



REGIONAL SPORTS CENTRE CIVIL ENGINEERING REPORT

SUBDIVISION DEVELOPMENT APPLICATION
SEPTEMBER 2021

PREPARED FOR QPRC

This report has been prepared by the office of Spiire
Suite 3, Level 1, 243 Northbourne Ave, Lyneham **Canberra** ACT 2602

Issue Date	Rev No	Authors	Checked	Approved
07.09.2021	REV 1	B.CARGILL	M.BOMBEN	B.CARGILL
07.09.2021	REV 2	B.CARGILL	B.CARGILL	B.CARGILL

Spiire Job Number: 308402

Citation: Spiire 2021, REGIONAL SPORTS CENTRE CIVIL ENGINEERING REPORT Report for QPRC.
Authors: B, CARGILL Spiire Australia Pty Ltd. Project Number 308402

File Name: G:\30\308402\Civil\Reports\308402CG-DA-MASTER REV 2.docx

© Spiire

The information contained in this document is intended solely for the use of the client named for the purpose for which it has been prepared and no representation is made or is to be implied as being made to any third party. Other than for the exclusive use of the named client, no part of this report may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of Spiire.

Cover photo: Courtesy of Spiire Pty Ltd

TABLE OF CONTENTS

1.	INTRODUCTION.....	4
1.1	OVERVIEW	4
1.2	DEVELOPMENT APPLICATION	4
1.3	CONSULTATION	6
2.	THE SITE	7
2.1	LOCATION	7
2.2	THE TOPOGRAPHY, DRAINAGE AND ELEVATION.....	7
3.	ROAD NETWORK	8
3.1	TRAFFIC GENERATION	8
3.1.1	INTERNAL TRAFFIC GENERATION	8
3.1.2	EXTERNAL ROAD NETWORK	8
3.1.3	VERTICAL GEOMETRY	8
3.1.4	HORIZONTAL GEOMETRY	8
3.1.5	TYPICAL CROSS SECTION	8
3.2	PUBLIC TRANSPORT	9
3.3	TURNING MOVEMENTS.....	9
3.4	PARKING	9
3.5	STREET LIGHTING	10
4.	CYCLING AND PEDESTRIAN ACCESS.....	11
5.	SEWER MASTER PLAN	12
5.1	EXISTING SEWER INFRASTRUCTURE	12
5.2	PROPOSED SEWER INFRASTRUCTURE	12
6.	WATER SUPPLY MASTER PLAN	13
6.1	EXISTING WATER SUPPLY INFRASTRUCTURE.....	13
6.2	PROPOSED WATER SUPPLY INFRASTRUCTURE	13
7.	STORMWATER MASTERPLAN.....	14
7.1	DRAINAGE REQUIREMENTS & SCOPE	14
7.2	STORMWATER QUANTITY	14
7.2.1	REQUIREMENTS AND OBJECTIVES	14

7.2.2	PROPOSED DEVELOPED CONDITIONS	14
8.	UTILITIES	16
9.	SITE RE-GRADING	17
9.1	EXISTING SLOPE	17
9.2	PROPOSED SLOPE	17
9.3	SITE GRADING	17
10.	SEDIMENT AND EROSION CONTROL	18
10.1	EARTHWORKS AROUND JERRABOMBERRA CREEK.....	18
10.2	CONCEPT EROSION AND SEDIMENT CONTROL PLAN	18
APPENDIX A TRAFFIC REPORT		21
APPENDIX B WATER SUPPLY REPORT		22

1. Introduction

1.1 OVERVIEW

This Development Application (DA) has been prepared on behalf of Queanbeyan Palerang Regional Council (QPRC). Its function is to support the DA documents which are being submitted for the Regional Sports Centre (RSC), Queanbeyan.

The land proposed to be developed is located along Environa Drive, Queanbeyan, also known as Tralee. The RSC is approximately 8 km southwest of the Queanbeyan City Centre.

The RSC Development proposed in this report refers to approximately 23Ha of land to the eastern side of the North Tralee Industrial Estate. From here in this area of land proposed to be developed will be referred to as the Site.

The Site has been zoned under the Queanbeyan Local Environmental Plan (West Jerrabomberra) 2013 as Light Industrial (IN2) and Rural Landscape (RU2). Environa Drive which is in the final stages of construction, creates the access to the RSC.

