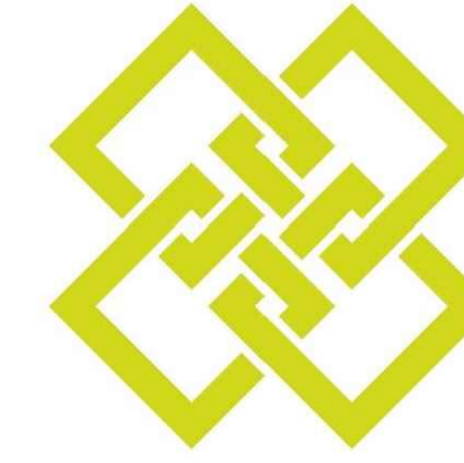


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CIVIL DRAWINGS

Issue Register		
Rev	Date	Description
A	16.05.2024	For Consent
B	17.05.2024	For Consent

Sheet No.	Rev	Date Issued	Sheet Title
C0.0	A	17.05.2024	General Notes and Legend
C1.0	A	16.05.2024	Site Plan
C1.1	A	17.05.2024	Pavement Details
C2.0	B	17.05.2024	Drainage Plan
C2.1	A	17.05.2024	Drainage Details
C3.0	A	16.05.2024	Earthworks Plan

NOTES:

REFERENCES

Survey: Procerto Group Ltd, survey undertaken 14-15/06/2023.
 Architectural: RM Designs, Job No. 22003, Plans Dated 13/05/2024.
 Geotechnical: Tetra Tech Coffey, "Reinforced Gravel Raft Design" Reference No. 773-CHCGE341448, Dated 23/04/2024.
 Resource Consent: N/A
 Hydraulics: HSC, "Hydraulic Services Design Drawings" Project No. 200250/2024, Dated 08.05.2024.
 Landscape: N/A

GENERAL

All work must comply with the approving authority engineering specifications
 Pavement in pedestrian area to be finished as per architect requirements.
 All services to be constructed in accordance with the requirements of the local regional council standards.
 All alternative products to be approved by Engineer.
 All services installed within the building envelope are indicative only, refer to Hydraulic Engineer, Electrical Engineer and Architects documentation for specific information.
 The contractor is responsible for all site setout.
 Ground levels on site and adjacent properties are to be confirmed prior to construction.
 Existing services and levels are indicated on Procerto Group Ltd, survey undertaken 14-15/06/2023.
 Engineer to be notified atleast 48 hours prior to any inspections required. Non-inspected will not be signed off by the engineer, this may result in additional work and/or delays at the cost of the contractor.

GENERAL EARTHWORKS

Unless stated otherwise, all works shall be undertaken in accordance with NZS 4431:1989, NZS 4404:2010, and any other requirements set by the Local Council. The Contractor shall engage a suitably qualified independent testing laboratory or consulting engineer to monitor the bulk fill preparation and placement and provide a certificate confirming the compaction works have met the specifications.
 The contractor shall co-operate with the engineer ahead of and during operations to avoid unnecessary over excavation.
 The contractor shall design and install all erosion and sediment control measures prior to commencement of construction works. The contractor shall also undertake earthworks in a controlled manner so that erosion from bare areas is kept to a practical minimum and eroded material is confined within the site and not allowed to enter waterways or stormwater drains. The contractor is to ensure that erosion and sediment control, and silt retention measures are in place at all times. All erosion and sediment control measures must comply with the local and/or district council guidelines.
 The engineer shall be notified 48 hours prior to when the final cut level is achieved and offer the engineer the opportunity to inspect the exposed subgrade.
 Prior to fill placement, the subgrade shall be proof-rolled, compacted and tested in a manner similar to that used on the layers of fill. Any resulting soft spots shall be brought to the attention of the engineer who shall determine if undercutting is required.
 The contractor must supply all maximum dry density (MDD) curves (developed in accordance with NZS4402: 1986 Test 4.1.1) and particle size distribution (PSD) graphs (developed in accordance with NZS4407:2015 Test 3.8.1).
 The materials shall be spread uniformly in layers not exceeding 225mm in thickness and conditioned to an appropriate average water content.
 The method of achieving the required compaction is the responsibility of the contractor, although control on layer depth etc., as specified in NZS4431:1989 shall be required.
 Fill materials shall be compacted to achieve the parameters specified below:

- AP40 and GAP40**
- Compaction, average result greater than 95% of MDD, individual result greater than 92% of MDD.
 - Air voids, average result less than 8%, individual result less than 10%.
 - Water content, average result within 3% of optimum, individual result within 5% of optimum.
 - CBR (%), average result greater than 35, individual result greater than 33.

GAP65

- Compaction, average result greater than 95% of MDD, individual result greater than 92% of MDD.
- Air voids, average result less than 8%, individual result less than 10%.
- Water content, average result within 3% of optimum, individual result within 5% of optimum.
- CBR (%), average result greater than 25, individual result greater than 23.

Non-Cohesive Fill

- Compaction, average result greater than 95% of MDD, individual result greater than 92% of MDD.
- Air voids, average result less than 8%, individual result less than 10%.
- Water content, average result within 3% of optimum, individual result within 5% of optimum.

Cohesive Fill

- Compaction, average result greater than 95% of MDD, individual result greater than 92% of MDD.
- Air voids, average result less than 8%, individual result less than 10%.
- Water content, average result within 3% of optimum, individual result within 5% of optimum.
- Undrained shear strength, average result 140kPa, individual result 120kPa.

The contractor shall be responsible for ensuring that the specified compaction parameters are achieved and shall carry out such testing as is needed to ensure the consistent quality of the fill.
 The tests described below shall be used to determine the classification and compaction standards of fill materials.
 Test: Insitu Density. Method: NZS 4407:1991 Tests 4.2.1, 4.2.2 (Nuclear Densometer) may be used as an approximate method.
 Test: Undrained shear strength. Method: In accordance with the guideline for hand held shear vane test, NZ geotechnical society, 2001.
 Frequency of Tests:
 In-situ density test (NDM), at least one test per 50m³ or at least one per 0.5m thickness of fill placed (whichever is less).
 Undrained shear strength, at least one test per 25m³ or at least two per 0.5m thickness of fill placed (whichever is less).
 Clegg impact hammer test of basecourse, at least one test every 10m alternate sides or at least one test every 100m².

STORMWATER AND WASTEWATER

Contractor to use latest versions of standards and specifications published unless stated otherwise.
 All works in private property shall comply with minimum requirements of the New Zealand Building Code, Clauses E1 - Surface water, G13 - Foul Water. The AS/NZS 3500 standard series provide means of compliances.
 All laterals must have a minimum diameter of 100mm unless shown otherwise.
 Unless specified otherwise, the contractor shall supply and deliver to site all pipes, junctions, precast manholes, granular bedding material and other design materials required for incorporation in the work.
 Materials shall be new, of good quality and free of defects.

- The design and installation of stormwater and wastewater pipes shall comply with the following standards:
- AS/NZS 1254:2010, PVC-U pipes and fittings for stormwater and surface water applications.
 - AS/NZS 1260:2009, PVC-U pipes and fittings for drain, waste and venting applications.
 - AS/NZS 2032:2006, installation of PVC pipe systems.
 - AS/NZS 2566.2:2002, buried flexible pipelines - installation.
 - AS/NZS 3725:2007, reinforced concrete pipe installation.
 - CPAA Engineering Guideline selecting materials for bedding steel reinforced concrete pipe.

