Annexure H

Infrastructure Report

Prepared by Kirk Roberts

KIRK ROBERTS CONSULTING

Structural | Geotechnical | Civil | Environmental | Fire

45 Beach Road, Tāhunanui, Nelson

JOB No: 2410250
DATE: 12 March 2025
ISSUE: A

ENGINEERING SERVICES

PRELIMINARY DESIGN STAGE ENGINEERING INFRASTRUCTURE REPORT

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QUALITY CONTROL

Title	Preliminary Infrastructure Design Report
Client	Cameo Projects
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TABLE OF CONTENTS

1 INTRODUCTION 1

2 SCOPE OF WORK 1

3 SITE DESCRIPTION 2

4 THE PROPOSED DEVELOPMENT 3

5 EARTHWORKS 3

5.1 EROSION AND SEDIMENT CONTROL 3

6 STORMWATER 4

6.1 EXISTING STORMWATER RETICULATION 4

6.2 PROPOSED STORMWATER NETWORK 4

6.2.1 Stormwater Quantity Mitigation 4

6.2.2 Stormwater Quality Mitigation 4

6.3 FLOODING 4

7 WASTEWATER 5

7.1 EXISTING WASTEWATER 5

7.2 PROPOSED WASTEWATER 5

8 WATER SUPPLY 5

8.1 EXISTING WATER SUPPLY 5

8.2 PROPOSED WATER SUPPLY 5

8.3 FIREFIGHTING WATER SUPPLY 5

9 VEHICULAR ACCESS AND CAR PARKING 6

10 UTILITIES 6

11 CONCLUSIONS 6

APPENDIX A KIRK ROBERTS DRAWINGS 7

APPENDIX B CORRESPONDENCE WITH COUNCIL 8

APPENDIX C DETENTION CALCULATIONS 9

1 INTRODUCTION

Kirk Roberts Consulting (Kirk Roberts) has been Engaged by Cameo Projects, to undertake the Civil Engineering Design for the Redevelopment at 45 Beach Road, Tāhunanui, Nelson 7011, the Site, refer to Figure 1. The Existing Dwellings will be removed and replaced by a Hotel.

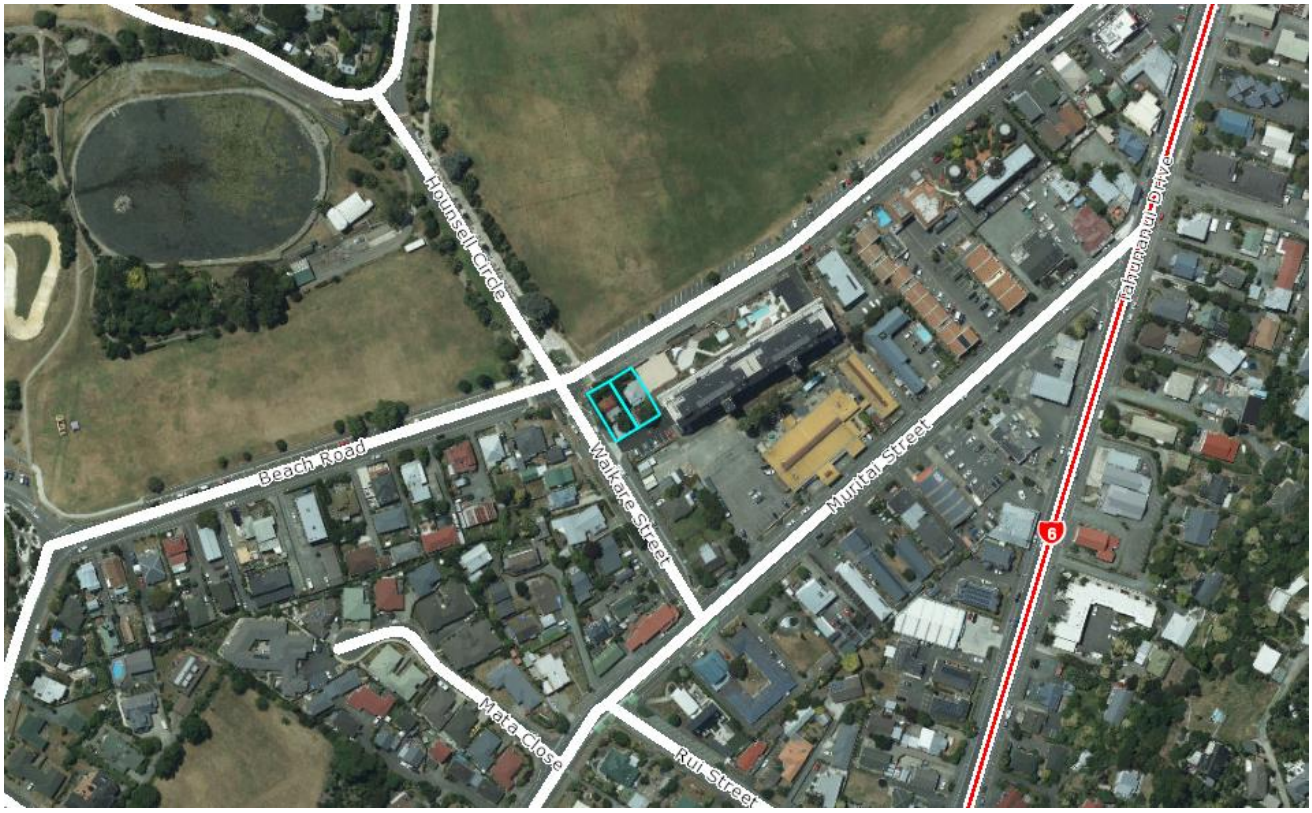


Figure 1: Location of the Site and surrounding features (source: Nelson Top of the South Maps)

2 SCOPE OF WORK

Kirk Roberts has prepared this Report to support the Resource Consent Application. It has been prepared to provide an assessment of the serviceability in compliance with the Resource Management Act, Nelson City Council, the Territorial Authority, Land Development Manual specifically relating to:

- Bulk Earthworks:
  - Erosion and Sediment Control Plan (ESCP).
- Stormwater:
  - Stormwater Quality and Quantity Assessment;
  - Public Network Connection Point; and
  - Flood Assessment.
- Wastewater:
  - Public Network Connection Point.
- Water Supply:
  - Public Network Connection Point.
- Access

This Report is based on the Architectural Drawings (Arthouse Architects), the Topographic Survey (Planscapes Ltd) and information extracted from Nelson Council's Top of the South Maps and the Territorial Authorities Codes of Practice.

3 SITE DESCRIPTION

The Site comprises two Lots (Legal Descriptions Lot 1 and 2 DP 530) and has a Total Area of 668m². It is located on the Beach Road - Waikare Street Intersection. Refer to Figure 1 and contains one Existing Dwelling and Garage on each Lot. The Site is Zoned Suburban Commercial (60% Maximum Probable Development - MPD), by the Nelson City Council, and has a current Impervious Coverage on Site of 56.5% (213m²). A review of Nelson Top of the South Maps shows a Wastewater and Stormwater Network on Waikare Street. Council has indicated that the Site is in a low point. Overland Flow Paths (OLFPs) travel through the centre of the Site and discharge onto Beach Road, refer to Figure 3.



Figure 2: The services around the Site. (Red = Wastewater, Green = Stormwater, Dark blue = Water Supply) (source: Nelson Top of the South Maps)

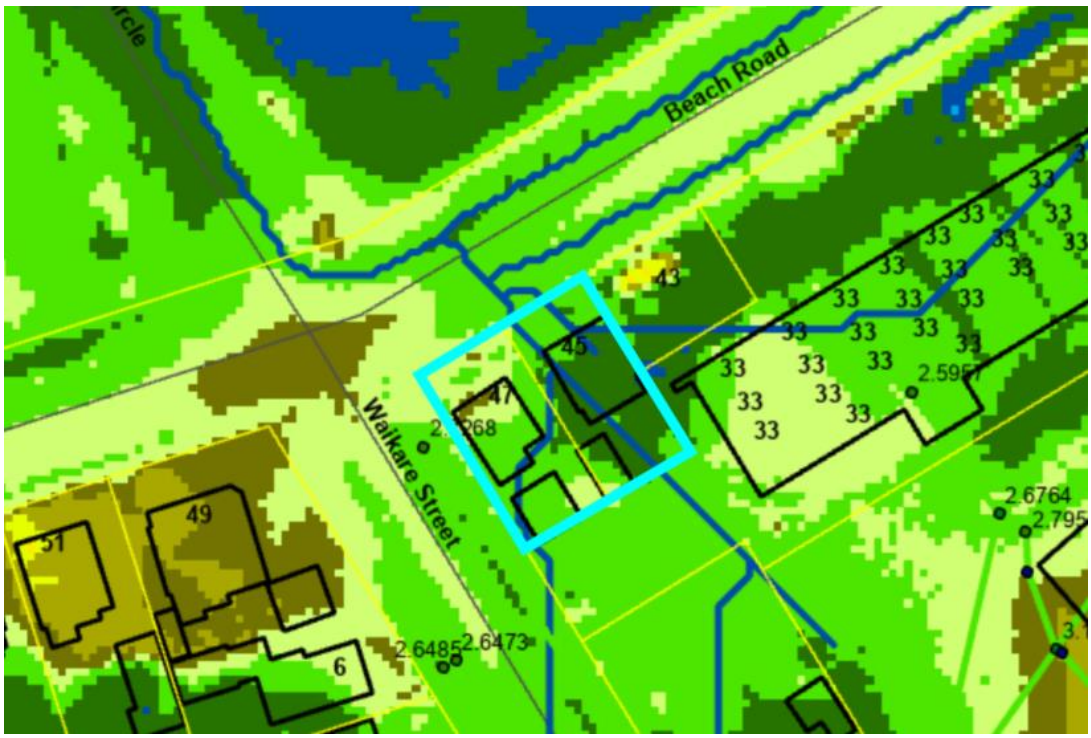


Figure 3: Flow-Paths around the Site. (Dark Blue – Flow Paths, Shading = Flood Plains) (source: Email from NCC Land Development Engineer)

The Site is relatively flat, and generally falls into a depression at the centre of the Site.

4 THE PROPOSED DEVELOPMENT

It is proposed to Construct a six-storey Hotel, with 47 rooms, refer to Figure 4. Vehicular Access is proposed from Waikare Street, with Pedestrian Access proposed directly from Beach Road. The Driveway and Carpark is proposed to be made up of a permeable surface to reduce overall Impervious Area, and total Coverage of 66% is proposed. The Finished Floor Level of the Building is proposed to be raised to avoid Flooding, however the Accessible Entry at the rear is located at ground level, to allow mobility impaired people to access.



Figure 4: Proposed Site Arrangement

5 EARTHWORKS

Bulk Earthworks are required for the Redevelopment of the Site.

An initial Assessment of the Earthworks is as follows, refer to Drawing 2410250 / C4.0 in Appendix A:

Earthworks Volumes	Area (m^2)	Depth (m)	Estimated Volume (m^3)		
			Cut	Fill	Balance
Cut / Fill Analysis from 3D Modelling (Existing / Proposed Finished Ground)	4,283	-0.15m Cut to 0.4m Fill	4	34	30 Fill

This is a Surface-to-Surface Assessment with the Existing Surface extracted from the Topographic Survey, compared with the Finished Design Surface, as per the Architectural Drawings. Earthworks associated with the Building Foundations and service trenches are not included in this Assessment.

5.1 Erosion and Sediment Control

The following Sediment sources may be present during Construction, as referenced in Nelson Tasman Erosion and Sediment Control Guidelines, 2019:

- Erosion from disturbed ground created by excavation;
- Truck movements;

- Stockpiled materials; and
- Construction dust.

The following ESCP Measures are proposed, refer to Drawing 2410250 / C5.0 in Appendix A:

- Stabilised access point; and
- Silt Fences.

It is for the Contractor to prepare the Final ESCP to align with the Works Methodology and as part of the Construction Management Plan.

6 STORMWATER

6.1 Existing Stormwater Reticulation

Refer to Figure 2 for the Existing Stormwater Network. No Public Laterals are indicated on Council's Maps to service the Existing Dwellings, and it is assumed that Stormwater is discharged to nominal Soak Pits. A 300mm ø Stormwater Main is adjacent on Waikare Street.

6.2 Proposed Stormwater Network

Correspondence with Nelson City Council (Appendix B), has confirmed Stormwater from the Site should discharge into the Stormwater Main in Waikare Street. A 150mm ø Lateral is proposed from the Site, with Manhole proposed onto the Main, refer to Drawing 2410250 / C3.0 in Appendix A.

The Network will be Designed in accordance the relevant Code of Practice and the New Zealand Building Code Standards. Full Design and Detailing will be provided at Detailed Design Stage.

6.2.1 Stormwater Quantity Mitigation

Correspondence with Nelson City Council (Appendix B) has confirmed the Existing Network has insufficient Capacity, and Attenuation is required for any increase in Stormwater Flows. In accordance with Nelson Tasman Land Development Manual, Table 5-9, Brownfield Developments that result in additional Impervious Area require 50 Litres of Detention per m² of additional Area. The Driveway and Carpark are proposed to be made of Permeable Concrete to reduce the Post-Development Impervious Area, and a total Detention Volume of 3.15m² is required, refer to Appendix C. As the proposed Building is raised ~2m above adjacent ground levels, Tanks are proposed to be located in the crawl space of the Building. In accordance with Table 5-9, a 20mm orifice is proposed.

6.2.2 Stormwater Quality Mitigation

The Redevelopment has three Car Parking Spaces, and contaminant loading from the Site is expected to be very low. Trafficable Areas are additionally made of Permeable Concrete, which will capture the 'first flush' of Rain Events before discharging into the wider Network. Therefore, specific Quality Treatment is not proposed.

It is recommended that the Building is constructed using inert material in roof, cladding, and other Architectural and Landscaping features. This will minimise the contaminant load into the environment from the Site.

