

**Appendix G: Traffic Effects Assessment ~~Approved Materials~~**

**Commented [SC1]:** New appendix G was previous Appendix F. Old appendix G is now in part Appendix A. No changes to contents in Traffics Effects Assessment

# **Traffic Effect Assessment**

## **A Guide to Preparation**

## **What is a Traffic Effects Assessment (TEA)?**

Many planning applications are of a size or type that would generate additional trips on the adjoining transport infrastructure. This additional demand may necessitate changes to be made to the road layout or to public transport services. Wherever possible, opportunities should be taken to provide direct access to public transport and to pedestrian / cycle infrastructure, thus helping to modify the overall transport impact.

The developer or promoter should provide a full and detailed assessment of how trips to and from the development might affect the road network and / or public transport facilities. The traffic effects assessment should be an impartial description of impacts and should include both positive and negative aspects of the proposed development.

Traffic effects assessment addresses two related issues. These are:

- Volume / capacity: what will be the effects of additional traffic on the safety and efficiency of the existing network?; and
- Environmental: what will be the effects of additional traffic in terms of noise, pollution and visual intrusion?

## **When is a TEA Required?**

TEA's are usually produced by developers in support of a planning application and the primary responsibility rests with the developer and not the Local Authority. As a guide TEA's should be produced where:

- Traffic to and from the development exceeds ten percent of the average traffic flow over the same period on the adjoining road; or
- Traffic to and from the development exceeds five percent of the traffic flow on the adjoining road, where traffic congestion exists, or will exist, within the assessment period, or in other sensitive locations.

Traffic problems often relate to peak hours; therefore, the threshold should be applied to these peak periods. However, it may also be appropriate to consider other time periods, such as all day or the peak periods of traffic generated by the development, if it is thought that the impact for such periods is likely to be of concern, for example Saturday shopping or Sunday tourism.

A TEA may be required even though the conventional threshold tests do not apply. An example might be where the percentage increase in vehicle numbers may be small but where most, if not all, of the additional vehicles are large goods vehicles, such as at a landfill site or quarry.

Furthermore, there will be developments so significant in size that TEA's should be undertaken as a matter of course. As a guide, proposals which are likely to attract additional traffic sufficient to warrant a TEA are:

- Residential development in excess of 200 units;
- Business with a Gross Floor Area (GFA) in excess of 5000m<sup>2</sup>;
- Warehousing with a GFA in excess of 10000m<sup>2</sup>;
- Retail development with a GFA in excess of 1000m<sup>2</sup>;
- 100 trips in/out combined in the peak hour; or
- 100 off-street parking spaces, with a single access to the street network.

The same threshold approach should be used to establish the area of influence of the development. Hence, the study area should include all links and associated junctions, where traffic to and from the development will be likely to exceed 10% of the existing traffic (or five per cent in congested or other sensitive locations) or such other threshold as may have been established by the local Roading or Planning Authority.

## **What Should a TEA Cover?**

### **Prior to understanding a TEA**

Prior to undertaking a full TEA a scoping study should be carried out by the developer, in conjunction with the Planning and Roading Authority, to agree the key aspects to be addressed by the TEA. The scoping study should set out details of data to be collected, the area of analysis, key junctions to be considered, the methodology to be adopted and the years of assessment. Such a scoping study will provide a basis for assessing the level of resources that will be required to undertake the TEA. This scoping study will be invaluable to all parties involved and should ensure that work is not undertaken unnecessarily and that resources are directed to those aspects requiring most attention.

### **Trip Attraction**

There are several databases that contain information about the level of traffic likely to be attracted to a development. A database allows a user to select existing developments and to examine traffic levels that occur at these sites.

However, there is normally a wide spread of trip-rate values even for similar developments and the reasons are not immediately obvious. Guidelines make the point that using a median value creates a forecast with a 50% chance of being exceeded. If car park size or junction capacity is to be derived from such values, there could be major risks associated with undersizing or under-designing such facilities.

Consequently, it is prudent to consider the design elements based on a trip-rate higher than the average. An 85<sup>th</sup> percentile value is recommended (ie, a value not exceeded by 85% of all values).

Assessments should be undertaken at the year of opening and for a year either 10 or 15 years later. Forecasts should relate specifically to the type of road, locality and time period being assessed. Assessors will, therefore, need to consider local traffic trends, the availability of local forecasts, or applications derived from any regional Trip-End Model.

### **Design Considerations**

Proposals for new developments will include layouts of access roads, service yards and car parking. Pedestrian access, facilities for cyclists and the design of public transport infrastructure, such as bus stops and shelters should also be examined.

The TEA should illustrate access to, and the internal layout of, the site and demonstrate how facilities are to be provided for disabled people, servicing traffic, pedestrian access, cyclists and public transport.

### **TEA Format**

The following pages outlines a suggested format for the production of a TEA and provide references. Clearly many TEA's will not need to cover all of the items identified within the suggested format but authors should state clearly why particular issues are not considered to be relevant.