All PVC-U pipes with cover depths complying with the Local Council's engineering specifications, any acceptable New Zealand city council design guidelines, NZBC and/or NZS4404, shall have minimum strength of SN10 (stormwater) and SN16 (wastewater).
 All reinforced concrete pipes with cover depths complying to the Local Council's engineering specifications, any acceptable New Zealand city council design guideline, NZBC and/or NZS4404, shall have minimum strength class 3.
 Concrete precast manholes shall comply with NZS 4058:2007 and shall have internal diameter of 1,050mm unless specified otherwise.

The contractor shall set out the works in accordance with the positions and levels shown on the drawings or otherwise provided by the engineer.
 Pipelines shall not be set out by use of laser equipment unless regular checks against reduced levels by conventional survey methods are also made to ensure cumulative errors do not occur.
 Unless otherwise specified, all stormwater and wastewater pipes shall be laid on and surrounded with imported compacted granular bedding to a height of at least 150mm above the pipe barrel. Granular bedding material shall consist of sand and gravels no larger than 10mm, free from vegetation, other organic matter or clay and from particles larger than 20mm, and in compliance with the requirements of this specification and the relevant AS/NZS pipelaying specification unless shown otherwise on the drawings.

Pipes shall be located in the trench not closer than 100mm from the trench wall unless specified otherwise.
 Manholes shall be constructed in reinforced concrete or using precast concrete elements in accordance with the drawings. Manhole inverts shall be cast in-situ, with channels formed in the concrete using glazed earthenware half pipes for all mains up to and including 300mm diameter. Inverts for larger mains shall be steel trowel finished cement mortar.

Where shown on the drawings. Y-junction pipes for service connections shall be inserted in stormwater and wastewater pipes, complete with inspection bends and concrete surround, Included riser pipes shall be used where appropriate to bring service connections to the required depths.

All sumps must be constructed as per the local council's specifications, any acceptable New Zealand city council design guideline, NZBC and/or NZS4404.
 The contractor shall test all stormwater pipes, wastewater pipes, connections and manholes for water tightness.
 Test results shall be recorded by the contractor in a neat clear form and provided to the engineer within 48 hours of completion of the testing.

Stormwater and wastewater pipes shall be tested by hydrostatic test specified in the local council's engineering specifications, any acceptable city council guideline, NZBC and/or NZS4404.
 Soakage pits shall be constructed to the dimensions and depths as shown on the drawings, manholes, pipes, geofabric, gravels and boulders, etc, shall be provided as shown on the drawings.
 Soakage and permeability field tests shall be carried out in accordance with the local council's engineering specifications, any acceptable New Zealand city council guidelines, NZBC and/or NZS4404.
 Prior to construction, the soakage pit test result shall be provided to the engineer for review and compliance confirmation.

WATER SUPPLY

All work shall comply with the local council's engineering specifications, any acceptable New Zealand city council design guidelines, NZBC and/or NZS4404.
 All work in private property shall comply with minimum requirements of the New Zealand Building Code, G12 - water supplies. the AS/NZS 3500 standard series provide means of compliances.
 Pipes, valves and fittings shall comply with the following standards as applicable:

- AS/NZS 4130: 2009, polyethylene (PE) pipes for pressure applications
- AS/NZS 3500.1: 2015, plumbing and drainage, part 1: water services
- NZS 7602: 1977, specification for polyethylene pipe (type 5) for cold water services
- AS/NZS 2033: 2008, installation of polyethylene pipe systems
- AS/NZS 2566.2: 2002, buried flexible pipelines - installation

Fire hydrant and surface box frames and covers shall comply with details shown on the drawings and the requirements of the local council's engineering specifications and meet the standards specified by BS750: 2012, specification for underground fire hydrants and surface box frames and covers.
 Toby boxes or alternative meter/valve box on water connection laterals shall comply with the requirements of the local council's engineering specifications.

Pipes shall be located in the trench not closer than 100mm from the trench wall.
 Cast in-situ anchor blocks shall be provided at all points where an unbalanced thrust occurs. this includes all bends, tees, valves, hydrants and reducers, dead ends, etc.
 Concrete required for anchor blocks and thrust blocks shall have minimum 28-day compressive strength of 17.5MPa (cast in-situ concrete) or 30MPa (precast concrete), complying with NZS 3109.
 A backflow preventer may be required to prevent flow of water in the opposite direction the premises back into the public water supply network wherewater pressure drops in the water distribution system. the backflow preventer shall be housed above ground in a lockable weather-proof cabinet where and when required unless otherwise specified.
 Unless otherwise specified all watermains and services shall be surrounded and backfilled to a height of 150mm above the pipe barrel with compacted granular material in compliance with the requirements of this specification and the relevant AS/NZS pipelaying specification unless shown otherwise in the drawing details.

The contractor shall test all watermains and connections against hydrostatic pressure to the satisfaction of the local council's engineering specifications and the engineer before completing backfilling, and any defective or leaking pipes, fittings or joints shall be replaced.
 Unless otherwise approved all pipelines shall be disinfected by the method specified in NZS 4404: 2010, Land Development and Subdivision Infrastructure Appendix C.

PAVEMENT

The contractor shall supply, spread, compact, trim and maintain the crushed rock, gravel, sand or mixtures all as specified, in accordance with the lines, grades, thicknesses and cross-sections shown on the drawings or directed by the engineer, within the tolerances specified.

All works shall comply with the local council's engineering specifications, NZTA and NZS4404.
 When the sub-grade has been brought to the formation levels shown on the drawings and compacted, it shall be tested by the contractor and results issued to the engineer for approval.
 It is the contractor's responsibility to verify the sub-grade conditions and submit the test results to the engineer before placing the sub-base materials.

For flexible pavements the contractor shall supply a two-axle truck with twin tyres on the rear axle, loaded to eight tonnes on the rear axle. a weighbridge docket certifying the rear axle weight shall be given to the engineer. Benkelman beam tests will be in accordance with the local council's engineering specifications, NZTA and NZS4404. minimum deflection of the pavement to be specified by the engineer.
 Material for construction of sub-base shall comply with the requirements of TNZ specification M/3 with regards to a general all passing (GAP) 65mm product.
 Grading of the sub-base material shall be in accordance with the the local council's engineering specifications, NZTA and NZS4404.

Sub-base material shall be placed and compacted in uniform near horizontal layers not exceeding 225mm uncompacted thickness, and shall not be placed during or immediately following wet weather, or on saturated ground.
 Aggregate for construction of basecourse layers shall be crushed rock, free from silt or clay lumps, weathered or disintegrated rock, organic and other non-mineral matter. unless otherwise specified or shown on the drawings:

- For hardstand area, basecourse material shall comply with the most recent TNZ specification M/4, "crushed basecourse aggregate", grading M/4 AP40.
- For footpaths, basecourse material shall comply with the most recent tnz specification M/4, "crushed basecourse aggregate", grading AP20.

It is the contractor's responsibility to verify the sub-base compaction and submit the test results to the engineer before placing the basecourse materials.
 Grading of the basecourse material shall be in accordance with the requirements specified in the local council's engineering specifications, NZTA and NZS4404.

Basecourse material shall be placed and compacted in layers with an uncompacted thickness not exceeding 225mm and conditioned to an appropriate average water content. each layer shall be compacted by multiple passes of a smooth steel wheeled roller or other plant approved by the engineer, to not less than 95% of the maximum dry density obtained for the basecourse material by the New Zealand standard compaction test (NZS 4402, test 4.1.1), and so as to satisfy deflection requirements as specified by in the local council's engineering specifications and/or any acceptable New Zealand city council design guidelines and NZS4404.