6.3 Flooding

Correspondence with Nelson City Council (Appendix B), has confirmed the following:

- The Site corresponds to Category A of the Nelson Inundation Practice Note (IPN), with a corresponding Flood Level of 4.1m;
- The latest Coastal Inundation Assessment (Phase MfE Guidance 2024), assesses the Flood Level to be 4.52m;
- A Freeboard of 0.30m is required for Commercial Activities, and 0.5m for Residential; and
- The Site is located in a low point, with OLFPs traveling through the Site, discharging onto Beach Road (refer to Figure 3).

The proposed Development only comprises Commercial Activities on the Ground Floor, and the 0.3m Freeboard Requirement is considered to apply. Although Council has recommended that only Category A of the IPN is applied to the

Site, the Development has adopted to comply with the higher Flood Level determined in MfE's Guidance, and a Finished Floor Level (FFL) of 4.82m is proposed for the Building (4.52m Flood Level + 0.30m Freeboard).

It is noted that an entrance is proposed to the carpark, with an FFL of 2.80m. This entrance only comprises the elevator, small lobby, and bottom of the stairs, and cannot be raised as it functions to provide entry for mobility impaired persons. It is recommended that as far as practical this entrance is made of waterproof materials (ie concrete block, no gib, exc) to limit damage from Flood Events. The elevator designer should be made aware of this potential Risk, and provide a means to dewater the elevator shaft after the Flood Event has occurred.

The centre of the Site is currently a low point and is proposed to be Filled by the Development in the creation of the carpark. To allow the Overland Flow Paths to continue to travel unimpeded through the Site, the maximum level of this carpark has been set lower than the level of the footpath of Beach Road, where the Flow Paths are indicated to exit the Site. The Building FFL is ~2m above this level, and Openings are proposed in the Facade to allow the Flow Path to travel underneath the Building, refer to Drawing 2410250 / C3.0 in Appendix A. The Flow through the Site is expected to be low, as Flow Depth greater than 100mm begins to also spill into Beach Road directly from Waikare Street, and not just through the Site. It is recommended however that a Consent Notice be applied to the Title, to make sure these Openings are not blocked in the future, and setting out the obligations of the landowner to keep the area free from obstructions.

7 WASTEWATER

7.1 Existing Wastewater

Refer to Figure 2 for the Existing Wastewater Network. A 225mm ø Wastewater Network is located on Waikare Street, and 100mm ø Laterals are indicated to connect to the wider Network, but not directly to the Network above.

7.2 Proposed Wastewater

Correspondence with Nelson City Council (Appendix B), has confirmed Wastewater from the Site should discharge into the Wastewater Main in Waikare Street, and sufficient Capacity exists for the Development. It is noted that the Assessment was undertaken for a 40 Bed Hotel, and the current Development comprises 47 Beds, and Council may want to reassess their Network, however the increase is relatively minor. A 150mm ø Lateral is proposed from the Site, with Manhole proposed onto the Main, refer to Drawing 2410250 / C3.0 in Appendix A. The Existing Laterals are proposed to be capped at the boundary.

The Network will be Designed in accordance the relevant Code of Practice and the New Zealand Building Code Standards. Full Design and Detailing will be provided at Detailed Design Stage.

8 WATER SUPPLY

8.1 Existing Water Supply

Refer to Figure 2 for the Existing Water Supply Network. A 1000mm ø Water Supply Network is located in Beach Road. Two Metered Connections service the Site.

8.2 Proposed Water Supply

Correspondence with Nelson City Council (Appendix B), has confirmed Water Supply from the Site should be connected to the Network in Beach Road, and sufficient Capacity exists for the Development. It is noted that the Assessment was undertaken for a 40 Bed Hotel, and the current Development comprises 47 Beds, and Council may want to reassess their Network, however the increase is relatively minor. A 50mm ø Connection is proposed from the Site, refer to Drawing 2410250 / C3.0 in Appendix A. The Existing Meters are proposed to be removed.

8.3 Firefighting Water Supply

The Site is Classified as FW 2 in accordance with the New Zealand Fire Service Firefighting Water Supplies Code of Practice, SNZ PAS 4509:2008. Four Fire hydrants are within 135m of the Site.

9 VEHICULAR ACCESS AND CAR PARKING

Vehicular Access is provided to the carpark from Waikare Street, at a similar location as an existing crossing. A new Vehicle Crossing will be created. The Carpark and Vehicle Crossing, are Designed in accordance with Nelson City Council Requirements.

10 UTILITIES

Utilities, Power and Telecommunications, are to be connected from the Existing Networks on Beach Road and Waikare Street directly.

11 CONCLUSIONS

Kirk Roberts has Completed the Preliminary Civil Engineering Design Stage for the Redevelopment of the Site.

Earthworks will be required for the formation of the Building and Carpark. Standard Erosion and Sediment Control measures are proposed in accordance with Nelson Tasman Erosion and Sediment Control Guidelines.

A Public Stormwater and Wastewater Connection is proposed onto the Existing Network on Waikare Street. Stormwater Detention is proposed to mitigate the effect of the increased Impervious Surfaces from the Development.

The Building Finished Floor Level has been set to respond to the Coastal Inundation that the Site is expected to experience. Openings through the Building Subfloor are proposed to allow the existing Overland Flow Paths to travel through the Site un-impeded. The Building entrance to the carpark is set below the Flood Level, and it is recommended that this be made of Water Proof materials to limit damage. The New Building will not be subject to Flood Hazard up to the 1 in 100-Year Event, with the exception of the entrance from the carpark.

A Water Supply Connection is proposed from the Existing Network in Beach Road.

Sufficient Stormwater, Wastewater, and Water Supply Networks, exist along with Power and Telecommunications, to adequately Service the Site.

Appendix A Kirk Roberts Drawings

GENERAL CIVIL NOTES AND SPECIFICATION SUMMARY

1. ALL WORK MUST COMPLY WITH THE APPROVING AUTHORITY ENGINEERING SPECIFICATIONS.
2. THE LOCATIONS AND EXTENT OF UNDERGROUND AND ABOVE GROUND SERVICES, WHERE SHOWN ON THE DRAWINGS, ARE PROVIDED FOR INFORMATION ONLY; NO GUARANTEE IS GIVEN AS TO THE CORRECTNESS OR COMPLETENESS OF THIS INFORMATION. THE CONTRACTOR SHALL NOTIFY ALL APPLICABLE SERVICE PROVIDERS, SEARCH ALL RECORDS AND HAVE FIELD SURVEYS OF ALL SERVICES UNDERTAKEN BY THE RELEVANT SERVICE PROVIDER(S), TO THE BEST AVAILABLE ACCURACY STANDARDS, AT LEAST ONE WEEK IN ADVANCE OF THE COMMENCEMENT OF THE WORKS, AND SHALL BE RESPONSIBLE FOR THEIR PROTECTION. THE ENGINEER MUST BE NOTIFIED IF THE EXISTING SERVICES ARE CLASHING WITH THE PROPOSED WORKS, IF THE FOUND LOCATIONS DON'T ALLOW THE WORK TO BE FULLY CARRIED OUT IN RESPECT OF THE DESIGN.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SITE SETOUT.
4. ALL EXISTING GROUND LEVELS ON THE SITE AND NEIGHBORING PROPERTY MUST BE CONFIRMED BEFORE CONSTRUCTION.
5. THE CONTRACTOR SHALL REVIEW AND EVALUATE THE DRAWINGS AND/OR SPECIFICATION DURING THE PERFORMANCE OF HIS SERVICES AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY PROBLEMS, CONFLICTS, DEFECTS, DEFICIENCIES, INCONSISTENCIES, ERRORS, OR OMISSIONS DISCOVERED IN THE DRAWINGS, SPECIFICATION, CONTRACT WORKS AND ANY VARIANCES DISCOVERED BETWEEN THE DESIGN DOCUMENTS AND APPLICABLE LAWS, STATUTES, NEW ZEALAND BUILDING CODE, RULES OR REGULATIONS.
6. THE BELOW SPECIFICATIONS IS A SUMMARY ONLY AND A FULL SPECIFICATION SHOULD BE REQUESTED BY THE CONTRACTOR IF ANY ITEMS HAVE NOT BEEN COVERED.
7. EXISTING LEVELS AND KNOWN SERVICES ARE INDICATED ON TOPOGRAPHICAL SURVEY FROM PLANSCAPES NZ LIMITED, DRAWING NO. 2688, REV. B AND DATED 27-01-2025.
8. THE ENGINEER SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY INSPECTIONS REQUIRED. ANY NON-INSPECTED WORK WILL NOT BE SIGNED OFF BY THE ENGINEER. FAILURE TO NOTIFY THE ENGINEER MAY RESULT IN ADDITIONAL WORK AND/OR DELAYS.THE COST OF THESE WORKS AND/OR DELAYS WILL BE AT THE CONTRACTORS COST.

EARTHWORKS;

9. EXCEPT WHERE EXPRESSLY STATED, ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH NZS 4431: 2022, NZS 4404: 2010, AND ANY OTHER REQUIREMENTS SET BY THE LOCAL COUNCIL. THE CONTRACTOR SHALL ENGAGE A SUITABLY QUALIFIED INDEPENDENT TESTING LABORATORY OR CONSULTING ENGINEER TO MONITOR THE BULK FILL PREPARATION AND PLACEMENT AND PROVIDE A CERTIFICATE CONFIRMING THAT THE COMPACTION WORKS HAVE MET THE SPECIFICATION.
10. EARTHWORKS INCLUDES CUT AND FILL WORKS TO ACHIEVE THE REQUIRED LEVELS, CROSSFALLS AND GRADIENTS. REQUIREMENTS FOR WORKS SUCH AS EXCAVATING UNSUITABLE MATERIALS, CUTTING TO STOCKPILES, DUST CONTROL, EROSION CONTROL AND OTHER RELATED INCIDENTAL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LOCAL AND/OR DISTRICT COUNCIL DESIGN GUIDELINES, NZS 4402: 1986, NZS 4404: 2010, NZS4431: 2022 AND WORK SAFE NEW ZEALAND'S GOOD PRACTICE GUIDELINES FOR EXCAVATION SAFETY.
11. THE CONTRACTOR SHALL CO-OPERATE WITH THE ENGINEER AHEAD OF AND DURING OPERATIONS TO AVOID UNNECESSARY OVER EXCAVATION.
12. THE CONTRACTOR SHALL DESIGN AND INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS. THE CONTRACTOR SHALL ALSO UNDERTAKE EARTHWORKS IN A CONTROLLED MANNER SO THAT EROSION FROM BARE AREAS IS KEPT TO A PRACTICAL MINIMUM AND ERODED MATERIAL IS CONFINED WITHIN THE SITE AND NOT ALLOWED TO ENTER WATERWAYS OR STORMWATER DRAINS. THE CONTRACTOR SHALL ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES, AND SILT RETENTION MEASURES ARE IN PLACE AT ALL TIMES. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST COMPLY WITH THE LOCAL AND/OR DISTRICT COUNCIL DESIGN GUIDELINES.
13. THE ENGINEER SHALL BE NOTIFIED 48 HOURS PRIOR TO WHEN THE FINAL CUT LEVEL IS ACHIEVED AND OFFER THE ENGINEER THE OPPORTUNITY TO INSPECT THE EXPOSED SUBGRADE.
14. PRIOR TO FILL PLACEMENT, THE SUBGRADE SHALL BE PROOF-ROLLED, COMPACTED AND TESTED IN A MANNER SIMILAR TO THAT USED ON THE LAYERS OF FILL. ANY RESULTING SOFT SPOTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER WHO SHALL DETERMINE IF UNDERCUTTING OF THE SOFT SPOT IS REQUIRED.
15. THE CONTRACTOR SHALL SUPPLY MAXIMUM DRY DENSITY (MDD) CURVES (DEVELOPED IN ACCORDANCE WITH NZS4402: 1986 TEST 4.1.1) AND PARTICLE SIZE DISTRIBUTION (PSD) GRAPHS (DEVELOPED IN ACCORDANCE WITH NZS4407: 2015 TEST 3.8.1).
16. THE MATERIALS SHALL BE SPREAD UNIFORMLY IN LAYERS NOT EXCEEDING 225mm IN THICKNESS AND CONDITIONED TO AN APPROPRIATE AVERAGE WATER CONTENT
17. THE METHOD OF ACHIEVING THE REQUIRED COMPACTION IS THE RESPONSIBILITY OF THE CONTRACTOR, ALTHOUGH CONTROL ON LAYER DEPTH ETC., AS SPECIFIED IN NZS4431: 1989 SHALL BE REQUIRED.
18. THE FILL MATERIALS SHALL BE COMPACTED TO ACHIEVE THE PARAMETERS SPECIFIED IN TABLES 1.1, 1.2, 1.3 AND 1.4 BELOW.

TABLE 1.1 - COMPACTION REQUIREMENTS - M/4 AP40 AND GAP40

PARAMETER	AVERAGE VALUE	INDIVIDUAL VALUE
COMPACTION	GREATER THAN 95% OF MDD	GREATER THAN 92% OF MDD
AIR VOIDS	LESS THAN 8%	LESS THAN 10%
WATER CONTENT	WITHIN 3% OF OPTIMUM	WITHIN 5% OF OPTIMUM
CBR (%)	GREATER THAN 35	GREATER THAN 33

TABLE 1.2 - COMPACTION REQUIREMENTS - GAP65

PARAMETER	AVERAGE VALUE	INDIVIDUAL VALUE
COMPACTION	GREATER THAN 95% OF MDD	GREATER THAN 92% OF MDD
AIR VOIDS	LESS THAN 8%	LESS THAN 10%
WATER CONTENT	WITHIN 3% OF OPTIMUM	WITHIN 5% OF OPTIMUM
CBR (%)	GREATER THAN 25	GREATER THAN 23

TABLE 1.3 - COMPACTION REQUIREMENTS - NON-COHESIVE FILL

PARAMETER	AVERAGE VALUE	INDIVIDUAL VALUE
COMPACTION	GREATER THAN 95% OF MDD	GREATER THAN 92% OF MDD
AIR VOIDS	LESS THAN 8%	LESS THAN 10%
WATER CONTENT	WITHIN 3% OF OPTIMUM	WITHIN 5% OF OPTIMUM

TABLE 1.4 - COMPACTION REQUIREMENTS - COHESIVE FILL

PARAMETER	AVERAGE VALUE	INDIVIDUAL VALUE
COMPACTION	GREATER THAN 95% OF MDD	GREATER THAN 92% OF MDD
AIR VOIDS	LESS THAN 8%	LESS THAN 10%
WATER CONTENT	WITHIN 3% OF OPTIMUM	WITHIN 5% OF OPTIMUM
UNDRAINED SHEAR STRENGTH	140kPa	120kPa

19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE SPECIFIED COMPACTION PARAMETERS ARE ACHIEVED AND SHALL CARRY OUT SUCH TESTING AS IS NEEDED TO ENSURE THE CONSISTENT QUALITY OF THE FILL.
20. THE TESTS DESCRIBED AND DEFINED IN TABLE 2.1 AND 2.2 SHALL BE USED TO DETERMINE THE CLASSIFICATION AND COMPACTION STANDARDS OF FILL MATERIALS.

