

[REDACTED]

From: Zhongyi Li (AT)
Sent: Monday, 4 September 2017 11:01
To: Christopher Glanfield (AT)
Subject: FW: NZTA 8164 / APP 88909 for Fulton Hogan Limited
Attachments: DetailReportData_88909_1325EX15450.pdf; ElementComparisonReportData_88909_1325DX15450.pdf; HPMV Permit Application 170630435.pdf; Summary Report - 88909.pdf

FYI

From: HPMV Auckland [mailto:HPMVAuckland@nzta.govt.nz]
Sent: Tuesday, 11 July 2017 2:38 p.m.
To: ATHPMV (AT) <ATHPMV@at.govt.nz>; [REDACTED]; [REDACTED]
Subject: NZTA 8164 / APP 88909 for Fulton Hogan Limited

Afternoon Guys

Can you please review this NZTA 8164 / APP 88909 for Fulton Hogan Limited from McNicol Road to Leon Leicester Ave

Route is as per attached Summary Sheet

Cheers

Joe

NZTA Auckland Northland Region High Productivity Motor Vehicle (HPMV) Permits
Email hpmvauckland@nzta.govt.nz

[REDACTED]

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Detail Report

Date/Time: 11 Jul 2017 10:53:10 AM

Permit application number : 88909

Schema Version:

1

Vehicle Information

Owner: Fulton Hogan Ltd (Dunedin)

| Units: | Unit Type | Registration |
|--------|-------------|--------------|
| | Prime Mover | KQM310 |
| | Trailer | 7E798 |

Max Speed: 90

Vehicle Type: HPMV

VAI: 1.11

VGI: 1.580

Gross Mass: 64.80

Number Of Axles: 9

Load Width: 2.50

Load Length: 22.53

Load Height: 3.25

| Axle No: | Axle Spacing (m): | Axle Load (t): | Axle Type: | Track Width: | Tyre Size: | Axle Index: |
|----------|-------------------|----------------|------------|--------------|------------|-------------|
| 1 | 0.000 | 5.50 | S | 1.100 | Standard | 1.08 |
| 2 | 1.990 | 5.50 | S | 1.100 | Standard | 1.08 |
| 3 | 3.100 | 8.20 | T | 1.850 | Standard | 1.11 |
| 4 | 1.370 | 8.20 | T | 1.850 | Standard | 1.11 |
| 5 | 6.630 | 8.20 | T | 1.880 | Standard | 1.11 |
| 6 | 1.310 | 8.20 | T | 1.880 | Standard | 1.11 |
| 7 | 3.210 | 7.00 | T | 1.880 | Standard | 1.11 |
| 8 | 1.270 | 7.00 | T | 1.880 | Standard | 1.11 |
| 9 | 1.280 | 7.00 | T | 1.880 | Standard | 1.11 |

Route Data

| Section: | Highway: | From RP: | From Junction: | To RP: | To Junction: |
|----------|-----------|-----------|----------------|----------|--------------|
| 1.0 | SH1N | 448/2.907 | | 431/7.92 | |
| 2.0 | EXIT438NB | 0/0.0 | EXIT438NB0 | 0/0.76 | EXIT438NB9 |
| 3.0 | EXIT438SB | 0/0.0 | EXIT438SB0 | 0/0.91 | EXIT438SB9 |
| 4.0 | OB2B | 0/0.0 | 2B0 | 0/15.0 | 2B9 |

Detailed Bridge Results:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|-----------------------|-------------|
| 1N | 431 | 9.480 | OTAHUHU CREEK CULVERT | 3 - Two-way |

Width of Carriageway: 11.10 Speed Limit: 0
 Number of Lanes Loaded: 2 Legal Loading Limit: 100
 Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
 Element Name: CULVERT ROOF SLAB

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|------|------|
| 2 | 1.600 | 1.800 | 2.100 | 311 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.916 | | |
| Basic Vehicle Moment: | 42.23 | Mpost: | 76.01 |
| Basic Vehicle Shear: | 110.70 | Spost: | 144.78 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 0.817 | 111 | 247 | 0.36 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 0.754 | 99 | 218 | 0.32 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 0.704 | 89 | 195 | 0.29 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 0.601 | 71 | 153 | 0.23 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 76 | 199 | 0.24 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Beam
 Element Name: CULVERT ROOF SLAB

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|------|------|
| 2 | 1.600 | 1.800 | 2.100 | 311 | 0 |

| | | | |
|-----------------------|-------|--------|-------|
| KBASIC: | 1.916 | | |
| Basic Vehicle Moment: | 42.23 | Mpost: | 76.01 |

| | | | |
|----------------------|--------|--------|--------|
| Basic Vehicle Shear: | 110.70 | Spost: | 144.78 |
|----------------------|--------|--------|--------|

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 0.817 | 111 | 247 | 0.36 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 0.754 | 99 | 218 | 0.32 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 0.704 | 89 | 195 | 0.29 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 0.601 | 71 | 153 | 0.23 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 76 | 199 | 0.24 | 0.00 |

Element Messages:

Element Result: **Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted**

Bridge Result: Increasing: -1 - Unrestricted
 Decreasing: -1 - Unrestricted

Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|----------------------|-------------|
| 1N | 431 | 10.530 | TRENWITH ST OVERPASS | 3 - Two-way |

Width of Carriageway: 3.67 Speed Limit: 0
Number of Lanes Loaded: 1 Legal Loading Limit: 100
Restrict X: Bypass Description: Bypass through local network

