



ORDINARY COUNCIL MEETING

AGENDA

2 APRIL 2024

Notice is hereby given, in accordance with the provisions of the Local Government Act 1993 that an **ORDINARY MEETING of ORANGE CITY COUNCIL** will be held in the **COUNCIL CHAMBER, CIVIC CENTRE, BYNG STREET, ORANGE** on **Tuesday, 2 April 2024** commencing at **6:30PM**.

David Waddell

CHIEF EXECUTIVE OFFICER

For apologies please contact Administration on 6393 8106.

AGENDA

EVACUATION PROCEDURE

In the event of an emergency, the building may be evacuated. You will be required to vacate the building by the rear entrance and gather at the breezeway between the Library and Art Gallery buildings. This is Council's designated emergency muster point.

Under no circumstances is anyone permitted to re-enter the building until the all clear has been given and the area deemed safe by authorised personnel.

In the event of an evacuation, a member of Council staff will assist any member of the public with a disability to vacate the building.

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1 INTRODUCTION

1.1 APOLOGIES AND LEAVE OF ABSENCE

1.2 LIVESTREAMING AND RECORDING

This Council Meeting is being livestreamed and recorded. By speaking at the Council Meeting you agree to being livestreamed and recorded. Please ensure that if and when you speak at this Council Meeting that you ensure you are respectful to others and use appropriate language at all times. Orange City Council accepts no liability for any defamatory or offensive remarks or gestures made during the course of this Council Meeting. A recording will be made for administrative purposes and will be available to Councillors.

1.3 ACKNOWLEDGEMENT OF COUNTRY

I would like to acknowledge the Traditional Custodians of the land on which we meet today, the people of the Wiradjuri Nation. I pay my respects to Elders past and present, and extend those respects to Aboriginal Peoples of Orange and surrounds, and Aboriginal people here with us today.

1.4 DECLARATION OF PECUNIARY INTERESTS, SIGNIFICANT NON-PECUNIARY INTERESTS AND LESS THAN SIGNIFICANT NON-PECUNIARY INTERESTS

The provisions of Chapter 14 of the Local Government Act, 1993 (the Act) regulate the way in which Councillors and designated staff of Council conduct themselves to ensure that there is no conflict between their private interests and their public role.

The Act prescribes that where a member of Council (or a Committee of Council) has a direct or indirect financial (pecuniary) interest in a matter to be considered at a meeting of the Council (or Committee), that interest must be disclosed as soon as practicable after the start of the meeting and the reasons given for declaring such interest.

As members are aware, the provisions of the Local Government Act restrict any member who has declared a pecuniary interest in any matter from participating in the discussion or voting on that matter, and requires that member to vacate the Chamber.

Council's Code of Conduct provides that if members have a non-pecuniary conflict of interest, the nature of the conflict must be disclosed. The Code of Conduct also provides for a number of ways in which a member may manage non pecuniary conflicts of interest.

RECOMMENDATION

It is recommended that Councillors now disclose any conflicts of interest in matters under consideration by the Council at this meeting.

1.5 OPENING PRAYER

COUNCIL MEETING ADJOURNS FOR THE CONDUCT OF THE OPEN FORUM

COUNCIL MEETING RESUMES

2 MAYORAL MINUTES

Nil

3 CONFIRMATION OF MINUTES OF PREVIOUS MEETING

RECOMMENDATION

That the Minutes of the Ordinary Meeting of Orange City Council held on 19 March 2024 (copies of which were circulated to all members) be and are hereby confirmed as a true and accurate records of the proceedings of the Council meeting held on 19 March 2024.

ATTACHMENTS

- 1 Minutes of the Ordinary Meeting of Orange City Council held on 19 March 2024

ORANGE CITY COUNCIL

MINUTES OF THE

ORDINARY COUNCIL MEETING

HELD IN COUNCIL CHAMBER, CIVIC CENTRE, BYNG STREET, ORANGE

ON 19 MARCH 2024

COMMENCING AT 6:36PM

1 INTRODUCTION

ATTENDANCE

Cr J Hamling (Mayor), Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard (*Audio Visual Link*), Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power (Deputy Mayor), Cr J Whitton

Chief Executive Officer, Acting Director Development Services (Johnston), Director Community, Recreation and Cultural Services, Director Technical Services, Manager Corporate Governance

1.1 APOLOGIES

Nil.

| | |
|---|-------------------------------------|
| RESOLVED - 24/078 | Cr F Kinghorne/Cr M McDonell |
| That Cr D Mallard be permitted to attend the Council Meeting of Orange City Council on 19 March 2024 via Audio Visual Link. | |
| For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton | |
| Against: Nil | |
| Absent: Nil | |

1.2 LIVESTREAMING AND RECORDING

The Mayor advised that the meeting was being livestreamed and recorded.

1.3 ACKNOWLEDGEMENT OF COUNTRY

Cr G Power conducted an Acknowledgement of Country.

1.4 DECLARATION OF PECUNIARY INTERESTS, SIGNIFICANT NON-PECUNIARY INTERESTS AND LESS THAN SIGNIFICANT NON-PECUNIARY INTERESTS

Cr Evans declared a Non-Significant, Non-Pecuniary Interest in item 6.3 Tender – F4040 – Provision of Heating, ventilation and Air Conditions (HVAC) Services and 6.4 Tender – F4175 – Provision of Fire Maintenance Services as tenderers are customers of his.

Cr Peterson declared a Non-Significant, Non-Pecuniary Interest in item 4.2 Notice of Motion – Letter of support to Orange Mountain Bike Club – The Trail of Awesomeness as he previously worked as a grants officer for Orange Mountain Bike Club.

Cr Mileto declared a Non-Significant, Non-Pecuniary Interest in item 4.2 Notice of Motion – Letter of support to Orange Mountain Bike Club – The Trail of Awesomeness as he assisted with the opening and part of the grant funding announcement.

1.5 OPENING PRAYER

Reverend Bob Cameron of the Orange East Anglican Church led the Council in Prayer.

The Mayor advised that item 4.1 – Notice of Motion - Consideration of Hockey Centre Budget Allocation has been withdrawn.

RESOLVED - 24/079**Cr J Whitton/Cr T Greenhalgh**

That the following Late Item be permitted to be considered at the Council Meeting of 19 March 2024:

6.6 – Senior Staff Contract – Chief Executive Officer.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

THE MAYOR DECLARED THE ORDINARY MEETING OF COUNCIL ADJOURNED FOR THE CONDUCT OF THE OPEN FORUM AT 6.44PM

- | | |
|---|-------------------------|
| • Andrew Kermode | • Stephen Martin – GHD |
| • Jack Rahilly – Orange Mountain Bike Club | • Uncle Neil Ingram Snr |
| • Dale Carr - Wiradjuri Cultural Art and Gaanha-Bula Dyrribang Mens Group | • Lucas Martin |
| • Dr Andrew Rawson - Canobolas Conservation Alliance | • John Carpenter |
| • Scott Turner | |

THE MAYOR DECLARED THE ORDINARY MEETING OF COUNCIL RESUMED AT 7.23PM

2 MAYORAL MINUTES

Nil

3 CONFIRMATION OF MINUTES OF PREVIOUS MEETING

RESOLVED - 24/080**Cr J Whitton/Cr T Greenhalgh**

That the Minutes of the Ordinary Meeting of Orange City Council held on 5 March 2024 (copies of which were circulated to all members) be and are hereby confirmed as a true and accurate record of the proceedings of the Council meeting held on 5 March 2024.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

THE MAYOR DECLARED THE ORDINARY MEETING OF COUNCIL ADJOURNED FOR THE CONDUCT OF THE POLICY COMMITTEE MEETINGS AT 7.23PM

THE MAYOR DECLARED THE ORDINARY MEETING OF COUNCIL RESUMED AT 7.25PM

4 NOTICES OF MOTION/NOTICES OF RESCISSION

4.1 NOTICE OF MOTION - CONSIDERATION OF HOCKEY CENTRE BUDGET ALLOCATION

TRIM REFERENCE: 2024/240

THIS ITEM WAS WITHDRAWN

4.2 NOTICE OF MOTION - LETTER OF SUPPORT TO ORANGE MOUNTAIN BIKE CLUB - THE TRAIL OF AWESOMENESS

TRIM REFERENCE: 2024/316

Cr Peterson declared a Non-Significant, Non-Pecuniary Interest in this item as he previously worked as a grants officer for Orange Mountain Bike Club.

Cr Mileto declared a Non-Significant, Non-Pecuniary Interest in this item as he assisted with the opening and part of the grant funding announcement.

RESOLVED - 24/086**Cr S Peterson/Cr G Floyd**

That Council provide a letter of support to the Orange Mountain Bike Club stating the value of the Glenwood Forest Mountain bike flow trail to Orange and ask that the section that would be destroyed by planned logging be spared, acknowledging the commercial value of the timber itself. The letter will encourage the club to work with the Forestry Corporation on a collaborative outcome.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

4.3 NOTICE OF MOTION - PROPOSED MOUNTAIN BIKE TRACK

TRIM REFERENCE: 2024/255

THIS ITEM WAS WITHDRAWN

THE MAYOR DECLARED THE ORDINARY MEETING OF COUNCIL ADJOURNED FOR A SHORT RECESS AT 8.06PM

THE MAYOR DECLARED THE ORDINARY MEETING OF COUNCIL RESUMED AT 8.10PM

4.4 NOTICE OF MOTION - SPORT4ALL ORANGE PROPOSAL

TRIM REFERENCE: 2024/335

RESOLVED - 24/087**Cr S Peterson/Cr F Kinghorne**

That the 'Sport4All' proposal be adopted at the 0.4 full-time equivalent option for a period of two years with the option of a third year to be considered following an evaluation of years 1 and 2.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

5 GENERAL REPORTS**5.1 ORANGE CITY LIBRARY STATISTICS JULY - DECEMBER 2023**

TRIM REFERENCE: 2024/200

RESOLVED - 24/088**Cr G Power/Cr M McDonell**

The report on Orange City Library Statistics by the Manager Central West Libraries be acknowledged.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

5.2 STRATEGIC POLICY REVIEW - GRANTS AND DONATIONS - POST EXHIBITION

TRIM REFERENCE: 2023/2240

RESOLVED - 24/089**Cr G Floyd/Cr J Evans**

That Council resolves to Adopt Strategic Policy ST32 - Donations and Grants.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

QUESTION TAKEN ON NOTICE**Cr S Peterson**

Cr Peterson noted Council was advised at its meeting on 19 December 2023 that the Educational Assistance allocation had not been used and requested this to be able to be re-allocated to other programs. Cr Peterson asked if this was provided for in the new Grants & Donations policy.

5.3 STRATEGIC POLICY REVIEW

TRIM REFERENCE: 2024/241

RESOLVED - 24/090**Cr T Greenhalgh/Cr G Power**

That Council resolves to adopt the Strategic Policy ST22 – Vandalism Reporting Scheme

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

QUESTION TAKEN ON NOTICE**Cr T Mileto**

Cr Mileto asked if there had been any funds expended on this program in recent years and if the policy is still relevant. The Manager Corporate Governance advised that no claims had been made. The Chief Executive Officer advised he would provide Council with a report on how to better implement the Vandalism Reporting Scheme.

5.4 REPORT ON FREE ENTRY TO AQUATIC CENTRE

TRIM REFERENCE: 2024/245

RESOLVED - 24/091**Cr K Duffy/Cr J Whitton**

That Council note the report on Free Entry to the Aquatic Centre.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

Cr McDonell asked if any other Council's offer similar free periods.

The Director Community, Recreation & Cultural Services advised that he was not aware of other Councils programs.

Cr Greenhalgh asked if it could be managed by a ticketing system and capping numbers after a certain amount of tickets have been allocated.

The Director Community, Recreation & Cultural Services advised that it could be possible however with 28,000 people over a six week period it will be difficult to manage. He noted that 250 people were ejected during the six weeks, with the volume of patrons it could have been 500 people ejected. The impact on staff has been significant.

5.5 RECOMMENDATIONS AND RESOLUTIONS FROM POLICY COMMITTEES

TRIM REFERENCE: 2023/2288

RESOLVED - 24/092**Cr M McDonell/Cr J Whitton**

That Council resolves:

- 1 That the Minutes of the Planning & Development Policy Committee at its meeting held on 5 March 2024 be and are hereby confirmed as a true and accurate record of the proceedings.
- 2 That the Minutes of the Infrastructure Policy Committee at its meeting held on 5 March 2024 be and are hereby confirmed as a true and accurate record of the proceedings.
- 3 That the Minutes of the Finance Policy Committee at its meeting held on 5 March 2024 be and are hereby confirmed as a true and accurate record of the proceedings.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

QUESTION TAKEN ON NOTICE**Cr M McDonell**

Cr McDonell asked for an update on the footpath at Orange Anglican Grammar School.

5.6 DEVELOPMENT APPLICATION DA 303/2023(1) - 14 AND 16 ELIZABETH STREET

TRIM REFERENCE: 2024/190

RESOLVED - 24/093**Cr K Duffy/Cr J Whitton**

That Council consents to development application DA 303/2023(1) for Demolition (two dwellings, outbuilding and tree removal) and Hotel or Motel Accommodation at Lot 6 DP 32306 and Lot 13 DP 610575 - 14 and 16 Elizabeth Street, Orange, pursuant to the conditions of consent in the updated Notice of Approval including additional conditions 50 and 53.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

Cr Kinghorne asked how we establish if the hotel would be used for crisis accommodation.

The Acting Director Development Services advised that there was no supporting information to indicate this would be the use. We are not able to dictate who stays in them.

Cr Kinghorne asked for information on flooding noting there were a number of flood photos included in the report.

The Acting Director Development Services advised that flooding is an issue on the site. The floor level is required to be 500mm above the 1 in 100 flood level. This is not dissimilar to other sites subject to flooding.

5.7 STATEMENT OF INVESTMENTS - FEBRUARY 2024

TRIM REFERENCE: 2024/332

RESOLVED - 24/094**Cr J Whitton/Cr G Floyd**

That Council resolves:

- 1 To note the Statement of Investments for the period February 2024.
- 2 To adopt the certification of the Responsible Accounting Officer.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

RESOLVED - 24/095**Cr J Hamling/Cr M McDonell**

That item 5.8 ARIC – Audit, Risk & Improvement Committee Membership be heard and determined in seriatim.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

5.8 ARIC - AUDIT, RISK AND IMPROVEMENT COMMITTEE MEMBERSHIP

TRIM REFERENCE: 2024/201

RESOLVED - 24/096**Cr M McDonell/Cr J Evans**

- 1 That Council notes the required changes to membership of its ARIC as outlined in the report and OLG Guidelines.

RESOLVED - 24/097**Cr M McDonell/Cr G Floyd**

- 2 That Council determines a Non-Voting Councillor will be a member of the ARIC from 1 July to 13 September 2024.

RESOLVED - 24/098**Cr G Floyd/Cr T Greenhalgh**

- 3 That Cr Kinghorne be appointed as a Non-Voting ARIC member with Cr Peterson as an alternate, for the period 1 July to 13 September 2024, noting re-election of Councillor members must occur at the first meeting of the Council after an ordinary election.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

5.9 PROGRESS REPORT - DELIVERY PROGRAM/OPERATIONAL PLAN 2023/2024 (DELIVERY PLAN YEAR 2) - SIX MONTHS FROM 1 JULY TO 31 DECEMBER 2023

TRIM REFERENCE: 2024/344

RESOLVED - 24/099**Cr S Peterson/Cr G Floyd**

That the Progress Report – Delivery Program/Operational Plan 2023/2024 (Delivery Program Year 2) – Six Months from 1 July 2023 to 31 December 2023 be noted.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

Cr Peterson asked if more frequent reporting could occur on the Conservatorium/Planetarium and the Sports Precinct.

The Chief Executive Officer advised that Council would receive more regular reports, with a report on each in open council and a report on each in closed council including financial information.

QUESTION TAKEN ON NOTICE**Cr F Kinghorne**

Cr Kinghorne asked if Business Newsletters has been sent as noted in the Operational Plan reporting as she was not aware of anyone receiving them.

QUESTION TAKEN ON NOTICE**Cr D Mallard**

Cr Mallard asked for a report to be provided to Council on the progress of each of the following project and how they will be delivered noting they are all due for completion by 30 June 2024:

- Homelessness Policy
- Affordable Housing Policy
- Infill Policy
- Worker Shortages Strategy
- Short Term Rental Strategy
- Audit of Council Land
- Holding of a Housing Summit

6 CLOSED MEETING

In accordance with the Local Government Act 1993, and the Local Government (General) Regulation 2021, in the opinion of the Chief Executive Officer, the following business is of a kind as referred to in Section 10A(2) of the Act, and should be dealt with in a Confidential Session of the Council meeting closed to the press and public.

In response to a question from the Mayor, the Chief Executive Officer advised that no written submissions had been received relating to any item listed for consideration by the Closed Meeting of Council.

The Mayor extended an invitation to any member of the public present at the meeting to make a presentation to the Council as to whether the meeting should be closed for a particular item.

RESOLVED - 24/100**Cr G Power/Cr T Greenhalgh**

That Council adjourn into a Closed Meeting and members of the press and public be excluded from the Closed Meeting, and access to the correspondence and reports relating to the items considered during the course of the Closed Meeting be withheld unless declassified by separate resolution. This action is taken in accordance with Section 10A(2) of the Local Government Act, 1993 as the items listed come within the following provisions:

6.1 NSW Local Roads Congress - Nomination(s) for Councillor Attendance

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (f) matters affecting the security of the Council, Councillors, Council staff or Council property.

6.2 Request to Enter into New Parking Agreement at the Orange City Centre

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (c) information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business.

6.3 Tender - F4040 - Provision of Heating, Ventilation and Air Conditions (HVAC) Services

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (c) information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business.

6.4 Tender - F4175 - Provision of Fire Maintenance Services

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (c) information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business.

6.5 Submission Redaction Report - 19 March 2024

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (e) information that would, if disclosed, prejudice the maintenance of law.

6.6 Senior Staff Contract - Chief Executive Officer

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (a) personnel matters concerning particular individuals (other than councillors).

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

The Mayor declared the Ordinary Meeting of Council adjourned for the conduct of the Closed Meeting at 9.08pm

The Mayor declared the Ordinary Meeting of Council resumed at 9.35pm.

7 RESOLUTIONS FROM CLOSED MEETING

The Manager Corporate Governance read out the following resolutions made in the Closed Meeting of Council.

6.1 NSW LOCAL ROADS CONGRESS - NOMINATION(S) FOR COUNCILLOR ATTENDANCE

TRIM REFERENCE: 2024/341

RESOLVED - 24/101

Cr J Whitton/Cr T Greenhalgh

That Council resolves two Councillors will attend the NSW Local Roads Congress to be held in Sydney on Monday 3 June 2024.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

6.2 REQUEST TO ENTER INTO NEW PARKING AGREEMENT AT THE ORANGE CITY CENTRE

TRIM REFERENCE: 2024/32

RESOLVED - 24/102

Cr J Whitton/Cr G Floyd

- 1 That Council publicly exhibits its proposal to declare the Orange City Centre Car Park at 212-220 Summer Street Orange, an area of 'Free Parking' in accordance with Section 650 of the Local Government Act 1993.
- 2 That Council approves the key terms of the Orange City Centre Car Park Lease Agreement between Orange City Council and Alceon Group Pty Ltd as described within the report.
- 3 That Council authorises the Chief Executive Officer of Council to negotiate and finalise the Orange City Centre Car Park Lease Agreement described in the report (including all matters that the Chief Executive Officer considers require amendment, alteration, clarification to his satisfaction).
- 4 That Council resolves to sign the Orange City Centre Car Park Lease Agreement and affix the seal of Council where required.
- 5 That a Community Engagement Plan be developed and implemented between Council and Alceon Group Pty Ltd during the exhibition period detailed in Recommendation 1. The Plan shall highlight parking changes that will come into effect at the end of the exhibition period and also the availability of alternative parking areas.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

6.3 TENDER - F4040 - PROVISION OF HEATING, VENTILATION AND AIR CONDITIONS (HVAC) SERVICES

TRIM REFERENCE: 2024/195

Cr Evans declared a Non-Significant, Non-Pecuniary Interest in this item as tenderers are customers of his, left the chamber and did not participate in discussion or voting on this item.

RESOLVED - 24/103**Cr G Floyd/Cr M McDonell**

That Council resolves:

- 1 That the Chief Executive Officer, or his nominee, enter into a standard contract with Williams Oriel Pty Ltd for the Provision of Heating, Ventilation and Air Conditioning (HVAC) Services for the amount of \$127,927.00 (excl. GST).
- 2 To grant permission to the Chief Executive Officer, or his nominee, to do such things as may be necessary or convenient to give effect to this decision, including affixing the Council Seal on any relevant documents.

For: Cr J Hamling, Cr K Duffy, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Cr J Evans

6.4 TENDER - F4175 - PROVISION OF FIRE MAINTENANCE SERVICES

TRIM REFERENCE: 2024/249

Cr Evans declared a Non-Significant, Non-Pecuniary Interest in this item as tenderers are customers of his, left the chamber and did not participate in discussion or voting on this item.

RESOLVED - 24/104**Cr T Mileto/Cr G Power**

That Council resolves:

- 1 That the Chief Executive Officer, or his nominee, enter into a standard contract with Wormald Pty Ltd for the Provision of Fire Maintenance Services for the amount of \$106,693.00 (excl. GST).
- 2 To grant permission to the Chief Executive Officer, or his nominee, to do such things as may be necessary or convenient to give effect to this decision, including affixing the Council Seal on any relevant documents.

For: Cr J Hamling, Cr K Duffy, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Cr J Evans

6.5 SUBMISSION REDACTION REPORT - 19 MARCH 2024

TRIM REFERENCE: 2024/256

RESOLVED - 24/105**Cr K Duffy/Cr F Kinghorne**

That the information contained in the Submission Redaction report be acknowledged.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

6.6 SENIOR STAFF CONTRACT - CHIEF EXECUTIVE OFFICER

TRIM REFERENCE: 2024/422

RESOLVED - 24/106**Cr J Whitton/Cr G Floyd**

That Council resolves to re-appoint Mr David Waddell to the position of Chief Executive Officer, Orange City Council for a period of 12 months in accordance with Option 1.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

THE MEETING CLOSED AT 9.39PM

This is Page Number 12 and the Final Page of the Minutes of the Ordinary Meeting of Orange City Council held on 19 March 2024.

COUNCIL MEETING ADJOURNS FOR THE CONDUCT OF THE POLICY COMMITTEES

Planning and Development - Chaired by Cr Jeff Whitton

Employment and Economic Development – Chaired By Cr Tony Mileto – No Items

Infrastructure - Chaired by Cr Jack Evans

Sport and Recreation - Chaired by Cr Tammy Greenhalgh

Environmental Sustainability - Chaired by Cr David Mallard – No Items

Finance - Chaired by Cr Kevin Duffy

Services - Chaired by Cr Melanie McDonell

COUNCIL MEETING RESUMES

4 NOTICES OF MOTION/NOTICES OF RESCISSION

4.1 NOTICE OF MOTION - PINNACLE ROAD SPEED

RECORD NUMBER: 2024/421

I, **CR STEVEN PETERSON** wish to move the following Notice of Motion at the Council Meeting of 2 April 2024:

MOTION

That Council resolves:

- 1 To support the revision of the speed limit to 60km/hr on Pinnacle Road for its entire length within the Orange LGA, to improve the safety of cyclists and other road users.
- 2 To write to TfNSW and formally request the speed review.
- 3 To seek Cabonne Council support for the same speed reduction consideration.

BACKGROUND

This was originally proposed as an Action through the bicycle committee (Wallace Lane to the bends below snow line).

TfNSW alone have the power to review and implement speed zones in NSW.

Staff discussions with TfNSW indicate in-principle support for full length of road review.

Pinnacle Road environment would benefit from this reduction for reasons including:

- o Narrow seal in sections
- o Sharp bends
- o Distracting views
- o Wineries
- o Lots of property accesses.
- o Difficult and busy Shiralee Road intersection

Signed Cr Steven Peterson

STAFF COMMENT

Pinnacle Road goes from 50 to 80 on the southern limits of the city past the Canobolas Road intersection. There is a temporary 60 speed limit at the Shiralee Road intersection returning to 80 then back to 60 for 1200m either side of the Orange / Cabonne LGA boundary. This proposal goes beyond what was asked by the Bicycle Committee (Wallace Lane to the bends below the snow line).

There are a number of commercial, agricultural, tourism, residential and other users of the road besides the Bicycle Committee. While staff from both LGA's have discussed the matter and Transport for NSW have given in principle support of a review, it may be prudent to seek wider community support for such a review.

FINANCIAL/RESOURCING IMPLICATIONS

There is no financial implications in seeking a review, and a modest cost of implementing the speed restriction, if that is the result of the review, that would be funded from the signs budget.

POLICY AND GOVERNANCE IMPLICATIONS

Unlike the Lucknow speed restriction from 60 back to the previous 50 kmph zone this is a totally new proposal and as such it may be best to defer such a review for Community Consultation through the YourSay site.

5 GENERAL REPORTS

5.1 RECOMMENDATIONS AND RESOLUTIONS FROM POLICY COMMITTEES

RECORD NUMBER: 2024/442

AUTHOR: Janessa Constantine, Manager Corporate Governance

EXECUTIVE SUMMARY

Council's Policy Committees (Planning and Development Committee, Employment and Economic Development Policy Committee, Infrastructure Policy Committee, Sport and Recreation Policy Committee, Environmental Sustainability Policy Committee, Finance Policy Committee and Services Policy Committee) have delegation to determine matters before those Committees with the exception of items that impact on Council's Delivery/Operational Plan.

This report provides minutes of the Policy Committees held this month. Resolutions made by the Committees are presented for adoption or amendment by Council.

LINK TO DELIVERY/OPERATIONAL PLAN

The recommendation in this report relates to the Delivery/Operational Plan strategy "18.1. Provide representative, responsible and accountable community governance".

FINANCIAL IMPLICATIONS

Nil

POLICY AND GOVERNANCE IMPLICATIONS

Nil

RECOMMENDATION

That Council resolves:

- 1 That the Minutes of the Environmental Sustainability Policy Committee at its meeting held on 19 March 2024 be and are hereby confirmed as a true and accurate record of the proceedings.
- 2 That the Minutes of the Services Policy Committee at its meeting held on 19 March 2024 be and are hereby confirmed as a true and accurate record of the proceedings.

FURTHER CONSIDERATIONS

Consideration has been given to the recommendation's impact on Council's service delivery; image and reputation; political; environmental; health and safety; employees; stakeholders and project management; and no further implications or risks have been identified.

SUPPORTING INFORMATION

Environmental Sustainability Policy Committee

At the Environmental Sustainability Policy Committee meeting held on 19 March 2024, all resolutions were made under delegation, and the minutes are presented for adoption.

Services Policy Committee

At the Services Policy Committee meeting held on 19 March 2024, all resolutions were made under delegation, and the minutes are presented for adoption.

ATTACHMENTS

- 1 ESPC 19 March 2024 Minutes, 2024/407 [↓](#)
- 2 SPC 19 March 2024 Minutes, 2024/406 [↓](#)

ORANGE CITY COUNCIL

MINUTES OF THE ENVIRONMENTAL SUSTAINABILITY POLICY COMMITTEE

HELD IN COUNCIL CHAMBER, CIVIC CENTRE, BYNG STREET, ORANGE

ON 19 MARCH 2024

COMMENCING AT 7.23PM

1 INTRODUCTION

ATTENDANCE

Cr D Mallard (Chairperson)(*Audio Visual Link*), Cr J Hamling (Mayor), Cr G Power (Deputy Mayor), Cr K Duffy, Cr M McDonell, Cr J Evans, Cr T Mileto, Cr G Floyd, Cr S Peterson, Cr T Greenhalgh, Cr F Kinghorne, Cr J Whitton

Chief Executive Officer, Acting Director Development Services (Johnston), Director Community, Recreation and Cultural Services, Director Technical Services, Manager Corporate Governance

The Mayor chaired the meeting with Cr Mallard attending via Audio Visual Link

APOLOGIES AND LEAVE OF ABSENCE

Nil.

RESOLVED - 24/081

Cr F Kinghorne/Cr M McDonell

That Cr D Mallard be permitted to attend the Council Meeting of Orange City Council on 19 March 2024 via Audio Visual Link.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

1.1 DECLARATION OF PECUNIARY INTERESTS, SIGNIFICANT NON-PECUNIARY INTERESTS AND LESS THAN SIGNIFICANT NON-PECUNIARY INTERESTS

Nil.

MINUTES OF ENVIRONMENTAL SUSTAINABILITY POLICY COMMITTEE

19 MARCH 2024

2 COMMITTEE MINUTES

2.1 MINUTES OF THE ENVIRONMENTAL SUSTAINABILITY COMMUNITY COMMITTEE 16
FEBRUARY 2024

TRIM REFERENCE: 2024/209

| | | |
|--------------------------|---|--------------------------------|
| RESOLVED - 24/082 | | Cr J Whitton/Cr G Floyd |
| 1 | That Council acknowledge the reports presented to the Environmental Sustainability Community Committee at its meeting held on 16 February 2024. | |
| 2 | That the minutes of the Environmental Sustainability Community Committee from its meeting held on 16 February 2024 be adopted. | |

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton
Against: Nil
Absent: Nil

THE MEETING CLOSED AT 7.24PM

ORANGE CITY COUNCIL

MINUTES OF THE

SERVICES POLICY COMMITTEE

HELD IN COUNCIL CHAMBER, CIVIC CENTRE, BYNG STREET, ORANGE

ON 19 MARCH 2024

COMMENCING AT 7.24PM

1 INTRODUCTION

ATTENDANCE

Cr M McDonell (Chairperson), Cr J Hamling (Mayor), Cr G Power (Deputy Mayor), Cr K Duffy, Cr D Mallard, Cr J Evans, Cr T Mileto, Cr G Floyd, Cr T Greenhalgh, Cr S Peterson, Cr F Kinghorne, Cr J Whitton

Chief Executive Officer, Acting Director Development Services (Johnston), Director Community, Recreation and Cultural Services, Director Technical Services, Manager Corporate Governance

APOLOGIES AND LEAVE OF ABSENCE

Nil.

RESOLVED - 24/083

Cr F Kinghorne/Cr M McDonell

That Cr D Mallard be permitted to attend the Council Meeting of Orange City Council on 19 March 2024 via Audio Visual Link.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

1.1 DECLARATION OF PECUNIARY INTERESTS, SIGNIFICANT NON-PECUNIARY INTERESTS AND LESS THAN SIGNIFICANT NON-PECUNIARY INTERESTS

Nil.

MINUTES OF SERVICES POLICY COMMITTEE**19 MARCH 2024**

2 COMMITTEE MINUTES**2.1 MINUTES OF THE NAIDOC WEEK COMMITTEE MEETING 8 DECEMBER 2023 AND 1 FEBRUARY 2024**

TRIM REFERENCE: 2024/115

RESOLVED - 24/084**Cr G Power/Cr T Greenhalgh**

- | | |
|---|---|
| 1 | That Council acknowledge the reports presented to the NAIDOC Week Community Committee at its meeting held on 8 December 2023 and 1 February 2024. |
| 2 | That the minutes of the NAIDOC Week Community Committee from its meetings held on 8 December 2023 and 1 February 2024 be adopted. |

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

MINUTES OF SERVICES POLICY COMMITTEE

19 MARCH 2024

2.2 MINUTES OF THE AGEING AND ACCESS COMMUNITY COMMITTEE 6 FEBRUARY 2024

TRIM REFERENCE: 2024/198

RESOLVED - 24/085**Cr G Floyd/Cr F Kinghorne**

- 1 That Council acknowledge the reports presented to the Ageing and Access Community Committee at its meeting held on 6 February 2024.
- 2 That Council determine recommendations 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6 and 4.1.7 from the minutes of the Ageing and Access Community Committee meeting of 6 February 2024.
 - 4.1.1 *That Council invite members of the Ageing and Access Community Committee and Events Team to identify potential ramp sites to grassed areas in Robertson and Cook Parks.*
 - 4.1.2 *That Council allocate funding in the forthcoming budget for the installation of ramps to identified grassed areas in Robertson and Cook Parks.*
 - 4.1.3 *That the Manager Building Services be invited to the next meeting of the Ageing and Access Community Committee to discuss the delineation of the steps located outside of Groundstone.*
 - 4.1.4 *That Orange City Council contact Centre Management at Orange City Centre to request that they investigate installing temporary accessible car parks at the ramp entrance during the closure of the main entrance due to building works.*
 - 4.1.5 *That a representative from Council's Project Management Office be invited to the next meeting of the Ageing and Access Community Committee to discuss the design and accessibility of new projects including the Conservatorium and Sports Stadium.*
 - 4.1.6 *That Council investigate improving the lighting on the eastern end of the Railway Station footbridge.*
 - 4.1.7 *That the Ageing and Access Community Committee Action Plan be reviewed and updated.*
- 3 That the remainder of the minutes of the Ageing and Access Community Committee from its meeting held on 6 February 2024 be adopted.

For: Cr J Hamling, Cr K Duffy, Cr J Evans, Cr G Floyd, Cr T Greenhalgh, Cr F Kinghorne, Cr D Mallard, Cr M McDonnell, Cr T Mileto, Cr S Peterson, Cr G Power, Cr J Whitton

Against: Nil

Absent: Nil

THE MEETING CLOSED AT 7.25PM

5.2 POLICY REVIEW - SUBDIVISION AND DEVELOPMENT CODE - POST EXHIBITION

RECORD NUMBER: 2023/2239

AUTHOR: Jason Theakstone, Manager Engineering Services

EXECUTIVE SUMMARY

This report presents the Subdivision and Development Code (Code) which has been reviewed and placed on public exhibition from 6 December 2023 to 19 January 2024. Two submissions were received during the exhibition period. It is now recommended the Code be adopted.

LINK TO DELIVERY/OPERATIONAL PLAN

The recommendation in this report relates to the Delivery/Operational Plan strategy “8.1. Plan for growth and development that balances liveability with valuing the local environment”.

FINANCIAL IMPLICATIONS

Nil

POLICY AND GOVERNANCE IMPLICATIONS

Nil

RECOMMENDATION

That Council adopt the Draft Orange City Council Subdivision and Development Code.

FURTHER CONSIDERATIONS

Consideration has been given to the recommendation’s impact on Council’s service delivery; image and reputation; political; environmental; health and safety; employees; stakeholders and project management; and no further implications or risks have been identified.

SUPPORTING INFORMATION

Council’s policy for engineering requirements on developments, the Subdivision and Development Code (Code), was first adopted on 15 November 1979 and subsequently amended in 1982. A further release of a Subdivision & Development Code has been used by Council since 1997. This policy is a basic document setting out accepted subdivision and development work methods within the Orange LGA area.

Over the past 30 years, major changes to work practices, Australian Standards, government legislation and public perception, have occurred in relation to developments in Local Government. It has been recognised that the Code is dated and required to be updated to consider these issues.

Council may remember resolving to exhibit a draft Subdivision Code at its 5 March 2019 Planning and Development Committee meeting. The 2019 draft Code was exhibited and Council received 2 comments. Parts of these comments were incorporated within the draft Code but the Code was shelved due to imminent changes within Austroads Guidelines and the WSAA codes.

Council's Technical Services Division has drafted a new Code for public exhibition and subsequent adoption. The new Code was placed on Public Exhibition from 6 December 2023 to 19 January 2024. Two submissions were received during the exhibition period. They are attached to this report along with the responses sent to the person making the submission and the amended code as a result of the submissions.

It is recommended that Council adopt the Subdivision and Development Code.

ATTACHMENTS

- 1 FOR ADOPTION - 2024 Subdivision and Development Code, D24/29130 [↓](#)
- 2 Submission 1 - Subdivision and Development Code, D24/28045 [↓](#)
- 3 Response to Submission 1 - Subdivision and Development Code, D24/29131 [↓](#)
- 4 Submission 2 - Subdivision and Development Code, D24/27943 [↓](#)
- 5 Response to Submission 2 - Subdivision and Development Code, D24/29132 [↓](#)



Subdivision and Development Code

FOR ADOPTION

PO Box 35, Orange
NSW 2800 Australia

135 Byng Street, Orange
NSW 2800 Australia

P: +61 2 6393 8000
F: +61 2 6393 8199

council@orange.nsw.gov.au
www.orange.nsw.gov.au



AMENDED RECORD

Proposals for amendment or addition to the contents of this manual are to be forwarded in writing to the Director Technical Services.

| No. | Date | Amendment | Name | Approval Date |
|-----|-----------|-----------------|------|---------------|
| 1 | 19/3/2024 | Post Exhibition | JT | 20/3/2024 |
| | | | | |
| | | | | |

FOR ADOPTION



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SECTION 1 GENERAL

1.1 INTRODUCTION

The Orange City Council Subdivision and Development Code (the Code) for engineering works has been developed to provide consistent guidelines for the design and construction of engineering works within the Orange City Council area to facilitate the expeditious processing of engineering plan submissions, Construction Certificate approvals, and Subdivision Certificate approval for subdivisions and developments within the Council area.

Council is the designated authority and can act as the Principal Certifying Authority (PCA) for subdivision works containing assets that will become Council assets. Any certifier with the appropriate accreditation, or council, can be the PCA for building work or private subdivisions such as strata subdivisions or community title subdivisions where Council assets are not involved.

This Code details the minimum standard of construction of civil works for the Orange Local Government Area.

The Council welcomes the submission of innovative design solutions which vary from the provisions contained within this Code and the Director of Technical Services will consider these proposals on their merits, having regard to such matters as the infrastructure design life, long-term maintenance requirements, and conformance generally with accepted engineering standards.

Applicants must be aware that all development applications are considered on the merits of the development and its overall impact on the area and not solely in compliance with minimum engineering standards. It is imperative that all conditions of development consent imposed under the Environmental Planning and Assessment Act 1979 are addressed within the detailed engineering plans, as these conditions take precedence over the information contained herein.

When development approval includes conditions of construction which are embodied in the approved plans and specifications, the onus is on the person who has the benefit of the approval to ensure works are carried out in compliance with these conditions.

The Council will hold the person who has the benefit of the approval solely responsible for constructing the approved infrastructure works. Any contractor carrying out subdivision or development works is directly responsible to the Developer, and not to Council.



1.2 DEFINITIONS

| Name | Description |
|---------------------------------------|---|
| AEP | Annual Exceedance Probability |
| Applicant | The person seeking development approval. |
| ARR | Australian Rainfall and Runoff Guidelines |
| Austroads | Austroads Guidelines produced by Austroads |
| CBR | California Bearing Ratios |
| Construction Certificate | Certificate provided by Director Technical Services, or their delegate, or Private Certifying Authority which allows construction of works to proceed. |
| Council Officer | Person with delegated authority from the Director Technical Services to carry out inspections. |
| Cross Drainage | Drainage used to convey stormwater from one side of a road carriageway to the other, nominally at right angles to the road centreline |
| DGA | Dense Graded Asphalt |
| Developer | The person who has the benefit of the approval |
| Development | Approved works to be carried out by the Applicant / Developer |
| Development Application | Application for approval to carry out building, engineering or other works as defined on the Environmental Planning and Assessment Act 1979. |
| Development Security Bond | A security bond taken from the Developer to cover the costs of making good any damage caused to any property of the consent authority, completing any public work, remedying any defects in any such public work & in relation to coastal protection works, 1. Maintaining works or 2. The restoration of a beach, or land adjacent to a beach. |
| Director Technical Services | Director Technical Services for Orange City Council |
| DCIA | Directly Connected Impervious Area |
| Drawings | Documents presenting information in pictorial form, including long sections, elevations, sections and other detail as necessary to fully describe the works to be carried out. |
| EPA | Environmental Protection Authority |
| ESCP | Erosion and Sediment Control Plan |
| ICIA | Indirectly Connected Impervious Area |
| LGA | Local Government Area |
| OSD | On site detention |
| Orange City Council | The Local Government body responsible for the Orange Local Government Area. |
| PA | Pervious Area |
| PMF | Probable Maximum Flood |
| Principal Certifying Authority | Principal Certifying Authority (PCA) is the person accredited by the Building Professionals Board and who ensures that all construction work has and is being executed in accordance with the development consent and Council's Subdivision and Development Code for future privately owned assets. |
| Registered Surveyor | A person registered under the Surveying Act, 2002, as amended. |



| Name | Description |
|----------------------------------|--|
| Road Opening Permit (ROP) | Approval granted by Council to carry out work within the Council road reserve. |
| ROL | Road Occupancy Licence |
| RRJ | Rubber Ringed Jointed |
| SMA | Stone Mastic Asphalt |
| Specifications | A written document with technical information, directions and conditions which deal with the quality of materials, standard of workmanship and other requirements of a project |
| Subdivision | The division of a lot, tract, or parcel of land into two or more lots or other divisions of land for the purpose of sale or of building development. |
| TfNSW | Transport for NSW |
| 'The Code' / 'This Code' | Reference to the Orange City Council Subdivision and Development Code |
| TGS | Traffic Guidance Scheme |
| TIA | Total Impervious Area |
| TPs | Tangent Points |
| TPZ | Tree Protection Zone |
| Traffic Controller | Must be suitably qualified in accordance with the TfNSW Guide for Traffic Control. |
| Verge | Area between kerb and property boundary. |
| WAE | Works as Executed |
| WSAA | Water Services Association of Australia |
| WSMP | Water and Soil Management Plan |
| WSUD | Water Sensitive Urban Design |

1.3 SUBMISSION OF DRAWINGS AND SPECIFICATIONS

1.3.1 ENGINEERING DRAWINGS

The Applicant is to submit the engineering plans electronically for approval.

Paper submissions are no longer accepted.

The engineering plan approval fee is shown within Councils fees and charges and must be paid before any plans will be assessed.

Where applicable all drawing packages must contain engineering justifications and specifications for the following:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Cover Sheet • Road details • Sewerage infrastructure • Electricity, gas and telecommunications plan • Erosion and sediment control plan • DRAINS stormwater model | <ul style="list-style-type: none"> • Earthwork – lot levels pre and post • Drainage details • Water Infrastructure • DWG. files for water analysis • Landscaping plan – where applicable • Traffic Management Plan (Traffic Guidance Scheme) |
|--|--|



- | | |
|--|--|
| <ul style="list-style-type: none">• MUSIC modelling• Certification Report | <ul style="list-style-type: none">• Safety Audit• Non-conformance for design report |
|--|--|

For uniformity of plan presentation and to facilitate filing and scanning, all plan sizes, lettering, line work, and symbols are to conform to the latest edition of AS 1100 - Technical Drawing.

Each sheet must include bar scales showing the reduction ratio of all works shown on that sheet, with a ratio scale shown adjacent thereto. All sheets are to be signed by the Consultant / Engineer responsible for the design of the works.

Once the plans have been approved, they will be stamped and returned electronically via Council's File Sharing Application.

1.3.2 PERSONS QUALIFIED

Council requires that engineering works be designed to Council standards by a suitably qualified person. The person must have professional indemnity insurance indemnifying themselves for a minimum of two (2) million dollars.

1.3.3 CONSTRUCTION SPECIFICATION

These Guidelines must not be interpreted as being a specification, even though some design criteria are included throughout.

The minimum standard of Construction Specifications to be used are the relevant Austroads, Transport for NSW (TfNSW) and Water Services Association of Australia (WSAA) construction specifications with some relevant construction specifications provided throughout this document. However, the Developer may submit their own job-specific specifications for approval where there is any variance from these standard specifications. Council is not bound to accept these specifications and has final approval of any variance.

The developer/ designer shall submit a non-conformance report detailing all areas within the design that do not conform with the relevant standard.

1.3.4 APPROVAL OF ENGINEERING DRAWINGS AND SPECIFICATIONS

Approval of Drawings and Specification may be made by a Private Certifying Authority accredited with the appropriate level of accreditation or the Director of Technical Services for assets relating to a development or subdivision.

Where the Applicant wishes the Director Technical Services to certify the development or subdivision plans, the correct fee must be paid at the time of plan lodgement and assessment of plans will not commence until payment of plan approval fees.

The Developer must make all necessary amendments using change clouds within the drawing set and submit a final set of engineering plans. When the Director Technical Services accepts all amendments, the plans will be approved.

Council's approval is conditional on the information presented by the Developer and does not relieve the Developer from rectifying any errors or omissions which may become evident during construction.



Further, the approval of engineering plans and specifications is current for a period of two years only. If this Code changes before the works are substantially commenced, the Developer must comply with the most recent version. If work has not substantially commenced inside of this two year period, the Director Technical Services may require revised Engineering Plans and Specifications to be submitted for approval.

1.4 CONSTRUCTION CERTIFICATE / SUBDIVISION WORKS CERTIFICATE

1.4.1 CONSTRUCTION CERTIFICATE / SUBDIVISION WORKS CERTIFICATE ISSUE

A Construction Certificate / Subdivision Works Certificate is required to be issued prior to works commencing as per Environment Planning and Assessment Act 1979. A Construction Certificate / Subdivision Works Certificate cannot be issued until all conditions of development approval relating to 'prior to Construction Certificate or Subdivision Works Certificate issue' have been completed and relevant fees paid. A Construction Certificate / Subdivision Works Certificate will not be issued in retrospect of works occurring.

1.4.2 WORKS CONTRACTOR DETAILS

The works contractor is required to be approved by Council as competent prior to works commencing. The applicant must provide written notice of the name, address, telephone number, references, previous experience, third party and public risk insurances of the works contractor to the Director Technical Services at least two days prior to the proposed date of commencement of any construction. Contractors previously approved by Council do not need to prove competence but must prove insurance coverage.

1.4.3 NOTIFICATION OF COMMENCEMENT OF WORKS

A Notification of Commencement of Works is required to be submitted to Council a minimum 48 hours prior to commencement of work.

1.5 INSPECTION OF COUNCIL ASSETS

All road, drainage, water, and sewerage construction works that will be publicly owned must be inspected and approved by Council staff or a Private Certifying Authority during construction.

The type and frequency of inspections are detailed in Section 1.7.

The Applicant and Developer must always provide uninterrupted access and afford every facility for the examination of any works and materials, as requested by the Director Technical Services, or their representative.

Council will provide written notice to the Applicant and Contractor of the inspection outcome within 24 hours of completion of inspection.

1.6 FEES AND CONTRIBUTIONS

Assessment of engineering drawings will not be commenced until payment of the appropriate plan approval fees, current as at time of plan lodgement.

Subdivisions and developments may also incur charges levied under Section 7.11 of the Environmental Planning and Assessment Act, Section 64 of the Local Government Act, and inspection fees as detailed in Council's Fees and Charges or as otherwise detailed in the development consent. The current value of these fees will be supplied upon request.



1.7 INSPECTION AND TESTING

All road, drainage, kerb and gutter and land shaping works that will become Council assets associated with a development will be inspected by Council's Engineering Services or an appropriately certified certifying authority.

As Council is the water and sewer authority for the Council area, water and sewerage reticulation works are required to be inspected and approved by Council's Engineering Services prior to issue of a Subdivision Certificate or Occupation Certificate.

A minimum of 24 hours-notice for booking in an inspection is required.

Inspections must be carried out Monday to Friday, except for public holidays, between the hours of 9:00 am and 3:30 pm. Bookings can be made by contacting Council's Engineering Services by phone on 63938039.

The whole of the works are to be carried out to the satisfaction of the Council's Director Technical Services or appropriately certified Principle Certifying Authority prior to the release of a Compliance Certificate.

Council will inspect engineering works at the following stages:

- Installation of erosion and sedimentation control measures
- Following site regrading and shaping, and prior to installation of verge infrastructure
- Stormwater and subsoil drainage lines prior to backfill
- Water and sewer lines prior to backfill
- Water Services prior to backfill
- Pressure testing of water and sewer lines
- Subgrade preparation, before placing pavement
- Establishment of line and level for kerb and gutter placement
- Completion of each pavement layer ready for testing
- Road pavement surfacing
- Benkelman Beaming results of pavement base layer prior to placement of asphalt
- Completion of works
- Reinforcement and formwork for concrete placement

The Developer or contractor must give Council a minimum 24 hours-notice when requesting an inspection to ensure that development works are not delayed.

The Developer must, if required by Council's Director Technical Services or delegate, submit delivery dockets for all materials used. Results of all quality testing of material used on the development must be submitted to Council prior to use on site.

Compliance with relevant standards and codes remains the responsibility of the Developer.

1.8 PUBLIC SAFETY

The Developer must not obstruct and will be held responsible for the safety of the public, traffic and utility services such as electricity, water, telecommunications and the like, and must provide all watchmen, lights, barriers, signs and fences to prevent accidents/injury to public or private damage or loss.



The applicant must provide, erect and maintain all necessary temporary roads, bridges, verges, drains, supports and protection in order to ensure the above. These traffic control facilities must be carried out in accordance with relevant standards.

1.9 ROAD OPENING PERMIT

A Road Opening Permit (ROP) in accordance with Section 138 of the Roads Act 1993 is used to apply for a permit to carry out any intrusive digging in the public road or footpath reserve. (Fees and charges relating to the ROP can be found in Council's Fees and Charges schedule for the relevant year). The type of works covered by this application, include, but are not limited to:

- Installation, maintenance, repairs/replacement or upgrading of utilities (water, gas, electricity or telecommunications).
- Any type of stormwater or sewer connection works and repairs.
- Construction of any temporary/permanent driveway access to a property for residential or construction vehicle access.
- Replacement of redundant driveways
- Installation of new footpaths.
- Upgrading the road, kerb and gutter associated with a development site approved by the Council.

TfNSW is responsible for state roads and shared responsibility for regional classified roads. A Road Occupancy Licence (ROL) is required to be obtained from the TfNSW if an activity is likely to impact on the operational efficiency of the road network such as a lane closure.

Should physical works on a regional classified road be required as part of the development, concurrence from TfNSW will be required prior to any ROP being issued. If a development is likely to require physical works on a state classified road, it will be identified as part of the development approval process and a Works Authorisation Deed (WAD) will be required to be obtained from the TfNSW.

Regional classified roads require a S138 concurrence from the TfNSW, as per Section 138 of the NSW Roads Act 1993.

1.10 ROAD CLOSURE

Public roads must not be closed to undertake works without the express approval of Orange City Council. A completed application to close a public road must be submitted to Council 28 days prior to the proposed road closure. Works must not commence until conditional approval is received and conditions of approval completed.

1.11 DAMAGE TO PROPERTY

In the event of any utility, Council asset or service being damaged or interrupted the Developer must forthwith notify the responsible Authority and take all necessary steps to provide for the safety of the public and to have the damage repaired as quickly as possible. The cost of all repairs is to be the responsibility of the Developer and their contractor.

Prior to commencing works the contractor must contact 'Before you Dig Australia', and/or the relevant service authority, to ensure there will be no conflict between proposed and existing services.



Where private property is damaged, the Developer must arrange with the concerned party replacement, repair, or otherwise. This cost is to be resolved between the Developer and the relevant party.

1.12 COMPLETION OF WORKS

When the Developer is of the opinion that all works have been satisfactorily completed, the Developer must make arrangements with Council's Engineering Services for a Final Inspection to be performed. A minimum 24 hours-notice is required for booking inspections.

All advisory / warning signs, and traffic control devices must be installed prior to Council's Final Inspection.

If all engineering works are satisfactory, Council will issue an Engineering Services Inspection Record of the final inspection indicating works are completed. Any defects or omissions must be repaired before a Compliance or Subdivision Certificate will be issued.

Council will provide written notice to the applicant of the inspection outcome within 24 hours of completion of inspection.

1.13 WORKS AS EXECUTED PLANS

Following the satisfactory completion of engineering works for a development or subdivision Works As Executed (WAE) Plans prepared by a registered surveyor or professional engineer must be submitted, in an electronic format (.dwg) and PDF, to Council.

These plans must be lodged prior to the issue of a Subdivision Certificate, or prior to Occupation Certificate or use of the development.

The WAE Plans must be the Council approved Engineering Drawings as modified, and must include the following items:

- Invert levels of all drainage and sewerage lines at entrance and exit
- Location, class, size, and material of all pipes and subsoil lines
- Location and diameter of service conduits
- Pavement thickness as constructed
- Location of all services/utilities (electricity, NBN, gas) including depths
- Road centreline and kerb levels at all Tangent Points (TPs), crests, sags, end of construction, and at 50 metre intervals on straights
- Road verge widths at all TPs, centre of curves, and at each end of construction
- Location of kerb laybacks and vehicular driveways
- Location of stop valves, hydrants, water services, sewer manholes, sewer junctions, stormwater and inter-allotment drainage pits
- Site regrading details - finished surface levels at centre of front and rear boundaries
- Contour depth of fill plans with depths in 0.25m increments shaded or hatched
- The location and level of any permanent survey marks
- Any departure from approved plans, and additional work undertaken
- Lots which cannot be serviced by sewer (i.e. area where 1.667% fall from 0.6m below ground level to the sewer junction is not possible)
- Each WAE plan must include the following certification by the Registered Surveyor responsible for the preparation of the plan



I certify that:

- 1) This survey is a true record of the works that have been constructed, and
- 2) All drainage pipes and pits are located within the drainage easements and/or reserves shown on the deposited plan.
- 3) All sewerage pipes and manholes are located within the sewerage easements and / or reserves shown on the deposited plan.
- 4) All water pipes and fittings are located within the water easements and/or reserves shown on the deposited plan.

| Name | Signature | Date |
|---------|-----------|------|
| | | |
| Address | | |

1.14 BONDS AND GUARANTEES

Where Council holds a bond or bank guarantee and works have not been satisfactorily completed within the agreed time frame, the Director Technical Services may either grant an extension of time or complete the works at the Developer's expense.

If serious defects arise during the bond period which require urgent attention due to safety concerns or otherwise, Council may rectify works and shall either use the bond money as payment or invoice the Developer.

1.14.1 SECURITY BOND

Where a Developer constructs or provides public infrastructure, a security bond equal to 5% of the total development construction cost is required to be paid to Council prior to the issue of a Subdivision Certificate. A minimum bond amount of \$1500 must apply.

The maintenance security bond is held by Council to ensure that all public infrastructure works have been constructed to a satisfactory standard and can withstand the rigours of service conditions. Unexpended bond monies are refunded to the Developer at the expiry of the maintenance defect period at their written request.

1.14.2 DEFECTS LIABILITY PERIOD

The duration of the defect liability period must be a **minimum** of twelve (12) months from the date of issue of a Subdivision Certificate for a subdivision or **minimum** of twelve (12) months from the date of issue of an Occupation Certificate. However, if in the opinion of the Director Technical Services, the infrastructure has not been subjected to normal operating conditions during this time, the defect liability period may be extended until such time as the facility has been adequately tested under operating conditions.

Within the defect liability period, the Developer is expected to rectify any defect which becomes apparent in the Development works. Council may seize bond money to rectify faults if they have not been repaired within a reasonable time or if necessary to urgently repair a defect, which could conceivably cause harm or injury to persons or property.



1.14.3 BOND/PRIVATE WORKS AGREEMENT FOR EARLY RELEASE OF A SUBDIVISION CERTIFICATE

Where engineering works for a Subdivision or Development are nearly complete, the Director Technical Services may accept payment of a private works order or a bond from the applicant for completion of works within a specified time after release of the Subdivision Certificate. A non-refundable fee applies for preparation of the early release by the Director Technical Services and the amount of the bond or bank guarantee must be at least 125% of the estimated cost of the works and the completion of the bonded works will be required within an agreed time as defined within the bond.

The estimated cost of the works must be determined by Council from a Council estimate compared to the Developer's estimate. The greater amount being accepted.

If works have not been completed within the specified time Council can use the bond to complete the works.

1.15 SURVEY REQUIREMENTS

All surveys must be undertaken on MGA Zone 55 using the Australian Height Datum (AHD). All plans or files submitted to council must indicate the datum used.

All plans of survey are to show connection to at least two survey control permanent marks where practicable. Where it is intended to open a new road, at least two control marks per sheet of the subdivision plan are to be established in the road by the Surveyor and connected to the nearest allotment corner.

The location and level of all permanent survey marks established as part of the works are to be clearly shown on the WAE Plans.

Survey Control Marks and lot boundaries must be placed in accordance with the Surveying and Spatial Information Regulation 2017, prior to the issue of a subdivision certificate.

1.16 MISCELLANEOUS

1.16.1 TREE PRESERVATION

A person must not ringbark, cut down, top, lop, remove, injure, or willfully destroy any tree or other vegetation to which any such Development Control Plan applies without the authority conferred by:

- a) Development consent, or
- b) Permit granted by the Council.

The refusal by the Council to grant a permit to a person who has duly applied for the grant of the permit is taken for the purposes of the Act to be a refusal by the Council to grant consent for the carrying out of the activity for which a permit was sought.

Council has tree preservation requirements, as per the Orange City Council Local Environmental Plan (LEP) and Development Control Plans (DCP), on trees situated within the Local Government Area (LGA). Advice must be obtained from Council's Development Services Department as to the requirements for the Orange Council area.

Plans for proposed Development works are to show trees which may be affected together with species identification. Any approval to remove trees will be assessed in the overall development approval process. No trees are to be removed until approval is given in the approval process.



Scarred or significant trees (Heritage/Aboriginal or endangered species) must be labelled on the plans.

1.16.2 ADJOINING OWNERS CONSENT

Where an applicant proposes to carry out work on an adjoining property, the applicant must submit the property owners written consent to Council before approval of engineering drawings will be issued.

At the completion of engineering works on the adjoining property a written statement is to be obtained from the adjoining property owner, stating that works on the adjoining property have been carried out to their satisfaction, and submitted to Council prior to the issue of a Subdivision Certificate or Occupation Certificate.

1.16.3 LOT FILLING / GRADING

Any areas to be filled or regraded are to be clearly identified on the engineering drawings. Provision must be made to ensure that no ponding of water occurs on adjoining properties, no overland flow paths are affected, and flood prone land effected as a result of filling or regrading.

Where fill is to extend onto adjoining properties, the adjoining owners' consent is required.

Where any excavation on a Development site extends below the existing level of the ground on adjoining land and is within the zone of influence of the property boundary, the Developer must, at their own expense:

- Protect and support the adjoining land from possible damage from the excavation, and
- Where necessary support the land to prevent any such damage
- Protect Council's assets – roads, mains, manholes etc.

The minimum lot grading must be 1% towards a public road or inter allotment drainage line, and a minimum 150mm of topsoil placed over all fill areas. All filled areas must be compacted to a level commensurate with the proposed land use.

Fill in residential, commercial and industrial areas must be carried out as per controlled fill and compacted to a minimum 95% standard compaction for residential, 98% for commercial and may require higher under specific conditions. Certification from a NATA accredited laboratory stating that the fill has been carried out in accordance with AS 3798-2007 is also required.

Any imported fill used is required to be clean and uncontaminated. Where imported fill is used, Council will require soil sampling for analysing chemical residue to be carried out on the fill material by an appropriately qualified and experienced consultant giving consideration to previous specific uses and onsite characteristics of the site.

A NATA accredited laboratory is to carry out such testing with reference made to the Contaminated Land Management Act 1997 and State Environmental Planning Policy (Resilience and Hazards) 2021. A report with results of testing will be required to be provided to Council demonstrating that the soil is suitable for the proposed use.

1.16.4 COMPLIANCE WITH ACTS

It is the responsibility of the Developer and contractor/s to ensure that all works are undertaken in a safe manner. In particular, the Developer and all contractor/s must ensure compliance with the Workplace Health and Safety Act 2011 and any other relevant Acts, Ordinances, and Regulations.



1.16.5 PUBLIC UTILITY SERVICES

Council will require all service authorities (except in emergency circumstances) to provide written notice of any intention to undertake a road opening. Such notification to be given at least fourteen (14) working days prior to road opening works.

1.16.5.1 EXISTING ROAD

Utility services to be installed across an existing roadway are to be under bored at a depth as advised by Council, taking into account road pavement depth and future works by Council.

At no time whatsoever is an open trench to be cut, unless approved by the Council as per Council's Road Opening Permit.

1.16.5.2 EXISTING FOOTPATH WITH CONCRETE PAVING

The utility service provider is to install the service on its correct alignment and depth. Saw cuts are to be in the same alignment as existing dummy joints or construction joints where existing. Refer to Council's Approved Standard Drawings.

1.16.5.3 TRAFFIC CONTROL

Both vehicular and pedestrian traffic is to be guided by signage conforming to AS1742.3 Manual of Uniform Traffic Control Devices Part 3: Traffic Control for Works on Roads, a copy of the Plan is to be kept on site during the works.

1.16.5.4 GENERAL

Services must be located in accordance with Council's Approved Standard Drawings.

All services must generally run parallel to the road centre line and cross the road perpendicular to the centre line unless otherwise approved by Council's Director Technical Services.

All service authorities are to have completed the installation of services prior to the final inspection of the works by Council.

1.16.7 KERB AND GUTTER

All stormwater connections must be undertaken to ensure they match the invert of the gutter. Restoration of the gutter must ensure the top of kerb maintains uniformity with a minimum of 50mm of concrete over the new pipe.

Vertical saw cuts must be made a minimum of 100mm from the outside of the connection and must be a minimum of 500mm from any layback.

Multiple pipes must be separated horizontally by a minimum of 100mm.

1.16.8 ELECTRICITY AND TELECOMMUNICATIONS

The applicant is required to supply electrical and telecommunications infrastructure, enabling all blocks to be serviced. The infrastructure must be installed underground in the service corridor for urban, commercial and industrial areas as shown in Council's Approved Standard Drawings.

All infrastructure must be installed in accordance with the requirements of the relevant Authorities. Certification from the relevant Authorities as indicated below, stating that the infrastructure has been installed to the relevant standards and requirements, must be submitted to Council prior to the issue of a Subdivision Certificate:

- A letter or Certificate of Practical Completion from relevant telecommunications authority
- A Notice of Arrangement from Essential Energy



The cost of altering existing services found necessary as a result of the development, must be borne by the Developer.

1.16.9 STREET LIGHTING

The applicant is required to provide appropriate street lighting for the whole of the development with design in accordance with AS/NZS 1158 Lighting for Roads and Public Spaces, and the requirements of Electricity Authority who will be responsible for completion certification and maintenance. Lighting design must be carried out by a suitably trained and accredited street lighting designer.

The use of energy-saving lighting fixtures (such as LED) is required.

Street and public lighting must meet the standards for Category V or Category P lighting as appropriate. Category V lighting is applicable on roads where visual requirements of motorists are dominant, such as sub arterial roads or greater traffic volume. Category P lighting is applicable on roads (and other public outdoor areas) where the visual requirements of pedestrians are dominant, such as local roads and outdoor shopping precincts.

1.16.10 HOURS OF CONSTRUCTION

Work on any construction site is limited between the hours of 7.00am and 6.00pm Monday to Friday inclusive, 8.00am to 1.00pm Saturday and no work on Sundays and Public Holidays, as per NSW Interim Construction Guidelines. Any construction outside these times will need to seek the appropriate approvals, inclusive of Councils approval. Consideration to EPA noise guidelines should be observed during any construction.

1.16.11 RAIL AUTHORITY

Before starting work across a railway, railway property or within 25m of a rail corridor, the Developer must obtain approval from the Rail Authority and their representative maintenance authority. Proof of this approval is required to be submitted to Council prior to the issue of a Construction Certificate. The cost of this approval and any associated costs shall be borne by the Developer.

1.16.12 STREET NAMES

An application form for street naming must be submitted for approval at the Development Application stage which, must comply with the policy of the Geographical Naming Board (GNB). Approval from the GNB must be issued prior to issue of a Subdivision Certificate for the development.

Street name signs must be provided and installed by Council at the Developer's cost as per Orange City Council's Fees and Charges relevant at the time of application for a Subdivision Certificate.

Preferably, an application form for street naming should be lodged with Council and approved by GNB prior to a development application for the development being lodged with Council. This would eliminate any possible delay in processing times in gaining GNB approval whilst a development application was being assessed.

**1.16.13 STREET TREES**

Trees must be provided as per the relevant Development Control Plan (DCP) for the subject area.

Developer's must provide and install street trees as indicated in the Street Tree Landscaping Plan approved by Council. Information concerning types of trees suited to development areas can be obtained from Council. Trees must be planted and approved, or bonded by Council prior to the issue of a Subdivision Certificate.

1.16.14 PATHWAY RESERVES

Pathway reserves must be a minimum width of 4.5m and must incorporate a minimum 2.5m wide concrete shared path extending to kerb and gutter at both ends of pathway. Minimum 100mm diameter hot dipped galvanized bollards are to be placed on road reserve boundary at either end of pathway. Minimum 2 bollards per end of pathway. Footpath design to be as per Council's Approved Standard Drawings.

The design of pathways must adhere to the guidelines of the Disability Inclusion Act 2014 where feasible and in accordance with Council Standard Drawings.

1.16.15 DEVELOPER'S RESPONSIBILITIES

The person having the benefit of the development approval shall be responsible for constructing the required development works to the Principal Certifying Authority's satisfaction.

The Council in issuing a Subdivision Certificate or issuing a Certificate of Completion accepts ownership of the assets for the related development subject to the defect liability period. Where assets are not to be the property of Council, such as in strata subdivisions or community title subdivisions the PCA will issue a Subdivision Certificate or Compliance Certificate that will be based on the relevant community plan or strata plan respectively.

The Developer must nominate to the Council for approval in writing, prior to commencement of construction, the name of the contractor who is to carry out the work associated with the Development. Details of experience and technical expertise in similar works and the financial capabilities of the contractor to carry out the works is also required by the Council.

The Council will not require the details above for contractors previously approved.

A contractor carrying out Subdivision works is the responsibility of the Developer, not the Council. However, Council will have the authority to direct the contractor in regard to quality of work.

The Developer must nominate to Council, the person or firm, with whom correspondence relating to the technical aspect of the Development must be exchanged.

1.16.16 FOOTPATH / VERGE

All footpaths must be plain concrete unless otherwise advised by Council. Concrete footpaths must be completed or bonded prior to the issue of a Subdivision Certificate, and as per Council's Approved Standard Drawings.

1.16.17 COMMUNITY TITLE SUBDIVISION

Community Title Subdivision is a scheme providing for low, medium or high-density housing, leisure and retail facilities and other community uses. Whether the scheme is single, dual occupancy or multi-dwelling housing for residential or commercial usage it can be incorporated in a Community Title Subdivision. The schemes provide for land to be set aside for community, precinct or neighbourhood use while providing secure Title to the ownership of the neighbourhood property.



Community Title Subdivision Plans can only be prepared by a Registered Surveyor. Common property relates to land or services that are shared within the community scheme such as the service infrastructure and driveways. Roads, water and sewer requirements for Community Title Subdivisions can be found in Sections 2, 4 & 5 respectively.

1.16.18 STRATA TITLE SUBDIVISION

All strata schemes are depicted in strata plans. The strata plan is a subdivision of a parcel of Real Property land into separate lots and common property. Strata plans differ from conventional subdivisions in various ways:

- All lots are defined as a cubic space and must be limited in height and depth.
- Every strata plan must have a building on the parcel
- The lots are defined on the floor plan by the building or other permanent structures within the parcel
- Everything within the parcel which does not form part of a lot is common property
- It is the responsibility of the owner's corporation to maintain and repair common property
- The owner's corporation is a body corporate of all the lot owners in a scheme
- Each lot in a strata plan is allocated a unit entitlement based upon its value relative to the other lots in the scheme. The unit entitlement represents that lot's share of the common property

Roads, water and sewer requirements for Strata Title Subdivisions can be found in Sections 2, 4 & 5 respectively.

1.16.19 TORRENS TITLE SUBDIVISION (REAL PROPERTY)

Torrens Title Subdivision is the standard type of subdivision where lots are defined in area and boundary. The individual purchasers who own both the house and the land on which it is built and are responsible for the property's upkeep, inside and out. Many new subdivisions, however, do have restrictive covenants that dictate the use of particular building materials or size of building envelope.

This Code is based on the requirements for Torrens Title Subdivision and any differences are detailed for Strata and Community type subdivisions.

1.16.20 CAR PARKING

Where off street carparking is required in a multi-dwelling residential development it shall be designed in accordance with AS/NZS 2890.1:2004, Austroads pavement technology and meet requirements of Austroads Design Vehicle and Turning Path Templates. Vehicles are required to enter and leave the car park in a forward direction. All driveway and parking areas are to be designed for all expected loading conditions.

Where off street carparking is required in an industrial/ development it shall be designed in accordance with AS/NZS 2890.1:2004 – Parking facilities. Part 1: Off-street car parking, Austroads pavement technology and meet requirements of Austroads Design Vehicle and Turning Path Templates. Vehicles are required to enter and leave the car park in a forward direction. All driveway and parking areas are to be designed for all expected loading conditions.

Hard stand surfaces for storage in industrial areas and not used for parking or driveways is required as a minimum, to use gravel meeting the requirements of *Table 2.5* in Section 2.4.3 Pavement Materials.



For hard stand areas permanent sediment controls will be required to be installed on site.

1.16.21 BLUE STONE KERB

Blue stone kerb and gutter is found in the Heritage Conservation Area of the City of Orange. Removal of blue stone kerb and gutter for proposed development requires Council approval.

1.16.22 INSTALLATION OF TRAFFIC CONTROL DEVICES

TfNSW is legislated as the organisation responsible for the control of traffic on all roads in New South Wales. Traffic is controlled by the installation of prescribed traffic control devices, such as regulatory signs, line marking, or traffic control facilities, such as medians. TfNSW has delegated control of traffic on local roads to Orange City Council in the Orange Local Government Area. Therefore, all traffic control devices on Council controlled roads are required to be approved by Council's Traffic Committee and approval of traffic control devices on state roads will require the approval of TfNSW.

The delegation to Council does have limitations and as such, Council does not have authority over traffic signals or speed zones. Therefore, advice must be obtained from Council and TfNSW.

SECTION 2 ROADS

2.1 INTRODUCTION

This section of The Code outlines the Council's recommended practice for the design of roads. It is not a comprehensive design manual and is intended to complement the relevant Austroads and TfNSW publications.

2.2 ENGINEERING DRAWINGS

2.2.1 GENERAL

Engineering drawing submissions are to include all information requested in Section 1.3.1 of this Code. The following section provides an outline of the road details which must accompany all design submissions.

Urban and industrial roads generally have kerb and gutter whereas rural roads do not have kerb and gutter and generally contain table drains.

2.2.2 PLANS

Plans of all proposed Development works are to include the following:

1. Lot boundaries and numbers
2. Road centre line chainages, radii, tangent points and deflection angles
3. A benchmark within 100 m of the development site, with survey co-ordinates shown
4. Street names and north point
5. Bar scales
6. Existing services, trees, structures, and other significant landmarks
7. Proposed service crossings
8. Existing and new easements
9. Road reserve and carriageway width
10. All datum references to the Australian Height Datum
11. Symbol legend
12. Radii on kerb returns and kerb lines
13. Vehicular crossings (both urban and rural)



14. Existing and proposed contours
15. Proposed location of all street signs and pavement markings
16. Location of soil test sites, and designed subgrade CBR values so determined
17. Cycleways and footpaths
18. Cut and fill areas
19. Culvert locations with catchment areas and velocities
20. Stormwater pits and pipes
21. Proposed tree removal – number and species

2.2.3 LONGITUDINAL SECTION

A longitudinal section of the centre line of the roads must be supplied at scales of 1:500 horizontal, and 1:100 vertical (for urban roads) and 1:1000 horizontal and 1:200 vertical for rural roads. The longitudinal section of the road centre line must include chainages, reduced levels at the existing and design surfaces, design grades, length of vertical curves, cut and fill, guidepost schedule and location and type of services.

Longitudinal levels must be taken at 20m for urban and 50m for rural intervals and at all intermediate changes of grade.

Longitudinal sections and cross-sections must be taken along existing intersecting roads for a sufficient distance (approximately 50m) to enable kerb returns, dish crossings and any necessary drainage to be designed.

2.2.4 CROSS-SECTION

Cross-sections must be supplied at intervals not exceeding 25m for straights and 15m at curves, at a scale of 1:100. Cross-sections must show chainage, reduced level of existing surface, design levels of pavement, kerb, gutter, and footpath.

Cross-sections must not be terminated at the property alignment but must be levelled sufficiently beyond the road boundaries, to enable batters of cutting and embankment to be shown. Cross sections must also identify boundary and fence lines. Batters beyond property boundaries must be maintained at no greater than 1:6 for urban environments.

A typical cross-section shall include showing the following information:

1. Cross-falls on carriageway and verge
2. Type of kerb and gutter
3. Depth, type of material to be used, compaction required for each layer of pavement
4. Subgrade depth, compaction required and design CBR
5. Subsoil drainage
6. Concrete footpath, if required
7. Type of surfacing
8. Property boundaries

2.2.5 KERB RETURNS

Kerb profiles must be shown for all kerb returns and cul-de-sac bulbs. A scale of 1:200 horizontally and 1:100 vertically is suggested.



2.2.6 INTERSECTION DETAILS

A contour plan must be provided at all proposed intersections, roundabouts, and cul-de-sac bulbs. The contour interval must be selected to show variations in the design pavement surface levels, and so that the direction of surface runoff can be determined. A plan scale of 1:200 and contour interval of 0.1 metres is recommended.

2.2.7 SUPPORTING INFORMATION

The following supporting information is to be submitted with the Engineering Drawings:

- A copy of the site investigation report, including test results
- Pavement design calculations

2.2.8 ROAD DEDICATION

Where a survey is carried out for the purposes of a Development and it is found that the constructed road falls outside the road reserve and into the Development area, such land is to be dedicated as a public road as it is currently fenced, or if unfenced, a minimum of 5 metres from the edge of the road formation as constructed, for road purposes.

2.3 DESIGN STANDARDS

2.3.1 ROAD HIERARCHY

In all areas, a road hierarchy must be established to ensure that a safe and efficient environment is provided for motorists and pedestrians. The road network must be designed to passively discourage through traffic in residential areas, by creating a noticeable difference in speed environment and geometric characteristics relative to arterial routes.

The following classes of road have been adopted for use in areas administered by Council:

| Function | Max. No. of Dwellings/Lots Served | Design Traffic (ESA's) | Frontage Access |
|--------------------------------|-----------------------------------|-------------------------------------|-----------------|
| Urban | | | |
| Urban distributor | >200 | 1.0×10^7 | No |
| Urban collector | 200 | 2.0×10^6 | Yes |
| Urban local access | 50 | 6.0×10^5 | Yes |
| Urban cul-de-sac (8 - 30 lots) | 30 | 3.0×10^5 | Yes |
| Urban cul-de-sac <8 lots | <8 | 6.0×10^4 | Yes |
| Industrial | | 1.0×10^7 | Yes |
| Rural | | | |
| Major arterial road | Inter-district | 1.0×10^7 | Yes |
| Rural collector | $40 < 100$ | 1.0×10^6 | Yes |
| Rural local access | $8 < 40$ | 6.0×10^5 | Yes |
| Rural farm collector | $2 < 8$ | 3.0×10^5 | Yes |
| Rural farm access | <2 | 2.0×10^4 | Yes |

Table 2.1 - Road Hierarchy



2.3.2 SPEED ENVIRONMENT

Speed Limits are determined by TfNSW.

Speed Environment is defined as the speed at which the 85th percentile driver will travel on the road network and is largely controlled by design elements such as horizontal road geometry. Safe operating conditions are achieved by ensuring that sight distance is adequate for the speed environment thus created.

Design speeds should be determined in accordance with Austroads Guidelines and designed in sympathy to the existing speed limit.

2.3.3 KERB AND GUTTER

An approved sealed pavement, including kerb and gutter, is to be provided to all classes of road having speed limits of 80km/h or less. It must be noted that rural roads are to be provided with a sealed shoulder, incorporating full depth pavement, in lieu of kerb and gutter.

Note that sealed shoulders are only permitted where stormwater velocity on the road shoulder is kept below 2m/s in the 5% AEP event. In cases where this velocity is exceeded, the shoulder must incorporate a concrete lined edge drain.

The following *Table 2.2* outlines the requirement for the different classes of kerb and gutter shown on Council's Approved Standard Drawings.

| Road Edge Treatment | Use |
|-------------------------------------|--|
| 1.0 m wide sealed shoulder | Rural collector roads Rural local access roads |
| 150mm high integral kerb and gutter | Urban roads Industrial roads |
| Semi-mountable kerb | Adjacent to medians, traffic islands and roundabouts where no pedestrian access occurs |
| Barrier kerb | Adjacent to medians, traffic islands and roundabouts where pedestrian access occurs |

Table 2.2 - Road Edge Treatments

2.3.4 CROSS-SECTIONS

2.3.4.1 STANDARD ROAD WIDTHS

| Class of Road | Width of Road Reserve | Verge Width | C'way Width | F'path Width (min.) | Seal Width | Formation Width | Shoulder Width |
|-------------------------------------|-----------------------|-------------|-------------|---------------------|------------|-----------------|----------------|
| Urban | | | | | | | |
| Urban distributor (shared footpath) | 25 | 4.5 | 13.0 | 2.5 (both sides) | | | |
| Urban distributor | 22 | 4.5 | 13.0 | 1.5 (both sides) | | | |
| Urban collector | 20 | 4.5 | 11.0 | 1.2 (one side) | | | |
| Urban local access | 20 | 4.5 | 11.0 | 1.2 (one side) | | | |
| Urban cul-de-sac >8 lots | 18 | 4.5 | 9.0 | 1.2 (one side) | | | |



| Class of Road | Width of Road Reserve | Verge Width | C'way Width | F'path Width (min.) | Seal Width | Formation Width | Shoulder Width |
|---|-----------------------|-------------|-------------|-----------------------|------------|-----------------|----------------|
| Urban cul-de-sac <8 lots | 17 | 4.5 | 8.0 | 1.2 (one side) | | | |
| Industrial | 22 | 4.5 | 13.0 | 1.5 (one side) | | | |
| Rural* | | | | | | | |
| Major arterial road | 20 | | | | 10.0 | 11.0 | 0.5 |
| Rural collector | 20 | | | | 10.0 | 10.0 | 0 |
| Rural local access | 20 | | | | 8.0 | 8.0 | 0 |
| Rural farm collector | 20 | | | | 5.0 | 7.0 | 1.0 |
| Rural farm access | 20 | | | | 0 | 5.0 | 0.5 |
| <i>* Not applicable to a proclaimed Main Road</i> | | | | | | | |
| Pedestrian Facilities | | | | | | | |
| Footpath | | | | 1.2/1.5* | | | |
| Cycleway – on road | | | | 1.5 | | | |
| Cycleway – off road | | | | 2.5 | | | |
| Shared path | | | | 2.5– 4.0 | | | |
| <i>*Depends on Road Type</i> | | | | | | | |
| Table 2.3 Standard Road Widths | | | | | | | |

Table 2.3 shows cross-section requirements which Council considers necessary to accommodate design traffic. The Director Technical Services will consider alternatives to the above standards where it can be demonstrated that such departure enhances the amenity of the locality and retains an appropriate road hierarchy.

Road shoulder widths shown in *Table 2.3* must be widened to 3.0 metres adjacent to barrier centrelines.

For Shiralee road widths, please refer to the Shiralee DCP, Chapter 9.4 and Appendix C.

2.3.4.2 PAVEMENT CROSS-FALL

The standard cross-fall on bituminous pavements is 3% from a central crown. Cross-falls of up to 7% may be used for super-elevated curves or at road intersections. Super-elevation is not normally provided (with the exception of rural development) but where design speeds so require, the super-elevation of horizontal curves is to be based on Austroads design guidelines.

In the cases where cross-fall from a central crown is not feasible, then one way cross-fall may be permitted. One way cross-fall must be nominally at a grade of 3%, up to an absolute maximum of 6% in isolated cases. One-way cross-falls towards the gutter are required on any split-level carriageways.



Any proposal to depart from these standards will require approval from the Director Technical Services.

2.3.4.3 OFFSET CROWN

Where local topography dictates that it is not practical to have the crown located on the centre of the road, the crown may be shifted towards the higher side of the road and designed and constructed in accordance with the Austroads Design Guidelines.

2.3.4.4 VERGE CROSS-FALLS

The verge must have a cross-fall of 4% towards the kerb. The Director Technical Services can approve a minimum grade of 2% in special circumstances.

2.3.4.5 BATTERS

All roads must be cleared and grubbed to the width of the road reserve or to a width sufficient to permit cut and fill batters, whichever is the greater.

Road batters must not be steeper than 1:4 (vertical: horizontal) in cuttings, and 1:4 in embankments, except with the approval of the Director Technical Services.

Any cutting or filling undertaken by the Developer which is designed to retain a structure, or could possibly undermine or remove the support of any existing structure, will require the construction of a retaining wall.

Plans and design calculations are to be submitted to the Director Technical Services for approval before the commencement of construction.

A structural engineers design and certification will be required for any retaining wall greater than 600mm in height if a retaining wall is proposed instead of a batter.

2.3.4.6 SPLIT-LEVEL CARRIAGEWAYS

Where sloping terrain necessitates split level construction, the width of the road reserve must be increased to accommodate the standard width verges, as well as the approved carriageway and median widths.

Long lengths of split-level road will not be permitted, nor may this type of construction be carried across street intersections without the written approval of Director Technical Services. Carriageways must be widened to permit the maximum dimension emergency and service vehicles to have free and unimpeded access, in the event that vehicles are parked parallel to the kerb line. The width of the carriageway and median are to be determined in consultation with the Director Technical Services.

The median may include a permanently retained batter not steeper than 1:4 to allow regular maintenance to be undertaken. Where minimum batter slopes cannot be achieved, retaining walls must be designed to accommodate the Austroads W7, T44 (Truck), and L44 (Lane) design traffic loadings.

Semi mountable type kerb and gutter is to be provided on the perimeter of the median island, but not pedestrian refuges.

Austroads and the relevant TfNSW supplements must be referenced to determine whether safety barriers are warranted. Where necessary, the design and construction guidelines within this publication are to be followed.



2.3.4.7 CUL-DE-SACS

Cul-de-sacs are to be constructed so that a minimum kerb line radius of 9.5 metres is achieved from the centre of the cul-de-sac to face of kerb and gutter, depending on usage and to ensure it is capable of accommodating service vehicles. The boundary of the road reserve must be curved with a minimum radius of 14 metres, to provide for a minimum 4.5 metre wide verge.

Cul-de-sac bowl radius for industrial roads must be 12.5 metres from the centre of the cul-de-sac to face of kerb and gutter, depending on usage and to ensure it is capable of accommodating service vehicles. The boundary of the road reserve must be curved with a minimum radius of 17 metres, to provide for a minimum 4.5 metre wide verge.

Where the head of the cul-de-sac is located on the low side of the road, special provision must be made to convey overland stormwater flows through easements or drainage reserves.

Rural cul-de-sacs are to have a minimum radius (to edge of carriageway) of 12.5 metres. The boundary must be curved, to a minimum of 17 metre radius, to provide for a 4.5 metre wide verge.

2.3.4.8 HALF-ROAD CONSTRUCTION

Where proposed subdivisions or development front one side of an existing sealed road the existing pavement may be retained if:

- The existing pavement is assessed as having pavement depth equal or more than the proposed design, and
- The existing pavement material meets Section 2.4.3 Pavement Materials of this document, and
- The vertical alignment complies with current standards, and
- The characteristic deflection and curvature is less than the design deflection and curvature shown in *Table 2.7*.

The remainder of the half-width construction can then be carried out to the standard of the existing road. In all cases, the new seal must extend to the crown of the road to avoid irregularities.

Where existing pavement strength or road alignment is unsatisfactory, pavement construction must extend to the road centreline.

Where a new road is to be constructed between two different Developers and only one Developer is to proceed, a half road width is to be constructed for the full frontage of the proposed development. The work is to include road pavement and pavement surfacing to the centreline, kerb and gutter construction and earth formed verge on the development side of the road. Pavement construction of the roadway on the opposite side of the development is also to be carried out for the first 30m if a new intersection is created.

For the Shiralee Development Area half-road construction shall be carried out as per Shiralee DCP.

2.3.5 GEOMETRIC STANDARDS

The following guidelines have been developed to ensure that carriageways provide:

- Smooth, safe and trafficable horizontal and vertical alignments
- Adequate sight distance
- Suitable vehicular and pedestrian access to building allotments
- Measures to prevent ponding of stormwater
- A path for overland flow in major storm events

**2.3.5.1 HORIZONTAL ALIGNMENT**

The minimum adopted horizontal radius must be determined in accordance with Austroads Guide to Road Design and the relevant TfNSW Supplements.

Where an obstruction off the pavement, such as a street tree, restricts sight distance, the minimum radius of curvature must be selected as the stopping sight distance for the adopted design speed.

2.3.5.2 VERTICAL GRADES

Urban collector and distributor roads (depending on hierarchy definition), and those which are likely to be used as bus routes, are to have a maximum longitudinal centreline grade of 8%. All other roads must be designed with a maximum grade of 10%. However, grades of up to 16% may be permissible on straights for a maximum distance of 150 metres, depending on traffic volume and type. The gradient at street intersections where stop or give way signs are used must not exceed 4%.

Any rural unsealed road greater than 10% must be bitumen or concrete sealed.

Gutters are to have a minimum longitudinal grading of 1% for all roads, however consideration must be given to increasing this grade where changes of direction or drainage concentration occurs.

When designing roads on steep grades, considerable attention must be given to alternative road layouts, as the cost of constructing special stormwater drainage structures on steep grades may be prohibitive.

Proposals to vary the maximum and minimum permissible grades over short road lengths will be considered by the Director Technical Services, however such approvals will be strictly limited, and must be sought prior to incorporating these variations in the road design.

2.3.5.3 VERTICAL CURVES

Vertical curves are to be provided at all changes in grade. Where possible, vertical curves must coincide with horizontal curves.

The length of crest vertical curves must be determined from the Austroads Guide to Road Design, based on stopping sight distance for the design speed environment, and an object height of 0.2 metres. Consideration must be given to appearance criteria for crest curves also described in Austroads Guide to Road Design.

Sag vertical curves must provide acceptable levels of comfort and allow adequate headlight sight distance as per Austroads Guide to Road Design.

2.3.5.4 INTERSECTIONS AND ROUNDABOUTS

Intersections of roads and roundabouts are to be designed in accordance with Austroads Guide to Road Design and the relevant TfNSW Supplements.

2.3.5.5 OVERTAKING AND TURNING LANES

Overtaking (or auxiliary) and turning lanes are to be provided where recommended by the Austroads Guide to Road Design, Austroads Guide to Traffic Management and the relevant TfNSW Supplements.



2.3.5.6 KERB RETURNS

Kerb returns must be designed for all roads to ensure a smooth trafficable surface around the return. Kerb return radii shall be designed with consideration to the turning speed of vehicles. The maximum longitudinal kerb grade and maximum pavement cross-fall must not exceed permissible values.

The Shiralee Residential release area has differing radius based on the Development Control Plan for that area. However, consideration must be given to increasing this radius where it is necessary to accommodate the turning circle of large vehicles and public transport.