Compaction of basecourse shall take place at a water content appropriate to the plant being used. if water is required to be added, a fine mist spray shall be used and excess water shall be prevented from damaging the sub-grade or sub-base. the uppermost layer shall be compacted and the finished surface proof rolled using a smooth steel wheeled roller, with rear rolls at least 500mm wide and loaded to not less than six tonnes per metre width.

It is the contractor's responsibility to verify the basecourse compaction and submit the test results to the engineer before placing the final surface material.
 Stormwater runoff from surrounding site shall be directed away from unsealed granular pavement, and any accidental deposit of mud or silt shall be removed immediately by the contractor.
 Any defects or damage caused by the operations of the contractor during construction or maintenance of pavement layers shall be made good by the contractor without extra payment.

The basecourse aggregate for use under the sealed areas must comply and be installed as per the New Zealand transport agency (NZTA) TNZ B/02 and TNZ M/4 specifications. the degree of saturation prior to bituminous surfacing must be no more than 65%.
 Asphalt pavement must comply with the NZTA M-01-A and TNZ M/10 specifications. the asphalt binder must be "PG 58S" unless specified otherwise.

Membrane chip seals with bituminous emulsion (waterproof treatment) must comply with the NZTA "Chipsealing in New Zealand" practice notes and TNZ M/6 specification.
 Penetration grade of bitumen for the road pavement shall be of 80/100 complying with the requirements within NZTA NZ specification M/1 "Specification for Roading Bitumen's".
 The transport, spreading and compaction of asphaltic concrete shall be carried out in accordance with the requirements of TNZ specification P/9 or P/9P the latter which provides for a wider range of rolling options.

All concrete and paved areas will be constructed with reference to the latest versions of the following documents: NZBC, NZS3104, NZS3109, NZS3112, NZS 3114.
 Unless otherwise specified, concrete shall be of normal grade ready mixed concrete, with an in-situ concrete strength of at least 40MPa at 28 days. the maximum size of coarse aggregate shall be 20mm except when otherwise specified.
 The concrete supplier shall be a member of the ready-mix concrete association of New Zealand. other suppliers may be approved by the engineer but only after receiving evidence of recent independent audits. Calcium chloride shall not be used.
 No additives shall be included in the mix design without the written approval of the engineer.
 No plasticisers or super-plasticisers shall be used in any mix, without written authorisation from the engineer.

Formwork shall be designed and constructed in compliance with section 5 of NZS3109: 1997
 Concrete, compaction and vibration shall be in accordance with section 7 of NZS3109: 1997
 Concrete for kerbs, channels and vehicle crossings shall have minimum 28-day compressive strength of 20MPa, supplied and placed in accordance with the local council's engineering specifications, NZTA and NZS4404.
 All NZTA M/4 AP40 or CCC SAP40 backfill used in the reinstatement shall be compacted to the following minimum Clegg Impact Values (CIV): Footpaths and residential crossings - 25, commercial crossings and carriageway - 35.

All concrete shall be cured in accordance with Section 7.8 of NZS3109: 1997.
 Mesh reinforcement shall be hard drawn steel wire complying with AS/NZS4671: 2001

MINIMUM SURFACE GRADIENTS AND EXCAVATION

- Asphalt: 1.5%
- Chip seal: 1.5%
- Concrete: 1.0%
- Pedestrian Asphalt: 1.5%
- Max Gradient of all surfaces unless otherwise approved: 5%
- Max cross fall on concrete footpaths 1%, elsewhere 2%
- Concrete pavements shall be non-slip rated when wet in accordance with NZBC D1
- Concrete pavements, greater than 30m long shall have free joints, refer to engineer.

Line markings shall comply with NZTA MOTSAM - Part 2; Line Markings & Part 3, Intersection Pavement Markings.

Prior to construction, contractor shall verify and confirm existing public infrastructure (invert levels, lid levels and base levels, falls, condition, size, material, location) at all key points within the working site, through physical potholing or similar means.

LEGEND

- Existing:**
- Boundary
 - Major Contour
 - Minor Contour
 - Existing Level
 - Vegetation
 - Existing Manhole
 - Existing Water Meter
 - Existing Hydrant
 - Existing Water Valve
 - Sump / Catch-pit
 - Power Box
 - Stormwater Pipe
 - Wastewater Pipe
 - Water Supply Pipe
- Proposed:**
- Boundary
 - Major Contour
 - Minor Contour
 - Proposed Level
 - Landscaping
 - Concrete
 - Permeable Concrete
 - Asphalt
 - Paver
 - Decking
 - Kerb & Channel
 - Nib Kerb
 - V-Channel
 - Stormwater Manhole
 - Treatment Device
 - Sump / Catch-pit
 - Strip Drain
 - Stormwater Pipe
 - Subsoil Drain
 - Downpipe
 - Rodding Point
 - Wastewater Pipe
 - Wastewater Manhole
 - Rodding Point
 - Water Supply Pipe
 - Water Meter
 - Gate/sluice Valve
 - Bulk Water Meter
 - Backflow Preventer
 - Streetlight
 - Overland Flow Path



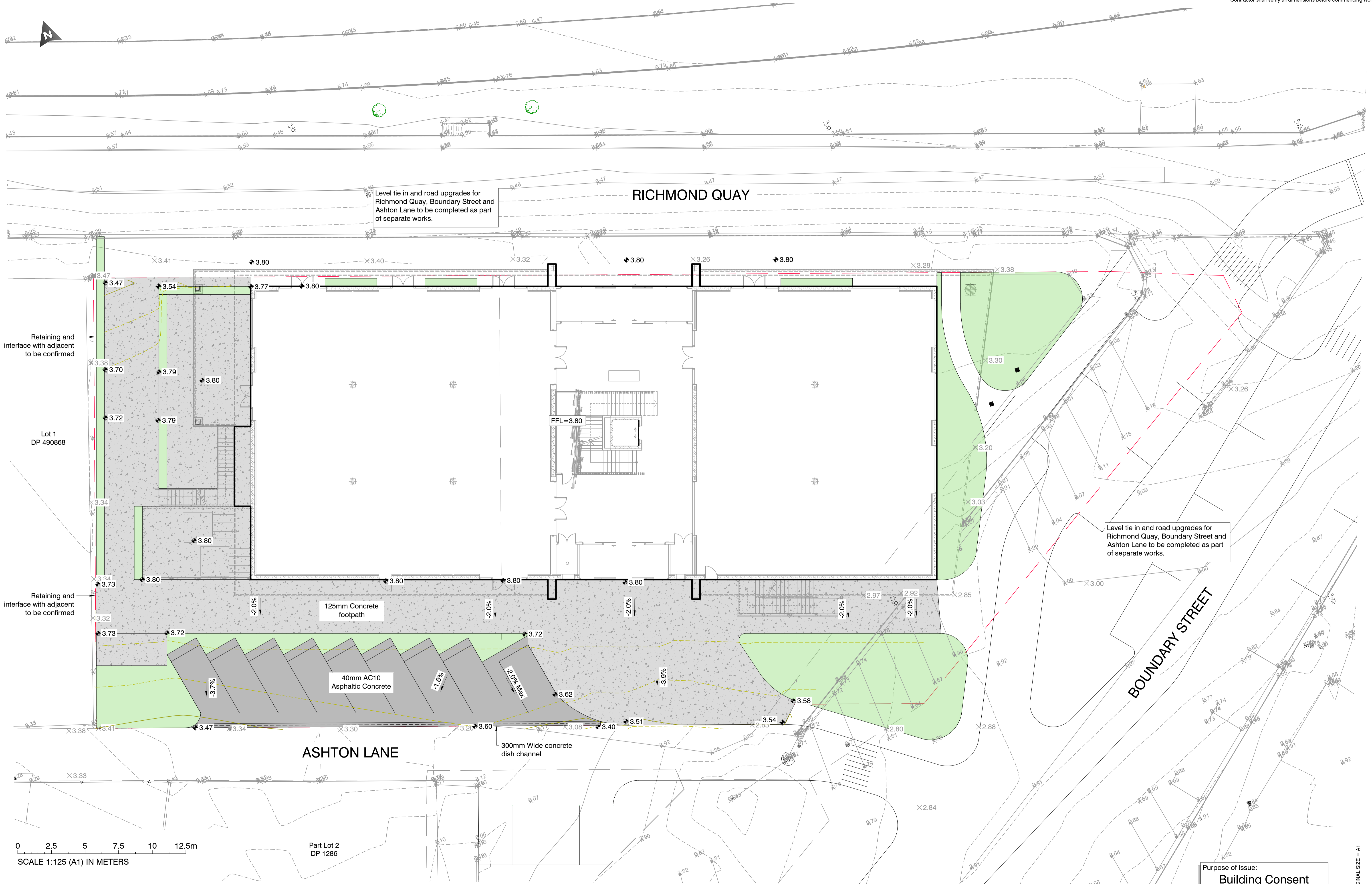
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General Notes and Legend