1.2 DEVELOPMENT APPLICATION

The proposed development involves the creation of 6 sports fields, 3 pavilions, a maintenance building, a block for an aquatic centre, a block for the basketball and associated parking/amenities.

Access to the proposed Site will be from Environa Drive upon its completion. The design of Environa Drive incorporates access to the Site through a unsignalized intersection with a dedicated right turn and left turn into the site from Environa Drive.

The DA Drawing list is as follows:

DRAWING	DESCRIPTION	SHEET No.
CC001	COVER SHEET - SHEET 1	1
CC002	DRAWING SCHEDULE - SHEET 1	2
CC005	GENERAL ARRANGEMENT PLAN - SHEET 1	3
CC006	GENERAL ARRANGEMENT PLAN - SHEET 2	4
CC007	GENERAL ARRANGEMENT PLAN - SHEET 3	5
CC008	GENERAL ARRANGEMENT PLAN - SHEET 4	6
CC009	GENERAL ARRANGEMENT PLAN - SHEET 5	7
CC010	EXISTING SITE PLAN - SHEET 1	8
CC020	CONSTRUCTION MANAGEMENT PLAN - SHEET 1	9
CC025	STAGING PLAN - SHEET 1	10
CC030	SITE LAYOUT PLAN - SHEET 1	11
CC032	SITE LAYOUT PLAN - SHEET 2	12
CC033	SITE LAYOUT PLAN - SHEET 3	13
CC035	PLAYING FIELD LAYOUT PLAN - SHEET 1	14
CC036	PLAYING FIELD LAYOUT PLAN - SHEET 2	15
CC037	PLAYING FIELD LAYOUT PLAN - SHEET 3	16
CC060	TYPICAL CROSS SECTIONS - SHEET 1	17

CC061	TYPICAL CROSS SECTIONS - SHEET 2	18
CC062	TYPICAL CROSS SECTIONS - SHEET 3	19
CC063	TYPICAL CROSS SECTIONS - SHEET 4	20
CC064	TYPICAL CROSS SECTIONS - SHEET 5	21
CC065	TYPICAL CROSS SECTIONS - SHEET 6	22
CC066	TYPICAL CROSS SECTIONS - SHEET 7	23
CC100	ROAD LONGITUDINAL SECTIONS - SHEET 1	24
CC101	ROAD LONGITUDINAL SECTIONS - SHEET 2	25
CC200	GRADING PLAN - SHEET 1	26
CC201	GRADING PLAN - SHEET 2	27
CC202	GRADING PLAN - SHEET 3	28
CC205	SLOPE PLAN - EXISTING	29
CC206	SLOPE PLAN - PROPOSED	30
CC210	SITE LONG SECTIONS - SHEET 1	31
CC211	SITE LONG SECTIONS - SHEET 2	32
CC212	SITE LONG SECTIONS - SHEET 3	33
CC213	SITE LONG SECTIONS - SHEET 4	34
CC214	SITE LONG SECTIONS - SHEET 5	35
CC270	INTERSECTION DETAILS - SHEET 1	36
CC410	HYDRAULICS - SHEET 1	37
CC850	ENVIRONMENTAL CONTROLS CONCEPT PLAN - SHEET 1	38
CC851	ENVIRONMENTAL CONTROLS CONCEPT PLAN - SHEET 2	39
CC910	TURNING MOVEMENTS - SHEET 1	40
CC911	TURNING MOVEMENTS - SHEET 2	41
CC912	TURNING MOVEMENTS - SHEET 3	42
CC913	TURNING MOVEMENTS - SHEET 4	43
CC914	TURNING MOVEMENTS - SHEET 5	44
CC920	WASTE COLLECTION - SHEET 1	45

1.3 CONSULTATION

The proposed development requires the assistance of various authorities for it to proceed:

- ▶ Queanbeyan Palerang Regional Council (QPRC)
- ▶ The Natural Resource Access Regulator (NRAR)
- ▶ Essential Energy
- ▶ NBN
- ▶ Office of Environment and Heritage (OEH)

2. THE SITE

2.1 LOCATION

The Site is surrounded by undeveloped land to the north, the proposed North Tralee Industrial Estate to the north, the existing ACT suburb of Hume to the east and undeveloped Environa Estate to the south. Jerrabomberra Creek forms the boundary along the northern fronts of the Site. Environa Drive which is currently under construction bisects the proposed development and the undeveloped lands of Environa.



