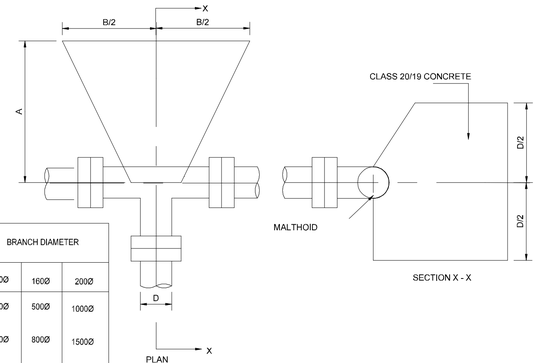
NOTES:

1. THESE DIMENSIONS AND THE FORM OF THE BLOCK ARE INTENDED AS A GUIDE ONLY. THE FINAL SHAPE IS TO BE DETERMINED ON SITE.
2. WHERE POSSIBLE THE BLOCK IS TO BE CAST AGAINST UNDISTURBED INSITU MATERIAL.
3. THE COUPLINGS MUST REMAIN FLEXIBLE AND REMOVABLE.
4. THRUSTBLOCKS FOR PIPES LARGER THAN 200Ø TO BE INDIVIDUALLY DESIGNED THE ENGINEER.
5. THRUSTBLOCK IN CLAY MATERIAL TO BE INDIVIDUALLY DESIGNED BY THE ENGINEER.



	DIMENSION	110 Ø	160 Ø	200 Ø
11 ¼°	A	500	500	500
	B	250	250	350
	C	150	150	150
	D	500	600	700
22 ½°	A	500	500	950
	B	250	300	550
	C	150	150	180
	D	500	600	700
45°	A	500	500	900
	B	400	600	1100
	C	210	320	380
	D	500	600	700
90°	A	500	550	1100
	B	600	1100	2000
	C	300	450	600
	D	500	600	700

THRUSTBLOCKS FOR BENDS

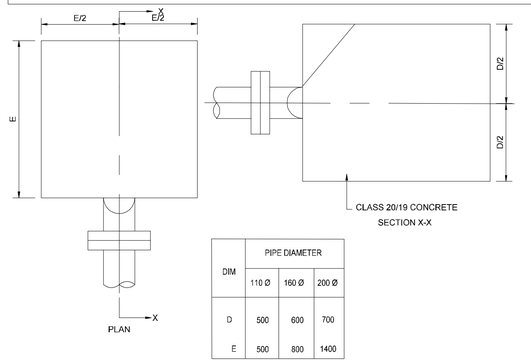


DIMENSION	BRANCH DIAMETER		
	110Ø	160Ø	200Ø
A	400Ø	500Ø	1000Ø
B	600Ø	800Ø	1500Ø
C	200Ø	300Ø	400Ø
D	500Ø	600Ø	700Ø

THRUSTBLOCKS FOR ENCAPS AND TEES

NOTES:

1. THESE DIMENSIONS AND THE FORM OF THE BLOCK ARE INTENDED AS A GUIDE ONLY. THE FINAL SHAPE IS TO BE DETERMINED ON SITE.
2. WHERE POSSIBLE THE BLOCK IS TO BE CAST AGAINST UNDISTURBED INSITU MATERIAL.
3. THE COUPLINGS MUST REMAIN FLEXIBLE AND REMOVABLE.
4. THRUSTBLOCKS FOR PIPES LARGER THAN 200Ø TO BE INDIVIDUALLY DESIGNED THE ENGINEER.
5. THRUSTBLOCK IN CLAY MATERIAL TO BE INDIVIDUALLY DESIGNED BY THE ENGINEER.

