

Piha Footpath Feasibility Study 2010							
Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate Cost	Recommendations	
Site 1 (refer to Site Plan 1) Community Centre Buildings 2 North Piha Road	170m ²	Community Centre Corner . The corner entry has limited road and pedestrian width.	1. Grass swale footpath. Includes wooden Low Level Safety Barrier to be placed at road carriageway edge for pedestrian safety.	Safety of pedestrian and traffic movement is required. Some tree removal or pruning will be required. Improved safety factor for pedestrians, stops road side parking. Can become overly wet and boggy in winter. High maintenance is required in the form of regular mowing.	\$31,000		Place Photo Of Preferred Option here
	170m ²		2. " JakMatEnviro" Honeycomb Cell Structure footpath. Placed with AP20 base course, with wooden Low Level safety barrier at road carriageway edge.	Low - medium maintenance, durable solution. Natural look for Piha environment, incorporating safety features. Gradients less than 1 in 10 must comply with WCC code CI 3.3.12.5	\$48,000		

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate	Recommendations
Site 2 Part 1 (refer to Site Plan 2) <i>Marine Parade North</i>	80m ²	High danger corner, limited pedestrian safety.	1. Installation of Timber Faced Guardrail. Includes "JakMatEnviro" Honeycomb Cell Structure footpath. Placed with AP20 base course. Existing traffic sign on corner to be relocated, in accordance with NZTA regulations, to permit pedestrians to pass.	Timber Faced Guardrail structures to be set back from carriageway edge together with relocation of sign improve pedestrian safety. Pruning will be required near corner. Low - medium maintenance, durable solution, natural look for Piha environment. Setting back footpath at the back of the timber faced guardrail may require stabilizing.	\$29,000	Place Photo Of Preferred Option here
	80m ²	High danger corner, limited pedestrian safety.	Includes installation of Timber Faced Guardrail. Existing traffic sign on corner to be relocated, in accordance with NZTA regulations, to permit pedestrians to pass.	Timber Faced Guardrail structures to be set back from carriageway edge together with relocation of sign improve pedestrian safety. Low - maintenance No path way will be provided in the option so there is limited pedestrian safety.	\$ 15,000	
Site 2 Part 2 (refer to Site Plan 2) <i>Marine Parade North</i>	300m ²	Existing safety concerns for pedestrians, vehicles park on grass berm.	1. From property numbers 178 to 186 a combination of grass pathway and roadside parking can be accommodated. Behind wooden low level safety barrier next to existing grass berm. Existing ground conditions remain.	High maintenance. Grass requires mowing and maintaining. Grass pathways can be very wet and slippery in winter. Gradients less than 1 in 10 must comply with WCC code CI 3.3.12.5	\$ 42,000	

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Site 2 Part 2 (refer to Site Plan 2) <i>Marine Parade North</i>	300m ²		2. From property numbers 178 to 186. Place Footpath Structure "JakMatEnviro" Honeycomb Cell Structure. Placed with AP20 base course. Placed on boundaries to allow for parking off road edge, behind wooden low level safety barrier	Low - medium maintenance, durable solution, natural look for Piha environment. Gradients less than 1 in 10 must comply with WCC code CI 3.3.12.5	76,000		
Site 2 Part 3 (refer to Site Plan 2) <i>Marine Parade North below property number 178 and bridge corner.</i>	20 lin m	The bridge on the corner has limited pedestrian safety.	1. Add cantilever structure to seaward side of outer side of bridge structure.	Safety factor for pedestrians and low maintenance, durable solution. High cost of engineering design and construction. Geotechnical assessment, possible investigation work and retaining wall design may be required.	\$54,000		Note : All costs exclude GST and include contingencies, professional design, supervision, P&G, and dayworks.