## TRAFFIC EFFECTS ASSESSMENT FORMAT CHECKLIST AND REFERENCE GUIDE

### 1. Non-Technical Summary

- ☐ A brief non-technical resume of the projected traffic impact of development

### 2. Existing Conditions

- ☐ Description of current transport policies for the area (including NZLTS, RLTS, LTCCP, etc);
- ☐ Quantification of current traffic flows on links and junctions within the affected area;
- ☐ Examination of historic accident records, where appropriate;
- ☐ Quantification of pedestrian flows at critical locations;
- ☐ Identification of critical links and junctions;
- ☐ Identification of committed highway works in the area; and
- ☐ Identification of developments with planning consent but not yet implemented

#### References

- Relevant Local District Plan
- Parking and Traffic Generation Survey Results (Site Specific)
- NZ Land Transport Strategy
- Regional Land Transport Strategy
- Long Term Council Community Plan (LTCCP)
- LTSA RTS
- LTSA RSS
- LTSA Road Safety Reports (by Region, District, State Highway)
- LTSA Crash Listings and CAS Database
- Austroads Guide to Traffic Engineering Practice - Part 1, Traffic Flow
- Austroads Guide to Traffic Engineering Practice - Part 2, Roadway Capacity
- Austroads Guide to Traffic Engineering Practice - Part 3, Traffic Studies
- Austroads Guide to Traffic Engineering Practice - Part 4, Road Crashes
- Austroads Guide to Traffic Engineering Practice - Part 13, Pedestrians
- Transit NZ 10 year Forward Works Plan
- Local Council 10 year Forward Works Plan
- Corridor Management Plans

### 3. Proposed Development

- ☐ Description of current planning policies for the site including parking guidelines;
- ☐ Description of current use of the site and its recent usage history;
- ☐ Description of proposed use, including site area and development phasing;
- ☐ Specification of size of the development; and
- ☐ Provision of site plan for proposed development, where available.

#### References

- Relevant Local District Plan

#### 4. Model Choice/Trip Attraction

- ☐ Quantification of current trip attraction of the site;
- ☐ Estimation of projected modal split;
- ☐ Estimation of trip attraction, specified by direction and vehicle type, for:
  - ☐ Weekday;
  - ☐ Peak hours; and
  - ☐ Development peak;
- ☐ Justification of the values used;
- ☐ Identification of times when traffic impact is at its greatest, i.e the peak combination of network and development traffic;
- ☐ For multi-purpose sites, provision of details of each significant element;
- ☐ Specification of trip attraction by phase (if appropriate); and
- ☐ Specification of trip attraction by construction period (if appropriate)

#### References

- Transfund Trips and Parking Related to Land Use – Report No. 209 and 210
- RTA Guide to Traffic Engineering Developments
- Relevant Local District Plan
- Parking and Traffic Generation Survey Results (Site Specific)
- Austroads Guide to Traffic Engineering Practice - Part 1, Traffic Flow
- Austroads Guide to Traffic Engineering Practice - Part 2, Roadway Capacity
- Austroads Guide to Traffic Engineering Practice - Part 3, Traffic Studies

#### 5. Trip Distribution

- ☐ Definition of catchment area;
- ☐ Consideration of competing opportunities;
- ☐ Identification of transfer trips, ie the trips previously attracted to an alternative site;
- ☐ Identification of non-primary trips, ie 'pass-by' and 'diverted' trips that might already be on the network;
- ☐ Distribution of trips to potential opportunities ; and
- ☐ Justification for the methodology adopted.

#### References

- Transfund Trips and Parking Related to Land Use – Report No. 209 and 210
- RTA Guide to Traffic Engineering Developments
- Relevant Local District Plan
- Austroads Guide to Traffic Engineering Practice - Part 1, Traffic Flow
- Austroads Guide to Traffic Engineering Practice - Part 2, Roadway Capacity
- Austroads Guide to Traffic Engineering Practice - Part 3, Traffic Studies

## 6. Assignment of Development Traffic

- ☐ Identification of traffic routing to and from the site;
- ☐ Definition of turning movements at the site entrance; and
- ☐ Provision of modified traffic projections at key links and junctions within the affected area.

### References

- Transfund Trips and Parking Related to Land Use – Report No. 209 and 210
- RTA Guide to Traffic Engineering Developments
- Parking and Traffic Generation Survey Results (Site Specific)
- Austroads Guide to Traffic Engineering Practice - Part 1, Traffic Flow
- Austroads Guide to Traffic Engineering Practice - Part 2, Roadway Capacity
- Austroads Guide to Traffic Engineering Practice - Part 3, Traffic Studies
- Site specific traffic modelling (as required)

## 7. Assessment Years

- ☐ Estimation of traffic growth over time for;
  - ☐ Network traffic; and
  - ☐ Development traffic;
- ☐ Estimation of traffic flows on the adjacent links and at key links and junctions within the affected area for:
  - ☐ Base year, i.e first year of full operations; and
  - ☐ Base year plus 10 years; or
  - ☐ Year of completion of infrastructure plus 15 years, if a new modified highway infrastructure is required;
- ☐ Inclusion of committed highway and development proposals that affect local traffic conditions; and
- ☐ Possible requirement for additional separate assessment for specific phasing proposals and or construction traffic impacts.

### References

- Relevant Local District Plan
- NZ Land Transport Strategy
- Regional Land Transport Strategy
- Long Term Council Community Plan (LTCCP)
- Corridor Management Plans
- Site specific traffic modelling (as required)



## 8. Highway Impact

- ☐ Indication of the proposed site access layout;
- ☐ Justification of the design;
- ☐ Traffic assessment on other key links and junctions within the affected area;
- ☐ Identification of reserve capacity and queue lengths, where appropriate;
- ☐ Identification of alternative designs for key links and junctions within the affected area which may be necessitated by the increased traffic movements;
- ☐ Identification of any departure from design standard; and
- ☐ Safety assessment of all designs