Element Analysis

Element Type: Beam Element Direction: INCREASING (Relevant to Increasing Travel)
Element Name: PSC T-Beams - Equiv 3.67m strip

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 1.000 | 1.000 | 14.940 | 2,000 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.686 | | |
| Basic Vehicle Moment: | 934.17 | Mpost: | 988.57 |
| Basic Vehicle Shear: | 285.69 | Spost: | 307.49 |

Element Analysis Direction: INCREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.41 | 1.43 | 1.000 | 1,319 | 409 | 0.66 | 0.00 |
| 50 km/h Own Lane | 1.28 | 1.30 | 1.000 | 1,199 | 371 | 0.60 | 0.00 |
| 20 km/h Own Lane | 1.19 | 1.20 | 1.000 | 1,111 | 343 | 0.56 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 1.000 | 934 | 286 | 0.47 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.000 | 934 | 286 | 0.47 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted

Element Type: Beam Element Direction: DECREASING (Relevant to Decreasing Travel)
Element Name: PSC T-Beams - Equiv 3.67m strip

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 1.000 | 1.000 | 14.940 | 2,000 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.686 | | |
| Basic Vehicle Moment: | 934.17 | Mpost: | 988.57 |

| | | | |
|----------------------|--------|--------|--------|
| Basic Vehicle Shear: | 285.69 | Spost: | 307.49 |
|----------------------|--------|--------|--------|

Element Analysis Direction: DECREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.41 | 1.43 | 1.000 | 1,319 | 409 | 0.66 | 0.00 |
| 50 km/h Own Lane | 1.28 | 1.30 | 1.000 | 1,199 | 371 | 0.60 | 0.00 |
| 20 km/h Own Lane | 1.19 | 1.20 | 1.000 | 1,111 | 343 | 0.56 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 1.000 | 934 | 286 | 0.47 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.000 | 934 | 286 | 0.47 | 0.00 |

Element Messages:

Element Result: Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: Between T-Beams & U-Beams

Element Direction: DECREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.25 |

Impact Code: 2
 Length: 1.51

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: Over U-Beams

Element Direction: DECREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
|------|------|

| | |
|------|------|
| DCF: | 1.25 |
|------|------|

Impact Code: 2
 Length: 1.51

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: T-Beam Flanges

Element Direction: DECREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.25 |

Impact Code: 2
 Length: 1.80

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: T-Beam Flanges

Element Direction: INCREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
|------|------|

| | |
|------|------|
| DCF: | 1.25 |
|------|------|

Impact Code: 2
 Length: 1.80

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: Between T-Beams & U-Beams

Element Direction: INCREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.25 |

Impact Code: 2
 Length: 1.51

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: Over U-Beams

Element Direction: INCREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
|------|------|

| | |
|------|------|
| DCF: | 1.25 |
|------|------|

Impact Code: 2
Length: 1.51

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: **Increasing: -1 - Unrestricted**

Bridge Result: Increasing: -1 - Unrestricted

Decreasing: -1 - Unrestricted

Bridge Warnings: An off-highway bypass exists: Bypass through local network

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|-------------------------|-------------|
| 1N | 431 | 11.120 | TAMAKI RIVER BRIDGE NO1 | 3 - Two-way |

Width of Carriageway: 3.67 Speed Limit: 0
Number of Lanes Loaded: 1 Legal Loading Limit: 100
Restrict X: Bypass Description: Local roads and SH20

Element Analysis

Element Type: Beam Element Direction: BOTH (Relevant to Both Directions)
Element Name: Modelled as a 3.67m wide strip of bridge

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 1.000 | 1.000 | 14.935 | 1,840 | 602 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.686 | | |
| Basic Vehicle Moment: | 933.72 | Mpost: | 988.06 |
| Basic Vehicle Shear: | 285.63 | Spost: | 307.45 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.41 | 1.43 | 1.000 | 1,318 | 408 | 0.72 | 0.68 |
| 50 km/h Own Lane | 1.28 | 1.30 | 1.000 | 1,198 | 371 | 0.65 | 0.62 |
| 20 km/h Own Lane | 1.19 | 1.20 | 1.000 | 1,110 | 343 | 0.60 | 0.57 |
| Crawl Own Lane | 1.00 | 1.00 | 1.000 | 934 | 286 | 0.51 | 0.47 |
| Crawl Central | 1.00 | 1.00 | 1.000 | 934 | 286 | 0.51 | 0.47 |

Element Messages:

Element Result: **Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted**

Element Type: Deck-Slab Element Direction: BOTH (Relevant to Decreasing Travel)
Element Name: Deck Slabs on Outer Half of Bridge

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.25 |

Impact Code: 2
Length: 6.56

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Deck-Slab

Element Name: Deck Slabs on Median Half of Bridge

Element Direction: BOTH (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.25 |

Impact Code: 2
Length: 7.11

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.977 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.888 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.820 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.683 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted

Decreasing: -1 - Unrestricted

Bridge Warnings: Two forms of bypass exist: Local roads and SH20

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|--|----------------|
| 1N | 431 | 14.850 | FLATBUSH RD (TUI CASPER) PEDESTRIAN SUBWAY | 2 - Decreasing |

Width of Carriageway: 11.10 Speed Limit: 0
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
Element Name: SUBWAY ROOF SLAB

Element Direction: DECREASING (Relevant to Decreasing Travel)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|------|------|
| 2 | 1.600 | 1.800 | 2.270 | 369 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.910 | | |
| Basic Vehicle Moment: | 46.21 | Mpost: | 82.72 |
| Basic Vehicle Shear: | 114.46 | Spost: | 145.77 |