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate	Recommendations	
Site 4 Part 2 (refer to Site Plan 4) <i>Seaview Road North and Marine Parade South corner, property numbers Seaview Road 10 - 14, Marine Parade from 55 - 57, as shown on site plan 4.</i>	180m ²	This area has high vehicle traffic and pedestrian flows, especially in summer. The corner and Seaview Road North has limited safe walking space for pedestrian traffic. Some road side parking is available in this area between property numbers 10 – 14 and between property numbers 57 – 61.	1."JakMatEnviro" Footpath Honeycomb Cell Structure. Placed with AP20 base course between property numbers 55-57.	This option is low - medium maintenance and has durable. It will provide some safety for pedestrians with a marked pathway. If a walkway is installed too close to the edge of the embankment, safety rails/fencing may be required. This area of embankment face may need geotechnical assessment and possible investigation work and retaining wall design.	\$33,000		Place Photo Of Preferred Option here
Site 4 Part 1 (refer to Site Plan 4) <i>Bend of Seaview Road and Marine Parade North</i>	180m ²		1. Placement of a Footpath Structure JakMatEnviro Honeycomb Cell Structure. Placed with AP20 base course, on boundaries of the. Place wooden low level barriers to allow for pathway and car parking, between property numbers 10 – 14.	Low - medium maintenance, durable solution, natural look for Piha environment. Provision of car parking and pedestrian safety. Gradients less than 1 in 10 must comply with WCC code CI 3.3.12.5	\$53,000		
			2. Place wooden low level barriers to allow for pathway and car parking, between property numbers 10 – 14.	High maintenance. Grass requires mowing and maintaining. Grass pathways can be very wet and slippery in winter.	\$31,000		
Site 4 Part 3 (refer to Site Plan 4) <i>Marine Parade 61.. Open swale drain.</i>	6 lin m	This section has an open swale drain, which interfaces with the community beach regeneration program.	1.Place wooden boardwalk on top of swale drain, the walkway will interface with the community beach regeneration program.	Low maintenance durable solution natural look for Piha environment. Risk factor, if wet slippery.	\$4,000		Note : All costs exclude GST and include contingencies, professional design, supervision, P&G, and dayworks.

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate	Recommendations	
Site 5 Part 1 (refer to Site Plan5) <i>Seaview Road, property numbers 14 - 32 as shown on site plan 5. A51</i>	75m2	This area has high vehicle traffic and pedestrian flows, especially in summer. Seaview Road has limited safe walking space for pedestrian traffic. Some road side parking is available in this area,	1. A combination of footpath and road side parking can be accommodated in these areas. Place wooden low level barriers adjacent to existing road side parking. Placement of Footpath Structure JakMatEnviro Honeycomb Cell Structure. Placed with AP20 base course.	Low - medium maintenance and has durable. It will provide some safety for pedestrians. Property 21 is the library which is required to provide car parking for patrons. Proposed walking pathway spaces to be confirmed, adjacent to car parking spaces after further investigation. Gradients less than 1 in 10 must comply with WCC code CI 3.3.12.5	\$19,000		Place Photo Of Preferred Option here
			2. A combination of grassed pathway and road side parking can be accommodated in these areas. Place wooden low level barriers adjacent to existing road side parking.	Low maintenance and has durable. It will provide some safety for pedestrians. Property 21 is the library which is required to provide car parking for patrons. High maintenance. Grass requires mowing and maintaining. Grass pathways can be very wet and slippery in winter.	\$11,000		
Site 5 part 2 (refer to Site Plan 5)	180m2	Current car parking conditions remain.	1. Site 5 Part 2 area, a separate footpath would help with pedestrian safety and car parking availability. Separate Footpath Structure JakMatEnviro Honeycomb Cell Structure would allow for all weather walking pathways.	Low - medium maintenance and has durable. Provision of separate footpath increasing for pedestrians. High maintenance. Grass requires mowing and maintaining. Grass pathways can be very wet and slippery in winter. Provision of car parking and pedestrian safety. Gradients less than 1 in 10 must comply with WCC code CI 3.3.12.5	\$22,000		Note : All costs <i>exclude</i> GST and <i>include</i> contingencies, professional design, supervision, P&G, and dayworks.
			2. Existing grass area behind flax and rock boulders to divide walking path from existing car parking area.	High maintenance. Grass requires mowing and maintaining. Grass pathways can be very wet and slippery in winter.	\$2,000		