### References

- Land Transport Safety Authority (LTSA) Traffic Notes
- LTSA RTS
- LTSA RSS
- LTSA Road Safety Reports (by Region, District, State Highway)
- Relevant Local District Plan
- Transit NZ Standards and Guidelines Manual
- Transit NZ Policy and Planning Manual
- LTSA Standards and Guidelines List (From SMS Development Manual)
- Austroads Guide to Traffic Engineering Practice - Part 1, Traffic Flow
- Austroads Guide to Traffic Engineering Practice - Part 2, Roadway Capacity
- Austroads Guide to Traffic Engineering Practice - Part 3, Traffic Studies
- Austroads Guide to Traffic Engineering Practice - Part 5, Intersections at Grade
- Austroads Guide to Traffic Engineering Practice - Part 6, Roundabouts
- Austroads Guide to Traffic Engineering Practice - Part 7, Traffic Signals
- Austroads Guide to Traffic Engineering Practice - Part 8, Traffic Control Devices
- Austroads Guide to Traffic Engineering Practice - Part 9, Arterial Road traffic Management
- Austroads Guide to Traffic Engineering Practice - Part 10, Local Area Traffic Management
- Austroads Guide to Traffic Engineering Practice - Part 12, Roadway Lighting
- Transit NZ Manual of Traffic Signs and Markings (MOTSAM) Parts 1, 2, and 3
- Transfund Road Safety Audit Procedures

## 9. Environmental Impacts

- ☐ Identification of the environment impact arising from the traffic consideration of the proposed development;
- ☐ Special consideration required for sensitive and residential areas; and
- ☐ Consideration of measures that might be appropriate to mitigate against any environmental disadvantage.

### References

- Resource Management Act
- Relevant Local District Plan
- Local Regional Council Requirements

### 10. Road Safety

- ☐ Examination of historical data for accident factors, trends and groups, for example, regular occurrence of one type of accident or involvement of one type of road-user; and
- ☐ Preparation of a safety audit on any proposed change to the highway layout.

#### References

- RTA Guide to Traffic Engineering Developments
- Land Transport Safety Authority (LTSA) Traffic Notes
- LTSA RTS
- LTSA RSS
- LTSA Road Safety Reports (by Region, District, State Highway)
- LTSA Crash Listings and CAS Database
- Transit NZ Standards and Guidelines Manual
- LTSA Standards and Guidelines List (From SMS Development Manual)
- Austroads Guide to Traffic Engineering Practice - Part 4, Road Crashes
- Austroads Guide to Traffic Engineering Practice - Part 15, Motorcycle Safety
- Transit NZ Manual of Traffic Signs and Markings (MOTSAM) Parts 1, 2, and 3
- Transfund Road Safety Audit Procedures

### 11. Internal Layout

- ☐ Definition of internal road and circulatory layout, with dimensions and plan;
- ☐ Consideration of services and emergency vehicle routes;
- ☐ Definition of aisle widths, road marking, traffic safety, visibility, etc, and
- ☐ Consideration of vehicle speed control measures.

#### References

- RTA Guide to Traffic Engineering Developments
- Relevant Local District Plan
- Parking and Traffic Generation Survey Results (Site Specific)
- Transit NZ Standards and Guidelines Manual (e.g. SHGDG)
- Austroads Guide to Traffic Engineering Practice - Part 10, Local Area Traffic Management
- Austroads Guide to Traffic Engineering Practice - Part 11, Parking
- Transit NZ Manual of Traffic Signs and Markings (MOTSAM) Parts 1, 2, and 3
- AutoTURN/TRACK analysis

## **12. Parking Provision**

- ☐ Determination of level of provision and justification;
- ☐ Consideration of essential operational, visitor, disabled spaces;
- ☐ Specification of bay and aisle dimensions and location of spaces;
- ☐ Verification that vehicles can access each space with adequate turning provisions; and
- ☐ Determination of service area requirements.

### **References**

- Transfund Trips and Parking Related to Land Use – Report No. 209 and 210
- RTA Guide to Traffic Engineering Developments
- Relevant Local District Plan
- Ministry of Transport (MOT) Parking Standard
- Parking and Traffic Generation Survey Results (site specific)
- Austroads Guide to Traffic Engineering Practice - Part 10, Local Area Traffic Management
- Austroads Guide to Traffic Engineering Practice - Part 11, Parking
- Transit NZ Manual of Traffic Signs and Markings (MOTSAM) Parts 1, 2, and 3

## **13. Public Transport**

- ☐ Indication of intended public transport provision;
- ☐ Determination of siting of bus stops, routes, etc; and
- ☐ Determination of access to bus/rail facilities.

### **References**

- Austroads Guide to Traffic Engineering Practice - Part 13, Pedestrians
- Relevant Local District Plan
- Transit NZ Manual of Traffic Signs and Markings (MOTSAM) Parts 1, 2, and 3

## **14. Pedestrian/Cyclists/People with Disabilities**

- ☐ Indication of specific provisions
- ☐ Indication of safety and security provisions; and
- ☐ Indication of facilities for disabled.