Element Analysis Direction: DECREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 0.832 | 124 | 258 | 0.34 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 0.769 | 110 | 226 | 0.30 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 0.719 | 99 | 203 | 0.27 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 0.614 | 79 | 160 | 0.21 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 83 | 206 | 0.23 | 0.00 |

Element Messages:

Element Result: **Decreasing: -1 - Unrestricted**

Bridge Result: Decreasing: -1 - Unrestricted
Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|-----------------------------|-------------|
| 1N | 431 | 14.850 | FLAT BUSH PEDESTRIAN SUBWAY | 3 - Two-way |

Width of Carriageway: 11.10 Speed Limit: 0
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
Element Name: SUBWAY ROOF SLAB

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|------|------|
| 2 | 1.600 | 1.800 | 2.270 | 369 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.910 | | |
| Basic Vehicle Moment: | 46.21 | Mpost: | 82.72 |
| Basic Vehicle Shear: | 114.46 | Spost: | 145.77 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 0.832 | 124 | 258 | 0.34 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 0.769 | 110 | 226 | 0.30 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 0.719 | 99 | 203 | 0.27 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 0.614 | 79 | 160 | 0.21 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 83 | 206 | 0.23 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted
Decreasing: -1 - Unrestricted

Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|-----------------------------------|-------------|
| 1N | 448 | 0.530 | SH1 CROSSOVER SH20 (INTERSECTION) | 3 - Two-way |

Width of Carriageway: 27.62 Speed Limit: 0
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description: Local roads

Element Analysis

Element Type: Beam
Element Name: 700mm deck slab with haunch - 3.65m width

Element Direction: INCREASING (Relevant to Increasing Travel)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|-------|
| 3 | 1.000 | 1.000 | 18.785 | 3,640 | 1,306 |

| | | | |
|-----------------------|----------|--------|----------|
| KBASIC: | 1.651 | | |
| Basic Vehicle Moment: | 1,285.64 | Mpost: | 1,399.05 |
| Basic Vehicle Shear: | 336.16 | Spost: | 338.88 |

Element Analysis Direction: INCREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.39 | 1.43 | 0.894 | 2,849 | 733 | 0.78 | 0.56 |
| 50 km/h Own Lane | 1.26 | 1.30 | 0.854 | 2,582 | 663 | 0.71 | 0.51 |
| 20 km/h Own Lane | 1.18 | 1.20 | 0.823 | 2,397 | 611 | 0.66 | 0.47 |
| Crawl Own Lane | 1.00 | 1.00 | 0.755 | 2,028 | 510 | 0.56 | 0.39 |
| Crawl Central | 1.00 | 1.00 | 1.000 | 1,286 | 336 | 0.35 | 0.26 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted

Element Type: Beam
Element Name: 700mm deck slab with haunch - 3.65m width

Element Direction: DECREASING (Relevant to Decreasing Travel)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|-------|
| 3 | 1.000 | 1.000 | 18.785 | 3,640 | 1,306 |

| | | | |
|-----------------------|----------|--------|----------|
| KBASIC: | 1.651 | | |
| Basic Vehicle Moment: | 1,285.64 | Mpost: | 1,399.05 |

| | | | |
|----------------------|--------|--------|--------|
| Basic Vehicle Shear: | 336.16 | Spost: | 338.88 |
|----------------------|--------|--------|--------|

Element Analysis Direction: DECREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.39 | 1.43 | 0.894 | 2,849 | 733 | 0.78 | 0.56 |
| 50 km/h Own Lane | 1.26 | 1.30 | 0.854 | 2,582 | 663 | 0.71 | 0.51 |
| 20 km/h Own Lane | 1.18 | 1.20 | 0.823 | 2,397 | 611 | 0.66 | 0.47 |
| Crawl Own Lane | 1.00 | 1.00 | 0.755 | 2,028 | 510 | 0.56 | 0.39 |
| Crawl Central | 1.00 | 1.00 | 1.000 | 1,286 | 336 | 0.35 | 0.26 |

Element Messages:

Element Result: Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted

Decreasing: -1 - Unrestricted

Bridge Warnings: An off-highway bypass exists: Local roads

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|----------------------------------|----------------|
| 1N | 448 | 1.930 | PUHINUI STREAM BRIDGE No.1 (SH1) | 1 - Increasing |

Width of Carriageway: 7.92 Speed Limit: 0
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
Element Name: PSC I-Beams

Element Direction: INCREASING (Relevant to Increasing Travel)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 1.460 | 1.800 | 18.290 | 6,049 | 0 |

| | | | |
|-----------------------|----------|--------|----------|
| KBASIC: | 1.655 | | |
| Basic Vehicle Moment: | 1,240.35 | Mpost: | 1,344.30 |
| Basic Vehicle Shear: | 329.52 | Spost: | 335.06 |

Element Analysis Direction: INCREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.39 | 1.43 | 1.393 | 4,279 | 1,123 | 0.71 | 0.00 |
| 50 km/h Own Lane | 1.27 | 1.30 | 1.365 | 3,979 | 1,042 | 0.66 | 0.00 |
| 20 km/h Own Lane | 1.18 | 1.20 | 1.342 | 3,765 | 981 | 0.62 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 1.289 | 3,330 | 856 | 0.55 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 2,233 | 593 | 0.37 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted

Element Type: Deck-Slab
Element Name: ALL DECK SLABS

Element Direction: INCREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.80 |

Impact Code: 2
Length: 2.17

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.678 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.617 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.569 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.474 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: **Increasing: -1 - Unrestricted**

