

I449. Hingaia 1

I449.1. Precinct Description

The Hingaia 1 precinct is located approximately 2.4km west of Papakura and is located in the southern part of the Hingaia Peninsula, to the south of the existing 'Karaka Lakes' residential subdivision.

The whole of the Hingaia Peninsula was structure planned for growth in 2000-2002. However, only Stage 1A was re-zoned at that time. This precinct is to be developed to provide for a logical extension of the existing Hingaia urban area, and development in the precinct will be guided by the Hingaia 1 precinct plan.

The purpose of the Hingaia 1 precinct is to provide for comprehensive and integrated residential development on the Hingaia Peninsula, to increase the supply of housing, to facilitate the efficient use of land, and to co-ordinate the provision of infrastructure.

It is envisaged that future land use, development and subdivision consents will give effect to the key elements of the precinct plan and provide opportunities for pedestrian and roading connections into future development areas.

The zoning of land within this precinct is Residential – Mixed Housing Suburban Zone, Residential – Mixed Housing Urban Zone and Business – Neighbourhood Centre Zone.

The following overlays apply to parts of the land within this precinct:

- D9 Significant Ecological Areas Overlay
- D13 Notable Trees Overlay
- D17 Historic Heritage Overlay
- D26 National Grid Corridor Overlay

All relevant overlay, Auckland-wide and zone provisions apply in this precinct unless otherwise specified below.

I449.2. Objectives

- (1) Subdivision and development occurs in a co-ordinated way that implements the Hingaia 1 precinct plan, provides a logical extension to the existing urban environment, and provides for connections to future development on adjoining land.
- (2) Development achieves a high standard of amenity while ensuring there is a choice of living environments and affordability options.
- (3) The existing stream network as illustrated on the Hingaia 1 precinct plan is retained and enhanced.
- (4) Subdivision and development occurs in a manner that achieves the co-ordinated and timely delivery of infrastructure, including transport, wastewater, and water services either prior to or at the same time as development.

- (5) The safety of users of shared paths and dedicated cycleways is prioritised over vehicle access.
- (6) Significant adverse effects of stormwater run-off on communities, the marine receiving environment and freshwater systems are avoided to the extent practical, or otherwise mitigated using water sensitive design principles.
- (7) Subdivision and development adjoining the coast provides for enhanced amenity and avoids risks of adverse effects arising from coastal erosion.

All relevant overlay, Auckland-wide and zone objectives apply in this precinct in addition to those specified above.

I449.3. Policies

- (1) Require the structural elements of the Hingaia 1 precinct plan to be incorporated into all subdivision and development that results in urbanisation of the land.
- (2) Require the construction of new roads, as generally indicated on the Hingaia 1 precinct plan, to achieve integration with the existing urban area and to enable future connections to link into adjoining sites to ensure that an interconnected movement network can be achieved on the Hingaia Peninsula.
- (3A) Manage the adverse traffic effects of subdivision and development on the following parts of the transport network:
 - (a) The intersection of Great South Road and Park Estate Road;
 - (b) The intersection of Park Estate Road and Goodwin Drive, unless the full construction of Hinau Road and/or Ngakoro Road to collector road standard between Wawatai Drive and Park Estate Road has been completed; and
 - (c) The intersection of Park Estate Road, Clover Road and a future fourth leg.
- (3B) Avoid subdivision and development that results in an average density of more than 40 dwellings per net ha (excluding roads and open space) or a total of 2,300 dwellings south of Park Estate Road, unless all adverse effects on the transport network resulting from this density are avoided, remedied or mitigated, including through the delivery of any necessary upgrades to the transport network.
- (3) Ensure that a range of lot sizes, housing typologies and densities is enabled throughout the precinct to reflect a choice of living environments and affordability, including by enabling greater development potential for higher density residential developments and integrated residential development.

- (4) Enable a range of residential living opportunities (including a range of lot sizes) with more intensive housing encouraged in locations with close proximity to the neighbourhood centre, public transport routes or areas with high amenity (e.g. locations close to public open space).
- (5) Ensure subdivision and development, including road design, achieves a high standard of amenity, pedestrian safety and convenience, and contributes to a positive sense of place and identity.
- (6) Require subdivision and development to be staged to align with the co-ordinated provision of infrastructure, including transport, water and wastewater.
- (7) Require subdivision and development to use water sensitive design principles as the core development approach to manage stormwater run-off, water quality, and flooding and mimic the natural hydrological regime and provide baseflow to streams.
- (8) Require subdivision and development to restore and to enhance the stream network, as illustrated on the Hingaia 1 precinct plan, to achieve a natural appearance with appropriate native species and encourage restoration and enhancement of wetland areas.
- (9) Encourage walkways along stream corridors and within and around wetland areas. Where possible, walkways should integrate with existing open space areas and enable future connections to adjoining undeveloped sites.
- (10) Require the design of stormwater retention devices in public areas to be integrated with the surrounding area and to contribute to multi-use benefits for public areas. Where appropriate, the devices should be natural in appearance.
- (11) Enhance the natural character of the coast and avoid adverse effects from further coastal erosion by restricting residential density on sites directly adjacent to the coast and encouraging restoration planting with eco-sourced plants where subdivision vests esplanade reserve in the council.
- (12) Promote the development and enhancement of a high amenity urban coastal character by:
 - (a) managing the interface between open space and private allotments to minimise visual dominance effects from buildings, fences and retaining walls; and
 - (b) providing for viewshafts out to the coast along roads and open space (and from the esplanade reserve back into the development).
- (13) Restrict or manage vehicle access to and from sites adjacent to shared paths or dedicated cycleways so that:
 - (a) the location, number, and design of vehicle crossings and associated access provides for the efficient movement of users of the shared path or dedicated cycleway; and
 - (b) any adverse effect on the effective, efficient and safe operation of the shared paths or dedicated cycleways arising from vehicle access across these facilities is avoided or mitigated.

- (14) Encourage subdivision and development to contribute to a positive sense of place and identity through in-street landscape elements, including retaining existing landscape features, and maximising coastal vistas.

All relevant overlay, Auckland-wide and zone policies apply in this precinct in addition to those specified above.

I449.4. Activity Table

All relevant overlay activity tables apply unless otherwise specified below.

All other relevant Auckland-wide and zone activity tables apply unless the activity is listed in Activity Table I449.4.1 below or Activity Table I449.4.2 below.

Table I449.4.1 specifies the activity status of land use and development activities in the Hingaia 1 Precinct pursuant to sections 9 (2) and 9(3) of the Resource Management Act 1991.

Table I449.4.2 specifies the activity status of subdivision activities in the Hingaia 1 Precinct pursuant to section 11 of the Resource Management Act 1991.

A blank cell in the activity status means that the activity status (and any relevant matters of control or discretion) in the relevant overlay, Auckland-wide or zone provisions applies.

