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s.75W ESD Report

1006537 23 – 41 Lindfield Avenue & 7,11 Havilah Lane, Lindfield



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The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.		

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Executive Summary

The proposed residential and retail development at 23 – 41 Lindfield Avenue, & 7, 11 Havilah Lane, Lindfield has committed to a high level of environmental performance.

This report summarises assesses the proposed Environmentally Sustainable Development (ESD) strategy for the site according to three sustainability tools which regulate residential development in NSW, namely;

- BASIX, a planning tool for residential development which calculates energy and water efficiency and sets minimum thermal performance requirements;
- NatHERS, which determines thermal performance of apartments;
- SEPP 65; the State Environmental Planning Policy regulating the design quality of residential flat development in terms of solar access and natural ventilation.

A separate ESD strategy has been developed for the retail component of the development, in coordination with the retail tenant IGA. This includes compliance under BCA Section J1 Building Fabric and J2 Glazing, as well as best practice ESD strategies for retail fitouts.

The following tables identify the compliance of the development with these tools;

Residential

BASIX and NatHERS targets;

Environmental Impact Category	NSW BASIX Minimum Target	% Achieved
Water Savings	40%	40%
Energy Savings	20%	20%
Thermal Comfort (NatHERs)	Pass	Pass

SEPP65 targets;

SEPP 65 Rule of Thumb	SEPP 65 target	% Achieved
Living rooms and private open spaces should receive a minimum of 2 hours direct sunlight between 9am-3pm in mid-winter, for at least 70% of apartments.	70%	Varies according to calculation
Maximum number of southerly single-aspect apartments is 10%	10%	0%
60% of units should be naturally cross-ventilated	60%	55%

Retail

The minimum thermal performance requirements to meet BCA Section J1 Fabric and J2 Glazing requirements are summarised in Section 4 of this report.

The retail development is committed to exceeding minimum requirements through implementation of a number of best practice initiatives including but not limited to low-flow water-efficient toilets and tap fittings, energy efficient lighting and controls and waste minimisation in construction and operation.

1. Introduction

This ESD report has been prepared to accompany an application to modify the Minister for Planning & Infrastructure's approval of Project Application MP 08_0244 for the mixed use development at 41 Lindfield Avenue & 7,11 Havilah Lane, Lindfield.

The proposed modifications to the development comprise the integration of Lot D in DP 347906 and Lot 4 in DP 713505 (39 and 41 Lindfield Avenue) into the development site and resulting amendments to the design of the mixed use development. Accordingly the modified description of development is summarised as follows:

- demolition of existing structures on the site;
- excavation of the site;
- construction of a mixed use development with a maximum gross floor area (GFA) of 15,487m², comprising:
 - 2,720m² GFA retail floorspace at ground floor within a single storey retail podium;
 - 140 residential apartments in two (2) towers above the retail podium;
 - Four (4) levels of parking for 241 vehicles;
 - 898m² of communal open space at podium level between the two towers;
 - associated landscaping, servicing and infrastructure; and
 - fit-out and use of the proposed major retail tenancy as a supermarket.
- FSR at 3.90:1 (0.68:1 retail and 3.22:1 residential).

NSW regulation requires the residential class 2 portion of 23-41 Lindfield Ave to be assessed under the following two tools;

- BASIX (including NatHERs for thermal performance)
- SEPP65

In addition, the retail development must comply with the fabric and glazing requirements of BCA Section J1 and J2 respectively.

This report details the NSW regulatory requirements of BASIX, SEPP65 and BCA Section J1 and J2 for the development and the strategies employed to achieve (and in some cases exceed) compliance.

1.1 BASIX Targets

41 Lindfield Avenue & 7,11 Havilah Lane, Lindfield is located in NatHERs climate zone 56 and is required by NSW regulation to achieve the following BASIX targets for energy, water and thermal comfort;

Environmental Impact Category	NSW BASIX Minimum Target
Water Savings	40%
Energy Savings	20%
Thermal Comfort	Pass

Energy and water targets represent a percentage saving compared to a NSW average benchmark. Thermal comfort targets are a pass/fail measure and are assessed using second generation NatHERs approved thermal modelling software to estimate each dwellings performance against climate specific heating and cooling load limits.

1.2 SEPP 65 Rule of Thumb

In addition to BASIX, the following SEPP-65 rules of thumb are applicable to the development:

SEPP 65 Criteria	SEPP-65 Target
Living rooms and private open spaces should receive a minimum of 2 hours direct sunlight between 9am-3pm in mid-winter, for at least 70% of apartments.	70%
Maximum number of southerly single-aspect apartments is 10%	10%
60% of units should be naturally cross-ventilated	60%

Solar access modelling has been conducted to determine the direct sunlight into each apartment during the winter solstice and a cross ventilation analysis has been conducted based on the location and orientation of operable windows in each apartment.

1.3 Retail ESD Strategy

The ESD strategy for the retail component is outlined in Section 4.