TABLE 2.1 - TESTS AND TEST METHODS

TEST NO.	TEST	TEST METHOD
1.	IN-SITU DENSITY	NZS 4407:1991 TESTS 4.2.1, 4.2.2 (NUCLEAR DENSOMETER) MAY BE USED AS AN APPROXIMATE METHOD
2.	UNDRAINED SHEAR STRENGTH	IN ACCORDANCE WITH THE GUIDELINE FOR HAND HELD SHEAR VANE TEST, NEW ZEALAND GEOTECHNICAL SOCIETY, 2001.

TABLE 2.2 - TEST FREQUENCY

TEST	LOCATION / PURPOSE	FREQUENCY
IN-SITU DENSITY TEST (NDM)	IN-SITU DENSITY	AT LEAST ONE TEST PER 50m³ OR AT LEAST ONE PER 0.5m THICKNESS OF FILL PLACED (WHICHEVER IS LESS)
SHEAR VANE	UNDRAINED SHEAR STRENGTH	AT LEAST ONE TEST PER 25m³ OR AT LEAST TWO PER 0.5m THICKNESS OF FILL PLACED (WHICHEVER IS LESS)
CLEGG IMPACT HAMMER TEST	BASECOURSE	AT LEAST ONE TEST EVERY 10m ALTERNATE SIDES OR AT LEAST ONE TEST EVERY 100m²

STORMWATER AND WASTEWATER;

1. FOR ALL THE REFERENCES LISTED, THE CONTRACTOR MUST USE THE LATEST VERSION OF THE STANDARDS AND SPECIFICATIONS PUBLISHED, UNLESS WHEN STATED OTHERWISE.
2. THE WORK SPECIFIED CONSISTS OF THE CONSTRUCTION OF UNDERGROUND GRAVITY STORMWATER AND WASTEWATER PIPES, TOGETHER WITH STRIP DRAINS, SUMPS/CATCH-PITS, MANHOLES, CHAMBERS, AND OTHER STRUCTURES SHOWN ON THE DRAWINGS.
3. ALL WORK IN PRIVATE PROPERTY SHALL COMPLY WITH MINIMUM REQUIREMENTS OF THE NEW ZEALAND BUILDING CODE, CLAUSES E1 - SURFACE WATER, G13 - FOUL WATER. THE AS/NZS 3500 STANDARD SERIES PROVIDE MEANS OF COMPLIANCES.
4. ALL LATERALS MUST HAVE A MINIMUM DIAMETER OF 100mm, UNLESS SHOWN OTHERWISE.
5. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL SUPPLY AND DELIVER TO THE SITE ALL PIPES, JUNCTIONS, PRECAST MANHOLES, GRANULAR BEDDING MATERIAL AND OTHER MATERIALS REQUIRED FOR INCORPORATION IN THE WORK. MATERIALS SHALL BE NEW, OF GOOD QUALITY AND FREE OF DEFECTS.
6. DESIGN AND INSTALLATION OF STORMWATER AND WASTEWATER PIPES SHALL COMPLY WITH THE FOLLOWING STANDARDS:
   - 6.1 AS/NZS 1254: 2010, PVC-U PIPES AND FITTINGS FOR STORMWATER AND SURFACE WATER APPLICATIONS
   - 6.2 AS/NZS 1260: 2009, PVC-U PIPES AND FITTINGS FOR DRAIN, WASTE AND VENT APPLICATION
   - 6.3 AS/NZS 2032: 2006, INSTALLATION OF PVC PIPE SYSTEMS
   - 6.4 AS/NZS 2566.2: 2002, BURIED FLEXIBLE PIPELINES - INSTALLATION
   - 6.5 AS/NZS 3725:2007, REINFORCED CONCRETE PIPE INSTALLATION
   - 6.6 CPAA ENGINEERING GUIDELINE SELECTING MATERIALS FOR BEDDING STEEL REINFORCED CONCRETE PIPE
7. ALL PVC-U PIPES WITH COVER DEPTHS COMPLYING WITH THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES, NZBC AND/OR NZS4404, SHALL HAVE MINIMUM STRENGTH SN10 (STORMWATER) AND SN16 (WASTEWATER).
8. ALL REINFORCED CONCRETE PIPES WITH COVER DEPTHS COMPLYING TO THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES, NZBC AND/OR NZS4404, SHALL HAVE MINIMUM STRENGTH CLASS 3.
9. CONCRETE PRECAST MANHOLES SHALL COMPLY WITH NZS 4058: 2007 AND SHALL HAVE INTERNAL DIAMETER OF 1,050mm UNLESS SPECIFIED OTHERWISE.
10. THE CONTRACTOR SHALL SET OUT THE WORKS IN ACCORDANCE WITH THE POSITIONS AND LEVELS SHOWN ON THE DRAWINGS OR OTHERWISE PROVIDED BY THE ENGINEER.
11. PIPELINES SHALL NOT BE SET OUT BY USE OF LASER EQUIPMENT UNLESS REGULAR CHECKS AGAINST REDUCED LEVELS BY CONVENTIONAL SURVEY METHODS ARE ALSO MADE TO ENSURE CUMULATIVE ERRORS DO NOT OCCUR
12. UNLESS OTHERWISE SPECIFIED, ALL STORMWATER AND WASTEWATER PIPES SHALL BE LAID ON AND SURROUNDED WITH IMPORTED COMPACTED GRANULAR BEDDING TO A HEIGHT OF AT LEAST 150mm ABOVE THE PIPE BARREL. GRANULAR BEDDING MATERIAL SHALL CONSIST OF SAND AND GRAVELS NO LARGER THAN 10mm, FREE FROM VEGETATION, OTHER ORGANIC MATTER OR CLAY AND FROM PARTICLES LARGER THAN 20mm, AND IN COMPLIANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION AND THE RELEVANT AS/NZS PIPELAYING SPECIFICATION UNLESS SHOWN OTHERWISE ON THE DRAWINGS
13. PIPES SHALL BE LOCATED IN THE TRENCH NOT CLOSER THAN 100mm FROM THE TRENCH WALL UNLESS SPECIFIED OTHERWISE.
14. MANHOLES SHALL BE CONSTRUCTED IN REINFORCED CONCRETE OR USING PRECAST CONCRETE ELEMENTS IN ACCORDANCE WITH THE DRAWINGS. MANHOLE INVERTS SHALL BE CAST IN-SITU, WITH CHANNELS FORMED IN THE CONCRETE USING GLAZED EARTHENWARE HALF PIPES FOR ALL MAINS UP TO AND INCLUDING 300mm DIAMETER. INVERTS FOR LARGER MAINS SHALL BE STEEL TROWEL FINISHED CEMENT MORTAR.
15. WHERE SHOWN ON THE DRAWINGS, Y JUNCTION PIPES FOR SERVICE CONNECTIONS SHALL BE INSERTED IN STORMWATER AND WASTEWATER PIPES, COMPLETE WITH INSPECTION BENDS AND CONCRETE SURROUND. INCLINED RISER PIPES SHALL BE USED WHERE APPROPRIATE TO BRING SERVICE CONNECTIONS TO THE REQUIRED DEPTHS
16. ALL SUMPS MUST BE CONSTRUCTED AS PER THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES, NZBC AND/OR NZS4404.
17. THE CONTRACTOR SHALL TEST ALL STORMWATER PIPES, WASTEWATER PIPES, CONNECTIONS AND MANHOLES FOR WATER TIGHTNESS
18. TEST RESULTS SHALL BE RECORDED BY THE CONTRACTOR IN A NEAT CLEAR FORM AND PROVIDED TO THE ENGINEER WITHIN 48 HOURS OF COMPLETION OF THE TESTING.
19. STORMWATER AND WASTEWATER PIPES SHALL BE TESTED BY HYDROSTATIC TEST SPECIFIED IN THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES, NZBC AND/OR NZS4404.
20. SOAKAGE PITS SHALL BE CONSTRUCTED TO THE DIMENSIONS AND DEPTHS AS SHOWN ON THE DRAWINGS. MANHOLES, PIPES, GEOFABRIC, GRAVELS AND BOULDERS, ETC. SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS.
21. SOAKAGE AND PERMEABILITY FIELD TESTS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES, NZBC AND/OR NZS4404.
22. PRIOR TO CONSTRUCTION THE SOAKAGE PIT TEST RESULT SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW AND COMPLIANCE CONFIRMATION

WATER SUPPLY;

1. ALL WORK SHALL COMPLY WITH THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES, NZBC AND/OR NZS4404.
2. ALL WORK IN PRIVATE PROPERTY SHALL COMPLY WITH MINIMUM REQUIREMENTS OF THE NEW ZEALAND BUILDING CODE, G12 - WATER SUPPLIES. THE AS/NZS 3500 STANDARD SERIES PROVIDE MEANS OF COMPLIANCES.
3. PIPES, VALVES AND FITTINGS SHALL COMPLY WITH THE FOLLOWING STANDARDS AS APPLICABLE.
   - 3.1 AS/NZS 4130: 2009, POLYETHYLENE (PE) PIPES FOR PRESSURE APPLICATIONS
   - 3.2 AS/NZS 3500.1: 2015, PLUMBING AND DRAINAGE, PART 1: WATER SERVICES
   - 3.3 NZS 7602: 1977, SPECIFICATION FOR POLYETHYLENE PIPE (TYPE 5) FOR COLD WATER SERVICES
   - 3.4 AS/NZS 2033: 2008, INSTALLATION OF POLYETHYLENE PIPE SYSTEMS
   - 3.5 AS/NZS 2566.2: 2002, BURIED FLEXIBLE PIPELINES - INSTALLATION
4. FIRE HYDRANT AND SURFACE BOX FRAMES AND COVERS SHALL COMPLY WITH DETAILS SHOWN ON THE DRAWINGS AND THE REQUIREMENTS OF THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS AND MEET THE STANDARDS SPECIFIED BY BS750: 2012, SPECIFICATION FOR UNDERGROUND FIRE HYDRANTS AND SURFACE BOX FRAMES AND COVERS.
5. TOBY BOXES OR ALTERNATIVE METER/VALVE BOX ON WATER CONNECTION LATERALS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS.
6. PIPES SHALL BE LOCATED IN THE TRENCH NOT CLOSER THAN 100mm FROM THE TRENCH WALL.
7. CAST IN-SITU ANCHOR BLOCKS SHALL BE PROVIDED AT ALL POINTS WHERE AN UNBALANCED THRUST OCCURS. THIS INCLUDES ALL BENDS, TEES, VALVES, HYDRANTS AND REDUCERS, DEAD ENDS, ETC.
8. CONCRETE REQUIRED FOR ANCHOR BLOCKS AND THRUST BLOCKS SHALL HAVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 17.5MPA (CAST IN-SITU CONCRETE) OR 30MPA (PRECAST CONCRETE), COMPLYING WITH NZS 3109.
9. A BACKFLOW PREVENTER MAY BE REQUIRED TO PREVENT FLOW OF WATER IN THE OPPOSITE DIRECTION THE PREMISES BACK INTO THE PUBLIC WATER SUPPLY NETWORK WHERE WATER PRESSURE DROPS IN THE WATER DISTRIBUTION SYSTEM. THE BACKFLOW PREVENTER SHALL BE HOUSED ABOVE GROUND IN A LOCKABLE WEATHER-PROOF CABINET WHERE AND WHEN REQUIRED UNLESS OTHERWISE SPECIFIED.
10. UNLESS OTHERWISE SPECIFIED ALL WATERMAINS AND SERVICES SHALL BE SURROUNDED AND BACKFILLED TO A HEIGHT OF 150mm ABOVE THE PIPE BARREL WITH COMPACTED GRANULAR MATERIAL IN COMPLIANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION AND THE RELEVANT AS/NZS PIPELAYING SPECIFICATION UNLESS SHOWN OTHERWISE IN THE DRAWING DETAILS.
11. THE CONTRACTOR SHALL TEST ALL WATERMAINS AND CONNECTIONS AGAINST HYDROSTATIC PRESSURE TO THE SATISFACTION OF THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS AND THE ENGINEER BEFORE COMPLETING BACKFILLING, AND ANY DEFECTIVE OR LEAKING PIPES, FITTINGS OR JOINTS SHALL BE REPLACED.
12. UNLESS OTHERWISE APPROVED ALL PIPELINES SHALL BE DISINFECTED BY THE METHOD SPECIFIED IN NZS 4404: 2010, LAND DEVELOPMENT AND SUBDIVISION INFRASTRUCTURE APPENDIX C.