Figure 2-1 Site Location

The Site does contain the remnants of the old Tralee Speedway as well as abandoned farm infrastructure/amenity buildings.

The Site is currently accessible via Arnott Street in Hume. However, as part of the Environa Drive Project, access to the site has been provided via an intersection with provision for right in and right out. The design of RSC does not propose any changes to this arrangement.

2.2 THE TOPOGRAPHY, DRAINAGE AND ELEVATION

The Site naturally falls in a number of directions, ultimately arriving at Jerrabomberra Creek. Recently the flow has been diverted to major culverts constructed for Environ Drive and then into swales before discharging into Jerrabomberra Creek. The existing slopes on the site are shown on Drawing 309402CC205 (based on existing site survey).

Further information on the drainage for the site can be found in Section 7 – Stormwater Masterplan within this Report.

3. ROAD NETWORK

It is proposed to permanently access the Site through the future unsignalised intersection that has been designed and is currently under construction as part of the Environa Drive Project (by others). To service the RSC it is proposed to connect an internal road to two carparking areas as well as the overflow bus parking locations. The general arrangement and hierarchy of these roads can be seen on plan 309401CC005.

3.1 TRAFFIC GENERATION

A traffic study was undertaken by Taylor Thompson Whiting to analyse the traffic generated by the development and assess whether the traffic generated can be absorbed into the surrounding road network. A copy of the full report is included in Appendix A.

3.1.1 INTERNAL TRAFFIC GENERATION

The traffic modelling conducted by TTW indicates that the Roads within the development will have a likely average maximum peak traffic generation rate of 240vph when the Sports Hub is in its completed state. TTW further anticipated that a maximum peak traffic volume of 400vph generated by the development would rarely occur as it would relate to larger carnivals.

3.1.2 EXTERNAL ROAD NETWORK

The development is proposed to utilise Environa Drive (currently under construction) as the primary access road to the site. An unsignalised intersection has been proposed with Environa Drive with a dedicated right and left turn lane within Environa Drive. This intersection geometry was designed as part of the Environa Drive project and has been deemed suitable for the development. Details of this intersection arrangement can be seen on 309401CC270.

3.1.3 VERTICAL GEOMETRY

The vertical geometry requirements adopted for all roads within RSC are as follows.

- Absolute Maximum Grade 12%, Desirable Maximum Grade 8%
- Absolute Minimum Grades 0.3%, Desirable Minimum Grades 0.5%

3.1.4 HORIZONTAL GEOMETRY

RSC internal roads have been designed to adequately provide safe passage for the largest vehicle likely to traverse the site. The road geometry was determined based on the 19m semi Austroads design vehicle utilising the entire road pavement area and/or two 14.5m coaches passing each other as they make a 90 degree bend. The development has been designed to ensure that the design vehicle (the 14.5m coach) can navigate the site without crossing the centreline. A copy of the turning movements can be seen on drawings 309401CC913 and 309401CC914.

3.1.5 TYPICAL CROSS SECTION

The typical cross sections for the development can be seen in Drawings 309401CC060 through to 309401CC066. These cross sections have been modified to a tailored solution more suited to the needs and function of the development.

3.1.5.1 Access Road 001

The predominant access to the Site has been designed with a minimum travel lane width of 4m to allow comfortable access by Coaches.

Due to the amount of parking provided it is not proposed to provide parking (either indented or on street) on this Access Road. This is to ensure the traffic flow is not hindered by a parking vehicle in this area.

Due to the function of the proposed roads and expected land uses within development it was deemed unnecessary to provide dedicated on road cycle lanes. The design instead elects to provide an additional 2.5m shared path for use by pedestrians/cyclists. This will provide greater separation for cyclist and the expected large vehicles traversing the site as well as providing pedestrians with greater amenities to navigate the site. This footpath will connect with the 2.5m footpath provided for within Environa Drive.

3.2 PUBLIC TRANSPORT

There are no public bus routes in the vicinity of the Site. Furthermore, Environa Drive was not listed in QPRC Integrated Transport Strategy (2019) as having a bus route in the future. The closest existing bus routes is the 836 which services Jerrabomberra Shops and the 902 servicing Hume in the ACT. Therefore, RSC has not been designed with a dedicated bus stop within the site.