### **References**

- Transfund Trips and Parking Related to Land Use – Report No. 209 and 210
- RTA Guide to Traffic Engineering Developments
- Austroads Guide to Traffic Engineering Practice - Part 13, Pedestrians
- Austroads Guide to Traffic Engineering Practice - Part 14, Bicycles
- Relevant Local District Plan
- Transit NZ Manual of Traffic Signs and Markings (MOTSAM) Parts 1, 2, and 3

## SEEKING WRITTEN APPROVAL FROM ROAD CONTROLLING AUTHORITY FOR YOUR DEVELOPMENT PROPOSAL

*If you are considering a development project near a road you must discuss your proposal with the Road Controlling Authority, and in many cases obtain written approval.*

**Who is the Road Controlling Authority?**

*The Road Controlling Authority may be the Local Authority, in this instance Wanganui District Council, or in the case of State Highway, New Zealand Transport Agency.*

**Where a State Highway is affected then the applicant will be required to submit their proposal to New Zealand Transport Agency for approval.**

### THE ROLE OF THE RCA

#### WHAT THE RCA CONSIDERS WHEN ASSESSING PROPOSALS

RCA assessment of a proposal includes but is not limited to the following factors:

- Traffic generated from the proposal and the effect this will have on the operation of the road;
- Development pressure in the area and any adverse cumulative effects that may arise from the proposal;
- Sight distances from any subject crossing place associated with the proposal;
- The proposed use of the crossing (e.g. heavy vehicles, farm use, residential use)
- The condition of the crossing place;
- The surrounding environment and landuse and how the proposal relates to this;
- Whether all alternatives for access have been considered (e.g. could a side road be used for access or could an accessway be shared with a neighbouring site?);
- Whether any advertising signage may unnecessarily distract drivers;
- Whether landscaping will compromise visibility to and from intersections and accesses;
- The potential for future complaints with respect to nuisance effects from the road traffic; and
- The overall effect of the proposal on the sustainability of the road network;

Each RCA will provide guidance and schedules for assessing applications.

## **THE PROCESS**

### **HELP WITH THE APPLICATION PROCESS**

It is generally advisable to employ a suitably qualified consultant to manage your proposal. Depending on the nature of your proposal this person may be a planner, surveyor, traffic engineer, acoustics engineer, and/or lawyer. In some cases more than one professional may be required.

At any time throughout the process the Council are available to assist.

### **APPLICATION FORM**

"Road" may refer to local road or state highway.

Similar information may be required by New Zealand Transport Agency if a state highway is affected.

## SECTION ONE: CONTACT DETAILS

*Return address:*

Wanganui District Council  
PO Box 637  
Wanganui

**Attention: Resource Planning Section**

Date:

Your name:

Applicants name:

Postal Address:

Home Phone No:

Business Phone No:

Cell Phone No:

Fax No:

E-Mail:

### HAVE YOU INCLUDED THE FOLLOWING WITH YOUR APPLICATION:

Plan of the existing site and access arrangements ..... ☐

Scheme Plan showing the proposal and proposed access arrangements..... ☐

Certificate of Title..... ☐

Resource Consent Application (if applicable)..... ☐

Assessment of Environmental Effects (if applicable)..... ☐

Any Traffic Effect Assessment\* or other specialist report (if required) ..... ☐

A request for New Zealand Transport Agency to provide its..... ☐  
written approval to the application in accordance with Section 94 of the  
Resource Management Act 1991 and/or Section 176(1)(B) of the  
Resource Management Act 1991 if a state highway is affected.

\* See WDC document Traffic Effect Assessment – A Guide to Preparation,  
which outlines requirements for producing a Traffic Effect Assessment report.

## SECTION TWO: PLANNING INFORMATION

Is your proposal for:

Land use ☐ Subdivision ☐ Other (please state) ☐

Location of site:

Road:  Locality (nearest settlement):

Legal Details

Legal Description of site (please attach a copy of the certificate of title):

Please provide details of any cross lease situation/ licenses to cross railway lines, etc.

Size of the site:

Please provide a description of the existing development and any significant landscape features on the site (e.g. streams, areas of native bush, heritage buildings, culturally significant sites)



**Description of Proposal** – *Please describe what you are proposing to do.*

**Reason for the application** – *Please state the reasons you are submitting this proposal including details of any additional development planned for the future (e.g. initial application to subdivide the site with an intention to construct one dwelling on the new lot at some stage in the future).*

**Activity classification and zoning under relevant planning documents**  
*(For assistance with this please contact your Council)*

**Have you lodged a Resource Consent application with Council?** *(If so, please state the Council reference and what stage this consent is at – only required for TNZ applications)*

**Have you made any previous applications to the RCA in relation to this site or any neighbouring sites that you own?** *(If so, please give relevant details including the proposal, outcome and date)*

### SECTION THREE – ACCESS

**How does the site *currently* gain access to the Road?** *(Please include crossing place numbers if applicable)*

**Does the site *currently* share any access(es) with other properties?** *(If yes please give details of the number of properties the crossing is shared with and details of any relevant right of way easements)*

**What is the *current* use of access(es) to the site (e.g. farm use, heavy vehicles, residential use, etc)?**

**How many vehicle movements per day (in and out) are *currently* generated from the site?**

**As a user of the crossing; are there any safety concerns relating to the access?**

**How do you *propose* to gain access to the site as a result of your proposal?**  
*(Please state the reasons why you have chosen this access arrangement, and whether any form of restricted access is proposed, such as gates.)*

**Are there any side roads that could be used to gain access for your proposal?**  
*(If yes, please name)*

**Could access be shared with a neighbouring lot?**

**What type and number of vehicle movements per day (in and out) will be generated as a result of the proposal?**

**SECTION FOUR – SUBDIVISION DETAILS (for subdivision only – please go to Section Five if you are making a land use application)**

**Number of proposed lots:**

**Size of proposed lots:**

**Intended use of proposed lots (e.g. – farming, lifestyle, residential, commercial**  
*[if commercial or industrial please give further details in Section Five]):*

**Are any buildings proposed for the new lots?** *(If so, please give details)*

**Are there any proposed buildings for each of the new lots?** *(If yes, please give details)*

**Will any areas of land be retired or covenanted as a result of the subdivision?**  
*(If yes, please give details. E.g. creation of a reserve)*