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REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

TITLE
GENERAL NOTES & LEGEND
DRAWING 1 OF 2

REVIEWED BY	MJG		31-01-2025
DESIGNED BY	JC		28-01-2025
DRAWN BY	MHA		28-01-2025
SCALE		JOB NO.	2410250
DRAWING NO.		REV.	
C1.0		A	

PRELIMINARY DESIGN

ACENZ

ENGINEERING NEW ZEALAND CHARTERED MEMBER

Cad File: Z:\PROJ_2024\241025\3-BEACH_ROAD_PROJECT\PD-CIVIL\DRFT\1\MOD\241025D-C1.0-GENERAL_NOTES.DWG Plot Date: 12/8/2025 4:27:07 pm Name: Mohammed Hanif Xrefs:

PAVEMENT;

1. THE CONTRACTOR SHALL SUPPLY, SPREAD, COMPACT, TRIM AND MAINTAIN THE CRUSHED ROCK, GRAVEL, SAND OR MIXTURES ALL AS SPECIFIED, IN ACCORDANCE WITH THE LINES, GRADES, THICKNESSES AND CROSS-SECTIONS SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER, WITHIN THE TOLERANCES SPECIFIED.
2. ALL WORKS SHALL COMPLY WITH THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, NZTA AND NZS4404.
3. WHEN THE SUB-GRADE HAS BEEN BROUGHT TO THE FORMATION LEVELS SHOWN ON THE DRAWINGS AND COMPACTED, IT SHALL BE TESTED BY THE CONTRACTOR AND RESULTS ISSUED TO THE ENGINEER FOR APPROVAL.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE SUB-GRADE CONDITIONS AND SUBMIT THE TEST RESULTS TO THE ENGINEER BEFORE PLACING THE SUB-BASE MATERIALS.
5. FOR FLEXIBLE PAVEMENTS THE CONTRACTOR SHALL SUPPLY A TWO-AXLE TRUCK WITH TWIN TYRES ON THE REAR AXLE, LOADED TO EIGHT TONNES ON THE REAR AXLE. A WEIGHBRIDGE DOCKET CERTIFYING THE REAR AXLE WEIGHT SHALL BE GIVEN TO THE ENGINEER. BENKELMAN BEAM TESTS WILL BE IN ACCORDANCE WITH THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, NZTA AND NZS4404. MINIMUM DEFLECTION OF THE PAVEMENT TO BE SPECIFIED BY THE ENGINEER.
6. MATERIAL FOR CONSTRUCTION OF SUB-BASE SHALL COMPLY WITH THE REQUIREMENTS OF TNZ SPECIFICATION M/3 WITH REGARDS TO A GENERAL ALL PASSING (GAP) 65mm PRODUCT.
7. GRADING OF THE SUB-BASE MATERIAL SHALL BE IN ACCORDANCE WITH THE THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, NZTA AND NZS4404.
8. SUB-BASE MATERIAL SHALL BE PLACED AND COMPACTED IN UNIFORM NEAR HORIZONTAL LAYERS NOT EXCEEDING 225mm UNCOMPACTED THICKNESS, AND SHALL NOT BE PLACED DURING OR IMMEDIATELY FOLLOWING WET WEATHER, OR ON SATURATED GROUND.
9. AGGREGATE FOR CONSTRUCTION OF BASECOURSE LAYERS SHALL BE CRUSHED ROCK, FREE FROM SILT OR CLAY LUMPS, WEATHERED OR DISINTEGRATED ROCK, ORGANIC AND OTHER NON-MINERAL MATTER. UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS:
   a. FOR HARDSTAND AREA, BASECOURSE MATERIAL SHALL COMPLY WITH THE MOST RECENT TNZ SPECIFICATION M/4, "CRUSHED BASECOURSE AGGREGATE", GRADING M/P AP40.
   b. FOR FOOTPATHS, BASECOURSE MATERIAL SHALL COMPLY WITH THE MOST RECENT TNZ SPECIFICATION M/4, "CRUSHED BASECOURSE AGGREGATE", GRADING AP20.
10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE SUB-BASE COMPACTION AND SUBMIT THE TEST RESULTS TO THE ENGINEER BEFORE PLACING THE BASECOURSE MATERIALS.
11. GRADING OF THE BASECOURSE MATERIAL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, NZTA AND NZS4404.
12. BASECOURSE MATERIAL SHALL BE PLACED AND COMPACTED IN LAYERS WITH AN UNCOMPACTED THICKNESS NOT EXCEEDING 225mm AND CONDITIONED TO AN APPROPRIATE AVERAGE WATER CONTENT. EACH LAYER SHALL BE COMPACTED BY MULTIPLE PASSES OF A SMOOTH STEEL WHEELED ROLLER OR OTHER PLANT APPROVED BY THE ENGINEER, TO NOT LESS THAN 100% OF THE MAXIMUM DRY DENSITY OBTAINED FOR THE BASECOURSE MATERIAL BY THE NEW ZEALAND STANDARD COMPACTION TEST (NZS 4402, TEST 4.1.1), AND SO AS TO SATISFY DEFLECTION REQUIREMENTS AS SPECIFIED BY IN THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS AND/OR ANY ACCEPTABLE NEW ZEALAND CITY COUNCIL DESIGN GUIDELINES AND NZS4404.
13. COMPACTION OF BASECOURSE SHALL TAKE PLACE AT A WATER CONTENT APPROPRIATE TO THE PLANT BEING USED. IF WATER IS REQUIRED TO BE ADDED, A FINE MIST SPRAY SHALL BE USED AND EXCESS WATER SHALL BE PREVENTED FROM DAMAGING THE SUB-GRADE OR SUB-BASE. THE UPPERMOST LAYER SHALL BE COMPACTED AND THE FINISHED SURFACE PROOF ROLLED USING A SMOOTH STEEL WHEELED ROLLER, WITH REAR ROLLS AT LEAST 500MM WIDE AND LOADED TO NOT LESS THAN SIX TONNES PER METRE WIDTH.
14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE BASECOURSE COMPACTION AND SUBMIT THE TEST RESULTS TO THE ENGINEER BEFORE PLACING THE FINAL SURFACE MATERIAL.
15. STORMWATER RUNOFF FROM SURROUNDING SITE SHALL BE DIRECTED AWAY FROM UNSEALED GRANULAR PAVEMENT, AND ANY ACCIDENTAL DEPOSIT OF MUD OR SILT SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
16. ANY DEFECTS OR DAMAGE CAUSED BY THE OPERATIONS OF THE CONTRACTOR DURING CONSTRUCTION OR MAINTENANCE OF PAVEMENT LAYERS SHALL BE MADE GOOD BY THE CONTRACTOR WITHOUT EXTRA PAYMENT.
17. THE BASECOURSE AGGREGATE FOR USE UNDER THE SEALED AREAS MUST COMPLY AND BE INSTALLED AS PER THE NEW ZEALAND TRANSPORT AGENCY (NZTA) TNZ B/02 AND TNZ M/4 SPECIFICATIONS. THE DEGREE OF SATURATION PRIOR TO BITUMINOUS SURFACING MUST BE NO MORE THAN 65%.
18. ASPHALT PAVEMENT MUST COMPLY WITH THE NZTA M-01-A AND TNZ M/10 SPECIFICATIONS. THE ASPHALT BINDER MUST BE "PG 58S" UNLESS SPECIFIED OTHERWISE.
19. MEMBRANE CHIP SEALS WITH BITUMINOUS EMULSION (WATERPROOF TREATMENT) MUST COMPLY WITH THE NZTA "CHIPSEALING IN NEW ZEALAND" PRACTICE NOTES AND TNZ M/6 SPECIFICATION.
20. PENETRATION GRADE OF BITUMEN FOR THE ROAD PAVEMENT SHALL BE OF 80/100 COMPLYING WITH THE REQUIREMENTS WITHIN NZTA NZ SPECIFICATION M/1 "SPECIFICATION FOR ROADING BITUMEN'S".
21. THE TRANSPORT, SPREADING AND COMPACTION OF ASPHALTIC CONCRETE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF TNZ SPECIFICATION P/9 OR P/9P THE LATTER WHICH PROVIDES FOR A WIDER RANGE OF ROLLING OPTIONS..
22. ALL CONCRETE AND PAVED AREAS WILL BE CONSTRUCTED WITH REFERENCE TO THE LATEST VERSIONS OF THE FOLLOWING DOCUMENTS: NZBC, NZS3104, NZS3109, NZS3112, NZS 3114.
23. UNLESS OTHERWISE SPECIFIED, CONCRETE SHALL BE OF NORMAL GRADE READY MIXED CONCRETE, WITH AN IN-SITU CONCRETE STRENGTH OF AT LEAST 40MPA AT 28 DAYS. THE MAXIMUM SIZE OF COARSE AGGREGATE SHALL BE 20MM EXCEPT WHEN OTHERWISE SPECIFIED.
24. THE CONCRETE SUPPLIER SHALL BE A MEMBER OF THE READY-MIX CONCRETE ASSOCIATION OF NEW ZEALAND. OTHER SUPPLIERS MAY BE APPROVED BY THE ENGINEER BUT ONLY AFTER RECEIVING EVIDENCE OF RECENT INDEPENDENT AUDITS.
25. CALCIUM CHLORIDE SHALL NOT BE USED.
26. NO ADDITIVES SHALL BE INCLUDED IN THE MIX DESIGN WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
27. NO PLASTICISERS OR SUPER-PLASTICISERS SHALL BE USED IN ANY MIX, WITHOUT WRITTEN AUTHORISATION FROM THE ENGINEER.
28. FORMWORK SHALL BE DESIGNED AND CONSTRUCTED IN COMPLIANCE WITH SECTION 5 OF NZS3109: 1997
29. CONCRETING, COMPACTION AND VIBRATION SHALL BE IN ACCORDANCE WITH SECTION 7 OF NZS3109: 1997
30. CONCRETE FOR KERBS, CHANNELS AND VEHICLE CROSSINGS SHALL HAVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 20MPA, SUPPLIED AND PLACED IN ACCORDANCE WITH THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS, NZTA AND NZS4404
31. VEHICLE CROSSINGS SHALL BE CLEGG-TESTED AND SHALL EXCEED A CBR OF 30%.
32. ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH SECTION 7.8 OF NZS3109: 1997
33. MESH REINFORCEMENT SHALL BE HARD DRAWN STEEL WIRE COMPLYING WITH AS/NZS4671: 2001

POST CONSTRUCTION

THE FOLLOWING DOCUMENTS MUST BE SUBMITTED TO THE ENGINEER FOR FINAL SIGN-OFF AND ISSUE OF PS4:

- PS3 (OF ALL CONTRACTORS AND SUB-CONTRACTORS)
- DETAILED AS-BUILT (AS PER THE LOCAL COUNCIL'S ENGINEERING SPECIFICATIONS AND NZS 4404), WITH:
  - INVERT LEVELS
  - PIPE CLASS
  - PIPE BENDS
  - PIPE CONNECTION/LATERALS
  - PIPE GRADE
  - MATERIAL
  - MANHOLE DETAILS
  - CONNECTION DETAILS
  - ALL DRAINAGE ASSET DETAILS
- SOIL COMPACTION TEST RESULTS
  - RIGID PAVEMENTS, VEHICLE CROSSINGS, KERB AND CHANNELS (CLEGG AND NDM)
  - FLEXIBLE PAVEMENTS (BENKELMAN BEAM TEST)
- MATERIAL CERTIFICATION
- CCTV INDENTIFYING ANY DEFECTS SUCH AS;
  - IRREGULAR OR POOR QUALITY JOINTING
  - PIPE LOSS OF SHAPE
  - PIPE CRACKING OR DEFECT
  - POOR QUALITY JUNCTIONS OR PENETRATION OF CONNECTIONS
  - EVIDENCE OF WATER INGRESS OR LEAKAGE FROM PIPES OR MANHOLES
  - EVIDENCE OF ANY SILT OR DEBRIS IN THE PIPELINE
  - DEPARTURE FROM DESIGN GRADE
  - EVIDENCE OF LOW POINTS IN THE PIPELINE CAUSING POOLING OF STATIC WATER OR DEPOSITING OF SOLIDS
  - FAULTY MANHOLE DETAILS INCLUDING PLASTERING, HAUNCHING, THICKNESS OF BASE CONCRETE, ETC
- LEAKAGE TEST RESULTS (AIR TESTING AND HYDROSTATIC TESTING)
- BACKFLOW PREVENTER, FOX VALVE, EMERGENCY SHUT OFF VALVE, SOAKAGE AND STORMWATER FILTER INSTALLATION/TEST CERTIFICATES (WHERE APPLICABLE)
- CONSTRUCTION INSPECTION RECORDS
- SITE PHOTOS AS REQUESTED BY THE ENGINEER

LEGEND

EXISTING:

- BOUNDARY
- MAJOR CONTOUR (27)
- MINOR CONTOUR
- EXISTING LEVEL (41.25)
- SUMP / CATCH-PIT
- POWER BOX (P)
- TELECOM POLE / JUNCTION (T)
- ROAD SIGN (S)
- HYDRANT (H)
- STORMWATER MANHOLE (SW)
- SOAK HOLE
- WASTEWATER MANHOLE (WW)
- OVERLAND FLOW PATH
- STORMWATER PIPE (SW)
- WASTEWATER PIPE (WW)
- WATER SUPPLY PIPE (W)
- VEGETATION
- RETAINING WALL
- TO BE REMOVED
- PIPE TO BE REMOVED (X X X X)

PROPOSED:

- BOUNDARY
- EXTENT OF WORKS
- RIGHT OF WAY / JOAL OUTLINE
- MAJOR CONTOUR (20.0)
- MINOR CONTOUR
- PROPOSED LEVEL (41.25)
- BUILDING
- LANDSCAPE
- CONCRETE
- PERMEABLE CONCRETE
- ASPHALT
- IMPERMEABLE PAVER
- PERMEABLE PAVER
- DECKING
- KERB & CHANNEL
- KERB ONLY
- DISH CHANNEL
- STORMWATER MANHOLE
- STORMWATER MANHOLE WITH SCRUFFY DOME
- SOAKPIT/SOAKHOLE (SP) (SH)
- STORMWATER FILTER (SF)
- SUMP / CATCHPIT
- CHANNEL DRAIN
- OPEN DRAIN
- PUBLIC STORMWATER PIPE (SW)
- PRIVATE STORMWATER PIPE (SW)
- SUBSOIL DRAIN
- DOWNPIPE (DP)
- RODDING/INSPECTION POINT (IP) (RP)
- PUBLIC WASTEWATER PIPE (WW)
- PRIVATE WASTEWATER PIPE (WW)
- WASTEWATER MANHOLE
- RODDING/INSPECTION POINT (IP) (RP)
- PUBLIC WATER SUPPLY PIPE (W)
- PRIVATE WATER SUPPLY PIPE (W)
- WATER METER (WM)
- GATE VALVE
- WATER METER BANK (WMB)
- BACKFLOW PREVENTER
- RETAINING WALL
- OVERLAND FLOWPATH
- ROAD LIGHTING COLUMN