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<p>Site 6 Part 1 (refer to Site Plan 6) Seaview Road, property numbers from 74 - 96 as shown on site plan 6.</p>	30 lin m	High danger bends for pedestrians, cars currently park on limited road berm, foot traffic has limited available road side pathways. This area of Seaview Road is elevated on one side and declines on the other.	<p>1. In these areas cutting back the bush and widening the berm area will create room for a boardwalk/footpath. Extend boardwalk as a cantilever structure over steep areas. At property numbers 82-86</p> <p>Some tree removal or pruning will be required.</p> <p>This area has a combination landscape that could be remedied by different options. Not all areas along this part of the road way need extended boardwalk/cantilever structure; a more standard type of footpath could be used in some places.</p> <p>Installed with Standard Steel powder coated handrail</p>	<p>Risk factor, if wet slippery. Add nonslip surfaces to boardwalk. This will be an added cost.</p> <p>In the areas a cantilever structure is required costs will be higher.</p>	\$89,000		Place Photo Of Preferred Option here

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Site 6 Part 1 (refer to Site Plan 6) <i>Seaview Road, property numbers from 74 - 96 as shown on site plan 6.</i> <i>(contd.)</i>	30 lin m	High danger bends for pedestrians, cars currently park on limited road berm, foot traffic has limited available road side pathways. This area of Seaview Road is elevated on one side and declines on the other.	<p>2. In these areas cutting back the bush and widening the berm area will create room for a boardwalk/footpath. Extend boardwalk as a cantilever structure over steep areas. At property numbers 82-86</p> <p>Some tree removal or pruning will be required.</p> <p>This area has a combination landscape that could be remedied by different options. Not all areas along this part of the road way need extended boardwalk/ cantilever structure; a more standard type of footpath could be used in some places.</p> <p>Installed with timber handrail</p>	<p>Risk factor, if wet slippery. Add nonslip surfaces to boardwalk. This will be an added cost.</p> <p>In the areas a cantilever structure is required costs will be higher.</p>	\$67,000		
Site 6 part 2 (refer to Site Plan 6) <i>Property numbers 80 - 92 excluding property numbers 82 - 86</i>	110 lin m		<p>1. Concrete Footpath with wooden Low Level safety barrier. Place at property numbers 80 - 92 excluding property numbers 82 - 86</p>	Low maintenance durable solution.	\$54,000		

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Site 6 part 2 (refer to Site Plan 6) <i>Property numbers 80 - 92 excluding property numbers 82 – 86 (contd.)</i>	110 lin m		2. Areas with berm placement of “JakMatEnviro” Footpath Structure Honeycomb Cell Structure. Placed with AP20 base course	Low - medium maintenance, durable solution, natural look for Piha environment.	\$52,000		
Site 6 part 3 (refer to Site Plan 6) <i>Entrances to walking tracks</i>	15 lin m	Walking track entrances are hard to find and not marked clearly	At entrance point place “JakMatEnviro” Footpath Honeycomb Cell Structure. Placed with AP20 base course. Place wooden low level barriers at road edge where required.	Low - medium maintenance, durable solution, natural look for Piha environment.	\$8,500		Note : All costs exclude GST and include contingencies, professional design, supervision, P&G, and dayworks.

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Site 7, Part 1 <i>Seaview Road property numbers 101 - 138 and Piha Road property numbers 2 - 28 as shown on site plan 7.</i>	150 lin m	High danger bends for pedestrians, cars currently park on limited road berm. Foot traffic has limited available road side pathways. This area of Seaview Road and Piha Road is elevated on one side and declines on the other as the roadway flows through this area.	1. Extended boardwalk cantilever structure over steep areas.	Risk factor, if wet slippery. Add nonslip surface to boardwalk. This will be an added cost.	\$440,000	Place Photo Of Preferred Option here	
			In these areas cutting back the bush and widening the berm area creates room for a boardwalk/footpath.	Some tree removal or pruning will be required			
Site 7, Part 2 <i>Berm replacement using footpath honeycomb structures.</i>	480m ²	Existing bush walking tracks are available in these areas.	1. Pedestrian safety could be supplemented by installing footpath Structure JakMatEnviro Honeycomb Cell Structure, placed with AP20 base course.	Low -medium maintenance, durable solution, natural look for Piha environment.	\$125,000		
			2. Pedestrian safety could be supplemented by installing a concrete footpath.	Low maintenance, durable solution.	\$128,000		
							Note : All costs exclude GST and include contingencies, professional design, supervision, P&G, and dayworks.