As far as practical, low points within the kerb return must be avoided to prevent the use of pits with curved lintels.

2.3.5.7 VEHICULAR ACCESS

Roads must be located and designed so that one vehicular access is readily available to each allotment using the standardised design vehicles. Refer to Council's Approved Standard Drawings for detail access requirements.

At intersections, roads and building allotment layouts must be designed so that driveway access is not required directly opposite an intersection or within six metres of either kerb return tangent point, whichever is greater. This requirement does not apply to Shiralee.

Where more than one vehicle crossing is required for an allotment and the lot has sufficient street frontage, a written letter must be submitted to Council's Director Technical Services detailing reasons for extra access and requesting approval.

2.3.5.8 STAGED ROAD CONSTRUCTION

Where roads are constructed in stages of a subdivision, a permanent-type barricade must be constructed at the end of that stage to warn motorists of the terminating road. These barricades, warning signs, and/or reflectors must comply with all requirements of AS1742 - Manual of Uniform Traffic Control Devices, and only be removed upon commencement of the adjoining stage.

A temporary hard stand turning area of minimum radius 11 metres or sufficient hammerhead turning arrangement is to be constructed at the end of the terminating roadway to permit the manoeuvrings of service vehicles.

2.3.5.9 ROAD RESERVES AND CORNER SPLAYS

Road boundaries may be curved, but where they are to be fenced as chords, these must be not less than 10 metres in length. Where a number of such chords occur adjacent to each other, they must be of equal length where practicable.

Corner splays must be incorporated on corner allotments to provide:

- Sufficient space for utility service allocations. Refer to Council's Approved Standard Drawings.
- A full width footpath for pedestrian use.
- Minimum intersection sight distance requirements for vehicles as per Austroads.

These splays must be determined to provide for the above, however, generally measure 4.5 metres parallel to front and side boundaries of the corner allotment and having a diagonal approximately 5.0 metres in length. The Shiralee Residential Release area requires 2.0 metres parallel to front and side boundaries of the corner allotment and having a diagonal approximately 2.8 metres in length.



2.3.6 FOOTPATHS AND CYCLEWAYS

Footpaths and cycleways will be designed in accordance with the relevant Australian Standards and Austroads Guide to Road Design, and Council's Approved Standard Drawings.

Generally, concrete footpaths, a minimum 1.5m wide, must be constructed on one side of all through streets and in cul-de-sacs where a pathway is located at the cul-de-sac bowl, as per Table 2.3.

In the Shiralee Residential Release area footpaths and cycleways are to be designed in accordance with the Shiralee DCP.

For overland flow paths within pathway alignments Council's Approved Standard Drawings must be referred to.

2.3.7 DRIVEWAY CONSTRUCTION

2.3.7.1 URBAN ACCESS DRIVEWAY

A ROP is required to be obtained from Council for urban access driveway construction. Driveways from the kerb layback to the property boundary (verge) are to be constructed in accordance with Council's Approved Standard Drawings.

All crossings are to be constructed as per the requirements of Council's Road Opening Policy. A compliance certificate must be obtained from Council Road Opening Officer, certifying that the driveway has been constructed in accordance with the Council requirements.

Prior to commencement of development, consideration must be given to the position and floor level of building construction to ensure that vehicular access is possible.

2.3.7.2 RURAL ACCESS DRIVEWAYS

A ROP is required to be obtained from Council for rural access driveway construction. Vehicular access locations must be sited and are to be constructed in accordance with Council's Approved Standard Drawings.

2.3.7.3 COMMERCIAL / INDUSTRIAL DRIVEWAYS

A ROP is required to be obtained from Council for commercial/industrial driveway construction. Commercial/Industrial zoned lots and driveways must be designed and constructed in accordance with Council's Approved Standard Drawings.

2.3.7.4 URBAN BATTLE-AXE LOTS

For urban battle-axe blocks serving one lot, the full length of the access handle (including verge crossing) must be paved with 25MPa, 125mm (min) thick concrete, and one-layer SL82 mesh with a minimum width of 3.0m in 4.5m wide lot access. The subgrade must be compacted to a minimum of 95% standard.

For urban battle-axe blocks serving more than one lot or dwelling, the full length of the access handle (including verge crossing) must be paved with 25MPa, 125mm (min) thick concrete, and one layer SL82 mesh with a minimum width of 4.5m in 6.0m wide lot access. The subgrade must be compacted to a minimum of 95% standard.

Keyed expansion joints must be provided using 9mm thick bitumen impregnated filler boards at 12m (max) spacing, with sealed control joints (e.g. 3mm wide, 40mm deep saw cuts) at no greater than 3m spacing.



Driveways for battle-axe lots are required to be constructed prior to the issue of an Occupation Certificate.

Where such driveways will be used by commercial vehicles, the construction detail must be increased to accommodate the increased loading – see Council’s Approved Standard Drawings for Commercial/Industrial Driveways. The width of access must be designed to suit the maximum sized vehicle proposed for the development and as directed by Council’s Director Technical Services.

2.3.7.5 RURAL BATTLE-AXE LOTS

For rural battle-axe blocks serving one lot, the full length of the access handle (including verge crossing) must be provided with a minimum of 4m wide granular pavement with a minimum thickness of 200mm. A minimum 10mm bitumen sealed surface is required. The length of the access handle must be 10m. Table drains are required to be constructed to ensure integrity of the roadway.

For rural battle-axe blocks serving two lots, the full length of the access handle (including verge crossing) must be provided with a minimum of 6m wide granular pavement with a minimum thickness of 200mm. A minimum 10mm bitumen sealed surface is required. The width of the access handle must be 10m in length. Table drains are required to be constructed to ensure the integrity of the roadway.

Maximum number of lots serviced by rural battle-axe must be two (2) with any greater number requiring a new road to be constructed.

Driveways in battle-axe blocks are required to be constructed prior to the issue of an Occupation Certificate.

2.3.7.6 BATTLE-AXE LOT DEVELOPMENT CONTROLS

A maximum of two (2) battle-axe allotments will be permitted behind an allotment which has direct frontage to a dedicated public road in the proposed subdivision. This allows for inherent site constraints such as slope or topography which may otherwise prevent a conventional residential subdivision providing direct public road access to all lots. Under no circumstances will Council favourably consider any subdivision proposal involving a series of battle-axe lots, one behind each other.

All battle-axe allotments must have direct access to a dedicated public road, through the provision of an access handle attached to each battle-axe lot or via a shared access corridor (i.e. maximum of two (2) lots may share a common access corridor).

The shared access handle must be designed wide enough to satisfactorily cater for the placement of garbage and recycling bins, services (electrical pillar, water meter) and letterbox’s (i.e. associated with the dwellings on the two battle axe lots) adjacent to the access handle driveway.

A shared access corridor may be permitted for a maximum of two (2) battle axe allotments where, in the opinion of Council, the proposed access arrangement will satisfactorily cater for safe vehicular and pedestrian access to each of the lots and that satisfactory sight line distances are available between the subject lots and the public road.

Any access corridor shared between two (2) battle axe allotments must be created through reciprocal rights of carriageway under Section 88B of the Conveyancing Act 1919.



2.3.8 SUBDIVISION

2.3.8.1 STRATA SUBDIVISION

Roads or access ways in strata subdivisions must be common property owned and maintained by the strata corporation. Council will require roads or access ways to be constructed to a standard as described in Section 2.3.7.4 Urban Battle-axe Lots.

2.3.8.2 COMMUNITY TITLE SUBDIVISION

A road that only services the community title subdivision must be community property owned and maintained by the community association. Council will require community roads or access ways to be constructed to a standard as described in Section 2.3.7.4 Urban Battle-axe Lots for residential developments or Section 2.3.7.3 Commercial/Industrial Driveways for Commercial/ Industrial developments.

If any community title assets are to transfer ownership to Council through further subdivision, it will need to be proven that their construction and maintenance meets the standards of the subdivision code, or the assets will need to be reconstructed to subdivision code requirements before transferal.

2.3.8.3 TORRENS TITLE SUBDIVISION (REAL PROPERTY)

This code is based on the requirements for Torrens Title Subdivision and any differences are detailed for Strata and Community type subdivisions.

2.4 PAVEMENT DESIGN

2.4.1 GENERAL

This section provides guidance on the design of flexible pavements consisting of two or more layers of unbound granular or cemented materials, where the primary distress mode is load related. The pavement designer must also consider the effects of environmentally induced stresses from moisture and temperature which may affect pavement performance.

In general, residential pavements are to be designed in accordance with the requirements of the Austroads Guide to Pavement Technology by a qualified designer, as per Section 1.3.2. The relevant TfNSW Austroads Supplement Publication must also be referenced for pavement design.

Flexible pavements are to be designed for a minimum design life of 20 years.

2.4.2 SUBGRADE EVALUATION

A site investigation is to be performed which is to include logging of test holes to a depth not less than one metre below design subgrade levels (unless rock is encountered). Soil tests must be taken at the design depth and samples taken for California Bearing Ratios (CBR) testing in accordance with AS 1289 Testing Soils for Engineering Purposes, or RMS Test Methods.

The design CBR must be selected following a careful assessment of the materials encountered in the site investigation, and the laboratory testing of samples at subgrade moisture and density conditions likely in service. Selection of design subgrade CBR values should be as per the requirements of the Austroads Design Guide. The Orange LGA is situated in Zone 9 of the TfNSW Classified Road Network and has a median annual rainfall >800mm. Therefore, the CBR value must assume poor drainage and must be determined from a ten-day soaked CBR.

A copy of the site investigation, including NATA accredited laboratory test results, is to be included with the Engineering Drawings.



Where the design subgrade CBR is below 3 or lesser value, the subgrade must be chemically stabilised to a minimum depth of 200mm.

2.4.3 PAVEMENT MATERIALS

Pavements are to be constructed with subbase and base layers over a subgrade, using either unbound granular, bound granular, cement concrete, asphaltic concrete or a combination of these materials. Layers are to be a maximum of 200mm thick after compaction.

Unbound granular materials are to consist of gravels or crushed rocks, and have a grading which makes them mechanically stable, workable, and able to be compacted. Small amounts of stabilising agents may be added to improve performance. Cemented materials are produced by the addition of cement, lime, or other hydraulically binding agent to granular materials, to improve the strength of the bound layer.

Laboratory testing will be necessary to determine the proportion of cementitious materials to mix with the granular pavement materials and the suitability of the material to mixing with the binding agent.

The type, grading, and strength of materials specified for use within the proposed pavement are to be shown on the typical cross sections submitted with the Engineering Drawings.

If, after the contractor's proposal of material has been approved by Council, any alteration will require Council approval.

Granular Base and Subbase Materials for Surfaced Road Pavements are to meet the requirements of TfNSW Specification 3051 Granular Base and Subbase Materials for Surfaced Road Pavements.

Pavement material must be selected based on the traffic category of the proposed road as per TfNSW Specification 3051 Granular Base and Subbase Materials for Surfaced Road Pavements.

Pavement base material shall have a minimum CBR value of 80%. Pavement subbase material shall have a minimum of CBR value of 30%.

Pavement materials for unsealed rural roads must meet the requirements detailed in Table 2.5- Unsealed Gravel Road Requirements.

| Description | NGS20 | Test Method | Description | NGS20 |
|--|--------|-------------|---|--------|
| Course particle size distribution | | T114 | Maximum Dry Compression Strength on fraction passing 19 mm sieve. (only applies if Plasticity Index is <1) | 1.0MPa |
| % passing 75.0 mm sieve | - | | | |
| % passing 53.0 mm sieve | - | | | |
| % passing 37.5 mm sieve | - | | | |
| % passing 26.5 mm sieve | 100 | | | |
| % passing 19.0 mm sieve | 96-100 | | | |
| % passing 13.2 mm sieve | - | | | |
| % passing 9.5 mm sieve | 65-89 | | | |
| % passing 6.7 mm sieve | - | | | |
| % passing 4.75 mm sieve | 47-80 | | | |
| % passing 2.36 mm sieve | 32-67 | | | |
| % passing 0.425 mm sieve | 14-42 | | | |
| % passing 0.075mm sieve | 6-26 | | | |



| Description | NGS20 | Test Method | Description | NGS20 |
|---|--------|-------------|--|-------|
| Fine Particle Size Distribution Ratios expressed as percentages (for that portion of the material passing 2.36mm sieve) | | AS1289.F1.1 | 10 day Soaked CBR (100% Standard Compaction) | 30 |
| A Pass 425µm sieve % | - | | | |
| B Pass 75 µm sieve % Pass 425 µm sieve % | - | | | |
| C Pass 13.5 µm sieve % Pass 75 µm sieve % | - | | | |
| Liquid Limit (if non plastic) | max 23 | | | |
| Plastic Limit (if plastic) | max 23 | | | |
| Plasticity Index | max 12 | | | |

Table 2.5 – Unsealed Road Gravel Requirements

2.4.4 DESIGN TRAFFIC

Pavements must be designed using the number of Equivalent Standard Axles (ESA's) shown in *Table 2.1- Road Hierarchy*, of this Code.

Where circumstances dictate that a variation to these figures may be warranted, the Developer must apply to Council for approval of the alternative. Such proposals are to be accompanied by careful estimates of the number of vehicles using the roadway by vehicle type, axle loading, and traffic growth over the life of the pavement.

2.4.5 SUBSOIL DRAINAGE

The need for subsoil drainage must be assessed through the design process and influenced by factors such as cuttings, low lying areas, etc.

Subsoil drainage pipes must be installed as required and graded at a minimum longitudinal slope of 1% towards a suitable outlet, in accordance with Council's Approved Standard Drawings. Where this slope is not achievable, subsoil drainage must not be used, and guidance must be obtained from Council.

Subsoil pipes must consist of a 100mm diameter slotted corrugated PVC pipe (or equivalent) enclosed in a geofabric sock, bedded in well graded filter material as per TfNSW Specification 3580-Aggregate Filter Materials for Subsurface Drainage. Flush out points must be installed at the upstream end of the pipe, and at regular intervals a maximum distance of 100 metres apart.

2.4.6 DESIGN OF FLEXIBLE PAVEMENT

Pavement thickness design must be based on the assessed subgrade strength, in accordance with guidelines contained in the Austroads Guide to Pavement Technology.

If DGA or Stone Mastic Asphalt (SMA) is used, thickness up to 40mm may be considered to contribute to total pavement thickness, but not base thickness.

Road shoulders are to be constructed using the full depth of pavement required for the adjacent traffic lanes.

Note that the minimum depth of pavement must be 300mm with base layer minimum 100mm thick but can be reduced with Director of Technical Services approval.



2.4.7 PAVEMENT SURFACING

All new sealed rural roads will be surfaced with a minimum 2 coat flush seal (14/7) designed in accordance with the TfNSW Sprayed Sealing Guide.

All new sealed urban roads will be surfaced with a minimum 7mm prime seal and 40mm thick AC10 asphalt. All new sealed industrial roads will be surfaced with a minimum 7mm prime seal and 50mm thick asphalt using A20E binder.

Asphalt must be supplied and placed as per the requirements of AS 2150:2020 Asphalt - A guide to good practice.

Alternative surface treatments may be submitted to the Director Technical Services for approval, provided the surfacing exhibits the following characteristics:

- Impermeable to air and moisture
- A long service life, and is maintenance free for a considerable period
- Flexible
- Acceptably low longitudinal roughness
- Adequate low speed skid resistance

2.4.8 SERVICE CROSSINGS

Where possible, all underground conduits, services and utilities must be placed under the road prior to construction of the initial pavement course, and their location marked on the kerb and gutter or by provision of marker post where kerb and gutter does not exist. Trenches must be constructed at a minimum grade of 1% to permit drainage of sub-surface water.

Road crossings through existing pavements will require a ROP from Council, which will detail requirements for backfilling of trenches.

2.5 GUIDELINES FOR TESTING

2.5.1 INTRODUCTION

This section outlines the Council's regime for testing new subdivision and development works which will become public property.

It is in no way a comprehensive Testing Manual and must be read in conjunction with relevant publications from TfNSW and the Australian Standards.

All expenses in connection with testing must be borne by the Developer. The Developer must have no claim for compensation or damages in respect of any postponement of the testing.

2.5.2 COMPACTION TESTING

Each layer of pavement must be tested for compaction as detailed below. The Director Technical Services or his delegate must approve each layer prior to the placing and compaction of subsequent layers. A record of this approval must be obtained by the Developer's contractor prior to continuation of next stage of works.

The subgrade, and all pavement layers, must be density tested in-situ at the start and finish of the work (within the first/last ten metres), and thereafter at intervals of no more than 50 metres, or as indicated by Council. A minimum of two tests will be required for road pavements less than 50 metres in length. At cul-de-sacs, additional testing will be required at the turning head.



The test sites selected must be representative of the likely minimum pavement compaction levels achieved.

Density testing must be undertaken by an authorised representative of a laboratory accredited by NATA. Density testing may be conducted using either the sand replacement test, nuclear gauge, or other NATA approved method.

Results of density testing must be forwarded directly to Council for approval. No pavement layer must be covered by a subsequent layer until the results of the density testing have been delivered to and approved by Council.

Statistical Techniques are to be used to determine compaction levels of individual lots in accordance with TfNSW Specification Q6 – Lower Q Value.

Table 2.6 sets out the minimum compaction requirement for each pavement layer.

| Layer | Compaction Requirement |
|-------------------|--|
| Subgrade and Fill | 98% relative to standard maximum dry density Moisture Ratio – 75-105% |
| Subbase | 102% relative to standard maximum dry density Moisture Ratio – 60-90% |
| Base | 102% relative to standard maximum dry density Moisture Ratio – 60-90% |

Table 2.6 - Compaction of Pavement Layers

Laboratory determination of maximum dry density for pavement materials which have been modified with cementitious binder must be undertaken within 4 hours of the binder being added to the material.

Materials tested outside this time will be subject to an adjustment to correctly determine the maximum dry density of the sample. For either natural or modified material, the laboratory determination of maximum dry density must be undertaken at a frequency of no less than one determination for each day's production of material.

Compaction test holes shall be repaired using freshly mixed material of the same type as used in the surrounding layer. Compact the repair material to a degree equal to that of the surrounding layer.

2.5.3 PROOF-ROLL TESTING

All pavement layers must be proof-rolled and approved by Council's delegated officer prior to the placement of subsequent pavement layers. A record of this approval must be obtained by the Developer prior to continuation of next stage of works. Inspections are generally available on Council's normal working days, from 9:00 am to 3:30 pm. A minimum of 24 hours' notice must be given to arrange an inspection.

The proof-rolling will be conducted using either:

1. A static smooth steel drum roller having a mass of not less than 12 tonnes,
2. A pneumatic-tyred static roller, not less than 4.5 tonnes per tyre and 600kPa tyre pressure,
3. A 10,000 L water tanker full of water with tyre pressure minimum 600kPa, or



4. A tandem axle rigid vehicle having:
- maximum load of 15 tonnes per axle group (eight tyres)
 - maximum load of 12 tonnes per axle group (six tyres)
 - maximum load of 10 tonnes per axle group (four tyres)
 - Single axle vehicles must have maximum loads of 8.5 tonnes (dual tyres) or 5.4 tonnes (single tyres).

Any visual movement of the pavement layer under loading will be deemed a failure.

At the time of proof rolling the subgrade, the level of the subgrade will be checked by Council for correct pavement depth as per approved pavement design. Survey pegs will be required to be in place indicating design level or a GPS report from a registered surveyor submitted to Council certifying pavement depth achieved.

2.5.4 BENKELMAN BEAM TESTING

Council requires elastic rebound deflection testing carried out on road base material prior to asphalt to determine the pavements actual deflection and curvature in accordance with TfNSW Test Method T160 utilising the Benkelman Beam or equivalent.

Adjustments to raw data must be undertaken in accordance with Austroads Guide to Pavement Technology.

Major Arterial Roads, as per table below, shall assume an f value of 2.0 when calculating the Characteristic Deflection, all other roads shall use a f value of 1.65.

The average maximum deflection and curvature must not exceed, the values indicated in *Table 2.7* for the relevant road hierarchy and the co-efficient of variation (CV) in recorded deflections must not exceed 30 per cent. Measurements must be taken at the rate of 1 per 20 metres with a minimum of ten measurements per road.

| Maximum Acceptable Deflections and Curvature (MM) | | | | |
|---|--|------------------|----------------|---------------------|
| Design Traffic (ESA'S) | Road Type | Unbound Pavement | Bound Pavement | D0 – D200 Curvature |
| 2 X 10 ⁴ | Rural Farm Access | 1.50 | 1.18 | 0.6 |
| 6 X 10 ⁴ | Urban Cul de Sac (< 8 Lots) | 1.20 | 1.05 | 0.6 |
| 3 X 10 ⁵ | Rural Farm Collector Urban Cul de Sac (>8 Lots) | 1.20 | 0.81 | 0.39 |
| 6 X 10 ⁵ | Rural Local Access Urban Local Access | 1.10 | 0.70 | 0.32 |
| 1 X 10 ⁶ | Rural Collector | 0.94 | 0.56 | 0.28 |
| 2 X 10 ⁶ | Urban Collector | 0.93 | 0.55 | 0.22 |
| 1 X 10 ⁷ | Urban Distributor Major Arterial Road | 0.85 | 0.425 | 0.12 |

Table 2.7 – Max Acceptable Deflection

2.5.5 FINAL ROAD PROFILE

The mean construction tolerance on pavement surface must be within +/- 15mm over 3 metre length.

The vertical alignment must not deviate by more than 25mm from the value shown on the drawings.



2.6 BRIDGES AND CULVERTS

Bridges and culverts must be designed in accordance with Section 3 of this Code.

2.7 ROAD FURNITURE

Road furniture must be designed to minimise the number of roadside obstructions, and to ensure that the risk of injury to vehicle occupants and pedestrians is minimal.

2.7.1 STREET SIGNS

Street signs are required at all road junctions as per AS 1742.5 - Manual of Uniform Traffic Control Devices and as indicated in Council's Approved Standard Drawings. The location of street signs is to be shown on the Engineering Drawings. Streets signs must be supplied and constructed by Council at the Developer's cost.

2.7.2 TRAFFIC CONTROL DEVICES

Traffic signs, traffic signals, pavement markings, guideposts, delineators, safety barriers and the like, whether permanent or temporary, are to be designed and installed for all roads in accordance with guidelines contained within the Austroads Guide to Traffic Management, AS 1742 - Manual of Uniform Traffic Control Devices and the relevant TfNSW specifications.

The consent of Council's Traffic Committee and relevant Road Authority will be required prior to the installation of any permanent traffic control devices on existing roads.

2.7.3 LOCAL AREA TRAFFIC MANAGEMENT

Where conditions of a development consent so indicate, Local Area Traffic Management (LATM) devices are to be designed and installed to Austroads Guide to Traffic Management and AS 1742 - Manual of Uniform Traffic Control Devices.

2.7.4 PUBLIC TRANSPORT

Roads used as public transport routes may require the provision of facilities such as bus shelters, bays, and low kerbing. Intersections, roundabouts, and median storage lanes on these routes must be designed to cater for the maximum dimension single unit truck/bus, without requiring reversing manoeuvres.

When placing road furniture, consideration must be given to the swept path of overhanging bodywork and the location of passenger waiting areas.

Bus stops and shelters must always be located on the departure side of walkways and cycle paths. The need to locally widen verges to provide visibility from adjacent driveways and intersections must be ascertained.

2.7.5 ROAD LIGHTING

Illumination must be provided on all new roads and public thoroughfares in accordance with AS 1158 - Road Lighting. Notwithstanding these requirements, lighting must be provided at all intersections, at the end of all cul-de-sac, and immediately in line with all pathways. Energy - saving LED lighting must be supplied for all street lighting.

Lighting columns must generally be located on the verge alignment shown in Council's Approved Standard Drawings.



2.8 LANDSCAPING

Landscaping within the road reserve may be used for aesthetic reasons, or functional purposes such as screening headlight and sunlight glare, screening undesirable views, and providing visual guidance.

Requirements under the relevant DCP must be taken into account for landscaping.

Plantings within the road reserve must be designed so as not to obstruct sight distances. Particular care must be taken with planting around curves, near intersections, driveways, and on pedestrian desire lines.

Slopes steeper than 1:4 will not be mown, and consequently mulched groundcover or stone pitching must be specified if steep slopes are required in urban areas.

If landscaping works are to be carried out, then a landscaping plan showing, but not limited to, plant species and estimated height and spread of mature trees is required as part of the Engineering Drawing submission.

Topsoil must be uniformly applied to provide a minimum compacted thickness of 100mm at any location. Prior to the issue of a Subdivision Certificate exposed areas must be vegetated by one of the following methods:

- Topsoiling and hydro mulching - road reserve, open public spaces
- Topsoiling, hydro seeding and straw mulching – road reserve, open public spaces
- Turf – road reserve, open public spaces
- Topsoiling and mechanical seeding with erosion controls – within the lots

Vegetation of open drains must take into account steepness of grades and water flows with rock lining, jute mesh and bitumen treatments to be used to reduce erosion, if longitudinal grades are greater than 2%.

2.9 DESIGN REFERENCES

The following publications must be read in conjunction with the recommendations in these guidelines.

| Australian Standards |
|--|
| 1158 – Lighting for roads and public spaces |
| 1289 – Methods of Testing Soil for Engineering Purposes |
| 1348 – Roads and Traffic Engineering – Glossary of Terms |
| 1428 – Design for Access and Mobility |
| 1742 – Manual of uniform traffic control devices |
| 2150 – Hotmix Asphalt – A Guide to Good Practice |
| Austroroads |
| Guide to Traffic Management |
| Guide to Pavement Technology |
| Guide to Road Design |
| Mulholland, P. J. – A Structural Guide for Flexible Residential Street Pavements, Australian Road Research Board. Special Report Number 41 |
| TfNSW |
| Transport for NSW (TfNSW) – Guide to Traffic Generating Developments |
| Transport for NSW (TfNSW) – Supplements to Austroroad Guides |
| Transport for NSW (TfNSW) – Sprayed Sealing Guide |



| |
|---|
| Transport for NSW (TfNSW) – Spec 3051 “Granular Base and Subbase Materials for Surfaced Road |
| Transport for NSW (TfNSW) – Landscape Guideline |
| T160 Benkelman Beam Deflection Test |
| T173 Field Dry Density of Road Construction Materials (Nuclear Gauge in Direct Transmission Method) |
| Transport for NSW (TfNSW) 3580 – Aggregate Filter Material for Sub Surface Drainage |

SECTION 3 STORMWATER DRAINAGE

3.1 INTRODUCTION

This Code outlines Council’s recommended practice for stormwater drainage design. The broad objectives of this Code are to ensure that the developers of land are to be wholly responsible for all stormwater which passes over or through the respective properties, roads and reserves, which includes:

- Conveyance of stormwater to receiving waters with minimal damage, danger and nuisance
- Stabilization of landforms and control erosion
- Enhancement of the urban landscape, whilst maximizing land available for urbanization
- Maintenance of the water quality of receiving waters
- and the management of stormwater in an environmentally sustainable manner

The Developer is required to repair all defects which are, due to faulty workmanship or materials, for a period of 12 months from the date of Council issuing a Subdivision Certificate. The Developer is advised to ensure that all Contractors are bound by a similar defect liability clause within their contracts.

3.2 ENGINEERING DRAWINGS

Engineering drawing submissions are to include all details requested in Section 1.3.1 of these guidelines. In general, stormwater drainage designs must be presented as shown in the most current version of Australian Rainfall and Runoff. Notwithstanding this, the following requirements must apply.

3.2.1 PLANS

Drainage plans must be drawn at a scale sufficient to show all necessary details, nominally 1:200, 1:500, 1:1000 or 1:2000. The following data is to be included with a contoured catchment area plan:

- Catchment areas and sub-catchment areas, watershed (catchment boundary), overland flow paths, existing and proposed pipe layout. For large catchments, the total catchment area must be shown at a large scale on a separate plan or inset
- All sub-catchment areas, drainage lines and pits are to be logically numbered.
- A schedule of pipe details, including pipe number, size, class, invert levels at inlet and outlet, slope and length
- A schedule of pit details, including pit number, type, surface level to the Australian Height Datum (AHD), invert level to AHD and depth
- North point and legend
- Set out information, including co-ordinate system used
- Accurate position of all services and utilities which cross underground drainage pipelines
- Identify those building allotments adjacent to channels and major storm flow paths which may be liable to flooding in major flood events, and the minimum design habitable floor level adjacent to prevent flooding in the design flood even



- Inlet and outlet treatments.
- Measures for the prevention of erosion and sedimentation as per Soil and Water Management Plan (SWMP)

3.2.2 LONGITUDINAL SECTIONS

Longitudinal sections must be drawn at a scale sufficient to show all necessary details, nominally 1:250 or 1:500 with a nominal vertical exaggeration of 5, for all road drainage, interallotment drainage, and open channels. The following details must be included:

- Road chainage (where applicable), cumulative pipe distance, design surface level, and design pipe invert level - all marked beneath the longitudinal pipe section. Longitudinal sections for channels and floodways must be provided in a similar format to road longitudinal sections
- Pit number, design pit inflow, pit type, pipe size, pipe class, pipe velocity, and design pipe discharge
- Hydraulic grade line
- Accurate level of all services and utilities which cross underground drainage pipelines.

Culvert details are to include all items required for longitudinal sections, and whether the inlet or outlet is the factor governing flow capacity.

3.2.3 CROSS-SECTIONS

Cross sections must be provided for all culverts. For all open channels cross-sections must be provided at a maximum of 20 metre spacing.

Channel and floodway cross sections must include details of hydraulic grade levels and available freeboard.

3.2.4 SUPPORTING INFORMATION

All stormwater drainage design submissions must include drainage calculations and electronic files from the designer. Council requires that engineering works be designed to Council standards by a suitably qualified person.

3.2.5 DRAINAGE CALCULATIONS

All stormwater drainage calculations are to be undertaken in accordance with current version of Australian Rainfall and Runoff Guidelines (ARR 2019). These calculations and the associated model must be submitted with the design plans and based on a fully developed catchment. Details must include:

- Proposed location of all drainage elements
- Any existing drainage elements
- Hydrological model (IFDs, storm losses, run-off coefficients, climate change factors)
- Catchment and sub-catchment sizes, pervious ratio, times of concentration
- Pipe sizes, grades, depth, and materials
- Pipe lengths, full-pipe flow velocities, and hydraulic grade lines
- Pit locations, sizes, surface levels, and depths
- Pit types, inflow capacities, and blockage factors (K values)
- Overland path lengths, slopes, cross-sections, and associated catchment
- Velocity times depth relationships for all overland flow paths
- Pre-existing and post-development discharge flow rates and volumes



3.2.5.1 SOFTWARE DESIGN PACKAGES

Where commercially available software is used to undertake a stormwater design, a copy of all data files must be provided to Council prior to approval. The designer is responsible for the selection of a suitably appropriate design package. Council's preferred software packages are:

- Small (<20, 000m²) urban catchment design – DRAINS Premium model
- Large (>20, 000m²) urban catchment design – TUFLOW / DRAINS Premium model
- Water quality design – MUSIC model

3.3 GENERAL REQUIREMENTS

Stormwater drainage systems must be designed using a major / minor approach.

The minor drainage system is to consist of the underground drainage network to control nuisance flooding. The major drainage system is to consist of overland flow paths and floodways to accommodate less frequent storm events, accounting for blockages in the minor system. The minor and major drainage systems must control stormwater flows so that the severity of flooding downstream, and afflux upstream, does not exceed pre-existing flows for the design rainfall event.

Any stormwater design which is downstream of land which has been recognised for future development is to accommodate the post development flows above it.

In all designs, consideration must be given to the effect of floods in events greater than the major design event. In no circumstances must the design create conditions where the capacity of the downstream drainage system is exceeded. Designs are also to ensure that there are no uncontrolled overland flows for return periods less than the design flood.

Where the drainage catchment includes an existing pipe system of unknown or limited capacity, the developer must either:

- Replace the existing drainage system,
- Hydraulically improve the existing system to reduce energy losses,
- Modify the existing system, by acquiring land, if necessary, to provide a safe overland flow route, or
- Limit the flow from new developments to keep downstream flows within the capacity of the system.

Any stormwater discharge that is concentrated onto and/or any stormwater works that are located on adjacent properties, are the responsibility of the developer to make appropriate arrangements. The developer must provide Council with a copy of the owner's consent prior to approval of the works being issued. Any easements required to facilitate these works are to be undertaken at no cost to Council.

Where work is to be carried out on a prescribed watercourse it must be noted that approval is required from the relevant statutory authority.

3.3.1 ANNUAL EXCEEDANCE PROBABILITIES

Annual Exceedance Probabilities (AEPs) for general use are shown in *Table 3.1* below.

| Land Use | Annual Exceedance Probability (AEP) |
|---|-------------------------------------|
| Minor (Piped) System | |
| State and Regional Arterial Road Culverts | 1% |
| Rural and Rural Residential Minor Systems | 20% |



| Land Use | Annual Exceedance Probability (AEP) |
|--|-------------------------------------|
| Rural and Residential Road Culverts | 5% |
| Urban Residential Minor Systems (sag point must have a defined 1% AEP) | 10% |
| Commercial and Industrial | 5% |
| Interallotment Drainage | 10% |
| Trunk Drainage | 1% |
| Table 3.1 - Annual Exceedance Probabilities | |

The major system drainage, for all land uses, must be designed to cater for flows from the 1% AEP storm event, with 300mm freeboard to any floor levels of adjacent properties, on the assumption that the minor system is totally blocked. Continuous designated overland flow paths are to be provided from the top of the catchment, through to the bottom of the catchment, while taking into consideration the existing downstream flow paths.

The designer must consider special damage or danger to life and property which may occur in specific situations. In such cases, the design frequency of flooding recommended or adopted must be the subject of specific advice and reports to Council for determination. In no circumstances must the design flood be less than the 1% AEP flood event.

3.3.2 DESIGN RAINFALL INTENSITIES

Design rainfall intensities for the Orange LGA must be determined in accordance with ARR2019. Following the major and minor designs, a risk-based assessment is to be undertaken with an applied Climate Change Factor.

An appropriate Climate Change Factor is to be obtained in accordance with ARR2019 or adopt a nominal climate change factor of +20%.

3.3.3 PERCENTAGE IMPERVIOUS

Catchment and sub-catchments are to have their areas of imperviousness calculated in accordance with ARR2019. Each catchment area is to consist of Directly Connected Impervious Areas (DCIA), Indirectly Connected Impervious Areas (ICIA), and Pervious Areas (PA). Total Impervious Area (TIA) is the combined total of the DCIA and ICIA. Estimations for TIA can be found in the table below, but should be reviewed to determine suitability to adopt on each site:

| Land Use | TIA (%) |
|--|---------|
| Residential Lot >800m ² | 50 |
| Residential Lot 600m ² to 800m ² | 65 |
| Residential Lot 400m ² to 600m ² | 80 |
| Residential Lot < 400m ² | 90 |
| Residential Lot Medium Density (villas, units, etc.) | 80 |
| Roads | 98 |
| Commercial Areas | 95 |
| Industrial Areas | 90 |
| Parks | 10 |
| Natural Bushland | 0 |
| Table 3.2 – Percentage Impervious | |

Note: Site specific DCP values may differ from the table above



3.3.4 TIMES OF CONCENTRATION

Times of concentration for each sub-catchment must be determined using the Kinematic Wave Equation, as detailed in ARR2019.

$$t = 6.94(Ln^*)^{0.6} / I^{0.4} S^{0.3}$$

Indicative Retardance Coefficients “n*” are listed below

| Land User | Coefficient |
|-------------------|-------------|
| Parkland | 0.17 |
| Rural Residential | 0.10 |
| Residential (2a) | 0.03 |
| Residential (2b) | 0.02 |
| Industrial | 0.013 |
| Commercial | 0.01 |
| Paved Areas | 0.013 |
| Asphalt roads | 0.011 |
| Gravel Areas | 0.017 |
| Natural Bushland | 0.350 |

Table 3.4 – Retardance Coefficients

Note: appropriate coefficients are to be determined based upon the proposed and existing site conditions. Runoff coefficients are also to be appropriately determined in conjunction with this.

3.4 ROAD DRAINAGE

The function of road drainage is to capture surface runoff from the design storm event, and safely convey it to an approved reserve or receiving waters with minimal damage, danger and nuisance to life, property and the environment.

3.4.1 DRAINAGE PITS

3.4.1.1 GENERAL REQUIREMENTS

1. Pits must be provided in drainage lines at all changes in grade, level, and direction, and at all pipe junctions and must be spaced at no more than 80m apart.
2. Drainage pits are to conform to Council's Approved Standard Drawings. Non- standard structures must be approved by Council prior to construction. Drainage structures must then be constructed as detailed in the design drawings. Such designs must comply with AS3600 – Concrete Code, AS4100 – Steel Structures, AS1657 – SAA code for Fixed Platforms, Walkways, Stairways and Ladders; and any other relevant standard.
3. Junction pits must be fitted with reinforced lids and approved lifting eyes.
4. In situ drainage structures may be used if prior approval of the typical detail has been obtained from Council.
5. Every endeavour must be made to maintain flow velocities through pits. Drop structures may be considered where appropriate.
6. Grading across pits must be designed with a minimum of 50mm.
7. At pit connections, a 3 metre length of approved subsoil drainage pipe enclosed in a geofabric sock must be placed alongside the main pipe so as to enter the pit at the same invert level and adequately drain the main trench, in accordance with Council's Approved Standard Drawings.



3.4.1.2 LOCATION OF KERB INLET PITS

The following criteria govern the location of pits in roadways, for the adopted minor storm event.

1. Inlet pits must be located so as to restrict the maximum gutter flow width to 2.5 metres.
2. Maximum spacing between any two consecutive pits is 80 metres
3. Pit bypass flows must be limited to 15% of the gutter flow at that location.
4. At intersections, kerb inlet pits must be constructed as close as possible to the upstream kerb return tangent point and not within kerb radius.
5. The minimum freeboard from the inlet height of pit to the design pit water level must be 150mm.
6. The product of flow velocity and depth of flow in the kerb and gutter must not exceed 0.4 m²/s.
7. Kerb inlet pits must be located clear of horizontal curves, pedestrian desire lines, and vehicle driveways where possible.
8. Inlet conditions must be designed so that the potential for blockage by silt and debris is minimised.

3.4.1.3 HYDRAULIC DESIGN

1. Pit inlet capacities must be estimated from design charts and formulae, based on lintel size for on-grade pits and depth of ponding for sag pits. The calculated inlet capacity must have a blockage factor of 50% for sag pits, and 20% for on-grade pits, for a minor storm event. All pits to have a blockage factor of 100% for a major storm event.
2. Standard lintel sizes of 1.8, 2.4, 3.0, or 3.6 metres must be used when possible.
3. The minimum lintel size on a sag must be 1.8 metres.
4. The head loss through pits must be determined from Missouri Charts or other recognised methods.

3.4.2 DRAINAGE PIPES

3.4.2.1 GENERAL REQUIREMENTS

1. The inlet and outlet of all pipe systems must be fitted with appropriate controls to ensure that no scouring can occur (e.g., headwalls, energy dissipating devices, etc.).
2. When constructing pipes under roads, road crossings should be at an angle no greater than 15 degrees from perpendicular to the centreline.
3. Pipe supports must be Type H2 trench installation within the verge, and Type HS2 trench installation under carriageways, as defined in AS3725 - Loads on Buried Concrete, refer to Council's Approved Standard Drawings.

3.4.2.2 DIAMETER

1. Pipes in public road reserves must have a minimum diameter of 375mm.
2. For single cell pipeline systems, a downstream pipe of smaller diameter than the upstream pipe will not be permitted.

3.4.2.3 MATERIAL

1. All drainage pipes used within public roads, public reserves or paths must be steel reinforced concrete or fibre reinforced concrete (i.e., RCP or FRCP, respectively) for any pipe size from 375mm to 600mm diameter. For any pipe size 675mm diameter or greater it must be RCP type. All pipes must be rubber ringed jointed (RRJ). This must be clearly indicated on the design plans. Any pipe material not mentioned above must be approved by Director Technical Services.
2. Pipe class must be determined for a given pipe diameter, cover, trench installation and loading in accordance with manufacturers specifications.



3.4.2.4 GRADIENT

1. Pipes must have a minimum grade of 1%, wherever physically possible, to permit self-cleansing under low flow conditions. Lesser grades are required to be approved by Director Technical Services. Actual pipe velocity must be greater than 0.6m/s for self-cleansing, and less than 8m/s to prevent cavitation and scouring.
2. Concrete bulkheads must be constructed for all drainage lines exceeding 16% grade, at intervals not exceeding 15 metres, as per AS2566 – Buried Flexible Pipelines.

3.4.2.5 ALIGNMENT

The normal alignment for stormwater drainage within the road reserve is to be in the proximity of the kerb line, where practical, as per Council's Approved Standard Drawings.

3.4.2.6 COVER

1. Pipe cover must be in accordance with manufacturer's requirements for pipe grading and class.
2. The normal minimum vertical clearance between drainage pipelines and other services is 75mm.

3.4.3 EASEMENTS

Drainage easements must be created pursuant to Section 88B of the Conveyancing Act, 1919, where stormwater drainage pipelines pass through, or concentrate water onto, private property. When conveying surface runoff from the road reserve, such easement must be in favour of Council. All other stormwater easements must be in favour of the allotments benefited only.

The width of these easements must be sufficient to contain all stormwater drainage infrastructure and flows, taking into account depth of pipes and provide for future maintenance requirements. The minimum width of such easements are generally as follows:

| Type of Drainage | Minimum Easement Width (metres) |
|--|--|
| Interallotment drainage | 2.0 |
| Interallotment drainage plus sewer | 3.0 |
| Piped drainage | |
| Up to 600 mm diameter | 2.5 |
| 675 - 1050 mm diameter | 3.0 |
| 1200 – 1500 mm diameter | 3.5 |
| 1650 – 1800 mm diameter | 4.0 |
| Floodway / Open channel | Surface width of 1%AEP flow + 0.3m freeboard + 1.0m horizontally |
| Narrower Easements will be considered by the Director Technical Services depending on circumstances. | |
| Table 3.5 – Minimum Easement Widths | |

3.4.4 SPECIAL PROVISIONS

3.4.4.1 MAJOR TRAFFIC ROUTES

Arterial routes must be kept free of surface runoff in the 2% AEP flood event. Bridges and other major drainage structures must be designed to pass the 1% AEP flood with freeboard of 500mm. Afflux and hydraulic gradients must be determined in all cases.



Note that bridges must be designed in accordance with the Austroads Guide to Bridge Technology and relevant TfNSW supplements.

Where surface flows cross a major road in the 1% AEP event, the maximum flow depth must be limited to 150mm at the road centreline, and maximum flow length of 10 metres.

3.4.4.2 CUL-DE-SACS

Cul-de-sacs, where the fall is towards the turning head, must have a floodway reservation or formed pathway in accordance with Council's Approved Standard Drawing at the sag point to ensure that major flows can be conveyed to a drainage reserve or overland flow path without flooding private properties.

3.4.4.3 STEEP GRADES

Close attention must be given to the placement and location of drainage inlets to intercept surface water off steep grades. This particularly applies where a steep side street intersects a flat cross street. Mounding may be necessary opposite the intersection to protect properties from flooding, or a floodway reservation provided opposite the steep street. Concrete bulkheads will be required for all piped drainage systems in accordance with Section 3.4.2.4.

3.4.4.4 ENERGY DISSIPATION STRUCTURES

In certain circumstances, it will be necessary to provide energy dissipating devices on stormwater outlet structures, to minimise the effect of erosion. Warrant for such structures will be determined using the procedure as described in Austroads Guide to Road Design and relevant TfNSW Supplements. Energy dissipating devices are to be installed in accordance with Council's Approved Standard Drawings.

3.5 TRUNK DRAINAGE

Trunk drainage systems are typically large capacity channels, which carry stormwater runoff from local street drainage systems to receiving waters. They typically serve large areas and overtopping is likely to cause nuisance and/or property flooding.

Trunk drainage generally comprises floodways and open channels to cater for 1% AEP flood events, with 500m freeboard. Floodways must be located along existing water courses or drainage depressions, unless exceptional circumstances exist, and the prior approval of the Director Technical Services has been obtained.

3.5.1 CALCULATION OF FLOWS

Flows through a trunk drainage network must be calculated using an appropriate runoff-routing computer model. The model must be calibrated against a known discharge, or one calculated using a different method. Details of the method used to calibrate the model must be submitted to Council.

Once calibrated, the model must be used to analyse the impact of the development on existing flows, based on zero initial and continuing loss rates.

For design of new channels, a fully developed catchment must be assumed.

3.5.2 HYDRAULIC DESIGN

Open channels must be designed using backwater calculations. A freeboard of 300mm above the 1% AEP flood level must be adopted.



The Director Technical Services will consider requests to vary the required freeboard, based on the risk of damage to life and property in large flood events.

Terracing may be introduced into the floodway where ancillary land uses, such as sports ovals, are also available for conveying the design 1% AEP flood event.

The product of velocity and depth must not exceed $1.0\text{m}^2/\text{s}$ in the 1% AEP event.

Centreline horizontal curves should not have a radius less than twice the 1% AEP surface flow width, with a minimum of 30 metres.

3.5.3 LOW FLOW DRAINAGE

All open channels must be provided with a low flow pipeline, or concrete lined invert of equivalent capacity, to cater for flows during a 1 EY (Exceedances per year) storm event.

Low flow pipes must have a minimum diameter of 375mm, and minimum longitudinal grade of 1%.

Road and interallotment drainage must be connected to low flow piped systems using a surcharge pit sized to cater for the maximum discharge in the sideline, as per Council's Approved Standard Drawings.

3.5.4 FLOW VELOCITIES

Piped low-flow systems should achieve a minimum peak velocity of 0.6m/s in a minor storm for self-cleansing purposes.

Grass-lined channels must be designed to ensure sub-critical flow with a Froude Number no greater than 1.0. Maximum velocity must be limited to 2m/s in the 5% AEP flood event, to prevent scouring. Where necessary this velocity must be reduced in highly erodible soils.

Where necessary, drop structures should be provided, or flow lengths increased, to reduce velocities to acceptable levels.

3.5.5 CHANNEL STABILISATION

Permanent scour protection devices must be designed for all discharge points into and out of the channel, and at all points where a significant change in flow conditions is likely.

Manger City Presentation approved species of grass must be planted in open channels.

Approved measures must be taken to ensure that erosion does not occur at any interface between concrete and grassed drainage structures.

Open channels must be stabilised by turfing, hydro-mulching, or by installing a geotextile material having a minimum life expectancy of two years and are to be maintained by the Developer throughout the 12 month maintenance period.

3.5.6 BATTER SLOPES

Batter slopes of grassed waterways must be no steeper than 1:4 (vertical: horizontal). Minimum cross-falls in channels must be 2% with a depressed invert.



3.5.7 ROAD CROSSINGS

In urban areas, the length of culverts must be extended to the width of the road reserve, so that standard width verges are provided on either side of the road. Headwalls, wingwalls, aprons, handrails, guard rails, and safety barriers must be provided in accordance with accepted practice, and relevant legislation and/or standards.

Trenches through existing roads where required must be backfilled as per Council's Approved Standard Drawings.

Road crossings must be constructed perpendicular to the road centreline where practicable, or in accordance with Clause 3.4.2.1.

3.6 OVERLAND FLOW PATHS

Overland flow paths are required to convey runoff to the drainage system, without causing erosion, scouring or the like. All overland flow paths must be designed to cater for the 1% AEP flood event without overtopping, including a 300mm freeboard as per Council's DCP. These pathways are not required to convey any runoff in minor storm events.

The design overland flow paths may consist of public roads, pathways, catch drains, parks, open space areas and other public spaces only. Overland flow paths are not to be constructed over private property.

3.6.1 PUBLIC ROADWAYS

The catchment area feeding roads that also act as overland flow paths must be limited, to satisfy public safety and roadway flow capacity criterion. In general, a standard 11 metre wide sealed road must have a maximum catchment area of 20 to 30 hectares, and be designed for a peak flow of $2.5\text{m}^3/\text{s}$. The product of velocity and depth must not exceed $0.4\text{m}^2/\text{s}$.

Special care must be exercised to ensure that continuity of flow is achieved, and that the floodway cross section is maintained at driveway entrances and the like.

Ready discharge must be provided at the low point, and other relief points along the road, to quickly remove water and avoid ponding and deposition of gravel and silt.

Overland flow paths must, where practicable, be provided within open space areas in preference to roadways.

3.6.2 OPEN SPACE AREAS

A suitably designed depression or flow path must be provided for the entire length of the Overland Flowpath. This particularly applies to smaller footpath reserves designed as Overland Flowpath.

Special consideration must be given to trapped low points where the overland flow path may divert surcharge into properties. This is especially important in the design of 'downhill' facing cul-de-sacs, and kerb returns adjacent to a sag vertical curve.

Where possible, tree and shrub plantings within floodway reserves must be located clear of the designed flow path. If the use of shrubby plant material cannot be avoided, the Overland Flowpath width must be increased to accommodate this factor.

Footpaths should be kept clear of the main flood flow, and be sufficiently thick and anchored to withstand the design discharge in areas of high velocity.



Grassed Overland Flowpath should be designed to avoid velocities in excess of 2m/s in the 5% AEP flood event. Concrete inverts, or other approved erosion control measures must be designed and constructed where flow velocities are excessive.

Where ponding of water is likely to occur at a road embankment, either:

- a) A larger return frequency must be adopted when designing the underpass or culvert,
- b) Property and floor levels must be kept above roadway levels, or 500mm above the 1% AEP flood, whichever is the higher,
- c) The safety of the embankment for rarer floods must be considered, particularly if there is a hazard to urban development, or if a roadway or any other structure diverts flow away from the natural drainage path.

Where practical, open space, parkland reserves, detention and retention basins must be strategically designed on a whole-catchment basis to improve downstream flow conditions and reduce flow velocities.

For major grassed channels and natural Overland Flowpaths (not small Overland Flowpaths in urban areas), signage must be provided as shown in Figure 3.1 at all principal means of pedestrian access to the creek or Overland Flowpath, advising people to take care at certain times. These signs must include black lettering on white reflective plate and have dimensions of 450mm x 600mm. The graphic is a 300mm triangle depicting a child in trouble within blue water.



Figure 3.1 Floodway Signage

3.7 DETENTION BASINS

Onsite Stormwater Detention (OSD) is required on all types of development and re-development on both flood liable and flood free sites, including the following:

- All commercial, industrial, special-use development, buildings and structures,
- Villas and home units (Multi dwelling housing),
- Dual occupancies,
- Subdivision,
- Infill development.

OSD is not required on:

- Subdivisions on existing dual occupancies where OSD was provided as part of the dual occupancy,
- Boundary adjustments and consolidations of allotments where no additional allotments are created,
- Change of use where no increase in the impervious surface area is proposed,



- Building alterations or additions where they lie within the footprint of the existing dwelling,
- New developments in subdivisions where OSD has already been provided for entire subdivision and impervious area will not exceed design limits,
- OSD may not be required where development is in the lower reaches of a catchment where OSD does not provide downstream benefits and where it can be demonstrated that runoff from the site can be conveyed through intervening properties to 'receiving waters' without adverse impact on flooding of these properties.

The Development's stormwater design is to include stormwater detention within the Development, designed to limit peak outflows from the land to the pre-existing natural outflows up to the 1% AEP. The Developer must make sufficient allowance in the overflow spillway design capacity to safely pass flows of lower frequency (that is, a rarer event) without damage to downstream developments. Where appropriate, the spillway design capacity is to be determined in accordance with the requirements of the Dam Safety Committee.

The design of the detention storage is to be undertaken using a Council approved electronic rainfall-runoff hydrologic model capable of assessing runoff volumes and their temporal distribution as well as peak flow rates. The model is to be used to calculate the flow rates for the existing and post-development conditions. The developed flows are to be routed through the proposed storage within the model so that the outflows obtained are no greater than the flows obtained for the pre-existing natural flows. A report, is required to be submitted to Council, detailing the results of the analysis including:

- Catchment plan showing sub-catchments under existing and developed conditions,
- Schematic diagram of the catchment model showing sub areas and linkages,
- Tabulation detailing the elevation, storage volume and discharge relationships, and
- Tabulation for the range of frequencies analysed, the inflows, outflows and peak storage levels for both existing and developed conditions.

Online detention basins in major flow paths must have 500mm freeboard from top water level in 1% AEP for the building floor levels. Detention basins in all other areas will require a freeboard from top water level in a 1% AEP for habitable buildings in accordance with the freeboard requirements for overland flow paths within Council's DCP.

On a new development (development of a vacant site or complete re-development of an already developed property), the OSD requirements must relate to the whole property.

In the case of a dual occupancy, if the existing dwelling is to be retained, the OSD requirements must relate only to the second dwelling and surrounding associated impervious areas.

Where the downstream hydraulic capacity of one or more components in a drainage system is inadequate for the design flow, and/or where economically feasible, detention basins are required at the discretion of the Director Technical Services.

3.7.1 DUAL USE

Basins must provide for multiple land uses where possible. Active and passive open space areas may be viable alternative uses. However, landscaping and permanent structures must be designed with due consideration of the basin's prime drainage function. Where possible, the floor of the basin must be designed so to have a minimum slope of 1%.



Where recreational uses are proposed, the basin must be provided with low-flow drainage pipes or channels, each having minimum longitudinal grades of 1%. Advisory signs must be erected, warning of the intermittent safety hazard.

3.7.2 DESIGN

While basins are generally designed and constructed to a specific brief, the following general guidelines must apply.

3.7.2.1 ANNUAL EXCEEDANCE PROBABILITY

The design must be based on a critical storm event with an Annual Exceedance Probability (AEP) of 1%, however consideration must be given to the provision of non-catastrophic failure mechanisms and public safety up to the Probable Maximum Flood (PMF) event.

The design flood must be passed entirely through a controlled system, and no uncontrolled outflow must occur. Defined spillways must be provided for flows in excess of the design flood.

Basin must be sized depending on the degree of flow attenuation necessary to ensure that the downstream drainage system can pass the design storm event.

3.7.2.2 EMBANKMENTS AND BATTERS

Grassed batters and embankments must be no steeper than 1:6 (vertical: horizontal) for maintenance purposes, although steeper slopes may be accepted by the Director Technical Services in special circumstances.

All pipelines under embankments must be rubber-ring jointed, and consideration must be given to the provision of suitable cut-off walls or seepage collars.

3.7.2.3 WATER LEVELS AND FREEBOARD

Where suitable land is available, basins must be designed for a maximum 1.2m depth of water in the 5% AEP flood event. Where constraints preclude this, the designer must ensure that adequate safety precautions have been taken, such as the provision of raised refuge mounds, fences, and warning signs.

A freeboard of 500mm above the 1% AEP flood level must be incorporated into the basin embankment, unless otherwise specified. Refer to Section 3.7 for individual detention basin detail of freeboard.

3.7.2.4 EROSION AND SEDIMENT CONTROL

Inlet and outlet structures must be designed to minimise scour.

Peak flow velocities must be limited to a maximum of 2m/s over grassed spillways and swales in the 5% AEP flood event.

3.7.3 HYDRAULIC ANALYSIS

When calculating inflows, a fully developed catchment must be assumed.

Basins must be analysed using a suitable reservoir routing runoff model using a recognised method.

The designer must ensure that at no time will the basin outflow interact with the downstream system so as to produce peak flow rates above the capacity of the system.

Backwater profiles must be checked to ensure that flood waters do not back up onto roads and properties in the 1% AEP event.



3.7.4 SPILLWAYS AND OUTLETS

Spillways must be designed to pass the 1% AEP and PMF events with minimal damage and no catastrophic failure.

Special attention must be given to the surfacing of spillways using turf, concrete, stone pitching, gabions, or other approved low-maintenance, durable material.

Outlets must be designed to minimise the risk of blockage. Clear access for machinery must be provided to permit removal of silt. Outlets must be designed to restrict access.

3.8 PROPERTY DRAINAGE

Property drainage systems are designed to convey surface runoff from roofs, paved areas, and other surfaces to a suitable outlet. Property drainage systems must be designed so that all runoff can drain naturally to the street gutter, interallotment drainage system, or road drainage system. Hydraulically 'charged' roof water systems, where the pipe outlet is at a higher elevation than some parts of the pipe invert, are not desirable within the Council area, as sediment and debris will tend to block the pipe.

Easements to drain water must be created where any component of the stormwater drainage system is located within adjoining, privately-owned lands.

Two guiding principles which must be adhered to when designing drainage systems are:

1. Cause no detriment to downstream properties by either increasing, concentrating, or diverting flows.
2. Cause no detriment to upstream properties by ponding or damming flows.

AS3500 – Plumbing and Drainage provides guidance for the design and construction of property drainage systems.

Note that stormwater must be piped to the Council underground system whenever the discharge flow rate at the gutter is more than 20 L/s per allotment, in a 10% AEP storm event.

3.8.1 BUILDING FLOOR LEVELS

The floor level of new buildings must be carefully determined so that flood damage does not occur in major storm events. In particular, houses must not be cut into the natural surface, or located within a natural drainage depression, unless provision has been made for surface runoff to safely bypass the dwelling.

Those properties which are located on the low side of the public road, or adjacent to road sag points and drainage structures, must also take particular care when selecting the design floor level, in anticipation of a pit surcharge during major flow events.

Landscaping works such as terracing and the construction of retaining walls must be designed to protect the dwelling, all site embellishments, and neighbouring properties, from inundation.

3.8.2 BUILDING ADJACENT TO FLOOD PLANNING AREA

The floor level of habitable buildings located adjacent to overland flow pathways, trunk drainage channels, and natural streams must be designed in accordance with Council's adopted Flood Planning Area.



3.8.3 DRAINAGE EASEMENTS

Easements are generally to be created over all pipelines conveying road and interallotment drainage. Generally, no construction of structures must occur on or above the easement.

Construction works adjacent to stormwater easements may be considered by the Director Technical Services, provided that the below criteria are met:

1. The stormwater pipe's condition must be surveyed (using CCTV or similar) and evidence of this survey presented to Council. The survey must extend 3m, or past the zone of influence (whichever the greater) beyond the structure. Where the pipe condition is not acceptable, or comprises flush jointed pipes, the developer will be required to replace the stormwater main with a size and material type as directed by Council.
2. The stormwater system must be designed for a 1% AEP storm event, with the incorporation of a defined overland flow path to provide for stormwater system failures.
3. Structural loads must be transmitted to the foundations outside of the zone of influence. Concrete encasement of the pipe may be approved by the Director Technical Services in special circumstances, where some additional loads on the pipe are unavoidable.
4. Maintenance access must be provided. Where applicable a Flood Impact Assessment must be carried out, considering major event storms and system failure, to determine the effect upon the proposed construction works and neighbouring properties.

3.8.4 INTERALLOTMENT DRAINAGE

Interallotment drainage systems are required whenever the lowest point in a building allotment cannot be drained directly to the street gutter. These pipes are designed to drain both roof water and surface water to Council's drainage system. Once the interallotment drainage system has been accepted as complete by Council it becomes the responsibility of the property owners it benefits and burdens.

3.8.4.1 GENERAL REQUIREMENTS

- a) The interallotment drainage system must be designed using the same principles as road drainage, based on a fully developed catchment area.
- b) Where existing allotments discharge runoff directly onto the development site, an interallotment drainage system (with appropriate easements) must be provided to alleviate this runoff.
- c) Easements must be provided over all interallotment drainage in accordance with Section 3.4.3 of this Code.

3.8.4.2 PITS

- a) Square grated surface inlet pits, a minimum size of 600mm x 600mm, must be provided at a suitable location on each affected allotment. The pit surface level must be designed for the finished surface level of the property.
- b) Pits greater than 1.2 metres in depth will require to be 900mm x 900mm in size, in accordance with Council's Approved Standard Drawings.
- c) Pits must be provided at all changes in level, grade, direction, and at all pipe junctions. Notwithstanding these requirements, the maximum pit spacing must be 80 metres.

3.8.4.3 PIPES

Detailed designs and calculations are required for medium density developments, and subdivisions of more than one allotment. One allotment can be serviced with a 150mm pipe at a grade no less than 1%. Pipes must nominally be located a distance of one metre from side and rear property boundaries. Where sewer lines are laid parallel with interallotment drainage lines, the drainage line must be located closer to the property boundary.



Minimum cover for pipes shall be in accordance with AS3500.3

Pipe material and class must be selected upon consideration of installation and maintenance, pipe depth and the design loads.

Materials which may be used without obtaining the separate approval of the Director Technical Services are RRJ sewer grade un-plasticised polyvinyl chloride (uPVC), solvent cement joint, fibre reinforced concrete, or reinforced concrete.

- a) Minimum grade for pipes shall be in accordance with AS3500.3.
- b) In steep terrain, trench stops or bulkheads will be required in accordance Section 3.4.2.4.

3.8.4.4 PUMP-OUT SYSTEMS

Pump out systems are not permitted for use within the Council area.

3.8.5 ABSORPTION TRENCHES

Absorption trenches may be constructed in rural or rural-residential areas, where the property area and soil types are suitable, and no nuisance will be caused to neighbouring properties. Absorption trenches are not acceptable in new urban areas.

The sizing of "soakaways", absorption, or seepage trenches is dependent on the hydraulic conductivity of the soils, and the consequences of any surcharging.

3.8.6 STORMWATER FLOWS IN PRIVATE PROPERTY

Problems with overland stormwater flow between neighbouring properties are generally a matter to be resolved between the respective owners as common law. Landowners are encouraged to talk to their neighbours about the problem and seek a mutually satisfactory solution.

Council has limited powers to intervene in civil disputes between neighbouring properties.

3.8.6.1 RESPONSIBILITY OF PROPERTY OWNERS

Common law requires that property owners use their property or land in a way that does not increase the risk of flooding to a neighbouring property. If a property owner carries out acts on their property that results in flooding to other people's property, they may face a civil action.

To reduce the risk of flooding to neighbouring properties, the law requires that property owners:

- Keep drains clear in their property and ensure that they do not drain water into a neighbour's property. There is a natural right of drainage that allows water that flows naturally across land to flow downhill to your neighbour's land. But you are not allowed to artificially channel water in a way that will cause damage to a neighbour's land. If they do, they may face a civil action.
- Maintain their flood defences. If failure to maintain these defences leads to flooding, the property owner could face a claim in negligence or nuisance.

3.9 LANDSCAPING OF OPEN SPACE AREAS

The following general guidelines must be used for landscaping open space areas:

- No vegetation, other than grass, must be planted in channels and overflow paths beneath the surface level of the 5% AEP flood event,
- Batter slopes must have a maximum gradient of 1:6 (vertical: horizontal),
- Trees with clean boles, strong crown structure, and with no propensity to root suckering may be planted at minimum 3 metre spacing's between the 5% and 1% AEP flood levels,
- No shrubs or flow interference landscaping must be designed below the 1% AEP flood level,



- Drainage paths throughout open space areas must be grassed, and free of boulders, dirt and debris,
- All drainage reserves must be trimmed to facilitate easy mowing.

3.10 WATER SENSITIVE URBAN DESIGN

Water Sensitive Urban Design (WSUD) is the integration of water cycle management, into planning, design and construction. Historically development has created large areas of impervious surfaces with stormwater flows directed through impervious pipe networks. This has resulted in flash flooding, higher rates of erosion, and increased pollutant loading with sediments, hydrocarbons, nutrients, and gross pollutants. The objectives of WSUD practices include, but are not limited to:

- targeting pre-development water quality and quantity, for surface and ground waters,
- reducing demand on reticulated water supply by having alternate water sources (rainwater, stormwater, low water use appliances),
- reducing volume of wastewater generated requiring treatment for release,
- the integration of water into the landscape for visual, ecological, and cultural amenity.

WSUD principles can be applied to developments of any size. All developments should take into consideration the feasibility and cost-effectiveness of implementing WSUD principles, while targeting a neutral or beneficial effect on water quality.

Drawings showing typical WSUD measures can be found in Council's Approved Standard Drawings. These include, but are not limited to:

- Wetlands,
- Bioretention basins,
- Bioretention swales,
- Raingardens,
- Permeable pavements,
- Tree pits,
- Infiltration pits,
- Gross Pollutant Traps.

WSUD is becoming more prevalent throughout the industry, and as such there are several guides available. One such guide for WSUD best practices can be found in the 'Water sensitive urban design guideline' produced by Transport for NSW.

3.11 DESIGN REFERENCES

The following publications must be read in conjunction with the recommendations in this Code.

| Australian Standards |
|--|
| 1657 – Fixed Platforms, Walkway, Stairways and Ladders - Design, construction and installation |
| 3500 – Plumbing and drainage Set |
| 3600 – Concrete structures |
| 3725 – Design for installation of buried concrete pipes |
| 4100 – Steel Structures |
| Legislation |
| NSW Conveyancing Act 1919 Section 88B |



| |
|--|
| Codes of Practice |
| Institute of Engineers, Australian Rainfall and Runoff, 2019 – A Guide to Flood Estimation |
| Austrroads |
| Guide to Bridge Technology |
| Guide to Road Design |
| Transport for NSW (TfNSW) Publications |
| Supplements to Austrroads Guides |
| Water Sensitive Urban Design |

SECTION 4 WATER INFRASTRUCTURE

4.1 INTRODUCTION

Orange City Council has adopted the Water Supply Code of Australia Regional NSW Edition (WSA 02-2014-3.1 Version 1.0) through Water Services Association of Australia (WSAA). There have been several changes made by Orange City Council to the WSAA code to suit historical standards and ensure that future works are compatible with existing infrastructure for operational purposes. The supplements in this code specify the changes & variations made by Orange City Council and must be read in conjunction with the relevant WSAA code.

4.2 STANDARDS

The following publications must be read in conjunction with the requirements in this code.

| |
|---|
| Codes of Practice |
| WSA 03-2011-3.1 Water Supply Code of Australia – Regional New South Wales Edition |
| Australian Standards |
| 2280 – Ductile Iron Pressure Pipes and Fittings |
| 2544 – Grey Iron Pressure Pipes and Fittings |
| 2977 – Unplasticised PVC (uPVC) Pipes for Pressure Applications |
| 3500 – National Plumbing Code of Australia |
| 4130 – Polyethylene (PE) Pipes for Pressure Applications |
| 4158 – Thermal Bonded Polymeric Coatings on Valves and Fittings |
| Council Policies |
| ST129 - Water Supply Infrastructure Services |
| Orange City Council Local Environment Policy (LEP) |
| Orange City Council Development Control Policies (DCP) |

4.3 SUPPLEMENT TO THE WATER SUPPLY CODE OF AUSTRALIA – REGIONAL NEW SOUTH WALES EDITION WSA 03-2022-3.1

| Supplement to WSA 03-2011-3.1 Water Supply Code of Australia – Regional NSW Editions (Version 1.0) | |
|--|---|
| 1.2.5.2 Detailed Design | <i>In addition:</i> The design shall provide a water supply to each property by way of a short or long service. The minimum water main size for residential subdivisions shall be DN100mm for commercial and industrial subdivisions shall be DN150mm or as advised by Orange City Council |
| 1.2.7 Instrumentation and Control Systems | <i>In addition:</i> Orange City Council to undertake all SCADA system works at the Developer's Cost |



| | |
|---|--|
| 2.5.2 Network Analysis | <i>In addition:</i> Orange City Council will complete a Networks Analysis on the submitted development proposal which will be undertaken at the developer's cost or provide a model for the developer to undertake the modelling on request. |
| 2.5.3 Operating Pressures | <i>Change Table 2.3:</i> Service Pressure Limits for Drinking Water Supply. Maximum Allowable service Pressure to be 800 kPa (80m head), Minimum allowable service Pressure is 200 kPa (15m head). |
| 2.6.3 Water Age | <i>Change:</i> For fire-fighting purposes, water mains are not to reduce in size in cul-de-sacs. |
| 3.3.1 (also 3.3.2 and 3.8) | <i>In addition:</i> For all systems, the minimum pressure rating class of water main pipes and fittings shall be not less than PN16 (160m/1600kPa). |
| 4.2.6 Marking Tapes | <i>In addition:</i> Non detectable marking tape is not permitted. |
| 5.4.14 Water Mains on Curved Alignments | <i>Change:</i> Pre-curved PVC pipe of any type is not permitted. |
| 5.11.2 Connections to Water Mains | <i>Change:</i> Split services are not permitted. |
| 8.2.2.2 Gate valves | <i>In addition:</i> All sluice valves shall be Class 16, non-rising spindle, resilient seated, clockwise closing, manufactured to AS 2638 and Nylon or Fusion Bonded Epoxy (FBE) coated to AS 4158. End connections (socket/spigot/flange) and other issues such as anchorage shall be to Orange City Council's requirements. Anchorage shall be in accordance with Clause 7.9. |
| 8.8.8 Hydrant Spacing | <i>Change Appendix H Table H .1:</i> Spacing of hydrants is a maximum of 60m. |
| 22 Connections to Existing Water Mains | <i>In addition:</i> All connections to live mains and any isolations/shutdowns are to be undertaken by Orange City Council or under Orange City Council supervision (fees and charges may apply). Minimum notifications are required in accordance with Council's requirements, and it is an offence under the Local Government Act 1993 to isolate/shutdown or undertake work on live water mains unless under the supervision of Orange City Council personnel. |
| Part 3: Drawings | <i>Not used</i> - refer to Orange City Council's Water and Sewer Standard Drawings |



SECTION 5 SEWERAGE INFRASTRUCTURE

5.1 INTRODUCTION

Orange City Council has adopted the Gravity Sewerage Code of Australia Regional NSW Edition (WSA 02-2014-3.1 Version 1.0) and Sewage Pumping Station Code of Australia (WSA 04-2022 Version 3.1) through Water Services Association of Australia (WSAA). There have been several changes made by Orange City Council to the WSAA codes to suit historical standards and ensure that future works are compatible with existing infrastructure for operational purposes. The supplements in this code specify the changes & variations made by Orange City Council and must be read in conjunction with the relevant WSAA code.

5.2 STANDARDS

The following publications must be read in conjunction with the requirements in this code:

| Codes of Practice | |
|---|--|
| WSA 02-2014-3.1 Gravity Sewerage Code of Australia Regional NSW Edition (Version 1.0) | |
| WSA 04-2022-3.1 Sewage Pumping Station Code of Australia | |
| Australian Standards | |
| 1260 – PVC (U) Pipes and Fittings for Drain Waste or Vent Application | |
| 1477 – PVC Pipes and Fittings for Pressure | |
| 1646 – Elastomeric Seals for Water Works Purposes | |
| 2280 – Ductile Iron Pipes and Fittings | |
| 3500 – Plumbing and drainage Set | |
| 4130 – Polyethylene (PE) Pipes for Pressure Applications | |
| 4198 – Precast Concrete Access Chambers for Sewerage Applications | |
| Council Policies | |
| ST130 - Sewer Infrastructure Services (June 2022) | |
| Orange City Council Local Environment Policy (LEP) | |
| Orange City Council Development Control Policies (DCP) | |

5.3 SUPPLEMENT TO THE GRAVITY SEWERAGE CODE OF AUSTRALIA REGIONAL NSW EDITION WSA 02-2014-3.1 (VERSION 1.0)

| Code Reference | Supplement to WSA 02-2014-3.1 Gravity Sewerage Code of Australia - Regional NSW Edition (Version 1.0) |
|---------------------------------------|---|
| 5.2.8 Easements | <p><i>Change:</i></p> <ul style="list-style-type: none"> - Minimum easement width of 2m for sewer mains up to 2m in depth (only one service within easement) - Minimum easement width of 3m if combined with stormwater drainage and sewer main up to a depth of 2m - Minimum of 3.0m if combined with Stormwater drainage up to a depth of 2.0m - Trunk, branch and rising sewer mains are not permitted within private residential properties. In all other situations, the easement must be a minimum width of 5m -When the sewer main is greater than 2m, additional easement widths will apply and will be assessed at the lodgement of the development |
| 5.3.6 Horizontal Changes in Direction | <p><i>Change:</i></p> <p>The maximum horizontal change in direction in pipes is 90°</p> |



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| 5.4.5.2 Clearance Requirements | <i>In addition:</i> Sewers constructed under large stormwater assets (i.e. RCP stormwater pipes greater than DN375) require structural bridging where vertical clearance is less than 1m |
| 5.5.4 Minimum Pipe Size for Maintenance Purposes | <i>Change:</i> Property connections must be a minimum pipe size of DN150 |
| 5.5.7 Minimum Grades for Self-Cleansing | <i>Change Table 5.6:</i> Maximum capacities for gravity sewers for various locations: for the purpose of the <i>Table 5.6</i> , Muswellbrook shall be used. |
| 5.6.6.5 Large Falls at Manholes | <i>Change:</i> All manhole drop structures are to be external drop structures. |
| 6.3.1 Methods of the Property Connection | <i>Change:</i> Standard option is Option B as per Council's Sewer Infrastructure Services Policy ST130. |
| 6.6.2 "Type 7 spur" or "Y" property sewer connections | <i>Change:</i> "Type 7 spur" or "Y" property sewer connection are not permitted, Vertical sewer junctions are also not permitted. |
| 6.7 Length of Property Connection Sewers | <i>In addition:</i> 150mm property connections are to be no more than 4m long. |
| 7.3.2 Maintenance structure spacing | <i>Change:</i> The maximum spacing between maintenance structures on reticulated sewers is 90m with only one maintenance shaft or maintenance chamber permitted between manhole structures. Maximum distance between manholes is 180m. |
| 7.6.9 Ladders, Step Irons and Landings | <i>Remove:</i> Ladders, step irons and landings are not to be installed in reticulation sewers. |
| 21 Acceptance Testing | <i>In addition:</i> The following tests must be undertaken as part of the acceptance of new sewer infrastructure: (1) Visual inspection (above-ground) - undertake in accordance with Section 21.2 (2) Compaction testing - undertake in accordance with Section 21.3 (3) Pressure Testing - Vacuum test in accordance with Section 21.4 (4) Infiltration Testing - undertake in accordance with Section 21.5 (5) Deflection (ovality) testing of flexible sewer mains - undertake in accordance with Section 21.6 (6) Measurement of sewer grade - undertake in accordance with Section 21.7 (7) Internal inspection - CCTV inspection must occur in accordance with APPENDIX L |



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| Appendix C - Flow Estimation for Development Areas | <i>In addition:</i> Table C.1 Leakage Severity Coefficient (C): a "C" factor of 1.0 shall be adopted for all design flow estimations |
| Part 3: Drawings | Not used - refer to Orange City Council's Water and Sewer Standard Drawings |

5.4 SUPPLEMENT TO WSA 04-2022-3.1 (VERSION 1.0)

| Code Reference | Supplement to WSA 04-2022-3.1 Sewage Pumping Code of Australia |
|---|---|
| 2.9 Odour Management | <i>In addition:</i> - Sewer Pump Stations must be fitted with activated carbon odour filter with a capacity of six (6) wet-well air changes per hour - Air valves on sewer rising mains in residential areas must be fitted with an activated carbon odour filter |
| 2.12 Access | <i>In addition:</i> - The vehicle turnaround area and hardstand surrounding the pump station must be concrete |
| 2.13 Security | <i>In addition:</i> Removeable bollards must be installed adjacent to the wet well, valve pit & switchboards |
| 3.7 Easements | <i>Change:</i> Rising sewer mains are not permitted within private residential properties. In all other situations, the minimum easement width shall be 5m |
| 3.8.2 Creeks and Drainage Reserves | <i>In addition:</i> The preferred "additional protection" measure is to construct a concrete slab over the top of the main. During design, consideration must be given to potential scouring |
| 6.2.2 Right of Occupancy and Access | <i>In addition:</i> The pump station site must be located in a separate lot dedicated to Council. Easements must be created for all services and access to the pump station site. |
| 6.3.2 Inlet MH Design | <i>Remove:</i> - The inlet MH is not required to have a gastight lid and safety grates - Step irons are not required in the inlet MH - A vent line is not required - Level sensors are not required in the inlet MH |
| 6.3.3 Pumping Station We-Well Isolating Valve | <i>In addition:</i> The knife gate valve is to be stainless steel |
| 6.4.1 Wet-Well Design General | <i>Remove:</i> The drop pipe must be stainless steel for all pump stations |
| 6.4.2 Sizing | <i>Change:</i> The minimum wet-well diameter is 1.8m |
| 6.4.3 Pumping Control | <i>Change:</i> The maximum number of pump starts per hour is 10 for pumps ≤ 15 kW |



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| Volume and Pump Starts | |
| 6.4.4 Control Levels | <i>In addition:</i> The distance between the pump cut-in/out levels is to be 1m |
| 6.4.5 Detention Time | <i>In addition:</i> Where the calculated detention time is greater than 2 hours, staging infrastructure will be required (for example constructing a second main to be operated in the interim which is a smaller diameter) |
| 6.5 Wet-Well Ventilation | <i>In addition:</i> All wet-wells must be fitted with an activated carbon filter with a capacity of six (6) wet-well air changes per hour |
| 6.6 Overflow Containment | <i>In addition:</i> Consultation is required with Council on the necessity for overflow containment. The minimum amount of offline storage required is 2 hours of Peak Wet-Weather Flow |
| 6.7 Ladders and Platforms | <i>In addition:</i> Council does not require ladders to be installed in MHs, wet-wells and emergency storage devices |
| 6.8 Wet-well Access Covers | <i>In addition:</i> - All wet-wells are to be fitted with four-sided fall protection safety grates |
| 6.9 Safety Systems | <i>In addition:</i> All pump station sites must have a davit anchor point installed (type approved by Council). Confirmation is required by the Sewer Section during installation on the correct location. |
| 7.6.3 Motor Selection | <i>Change:</i> The maximum number of pump starts per hour is 10 for pumps ≤ 15 kW |
| 7.8 Pump Starters and Variable Speed Drives | <i>In addition:</i> All Pumps < 22 kW to have a soft starter installed and ≥ 22 kW are to have Variable Speed Drives installed |
| 9.8.2 Flow Measurement | <i>In addition:</i> A mag flow meter is to be installed at every sewer pump station installation and located either in the valve pit or a separate pit. Direct burying the meter is not permitted |
| 10.1.3 Pump Station Pipework Type | <i>Change:</i> Only stainless steel pipework is permitted in wet-wells |
| 10.2.1 Isolating Valves | <i>In addition:</i> All sewer pump stations valves shall be clockwise closing |
| 10.3.1 Valve Chamber General | <i>Change:</i> Isolating valves, flow meters and other appurtenances are not permitted to be directly buried. |
| 10.3.2 Valve Chamber Design | <i>Change:</i> A fibreglass non-return flap reflux valve be specified on the outlet of the valve chamber drain in the wet-well. |



| | |
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| 10.4 Emergency Pumping Arrangements | <i>In addition:</i> A temporary pump station bypass point must be provided in the valve chamber with a camlock connection |
| 11.2 Location of Pressure Mains | <i>In addition:</i> Pressure sewer mains are not permitted within private residential properties. |
| 11.4.3 Surge | <i>Change:</i> The minimum pressure can drop below zero in the event of sudden power failure but must stay above vaporisation pressure, subject to the pipe having suitable pressure capabilities. |
| 11.11.12 Discharge Manholes | <i>In addition:</i> - Where a discharge manhole is located in a residential area, a carbon activated odour filter must be installed. - Sydney Water's Supplement to WSA 201 must be used in conjunction with the WSA 201 Manual for Selection and Application of Protection Coating Systems |
| 12.3.6.1 Concrete Encasement | <i>In addition:</i> The preferred solution for mitigating the risk factors listed is to construct a protective concrete slab above the sewer rising main. |
| 12.3.8 Bulkheads and Trenchstops | <i>Change:</i> Trench stops are only required for grades greater than 10% |
| 12.3.9 Trenchless Technology | <i>In addition:</i> Under-boring in environmentally sensitive areas requires close consultative with Council and "frac-outs" must be considered in the environment impact assessments (Review of Environmental Factors or similar) |
| 13.1.2 Water | <i>Change:</i> The water service shall be DN25, metered and have an RPZD installed. |
| 29.8 Glass Reinforced Plastics (GRP) MHs | Not permitted. |
| 29.9 Polyethylene (PE) MHs | Not permitted. |
| 29.10 Polypropylene (PP) MHs | <i>In addition:</i> Product must be approved by the Sewer Section prior to installation. |
| Appendix E2 Protection against Internal Corrosion | <i>In addition:</i> Internal Epoxy coating must be applied to the wet-well and valve chamber in accordance with WSA 201 Manual for Selection and Application of Protection Coating Systems and Sydney Water's Supplement to WSA 201 |
| Part 3: Drawings | Not used - refer to Orange City Council's Water and Sewer Standard Drawings |



SECTION 6 ENVIRONMENT

6.1 INTRODUCTION

Land development can lead to significant environmental impacts, even on relatively small projects. These impacts include erosion, sedimentation, land degradation, habitat destruction, water pollution, air pollution, noise pollution and waste generation. With adequate planning and management, these impacts can be minimised or prevented altogether.

It is the requirement that the Development complies with the Environmental Planning and Assessment Act 1979, Protection of Environment Operations Act 1997, the Water Management Act 2000 and all other environmental Acts throughout the course of the development. Particular attention to the Protection of the Environment Operations Act 1997, which requires notification to EPA for a pollution event.

6.2 ENVIRONMENTAL IMPACTS FROM LAND DEVELOPMENT

6.2.1 SOIL EROSION

Erosion is the wearing away of the land by the action of running water, rainfall, wind or ice. Human activities, including land development, often accelerates and intensifies this process. The factors influencing erosion include soil erodibility, rainfall intensity, surface slopes and vegetation cover.

According to information published by the Department of Regional NSW, the majority of the soils in the Council's areas have moderate to high erodibility.

The vast majority of erosion occurring on land development projects is due to the action of water.

6.2.2 SEDIMENTATION

Sedimentation occurs when eroded soil is deposited at a new location either on land or in a water course. Once the runoff containing the eroded soil slows, heavier soil particles (coarse sands and gravels) will be deposited as sediment, then followed by smaller particles.

6.2.3 LAND DEGRADATION

Land degradation is the combined result of the soil erosion and sedimentation. The loss of the fertile topsoil layer causes sensitive plant species to struggle to survive or re-establish. Under these conditions, infestations of noxious weeds can occur due to the weeds being more adapt to low fertility soils.

Conversely, overly nutrient rich soils encourage weed growth – i.e. noxious weed infestations and therefore the build-up of organic matter, concentration of stormwater flows carry fertilisers or chemicals etc. must be managed appropriately.

6.2.4 DESTRUCTION OF HABITAT

Remnant vegetation may form part of a valuable habitat - e.g. ecologically endangered vegetation community - for native fauna or act as a corridor between such areas. These habitats may contain rare and endangered species of both flora and fauna.

6.2.5 WATER POLLUTION

Not all eroded soil particles will go through the sedimentation process, with fine soil particles, nutrients and heavy metal contaminants. As a result, waterways become turbid (cloudy) and will have the effect of causing algal blooms and changing the biological composition of the waterway.



6.2.6 AIR POLLUTION

The main forms of air pollution are:

- Dust
- Burning waste
- Vapours from volatile compounds

6.3 SOIL AND WATER MANAGEMENT PLAN

A variety of documents have been produced relating to erosion and sediment control on construction sites. The document accepted as industry standard is "Managing Urban Stormwater: Soils and Construction" by Office of Environment and Heritage, which is useful in designing erosion and sediment controls for a site. It is recommended that these documents be referred to in conjunction with the following information when preparing any erosion or sediment control works.

The Soil and Water Management Plan (SWMP) is the major component of the environmental management of a land development site. The SWMP is required to be submitted and approved by Council prior to the issue of a Construction Certificate. The object of an SWMP is to minimise, preferably eliminate, the impacts of soil erosion and sedimentation resulting from land development activities.

The following is a guide as to the Council's expectations for inclusion in an SWMP. Please note that if the requirements as set out below are not met, the Developer will be asked to amend and re-submit the SWMP.

The SWMP is required to be presented as a suitably scaled drawing(s) (1:1000 or less) with the north point clearly marked and accompanied by detailed specifications and notes. The drawings, specifications and notes must be sufficiently clear so that they can be understood by on site staff.

6.3.1 SITE CHARACTERISTICS

6.3.1.1 TOPOGRAPHY

The contours, drainage lines and the catchment area are to be identified. The contour intervals as drawn on the SWMP must be in 0.5m intervals or less.

6.3.1.2 SOILS

The SWMP must show the locations of the main soil types present on the site. In addition, the erodibility of the soil types must be presented. As a general guide, soils containing a large proportion of fine sands and silts or dispersive clays are usually moderately to highly erodible (specialist advice can be sought from the NSW Department of Environment, Land and Water). Areas of rock outcrops must also be highlighted.

The areas of existing erosion and sedimentation problems (if any) must also be shown on the SWMP. These areas are more than likely to become a greater problem once land development starts and will require special attention.

6.3.1.3 VEGETATION

The types of the existing vegetation and the areas that they occupy must be shown on the SWMP.

The different classes of vegetation must be identified as they vary in their capability to prevent erosion and filter sediments. A detailed flora survey using scientific names is not required to complete this component of the SWMP.



Where significant groupings of shrubs / trees are concerned, descriptions such as Acacia (Wattle), Eucalyptus (Gum), Melaleuca, Willow, Pine, etc. are sufficient. Grasses can be described broadly as either native grasses or pasture grasses. Some indication must be given to the percentage ground cover the grasses provide.

Areas of weed infestation, especially noxious weeds, must also be noted on the SWMP.

6.3.1.4 SENSITIVE AREAS

The areas within and adjacent to the development site, in particular, environmentally sensitive areas, must be highlighted in the SWMP. Sensitive areas may include rivers, flood ways, creeks, and wetlands, significant areas of native vegetation, national parks and heritage areas. Residential areas must also be considered as sensitive, as significant erosion and sedimentation can affect the amenity of the area and possibly cause inundation from altered drainage patterns. Licencing from the Department of Primary Industries relating to fish habitats and controlled activity licencing from the NSW Office of Water may be required if proposed works are to be carried out within 40 metres of a blue line creek or river.

6.4.2 EXTENT OF PROPOSED WORKS

6.4.2.1 CLEARING OF VEGETATION

The area of vegetation proposed to be cleared must be shown clearly on the SWMP. Areas proposed for clearing must be kept to the minimum required to carry out the development. Excessive clearing of vegetation will not be considered as satisfactory. Trees required to be retained must be fenced off and Tree Protection Zones (TPZ) created in accordance with AS 4970-2009 - Protection of Trees in Development Sites.

6.4.2.2 EARTHWORKS

All areas where topsoil is proposed to be stripped and proposed areas of cut and fill need to be shown on the SWMP. Excessive stripping / cut and fill works will not be considered satisfactory.

The SWMP must also include the plan / method proposed to be used to stabilise / repair any areas of erosion and prevent further sedimentation.

6.4.2.3 MATERIALS STORAGE AREAS AND STOCKPILES

All locations where stored materials and stockpiles are proposed to be positioned are to be shown on the SWMP.