revisions	A	17.05.2024	For Consent

Purpose of Issue:
Building Consent

design B.Williams	file	22500	
drawn B.Williams	dwg	C0.0	rev.
apprvd D.Marais	date	17.05.2024	A

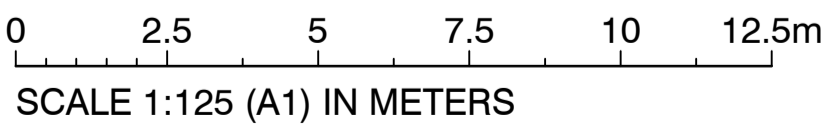


Level tie in and road upgrades for Richmond Quay, Boundary Street and Ashton Lane to be completed as part of separate works.

Level tie in and road upgrades for Richmond Quay, Boundary Street and Ashton Lane to be completed as part of separate works.

Retaining and interface with adjacent to be confirmed

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Site Plan

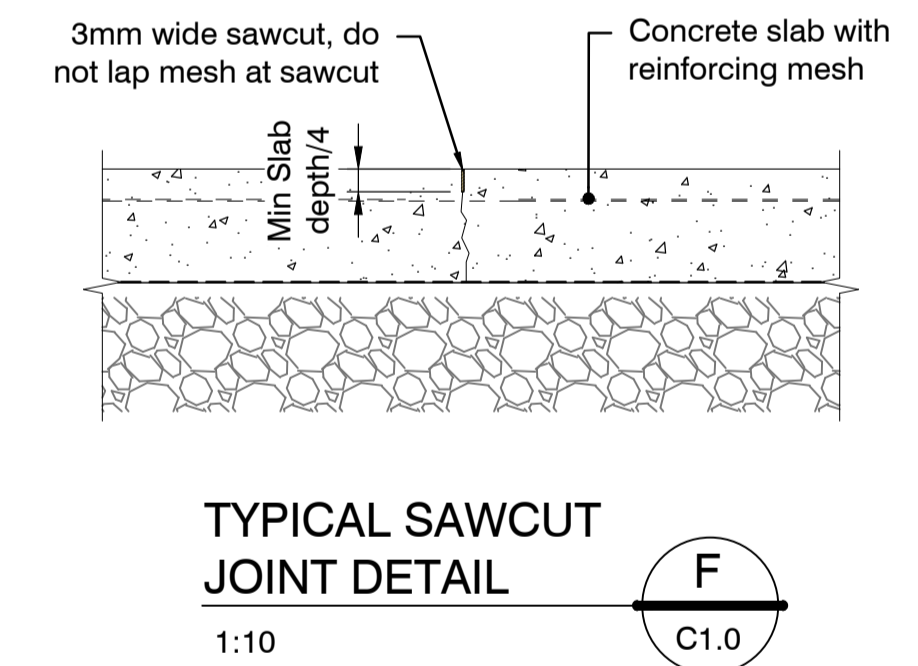
