

ALL DIMENSIONS TO BE VERIFIED PRIOR TO CONSTRUCTION

The undersigned has reviewed and take responsibility for these drawings and meets the requirements to be a designer.



Nicholas Nobel BCIN: 100825  
Altus Home Design BCIN: 201645



**DESIGN LOADS CRITERIA:**

This construction drawing has been designed with the following specified loads.

	Live Load	Dead Load	Total Load
Roof Load	2.8 kPa	0.7 kPa	3.5 kPa
Floor Load	1.9 kPa	0.95 kPa	2.85 kPa
Deck load	1.9 kPa	0.7 kPa	2.6 kPa

Specified Snow Load Used 1.665 kPa  $S = 0.55 \times 2.3 + 0.4 S = 1.665$

Minimum Allowable Soil Bearing Capacity to 75 kPA (10.9 P.S.I.)

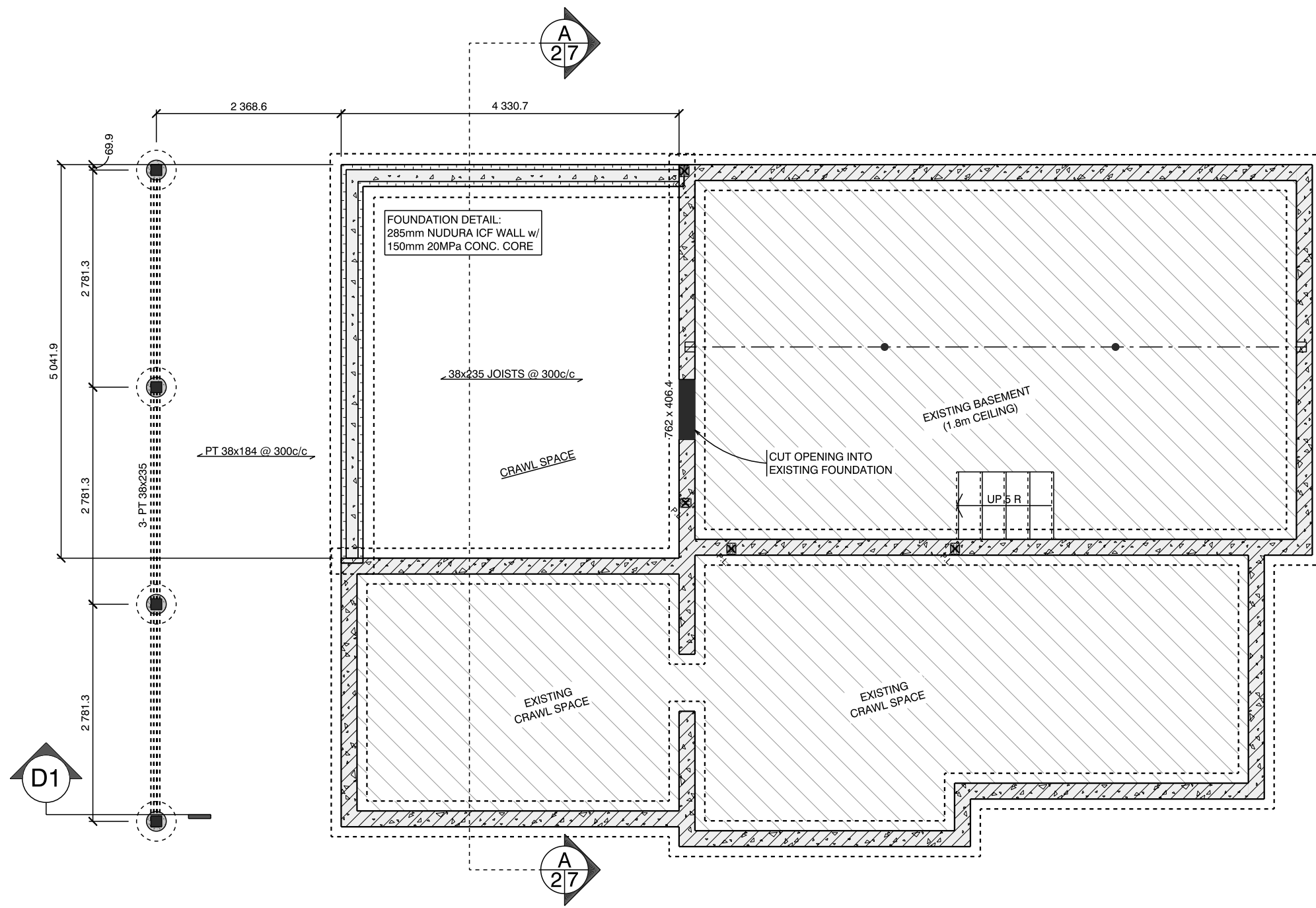