Generally, stockpiles and material storage areas must be at least 5m, preferably 10m, from concentrated water flows and traffic areas and on slopes less than 1 (vertical) in 10 (horizontal).

Stockpiles of topsoil or fill material that will only be present on site for 14 days or less must be protected with standard erosion and sediment controls. Any stockpile to be on site for longer than 14 days must be hydroseeded or covered with Council approved material.

Material stockpiles must not occur within the TPZ of any tree identified as being retained.

6.4.2.4 SCHEDULING OF WORKS

A schedule of the proposed works to be carried out is to accompany the SWMP. Obviously, the actual timing of the works will depend heavily upon the weather and other work commitments. The schedule is required to assess whether the works as proposed are staged correctly and that vulnerable areas are not left exposed for prolonged periods.



6.4.3 PROPOSED EROSION AND SEDIMENT CONTROLS

The NSW Environment Protection Authority and the State Stormwater Co-ordinating Committee have produced a series of three draft documents titled "Managing Urban Stormwater". Two of these documents, "Construction Activities" and "Treatment Techniques" are very useful in designing the erosion and sediment controls for a site. It is recommended that these documents be referred to in conjunction to the information presented below when preparing this part of the SWMP.

6.4.3.1 DIVERSION OF "CLEAN" RUNOFF

The SWMP must show how it is proposed to minimise the amount of stormwater entering the site. Whilst the building site may be well vegetated and suitable erosion control measures in place, large volumes of stormwater runoff can still cause erosion and damage or destroy sediment controls. "Clean" water must be intercepted upstream of the development site by an earth bank and diverted to a stable and undisturbed area.

6.4.3.2 EROSION CONTROLS

There are likely to be situations where the existing vegetation and diversion of stormwater may not be adequate by themselves as erosion control. When this is the case, the SWMP must show the methods proposed to be used as further erosion control. This may include the use of soil binders, mulches, blankets and revegetation.

6.4.3.3 INTERCEPTION AND TREATMENT OF "DIRTY" RUNOFF

The SWMP must show the locations and details of the proposed sediment controls. These controls must have the aim to eliminate sediments entering sensitive areas and / or leaving the site.

The use of the existing vegetation will not be totally suitable as the only sediment control measure. Other sediment controls (e.g. sediment filter (silt) fences, straw bale sediment filters, sediment retention basins, etc.) will be required. This applies to onsite stormwater inlets as well as site boundaries. The use of sediment filter fences is preferred as these structures can perform better in situations of high flow and the materials can be reused from site to site if undamaged.

6.4.3.4 ACCESS TO SITE

Access to subdivisions and larger development sites, as shown on the SWMP, must be limited to one point only where possible. This all-weather access will improve access to the site in wet conditions, reduce disturbance of the site and reduce the amount of mud that is deposited on the roadway that will be washed away by rain, possibly causing sedimentation problems and water pollution.

Where possible, the access must be 15m long by 3m wide. A berm (height 300mm) must comprise part of the all-weather access adjacent to the site boundary (not the roadway). In accordance with Council's Approved Standard Drawings.

Construction of a 200mm thick pad of geotextile using 30mm aggregate. The materials used in the construction of the all-weather access can be reused once the building activity is completed.

Runoff from the access must be treated as "dirty" runoff and directed back into the site to the existing sediment controls.

6.4.3.5 REVEGETATION

A plan to revegetate the disturbed areas must be provided with the SWMP. This applies to both temporary revegetation (for disturbed areas, batters, stockpiles, etc.) and permanent revegetation (at the completion of the project).



The method of preparing the seedbed is also required as part of this information. If in doubt, seek the advice of a professional landscaper, gardener or refer to the Department of Housing documents Guidelines for Grass Selection in NSW (1993) and Guidelines for Plant Selection (1993).

6.4.4 INSPECTION AND MAINTENANCE

A program of inspection and maintenance is required to be provided with the SWMP. Suggested inspection intervals are:

- Once a week (on Friday)
- Prior to predicted and after a rain fall event
- Prior to the site being unattended for a period in excess of 24 hours

All sediment and erosion controls must be repaired / cleaned if they are damaged or filled with sediment, as soon as possible.

6.4.5 NOISE POLLUTION

Work on any construction site is limited between the hours of 7.00am and 6.00pm Monday to Friday inclusive, 8.00am to 1.00pm Saturday and no work on Sundays and Public Holidays, as per NSW Interim Construction Guidelines. Any construction outside these times will need to seek the appropriate approvals, inclusive of Councils approval. Consideration to EPA noise guidelines should be observed during any construction.

6.4.6 CONSULTATION

Both the Soil Conservation Service and the NSW EPA may be consulted during preparation of an SWMP. These departments can provide specialist advice on soil types, erodibility, vegetation clearing, erosion controls, sediment controls, legislative requirements and management of sensitive areas.

6.4.7 USE OF CHEMICALS

Many chemicals associated with land development activities can have short or long term effects on the environment and / or on people's health. Therefore, chemicals are always to be handled, used and disposed of in accordance with the manufacturer's instructions.

When not in use, chemicals must be sealed to prevent the escape of vapours. Chemicals, if left on an unattended site, must be kept upright and sealed in an unexposed, secure area, preferably on an impermeable surface (such as concrete).

If a spillage or a leak occurs, the following action must be taken:

1. Stop the spill or leak
2. Prevent the spill / leak from leaving the site and / or entering watercourses
3. Clean up the spill using an absorbent material (e.g. sand or sawdust), and
4. Notify the NSW Environment Protection Authority and the Council so that appropriate arrangements can be made to clean up and dispose of the absorbent material and any effected soil.

Please take note that on site disposal of chemicals is not, and never will be, an acceptable form of waste disposal.



6.4.8 WASTE MANAGEMENT

The fees for disposal of waste at Council’s Resource Recovery Centre are more expensive for mixed waste rather than for sorted waste due to the increased cost of disposal and the lost opportunity of recycling. For current disposal fees, see the Council’s Fees and Charges in the Integrated Planning and Reporting (IP&R) Documents.

6.5 REFERENCES

The following publications must be read in conjunction with the recommendations in these guidelines.

| Australian Standards | |
|--|--|
| AS 4970 | Protection of Trees in Development Sites |
| Industry Handbooks | |
| Landcom “Managing urban Stormwater: soils and construction” | |
| Orange City Council’s document “Divert < Cover > Capture Maintain” | |
| Codes of Practice | |
| Department of Housing document Guidelines for Grass Selection in NSW (1993). | |
| Department of Housing document Guidelines for Plant Selection (1993). | |
| NSW EPA and the State Stormwater Co- coordinating Committee “Managing Urban Stormwater - Construction Activities” “Treatment Techniques” | |
| NSW EPA and the State Stormwater Co- coordinating Committee “Managing Urban Stormwater - Treatment Techniques” | |
| Concrete Sawing | |
| Legislation | |
| Environmental planning and Assessment Act 2017 | |
| Water Management Act 2000 | |
| Protection of the Environment Operations Act 1997 | |

SECTION 7 TRAFFIC MANAGEMENT

This section is to ensure that any traffic or pedestrian movement through or past the work site is undertaken in a safe manner.

Any organisation that is carrying out works within a public road reserve is to prepare and implement a Traffic Guidance Scheme (TGS) that provides necessary direction to traffic or pedestrian movements through or past the work site.

The TGS is to be prepared by a suitably qualified person in accordance with AS 1742.3 Manual of uniform traffic control devices, Part 3: Traffic control for works on roads.



Appendix A - Engineering Design Certification

| | |
|--|--|
| Project / Development | |
| Development Application Number | |
| Consultants Plan Number/s and Version | |
| Name of Consultant/s | |
| Name of Developer | |
| Address of Developer | |

- I certify that this development complies with good industry practice, Orange City Council's Development and Subdivision Code, and specific instructions from the Director of Technical Services
- I certify that this development will have no significant environmental impact as interpreted under Part 5 of the Environmental Planning and Assessment Act, 1979, as amended.
- I certify that this development is in strict compliance with all conditions of Development Consent, unless written confirmation from Council has been received approving of any variance prior to the submission of design plans (including designs for staged construction).
- I certify that all structural elements of the development have been designed by a competent consultant.
- I certify that all pavement designs comply with Orange City Council Subdivision and Development Code

Design Engineer / Surveyor

| <i>Name</i> | <i>Position</i> | <i>Signature</i> | <i>Date</i> |
|-------------|-----------------|------------------|-------------|
| | | | |

| | |
|------------------------|--|
| Contact Details | |
| Company | |
| Phone | |
| Email | |
| Qualifications | |



Appendix B – Standard Drawings

| No. | Description |
|-------|---|
| SD 01 | Cover Sheet |
| SD 02 | Kerb and Gutter Profiles |
| SD 03 | Pram Ramps |
| SD 04 | Residential Vehicular Access 4.5m Verge |
| SD 05 | Industrial and Commercial Vehicular Access |
| SD 06 | Rural Property Access |
| SD 07 | Typical Road Verge Detail |
| SD 08 | Concrete Cycleways and Footpaths |
| SD 09 | Intersection Median Islands |
| SD 10 | Typical Sign and Street Sign Footing Details |
| SD 11 | Dished Crossing for Minor Road Junctions |
| SD 12 | Fixing Kerb to Existing Pavement |
| SD 13 | New Pavement Tie-in to Existing Pavement |
| SD 14 | Transverse Pavement Trench and Pit Restoration |
| SD 15 | Footpath and Shared Path Restoration |
| SD 16 | Residential Vehicle Access Crossing Restoration |
| SD 17 | Stormwater Pipe Bedding |
| SD 18 | Subsoil Flushout and Outlet Structures |
| SD 19 | Surface Inlet Pit |
| SD 20 | Surface Surcharge Pit |
| SD 21 | Interallotment and Junction Pit |
| SD 22 | Flush Grated Pit for SB Kerb |
| SD 23 | Precast Concrete Lintels Sheet 01 of 03 |
| SD 24 | Precast Concrete Lintels Sheet 02 of 03 |
| SD 25 | Precast Concrete Lintels Sheet 03 of 03 |
| SD 26 | Concrete Headwall |
| SD 27 | Concrete Support Cradle |
| SD 28 | Concrete Bulkhead and Trenchstop Details |
| SD 29 | Floodway Within Footpath Alignment |
| SD 30 | Access Erosion and Sediment Control |
| SD 31 | Typical Constructed Wetland Sheet 01 of 02 |



| | |
|-------|--|
| SD 32 | Typical Constructed Wetland Sheet 02 of 02 |
| SD 33 | Typical Raingarden |
| SD 34 | Typical Urban Swale |
| SD 35 | Typical Bioretention Basin |
| SD 36 | Permeable Pavement |
| SD 37 | Typical Street Tree with Path Sheet 01 of 02 |
| SD 38 | Typical Street Tree with Path Sheet 02 of 02 |
| SD 39 | Typical Open Space Tree |

FOR ADOPTION

SHEET No. 01 OF 39

ORANGE CITY COUNCIL SUBDIVISION CODE STANDARD DRAWINGS

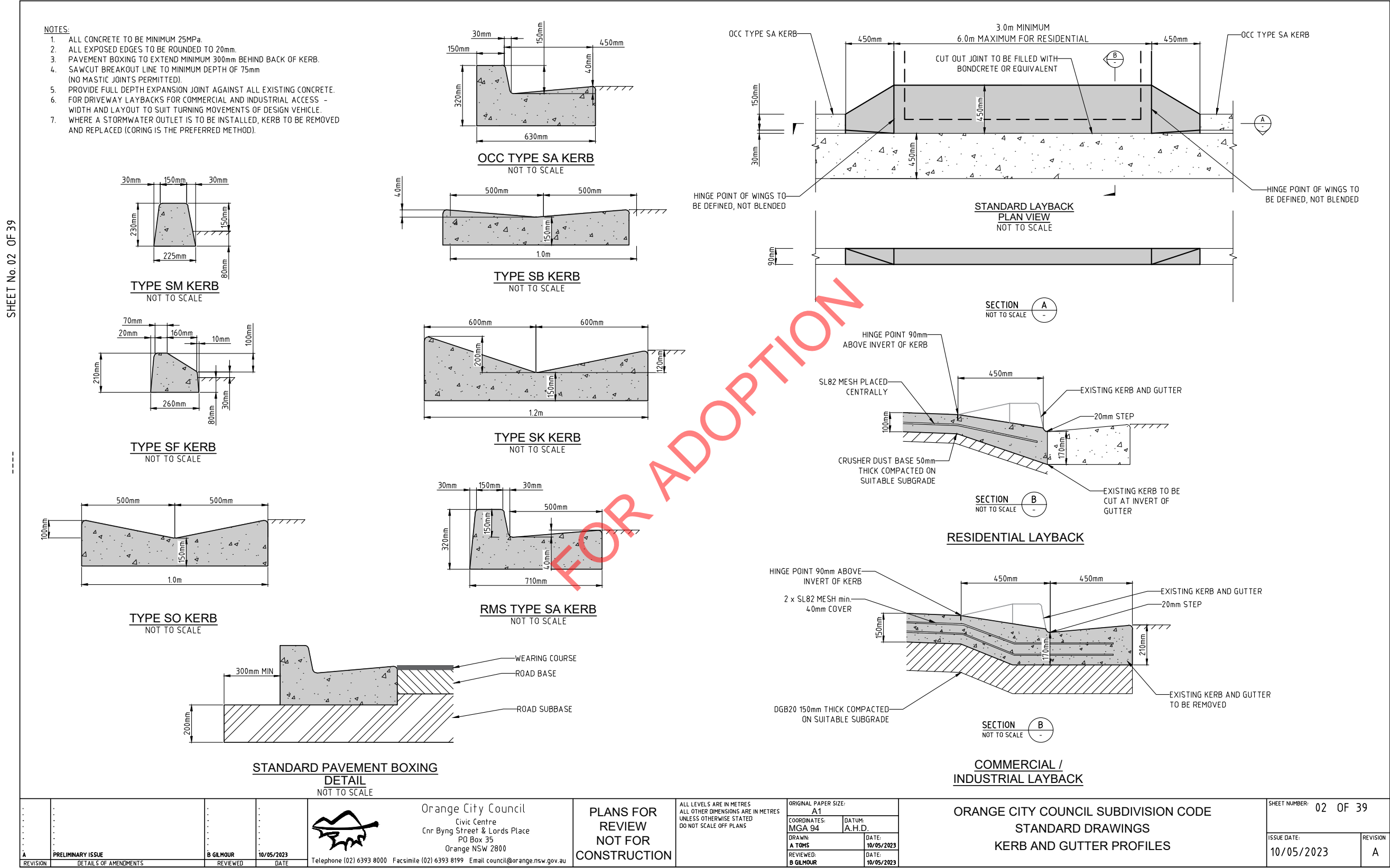
| Sheet List Table | |
|------------------|---|
| Sheet Number | Sheet Title |
| 01 | COVER SHEET |
| 02 | KERB AND GUTTER PROFILES |
| 03 | PRAM RAMPS |
| 04 | RESIDENTIAL VEHICULAR ACCESS 4.5m VERGE |
| 05 | INDUSTRIAL AND COMMERCIAL VEHICULAR ACCESS |
| 06 | RURAL PROPERTY ACCESS |
| 07 | TYPICAL ROAD VERGE DETAIL |
| 08 | CONCRETE CYCLEWAYS AND FOOTPATHS |
| 09 | INTERSECTION MEDIAN ISLANDS |
| 10 | TYPICAL SIGN AND STREET SIGN FOOTING DETAILS |
| 11 | DISHED CROSSING FOR MINOR ROAD JUNCTIONS |
| 12 | FIXING KERB TO EXISTING PAVEMENT |
| 13 | NEW PAVEMENT TIE-IN TO EXISTING PAVEMENT |
| 14 | TRANSVERSE PAVEMENT TRENCH AND PIT RESTORATION |
| 15 | FOOTPATH AND SHARED PATH RESTORATION |
| 16 | RESIDENTIAL VEHICLE ACCESS CROSSING RESTORATION |
| 17 | STORMWATER PIPE BEDDING |
| 18 | SUBSOIL FLUSHOUT AND OUTLET STRUCTURES |
| 19 | SURFACE INLET PIT |
| 20 | SURFACE SURCHARGE PIT |
| 21 | INTERALLOTMENT & JUNCTION PIT |
| 22 | FLUSH GRATED PIT FOR SB KERB |
| 23 | PRECAST CONCRETE LINTELS SHEET 01 OF 03 |
| 24 | PRECAST CONCRETE LINTELS SHEET 02 OF 03 |
| 25 | PRECAST CONCRETE LINTELS SHEET 03 OF 03 |
| 26 | CONCRETE HEADWALL |
| 27 | CONCRETE SUPPORT CRADLE |
| 28 | CONCRETE BULKHEAD AND TRENCHSTOP DETAILS |
| 29 | FLOODWAY WITHIN FOOTPATH ALIGNMENT |
| 30 | ACCESS EROSION AND SEDIMENT CONTROL |
| 31 | TYPICAL CONSTRUCTED WETLAND SHEET 01 OF 02 |
| 32 | TYPICAL CONSTRUCTED WETLAND SHEET 02 OF 02 |
| 33 | TYPICAL RAINGARDEN |
| 34 | TYPICAL URBAN SWALE |
| 35 | TYPICAL BIORETENTION BASIN |
| 36 | PERMEABLE PAVEMENT |
| 37 | TYPICAL STREET TREE 01 OF 02 |
| 38 | TYPICAL STREET TREE 02 OF 02 |
| 39 | TYPICAL OPEN SPACE TREE |

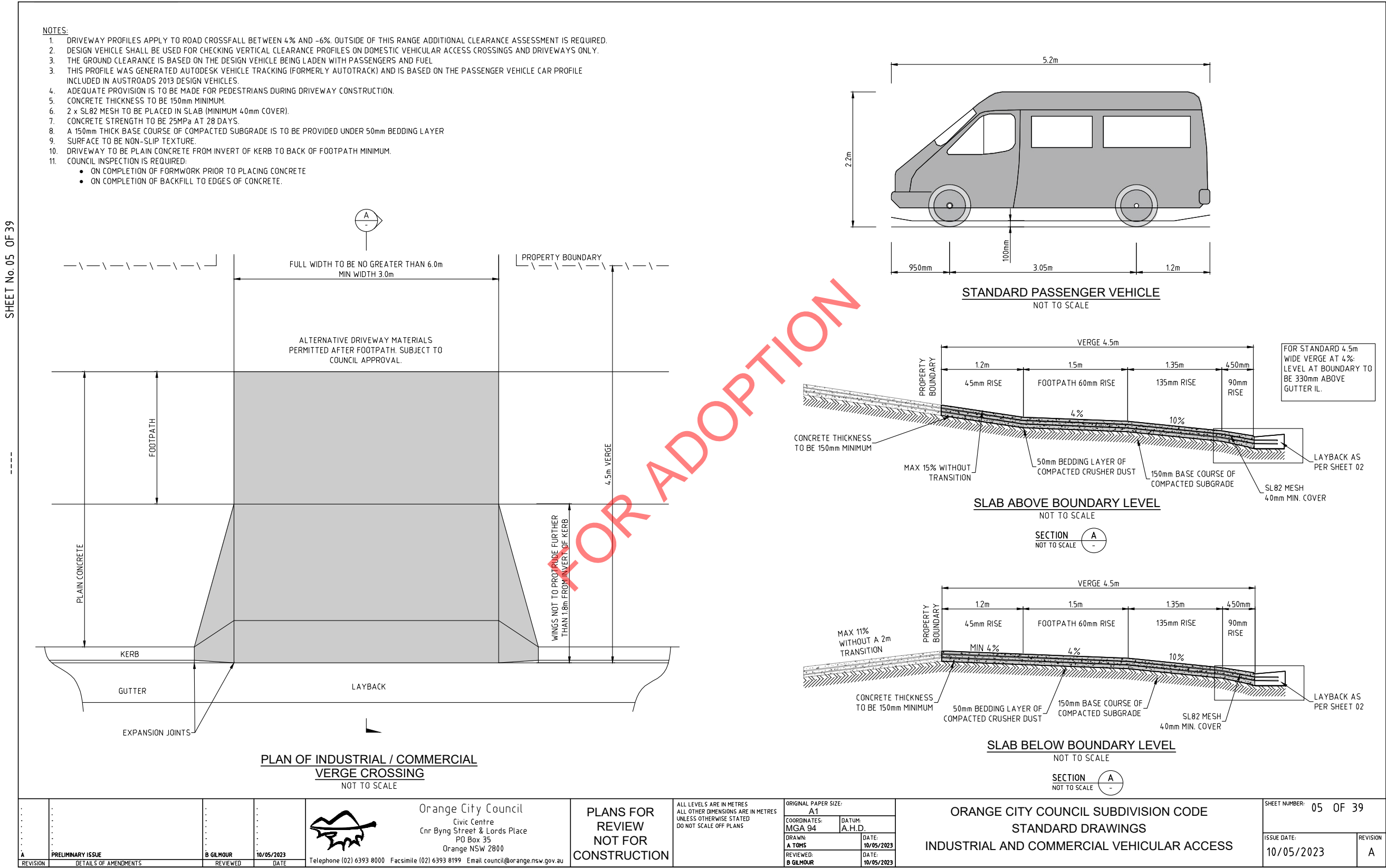
| Sheet List Table | |
|------------------|---|
| Sheet Number | Sheet Title |
| 40 | PROPERTY SERVICE LAYOUT |
| 41 | PROPERTY SERVICE CONNECTION & DN20/DN25 & DN40/DN50 SERVICE DETAILS |
| 42 | WATER MAINS ARRANGEMENT FOR CUL-DE-SACS |
| 43 | WATER MAIN PIPE BEDDING |
| 44 | FIRE HYDRANT DETAILS |
| 45 | STOP VALVE DETAILS |
| 46 | AIR VALVE AND SCOUR VALVE DETAILS |
| 47 | MARKING FOR LOCATION OF HYDRANTS |
| 48 | HORIZONTAL THRUST BLOCKS |
| 49 | VERTICAL THRUST BLOCKS |
| 50 | VALVES & INLINE THRUST BLOCKS |
| 51 | DN50 OR SMALLER PROPERTY SERVICE WITH DN100 OR LARGER FIRE SERVICE |
| 52 | DN100 OR LARGER PROPERTY SERVICE WITH DN100 OR LARGER SEPARATE FIRE SERVICE |
| 53 | MAIN TRENCH DRAINAGE BULKHEADS & TRENCHSTOPS |
| 54 | VALVE INSTALLATION DETAILS |
| 55 | PROPERTY JUNCTION CONNECTION DETAILS |
| 56 | SEWER MAIN BEDDING |
| 57 | MAINTENANCE SHAFTS AND RISER JUNCTIONS |
| 58 | MAINTENANCE HOLES FOR SEWER |
| 59 | MAINTENANCE HOLE TYPICAL CHANNEL ARRANGEMENTS |
| 60 | AIR VALVE AND SCOUR VALVE DETAILS |
| 61 | DISCHARGE MAINTENANCE HOLE FOR SEWER RISING MAINS |
| 62 | MAIN TRENCH DRAINAGE BULKHEADS & TRENCHSTOPS |
| 63 | SEWER PUMP STATION PRE-COMMISSIONING CHECKLIST |
| 64 | SEWER PUMP STATION FACTORY ACCEPTANCE TESTING (FAT0 AND COMMISSIONING CHECKLISTS SHEET 1 OF 3 |
| 65 | SEWER PUMP STATION FACTORY ACCEPTANCE TESTING (FAT0 AND COMMISSIONING CHECKLISTS SHEET 1 OF 3 |
| 66 | SEWER PUMP STATION FACTORY ACCEPTANCE TESTING (FAT0 AND COMMISSIONING CHECKLISTS SHEET 1 OF 3 |
| 67 | SITE LAYOUT |
| 68 | WET WELL PLAN VIEW |
| 69 | WET WELL ELEVATION |
| 70 | TYPICAL MEMBER DETAILS |
| 71 | EXCAVATION ELEVATION |
| 72 | TYPICAL VALVE CHAMBER ACCESS COVER |
| 73 | TYPICAL WELL ACCESS COVER |

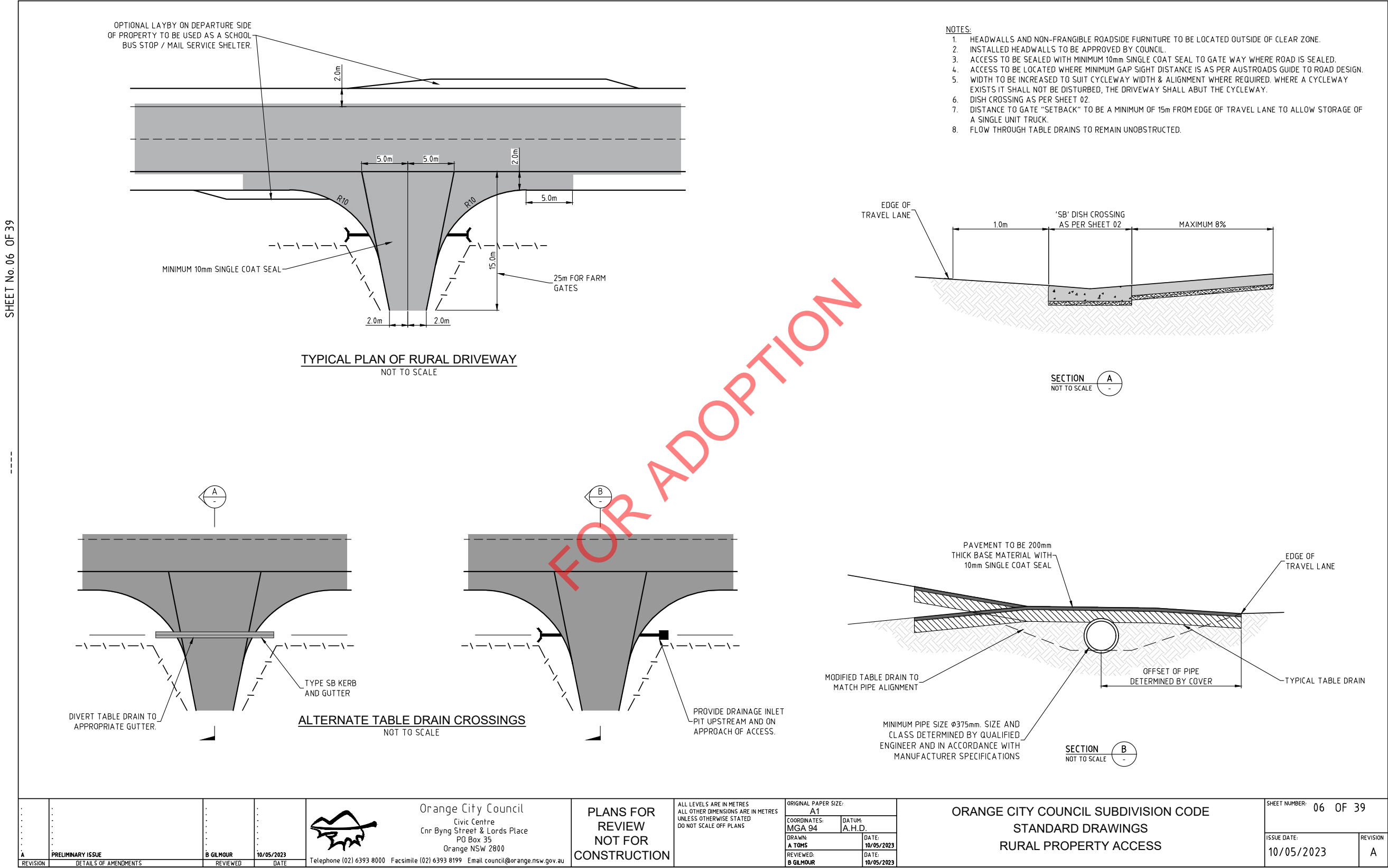
| Sheet List Table | |
|------------------|---------------------|
| Sheet Number | Sheet Title |
| 74 | COVER SHEET |
| 75 | 415VAC DISTRIBUTION |
| 76 | 415VAC DISTRIBUTION |
| 77 | 415VAC DISTRIBUTION |
| 78 | SOFT STARTERS |
| 79 | 240VAC CONTROL |
| 80 | 24VDC CONTROL |
| 81 | 24VDC CONTROL |
| 82 | TERMINAL STRIP |
| 83 | CONTROL PANEL |
| 84 | CONTROL PANEL |
| 85 | CONTROL PANEL |
| 87 | EQUIPMENT LIST |

| Sheet List Table | |
|------------------|---------------------|
| Sheet Number | Sheet Title |
| 87 | COVER SHEET |
| 88 | 415VAC DISTRIBUTION |
| 89 | 415VAC DISTRIBUTION |
| 90 | 415VAC DISTRIBUTION |
| 91 | SOFT STARTERS |
| 92 | 240VAC CONTROL |
| 93 | 24VDC CONTROL |
| 94 | 24VDC CONTROL |
| 95 | TERMINAL STRIP |
| 96 | CONTROL PANEL |
| 97 | CONTROL PANEL |
| 98 | CONTROL PANEL |
| 99 | VSD CONTROL PANEL |
| 100 | EQUIPMENT LIST |

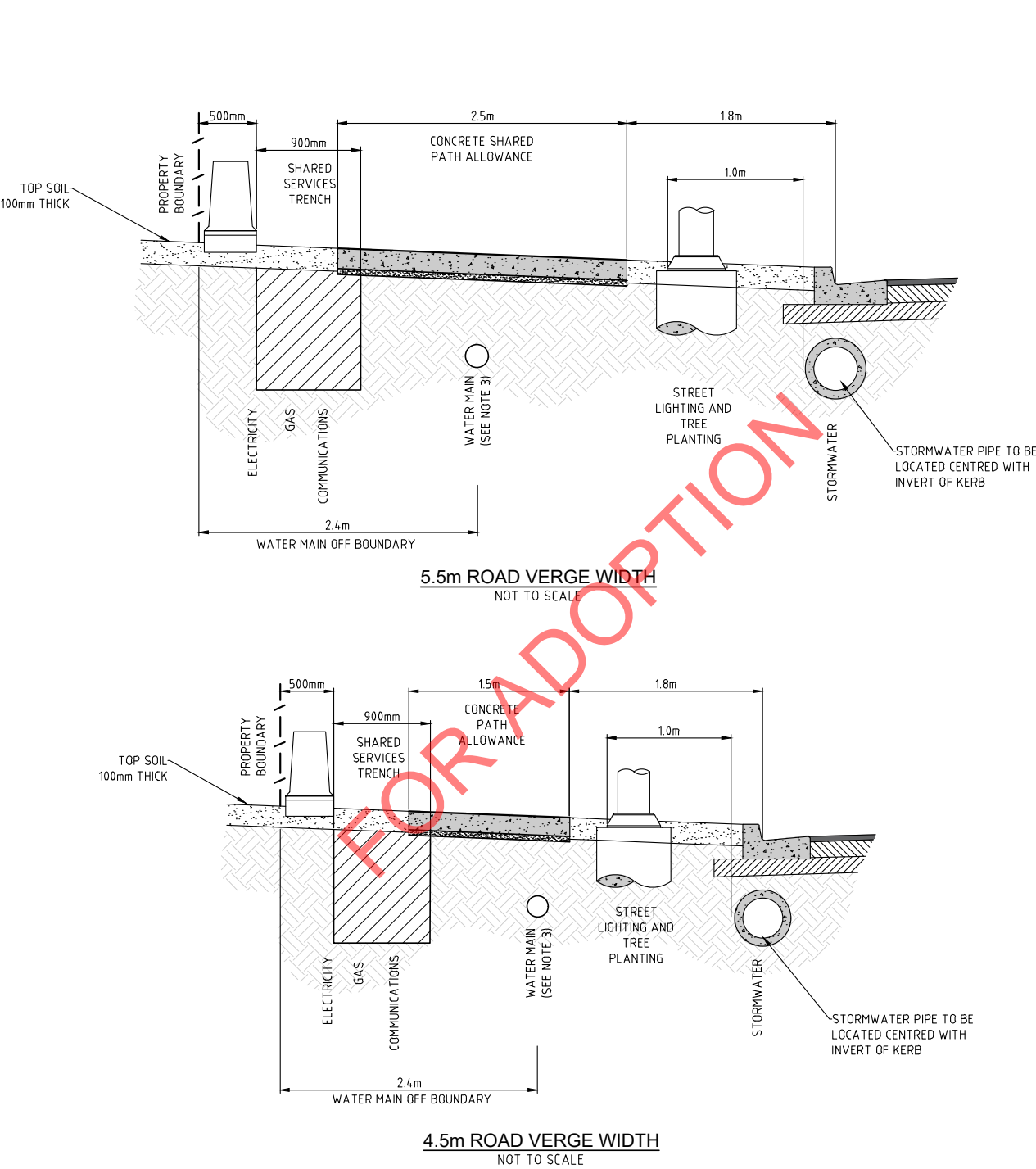









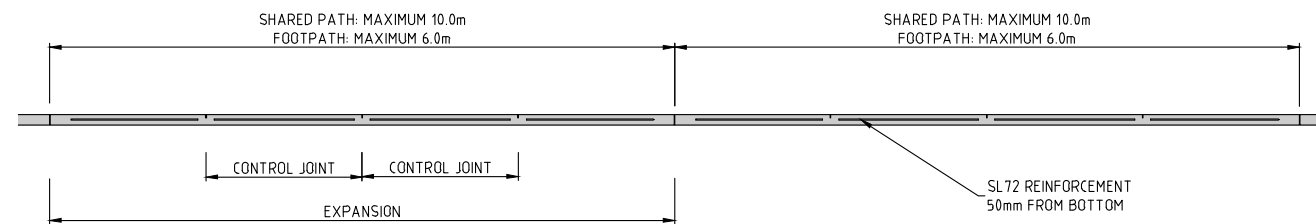
SHEET No. 07 OF 39



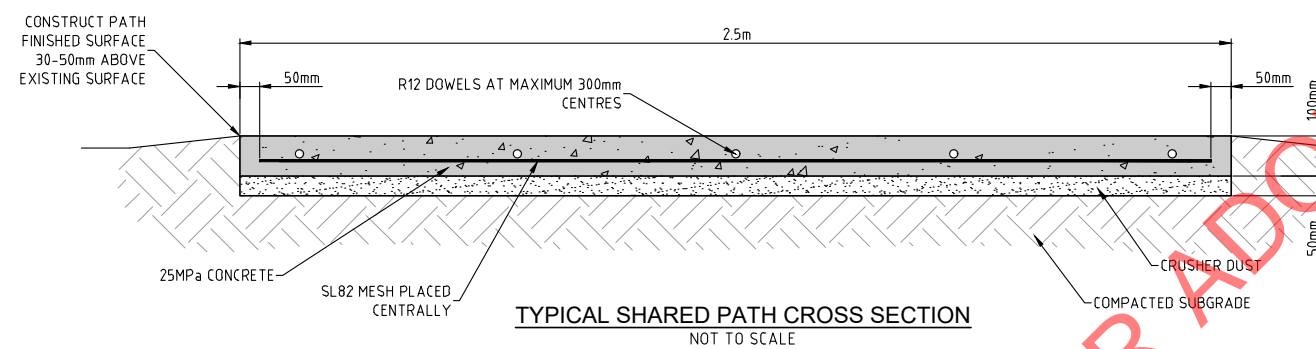
- NOTES:
- 1. THE ALIGNMENT AND DEPTHS OF EXISTING SERVICES SHALL BE PROVEN ON SITE BY CONSULTATION WITH THE RELEVANT SERVICE AUTHORITIES PRIOR TO ANY EXCAVATION AND ARE NOT TO BE INFERRED FROM THIS DRAWING.
 - 2. VARIOUS CONFIGURATIONS OF TRENCH WIDTH AND CONDUIT NUMBERS/DIAMETERS EXIST FOR BOTH ELECTRICITY AND COMMON TRENCH ARRANGEMENTS WITH COMMUNICATIONS.
 - 3. WHERE DUAL WATER MAINS ARE TO BE INSTALLED, THEY ARE TO BE PLACED CENTRALLY 2.4m FROM THE PROPERTY BOUNDARY.
 - 4. VERGE TO BE AT A 4% GRADIENT

| | | | | | | | | | | | | |
|---|-------------------|-----------|------------|---|---|--|---|--|--|--|---------------------------|---------------|
| A | PRELIMINARY ISSUE | B GILMOUR | 10/05/2023 |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DRAWN: A TOMS REVIEWED: B GILMOUR | DATE: 10/05/2023 DATE: 10/05/2023 | ORANGE CITY COUNCIL SUBDIVISION CODE STANDARD DRAWINGS TYPICAL ROAD VERGE DETAIL | SHEET NUMBER: 07 OF 39 | |
| | | | | | | | | | | | ISSUE DATE: 10/05/2023 | REVISION A |

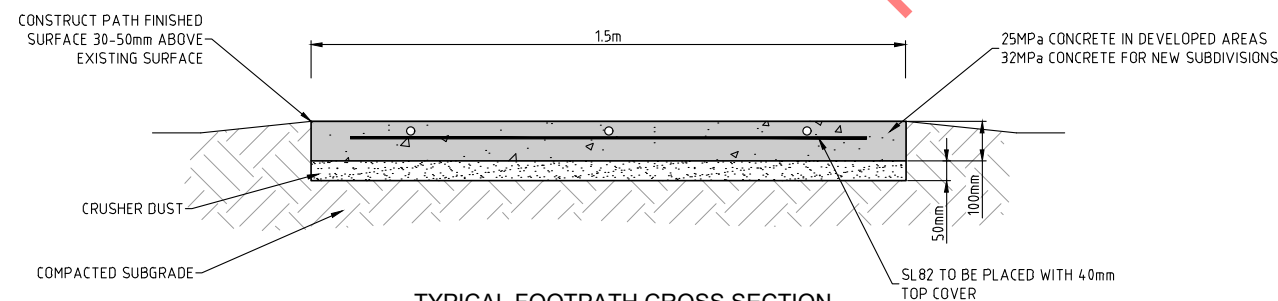
SHEET No. 08 OF 39



TYPICAL PATH LONG SECTION
NOT TO SCALE



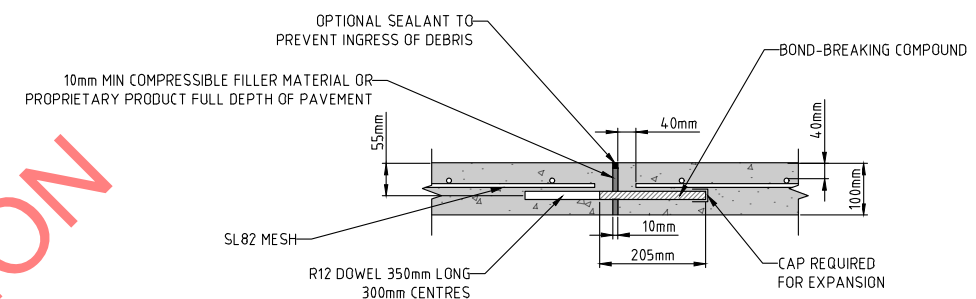
TYPICAL SHARED PATH CROSS SECTION
NOT TO SCALE



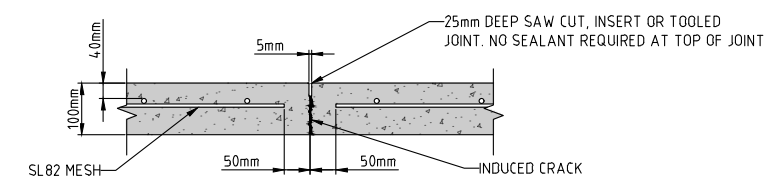
TYPICAL FOOTPATH CROSS SECTION
NOT TO SCALE

NOTES:

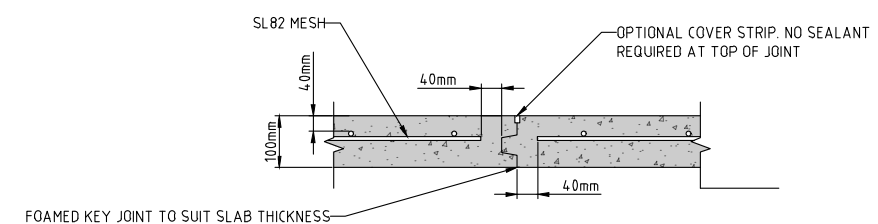
- NOTES:**
1. ALL PATHS IN DEVELOPED AREAS WITH ESTABLISHED DRIVEWAYS TO BE 25MPa CONCRETE BROOM FINISH.
 2. WHERE FOOTPATH IS TO BE CONSTRUCTED IN NEW SUBDIVISION:
 - FOOTPATH 100mm THICK 32MPa CONCRETE COVE FINISH - NO SLIP
 - SL82 MESH WITH 40mm TOP COVER
 - 50mm THICK LAYER OF CRUSHER DUST
 - ON SUITABLE COMPACTED SUBGRADE 95% MODIFIED COMPACTION.
 3. SL82 REINFORCEMENT TO BE PLACED 50mm FROM THE BOTTOM IN CYCLEWAY.
 4. ALL JOINTS ARE TO BE SMOOTH AND/OR AT SAME LEVEL.
 5. CONTROL JOINTS TO BE PLACED AT 2.5m SPACINGS FOR CYCLEWAYS, AND 1.5m SPACINGS FOR FOOTPATHS.
 6. EXPANSION JOINTS TO BE PLACED AT MAXIMUM 10m SPACINGS FOR CYCLEWAYS, AND MAXIMUM 6m SPACINGS FOR FOOTPATHS.
 7. MAXIMUM CROSSFALL TO BE 4%.
 8. MAXIMUM LONGITUDINAL GRADE TO BE 10% WHERE POSSIBLE.
 9. INSTALL 'TRIPSTOP' OR EQUIVALENT AT JOINTS WHERE FOOTPATH IS ADJACENT TO EXISTING TREES.




EXPANSION JOINT
NOT TO SCALE

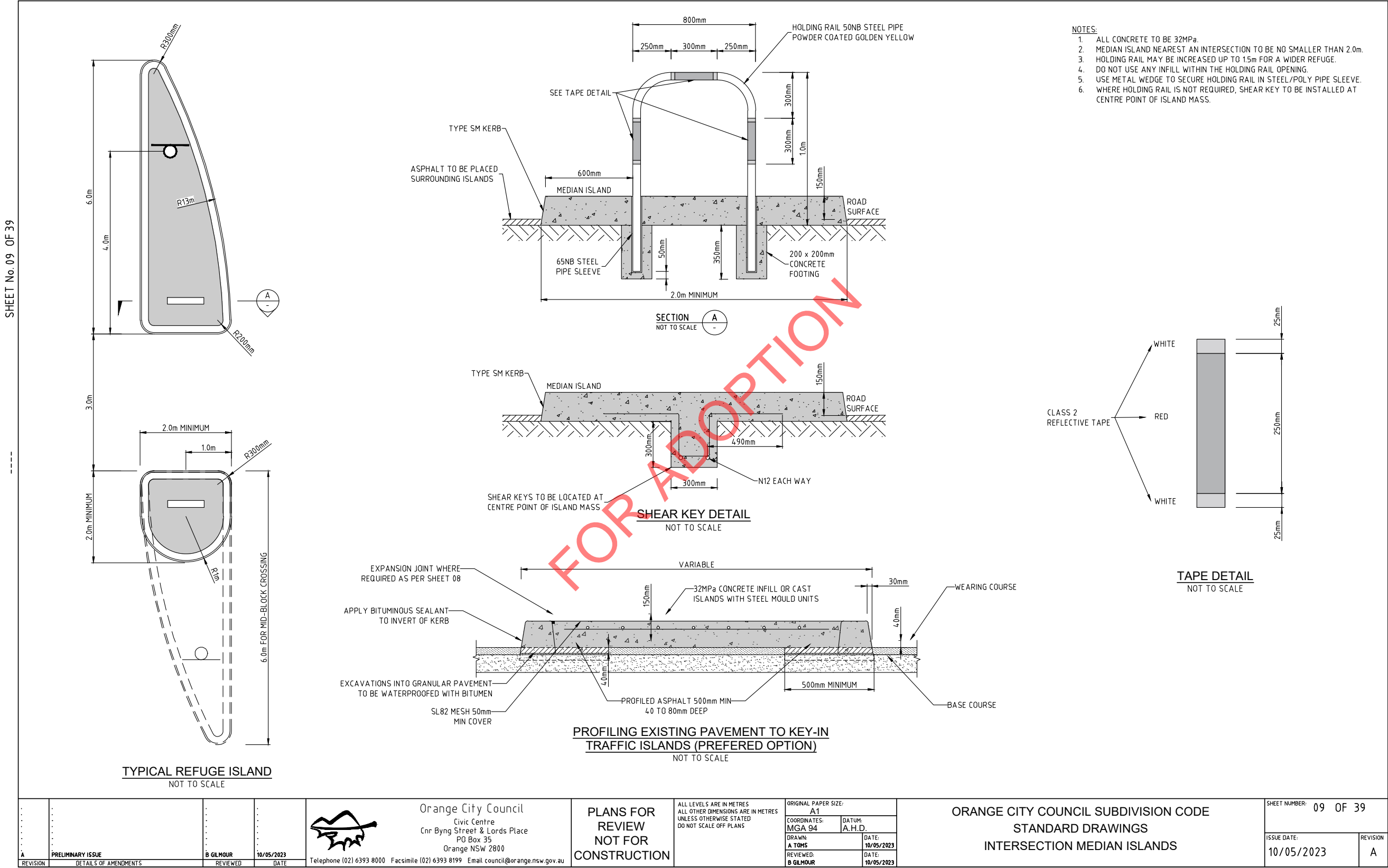


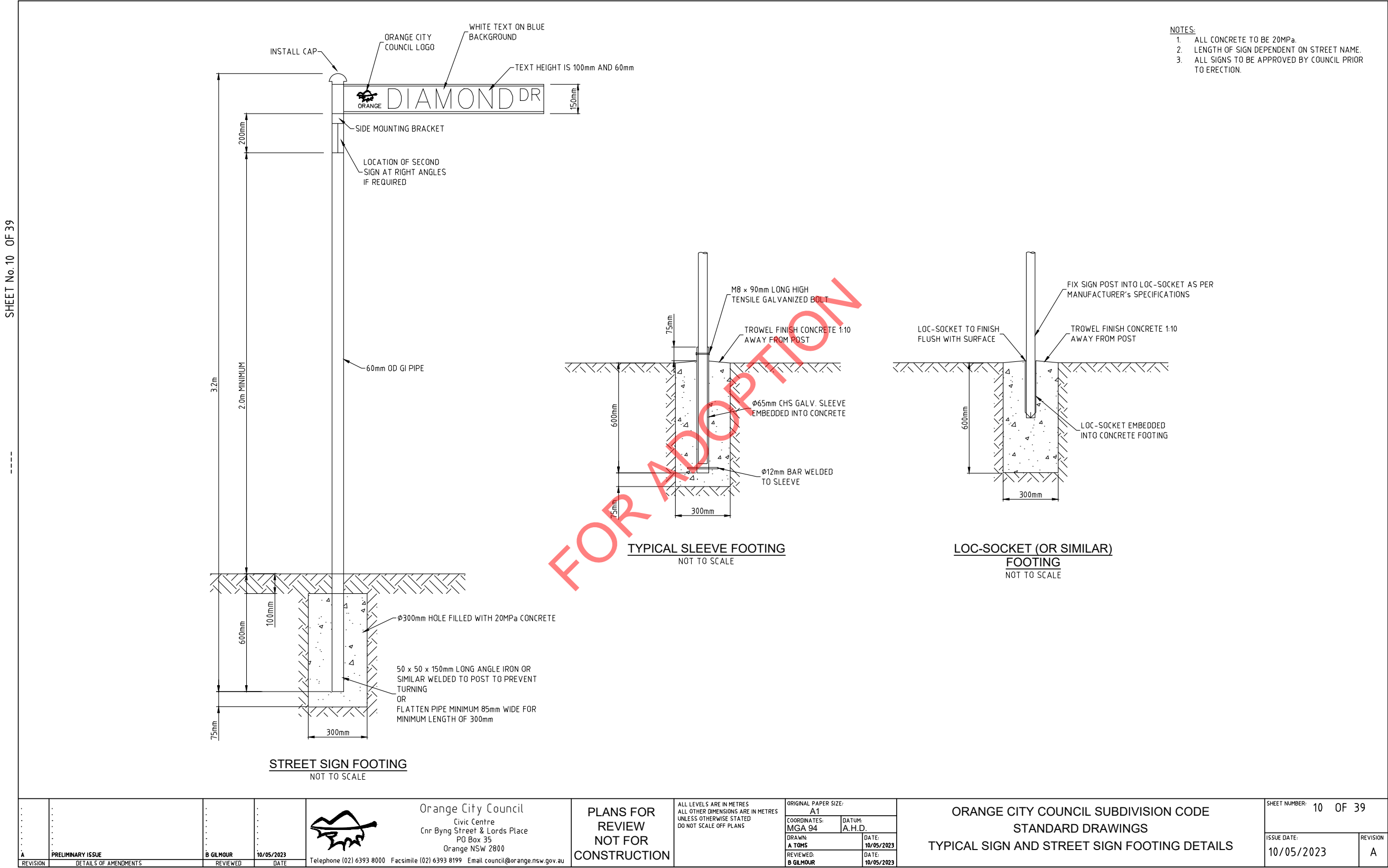
CONTROL JOINT (CJ) - TYPE 1
NOT TO SCALE

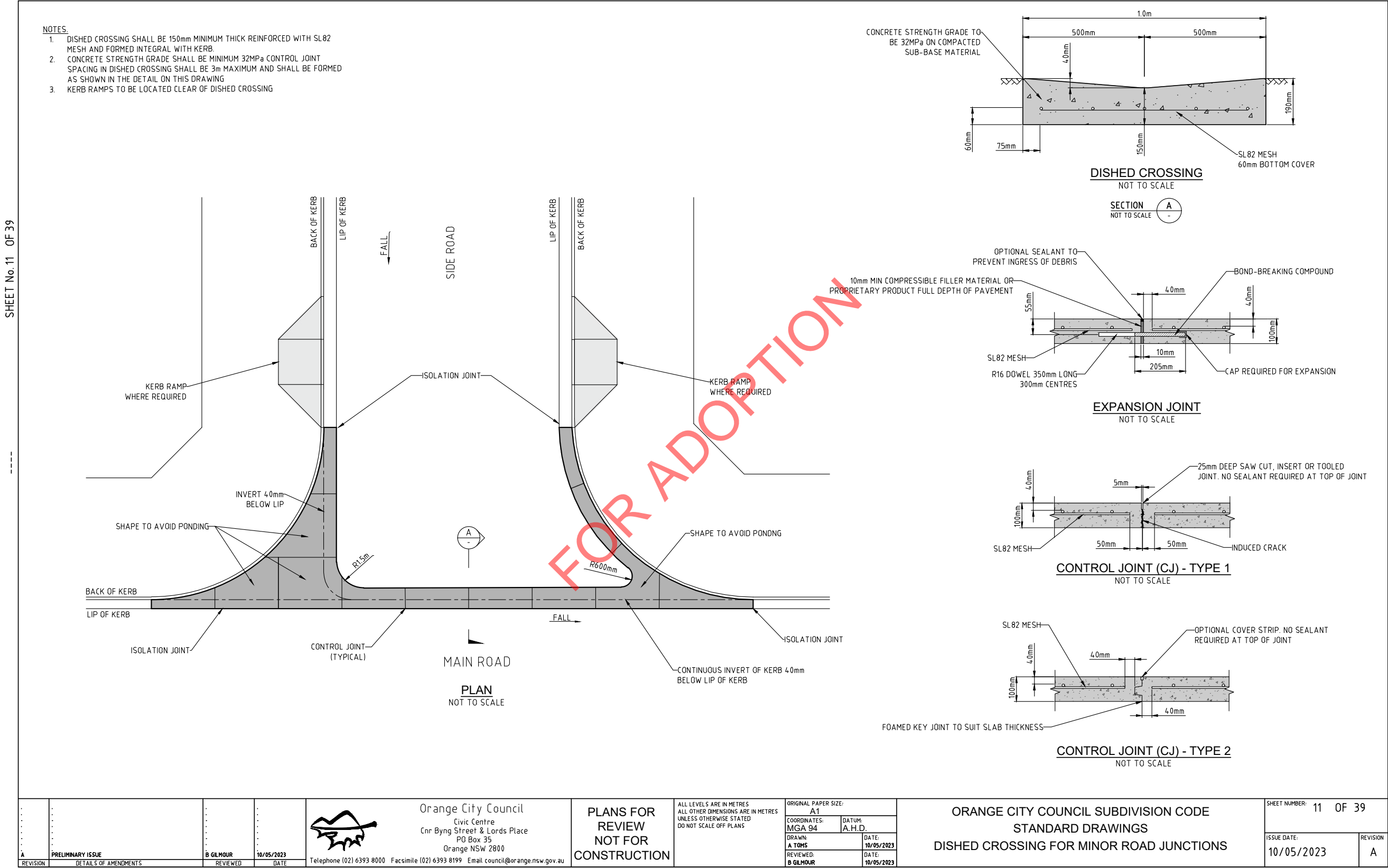


CONTROL JOINT (CJ) - TYPE 2
NOT TO SCALE

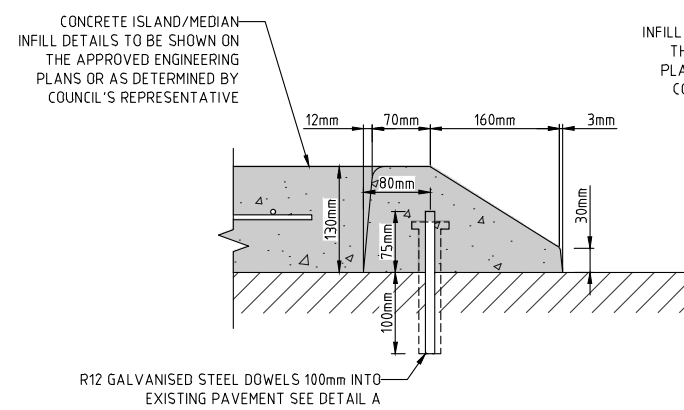
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|---|--|---------------------------------|--|--------------------|--|---|--|--|--|---|--|--|--|---|--|---|--|
| PRELIMINARY ISSUE REVISION DETAILS OF AMENDMENT | | B GILMOUR REVIEWED DATE | | 10/05/2023 DATE | |  Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | | PLANS FOR REVIEW NOT FOR CONSTRUCTION | | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DATUM: A.H.D. DRAWN: A TOMS DATE: 10/05/2023 REVIEWED: B GILMOUR DATE: 10/05/2023 | | ORANGE CITY COUNCIL SUBDIVISION CODE STANDARD DRAWINGS CONCRETE CYCLEWAYS AND FOOTPATHS | | SHEET NUMBER: 08 OF 39 ISSUE DATE: 10/05/2023 REVISION: A | |
|---|--|---------------------------------|--|--------------------|--|---|--|--|--|---|--|--|--|---|--|---|--|



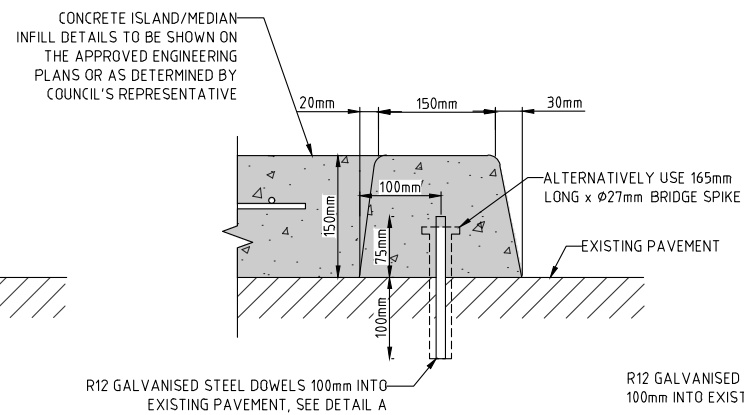




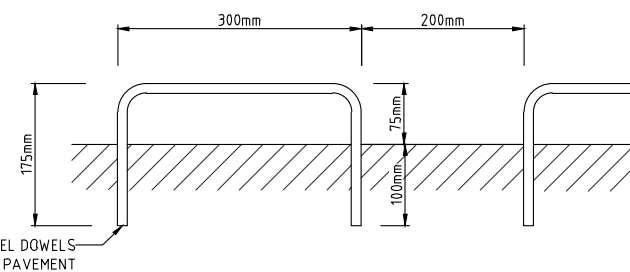
SHEET No.12 OF 39



DOWELLING SEMI-MOUNTABLE (SF)
KERB TO EXISTING PAVEMENT DETAIL
NOT TO SCALE



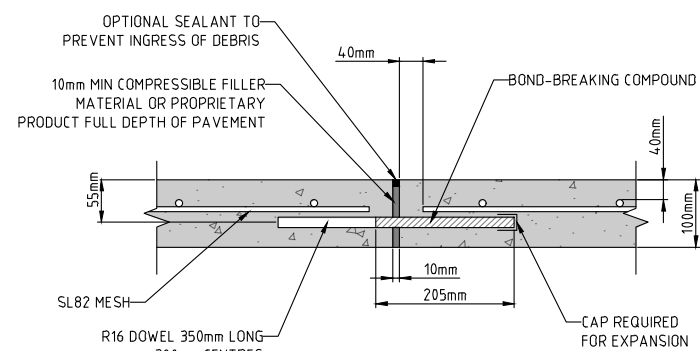
DOWELLING BARRIER (SM) KERB TO
EXISTING PAVEMENT DETAIL
NOT TO SCALE



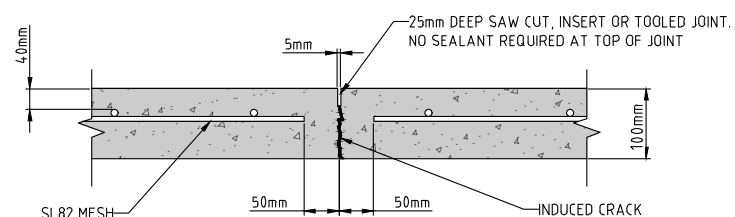
DETAIL A
NOT TO SCALE

NOTES.

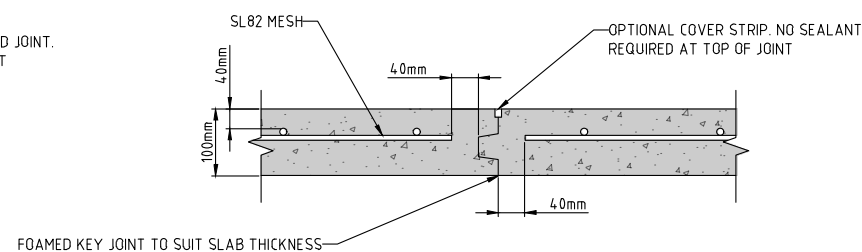
1. ONLY SEMI-MOUNTABLE (SF) KERB OR BARRIER (SM) KERB TO BE FIXED TO EXISTING PAVEMENTS.
2. ALTERNATIVELY, BRIDGE SPIKES MAY BE EMBEDDED 100mm MINIMUM AT 500mm CENTRES INTO THE PAVEMENT PRIOR TO CASTING KERB OVER THE SPIKES.
3. CONTROL JOINT SPACING IN KERB SHALL BE 3m MAXIMUM.
4. ISOLATION JOINTS SHALL BE LOCATED BETWEEN BACK OF KERB AND CONCRETE INFILL.
5. KERB DETAILS AS PER SHEET 02



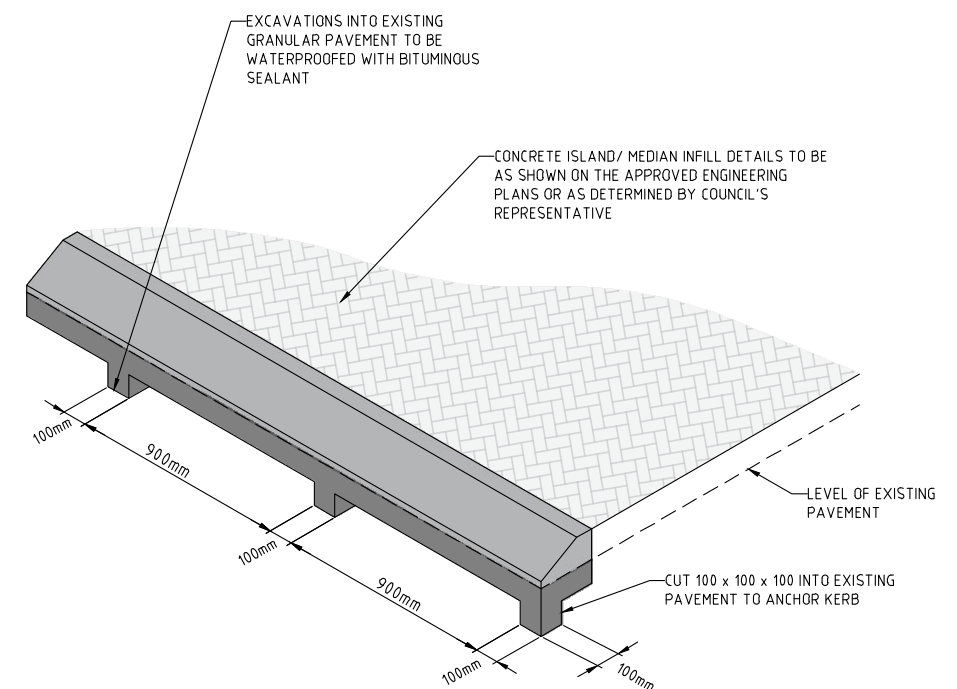
EXPANSION JOINT
NOT TO SCALE



CONTROL JOINT - TYPE 1
NOT TO SCALE



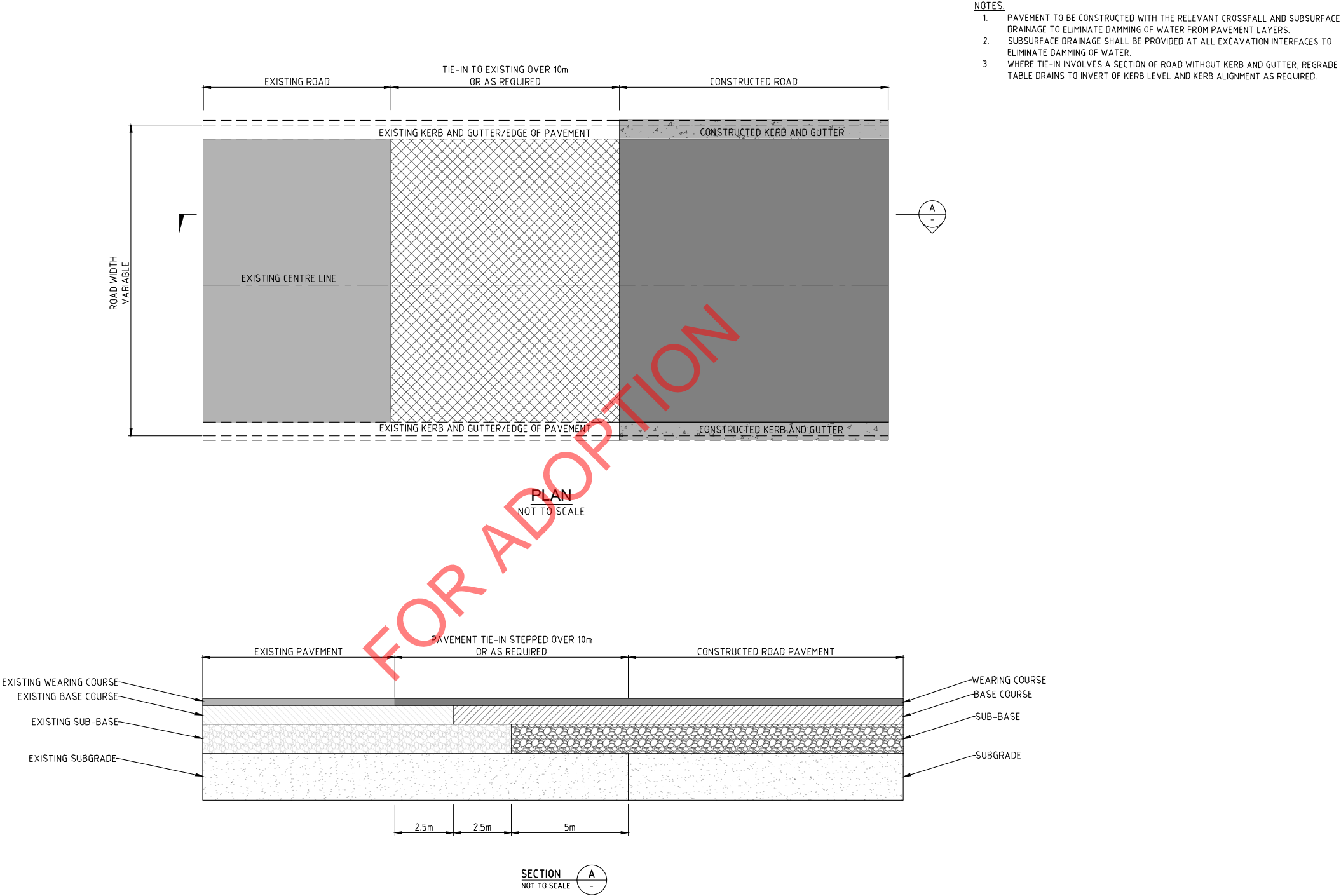
CONTROL JOINT (CJ) - TYPE 2
NOT TO SCALE



KERB ANCHORING INTO EXISTING PAVEMENT DETAIL
NOT TO SCALE

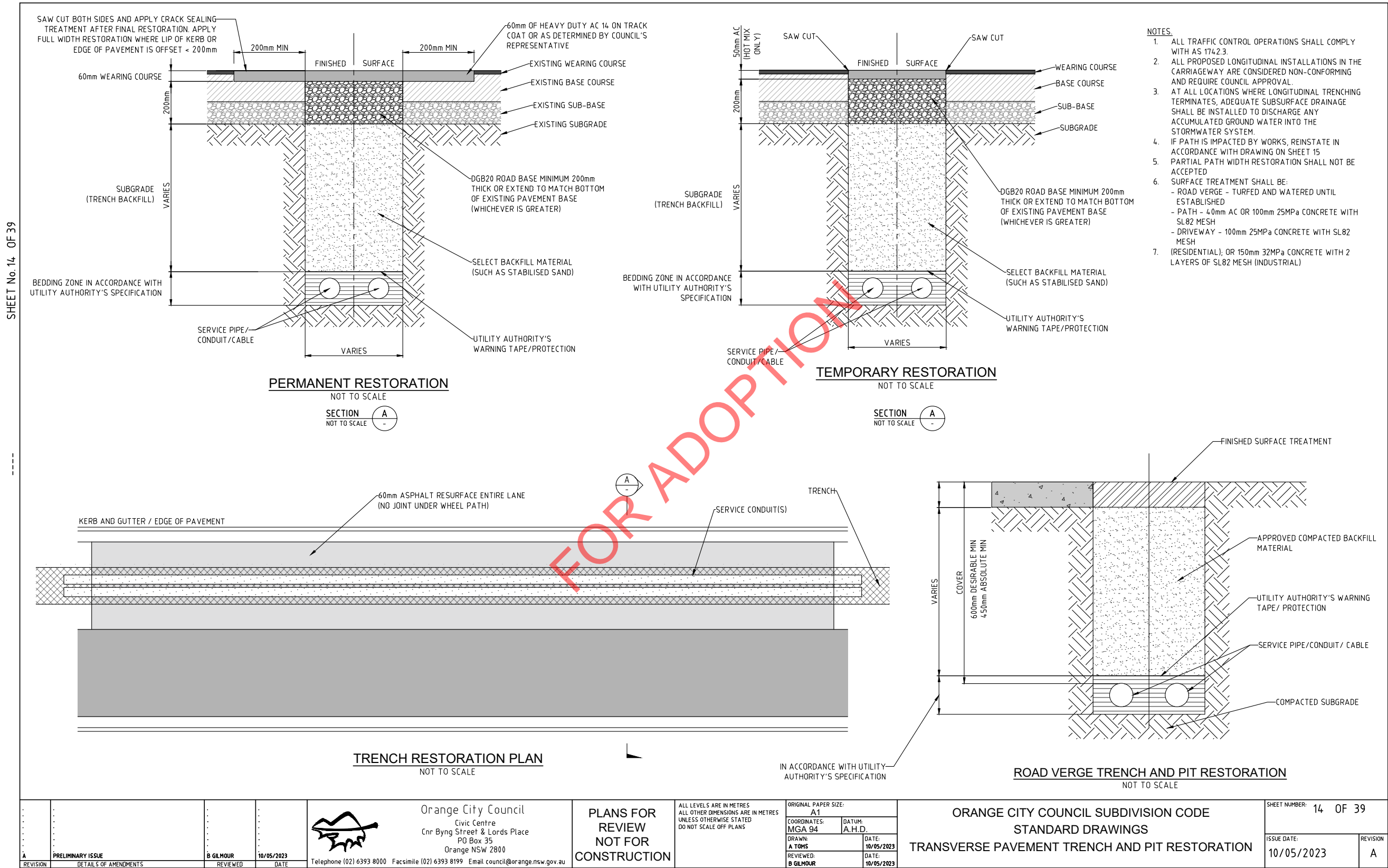
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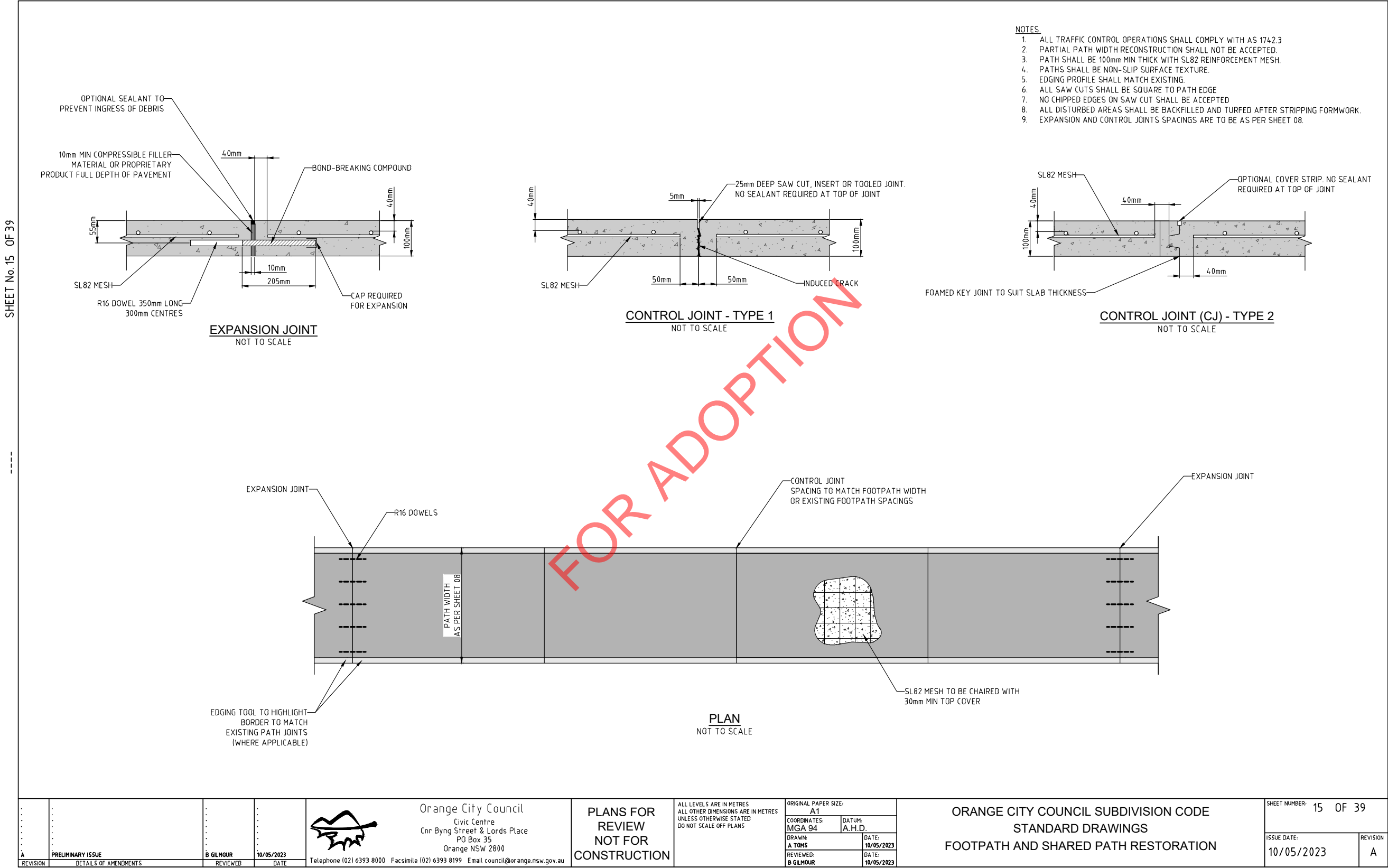
SHEET No.13 OF 39

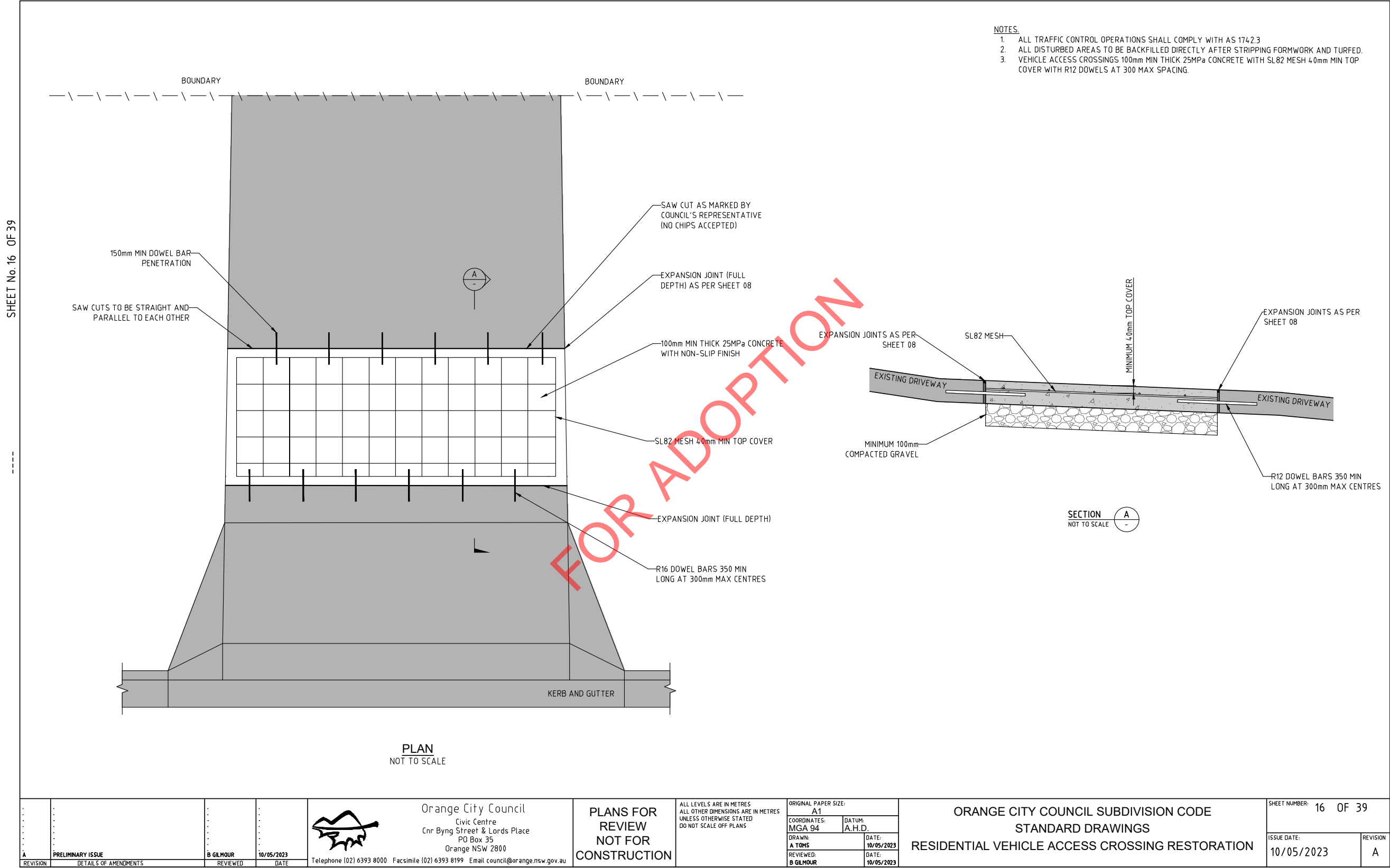



- NOTES.
1. PAVEMENT TO BE CONSTRUCTED WITH THE RELEVANT CROSSFALL AND SUBSURFACE DRAINAGE TO ELIMINATE DAMMING OF WATER FROM PAVEMENT LAYERS.
 2. SUBSURFACE DRAINAGE SHALL BE PROVIDED AT ALL EXCAVATION INTERFACES TO ELIMINATE DAMMING OF WATER.
 3. WHERE TIE-IN INVOLVES A SECTION OF ROAD WITHOUT KERB AND GUTTER, REGRADE TABLE DRAINS TO INVERT OF KERB LEVEL AND KERB ALIGNMENT AS REQUIRED.