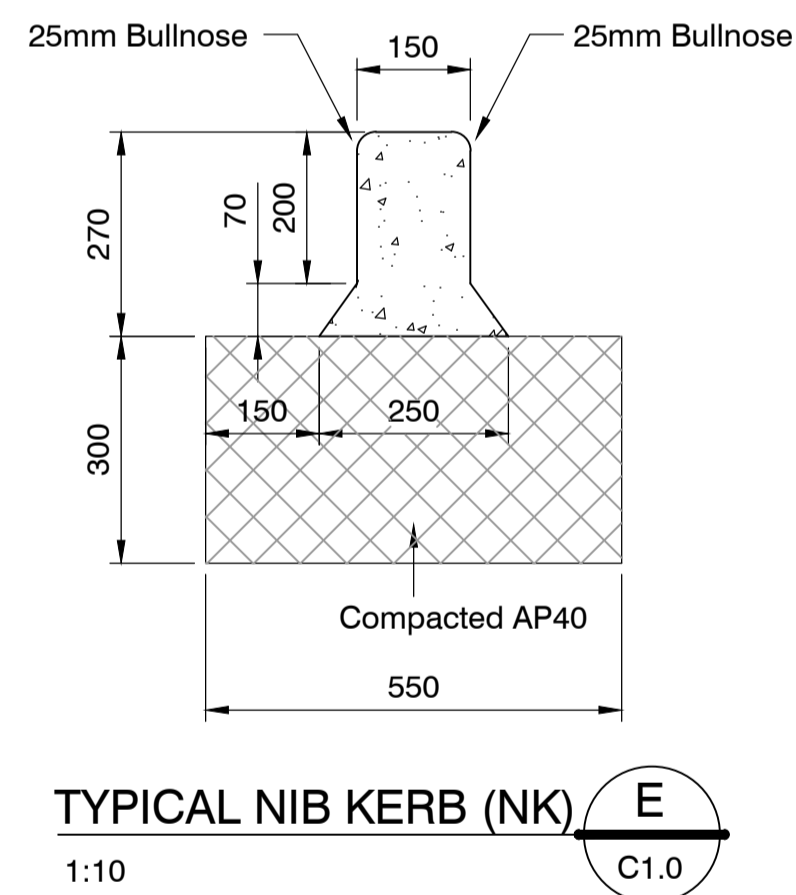
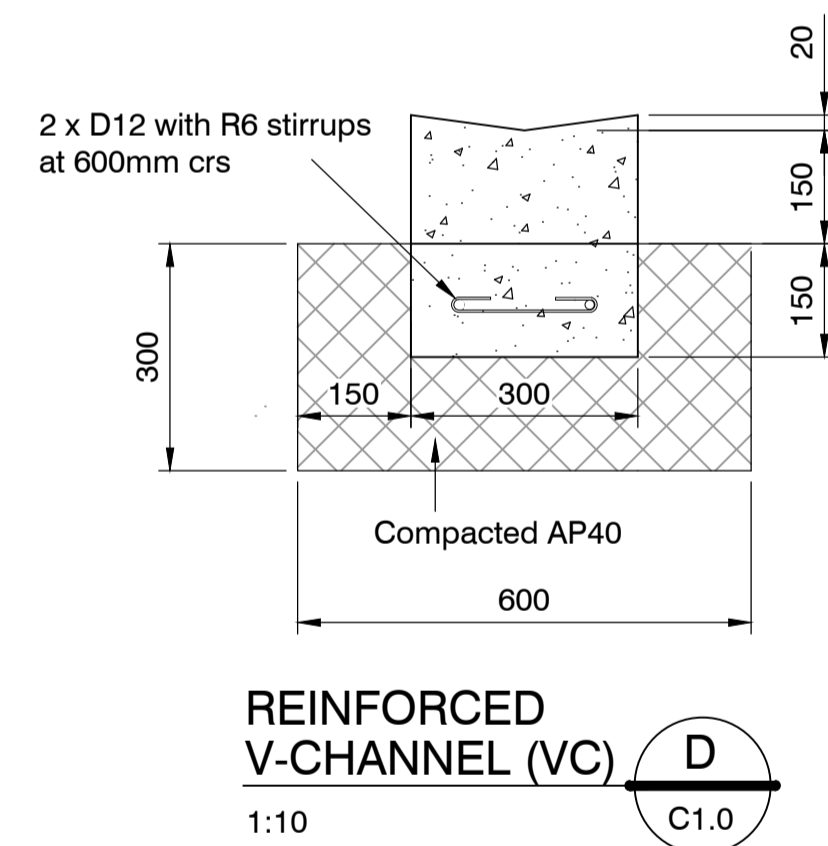
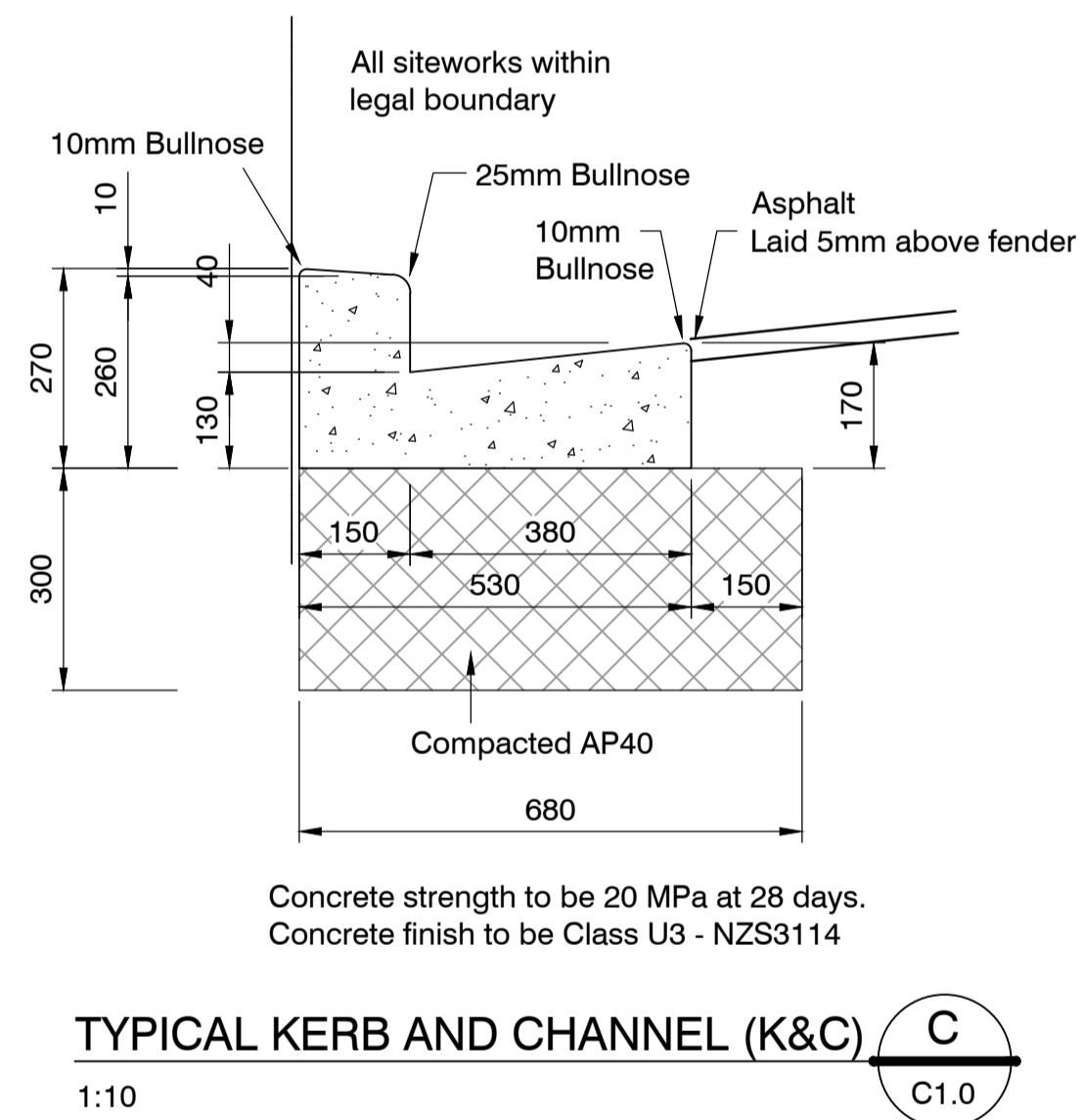
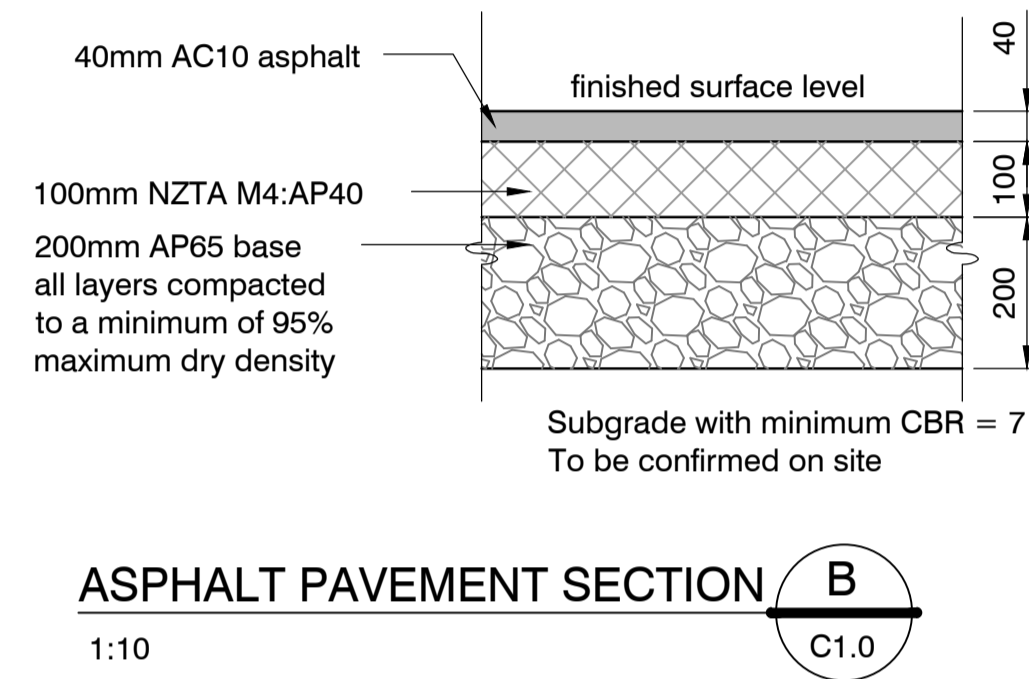
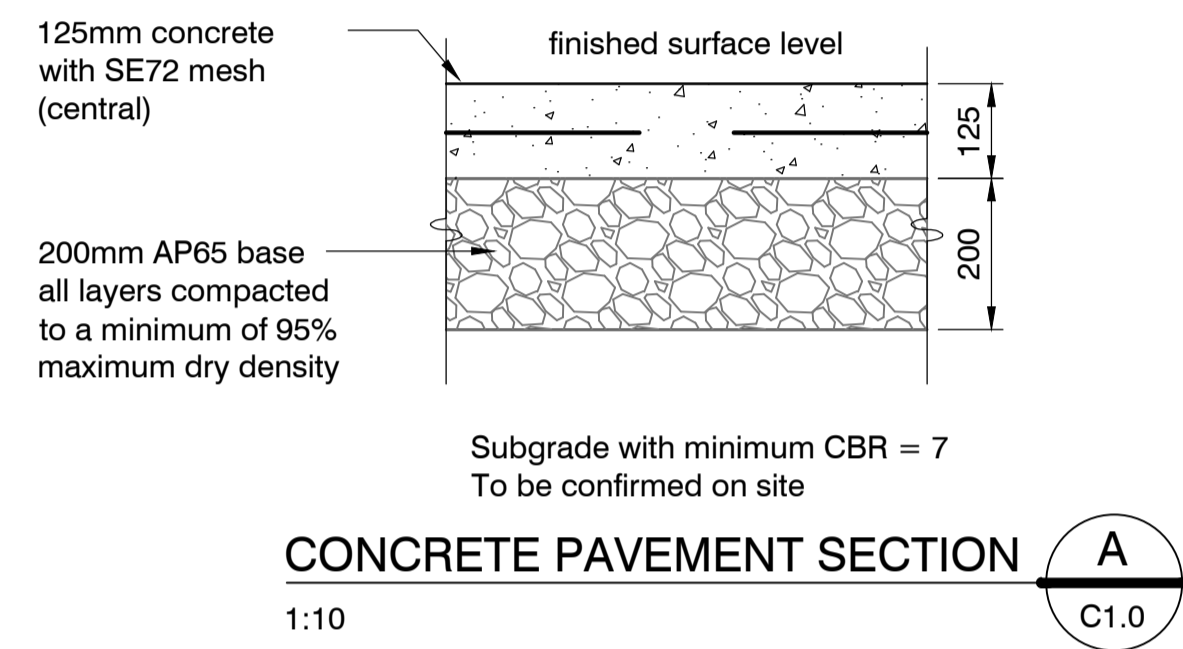
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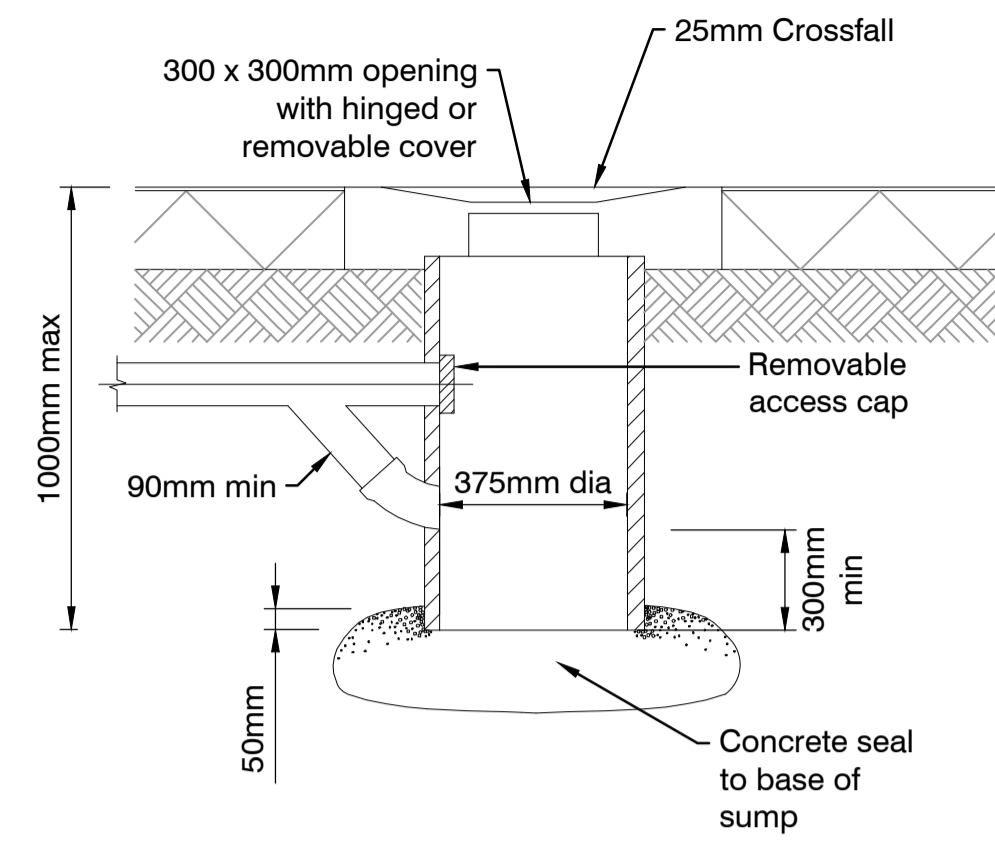
Purpose of Issue:
Building Consent