EROSION SEDIMENT CONTROL:

- SILT FENCE
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- STABILISED ENTRANCEWAY
- MATERIAL STOCKPILE
- DECANTING EARTHBUND
- SUMP INLET PROTECTION

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REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

TITLE
GENERAL NOTES & LEGEND
DRAWING 2 OF 2

REVIEWED BY	MJG		31-01-2025
DESIGNED BY	JC		28-01-2025
DRAWN BY	MHA		28-01-2025
SCALE		JOB NO.	2410250
DRAWING NO.		REV.	
C1.1		A	

PRELIMINARY DESIGN

Cad File: Z:\PROJ_2024\2410250-BEACH_ROAD_PROJECT\PD-CIVIL\DRFT\1)MOD\2410250-C1.0-GENERAL_NOTES.DWG Plot Date: 1/28/2026 4:27:11 pm Name: Mohammed Hanif Xrefs:

LOT 2
DP 561085

LOT 1
DP 561085

0.3m HIGH OPENINGS IN FACADE REQUIRED TO ALLOW PASSAGE OF OVERLAND FLOW PATH

BUILDING SUBFLOOR TO BE NO HIGHER THAN 2.70m, TO ALLOW PASSAGE OF OVERLAND FLOW PATH

FFL=2.80

FFL=4.82

30.78

-4.5%

-1.7%

-1.0%

-1.0%

-2.0%

-1.1%

-1.1%

2.70 2.70 2.70 2.80 2.70 2.69 2.58 2.71 2.81 2.78 2.78 2.70 2.72 2.84 2.80 2.67 2.64 2.67 2.82 2.72 2.72

C C2.1

B C2.1

A C2.1

1 C2.1

IP

0.00

VEHICLE CROSSING IN ACCORDANCE TO NELSON-TASMAN LAND DEVELOPMENT MANUAL 407

VEHICLE CROSSING TO TIE INTO EXISTING

Sealed Footpath

Edge of Seal

TRANSFORMER

BEACH ROAD

WAIKARE STREET

SCALE 1:75 (A1) 0 1.5 3.0 4.5 6.0 7.5m

ORIGINAL SHEET SIZE A1 (841X594) - Do not scale from Drawing

FOR APPROVAL

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Cad File: \\KRCHCH1.LOCAL\SHARES\CHRISTCHURCH\PROJ_2024\2410250-BEACH_ROAD_PROJECT\PD-CIVL\DRFT\1)MOD\2410250-C2.0-SITE_PLAN.DWG Plot Date: 3/12/2025 2:31:18 pm Name: Lance Hope Xrefs:

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REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

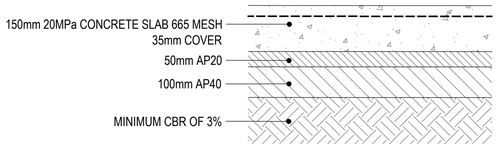
PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

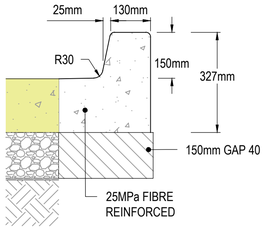
TITLE
SITE PLAN

REVIEWED BY	MJG	31-01-2025
DESIGNED BY	JC	28-01-2025
DRAWN BY	MHA	28-01-2025
SCALE	1:75 (A1)	JOB NO. 2410250
DRAWING NO.	C2.0	REV. A

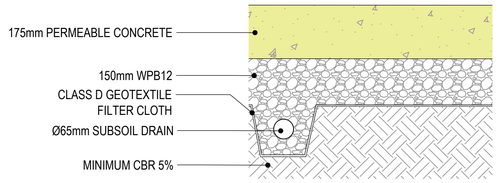
PRELIMINARY DESIGN



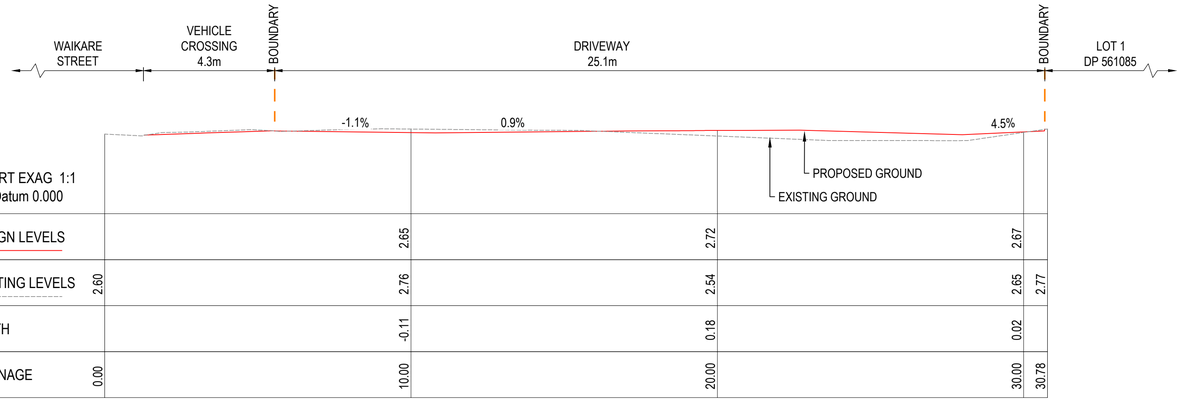
A C2.0 PAVEMENT MALE-UP DETAIL
SCALE 1:10 (A1)



B C2.0 KERB DETAIL
SCALE 1:10 (A1)



C C2.0 PERMEABLE PAVEMENT MAKE-UP DETAIL
SCALE 1:10 (A1)



DESIGN LEVELS		2.65	2.72	2.67	
EXISTING LEVELS	2.60	2.76	2.54	2.65	2.77
DEPTH		-0.11	0.18	0.02	
CHAINAGE	0.00	10.00	20.00	30.00	30.78

1 C2.0 PAVEMENT LONG SECTION
SCALE 1:100 (A1)

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REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

TITLE
PAVEMENT DETAILS

REVIEWED BY	MJG		31-01-2025
DESIGNED BY	JC		28-01-2025
DRAWN BY	MHA		28-01-2025
SCALE	AS SHOWN	JOB NO.	2410250
DRAWING NO.		REV.	
C2.1		A	

PRELIMINARY DESIGN

FOR APPROVAL

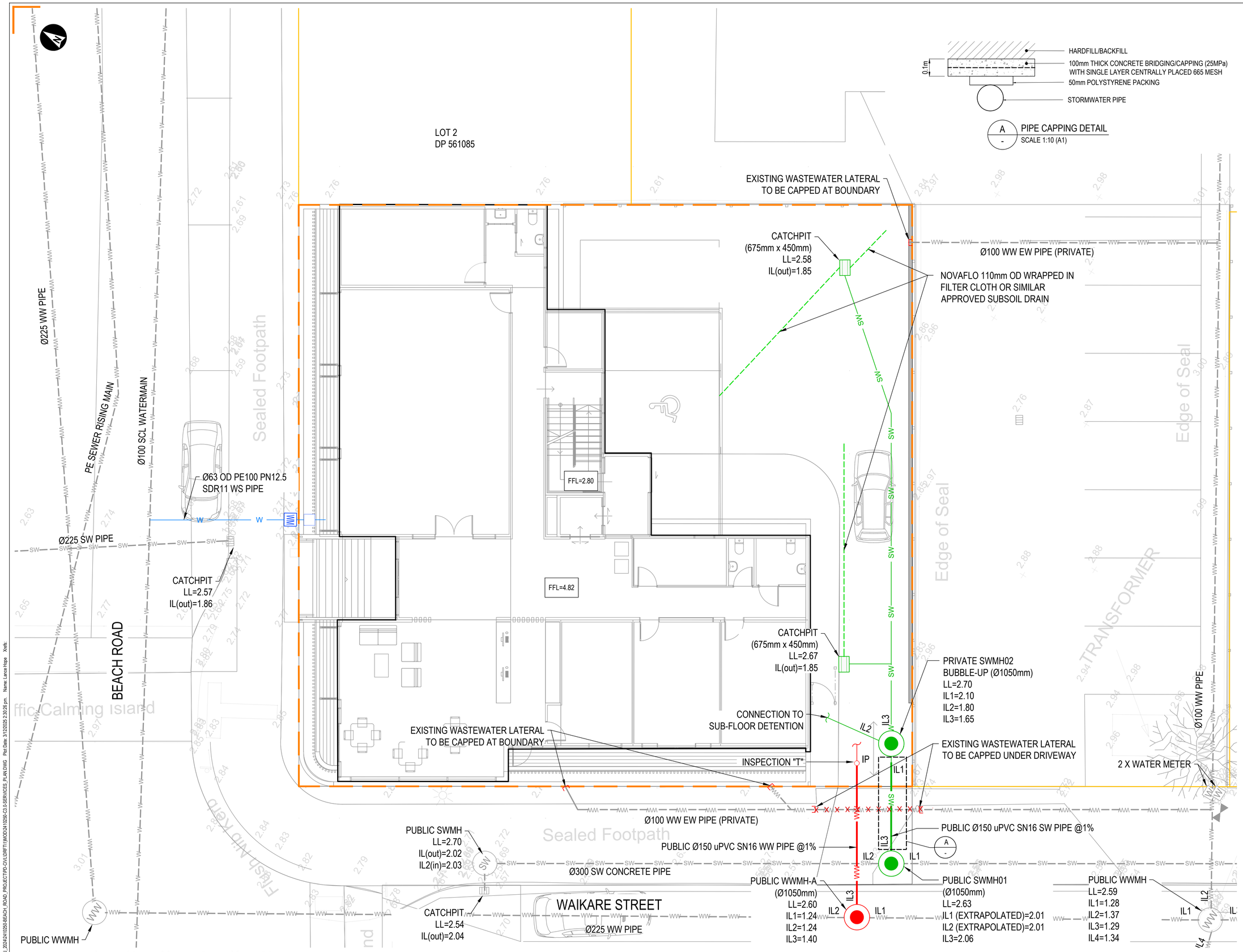
THIS IS A COLOUR DRAWING

ACENZ

ENGINEERING NEW ZEALAND IPENZ MEMBER

Cad File: \\KRCHCH1.LOCAL\SHARES\CHRISTCH\JRCH\PROJ_2024\2410250-BEACH_ROAD_PROJECT\PD-CIVL\DRFT1\MOD\2410250-C2.0-SITE_PLAN.DWG Plot Date: 3/12/2025 12:44:56 pm. Name: Lance Hope Xrefs:

ORIGINAL SHEET SIZE A1 (841X594) - Do not scale from Drawing



SCALE 1:75 (A1)

0 1.5 3.0 4.5 6.0 7.5m

ORIGINAL SHEET SIZE A1 (841X594) - Do not scale from Drawing

FOR APPROVAL

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Cad File: Z:\PROJ_2024\2410250-BEACH_ROAD_PROJECT\PD-CIVL\DRFT\1)MOD\241025D-C3.0-SERVICES_PLAN.DWG Plot Date: 31/2/2025 2:30:26 pm Name: Lance Hope Xrefs:

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NOTES:

1) SUB-FLOOR DETENTION TO COMPRISE 3.15m³ MIN, WITH Ø20mm ORIFICE. DETENTION TO BE FED BY ROOF.

REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

TITLE
SERVICES PLAN

REVIEWED BY	MJG		31-01-2025
DESIGNED BY	JC		28-01-2025
DRAWN BY	MHA		28-01-2025
SCALE	1:75 (A1)	JOB NO.	2410250
DRAWING NO.	C3.0	REV.	A

PRELIMINARY DESIGN

LOT 2
DP 561085

LOT 1
DP 561085

BEACH ROAD

WAIKARE STREET

FFL=2.80

FFL=4.82

0.0
0.1
0.2
0.3
0.3
0.2
0.1
0.0
-0.1
0.0

SCALE 1:75 (A1)

0 1.5 3.0 4.5 6.0 7.5m

ORIGINAL SHEET SIZE A1 (841X594) - Do not scale from Drawing

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EARTHWORKS VOLUME
(EXCLUDING BUILDING FOOTPRINT)

4 m³ CUT
34 m³ FILL
307 m² AREA OF EARTHWORKS

BETWEEN EXISTING SURFACE LEVELS TO THE FINISHED SURFACE LEVELS.

TOPSOIL STRIPPING NOT INCLUDED IN EARTHWORKS VOLUMES.