Table I449.4.1 Activity Table – Land use activities

Activity		Activity Status	Zone and Precinct Standards to be complied with
Transport			
(A1)	Construction or use of a vehicle crossing that does not comply with Standard I449.6.1.7 Vehicle access restrictions – Cycle facilities	RD	
Residential			
(A2)	Residential activities (including dwellings) not provided for below		The underlying zone standards applying to that activity; Standard I449.6.1.4 Fences and walls adjoining public places other than roads
(A2A)	Two or three dwellings on sites that adjoin the coast and/or esplanade reserve	RD	The underlying zone standards applying to that activity; Standard I449.6.1.4 Fences and walls adjoining public places other than roads
(A3)	Two or three dwellings per site where the site area per dwelling is less than 400 m ² in the Residential – Mixed Housing Suburban Zone that do not comply with Standard H4.6.8 Maximum impervious area, Standard H4.6.9 Building coverage or Standard H4.6.10 Landscaped area	RD	Standard H4.6.4 Building height; Standard H4.6.5 Height in relation to boundary; H4.6.6 Alternative height in relation to boundary; Standard H4.6.7 Yards; Standard I449.6.1.4 Fences and walls adjoining public places other than roads

(A4)	Four or more dwellings per site where the site area per dwelling is less than 400 m ² in the Residential – Mixed Housing Suburban Zone	RD	Standard H4.6.4 Building height; Standard; H4.6.5 Height in relation to boundary; H4.6.6 Alternative height in relation to boundary; Standard H4.6.7 Yards; Standard I449.6.1.4 Fences and walls adjoining public places other than roads
(A4A)	Four or more dwellings on sites that adjoin the coast and/or esplanade reserve in the Residential – Mixed Housing Suburban Zone	RD	Standard H4.6.4 Building height; Standard H4.6.5 Height in relation to boundary; H4.6.6 Alternative height in relation to boundary; Standard H4.6.7 Yards; Standard I449.6.1.4 Fences and walls adjoining public places other than roads
(A5)	One dwelling on a front site less than 400 m ² in area in the Residential – Mixed Housing Urban Zone	P	Standard H5.6.4 Building height; Standard H5.6.8 Yards; Standard H5.6.12 Outlook space; Standard H5.6.13 Daylight; Standard H5.6.14 Outdoor living space; Standard H5.6.15 Front, side and rear fences and walls; Standard H5.6.16 Minimum dwelling size; Standard I449.6.1.1 Maximum impervious areas for higher density development; Standard I449.6.1.2. Building coverage for higher density development; Standard I449.6.1.3. Landscaped area for higher density development; Standard I449.6.1.4 Fences and walls adjoining public places other than roads; Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone
(A6)	Two or three dwellings per site where the site area per dwelling is less than 400 m ² in the Residential – Mixed Housing Urban Zone that do not comply with Standard H5.6.9 Maximum impervious area, Standard H5.6.10 Building coverage or Standard H5.6.11 Landscaped area	RD	Standard H5.6.4 Building height; Standard H5.6.8 Yards; Standard I449.6.1.4 Fences and walls adjoining public places other than roads; Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone
(A7)	Four or more dwellings per site where the site area per dwelling is less than 400 m ² in the Residential – Mixed Housing Urban Zone	RD	Standard H5.6.4 Building height; Standard H5.6.8 Yards; Standard I449.6.1.4 Fences and walls adjoining public places other than roads; Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone

(A7A)	Four or more dwellings on sites that adjoin the coast and/or esplanade reserve in the Residential – Mixed Housing Urban Zone	RD	Standard H5.6.4 Building height; Standard H5.6.8 Yards; Standard I449.6.1.4 Fences and walls adjoining public places other than roads; Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone
(A8)	Integrated Residential Development in the Residential – Mixed Housing Suburban Zone	RD	Standard H4.6.4 Building height; Standard H4.6.5 Height in relation to boundary; Standard H4.6.6 Alternative height in relation to boundary; Standard H4.6.7 Yards
(A9)	Integrated Residential Development in the Residential – Mixed Housing Urban Zone	RD	Standard H5.6.4 Building height; Standard H5.6.8 Yards; Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone
Commerce			
(A10)	Show homes in a residential zone	P	Standard I449.6.1.6 Show homes
Development			
(A11)	Internal and external alterations to buildings in residential zones	The same activity status and standards as applies to the land use activity that the building is designed to accommodate	
(A12)	Accessory buildings in residential zones	The same activity status and standards as applies to the land use activity that the building is accessory to	
(A14)	New buildings and additions to buildings in the Residential – Mixed Housing Urban zone which do not comply with Standard H5.6.5 Height in relation to boundary but comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone	P	Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone Note: Compliance with Standard H5.6.5 Height in relation to boundary is not required.
(A15)	New buildings and additions to buildings in the Residential – Mixed Housing Urban zone which do not comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone but comply with Standard H5.6.6 Alternative height in relation to boundary	RD	H5.6.6 Alternative height in relation to boundary Note: Compliance with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone is not required.
(A16)	New buildings and additions to buildings in residential zones	The same activity status and standards as applies to the land use activity that the new building or addition to a building is designed to accommodate	

(A17)	Structures not defined as buildings under Chapter J in the Residential – Mixed Housing Suburban zone that are accessory to a residential activity listed as permitted or restricted discretionary activity in this activity table	P	Standard H4.6.14 Front, side and rear fences and walls; Standard I449.6.1.1 Maximum impervious areas for higher density development; Standard I449.6.1.3. Landscaped area for higher density development; Standard I449.6.1.4 Fences and walls adjoining reserves
(A18)	Structures not defined as buildings under Chapter J in the Residential – Mixed Housing Suburban zone not otherwise provided for	P	Standard H4.6.8 Maximum impervious areas; Standard H4.6.10 Landscaped area; Standard H4.6.14 Front, side and rear fences and walls; Standard I449.6.1.4 Fences and walls adjoining reserves
(A19)	Structures not defined as buildings under Chapter J in the Residential – Mixed Housing Urban zone that are accessory to a show home or a residential activity listed as permitted or restricted discretionary activity in this activity table	P	Standard H5.6.15 Front, side and rear fences and walls; Standard I449.6.1.1 Maximum impervious areas for higher density development; Standard I449.6.1.3. Landscaped area for higher density development; Standard I449.6.1.4 Fences and walls adjoining reserves
(A20)	Structures not defined as buildings under Chapter J in the Residential – Mixed Housing Urban Zone not otherwise provided for	P	Standard H5.6.9 Maximum impervious areas; Standard H5.6.11 Landscaped area; Standard H5.6.15 Front, side and rear fences and walls; Standard I449.6.1.4 Fences and walls adjoining reserves
(A21)	Structures not defined as buildings under Chapter J in the Business – Neighbourhood Centre zone	P	Standard H12.6.11 Landscaping; Standard H12.6.6. Maximum impervious area in the riparian yard; Standard I449.6.1.4 Fences and walls adjoining reserves
(A21A) [rp]	Development of new or redevelopment of existing impervious areas greater than 50 m ² within Stormwater management area control – Flow 2 complying with Standard E10.6.1 and Standard E10.6.4.1	P	