Gara Farm Buildings Inc.  
8633 Side Rd. 25  
Belwood, ON  
N0B 1J0

Drawn by: Tom Lodder

Johanna Magee  
68 Water Street  
Grand Valley, ON  
House Addition



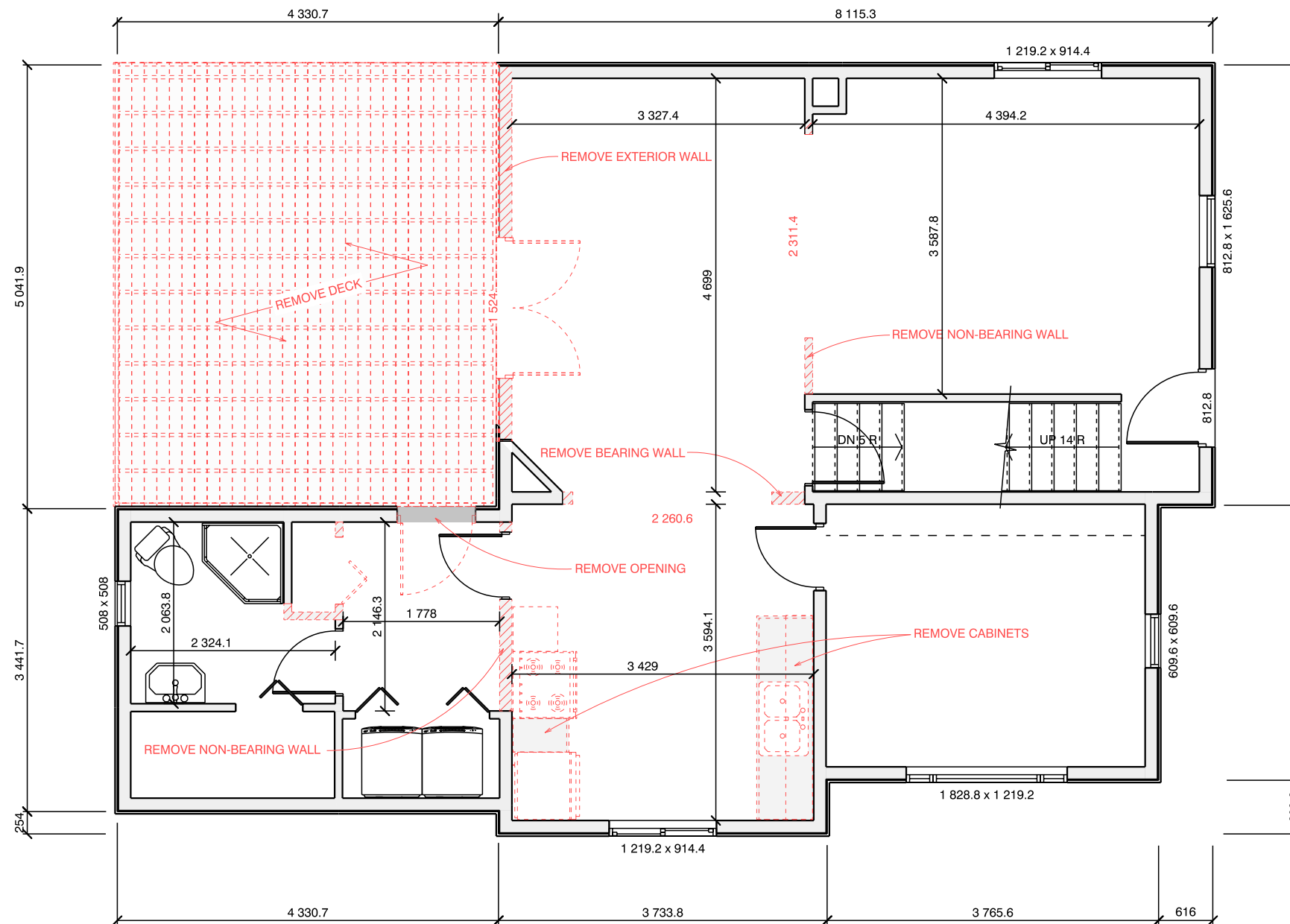


# FOUNDATION PLAN

SCALE: 1:64

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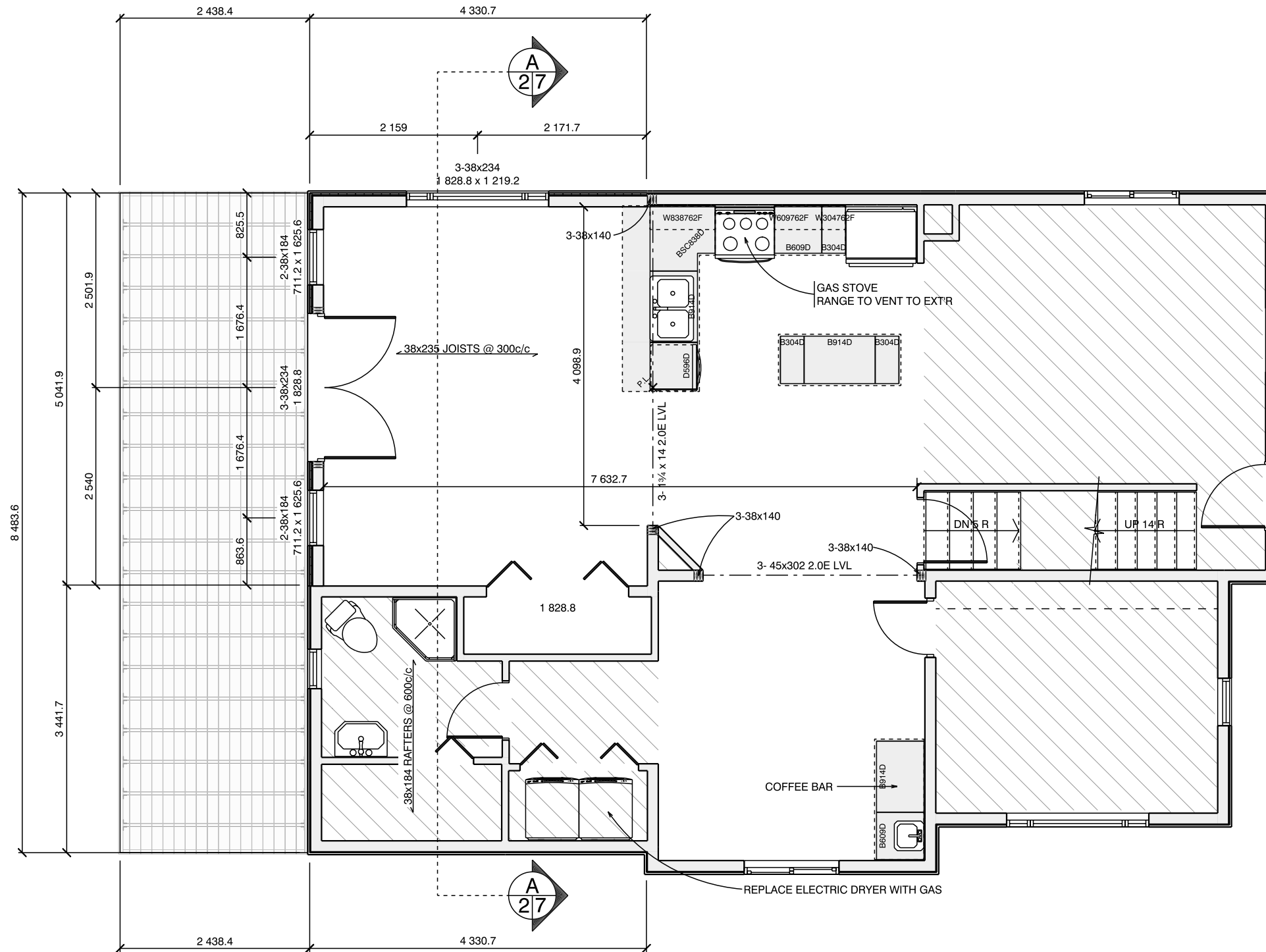