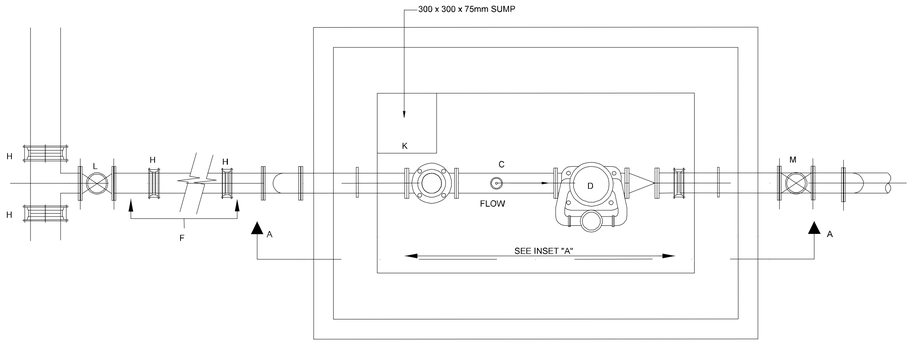


DIM	PIPE DIAMETER		
	110 Ø	160 Ø	200 Ø
D	500	600	700
E	500	800	1400

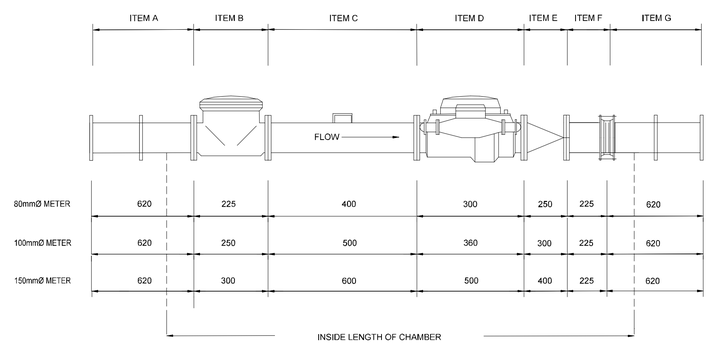
THRUSTBLOCKS FOR END CAPS

INSET "B"

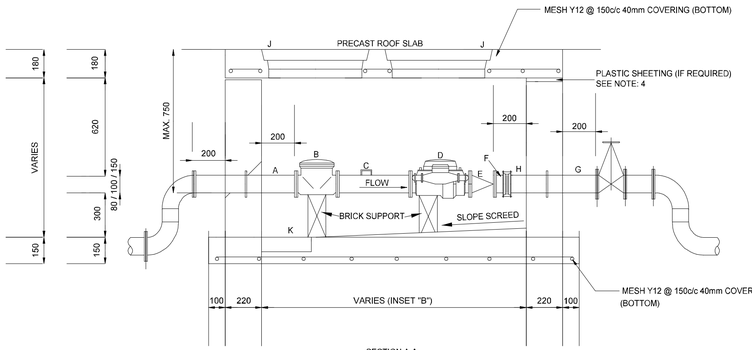
CHAMBER DIMENSIONS		FLOOR SLAB	WATER METER
INSIDE DIMS	OUTSIDE DIMS	OUTSIDE DIMS	METER SIZE
1800x900	2240x1340	2440x1540	80mm
2035x900	2475x1340	2675x1540	100mm
2425x900	2865x1340	3065x1540	150mm

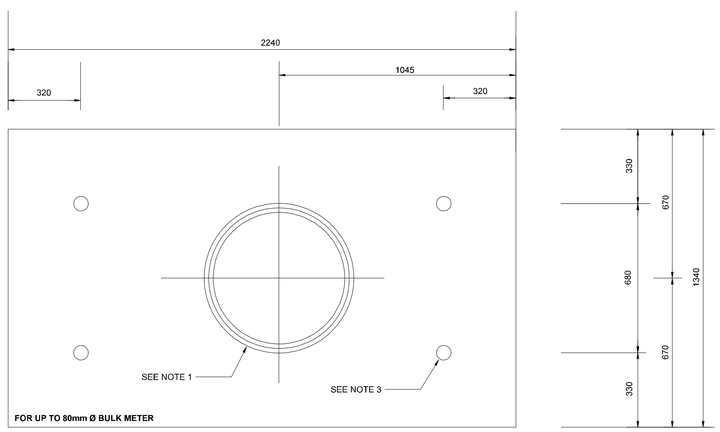


PLAN



BULK WATER METER PLAN VIEW





BULK WATER METER SECTION & NOTES

PARTS LIST:

ITEM A: PUDDLE PIECE, FLANGED / T16
ITEM B: STRAINER, FLANGED / T16 / (SENSUS)
ITEM C: SPOOL PIECE, FLANGED / T16 (BOTH SIDES) WITH PRESSURE NIPPLE & 25mmØ BALL VALVE
ITEM D: COMBINATION WATER METER, FLANGED / T16 (SENSUS)
(SENSUS, MEITWIN = 80 & 100mm)
(SENSUS, WPVD = 150mm)
ITEM E: (AVK SWING CHECK VALVE)* , FLANGED / PN16 / T16
ITEM F: FLANGED ADAPTOR , T16
ITEM G: PUDDLE PIECE, PLAIN & FLANGED ENDED / T16
ITEM H: VIKING JOHNSON COUPLING
ITEM J: 60ØØ, LIGHT DUTY, DUCTILE IRON & FRAME (HINGE WITH SNAP LOCK)
ITEM K: SUMP
ITEM L: MUNCIPAL VALVE TO BE LHC (AVK TYPE 1)* WITH CAP TOP
ITEM M: CONSUMER VALVE TO BE RHC (AVK TYPE 1)* WITH HAND WHEEL
*AVK OR SIMILAR APPROVED BY PROJECT ENGINEER

NOTES:

NOTE 1: DUCTILE IRON COVER FRAMES TO BE PLACED ABOVE WATER METER & STRAINER
NOTE 2: CUT & BEND MESH TO SUIT COVER OPENING & SUMP
NOTE 3: PROVIDE 4 No. 40mmØ LIFTING HOLE IN ROOF SLAB (PLUGGED WITH BITUMEN AFTER ROOF SLAB IS IN PLACE TO PREVENT WATER SEEPAGE)
NOTE 4: PLASTIC SHEETING 375 MICRON EMBOSSED DPC SABS 952/1962 TYPE B TO BE PLACED ON WALLS BEFORE PLACING ROOF SLAB IN PLACE AND SEAL INTERNAL AND EXTERNAL JOINTS WITH SIKAFLEX-PRO 2HP
NOTE 5: CONCRETE GRADE 25 / 19 FOR FLOOR AND ROOF SLABS
NOTE 6: AVOID PLACING THE METRE CHAMBER IN THE ROAD AND ENTRANCES WHEREVER POSSIBLE
NOTE 7: CHAMBER WALLS TO BE PLASTERED, EXTERNAL AND INTERNAL TO PREVENT SEEPAGE OF GROUND WATER INTO MANHOLE (PLASTER 13mm THICK, STEEL TROWELLED TO SMOOTH SURFACE.
NOTE 8: EXTERNAL PLASTERED WALLS TO BE COATED WITH 2 COATS FLINTKOTE (ABE) AND 1 FINAL COAT SILVACOAT (ABE) AND INTERNAL PLASTERED WALLS TO BE COATED WITH 3 COATS DURASLURRY (ABE)
NOTE 9: ALL FLANGES TO BE DRILLED T16
NOTE 10: VIKING JOHNSON COUPLING TO BE SEALED WITH DENSO TYPE
NOTE 11: ONLY STAINLESS STEEL 316L SHOULD BE USED FOR BOLTS & NUTS
NOTE 12: INTERNAL, PIPE PIECES SHALL BE COATED WITH 3 COATS CARBOLINE 891, MIN. TOTAL THICKNESS OF 250 MICRON
NOTE 13: EXTERNAL PIPE PIECES SHALL BE COATED WITH 3 COATS CARBOLINE 891, MIN. TOTAL THICKNESS OF 250 MICRON
NOTE 14: EXTERNAL VIKIMG JOHNSON / FLANGE ADAPTORS TO BE SEALED WITH DENSO TAPE
NOTE 15: EXTERNAL BENDS, TEE'S & FLANGE ADAPTORS SHALL BE COATED WITH 3 COATS CARBOLINE 891, MIN.
TOTAL THICKNESS OF 250 MICRON

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THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT's AND NWE DRAWINGS AND SPECIFICATIONS.

SPECIAL NOTES

REV	DESCRIPTION	BY	DATE

ISSUED FOR:

TENDER

NWE
CONSULTING ENGINEERS
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TEL. (+27) 21 914 2264
E-MAIL: admin@nweng.co.za / WEB: www.nweng.co.za

CLIENT:

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Fax: +27 (0) 28 312 2039

PROJECT NAME:

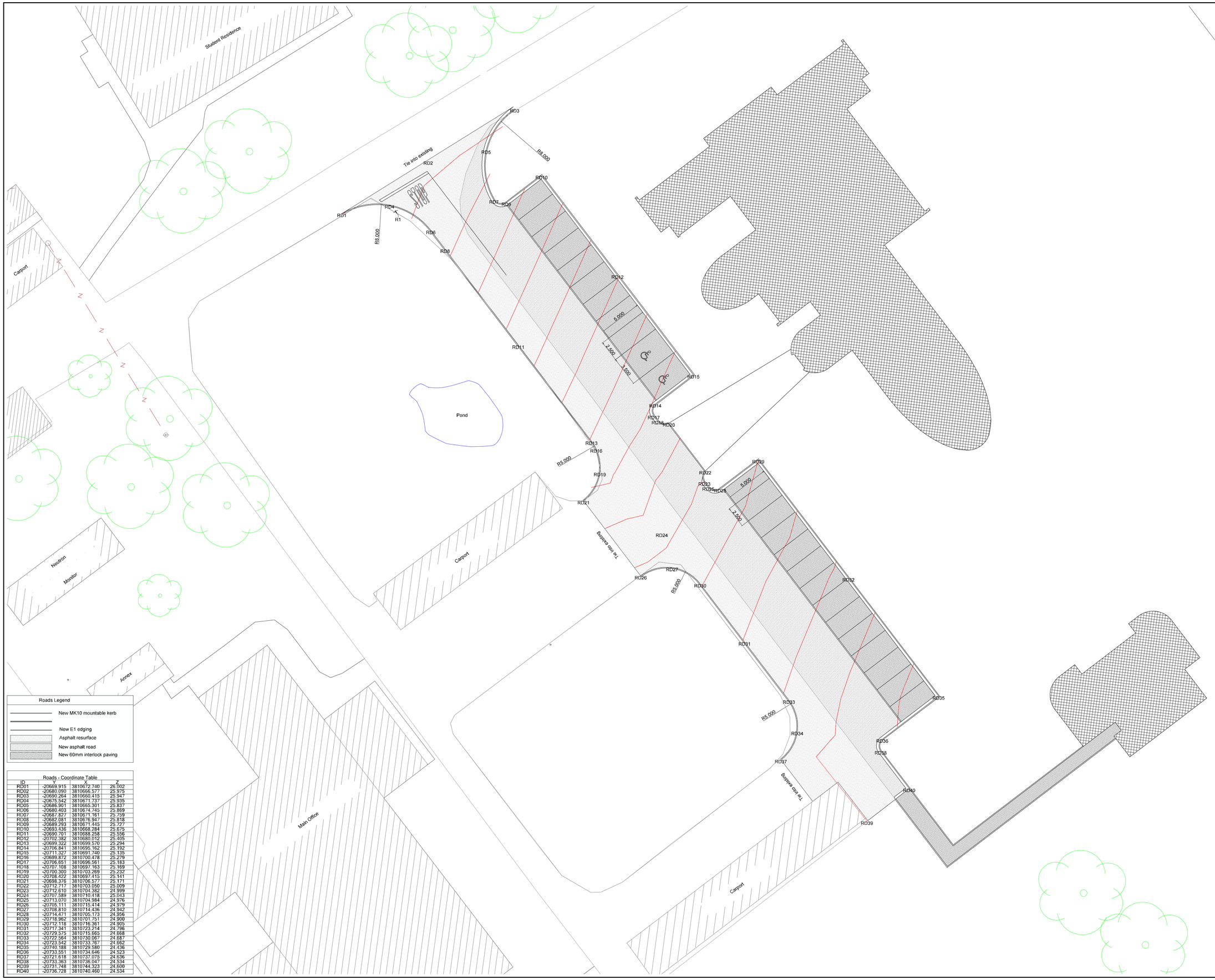
SANSA
SPACE WEATHER STATION

DRAWING TITLE:

TYPICAL DETAILS - SHEET 1

RESPONSIBLE PERSON	SIGNATURE + ECSA DETAILS	DATE
M Smuts (Pr Eng)	ECSA 960566	2020-10-14

NWE RESPONSIBLE PERSON		DATE:	SHEET SIZE:
DESIGN	TF Prinsloo	2020-10-14	A1
DRAWN	TF Prinsloo	2020-10-14	SCALE:
CHECKED	M Smuts	2020-10-14	NTS
DRAWING NO:			REVISION:
20005-SANSA-C-D001			**A**