Table I449.4.2 Activity Table – Subdivision activities

Subdivision Activity		Activity Status
(A22)	Subdivision that is listed as a restricted discretionary activity in Table E38.4.1, E38.4.2, E38.4.3 or E38.4.4 and not otherwise provided for below	RD
(A23)	Vacant sites subdivision in a residential zone	RD

(A24)	Any subdivision listed in this activity table that does not comply with any of the relevant standards in I449.6.2 Subdivision standards	D
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I449.5. Notification

- (1A) Any application for resource consent for the following activities will be considered without public or limited notification or the need to obtain the written approval from affected parties:
- (a) Two or three dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Suburban zone that do not comply with Standard H4.6.8 Maximum impervious area, Standard H4.6.9 Building coverage or Standard H4.6.10 Landscaped area that comply with all of the standards listed for that activity in Table I449.4.1 Activity Table – Land use activities;
 - (b) Four or more dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Suburban zone that comply with all of the standards listed for that activity in Table I449.4.1 Activity Table – Land use activities;
 - (c) Two or three dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Urban zone that do not comply with Standard H5.6.9 Maximum impervious area, Standard H5.6.10 Building coverage or Standard H5.6.11 Landscaped area that comply with all of the standards listed for that activity in Table I449.4.1 Activity Table – Land use activities;
 - (d) Four or more dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Urban zone that comply with all of the standards listed for that activity in Table I449.4.1 Activity Table – Land use activities;
 - (e) Integrated Residential Development in the Residential – Mixed Housing Urban zone that comply with all of the standards listed for that activity in Table I449.4.1 Activity Table – Land use activities;
 - (f) Integrated Residential Development in the Residential – Mixed Housing Suburban zone that comply with all of the standards listed for that activity in Table I449.4.1 Activity Table – Land use activities; and
 - (g) New buildings and additions to buildings in the Residential – Mixed Housing Urban zone which do not comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone but comply with Standard H5.6.6 Alternative height in relation to boundary.
- (1) Any application for resource consent for an activity listed in Table I449.4.1 or Table I449.4.2 and which is not listed in I449.5(1A) above will be subject to the normal tests for notification under the relevant sections of the Resource Management Act 1991.
- (2) When deciding who is an affected person in relation to any activity for the purposes of section 95E of the Resource Management Act 1991 the council will give specific consideration to those persons listed in Rule C1.13(4).

I449.6. Standards

I449.6.1. Land use standards

- (1) All relevant overlay and Auckland-wide standards apply to the activities listed in Table I449.4.1.
- (2) Land use activities listed in Table I449.4.1 Activity Table – Land use activities must comply with the standards listed in the column in Table I449.4.1 called Standards to be complied with, including the relevant zone standards.

I449.6.1.1. Maximum impervious areas for higher density development

Purpose:

- to manage the amount of stormwater runoff generated by a development, particularly in relation to the capacity of the stormwater network and potential flood risk;
 - to support the functioning of riparian yards, lakeside yards and coastal yards and water quality and ecology;
 - to reinforce the building coverage and landscaped area standards;
 - to limit paved areas on a site to improve the site's appearance and cumulatively maintain amenity values in a neighbourhood; and
 - to provide for flexibility of built form for higher density development.
- (1) The maximum impervious area must not exceed 70 per cent of the site area.
 - (2) The maximum impervious area within a riparian yard, a lakeside yard or a coastal protection yard must not exceed 10 per cent of the riparian yard, the lakeside yard or the coastal protection yard area.

I449.6.1.2. Building coverage for higher density development

Purpose:

- in the Residential – Mixed Housing Suburban zone, to manage the extent of buildings on a site to achieve the planned suburban built character of buildings;
 - in the Residential – Mixed Housing Urban Zone, to manage the extent of buildings on a site to achieve the planned urban built character of buildings; and
 - to provide for flexibility of built form for higher density residential development.
- (1) The maximum building coverage must not exceed 50 per cent of the net site area.

I449.6.1.3. Landscaped area for higher density development

Purpose:

- in the Residential – Mixed Housing Suburban Zone, to provide for quality living environments consistent with the planned suburban built character of buildings within a generally spacious setting;
- in the Residential – Mixed Housing Urban zone, to provide for quality living environments consistent with the planned urban built character of buildings surrounded by open space;
- to maintain the landscaped character of the streetscape within the zone; and
- to provide for flexibility of built form for higher density residential development.

- (1) The minimum landscaped area must be at least 30 per cent of the net site area.
- (2) The front yard must comprise landscaped area of at least 40 per cent of the front yard.

I449.6.1.4. Fences and walls adjoining public places other than roads

Purpose: to enable fences and walls to be constructed on or adjacent to a site boundary adjoining a public place (other than roads) to be a sufficient height to:

- provide privacy for dwellings while enabling opportunities for passive surveillance of the adjoining public place; and
- minimise visual dominance effects to the adjoining public place.

- (1) Where a site has a boundary that adjoins either the marginal strip legally described as Allotment 435 Parish of Opaheke or a site that is vested in the council as a local purpose (esplanade) reserve and is adjacent to the coastal marine area, then:
 - (a) no fences or walls shall be constructed on or within 1.0 m of that boundary;
 - (b) no retaining walls shall be constructed within 1.5 m of that boundary;
 - (c) within 1.5 m of that boundary, any fences must not exceed a height, measured from the ground level at the boundary, of either:
 - (i) 1.2 m; or
 - (ii) 1.6 m, if the fence is at least 50 per cent visually open as viewed perpendicular to the boundary;
 - (d) within 1.5 m of that boundary, any fences must be a dark, recessive colour; and
 - (e) if any fence is constructed within 1.5 m of that boundary, then the area between the fence and that boundary shall be fully planted with shrubs that are maintained at a height of at least 1.0 m, except that:
 - (i) where a fence contains a gate, no planting is required between that gate and the boundary for a maximum width of 2 m.
- (2) Where a site has a boundary that adjoins a public place other than a road that Standard I449.6.1.4(1) does not apply to, then:
 - (a) on or within 1.0 m of that boundary, fences or walls or any combination of these structures (whether separate or joined together) must not exceed a height, measured from the ground level at the boundary, of either:
 - (i) 1.4 m;
 - (ii) 1.8 m for no more than 50 per cent of the length of the boundary and 1.4 m for the remainder; or
 - (iii) 1.8 m if the fence is at least 50 per cent visually open as viewed perpendicular to the boundary.