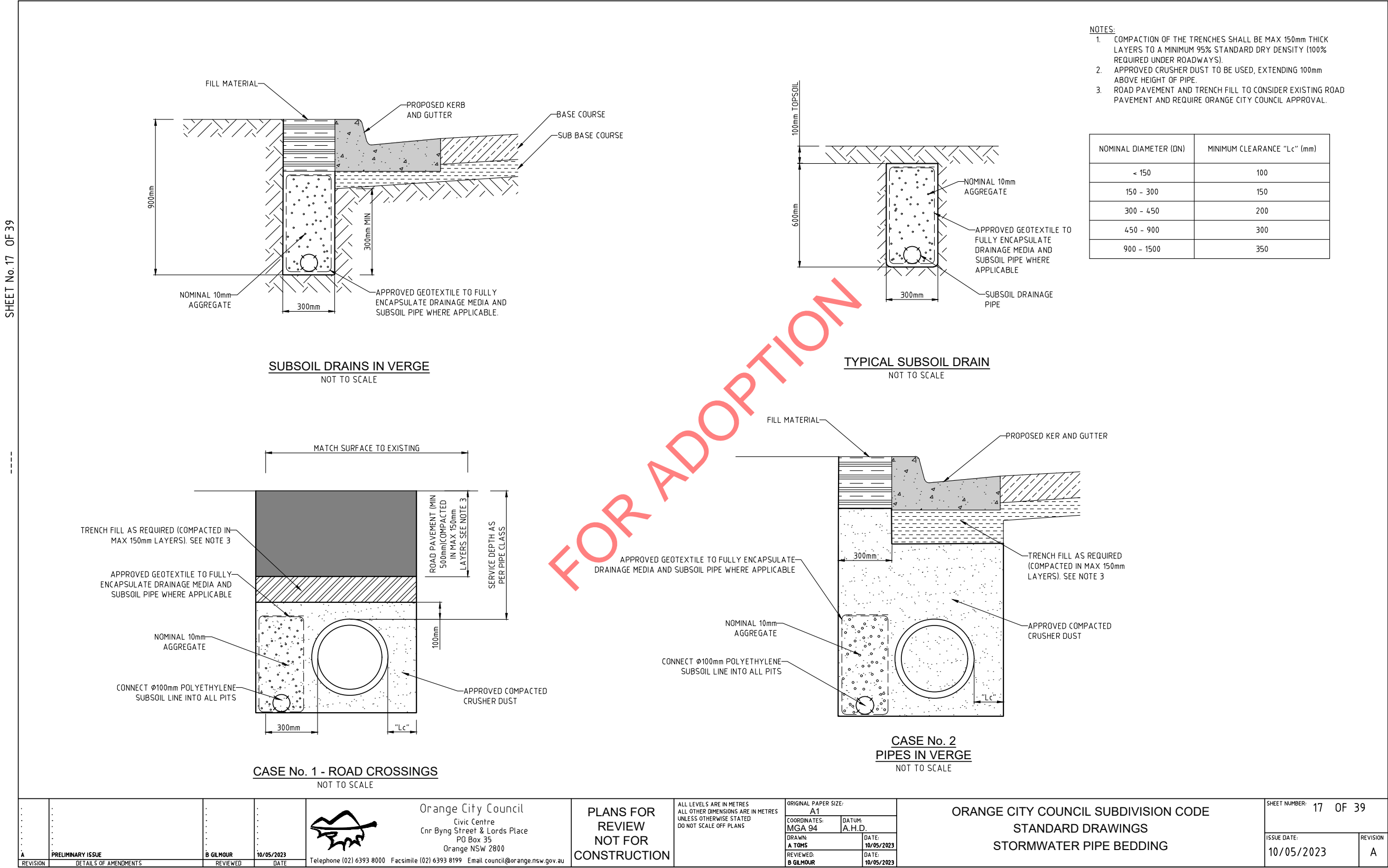
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| A | PRELIMINARY ISSUE | B GILMOUR | 10/05/2023 |  <div>Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au</div> | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DRAWN: A TOMS REVIEWED: B GILMOUR | DATE: 10/05/2023 DATE: 10/05/2023 | DATE: 10/05/2023 | DATE: 10/05/2023 | ORANGE CITY COUNCIL SUBDIVISION CODE STANDARD DRAWINGS NEW PAVEMENT TIE-IN TO EXISTING PAVEMENT | SHEET NUMBER: 13 OF 39 | |
| | REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DRAWN: A TOMS REVIEWED: B GILMOUR | DATE: 10/05/2023 DATE: 10/05/2023 | DATE: 10/05/2023 | DATE: 10/05/2023 | | ISSUE DATE: 10/05/2023 | REVISION A |

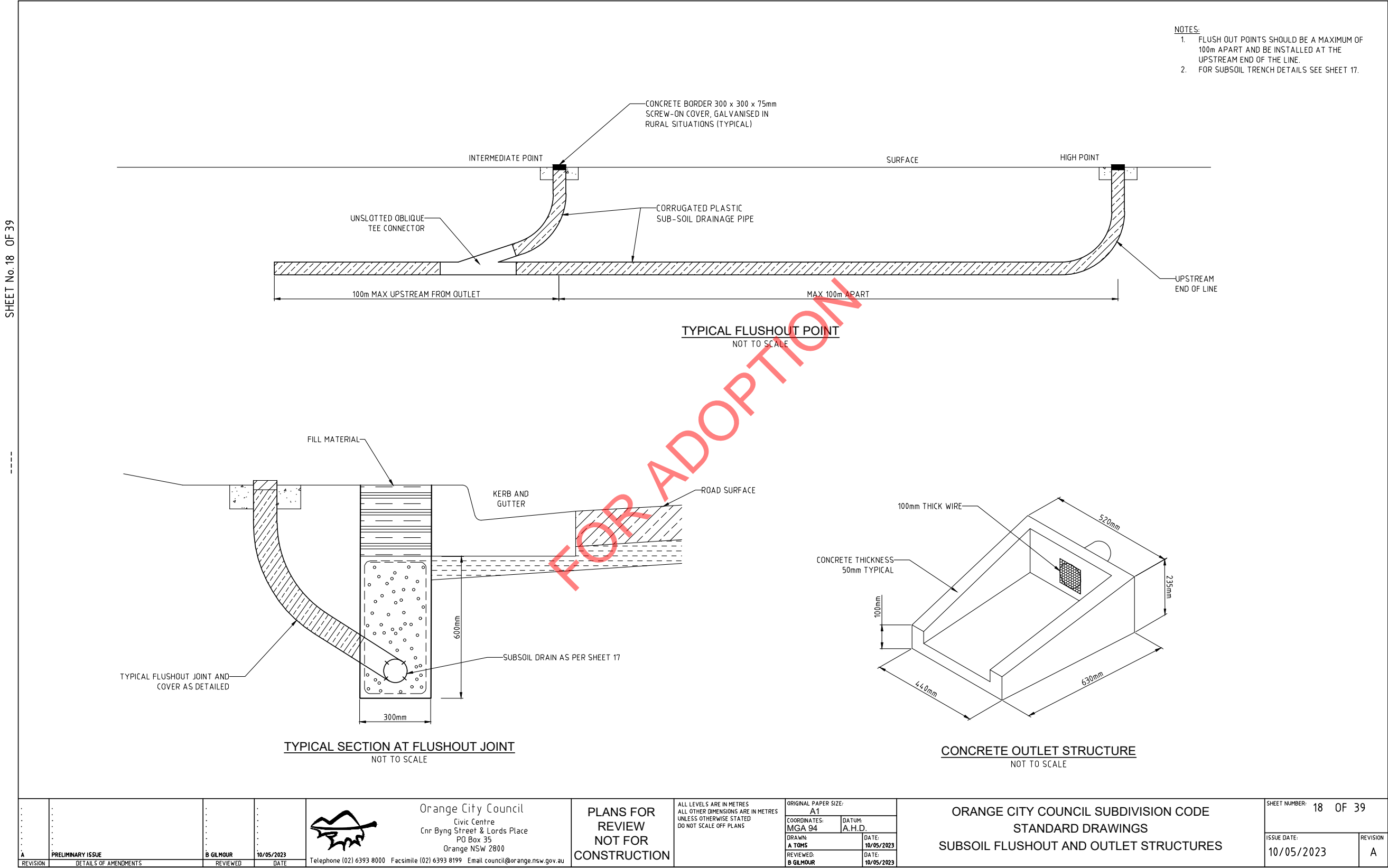


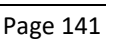


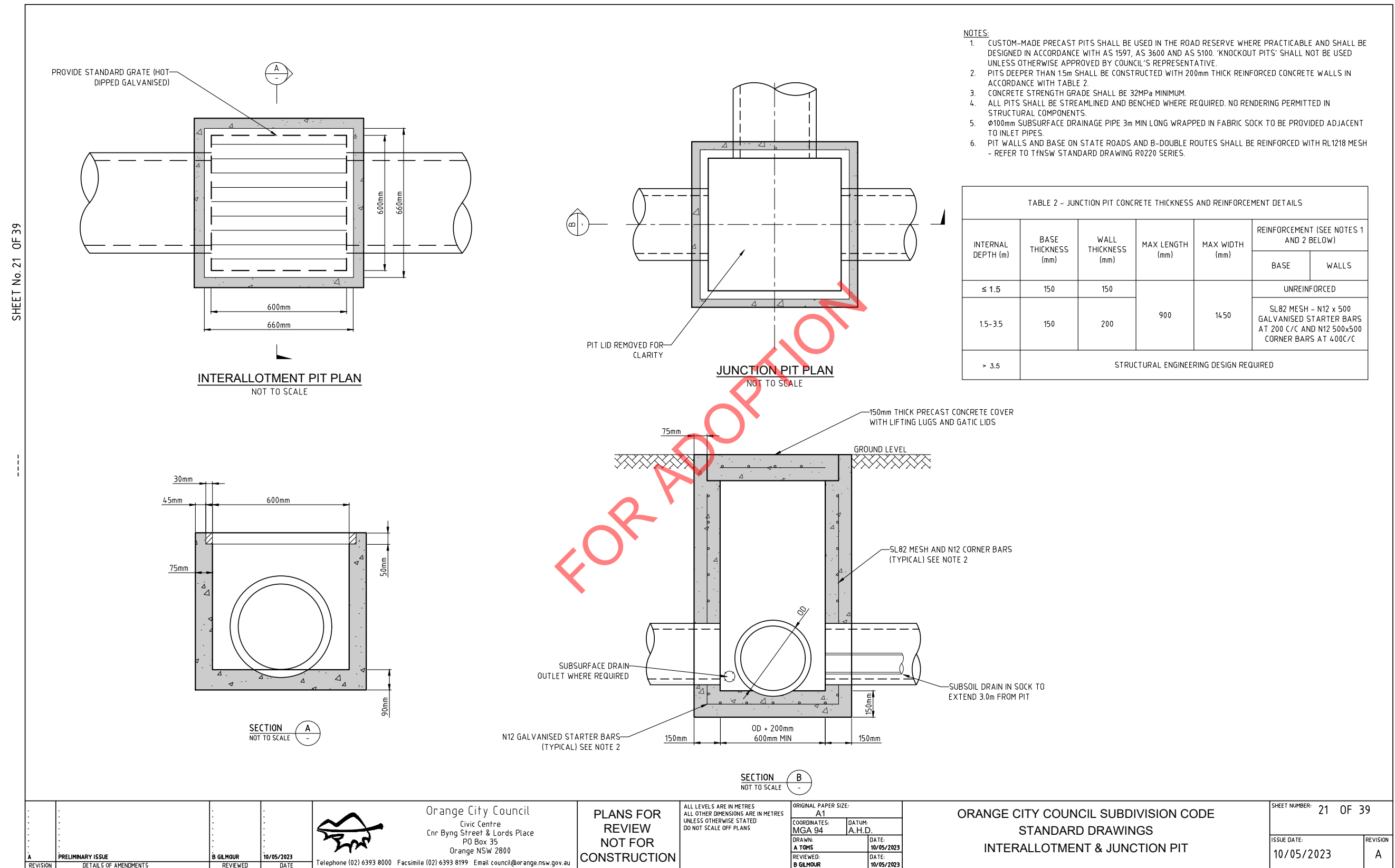


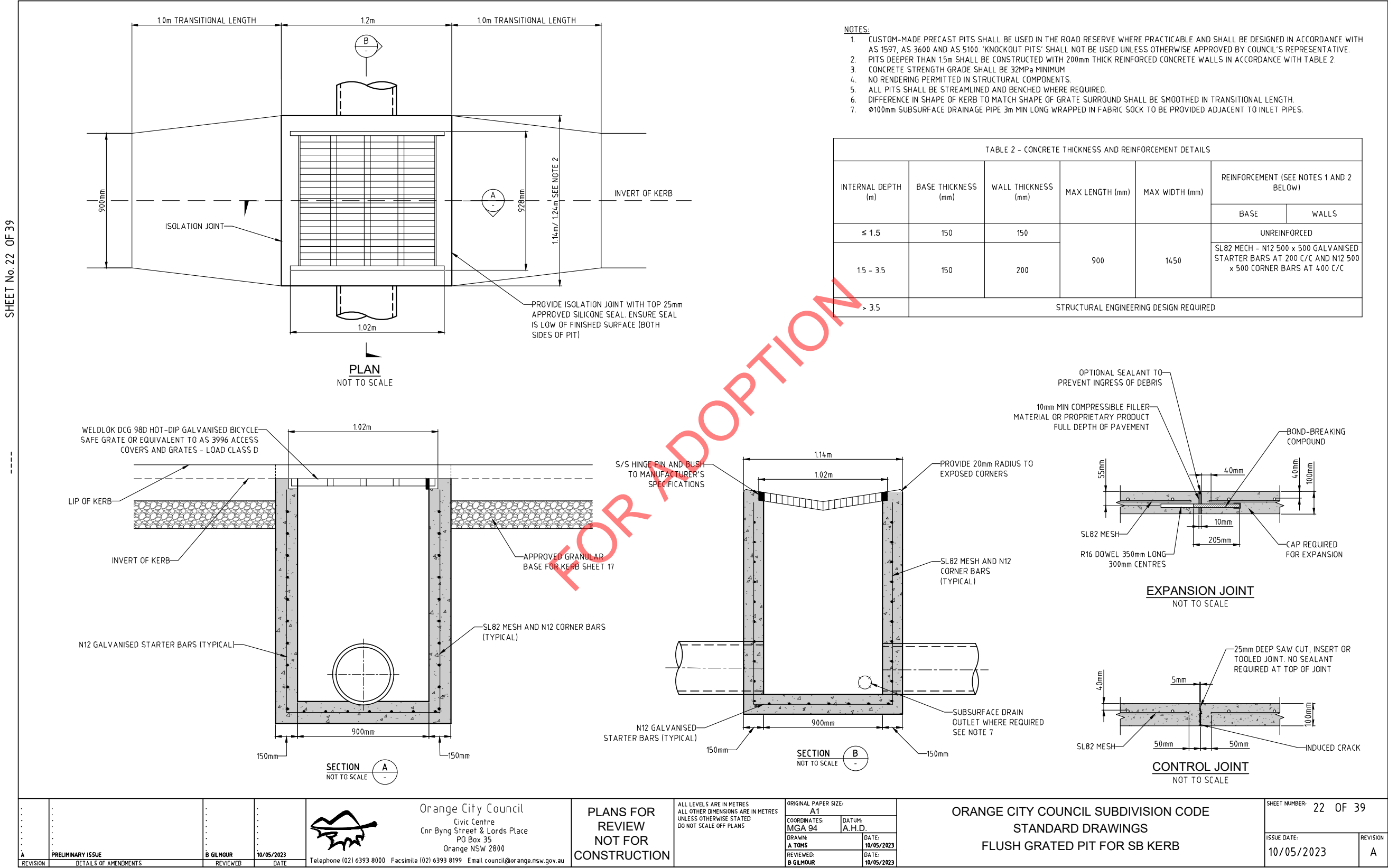
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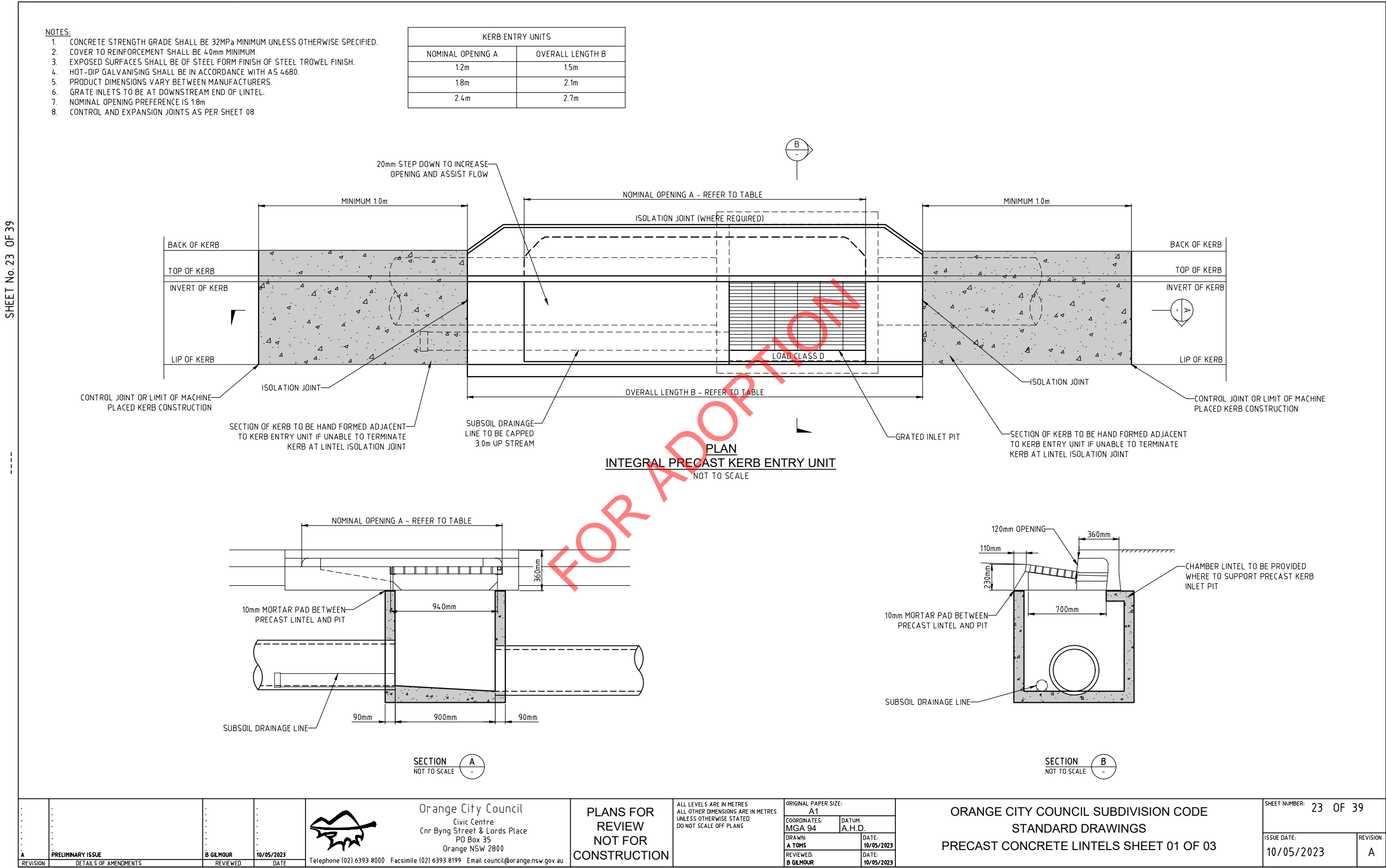


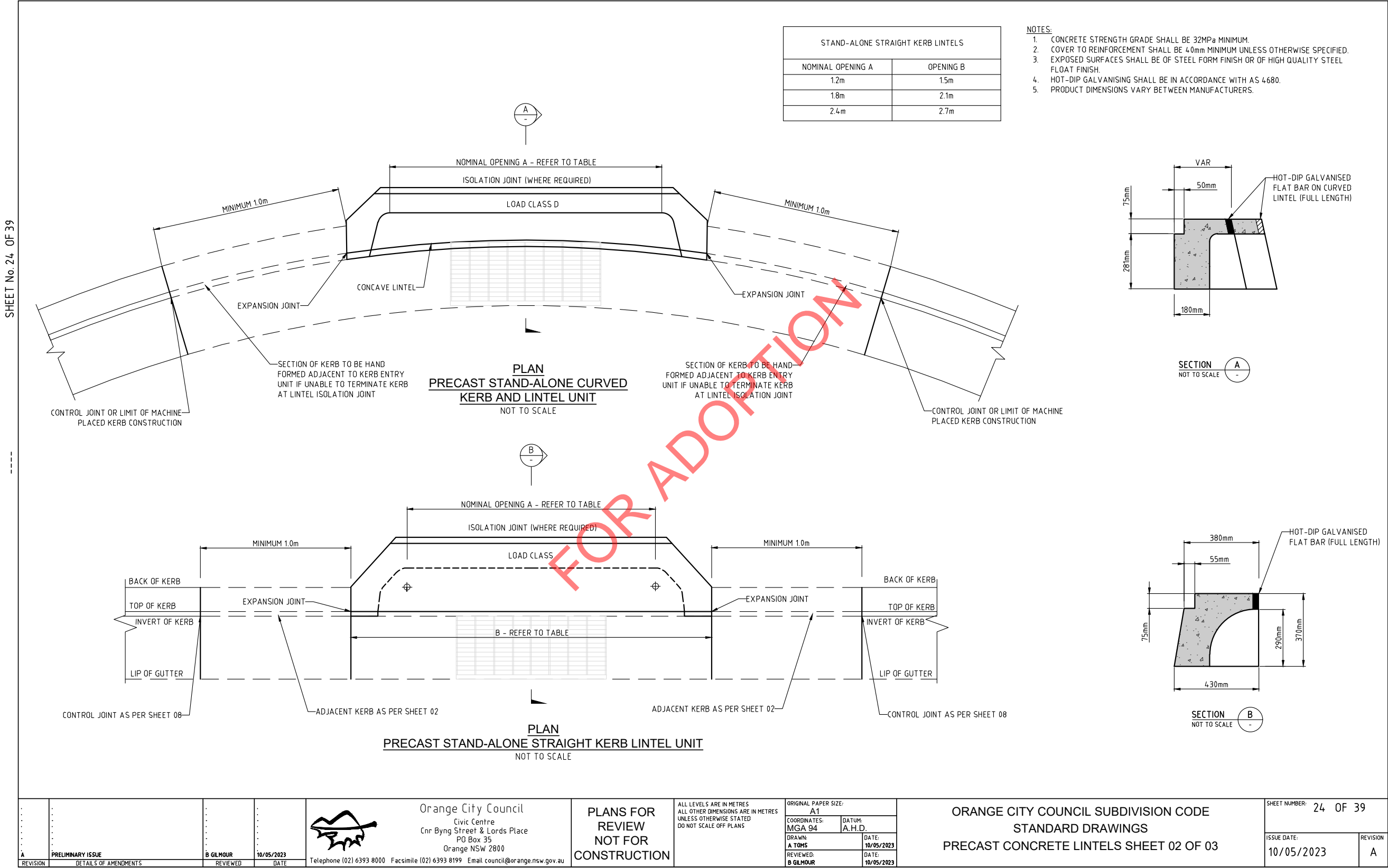


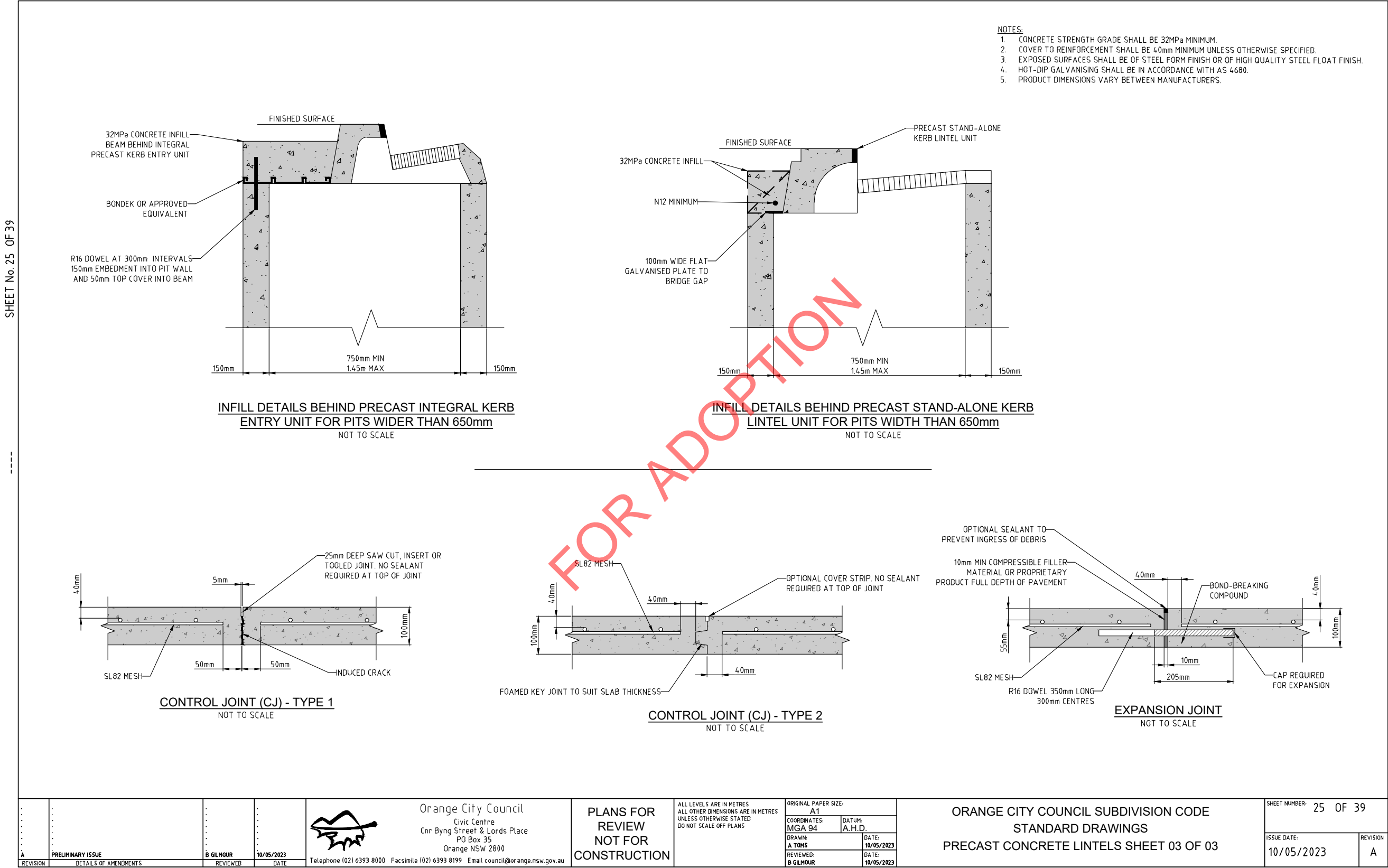


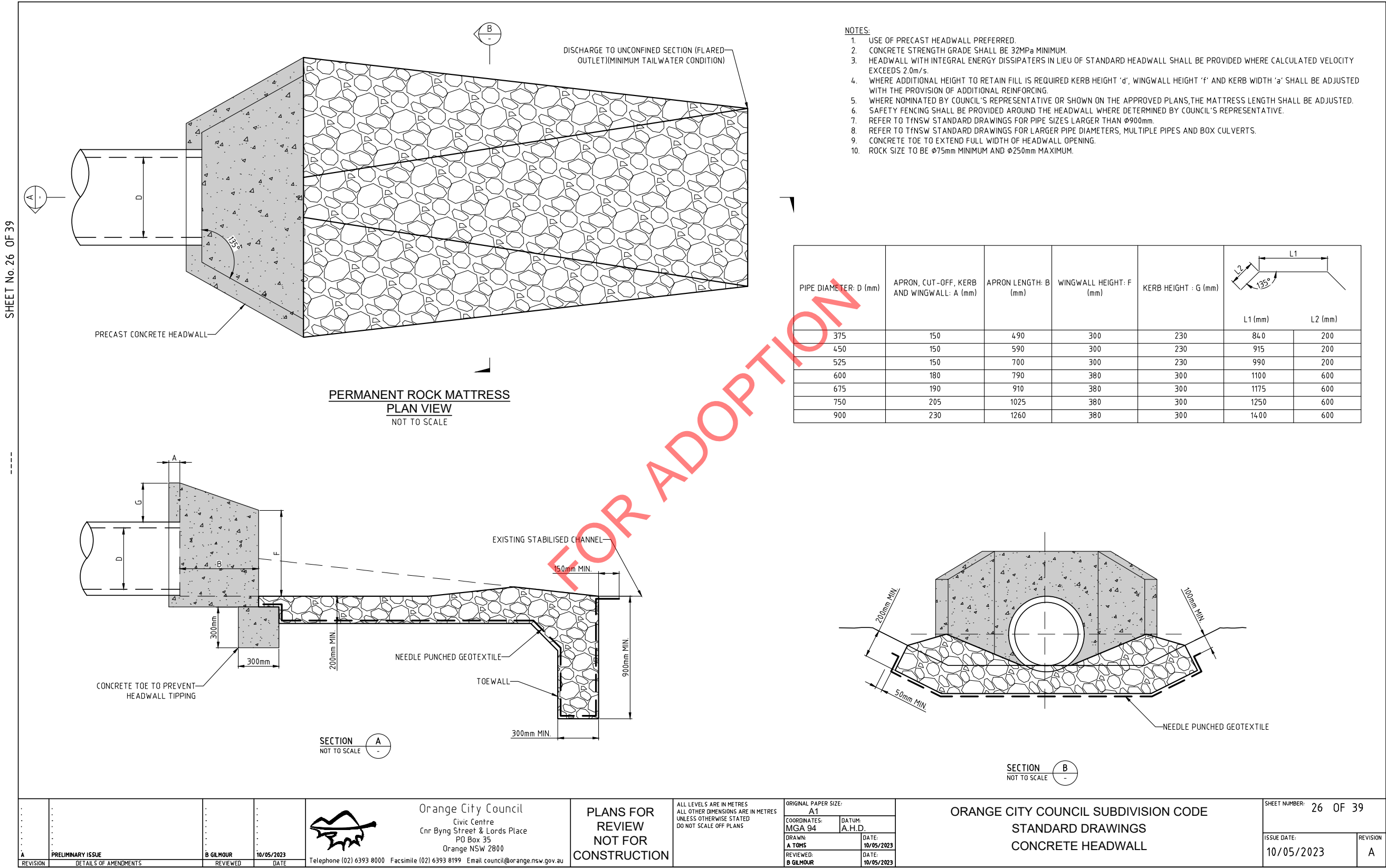


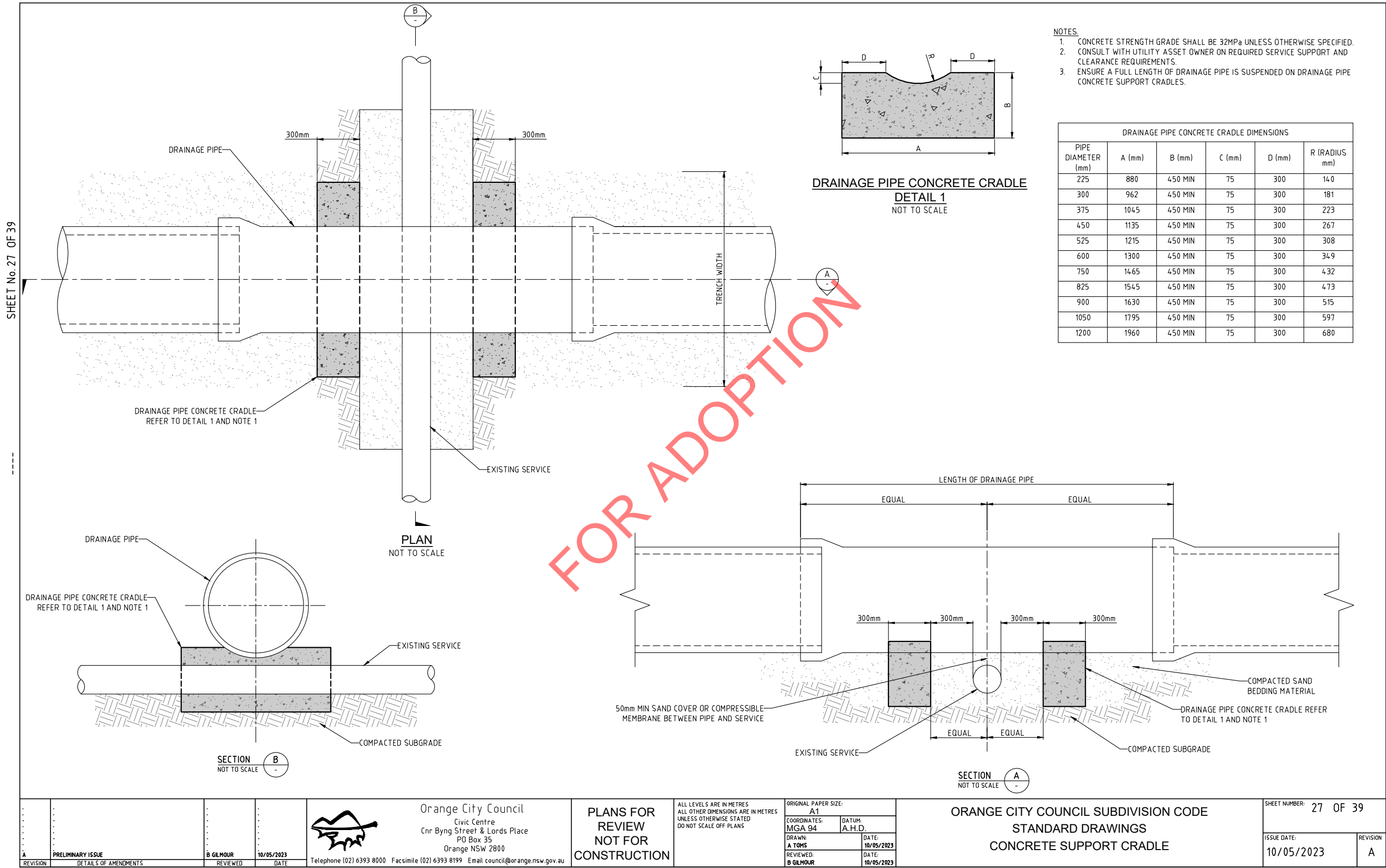





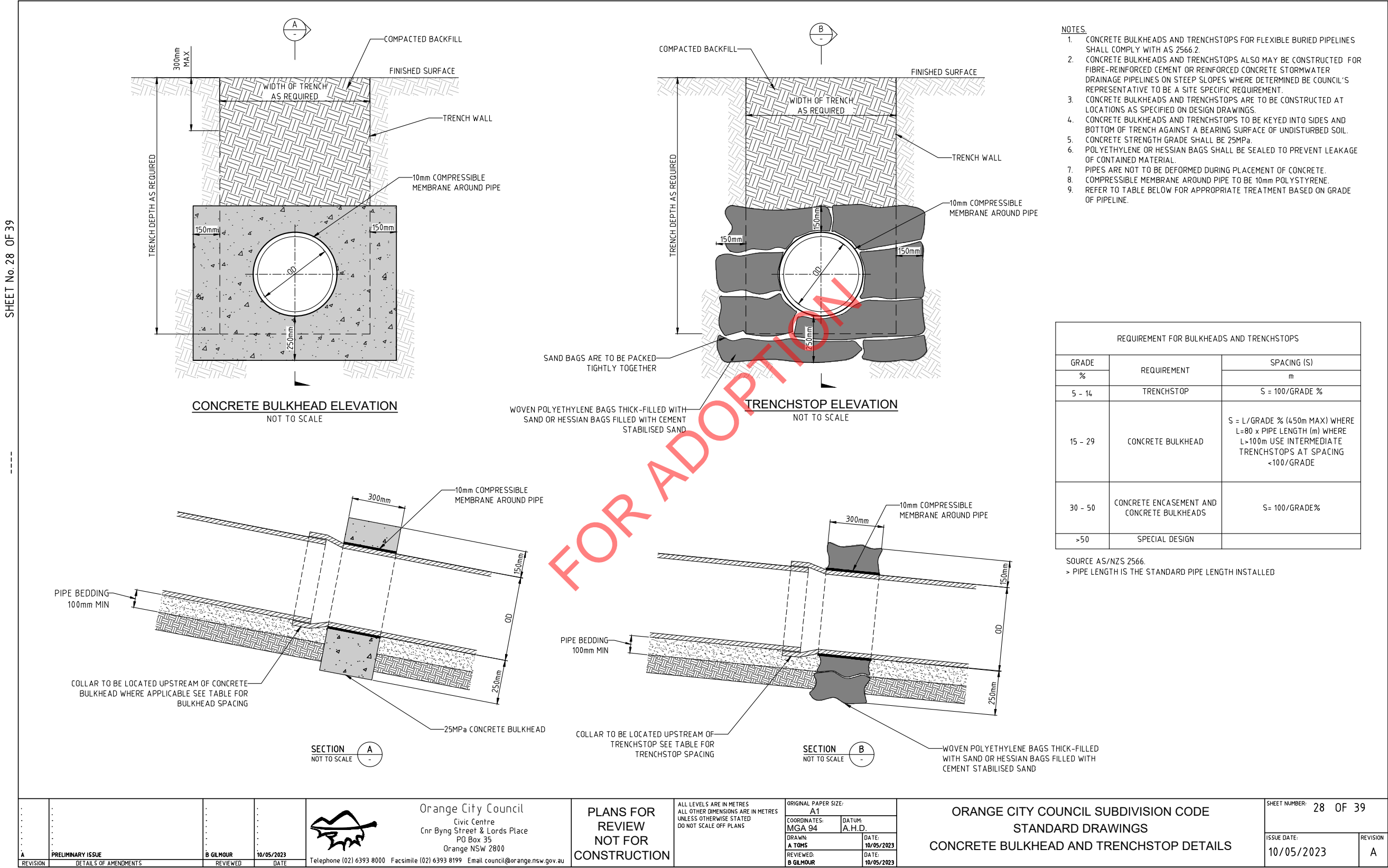


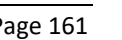


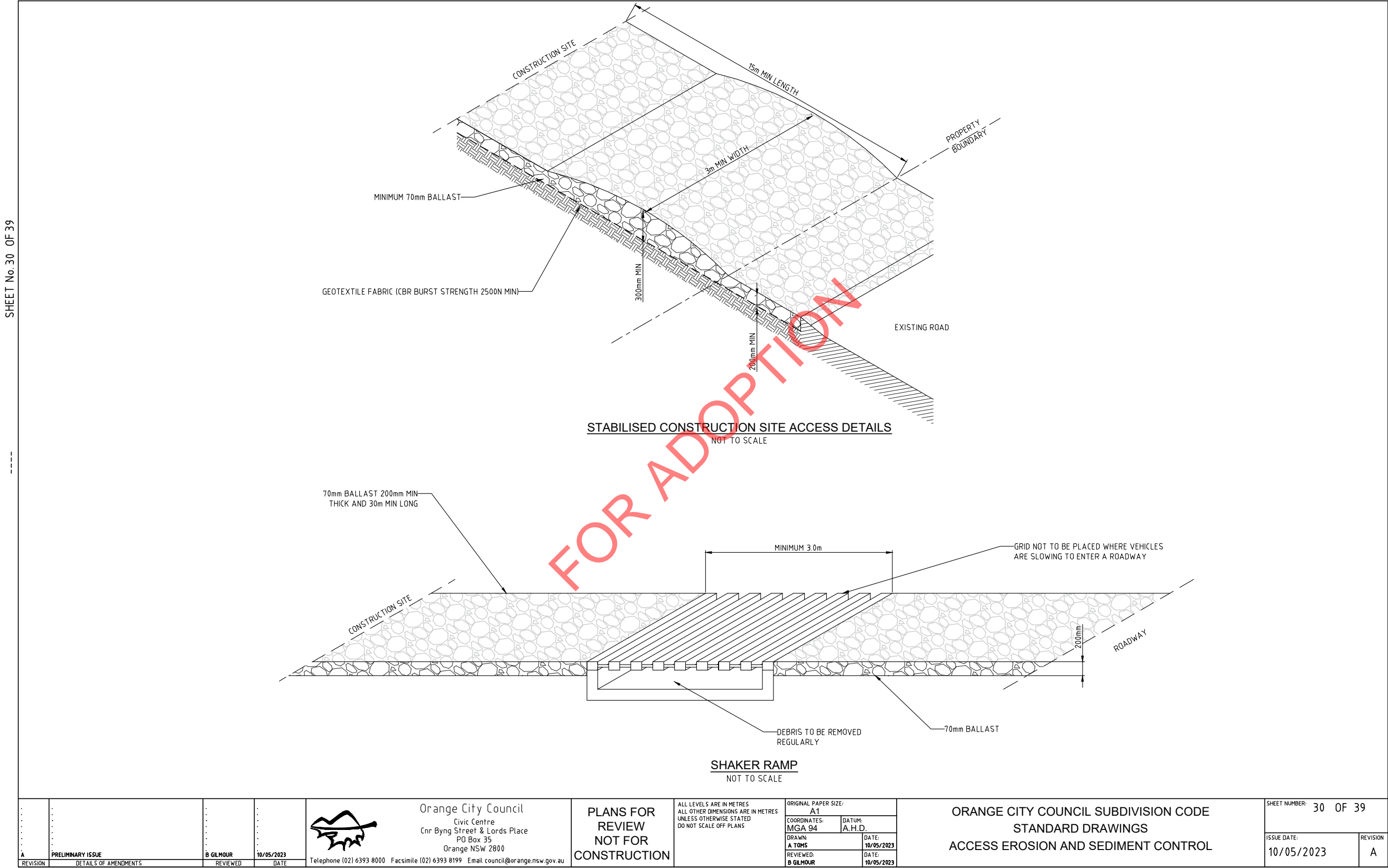


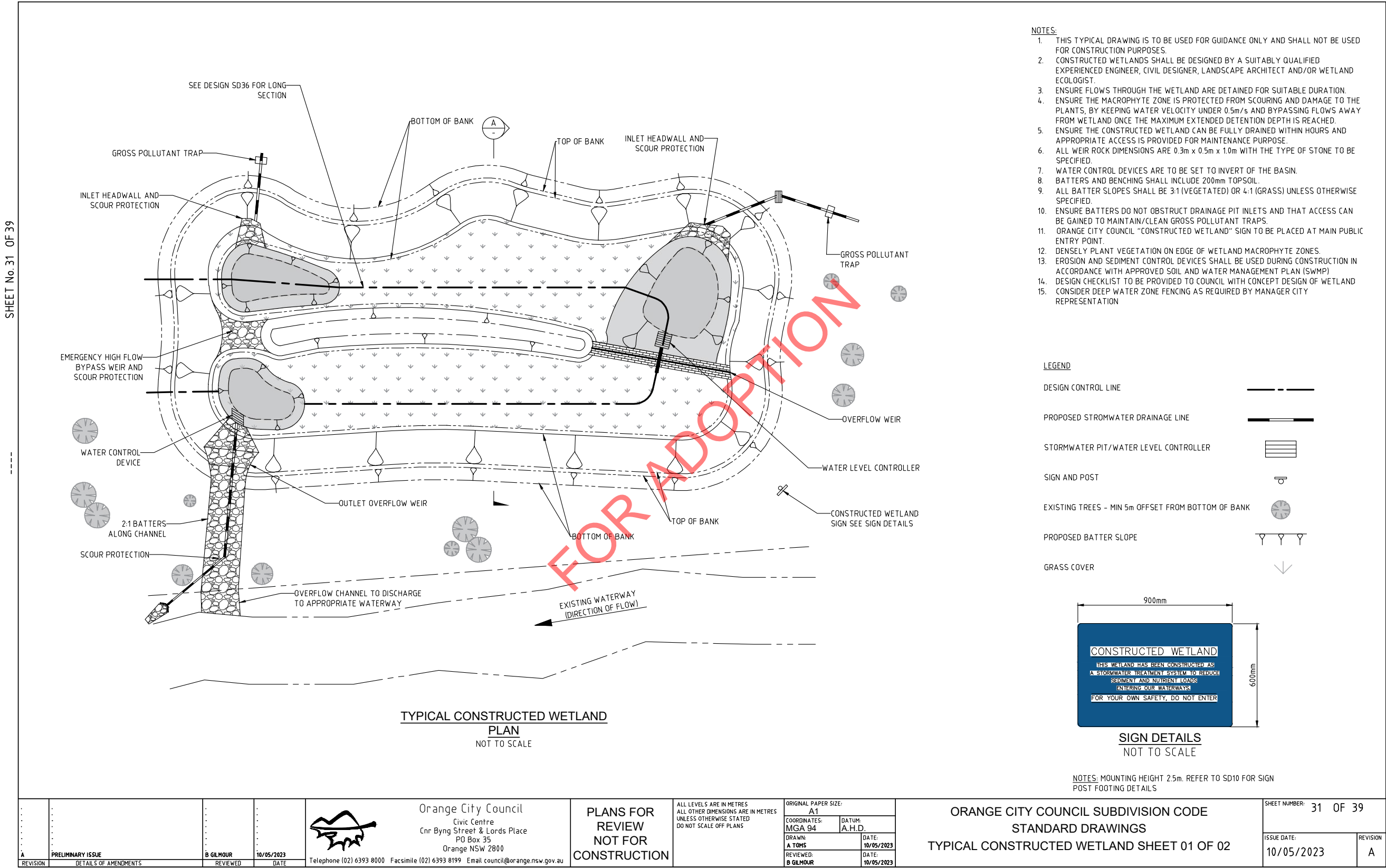


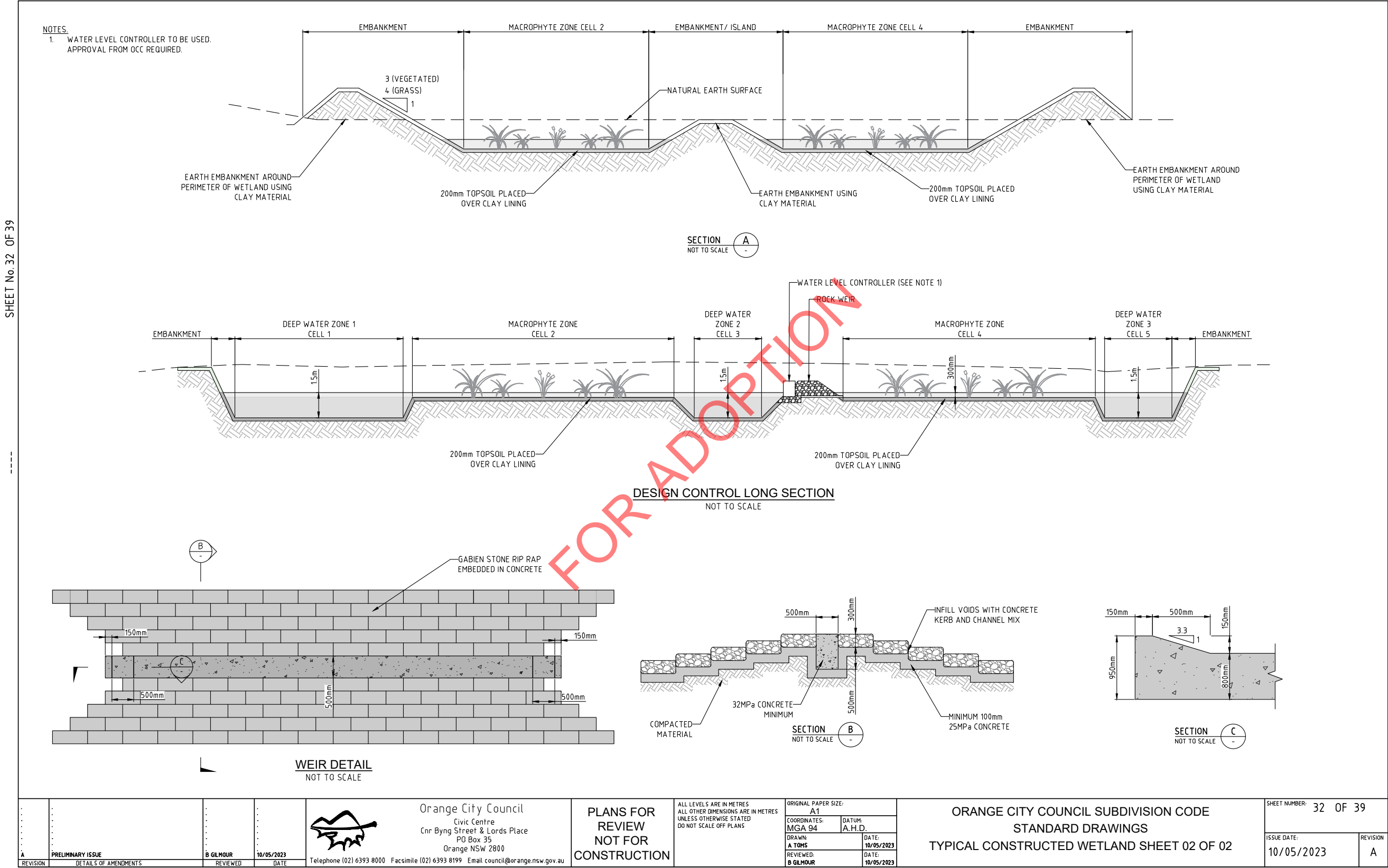
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| | | | |  | | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 | | PLANS FOR REVIEW NOT FOR CONSTRUCTION | | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DATUM: A.H.D. DRAWN: A TOMS DATE: 10/05/2023 REVIEWED: B GILMOUR DATE: 10/05/2023 | | ORANGE CITY COUNCIL SUBDIVISION CODE STANDARD DRAWINGS CONCRETE SUPPORT CRADLE | | SHEET NUMBER: 27 OF 39 | |
| A PRELIMINARY ISSUE | | B GILMOUR | | 10/05/2023 | | Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | | | | | | | | ISSUE DATE: 10/05/2023 | | REVISION A | |
| REVISION | | DETAILS OF AMENDMENTS | | REVIEWED | | DATE | | | | | | | | | | | |

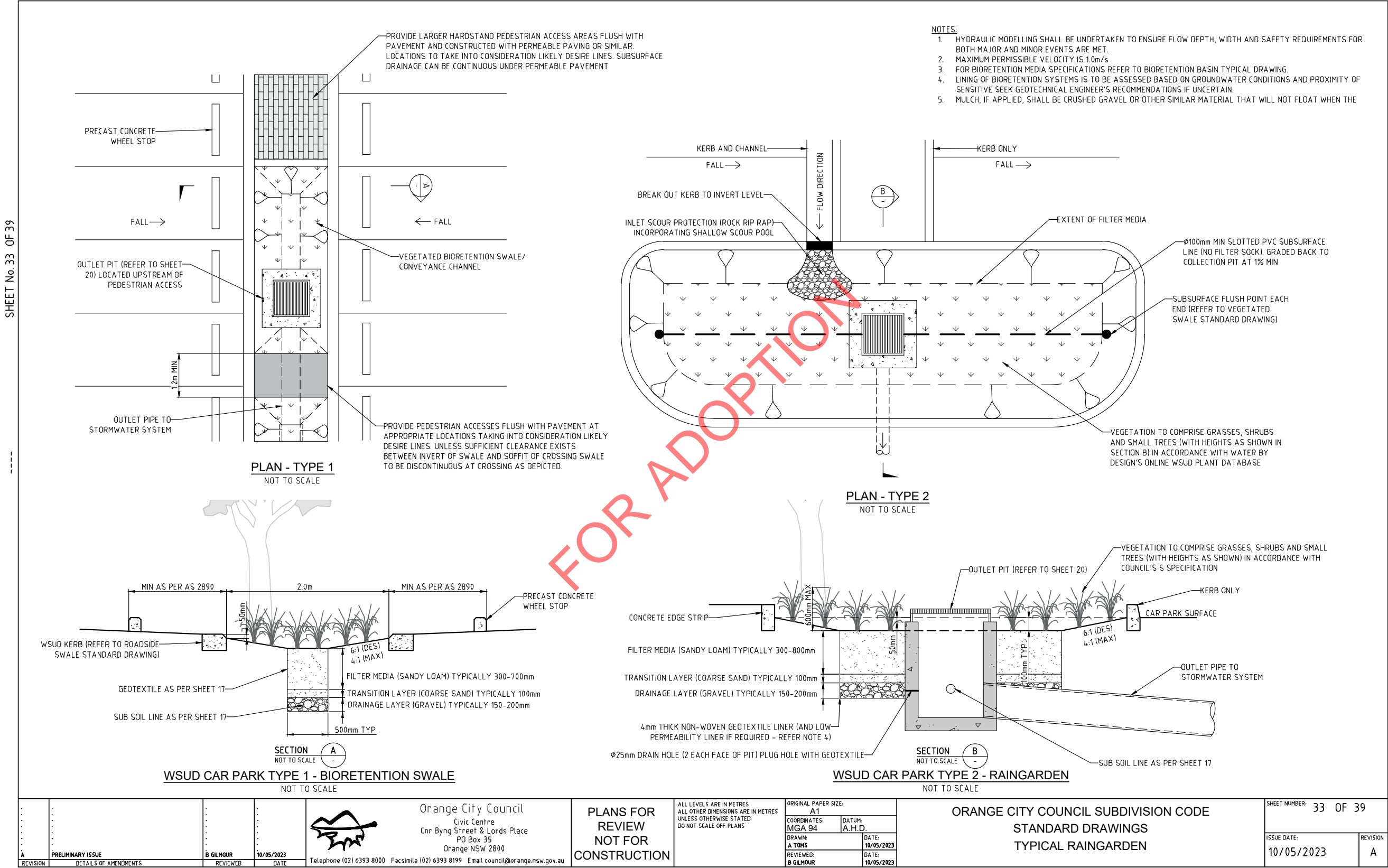


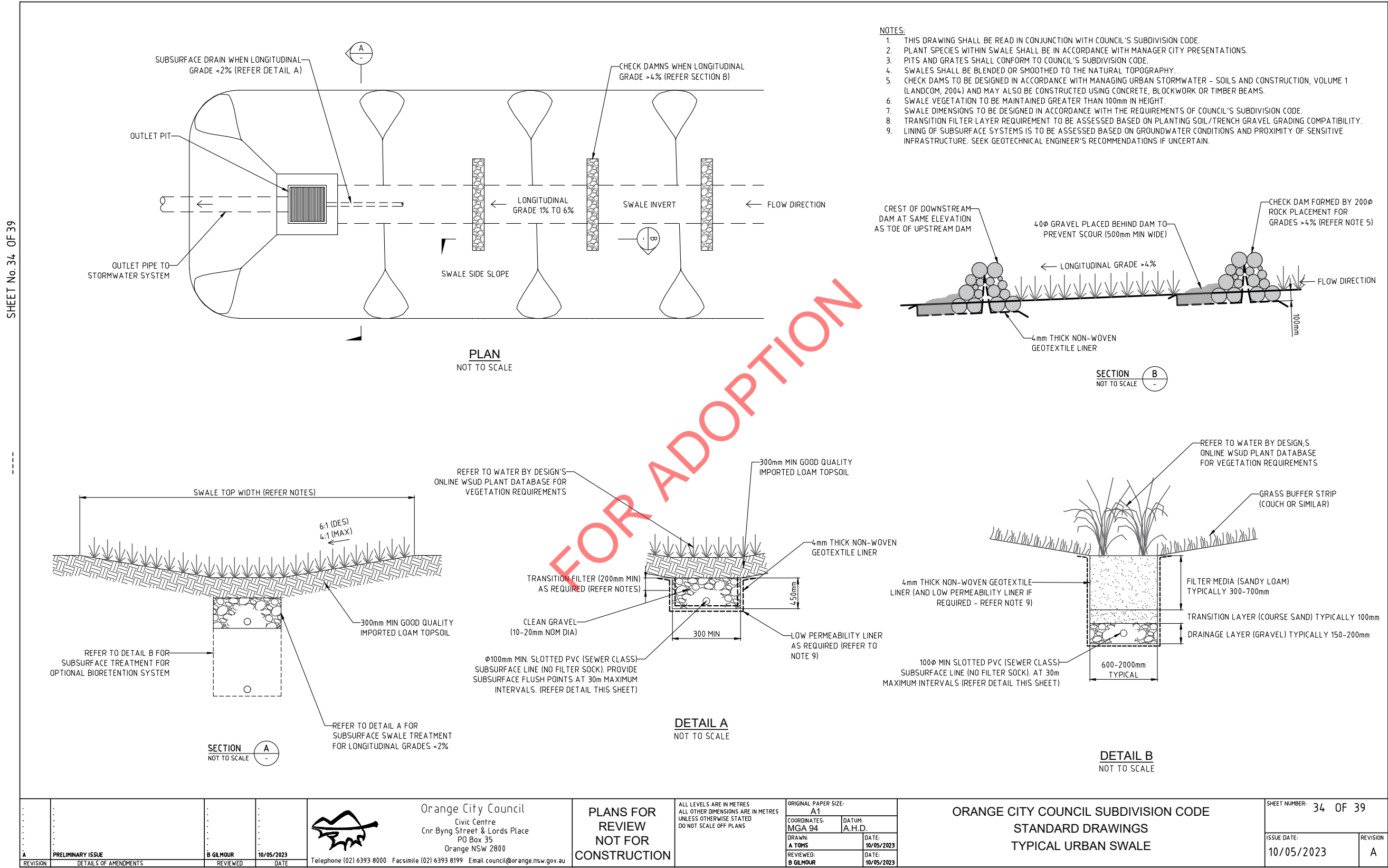


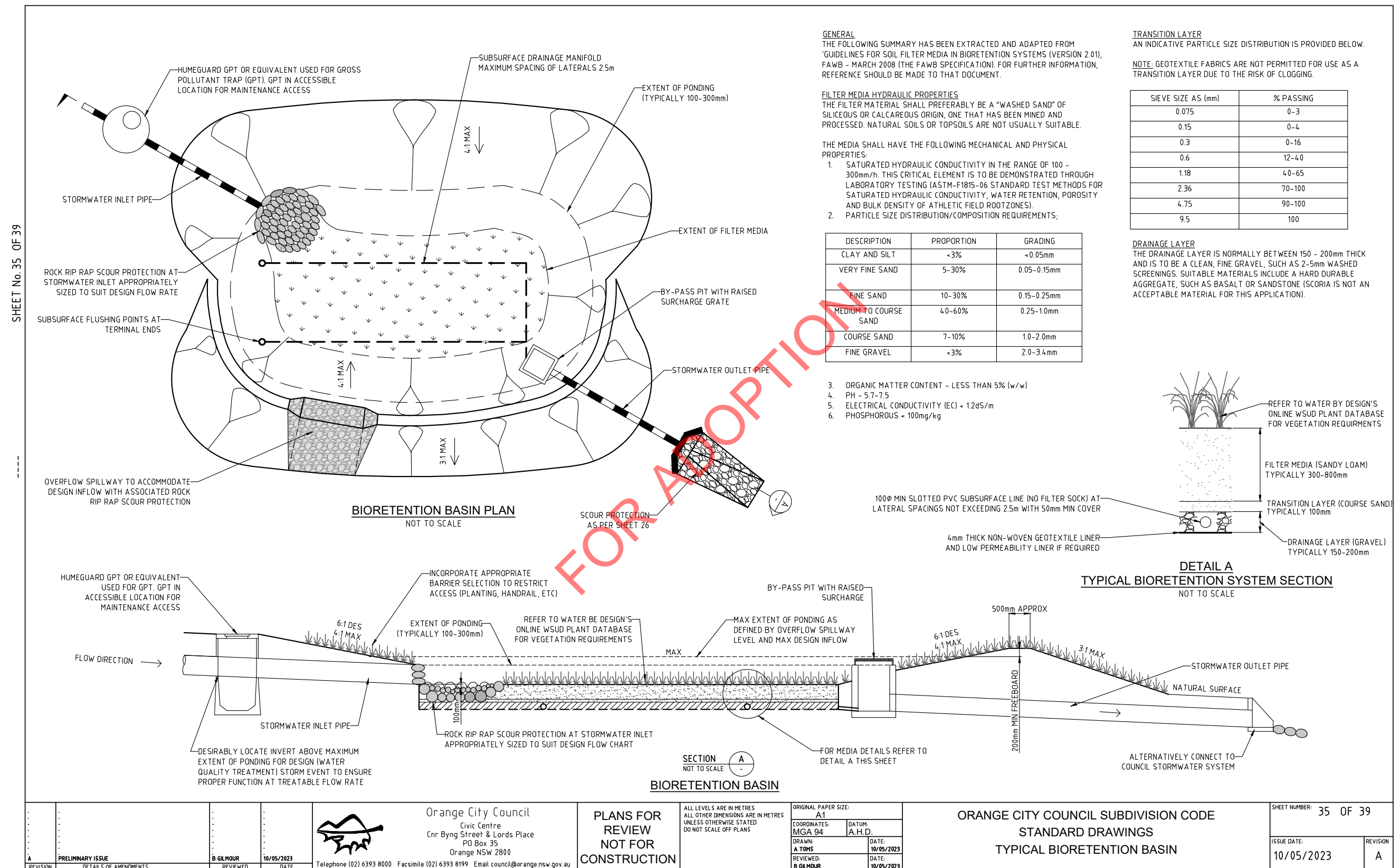


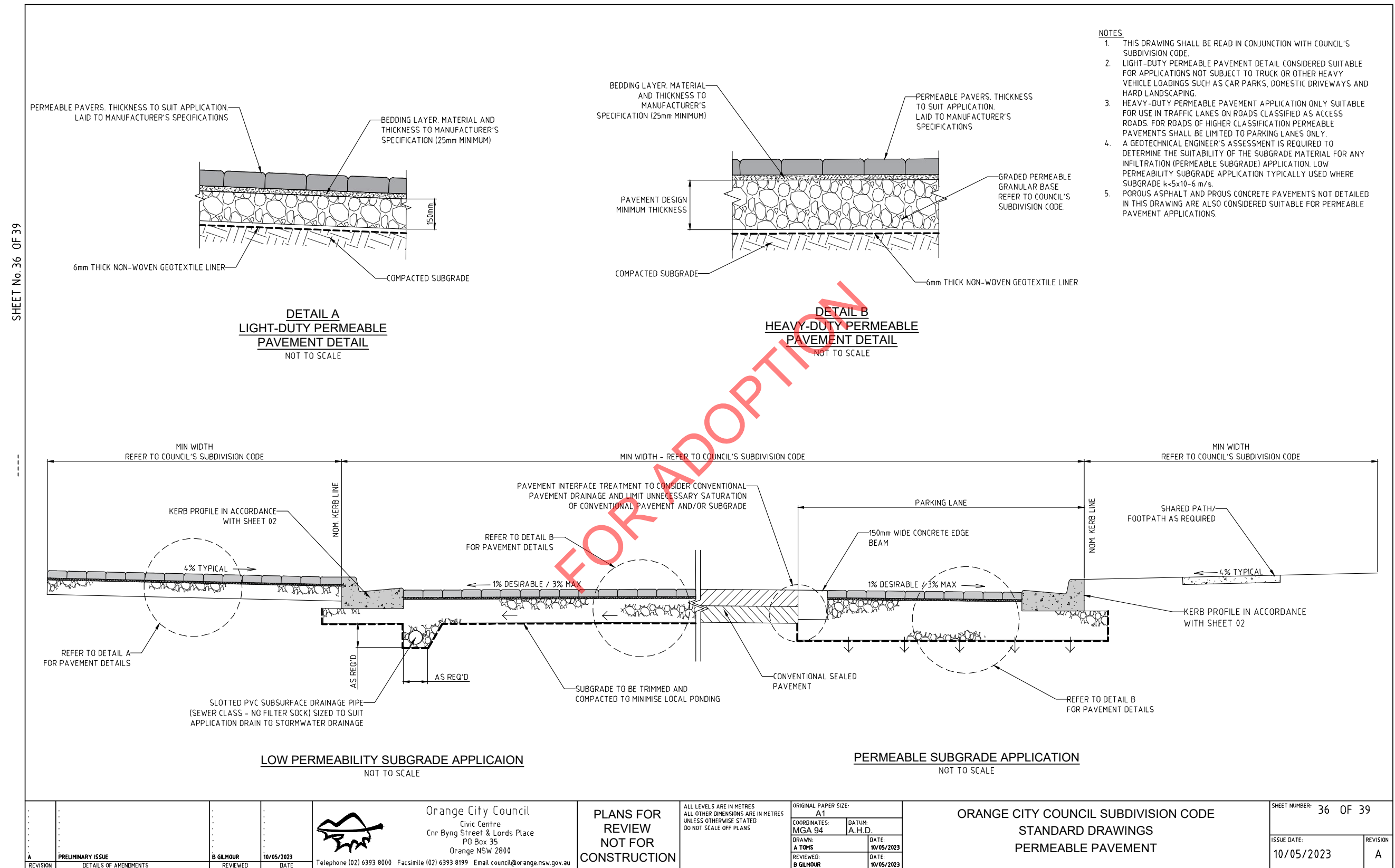


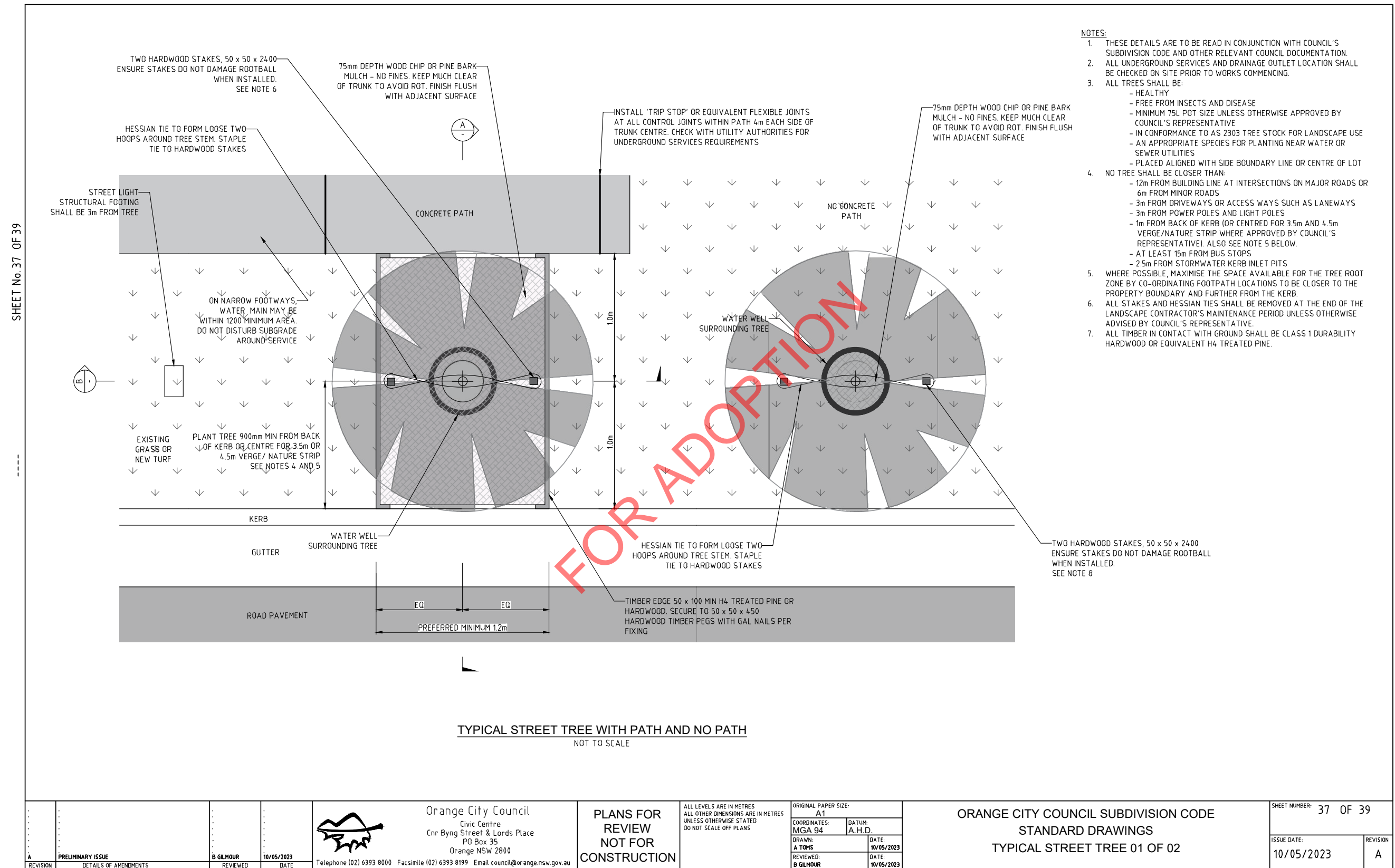


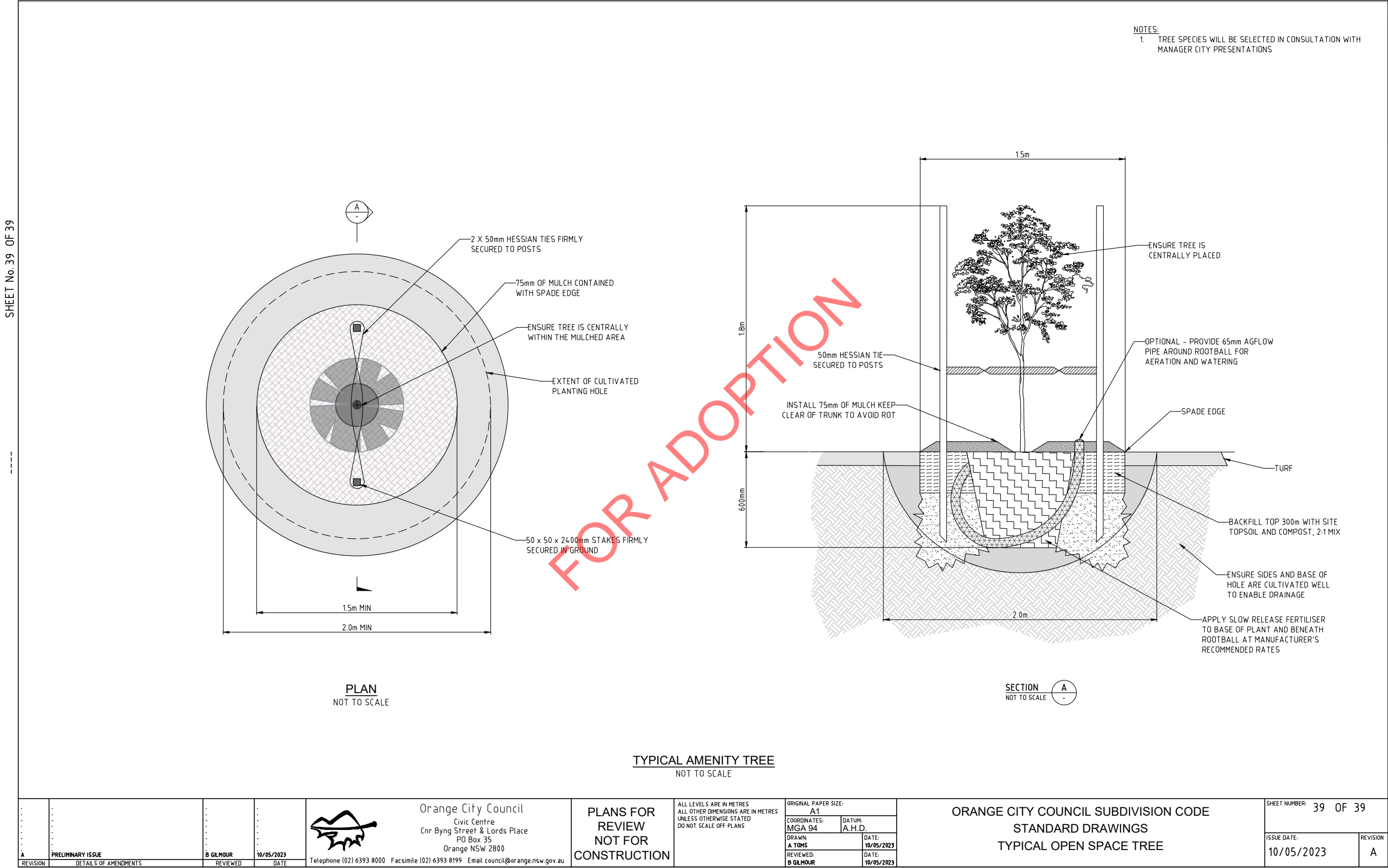


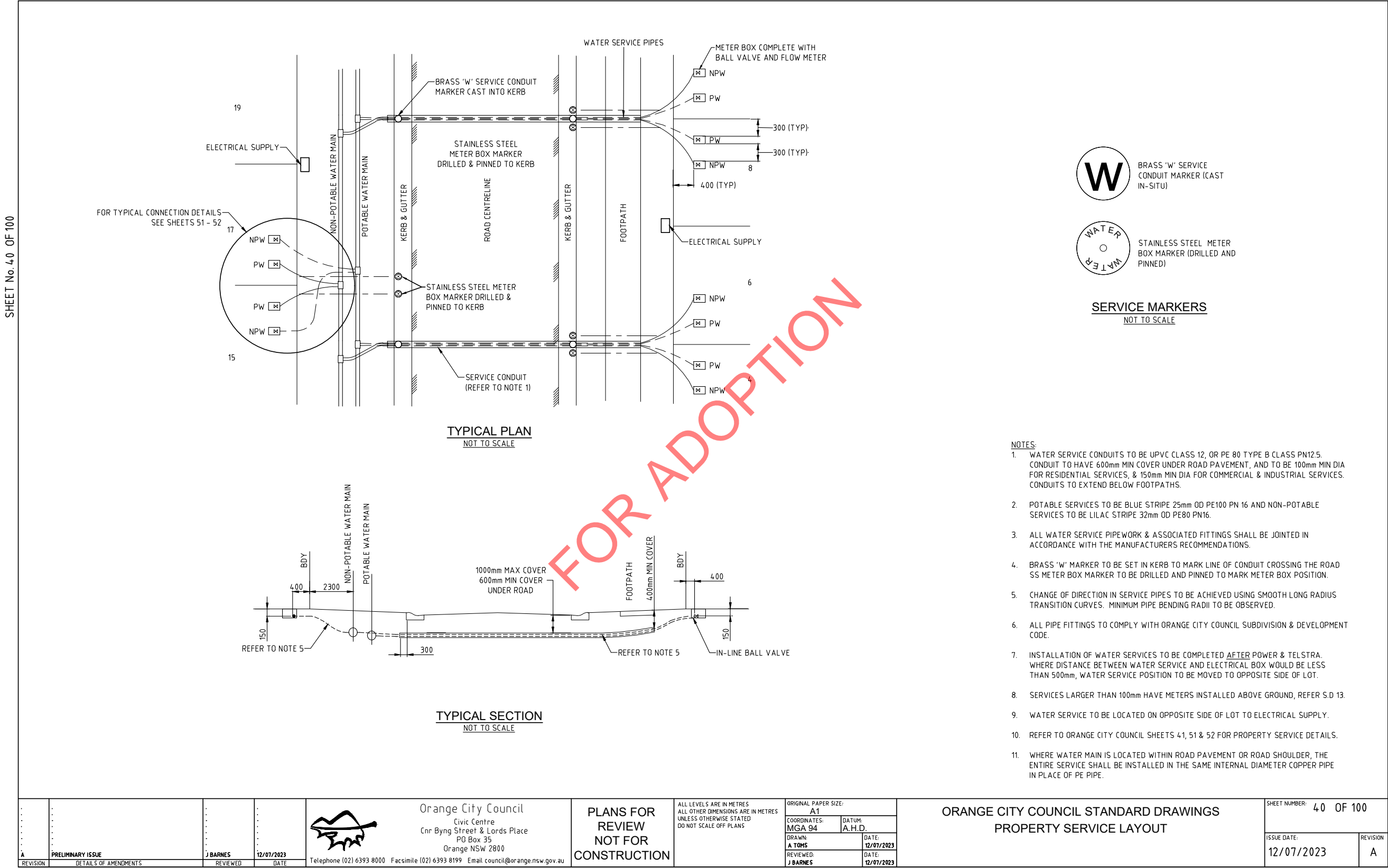




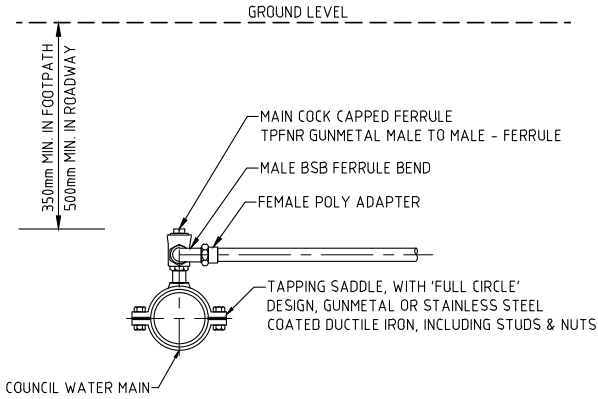






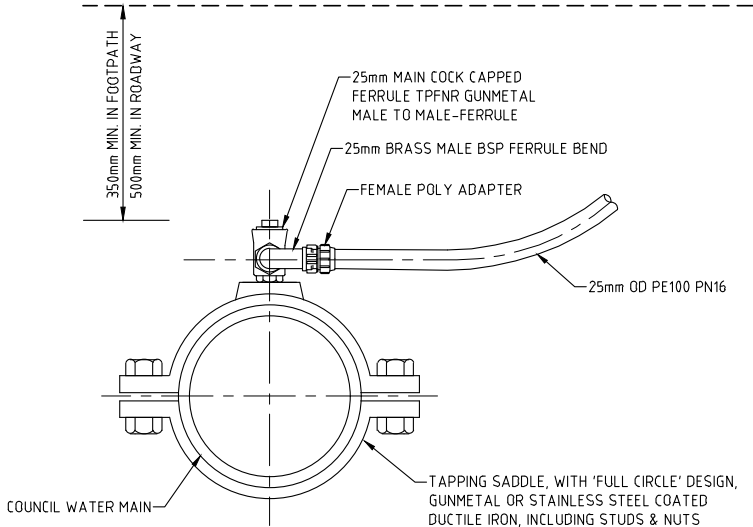


SHEET No. 41 OF 100

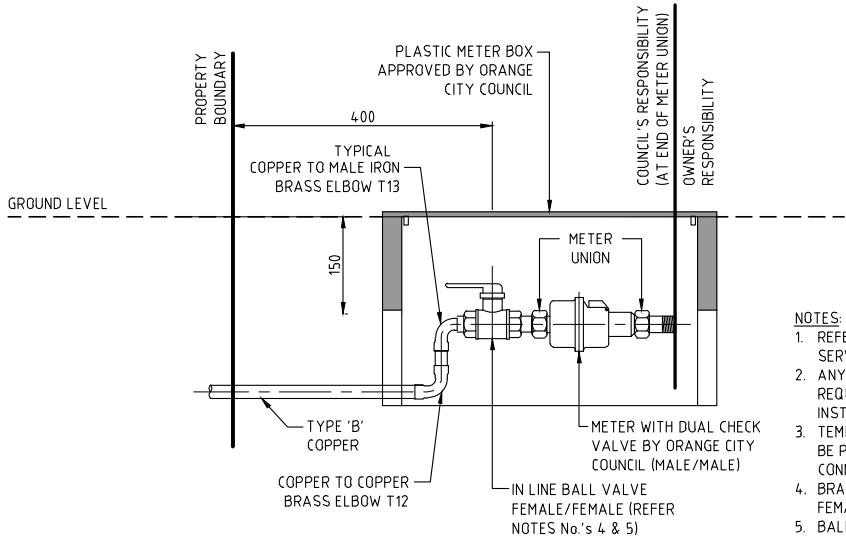


40mm OR 50mm COPPER TO ANY SIZE MAIN
(EXCLUDES MILD STEEL PIPES)
NOT TO SCALE

- NOTES:
- 1. WHERE THE WATER MAIN IS LOCATED WITHIN THE ROAD PAVEMENT OR ROAD SHOULDER, THE ENTIRE SERVICE LINE SHALL BE INSTALLED IN THE SAME INTERNAL DIAMETER COPPER PIPE IN PLACE OF PE PIPE.
 - 2. REFER TO SHEET 40 FOR LAYOUT DETAILS.
 - 3. PRE-TAPPED WATER SERVICE FITTINGS ARE NOT PERMITTED.

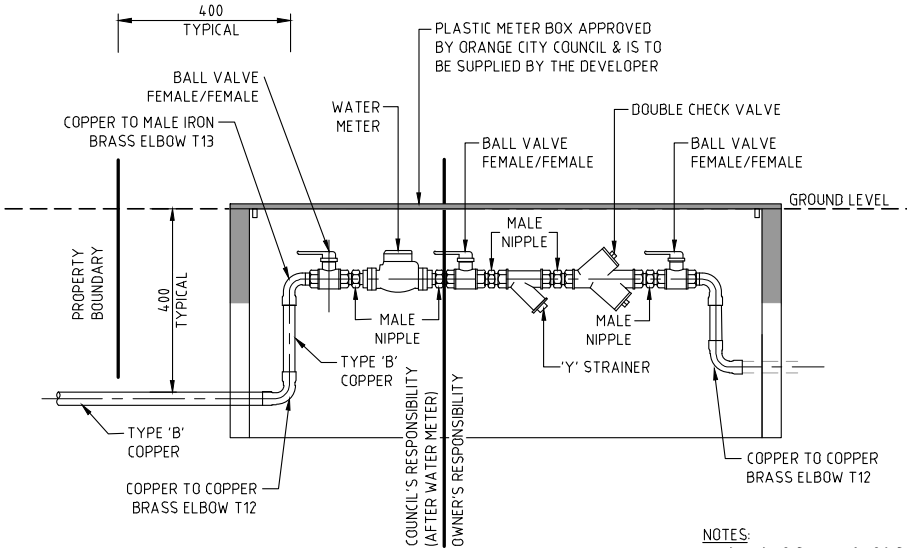


25mm OR 32mm OD PE TO ANY SIZE MAIN
(EXCLUDES MILD STEEL PIPES)
NOT TO SCALE




20/25mm DOMESTIC WATER METER
NOT TO SCALE

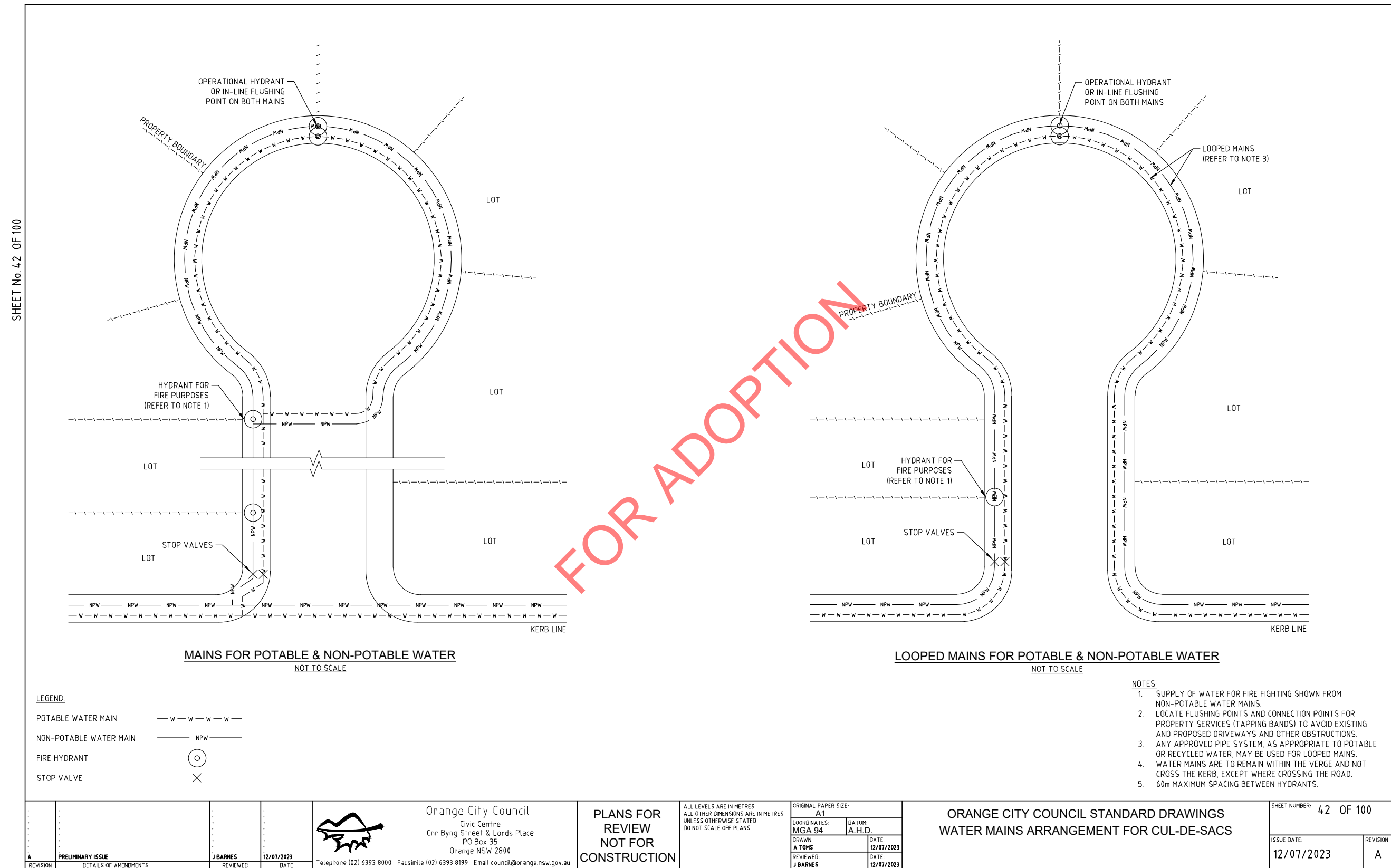
- NOTES:
- 1. REFER TO SHEET 40 FOR SERVICE LAYOUT DETAILS. SERVICE CONDUITS DETAILS AND CONNECTION DETAILS
 - 2. ANY IRRIGATION LINE TAKEN OFF THE SUPPLY SHALL REQUIRE ADDITIONAL BACKFLOW PREVENTION DEVICES INSTALLED AT TAKE OFF POINT.
 - 3. TEMPORARY SUPPORT FOR METER INSTALLATION TO BE PROVIDED PRIOR TO PRIVATE PLUMBERS CONNECTION.
 - 4. BRASS BALL VALVE TO BE MALE FOR POTABLE AND FEMALE FOR NON-POTABLE.
 - 5. BALL VALVE TO BE INSTALLED AT END OF LINE ONLY WHEN THERE IS A TIME LAG BETWEEN CONSTRUCTION OF THE PIPE TO THE BOUNDARY & THE INSTALLATION OF THE METER.