Roads - Coordinate Table

ID	Y	X	Z
RD01	-20669.915	3810672.740	26.002
RD02	-20680.090	3810666.577	25.975
RD03	-20690.264	3810660.415	25.947
RD04	-20675.542	3810671.737	25.935
RD05	-20686.901	3810665.301	25.837
RD06	-20680.403	3810674.745	25.869
RD07	-20687.827	3810671.161	25.799
RD08	-20682.081	3810676.947	25.818
RD09	-20689.293	3810671.445	25.727
RD10	-20693.436	3810668.284	25.675
RD11	-20690.701	3810688.258	25.556
RD12	-20702.382	3810680.012	25.405
RD13	-20699.322	3810699.570	25.294
RD14	-20706.841	3810695.162	25.192
RD15	-20711.327	3810691.740	25.135
RD16	-20699.872	3810700.478	25.279
RD17	-20706.851	3810696.561	25.183
RD18	-20707.108	3810697.163	25.169
RD19	-20700.300	3810703.269	25.232
RD20	-20708.422	3810697.415	25.141
RD21	-20698.376	3810706.577	25.171
RD22	-20712.717	3810703.050	25.009
RD23	-20712.610	3810704.382	24.999
RD24	-20707.589	3810710.418	25.043
RD25	-20713.070	3810704.984	24.976
RD26	-20705.111	3810715.414	24.979
RD27	-20708.810	3810714.436	24.942
RD28	-20714.471	3810705.173	24.956
RD29	-20718.962	3810701.751	24.900
RD30	-20712.118	3810716.361	24.905
RD31	-20717.341	3810723.214	24.796
RD32	-20729.575	3810715.665	24.668
RD33	-20722.564	3810730.067	24.687
RD34	-20723.542	3810733.767	24.662
RD35	-20740.188	3810729.580	24.436
RD36	-20733.551	3810734.646	24.523
RD37	-20721.618	3810737.075	24.536
RD38	-20733.363	3810736.047	24.534
RD39	-20731.748	3810744.323	24.600
RD40	-20736.728	3810740.460	24.534

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SPECIAL NOTES

REV	DESCRIPTION	BY	DATE

ISSUED FOR:

TENDER

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PROJECT NAME:

SANSA
SPACE WEATHER STATION

DRAWING TITLE:

ROADS & PARKING

RESPONSIBLE PERSON	SIGNATURE + ECSA DETAILS	DATE
M Smuts (Pr Eng)	ECSA 960866	2020-10-14

NWE RESPONSIBLE PERSON		DATE:	SHEET SIZE:
DESIGN	TF Prinsloo	2020-10-14	A1
DRAWN	TF Prinsloo	2020-10-14	SCALE:
CHECKED	M Smuts	2020-10-14	1:200

DRAWING NO: **20005-SANSA-C-RD001**

REVISION: **A**

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SPECIAL NOTES

FOUL SEWER NOTES:

1. All gravity sewer pipes to be uPVC Class 34 (heavy duty) to SANS 791.
2. Rising main pipes shall be uPVC Class 12 pressure pipes to SANS 966.
3. Cover over building connections shall be at least 600 mm at the end cap and connection slope to be 1:60 minimum.
4. Pipe bedding to be for flexible pipes as per SANS 1200 LB.
5. Tests for sewers shall be carried out as per Part 7 of SANS 1200 LD.
6. The sewer pump station shall be ?????????.
8. The position of existing services as shown are schematic. The Contractor is responsible for the location of all existing services.
9. Assistance should be obtained from the various authorities to ensure that no other services exist.
10. The Contractor must verify all existing levels at connection points with new foul sewer system prior to any construction.
11. Refer to Mechanical Engineer's drawings for building plumbing interface.

REV	DESCRIPTION	BY	DATE

ISSUED FOR:

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PROJECT NAME:

SANSA
SPACE WEATHER STATION

DRAWING TITLE:

FOUL SEWER LAYOUT

RESPONSIBLE PERSON	SIGNATURE + ECSA DETAILS	DATE
M Smuts (Pr Eng)	ECSA 960566	2020-10-14

NWE RESPONSIBLE PERSON		DATE:	SHEET SIZE:
DESIGN	TF Prinsloo	2020-10-14	A1
DRAWN	TF Prinsloo	2020-10-14	SCALE:
CHECKED	M Smuts	2020-10-14	1:500