Bridge Result: Increasing: -1 - Unrestricted

Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|----------------------------------|----------------|
| 1N | 448 | 1.930 | PUHINUI STREAM BRIDGE No.2 (SH1) | 2 - Decreasing |

Width of Carriageway: 7.92
Number of Lanes Loaded: 2
Restrict X:

Speed Limit: 0
Legal Loading Limit: 100
Bypass Description:

Element Analysis

Element Type: Beam
Element Name: PSC I-Beams

Element Direction: DECREASING (Relevant to Decreasing Travel)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 1.460 | 1.800 | 18.290 | 6,049 | 0 |

| | | | |
|-----------------------|----------|--------|----------|
| KBASIC: | 1.655 | | |
| Basic Vehicle Moment: | 1,240.35 | Mpost: | 1,344.30 |
| Basic Vehicle Shear: | 329.52 | Spost: | 335.06 |

Element Analysis Direction: DECREASING

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.39 | 1.43 | 1.393 | 4,279 | 1,123 | 0.71 | 0.00 |
| 50 km/h Own Lane | 1.27 | 1.30 | 1.365 | 3,979 | 1,042 | 0.66 | 0.00 |
| 20 km/h Own Lane | 1.18 | 1.20 | 1.342 | 3,765 | 981 | 0.62 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 1.289 | 3,330 | 856 | 0.55 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 2,233 | 593 | 0.37 | 0.00 |

Element Messages:

Element Result: Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
Element Name: ALL DECK SLABS

Element Direction: DECREASING (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.80 |

Impact Code: 2
Length: 2.17

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.678 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.617 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.569 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.474 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: **Decreasing: -1 - Unrestricted**

Bridge Result: Decreasing: -1 - Unrestricted

Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|---------------------------------|-------------|
| HILL RD | 448 | 3.080 | HILL ROAD UNDERPASS (OVER SH1N) | 3 - Two-way |

Width of Carriageway: 7.32 Speed Limit: 50
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
Element Name: LONG BEAMS SPAN 2

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|--------|------|
| 3 | 1.420 | 1.800 | 3.962 | 13,694 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.852 | | |
| Basic Vehicle Moment: | 116.43 | Mpost: | 154.11 |
| Basic Vehicle Shear: | 137.55 | Spost: | 155.58 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 1.084 | 347 | 382 | 0.03 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 1.026 | 313 | 343 | 0.02 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 0.977 | 287 | 313 | 0.02 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 0.871 | 236 | 255 | 0.02 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 210 | 248 | 0.02 | 0.00 |

Element Messages:

Element Result: **Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted**

Element Type: Beam
Element Name: LONG BEAMS SPANS 1 AND 3

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 1.390 | 1.800 | 17.069 | 6,264 | 0 |

| | | | |
|-----------------------|----------|--------|----------|
| KBASIC: | 1.666 | | |
| Basic Vehicle Moment: | 1,128.68 | Mpost: | 1,211.64 |

| | | | |
|----------------------|--------|--------|--------|
| Basic Vehicle Shear: | 315.08 | Spost: | 325.38 |
|----------------------|--------|--------|--------|

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.40 | 1.43 | 1.329 | 3,710 | 1,031 | 0.59 | 0.00 |
| 50 km/h Own Lane | 1.27 | 1.30 | 1.303 | 3,449 | 957 | 0.55 | 0.00 |
| 20 km/h Own Lane | 1.18 | 1.20 | 1.281 | 3,261 | 901 | 0.52 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 1.230 | 2,878 | 788 | 0.46 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 1.800 | 2,032 | 567 | 0.32 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: ALL DECK SLABS

Element Direction: BOTH (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.00 |

Impact Code: 2
 Length: 6.12

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 1.221 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 1.110 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 1.025 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.854 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted
 Decreasing: -1 - Unrestricted

Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|-------------------------------|-------------|
| OB2B | 0 | 1.250 | TAMAKI DRIVE OVER RAIL BRIDGE | 3 - Two-way |

Width of Carriageway: 22.80 Speed Limit: -1
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description: Off-Highway Bypass

Element Analysis

Element Type: Beam Element Direction: BOTH (Relevant to Both Directions)
Element Name: Pre-stressed I-Beams with composite deck

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|--------|------|
| 3 | 3.380 | 3.600 | 20.400 | 20,720 | 0 |

| | | | |
|-----------------------|----------|--------|----------|
| KBASIC: | 1.637 | | |
| Basic Vehicle Moment: | 1,490.85 | Mpost: | 1,581.53 |
| Basic Vehicle Shear: | 356.13 | Spost: | 351.05 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.38 | 1.43 | 3.106 | 11,316 | 2,672 | 0.55 | 0.00 |
| 50 km/h Own Lane | 1.26 | 1.30 | 2.988 | 10,323 | 2,432 | 0.50 | 0.00 |
| 20 km/h Own Lane | 1.17 | 1.20 | 2.899 | 9,645 | 2,256 | 0.47 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 2.696 | 8,284 | 1,907 | 0.40 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 3.600 | 5,367 | 1,282 | 0.26 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted
Decreasing: -1 - Unrestricted

Bridge Warnings: An off-highway bypass exists: Off-Highway Bypass
Check 1 Message: OVERWEIGHT PERMITS FOR THIS BRIDGE ISSUED BY AUCKLAND TRANSPORT

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|--|-------------|
| OB2B | 0 | 3.900 | POINT RESOLUTION ESTUARY BRIDGE (HOBSON BAY) | 3 - Two-way |