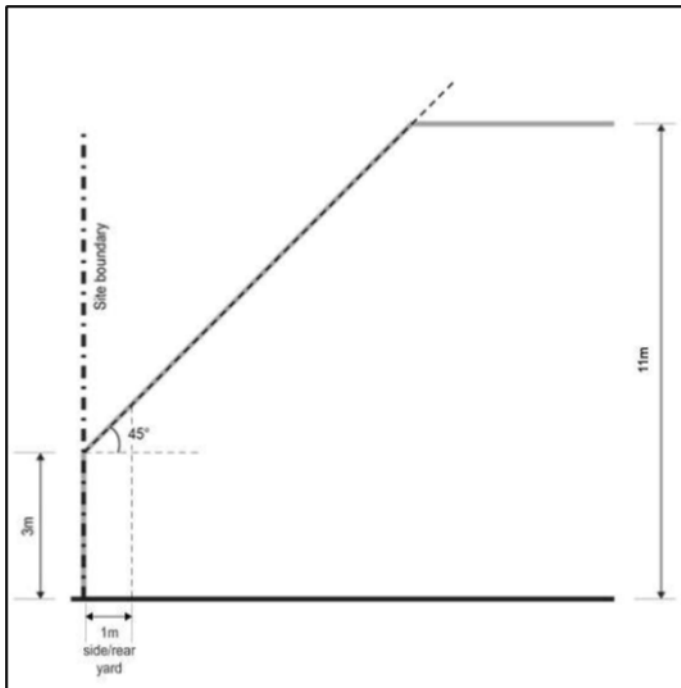
I449.6.1.5. Height in relation to boundary in the Residential – Mixed Housing Urban Zone

Purpose:

- to manage the height and bulk of buildings at boundaries to maintain a reasonable level of sunlight access and minimise adverse visual dominance effects to immediate neighbours; and
- to enable the efficient use of the site by providing design flexibility at upper floors of a building close to the street frontage, while maintaining a reasonable level of sunlight access and minimising overlooking and privacy effects to immediate neighbours.

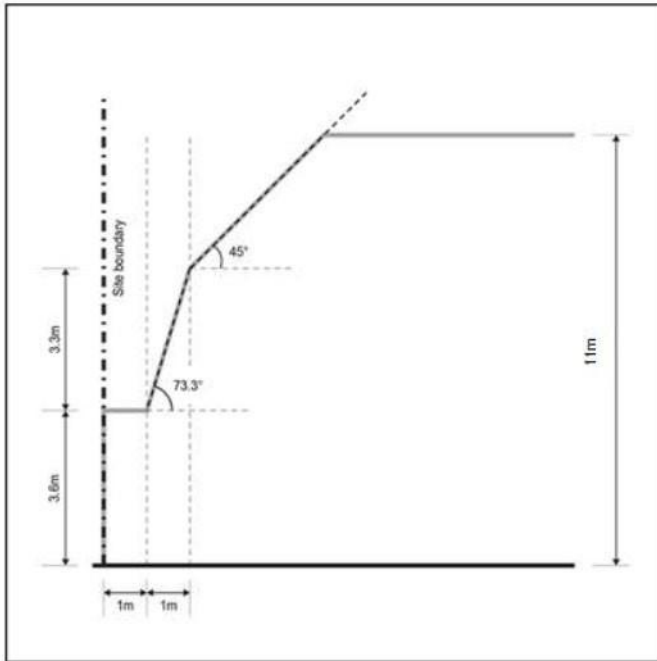
- (1) Unless otherwise specified below, buildings must not project beyond a 45 degree recession plane measured from a point 3 m vertically above ground level along side and rear boundaries, as shown in Figure I449.6.1.5.1 Height in relation to boundary below.

Figure I449.6.1.5.1 Height in relation to boundary



- (2) Standard I449.6.1.5(1) does not apply to any buildings or parts of buildings that comply with Standards I449.6.1.5(3) and I449.6.1.5(4) below.
- (3) Any buildings or parts of buildings on front sites within 20 m of the site frontage and more than 6 m from any rear boundary must not exceed a height of 3.6 m measured vertically above ground level at side boundaries. Thereafter, buildings must be set back 1 m and then 0.3 m for every additional metre in height (73.3 degrees) up to 6.9 m and then 1 m for every additional metre in height (45 degrees) as shown in Figure I449.6.1.5.2 Alternative Height in relation to boundary, below.

Figure I449.6.1.5.2 Alternative Height in relation to boundary



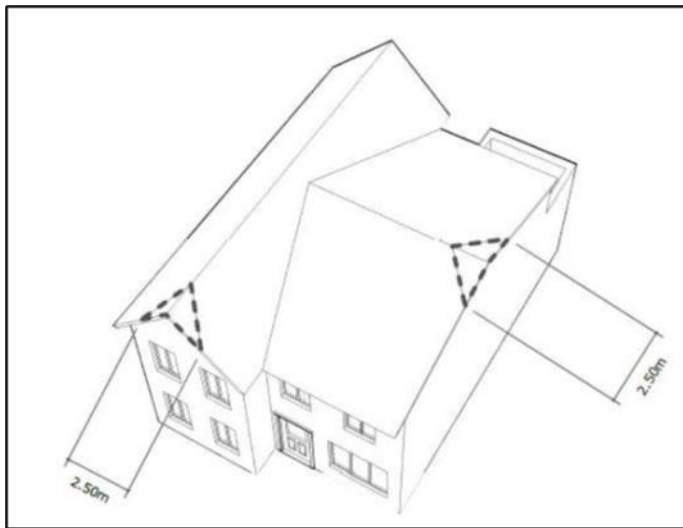
(4) Standard I449.6.1.5(3) above only applies to buildings that comply with the following:

- (a) Where the site that adjoins the side boundary that the recession plane under Standard I449.6.1.5(3) is taken from contains an existing dwelling (or a dwelling that has obtained building consent), then shading caused by those parts of the building that would not comply with Standard I449.6.1.5(1) shall not result in less than four hours of sunlight between the hours of 9am and 4 pm during the equinox (22 September) over an area of at least:
 - (i) 75% of that existing dwelling's outdoor living space, if the outdoor living space has a total area of 20 m² or greater; or
 - (ii) 100% of that existing dwelling's outdoor living space, if the outdoor living space has a total area of less than 20 m².
- (b) The front façade of each building must contain glazing that is cumulatively at least 20 percent of the area of the front façade (excluding any garage door).
- (c) The front yard must comprise landscaped area of at least 50 per cent of the front yard.
- (d) The proposed building shall provide a main entrance door that is visible from the street.
- (e) Pedestrian access between the main entrance door of the building and the street must not cross any areas for the parking or manoeuvring of vehicles.
- (f) Any garage doors facing the street must:
 - (i) Be set back at least 5 m from the front boundary; and
 - (ii) Must not project forward of the front façade of the building.