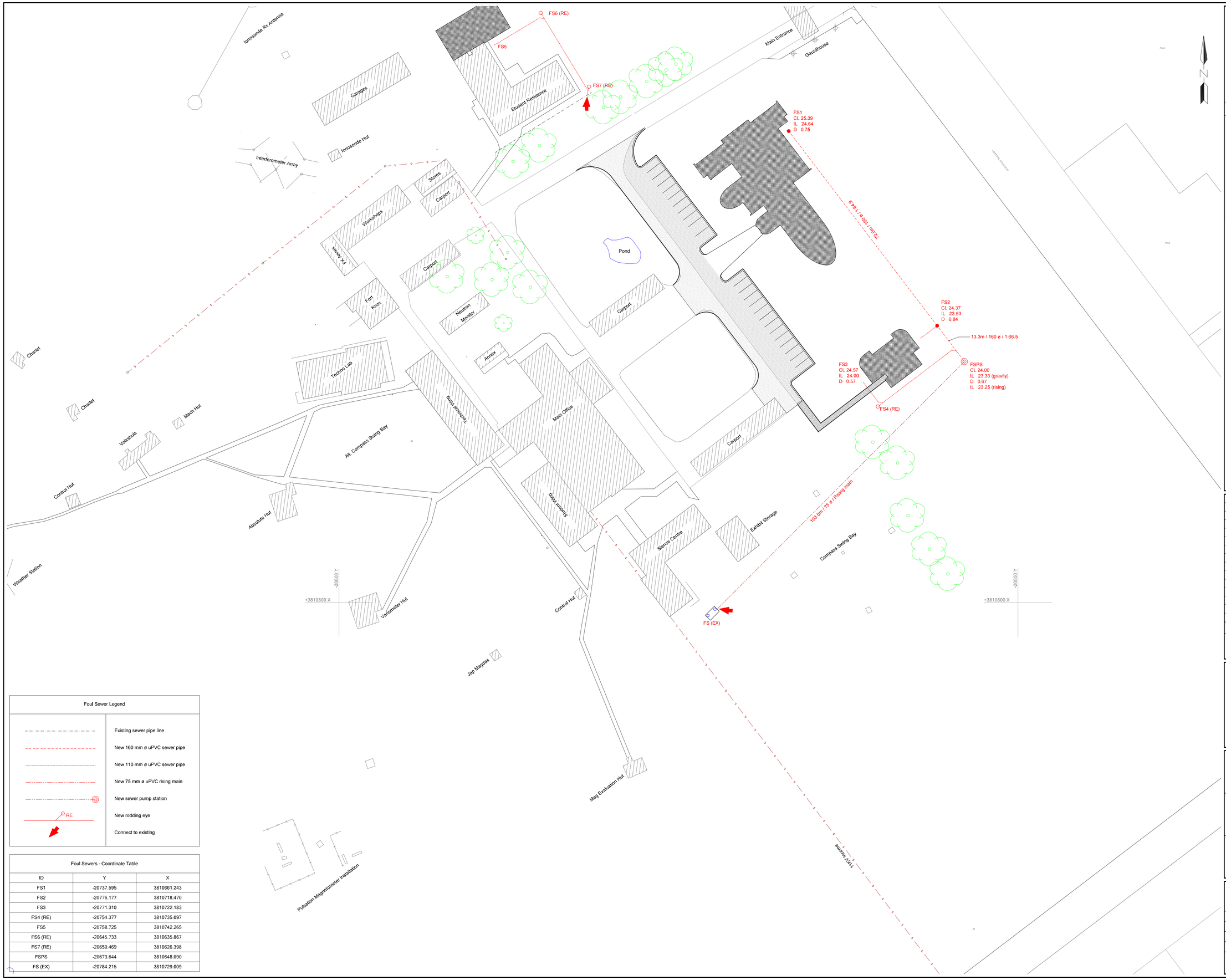
DRAWING NO: **20005-SANSA-C-FS001** REVISION: **A**

Foul Sewer Legend

	Existing sewer pipe line
	New 160 mm ø uPVC sewer pipe
	New 110 mm ø uPVC sewer pipe
	New 75 mm ø uPVC rising main
	New sewer pump station
RE	New rodding eye
	Connect to existing

Foul Sewers - Coordinate Table

ID	Y	X
FS1	-20737.595	3810661.243
FS2	-20776.177	3810718.470
FS3	-20771.310	3810722.183
FS4 (RE)	-20754.377	3810735.097
FS5	-20758.725	3810742.265
FS6 (RE)	-20645.733	3810635.867
FS7 (RE)	-20659.469	3810626.398
FSPS	-20673.644	3810648.090
FS (EX)	-20784.215	3810729.009