Width of Carriageway: 12.20 Speed Limit: 0
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
Element Name: LONG BEAM SPAN 2

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|-------|------|
| 3 | 3.260 | 3.210 | 9.140 | 3,306 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.740 | | |
| Basic Vehicle Moment: | 405.92 | Mpost: | 431.91 |
| Basic Vehicle Shear: | 223.60 | Spost: | 245.69 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 2.938 | 2,975 | 1,661 | 0.90 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 2.816 | 2,703 | 1,511 | 0.82 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 2.713 | 2,493 | 1,395 | 0.75 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 2.477 | 2,075 | 1,162 | 0.63 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 3.210 | 1,303 | 718 | 0.39 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Beam
Element Name: LONG BEAMS SPANS 1 & 3

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|-------|------|
| 3 | 3.240 | 3.240 | 6.100 | 1,918 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.789 | | |
| Basic Vehicle Moment: | 226.58 | Mpost: | 256.18 |

| | | | |
|----------------------|--------|--------|--------|
| Basic Vehicle Shear: | 165.50 | Spost: | 191.90 |
|----------------------|--------|--------|--------|

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 2.719 | 1,577 | 1,165 | 0.82 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 2.577 | 1,419 | 1,049 | 0.74 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 2.460 | 1,299 | 961 | 0.68 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 2.200 | 1,062 | 786 | 0.55 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 3.240 | 734 | 536 | 0.38 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: SPAN 2 - SPANS 1 & 3 NOT CRITICAL

Element Direction: BOTH (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.29 |

Impact Code: 2
 Length: 9.14

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.947 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.860 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.794 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.662 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted
 Decreasing: -1 - Unrestricted

Bridge Warnings:

| Highway | Reference Stn | Displacement | Bridge Name | Direction |
|---------|---------------|--------------|-------------------------------------|-------------|
| OB2B | 0 | 5.000 | NGAPIPI ESTUARY BRIDGE (HOBSON BAY) | 3 - Two-way |

Width of Carriageway: 12.20 Speed Limit: 0
Number of Lanes Loaded: 2 Legal Loading Limit: 100
Restrict X: Bypass Description:

Element Analysis

Element Type: Beam
Element Name: LONG BEAMS SPANS 1 & 3

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|-------|-------|------|
| 3 | 3.210 | 3.210 | 9.140 | 3,420 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.740 | | |
| Basic Vehicle Moment: | 405.92 | Mpost: | 431.91 |
| Basic Vehicle Shear: | 223.60 | Spost: | 245.69 |

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 2.893 | 2,929 | 1,636 | 0.86 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 2.773 | 2,661 | 1,487 | 0.78 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 2.671 | 2,455 | 1,373 | 0.72 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 2.439 | 2,043 | 1,145 | 0.60 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 3.210 | 1,303 | 718 | 0.38 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Beam
Element Name: LONG BEAM SPAN 2

Element Direction: BOTH (Relevant to Both Directions)

| Impact Code | ESTD | E_CENTR | SPAN | MCAP | SCAP |
|-------------|-------|---------|--------|-------|------|
| 3 | 3.210 | 3.210 | 12.190 | 6,041 | 0 |

| | | | |
|-----------------------|--------|--------|--------|
| KBASIC: | 1.712 | | |
| Basic Vehicle Moment: | 683.26 | Mpost: | 716.51 |

| | | | |
|----------------------|--------|--------|--------|
| Basic Vehicle Shear: | 259.45 | Spost: | 281.53 |
|----------------------|--------|--------|--------|

Element Analysis Direction: BOTH

| Restriction Level | Impact Factors | | Eccent Factor | Total | | Fraction of Capacity | |
|-------------------|----------------|-------|---------------|--------|-------|----------------------|-------|
| | Moment | Shear | | Moment | Shear | Moment | Shear |
| Unrestricted | 1.43 | 1.43 | 2.973 | 5,033 | 1,940 | 0.83 | 0.00 |
| 50 km/h Own Lane | 1.30 | 1.30 | 2.870 | 4,603 | 1,776 | 0.76 | 0.00 |
| 20 km/h Own Lane | 1.20 | 1.20 | 2.781 | 4,272 | 1,649 | 0.71 | 0.00 |
| Crawl Own Lane | 1.00 | 1.00 | 2.575 | 3,604 | 1,393 | 0.60 | 0.00 |
| Crawl Central | 1.00 | 1.00 | 3.210 | 2,193 | 833 | 0.36 | 0.00 |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Element Type: Deck-Slab
 Element Name: SPAN 2 - SPANS 1 & 3 NOT CRITICAL

Element Direction: BOTH (Relevant to Decreasing Travel)

| | |
|------|------|
| VAI: | 1.11 |
| DCF: | 1.32 |

Impact Code: 2
 Length: 12.19

| Restriction Level | Kv | Ks | Impact Factors | DLR |
|-------------------|------|------|----------------|-------|
| Unrestricted | 1.10 | 3.00 | 1.43 | 0.925 |
| 50 km/h Own Lane | 1.00 | 3.00 | 1.30 | 0.841 |
| 20 km/h Own Lane | 1.00 | 2.00 | 1.20 | 0.776 |
| Crawl Own Lane | 1.00 | 0.00 | 1.00 | 0.647 |
| Crawl Central | 1.00 | 0.00 | | |

Element Messages:

Element Result: Increasing: -1 - Unrestricted, Decreasing: -1 - Unrestricted

Bridge Result: Increasing: -1 - Unrestricted
 Decreasing: -1 - Unrestricted

Bridge Warnings:

Element Comparison Report

Date/Time: 11 Jul 2017 10:49:52 AM

Permit application number : 88909

Schema Version:

1

Vehicle Information

Owner: Fulton Hogan Ltd (Dunedin)

| Units: | Unit Type | Registration |
|--------|-------------|--------------|
| | Prime Mover | KQM310 |
| | Trailer | 7E798 |

Max Speed: 90

Vehicle Type: HPMV

VAI: 1.11

VGI: 1.580

Gross Mass: 64.80

Number Of Axles: 9

Load Width: 2.50

Load Length: 22.53

Load Height: 3.25

| Axle No: | Axle Spacing (m): | Axle Load (t): | Axle Type: | Track Width: | Tyre Size: | Axle Index: |
|----------|-------------------|----------------|------------|--------------|------------|-------------|
| 1 | 0.000 | 5.50 | S | 1.100 | Standard | 1.08 |
| 2 | 1.990 | 5.50 | S | 1.100 | Standard | 1.08 |
| 3 | 3.100 | 8.20 | T | 1.850 | Standard | 1.11 |
| 4 | 1.370 | 8.20 | T | 1.850 | Standard | 1.11 |
| 5 | 6.630 | 8.20 | T | 1.880 | Standard | 1.11 |
| 6 | 1.310 | 8.20 | T | 1.880 | Standard | 1.11 |
| 7 | 3.210 | 7.00 | T | 1.880 | Standard | 1.11 |
| 8 | 1.270 | 7.00 | T | 1.880 | Standard | 1.11 |
| 9 | 1.280 | 7.00 | T | 1.880 | Standard | 1.11 |

Route Data

| Section: | Highway: | From RP: | From Junction: | To RP: | To Junction: |
|----------|-----------|-----------|----------------|----------|--------------|
| 1.0 | SH1N | 448/2.907 | | 431/7.92 | |
| 2.0 | EXIT438NB | 0/0.0 | EXIT438NB0 | 0/0.76 | EXIT438NB9 |
| 3.0 | EXIT438SB | 0/0.0 | EXIT438SB0 | 0/0.91 | EXIT438SB9 |
| 4.0 | OB2B | 0/0.0 | 2B0 | 0/15.0 | 2B9 |

Bridge Results

| Highway: | RP: | BSN: | Bridge Name: | Analysis Direction: | BEAM: | VBEAM: | DECK SLAB: | TIMB DECK: | TRANSOM: | INFLUENCE LINE: | Fraction of Capacity: | | Critical Restriction: | | Speed Limit: |
|---|-----------|------|--|---------------------|-------|--------|------------|------------|----------|-----------------|-----------------------|-------|-----------------------|--------------|--------------|
| | | | | | | | | | | | Moment | Shear | Code | Description | |
| 1N | 431/9.48 | 4404 | OTAHUHU CREEK CULVERT | increasing | - 1 | NME | NME | NME | NME | NME | 0.36 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | NME | NME | NME | NME | 0.36 | 0.00 | - 1 | Unrestricted | 90 |
| 1N | 431/10.53 | 4415 | TRENWITH ST OVERPASS | increasing | - 1 | NME | - 1 | NME | NME | NME | 0.66 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | - 1 | NME | NME | NME | 0.66 | 0.00 | - 1 | Unrestricted | 90 |
| 1N | 431/11.12 | 4422 | TAMAKI RIVER BRIDGE NO1 | increasing | - 1 | NME | - 1 | NME | NME | NME | 0.72 | 0.68 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | - 1 | NME | NME | NME | 0.72 | 0.68 | - 1 | Unrestricted | 90 |
| 1N | 431/14.85 | 4459 | FLATBUSH RD (TUI CASPER) PEDESTRIAN SUBWAY | decreasing | - 1 | NME | NME | NME | NME | NME | 0.34 | 0.00 | - 1 | Unrestricted | 90 |
| 1N | 431/14.85 | 4459 | FLAT BUSH PEDESTRIAN SUBWAY | increasing | - 1 | NME | NME | NME | NME | NME | 0.34 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | NME | NME | NME | NME | 0.34 | 0.00 | - 1 | Unrestricted | 90 |
| 1N | 448/0.53 | 4485 | SH1 CROSSOVER SH20 (INTERSECTION) | increasing | - 1 | NME | NME | NME | NME | NME | 0.78 | 0.56 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | NME | NME | NME | NME | 0.78 | 0.56 | - 1 | Unrestricted | 90 |
| 1N | 448/1.93 | 4500 | PUHINUI STREAM BRIDGE No.1 (SH1) | increasing | - 1 | NME | - 1 | NME | NME | NME | 0.71 | 0.00 | - 1 | Unrestricted | 90 |
| 1N | 448/1.93 | 4501 | PUHINUI STREAM BRIDGE No.2 (SH1) | decreasing | - 1 | NME | - 1 | NME | NME | NME | 0.71 | 0.00 | - 1 | Unrestricted | 90 |
| HILL RD | 448/3.08 | 4510 | HILL ROAD UNDERPASS (OVER SH1N) | increasing | - 1 | NME | - 1 | NME | NME | NME | 0.59 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | - 1 | NME | NME | NME | 0.59 | 0.00 | - 1 | Unrestricted | 90 |
| OB2B | 0/1.25 | | TAMAKI DRIVE OVER RAIL BRIDGE | increasing | - 1 | NME | NME | NME | NME | NME | 0.55 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | NME | NME | NME | NME | 0.55 | 0.00 | - 1 | Unrestricted | 90 |
| CHECK 1: OVERWEIGHT PERMITS FOR THIS BRIDGE ISSUED BY AUCKLAND TRANSPORT | | | | | | | | | | | | | | | |
| OB2B | 0/3.90 | | POINT RESOLUTION ESTUARY BRIDGE (HOBSON BAY) | increasing | - 1 | NME | - 1 | NME | NME | NME | 0.90 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | - 1 | NME | NME | NME | 0.90 | 0.00 | - 1 | Unrestricted | 90 |
| OB2B | 0/5.00 | | NGAPIPI ESTUARY BRIDGE (HOBSON BAY) | increasing | - 1 | NME | - 1 | NME | NME | NME | 0.86 | 0.00 | - 1 | Unrestricted | 90 |
| | | | | decreasing | - 1 | NME | - 1 | NME | NME | NME | 0.86 | 0.00 | - 1 | Unrestricted | 90 |