2. BASIX

2.1 Water Efficiency

The BASIX water strategy for the site utilises water efficient sanitary fixtures to reduce water consumption throughout the development. The utilisation of efficient fixtures will not only reduce sanitary water consumption, but in turn also reduces the wastewater to be discharged to the sewerage system.

Further potable-water savings are achieved through the utilisation of rainwater for landscape irrigation.

Proposed strategies to achieve the BASIX water target of 40% reduction in potable water consumption are outlined in the table below:

BASIX Base Case	Water Conservation Strategies
Fixtures ¹	- Water efficient fixtures including 3-Star showerheads (<7.5L/min); 4-Star kitchen taps 5-Star bathroom taps; and 4-Star dual-flush toilets.
Appliances	4 Star WELS rated Dishwashers. - Clothes washers not specified
Common Areas	32.486kL rainwater storage for landscape irrigation and car washing bay - Fire Sprinkler test water is contained in a closed loop
BASIX Water Target	40%
BASIX Water Score	40%
Compliant?	

¹ More information on water efficient appliances can be found at www.waterrating.gov.au

2.2 Energy Efficiency

Strategies to achieve the BASIX energy target of 20% reduction in energy consumption are outlined in the following table:

BASIX Base Case	Energy Conservation Strategies
Common Areas	- Variable Speed Drive (VSD) car park ventilation with carbon monoxide sensors (supply and exhaust) - Mechanical ventilation to service/plants, switch rooms and garbage rooms (exhaust only) - Mechanical ventilation to hallways and lobbies with time clock controls. (supply only) - Fluorescent lighting with motion sensors to all common areas including (but not limited to) car park, garbage rooms, lobby/stairways, service/plants and switch rooms. - LED lighting to lift car, connected to call buttons - Residential lifts - Gearless traction with VVVF motor
Appliances	- Gas cooktop and electric oven 3 Star dishwashers 2 Star clothes dryers - No refrigerators specified
Domestic Hot Water	Central Gas-fired boiler with R1.0 pipe insulation
Air-conditioning and ventilation	1.5 Star (1-phase) heating and cooling to living rooms and bedrooms - Kitchen exhaust, individual fan ducted to facade (manual on/off switch) - Bathroom exhausts, individual fan ducted to facade (interlocked to light) - Laundry exhausts, individual fan ducted to facade (manual on/off switch)
Lighting	Dedicated LED or Fluorescent lighting throughout dwellings
BASIX Energy Target	20%
BASIX Energy Score	20%
Pass?	✓

2.3 Thermal Comfort

The thermal properties of the building fabric have been chosen to achieve thermal comfort within the dwellings for the greatest percentage of the year. In the Eastern Sydney climate zone (56) in which the building resides, consideration must be given to reducing both heating and cooling loads to ensure thermal comfort in summer and winter months.

The table below identifies the fabric and thermal properties of the building elements modelled in the NatHERs assessment to achieve the thermal comfort targets specified by BASIX.

Building Envelope Requirements	
Construction & shading	As indicated on the architectural drawings
External Wall	200mm Concrete + R1.0 insulation + plasterboard
Internal Walls	- Plasterboard on Stud (internal apartment) - ACC + plasterboard (party walls)
Roof	200mm Concrete + R3.0 insulation + plasterboard ceiling 200mm Concrete + R1.0 + plasterboard ceiling (below balcony)
Floor	200mm Concrete slab + carpet/tile
Glazing	- single low-e: U 4.75 SHGC 0.45* - Skylight : U 6.35 SHGC 0.77*
Ceiling penetrations	- All exhaust fans sealed - Rated without vented downlights
BASIX Target	Average Thermal Load: Heating 51MJ/m ² Cooling 45MJ/m ²
Lindfield Score	Average Thermal Load: Heating 30.1MJ/m ² Cooling 29.0MJ/m ²
Compliant?	✓

* All U-values and SHGC values are based on AFRC figures and are figures for total glazing including frames.

3. SEPP 65

SEPP 65 planning guidelines apply to the development and set targets for cross ventilation and solar access in new multi-unit residential developments.

The SEPP-65 criteria are:

- Living rooms and private open spaces should receive a minimum of 2 hours direct sunlight between 9am-3pm in mid-winter, for at least 70% of apartments.
- Maximum number of southerly single-aspect apartments is 10%
- 60% of units should be naturally cross-ventilated with recommended maximum building depth: 10-18m (unless natural ventilation can be otherwise demonstrated)

3.1 Solar Access

The solar access requirements are:

- Living rooms and private open spaces should receive a minimum of 2 hours direct sunlight between 9am-3pm in mid-winter, for at least 70% of apartments.

Typical floors have been modelled to assess solar access into each apartment. The effect of the proposed development at 43-47 Lindfield Ave has also been considered. When modelled to include the current neighbouring properties 76 (54%) apartments achieve 2 hours of solar access to living rooms and/or private open spaces. The proposed neighbouring development at 43-47 Lindfield Ave will affect the solar access amenity into 4 dwellings, hence a total of 72 (51%) of apartments will achieve the 2 hour solar access requirement.

A full list of compliant dwellings that receive solar access into the living rooms, private open spaces and the effects of the proposed neighbouring development can be found in Appendix A.