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate	Recommendations	
Site 8, Part 1 (refer to Site Plan 8) <i>Walking tracks entrance and exit on Piha Road</i>	15 lin m	Walking tracks entrance and exits are hard to find and not marked clearly.	1. At entrance point place "JakMatEnviro" Honeycomb Cell footpath Structure. Placed with AP20 base course. Place wooden low level barriers at road edge where required.	Low - medium maintenance, durable solution, natural look for Piha environment.	\$9,000		Place Photo Of Preferred Option here
Site 8 part 2 (refer to Site Plan 8) <i>Walking track are mostly grass exiting on Piha Road</i>	250 lin m	Walking track are mostly grass and very wet and slippery in winter.	1. Place "JakMatEnviro" Honeycomb Cell Structure in track walk path areas. Placed with AP20 base course.	Low - medium maintenance, durable solution, natural look for Piha environment.	\$116,000		Note : All costs exclude GST and include contingencies, professional design, supervision, P&G, and dayworks.

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages/ Disadvantages	Estimate	Recommendations	
Site 9, Part 1 (refer to Site Plan 9) <i>Piha Road, property numbers 110 - 134, as shown on site plan 9.</i>	120 lin m	High danger bends for pedestrians, cars currently park on limited road berm. Foot traffic has limited available road side pathways. This area of Piha Road is elevated on one side and declines on the other as the roadway flows through this area. Bus stop area has limited pedestrian setdown space.	<p>1. Extend boardwalk cantilever structure over steep areas.</p> <p>In these areas cutting back the bush and widening the berm area creates room for a boardwalk/footpath. Some tree removal or pruning will be required</p> <p>This area has a combination landscape that could be remedied by different options. Not all areas along this part of the road way need extended boardwalk/ cantilever structure; a more standard type of footpath could be used in some places. Removal of large Pohutukawa tree on corner opposite property numbers 129 to place cantilever structure</p>	<p>Risk factor, if wet slippery. Add nonslip surface to boardwalk. This will be an added cost to an expensive option.</p> <p>This is a high danger area for pedestrians, however the cantilever structure will provide safety for pedestrians.</p> <p>The removal of large Pohutukawa tree on corner opposite property numbers 129 to place cantilever structure. Will require replacement tree(s) planted in this area</p>	\$361,000		Place Photo Of Preferred Option here

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Site 9, Part 2 (refer to Site Plan 9) <i>Piha Road, property numbers 110 - 134, as shown on site plan 9.</i>	300m ²		2. "JakMatEnviro" Honeycomb Cell footpath Structure, placed with AP20 base course, where terrain allows. Cantilever/boardwalk structures where applicable.	Low - medium maintenance, durable solution, natural look for Piha environment. Using a combination approach of option 1 and 2 creates a more cost effective solution and provides pedestrian safety. Cost estimates for JakMatEnviro Honeycomb Cell Structure only are shown, not combination costs.	\$78,000		
Site 9 Part 3 (refer Site Plan 9) <i>Piha Road, property numbers 110 - 134, as shown on site plan 9.</i>	300m ²		3. Wide Concrete Swale, stormwater over existing roadside drainage, with low level wooden safety barrier on road carriageway to prevent parking on swale.	Low maintenance, durable solution. Stormwater will flow in swale in rainstorm conditions. This will need geotechnical assessment and possible investigation work.	\$79,000		Note : All costs <i>exclude</i> GST and <i>include</i> contingencies, professional design, supervision, P&G, and dayworks.