Stormwater Legend

Symbol	Description
(green dashed double line)	New concrete grass block lined channel
(dashed box with headwalls)	New 1200 x 450 mm box culvert & headwalls

Stormwater Channel - Coordinate List

ID	Y	X	Z
SW01	-20690.399	3810661.004	25.300
SW02	-20691.194	3810660.397	25.300
SW03	-20712.993	3810690.627	24.740
SW04	-20713.766	3810689.991	24.740
SW05	-20735.587	3810720.250	24.180
SW06	-20736.338	3810719.585	24.180
SW07	-20758.181	3810749.873	23.620
SW08	-20758.910	3810749.179	23.620
SW09	-20780.776	3810779.497	23.060
SW10	-20781.482	3810778.774	23.060
SW11	-20784.727	3810783.380	22.851
SW12	-20785.332	3810782.557	22.851
SW13	-20789.611	3810785.995	22.650
SW14	-20790.091	3810785.105	22.650
SW15	-20832.564	3810801.628	22.275
SW16	-20833.004	3810800.724	22.275
SW17	-20875.518	3810817.262	21.900
SW18	-20875.918	3810816.344	21.900

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SPECIAL NOTES

REV	DESCRIPTION	BY	DATE

ISSUED FOR:

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PROJECT NAME:

SANSA SPACE WEATHER STATION

DRAWING TITLE:

STORMWATER LAYOUT

RESPONSIBLE PERSON	SIGNATURE + ECSA DETAILS	DATE
M Smuts (Pr Eng)	ECSA 960566	2020-10-14

NWE RESPONSIBLE PERSON		DATE:	
DESIGN	TF Prinsloo	2020-10-14	SHEET SIZE: A1
DRAWN	TF Prinsloo	2020-10-14	SCALE: 1:500
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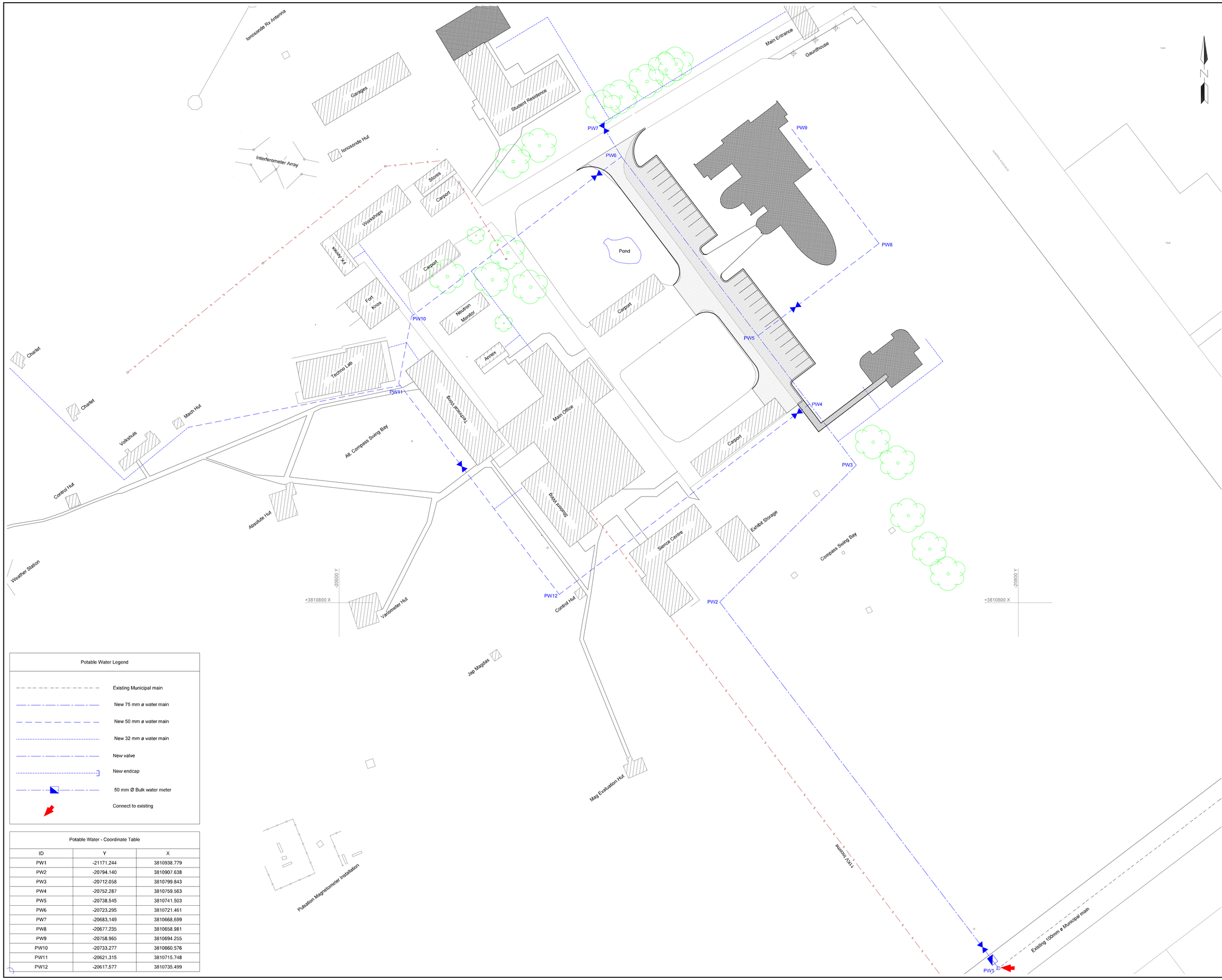
DRAWING NO: **20005-SANSA-C-SW001**			REVISION: **A**