3.2 Southerly Aspect

The southerly aspect requirement is:

- Maximum number of southerly (SW-SE) single-aspect apartments is 10%.

Each typical floor has been assessed and it has been concluded that all apartments are considered to either be dual aspect or do not only face in a southerly direction.



3.3 Natural Ventilation

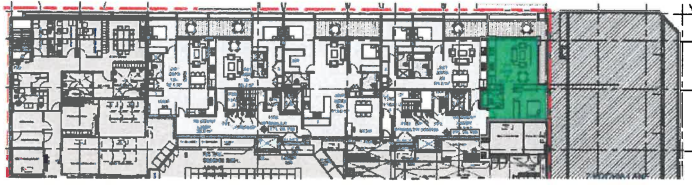
The natural ventilation requirement is:

- 60% of units should be naturally cross-ventilated with recommended maximum building depth: 10-18m

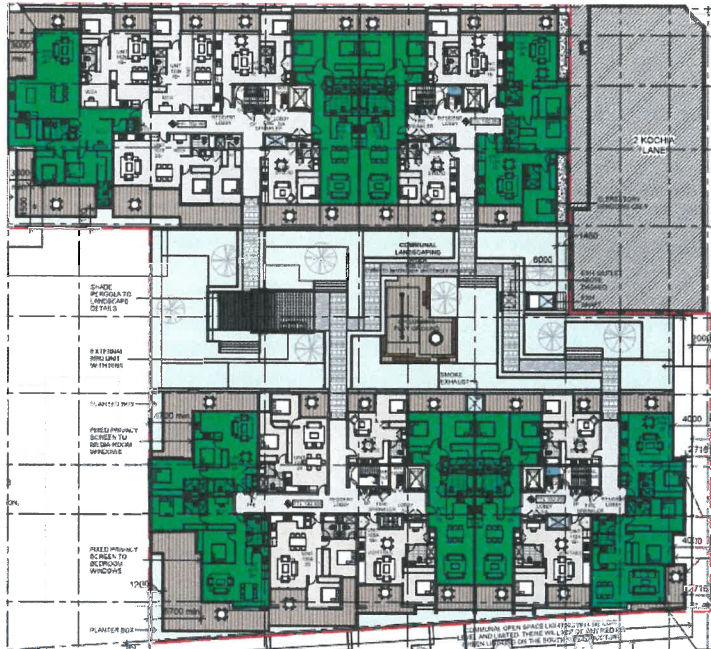
On review of each typical floor **77 (55%)** apartments comply with the cross-ventilation requirements of SEPP65. The compliant apartments are highlighted on the images below. A number of top floor apartments have been provided with operable skylights and roof clerestory windows, which enables them to achieve cross ventilation, these apartments are indicated in blue.

A full list of compliant apartments can be found in Appendix A.

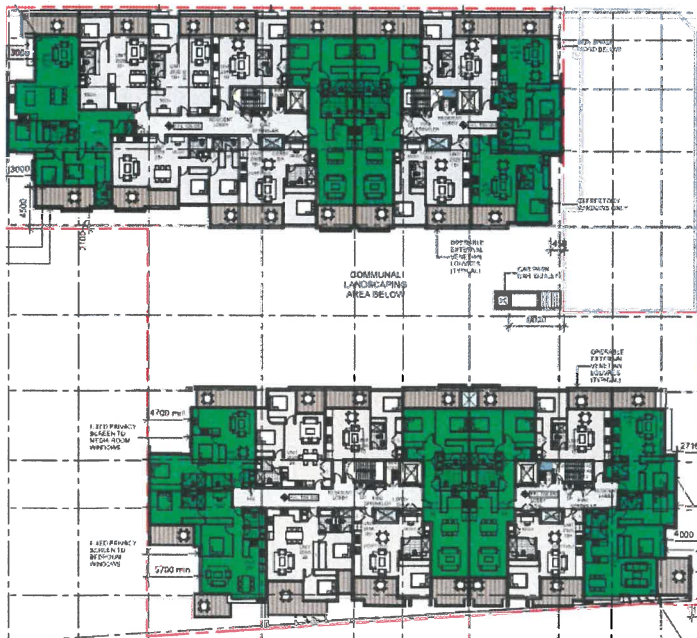
Ground



Level 01



Level 2



10th Floor Plan (Top):

- Room numbers: 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667

[illegible]

This is a detailed architectural floor plan of the 4th floor of a building, identified as the University of Illinois at Chicago. The plan shows a complex arrangement of rooms, corridors, and service areas. A large portion of the plan is shaded in green, indicating a specific area of interest or a particular type of space. Key features include:

- Rooms and Spaces:** Numerous rooms are labeled with numbers (e.g., 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, 4014, 4015, 4016, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 4027, 4028, 4029, 4030, 4031, 4032, 4033, 4034, 4035, 4036, 4037, 4038, 4039, 4040, 4041, 4042, 4043, 4044, 4045, 4046, 4047, 4048, 4049, 4050, 4051, 4052, 4053, 4054, 4055, 4056, 4057, 4058, 4059, 4060, 4061, 4062, 4063, 4064, 4065, 4066, 4067, 4068, 4069, 4070, 4071, 4072, 4073, 4074, 4075, 4076, 4077, 4078, 4079, 4080, 4081, 4082, 4083, 4084, 4085, 4086, 4087, 4088, 4089, 4090, 4091, 4092, 4093, 4094, 4095, 4096, 4097, 4098, 4099, 4100, 4101, 4102, 4103, 4104, 4105, 4106, 4107, 4108, 4109, 4110, 4111, 4112, 4113, 4114, 4115, 4116, 4117, 4118, 4119, 4120, 4121, 4122, 4123, 4124, 4125, 4126, 4127, 4128, 4129, 4130, 4131, 4132, 4133, 4134, 4135, 4136, 4137, 4138, 4139, 4140, 4141, 4142, 4143, 4144, 4145, 4146, 4147, 4148, 4149, 4150, 4151, 4152, 4153, 4154, 4155, 4156, 4157, 4158, 4159, 4160, 4161, 4162, 4163, 4164, 4165, 4166, 4167, 4168, 4169, 4170, 4171, 4172, 4173, 4174, 4175, 4176, 4177, 4178, 4179, 4180, 4181, 4182, 4183, 4184, 4185, 4186, 4187, 4188, 4189, 4190, 4191, 4192, 4193, 4194, 4195, 4196, 4197, 4198, 4199, 4200, 4201, 4202, 4203, 4204, 4205, 4206, 4207, 4208, 4209, 4210, 4211, 4212, 4213, 4214, 4215, 4216, 4217, 4218, 4219, 4220, 4221, 4222, 4223, 4224, 4225, 4226, 4227, 4228, 4229, 4230, 4231, 4232, 4233, 4234, 4235, 4236, 4237, 4238, 4239, 4240, 4241, 4242, 4243, 4244, 4245, 4246, 4247, 4248, 4249, 4250, 4251, 4252, 4253, 4254, 4255, 4256, 4257, 4258, 4259, 4260, 4261, 4262, 4263, 4264, 4265, 4266, 4267, 4268, 4269, 4270, 4271, 4272, 4273, 4274, 4275, 4276, 4277, 4278, 4279, 4280, 4281, 4282, 4283, 4284, 4285, 4286, 4287, 4288, 4289, 4290, 4291, 4292, 4293, 4294, 4295, 4296, 4297, 4298, 4299, 4300, 4301, 4302, 4303, 4304, 4305, 4306, 4307, 4308, 4309, 4310, 4311, 4312, 4313, 4314, 4315, 4316, 4317, 4318, 4319, 4320, 4321, 4322, 4323, 4324, 4325, 4326, 4327, 4328, 4329, 4330, 4331, 4332, 4333, 4334, 4335, 4336, 4337, 4338, 4339, 4340, 4341, 4342, 4343, 4344, 4345, 4346, 4347, 4348, 4349, 4350, 4351, 4352, 4353, 4354, 4355, 4356, 4357, 4358, 4359, 4360, 4361, 4362, 4363, 4364, 4365, 4366, 4367, 4368, 4369, 4370, 4371, 4372, 4373, 4374, 4375, 4376, 4377, 4378, 4379, 4380, 4381, 4382, 4383, 4384, 4385, 4386, 4387, 4388, 4389, 4390, 4391, 4392, 4393, 4394, 4395, 4396, 4397, 4398, 4399, 4400, 4401, 4402, 4403, 4404, 4405, 4406, 4407, 4408, 4409, 4410, 4411, 4412, 4413, 4414, 4415, 4416, 4417, 4418, 4419, 4420, 4421, 4422, 4423, 4424, 4425, 4426, 4427, 4428, 4429, 4430, 4431, 4432, 4433, 4434, 4435, 4436, 4437, 4438, 4439, 4440, 4441, 4442, 4443, 4444, 4445, 4446, 4447, 4448, 4449, 4450, 4451, 4452, 4453, 4454, 4455, 4456, 4457, 4458, 4459, 4460, 4461, 4462, 4463, 4464, 4465, 4466, 4467, 4468, 4469, 4470, 4471, 4472, 4473, 4474, 4475, 4476, 4477, 4478, 4479, 4480, 4481, 4482, 4483, 4484, 4485, 4486, 4487, 4488, 4489, 4490, 4491, 4492, 4493, 4494, 4495, 4496, 4497, 4498, 4499, 4500, 4501, 4502, 4503, 4504, 4505, 4506, 4507, 4508, 4509, 4510, 4511, 4512, 4513, 4514, 4515, 4516, 4517, 4518, 4519, 4520, 4521, 4522, 4523, 4524, 4525, 4526, 4527, 4528, 4529, 4530, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4538, 4539, 4540, 4541, 4542, 4543, 4544, 4545, 4546, 4547, 4548, 4549, 4550, 4551, 4552, 4553, 4554, 4555, 4556, 4557, 4558, 4559, 4560, 4561, 4562, 4563, 4564, 4565, 4566, 4567, 4568, 4569, 4570, 4571, 4572, 4573, 4574, 4575, 4576, 4577, 4578, 4579, 4580, 4581, 4582, 4583, 4584, 4585, 4586, 4587, 4588, 4589, 4590, 4591, 4592, 4593, 4594, 4595, 4596, 4597, 4598, 4599, 4600, 4601, 4602, 4603, 4604, 4605, 4606, 4607, 4608, 4609, 4610, 4611, 4612, 4613, 4614, 4615, 4616, 4617, 4618, 4619, 4620, 4621, 4622, 4623, 4624, 4625, 4626, 4627, 4628, 4629, 4630, 4631, 4632, 4633, 4634, 4635, 4636, 4637, 4638, 4639, 4640, 4641, 4642, 4643, 4644, 4645, 4646, 4647, 4648, 4649, 4650, 4651, 4652, 4653, 4654, 4655, 4656, 4657, 4658, 4659, 466