# EXISTING MAIN FLOOR

SCALE: 1:64

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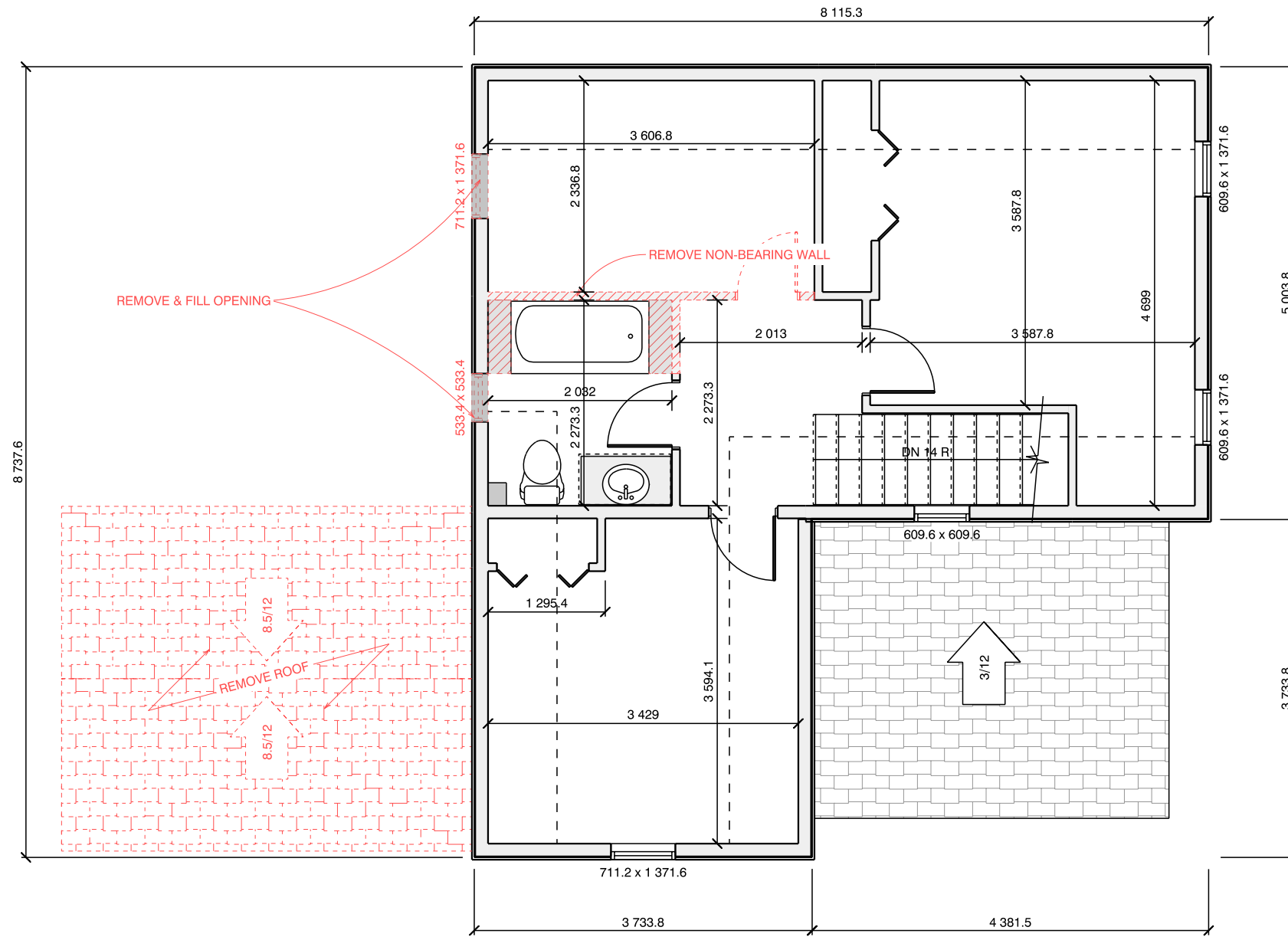