design B.Williams
drawn B.Williams
appvd D.Maraia
date 16.05.2024

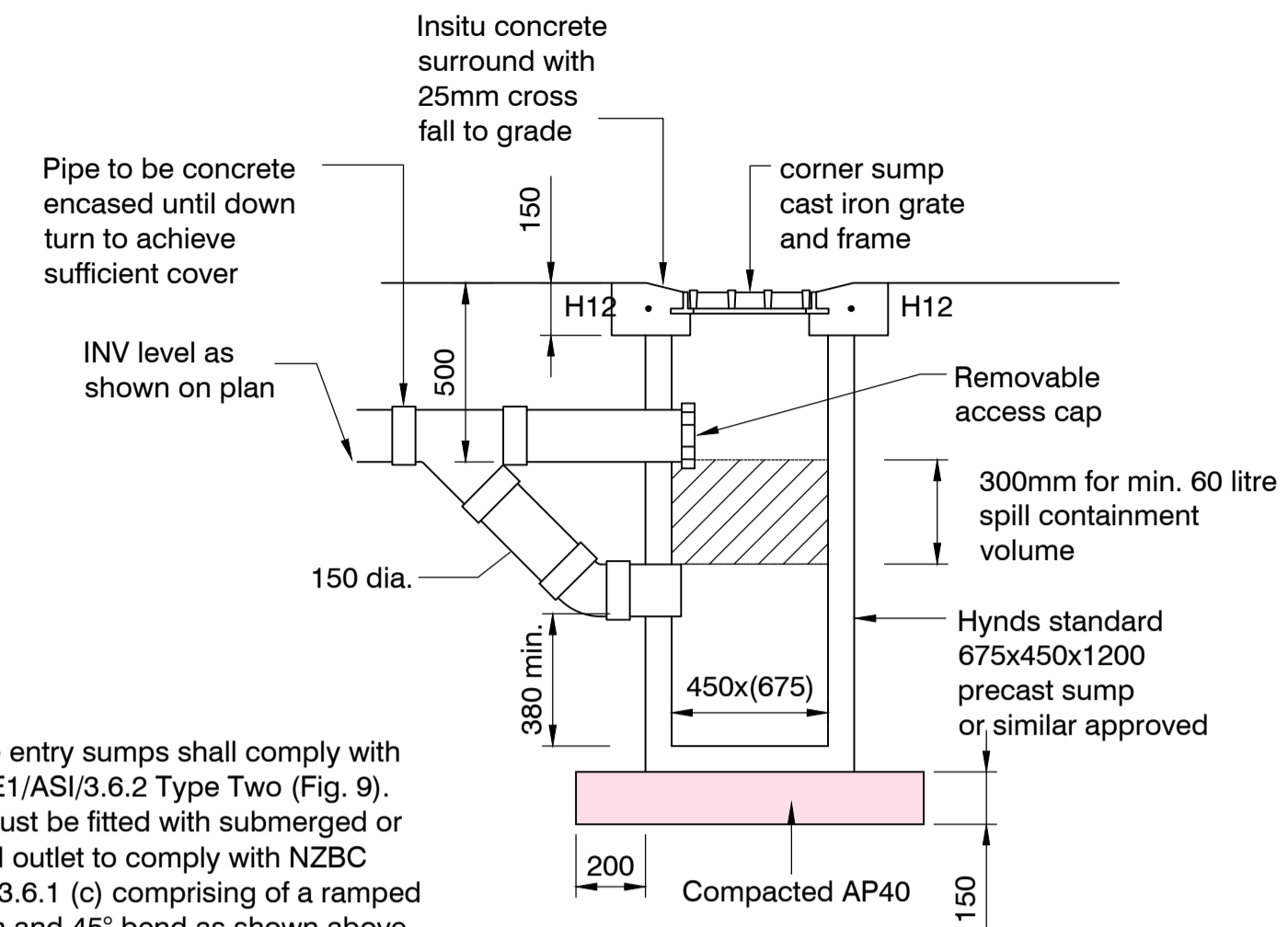
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dwg	C1.0
rev.	A

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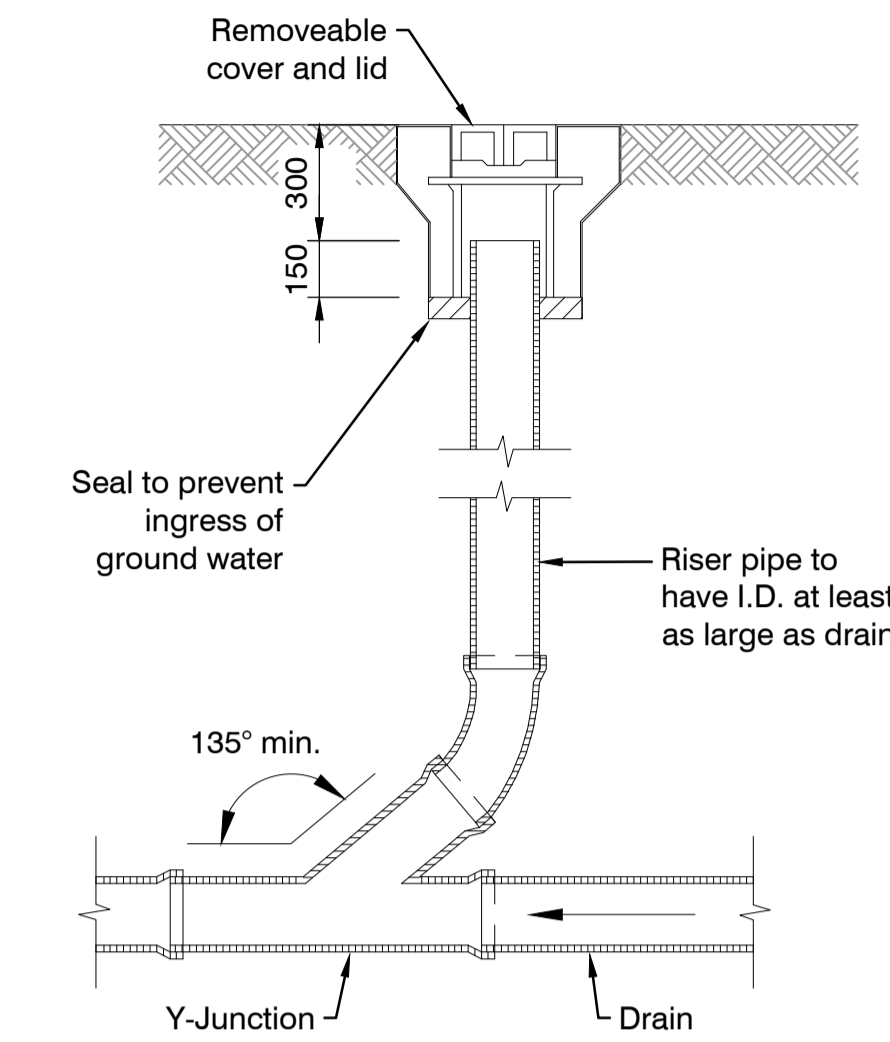


TYPE 1 SURFACE WATER SUMP A
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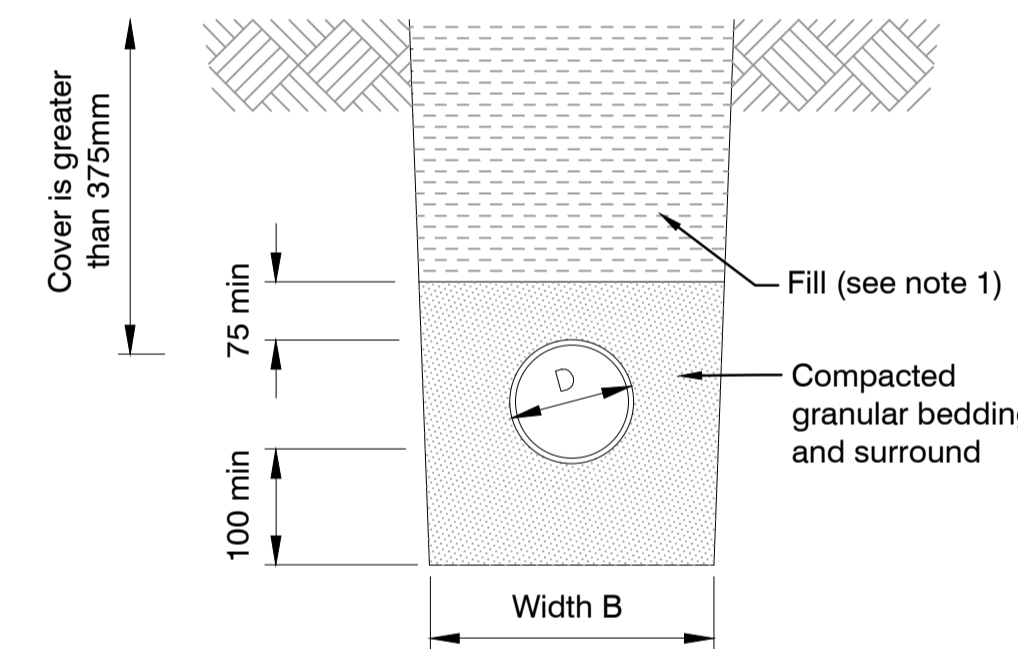