4. Retail

4.1 Building Code of Australia (BCA) Section J

The retail portion of the development is required to comply with the BCA/NCC Section J for Energy Efficiency.

J1.3 Roof & Ceiling

The roof and ceiling of retail spaces located below the exterior of the building or non-conditioned space, will achieve the following minimum total insulation levels for roof and ceiling constructions;

Roof	Minimum Total R-value Solar absorptance (0.4 - 0.6)
Below non-conditioned Space	3.7
Below External space	3.7
Below landscaped area	3.7

The values above assume that the external roof surface is of a medium colour and solar absorptance. This is considered conservative for the areas with landscaping above, as landscaping and plants absorb heat and hence reduce the heat absorbed by the upper roof surface.

J1.4 Roof Lights

A skylight is provided in the roof of the ground floor retail corridor and provides light to the lobby along with adjacent retail spaces (retail 6, 8 and major). The area of skylight is 47.6m², which is 4.7% of the area it serves.

Location	U-value	SHGC
Retail Corridor	≤ 3.4	≤ 0.34

J1.5 Walls

The deemed-to-satisfy provisions specify the minimum total insulation levels for each external wall of a conditioned space and for internal walls separating conditioned space with non-conditioned space.

The development will be designed to comply with the requirements for climate zone 5, as summarised in the below table:

Wall type	Minimum Total R-value for Wall
External envelope	2.8
Internal wall adjacent to non-conditioned space with mechanical ventilation ≤ 1.5ach	1.0
Internal wall adjacent to non-conditioned space with mechanical ventilation > 1.5ach	1.8

J1.6 Floors

The deemed-to-satisfy provisions for floors specify minimum insulation levels for the suspended floors of conditioned spaces above non-conditioned space.

The retail suspended floors above the car park and non-conditioned spaces will be designed to comply with the following thermal performance requirements for climate zone 5:

Floor type	Minimum Total R-value for Floor
Suspended floor above non-conditioned space	2.0

J2.0 Glazing

The retail glazing has been assessed to ensure that the aggregate air-conditioning value, calculated for each level and orientation does not exceed the allowance in Table J2.4a of the NCC. Based on the current design, each orientation will pass with single glazing of the thermal performance values summarised in the below table;

Level	Facade	U-value	SHGC	Glazing type
Ground (Retail)	SW	≤ 7.0	≤ 0.73	Single Clear
Ground (Retail)	SE	≤ 7.0	≤ 0.73	Single Clear

Note: All U-values and SHGC values are based on AFRC figures for total glazing including frames.

A completed glazing calculator can be found in the appendix.

4.2 Additional ESD Initiatives

The retail development is committed to exceeding minimum requirements through implementation of the following initiatives:

- Install low-flow water-efficient toilets and tap fittings;
- Install energy efficient lighting and controls;
- Submetering of major energy and water uses to monitor energy consumption and leakages;
- Separate collection and recycling of cardboard waste to minimise waste going to landfill;
- Divert from landfill (recycle and /or reuse) at least 80% of construction waste;
- Use best endeavours to select environmentally certified products and materials;
- Use best endeavours to select responsible materials such as FSC certified timbers and best practice PVC.

Appendix A. SEPP-65 Compliance

Solar Access SEPP-65 Compliant Apartments - MOD 3

Solar access modelling has been conducted to determine the direct sunlight into each apartment during the winter solstice.

The objective of SEPP-65 'Building Amenity – Daylight access' is as follows:

- To ensure that daylight access is provided to all habitable rooms and encouraged in all other areas of residential flat development'.

The 'Rules of thumb' then state:

- Living rooms and private open spaces for at least 70% of apartments should receive a minimum of 3 hours direct sunlight between 9am-3pm in mid-winter. In dense urban areas a minimum of two hours may be acceptable.

Typical floors have been modelled to assess solar access into each apartment. The results of the assessment have fluctuated for a number of reasons, outlined below:

- The interpretation of 'habitable spaces' was considered to include bedrooms in previous assessments which led to an increase in percentage compliance;
- The assessment has been revised to include only those apartments that achieve 2 hours of direct sunlight to both living rooms and private open spaces;
- The impact of the proposed adjacent building '43-47 Lindfield Ave' has been included;
- The original MOD 3 assessment erroneously showed five units as being non-compliant which should have been nominated as compliant (outlined below).