Should QCity determine a service to RSC is required, there is adequate capacity in the Road network to accommodate bus movements. The internal roads also accommodate the necessary space required for a bus service.

3.3 TURNING MOVEMENTS

Turning movements for the proposed development are shown on Drawings 309401CC910 through to 309401CC914.

These movements demonstrate the following:

- ▶ Two 5.2m passenger vehicles can navigate the carparking areas without hitting each other
- ▶ The 14.5m long rigid bus can navigate the access road and cul-de sac without colliding with a 14.5m bus travelling in the opposite direction.
- ▶ The 19m semi-trailer can navigate the site.
- ▶ The 8.8m service vehicle can access all the nominated waste collection locations within the development.
- ▶ Additionally, the turning movement required to enter the site from Environa drive has also been reviewed to confirm suitability with the proposed development. This movement has been provided on drawing 309401CC913.

3.4 PARKING

Parking is proposed to be provided for within the dedicated carparks for the site. Parking provisions have been determined by TTW in their Traffic and Parking Assessment Report. A copy of this report is provided in Appendix A.

TTW determined the following provisions were required:

- 448 general car spaces
- 19 Disability Discrimination Act compliant spaces
- Overflow parking for 100 cars or 9 x 12.5m buses
- 7 x 12.5m buses provided along the central roadway

The following spaces have been provided:

- 466 general car spaces
- 20 DDA compliant spaces
- Overflow provision for 100 cars, or six 14.5m long rigid buses and two 12.5m single unit buses
- On-road parking for eight 12.5m Single unit buses or six 14.5m long rigid buses

The provision provided exceeds that outlined in the TTW report. Parking has been provided in accordance with AS2890.1 user Class 2.

3.5 STREET LIGHTING

Street lighting is proposed to be provided within the development to AS/NZS 1158. The design of the streetlights is proposed to be undertaken at the detailed design stage. Options will be explored during detailed design as to the suitability of solar lighting for this development.

4. CYCLING AND PEDESTRIAN ACCESS

The footpath network can be seen on Drawing 309401CC030.

A mixture of paths varying in width from 1.5m – 4.0m have been provided for within the development. All paths have been designed with DDA compliant grades. The internal path network connects to the 2.5m shared path within Environa Drive.

An on-road cycle lane has also been provided for within the shoulder of Environa Drive prior to the intersection of Environa Drive with RSC. Cyclists approaching the Environa Drive intersection with RSC will not have a dedicated cycle lane as they enter the RSC. No on-road cycle, or shared bike paths are proposed within the RSC development.

5. SEWER MASTER PLAN

5.1 EXISTING SEWER INFRASTRUCTURE

At the time of writing this report, there is no commissioned infrastructure to service the RSC Development. However, the Review of Environmental Effects (REF) and Northern Entry Road (NER) Projects currently under construction, are all scheduled for completion prior to the commencement of construction of RSC. These two projects have been planned and designed to provide the associated external infrastructure required to service RSC. The associated infrastructure includes:

- ▶ 225mm dia. stub connection point at the Eastern edge of the site to provide connection to the sewer pump station for development within the area.
- ▶ Sewer Pump Station with a final control volume of 9,900 L (2.9hr detention)
- ▶ A 250mm dia. sewer rising main (A 180mm dia. temporary main will be utilised until demand requires the upgrade to the 250mm dia. main) to connect the SPS to the existing gravity network on Tomsitt Drive.

5.2 PROPOSED SEWER INFRASTRUCTURE

The proposed sewer network can be seen on Drawing 309401CC410.

It is proposed to connect to what will be an existing sewer manhole and stub provided by the REF works undertaken by the developer of the South Jerrabomberra Estate. The stub and the downstream network have been designed to have capacity for the RSC development as well as the future development of North Tralee to the east of RSC. Therefore, no upgrades to the external network are proposed as part of the RSC Project.

As confirmed with QPRC, PVC pipe sizes of 150mm dia are proposed to service the majority of the site with 225mm dia main required through the middle of the site. It is proposed to design the sewer to the minimum allowable grade capable of achieving self-cleansing. This will reduce the depth of sewer as much as possible, aiding in the accessibility for any future maintenance.