Surface Analysis: Cut & Fill Depth

Number	Color	Minimum Depth (m)	Maximum Depth (m)
1		-0.144	0.000
2		0.000	0.100
3		0.100	0.200
4		0.200	0.400

REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

TITLE
EARTHWORKS PLAN

REVIEWED BY	MJG		31-01-2025
DESIGNED BY	JC		28-01-2025
DRAWN BY	MHA		28-01-2025
SCALE	1:75 (A1)	JOB NO.	2410250
DRAWING NO.	C4.0	REV.	A

PRELIMINARY DESIGN

ACENZ

ENGINEERING NEW ZEALAND CHARTERED MEMBER

Cad File: Z:\PROJ...2024\2410250-BEACH_ROAD_PROJECT\PD-CIV\LDRFT\1)MOD\2410250-C4.0-EARTHWORKS_PLAN.DWG Plot Date: 2/3/2025 11:51:59 am. Name: Mohammed Hanif Xrefs:

LOT 2
DP 561085

LOT 1
DP 561085

VEHICLE STABILISED ENTRANCE WAY

SILT FENCE REQUIRED WHERE
NEIGBOURING PROPERTY IS LOWER
THAN THE SUBJECT SITE

BEACH ROAD

WAIKARE STREET

Sealed Footpath

Edge of Seal

TRANSFORMER

SCALE 1:75 (A1)

0 1.5 3.0 4.5 6.0 7.5m

ORIGINAL SHEET SIZE A1 (841X594) - Do not scale from Drawing

FOR APPROVAL

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REV	DATE	ISSUED FOR	BY
A	28-01-2025	APPROVAL	MHA

PROJECT
45-47 BEACH ROAD
TAHUNANUI
NELSON

CLIENT
CAMEO PROJECTS

TITLE
EROSION AND SEDIMENT CONTROL PLAN

REVIEWED BY	MJG		31-01-2025
DESIGNED BY	JC		28-01-2025
DRAWN BY	MHA		28-01-2025
SCALE	1:75 (A1)	JOB NO.	2410250
DRAWING NO.	C5.0	REV.	A

PRELIMINARY DESIGN

ACENZ

CONSULTING ENGINEERS NEW ZEALAND CHARTERED MEMBER

Cad File: Z:\PROJ_2024\2410250-BEACH_ROAD_PROJECT\PD-CIVL\DRFT\1)MOD\2410250-C5.0-ESC_PLAN.DWG Plot Date: 2/3/2025 10:46:26 am. Name: Mohammed Hanif Xrefs:

Appendix B Correspondence with Council

James Creek

From: Shane Overend <shane.overend@ncc.govt.nz>
Sent: Wednesday, 25 September 2024 7:58 am
To: Hayden Taylor
Cc: Vince Matschke
Subject: 45 and 47 Beach Road - proposed development - Inundation design level enquiry - 25Sept2024

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Hayden,

Based on the latest MfE 2024 advice (that Intensification should be treated as category A) NCC staff recommend that Category A of the IPN is adopted for this proposed development.

Please see the information and advice provided by Toby below.

Regards

Shane Overend
Senior Engineer – Land Development
Nelson City Council / *Te Kaunihera o Whakatū*
P: 03 546 0303
www.nelson.govt.nz

From: Toby Kay <toby.kay@ncc.govt.nz>
Sent: Thursday, September 19, 2024 4:29 PM
To: Shane Overend <shane.overend@ncc.govt.nz>
Cc: Vince Matschke <vince.matschke@ncc.govt.nz>
Subject: RE: 45 and 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024

Hi Shane,

Here's the table I said I'd send.

	Present day 1% AEP coastal inundation level (Tahunanui)	Category A (Coastal subdivision, major infrastructure, greenfield)	Category B (Intensification)	Category C (Existing Development, single lot)
IPN (Based on MfE guidance 2017)	RL 2.6m	RL 4.1m RL (includes 1.5m SLR)	Not specified. Undertake DAPP process	RL 3.6m (includes 1.0m SLR)
Latest coastal inundation assessment – Phase B report/ MfE guidance 2024	RL 2.69m	RL 4.52 m (includes 1.61m SLR + 0.22m VLM) for SSP 8.5 H+ at 2130	If DAPP process not yet completed use category A (SSP 8.5 H+)	RL 4.09m (includes 1.18m SLR + 0.22m VLM) for SSP 8.5 M at 2130

Freeboard excluded from levels in the above table. Figures in 2nd row (Latest) from T+T assessment (attached cells highlighted yellow).

In short, category A under MfE 2017 is similar to updated 1% AEP and Category C under MfE 2024.

MfE 2024, Table 8 clarifies that Intensification should be treated as category A. These interim precautionary SLR allowances to apply until such time as DAPP process has been completed, as set out below.

Thanks,
Toby

MfE 2024:

Table 8: Interim precautionary relative sea-level rise allowances recommended planning and policy before undertaking a dynamic adaptive pathways p approach for a precinct, district or region

Planning category	Recommended interim precautionary RSLR allowances
A. Coastal subdivision, greenfield developments and major new infrastructure	Using a **timeframe** out to **2130** (≥100 years), apply the *me* **SSP5-8.5 H+** based RSLR projection* that includes the relev the local and/or regional area. (Note: approximately 1.6 metre rise in MSL, before includi
B. Changes in land use and redevelopment (intensification and upzoning)	Using a **timeframe** out to **2130** (≥100 years), apply the *me* **SSP5-8.5 H+** based RSLR projection* that includes the relev the local and/or regional area. (Note: approximately 1.6 metre rise in MSL, before includi
C. Land-use planning controls for existing coastal uses and assets (building additions)	Using a **timeframe** out to **2130** (≥100 years), apply the *me* **SSP5-8.5 M** based RSLR projection that includes the releva the local and/or regional area. (Note: approximately 1.2 metre rise in MSL, before includi

[36] *Medium confidence* projections are available further out to 2150 on the NZ SeaRise plat

Planning category	Recommended interim precautionary RSLR allowances
D. Non-habitable, short-lived assets with a functional need to be at the coast, which are either low consequences or readily adaptable (including services)	Using a **timeframe** out to **2075** (≥50 years), apply the *medi* **SSP5-8.5 M** based RSLR projection that includes the releva the local and/or regional area. (Note: approximately 0.5 metre rise in MSL, before includi

Toby Kay
Activity Engineer – Stormwater and Flood Protection
Nelson City Council / *Te Kaunihera o Whakatū*
DDI 03 265 6993

From: Hayden Taylor <Hayden@planscapes.co.nz>
Sent: Monday, September 16, 2024 2:56 PM
To: Shane Overend <shane.overend@ncc.govt.nz>
Cc: Vince Matschke <vince.matschke@ncc.govt.nz>
Subject: RE: 45 and 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024

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Hi Shane,

Thanks very much for this advice. In terms of the applicable sea level rise scenario to use, as there will be no subdivision associated with the development, would the 1.0m SLR scenario be applied rather than 1.5m?

In terms of servicing demand, we don't have a full assessment of this at the current time. If we assume 40 rooms at 2pp each, and 80% occupancy for the hotel, plus a nominal number of HUD's (say, 2?) for the small commercial at ground floor, would that suffice in the interim?

Ngā mihi/ Kind Regards,

Hayden

Hayden Taylor
Resource Management Consultant
BSc (Hons)

Planscapes (NZ) Ltd
94 Selwyn Place : PO Box 99 : Nelson
T 03 539 0281 : **M** 021 071 2209 **E** Hayden@planscapes.co.nz

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From: Shane Overend <shane.overend@ncc.govt.nz>
Sent: Friday, 13 September 2024 12:55 pm
To: Hayden Taylor <Hayden@planscapes.co.nz>
Cc: Vince Matschke <vince.matschke@ncc.govt.nz>
Subject: 45 and 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024

Hi Hayden,

In relation to your questions for me, I comments as follows:

1. Coastal Inundation - as per Figure 3 of the IPN, this development is Category A. The design coastal water level to use would be 4.1m RL (2130, RCP8.5).

   The 4.1m RL is made up of a present day 1% AEP storm tide of 2.6m (Nelson Haven) plus 1.5m sea level rise.

   The minimum freeboard from the design water level (4.1m) to floor levels should be 0.3m for commercial and 0.5m for residential. The freeboard shall be measured from the prescribed

water level to either the building platform level, the underside of the floor joists, or underside of the floor slab.

Finished ground levels should be raised where possible/practical to at least 4.1m. Noting that this wont be possible for the driveway and access areas that must marry with existing road levels. Also, any proposed filling must be assessed in terms of increased flood risk to adjoining property.

Please also be aware that MfE have released final Coastal Hazards and Sea Level Rise guidance in 2024: https://environment.govt.nz/publications/coastal-hazards-and-climate-change-guidance/ which includes allowance for vertical land movement. Whilst NCC has not yet adopted this guidance it's likely we will do in the near future. There are no formal dates set yet for the review/update of the IPN.

2. Regarding stormwater inundation, the following is a clip of LIDAR land elevation and draft overland flow path mapping (polylines, based on 2015 LIDAR). Please note that the LIDAR pre-dates the work done on the raised intersection of Beach Rd/Waikare Street, so road levels adjacent to the property may have changed:



The site is a basin area with SW flow path polylines routed through it as it's adjacent to a low point on Beach Road. The applicant will need to demonstrate that any earthworks / raised platform does not prevent secondary flows from the basin area reaching the lowest section of Beach Road adjacent to their property.

3. Can you please provide the design demand for water and wastewater from the proposed development. If the development is a mixture of residential and commercial then maybe you could advise the total equivalent number of residential units proposed. I will need something from you (design flows/demand) so I can forward to our Modeller to assess.

James Creek

From: Shane Overend <shane.overend@ncc.govt.nz>
Sent: Thursday, 30 January 2025 10:24 am
To: James Creek
Cc: Michael Gordon; Michael Gordon
Subject: 2410250 - 45 Beach Road - Infrastructure Servicing and Flooding - 30Jan2025
Attachments: RE: 47 Beach Road - proposed development - servicing enquiry - Water model results - 31Oct2024; HOTEL DEVELOPMENT - 241115 For RC.pdf

Hi James,

Apologies for the delay in getting back to you.

I have inserted my responses below to your questions

Please get back to me if you have any further questions

Regards

Shane Overend
Senior Engineer – Land Development
Nelson City Council / *Te Kaunihera o Whakatū*
P: 03 546 0303
www.nelson.govt.nz

From: James Creek <jamesc@kirkroberts.co.nz>
Sent: Tuesday, 28 January 2025 12:32 pm
To: Shane Overend <shane.overend@ncc.govt.nz>
Cc: Michael Gordon <MichaelG@kirkroberts.co.nz>; Michael Gordon <MichaelG@kirkroberts.co.nz>
Subject: 2410250 - 45 Beach Road - Infrastructure Servicing and Flooding

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Hi Shane,

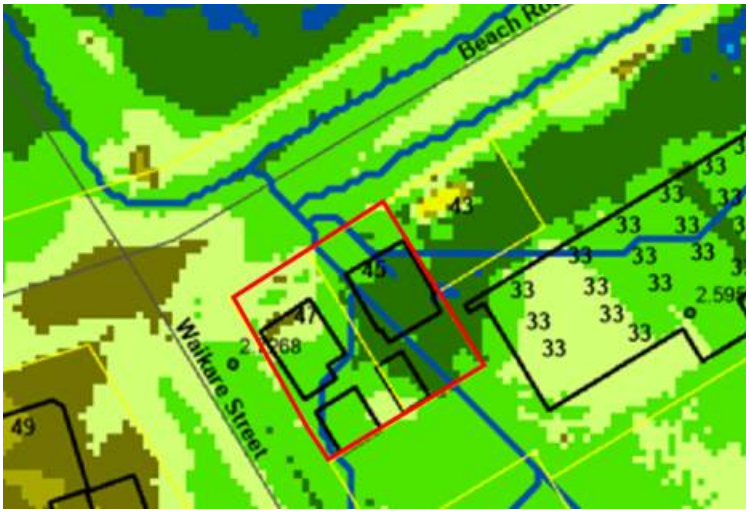
I have been passed along your details by Hayden Taylor, who I understand has had some discussions with you regarding the Infrastructure servicing the Hotel Development at 45 Beach Road. I am the Civil Engineer who has now been engaged for the Development, and have some follow up questions - ideally when our Report and Drawings are submitted they match NCC's requirements.

Wastewater:
We are proposing a 150mm lateral connection onto the 225 Trunk main in Waikare Street – does this require a Manhole at the point of connection, or can we propose a Wye or Banded connection as per Drawing 610? The Wastewater Main is only 1.5m deep at the point of connection. Yes manhole required

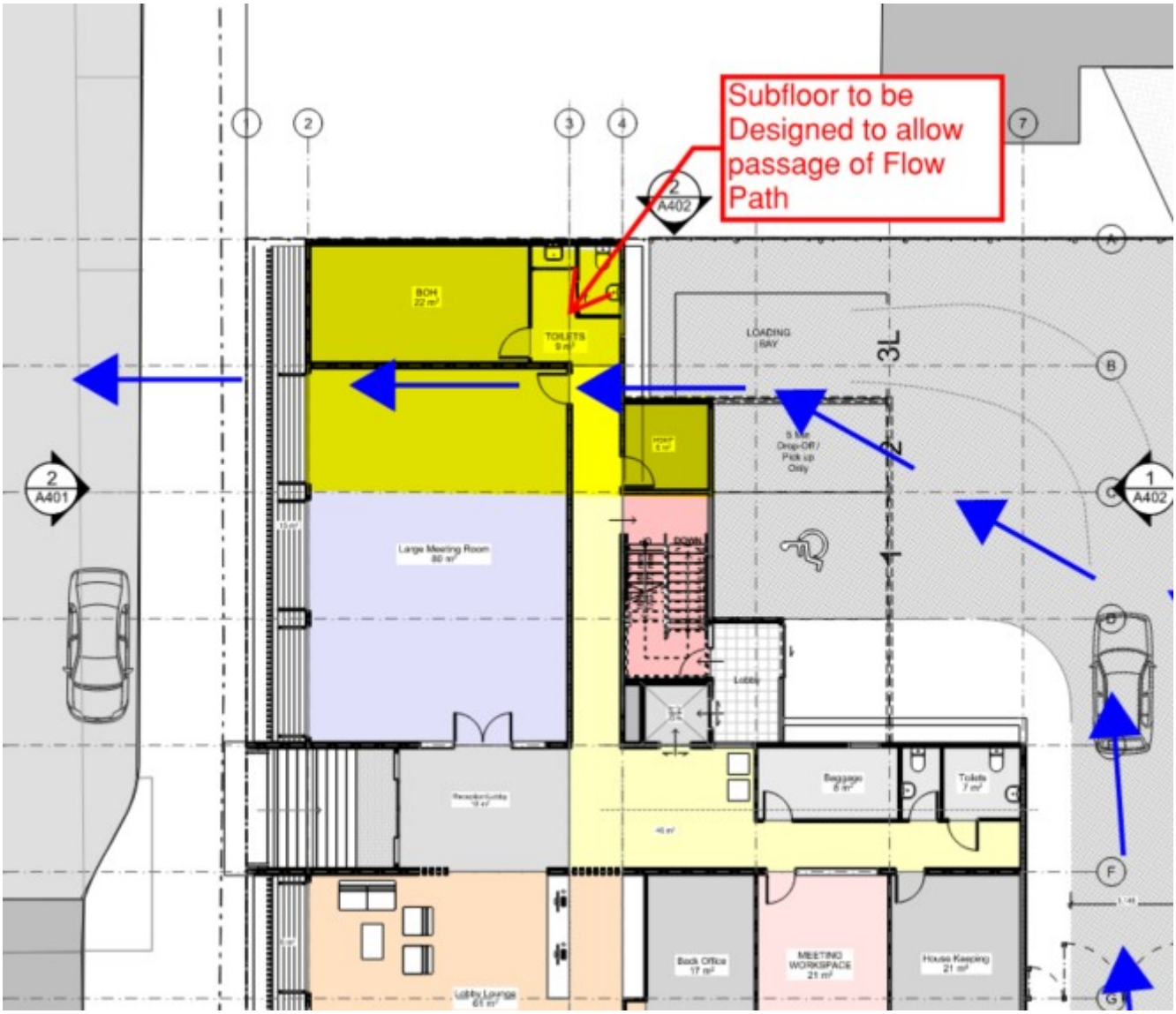
Stormwater:
I assume the 150mm lateral proposed onto the 300mm Main will not require a Manhole, but wish to confirm. A manhole (under the requirements of the NTLDM) is required. Otherwise you could consider cutting in a preformed, purpose made 300/150 'T' into the main line.