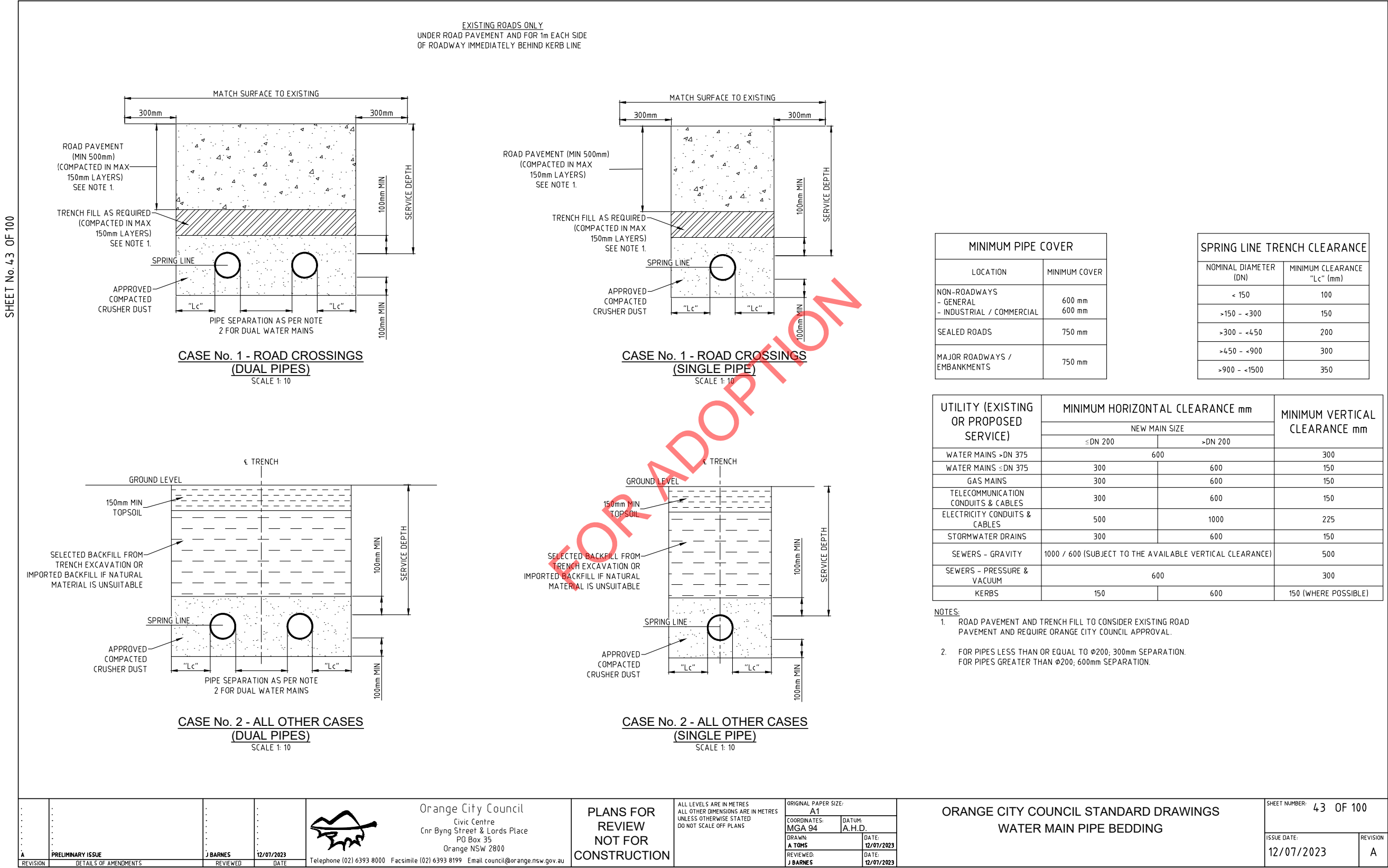


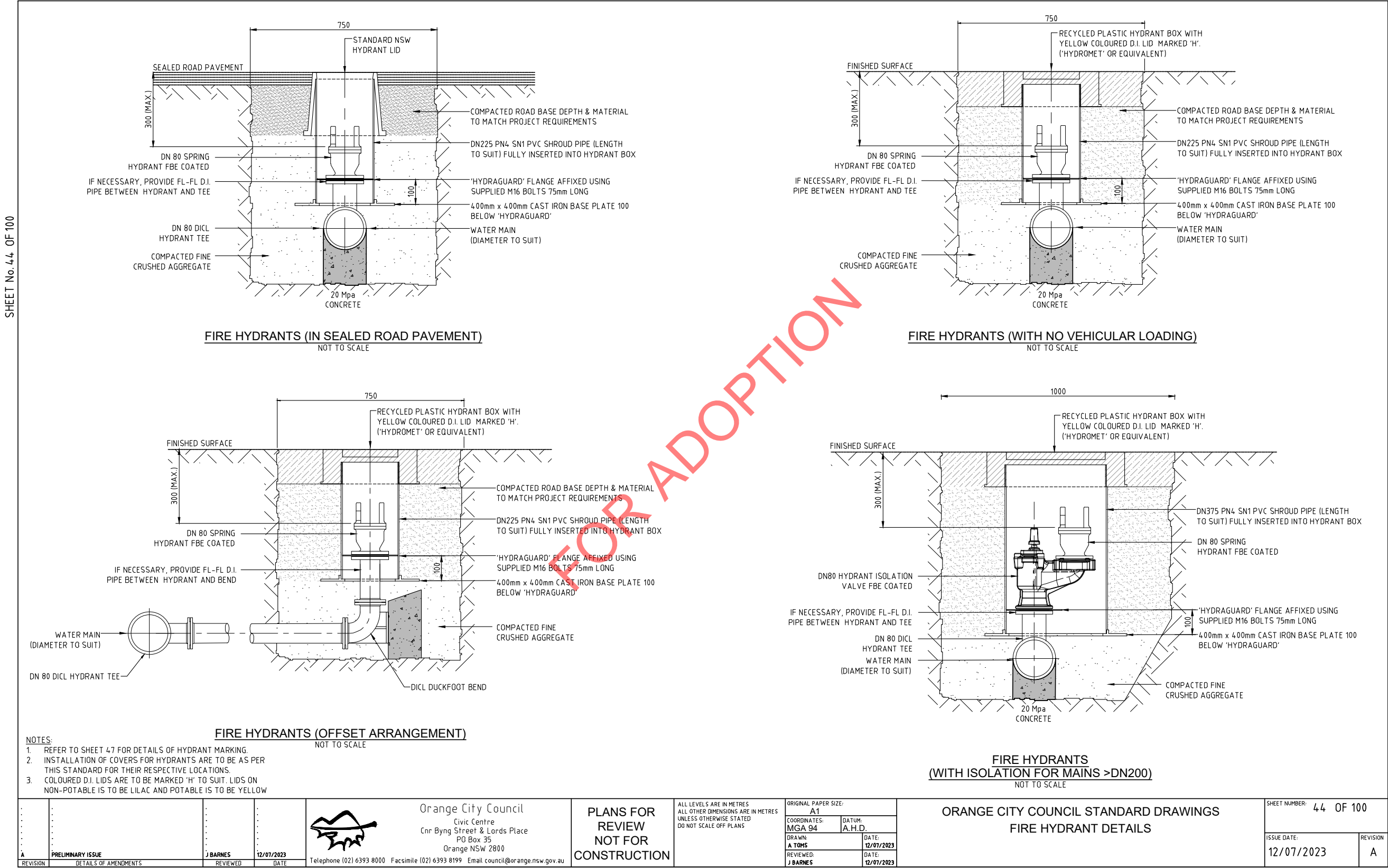
DN32 - DN50 COMMERCIAL/INDUSTRIAL/DOMESTIC
WATER METER WITH FIRE HOSE REELS
LOW TO MEDIUM BACKFLOW HAZARD RATING
NOT TO SCALE

- NOTES:
- 1. REFER TO SHEET 40 FOR SERVICE LAYOUT DETAILS. SERVICE CONDUITS DETAILS AND CONNECTION DETAILS
 - 2. ANY IRRIGATION LINE TAKEN OFF THE SUPPLY SHALL REQUIRE ADDITIONAL BACKFLOW PREVENTION DEVICES INSTALLED AT TAKE OFF POINT.
 - 3. WALL OR WINDOW DRENCHER SPRINKLER SUPPLY MAY BE TAKEN OFF FIRE SPRINKLER SERVICE

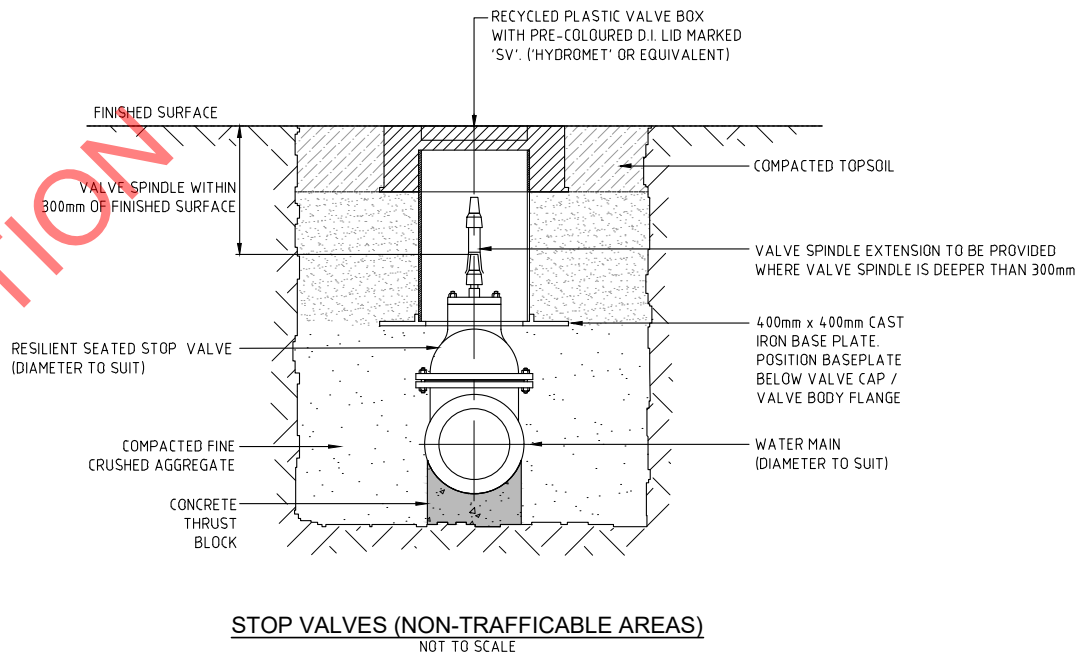
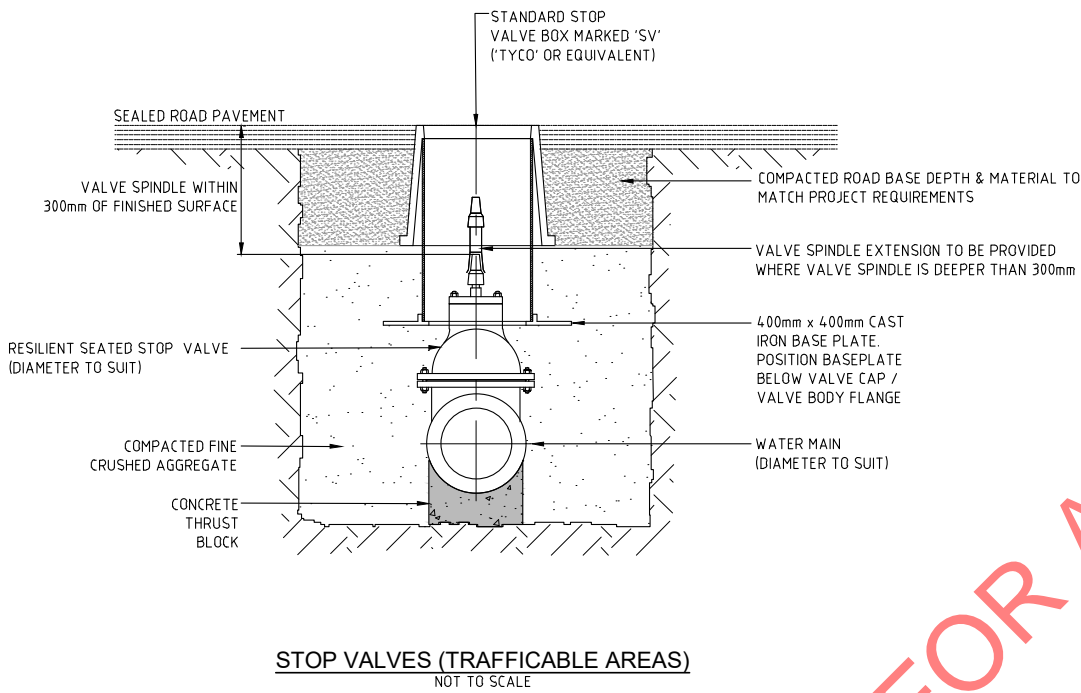
| | | | | | | | | | | | | |
|----------|-----------------------|----------|------|---|---|--|---|---|--|--|---------------------------|---------------|
| | | | |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DRAWN: A TOMS REVIEWED: J BARNES | DATE: 12/07/2023 DATE: 12/07/2023 | ORANGE CITY COUNCIL STANDARD DRAWINGS PROPERTY SERVICE CONNECTION & DN20/25 & DN40/DN50 PROPERTY SERVICE DETAILS | SHEET NUMBER: 41 OF 100 | |
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | | | | | | | | ISSUE DATE: 12/07/2023 | REVISION A |






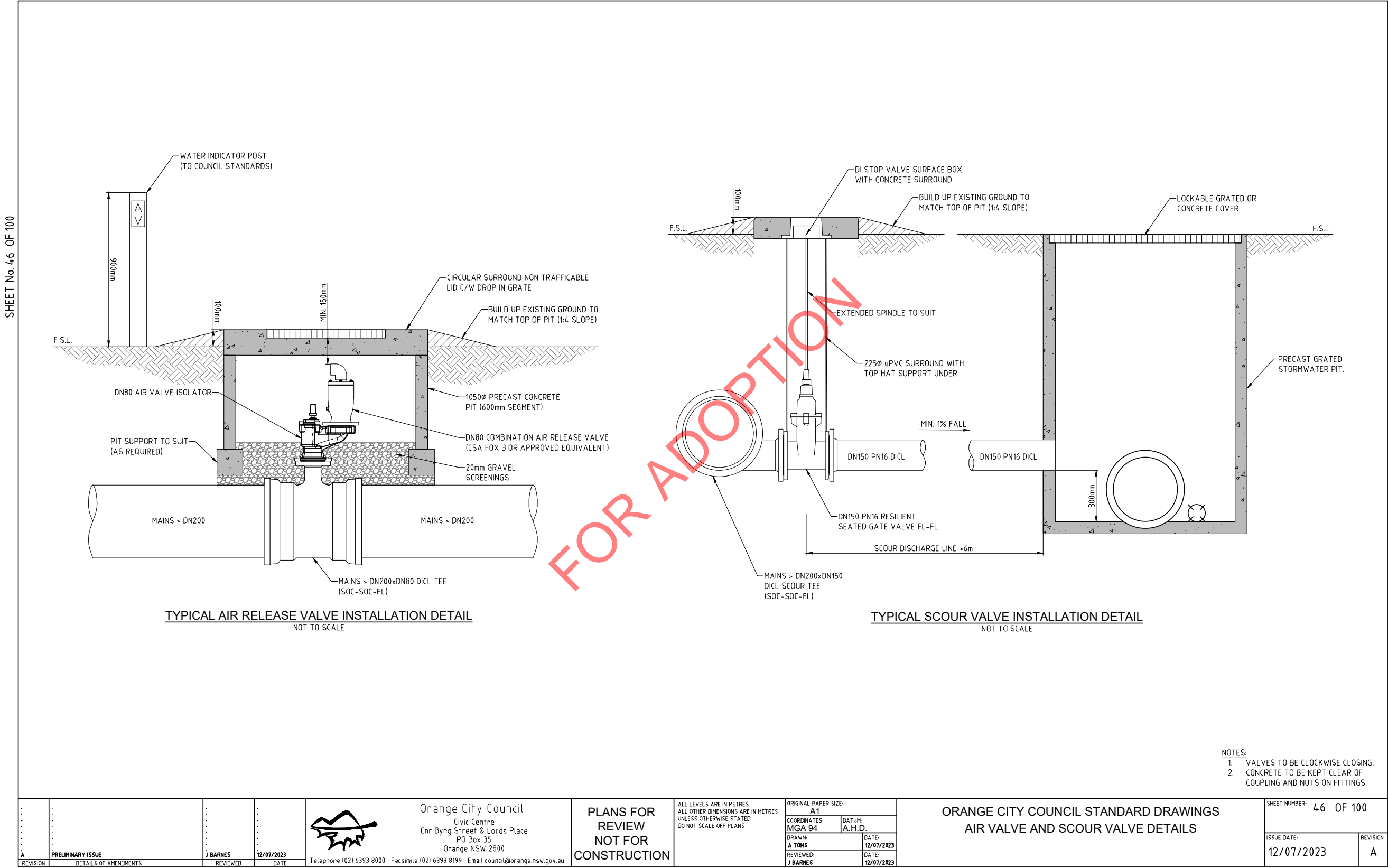


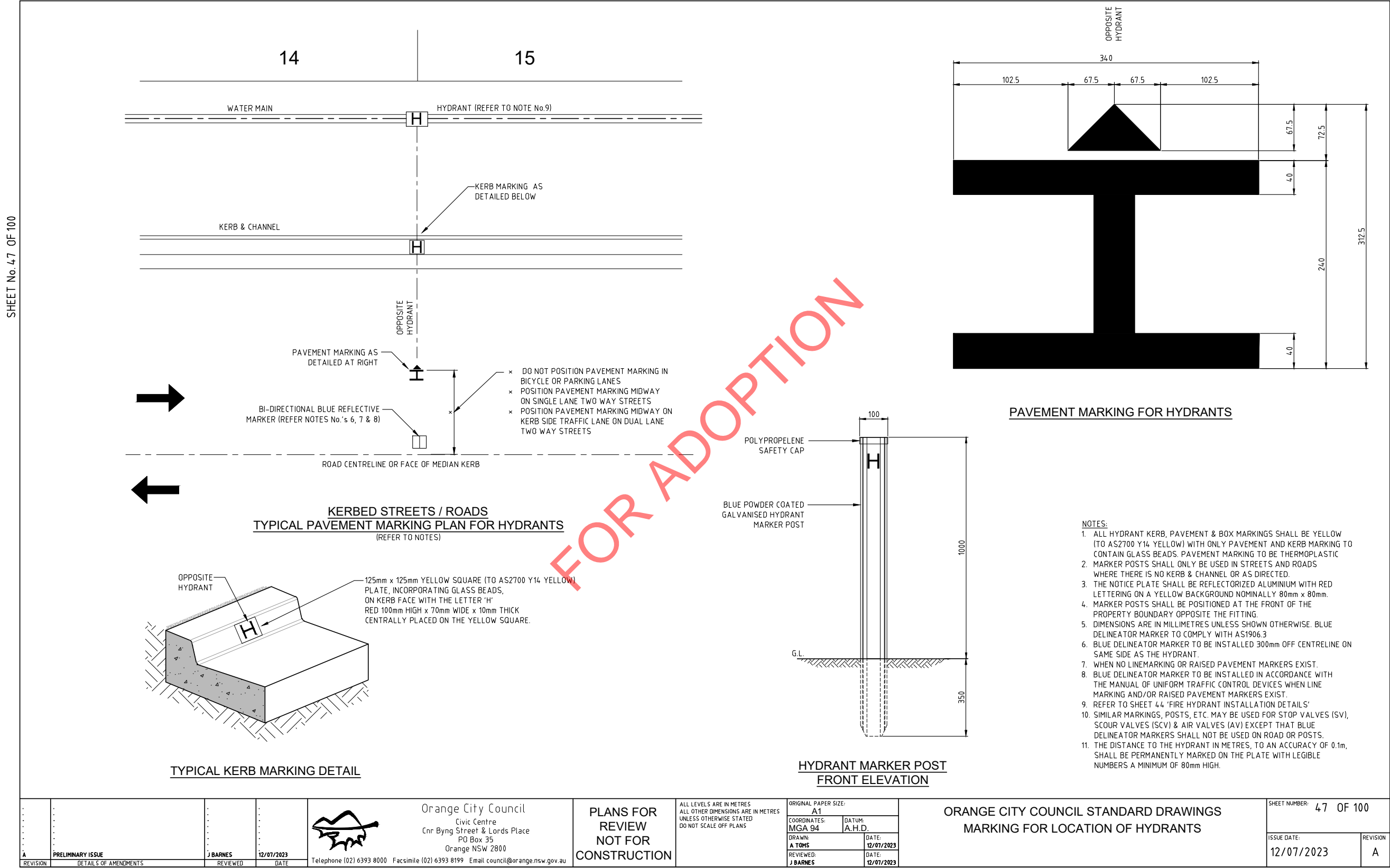
SHEET No. 45 OF 100

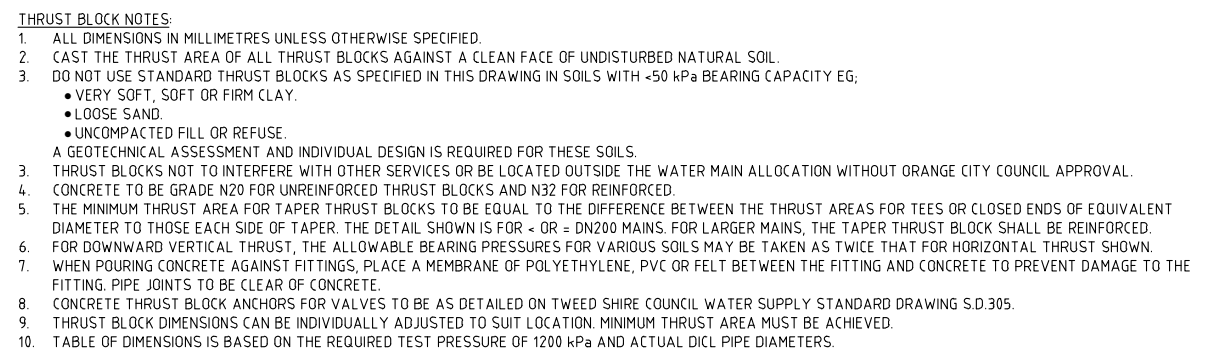


- NOTES:
1. STOP VALVES TO BE CLOCKWISE CLOSING. DIRECTION ARROW TO BE DISPLAYED ON SPINDLE TOP.
 2. REFER TO SHEET 47 FOR DETAILS OF VALVE MARKING.
 3. WHERE DISTANCE BETWEEN VALVE SPINDLE AND TOP OF VALVE BOX IS GREATER THAN 300mm, AN EXTENSION SPINDLE IS TO BE PROVIDED.

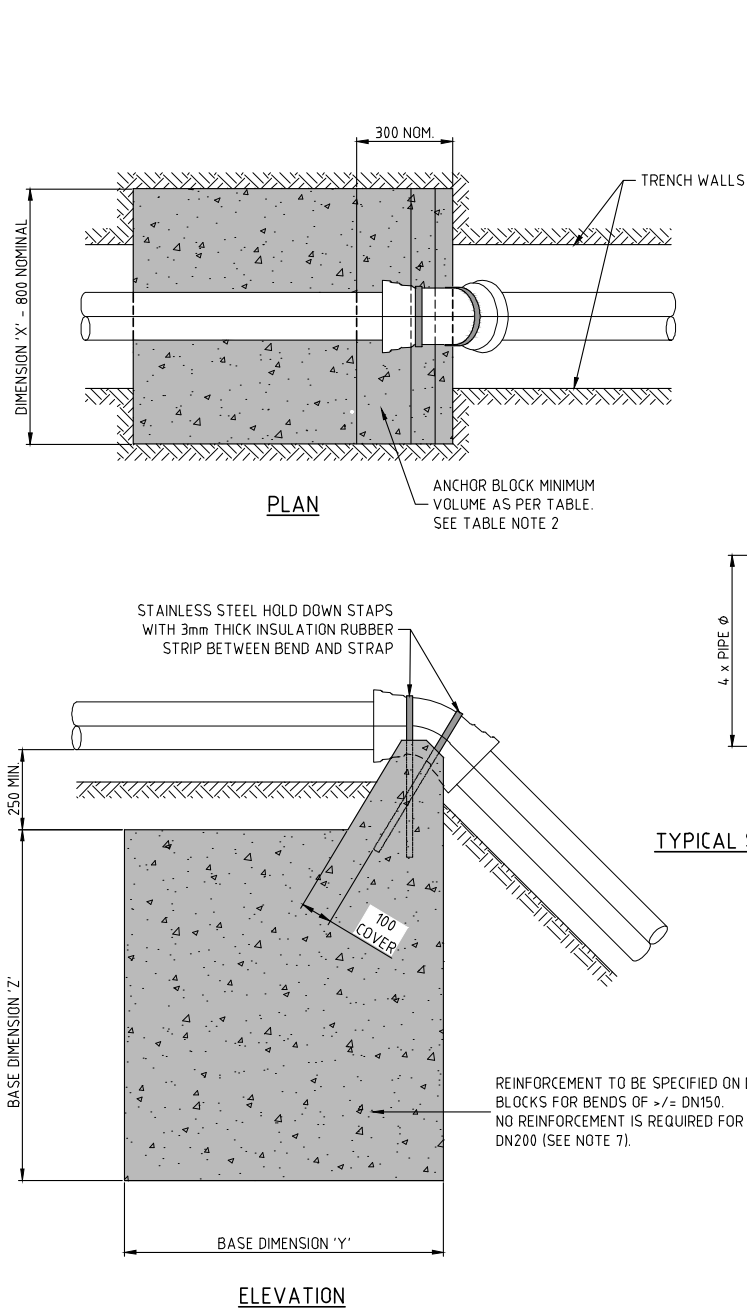
| | | | | | | | | | | | | |
|---|-------------------|----------|------------|---|---|--|---|---|--|---|-------------------------|----------|
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DRAWN: A TOMS REVIEWED: J BARNES | DATE: 12/07/2023 DATE: 12/07/2023 | ORANGE CITY COUNCIL STANDARD DRAWINGS STOP VALVE DETAILS | SHEET NUMBER: 45 OF 100 | |
| | | | | | | | | | | | ISSUE DATE: | REVISION |
| | | | | | | | | | | | 12/07/2023 | A |







SHEET No. 49 OF 100

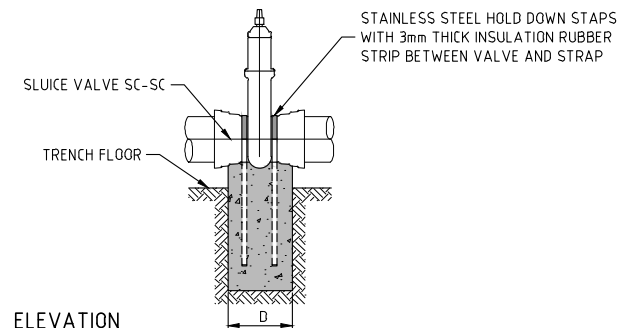


- VERTICAL BEND ANCHOR BLOCK CONSTRUCTION NOTES:
1. LOCATE ANCHOR BLOCK CENTRALLY AROUND BEND AND KEY ANCHOR BLOCK INTO BASE OF TRENCH A MINIMUM DEPTH OF 250mm (DIMENSION 'Z').
 2. POUR BASE CONCRETE AGAINST A SOLID EXCAVATION FACE.
 3. USE GRADE N32 CONCRETE FOR REINFORCED THRUST BLOCKS. GRADE N20 FOR NON-REINFORCED.
 4. REINFORCEMENT IS NOT NECESSARY FOR THRUST BLOCKS WHERE BENDS ARE LESS THAN DN200.
 5. KEEP CONCRETE CLEAR OF ALL BOLTS, NUTS AND PIPE JOINTS.
 6. DESIGN OF ANCHOR BLOCKS AT VERTICAL BENDS INCLUDE ALLOWANCE FOR THE HORIZONTAL COMPONENT OF THRUST.
 7. DESIGN PLANS TO DETAIL REINFORCING STEEL.
 8. ANCHOR BLOCKS IN THE TABLE ARE DESIGNED FOR A TEST PRESSURE OF 1200kPa (122m HEAD).
 9. FOR DOWNWARD VERTICAL THRUST, THE ALLOWABLE BEARING PRESSURE FOR VARIOUS SOILS MUST BE TAKEN AS TWICE THAT FOR HORIZONTAL THRUST AS SHOWN ON SHEET 48.

| MINIMUM BLOCK VOLUME FOR ANCHORAGE OF VERTICAL COMPONENT OF THRUST | | | | | |
|--|-----------------|---|-------------|------------|----------|
| PIPE DN | TYPICAL PIPE OD | VERTICAL BENDS FOR TEST PRESSURE OF 1200kPa AND MINIMUM SOIL ALLOWABLE HORIZONTAL BEARING PRESSURE OF 50kPa (SEE NOTES) | | | |
| | DIMENSION | CONCRETE MASS / VOLUME m³ | | | |
| | S | 6° BEND | 11.25° BEND | 22.5° BEND | 45° BEND |
| 100 | 122 | 0.06 | 0.13 | 0.26 | 0.47 |
| | X | 400 | 800 | 800 | 800 |
| | Y | 400 | 400 | 400 | 600 |
| | Z | 400 | 450 | 800 | 1000 |
| 150 | 177 | 0.13 | 0.28 | 0.54 | 1.00 |
| | X | 800 | 800 | 800 | 800 |
| | Y | 400 | 400 | 800 | 1000 |
| | Z | 450 | 800 | 850 | 1250 |
| 200 | 232 | 0.22 | 0.47 | 0.93 | 1.72 |
| | X | 800 | 800 | x | x |
| | Y | 400 | 600 | x | x |
| | Z | 800 | 1000 | x | x |
| 225 | 259 | 0.26 | 0.59 | 1.16 | 2.14 |
| | X | 800 | 800 | x | x |
| | Y | 400 | 800 | x | x |
| | Z | 800 | 950 | x | x |
| 250 | 286 | 0.31 | 0.72 | 1.41 | 2.61 |
| | X | 800 | 800 | x | x |
| | Y | 500 | 1000 | x | x |
| | Z | 800 | 900 | x | x |
| 300 | 345 | 0.48 | 1.05 | 2.05 | 3.79 |
| | X | 800 | 800 | x | x |
| | Y | 600 | 1050 | x | x |
| | Z | 1000 | 1250 | x | x |
| 375 | 426 | 0.73 | 1.60 | 3.13 | 5.78 |
| | X | 800 | x | x | x |
| | Y | 1000 | x | x | x |
| | Z | 950 | x | x | x |

- TABLE NOTES:
1. IN THE TABLE ABOVE THE 'x' DENOTES A DIMENSION TO BE NOMINATED BY THE DESIGNER TO SUIT THE LOCATION.
 2. ANCHOR BLOCKS FOR BENDS DN200 TO DN375 ARE TO HAVE DIMENSIONS 'X', 'Y' AND 'Z' TO SUIT LOCATIONS NOMINATED BY THE DESIGNER.
 3. ANCHOR BLOCKS FOR BENDS LARGER THAN DN375 INDIVIDUAL DETAILED DESIGN IS REQUIRED.
 4. CALCULATION FOR BLOCK MASS IS:
 $M^3 = (Sf \times P \times A \times \sin Z \times 1000) / (Wm \times 9.8)$
WHERE:
Sf SAFETY FACTOR OF 1.0
P TEST PRESSURE 1200kPa
A AREA OF PIPE ACTUAL OD (m²)
Z BEND ANGLE (DEGREES)
Wm DENSITY OF CONCRETE (2400kg/m³)
 5. IN CALCULATING THE CONCRETE MASS, NO CONTRIBUTION FROM THE PIPELINE SELF WEIGHT, BACKFILL OR EMBEDMENT HAS BEEN INCLUDED.
 6. BLOCK WIDTHS 'X' SHOULD BE WITHIN THE PIPELINE ALLOCATED CORRIDOR AND HAVE A NOMINAL WIDTH OF 800mm.

| | | | | | | | | | | | |
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| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | | ISSUE DATE: 12/07/2023 | REVISION A |
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | | | | DRAWN: A TOMS | | | DATE: 12/07/2023 | |
| | | | | | | | REVIEWED: J BARNES | | | DATE: 12/07/2023 | |

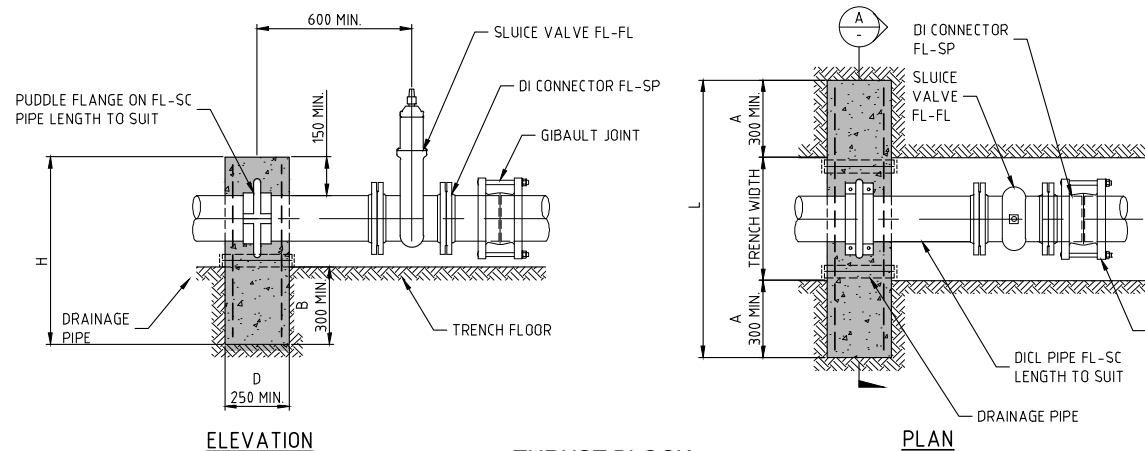


ELEVATION

THRUST BLOCK

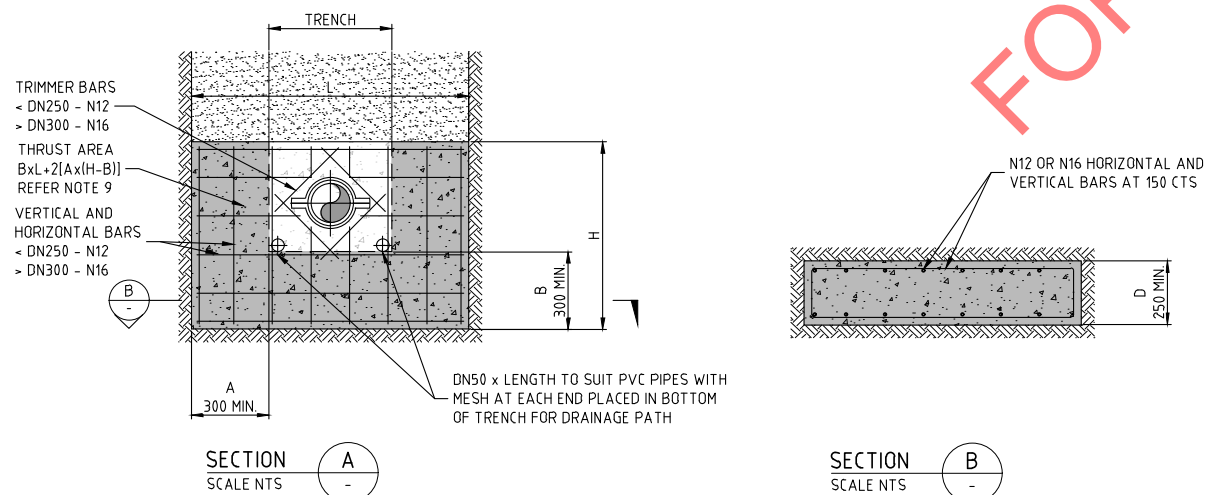
SOCKETED STRAPPED VALVES <= DN375

REFER NOTE 10.



ELEVATION

THRUST BLOCK FLANGED VALVES



SECTION
SCALE NTS


SECTION
SCALE NTS

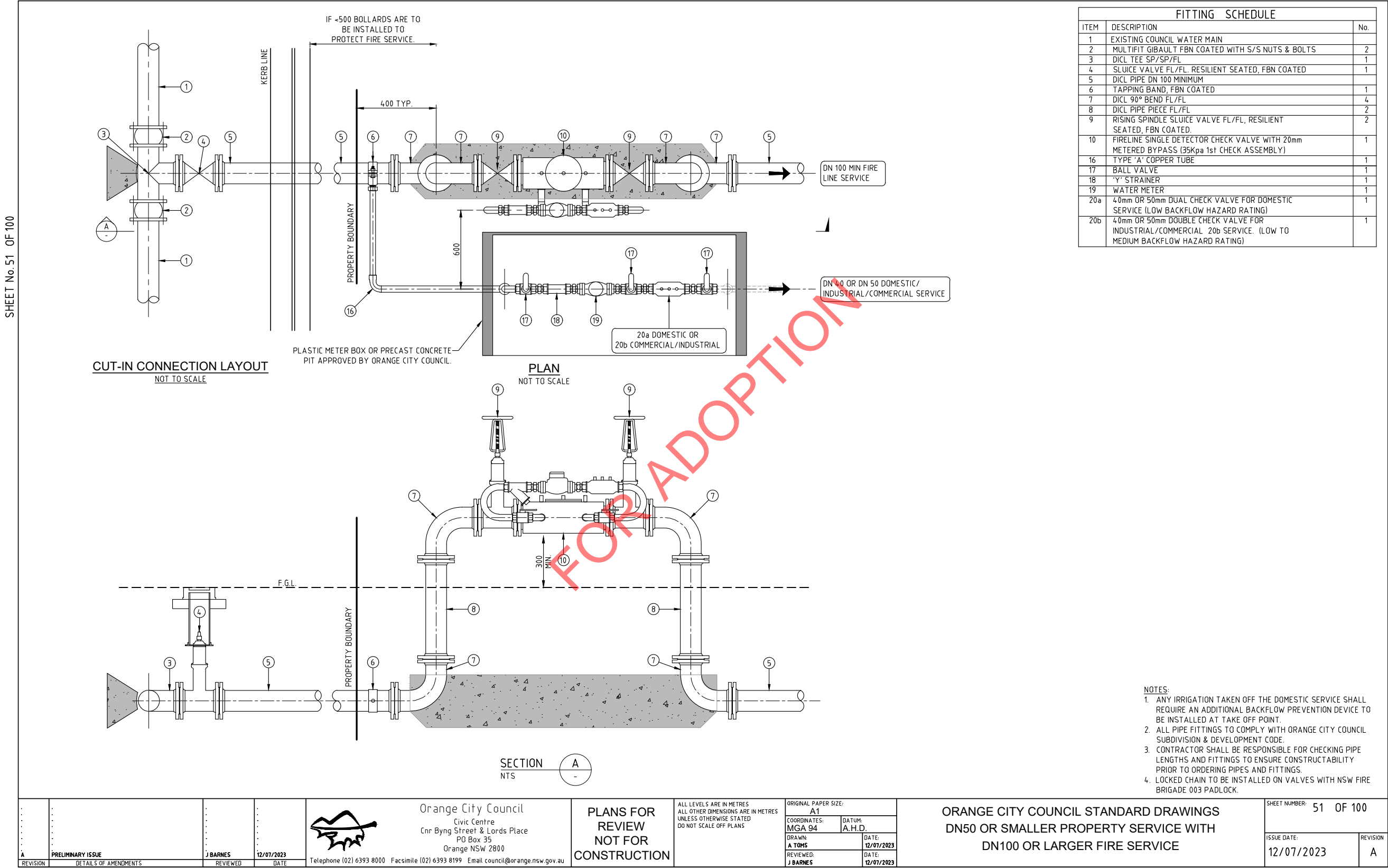
| MINIMUM BLOCK DIMENSIONS FOR THE ANCHORAGE OF THE IN-LINE THRUST | | | | |
|--|---------------|---|-----------------------------------|----------------------------------|
| IN-LINE BLOCK FOR TEST PRESSURE OF 1200kPa SOIL ALLOWABLE HORIZONTAL BEARING PRESSURE IN kPa's of 50, 100 and 150 LISTED (SEE NOTES) | | | | |
| PIPE DN | DIMENSION | STIFF CLAY 50Kpa | VERY STIFF CLAY SANDY LOAM 100Kpa | SAND AND GRAVEL RICH CLAY 150Kpa |
| 100 | 14.6kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 0.30 | 0.15 | 0.10 |
| | L | 1000 | 1000 | 1000 |
| | L1 | 500 | 400 | 400 |
| | D | 250 | 250 | 250 |
| | B | 300 | 300 | 300 |
| | A | 300 | 300 | 300 |
| | H | 700 | 700 | 700 |
| | H1 | 600 | 400 | 300 |
| 150 | 30.5kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 0.60 | 0.31 | 0.20 |
| | L | 1050 | 1050 | 1050 |
| | L1 | 600 | 550 | 450 |
| | D | 250 | 250 | 250 |
| | B | 300 | 300 | 300 |
| | A | 300 | 300 | 300 |
| | H | 800 | 750 | 750 |
| | H1 | 1000 | 600 | 450 |
| 200 | 51.2kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 1.02 | 0.51 | 0.34 |
| | L | 1100 | 1100 | 1100 |
| | L1 | 1050 | 550 | 500 |
| | D | 300 | 300 | 300 |
| | B | 600 | 300 | 300 |
| | A | 300 | 300 | 300 |
| | H | 1150 | 800 | 800 |
| | H1 | 1000 | 1000 | 700 |

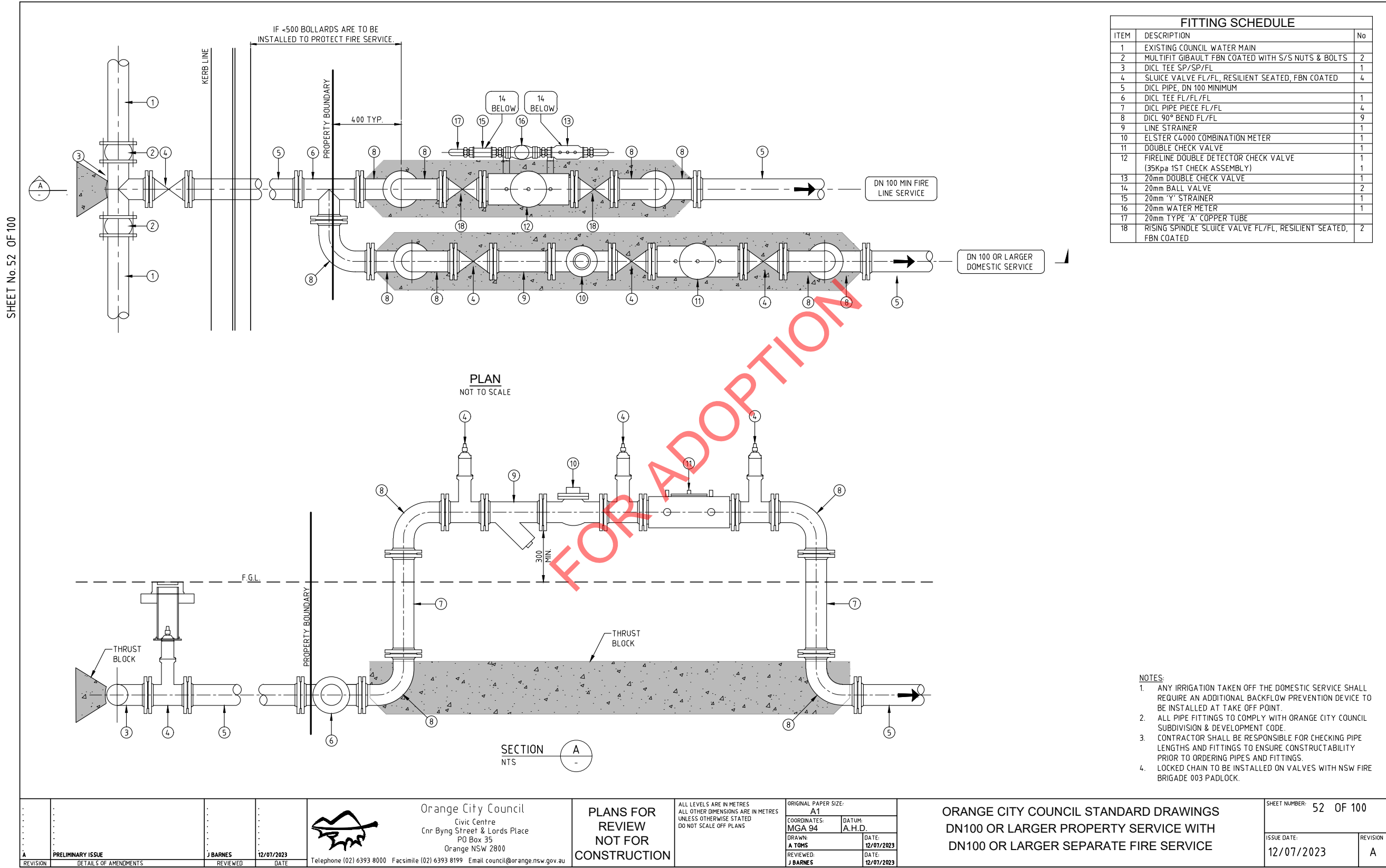
| MINIMUM BLOCK DIMENSIONS FOR THE ANCHORAGE OF THE IN-LINE THRUST | | | | |
|--|----------------|---|-----------------------------------|----------------------------------|
| IN-LINE BLOCK FOR TEST PRESSURE OF 1200kPa SOIL ALLOWABLE HORIZONTAL BEARING PRESSURE IN kPa's OF 50, 100 AND 150 LISTED (SEE NOTES) | | | | |
| PIPE DN | DIMENSION | STIFF CLAY 50kPa | VERY STIFF CLAY SANDY LOAM 100kPa | SAND AND GRAVEL HARD CLAY 150kPa |
| 225 | 64.7kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 1.30 | 0.65 | 0.43 |
| | L | 1300 | 1150 | 1150 |
| | L1 | 1200 | 650 | 650 |
| | D | 300 | 300 | 300 |
| | B | 600 | 300 | 300 |
| | A | 400 | 300 | 300 |
| | H | 1300 | 850 | 850 |
| | H1 | 1100 | 1000 | 700 |
| 250 | 78.1kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 1.56 | 0.78 | 0.52 |
| | L | 1400 | 1200 | 1200 |
| | L1 | 1250 | 780 | 650 |
| | D | 400 | 400 | 400 |
| | B | 700 | 400 | 300 |
| | A | 400 | 300 | 300 |
| | H | 1350 | 1000 | 900 |
| | H1 | 1250 | 1000 | 850 |
| 300 | 114.7kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 2.29 | 1.15 | 0.76 |
| | L | 1650 | 1450 | 1250 |
| | L1 | 1400 | 1150 | 850 |
| | D | 400 | 400 | 400 |
| | B | 900 | 450 | 300 |
| | A | 500 | 400 | 300 |
| | H | 1700 | 1100 | 950 |
| | H1 | 1600 | 1000 | 900 |
| 375 | 174.5kN THRUST | | | |
| | | MIN. THRUST BEARING AREA m ² | | |
| | | 3.49 | 1.75 | 1.16 |
| | L | 1700 | 1550 | 1450 |
| | L1 | 1700 | 1350 | 1100 |
| | D | 500 | 500 | 500 |
| | B | 1500 | 700 | 450 |
| | A | 500 | 400 | 350 |
| | H | 2400 | 1600 | 1200 |
| | H1 | 2050 | 1300 | 1050 |

THRUST BLOCK NOTES:

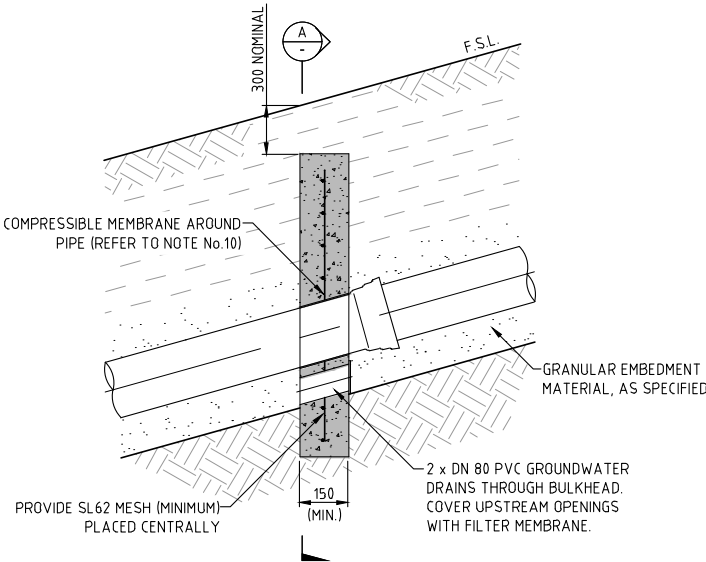
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. POUR BASE CONCRETE AGAINST A SOLID EXCAVATION FACE.
3. USE GRADE N32 CONCRETE FOR REINFORCED THRUST BLOCKS. GRADE N20 FOR NON-REINFORCED.
4. REINFORCEMENT IS NOT NECESSARY FOR THRUST BLOCKS WHERE VALVES ARE \leq DN150.
5. KEEP CONCRETE CLEAR OF ALL BOLTS, NUTS AND PIPE JOINTS.
6. THRUST BLOCK DIMENSIONS CAN BE INDIVIDUALLY ADJUSTED TO SUIT LOCATION. MINIMUM THRUST AREA MUST BE ACHIEVED. KEY INTO SIDES OF TRENCH TO REDUCE THRUST BLOCK DEPTH.
7. FOR VALVES LARGER THAN DN375 INDIVIDUAL DETAILED DESIGN IS REQUIRED. THE DESIGNER IS TO NOMINATE DIMENSIONS L, D, B, A, H AND H1 TO SUIT LOCATIONS.
8. IF THRUST BLOCK WIDTH "L" IS REQUIRED TO BE WITHIN THE ALLOCATED CORRIDOR, GENERALLY 800mm WIDE BEARING AREA IS TO BE PREDOMINANTLY BELOW THE BEDDING ZONE. IMPACTS OF WIDE BLOCKS ON ADJACENT SERVICES SHALL BE ADDRESSED.
9. THRUST AREA FOR DN100 AND DN150 FLANGED VALVES CAN BE LOCATED BELOW THE BEDDING ZONE (MIN. 300 INTO TRENCH WALL IS NOT REQUIRED). USE DIMENSION H1 x L1 FOR THRUST BLOCK SIZE.
10. SC-SC VALVES ARE PREFERRED FOR DN100 AND DN150.

| | | | | | | | | | | | | | | |
|-------------------|-----------------------|-----------|------------|---|---|--|---|----------------------------|-----------|------------------------|------------------|--|-------------------------|---|
| PRELIMINARY ISSUE | | J BARNES | 12/07/2023 |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 | | COORDINATES: MCA 94 | DATUM: A.H.D. | ORANGE CITY COUNCIL STANDARD DRAWINGS VALVES & INLINE THRUST BLOCKS | SHEET NUMBER: 50 OF 100 | |
| REVISION: | DETAILS OF AMENDMENT: | REVIEWED: | DATE: | | | | | DATE: | REVISION: | | | | | |
| | | | 12/07/2023 | | | | | | | | | | 12/07/2023 | A |

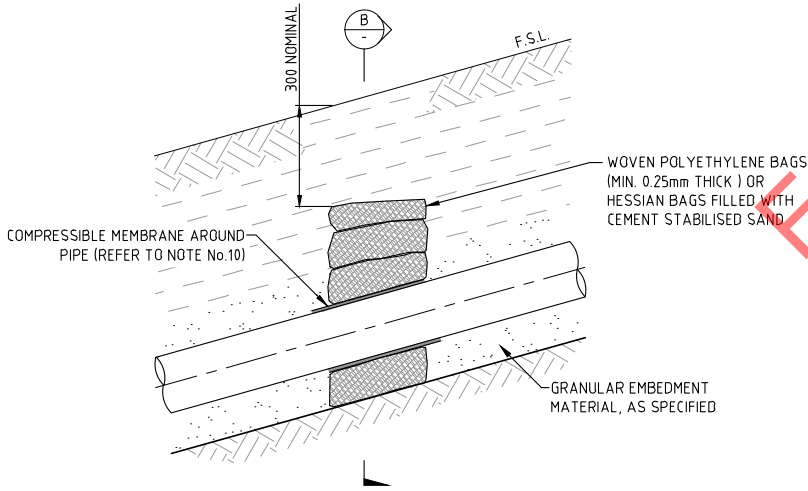




SHEET No.53 OF 100

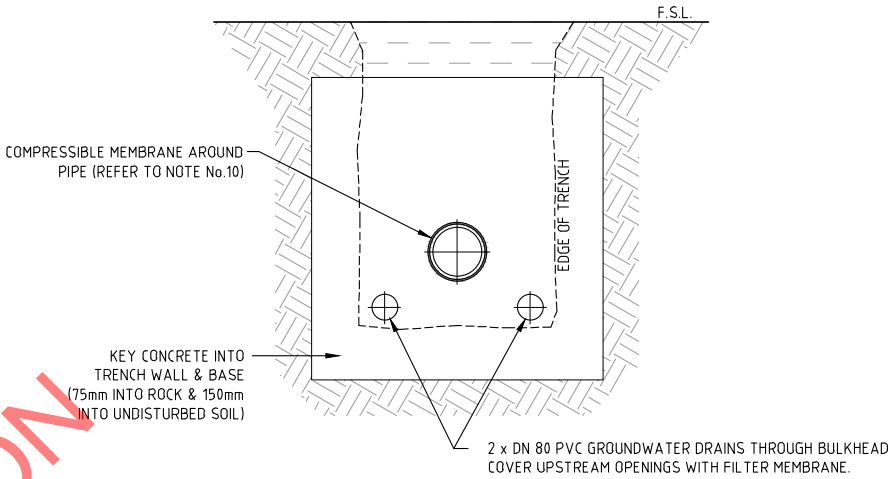


CONCRETE BULKHEAD DETAIL
NOT TO SCALE

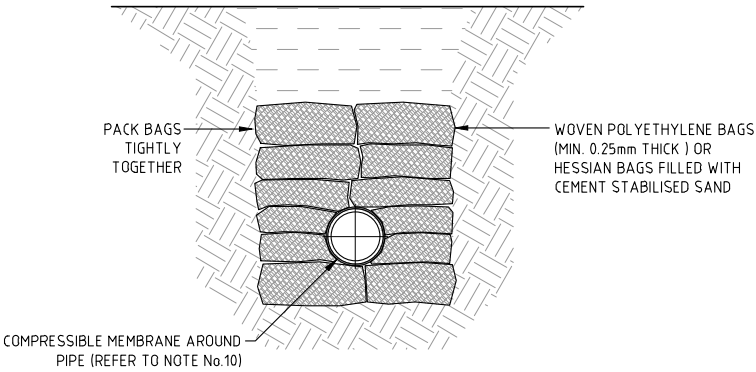


TRENCH STOP DETAIL
NOT TO SCALE


- NOTES:
1. ALL DIMENSIONS IN MILLIMETERS.
 2. CONSTRUCT CONCRETE BULKHEADS & TRENCH STOPS AT LOCATIONS SPECIFIED IN THE DESIGN DRAWINGS.
 3. BULKHEAD AT RETAINING WALL TO BE UNDER WALL.
 4. KEY CONCRETE BULKHEADS INTO SIDES & BOTTOM OF TRENCH AGAINST A BEARING SURFACE OF UNDISTURBED SOIL.
 5. CONCRETE TO BE CLASS N25.
 6. DO NOT DEFORM PIPES DURING PLACEMENT OF CONCRETE.
 7. SEAL BAGS TO PREVENT LEAKAGE OF CONTAINED MATERIAL.
 8. PROVIDE A CONTINUOUS DRAINAGE PATH:
 - THROUGH BULKHEADS & TRENCH STOPS
 - AROUND VALVE CHAMBERS
 - IN TRENCH EXCAVATIONS ACROSS ROADWAYS
 - TRENCH DRAINAGE TO BE IN ACCORDANCE WITH WSA03-2002 WAT-1210
 9. COMPRESSIBLE MEMBRANE AROUND PIPE TO BE 10mm THICK RUBBER FOR BULKHEADS & 3mm THICK FOR TRENCH STOPS.
 10. FOR SLOPES >30% CONTINUOUSLY ENCASE THE PIPE TO PREVENT MOVEMENT & TRANSFER OF GROUND WATER. WRAP JOINTS TO PREVENT DAMAGE TO RRJ.

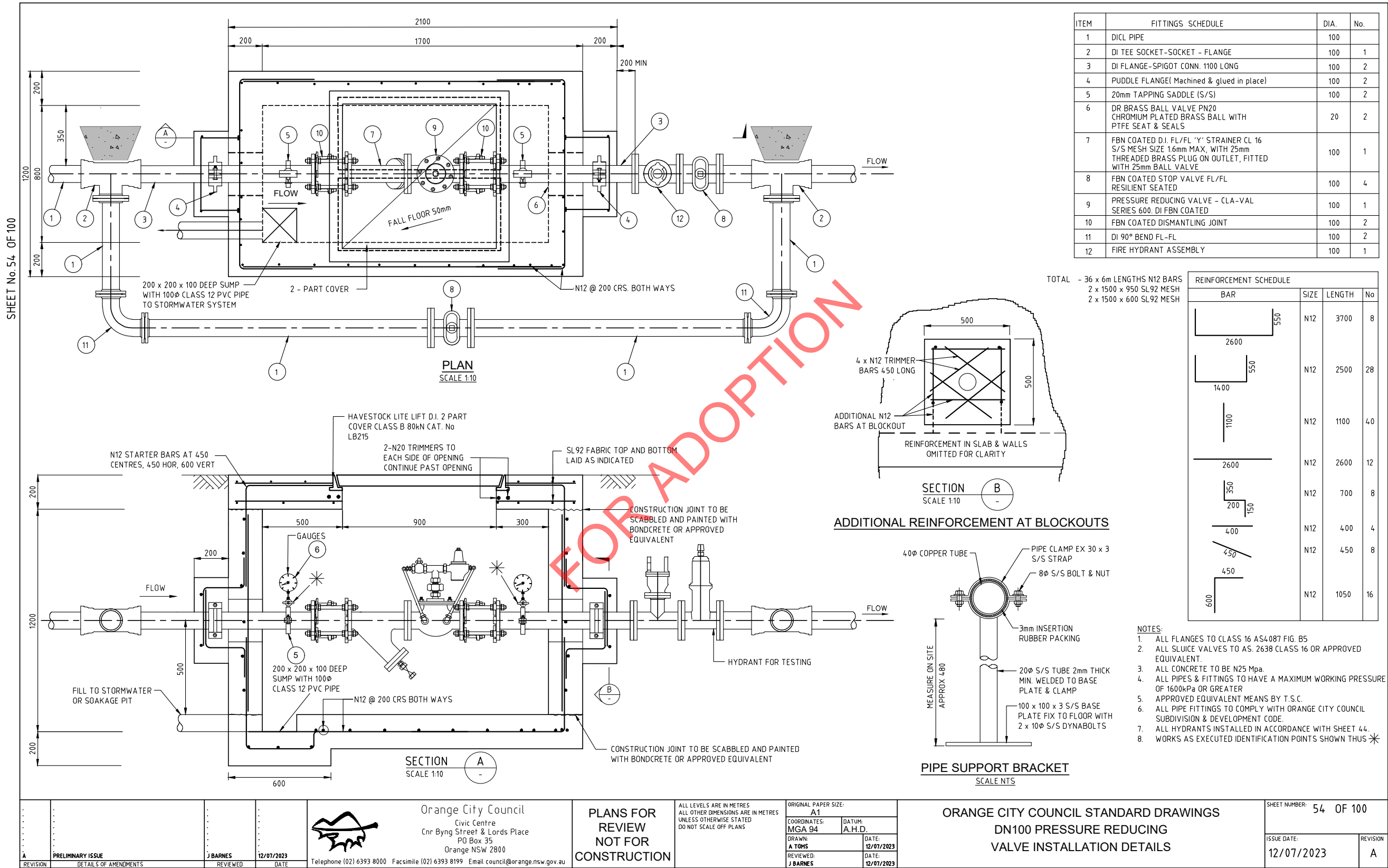


SECTION A
SCALE NTS

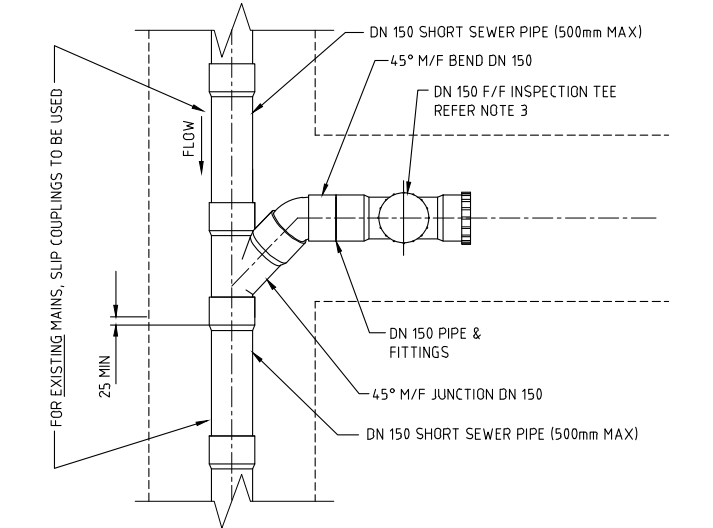


SECTION B
SCALE NTS

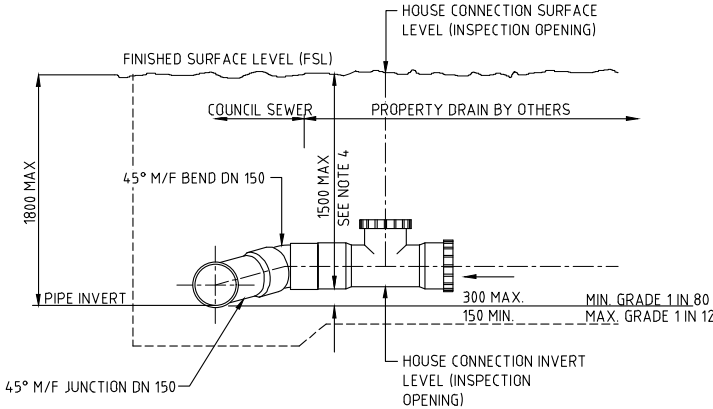
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|----------|-------------------|-----------------------|------------|---|---|--|---|----------------------------|------------------|---|---------------------|-------------------------|---------------------|
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| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | DRAWN: A TOMS | DATE: 12/07/2023 | REVIEWED: J BARNES | DATE: 12/07/2023 |
| REVISION | | DETAILS OF AMENDMENTS | | REVIEWED | DATE | | | | | | | | |



SHEET No.55 OF 100



PLAN

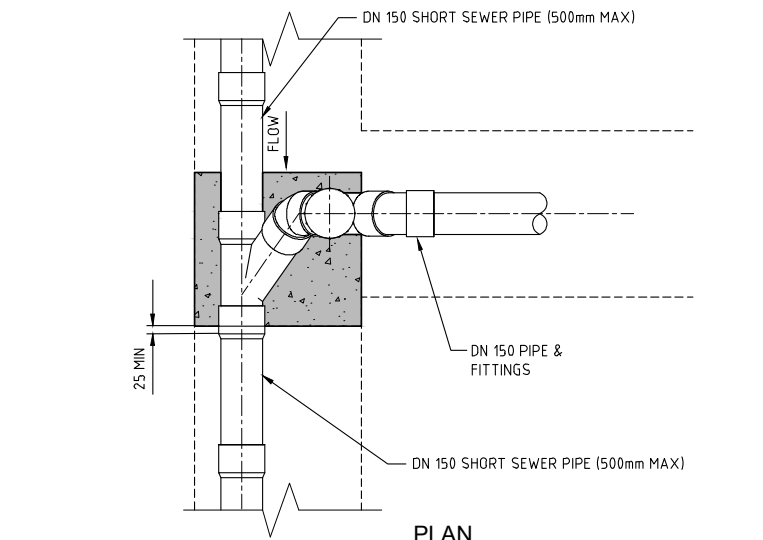


SHALLOW JUNCTION ELEVATION

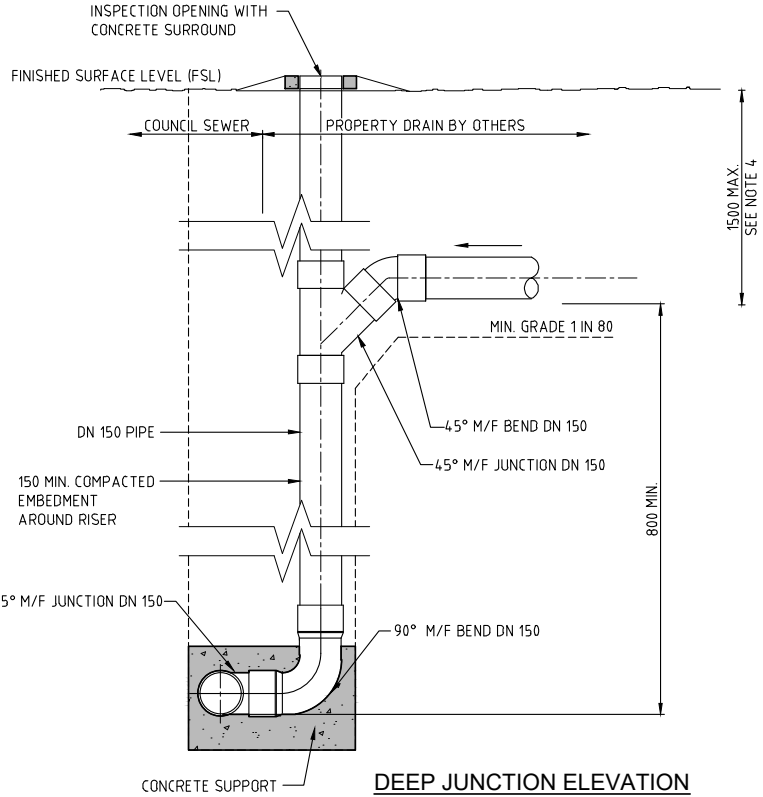
| PARTS LIST- SHALLOW JUNCTION | | |
|------------------------------|---|-----|
| ITEM | DESCRIPTION | No. |
| 1 | SEWER JUNCTION M/F DN 150 45° R.R.J | 1 |
| 2 | SEWER BEND M/F DN 150 45° R.R.J | 1 |
| 3 | DWV TEST OPENING/INSPECTION TEE/ACCESS FITTING DN 150 F/F | 1 |
| 4 | DN 150 SHORT SEWER PIPE 500mm MAX | 2 |
| 5 | DN 150 SHORT SEWER PIPE CUT TO SUIT | 1 |

| PARTS LIST-DEEP JUNCTION | | |
|--------------------------|---|-----|
| ITEM | DESCRIPTION | No. |
| 1 | SEWER JUNCTION M/F DN 150 90° R.R.J | 2 |
| 2 | SEWER BEND M/F DN 150 45° R.R.J | 1 |
| 3 | DWV TEST OPENING/INSPECTION TEE/ACCESS FITTING DN 150 F/F | 1 |
| 4 | DWV ACCESS COUPLING DN 150 R.R.J./SPGT WITH CAP | 1 |
| 5 | DN 150 SHORT SEWER PIPE 500mm MAX | 2 |
| 6 | DN 150 SHORT SEWER PIPE CUT TO SUIT | 1 |

- NOTES:
- DN MEANS NOMINAL DIAMETER.
 - ALL PROPERTY SEWER CONNECTION BRANCHES SHALL HAVE A MIN. GRADE OF 1 IN 80.
 - ALL PROPERTY SEWER CONNECTION BRANCHES SHALL FINISH WITH AN INSPECTION TEE WITH THE END AND INSPECTION OPENING HAVING A SCREWED CAP AT THE INVERT LEVEL SHOWN ON THE DRAWINGS.
 - PLUMBER TO INSTALL SHAFT WHEN CONNECTING PROPERTY. DEPTH OF THE INVERT OF THE TEE SHALL BE NO GREATER THAN 15m UNLESS A GREATER DEPTH IS REQUIRED TO SERVICE A MINIMUM OF 90% OF EACH LOT IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 3500.2:2018 SECTION 4.
 - THE MINIMUM DEPTH OF THE SOFFIT OF THE SEWER CONNECTION POINT SHALL BE 1.2m OR IN ACCORDANCE WITH WSA02-2014-3.1 CLAUSE 5.6.5 SUBJECT TO APPROVAL OF THE DIRECTOR.
 - LOCATION OF INSPECTION TEE SHALL BE:
 - WHERE PUBLIC SEWER IS LOCATED WITHIN THE PROPERTY BEING SERVED:
 - FOR EXISTING DWELLINGS, AT THE MOST PRACTICAL POINT INSIDE THE PROPERTY BOUNDARY TO FACILITATE THE CONNECTION.
 - FOR VACANT ALLOTMENTS, AT THE MOST PRACTICAL POINT INSIDE THE PROPERTY BOUNDARY TO FACILITATE THE CONNECTION, CONSIDERING TOPOGRAPHY AND THE MOST LIKELY POSITION OF SEWER DRAINAGE OUTLETS.
 - WHERE PUBLIC SEWERS ARE NOT LOCATED WITHIN THE PROPERTY BEING SERVED, THE INSPECTION TEE SHALL BE LOCATED 1.0m INSIDE THE PROPERTY BOUNDARY TO FACILITATE THE CONNECTION, CONSIDERING TOPOGRAPHY AND THE MOST LIKELY POSITION OF SEWER DRAINAGE OUTLETS.
 - BEDDING MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF COUNCIL'S STANDARD SPECIFICATION.
 - CONCRETE SUPPORTS SHALL BE N20 AND COMPACTED TO SUPPORT 45° JUNCTIONS AND PIPES. THE SUPPORTS SHALL EXTEND FROM THE TRENCH WALLS AND FLOOR TO THE TOP OF THE PIPES AS SHOWN.
 - THESE DETAILS ARE APPLICABLE TO SEWER MAINS FROM DN150 TO DN300 INCLUSIVE.
 - ALL DIMENSIONS ARE IN MILLIMETRES.
 - ALL PUBLIC PROPERTY SEWER CONNECTIONS ARE DN150 MIN.
 - ALL PIPEWORK AND FITTINGS TO BE RUBBER RING JOINTS (R.R.J)
 - NO PROPERTY SEWER CONNECTION LINE SHALL BE LONGER THAN 10m.
 - PROPERTY SEWER CONNECTIONS ARE NOT PERMITTED ON SEWERS OF DN300 OR LARGER. AN ADDITIONAL SMALLER DIAMETER PUBLIC SEWER LINE IS TO BE PROVIDED FOR SUCH CONNECTIONS.
 - ALL COUNCIL PIPEWORK TO BE S.N.8 OR GREATER IF OTHERWISE SPECIFIED.



PLAN



DEEP JUNCTION ELEVATION

Orange City Council
Civic Centre
Cnr Byng Street & Lords Place
PO Box 35
Orange NSW 2800
Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au

PLANS FOR
REVIEW
NOT FOR
CONSTRUCTION

ALL LEVELS ARE IN METRES
ALL OTHER DIMENSIONS ARE IN METRES
UNLESS OTHERWISE STATED
DO NOT SCALE OFF PLANS

ORIGINAL PAPER SIZE:
A1
COORDINATES:
MGA 94
DRAWN:
A TOMS
REVIEWED:
J BARNES
DATE:
12/07/2023
DATE:
12/07/2023

ORANGE CITY COUNCIL STANDARD DRAWINGS
PROPERTY JUNCTION CONNECTION DETAILS

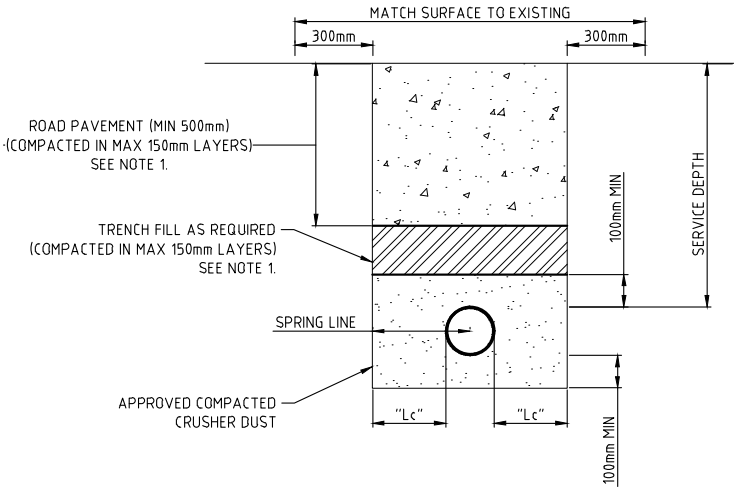
SHEET NUMBER: 55 OF 100
ISSUE DATE: 12/07/2023
REVISION: A

PRELIMINARY ISSUE
DETAILS OF AMENDMENTS

J BARNES
REVIEWED

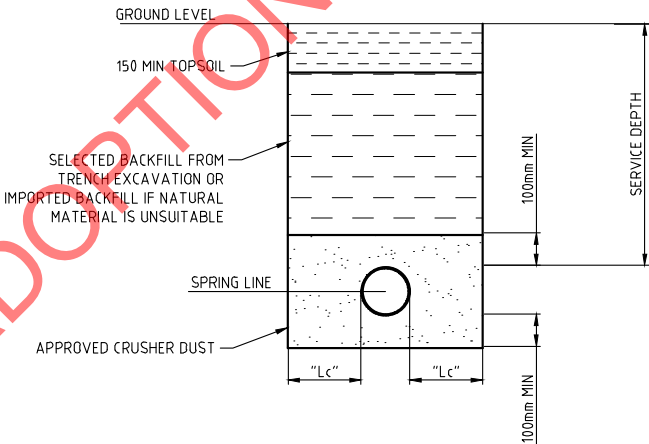
12/07/2023
DATE

SHEET No. 56 OF 100



CASE No. 1 - ROAD CROSSINGS
SCALE 1: 10

EXISTING ROADS ONLY
UNDER ROAD PAVEMENT AND FOR 1m EACH SIDE
OF ROADWAY IMMEDIATELY BEHIND KERB LINE




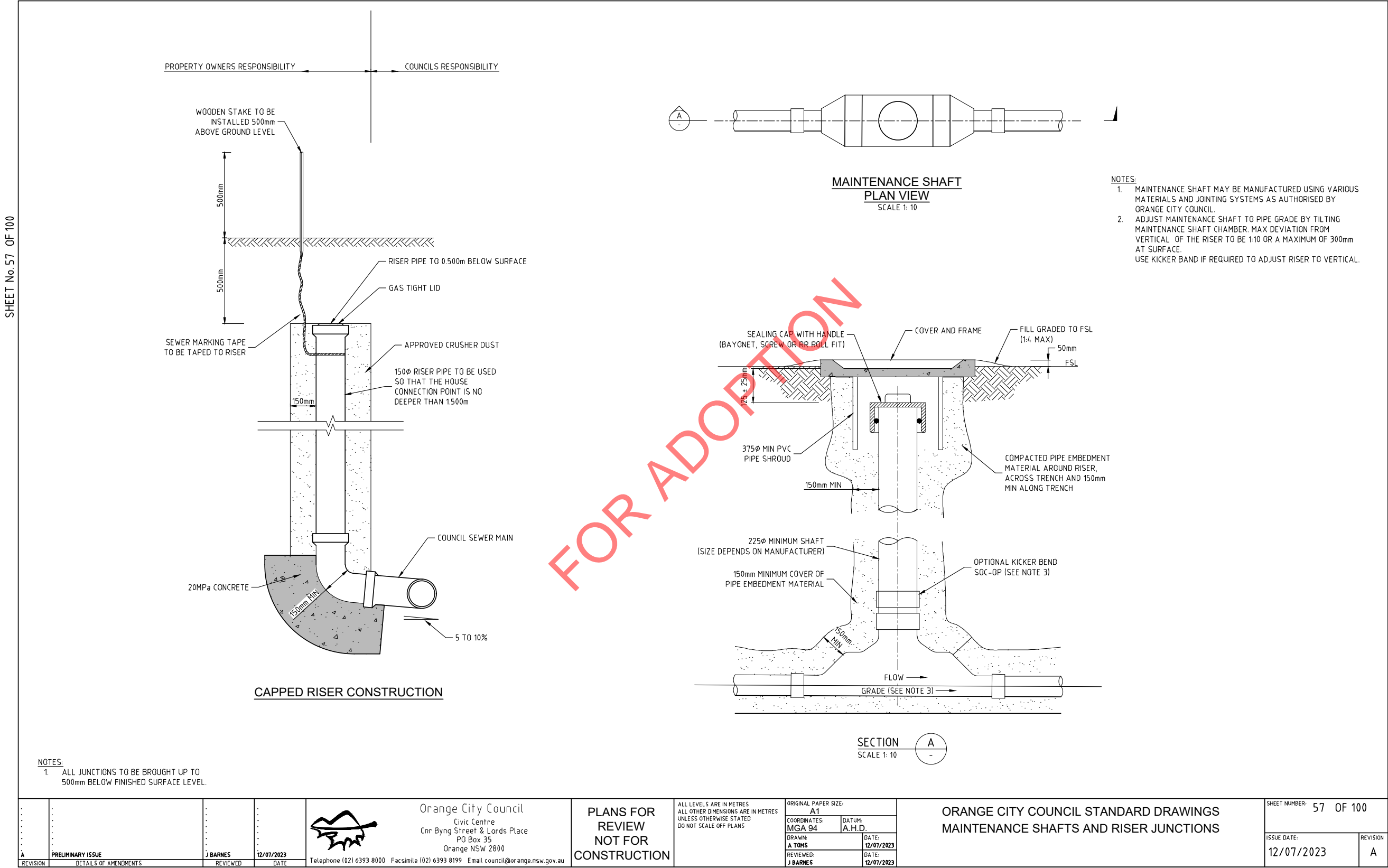
CASE No. 2 - ALL OTHER CASES
SCALE 1: 10

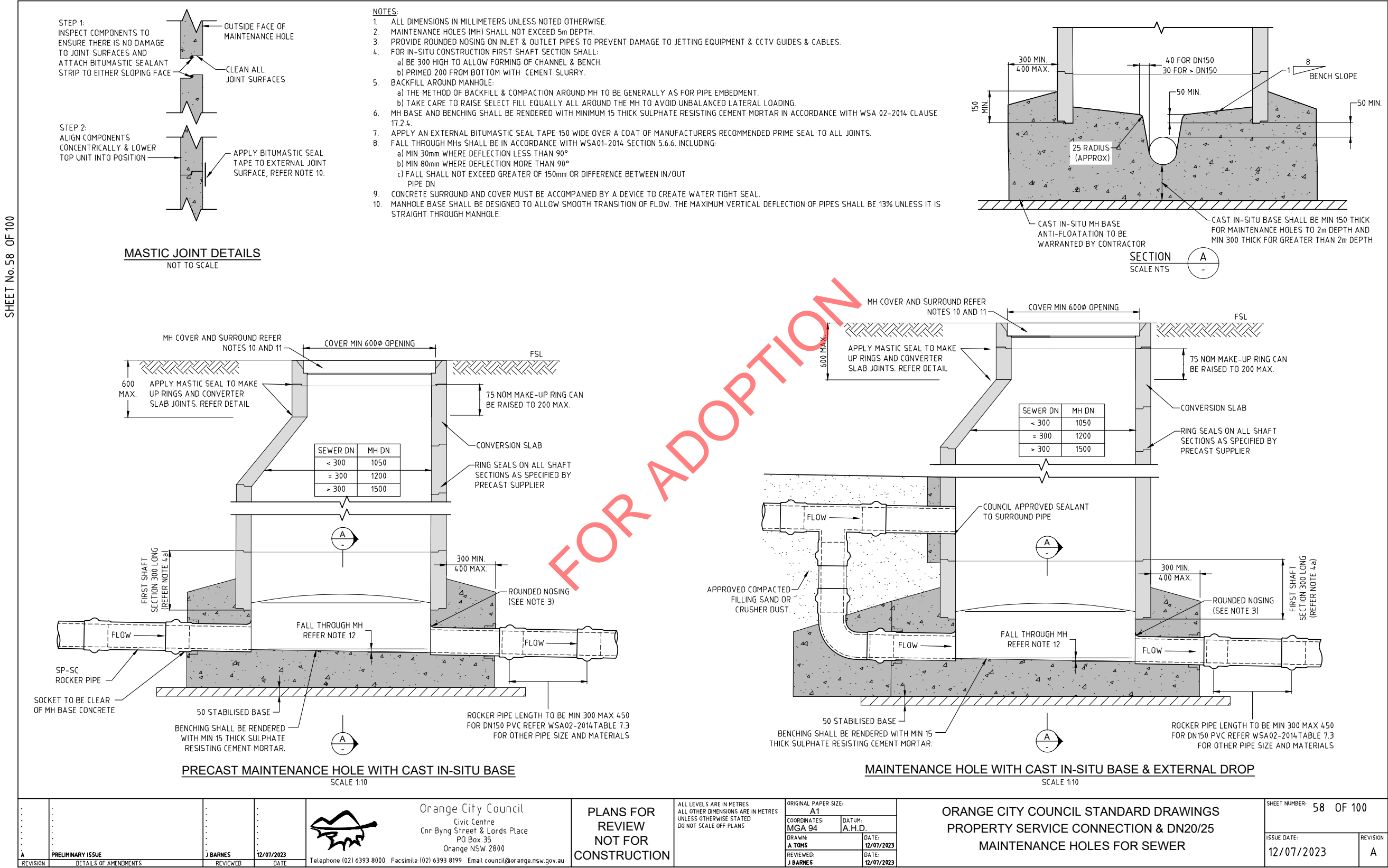
| MINIMUM PIPE COVER | |
|------------------------------|---------------|
| LOCATION | MINIMUM COVER |
| NON-ROADWAYS - GENERAL | 600 mm |
| - INDUSTRIAL / COMMERCIAL | 600 mm |
| SEALED ROADS | 900 mm |
| MAJOR ROADWAYS / EMBANKMENTS | 1200 mm |

| SPRING LINE TRENCH CLEARANCE | |
|------------------------------|------------------------|
| NOMINAL DIAMETER (DN) | MINIMUM CLEARANCE "Lc" |
| ≤ 150 | 100 |
| >150 - ≤300 | 150 |
| >300 - ≤450 | 200 |
| >450 - ≤900 | 300 |
| >900 - ≤1500 | 350 |

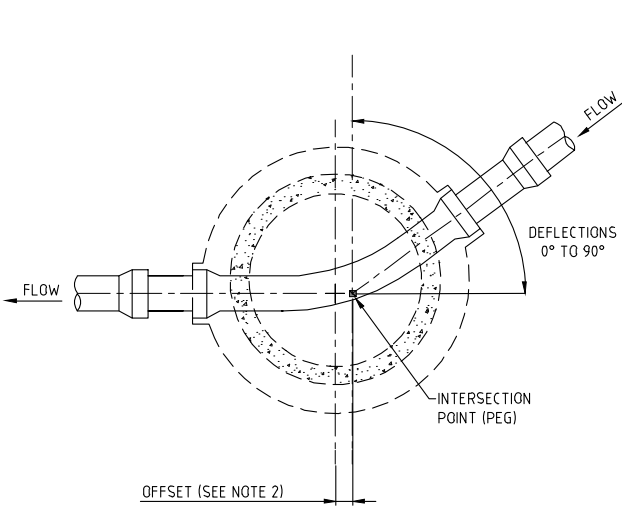
NOTES:
1. ROAD PAVEMENT AND TRENCH FILL TO CONSIDER EXISTING ROAD PAVEMENT AND REQUIRE ORANGE CITY COUNCIL APPROVAL.

| | | | | | | | | | | | |
|---|-------------------|----------|------------|---|--|---|---|--|---|---------------------------|---------------|
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 |  <div>Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au</div> | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 COORDINATES: MGA 94 DRAWN: A TOMS REVIEWED: J BARNES | DATUM: A.H.D. DATE: 12/07/2023 DATE: 12/07/2023 | ORANGE CITY COUNCIL STANDARD DRAWINGS SEWER MAIN BEDDING | SHEET NUMBER: 56 OF 100 | |
| | | | | | | | | | | ISSUE DATE: 12/07/2023 | REVISION A |

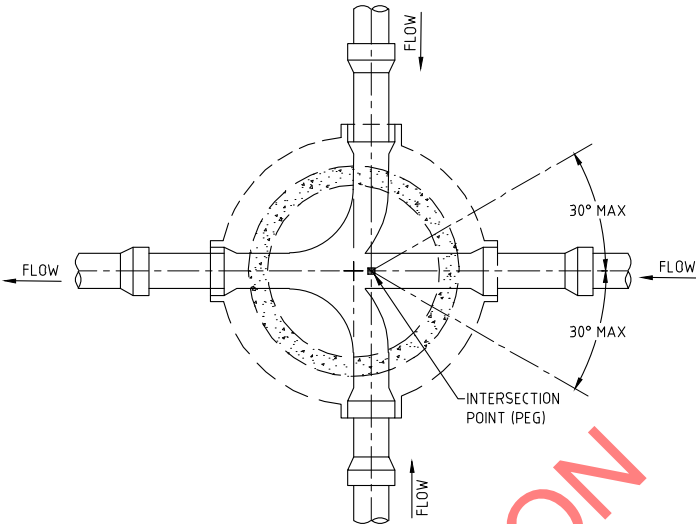




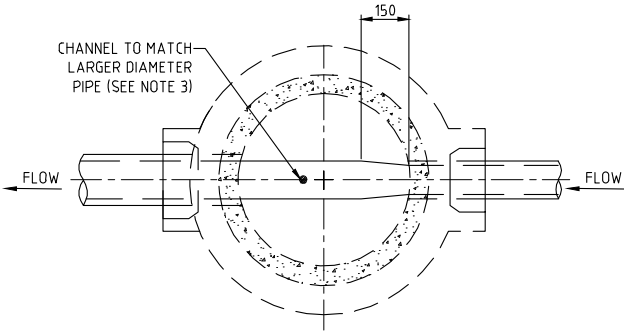
SHEET No.59 OF 100



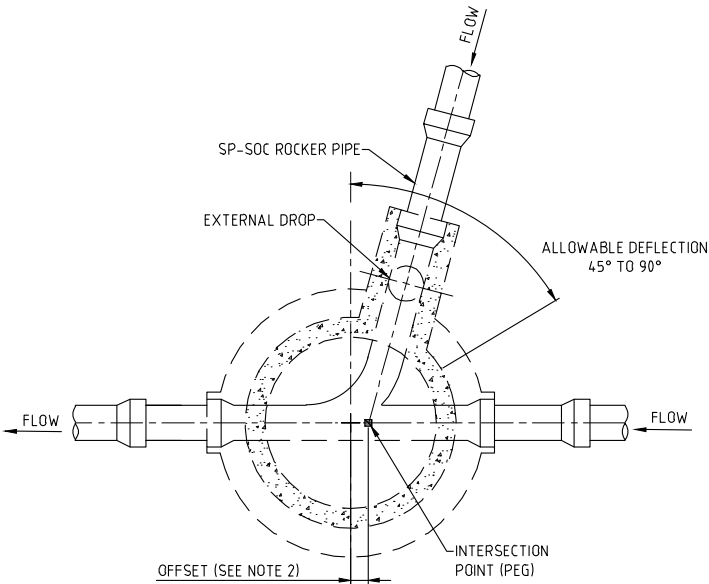
CHANGE IN DIRECTION OF SEWER



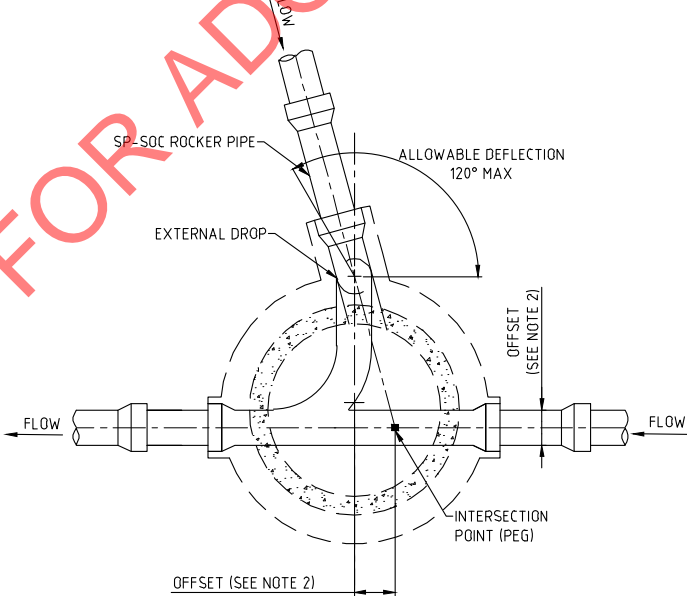
MULTIPLE INCOMING SEWERS



CHANGE IN DIAMETER OF SEWER




INCOMING SEWERS HAVING EXTERNAL DROP

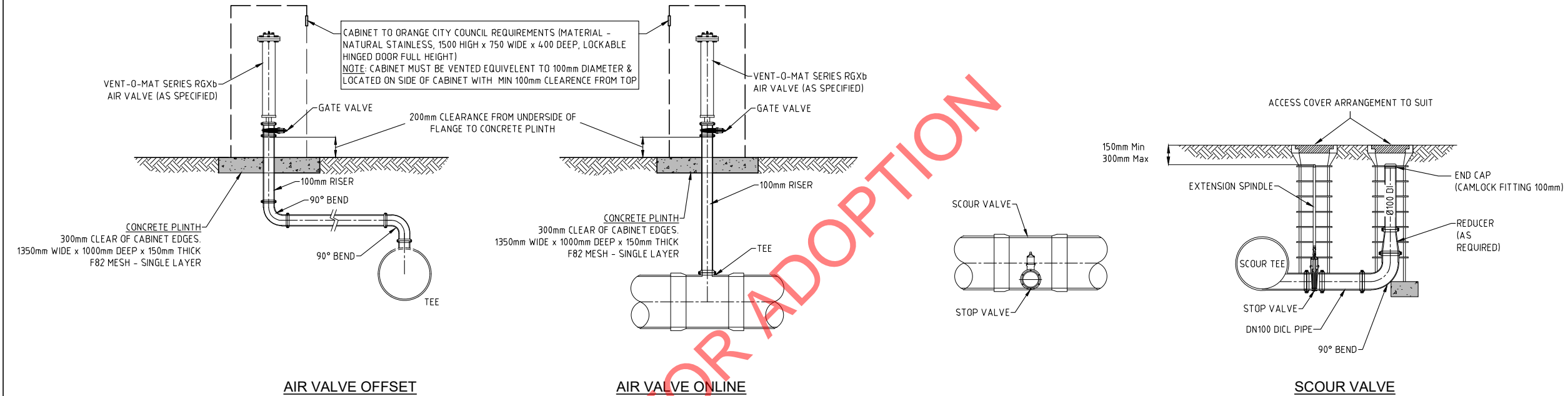


- LEGEND:
- Intersection point symbol: INTERSECTION POINT
 - Centreline of manhole symbol: CENTRELINE OF MH

- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETRES.
 - WHERE NECESSARY PULL MH OFF CENTRELINE OF SEWER (MAX 200) TO IMPROVE FLOW AND ACCESSIBILITY PROVIDED TO BE CONTINUED WITHIN MH.
 - INVERT LEVELS TO BE AS SHOWN IN DESIGN DRAWINGS
 - PROVIDE BENCHING COMPRISING TWO UNOBSTRUCTED AREAS OF AT LEAST 250mm, SUITABLY SPACED TO ALLOW A PERSON TO STAND WITHOUT OBSTRUCTION BY DROPS, STEP IRONS OR LADDERS. PROVIDE ALSO A MINIMUM 750x750 WORKING AREA CLEAR OF ANY OBSTRUCTION.
 - PROVIDE FALL ACROSS MH
 - FOR DEFLECTIONS UP TO 30°, FALL TO BE NOT LESS THAN 30.
 - FOR DEFLECTIONS BETWEEN 30 & 60°, FALL TO BE NOT LESS THAN 50.
 - FOR DEFLECTIONS >60°, FALL TO BE NOT LESS THAN 80.

| | | | | | | | | | | | | | | | | | |
|------------------------|--|-----------------------|--|---|--|--|--|--|--|---|--|---|--|--|--|-------------------------|--|
| | | | |  | | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 | | PLANS FOR REVIEW NOT FOR CONSTRUCTION | | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | | <div>ORIGINAL PAPER SIZE: A1</div> <div>COORDINATES: MGA 94</div> <div>DRAWN: A TOMS</div> <div>REVIEWED: J BARNES</div> <div>DATUM: A.H.D.</div> <div>DATE: 12/07/2023</div> <div>DATE: 12/07/2023</div> | | ORANGE CITY COUNCIL STANDARD DRAWINGS MAINTENANCE HOLE TYPICAL CHANNEL ARRANGEMENTS | | SHEET NUMBER: 59 OF 100 | |
| A PRELIMINARY ISSUE | | J BARNES | | 12/07/2023 | | Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | | | | | | | | ISSUE DATE: 12/07/2023 | | REVISION A | |
| REVISION | | DETAILS OF AMENDMENTS | | REVIEWED | | DATE | | | | | | | | | | | |

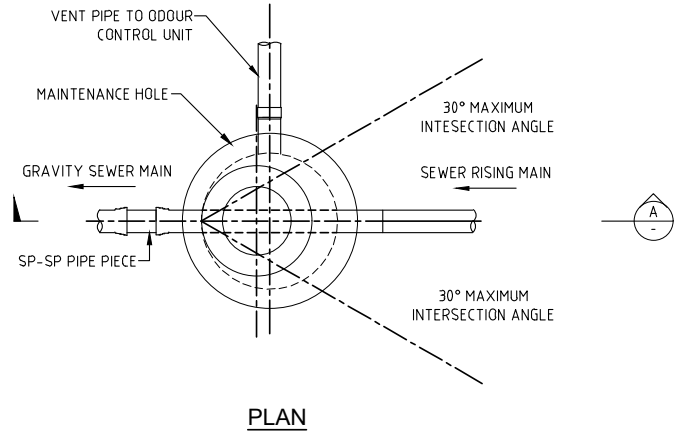
SHEET No. 60 OF 100



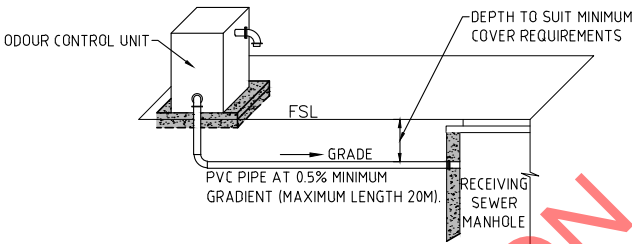
- NOTES:
- 1. ALL DIMENSIONS ARE IN MILLIMETRES
 - 2. PHYSICAL POSITION AND SIZE TO BE IN ACCORDANCE WITH ORANGE CITY COUNCIL REQUIREMENTS
 - 3. ODOUR CONTROL UNITS TO BE OF AN ACTIVATED CARBON TYPE, SIZED TO MANAGE ACTUAL PUMP FLOWS (ZC300 MCBURNS OR SIMILAR)
 - 4. ALL SEWER AIR VALVES ARE TO HAVE ODOUR CONTROL UNITS INSTALLED.

| | | | | | | | | | | | | | |
|----------|-----------------------|----------|------------|---|---|--|---|----------------------------|------------------|--|---------------------|---------------------------|---------------------|
| | | | |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 | | ORANGE CITY COUNCIL STANDARD DRAWINGS AIR VALVE AND SCOUR VALVE DETAILS | | SHEET NUMBER: 60 OF 100 | |
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | DRAWN: A TOMS | DATE: 12/07/2023 | ISSUE DATE: 12/07/2023 | REVISION: A |
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | | | | | | | | | REVIEWED: J BARNES | DATE: 12/07/2023 |

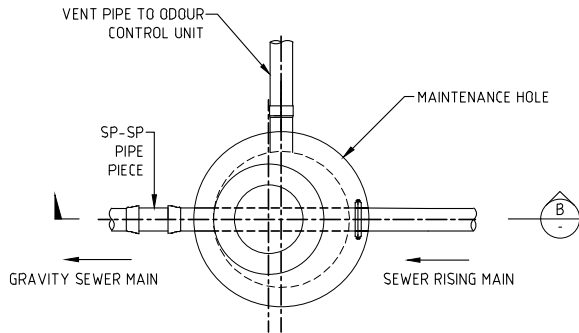
SHEET No. 61 OF 100



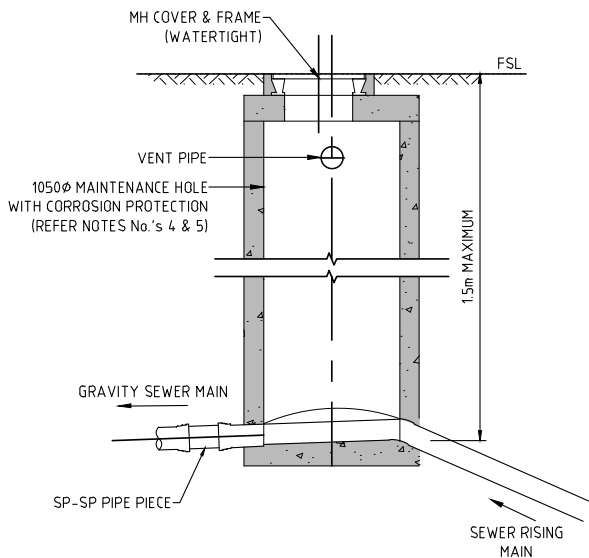
PLAN



TYPICAL ODOUR CONTROL UNIT
ARRANGEMENT - MANHOLE

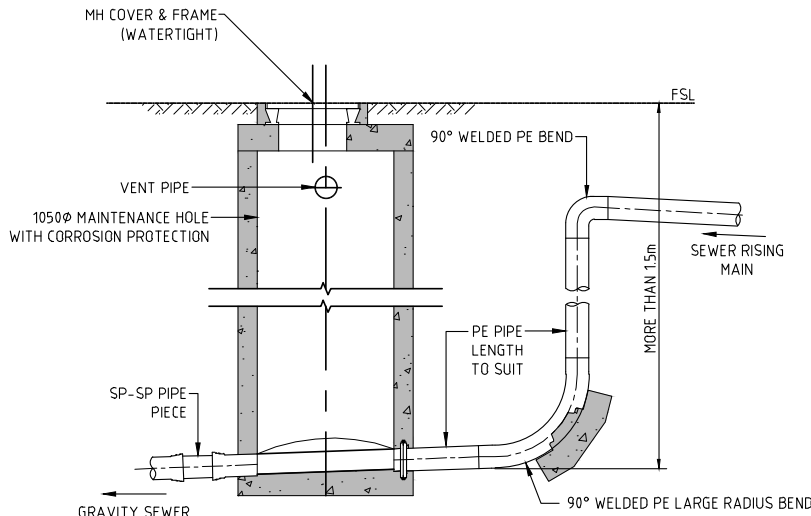


PLAN



SECTION A-A
SCALE NTS

TYPE 1



SECTION B-B
SCALE NTS

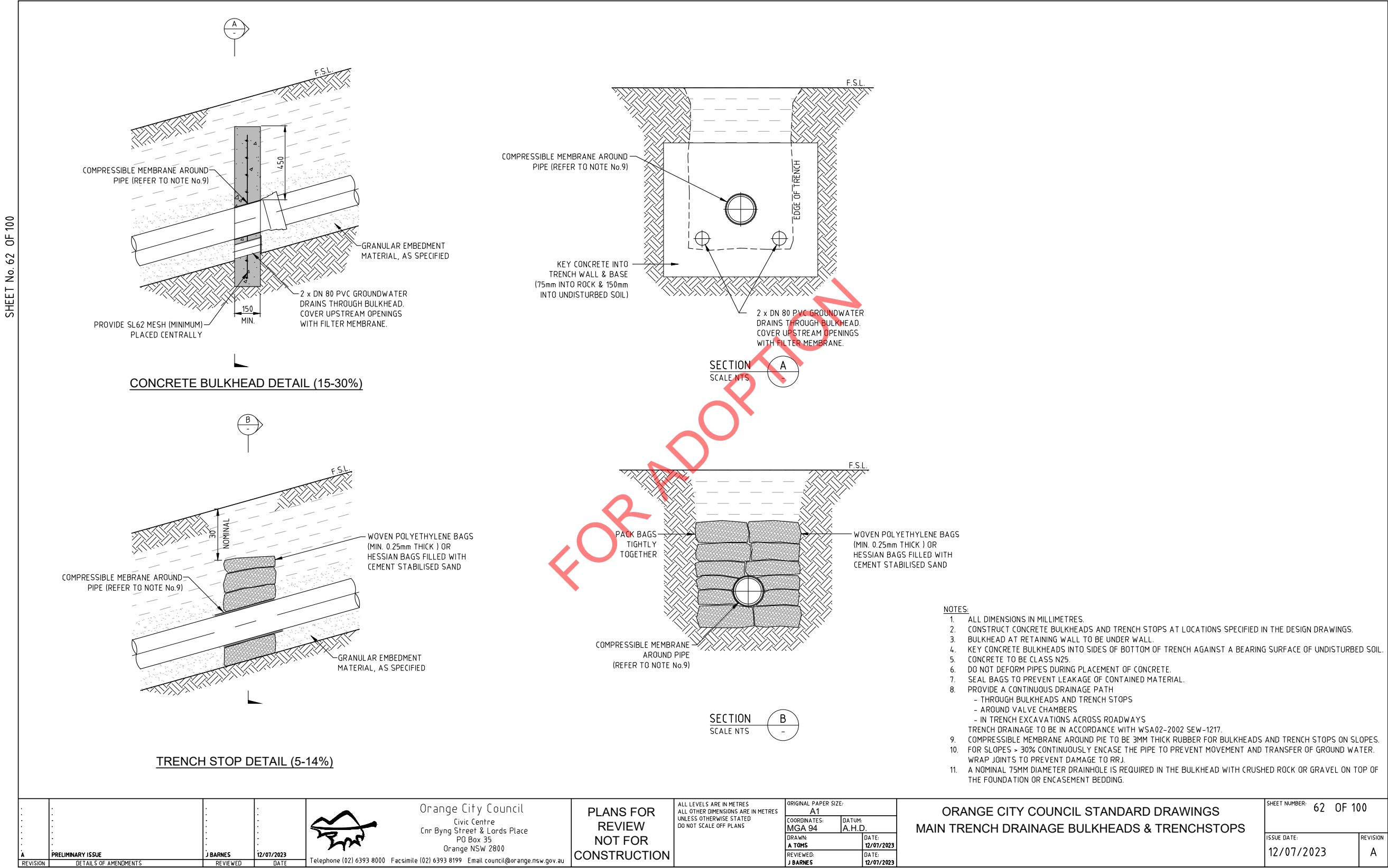
TYPE 2

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. DISCHARGE CHAMBERS TO BE IN ACCORDANCE WITH SHEET 58.
 3. INTERNAL CONCRETE SURFACES TO BE COATED WITH SIKA SIKAGUARD 62 OR FOSROC NITOMORTAR ELS OR APPROVED EQUIVALENT. APPLICATION TO BE IN ACCORDANCE WITH PRODUCT SUPPLIER'S SPECIFICATIONS.
 4. ANY CHAMBER WITHIN 100m DOWNSTREAM OF A RISING MAIN DISCHARGE CHAMBER TO BE PROTECTED IN A SIMILAR MANNER TO THE DISCHARGE CHAMBER.
 5. BACKFILL IN VENT PIPE TRENCH SHALL BE COMPACTED TO AT LEAST THE SAME DENSITY AS THE SURROUNDING SOIL.
 6. MASS CONCRETE THRUST BLOCKS ARE TO BE PLACED AT BENDS & PIPE JUNCTIONS ON THE SRM. REFER TO DESIGN DRAWINGS FOR LOCATION & SIZES OF THRUST BLOCKS.
 7. ALL RECEIVING MANHOLES IN RESIDENTIAL AREAS ARE TO HAVE ODOUR CONTROL UNITS INSTALLED.
 8. THE DIAMETER OF THE PIPEWORK FROM THE MAINTENANCE HOLE TO THE VENT PIPE & WITHIN THE VENT PIPE SHOULD BE EQUAL TO OR LARGER THAN THE DIAMETER OF THE LARGEST MAIN IN THE MAINTENANCE HOLE. THE VENT PIPE STRUCTURE SHOULD BE CONSTRUCTED TO MATCH THE SIZE OF THE VENT PIPEWORK.