6. WATER SUPPLY MASTER PLAN

6.1 EXISTING WATER SUPPLY INFRASTRUCTURE

At the time of writing this report, there is no commissioned infrastructure to service the RSC Development. However, the Review of Environmental Effects (REF) and Northern Entry Road (NER) projects currently under construction will provide the following infrastructure.

The existing water infrastructure within the vicinity of the Site includes:

- ▶ A 225mm dia supply main along Environa Drive with a 150mm dia stub connection for RSC

The local water main servicing RSC sizing and location along Environa Drive was reviewed and confirmed in Urban Water Solutions' (UWS) Technical Memo dated 28th April 2020. This memo was circulated to QPRC prior to construction with the following assumptions and conclusions included for RSC:

- 3.7L/s @ 550kPa for drinkable cold water
- 29L/s @ 456kPa for fire service
- No allowance for Irrigation is allowed for. Any Irrigation was assumed to be from on-site storage tanks and that any potable water top-up would be from off peak flow.

This information was provided by QPRC. A copy of this memo and correspondence with QPRC is included in Appendix B.

6.2 PROPOSED WATER SUPPLY INFRASTRUCTURE

The proposed water network can be seen on Drawing 309401CC410.

It is proposed to connect to what will be an existing water stub provided by the REF works along Environa Drive. The stub and external network have been designed to have capacity for the RSC development. Therefore, no upgrades to the external network are proposed as part of the RSC Project. As confirmed with QPRC, PVC pipe sizes of 150mm dia are proposed to service the majority of the site.

7. STORMWATER MASTERPLAN

7.1 DRAINAGE REQUIREMENTS & SCOPE

This section of the report details the minor stormwater management strategy for the site and demonstrates that the proposed assets are appropriate for approval. For the major Stormwater Strategy for the Site please refer the stormwater report prepared by Lyall & Associates.

7.2 STORMWATER QUANTITY

7.2.1 REQUIREMENTS AND OBJECTIVES

7.2.1.1 Minor and Major Drainage Requirements

As required by QPRC's Development Design Specification – Part D5, the following conveyance capacities will apply:

- The minor drainage network, i.e. the stormwater drainage pipe network, will be required to convey 10% AEP event flows, as the site is commercial/industrial.
- The major drainage network, i.e. stormwater flow overland through road reserves, is required to convey the gap flow between the 1% and 10% AEP events. Furthermore:
 - o All overland flows will be subject to the relevant Velocity x Depth criteria to ensure safety of pedestrians and vehicles

7.2.2 PROPOSED DEVELOPED CONDITIONS

7.2.2.1 Developed Drainage Arrangement

The proposed drainage arrangement for the development can be seen on Drawing 309401CC410 and functions as follows:

- ▶ The minor drainage system, to convey flows up to the 10% AEP event will convey flows via pipe network to the major stormwater channels through the site.
- ▶ The major drainage system, conveying flows up to the 1% AEP event, will be split into three swales as follows:
 - A swale on the eastern side of the Site
 - A Swale in the central part of the Site
 - A swale on the western side of the Site

7.2.2.2 Creek Outfalls

There will be one outfall locations from the RSC to Jerrabomberra Creek.

- ▶ Outfall locations and design will minimise any required vegetation removal, with specific avoidance of notable native vegetation
- ▶ Piped flow will be generally directed downstream

- ▶ Scour protection will be considered at outfall locations, such that:
 - Rockwork will be placed from pipe outfalls to the central creek formation
 - Any overland flowpath to the creek will manage scour with soil-binding vegetation planted in the extent of 1% AEP flow width, and rockwork where required.

8. UTILITIES

Underground shared trenching for Electricity, and Telecommunications is proposed for the development.

9. SITE RE-GRADING

9.1 EXISTING SLOPE

As shown on Drawing 309401CC205 the existing slope of the proposed development area is predominantly 0 – 5% but includes small sections of batters that are approximately 25%. To the edge of the developable area the slopes increase to greater than 25% as the land drops into Jerrabomberra Creek. There is also a section of the abandoned North Tralee race circuit that enters the site and has a slope in excess of 25%

9.2 PROPOSED SLOPE

As shown on Drawing 309401CC206 the proposed slope of the development is predominantly 0 – 5% with only a few interface batters requiring steep slopes.

9.3 SITE GRADING

As shown on Drawing 309401CC200 re-grading is proposed across the majority of the Site.