Flooding:

You have previously provided advice that an Overland Flow Path Travels through the Site – the Survey confirms the results of Council's model, with the Site being lower in elevation compared to the surrounding ground levels, and the footpath adjacent to the raised table on the Beach Road / Waikare St intersection being 100mm higher than the footpath at the indicated exit location of the Flow Path.



The current proposed Development builds over this path location (concept Drawings attached). Given that the proposed FFL is 2m above ground level however, is it acceptable if the building is piled in a way to allow the flow path to travel underneath? Your guidance on this is much appreciated. We would need to see more information about the space under the building and be satisfied that this space will not become obstructed . What would the day to day use of this space be for? Does the flow to Waikere cause any increased flood risk to any other properties? If approved then there would need to be a Consent Notice or equivalent placed on the title seting out the obligation s of the landowner to keep the area free from any obstructions etc



Kind regards

James Creek
Senior Civil Engineer
Associate
M: 022 678 2993

KIRK ROBE
CONSU

109 Carlton Gore Road, Newmarket, Auckland
PO Box 99388, Auckland 1023
09 972 9038 ext 607
JamesC@kirkroberts.co.nz
www.kirkroberts.co.nz
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James Creek

From: Atsushi Ota <atsushi.ota@ncc.govt.nz>
Sent: Thursday, 31 October 2024 10:55 am
To: Shane Overend; Phil Ruffell
Subject: FW: 45 and 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024 - Water Supply Network
Attachments: image001.png

FYI

From: Atsushi Ota
Sent: Monday, 14 October 2024 4:47 pm
To: Phil Ruffell <phil.ruffell@ncc.govt.nz>
Subject: RE: 45 and 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024 - Water Supply Network

Hi Phil,

Here is a summary of the water modelling conditions and simulation results.

Model conditions

- The residential and commercial flows were calculated based on the Land Development Manual.
- For the residential flow, the proposed 40 lots, with a population density of 2.5 people per lot, were used to determine the Peak Daily Flow.
- The commercial flow was determined based on the measured area of 0.067 Ha and the Wastewater Land Development Manual, with the peak wet weather flow factor deducted.
- The future peak daily flow, which is a total of the residential flow of 0.72 l/s and the commercial flow of 0.01 l/s, was calculated to be 0.73 l/s. The peak hourly flow was calculated to be 1.47 l/s.
- This future was then allocated to the customer point W350572.
- The Water Supply Classification FW2 was adopted for this study under the sprinklered structure category from the firefighting guideline. The required water was determined from Table C1. The fire flow was applied to Fire Hydrant 10 (Asset Key 44289) in the model.

Simulation Results

- The model results indicated that the network could cope with the new development under the peak dry weather flow conditions. The model predicted a 0.30m pressure reduction.
- The model predicted that the network would have sufficient capacity to provide the required fire flow with the new development. It was found that the pressure difference between pre-post development was negligible.

You can access the calculation file from the link below:

WSModel_20240927 45-47 Beach Rd.xlsx

Please let me know if you have any questions. Details are shown below.

Best regards,

Atsushi Ota
Senior Asset Analyst
Nelson City Council | Te Kaunihera o Whakatū
P 03 546 0200

James Creek

From: Shane Overend <shane.overend@ncc.govt.nz>
Sent: Thursday, 31 October 2024 10:04 am
To: Hayden Taylor
Subject: 47 Beach Road - proposed development - Wastewater servicing enquiry - wastewater model results - 31Oct2024

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Hayden,

Looks like the wastewater capacity is acceptable subject to connection being made to the 225mm dia pipe.

Regards

Shane Overend
Senior Engineer – Land Development
Nelson City Council / *Te Kaunihera o Whakatū*
P: 03 546 0303
www.nelson.govt.nz

From: Mel Large <mel.large@ncc.govt.nz>
Sent: Friday, October 25, 2024 12:48 PM
To: Shane Overend <shane.overend@ncc.govt.nz>
Cc: Atsushi Ota <atsushi.ota@ncc.govt.nz>; Chloe Light <chloe.light@ncc.govt.nz>; Phil Ruffell <phil.ruffell@ncc.govt.nz>
Subject: 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024 - wastewater model results

Hi Shane,

No concerns from a wastewater perspective providing the connection are made to the existing 225mm diameter concrete pipe along Waikare Street (as opposed to the smaller 150mm diameter pipe that the pipes are currently connected too).

Thanks

Mel

From: Atsushi Ota <atsushi.ota@ncc.govt.nz>
Sent: Tuesday, October 15, 2024 12:34 PM
To: Mel Large <mel.large@ncc.govt.nz>; Chloe Light <chloe.light@ncc.govt.nz>; Phil Ruffell <phil.ruffell@ncc.govt.nz>
Subject: FW: 45 and 47 Beach Road - proposed development - flood and servicing enquiry - 13Sept2024 - wastewater model results

Hi all,

I have assessed the impact of the proposed development on 45 and 47 Beach Road. The developer plans to build a 40-room hotel with a commercial area on the ground floor. Please see the details of the development in Shane's email below.

In summary,

- The total number of flooding nodes would remain unchanged at 132, and no negative impact of the new development was identified on the Beach Road PS network from the model simulation results.
- Discharging wastewater to the existing DN225 concrete pipe, along Waikare Street and Beach Road, was recommended since this pipe has more capacity and can handle the increased wastewater flow from the new development without causing surcharge or flooding. Discharging wastewater to the existing DN150 concrete pipe, crossing the private properties, was not recommended because it was predicted to surcharge.

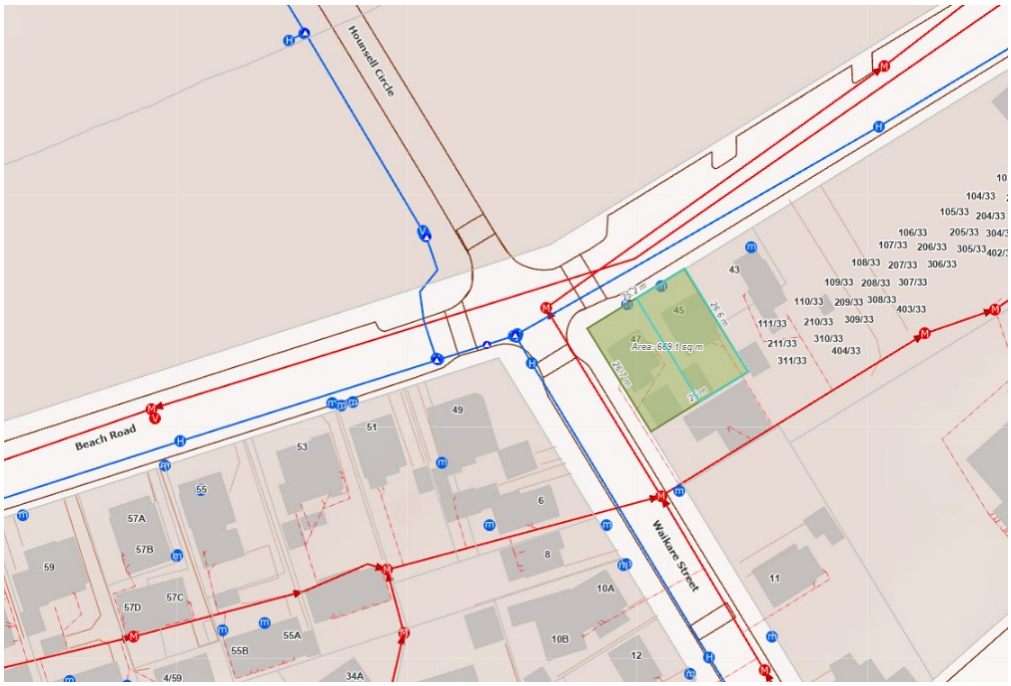
Please however note that:

- The model is calibrated but not specifically for the targeted area. Therefore, its accuracy is limited.
- The model is considered slightly unstable. Hence, all model results need to be treated cautiously.

The model calculation and simulation results are saved under:
45-47 Beach Rd WW.xlsx

Assumptions and conditions

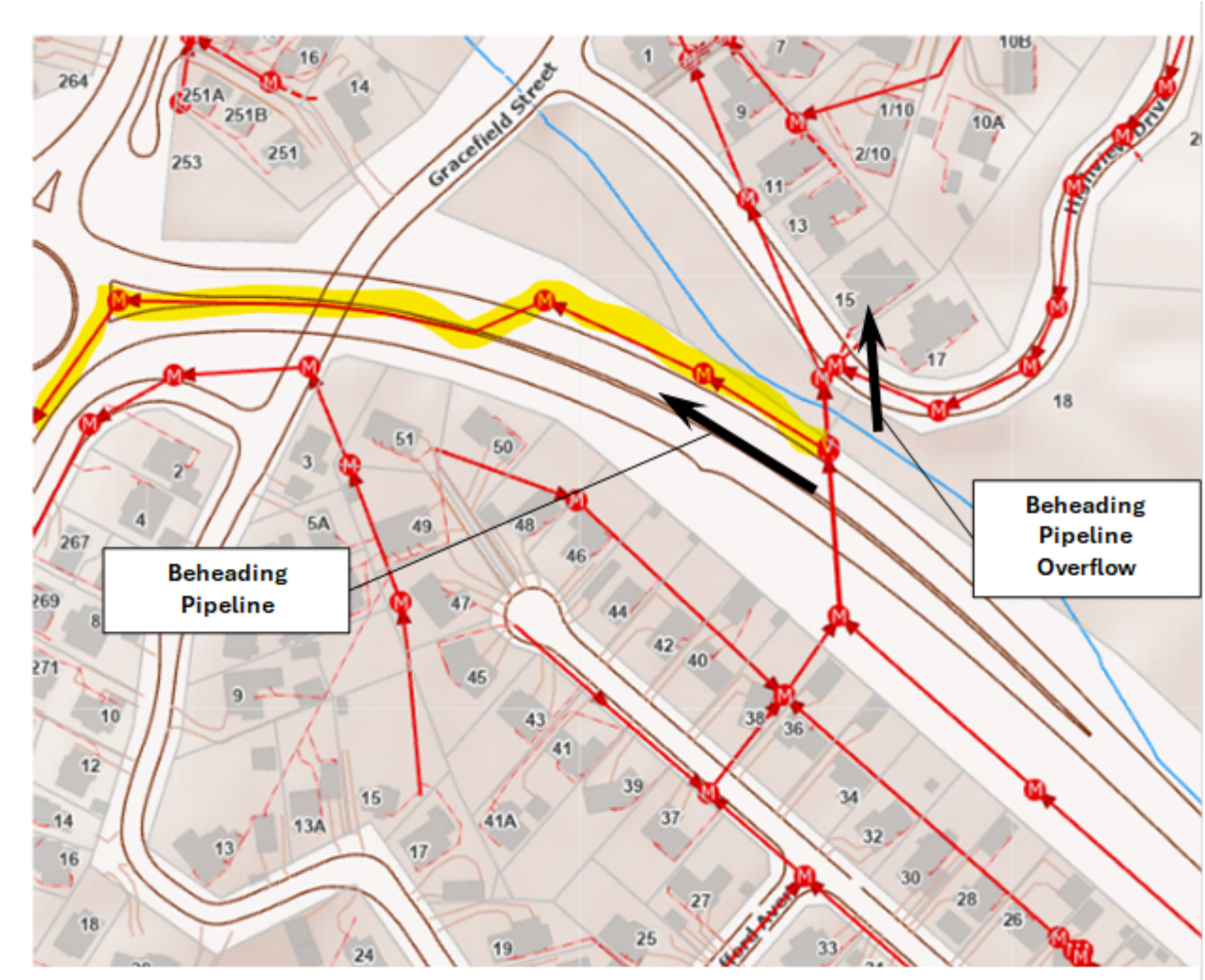
- The hotel has 40 rooms, and the commercial area is on the ground floor. The LDM's PWWF calculation was applied, and the determined PWWF was 2.2 l/s. Note that the developer's original estimate was 2 people per room with 80% occupancy, but this study followed the LDM.
- As a base flow, the calculated PWWF 2.2 l/s was added to the subcatchment NESO_S400020_3. The location of the development is highlighted in green in the snapshot below.
- The 2-year ARI nested storm with (RCP8.5 climate change) was applied to the model based on the agreement with the Wastewater Activity Engineer.
- The latest Nelson South model, calibrated in 2023, was used for this study.



Network's noticeable point

- The overflow from the Whakatu Drive Beheading pipeline, installed in 2021 and highlighted in yellow in the snapshot below, to the Beach Road PS subcatchment was predicted to be about 9 l/s during the PWWF.