- (g) Any balconies, decks or any similar outdoor living spaces above ground floor level must not be visible from any side boundary (when viewing perpendicular to that boundary), unless the structure (including any balustrades) does not intrude the recession planes specified in Standard I449.6.1.5(1).
- (h) Those parts of the building that would not comply with Standard I449.6.1.5(1) must not include any glazing that faces a side boundary unless at least one of the following applies:
 - (i) The glazing is opaque; or
 - (ii) The window sill height is at least 1.6 m above the room's floor level.
- (5) Standards I449.6.1.5(1) and I449.6.1.5(3) above do not apply to a boundary or part of a boundary adjoining any of the following:
 - (a) a Business – Neighbourhood Centre Zone;
 - (b) sites within the Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Sports and Active Recreation Zone, Open Space – Civic Spaces Zone or the Open Space – Community Zone, sites vested in the council as reserve, or sites held by the council as a park pursuant to section 138 of the Local Government Act 2002:
 - (i) that are greater than 2,000 m² in area;
 - (ii) where that part of the site in (i) is greater than 20 metres in width when measured perpendicular to the shared boundary;
 - (iii) where an open space comprises multiple sites but has a common open space zoning, the entire zone may be treated as a single site for the purpose of applying this standard; and
 - (iv) where multiple reserves adjoin each other, the combined reserves may be treated as a single site for the purpose of applying this standard.
- (6) Unless otherwise specified below, buildings must not project beyond a 45 degree recession plane measured from a point 2.5 m vertically above ground level along any boundary adjoining any of the following sites:
 - (a) Any site in the Residential – Mixed Housing Suburban Zone; or
 - (b) Any site within the Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Sports and Active Recreation Zone, Open Space – Civic Spaces Zone or the Open Space – Community Zone not covered by Standard I449.6.1.5(5)(b) above.
- (7) Standards I449.6.1.5(1), I449.6.1.5(3) and I449.6.1.5(6) do not apply to site boundaries where there is an existing common wall between two buildings on adjacent sites or where a common wall is proposed.

- (8) Where the boundary forms part of a legal right of way, entrance strip, access site or pedestrian access way, the applicable recession plane in Standard I449.6.1.5(1), I449.6.1.5(3) or I449.6.1.5(6) applies from the farthest boundary of that legal right of way, entrance strip, access site or pedestrian access way.
- (9) A gable end, dormer or roof may project beyond the applicable recession plane in Standard I449.6.1.5(1), I449.6.1.5(3) or I449.6.1.5(6) where that portion beyond the recession plane is:
 - (a) no greater than 1.5 m² in area and no greater than 1 m in height; and
 - (b) no greater than 2.5 m cumulatively in length measured along the edge of the roof as shown in I449.6.1.5.3 Exceptions for gable ends, dormers and roof projections and dormers below.

Figure I449.6.1.5.3 Exceptions for gable ends, dormers and roof projections and dormers



- (10) No more than two gable end, dormer or roof projections enabled under I449.6.1.5(9) above are allowed for every 6 m length of site boundary.
- (11) The recession planes in Standards I449.6.1.5(1), I449.6.1.5(3) and I449.6.1.5(6) do not apply to existing or proposed internal boundaries within a site.

I449.6.1.6. Show homes

Purpose: to avoid, remedy and mitigate adverse effects on residential amenity resulting from show homes, including in relation to noise and traffic.

- (1) The show home shall comply with all standards that are applicable to a dwelling on the site.
- (2) The show home shall not operate outside the hours of 9:00 am and 5:00 pm on any day.
- (3) The show home shall cease to operate five years after approval of code compliance certificate for that show home. From that date, the show home shall be deemed to be a dwelling.

I449.6.1.7. Vehicle access restrictions – cycle facilities

- (1) In addition to the requirements of Standard E27.6.4.1, new vehicle crossings must not be constructed or used to provide vehicle access across that part of a site boundary which has frontage to an existing or proposed shared path or dedicated cycle way, including where shown on Figure I449.10.1. Hingaia 1 - Precinct Plan. For the avoidance of doubt, this relates only to allotments fronting that side of the road where the shared path or dedicated cycle way exists or is proposed.
- (2) Standard I449.6.1.7(1) above applies in any of the following circumstances:
 - (a) a new vehicle crossing is proposed;
 - (b) a new activity is established on a site;
 - (c) there is a change of type of activity; or
 - (d) a building(s) is constructed, or additions to buildings that are not permitted activities in Table H12.4.1 Activity table, except that this does not apply in the case of a dwelling where the reconstruction, alteration or addition does not increase the number of dwellings on a site.
- (3) Standards I449.6.1.7(1) and I449.6.1.7(2) above do not apply to:
 - (a) the use of a vehicle crossing that exists on 12 August 2022 that serves no more than one dwelling per site; and
 - (b) the construction or use of a vehicle crossing that has been shown on the plans of an approved subdivision consent that will serve no more than one dwelling per existing or approved site.

I449.6.2. Subdivision controls

- (1) All relevant overlay, Auckland-wide and zone standards apply to the activities listed in Table I449.4.1.
- (2) Activities listed in Table I449.4.2 must comply with the Standards I449.6.2.1 to I449.6.2.3.

I449.6.2.1. Precinct plan

- (1) Vacant sites subdivision shall provide for the following structural elements shown on Figure I449.10.1. Hingaia 1 - Precinct Plan, unless they are shown on the precinct plan to be within any proposed allotment 4 ha or greater in area:
 - (a) Collector roads;
 - (b) Shared paths or dedicated cycle ways (excluding the shared path along the Southern Motorway);
 - (c) Parks, in the locations shown on the precinct plan.

- (2) Where the structural elements shown on Figure I449.10.1. Hingaia 1 - Precinct Plan are required within any proposed allotment that is 4 ha or greater in area, it shall be demonstrated that the proposed subdivision does not preclude the provision of these elements under future subdivisions of that allotment.

I449.6.2.2. Vacant sites subdivision in residential zones

- (1) Where subdivision is of a parent site less than 1 ha, each vacant site must comply with the minimum net site area of 300 m².
- (2) Where subdivision is of a parent site 1 ha or greater in area:
 - (a) Each vacant site within residential zones must comply with the minimum net site area in Table I449.6.2.3.1 Minimum and average net site areas for vacant sites subdivisions involving parent sites of 1 hectare or greater above.

Table I449.6.2.2.1 Minimum and average net site areas for vacant sites subdivisions involving parent sites of 1 hectare or greater

Zone	Minimum Net Site Area	Minimum Average Net Site Area	Maximum Average Net Site Area
Residential – Mixed Housing Suburban Zone	240m ²	300m ²	480m ²
Residential – Mixed Housing Urban Zone	240m ²	300m ²	360m ²

- (b) The minimum average net site area calculated over the total of all sites created must comply with Table I449.6.2.2.1 Minimum and average net site areas for vacant sites subdivisions involving parent sites of 1 hectare or greater above.

When calculating the minimum average net site area for the purpose of this standard, any proposed site with a net site area greater than the maximum average net site area specified for the applicable zone in Table I449.6.2.2.1 Minimum and average net site areas for vacant sites subdivisions involving parent sites of 1 hectare or greater must be included in the averaging calculation at the figure specified as the maximum average net site area for the applicable zone.

- (3) Where 30 or more vacant sites are proposed, the total number of rear sites must not exceed five per cent of the total number of proposed sites.