## SECTION FIVE – LAND USE DETAILS

**What is the existing land use of the site?**

**What is the general land use in the vicinity?**

**Is this application for a commercial or industrial development?** *(If yes please provide details of peak traffic hours, opening hours, nature and size of the business and origin of traffic)*

**How will on site manoeuvring and car parking be accommodated for?**

**What mitigation is offered to address any nuisance effects from the Road on the proposed activity?**

## SECTION SIX – SIGNAGE AND LANDSCAPING

**Are there currently any signs on the site?** *(If yes, please give details)*

**Is any signage proposed in conjunction with this proposal?** *(If yes, please give details of size, location, content, size of lettering and whether these the sign(s) will be illuminated)*

**Is there currently any landscaping on the site?** *(If yes, please give details)*

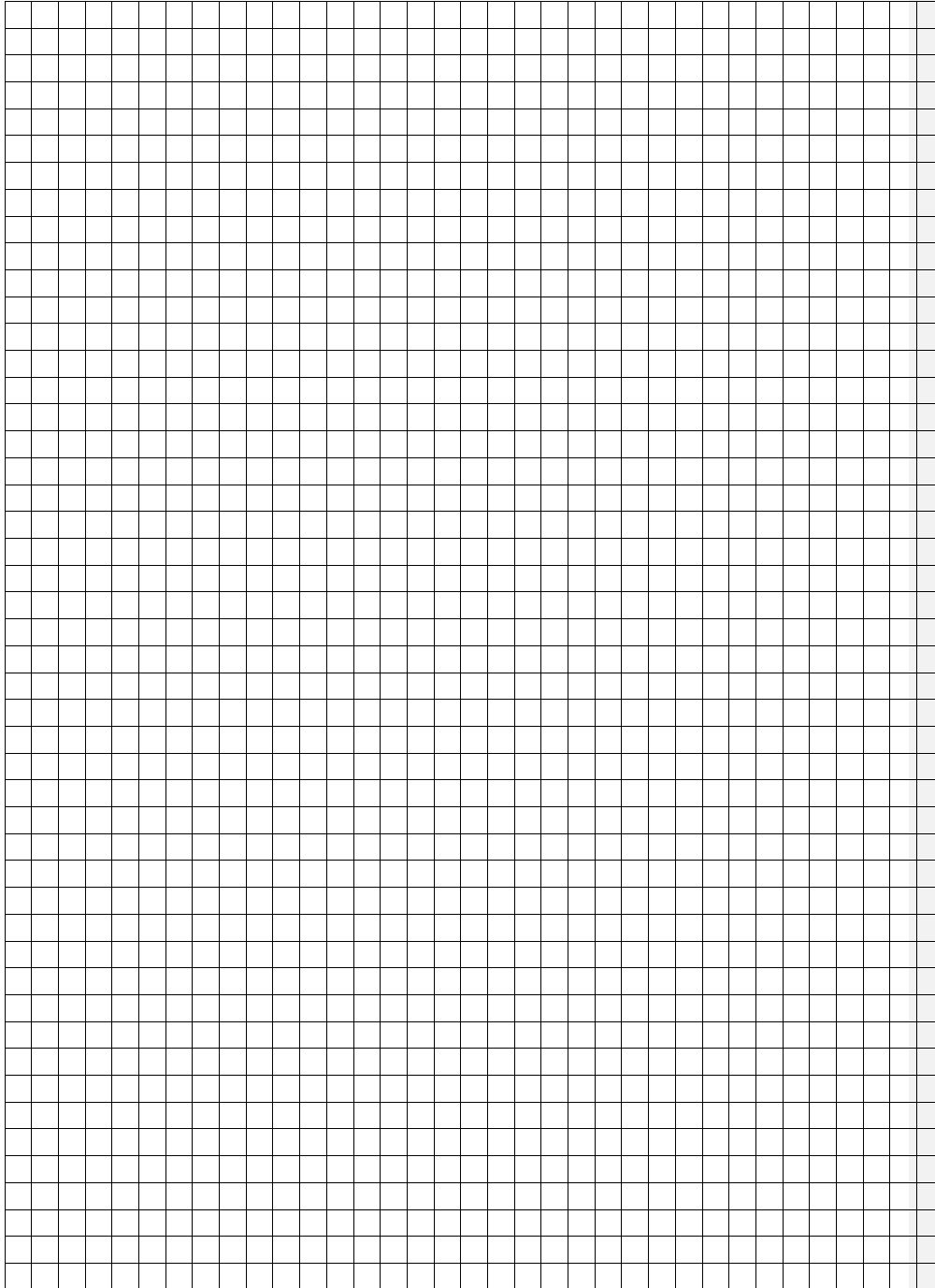
**Is any landscaping proposed in conjunction with this proposal?** *(If yes, please give details of species of plant, size, location, and any other landscaping features)*

## SECTION SEVEN – OTHER DETAILS

**Is there any construction traffic associated with your proposal?** *(If yes, please give details of the type of vehicles, number of vehicle movements involved [in and out], direction of travel on the Road, materials involved and length of time for the construction)*

**Please include any comments you may have in relation to this proposal**

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APPENDIX G: TRAFFIC EFFECTS ASSESSMENT