# MAIN FLOOR PLAN

SCALE: 1:64

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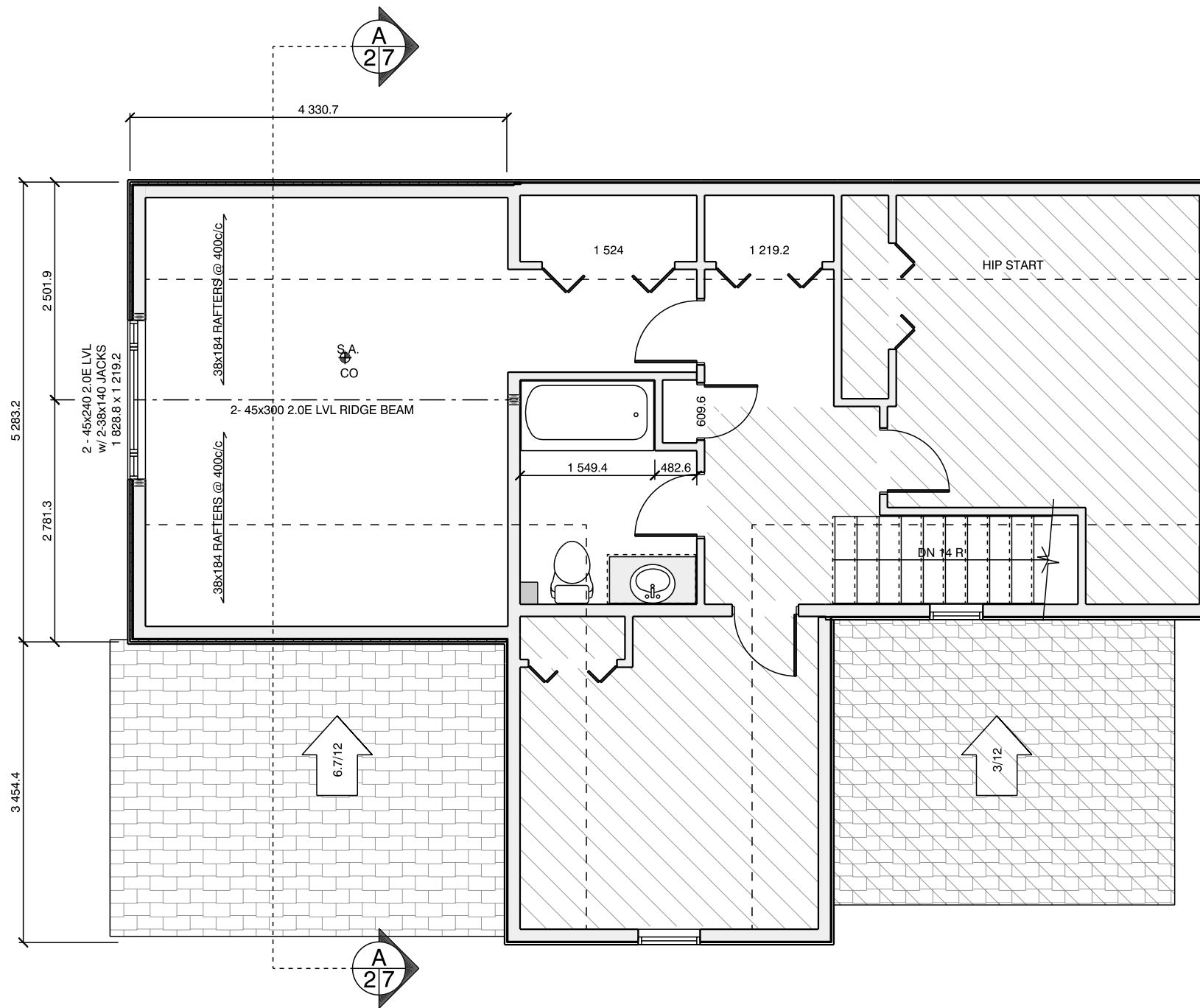
# EXISTING SECOND FLOOR