NOTE:
ALL FITTINGS USED FOR EXTERNAL DROP
CONSTRUCTION ARE TO BE mPVC OR DI EPOXY
LINED INTERNALLY & EXTERNALLY

NOTE:
THE TYPE 1 OPTION IS THE PREFERRED
OPTION IF THE LOCATION ALLOWS.

| | | | | | | | | | | | | | |
|---|-------------------|----------|------------|---|---|--|---|----------------------------|------------------|--|---------------------|---------------------------|----------------|
| | | | |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 | | ORANGE CITY COUNCIL STANDARD DRAWINGS DISCHARGE MAINTENANCE HOLE FOR SEWER RISING MAINS | | SHEET NUMBER: 61 OF 100 | |
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | DRAWN: A TOMS | DATE: 12/07/2023 | ISSUE DATE: 12/07/2023 | REVISION: A |



SHEET No. 63 OF 100

| PRE-COMMISSIONING CHECKLIST | CHECK |
|--|-------|
| ELECTRICAL | |
| CONFIRM THAT 'NOTIFICATION OF ELECTRICAL WORK' HAS BEEN SUBMITTED TO ENERGY SUPPLIER AND ORANGE CITY COUNCIL WATER AND WASTEWATER UNIT | |
| CHECK THAT ELECTRICITY SUPPLY HAS BEEN CONNECTED AND ENERGISED | |
| FACTORY ACCEPTANCE TESTING (FAT) COMPLETED AND RESULTS ACCEPTABLE? (NOTE: SEPARATE DOCUMENTATION IS REQUIRED FOR THIS CHECK E.1.001.1) | |
| CHECK 'DANGER ELECTRIC' MARKER BRICKS ARE INSTALLED AT GROUND LEVEL AND PAINTED YELLOW | |
| CHECK POLE / PILLAR TERMINATION METHOD IS AS PER THE SPECIFICATION AND THE SUPPLY AUTHORITY REQUIREMENTS | |
| CHECK CABLE SUPPORTS FOR THE PUMP CABLES, LEVEL PROBE AND ANY LEVEL REGULATORS ARE CORRECTLY LOCATED AND PROPERLY FIXED | |
| CHECK MOTOR CABLES ARE SUPPORTED IN THE WET-WELL - TO AVOID DAMAGE WHEN REMOVING OTHER PUMP | |
| VERIFY LEVEL CONTROLLER CALIBRATION | |
| CHECK OVERFLOW TRODE HAS BEEN ADJUSTED TO THE REQUIRED LEVEL AND TERMINATED IN SWITCHBOARD | |
| CHECK NO-FLOW PROTECTION EQUIPMENT (IF SPECIFIED) FITTED AND WIRED CORRECTLY | |
| CHECK SWITCHBOARD HAS BEEN INSTALLED CORRECTLY | |
| CHECK EARTH ELECTRODE INSTALLED AS SPECIFIED AND MEASURE AND RECORD EARTH RESISTANCE | |
| CHECK EARTH PIT, MAIN EARTH ELECTRODE AND BOND INSTALLED AND LABELLED AS SPECIFIED | |
| CHECK ALL CABLES ARE PROPERLY GLANDED AT THE SWITCHBOARD | |
| CHECK APPROPRIATE LUGS FITTED TO ALL FLEXIBLE CABLES, AND CABLES CORRECTLY IDENTIFIED AT TERMINATORS | |
| CHECK ALL SWITCHBOARD LABELS ARE AS SPECIFIED | |
| CHECK ALL SAFETY LABELS INSTALLED AS SPECIFIED | |
| IF NO-FLOW PROTECTION IS FITTED SET THE NO-FLOW BYPASS TIMER TO 20 SECONDS | |
| CHECK ALL SWITCHBOARD TERMINALS HAVE BEEN RE-TENSIONED, PARTICULARLY THOSE TERMINATIONS CARRYING MOTOR CURRENT | |
| CHECK ALL WIRE NUMBERS ARE AS SHOWN ON THE DRAWINGS | |
| CHECK ALL TERMINAL NUMBERS ARE AS SHOWN ON THE DRAWINGS | |
| CHECK ALL FUSES / CIRCUIT BREAKER SETTINGS ARE CORRECT | |
| CHECK ALL OTHER MOTOR PROTECTION EQUIPMENT OPERATES AS SPECIFIED | |
| CARRY OUT POINT TO POINT WIRING CHECKS | |
| TECHNICAL | |
| PLC DEVELOPED AND TESTING IN WORKSHOP? | |
| RTU INSPECTED AND INSTALLED TO STANDARD? | |
| COMMUNICATIONS TO SITE CHECKED AND SATISFACTORY? | |
| LEVEL SETTINGS ESTABLISHED FROM DESIGN PHILOSOPHY FOR SPS LEVELS (INTERNAL TSC)? | |
| MECHANICAL | |
| CHECK ALL SIGNAGE IS INSTALLED AND IS APPROPRIATE E.G. CRANE SWL, 'DANGER', AUTOMATIC EQUIPMENT SIGNS, HEARING PROTECTION REQUIREMENT ETC. | |
| CHECK BUILDING AND EQUIPMENT IDENTIFICATION E.G. SITE SIGNAGE, SEWERAGE PUMPS, PIPEWORK, AND ISOLATING VALVES | |
| CHECK RPZD IS INSTALLED AND HAS BEEN TESTED BY APPROPRIATELY LICENSED PLUMBER | |

| PRE-COMMISSIONING CHECKLIST | CHECK |
|--|-------|
| CHECK TSC VEHICLE CRANE FUNCTIONALITY AND COVERAGE OVER STRATEGIC EQUIPMENT | |
| CHECK THERE IS NO RUBBISH IN THE WET WELL, INLET MH AND EMERGENCY STORAGE WHICH IS LIKELY TO DAMAGE THE SEWAGE PUMPS | |
| CHECK STAIRWAYS, HANDRAILS AND LANDING COMPLY WITH DESIGN REQUIREMENTS AND ARE PROPERLY INSTALLED, IF APPLICABLE | |
| CHECK THAT MANUFACTURERS' REQUIREMENTS IN TERMS OF INSTALLATION, LUBRICANTS AND QUANTITIES, AND ALIGNMENT HAVE BEEN COMPLIED WITH FOR RELEVANT EQUIPMENT | |
| CHECK ACCESSIBILITY TO EQUIPMENT FOR OPERATION AND MAINTENANCE | |
| CHECK PRESSURE GAUGE COCKS PROVIDED FOR EACH PUMP UPSTREAM OF THE REFLUX VALVE. | |
| CHECK ALL PIPEWORK WITHIN THE STATION IS COMPLETE AND SUITABLE SUPPORTED AND ANCHORED | |
| CHECK ALL SEWAGE PIPEWORK & VALVES IN VALVE PIT COMPLY WITH DESIGN, CLOSING IS CORRECT ORIENTATION AND CAN BE DISMANTLED, ETC. | |
| CHECK DIRECTION OF ROTATION OF ALL ROTATING EQUIPMENT IS CORRECT AND FREE (BUMP TEST) | |
| CHECK ALL SAFETY SIGNAGE IS INSTALLED AND IS APPROPRIATE E.G. CRANE SWL, 'DANGER', AUTOMATIC EQUIPMENT SIGNS, HEARING PROTECTION REQUIREMENT ETC. | |
| CONFIRM PUMP INSTALLATION MINIMUM DIMENSION OFF FLOOR AS PER PUMP DESIGN. | |
| CONFIRM THAT WELL WILL BE FILLED WITH SUFFICIENT WATER FOR TESTING AND HOW THIS IS BEING ARRANGED. | |
| CIVIL | |
| IS THE SRM PIPEWORK READY FOR TESTING? (I.E. PRESSURE TESTED, AIR VALVES AND SCOURS CHECKED AND COMBINED PUMPING LINES KNOWN) | |
| CHECK SITE DRAINAGE AND VALVE PIT DRAINAGE | |
| WELL SURFACE COATINGS ARE OF APPROVED PRODUCT AND APPLIED TO SUIT APPLICATION? | |
| CHECK ACCESSIBILITY TO SITE INCLUDING DRIVEWAY ENTRANCE/EXIT, TURNING OF VEHICLES, PREVENTION DEVICES TO STOP DRIVING ON LIDS ETC. | |
| WET WELL LIDS AND VALVE LIDS OPEN CORRECTLY? | |
| IS FALL PREVENTION EQUIPMENT INSTALLED CORRECTLY? | |
| BUILDING IS AS PER DESIGN AND BUILDING CODE? | |
| BUILDING CONNECTED TO POWER, LIGHTING WORKING, VENTILATION, DOORS AND SECURITY SUITABLE? | |
| HAS WATER BEEN CONNECTED WITH METER AND RPZD? | |
| DOCUMENTATION | |
| DRAWINGS – WAE COMPLETED ARE RECEIVED? | |
| OPERATIONS MANUALS PROVIDED AND SUFFICIENT FOR EACH PIECE OF EQUIPMENT? | |
| PERFORMANCE AND ASSET INFORMATION RECEIVED (PUMP CURVES, FACTORY TESTING RESULTS, USER DEFINED FIELDS IN ASSET REGISTER)? | |
| DEFECTS LIABILITY AND WARRANTIES ARE PROVIDED AND ADEQUATE? | |
| ARE INSPECTION TEST PLANS (ITP'S) IN PLACE FOR EACH PIECE OF EQUIPMENT ON THE SITE? TSC ITP'S CAN BE USED. | |

SHEET No. 64 OF 100

| COMMISSIONING CHECKLIST | | | | |
|--|---------|------|------|---------|
| SPS NAME: | | | | |
| SPS LOCATION: | | | | |
| DNP (WHEN CHANGING DNP ADDRESS POWER DOWN AFTER CHANGE) | | | | |
| NOTE: ENSURE: SCADAPACK FIRMWARE IS ABOVE 8.12.1, HMI IS VERSION 4.2, ISAGRAF IS VERSION 09D FOR SPS AND BACKUP CONTROLLER PLC HAS STD_SPS_TSC_V_1.0.PRO. | | | | |
| GENERAL | TYPE | PASS | FAIL | CHECKED |
| TOUCH SCREEN (DOOR SW MUST BE OPEN OR RESET WILL OCCUR) CODE 0000 TILL SCADA CHANGES | GENERAL | | | |
| DUTY TYPE - CHECK CORRECT SELECTION AND BACKUP CONTROLLER IS CONFIGURED CORRECTLY. CONFIRM THAT PULSES ARE SENT IN BOTH DIRECTIONS. IF IT FAILS CHECK WIRING OR TRY 'WRITE DUTY CONFIG' AGAIN. | GENERAL | | | |
| ENSURE WORKSITE IS SAFE TO PROCEED FILL OUT RISK ASSESSMENT | GENERAL | | | |
| RECORD RADIO SERIAL NO. | GENERAL | | | |
| ALL RADIO AND COMMUNICATIONS LEADS MUST BE TESTED PRIOR TO INSTALLATION. | GENERAL | | | |
| ADJUST OVERLOAD SETTINGS TO FLC OF MOTOR, CHANGE IF REQUIRED. RECORD NAME PLATES AMPS | GENERAL | | | |
| PERFORM POINT TO POINT CHECK ON ALL WIRING. | GENERAL | | | |
| ENSURE BOTH NEUTRAL TERMINALS ON MAIN SWITCH ARE TIGHTENED (EVEN IF UNUSED) | GENERAL | | | |
| ENSURE ALL CABLES ENDS ARE FERRULED AND NUMBERED. (HAND WRITTEN LABELS UNACCEPTABLE). | GENERAL | | | |
| APPLY 3 PHASE POWER TO THE SWITCHBOARD AND TEST POWER AND CONTROL FUNCTIONS. | GENERAL | | | |
| CONFIGURE ALL COMPONENTS (ADDRESSES ETC) | GENERAL | | | |
| CHECK SYSTEM IS SET TO STANDBY AND DUTY MODE IS OPERATIONAL. | GENERAL | | | |
| ATTACH TEST MOTOR TO PUMP STARTER FOR CURRENT TEST | GENERAL | | | |
| ENSURE POWER SUPPLY 0VDC AND B- ARE IN CORRECT ORDER (0VDC ON FAR LEFT OF GREEN PLUG, B- 2ND TERMINAL IN) | GENERAL | | | |
| PRIMARY CHECK CT'S DIRECTION OF CABLE THROUGH CT | GENERAL | | | |

| COMMISSIONING CHECKLIST | | | | |
|---|---------------|-----|-------|-------|
| INPUTS & ALARMS (ATTACH TEST MOTOR TO PUMP STARTER FOR CURRENT TEST) | TYPE | HMI | SCADA | ALARM |
| PUMP 1 AUTO | DIGITAL INPUT | | | |
| PUMP 1 MANUAL | DIGITAL INPUT | | | |
| PUMP 1 RUNNING | | | | |
| PUMP 1 THERMISTOR (REMOVE BRIDGING RESISTOR) | DIGITAL INPUT | | | |
| PUMP 1 SEAL (SHORT TO EARTH) | DIGITAL INPUT | | | |
| PUMP 1 STARTER FAULT (REMOVE WIRE 610 ON STARTER) ENSURE DOESN'T AUTO RESET | DIGITAL INPUT | | | |
| PUMP 1 C/B STATUS (TURN OFF PUMP ISOLATOR) | DIGITAL INPUT | | | |
| PUMP 1 UNAVAILABLE | DIGITAL INPUT | | | |
| PUMP 1 FAILED TO START (REMOVE RUN RELAY) | ALARM | | | |
| PUMP 1 INHIBITED (SELECT IN PUMP > CONTROL) | ALARM | | | |
| PUMP 1 LOW AMPS (CHANGE SETTINGS ON TOUCH SCREEN) THREE TIMES THEN LOCKOUT | ALARM | | | |
| PUMP 1 HIGH AMPS (CHANGE SETTINGS ON TOUCH SCREEN) | ALARM | | | |
| PUMP 2 AUTO | ALARM | | | |
| PUMP 2 MANUAL | DIGITAL INPUT | | | |
| PUMP 2 RUNNING | DIGITAL INPUT | | | |
| PUMP 2 THERMISTOR | DIGITAL INPUT | | | |
| PUMP 2 SEAL | DIGITAL INPUT | | | |
| PUMP 2 STARTER FAULT | DIGITAL INPUT | | | |
| PUMP 2 C/B STATUS | DIGITAL INPUT | | | |
| PUMP 2 UNAVAILABLE | DIGITAL INPUT | | | |
| PUMP 2 FAILED TO START | ALARM | | | |
| PUMP 2 INHIBITED | ALARM | | | |
| PUMP 2 LOW AMPS | ALARM | | | |

SHEET No. 65 OF 100

| COMMISSIONING CHECKLIST | | | | |
|---|----------------|--|--|--|
| PUMP 2 HIGH AMPS | ALARM | | | |
| PUMP 3 AUTO | DIGITAL INPUT | | | |
| PUMP 3 MANUAL | DIGITAL INPUT | | | |
| PUMP 3 RUNNING | DIGITAL INPUT | | | |
| PUMP 3 THERMISTOR | DIGITAL INPUT | | | |
| PUMP 3 SEAL | DIGITAL INPUT | | | |
| PUMP 3 STARTER FAULT | DIGITAL INPUT | | | |
| PUMP 3 C/B STATUS | DIGITAL INPUT | | | |
| PUMP 3 UNAVAILABLE | ALARM | | | |
| PUMP 3 FAILED TO START | ALARM | | | |
| PUMP 3 INHIBITED | ALARM | | | |
| PUMP 3 LOW AMPS | ALARM | | | |
| PUMP 3 HIGH AMPS | ALARM | | | |
| DOOR SWITCH | DIGITAL INPUT | | | |
| SURGE ARRESTORS (REMOVE WIRE 656) | DIGITAL INPUT | | | |
| LIT1005 H LEVEL (SETUP ULTRASONIC, ADJUST POSITION SENSOR HEAD) | DIGITAL INPUT | | | |
| LIT1005 HH LEVEL (SETUP ULTRASONIC, ADJUST POSITION SENSOR HEAD) | DIGITAL INPUT | | | |
| OVERFLOW PROBE (SHORT RELAY TO EARTH) MAKE SURE BACKUP CONTROLLER RUNS | DIGITAL INPUT | | | |
| STANDBY PUMP RUNNING (SETUP ULTRASONIC, ADJUST POSITION) | DIGITAL INPUT | | | |
| LIT 1005 LOW LEVEL (SETUP ULTRASONIC, ADJUST POSITION) | DIGITAL INPUT | | | |
| BACKUP CONTROLLER RUNNING (SETUP ULTRASONIC, ADJUST POSITION) | DIGITAL INPUT | | | |
| DC POWER SUPPLY FAULT (DISCONNECT POWER TO POWER SUPPLY CB Q19) | DIGITAL INPUT | | | |
| ULTRASONIC LEVEL, INJECT 4-20MA AT INPUT AND CONFIRM CORRECT OPERATION. | ANALOGUE INPUT | | | |
| GENERATOR FAULT (IF TO BE INSTALLED) | DIGITAL INPUT | | | |

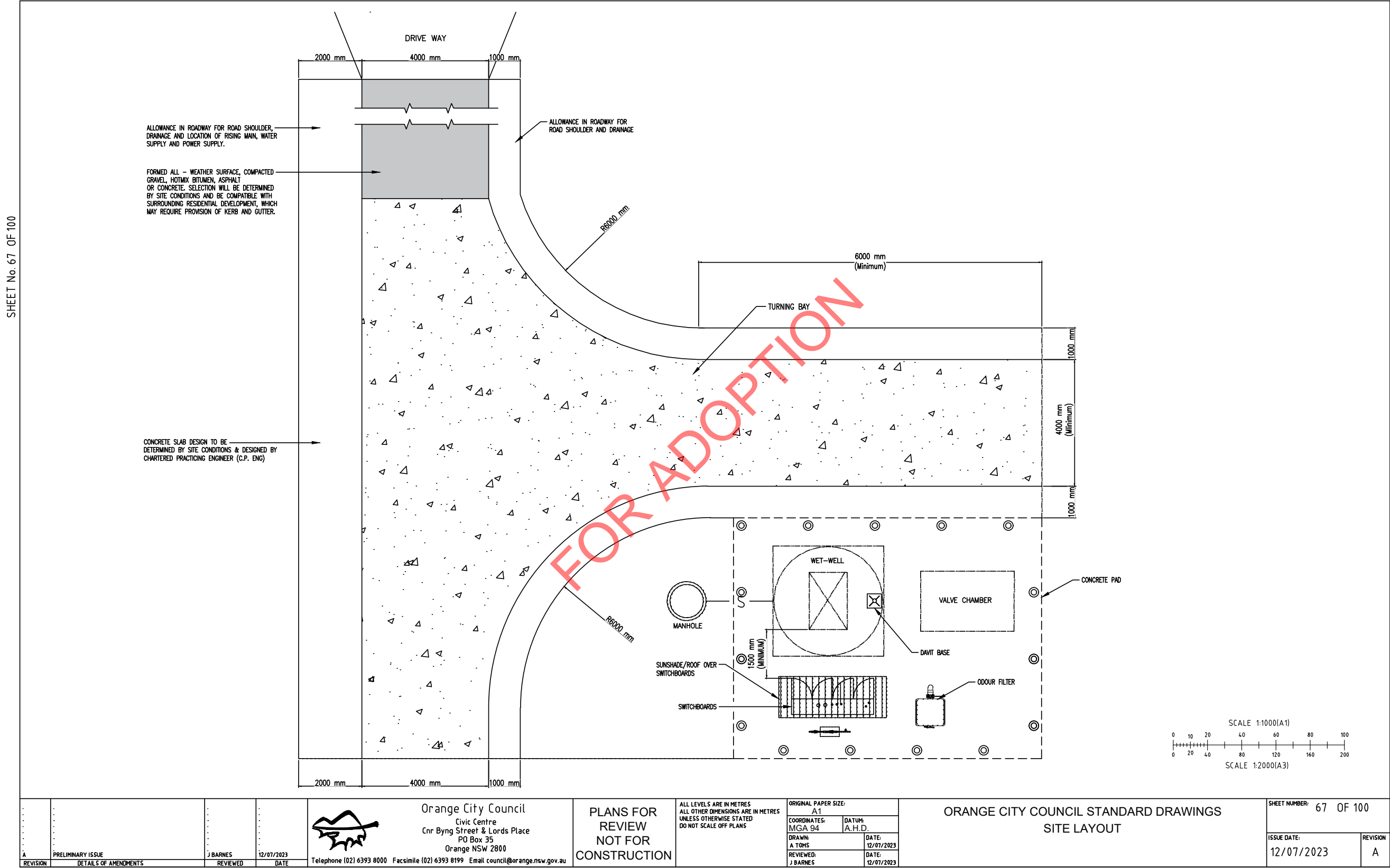
| COMMISSIONING CHECKLIST | | | | |
|--|---------------|-----|-------|-------|
| GENERATOR RUNNING (IF TO BE INSTALLED) | DIGITAL INPUT | | | |
| RAIN GAUGE COUNTER (IF TO BE INSTALLED) | DIGITAL INPUT | | | |
| FLOW METER PULSE (IF TO BE INSTALLED) | DIGITAL INPUT | | | |
| SUMP HIGH ALARM FLOAT (DRY WELL ONLY - 1 MINUTE DELAY BEFORE ALARMING) | DIGITAL INPUT | | | |
| OUTPUTS | TYPE | HMI | SCADA | ALARM |
| BACKUP PLC TEST RELAY (TIME TO RUN FROM SCADA) MAKE SURE BACKUP CONTROLLER RUNS FOR 5 MINS | DIGITAL INPUT | | | |
| STATION INHIBIT RELAY (SET TIME ON TOUCH SCREEN- ZERO WILL RESET) | DIGITAL INPUT | | | |
| WELL WASH SOLENOID RELAY (IF TO BE INSTALLED) | DIGITAL INPUT | | | |
| POWER METER (Modbus Address = 1) Comms 19200, 8,E, 1 - Primary CT set | TYPE | HMI | SCADA | ALARM |
| VOLTS A PHASE | DISPLAY | | | |
| VOLTS B PHASE | DISPLAY | | | |
| VOLTS C PHASE | DISPLAY | | | |
| AMPS A PHASE | DISPLAY | | | |
| AMPS B PHASE | DISPLAY | | | |
| AMPS C PHASE | DISPLAY | | | |
| POWER METER COMMS (REMOVE COMM-B WIRE WAIT FOR TIME OUT) | ALARM | | | |
| AC POWER FAIL (TURN OFF SUPPLY C/B Q13) OR (FOR A MULTIPLE POWER METER SITE TURN OFF ALL CIRCUIT BREAKERS) | ALARM | | | |
| TESYSU PUMP NO.1. (DIP-SWITCH SETTINGS - 01011) | TYPE | HMI | SCADA | ALARM |
| C/B OPEN REASON CODE (CIRCUIT BREAKER MUST BE IN OFF STATE) | MODBUS INPUT | | | |
| COMMS (REMOVE RJ 45 WAIT FOR TIME OUT) | MODBUS ALARM | | | |
| TESYSU PUMP NO.2. (DIP-SWITCH SETTINGS -01100) | TYPE | HMI | SCADA | ALARM |
| C/B OPEN REASON CODE (CIRCUIT BREAKER MUST BE IN OFF STATE) | MODBUS INPUT | | | |
| COMMS (REMOVE RJ 45 WAIT FOR TIME OUT) | MODBUS ALARM | | | |
| SOFT STARTER NO 1 (MODBUS ADDRESS, P1=24, P2=25, P3=26) COMMS 9600, 8, N, 1) | TYPE | HMI | SCADA | ALARM |
| ACTIVE POWER | MODBUS INPUT | | | |

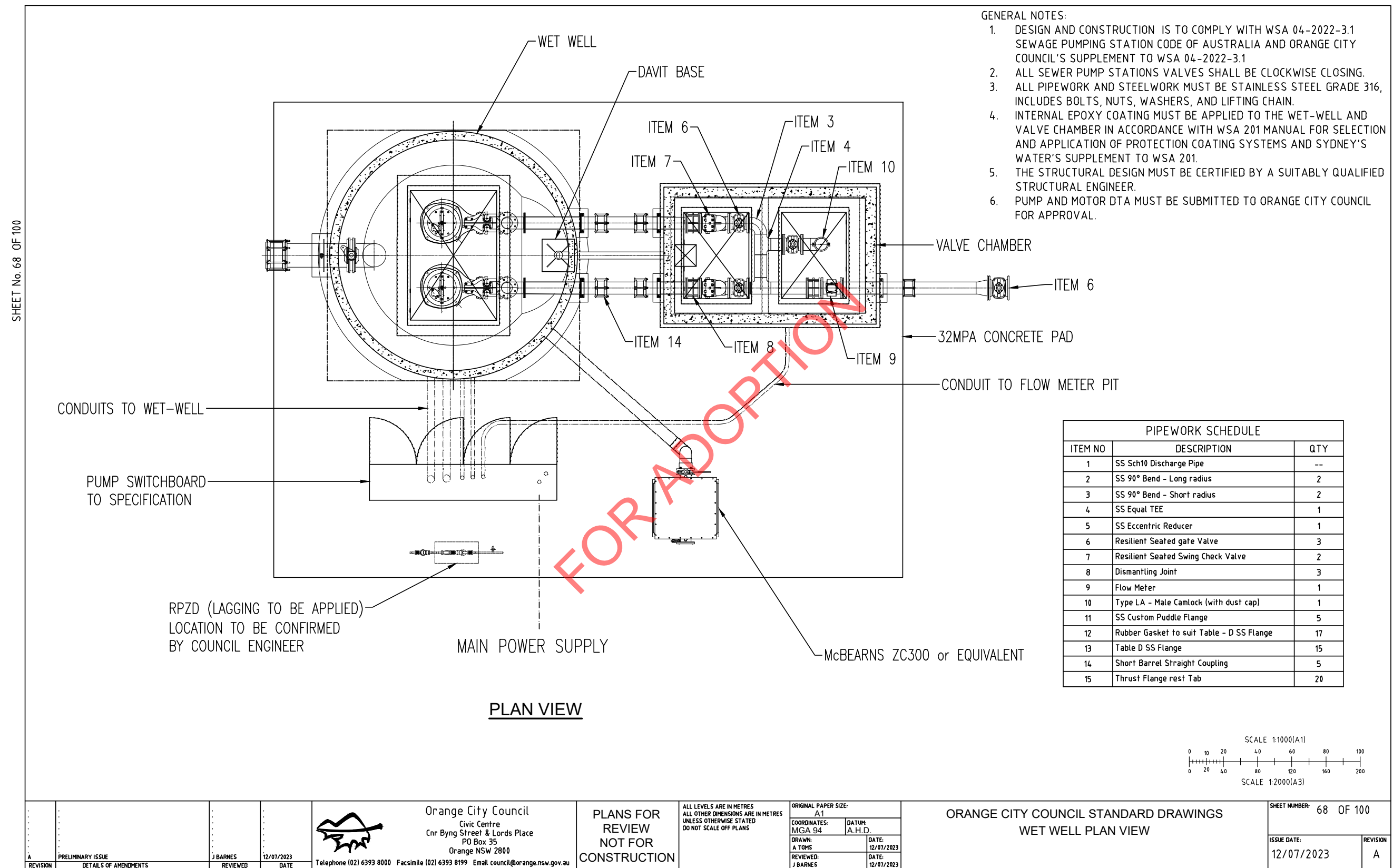
SHEET No. 66 OF 100

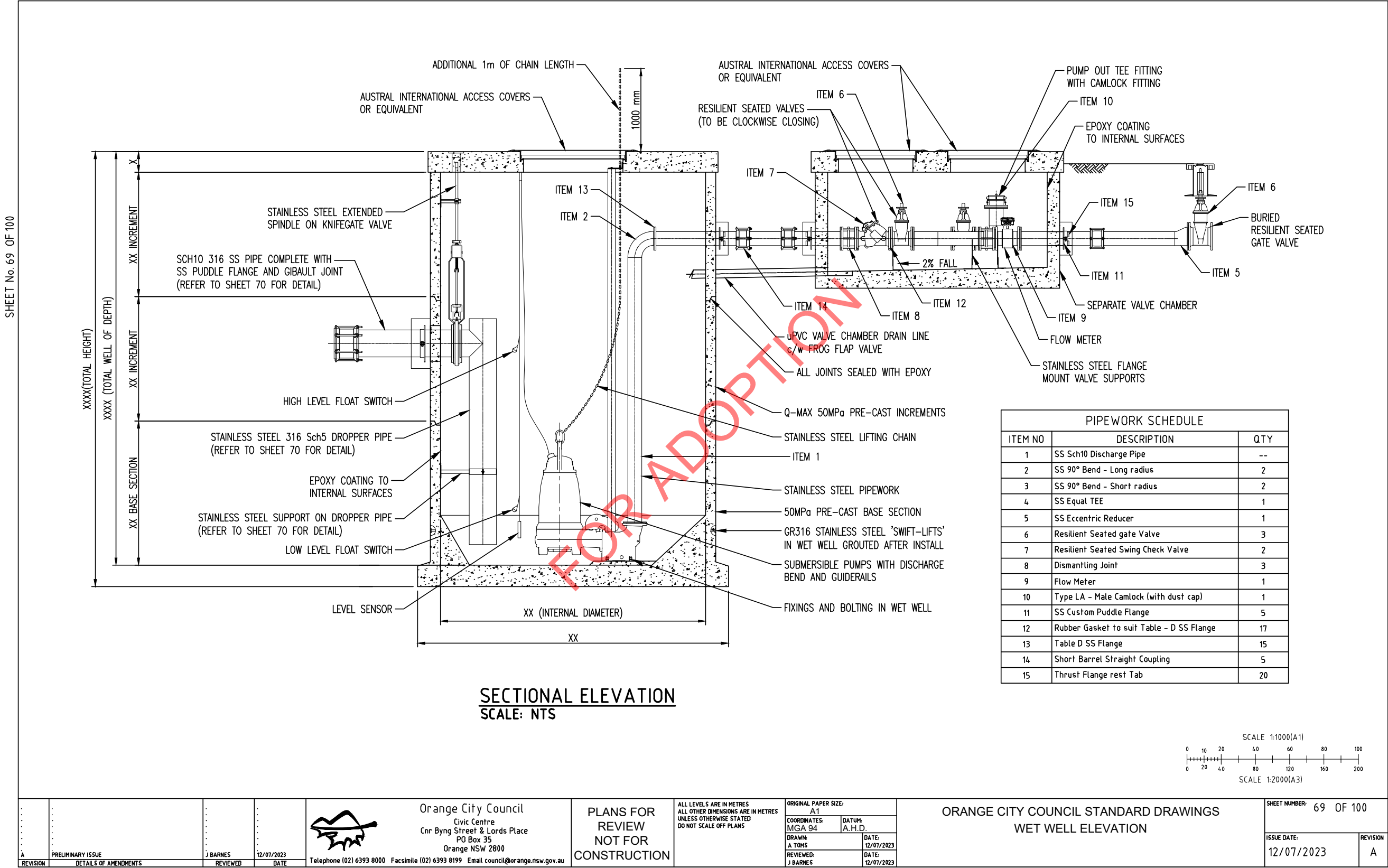
| COMMISSIONING CHECKLIST | | | | | |
|---|--------------|-----|-------|-------|--|
| ENSURE COM 2 LINK (JUMPER 13) IN SCADA PACK IS MOVED TO 485 | GENERAL | | | | |
| AMPS | MODBUS INPUT | | | | |
| C/B OPEN REASON CODE (CIRCUIT BREAKER MUST BE IN OFF STATE) | MODBUS INPUT | | | | |
| COMMS (REMOVE RJ 45 WAIT FOR TIME OUT) | MODBUS ALARM | | | | |
| SOFT STARTER NO 2 (MODBUS ADDRESS, P1=24, P2=25, P3=26) COMMS 9600, 8, N, 1) | TYPE | HMI | SCADA | ALARM | |
| ACTIVE POWER | MODBUS INPUT | | | | |
| ENSURE COM 2 LINK (JUMPER 13) IN SCADA PACK IS MOVED TO 485 | GENERAL | | | | |
| AMPS | MODBUS INPUT | | | | |
| C/B OPEN REASON CODE (CIRCUIT BREAKER MUST BE IN OFF STATE) | MODBUS INPUT | | | | |
| COMMS (REMOVE RJ 45 WAIT FOR TIME OUT) | MODBUS ALARM | | | | |
| VSD STARTER NO 1 (MODBUS ADDRESS, P1=21, P2=22, P3=23) COMMS 9600, 8, N, 1) SET TO 50HZ | TYPE | HMI | SCADA | ALARM | |
| SPEED | MODBUS INPUT | | | | |
| AMPS | MODBUS INPUT | | | | |
| C/B OPEN REASON CODE (CIRCUIT BREAKER MUST BE IN OFF STATE) | MODBUS INPUT | | | | |
| COMMS (REMOVE RJ 45 WAIT FOR TIME OUT) | MODBUS ALARM | | | | |
| VSD STARTER NO 2 (MODBUS ADDRESS, P1=21, P2=22, P3=23) COMMS 9600, 8, N, 1) SET TO 50HZ | TYPE | HMI | SCADA | ALARM | |
| SPEED | MODBUS INPUT | | | | |
| AMPS | MODBUS INPUT | | | | |
| C/B OPEN REASON CODE (CIRCUIT BREAKER MUST BE IN OFF STATE) | MODBUS INPUT | | | | |
| COMMS (REMOVE RJ 45 WAIT FOR TIME OUT) | MODBUS ALARM | | | | |
| GENERAL | TYPE | HMI | SCADA | ALARM | |
| TEST RCD, TEST GPO AND LIGHT FOR CORRECT OPERATION. RECORD RCD TRIP TIME | GENERAL | | | | |
| CONNECT BATTERY AND TEST EXTRA LOW VOLTAGE CIRCUITS. | GENERAL | | | | |
| ISOLATE SME POWER SUPPLY AND CHECK DC BATTERY VOLTAGE AT (521, 519 & 525). | GENERAL | | | | |
| DISCONNECT BATTERY AND RE CHECK ABOVE VOLTAGES. | GENERAL | | | | |

| COMMISSIONING CHECKLIST | | | | |
|--|----------|------------|--|--|
| TURN ON RADIO AND CHECK COMMUNICATIONS (CONNECT TEMPORARY DI-POLE AERIAL). | GENERAL | | | |
| ENSURE ALL EQUIPMENT IS LABELED. | GENERAL | | | |
| ISOLATE ALL CIRCUIT BREAKERS AND DISCONNECT TEMPORARY SUPPLY. | GENERAL | | | |
| ENSURE A COPY OF ELECTRICAL SCHEMATICS ARE INCLUDED IN THE ENCLOSURE. | GENERAL | | | |
| CLEAN OUT AND VACUUM ALL ENCLOSURES WIPE AND CLEAN LIDS. | GENERAL | | | |
| RETURN ORIGINAL COPY OF COMMISSIONING SHEET TO THE ELECTRICAL SUPERVISOR. | GENERAL | | | |
| INCLUDE A COPY OF COMMISSIONING SHEET WITH SWITCHBOARD DOCUMENTATION. | GENERAL | | | |
| REMOVE/NULLIFY ALL ALARMS ON CLEARSCADA BEFORE SITE IS TURNED OFF. | CRITICAL | | | |
| QA SIGN OFF | DATE: | | | |
| | NAME: | SIGNATURE: | | |
| ELECTRICIAN: | | | | |
| ELEC SUPERVISOR: | | | | |
| SCADA SUPERVISOR: | | | | |

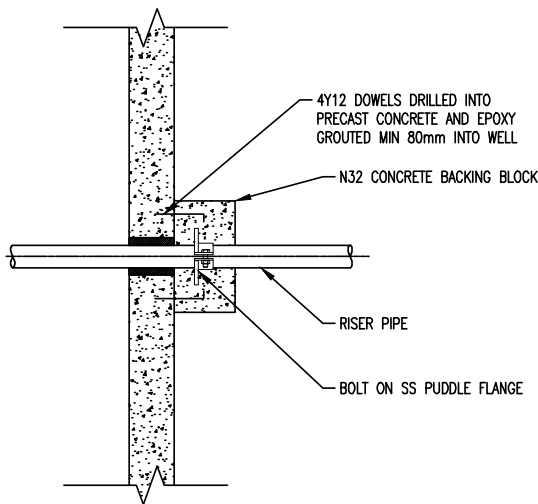
| BACK UP CONTROLLER PULSE TABLE | | HIGH AMPS TRIP CODE | |
|--------------------------------|-------------------------|---------------------|-----------------------------|
| BACKUP CONTROLLER PULSES | SITE TYPE CONFIGURATION | PERCENTAGE OF FLC | TIME DELAY TILL TRIP OCCURS |
| 1 | 1 PUMP | 100-115% | 300 SECONDS (5 MINS) |
| 2 | 2 PUMPS MAX 1 TO RUN | 115-125% | 60 SECONDS |
| 3 | 2 PUMPS MAX 2 TO RUN | 125-150% | 30 SECONDS |
| 4 | 3 PUMPS PUMP 1 JOCKEY | 150-175% | 15 SECONDS |
| 5 | 3 PUMPS PUMP 2 JOCKEY | 175-200% | 10 SECONDS |
| 6 | 3 PUMPS PUMP 3 JOCKEY | 200% & GREATER | 1 SECOND |



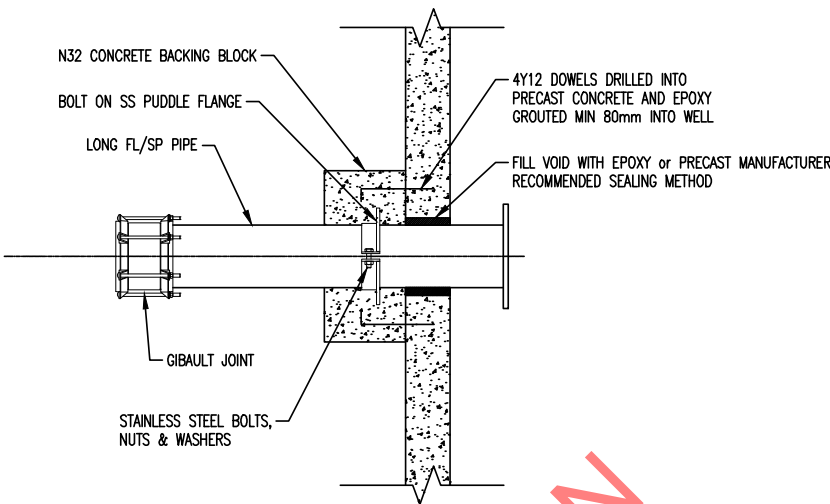




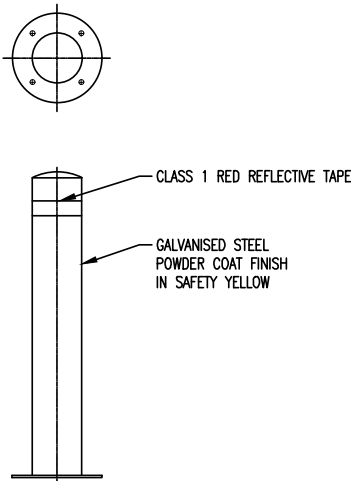
SHEET No. 70 OF 100



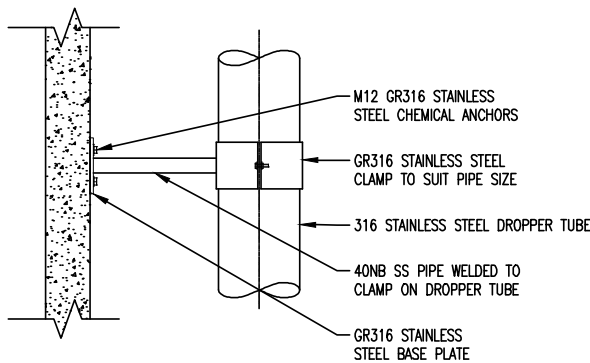
RISER PIPE PENETRATION
SCALE: N.T.S.



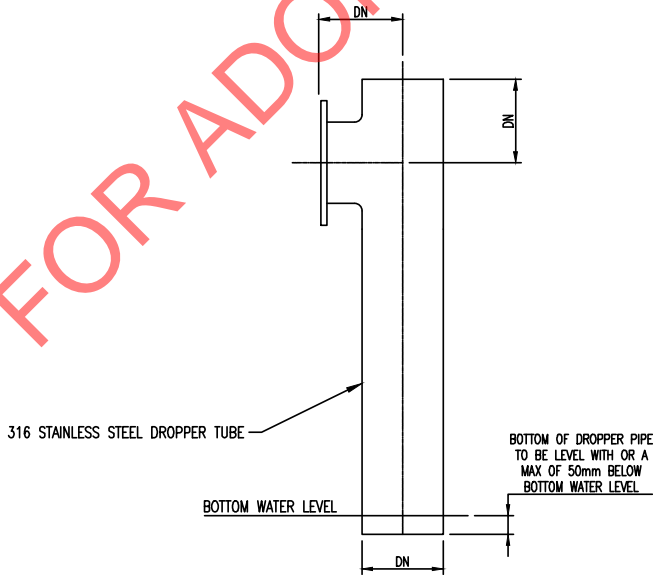
INLET PIPE PENETRATION
SCALE: N.T.S.



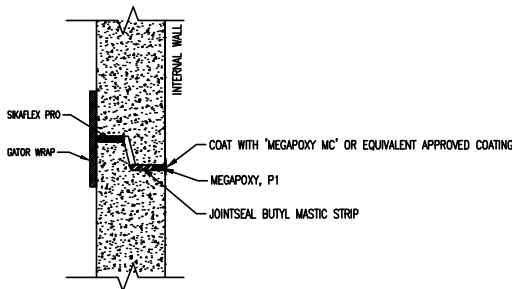
BOLLARD STOP
SCALE: N.T.S.



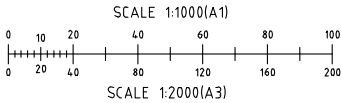
DROPPER SUPPORT
SCALE: N.T.S.




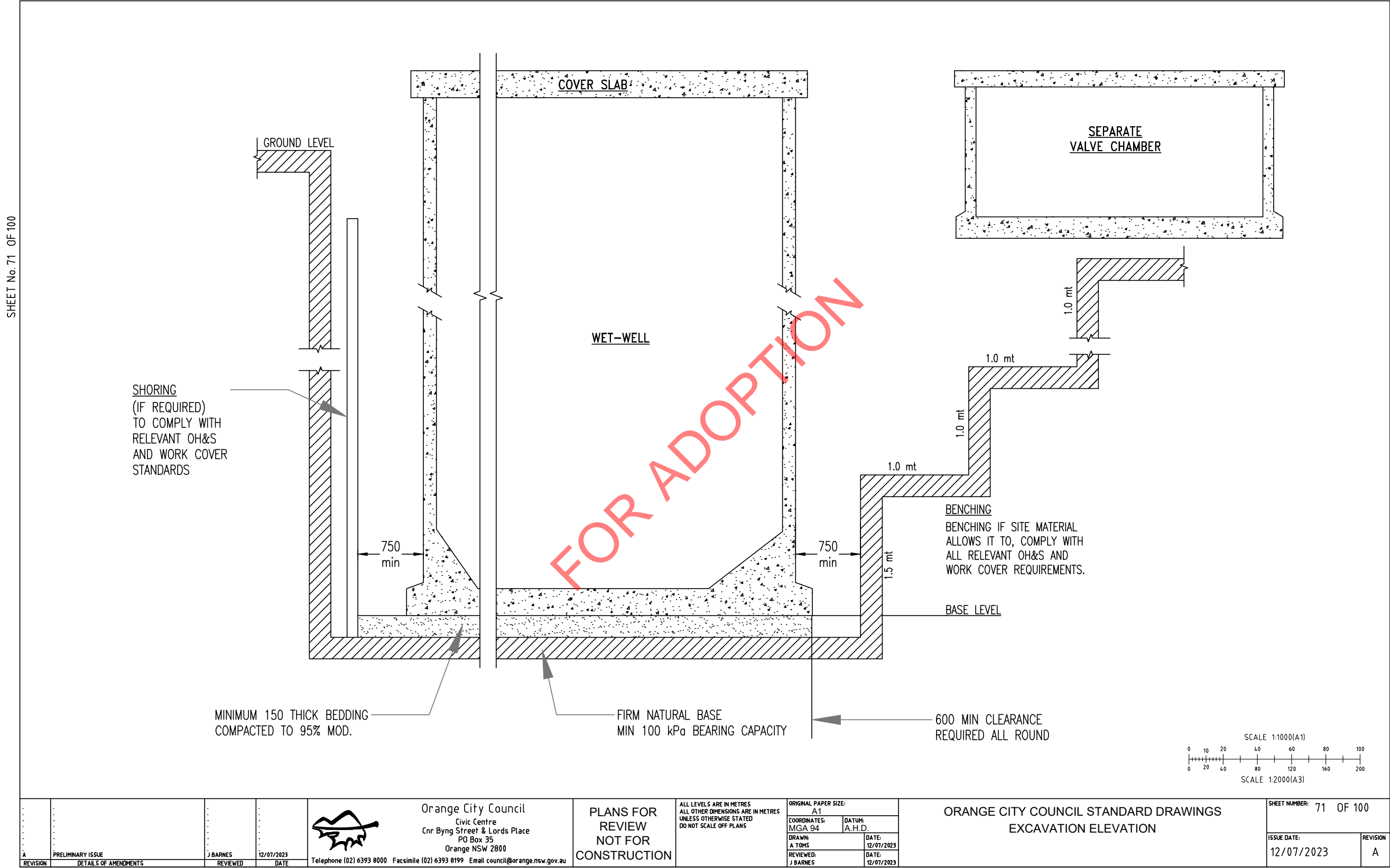
DROPPER TUBE
SCALE: N.T.S.



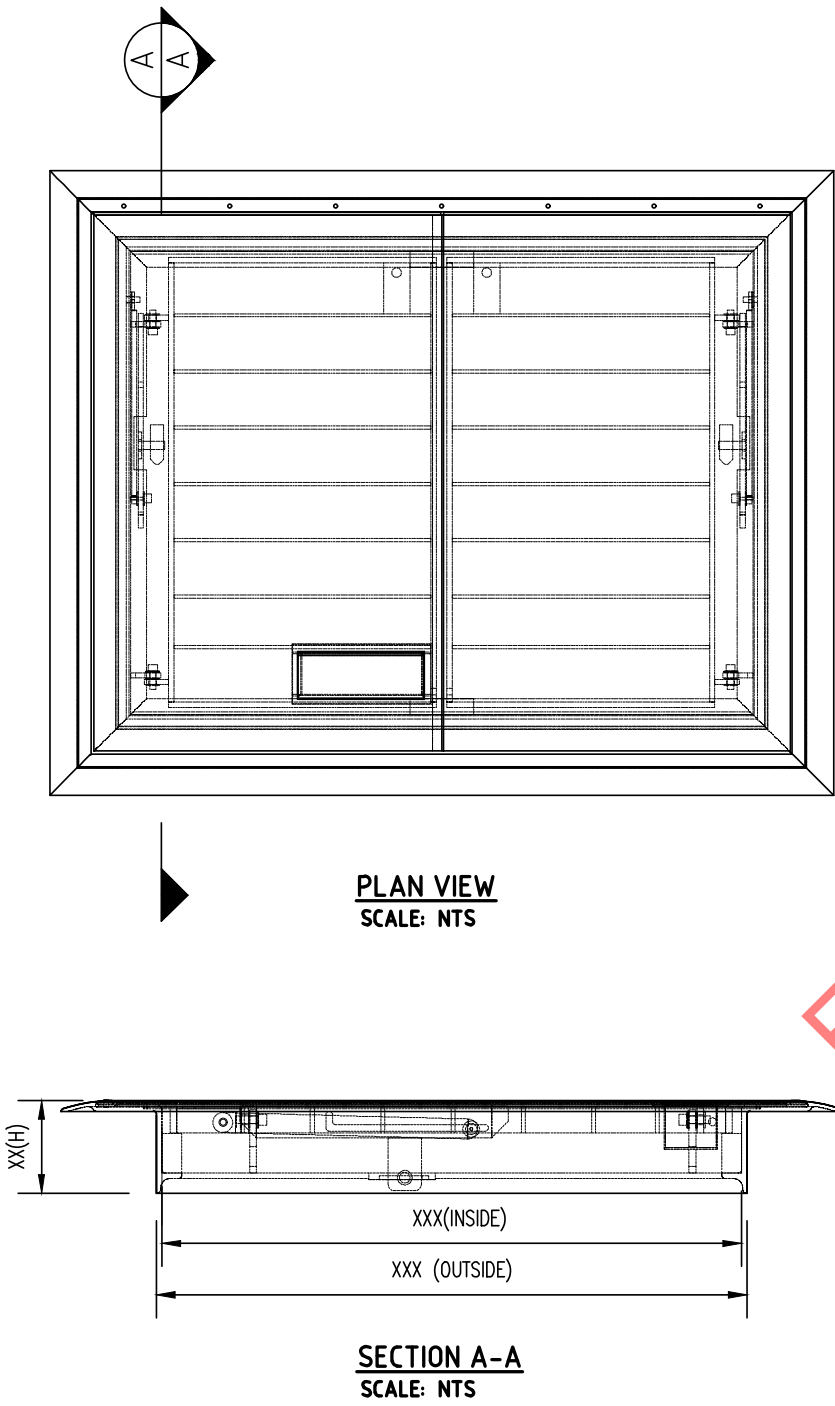
INCREMENT JOINT DETAIL
SCALE: N.T.S.



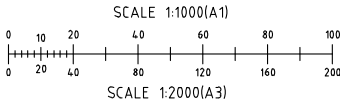
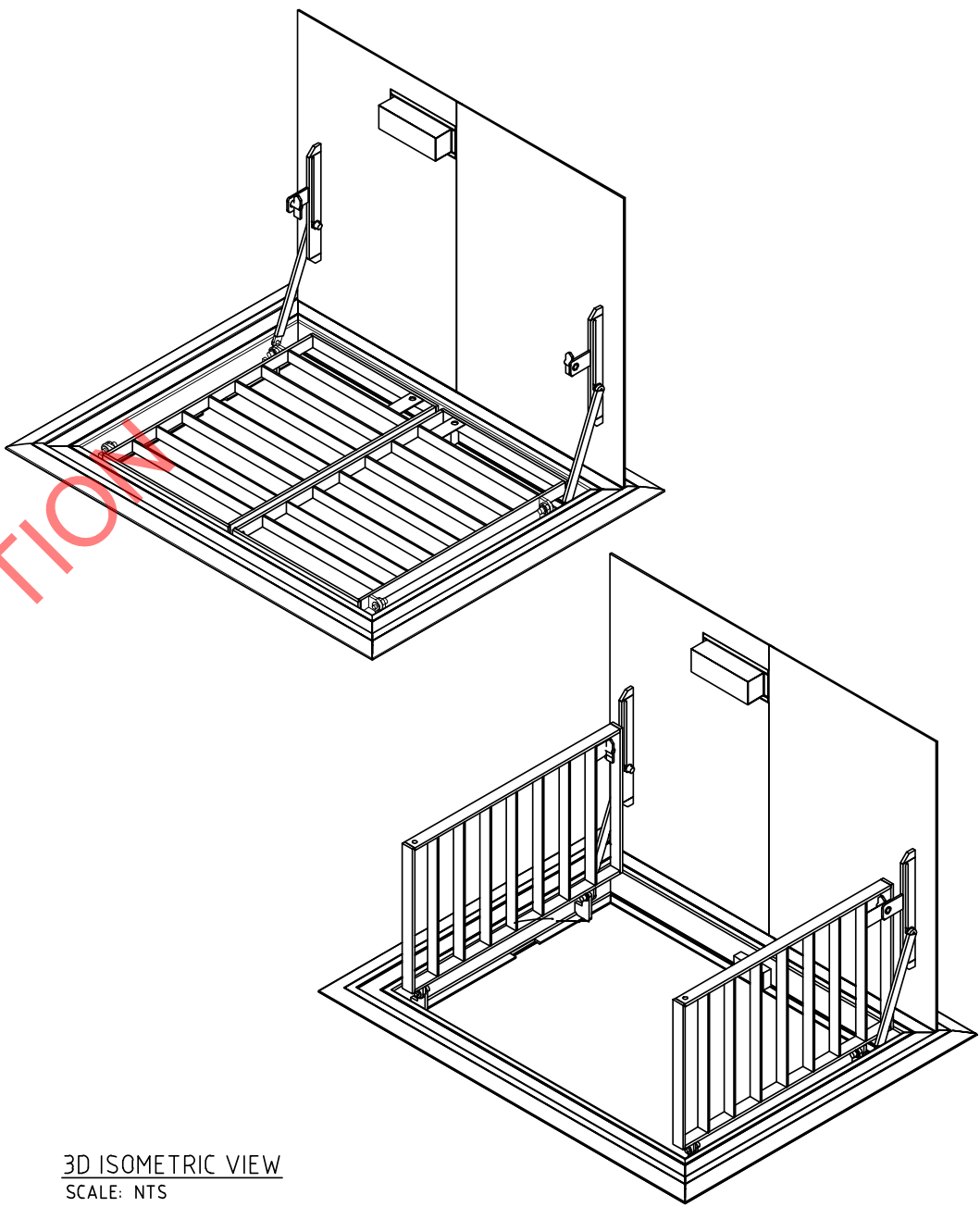
| | | | | | | | | | | | | | |
|----------|-----------------------|----------|------------|---|---|--|---|----------------------------|------------------|---|---------------------|---------------------------|---------------|
| | | | |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 | | ORANGE CITY COUNCIL STANDARD DRAWINGS TYPICAL MEMBER DETAILS | | SHEET NUMBER: 70 OF 100 | |
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | DRAWN: A TOMS | DATE: 12/07/2023 | ISSUE DATE: 12/07/2023 | REVISION A |
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | | | | | | | | | | |




SHEET No. 72 OF 100

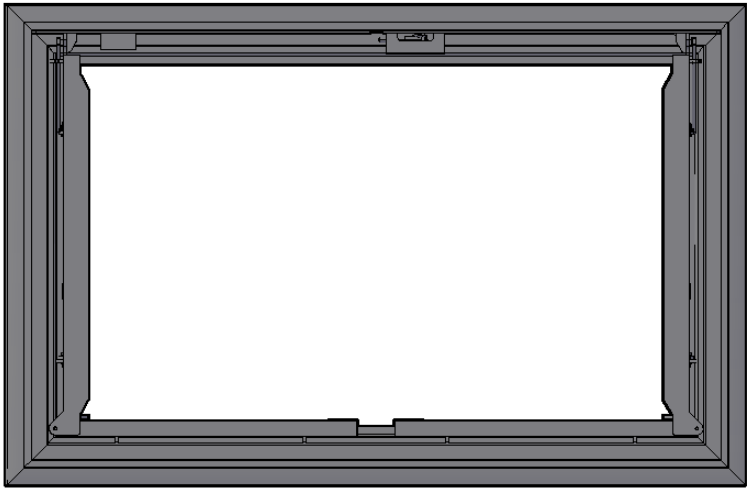


FOR ADOPTION

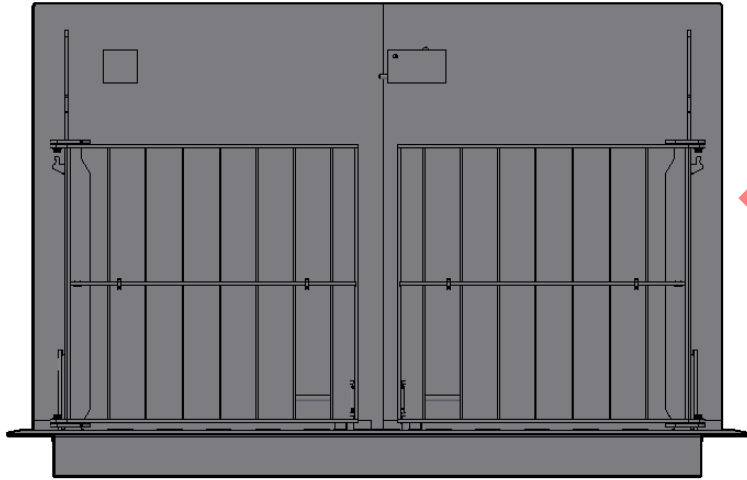


| | | | | | | | | | | | | | |
|----------|-----------------------|----------|------------|---|---|--|---|----------------------------|------------------|---|---------------|-------------------------|--|
| | | | |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 | | ORANGE CITY COUNCIL STANDARD DRAWINGS TYPICAL VALVE CHAMBER ACCESS COVER | | SHEET NUMBER: 72 OF 100 | |
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | ISSUE DATE: 12/07/2023 | REVISION A | | |
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | | | | | | | | | |

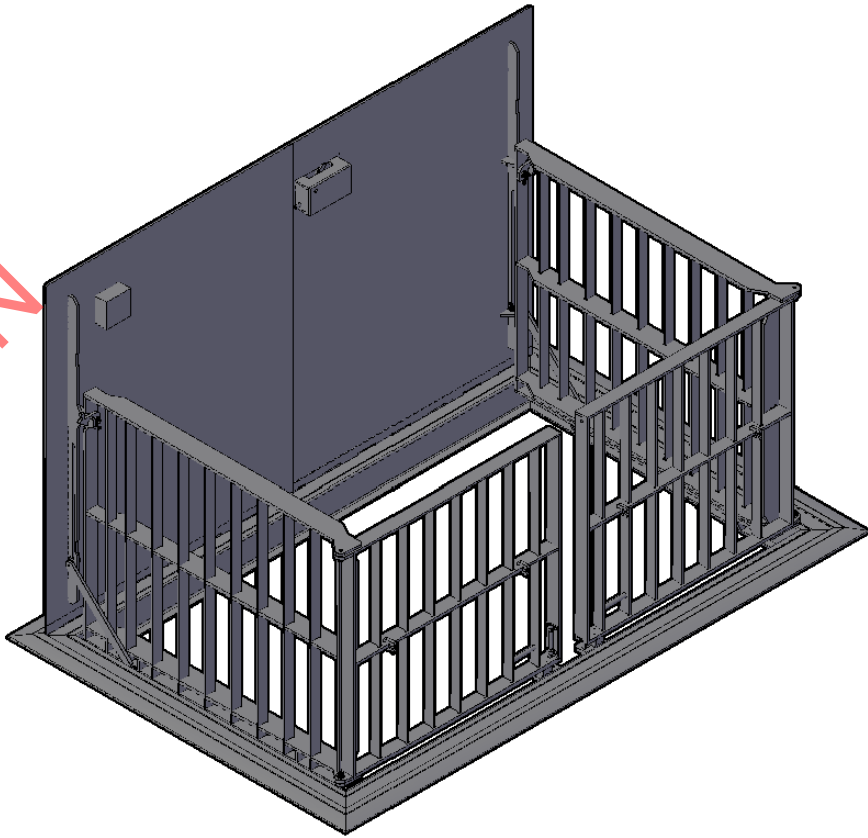
SHEET No. 73 OF 100



PLAN VIEW

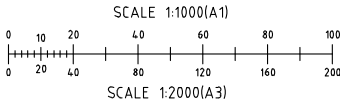



ELEVATION



3D ISOMETRIC VIEW

FOR ADOPTION



| | | | | | | | | | | | | | | |
|----------|-----------------------|----------|------------|---|---|--|---|----------------------------|------------------|--|-----------------------|-------------------------|---------------------------|---------------|
| | | | |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | ORIGINAL PAPER SIZE: A1 | | ORANGE CITY COUNCIL STANDARD DRAWINGS TYPICAL WELL ACCESS COVER | | SHEET NUMBER: 73 OF 100 | | |
| A | PRELIMINARY ISSUE | J BARNES | 12/07/2023 | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | DATE: 12/07/2023 | REVIEWED: J BARNES | DATE: 12/07/2023 | ISSUE DATE: 12/07/2023 | REVISION A |
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE | | | | | | | | | | | |

SHEET No. 74 OF 100

OCC STADARD DRAWINGS ELECTRICAL SCHEMATICS

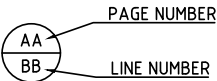
SOFT STARTERS FOR PUMPS LESS THAN 22KW

PROJECT NUMBER: 20943-2
REV: C

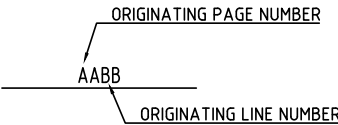
| Sheet List Table | |
|------------------|---------------------|
| Sheet Number | Sheet Title |
| 74 | COVER SHEET |
| 75 | 415VAC DISTRIBUTION |
| 76 | 415VAC DISTRIBUTION |
| 77 | 415VAC DISTRIBUTION |
| 78 | SOFT STARTERS |
| 79 | 240VAC CONTROL |
| 80 | 24VDC CONTROL |
| 81 | 24VDC CONTROL |
| 82 | TERMINAL STRIP |
| 83 | CONTROL PANEL |
| 84 | CONTROL PANEL |
| 85 | CONTROL PANEL |
| 87 | EQUIPMENT LIST |

SYMBOL LEGEND

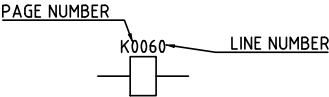
CROSS REFERENCE



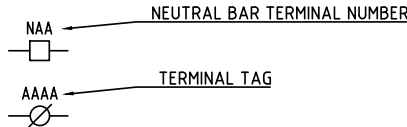
WIRE NUMBER




COMPONENT TAG

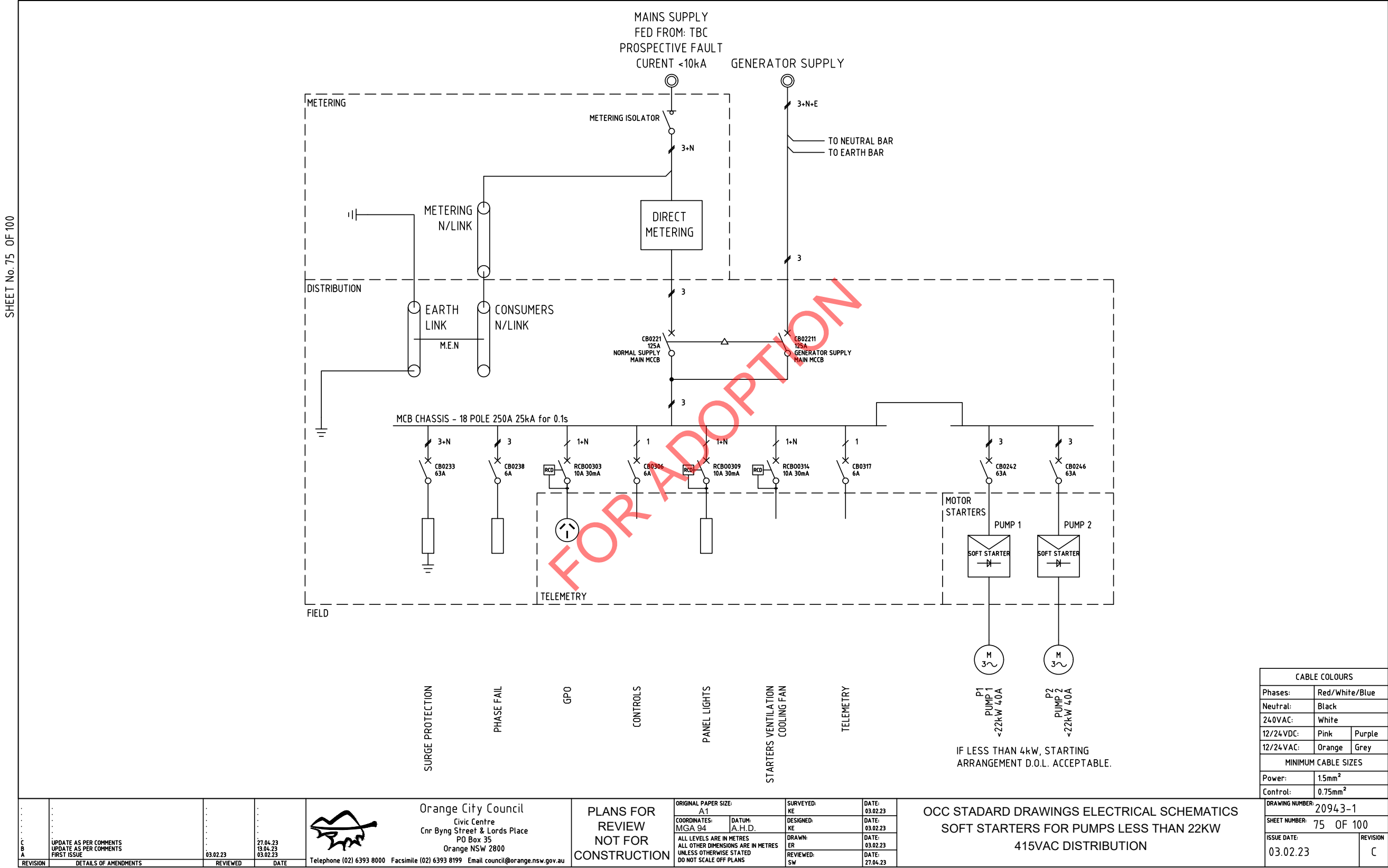


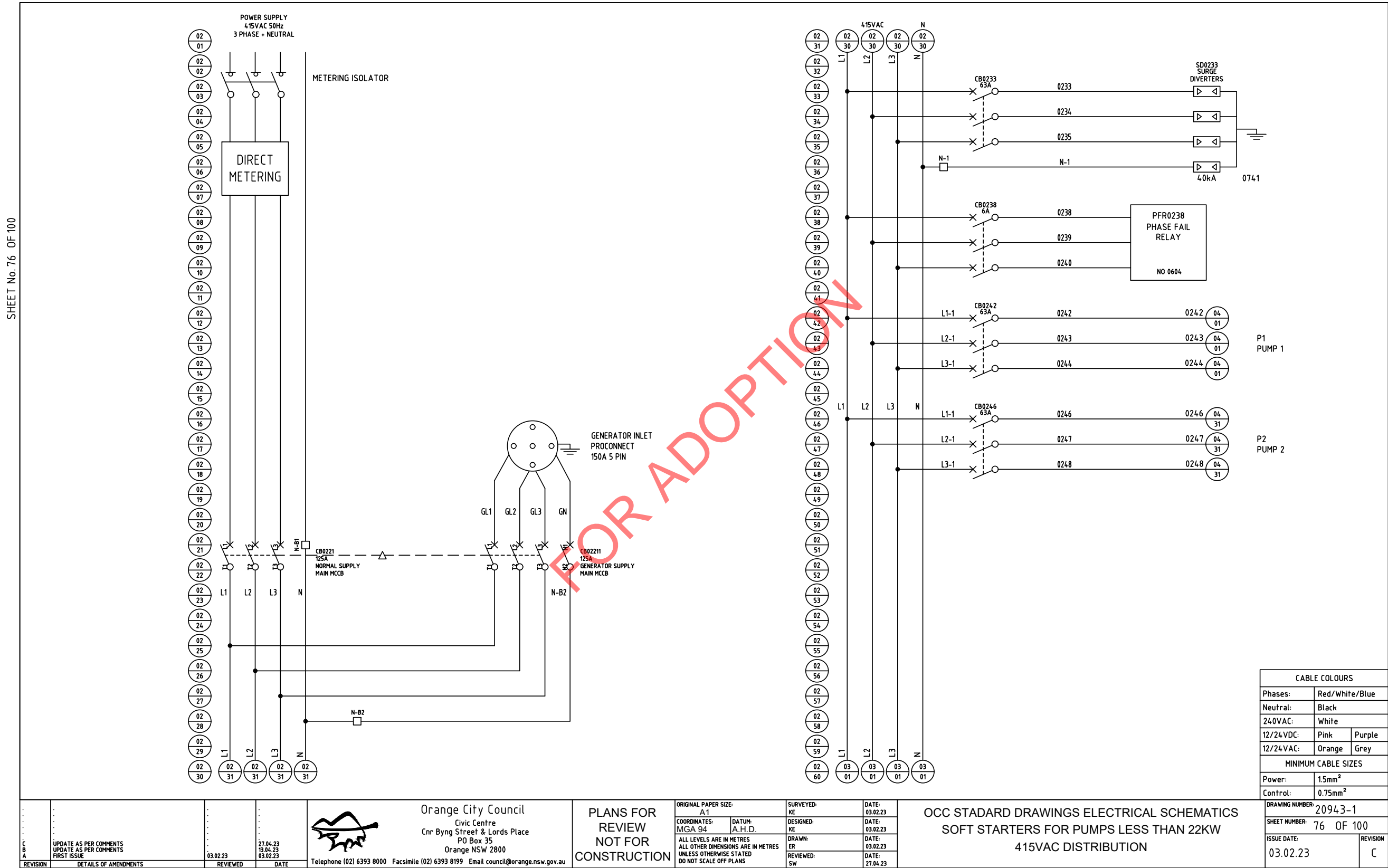
TERMINALS

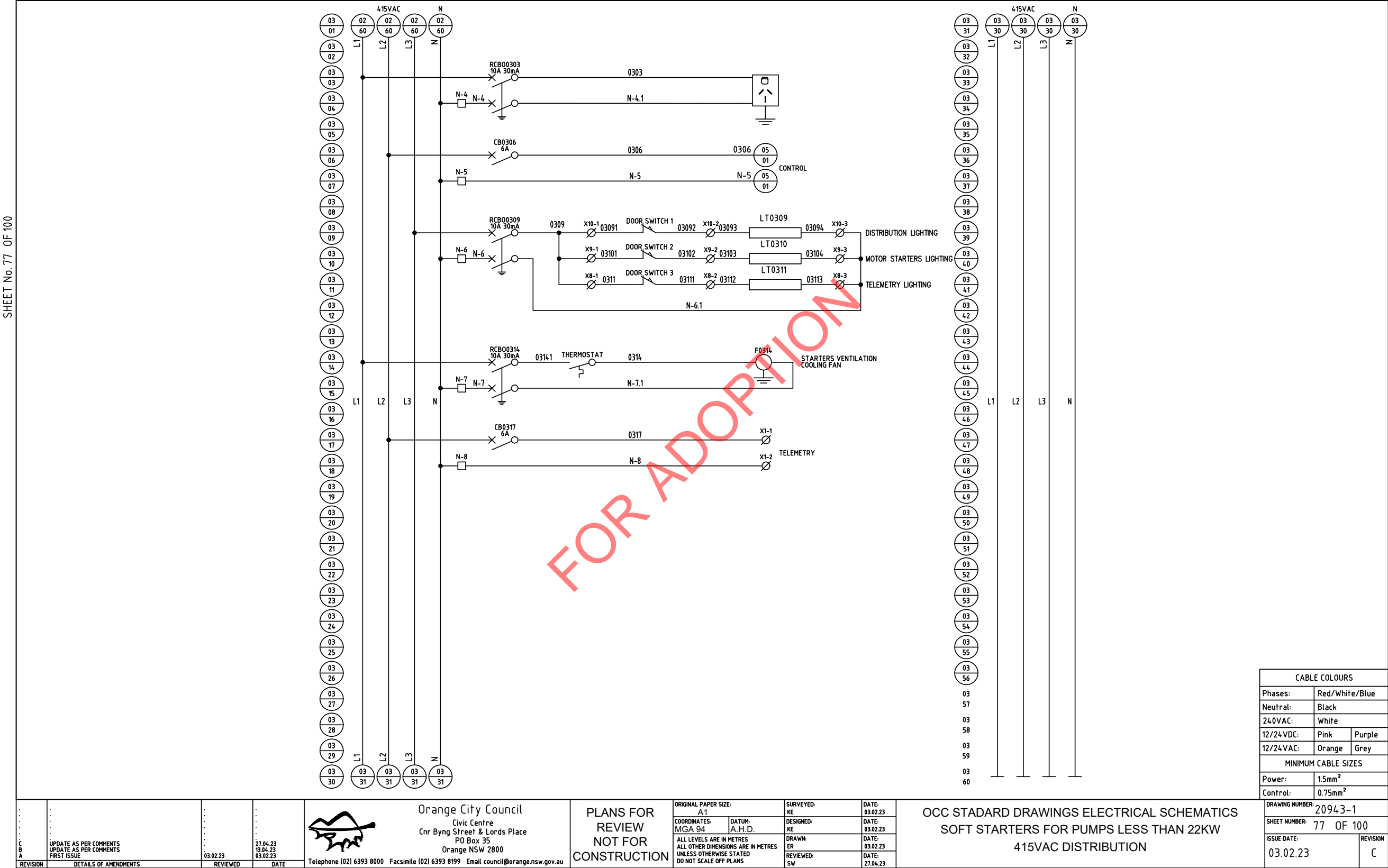


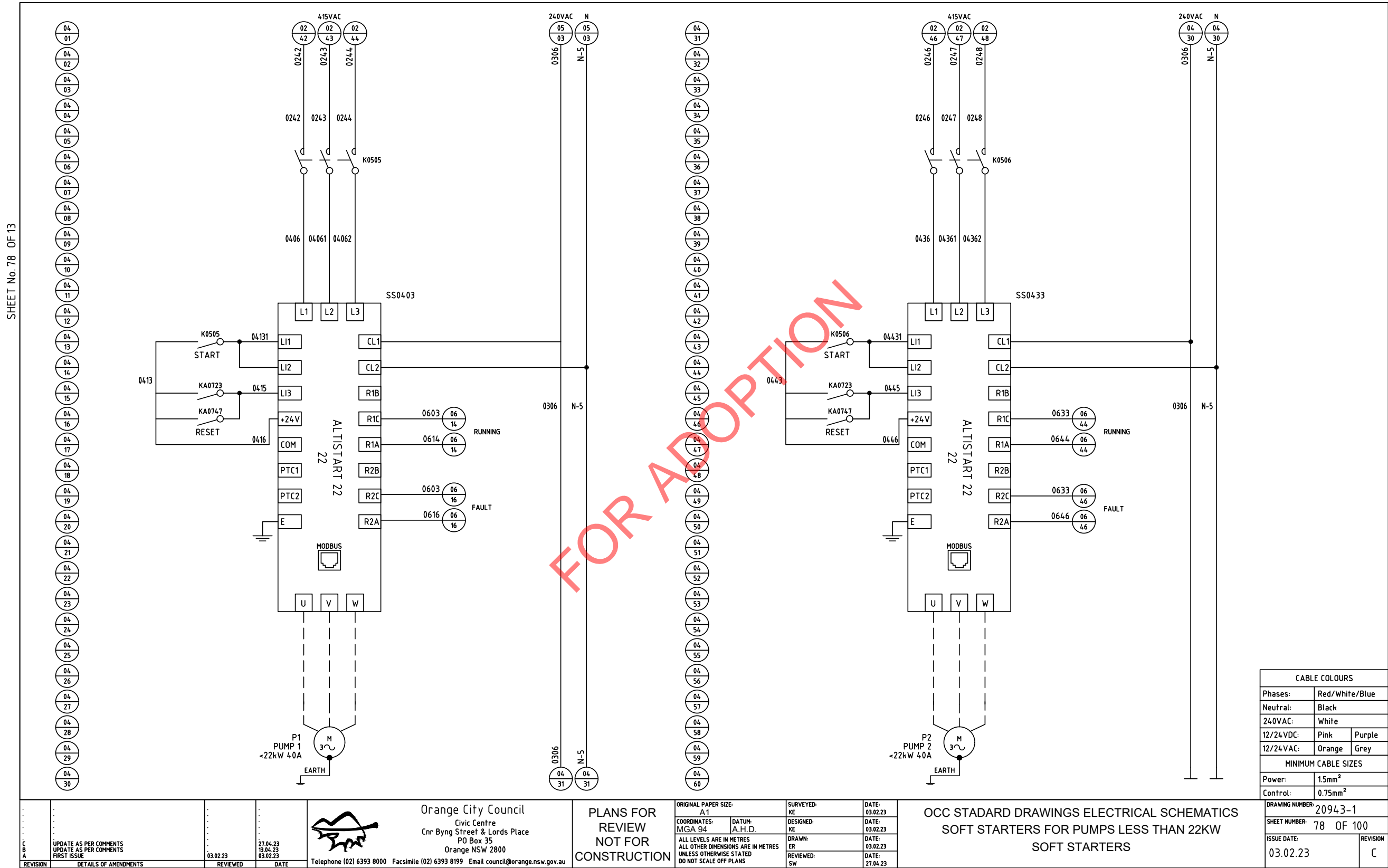
| CABLE COLOURS | |
|---------------------|---------------------|
| Phases: | Red/White/Blue |
| Neutral: | Black |
| 240VAC: | White |
| 12/24VDC: | Pink Purple |
| 12/24-VAC: | Orange Grey |
| MINIMUM CABLE SIZES | |
| Power: | 1.5mm ² |
| Control: | 0.75mm ² |