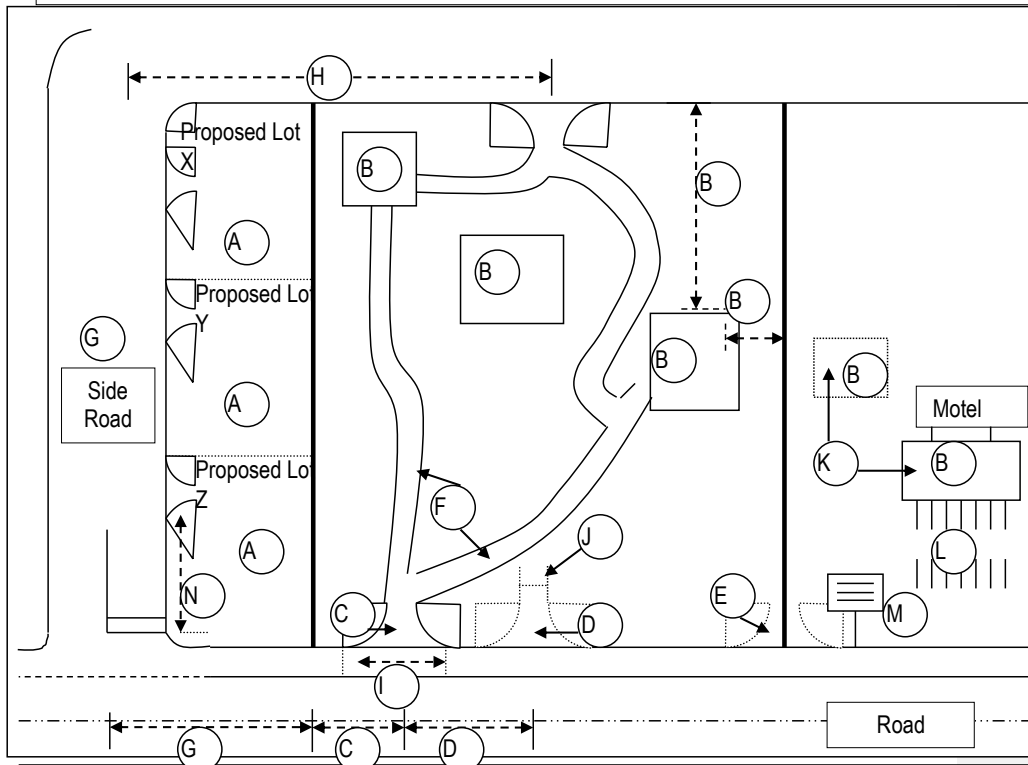
## DETAILED DRAWING OF PROPOSAL

PLEASE INCLUDE A DETAILED DRAWING OF YOUR PROPOSAL.  
THE FOLLOWING INFORMATION IS THE MINIMUM REQUIREMENT.

Transit requires a detailed drawing of your proposal. If you do not have a site plan of your subdivision or landuse activity please provide a sketch of the proposal. Please note that if insufficient information is provided this may result in your application being returned with a request to provide additional information. The drawing given below is an example to indicate the type of information that we require. A grid sheet is attached for your use. Your sketch should include the following points:

- A. Size and shape of existing and proposed lots (if any).
- B. Location and orientation and **use of all** existing and proposed buildings and structures.
- C. Location of **all** EXISTING accessways and gates including distances to existing and proposed boundaries adjacent to the State Highway.
- D. Location of **all** PROPOSED accessways and gates including distances to existing and proposed boundaries adjacent to the Road.
- E. Location of any shared access arrangements (ROW's, access lots, dual accessways etc).
- F. All internal roading.
- G. Location of side roads (if any).
- H. Location of all existing and proposed accessways on side roads (if any).
- I. Width of all existing and proposed accessways where they meet the Road.
- J. Width of all existing and proposed accessways at the fenceline.
- K. Gross floor area in m<sup>2</sup> of all existing and proposed buildings.
- L. Location and number of all parking spaces (if any) and manoeuvring areas.
- M. Location, size, and distance to boundary of all signage (existing and proposed).
- N. Distance of all accessways along side road(s) from intersection(s).

Please note that this diagram is an example only.



Approved materials for:

1. ~~Stormwater and Wastewater~~  
~~See NZS4404, page 101, Table 4.2, and Modifications in Part 4 of Supplement Document.~~
2. ~~Water Supply~~  
~~See attached list.~~