I449.6.2.3. Riparian Margins

- (1) Where a permanent or intermittent stream is shown on Figure I449.10.1. Hingaia 1 - Precinct Plan within or adjoining a road or an allotment less than 4 ha in area riparian margins shall be established either side of the banks of the stream (or on one side where the opposite side adjoins an allotment 4 ha or more in area) to a minimum width of 10m measured from the bank of the stream, where the location of the bank can be physically identified by ground survey, or from the centreline of the stream where the bank cannot be physically identified by ground survey. Those margins shall be planted in native vegetation and shall be offered to the council for vesting as local purpose (drainage) reserves.

I449.7. Assessment – controlled activities

There are no controlled activities in this precinct.

I449.8. Assessment of Restricted Discretionary Activities

I449.8.1. Matters of Discretion

The council will restrict its discretion to all the following matters when assessing a restricted discretionary activity resource consent application.

(1A) For two or three dwellings on sites that adjoin the coast and/or esplanade reserve:

- (a) effects on the natural character of the coast; and
- (b) risks from coastal erosion.

(1) For four or more dwellings on sites that adjoin the coast and/or esplanade reserve in the Residential – Mixed Housing Suburban Zone; two or three dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Suburban Zone that do not comply with Standard H4.6.8 Maximum impervious area, Standard H4.6.9 Building coverage or Standard H4.6.10 Landscaped area; four or more dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Suburban Zone:

(aa) for sites that adjoin the coast and/or esplanade reserve:

- (i) effects on the natural character of the coast; and
- (ii) risks from coastal erosion;
- (a) the matters listed in H4.8.1(2)(a) and H4.8.1(2)(c); and
- (b) all of the following standards:
 - (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2 Building coverage for higher density development;
 - (iii) Standard I449.6.1.3 Landscaped area for higher density development;
 - (iv) Standard H4.6.11 Outlook space;
 - (v) Standard H4.6.12 Daylight;
 - (vi) Standard H4.6.13 Outdoor living space;
 - (vii) Standard H4.6.14 Front, side and rear fences and walls; and
 - (viii) Standard H4.6.15 Minimum dwelling size.

- (2) For four or more dwellings on sites that adjoin the coast and/or esplanade reserve in the Residential – Mixed Housing Urban Zone; two or three dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Urban Zone that do not comply with Standard H5.6.9 Maximum impervious area, Standard H5.6.10 Building coverage or Standard H5.6.11 Landscaped area; four or more dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Urban Zone:
- (aa) for sites that adjoin the coast and/or esplanade reserve:
- (i) effects on the natural character of the coast; and
 - (ii) risks from coastal erosion;
- (a) the matters listed in H5.8.1(2)(a) and H5.8.1(2)(c); and
- (b) all of the following standards:
- (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2 Building coverage for higher density development;
 - (iii) Standard I449.6.1.3 Landscaped area for higher density development;
 - (iv) Standard H5.6.12 Outlook space;
 - (v) Standard H5.6.13 Daylight;
 - (vi) Standard H5.6.14 Outdoor living space;
 - (vii) Standard H5.6.15 Front, side and rear fences and walls; and
 - (viii) Standard H5.6.16 Minimum dwelling size.
- (3) For Integrated Residential Development in the Residential – Mixed Housing Suburban Zone:
- (a) the matters listed in H4.8.1(3)(a) and H4.8.1(3)(c); and
- (b) all of the following standards:
- (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2 Building coverage for higher density development;
 - (iii) Standard I449.6.1.3 Landscaped area for higher density development;
 - (iv) Standard I449.6.1.4 Fences and walls adjoining public places other than roads;
 - (v) Standard H4.6.11 Outlook space;
 - (vi) Standard H4.6.12 Daylight;

- (vii) Standard H4.6.13 Outdoor living space;
 - (viii) Standard H4.6.14 Front, side and rear fences and walls; and
 - (ix) Standard H4.6.15 Minimum dwelling size.
- (4) For Integrated Residential Development in the Residential – Mixed Housing Urban Zone:
- (a) the matters listed in H5.8.1(3)(a) and H5.8.1(3)(c); and
 - (b) all of the following standards:
 - (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2 Building coverage for higher density development;
 - (iii) Standard I449.6.1.3 Landscaped area for higher density development;
 - (iv) Standard I449.6.1.4 Fences and walls adjoining public places other than roads;
 - (v) Standard H5.6.12 Outlook space;
 - (vi) Standard H5.6.13 Daylight;
 - (vii) Standard H5.6.14 Outdoor living space;
 - (viii) Standard H5.6.15 Front, side and rear fences and walls; and
 - (ix) Standard H5.6.16 Minimum dwelling size.
- (5) For development that does not comply with Standard I449.6.1.1 Maximum impervious areas for higher density development; Standard I449.6.1.2 Building coverage for higher density development; Standard I449.6.1.3 Landscaped area for higher density development; Standard I449.6.1.4 Fences and walls adjoining public places other than roads; Standard I449.6.1.6 Show homes:
- (a) any precinct or zone policy which is relevant to the standard;
 - (b) the purpose of the standard;
 - (c) the effects of the infringement of the standard;
 - (d) in the Residential – Mixed Housing Suburban Zone, the effects on the suburban built character of the zone;
 - (e) in the Residential – Mixed Housing Urban Zone, the effects on the urban built character of the zone;
 - (f) the effects on the amenity of neighbouring sites;
 - (g) the effects of any special or unusual characteristic of the site which is relevant to the standard;

- (h) the characteristics of the development;
 - (i) any other matters specifically listed for the standard; and
 - (j) where more than one standard will be infringed (including standards in the underlying zone), the effects of all infringements.
- (6) For new buildings and additions to buildings in the Residential – Mixed Housing Urban zone which do not comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone but comply with Standard H5.6.6 Alternative height in relation to boundary:
 - (a) the matters listed in H5.8.1(5).
- (7) for new buildings and additions to buildings in the Residential – Mixed Housing Urban zone that does not comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone where Standard H5.6.6 Alternative height in relation to boundary is either not applicable or infringed:
 - (a) any precinct or zone policy which is relevant to the standard;
 - (b) the purpose of the standard;
 - (c) the effects of the infringement of the standard;
 - (d) the effects on the urban built character of the zone;
 - (e) the effects on the amenity of neighbouring sites;
 - (f) the effects of any special or unusual characteristic of the site which is relevant to the standard;
 - (g) the characteristics of the development;
 - (h) any other matters specifically listed for the standard; and
 - (i) where other standards will be infringed (including standards in the underlying zone), the effects of all infringements.
- (8) for construction or use of a vehicle crossing that does not comply with Standard I449.6.1.7. Vehicle access restrictions – Cycle facilities:
 - (a) the matters listed in E27.8.1(12); and
 - (b) effects on cyclist safety and amenity.
- (9) for subdivision listed as a restricted discretionary activity in Activity Table I449.4.2:
 - (a) the relevant matters listed in section E38.12.1;
 - (b) the subdivision's consistency with Figure I449.10.1. Hingaia 1 - Precinct Plan;
 - (c) consistency with Standard I449.6.1.7 Vehicle access restrictions – Cycle facilities for any proposed or future vehicle crossings required to access proposed or existing allotments;

- (cc) effects on the transport network
- (d) any applicable on-site stormwater management requirements for lots less than 4 ha in area; and
- (e) the management of effects of stormwater from any proposed roads; and
- (f) enabling viewshafts out to the coast.