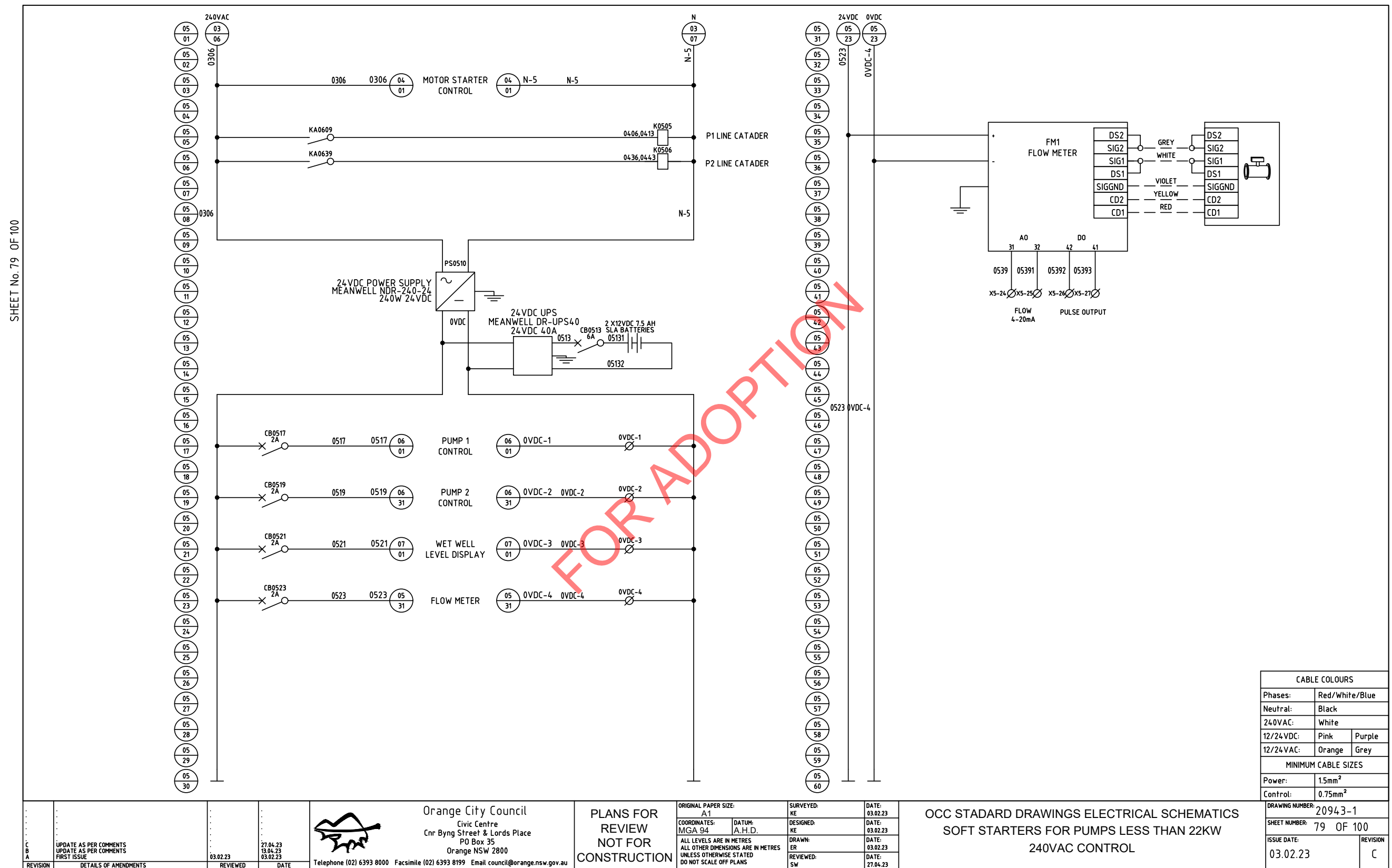
| | | | | | | | | | | | |
|----------|-----------------------|----------|------|---|---|--|---|------------------|-------------------|---|--|
| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ORIGINAL PAPER SIZE: A1 | SURVEYED: KE | DATE: 03.02.23 | OCC STADARD DRAWINGS ELECTRICAL SCHEMATICS SOFT STARTERS FOR PUMPS LESS THAN 22KW COVER SHEET | DRAWING NUMBER: 20943-1 SHEET NUMBER: 74 OF 100 ISSUE DATE: 03.02.23 REVISION: C |
| | | | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | DESIGNED: KE | DATE: 03.02.23 | |
| | | | | | | | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | | DRAWN: ER | DATE: 03.02.23 | |
| | | | | | | | | | REVIEWED: SW | DATE: 27.04.23 | |

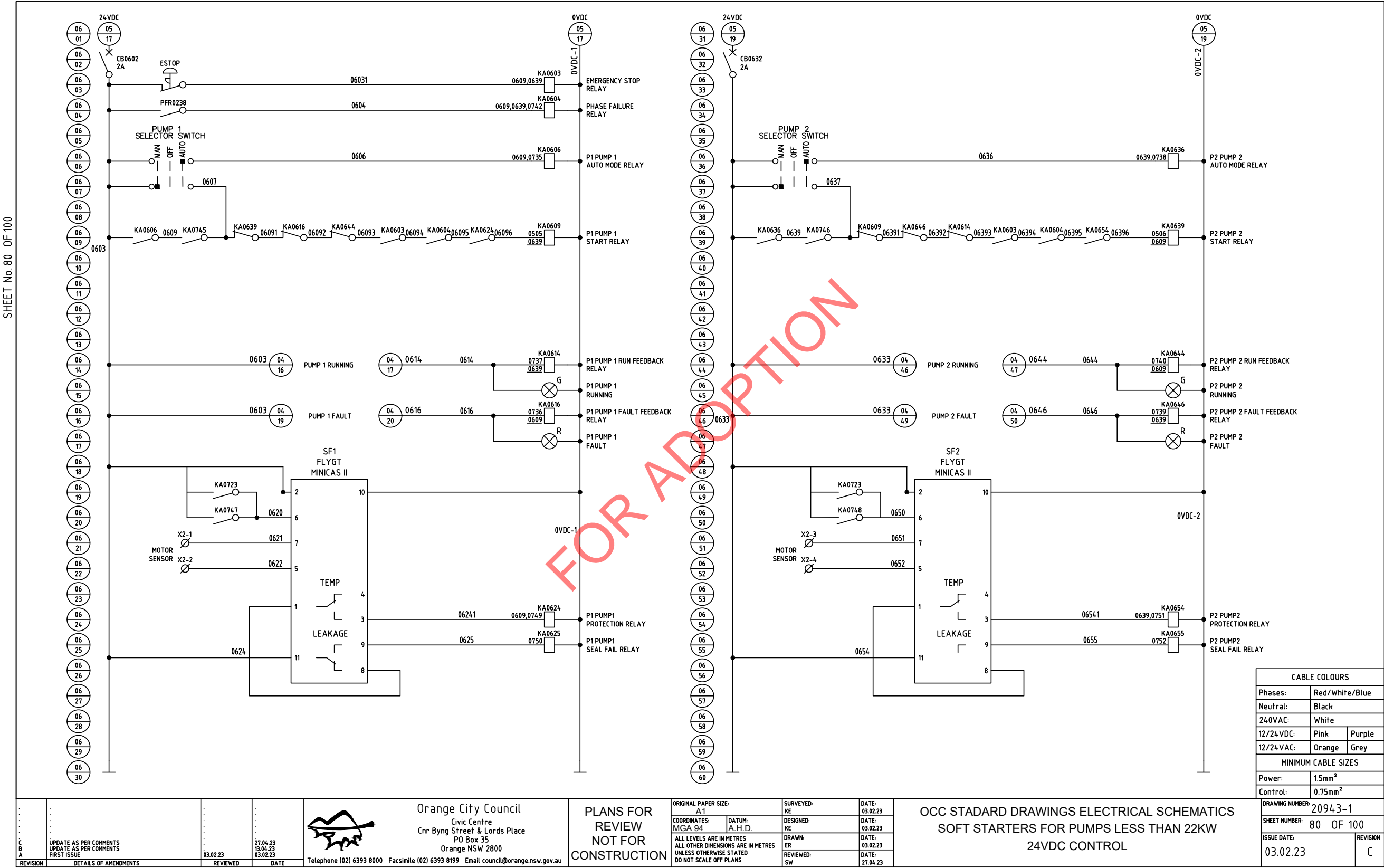


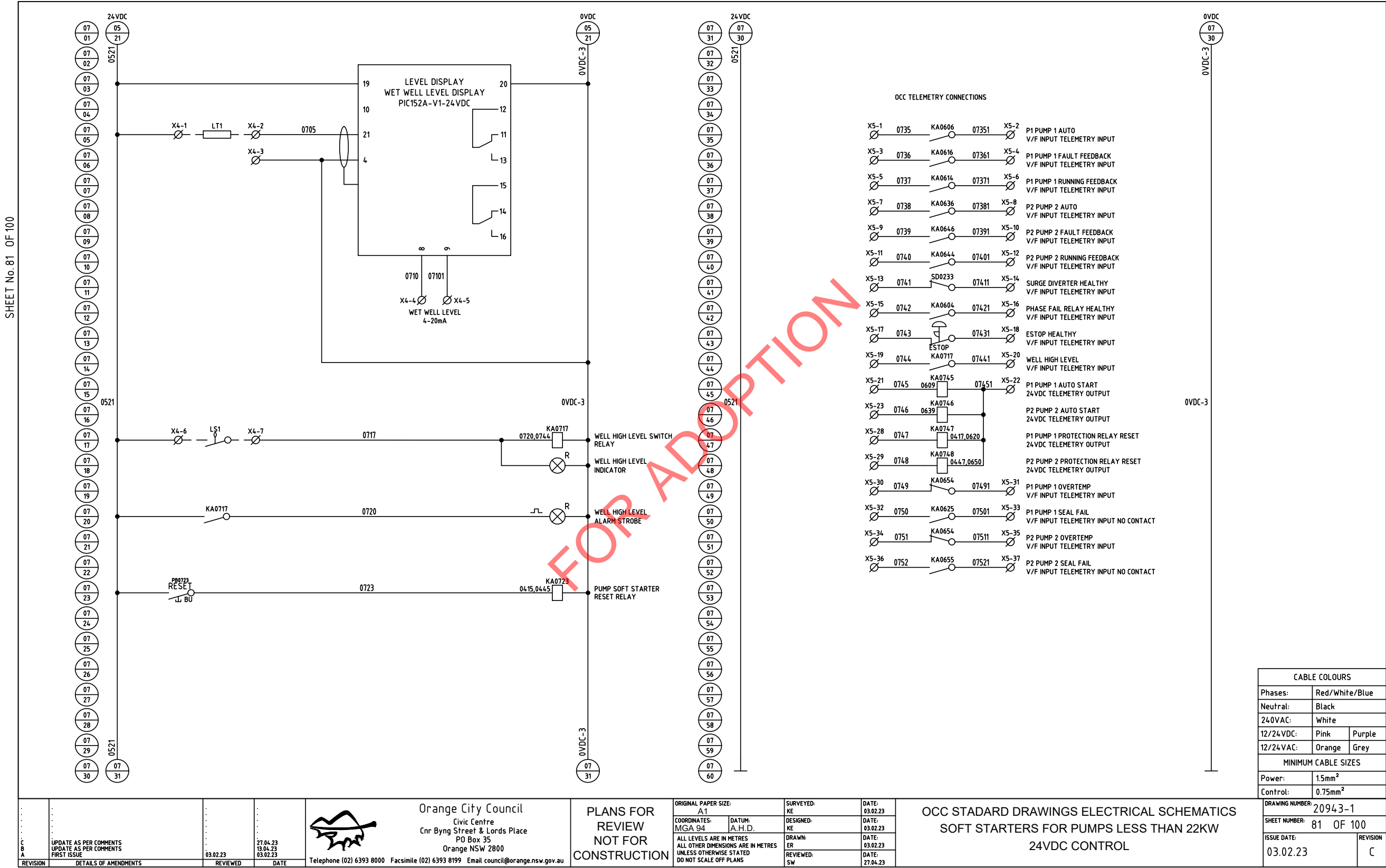


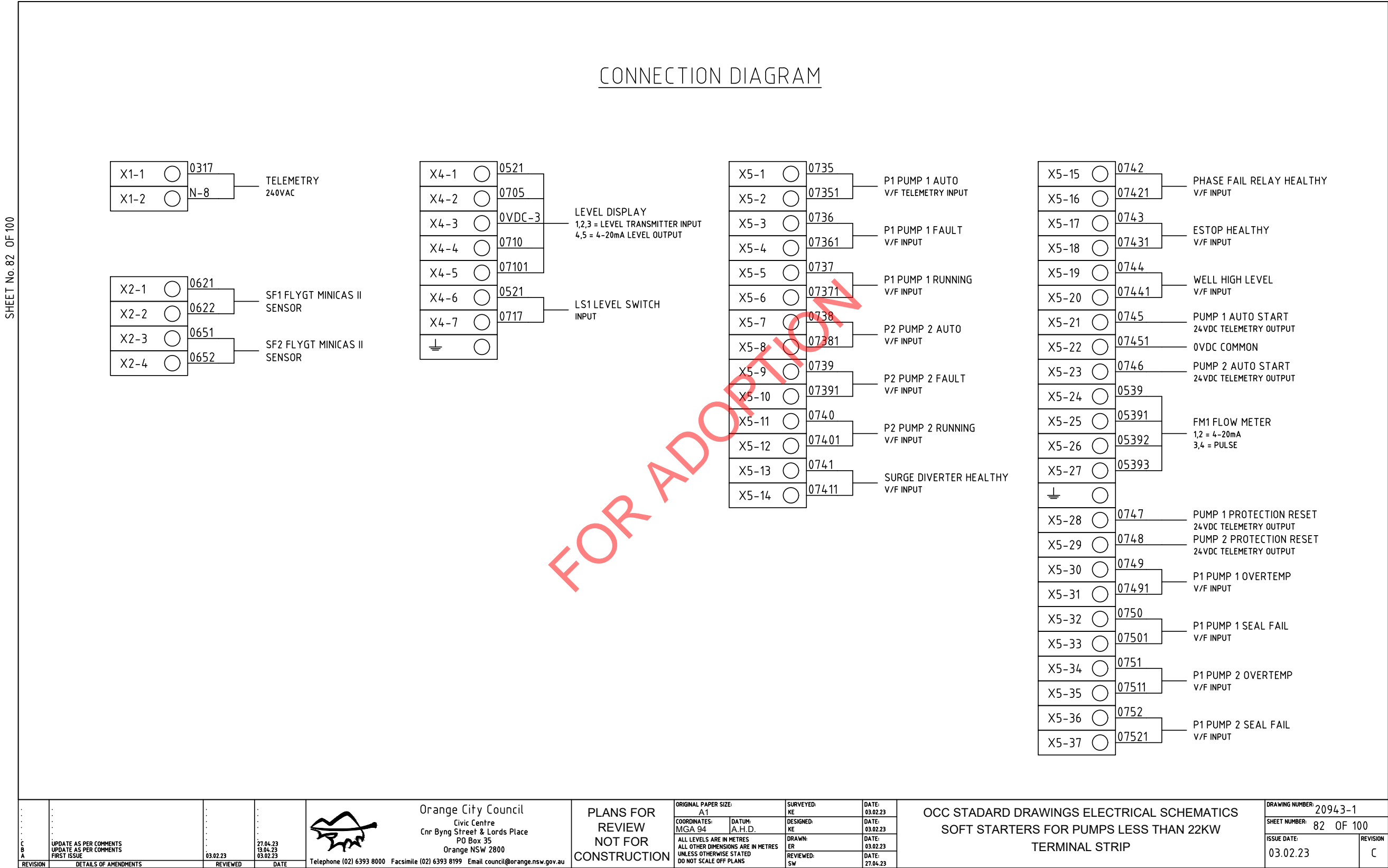


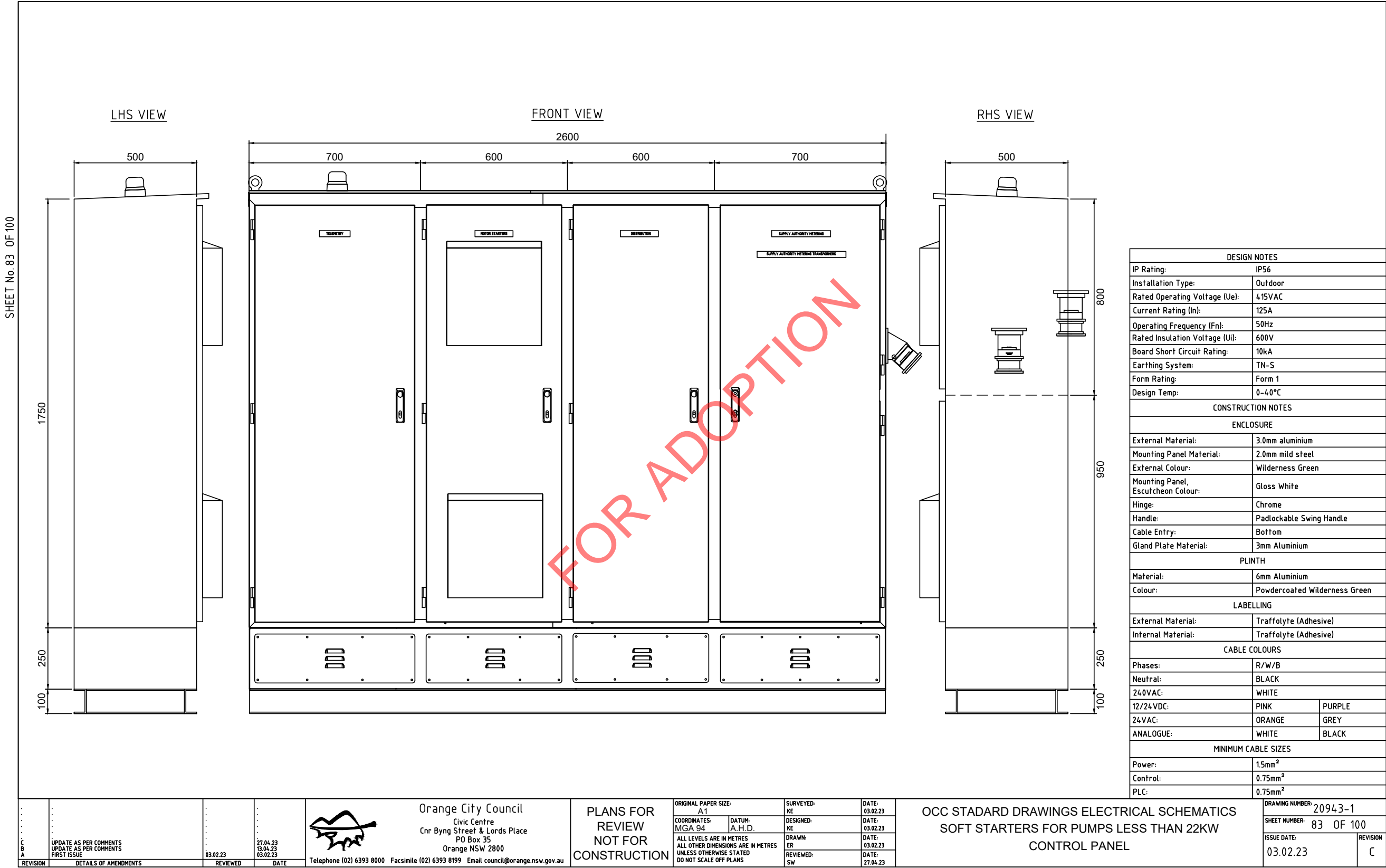




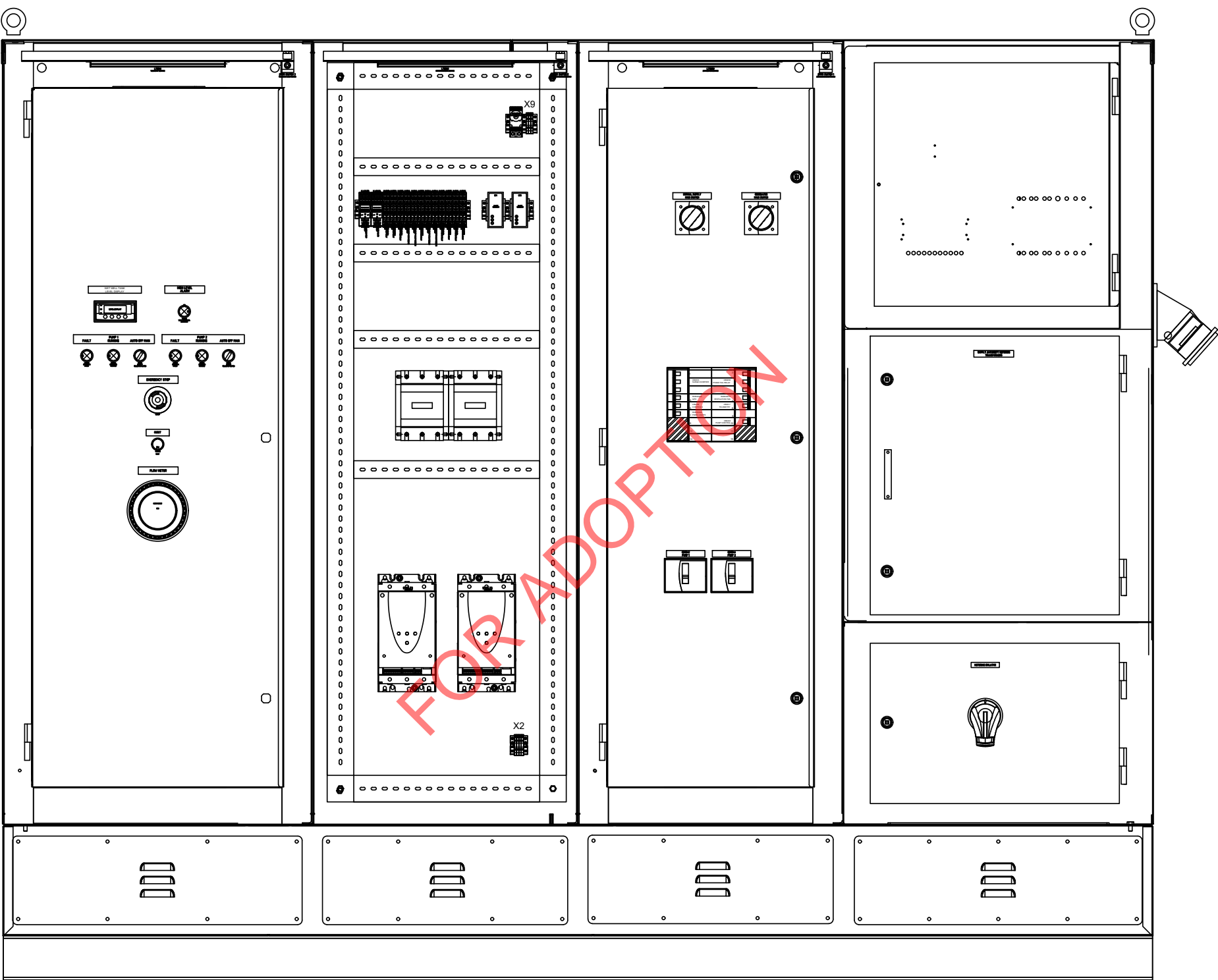






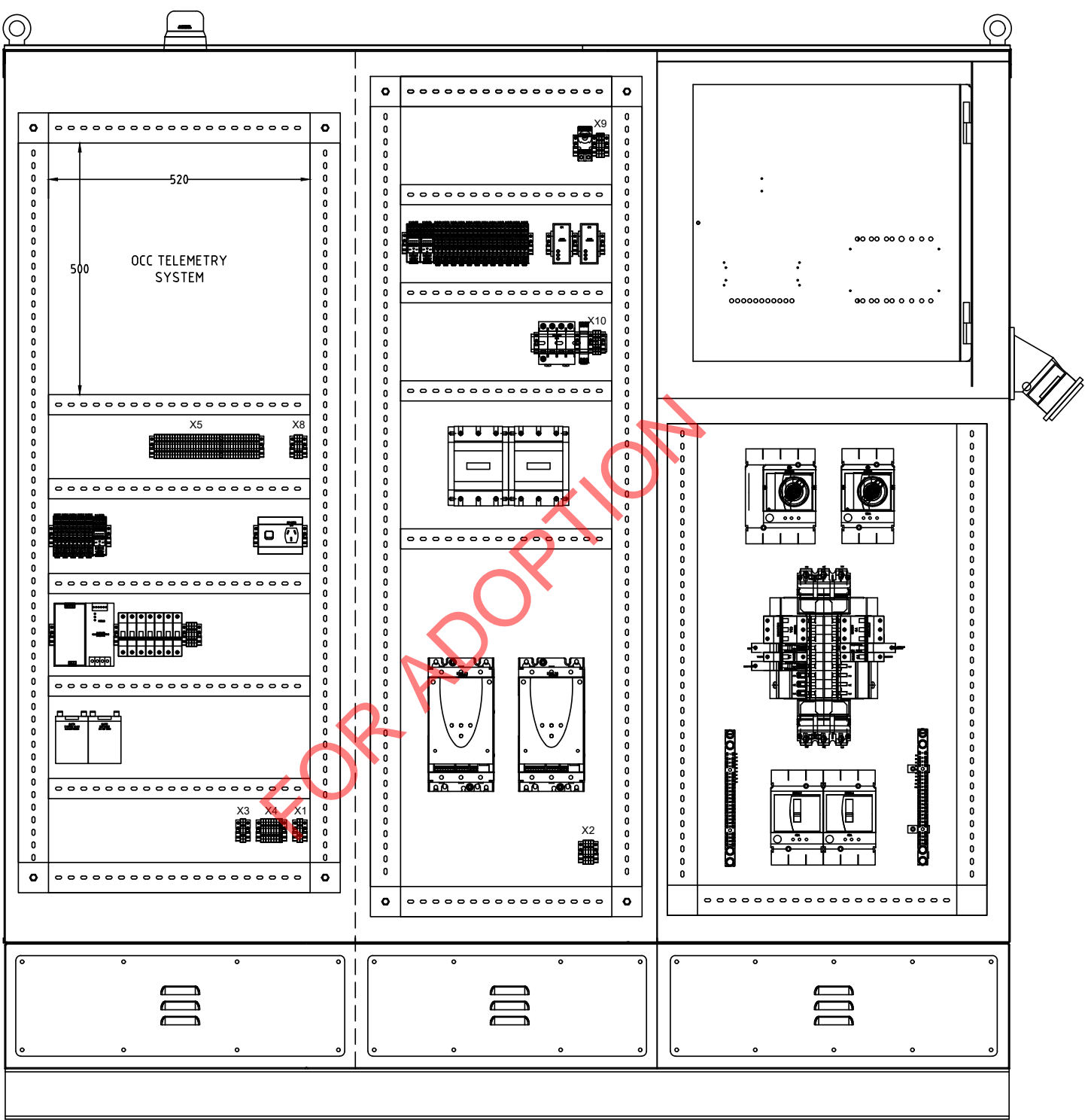



SHEET No. 84 OF 100



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SHEET No. 85 OF 100



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| REVISION | DETAILS OF AMENDMENTS | REVIEWED | DATE |  | Orange City Council Civic Centre Cnr Byng Street & Lords Place PO Box 35 Orange NSW 2800 Telephone (02) 6393 8000 Facsimile (02) 6393 8199 Email council@orange.nsw.gov.au | PLANS FOR REVIEW NOT FOR CONSTRUCTION | ORIGINAL PAPER SIZE: A1 | | SURVEYED: KE | DATE: 03.02.23 | OCC STAADARD DRAWINGS ELECTRICAL SCHEMATICS SOFT STARTERS FOR PUMPS LESS THAN 22KW CONTROL PANEL | | DRAWING NUMBER: 20943-1 | |
| | | | | | | | COORDINATES: MGA 94 | DATUM: A.H.D. | | | | | SHEET NUMBER: 85 OF 100 | |
| | | | | | | | ALL LEVELS ARE IN METRES ALL OTHER DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED DO NOT SCALE OFF PLANS | | DRAWN: ER | DATE: 03.02.23 | | | ISSUE DATE: 03.02.23 | REVISION C |
| | | | | | | | | | REVIEWED: SW | DATE: 27.04.23 | | | | |

SHEET No. 86 OF 100

| Item | Manufacturer | Part Number | Description |
|------|--------------|------------------|---|
| 1 | Schneider | LV430310 | MCCB NSX160 112-160A 3P 25KA |
| 2 | Schneider | LV430640 | Schneider MCCB NSX160F 4P 112-160A 36KA |
| 3 | Schneider | A9D11810 | Schneider RCBO 10A 30mA 10kA chassis mount |
| 4 | Schneider | A9F54102 | Schneider MCB 2A 10kA 1P |
| 5 | Schneider | A9F54106 | Schneider MCB 6A 10kA 1P |
| 6 | Schneider | A9F54306 | Schneider MCB 6A 10kA 3P |
| 7 | Schneider | A9F54363 | Schneider MCB 63A 10kA 3P |
| 8 | Schneider | ATS22C11Q | Schneider Soft starter 22KW |
| 9 | Schneider | LC1D1156U7 | Schneider Contactor 59kW 3P 240VAC Coil |
| 10 | Schneider | RXG22BD | Schneider Relay 24VDC coil 2CO LED |
| 11 | Schneider | RGZE1S48M | Schneider Relay base for RGX22 2CO |
| 12 | Schneider | RXM4AB2BD | Schneider Relay 4CO 24VDC coil |
| 13 | Schneider | RXZE2S114M | Schneider Relay base 4P for RXM |
| 14 | Schneider | A9L40601 | Schneider Surge diverter 4P 40KA alarm o/p |
| 15 | Schneider | RM17TG00 | Schneider Phase Fail / Sequence relay 1CO |
| 16 | Schneider | SAU25018183DF | Schneider Chassis 250A 18P @18mm Dual Feed |
| 17 | Meanwell | NDR-240-24 | Power supply 24VDC 10A 240W DIN rail |
| 18 | Meanwell | DRUPS-40 | Meanwell UPS module 24VDC 40A |
| 19 | East Power | ES1272 | Battery SLA 12V 7.2AH |
| 20 | WF | 240S45CL05S/ST | Current Transformer 200/5 Power Auth approved |
| 21 | | KWHTB01 | Test block for CT metering 3ph |
| 22 | Proconnect | 3PS9A3NE01 | Generator inlet 150A 3P+N+E |
| 23 | Clipsal | 4SSO15D | GPO 10A switched DIN rail mount |
| 24 | Schneider | ZB4BD3 | Schneider Switch head 3 pos stay put |
| 25 | Schneider | XB4BVB3 | Schneider Indicator 24V green |
| 26 | Schneider | XB4BVB4 | Schneider Indicator 24V red |
| 27 | Schneider | ZB4BS844 | Schneider Emergency stop head 40mm twist release |
| 28 | Schneider | NSYCVF300M230PF | Fan & filter 230VAC 300m3/hr |
| 29 | Pfannenbergl | 103-257 | Thermostat 0-60deg DIN rail NO for cooling |
| 30 | | PIC152A-V1-24VDC | Panel Meter LED 24VDC 96x48 1AI 2RO 1AO |
| 31 | Moflash | 721-6429 | Strobe beacon red 10-100VDC 20-72VAC |
| 32 | ABB | FM011033 | Watermaster Flow Meter 240VAC |
| 33 | | 902-6865 | Limit switch adjustable side roller lever IP65 M20 |
| 34 | Sunny | 9706/280TC | LED strip cabinet light 280mm 4W 240VAC flex & plug |
| 35 | | SC32BW | Fuse holder NS 32A back wire |
| 36 | Phoenix | 3044102 | Phoenix Terminal UT 4mm2 grey DIN rail |
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| 38 | Netec | NL34F024X | Netec Neutral bar 16SA 4xM8 24 tunnels |
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REVISION

DETAILS OF AMENDMENTS

REVIEWED

DATE

Orange City Council

Civic Centre

Cnr Byng Street & Lords Place

PO Box 35

Orange NSW 2800

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27.04.23

OCC STADARD DRAWINGS ELECTRICAL SCHEMATICS

SOFT STARTERS FOR PUMPS LESS THAN 22KW

EQUIPMENT LIST

DRAWING NUMBER: 20943-1

SHEET NUMBER: 86 OF 100

ISSUE DATE:
03.02.23

REVISION
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Page 275

SHEET No. 87 OF 100

OCC STANDARD DRAWINGS ELECTRICAL SCHEMATICS

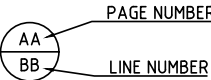
FOR PUMPS GREATER THAN 22KW

PROJECT NUMBER: 20943-2
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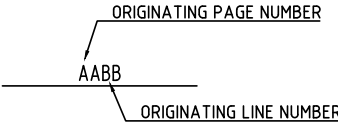
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|------------------|---------------------|
| Sheet Number | Sheet Title |
| 87 | COVER SHEET |
| 88 | 415VAC DISTRIBUTION |
| 89 | 415VAC DISTRIBUTION |
| 90 | 415VAC DISTRIBUTION |
| 91 | SOFT STARTERS |
| 92 | 240VAC CONTROL |
| 93 | 24VDC CONTROL |
| 94 | 24VDC CONTROL |
| 95 | TERMINAL STRIP |
| 96 | CONTROL PANEL |
| 97 | CONTROL PANEL |
| 98 | CONTROL PANEL |
| 99 | VSD CONTROL PANEL |
| 100 | EQUIPMENT LIST |

SYMBOL LEGEND

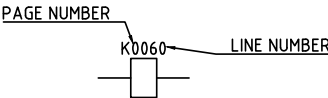
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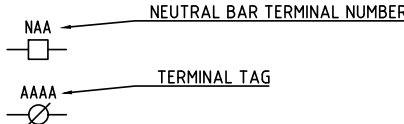
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COMPONENT TAG

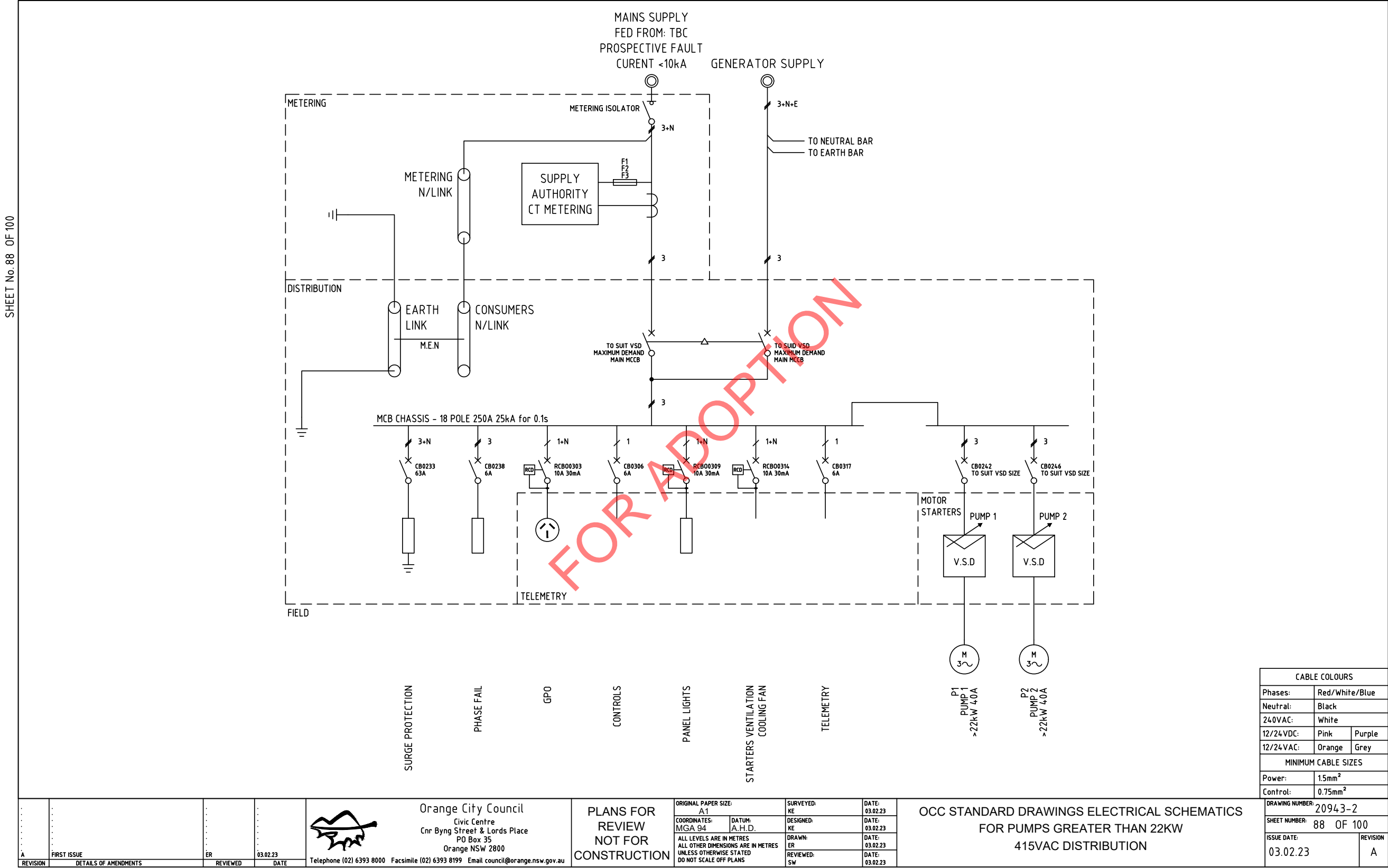


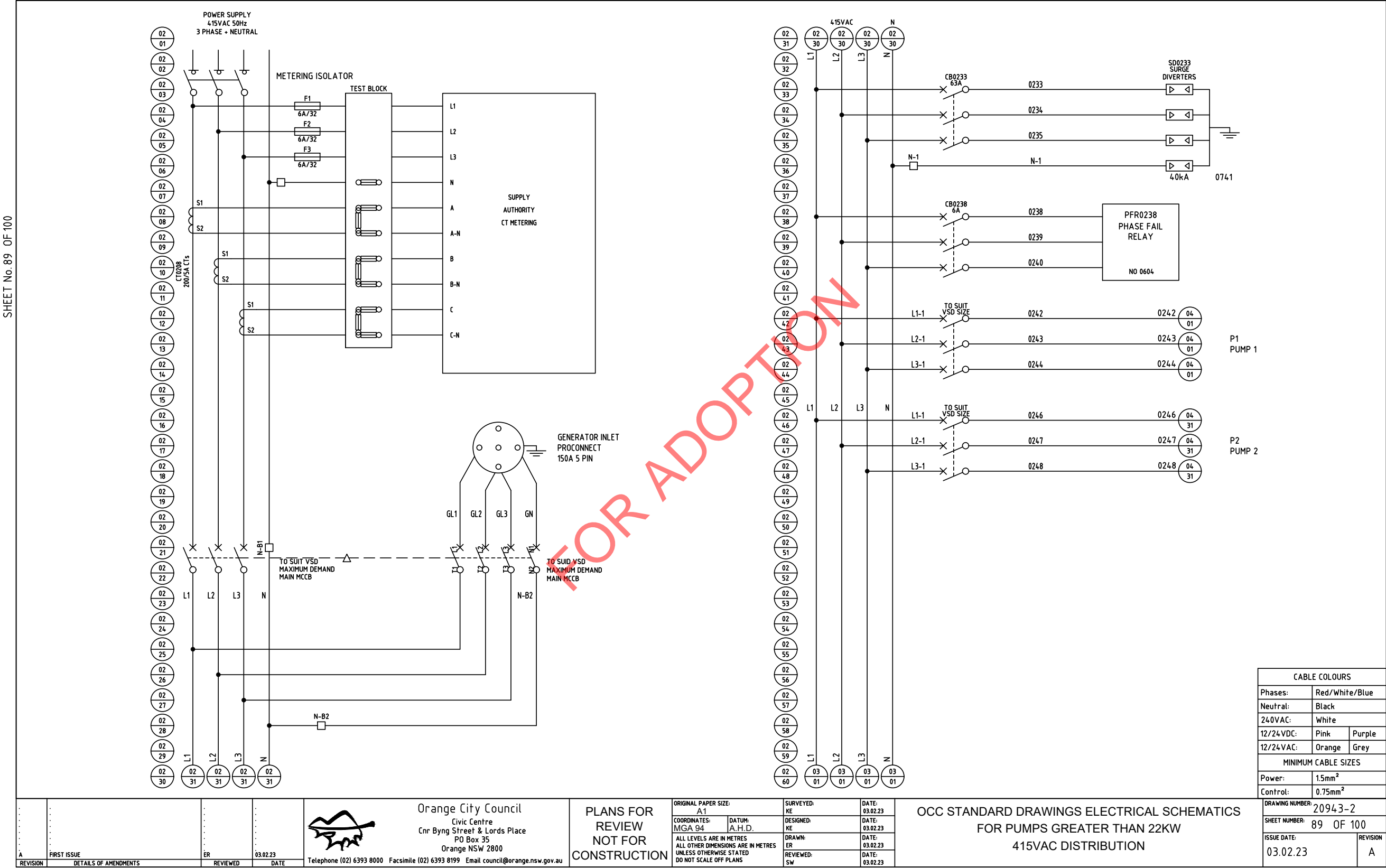
TERMINALS

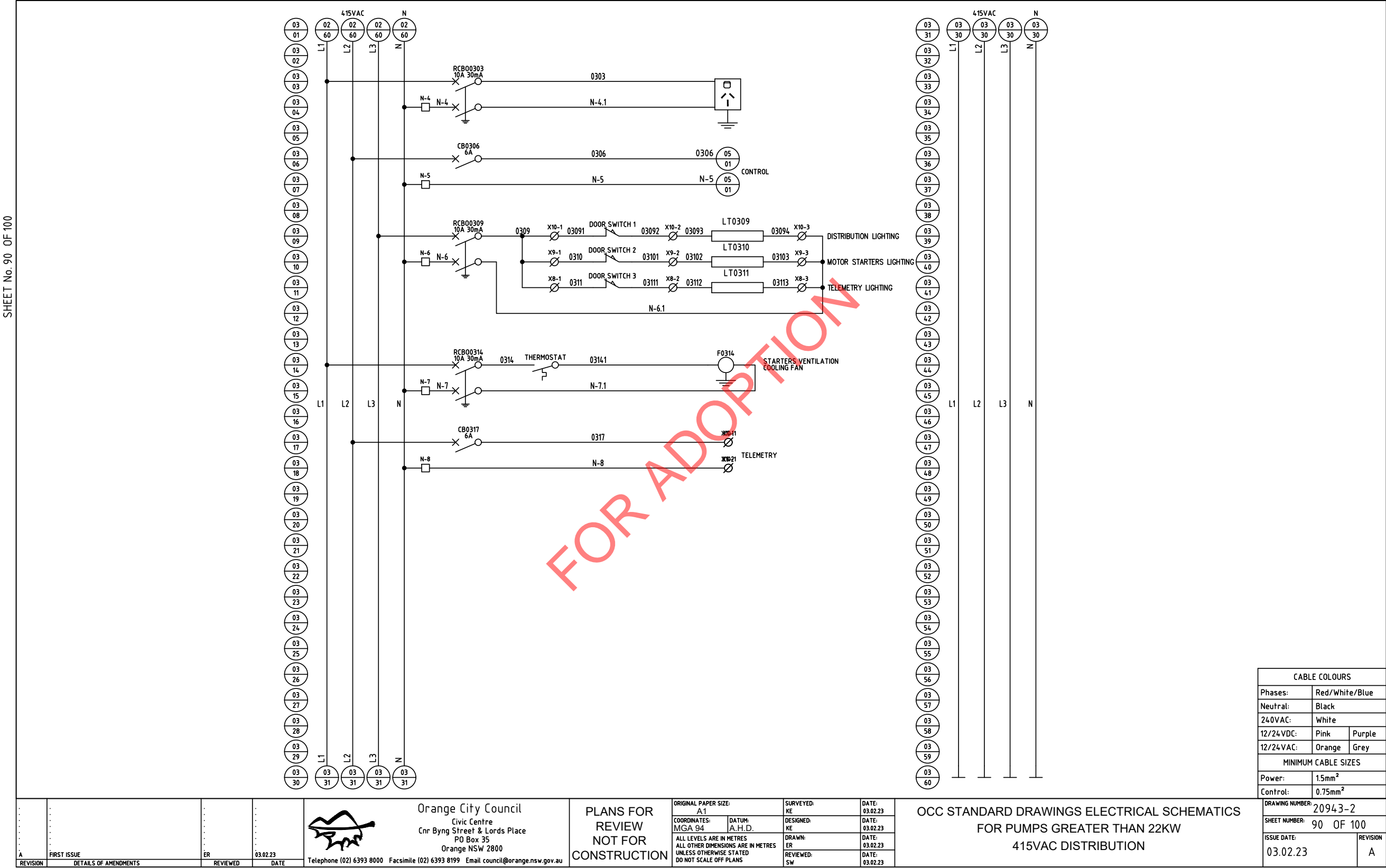


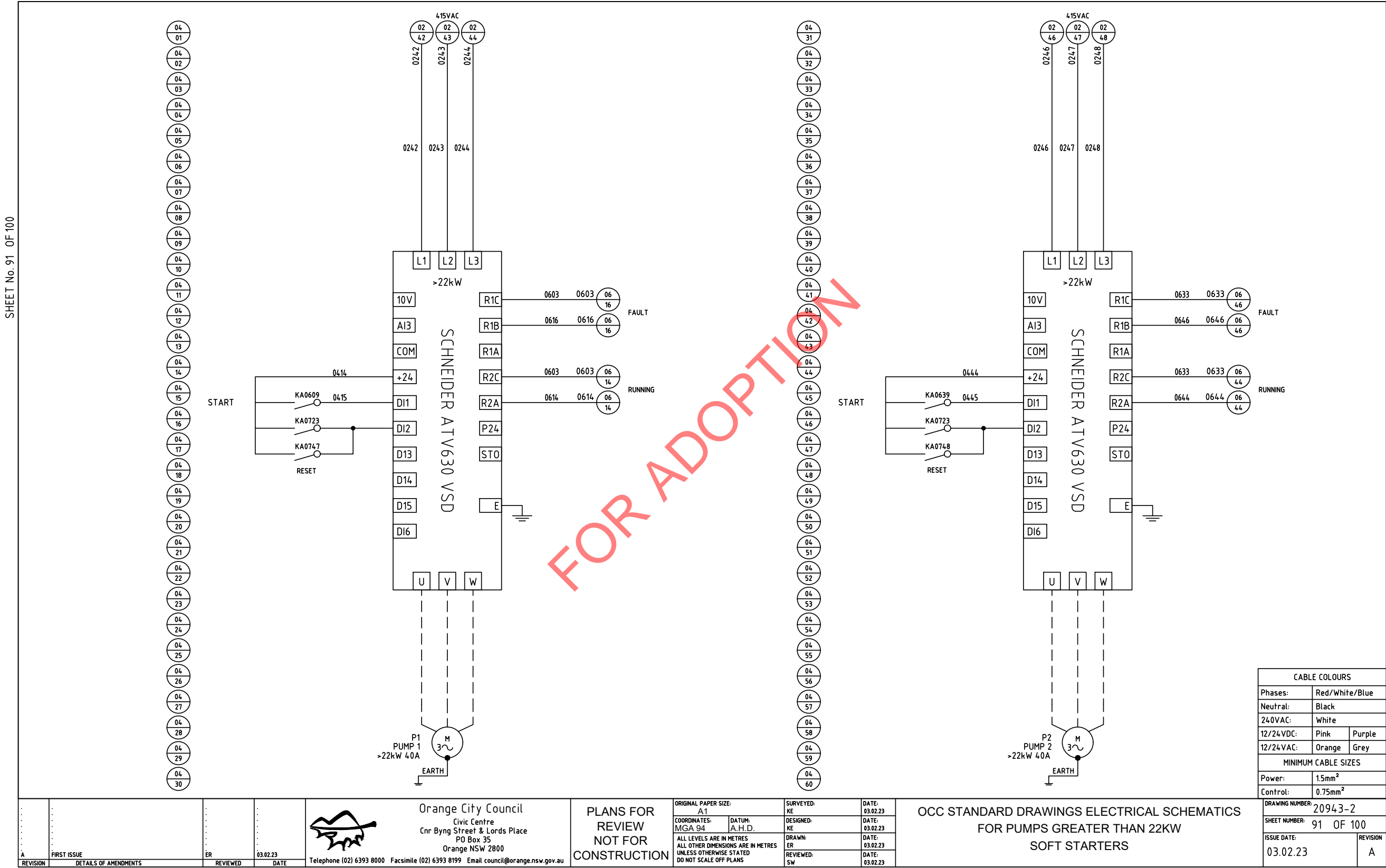
| CABLE COLOURS | |
|---------------------|---------------------|
| Phases: | Red/White/Blue |
| Neutral: | Black |
| 240VAC: | White |
| 12/24VDC: | Pink Purple |
| 12/24VAC: | Orange Grey |
| MINIMUM CABLE SIZES | |
| Power: | 1.5mm ² |
| Control: | 0.75mm ² |

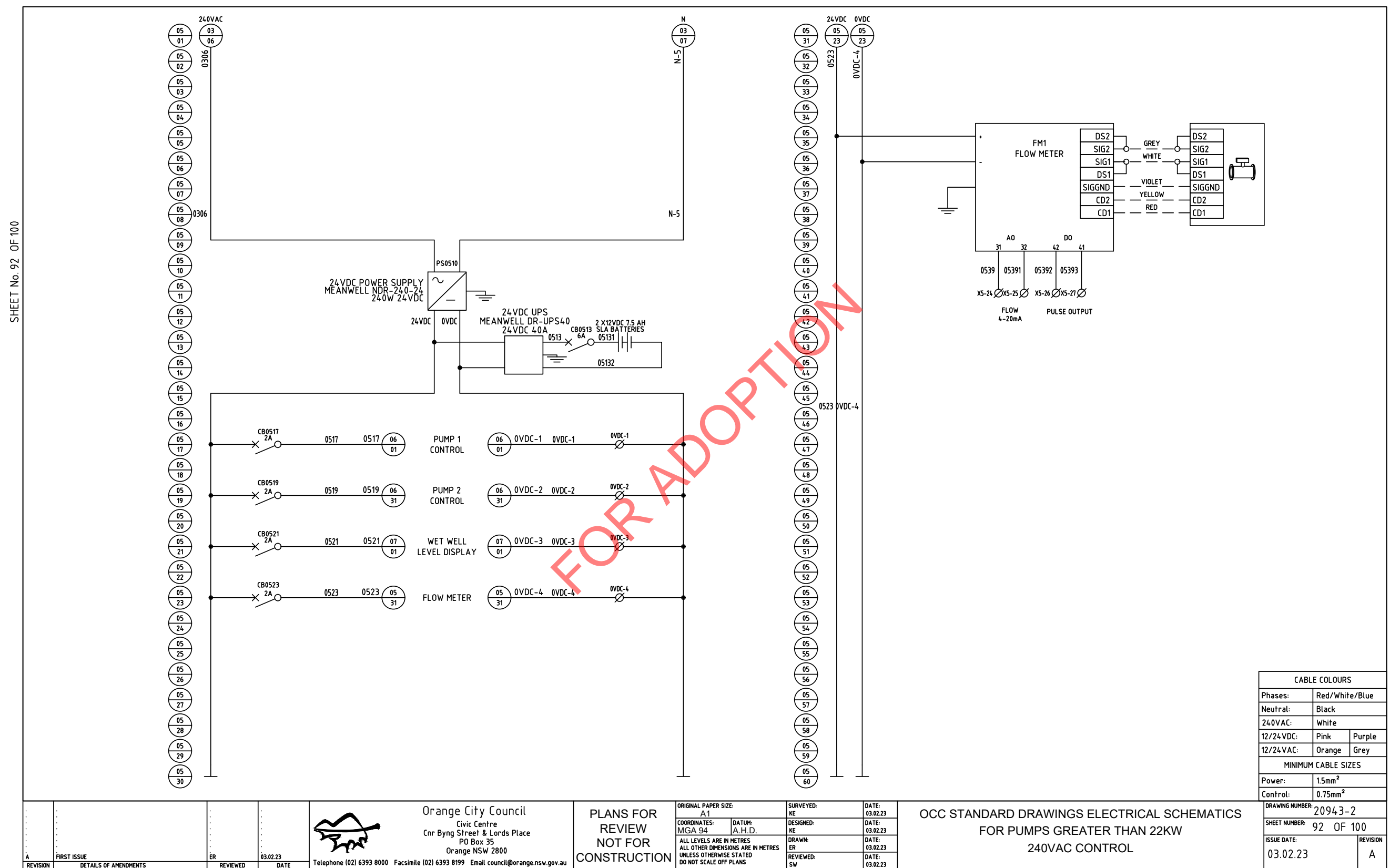
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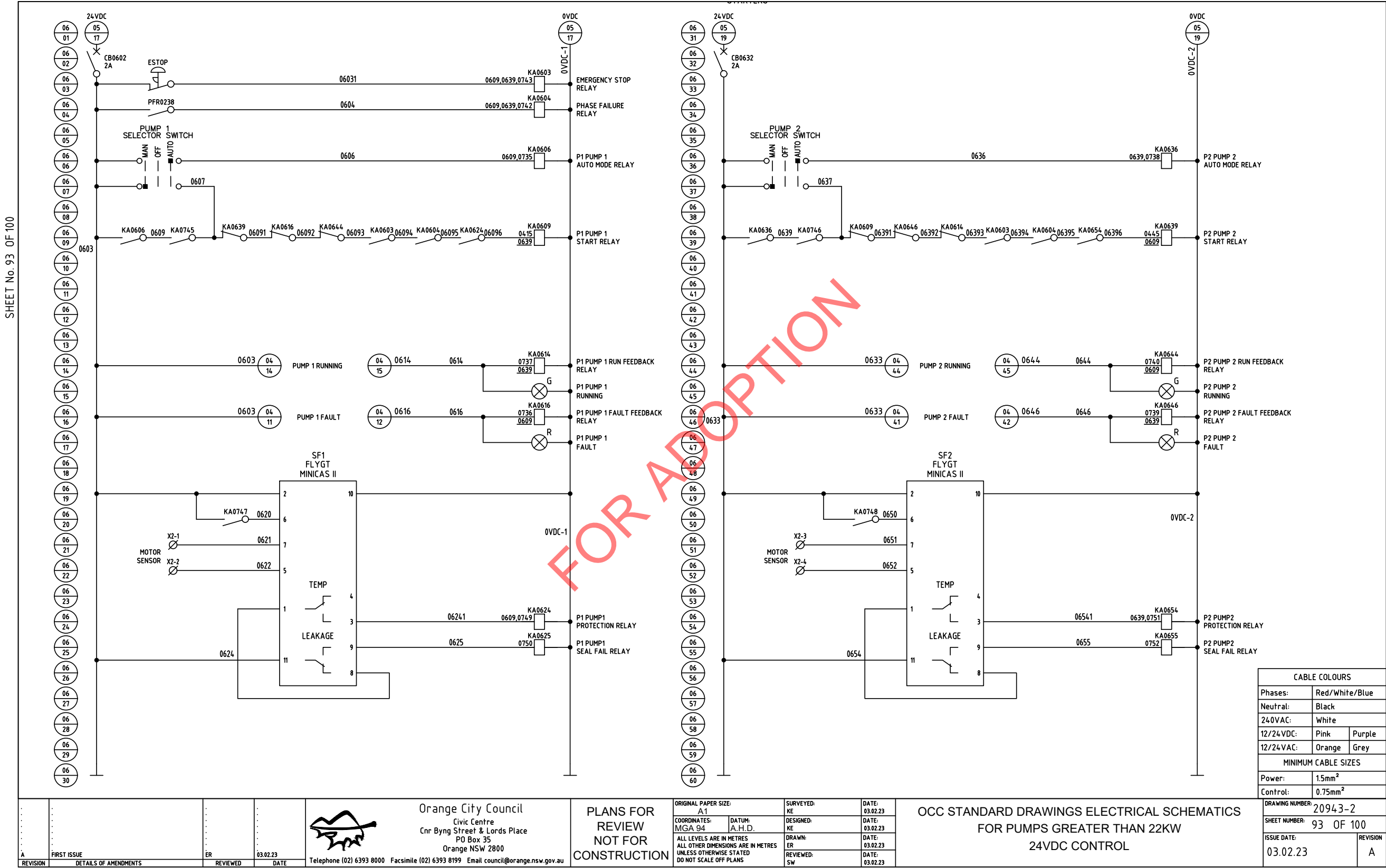


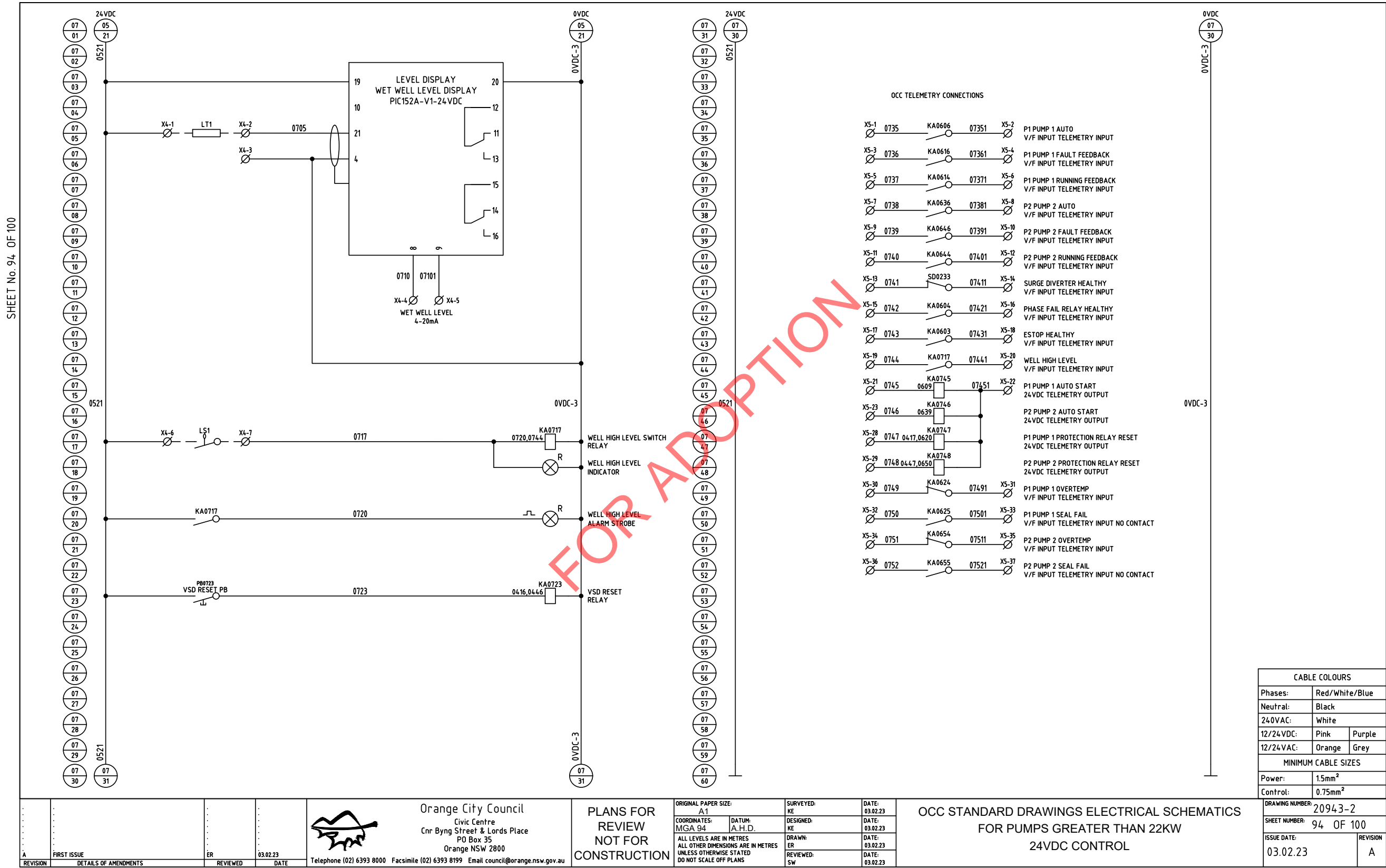


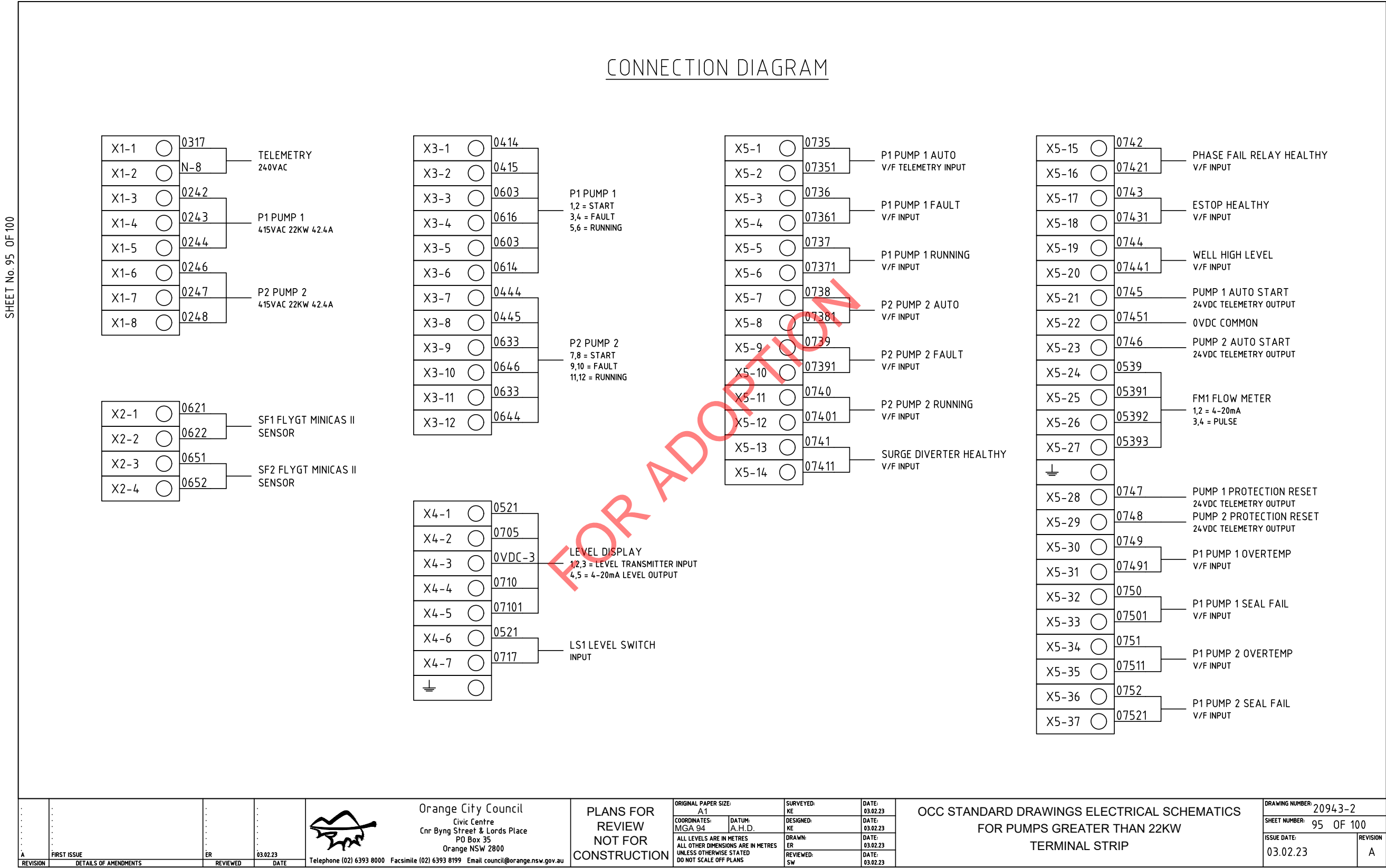












X4-1

0521

X4-2

0705

X4-3

0VDC-3

X4-4

0710

X4-5

07101

X4-6

0521

X4-7

0717

LEVEL DISPLAY
1,2,3 = LEVEL TRANSMITTER INPUT
4,5 = 4-20mA LEVEL OUTPUT

LS1 LEVEL SWITCH
INPUT

X5-1

0735

X5-2

07351

X5-3

0736

X5-4

07361

X5-5

0737

X5-6

07371

X5-7

0738

X5-8

07381

X5-9

0739

X5-10

07391

X5-11

0740

X5-12

07401

X5-13

0741

X5-14

07411

P1 PUMP 1 AUTO
V/F TELEMETRY INPUT

P1 PUMP 1 FAULT
V/F INPUT

P1 PUMP 1 RUNNING
V/F INPUT

P2 PUMP 2 AUTO
V/F INPUT

P2 PUMP 2 FAULT
V/F INPUT

P2 PUMP 2 RUNNING
V/F INPUT

SURGE DIVERter HEALTHY
V/F INPUT

X5-15

0742

X5-16

07421

X5-17

0743

X5-18

07431

X5-19

0744

X5-20

07441

X5-21

0745

X5-22

07451

X5-23

0746

X5-24

0539

X5-25

05391

X5-26

05392

X5-27

05393

X5-28

0747

X5-29

0748

X5-30

0749

X5-31

07491

X5-32

0750

X5-33

07501

X5-34

0751

X5-35

07511

X5-36

0752

X5-37

07521

PHASE FAIL RELAY HEALTHY
V/F INPUT

ESTOP HEALTHY
V/F INPUT

WELL HIGH LEVEL
V/F INPUT

PUMP 1 AUTO START
24VDC TELEMETRY OUTPUT

0VDC COMMON

PUMP 2 AUTO START
24VDC TELEMETRY OUTPUT

FM1 FLOW METER
1,2 = 4-20mA
3,4 = PULSE

PUMP 1 PROTECTION RESET
24VDC TELEMETRY OUTPUT

PUMP 2 PROTECTION RESET
24VDC TELEMETRY OUTPUT

P1 PUMP 1 OVERTEMP
V/F INPUT

P1 PUMP 1 SEAL FAIL
V/F INPUT

P1 PUMP 2 OVERTEMP
V/F INPUT

P1 PUMP 2 SEAL FAIL
V/F INPUT

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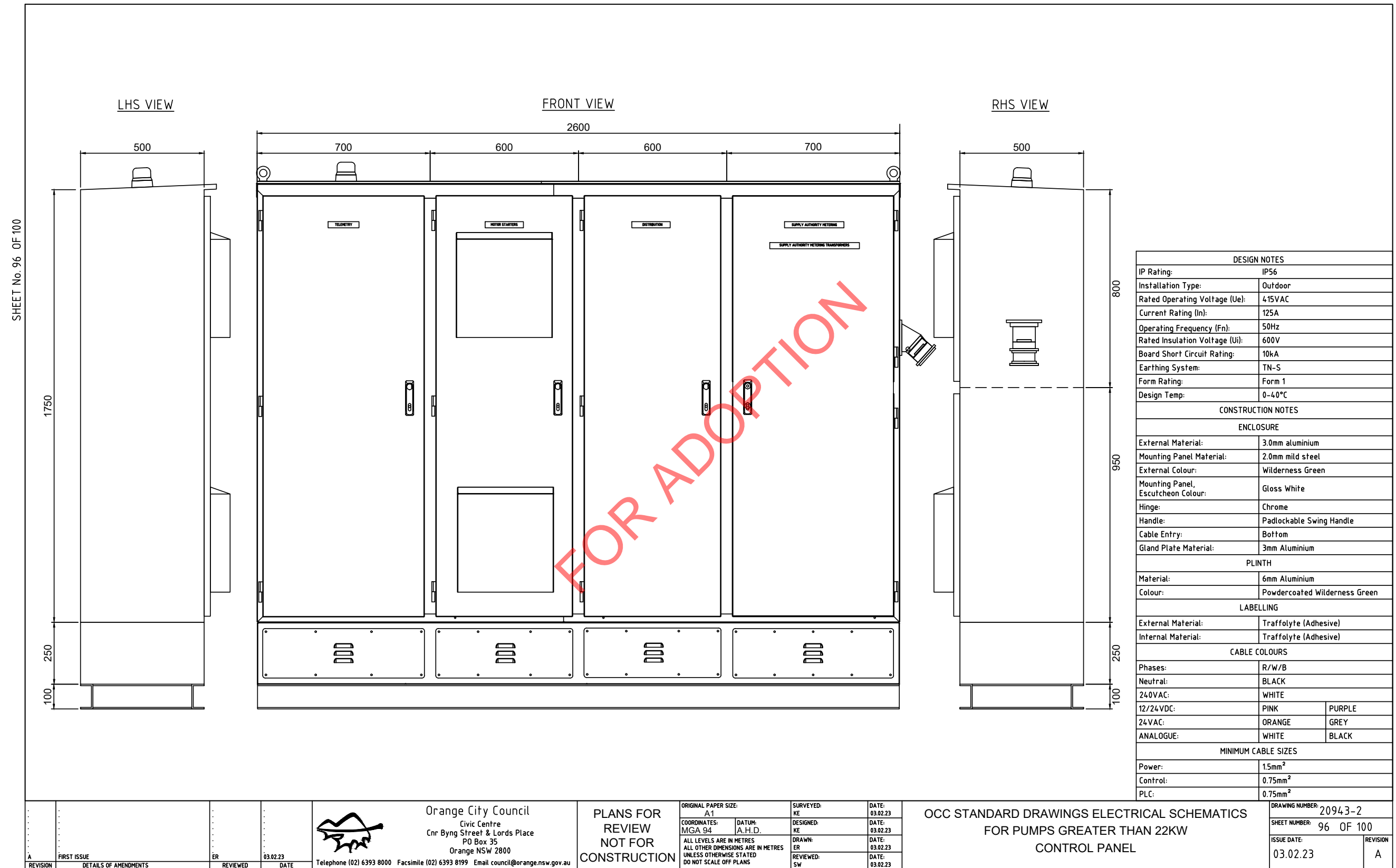
OCC STANDARD DRAWINGS ELECTRICAL SCHEMATICS
FOR PUMPS GREATER THAN 22KW
TERMINAL STRIP

DRAWING NUMBER: 20943-2

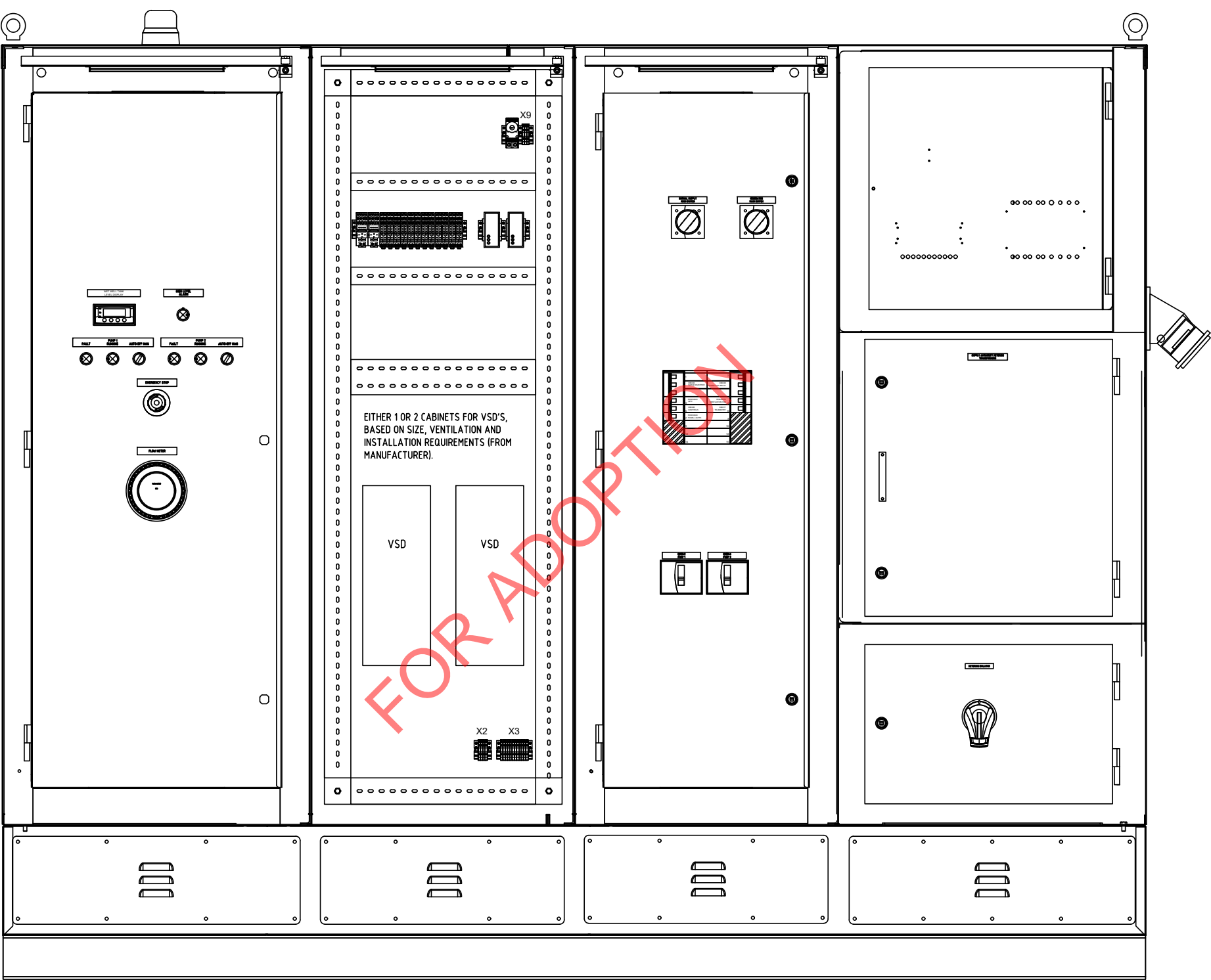
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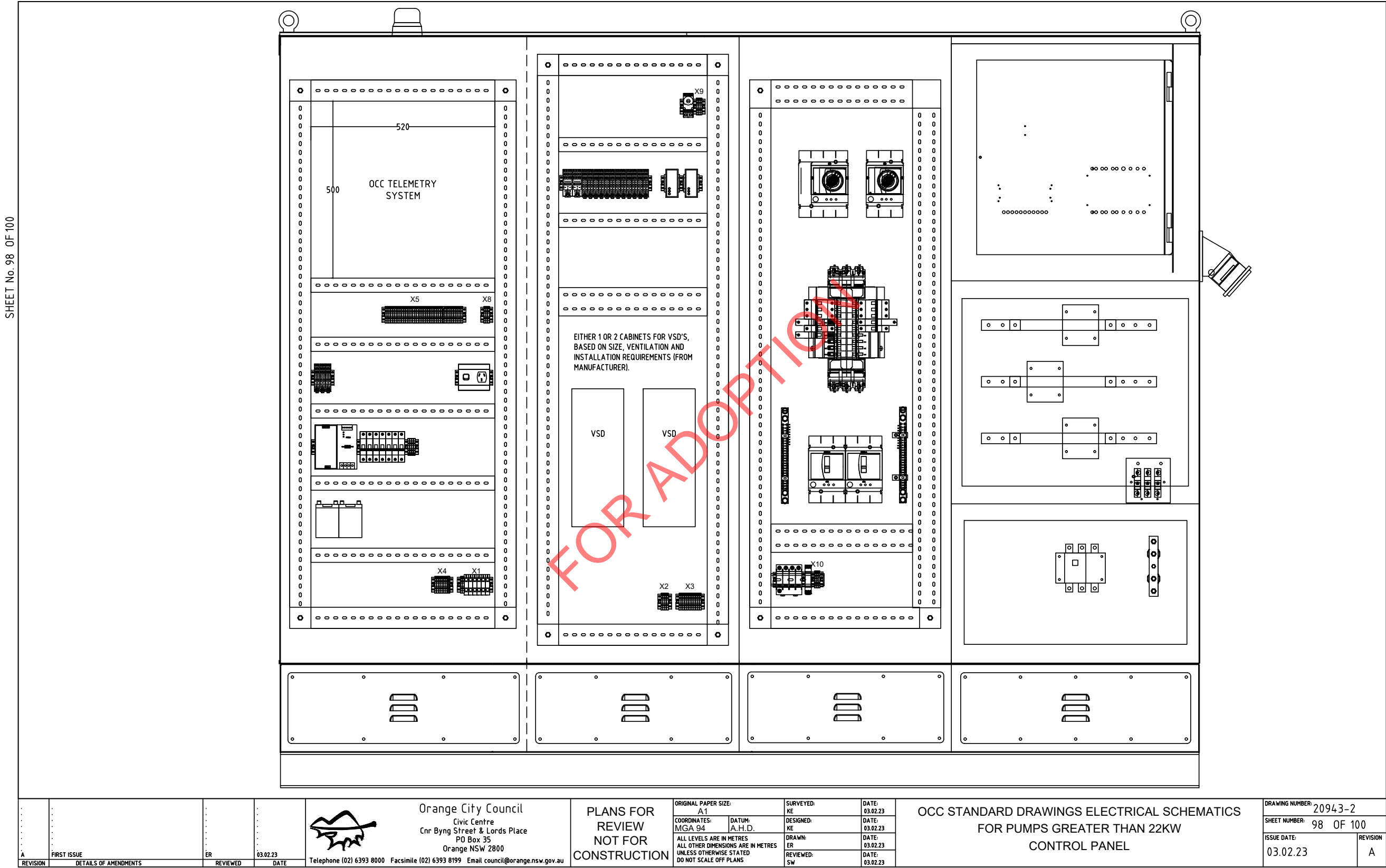
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SHEET No. 100 OF 100

| Item | Manufacturer | Part Number | Description |
|------|--------------|------------------|---|
| 1 | Schneider | LV430310 | MCCB NSX160 112-160A 3P 25KA |
| 2 | Schneider | LV430640 | Schneider MCCB NSX160F 4P 112-160A 36KA |
| 3 | Schneider | A9D11810 | Schneider RCBO 10A 30mA 10kA chassis mount |
| 4 | Schneider | A9F54102 | Schneider MCB 2A 10kA 1P |
| 5 | Schneider | A9F54106 | Schneider MCB 6A 10kA 1P |
| 6 | Schneider | A9F54306 | Schneider MCB 6A 10kA 3P |
| 7 | Schneider | A9F54363 | Schneider MCB 63A 10kA 3P |
| 8 | Schneider | LC1D1156U7 | Schneider Contactor 59kW 3P 240VAC Coil |
| 9 | Schneider | RXG22BD | Schneider Relay 24VDC coil 2CO LED |
| 10 | Schneider | RGZE1S48M | Schneider Relay base for RGX22 2CO |
| 11 | Schneider | RXM4AB2BD | Schneider Relay 4CO 24VDC coil |
| 12 | Schneider | RXZE2S114M | Schneider Relay base 4P for RXM |
| 13 | Schneider | A9L40601 | Schneider Surge diverter 4P 40KA alarm o/p |
| 14 | Schneider | RM17TG00 | Schneider Phase Fail / Sequence relay 1CO |
| 15 | Schneider | SAU25018183DF | Schneider Chassis 250A 18P @18mm Dual Feed |
| 16 | Meanwell | NDR-240-24 | Power supply 24VDC 10A 240W DIN rail |
| 17 | Meanwell | DRUPS-40 | Meanwell UPS module 24VDC 40A |
| 18 | East Power | ES1272 | Battery SLA 12V 7.2AH |
| 19 | WF | 240S45CLO5S/ST | Current Transformer 200/5 Power Auth approved |
| 20 | | KWHTB01 | Test block for CT metering 3ph |
| 21 | Proconnect | 3PS9A3NE01 | Generator inlet 150A 3P+N+E |
| 22 | Clipsal | 4SSO15D | GPO 10A switched DIN rail mount |
| 23 | Schneider | ZB4BD3 | Schneider Switch head 3 pos stay put |
| 24 | Schneider | XB4BVB3 | Schneider Indicator 24V green |
| 25 | Schneider | XB4BVB4 | Schneider Indicator 24V red |
| 26 | Schneider | ZB4BS844 | Schneider Emergency stop head 40mm twist release |
| 27 | Schneider | NSYCVF300M230PF | Fan & filter 230VAC 300m3/hr |
| 28 | Pfannenbergl | 103-257 | Thermostat 0-60deg DIN rail NO for cooling |
| 29 | | PIC152A-V1-24VDC | Panel Meter LED 24VDC 96x48 1AI 2RO 1AO |
| 30 | Moflash | 721-6429 | Strobe beacon red 10-100VDC 20-72VAC |
| 31 | ABB | FM011033 | Watermaster Flow Meter 240VAC |
| 32 | | 902-6865 | Limit switch adjustable side roller lever IP65 M20 |
| 33 | Sunny | 9706/280TC | LED strip cabinet light 280mm 4W 240VAC flex & plug |
| 34 | | SC32BW | Fuse holder NS 32A back wire |
| 35 | Phoenix | 3044102 | Phoenix Terminal UT 4mm2 grey DIN rail |
| 36 | Phoenix | 3044076 | Phoenix Terminal UT 2.5mm2 grey DIN rail |
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DRAWING NUMBER: 20943-2

SHEET NUMBER: 100 OF 100

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REVISION
A

11 January 2024

The General Manger
Orange City Council
PO Box 35
ORANGE NSW 2800

By Email: council@orange.nsw.gov.au

Dear Sir,

**RE. RESUBMISSION OF DRAFT SUBDIVISION & DEVELOPMENT CODE AND
STANDARD DRAWINGS – JANUARY 2024**

In reference to the above draft documents we now formally lodge our second submission on the Draft Subdivision & Development Code, hereinafter called the Code, and the Standard Drawings, hereinafter called the Drawings, which have been exhibited following the Council Meeting on the 5th December 2023.

It is our opinion that the exhibition of the new draft code being “*Council’s policy for engineering requirements on developments*”, has not met the requirements of the Local Government Act 1993, namely *Section 160 Public Notice and exhibition of draft local policy* and *Section 705 What is public notice?* We believe that the publication on Council’s website under “*On exhibition for public comment and expressions of interest*” does not satisfy S705 C13 *The notice is to be given in a manner determined by the council with the object of bringing the matter notified to the attention of as many people in its area as possible*. In addition, it is certainly not clear as to when the notice was published on Council’s website to know whether the statutory timeframes have been complied with.

Having previously lodged a submission on the draft code back in April 2019, we were certainly keen to review the new draft code and provide a submission. As part of the 2019 draft Code local consultants were advised by letter that the Code was on exhibition and invited to comment. This has not occurred this time.

In summary the key points to be taken from this submission are as follows:

- The Draft Subdivision and Development Code proposes a number of changes, particularly to do with defects liability and maintenance which are not in accordance with and contravene the Environmental Planning and Assessment Act 1979. This was advised in April 2019;
- The Draft Subdivision and Development Code proposes changes that will have the affect of potentially increasing the civil construction costs by anywhere from \$5,000 to \$10,000 per residential lot. This cost will need to be directly past on to the purchaser.

These include but not limited to: pavement thicknesses, pavement design requirements, pavement testing, asphalt thicknesses, turfing or hydroseeding of footpath areas and testing requirements.

- The Draft Subdivision and Development Code references a great many publications, codes and standards, however, these documents themselves can be quite broad and do not always reflect the requirements or historical practices of this Council area. More specific references need to be made to avoid a broad brush approach in order to ensure consistent delivery of civil works.
- The Draft Subdivision and Development Code does not provide a sufficient specification for works required in the Orange LGA, meaning that the quality of the public works delivered by developers and Council will not be consistent. Council works do not appear to comply with the requirements of the existing and proposed subdivision code. The specification has been left to the developer to provide, meaning that every developer could in fact provide a slightly different specification leading to inconsistent works.

We recommend that all civil construction works carried out by developers & Council be subject to the same scrutiny of inspections and testing, by one department of Council. This will ensure a consistent approach and ensure that the ratepayers of Orange receive value for money.

- The Draft Subdivision and Development Code has many inconsistencies and discrepancies which have still not been addressed from the 2019 Draft Code.
- We recommend that a joint approach by CENTROC be taken to implementing a single code and specification to be used for civil construction works across the Central West Council group.

We strongly recommend that this Draft Subdivision and Development Code **NOT** be adopted in its present form. A significant amount of work is still required to ensure Council has a robust, consistent, clear and economically sustainable code for use by Council and developers. This current Code being a revision of 2019 Draft Code has failed to address some very important discrepancies and inconsistencies, not to mention contraventions with the EP&A act.

To ensure the Subdivision and Development Code is consistent, robust, compliant and practical, we urge Council to establish a working group to review the Code and address many of the issues raised. This working group should consist of Councillors, Council staff both development and works staff, interested design consultants and contractors. All of these people will have to work with the new Code are must be involved in its preparation to ensure success of the Code.