**WDC APPROVED MATERIALS LIST – TABLE 4.2**

Pipe Materials	Applicable Manufacturing Standards	Stormwater	Wastewater	Water Supply	Comments
VC (Vitrified Clay pipes and fittings)	AS/1741:1991	✓	✓		Has benefits for particularly aggressive wastes or ground conditions.
PVC-U (Unplasticised Poly Vinyl Chloride pipes and fittings) Class SN4 to 16 as required by TA	AS/NZS 1260:2009		✓		For wastewater gravity pipes.
PVC-U (Unplasticised Poly Vinyl Chloride and fittings) Class SN4 to 16 as required by TA	AS/NZS 1254:2010	✓			For stormwater gravity pipes.
PE (Poly Ethylene Pipes and fittings)	AS/NZS 4130:2009 AS/NZS 5065:2005	✓	✓	✓	Note AS/NZS 4130 – for pressure applications and fittings. Note AS/NZS 5065 – For gravity drainage and sewage applications and fittings.
PVC (pressure pipe and fittings)	AS/NZS 1477:2006		✓		PVC pipes and fittings for pressure applications. Wastewater applications only.
PVC-M (Poly Vinyl Chloride Pipe)	AS/NZS 4765:2007		✓	✓	For pressure applications
PVC-O (Poly Vinyl Chloride Oriented Pipe)	AS/NZS 4441:2008			✓	For pressure applications, generally water applications only.
GRP (Glass Reinforced Plastic Pipe)	AS 3574	✓	✓		Lightweight. Resists many aggressive wastes in wastewater applications.
RRJ reinforced concrete pipes and Concrete Manhole Risers and lids	AS/NZS 4058:2007	✓	✓ (Large Pipe)	✓	Principally used for pipe sizes 300mm or larger. Sometimes used for waste water pressure lines but subject to hydrogen sulphide attack.
RCP pipe (Roller Compacted Pipe)	AS/NZS 4058:2007	✓	✓		Approved for use of RCP pipes that can individually be verified to have passed the factory hydrostatic test.
Stormboss Pipe (and fittings)	AS/NZS 5065:2005	✓			Limited to stormwater applications only. Prior approval required from the TA.
Nexus Pipe	AS 2439.1 & NZTA F2/1998	✓			Punched & Non Punched pipe available
Spiral welded steel (Including CLS)	NZS 4442:1988	✓	✓	✓	Internal linings included concrete, epoxy, bitumen and galvanizing. Principal mains only.
Ductile iron pipe (and fittings)	AS/NZS 2280:2004	✓	✓	✓	Generally suspended pipes and high structural loadings.
Corrugated steel pipe	AS/NZS 2041:1998 NZS 4405 NZS 4406	✓			Not acceptable to some TA's. Generally of short length (culverts etc). Joints need consideration in fine soils with high water tables. Invert may need lining. Stormwater applications only.
Grey Iron	AS/NZS 2544:1982		✓	✓	Generally special fittings pump stations etc.
ABS (Acrylonitrile-Butadiene-Styrene High Pressure Pipe)	AS/NZS 3518:2004		✓	✓	Generally limited to pump stations, manifolds etc.
EW Manhole Channel Forms (U Shaped channel)	BS EN295-4:1995	✓	✓		All manhole channels shall be formed using Earthen Ware type preformed channels.
Access Covers & grates	AS 3996: 2006	✓	✓	✓	All ironware to comply with the standard. (MH Covers to be Hygrade 500HD. Sealed down lids to be Saint Gabain Korum.)
Other Drainage Produces		✓	✓	✓	With approval of the TA Engineer

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APPENDIX G: TRAFFIC EFFECTS ASSESSMENT

~~This approved materials list covers acceptable materials and fittings for use within the TA district, and covers the products which the TA has, or will assume reasonability for.~~

~~Products which are not in accordance with this list will be rejected, unless written approval is given prior to installation by the TA Engineer. Rejected products will be subject to removal at the subdividers cost.~~

~~All of the materials supplied by the subdivider shall be the best of their respective kinds and conform to the appropriate New Zealand, Australian or British Standard and or Specifications as specified hereafter. All materials and fittings shall be free from flaws and defects, and shall be subject to such tests as the TA Engineer may impose.~~

~~Unless otherwise specified the standards and specifications (and latest amendments) shall apply to the various materials and fittings installed.~~

~~The TA reserves the right to refuse any material or fitting from the Acceptable Materials list for any reason and at any time. In these circumstances the TA will provide written notification, stating the reasons why the material is not fit for purpose.~~

## WDC APPROVED MATERIALS FOR WATER

Fittings	Approved Type, Brand Name or Manufacturer
<p><b>Universal (Gibault) Joints/Couplings</b> (cast coated in accordance with AS/NZS 4158 and amendments) All bolts shall be Stainless Steel grade 316 with factory applied molybond coating and complying with AS/NZS 4252</p> <p><b>Mechanical Tapping Bands</b> (standards Australia MP 52-2001, chapter six, section 6.25) Note:- Aluminium and Universal tapping bands with u-bolt support straps shall not be used All tapping bands on PVC shall be gunmetal DR LG2 — fully enclosed All tapping bands on MDPE shall be plassim — fully enclosed All bolts shall be Stainless Steel grade 316 with factory applied molybond coating and complying with AS/NZS 4252</p> <p><b>Medium Density Poly Ethylene pipe — MDPE Fittings</b> All MDPE pipe shall be joined using compression fittings</p>	<p>AVK Tyco Viking Johnson</p> <p>Crevet Taptite Milnes Pty Ltd Plassim</p> <p>Plasson /Iplex Philmac / Marley Pushlok / Marley Easygrip</p>
Valves and Fire Hydrants	Approved Type, Brand Name or Manufacturer
<p><b>Sluice Valves</b> (manufactured to AS/NZS 2638:2, coatings to comply with AS/NZS 4158 and amendments, flanges to be drilled to AS 4087) 15mm diameter and larger. Resilient seated, nylon coated, minimum class PN 16, open clockwise with a non-rising stainless steel spindle, coated internally and externally with Fusion-bonded Epoxy to 200u or Nylon Rilsan 11, coloured blue Valves shall be flanged (table D) when laid in conjunction with other ductile fittings. All valves 100mm or larger shall be strapped to a concrete anchor block = Surface boxes shall be cast iron fully coated with Fusion-bonded Epoxy to 200u or Nylon Rilsan 11, coloured blue. Concrete base blocks shall be approved by the Engineer. They are to be accurately centred over the main and the lids are to conform to the finished ground surface. The "V" in SV lid is to point in the direction of pipe that the valve controls</p>	<p>AVK Series 55 and 57 Gillies SF Series Tyco figure 500 Series Hawle 4060E2/4500EAS Series/Hawle A Series = Technicast Surecast</p>
<p><b>Fire Hydrants</b> (manufactured to NZS/BS 750, coatings to comply with AS/NZS 4158 and amendments, polyurethane cup washer to NZS/BS 750) Resilient seated, nylon coated tall pattern screw down standard, minimum class PN 16, with approved polyurethane cup washer, pure PTFE gland packing or "O" ring sealing system. Coated internally and externally with Fusion-bonded Epoxy to 200u or Nylon Rilsan 11, coloured blue = Risers and tee's are to be ductile iron coated with Fusion-bonded Epoxy to 200u or Nylon Rilsan 11, coloured blue. = Surface boxes shall be cast iron fully coated with Fusion-bonded Epoxy to 200u or Nylon Rilsan 11, coloured yellow. Concrete base blocks shall be approved by the Engineer. They are to be accurately centred over the main and the lids are to conform to the finished ground surface.</p>	<p>AVK Series 29 Hydrant Tyco F502 Series Gillies Humes Torq-loc = Humes AVK Tyco Gillies = Technicast Surecast</p>
<p><b>Gate Valves</b> (manufactured to NZS/AS 1628 Gunmetal to BS 5154) 15mm, 20mm, 25mm, 40mm and 50mm Diameter Dezincification resistant materials or LG2 gunmetal with malleable (cast) iron T bar handles, minimum class PN 16</p>	<p>Kitz Fig AS-H (with handle retaining nut changed to DR type) Tour Anderson Series 64MT DZR brass gate valve Maxiflo A59m JY gate valve</p>
<p><b>Combination Valves</b> 2 or 3 way valves = Combi bases, risers 1050mm Diameter, Depth 450, 600mm or to suit. = Combi frame and lid — cast iron fully coated with fusion bonded Epoxy to 200u or nylon rilsan 11, coloured blue.</p>	<p>Hygrade = Humes = Humes</p>