Total Checked: 12
Structures with No Restriction: 0

High Productivity Motor Vehicle Permit Application

Permit Information

| | |
|---------------------------------|---------------------------------|
| Reference No.: 170630435 | |
| Road Network: Both | Application Type: New |
| Existing Permit #: | Permit Type: Higher Mass |
| Pro-forma: Pro-forma | |

General Information

| | |
|--|---|
| Company Name: Fulton Hogan - Auckland | TSL Number: 05457 |
| Contact Person: Brett Horrobin | Depot Location: Reliable Way, Mt Wellington |
| Postal Address: Private Bag 11-900 Ellerslie | |
| Postal Code: | Applicant Email: [REDACTED] |
| Date of Application: 30/06/2017 | Date Permit Required: 17/07/2017 |
| Tel No.: [REDACTED] | Cellphone No.: [REDACTED] |
| Permit From date : | Permit To date: |
| Route From: Fulton Hogan Quarry, 546 McNicol Rd Clevedon | Route To: Fulton Hogan 85 Leon Leicester Avenue, Mt Wellington |
| Route From Postal Code: 2585 | Route To Postal Code: 1060 |
| Return Trip: Yes | |
| Route Description: Head northwest on McNicol Rd toward Quinns Rd then turn left onto Tourist Rd. Turn left onto Papakura-Clevedon Rd. Head southwest on Papakura-Clevedon Rd toward Burnside Rd then turn right onto Mullins Rd. Turn left onto Airfield Rd. Head west on Airfield Rd then at the roundabout, take the 3rd exit onto Mill Rd. At the roundabout, take the 1st exit onto Alfriston Rd/Pacific Coast Hwy. Continue to follow Pacific Coast Hwy. At the roundabout, take the 1st exit onto Hill Rd/Pacific Coast Hwy. Turn right onto Grande Vue Rd/Pacific Coast Hwy then slight right to stay on Grande Vue Rd/Pacific Coast Hwy. Merge onto State Highway 1. Take exit 438 for Urban Route 6/Mount Wellington Hwy. Turn right onto Mount Wellington Hwy/Urban Route 6. Turn left onto Penrose Rd then head west on Penrose Rd toward Ruawai Rd. Turn right onto Leonard Rd and continue straight onto Leon Leicester Ave where the destination is on the right. | |
| Comments (e.g. Previous related permit number, etc): | |

Vehicle Information

| | |
|-------------------------------------|--|
| Vehicle Type: R22T23 | # Units: 2 |
| Total Width (m): 2.50 | Total Height (m): 3.25 |
| Total Length (m): 22.53 | Width to Outside Tyres (m): 2.50 |
| Load Description: Aggregates | Total Mass Applied For (kg): 57800.00 |
| Load: Divisible | Axle Weight flexibility (AWF): Yes |
| AWF limits: HPMV | |

Unit Reg. KQM310

| | | |
|---------------------------------------|---------------------------|----------------------------|
| Reg. Number: KQM310 | GVM (kg): 27000.00 | GCM (kg): 60000.00 |
| Total Unit Mass (kg): 27000.00 | No. Of Axles: 4 | Is Prime Mover: Yes |

Axle information for unit KQM310

| Steering Axle | Axle Set | Axle Type | Tyre Size | Suspension Type | Track Outer | Mass (kg) | Max Mass (user defined kg) | Spacing from prev (m) |
|---------------|-----------------|-----------------------|-------------|---------------------------|-------------|-----------|----------------------------|-----------------------|
| Yes | (IN) Individual | (S) Single Tyred Axle | 275/70/22.5 | (L) Leaf Spring | 1.10 | 5400.00 | | 0.00 |
| Yes | (IN) Individual | (S) Single Tyred Axle | 275/70/22.5 | (L) Leaf Spring | 1.10 | 5400.00 | | 1.99 |
| No | (T) Tandem | (T) Twin Tyred Axle | 275/70/22.5 | (AD) Air Bag - Drive Axle | 1.85 | 8000.00 | | 3.10 |
| No | (T) Tandem | (T) Twin Tyred Axle | 275/70/22.5 | (AD) Air Bag - Drive Axle | 1.85 | 8000.00 | | 1.37 |

Unit Reg. 7E798

| | | |
|--------------------------------|--------------------|--------------------|
| Reg. Number: 7E798 | GVM (kg): 32000.00 | GCM (kg): 60000.00 |
| Total Unit Mass (kg): 32000.00 | No. Of Axles: 5 | Is Prime Mover: No |