I449.8.2. Assessment Criteria

The council will consider the relevant assessment criteria below for restricted discretionary activities from the list below.

(1A) For two or three dwellings on sites that adjoin the coast and/or esplanade reserve

(a) Refer to Policy I449.3(11).

(1) For four or more dwellings on sites that adjoin the coast and/or esplanade reserve in the Residential – Mixed Housing Suburban zone; two or three dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Suburban Zone that do not comply with Standard H4.6.8 Maximum impervious area, Standard H4.6.9 Building coverage or Standard H4.6.10 Landscaped area; four or more dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Suburban Zone

(aa) For sites that adjoin the coast and/or esplanade reserve, refer to Policy I449.3(11).

(a) The extent to which or whether the development achieves the purpose outlined in the following standards or what alternatives are provided that result in the same or a better outcome:

- (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
- (ii) Standard I449.6.1.2 Building coverage for higher density development;
- (iii) Standard I449.6.1.3 Landscaped area for higher density development;
- (iv) Standard H4.6.11 Outlook space;
- (v) Standard H4.6.12 Daylight;
- (vi) Standard H4.6.13 Outdoor living space;
- (vii) Standard H4.6.14 Front, side and rear fences and walls; and
- (viii) Standard H4.6.15 Minimum dwelling size.

(b) The criteria listed in H4.8.2(2)(b) to H4.8.2(2)(i).

- (2) For four or more dwellings on sites that adjoin the coast and/or esplanade reserve in the Residential – Mixed Housing Urban Zone; two or three dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Urban Zone that do not comply with Standard H5.6.9 Maximum impervious area, Standard H5.6.10 Building coverage or Standard H5.6.11 Landscaped area; four or more dwellings per site where the site area per dwelling is less than 400 m² in the Residential – Mixed Housing Urban Zone:
 - (aa) For sites that adjoin the coast and/or esplanade reserve, refer to Policy I449.3(11).
 - (a) The extent to which or whether the development achieves the purpose outlined in the following standards or what alternatives are provided that result in the same or a better outcome:
 - (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2. Building coverage for higher density development;
 - (iii) Standard I449.6.1.3. Landscaped area for higher density development;
 - (iv) Standard H5.6.12. Outlook space;
 - (v) Standard H5.6.13. Daylight;
 - (vi) Standard H5.6.14. Outdoor living space;
 - (vii) Standard H5.6.15. Front, side and rear fences and walls; and
 - (viii) Standard H5.6.16. Minimum dwelling size.
 - (b) The criteria listed in H5.8.2(2)(b) to H5.8.2(2)(h).
- (3) For integrated residential development in the Residential – Mixed Housing Suburban Zone
 - (a) The extent to which or whether the development achieves the purpose outlined in the following standards or what alternatives are provided that result in the same or a better outcome:
 - (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2 Building coverage for higher density development;
 - (iii) Standard I449.6.1.3 Landscaped area for higher density development;
 - (iv) Standard I449.6.1.4 Fences and walls adjoining public places other than roads;
 - (v) Standard H4.6.11 Outlook space;
 - (vi) Standard H4.6.12 Daylight;
 - (vii) Standard H4.6.13 Outdoor living space;

- (viii) Standard H4.6.14 Front, side and rear fences and walls; and
 - (ix) Standard H4.6.15 Minimum dwelling size.
- (b) The criteria listed in H4.8.2(3)(b) to H4.8.2(3)(k).
- (4) For integrated residential development in the Residential – Mixed Housing Urban Zone
 - (a) The extent to which or whether the development achieves the purpose outlined in the following standards or what alternatives are provided that result in the same or a better outcome:
 - (i) Standard I449.6.1.1 Maximum impervious areas for higher density development;
 - (ii) Standard I449.6.1.2. Building coverage for higher density development;
 - (iii) Standard I449.6.1.3. Landscaped area for higher density development;
 - (iv) Standard I449.6.1.4 Fences and walls adjoining public places other than roads;
 - (v) Standard H5.6.12. Outlook space;
 - (vi) Standard H5.6.13. Daylight;
 - (vii) Standard H5.6.14. Outdoor living space;
 - (viii) Standard H5.6.15. Front, side and rear fences and walls; and
 - (ix) Standard H5.6.16. Minimum dwelling size.
 - (b) The criteria listed in H5.8.2(3)(b) to H3.8.2(3)(k).
- (5) For development that does not comply with Standard I449.6.1.1 Maximum impervious areas for higher density development:
 - (a) Refer Policies I449.3(3) and I449.3(4).
 - (b) In the Residential – Mixed Housing Suburban Zone, the criteria listed in H4.8.2(9).
 - (c) in the Residential – Mixed Housing Urban Zone, the criteria listed in H5.8.2(10).
- (6) For buildings that do not comply with Standard I449.6.1.2 Building coverage for higher density development:
 - (a) refer Policies I449.3(3) and I449.3(4).
 - (b) in the Residential – Mixed Housing Suburban Zone, the criteria listed in H4.8.2(10).
 - (c) in the Residential – Mixed Housing Urban Zone, the criteria listed in H5.8.2(11).
- (7) For development that does not comply with Standard I449.6.1.3 Landscaped area for higher density development:

- (a) refer Policies I449.3(3) and I449.3(4).
 - (b) in the Residential – Mixed Housing Suburban Zone, the criteria listed in H4.8.2(11).
 - (c) in the Residential – Mixed Housing Urban Zone, the criteria listed in H5.8.2(12).
- (8) For development that does not comply with Standard I449.6.1.4 Fences and walls adjoining public places other than roads:
- (a) refer Policies I449.3(5) and I449.3(12).
- (9) For new buildings and additions to buildings in the Residential – Mixed Housing Urban Zone which do not comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone but comply with Standard H5.6.6 Alternative height in relation to boundary:
- (a) the criteria listed in H5.8.2(5).
- (10) For new buildings and additions to buildings in the Residential – Mixed Housing Urban zone that does not comply with Standard I449.6.1.5 Height in relation to boundary in the Residential – Mixed Housing Urban Zone where Standard H5.6.6 Alternative height in relation to boundary is either not applicable or infringed:
- (a) refer Policies I449.3(3) and I449.3(4).
 - (b) the criteria listed in H5.8.2(6) and H5.8.2(7).
- (11) For development that does not comply with Standard I449.6.1.6 Show homes:
- (a) refer Policy H5.8.2(8).
- (12) For construction or use of a vehicle crossing that does not comply with Standard I449.6.1.7. Vehicle access restrictions – Cycle facilities:
- (a) the criteria listed in E27.8.2(11); and
 - (b) refer to Policy I449.3(13).
- (13) For subdivision listed as a restricted discretionary activity in Activity Table I449.4.2:
- (a) The relevant criteria listed in section E38.12.2.
 - (b) whether the structural elements shown in Figure I449.10.1. Hingaia 1 - Precinct Plan (including roads and stream corridors) are incorporated into the subdivision design (other than where proposed sites are 4 ha or greater in area);
 - (ba) the extent to which any roads are designed in accordance with the road construction guidelines in Appendix 1.
 - (c) whether the proposed staging of development promotes efficient development of the structural elements shown in Figure I449.10.1. Hingaia 1 - Precinct Plan.
 - (cc) whether there is a need for any of the following transport upgrades:
 - (i) The signalisation of the intersection of Great South Road and Park Estate Road;