<p><b>Isolation valves</b></p> <p>Note:- Suitable for Suitable for rider mains only</p> <p>Threaded Male, PE push fit (must include nose cone), Resilient seated, nylon coated, non-rising stainless steel spindle, coated internally and externally with Fusion-bonded Epoxy to 200u or Nylon Rilsan 11, coloured blue</p>	<p>Humes-SSV-10</p>
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<b>Tobies and Fire Hydrants</b>	<b>Approved Type, Brand Name or Manufacturer</b>
<p><b>Domestic Tobies</b> (manufactured to AS 1460*)</p> <p>≈</p> <p>Toby boxes shall be a black high density polyethylene (HDPE) surface box, with base plate, and with a blue lid marked 'water'.</p> <p>≈</p> <p>Risers shall be 150mm Diameter PVC stormwater pipe by 260mm long.</p>	<p>Plasson Compression Stopcock.</p> <p>≈</p> <p>Acuflo Industries Ltd Hygrade Products Ltd Draper Enterprises Ltd</p> <p>≈</p>
<b>Miscellaneous</b>	<b>Approved Type, Brand Name or Manufacturer</b>
<p><b>Standard Water Meter</b> (Supplied by the Principal)</p> <p>Note: Device shall conform to Water NZ Water Meter Code of Practice 2003 15—40mm Diameter Fan Jet / Class C</p>	<p>Socam</p>
<p><b>Combo Water Meter</b> (Supplied by the Principal)</p> <p>Note: Device shall conform to Water NZ Water Meter Code of Practice 2003 50—150mm Diameter Combination (meter and Backflow)</p>	<p>Meinecke Metwin / Sensus</p>
<p><b>Fire Meter</b></p> <p>Note: Device shall conform to Water NZ Water Meter Code of Practice 2003 Shall be used on dedicated fire sprinkler mains</p>	<p>Metwin / Sensus</p>
<p><b>Backflow Preventer</b> (Supplied by the Principal)</p> <p>(Shall comply with AS/NZS 2845.1 and the ASSE standards).</p> <p>Note: Type to be installed shall comply with the Levels of Risk table as defined in the Building Code G12. The device shall comply with the Water NZ Backflow Prevention for Drinking Water Suppliers Code of Practice.</p> <p>Non-testable dual check valve — Low risk</p> <p>≈</p> <p>Testable double check valves — Medium risk</p> <p>≈</p> <p>Testable Reduced Pressure Zone Device (RPZ) — High risk</p>	<p>Wilkins</p>
<p><b>Repair Straps</b> Straps should be used with 316 stainless steel bolt sets. Mild steel minimum dimensions 60mm wide x 6mm thick</p> <p><b>Pipe Wrapping</b> 50—100 mm Petroleum based</p>	<p>Polyken Petrotech</p>
<p><b>Thread Tape</b></p> <p>Note: To be used when joining PVC or MDPE to metal fittings</p> <p><b>Hemp</b> (with manufacturers specified grease) Shall be used for all metal to metal fittings.</p>	<p>Coelon (red only)</p> <p>Good quality, standard plumbers Hemp</p>
<p><b>Conduit trace Wire</b> 1.5mm Copper sheathed in PVC Installed with all non-metallic pipe (including mains, riders and connections).</p> <p><b>Gaskets</b> 32mm thick diameter to suit flanges Nylon Reinforced Insertion Rubber</p>	<p>Installed with all non-metallic pipe (including mains, riders and connections)</p>
<p><b>Bolt Sets</b> <b>316 stainless steel</b> All new replacement bolt sets are to include bolt, nut, flat washers and one spring washer. 'ROCL' grease is to be used with all bolt installations.</p>	
<p><b>Security Cage</b> Lockable galvanised steel cage fixed onto a Concrete pad</p>	



<b>Valve Packing</b> (for existing valves) PTFE 210kg/cm <sup>2</sup> (20,594 KPa) Chesteron, Style 1724 Super — Lon <del>To be installed as per Chesteron's recommended packing procedure.</del>	
<b>Other Water Products</b>	With Approval of TA Engineer