Following is a list of the major issues that we have identified with the Code. These must be addressed and the code readvertised prior to any adoption as the discrepancies and impact are too great for the code not to be readvertised.

| Item | Section | Paragraph | Comments |
|------|-------------------|------------------------|---|
| 1 | Report to Council | Supporting Information | The report states that the last amendment to the Subdivision and Development Code was in 1982 but fails to mention the current four (4) volumes of Council's Development and Subdivision Code which has been used by Council since circa 1997 providing guidance on engineering design and construction requirements within the Orange LGA. This document not only provided the design and construction requirements but was also the basis for the specification or the standard the works to be constructed. |
| 2 | 1.1 | 3 | This new code should also be applicable to all works constructed by Council to ensure consistency in the delivery of Council infrastructure and should NOT just be used for development works. |
| 3 | 1.1 | 6 | <i>"the onus is on the applicant to whom the approval is given"</i> . The applicant on a DA approval is quite often not the developer or the land owner. This wording is not consistent with the EP&A act. Better wording is "the onus is on the person who has the benefit of the approval" . This covers instances where an approval may be granted and the land is subsequently sold. It is not possible to hold the applicant of accountable if they have nothing to do with the development. |
| 4 | 1.1 | 7 | <p>Same as above. In addition the statement including <i>"maintaining them for the duration of any maintenance period."</i> The words including maintenance and maintenance period either need to be changed or they need to be very clearly defined. This will be a continual theme through the draft Code.</p> <p>The definition of maintenance is <i>"The process of preserving a condition or situation or the state of being preserved."</i></p> <p>The EP&A act does not require the person having the benefit of a consent to maintain public works. Section 4.17(6)(c) allows Council to impose a condition of consent requiring security to be provided to council for <i>"remedying any defects in any such public work that arise within 6 months after the works is completed"</i>.</p> <p>Legally Council cannot require the developer to maintain public works, they can only require then to remedy any defects. Once Council takes ownership of the public works through the issue of a subdivision certificate the maintenance of any public asset rests with the asset owner as the developer no longer has control. A developer cannot go and patch a road or mow grass where it does not own the asset. To do this opens up all sorts of liability issues with Council as works are being carried out on Council owned land. Rates are paid to Council for the maintenance of public assets.</p> <p>Therefore, the wording must be changed to reflect the requirements of the EP&A act and to avoid Council trying to force works to be done that they have no authority to do so.</p> |
| 5 | 1.2 | 1 | Applicant Developer – This is not one term and both words have different meanings. The person seeking development approval may not be the person that ultimately does the development. |
| 6 | 1.2 | 12 | Provide accurate definition for Development Security Bond. Security required by Council and provided by a developer under Section 4.17(6) of the EP&A act could be for a number of separate reason and not solely for the protection of Council assets. |
| 7 | 1.3.1 | 1 | It is understood that Council are no longer using the <i>Hightail</i> method of accepting engineering design plans. Therefore, the appropriate means of transmitting should be included. |
| 8 | 1.3.1 | 3 | This paragraph should state that the plan approval fees are contained within Councils and fees and charges. |

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| 9 | 1.3.1 | 7 | It is understood that Council are no longer using the <i>Hightail</i> method of accepting engineering design plans. Therefore, the appropriate means of transmitting should be included. |
| 10 | 1.3.2 | 1 | <p>The actual criteria for approving a person as being qualified should be included to ensure consistency. The Institution of Engineers is no longer referred to in this way and is known as Engineers Australia. In addition, there is no membership category of Corporate Membership. There are four occupational membership grades, fellow, member, graduate and student and three occupational categories, professional engineers, engineering technologists and engineering associates.</p> <p>We would suggest that the required level of qualification required to submit designs to Council is professional engineer eligible for membership of Engineers Australia.</p> <p>If designers are required to have a certain qualification level then the same requirement must hold for any Council officer that is tasked with assessing the designs. I do not think it is appropriate that only the Director of Technical Services holds the same qualification as they are not the person actually carrying out the assessment of the submitted designs.</p> <p>The 2019 Draft Code only required Professional Indemnity (PI) insurance of \$2million. The new draft code now suggests a minimum of \$5million of insurance cover is required that also indemnifies Council. Unfortunately, no PI insurance underwriter is going to include Council in the indemnity on the insurance policy. We see no need to have this level of cover or even have Council listed on the policy as there is no contractual arrangement between the designer and Council. The level of cover is solely between the developer and the designer. Council in section 1.1 make it very clear that they will hold the developer solely responsible.</p> <p>In May 2023 the Australian Prudential Regulation Authority conducted a Review of claims trends and affordability of public liability and professional indemnity insurance in Australia. This review found that since 2015 PI Insurance average premiums have risen by 27%. Engineers Australia has recognised that the <i>"current insurance situation is not sustainable"</i>.</p> <p>www.engineersaustralia.org.au/policy-and-advocacy/professional-indemnity-insurance</p> <p>If Council choose to adopt the above PI Insurance criteria as part of the subdivision code then this will spell the end for small engineering consultancies in this area.</p> |
| 11 | 1.3.3 | 2 | <p>Austrorads, NSW Roads and Maritime Services and the Water Services Association of Australia construction specifications are all very broad documents with a lot that is not relevant to works within Orange City Council.</p> <p>It is recommended that Council liaise with CENTROC to put together a generic Construction Specification that is used across the Central West region to obtain consistencies in development or provide a specification of their own for all works to comply with. By doing this there can be consistency across all developers and Council work.</p> <p>Without ONE generic specification and by simply referring to the Austrorads, Transport for NSW (TfNSW) and the Water Services Association of Australia specifications as the minimum provided too much uncertainty. Specifications by their nature must not be uncertain. TfNSW specifications are written for high volume highways and are not intended for local streets. The cost to deliver roads to the same specification used by TfNSW will be exorbitant.</p> <p>This section allows for the developer to provide their own specification but also states that Council is not bound to accept it. Therefore, to ensure Council get consistent assets it must be up to Council to provide a clear and concise</p> |

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| | | | specification for civil construction work, otherwise, the process will go around in circles until Council get what they want. |
| 12 | 1.3.4 | 4 | Noted but it must be made clear that where Council is the certifying authority and have been paid a fee to approve assess and approve the designs against the conditions of consent, Council has no authority to change requirements part way through construction of a development, due to change of heart or interpretation. |
| 13 | 1.4 | | This clause should be adjusted to include and changes in terminology for construction certificates to either be or include Subdivision Works Certificates. |
| 14 | 1.5 | 3 | Define Applicant or change word to Contractor. |
| 15 | 1.5 | 4 | Define Applicant or change word to Contractor. Council has inspection sheets which are to be signed by contractor at time of inspection therefore, notice can be provided almost immediately for some inspections. This is required to ensure timely backfill of trenches. |
| 16 | 1.7 | 3 | Include Council phone number for arranging inspections. |
| 17 | 1.7 | 6 | This paragraph is not really necessary as it is already stated what notice is required to be given when requesting an inspection. Perhaps replace this paragraph with what procedure should be followed when Council staff fail to turn up for a booked inspection, to ensure that the contractors works are not delayed by Council or safety put at risk. |
| 18 | 1.9 | | Is a ROP required when the DA conditions specifically require a subdivision works certificate that involves construction works in Council road reserves? |
| 19 | 1.10 | 1 | What are the "required fees" and where are these found? |
| 20 | 1.13 | 1 | Professional engineer allowed to prepare plans yet in Paragraph 3 a registered surveyor is required to sign off plans. Given Council are imposing development conditions requiring statements from Registered Surveyors why is the certification required at the bottom of the page. |
| 21 | 1.13 | Dot point 14 | Where does the value of 0.6m come from? Historically a value of 0.45m has been used. Grade in AS3500.2 for sanitary drainage is 1.65%. |
| 22 | 1.14 | 2 | Council only has power under the EP&A act to utilise the security bond for rectification of defects. It does not have the power under the Act to invoice the developer. |
| 23 | 1.14.1 | 1 | Change maintenance to security in compliance with EP&A act. |
| 24 | 1.14.1 | 2 | Change maintenance to security in compliance with EP&A act. Reword to reflect the actual reason that the security bond is held, use wording from EP&A act for consistency and compliance and to avoid confusion. This section should also reflect the requirements of Section 4.17(8) as to how the security can be provided by the developer. |
| 25 | 1.14.2 | | This section should be retitled to Defects Liability Period |
| 26 | 1.14.2 | 1 | Change <i>maintenance period</i> to defects liability period. The timeframe for this period MUST be in accordance with the EP&A act, 6 months. This act does not give the Director of Technical Services the authority to extend the timeframe. |
| 27 | 1.14.2 | 2 | Change <i>maintenance period</i> to defects liability period and delete <i>omission</i> as this is not in the EP&A act. There should not be any omissions as the Subdivision Certificate was released on the basis that all work was complete. |

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| 28 | 1.16.2 | 2 | <p>It is completely unreasonable to require a developer to obtain a written statement from an adjoining property owner on completion of works. It is the certifier's responsibility to ensure the works are at the required standard and in accordance with the approved design plans.</p> <p>Anything could happen from the time the original permission was granted to the developer, from the owner no longer liking the development and holding the developer to ransom, or the ownership of the property changing.</p> <p>This requirement is completely unreasonable.</p> |
| 29 | 1.16.5.2 | 1 | Reference the actual standard drawing to avoid any confusion. |
| 30 | 1.16.5.3 | 1 | Provided a person has carried out the required training to prepare Traffic Control plans, there should be no need for them to be accredited by TfNSW. Refer to Safework Traffic Control Training. |
| 31 | 1.16.6 | | Road opening permits are already covered in Section 1.9 and as such no need to repeat it here. |
| 32 | 1.16.8 | 1 | Define Applicant. |
| 33 | 1.16.9 | 1 | Council are the authority that must determine street lighting requirements and not Essential Energy. |
| 34 | 1.16.9 | 3 | <p>Category PR lighting is not the correct reference from AS1158. AS1158 refers to Category P lighting which then covers PR, PP, PA, PE and PC lighting categories.</p> <p>Why not include a table of what street lighting is required for the different road classifications. This would be much simpler reference point.</p> |
| 35 | 1.16.10 | 1 | The guidelines referred to are only interim and these guidelines note that the working hours are only recommended and are NOT mandatory. There needs to be flexibility to allow work outside of the adopted hours via appropriate approval. |
| 36 | 1.16.12 | 2 | Refer to the actual standard drawing |
| 37 | 1.16.12 | 3 | Remove this clause. No point lodging the road naming application prior to the development application being lodged as there is no guarantee that the development application will be approved. |
| 38 | 1.16.13 | 2 | The requirement to plant the trees prior to the subdivision certificate goes against Council officer's views that trees need to be planted after the houses are built so that are not damaged. Provide a clause allowing for the trees to be bonded or just adopt a set fee per tree in the management plan for street trees as per the current subdivision release requirements. |
| 39 | 1.16.14 | 1 | <p>Why has the minimum width been increased from 4m to 4.5m and why is a minimum 2.5m wide concrete shared path required if the pathway is not identified in any bicycle plan? This seems unreasonable and not consistent with the DCP.</p> <p>The clause requires the path to be extended to kerb and gutter at both ends. What if there is no kerb and gutter at one end?</p> |
| 40 | 1.16.15 | 1 | <p>This paragraph should be changed to read as follows:</p> <p>The person having the benefit of the development approval shall be responsible for constructing the required development works to the principal certifying authority's satisfaction. It is not the developers responsibility to maintain the assets handed over to Council.</p> |
| 41 | 1.16.15 | 2 | Move the word liability to after defect. |

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| 42 | 1.16.16 | | This clause no longer makes sense, does it refer to concrete footpaths or the verge? Council officers have advised many times that they do not want the footpaths built prior to subdivision release as the builders damage the footpaths. Provide a clause allowing for the footpaths to be paid for by the developer but done by Council once houses are built. |
| 43 | 1.16.19 | 2 | The code relates to all development work and should also relate to works done by Council to ensure consistency in the delivery of infrastructure. It does not just relate to Torrens Title Subdivisions. |
| 44 | 2.2.4 | 2 | 1:6 batters are only relevant to Urban roads and as such other requirements should be included for rural roads. It is noted that Council's designs never comply with his requirement! |
| 45 | 2.3 | Table 2.1 | Design traffic has increased substantially from previous subdivision code. Calculations for design traffic using procedures from Austroads Guide to Pavement Technology do not justify such high figures. |
| 46 | 2.3.3 | 1 | The requirement to seal shoulders for rural roads contradicts requirements of Table 2.3. |
| 47 | 2.3.3 | Table 2.2 | The requirement to seal shoulders on Rural collector roads and Rural Local Access roads would mean that these roads would have bitumen seal widths wider than Cargo Road and many RMS controlled roads. This is excessive and expensive. |
| 48 | 2.3.4.1 | Table 2.3 | Why do shared ways need to be up to 4m wide? What justifies this width? |
| 49 | 2.3.4.1 | 2 | Why do road shoulders need to be widened to 3m adjacent to barrier centrelines and what does this really mean? What is the justification for this? |
| 51 | 2.3.4.5 | 2 | Road batters in rural situations need to be allowed to be steeper, particularly in cut situations to be maintained within the road reserve. |
| 52 | 2.3.4.5 | 5 | Specify at what height a structural design is required to avoid any confusion. |
| 53 | 2.3.4.7 | 4 | Radius for rural cul-de-sacs are excessive and not justified. |
| 54 | 2.3.5.2 | 1 | Where do grades come from? Are they in accordance with Austroads? Other Council's have different requirements and in Orange the natural topography will make these grades hard to comply with. |
| 55 | 2.3.5.2 | 3 | Sealing of unsealed roads where grade exceeds 10% is unreasonable given the topography of the Orange area. Which standard or code does this requirement come from? |
| 56 | 2.3.5.7 | 2 | This is not possible to comply with in the Shiralee area due to the small lot sizes nor is it possible to comply with in most areas. By my reading the lot width at an intersection would need to be at least 33m wide! |
| 57 | 2.3.6 | 2 | Rather than specify the footpath requirements this is already done in Table 2.3. The width specified contradicts Table 2.3. |
| 58 | 2.3.6 | 4 | Refer to the appropriate standard drawing. |
| 59 | 2.3.7 | | Refer to the appropriate standard drawing relevant to the section. |
| 60 | 2.3.7.4 | 1 | The requirement to concrete battleaxe driveways contradicts previous Council resolutions. |
| 61 | 2.3.7.5 | 2 | The third sentence does not make sense. |
| 62 | 2.3.7.6 | | This clause is really relevant to planning controls which should be part of the relevant DCP and not engineering standards. |

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| 63 | 2.3.8.3 | | The code relates to all development work and should also relate to works done by Council to ensure consistency in the delivery of infrastructure. It does not just relate to Torrens Title Subdivisions. |
| 64 | 2.4.1 | 1 | Why does the TfNSW supplement need to be referred to for local roads? The Code relates to development works essentially on local roads we are not building highways under this Code. |
| 65 | 2.4.3 | 6 | Why adopt TfNSW specifications for local roads, we are not building highways under this code. |
| 66 | 2.4.5 | 3 | This contradicts Council's standard drawings. |
| 67 | 2.4.6 | 4 | How has the minimum pavement thickness been arrived at? Specifying gravel thickness does not allow for thin asphalt surfaces to be considered, refer above. Current code allows 200mm minimum thickness, why the change? If the design guides call for a thinner pavement and we are required to design to these codes then it should be allowed. |
| 68 | 2.4.7 | 2 | Why has asphalt thickness been increased to 40mm? What is the justification? This effectively increase asphalt cost by 33%. Whether the asphalt is 30mm or 40mm it is not considered to any additional structural performance. It is simply a wearing and waterproofing surface. |
| 69 | 2.4.8 | 2 | The ROP should not specify the backfill requirements. This detail should be in the Code to avoid confusion or different interpretations by Council officers |
| 70 | 2.5.1 | 2 | What have the TfNSW publications got to do with Council roads? Very general statement with no definitive approach or requirement. |
| 71 | 2.5.2 | 1 | The record of approval must be provided by Council to the contractor after the inspection rather than making the contractor obtain it from Council. |
| 72 | 2.5.2 | 2 | The compaction testing proposed is excessive and again is different to the requirements of the Austroads publications. Reproduce requirements from Austroads Guide to Technology – Part 8 Pavement Construction. |
| 73 | 2.5.2 | Table 2.6 | The compaction requirements have changed from the 2019 Draft Code and have increased. It appears as though they are from a TfNSW specification but contradict Australian standards previously used. Again these roads are not highways! |
| 74 | 2.5.3 | 1 | What are the minimum qualifications required for the Council's delegated officer? Rather than the developer obtain record of approval, the Council office/engineer must provide this following the inspection. |
| 75 | 2.5.3 | 3 | The extent of visual movement MUST be defined and not just any movement. Refer to Austroads guides for direction on this. |
| 76 | 2.7.5 | 1 | No need to specify where lights need to be placed when a lighting design is already required. Potential for contradiction and confusion |
| 77 | 2.8 | 6 | The requirement to turf road reserve areas is excessive and unreasonable. The requirement to hydro mulch and or hydro seed with straw mulching of road reserves is also excessive. There has been no justification offered as to why this requirement is proposed to be imposed. |
| 78 | 2.8 | 7 | The requirement to rock line, jute mesh and bitumen treat open drains where grades exceed 2% is completely ridiculous. The minimum grade on an open grass line drain is typically 1%. The requirement to jute mesh and bitumen line open drains MUST be a function of the velocity of water in the drain and not the gradient. The gradient has a direct impact on water velocities. |

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| | | | The treatment requirement should not just be a function of drain gradient. |
| 79 | 3.1 | 1 | <p><i>"Developers of land are to be wholly responsible for disposing of all storm water runoff which passes over or through the respective properties, roads and reserves."</i></p> <p>What does this actually mean? It seems to be one great over arching statement that has no meaning or purpose. Developers cannot be responsible for stormwater from upstream works.</p> <p>Council may have some responsibility in this area particularly where drainage works form part of a developer contributions plan.</p> |
| 80 | 3.1 | 2 | <p>Developers cannot be held responsible for maintaining drainage works. They can only be held responsible for fixing defects which can be proven to be a result of faulty workmanship or materials that become evident within 6 months of subdivision certificate issue. Refer to EP&A act Section 4.17(6)(c).</p> <p>Replace maintenance with defects liability.</p> |
| 81 | 3.2.4 | 1 | <p>The actual criteria for approving a person as being qualified should be included to ensure consistency. The Institution of Engineers is no longer referred to in this way and is known as Engineers Australia. In addition, there is no membership category of Corporate Membership. There are four occupational membership grades, fellow, member, graduate and student and three occupational categories, professional engineers, engineering technologists and engineering associates.</p> <p>We would suggest that the required level of qualification required to submit designs to Council is professional engineer eligible for membership of Engineers Australia.</p> <p>If designers are required to have a certain qualification level then the same requirement must hold for any Council officer that is tasked with assessing the designs. I do not think it is appropriate that only the Director of Technical Services holds the same qualification as they are not the person actually carrying out the assessment of the submitted designs.</p> |
| 82 | 3.3.1 | 2 | 500mm freeboard is excessive for overland stormwater flow. This freeboard is applicable to major flood plains and should not be applied to overland stormwater flow. The argument is that no house would be able to be built with a floor level lower than 500mm above the top of the kerb given that this is part of the major overland flow path. |
| 83 | 3.3.2 | 2 | Remove the 20% nominal climate change factor. It is an arbitrary factor not reference in ARR2019. |
| 84 | 3.3.4 | Table 3.4 | No coefficient provided for grass or lawns. The co-efficient for rural residential, residential and industrial do not reflect the catchment area breakup provided in section 3.3.3. ie a pervious area in a residential area will NOT have a retardance coefficient of 0.02 or 0.03. |
| 85 | 3.4.1.1 | Point 1 | No need to specify a maximum pit spacing when a maximum gutter flow width is specified. This will lead to excessive pits when only road water is being collected. |
| 86 | 3.4.1.1 | Point 3 | Specify the lifting eyes on the standard drawings. Be specific. |
| 87 | 3.4.1.2 | Point 1 | Define the storm event that this applies to this point and other points following, 3, 5, 6. |
| 88 | 3.4.1.2 | Point 2 | No need for maximum spacing of pits. This will be governed by catchment area and point 1 above. |
| 89 | 3.4.1.3 | Point 1 | Remove last sentence as no reference to Section 3.3.1. |

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| 90 | 3.4.1.3 | Point 3 | 2.4m lintels on low points in cul-de-sacs has previously not been liked by Council due to size of lintel on curved kerb. |
| 91 | 3.4.2.1 | Point 2 | Why limit angle of pipes under roads. This may not work when good design dictates usually means lintels are placed at property boundaries to avoid conflicts with future driveways. Property boundaries are not always directly opposite. Provided pipes are installed correctly it really makes no difference what angle the pipes are at. . |
| 92 | 3.4.2.4 | Point 1 | Do not limit gradient on pipe as discharge levels or services may not allow these to be achieved. |
| 93 | 3.4.2.4 | Point 2 | Refer to Council standard drawing. Is AS2566-Buried Flexible Pipelines applicable to concrete pipes which are not flexible? |
| 92 | 3.4.2.4 | Point 1 | Do not limit gradient on pipe as discharge levels or services may not allow these to be achieved. |
| 93 | 3.4.3 | Table 3.5 | Minimum width for floodway / open channel with 500mm freeboard is excessive. Differentiation between flooding and overland flow path MUST be made. Based on this requirement then the requirement of a floodway in Section 3.4.4.2 would mean a very deep channel and no way of achieving this between the kerb & gutter and property boundary. |
| 94 | 3.4.4.1 | 1 | Remove the word flood after AEP and just have event. (A flood is an event!) |
| 95 | 3.4.4.2 | 1 | Needs to be mention of a freeboard (300mm) for overland flow paths. 500mm is just unrealistic and not necessary. Particularly as there is no way of providing this between the kerb & property boundary. |
| 96 | 3.5.1 | 2 | Zero initial and continuing loss rates are not in accordance with ARR2019 methodology. |
| 97 | 3.5.2 | 1 | 500mm freeboard is excessive for overland stormwater flow. |
| 98 | 3.5.4 | 1 | For what AEP is this requirement applicable to? |
| 99 | 3.5.5 | 4 | Refer to EP&A act Section 4.17(6)(c). Developers are only required to fix defects not maintain works that become Council infrastructure. The requirement to turf, hydro-mulch etc open drains MUST be a function of the velocity of water in the drain and not just a blanket requirement. Unrealistic and excessive with no justification or performance based. |
| 100 | 3.5.7 | 3 | Not always possible or practical to construct road crossings perpendicular to the road centreline particularly where pits are required to avoid future driveways. |
| 101 | 3.6.2 | | Change all references to floodway. Look at what actual definition of a floodway is. Should use overland flow path. |
| 102 | 3.7 | | Many of the requirements listed in this section are not applicable to small OSD basin for a dual occupancy or unit development. Make it clear in the following sections what parts are applicable to the differing OSD's to avoid any confusion or unrealistic expectations by Council officers. |
| 103 | 3.7.2.1 | 1 | Consideration of the PMF for OSD's is unrealistic and cost prohibitive. PMF never meant for these analysis. |
| 104 | 3.7.4 | 1 | Consideration of the PMF for OSD's is unrealistic and cost prohibitive. PMF never meant for these analysis. |
| 105 | 3.8 | 1 | Hydraulically charged downpipe systems are often the only solution available to redevelopment in existing areas where there is no Council drainage infrastructure and easements cannot be obtained. |

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| 106 | 3.8 | 5 | Where has the requirement of piping 20L/s to Council infrastructure come from. I am aware that Council have been conditioning DA's in recent times but are yet to provide justification as to what standard this has come from. May prove difficult in existing urban areas where there is no underground drainage present for many hundreds of metres and where the existing predevelopment flow from the site exceeds 20L/s. reference a standard otherwise this is an unreasonable requirement. |
| 107 | 3.8.2 | 1 | Relook at final words in the sentence as " <i>Flood Planning Area</i> " does not appear to be correct. |
| 108 | 3.8.3 | 2 Point 1 | Too much discretion to Council. If the main is already failing then Council MUST bear some liability with regard to the replacement. If no development occurs then Council would be completely liable for the replacement of the main at their total cost. Consider a 50% cost split. Developer cannot be forced to increase pipe size for no reason just because Council has the say. |
| 109 | 3.8.4.2 | Point a | The land developer has no way of knowing what future vut levels for buildings may be on the site and being required to take this into consideration is ridiculous. The requirements for drainage in strata and community title subdivisions has not been specified. |
| 110 | 3.8.4.2 | Point c | Why is there a maximum spacing requirement? No justification. |
| 111 | 3.8.4.3 | Point a Table 3.6 | A 150mm diameter pipe at 1% has sufficient capacity for 1 x 800m2 lot. Do not provide a table as this is very misleading and depends on impervious area of the lot. This also contradicts AS3500.3. |
| 112 | 3.8.4.3 | Point c | Reduce cover requirements as a 150mm pipe in a 600mm deep pit will not satisfy 500mm of cover. This will lead to pits that are deeper than required. AS3500.3 has different cover requirements. Just refer to this standard. |
| 113 | 3.8.4.3 | 3 | RRJ sewer grade pipes have not been required by Council for the last 10 to 15 years. Council specifically went away from RRJ pipes and allowed SCJ pipes. As Council do not own or maintain the asset allow pipe materials in accordance with AS3500.3. To leave this as is will substantially increase costs to development. |
| 114 | 3.8.4.3 | Point a | Allow minimum grades in accordance with AS3500.3 as the grade of the pipe may need to be reduced to connect to existing infrastructure. |
| 115 | 3.8.6 & 3.8.6.1 | | This clause has no relevance to the Code. |
| 116 | 3.8.4.4 | 1 | Consider allowing pump out systems where all other avenues for obtaining legal drainage points have been exhausted. Otherwise this potentially land locks redevelopment of older parcels of land where no interallotment drainage system currently exists. It is an allowable method under AS3500.3. |
| 117 | 3.9 | | Why is this section in stormwater drainage? |
| 118 | 3.9 | Dot point 2 | Do these batter slopes relate to the open drain or generally in open space areas? |
| 119 | 3.9 | Dot point 6 | What if boulders are required to be placed by Council along with large tree logs which often happens. This is then contradictory. |
| 120 | 3.10 | | This section needs more reference as to whether WSUD is required or not as it is not clear. Orange soils typically are not suited to many of the WSUD methodologies. Council must also consider the long term maintenance costs if these measures are to be implemented. There must also be design criteria adopted as the section is too vague and obviously not well thought through. |

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| 121 | 4.3 | Network Analysis | Why does water modelling have to be carried out by Council? No other Council that I am aware of enforces this requirement. This creates a monopoly and essentially holds the developer to ransom as Council set the fees and make the rules! |
| 122 | 4.3 | 2.5.3 | Why has the minimum allowable service pressure been dropped to 150kPa. For the past 20 years this has been 200kPa? What is the reasoning and justification for reducing the standard? |
| 123 | 4.3 | 3.3.1 | Why has the pipe pressure class been increased to PN16. The minimum pressure class in the past has been PN12. This will be additional cost to development for no apparent reason. |
| 124 | 5.3 | 5.2.8 | Provide a table specifying required easement widths for main depths. Most other Council's do. Do not leave it to the time of lodgement of the development as this does not make sense. This information needs to be known upfront. Too subjective for Council and provides no guidance when in the planning stage. |
| 125 | 5.3 | 5.4.5.2 | Structural bridging of stormwater pipes where vertical clearance is less than 1m is completely unrealistic. The WSA Code actually only requires 225mm vertical clearance to drains with no reference to structural bridging. The requirement of 1m is almost 4.5 times the accepted WSA code requirements. Structural bridging is typically only required where the minimum vertical clearances cannot be achieved. |
| 126 | 5.3 | 21 Acceptance Testing | The testing requirements for sewer main construction will add substantial costs to any new developments. In particular vacuum testing of manholes and compaction testing of trenches where they are located in easements at the rear or front of properties outside of building zones. From what we are aware vacuum testing of precast concrete manhole is very unreliable with no matter how well they are constructed they very rarely pass a test. |
| 127 | 5.3 | Appendix C Flow Estimation for Development Areas | Why does Council see the need to have a factor of 1.0 when the WSA Code provides appropriate ranges? |
| 128 | 5.4 | 10.1.3 | Why aren't HDPE pipes allowed in wet wells? Council have used these themselves in recent pump stations |
| 129 | 6.3.1.3 | 4 | ESCP or SWMP? |
| 130 | 6.4.3.4 | 2 | This contradicts Council documents provided to builders for housing construction. |
| 131 | 6.4.3.4 | 3 | What does this relate to? Very unclear! |
| 132 | 6.4.5 | | This clause contradicts Section 1.16.10 of the Code. |
| 133 | 6.4.8 | | Is the reference to the Fees and Charges correct? Why can't other sections of the Code be hyperlinked to the appropriate section within Council's website for appropriate fees and charges, contributions etc? |
| 134 | 7 | | This clause contradicts Section 1.16.5.3 of the Code. |
| 135 | Appendix A | Dotpoint 1 | Does this mean that designers will only deal with the Director of Technical Services and not go through other parties?? |

| Draft Standard Drawings | | | |
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| Item | Sheet No. | Paragraph | Comments |
| 136 | 02 | | Where does Note 4 apply to? |
| 137 | 03 | | Council contractors and Council work staff need to ensure compliance with this standard drawing. |
| 138 | 04 & 05 | | The vehicle shown is not the standard 85 th percentile passenger vehicle as per AS2890. Reference back to the correct standard. 4% crossfall within the footpath zone does NOT comply with Austroads guidelines of a maximum of 2.5% for footpaths. |
| 139 | 07 | | Stormwater pipe to be centred on face of kerb not back to ensure lintels align with pits. Electricity is not allowed to be in a shared trench arrangement with other services. 300mm to the face of an electrical pillar is NOT correct. This would have the pillar inside the property boundary which is NOT allowed. |
| 140 | 08 | | Note 4 allows a maximum crossfall of 4%. This is not in accordance with Austroads or any disability requirement which has a maximum crossfall of 2.5%. Typical section is not provided for 1.2m wide footpath as required by earlier sections of the Code. |
| 141 | 13 | | Council work staff need to be aware of this standard to ensure any rehabilitated roads and constructed in this manner! |
| 142 | 14 | | Heavy duty AC with different thickness to surrounding will result in differential movements causing displacement at joint. Section references Council's Civil Works Specifications, where are these? |
| 143 | 17 | | Where are Case 1 & 2 referred to in the Code. Crusher dust bedding not consistent with Code. Why wrap trench with geotextile if pipe already has filter sock? Interested in Council's view of constructability of subsoil pipes in geotextile filter in the bottom of the trench and be able to maintain material around stormwater pipe. Crusher dust and aggregate flows and geofabric does not stand up straight. No typical trench provided for pipes not in roadway. |
| 144 | 19 | | Specify appropriate internal pit dimensions for different sized stormwater pipes. |
| 145 | 20 | | What about precast concrete pits? |
| 146 | 21 | | What about precast concrete pits? |
| 147 | 22 | | What about precast concrete pits? |
| 148 | 23 | | What about precast concrete pits? What about other sized lintels as per the Code? |
| 149 | 29 | | Batter maximum should be 1:6 to allow for easy mowing. Concrete requirement contradicts other standard drawings and the code. Flat bottom pathway would be much safer for pedestrians. |
| 150 | 31 to 35 | | Has Council obtained the necessary copyright approval for the copying of these plans? |
| 151 | 37 & 38 | | These details do not reflect how Council currently plant street trees. |

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| 152 | 40 & 41 | | Termination points inside property boundary are contradictory between Sheets 40 & 41 for residential 20/25mm services. Sheet 40 shows poly pipe to the in line ball valve. Is Council going to comply with service markers when they install services?? |
| 153 | 44 | | What about hydrant details on non-potable mains |
| 154 | 47 | | Hydrant marker detail is not consistent with what is within Council's existing water supply network. Are existing installations going to be changed? |
| 155 | 50 | | Why do SC stop valves require a thrust block? |
| 156 | 51 & 52 | | Are all of the fittings and valves shown those that are actually used by Council? |
| 157 | 55 | | Are RRJ junctions actually able to be purchased or are they just SCJ fittings with RRJ sockets cemented into them. Meds more input from what can actually be supplied. |
| 158 | 58 | | What about precast bases? Council have not required sanded MH connectors for 25 years what has changed? |
| 159 | 63 to 100 | | This drawing now refers to 100 in the set whereas previous drawing refer to 39 in the set? Have not actually checked these drawings as they appear as though they have been copied from the WSA Code. Assuming Council have necessary copyright clearances to reproduce these drawings on their own title blocks. |

If you have any questions or require additional information, do not hesitate to contact the undersigned.

We would greatly appreciate the opportunity to review the Code with Council staff and other interested consultants and contractors to achieve a consistent and compliant Subdivision Code.

Yours faithfully

Per:

Response to Submission 1

| Item | Section | Paragraph | Comment | MES Response |
|------|-------------------|-----------------------|---|---|
| 1 | Report to Council | Supporting Informtion | The report states that the last amendment to the Subdivision and Development Code was in 1982 but fails to mention the current four (4) volumes of Council's Development and Subdivision Code which has been used by Council since circa 1997 providing guidance on engineering design and construction requirements within the Orange LGA. This document not only provided the design and construction requirements but was also the basis for the specification or the standard the works to be constructed | Noted |
| 2 | 1.1 | 3 | This new code should also be applicable to all works constructed by Council to ensure consistency in the delivery of Council infrastructure and should NOT just be used for development works | Noted |
| 3 | 1.1 | 6 | "the onus is on the applicant to whom the approval is given". The applicant on a DA approval is quite often not the developer or the land owner. This wording is not consistent with the EP&A act. Better wording is "the onus is on the person who has the benefit of the approval". This covers instances where an approval may be granted and the land is subsequently sold. It is not possible to hold the applicant of accountable if they have nothing to do with the development. | Agreed. The Definition of Applicant / Developer is changed to "the person who has the benefit of the approval" |
| 4 | 1.1 | 7 | Same as above. In addition the statement including "maintaining them for the duration of any maintenance period." The words including maintenance and maintenance period either need to be changed or they need to be very clearly defined. This will be a continual theme through the draft Code. The definition of maintenance is "The process of preserving a condition or situation or the state of being preserved." The EP&A act does not require the person having the benefit of a consent to maintain public works. Section 4.17(6)(c) allows Council to impose a condition of consent requiring security to be provided to council for "remedying any defects in any such public work that arise within 6 months after the works is completed". Legally Council cannot require the developer to maintain public works, they can only require then to remedy any defects. Once Council takes ownership of the public works through the issue of a subdivision certificate the maintenance of any public asset rests with the asset owner as the developer no longer has control. A developer cannot go and patch a road or mow grass where it does not own the asset. To do this opens up all sorts of liability issues with Council as works are being carried out on Council owned land. Rates are paid to Council for the maintenance of public assets. Therefore, the wording must be changed to reflect the requirements of the EP&A act and to avoid Council trying to force works to be done that they have no authority to do so | Disagree, Section 4.17(6)(i) of the EP&A Act does allow Council to impose a condition to maintain a public asset however, Paragraph 7 to be reworded to, The Council will hold the person who has the benefit of the approval responsible for constructing the approved infrastructure works. Any contractor carrying out subdivision or development works is directly responsible to the Developer, and not to Council. |
| 5 | 1.2 | 1 | Applicant Developer – This is not one term and both words have different meanings. The person seeking development approval may not be the person that ultimately does the development. | Agreed, Applicant to be desined as "the person who makes a formal application for development consent" Developer to be defined as "the person who has the benefit of the approval & develops land" |
| 6 | 1.2 | 12 | Provide accurate definition for Development Security Bond. Security required by Council and provided by a developer under Section 4.17(6) of the EP&A act could be for a number of separate reason and not solely for the protection of Council assets. | Agreed, Reword definition as per section 4.17(6) of the EP&A Act to "A security bond taken from the Developer to cover the costs of making good any damage caused to any property of the consent authority, completing any public work, remedying any defects in any such public work & in relation to coastal protection works, 1. Maintaining works or 2. The restoration of a beach, or land adjacent to the beach. |
| 7 | 1.3.1 | 1 | It is understood that Council are no longer using the Hightail method of accepting engineering design plans. Therefore, the appropriate means of transmitting should be included. | Agreed, Paragraph 1 to read, "The Applicant is to submit the engineering plans electronically for approval. " |
| 8 | 1.3.1 | 3 | This paragraph should state that the plan approval fees are contained within Councils and fees and charges | Agreed, Paragraph 3 to be amended to "The engineering plan approval fee is shown within Councils fees and charges and must be paid before any plans will be assessed." |
| 9 | 1.3.1 | 7 | It is understood that Council are no longer using the Hightail method of accepting engineering design plans. Therefore, the appropriate means of transmitting should be included | Agreed, Paragraph 7 to be amended to, "Once the plans have been approved, they will be stamped and returned electronically via Council's File Sharing Application" |

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| 10 | 1.3.2 | 1 | <p>The actual criteria for approving a person as being qualified should be included to ensure consistency. The Institution of Engineers is no longer referred to in this way and is known as Engineers Australia. In addition, there is no membership category of Corporate Membership. There are four occupational membership grades, fellow, member, graduate and student and three occupational categories, professional engineers, engineering technologists and engineering associates. We would suggest that the required level of qualification required to submit designs to Council is professional engineer eligible for membership of Engineers Australia. If designers are required to have a certain qualification level then the same requirement must hold for any Council officer that is tasked with assessing the designs. I do not think it is appropriate that only the Director of Technical Services holds the same qualification as they are not the person actually carrying out the assessment of the submitted designs. The 2019 Draft Code only required Professional Indemnity (PI) insurance of \$2million. The new draft code now suggests a minimum of \$5million of insurance cover is required that also indemnifies Council. Unfortunately, no PI insurance underwriter is going to include Council in the indemnity on the insurance policy. We see no need to have this level of cover or even have Council listed on the policy as there is no contractual arrangement between the designer and Council. The level of cover is solely between the developer and the designer. Council in section 1.1 make it very clear that they will hold the developer solely responsible. In May 2023 the Australian Prudential Regulation Authority conducted a Review of claims trends and affordability of public liability and professional indemnity insurance in Australia. This review found that since 2015 PI Insurance average premiums have risen by 27%. Engineers Australia has recognised that the “current insurance situation is not sustainable”. www.engineersaustralia.org.au/policy-and-advocacy/professional indemnity-insurance If Council choose to adopt the above PI Insurance criteria as part of the subdivision code then this will spell the end for small engineering consultancies in this area.</p> | <p>Agreed,1.3.2 to be amended to, "Council requires that engineering works be designed to Council standards by a person qualified pursuant to Division 1 of the Design and Building Practitioners Act, The person must have professional indemnity insurance indemnifying themselves for a minimum of two (2)million dollars."</p> |
| 11 | 1.3.3 | 2 | <p>Austroads, NSW Roads and Maritime Services and the Water Services Association of Australia construction specifications are all very broad documents with a lot that is not relevant to works within Orange City Council. It is recommended that Council liaise with CENTROC to put together a generic Construction Specification that is used across the Central West region to obtain consistencies in development or provide a specification of their own for all works to comply with. By doing this there can be consistency across all developers and Council work. Without ONE generic specification and by simply referring to the Austroads, Transport for NSW (TfNSW) and the Water Services Association of Australia specifications as the minimum provided too much uncertainty. Specifications by their nature must not be uncertain. TfNSW specifications are written for high volume highways and are not intended for local streets. The cost to deliver roads to the same specification used by TfNSW will be exorbitant. This section allows for the developer to provide their own specification but also states that Council is not bound to accept it. Therefore, to ensure Council get consistent assets it must be up to Council to provide a clear and concisespecification for civil construction work, otherwise, the process will go around in circles until Council get what they want.</p> | <p>Noted, no change. Austroads, NSW Roads and Maritime Services and the Water Services Association of Australia construction specifications are used by councils for civil works throughout NSW. The specifications are cited as they are updated to relect new technology and practices. The Councils within CENTROC have expressed interest to adopt this code once complete thus giving one specification across the Central West</p> |
| 12 | 1.3.4 | 4 | <p>Noted but it must be made clear that where Council is the certifying authority and have been paid a fee to approve assess and approve the designs against the conditions of consent, Council has no authority to change requirements part way through construction of a development, due to change of heart or interpretation.</p> | <p>Noted, no change</p> |
| 13 | 1.4 | | <p>This clause should be adjusted to include and changes in terminology for construction certificates to either be or include Subdivision Works Certificates</p> | <p>Agreed, Clause 1.4 to include "Subdivision Works Certificate"</p> |
| 14 | 1.5 | 3 | <p>Define Applicant or change word to Contractor.</p> | <p>Agreed, Applicant defined as per Point 5 above.</p> |
| 15 | 1.5 | 4 | <p>Define Applicant or change word to Contractor. Council has inspection sheets which are to be signed by contractor at time of inspection therefore, notice can be provided almost immediately for some inspections. This is required to ensure timely backfill of trenches</p> | <p>Agreed, Paragraph 4 of Cl. 1.5 to be amended to, Council will provide written notice to the Applicant and Contractor of the inspection outcome within 24 hours of completion of inspection.</p> |
| 16 | 1.7 | 3 | <p>Include Council phone number for arranging inspections</p> | <p>Agreed, Paragraph 3 of cl. 1.7 to be amended to, "Inspections must be carried out Monday to Friday, except for public holidays, between the hours of 9:00 am and 3:30 pm. Bookings can be made by contacting Council’s Engineering." Services by phone on 0263 938039.</p> |

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| 17 | 1.7 | 6 | This paragraph is not really necessary as it is already stated what notice is required to be given when requesting an inspection. Perhaps replace this paragraph with what procedure should be followed when Council staff fail to turn up for a booked inspection, to ensure that the contractors works are not delayed by Council or safety put at risk | Noted, no change |
| 18 | 1.9 | | Is a ROP required when the DA conditions specifically require a subdivision works certificate that involves construction works in Council road reserves? | Noted, A ROP is required when included as a Condition of Consent |
| 19 | 1.10 | 1 | What are the “required fees” and where are these found? | Cl 1.10 to be amended to, "Public roads must not be closed to undertake works without the express approval of Orange City Council. A completed application to close a public road must be submitted to Council 28 days prior to the proposed road closure. Works must not commence until conditional approval is received and conditions of approval completed." |
| 20 | 1.13 | 1 | Professional engineer allowed to prepare plans yet in Paragraph 3 a registered surveyor is required to sign off plans. Given Council are imposing development conditions requiring statements from Registered Surveyors why is the certification required at the bottom of the page. | Noted, certification is required to ensure all services are within their allocated easements. |
| 21 | 1.13 | Dot Point 14 | Where does the value of 0.6m come from? Historically a value of 0.45m has been used. Grade in AS3500.2 for sanitary drainage is 1.65%. | Noted, Councils W&S department requested 0.6m as it is a typical depth of sewer under a house allowing for some cutting. |
| 22 | 1.14 | 2 | Council only has power under the EP&A act to utilise the security bond for rectification of defects. It does not have the power under the Act to invoice the developer. | Noted, Should a serious defects arise during the bond period which require urgent attention due to safety and the bond not cover the remedial work to make safe, Council will undertake the works and invoice the developer. |
| 23 | 1.14.1 | 1 | Change maintenance to security in compliance with EP&A act | Agreed, "Maintenance Security Bond" to be replaced with "Security Bond" |
| 24 | 1.14.1 | 2 | Change maintenance to security in compliance with EP&A act. Reword to reflect the actual reason that the security bond is held, use wording from EP&A act for consistency and compliance and to avoid confusion. This section should also reflect the requirements of Section 4.17(8) as to how the security can be provided by the developer. | Agreed, Paragraph 2 to be reworded to, "The security bond, or guarantee satisfactory to the consent authority, is held by Council to ensure that all public infrastructure works have been constructed to a satisfactory standard and can withstand the rigours of service conditions. Unexpended bond monies, or the release of guarantee, are refunded to the Developer at the expiry of the defect period at their written request." |
| 25 | 1.14.2 | | This section should be retitled to Defects Liability Period | Agreed, Section 1.14.2 to be titled "DEFECTS LIABILITY PERIOD" |
| 26 | 1.14.2 | 1 | Change maintenance period to defects liability period. The timeframe for this period MUST be in accordance with the EP&A act, 6 months. This act does not give the Director of Technical Services the authority to extend the timeframe | Agreed, Change "maintenance period" to "defects liability period." Disagree, Advice says Council can set its own Defect Liability Period via a Condition of Consent and S6.20 of the EP&A Act also allows a civil action to be brought for defective works up to 10 years after the issuing of the subdivision certificate. |
| 27 | 1.14.2 | 2 | Change maintenance period to defects liability period and delete omission as this is not in the EP&A act. There should not be any omissions as the Subdivision Certificate was released on the basis that all work was complete. | Agree, Paragraph 2 to read, "Within the defect liability period, the Developer is expected to rectify any defect which becomes apparent in the Development works. Council may seize bond money to rectify faults if they have not been repaired within a reasonable time or if necessary to urgently repair a defect, which could conceivably cause harm or injury to persons or property." |
| 28 | 1.16.2 | 2 | It is completely unreasonable to require a developer to obtain a written statement from an adjoining property owner on completion of works. It is the certifier’s responsibility to ensure the works are at the required standard and in accordance with he approved design plans. Anything could happen from the time the original permission was granted to the developer, from the owner no longer liking the development and holding the developer to ransom, or the ownership of the property changing. This requirement is completely unreasonable. | Noted, It is reasonable to require at the completion of engineering works on the adjoining property a written statement from the adjoining property owner, stating that works on the adjoining property have been carried out to their satisfaction as the agreement to work on adjoining land may extend past the provisions of the Subdivision Code or Conditions of Consent. |
| 29 | 1.16.5.2 | 1 | Reference the actual standard drawing to avoid any confusion | Noted, No change |
| 30 | 1.16.5.3 | 1 | Provided a person has carried out the required training to prepare Traffic Control plans, there should be no need for them to be accredited by TfNSW. Refer to Safework Traffic Control Training | Noted, Section 1.16.5.3 to read, Both vehicular and pedestrian traffic is to be guided by signage conforming to AS1742.3 Manual of Uniform Traffic Control Devices Part 3: Traffic Control for Works on Roads, a copy of the Plan is to be kept on site during the works. |
| 31 | 1.16.6 | | Road opening permits are already covered in Section 1.9 and as such no need to repeat it here | Agreed, Remove section 1.16.6 |
| 32 | 1.16.8 | 1 | Define Applicant. | Applicant is defined |
| 33 | 1.16.9 | 1 | Council are the authority that must determine street lighting requirements and not Essential Energy. | Noted, No change |
| 34 | 1.16.9 | 3 | Category PR lighting is not the correct reference from AS1158. AS1158 refers to Category P lighting which then covers PR, PP, PA, PE and PC lighting categories. Why not include a table of what street lighting is required for the different road classifications. This would be much simpler reference point | Paragraph 3 to read, "Street and public lighting must meet the standards for Category V or Category P lighting as appropriate. Category V lighting is applicable on roads where visual requirements of motorists are dominant, such as sub arterial roads or greater traffic volume. Category P lighting is applicable on roads (and other public outdoor areas) where the visual requirements of pedestrians are dominant, such as local roads and outdoor shopping precincts." |
| 35 | 1.16.10 | 1 | The guidelines referred to are only interim and these guidelines note that the working hours are only recommended and are NOT mandatory. There needs to be flexibility to allow work outside of the adopted hours via appropriate approval. | Agreed, Section 1.16.10 to read, "Work on any construction site is limited between the hours of 7.00am and 6.00pm Monday to Friday inclusive, 8.00am to 1.00pm Saturday and no work on Sundays and Public Holidays, as per NSW Interim Construction Guidelines. Any construction outside these times will need to seek the appropriate approvals, inclusive of Councils approval. Consideration to EPA noise guidelines should be observed during any construction." |

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| 36 | 1.16.12 | | 2 Refer to the actual standard drawing | Paragraph 2 to read, "Street name signs must be provided and installed by Council at the Developer's cost as per Orange City Council's Fees and Charges relevant at the time of application for a Subdivision Certificate." |
| 37 | 1.16.12 | | 3 Remove this clause. No point lodging the road naming application prior to the development application being lodged as there is no guarantee that the development application will be approved | Noted, No Change as this would eliminate any possible delay in processing times in gaining GNB approval whilst a development application was being assessed. |
| 38 | 1.16.13 | | 2 The requirement to plant the trees prior to the subdivision certificate goes against Council officer's views that trees need to be planted after the houses are built so that are not damaged. Provide a clause allowing for the trees to be bonded or just adopt a set fee per tree in the management plan for street trees as per the current subdivision release requirements. | Agreed, Paragraph 2 to read, "Developer's must provide and install street trees as indicated in the Street Tree Landscaping Plan approved by Council. Information concerning types of trees suited to development areas can be obtained from Council. Trees must be planted and approved, or bonded by Council prior to the issue of a Subdivision Certificate." |
| 39 | 1.16.14 | | 1 Why has the minimum width been increased from 4m to 4.5m and why is a minimum 2.5m wide concrete shared path required if the pathway is not identified in any bicycle plan? This seems unreasonable ant not consist with the DCP. The clause requires the path to be extended to kerb and gutter at both ends. What if there is no kerb and gutter at one end? | Noted, No Change. The TfNSW Cycleway Design Toolbox sites a desirable width of 2.5m for a cycleway (shared path). |
| 40 | 1.16.15 | | 1 This paragraph should be changed to read as follows: The person having the benefit of the development approval shall be responsible for constructing the required development works to the principal certifying authority's satisfaction. It is not the developers responsibility to maintain the assets handed over to Council. | Agreed, Paragraph 1 to read, "The person having the benefit of the development approval shall be responsible for constructing the required development works to the Principal Certifying Authority's satisfaction." |
| 41 | 1.16.15 | | 2 Move the word liability to after defect. | Agreed, Paragraph 2 to read, "The Council in issuing a Subdivision Certificate or issuing a Certificate of Completion accepts ownership of the assets for the related development subject to the defect liability period. Where assets are not to be the property of Council, such as in strata subdivisions or community title subdivisions the PCA will issue a Subdivision Certificate or Compliance Certificate that will be based on the relevant community plan or strata plan respectively." |
| 42 | 1.16.16 | | This clause no longer makes sense, does it refer to concrete footpaths or the verge? Council officers have advised many times that they do not want the footpaths built prior to subdivision release as the builders damage the footpaths. Provide a clause allowing for the footpaths to be paid for by the developer but done by Council once houses are built. | Agreed, Section 1.16.16 to read, "All footpaths must be plain concrete unless otherwise advised by Council. Concrete footpaths must be completed or bonded prior to the issue of a Subdivision Certificate, and as per Council's Approved Standard Drawings." |
| 43 | 1.16.19 | | 2 The code relates to all development work and should also relate to works done by Council to ensure consistency in the delivery of infrastructure. It does not just relate to Torrens Title Subdivisions. | Noted, No Change |
| 44 | 2.2.4 | | 2 1:6 batters are only relevant to Urban roads and as such other requirements should be included for rural roads. It is noted that Council's designs never comply with his requirement! | Paragraph 2 to read, "Cross-sections must not be terminated at the property alignment but must be levelled sufficiently beyond the road boundaries, to enable batters of cutting and embankment to be shown. Cross sections must also identify boundary and fence lines. Batters beyond property boundaries must be maintained at no greater than 1:6 for urban environments." |
| 45 | 2.3 | Table 2.1 | Design traffic has increased substantially from previous subdivision code. Calculations for design traffic using procedures from Austroads Guide to Pavement Technology do not justify such high figures | Noted, No Change. Design traffic is appropriate |
| 46 | 2.3.3 | | 1 The requirement to seal shoulders for rural roads contradicts requirements of Table 2.3 | Agreed, Table 2.3 to be amended |
| 47 | 2.3.3 | Table 2.2 | The requirement to seal shoulders on Rural collector roads and Rural Local Access roads would mean that these roads would have bitumen seal widths wider than Cargo Road and many RMS controlled roads. This is excessive and expensive | Noted, No Change. Having a sealed shoulder reduces run off road riskS and reduces edge breaks within the travel lane. |
| 48 | 2.3.4.1 | Table 2.3 | Why do shared ways need to be up to 4m wide? What justifies this width? | Noted, No Change. TfNSW require 4m wide shared paths at certain locations. |
| 49 | 2.3.4.1 | | 2 Why do road shoulders need to widened to 3m adjacent to barrier centrelines and what does this really mean? What is the justification for this? | Noted, No Change. This is the seal width, not shoulder width |
| 50 | Note, No point 50 exists within this submission. | | | |
| 51 | 2.3.4.5 | | 2 Road batters in rural situations need to be allowed to be steeper, particularly in cut situations to be maintained within the road reserve | Noted, No Change. The paragraph concludes with, "except with the approval of the Director Technical Services." |
| 52 | 2.3.4.5 | | 5 Specify at what height a structural design is required to avoid any confusion. | Agreed, Paragraph 5 to read, "A structural engineers design and certification will be required for any retaining wall greater than 600mm in height if a retaining wall is proposed instead of a batter." |
| 53 | 2.3.4.7 | | 4 Radius for rural cul-de-sacs are excessive and not justified. | Noted, No Change. Cul-de-sac radius is the same as an industrial road to allow farm vehicles turning opportunity |
| 54 | 2.3.5.2 | | 1 Where do grades come from? Are they in accordance with Austroads? Other Council's have different requirements and in Orange the natural topography will make these grades hard to comply with. | Noted, No Change, Paragraph 2 provides latitude with, "However, grades of up to 16% may be permissible on straights for a maximum distance of 150 metres, depending on traffic volume and type." |
| 55 | 2.3.5.2 | | 3 Sealing of unsealed roads where grade exceeds 10% is unreasonable given the topography of the Orange area. Which standard or code does this requirement come from? | Noted, No Change. It is very reasonable t seal a road with such a high grade as these roads are prone to errosion and high maintenance cost for council. |
| 56 | 2.3.5.7 | | 2 This is not possible to comply with in the Shiralee area due to the small lot sizes nor is it possible to comply with in most areas. By my reading the lot width at an intersection would need to be at least 33m wide | Agreed, Paragraph 2 to read, "At intersections, roads and building allotment layouts must be designed so that driveway access is not required directly opposite an intersection or within six metres of either kerb return tangent point, whichever is greater. This requirement does not apply to Shiralee" |

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| 57 | 2.3.6 | 2 | Rather than specify the footpath requirements this is already done in Table 2.3. The width specified contradicts Table 2.3 | Noted, No Change. |
| 58 | 2.3.6 | 4 | Refer to the appropriate standard drawing. | Noted, No Change. |
| 59 | 2.3.7 | | Refer to the appropriate standard drawing relevant to the section. | Noted, No Change. |
| 60 | 2.3.7.4 | 1 | The requirement to concrete battleaxe driveways contradicts previous Council resolutions. | Noted, No Change. |
| 61 | 2.3.7.5 | 2 | The third sentence does not make sense | Agreed, third sentence to read, "The length of the access handle must be 10m." |
| 62 | 2.3.7.6 | | This clause is really relevant to planning controls which should be part of the relevant DCP and not engineering standards. | Noted, No Change |
| 63 | 2.3.8.3 | | The code relates to all development work and should also relate to works done by Council to ensure consistency in the delivery of infrastructure. It does not just relate to Torrens Title Subdivisions | Noted, No Change |
| 64 | 2.4.1 | 1 | Why does the TfNSW supplement need to be referred to for local roads? The Code relates to development works essentially on local roads we are not building highways under this Code. | Noted, No Change. This code will be used by developers whose land fronts TfNSW roads & the TfNSW supplements provide guidance for designers |
| 65 | 2.4.3 | 6 | Why adopt TfNSW specifications for local roads, we are not building highways under this code. | Noted, No Change. This code will be used by developers whose land fronts TfNSW roads & the TfNSW supplements provide guidance for designers |
| 66 | 2.4.5 | 3 | This contradicts Council’s standard drawings. | No Change. |
| 67 | 2.4.6 | 4 | How has the minimum pavement thickness been arrived at? Specifying gravel thickness does not allow for thin asphalt surfaces to be considered, refer above. Current code allows 200mm minimum thickness, why the change? If the design guides call for a thinner pavement and we are required to design to these codes then it should be allowed | Agreed, Paragraph 4 to read, "Note that the minimum depth of pavement must be 300mm with base layer minimum 100mm thick but can be reduced with Director of Technical Services approval". |
| 68 | 2.4.7 | 2 | Why has asphalt thickness been increased to 40mm? What is the justification? This effectively increase asphalt cost by 33%. Whether the asphalt is 30mm or 40mm it is not considered to any additional structural performance. It is simply a wearing and waterproofing surface. | Noted, No Change - It is the case that the current Austroads Design Guide simply ignores the structural contribution of thin asphalt layers and simply suggests it be added to the overall sub-base layer thickness for assessing minimum overall pavement thickness. This is a simplistic approach to assist designers in situations where traffic volumes are lower. It does not state that the asphalt provides no contribution to structural performance – in fact it says the opposite in section 6 of the guide. It is incorrect to say that the thin asphalt does not provide contribution to structural performance. To the contrary the following is from a recent paper about asphalt fatigue. “The structural factor that most significantly affects the bottom-up cracking at the bottom of the asphalt pavement layer is the tensile strain. The factors that most significantly affect the tensile strain are the pavement thickness and elastic modulus of the asphalt layer.” Ref: Article Fatigue Cracking Characteristics of Asphalt Pavement Structure under Aging and Moisture Damage Sunglin Yang, Heebeom Park and Cheolmin Baek * Department of Highway & Transportation Research, Korea Institute of Civil Engineering and Building Technology, Goyang-Si 10223, Republic of Korea It is very evident that fatigue cracking of 30mm asphalt pavements in roads constructed in Orange over the past several decades is common. An increase in the minimum asphalt thickness to 40mm will improve this situation. |
| 69 | 2.4.8 | 2 | The ROP should not specify the backfill requirements. This detail should be in the Code to avoid confusion or different interpretations by Council officers | Noted, No Change. Details are on the ROP. |
| 70 | 2.5.1 | 2 | What have the TfNSW publications got to do with Council roads? Very general statement with no definitive approach or requirement. | Noted, No Change, TfNSW have supplements to Austroads standards and standards that should be observed when testing roads |
| 71 | 2.5.2 | 1 | The record of approval must be provided by Council to the contractor after the inspection rather than making the contractor obtain it from Council. | Noted, No Change. The approval will be given if the layer passes. The next layer should not be placed without the approval. |
| 72 | 2.5.2 | 2 | The compaction testing proposed is excessive and again is different to the requirements of the Austroads publications. Reproduce requirements from Austroads Guide to Technology – Part 8 Pavement Construction. | Noted, No Change. |
| 73 | 2.5.2 | Table 2.6 | The compaction requirements have changed from the 2019 Draft Code and have increased. It appears as though they are from a TfNSW specification but contradict Australian standards previously used. Again these roads are not highways | Noted, No change. Council want well compacted roads that do not fail and incur maintenance cost. The TfNSW specification is a reasonable requirement in this case. |
| 74 | 2.5.3 | 1 | What are the minimum qualifications required for the Council’s delegated officer? Rather than the developer obtain record of approval, the Council office/engineer must provide this following the inspection | Noted, No Change. There are no qualification required to observe visual movement of a pavement moving under a proof roll test. |
| 75 | 2.5.4 | 3 | The extent of visual movement MUST be defined and not just any movement. Refer to Austroads guides for direction on this. | Noted, No Change |
| 76 | 2.7.5 | 1 | No need to specify where lights need to be placed when a lighting design is already required. Potential for contradiction and confusion | Noted, No Change |
| 77 | 2.8 | 6 | The requirement to turf road reserve areas is excessive and unreasonable. The requirement to hydro mulch and or hydro seed with straw mulching of road reserves is also excessive. There has been no justification offered as to why this requirement is proposed to be imposed. | Noted, No Change. The requirement to turf road reserves is within the Shiralee DCP. Hydroseeding road reserves provides good sediment control. |

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| 78 | 2.8 | 7 | The requirement to rock line, jute mesh and bitumen treat open drains where grades exceed 2% is completely ridiculous. The minimum grade on an open grass lines drain is typically 1%. The requirement to jute mesh and bitumen line open drains MUST be a function of the velocity of water in the drain and not the gradient. The gradient has a direct impact on water velocities. | Noted, no Change. Austroads GRD 5b disagrees. It is ridiculous to impose a requirement to show velocities on open swales as grade changes along open drains |
| 79 | 3.1 | 1 | "Developers of land are to be wholly responsible for disposing of all storm water runoff which passes over or through the respective properties, roads and reserves." What does this actually mean? It seems to be one great over arching statement that has no meaning or purpose. Developers cannot be responsible for stormwater from upstream works. Council may have some responsibility in this area particularly where drainage works form part of a developer contributions plan. | Noted, No change. Context is provided further in the paragraph with, ".....all stormwater which passes over or through the respective properties, roads and reserves, which includes: <ul style="list-style-type: none">• Conveyance of stormwater to receiving waters with minimal damage, danger and nuisance• Stabilization of landforms and control erosion• Enhancement of the urban landscape, whilst maximizing land available for urbanization• Maintenance of the water quality of receiving waters• and the management of stormwater in an environmentally sustainable manner" |
| 80 | 3.1 | 2 | Developers cannot be held responsible for maintaining drainage works. They can only be held responsible for fixing defects which can be proven to be a result of faulty workmanship or materials that become evident within 6 months of subdivision certificate issue. Refer to EP&A act Section 4.17(6)(c). Replace maintenance with defects liability. | Paragraph 2 to read, "The Developer is required to repair all defects which are, due to faulty workmanship or materials, for a period of 12 months from the date of Council issuing a Subdivision Certificate. The Developer is advised to ensure that all Contractors are bound by a similar defect liability claus within their contracts" |
| 81 | 3.2.4 | 1 | The actual criteria for approving a person as being qualified should be included to ensure consistency. The Institution of Engineers is no longer referred to in this way and is known as Engineers Australia. In addition, there is no membership category of Corporate Membership. There are four occupational membership grades, fellow, member, graduate and student and three occupational categories, professional engineers, engineering technologists and engineering associates. We would suggest that the required level of qualification required to submit designs to Council is professional engineer eligible for membership of Engineers Australia. If designers are required to have a certain qualification level then the same requirement must hold for any Council officer that is tasked with assessing the designs. I do not think it is appropriate that only the Director of Technical Services holds the same qualification as they are not the person actually carrying out the assessment of the submitted designs | Agreed,3.2.4 to read, "All stormwater drainage design submissions must include drainage calculations and electronic files from the designer. The designer must be a person qualified pursuant to Division 1 of the Design and Building Practitioners Act or approved by the Director Technical Services as having proven experience in the preparation of plans and specifications for land development." |
| 82 | 3.3.1 | 2 | 500mm freeboard is excessive for overland stormwater flow. This freeboard is applicable to major flood plains and should not be applied to overland stormwater flow. The argument is that no house would be able to be built with a floor level lower than 500mm above the top of the kerb given that this is part of the major overland flow path. | Agreed, Paragraph 2 to read, "The major system drainage, for all land uses, must be designed to cater for flows from the 1% AEP storm event, with 300mm freeboard to any floor levels of adjacent properties, on the assumption that the minor system is totally blocked. Continuous designated overland flow paths are to be provided from the top of the catchment, through to the bottom of the catchment, while taking into consideration the existing downstream flow paths. |
| 83 | 3.3.2 | 2 | Remove the 20% nominal climate change factor. It is an arbitrary factor not reference in ARR2019. | Noted, No Change. |
| 84 | 3.3.4 | Table 3.4 | No coefficient provided for grass or lawns. The co-efficient for rural residential, residential and industrial do not reflect the catchment area breakup provided in section 3.3.3. ie a pervious area in a residential area will NOT have a retardance coefficient of 0.02 or 0.03. | Noted, No change. Rural residential (Table 3.4) is Residential Lots >800m2. |
| 85 | 3.4.1.1 | Point 1 | No need to specify a maximum pit spacing when a maximum gutter flow width is specified. This will lead to excessive pits when only road water is being collected. | Noted, No Change. 80m is specified for maintenance reasons. |
| 86 | 3.4.1.1 | Point 3 | Specify the lifting eyes on the standard drawings. Be specific. | Lifting lugs are shown on standard drawings 21/39 |
| 87 | 3.4.1.2 | Point 1 | Define the storm event that this applies to this point and other points following, 3, 5, 6. | Noted, No Change, Minor storm is described at the top of the paragraph. |
| 88 | 3.4.1.2 | Point 2 | No need for maximum spacing of pits. This will be governed by catchment area and point 1 above. | Noted, No Change. 80m is specified for maintenance reasons. |
| 89 | 3.4.1.3 | Point 1 | Remove last sentence as no reference to Section 3.3.1. | Agreed, Point 1 to read, "Pit inlet capacities must be estimated from design charts and formulae, based on lintel size for on-grade pits and depth of ponding for sag pits. The calculated inlet capacity must have a blockage factor of 50% for sag pits, and 20% for on-grade pits, for a minor storm event. All pits to have a blockage factor of 100% for a major storm event." |
| 90 | 3.4.1.3 | Point 3 | 2.4m lintels on low points in cul-de-sacs has previously not been liked by Council due to size of lintel on curved kerb. | Agreed, Point 3 to read, "The minimum lintel size on a sag must be 1.8 metres." |
| 91 | 3.4.2.1 | Point 2 | Why limit angle of pipes under roads. This may not work when ggod design dictates usually means lintels are placed at property boundaries toa vopid conflicts with future driveways. Property boundaries are not always directly opposite. Provided pipes are installed correctly it really makes no difference what angle the pipes are at. . | Noted, No Change. The point states " <u>should</u> be at an angle no greater than 15 degrees ". Should allows scope to vary. |
| 92 | 3.4.2.4 | Point 1 | Do not limit gradient on pipe as discharge levels or services may not allow these to be achieved. | Noted, No Change. The Point states "wherever physically possible" |
| 92 repeated | 3.4.2.4 | Point 2 | Refer to Council standard drawing. Is AS2566-Buried Flexible Pipelines applicable to concrete pipes which are not flexible? | Noted, No Change. This point is about Bulkheads not the type of pipe |

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| 93 repeated | 3.4.3 | Table 3.5 | Minimum width for floodway / open channel with 500mm freeboard is excessive. Differentiation between flooding and overland flow path MUST be made. Based on this requirement then the requirement of a floodway in Section 3.4.4.2 would mean a very deep channel and no way of achieving this between the kerb & gutter and property boundar | Agreed, Minimum Easement Width for Floodway/Open Chanel to read, "Surface width of 1%AEP flow + 0.3m freeboard + 1.0m horizontally" |
| 94 | 3.4.4.1 | | 1 Remove the word flood after AEP and just have event. (A flood is an event!) | Note, No Change. |
| 95 | 3.4.4.2 | | 1 Needs to be mention of a freeboard (300mm) for overland flow paths. 500mm is just unrealistic and not necessary. Particularly as there is no way of providing this between the kerb & property boundary. | Noted, No Change. 300mm changed above. |
| 96 | 3.5.1 | | 2 Zero initial and continuing loss rates are not in accordance with ARR2019 methodology. | Agreed, Paragraph 2 to read, "Once calibrated, the model must be used to analyse the impact of the development on existing flows, based on the appropriate initial and continuing loss rates." |
| 97 | 3.5.2 | | 1 500mm freeboard is excessive for overland stormwater flow. | Agree, Paragraph 1 to read, "Open channels must be designed using backwater calculations. A freeboard of 300mm above the 1% AEP flood level must be adopted." |
| 98 | 3.5.4 | | 1 For what AEP is this requirement applicable to? | Agreed, Paragraph 1 to read, "Piped low-flow systems should achieve a minimum peak velocity of 0.6m/s in a minor storm for self-cleansing purposes." |
| 99 | 3.5.5 | | 4 Refer to EP&A act Section 4.17(6)(c). Developers are only required to fix defects not maintain works that become Council infrastructure. The requirement to turf, hydro-mulch etc open drains MUST be a function of the velocity of water in the drain and not just a blanket requirement. Unrealistic and excessive with no justification or performance based. | Noted, No Change. Council requires any turfing or hydromulching to be free of any defects at the end of the defet liability period. Dead grass, trees or planting will be deamed a defect. |
| 100 | 3.5.7 | | 3 Not always possible or practical to construct road crossings perpendicular to the road centreline particularly where pits are required to avoid future driveways. | Noted, No Change. The paragraph gos on the read, ".....where practicable, or in accordance with Clause 3.4.2.1" |
| 101 | 3.6.2 | | Change all references to floodway. Look at what actual definition of a floodway is. Should use overland flow path. | Agreed, Change "floodway" to "Overland Flowpath" throughout Section 3.6.2 but keep signage as is. |
| 102 | 3.7 | | Many of the requirements listed in this section are not applicable to small OSD basin for a dual occupancy or unit development. Make it clear in the following sections what parts are applicable to the differing OSD's to avoid any confusion or unrealistic expectations by Council officers. | Noted, No Change |
| 103 | 3.7.2.1 | | 1 Consideration of the PMF for OSD's is unrealistic and cost prohibitive. PMF never meant for these analysis. | Noted, No change. "Consideration" is not unrealistic. |
| 104 | 3.7.4 | | 1 Consideration of the PMF for OSD's is unrealistic and cost prohibitive. PMF never meant for these analysis | Noted, No change. "Consideration" is not unrealistic. |
| 105 | 3.8 | | 1 Hydraulically charged downpipe systems are often the only solution available to redevelopment in existing areas where there is no Council drainage infrastructure and easements cannot be obtained. | Noted, No Change. Charged pipes "are not desirable within the Council area, as sediment and debris will tend to block the pipe" |
| 106 | 3.8 | | 5 Where has the requirement of piping 20L/s to Council infrastructure come from. I am aware that Council have been conditioning DA's in recent times but are yet to provide justification as to what standard this has come from. May prove difficult in existing urban areas where there is no underground drainage present for many hundreds of metres and where the existing predevelopment flow from the site exceeds 20L/s. reference a standard otherwise this is an unreasonable requirement. | Noted, No Change. |
| 107 | 3.8.2 | | 1 Relook at final words in the sentence as "Flood Planning Area" does not appear to be correct. | Note, No change. Flood Planning Area is the correct term |
| 108 | 3.8.3 | 2 Point 1 | Too much discretion to Council. If the main is already failing then Council MUST bear some liability with regard to the replacement. If no development occurs then Council would be completely liable for the replacement of the main at their total cost. Consider a 50% cost split. Developer cannot be forced to increase pipe size for no reason just because Council has the say. | Noted, No Change. If the easement is in favor of Council, Council should have all the discesion. |
| 109 | 3.8.4.2 | Point a | The land developer has no way of knowing what future vut levels for buildings may be on the site and being required to take this into consideration is ridiculous. The requirements for drainage in strata and community title subdivisions has not been specified. | Agreed, Point a to read, "Square grated surface inlet pits, a minimum size of 600mm x 600mmm, must be provided at a suitable location on each affected allotment. The pit surface level must be designed for the finished surface level of the property." |
| 110 | 3.8.4.3 | Point c | Why is there a maximum spacing requirement? No justification. | Noted, No change. Spacing is for maintenance |
| 111 | 3.8.4.3 | Point a Table 3.6 | A 150mm diameter pipe at 1% has sufficient capacity for 1 x 800m2 lot. Do not provide a table as this is very misleading and depends on impervious area of the lot. This also contradicts AS3500.3. | Agreed, Remove Point a, re letter points and reword lead paragraph to, "Detailed designs and calculations are required for medium density developments, and subdivisions of more than one allotment, One allotment can be serviced wit a 150mm pipe at a grade no less than 1%" |
| 112 | 3.8.4.4 | Point c | Reduce cover requirements as a 150mm pipe in a 600mm deep pit will not satisfy 500mm of cover. This will lead to pits that are deeper than required. AS3500.3 has different cover requirements. Just refer to this standard. | Agreed, Point c to read, "Minimum cover for pipes shall be in accordance with AS3500.3." |

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| 113 | 3.8.4.3 | | RRJ sewer grade pipes have not been required by Council for the last 10 to 15 years. Council specifically went away from RRJ pipes and allowed SCJ pipes. As Council do not own or maintain the asset allow pipe materials in accordance with AS3500.3. To leave this as is will substantially increase costs to development. | Agreed, Paragraph 3 to read, "Materials which may be used without obtaining the separate approval of the Director Technical Services are RRJ sewer grade un-plasticised polyvinyl chloride (uPVC), solvent cement joint, fibre reinforced concrete, or reinforced concrete." |
| 114 | 3.8.4.3 | Point a | Allow minimum grades in accordance with AS3500.3 as the grade of the pipe may need to be reduced to connect to existing infrastructure. | Agreed, Point a to read, " Minimum grade for pipes shall be in accordance with AS3500.3." |
| 115 | 3.8.6 & 3.8.6.1 | | This clause has no relevance to the Code. | Noted, No Change. |
| 116 | 3.8.4.4 | | Consider allowing pump out systems where all other avenues for obtaining legal drainage points have been exhausted. Otherwise this potentially land locks redevelopment of older parcels of land where no interallotment drainage system currently exists. It is an allowable method under AS3500.3 | Noted, No Change. |
| 117 | 3.9 | | Why is this section in stormwater drainage? | Noted, No Change. This section relates to stormwater channels. |
| 118 | 3.9 | Point 2 | Do these batter slopes relate to the open drain or generally in open space areas? | These slopes relate to open drains |
| 119 | 3.9 | Point 6 | What if boulders are required to be placed by Council along with large tree logs which often happens. This is then contradictory. | Agreed, point 6 to read, "All drainage reserves must be trimmed to facilitate easy mowing." |
| 120 | 3.1 | | This section needs more reference as to whether WSUD is required or not as it is not clear. Orange soils typically are not suited to man y of the WSUD methodologies. Council must also consider the long term maintenance costs if these measures are to be implemented. There must also be design criteria adopted as the section is too vague and obviously not well thought through. | Noted, No Change. WSUD targets will be included within Councils Development Control Plan and imposed within Conditions of Consent for differing developments. |
| 121 | 4.3 | Network analysis | Why does water modelling have to be carried out by Council? No other Council that I am aware of enforces this requirement. This creates a monopoly and essentially holds the developer to ransom as Council set the fees and make the rules! | Agreed, Council will change the process to allow developers to create new developments on the water supply model, develop the servicing strategy and provide a suitable file for Council to import into the model & verify the strategy. There will still be the option for Council to undertake at a fee as specified in the fees and charges. |
| 122 | 4.3 | 2.5.3 | Why has the minimum allowable service pressure been dropped to 150kPa. For the past 20 years this has been 200kPa? What is the reasoning and justification for reducing the standard? | Agreed, Following further consideration, this will be changed back to a minimum of 200 kPa. |
| 123 | 4.3 | 3.3.1 | Why has the pipe pressure class been increased to PN16. The minimum pressure class in the past has been PN12. This will be additional cost to development for no apparent reason. | Noted No Change, Council has found that PN16 is more suitable for reticulation and trunk mains to account for surge pressures. The proposed change to PN16 pipe is to remain. |
| 124 | 5.3 | 5.2.8 | Provide a table specifying required easement widths for main depths. Most other Council's do. Do not leave it to the time of lodgement of the development as this does not make sense. This information needs to be known upfront. Too subjective for Council and provides no guidance when in the planning stage. | Noted, No Change, Requirements for easements are outlined in this section and consultant with Council during DA stage is advised if further information is required. |
| 125 | 5.3 | 5.4.5.2 | Structural bridging of stormwater pipes where vertical clearance is less than 1m is completely unrealistic. The WSA Code actually only requires 225mm vertical clearance to drains with no reference to structural bridging. The requirement of 1m is almost 4.5 times the accepted WSA code requirements. Structural bridging is typically only required where the minimum vertical clearances cannot be achieved. | Noted, No change, Structural bridging has now been included (for concrete stormwater pipes greater than DN375) in response to the crushing/sagging of sewer mains. WSA states that where services fall within the zone of influence, mechanical protection may be specified by the Water Agency. The clearances specified in the table (225mm) refer to the absolute minimum required for maintenance purposes. |
| 126 | 5.3 | 21 Acceptance | The testing requirements for sewer main construction will add substantial costs to any new developments. In particular vacuum testing of manholes and compaction testing of trenches where they are located in easements at the rear or front of properties outside of building zones. From what we are aware vacuum testing of precast concrete manhole is very unreliable with no matter how well they are constructed they very rarely pass a test. | Noted, No Change, Council has adopted the recommended testing requirements in WSA. New developments are generating a substantial amount of I&I which Council is endeavouring to address through more stringent testing at subdivision stage. If a designer does not believe his/her design can meet this specification then alternate solutions can be investigated (alternate products, cast-in-situ manholes etc.). Testing to remain as per standard. |
| 127 | 5.3 | Flow Estimation for Development | Why does Council see the need to have a factor of 1.0 when the WSA Code provides appropriate ranges? | Noted, No Change, In accordance with Appendix C section C4, "the Water Agency should nominate values of C to be adopted..". Following a review, Council will adopt a "C" factor of 1.0 as per the recommendation of the Regional WSA Code. |
| 128 | 5.3 | 10.1.3 | Why aren't HDPE pipes allowed in wet wells? Council have used these themselves in recent pump stations | Noted, No Change, It is Council's preference to have stainless steel pipe installed in all SPS's moving forward. |
| 129 | 6.3.1.3 | | 4 ESCP or SWMP? | Agreed, Paragraph 4 to read, "Areas of weed infestation, especially noxious weeds, must also be noted on the SWMP." |
| 130 | 6.4.3.4 | | 2 This contradicts Council documents provided to builders for housing construction. | Agreed, Paragraph 1 to read, "Access to subdivision and larger development sites, as shown on the SWMP, must be limited to one point only where possible. This all-weather access will improve access to the site in wet conditions, reduce disturbance of the site and reduce the amount of mud that is deposited on the roadway that will be washed away by rain, possibly causing sedimentation problems and water pollution." |
| 131 | 6.4.3.4 | | What does this relate to? Very unclear! | Reword in Point above |
| 132 | 6.4.5 | | This clause contradicts Section 1.16.10 of the Code. | Agreed, Section 6.4.5 to read, "Work on any construction site is limited between the hours of 7.00am and 6.00pm Monday to Friday inclusive, 8.00am to 1.00pm Saturday and no work on Sundays and Public Holidays, as per NSW Interim Construction Guidelines. Any construction outside these times will need to seek the appropriate approvals, inclusive of Councils approval. Consideration to EPA noise guidelines should be observed during any construction." |

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| 133 | 6.4.8 | | Is the reference to the Fees and Charges correct? Why can't other sections of the Code be hyperlinked to the appropriate section within Council's website for appropriate fees and charges, contributions etc? | 6.4.8 to read, "The fees for disposal of waste at Council's Resource Recovery Centre are more expensive for mixed waste rather than for sorted waste due to the increased cost of disposal and the lost opportunity of recycling. For current disposal fees, see the Council's Fees and Charges in the Integrated Planning and Reporting (IP&R) Documents." |
| 134 | | 7 | His clause contradicts Section 1.16.5.3 of the Code. | Agreed, Section 7 Paragraph 3 to read, "The TGS is to be prepared by a suitably qualified person in accordance with AS 1742.3 Manual of uniform traffic control devices, Part 3: Traffic control for works on roads". |
| 135 | Appendix A | Dotpoint 1 | Does this mean that designers will only deal with the Director of Technical Services and not go through other parties?? | No Change. Further dot points apply |
| 136 | Sheet 02 | | Where does Note 4 apply to? | Note 4 applies to existing concrete kerb |
| 137 | Sheet 03 | | Council contractors and Council work staff need to ensure compliance with this standard drawing. | Noted |
| 138 | Sheet 4 & 5 | | The vehicle shown is not the standard 85th percentile passenger vehicle as per AS2890. Reference back to the correct standard. 4% crossfall within the footpath zone does NOT comply with Austroads guidelines of a maximum of 2.5% for footpaths. | Noted TfNSW design vehicle is used. 4% is adopod to match with the 4% typical profile |
| 139 | Sheet 7 | | Stormwater pipe to be centred on face of kerb not back to ensure lintels align with pits. Electricity is not allowed to be in a shared trench arrangement with other services. 300mm to the face of an electrical pillar is NOT correct. This would have the pillar inside the property boundary which is NOT allowed. | Agreed, Drawing changed |
| 140 | Sheet 8 | | Note 4 allows a maximum crossfall of 4%. This is not in accordance with Austroads or any disability requirement which has a maximum crossfall of 2.5%. Typical section is not provided for 1.2m wide footpath as required by earlier sections of the Code. | Agreed, Drawing changed |
| 141 | Sheet 13 | | Council work staff need to be aware of this standard to ensure any rehabilitated roads and constructed in this manner | Noted |
| 142 | Sheet 14 | | Heavy duty AC with different thickness to surrounding will result in differential movements causing displacement at joint. Section references Council's Civil Works Specifications, where are these? | No Change, Joints to be crack sealed as per drawing. Agreed, Remove "Civil Works Specifications" or provide standard. |
| 143 | Sheet 17 | | Where are Case 1 & 2 referred to in the Code. Crusher dust bedding not consistent with Code. Why wrap trench with geotextile if pipe already has filter sock? Interested in Council's view of constructability of subsoil pipes in geotextile filter in the bottom of the trench and be able to maintain material around stormwater pipe. Crusher dust and aggregate flows and geofabric does not stand up straight. No typical trench provided for pipes not in roadway | No Change, Road crossings (Case 1) and Pipes in verge (Case 2) are within the code. Other contractors within Orange achieve this. |
| 144 | Sheet 19 | | Specify appropriate internal pit dimensions for different sized stormwater pipes. | No Change. |
| 145 | Sheet 20 | | What about precast concrete pits? | No Change, See Note 1 |
| 146 | Sheet 21 | | What about precast concrete pits? | No Change, See Note 2 |
| 147 | Sheet 22 | | What about precast concrete pits? | No Change, This is precast |
| 148 | Sheet 23 | | What about precast concrete pits? What about other sized lintels as per the Code? | No Change, This is precast |
| 149 | Sheet 29 | | Batter maximum should be 1:6 to allow for easy mowing. Concrete requirement contradicts other standard drawings and the code. Flat bottom pathway would be much safer for pedestrians. | Noted, No Change |
| 150 | Sheets 31 to 35 | | Has Council obtained the necessary copyright approval for the copying of these plans? | Noted, No Change, Yes |
| 151 | Sheets 37 & 38 | | These details do not reflect how Council currently plant street trees. | Noted, No Change |
| 152 | Sheets 40 & 41 | | Termination points inside property boundary are contradictory between Sheets 40 & 41 for residential 20/25mm services. Sheet 40 shows poly pipe to the in line ball valve. Is Council going to comply with service markers when they install services?? | Agreed, This will be amended on revised standard drawings - services to terminate 400mm inside proeprty boundary. 20, 25 & 32mm water services are to be PE with copper tail. Sheet 40 indicatively showing PE pipe extending to meter, with the main purpose of this drawing is to show the service arrangements from the main. |
| 153 | Sheet 44 | | What about hydrant details on non-potable mains | No Change, As per note 3, non-potable hydrants are to have lilac lids. |
| 154 | Sheet 47 | | Hydrant marker detail is not consistent with what is within Council's existing water supply network. Are existing installations going to be changed? | No Change, Council is currently updating hydrant markings throughout the network. |
| 155 | Sheet 50 | | Why do SC stop valves require a thrust block? | No Change, If Council needed to undertake emergancy repairs in close proximity to SC valves, thrust support would be required. |
| 156 | Sheets 51 & 52 | | Are all of the fittings and valves shown those that are actually used by Council? | No Change, Yes Council will be using these fittings or similar. |
| 157 | Sheet 55 | | Are RRJ junctions actually able to be purchased or are they just SCJ fittings with RRJ sockets cemented into them. Meds more input from what can actually be supplied. | No Change, Junctions with SCJ to RRJ offtakes are acceptable. |
| 158 | Sheet 58 | | What about precast bases? Council have not required sanded MH connectors for 25 years what has changed? | Agree, Council will remove the requirement for sanded MH connectors. |
| 159 | Sheets 63 - 100 | | This drawing now refers to 100 in the set whereas previous drawing refer to 39 in the set? Have not actually checked these drawings as they appear as though they have been copied from the WSA Code. Assuming Council have necessary copyright clearances to reproduce these drawings on their own title blocks. | Agreed, Drawing numbers to be updated in final set. No Change, These drawings have been developed by Council, not copied from WSA Code. |

Submission 2

Orange City Council

David Waddell CEO

Re: Draft Subdivision and Development Code – 5 Dec 2023 OCC meeting

I take the opportunity to comment on the Draft Subdivision and Development Code. It does not reflect the aspirations of the State Architect or recent NSW State documents – (not limited to Greener Places, Rural Urban Design, Better Places and their associated frameworks). Nor does include the appropriate inclusion of references to Council's information in the Local Environment Plan (LEP), Local Strategic Planning Statement (LSPS) and Draft Urban Forest Strategy relating to the environment and creating a more liveable city.

The new Subdivision Code should reflect a more holistic approach between the Technical and Development sections of Council, as it will be a major support document for the Development Control Plan (DCP).

Each new subdivision should reflect an area that could be designated as Water Sensitive, sustainable and liveable. (Refer to Water Sensitive Australia). Any new subdivision should reflect the community's desire for a better urban design.

The new Code should include direct quotes from other useful documents as it will ensure developers and builders are clearly informed of Council's expectations.

The expected features of the Landcom/OCC Development, Redmond Precinct, should be included for consideration in this Draft Subdivision Code. These features would probably include:

better permanent stormwater/sediment control measures from the very start of the construction phase as outlined recently by Stormwater NSW.

all electric, no piped gas supply, supportive of rooftop solar generation and community battery storage

greater appreciation of the natural environment by retaining, restoring, and enhancing the present natural waterways - allowing for better nature connectivity open spaces and street design. A return to centre of road nature strips employed in the Rosewood Estate to allow for space connectivity of larger native trees and storey plants.

as the greater proportion of NSW population is regulated by mandatory rainwater tanks, it is worthy to consider introducing similar requirements to Orange via changes to the Subdivision Code. The current IWCM recommends, for efficiency, 10 000 litre tanks.

Happy to discuss further with staff

18 Jan 2024

Response to Submission 2

Date: 20/3/2024

To:

Address:

Re: Draft Subdivision and Development Code – 5 Dec 2023 OCC meeting

Thank you for your submission in relation to the Draft Subdivision and Development Code.

In response to your submission,

Paragraph 1. You are correct in stating the Draft Subdivision and Development Code does not reflect the aspirations of the State Architect or recent NSW State documents, these documents are best reflected within a Development Control Plan. The Subdivision and Development Code describes how engineering works are to be undertaken.

Paragraph 2. The Subdivision and Development Code describes engineering standards that relate to the development of land under the control of the DCP.

Paragraph 3. This requirement would need to be put within the DCP. The Subdivision and Development Code shows HOW to undertake WSUD work.

Paragraph 4. The Subdivision and Development Code sites various documents including Austroads, Australian Standards and WSAA.

Paragraph 5. A) The Subdivision and Development Code refers to Managing Urban Stormwater: Soils and construction (Blue Book) by OEH. This document is the standard for sediment control within NSW.

Paragraph 5. B) This comment is best reserved for the DCP for the Redmond Place development.

Paragraph 5. C) This comment is best reserved for the DCP as it relates to what the development looks like rather than how to undertake engineering works.

Paragraph 5. D) This comment is best reserved for the DCP as it relates to what the development looks like rather than how to undertake engineering works.

Again, I thank you for your comments.

Regards,

6 CLOSED MEETING - SEE CLOSED AGENDA

The Chief Executive Officer will advise the Council if any written submissions have been received relating to any item advertised for consideration by a closed meeting of Orange City Council.

The Mayor will extend an invitation to any member of the public present at the meeting to make a representation to Council as to whether the meeting should be closed for a particular item. In accordance with the Local Government Act 1993, and the Local Government (General) Regulation 2021, in the opinion of the Chief Executive Officer, the following business is of a kind as referred to in Section 10A(2) of the Act, and should be dealt with in a Confidential Session of the Council meeting closed to the press and public.

RECOMMENDATION

That Council adjourn into a Closed Meeting and members of the press and public be excluded from the Closed Meeting, and access to the correspondence and reports relating to the items considered during the course of the Closed Meeting be withheld unless declassified by separate resolution. This action is taken in accordance with Section 10A(2) of the Local Government Act, 1993 as the items listed come within the following provisions:

6.1 Tender - F4054 - Remediation of Pines Lane Stormwater C7 Basin

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (c) information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business.

6.2 Nomination of Councillor Attendance - 64th Floodplain Management Australia National Conference

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (f) matters affecting the security of the Council, Councillors, Council staff or Council property.

6.3 Submission Redaction Report - 2 April 2024

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (e) information that would, if disclosed, prejudice the maintenance of law.

6.1 TENDER - F4054 - REMEDIATION OF PINES LANE STORMWATER C7 BASIN

RECORD NUMBER: 2024/394

AUTHOR: Jason Theakstone, Manager Engineering Services

REASON FOR CONFIDENTIALITY

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (c) information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business.

**6.2 NOMINATION OF COUNCILLOR ATTENDANCE - 64TH FLOODPLAIN MANAGEMENT
AUSTRALIA NATIONAL CONFERENCE**

RECORD NUMBER: 2024/379

AUTHOR: Jason Theakstone, Manager Engineering Services

REASON FOR CONFIDENTIALITY

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (f) matters affecting the security of the Council, Councillors, Council staff or Council property.

6.3 SUBMISSION REDACTION REPORT - 2 APRIL 2024

RECORD NUMBER: 2023/2297

AUTHOR: Janessa Constantine, Manager Corporate Governance

REASON FOR CONFIDENTIALITY

This item is classified CONFIDENTIAL under the provisions of Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to (e) information that would, if disclosed, prejudice the maintenance of law.

7 RESOLUTIONS FROM CLOSED MEETING