The amount of cut/fill has been minimised; the preliminary earthworks design has resulted in a Net import of Fill to the site. The constraints caused by the flood levels is a major driver for the current site regrading design.

It was seen as preferential to ensure the site was lifted to help bolster the developments flood immunity from future storm events and ensure immunity for particular fields from the 1% AEP event.

The current cut/fill balance is as per the table below:

Cut (m3) approx.	60,000
Fill (m3) approx.	150,000
Balance – Import (m3) approx.	90,000

10. SEDIMENT AND EROSION CONTROL

10.1 EARTHWORKS AROUND JERRABOMBERRA CREEK

In order to minimise the potential impacts from the proposed construction of the RSC on the nearby Jerrabomberra Creek, additional measures and controls have been and will continue to be implemented throughout the project until ultimately culminating in the construction Erosion and Sediment Control Management Plan (ESCMP). The project team has attempted to reduce the risk of damage to the nearby creek with an elimination first and eliminate early approach.

The first steps of elimination have already been undertaken during the planning and urban design stage. The only works that are planned to be constructed in the riparian zone is the final stormwater outlets. The remainder of the estate has been designed to incorporate a buffer zone to the top of the creek channel. With the exception of the outlets there is no other work proposed within 5m of the top of batter. This is despite the land zoning allowing work to occur within the creek reserve. This Buffer zone will act as a final form of treatment should any extreme events occur during construction.

The preliminary grading design has also been conducted with protection of the creek at the forefront of the design. It was decided that the most effective elimination strategy for the design was to avoid the creek altogether. This also means that during construction, earthworks can also be staged to ensure disturbed ground will not flow directly towards the creek. Mitigating the risk of spills or leaks caused by future landowners spilling into the creek.

In the following design work prior to construction, staging of works will be implemented to reduce the quantity of disturbed soil at any one time. This will allow future temporary measures to be sized and implemented in a manner that is both practical, attainable and cost-efficient during construction. The basis of this will be to reduce the amount of untreated runoff to an extent where it effectively eliminates the risk of the control measures becoming overwhelmed and failing.

10.2 CONCEPT EROSION AND SEDIMENT CONTROL PLAN

A Concept Sediment and Erosion Control (ESC) Plan has been prepared for the site and is shown on Drawings 309401CC850 and 309401CC851. A final ESCMP will be prepared by the Contractor as part of CMP.

The ESC concept strategy aims to minimise the extent of disturbed area and reduce upstream catchment through the use of diversion drain. The ESCMP will in unison maximise the size of the sediment basins to amplify the effectiveness of the controls.

Each of the temporary sediment basins have been indicatively sized for the 90th percentile event in accordance with Managing Urban Stormwater, Soils & Construction. Values used for indicative sizing are below:

Parameter	Value	Source
5-day rainfall depth, 90 th percentile. (R)	33mm	(Section 6, Table 6.3a Bluebook Volume 1).

Parameter	Value	Source
R-Factor (Rainfall Erosivity).	1500	(Map 12, Appendix B Bluebook Volume 1)
Sediment Type.	Type D and F	(Table C24, Appendix C Bluebook Volume 1)
Soil Hydrological Group.	Group B and C	(Table C24, Appendix C Bluebook Volume 1)
Runoff Coefficient (Cv)	0.51 (For rainfall depth 33mm and worst case soil group C)	(Table F.3, Appendix F Bluebook Volume 1)
Settling Zone Volume (m ³)	$10 * C_v * R * A$	(J.4, Appendix J Bluebook Volume 1)
Sediment Storage Zone Volume (m ³)	Settling Zone Volume * 0.5	(J.4, Appendix J Bluebook Volume 1)
Total Volume	Settling Zone Volume (m ³) + Sediment Storage Zone Volume (m ³)	(J.4, Appendix J Bluebook Volume 1)

	Basin A	Basin B
Scaling Factor		10
R (mm)		33
Cv		0.51
Disturbed Area (Ha)	6.5	10
Settling Zone Volume (m ³)	1,094	1,683
Sediment Storage Zone Volume (m ³)	547	842
Total Volume (m ³)	1641	2525

APPENDIX A – TAYLOR THOMPSON WHITING TRAFFIC REPORT

APPENDIX B - WATER SUPPLY REPORT