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SPECIAL NOTES

POTABLE WATER NOTES:

1. Water main trench excavations to be 1m deep only.
2. Pipe bedding to comply with SANS 1200 LB.
3. All backfill material to be compacted to 93% Mod. AASHTO (100% for sand).
4. All 75 mm ø pipes to be Class 12, uPVC to SANS 966.
5. All 75 mm ø bends to be Class 12, uPVC.
6. All 75 mm ø reducing tees to be DI and fusion bond epoxy coated.
7. All 50 mm ø and 32 mm ø pipes to be HDPE PE80 PN12.5 to SABS ISO 4427.
8. All HDPE specials shall be with approved compression fittings.
9. Thrust blocks to be provided at all T pieces, bends and valves.
10. Pipe fittings and thrust blocks to be inspected by the Engineer before backfilling commences.
11. Water reticulation network to be tested in accordance to SANS 1200 L, Part 7 (Standard Hydraulic Pipe Test) specifications.
12. The position of existing services as shown are schematic.The Contractor is responsible for the location of all existing services.
13. Assistance should be obtained from the various authorities to ensure that no other services exist.
14. Plumbing interface / switch-over of existing buildings to new water network to be determined and coordinated on site.
15. Refer to Mechanical Engineer's drawings for plumbing interface on new buildings.

Potable Water Legend

- Existing Municipal main
- New 75 mm ø water main
- New 50 mm ø water main
- New 32 mm ø water main
- New valve
- New endcap
- 50 mm Ø Bulk water meter
- Connect to existing

Potable Water - Coordinate Table

ID	Y	X
PW1	-21171.244	3810938.779
PW2	-20794.140	3810907.638
PW3	-20712.058	3810799.843
PW4	-20752.287	3810759.563
PW5	-20738.545	3810741.503
PW6	-20723.295	3810721.461
PW7	-20683.149	3810668.699
PW8	-20677.235	3810658.981
PW9	-20758.965	3810694.255
PW10	-20733.277	3810660.576
PW11	-20621.315	3810715.748
PW12	-20617.577	3810735.499

REV	DESCRIPTION	BY	DATE

ISSUED FOR:

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PROJECT NAME:

SANSA
SPACE WEATHER STATION

DRAWING TITLE:

POTABLE WATER LAYOUT

RESPONSIBLE PERSON	SIGNATURE + ECSA DETAILS	DATE
M Smuts (Pr Eng)	ECSA 960566	2020-10-14

NWE RESPONSIBLE PERSON		DATE:	SHEET SIZE:
DESIGN	TF Prinsloo	2020-10-14	A1
DRAWN	TF Prinsloo	2020-10-14	SCALE:
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20005-SANSA-C-PW001			**A**