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate	Recommendations	
Site 10 (refer to Site Plan 10) Corner Seaview Road and Beach Valley Road, as shown on site plan 10.	150m ²	High danger bends for pedestrians, cars currently park on limited road berm. Foot traffic has limited available road side pathways. The corner of Seaview Road and Beach Valley Road is elevated on one side and declines on the other as the road way flows through this area. There is an existing concrete footpath and steps on the carriageway edge with a rail structure. The current contour in the area of the zig zag path is very steep at a gradient of 40% (1 in 2.5).	1. Zig Zag Pathway, pedestrian safety could be increased by building bush walking tracks as shown on site plan 10 option 2. Place Footpath Structure JakMatEnviro Honeycomb Cell Structure, placed with AP20 base course. Some tree removal or pruning will be required. Wooden Low Level Safety Barrier to be placed at road carriageway edge for pedestrian safety. Safety handrails will be required in steep sections of this area.	Low - medium maintenance, durable solution, natural look for Piha environment. This option will require cut and fill of areas within the walking track. Due to existing contours the zig zag pathway is set at a gradient to comply with WCC code CI 3.3.12.5	\$96,000		Place Photo Of Preferred Option here
Site 10 (refer to Site Plan 10) Corner Seaview Road and Beach Valley Road, as shown on site plan 10. (contd.)	40 lin m		2. Stairway and Pathway, Pedestrian safety could be increased by building a bush stairway and footpath, walking tracks as shown on site plan 10 option 3. Place combination of Footpath Structure JakMatEnviro Honeycomb Cell Structure, placed with AP20 base course with staircase and landings.	This would be steep due to the elevation of the site and only suitable for able bodied people. Some tree removal or pruning will be required.	\$67,000		Note : All costs <i>exclude</i> GST and <i>include</i> contingencies, professional design, supervision, P&G, and dayworks.

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Location Identified	Estimate Quantities Required	Existing Conditions	Options	Advantages / Disadvantages	Estimate	Recommendations	
Site 12, Part 1 (refer to Site Plan 12) Corner Seaview Road and Glenesk Road, as shown on site plan 12.	60m ²	High danger corner for pedestrians, cars currently park on limited road berm in Glenesk Road. Foot traffic has limited available road side pathways. The corner of Seaview Road and Glenesk Road declines on the northern side of the roadway. Children use this roadway to travel to and from the beach.	1. Concrete footpath set back to follow the road edge in corner.	Safety of pedestrian. Low maintenance durable solution.	\$8,000		Place Photo Of Preferred Option here
	60m ²		2. Place "JakMatEnviro" Honeycomb Cell Footpath Structure, placed with AP20 base course. Set footpath back from carriageway edge for pedestrian safety.	Low maintenance durable solution natural look for Piha environment.	\$7,000		

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Site 12, Part 2 (refer to Site Plan 12) <i>Glenesk Road</i>	80 lin m	Dangerous corner for pedestrians, cars currently park on limited road berm in Glenesk Road. Foot traffic has limited available road side pathways. The bend at 17 Glenesk Road is used by children traveling to and from the beach.	1. Install Timber Faced Guardrail. No pathway is provide be hide guardrail	Timber Faced Guardrail, the safety structure to be placed at road carriageway edge for pedestrian safety. Limited safety factor for pedestrians on corner. Low - medium maintenance, durable solution, natural look for Piha environment. No footpath will be placed behind the timber faced guardrail. This is a safety factor.	\$27,000		Note : All costs <i>exclude</i> GST and <i>include</i> contingencies, professional design, supervision, P&G, and dayworks.

4 GEOTECHNICAL REVIEW

At the time of writing this report no geotechnical information has been provided to Blue Barn Consultants Ltd. This information will be required and utilised to support any planning consents and building consent applications.

A brief desktop review indicates that the project area may need geotechnical assessment.

The principal geotechnical risks associated with these construction techniques:

- Consolidation settlement associated with groundwater drawdown in both the temporary and potentially long-term cases may affect retaining wall structures, and utilities.
- Construction issues in weak materials including potential collapse of open excavations or erosion of material during thrusting/directional drilling.
- Construction issue obstructions in non engineered fill:
 - cut to fill - conservatively allow cut to waste, imported hard fill
 - typical cantilever timber retaining structures - use where possible review weak subsoils and obstructions.

To fully assess the geotechnical risks associated with each technique the following is recommended:

- Preliminary Geotechnical Appraisal (PGA) Report - A preliminary geotechnical appraisal report be prepared to inform the preliminary design. The report to include a detailed review of existing geotechnical information, a geotechnical risk register outlining the anticipated risks with each technique, and recommendations and costs for ground investigation.
- Discussions between the geotechnical engineer and the designers on preferred route for investigation.
- Geotechnical Factual Report – The PGA will inform the scope of the ground investigation and a stand-alone factual report detailing the results of the field investigations prepared.
- Geotechnical Assessment Report (GAR) – The GAR will provide detailed interpretation of the ground investigation in relation to the geotechnical risk register.

It is recommended the geotechnical risk register be updated as the project progresses and be used as a tool in discussion with designers and council to ensure the investigations are targeted appropriately.