A list of compliant dwellings that receive solar access into the living rooms **and** private open spaces can be found in the table below for MOD 2, and MOD 3 with and without overshadowing from the adjacent building. Changes are highlighted in grey with comments in the last column.

Apartment Number	Excluding Effects of 43-47 Lindfield Ave			Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
101A*	Y	Y	Y	N	Y	N	No change
102A	Y	Y	Y	Y	Y	Y	Revised assessment shows this unit is compliant.
103A	Y	Y	Y	Y	Y	Y	Revised assessment shows this unit is compliant.
104A	N	Y	N	N	Y	N	No change
105A	N	N	N	N	N	N	No change
106A	N	N	N	N	N	N	No change
107A*	Y	Y	Y	N	N	N	No change

Apartment Number	Excluding Effects of 43-47 Lindfield Ave			Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
108A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
109A	N	Y	N	N	Y	N	No change
110A	N	Y	N	N	Y	N	No change
111A	N	N	N	N	N	N	No change
112A	N	N	N	N	N	N	No change
201A	Y	Y	Y	Y	Y	Y	No change
202A	Y	Y	Y	Y	Y	Y	No change
203A	Y	Y	Y	Y	Y	Y	No change
204A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
205A	N	N	N	N	N	N	No change
206A	N	N	N	N	N	N	No change
207A*	Y	Y	Y	N	N	N	No change
208A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
209A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
210A	N	Y	N	N	Y	N	Revised assessment shows these units achieve just under 2 hours in living rooms and have now been removed.
211A	N	N	N	N	N	N	No change
212A	N	N	N	N	N	N	No change
301A	Y	Y	Y	Y	Y	Y	No change
302A	Y	Y	Y	Y	Y	Y	No change
304A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
305A	N	N	N	N	N	N	No change
306A	N	N	N	N	N	N	No change
307A*	Y	Y	Y	N	N	N	No change

Apartment Number	Excluding Effects of 43-47 Lindfield Ave			Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
308A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
309A	Y	Y	Y	Y	Y	Y	Revised assessment shows this unit is compliant.
310A	Y	Y	Y	Y	Y	Y	No change
311A	N	N	N	N	N	N	No change
312A	N	N	N	N	N	N	No change
401A	Y	Y	Y	Y	Y	Y	No change
402A	Y	Y	Y	Y	Y	Y	No change
403A	Y	Y	Y	Y	Y	Y	No change
404A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
405A	N	N	N	N	N	N	No change
406A	N	N	N	N	N	N	No change
407A	Y	Y	Y	Y	Y	Y	No change
408A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
409A	Y	Y	Y	Y	Y	Y	No change
410A	Y	Y	Y	Y	Y	Y	No change
411A	N	N	N	N	N	N	No change
412A	N	N	N	N	N	N	No change
501A	Y	Y	Y	Y	Y	Y	No change
502A	Y	Y	Y	Y	Y	Y	No change
503A	Y	Y	Y	Y	Y	Y	No change
504A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
505A	N	N	N	N	N	N	No change
506A	N	N	N	N	N	N	No change
507A	Y	Y	Y	Y	Y	Y	No change
508A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.

Apartment Number	Excluding Effects of 43-47 Lindfield Ave			Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
509A	Y	Y	Y	Y	Y	Y	No change
510A	N	N	N	N	N	N	No change
511A	N	N	N	N	N	N	No change
601A	Y	Y	Y	Y	Y	Y	No change
602A	Y	Y	Y	Y	Y	Y	No change
603A	Y	Y	Y	Y	Y	Y	No change
604A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
605A	N	N	N	N	N	N	No change
606A	N	N	N	N	N	N	No change
607A	Y	Y	Y	Y	Y	Y	Reassessment shows this unit is compliant, through the introduction of clerestory windows to the living room.
608A	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
609A	Y	Y	Y	Y	Y	Y	No change
610A	N	N	N	N	N	N	No change
611A	N	N	N	N	N	N	No change
701A	Y	Y	Y	Y	Y	Y	No change
702A	Y	Y	Y	Y	Y	Y	No change
703A	Y	Y	Y	Y	Y	Y	No change
704A	Y	Y	Y	Y	Y	Y	No change
705A	Y	Y	Y	Y	Y	Y	New skylight added to living spaces.
706A	Y	Y	Y	Y	Y	Y	New skylight added to provide open space.
707A	Y	Y	Y	Y	Y	Y	New skylight added to provide open space.
708A	Y	Y	Y	Y	Y	Y	Reassessment shows this unit is compliant, through the introduction of clerestory windows to the living room.
709A	Y	Y	Y	Y	Y	Y	New skylight added to living spaces.
710A	Y	Y	Y	Y	Y	Y	No change