Axle information for unit 7E798

| Steering Axle | Axle Set | Axle Type | Tyre Size | Suspension Type | Track Outer | Mass (kg) | Max Mass (user defined kg) | Spacing from prev (m) |
|---------------|----------------|---------------------|--------------|-----------------|-------------|-----------|----------------------------|-----------------------|
| No | (T) Tandem | (T) Twin Tyred Axle | 265/70 R19.5 | (A) Air Bag | 1.88 | 6200.00 | | 6.63 |
| No | (T) Tandem | (T) Twin Tyred Axle | 265/70 R19.5 | (A) Air Bag | 1.88 | 6200.00 | | 1.31 |
| No | (Tri) Tri-axle | (T) Twin Tyred Axle | 265/70 R19.5 | (A) Air Bag | 1.88 | 6200.00 | | 3.21 |
| No | (Tri) Tri-axle | (T) Twin Tyred Axle | 265/70 R19.5 | (A) Air Bag | 1.88 | 6200.00 | | 1.27 |
| No | (Tri) Tri-axle | (T) Twin Tyred Axle | 265/70 R19.5 | (A) Air Bag | 1.88 | 6200.00 | | 1.28 |

OPermit**Appl. No. 88909**

Company Name: Fulton Hogan Ltd (Dunedin)

BESS No.: 18 **Region:** Dunedin

Contact Person: Steve Divers **Email:** [REDACTED]

Phone Number: [REDACTED] **Fax Number:** 03 4882411

Depot Location: Dunedin **Mobile Number:** [REDACTED]

Comment: SAP Business Partner: 101003714 **Postal Address:** Private Bag 1962 DUNEDIN 9054

Application Type: HPMV

Permit Type: HPMV - Higher Mass

Load Type: Divisible

Feasibility Study: Yes

Permit From: 25/07/2017

Permit To: 25/07/2019

HVI No.: KQM310 + 7E798

Registration Nos: KQM310
7E798 **Vehicle Type:** HPMV

Gross Combined Mass from COL: 60000 **Max Speed:** 90 (km/h)

Overall Dimensions (m)

Width: 2.5

Height: 3.25

Length: 22.53

Load Description: Aggregates

Axle Weight Flexibility: None

Vehicle Design: R22T23

| Axle Position: | Type: | Axle Set: | Tyre Size: | Suspn: | Track (Out): | Track (In): | Weight: | Spacing: | Axle Index: |
|----------------|-------|-----------|------------|--------|--------------|-------------|---------|----------|-------------|
| 1 | S | TS | Standard | L | 1.1 | | 5.5 | 0.0 | 1.08 |
| 2 | S | TS | Standard | L | 1.1 | | 5.5 | 1.99 | 1.08 |
| 3 | T | T | Standard | AD | 1.85 | | 8.2 | 3.1 | 1.11 |
| 4 | T | T | Standard | AD | 1.85 | | 8.2 | 1.37 | 1.11 |
| 5 | T | T | Standard | A | 1.88 | | 8.2 | 6.63 | 1.11 |
| 6 | T | T | Standard | A | 1.88 | | 8.2 | 1.31 | 1.11 |
| 7 | T | TRI | Standard | A | 1.88 | | 7.0 | 3.21 | 1.11 |
| 8 | T | TRI | Standard | A | 1.88 | | 7.0 | 1.27 | 1.11 |
| 9 | T | TRI | Standard | A | 1.88 | | 7.0 | 1.28 | 1.11 |

Vehicle Parameters - GM: 64.80 **VAI:** 1.11 **VGI:** 1.58 **Crit. WB:** 20.16

Route Name: McNicol Road to Leon Leicester Ave **Region:** AK
Route Description: HPMV 29/07/16 Return Via Reverse Route (9 Axle Unit Only)

[Group 1: Contains 1 section]

| Highway: | From | Junc: | Ref-Stn: | Disp: | To Junc: | Ref-Stn: | Disp: |
|----------|------|-------|----------|-------|----------|----------|-------|
| SH1N | | | 448 | 2.907 | | 431 | 7.92 |

Route Section Comment: McNicol Rd (AT) - Tourist Rd (AT) - Papakura / Clevedon Rd (AT) - Mullins Rd (AT) - Airfield RD (AT) - Mill Rd (AT) - Alfriston Rd (AT) - Straford Rd (AT) - Hill Rd - Grande Vue Rd (AT) - SH1N - Exit 438 (Mt Wellington Northbound Off Ramp Exit 438)

Misc. Bridges

HILL ROAD UNDERPASS (OVER SH1N)

[Group 2: Contains 1 section]

| Highway: | From | Junc: | Ref-Stn: | Disp: | To Junc: | Ref-Stn: | Disp: |
|-----------|------|-------|------------|-------|----------|------------|-------|
| EXIT438NB | | | EXIT438NB0 | | | EXIT438NB9 | |

Route Section Comment: Mt Wellington Highway Northbound Off Ramp

Misc. Bridges

[Group 3: Contains 1 section]

| Highway: | From | Junc: | Ref-Stn: | Disp: | To Junc: | Ref-Stn: | Disp: |
|-----------|------|-------|------------|-------|----------|------------|-------|
| EXIT438SB | | | EXIT438SB0 | | | EXIT438SB9 | |

Route Section Comment: Mt Wellington Highway Southbound Off Ramp

Misc. Bridges

[Group 4: Contains 1 section]

| Highway: | From | Junc: | Ref-Stn: | Disp: | To Junc: | Ref-Stn: | Disp: |
|----------|------|-------|----------|-------|----------|----------|-------|
| OB2B | | | 2B0 | | | 2B9 | |

Route Section Comment: Mt Wellington Highway (AT) - Penrose Road (OB2B) - Leonard Road (AT) - Leon Leicester Ave (AT)

Misc. Bridges