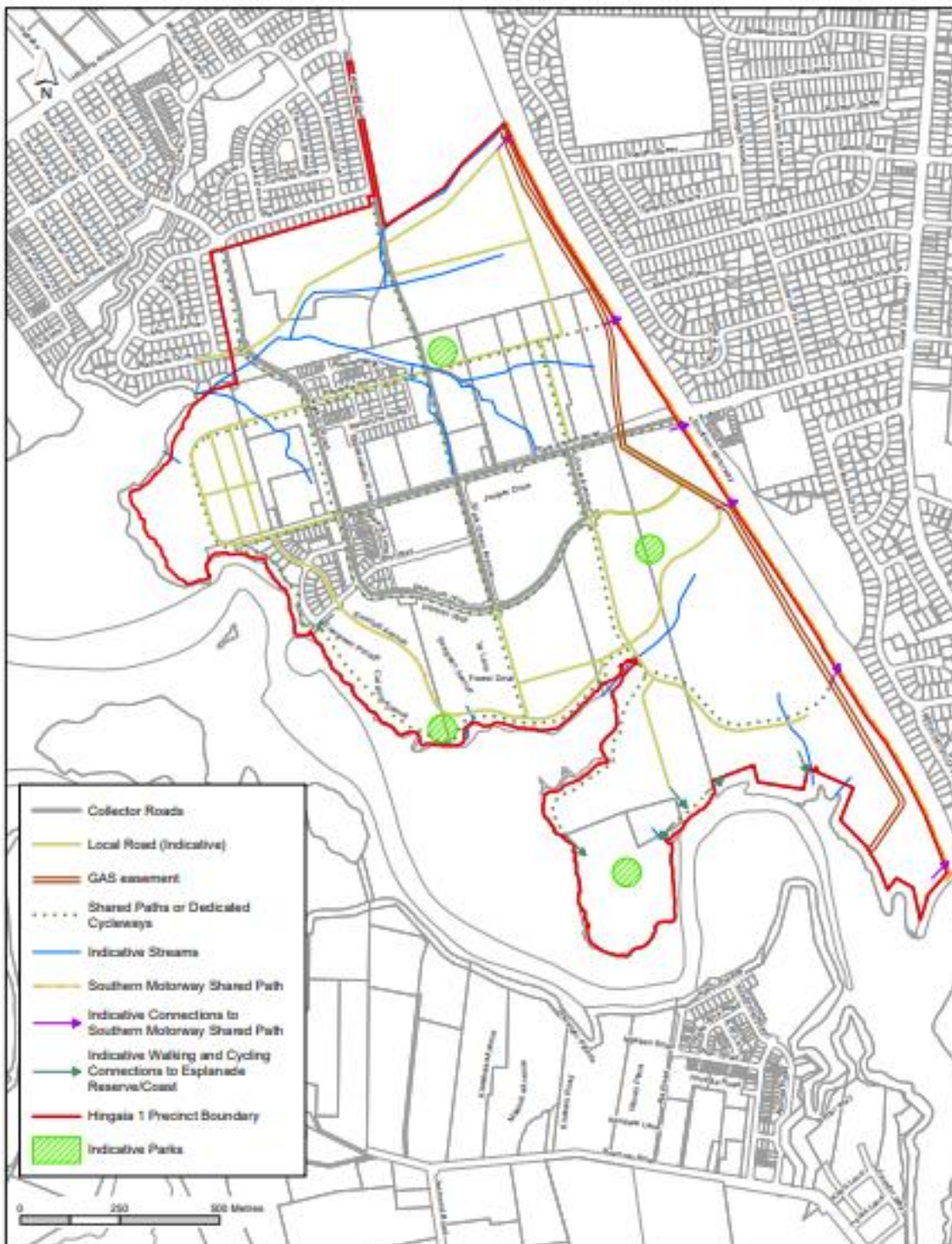
- (ii) If Hinau Road or Ngakoro Road is not yet constructed to collector road standard between Wawatai Drive and Park Estate Road, any upgrades to the intersection of Park Estate Road and Goodwin Drive;
 - (iii) The installation of a roundabout at the intersection of Park Estate Road and Clover Road when the northern fourth leg is constructed; or
 - (iv) If the development will provide for an average density of 40 dwellings per net ha (excluding roads and open space) across all of the Hingaia 1 Precinct south of Park Estate Road, any other transport upgrades to the road network resulting from this density.
- (d) whether the subdivision is consistent with the Hingaia 1 precinct objectives and policies.
- (e) whether lots adjoining an existing or proposed shared path or dedicated cycle way, including where shown on Figure I449.10.1. Hingaia 1 - Precinct Plan, are provided with access from an alternative road so that infringement of Standard I449.6.1.7 Vehicle access restrictions – Cycle facilities (including future infringements by land use activities on the proposed allotments) can be avoided or minimised.
- (f) whether on-going compliance with the on-site stormwater management requirements contained in any relevant approved Stormwater Management Plan will be achieved.
- (g) whether the management of stormwater runoff from any proposed road is consistent with the requirements of any relevant Stormwater Management Plan.
- (h) the extent to which viewshafts from roads and open spaces out to the coast are provided for.

I449.9. Special Information Requirements

There are no special information requirements in this section.

I449.10. Precinct Plan

Figure I449.10.1. Hingaia 1 - Precinct Plan



I449.11. Hingaia 1 Precinct – Appendix 1

This appendix sets out the guidelines for the construction of roads in the precinct but is not intended to represent the only design solution.

Table I449.11.1 Hingaia 1 Precinct road construction guidelines

Road Type/Function	Minimum* Road Reserve Width	Total Number of Lanes	Design Speed	Cycle Provisions	Pedestrian Provision	Access Restrictions	Bus Provision
Park Estate Road, Hinau Road or Ngakoro Road (Collector)	21m	2	50 km/h	Yes	Both sides	Where cycle provision is made, in accordance with Standard I449.6.1.7.	Yes
Other Collector Road	21m	2	30 km/h	Yes	Both sides		Yes
Local Road	16m	2	30 km/h	If shown on Figure I449.10.1. Hingaia 1 - Precinct Plan	Both sides		No
Park Edge Local Road	12m	2	30 km/h		Both sides, but can be provided within park rather than the road		No

* Typical minimum cross section which may need to be varied in specific locations where required to accommodate batters, structures, intersection design, significant constraints or other localised design requirements.