Apartment Number	Excluding Effects of 43-47 Lindfield Ave				Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space		Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
G01B	Y	Y	Y		Y	Y	Y	No change
G02B	Y	Y	Y		Y	Y	Y	No change
G03B	Y	Y	Y		Y	Y	Y	No change
G04B	Y	Y	Y		Y	Y	Y	No change
G05B	Y	Y	Y		Y	Y	Y	No change
101E	Y	Y	Y		Y	Y	Y	No change
102E	Y	Y	Y		Y	Y	Y	No change
103E	Y	Y	Y		Y	Y	Y	No change
104B	Y	Y	Y		Y	Y	Y	No change
105B	N	Y	N		N	Y	N	Previously included bedrooms as compliant habitable spaces.
106B	N	N	N		N	N	N	No change
107B	N	N	N		N	N	N	No change
108B	N	Y	N		N	Y	N	Previously included bedrooms as compliant habitable spaces.
109B	Y	Y	Y		Y	Y	Y	No change
110B	Y	Y	Y		Y	Y	Y	No change
111B	N	N	N		N	N	N	No change
112B	N	N	N		N	N	N	No change
201B	Y	Y	Y		Y	Y	Y	No change
202B	Y	Y	Y		Y	Y	Y	No change
203B	Y	Y	Y		Y	Y	Y	No change
204B	Y	Y	Y		Y	Y	Y	No change
205B	N	Y	N		N	Y	N	Previously included bedrooms as compliant habitable spaces.
206B	N	N	N		N	N	N	No change
207B	N	N	N		N	N	N	No change
208B	N	Y	N		N	Y	N	Previously included bedrooms as compliant habitable spaces.
209B	Y	Y	Y		Y	Y	Y	No change

Apartment Number	Excluding Effects of 43-47 Lindfield Ave			Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
210B	Y	Y	Y	Y	Y	Y	No change
211B	N	N	N	N	N	N	No change
212B	N	N	N	N	N	N	No change
301B	Y	Y	Y	Y	Y	Y	No change
302B	Y	Y	Y	Y	Y	Y	No change
303B	Y	Y	Y	Y	Y	Y	No change
304B	Y	Y	Y	Y	Y	Y	No change
305B	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
306B	N	N	N	N	N	N	No change
307B	N	N	N	N	N	N	No change
308B	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
309B	Y	Y	Y	Y	Y	Y	No change
310B	Y	Y	Y	Y	Y	Y	No change
311B	N	N	N	N	N	N	No change
312B	N	N	N	N	N	N	No change
401B	Y	Y	Y	Y	Y	Y	No change
402B	Y	Y	Y	Y	Y	Y	No change
403B	Y	Y	Y	Y	Y	Y	No change
404B	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
405B	N	N	N	N	N	N	No change
406B	N	N	N	N	N	N	No change
407B	N	Y	N	N	Y	N	Previously included bedrooms as compliant habitable spaces.
408B	Y	Y	Y	Y	Y	Y	No change
409B	N	N	N	N	N	N	No change
410B	N	N	N	N	N	N	No change
501B	Y	Y	Y	Y	Y	Y	No change

Apartment Number	Excluding Effects of 43-47 Lindfield Ave				Including Effects of 43-47 Lindfield Ave			Comment on change
	Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space		Solar Access - Living rooms	Solar Access - open space	Solar access Living room AND Open Space	
502B	Y	Y	Y		Y	Y	Y	No change
503B	Y	Y	Y		Y	Y	Y	No change
504B	Y	Y	Y		Y	Y	Y	No change
505B	Y	Y	Y		Y	Y	Y	No change
506E	Y	Y	Y		Y	Y	Y	Reassessment shows the balcony and living spaces are compliant (including the effect of the clerestory window to the living space).
507E	Y	Y	Y		Y	Y	Y	New skylight added to provide open space.
508E	Y	Y	Y		Y	Y	Y	No change
509E	Y	Y	Y		Y	Y	Y	New skylight added to provide open space.
510E	Y	Y	Y		Y	Y	Y	New skylight added to provide open space.
# units	76	100	76		72	97	72	
%	54.3%	71.4%	54.3%		51.4%	69.3%	51.4%	

Cross Ventilation SEPP-65 Compliant Apartments

Apartment Number	Building	Cross Ventilated
101A	A	Y
102A	A	N
103A	A	N
104A	A	Y
105A	A	N
106A	A	N
107A	A	Y
108A	A	Y
109A	A	N
110A	A	Y
111A	A	Y
112A	A	N
201A	A	Y
202A	A	N
203A	A	N
204A	A	Y
205A	A	N
206A	A	N
207A	A	Y
208A	A	Y
209A	A	N
210A	A	Y
211A	A	Y
212A	A	N
301A	A	Y
302A	A	N
304A	A	Y
305A	A	N
306A	A	N
307A	A	Y
308A	A	Y
309A	A	N
310A	A	Y
311A	A	Y
312A	A	N
401A	A	Y
402A	A	N
403A	A	N
404A	A	Y
405A	A	N
406A	A	N
407A	A	Y
408A	A	Y
409A	A	N
410A	A	Y
411A	A	Y
412A	A	N
501A	A	Y
502A	A	N
503A	A	N
504A	A	Y
505A	A	N
506A	A	N
507A	A	Y
508A	A	Y
509A	A	Y
510A	A	Y
511A	A	N
601A	A	Y
602A	A	N
603A	A	N
604A	A	Y