- This model still includes the Parkers No. 1 and No. 2 pump stations, which the Atawhai PS has replaced. This section of the network needs to be updated. However, in order to meet the completion date for this work, the study was conducted using the current network configuration.



The model results - DWF

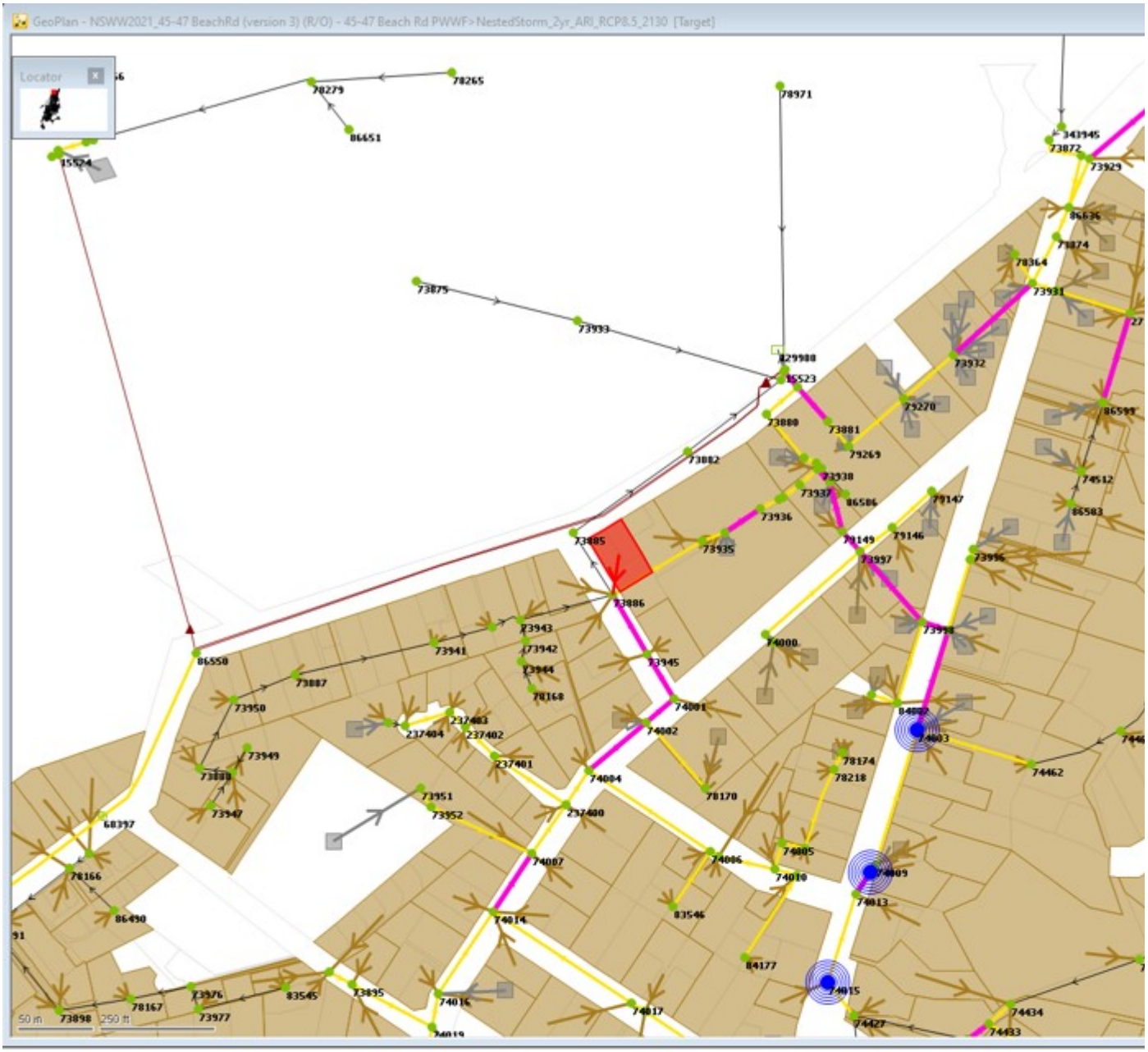
- No flooding was identified in the current and new development scenarios.

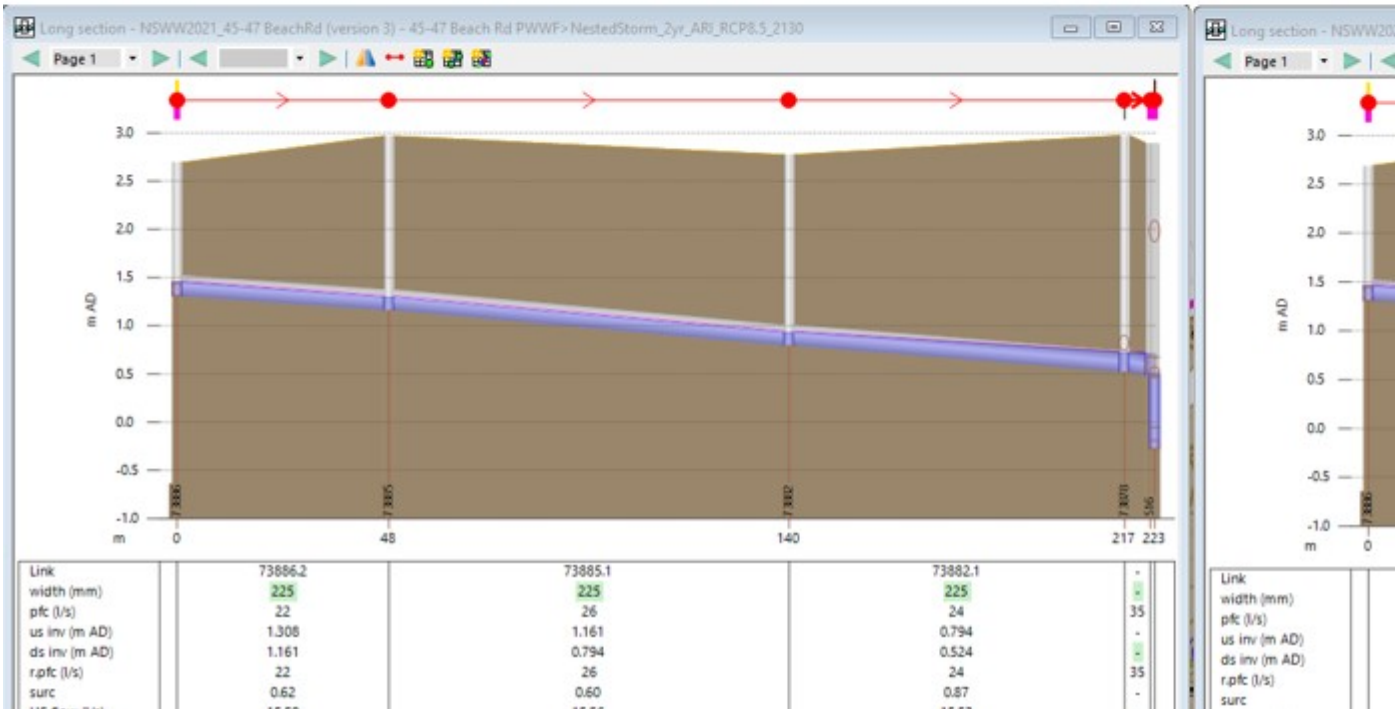
The model results – PWWF

Key findings are shown as follows:

- The simulation results suggested that the total number of flooding nodes would be 132 for the pe-post condition. However, one flood on Manhole 78723 was resolved after the development, but new flooding appeared on Manhole 78882.
- The total flooding volume increased by 3 m3 from 7846 m3 to 7849 m3, less than 0.1% of the total flooding volume.
- The resolved flooding node (Manhole 78723) was located upstream of the Beach Road PS. The estimated flooding volume from this manhole was 0.141 m3. While showing some fluctuations, this manhole would likely flood in both pre-post development.
- Regarding the new flooding of Manhole 78882, the simulated flow was abnormally high during the storm event in the post-development condition. This result could be treated as a simulation error. In addition, the new flooding Manhole 78882 would discharge to the Atawai PS network, which is not directly connected to the Beach Road PS catchment. Hence, this flooding node was considered not directly related to the new development and discarded from the discussion.
- That means the total number of flooding nodes would remain unchanged at 132, and the model results indicated that no negative impact of the new development was identified on the Beach Road PS network.

Left: Pre-development, Right: Post-development

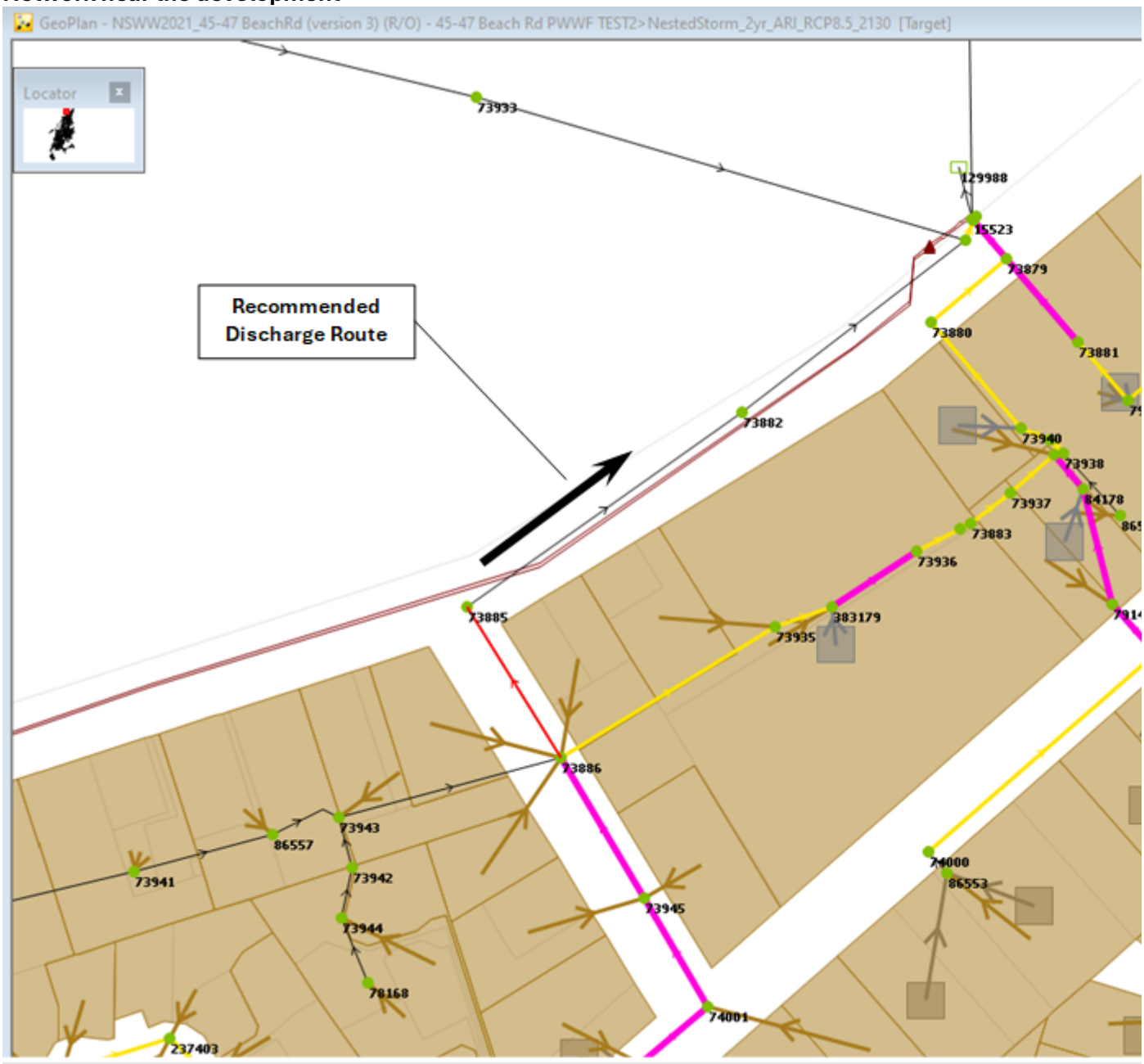

GeoPlan - NSWW2021_45-47 BeachRd (version 3) (R/O) - 45-47 Beach Rd PWWF>NestedStorm_2yr_ARI_RCP8.5_2130 [Target]
Locator
50 m
250 ft


Long section - NSWW2021_45-47 BeachRd (version 3) - 45-47 Beach Rd PWWF>NestedStorm_2yr_ARI_RCP8.5_2130
Page 1
m AD
m
Link
width (mm)
pfc (l/s)
us inv (m AD)
ds inv (m AD)
r.pfc (l/s)
surc
73886.2
73885.1
73882.1

Other findings are shown below:

- The new development on 45-47 Beach Road has two possible discharge points:
  - An existing DN225 Concrete pipe, installed in 1975, along Waikare Street and Beach Road (73886-73885-73882 route).
  - An existing DN150 Concrete pipe, installed in 1951, crossing 33 Beach Road (73886-73935-383179-73936-73883-73937 route).
- Discharging wastewater to the existing DN225 was recommended since this pipe has more capacity and can handle the increased wastewater flow from the new development without causing surcharge or flooding. Discharging wastewater to the existing DN150 was not recommended because it was predicted to surcharge.

Network near the development



The limitations and issues

- The model is calibrated but not specifically for the targeted area. Therefore, its accuracy is limited.
- As mentioned above, the model is considered slightly unstable. Hence, all model results need to be treated cautiously.

Appendix C Detention Calculations

KIRK ROBERTS CONSULTING	TITLE	Attenuation Calcs	JOB No.	2410250
	ADDRESS	45 & 47 Beach Road, Nelson		
	DATE	5/03/2025	BY	Akshay Sekhri

	PRE DEV (m²)	POST DEV (m²)
IMPERVIOUS AREA	378	441
PERVIOUS AREA	-	-

DIFF	63	m²
Table 5-9 Detention Requirements	50	l/m² of additional impervious area
	3150	L
	3.15	**m²**

PRE DEV -



POST DEV -