Surface entry sumps shall comply with NZBC E1/AS1/3.6.2 Type Two (Fig. 9). They must be fitted with submerged or trapped outlet to comply with NZBC E1/AS1/3.6.1 (c) comprising of a ramped junction and 45° bend as shown above. Bends into the sump or, capped tees to form the trap are not permitted. In certain circumstances, CCC Type SD325 or SD327 may be used, subject to approval by the engineer. All surface entry sumps shall have a concrete surround

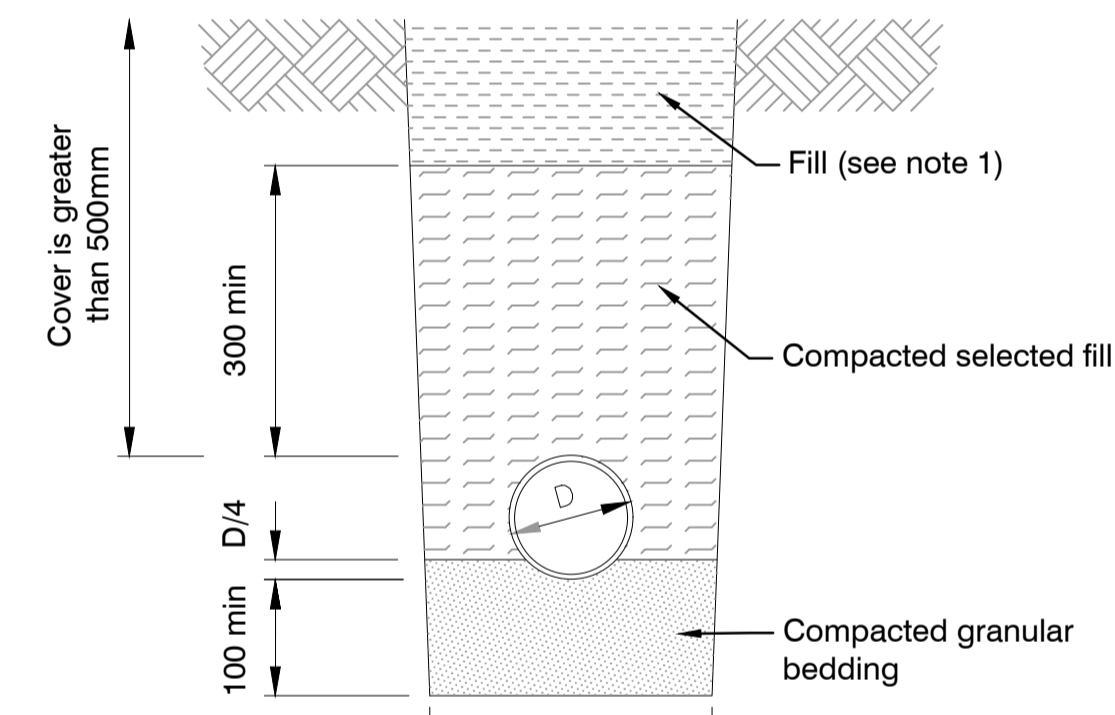
TYPE 2 SURFACE WATER SUMP B
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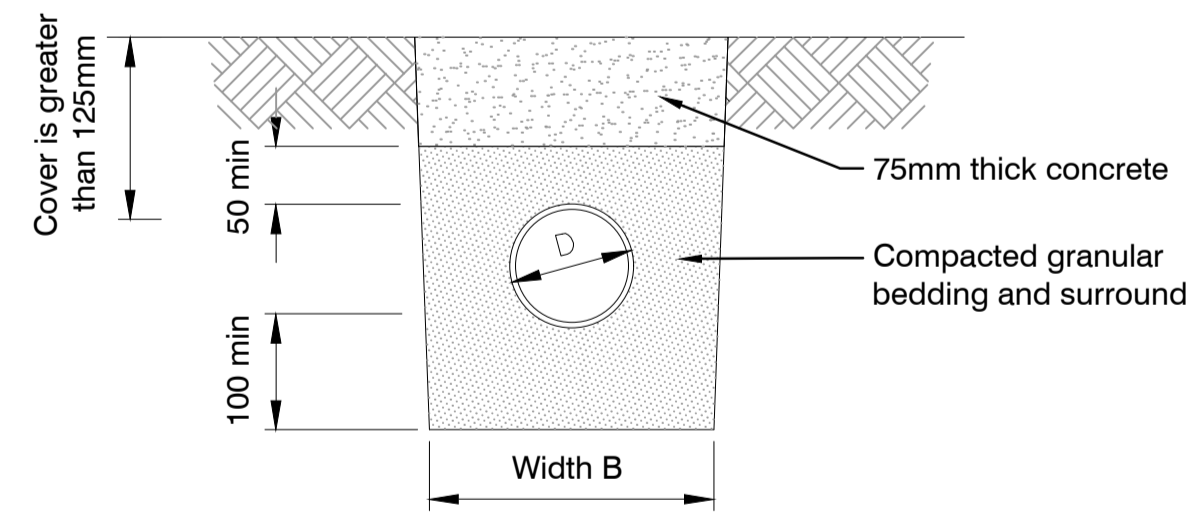
TYPICAL RODDING POINT C
1:20



(b) Cover greater than 375mm
Bedding type 'B' of NZS 4452



(a) Cover greater than 500mm
Bedding type 'B' of NZS 4452



(c) Cover greater than 125mm

NOTES:
1. Fill shall be:
- Ordinary fill where drains are located below gardens and open country.
- Compacted selected fill where the drains are located below residential driveways and similar areas subjected to light traffic.
2. The width B of the trench shall be no less than the diameter D plus 200mm. Trench width at the top of the pipe shall be no more than 600mm unless the pipe in the trench are covered with concrete.

BEDDING AND BACKFILLING D
N.T.S

revisions	A	17.05.2024	For Consent

Purpose of Issue: Building Consent	
design B.Williams drawn B.Williams appvd D.Marais date 17.05.2024	file 22500 dwg C2.1 rev. A

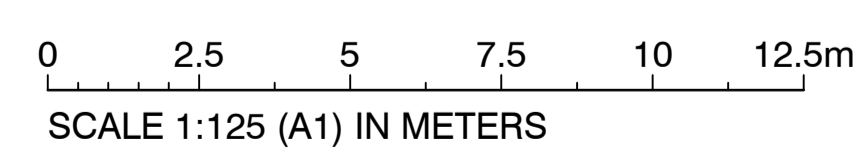


Earthworks Volumes:

0m³ Cut
 1120m³ Fill
 Over an area of 1996m²

Volumes above are a comparison of existing surface level to finished surface level and does not account for site stripping or excavation required to reach designed subgrade level.

Surface Analysis: Cut & Fill Depth			
Number	Color	Minimum Depth (m)	Maximum Depth (m)
1	Orange	-0.200	0.000
2	Light Green	0.000	0.200
3	Light Green	0.200	0.400
4	Light Green	0.400	0.600
5	Light Green	0.600	0.800
6	Light Green	0.800	1.000
7	Light Green	1.000	1.200



Part Lot 2
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Earthworks Plan

revisions	date	description
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 appvd D.Maraia
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file **22500**
 dwg **C3.0** rev. **A**

ORIGINAL SIZE = A1