Apartment Number	Building	Cross Ventilated
605A	A	N
606A	A	N
607A	A	Y
608A	A	Y
609A	A	Y
610A	A	Y
611A	A	N
701A	A	Y
702A	A	Y
703A	A	Y
704A	A	Y
705A	A	Y
706A	A	Y
707A	A	Y
708A	A	Y
709A	A	Y
710A	A	Y
G01B	B	N
G02B	B	N
G03B	B	N
G04B	B	N
G05B	B	Y
101B	B	Y
102B	B	N
103B	B	N
104B	B	N
106B	B	N
107B	B	N
108B	B	Y
109B	B	N
110B	B	Y
111B	B	Y
112B	B	N
201B	B	Y
202B	B	N
203B	B	N
204B	B	N
205B	B	Y
206B	B	N
207B	B	N
208B	B	Y
209B	B	N
210B	B	Y
211B	B	Y
212B	B	N
301B	B	Y
302B	B	N
303B	B	N
304B	B	N
305B	B	Y
306B	B	N
307B	B	N
308B	B	Y
309B	B	N
310B	B	Y
311B	B	Y
312B	B	N
401B	B	Y
402B	B	N
403B	B	N
404B	B	Y
405B	B	N

Apartment Number	Building	Cross Ventilated
406B	B	N
407B	B	Y
408B	B	Y
409B	B	Y
410B	B	N
501B	B	Y
502B	B	Y
503B	B	Y
504B	B	Y
505B	B	Y
506B	B	Y
507B	B	Y
508B	B	Y
509B	B	Y
510B	B	Y
TOTAL Compliant		77
Total Compliant (%)		55%

Appendix B. BCA Glazing Calculator

BCA VOLUME ONE GLAZING CALCULATOR (first issued with BCA 2013) HELP

Building name/description
LINDFIELD MIXED-USE DEVELOPMENT 23-37 LINDFIELD AVE & 11 HAVILAH LA LINDFIELD NSW 2070

Application
shop display

Climate zone
5

Storey
Ground

Facade areas		N	NE	E	SE	S	SW	W	NW	Internal
Option A					262m²		226m²			
Option B										

Glazing area (A) 115m² 111m²

Number of rows preferred in table below **15** (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS										SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes	
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	PH	G (m)	Heating (S _a)	Cooling (S _c)	Area used (m²)	Element share of % of allowance used	
1	WG01 Retail 1	SW		3.60	5.70		7.0	0.73	2.800	4.300	0.88	0.70	0.92	0.86	20.52	19% of 92%	
2	WG02 Retail 2	SW		3.60	4.90		7.0	0.73	2.800	4.800	0.88	1.20	0.93	0.89	17.04	16% of 92%	
3	WG04 Entry	SW		2.00	1.30		7.0	0.73	6.000	2.900	2.07	0.90	0.87	0.84	2.80	2% of 92%	
4	WG04 Entry	SW		1.40	3.00		7.0	0.73	6.200	2.300	2.70	0.90	0.87	0.84	4.20	3% of 92%	
5	WG05 Entry	SW		2.60	2.30		7.0	0.73	6.300	3.600	1.75	1.00	0.72	0.66	5.96	5% of 92%	
6	WG06 Retail 3	SW		3.60	8.40		7.0	0.73	2.800	4.500	0.88	0.80	0.93	0.87	30.24	28% of 92%	
7	WG07 Retail 4	SW		3.60	5.90		7.0	0.73	2.800	4.200	0.87	0.80	0.92	0.86	21.24	19% of 92%	
8	WG08 Retail 4	SW		3.60	2.40		7.0	0.73	2.800	4.100	0.88	0.80	0.83	0.73	8.64	7% of 92%	
9	WG09 Retail 4	SE		3.60	8.20		7.0	0.73	2.000	4.100	0.49	0.60	0.85	0.80	20.92	26% of 89%	
10	WG09 Retail 4	SE		2.50	5.10		7.0	0.73	2.000	3.100	0.66	0.60	0.81	0.86	12.76	12% of 89%	
11	WG10 Retail 5	SE		2.80	4.40		7.0	0.73	2.000	3.900	0.61	1.10	0.84	0.90	12.52	12% of 89%	
12	WG10 Retail 5	SE		3.40	2.90		7.0	0.73	2.000	4.600	0.43	1.20	0.96	0.93	9.88	9% of 89%	
13	WG11 Entry	SE		5.80	8.70		7.0	0.73	3.400	5.800	0.58	0.80	0.70	0.82	50.48	41% of 89%	
14																	
15																	

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR
 The Glazing Calculator has been developed by the ABCB to assist in developing a better understanding of glazing energy efficiency parameters.
 While the ABCB believes that the Glazing Calculator, if used correctly, will produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all.
 Your use of the Glazing Calculator is entirely at your own risk and the ABCB accepts no liability of any kind.

If inputs are valid