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# SECOND FLOOR PLAN

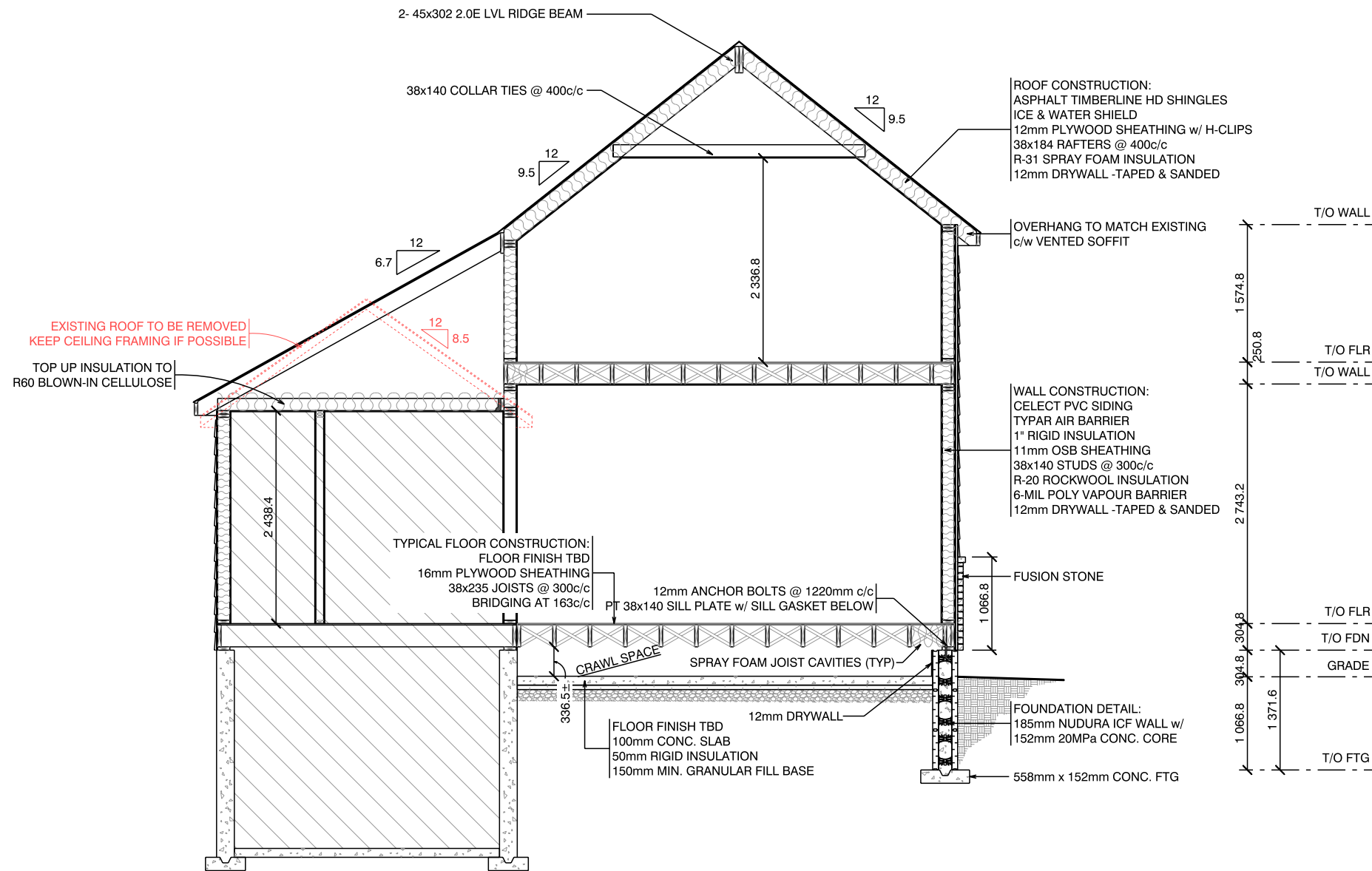
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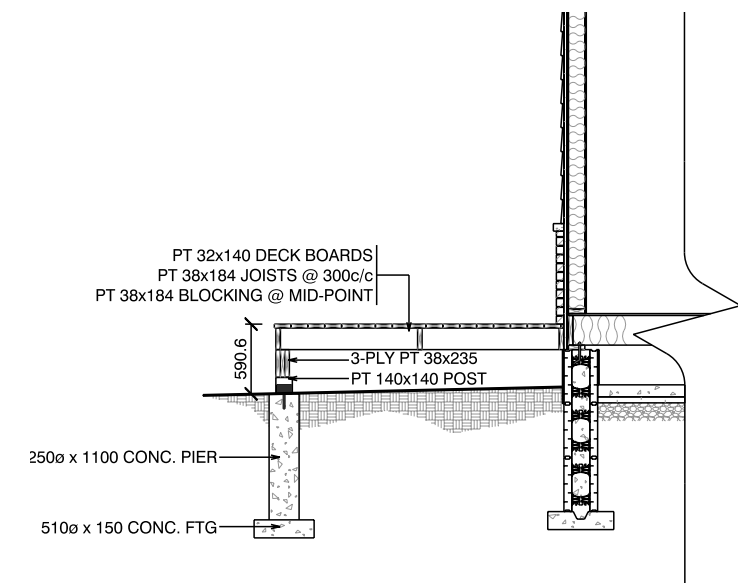
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A  
27

# CROSS SECTION A

SCALE: 1:64



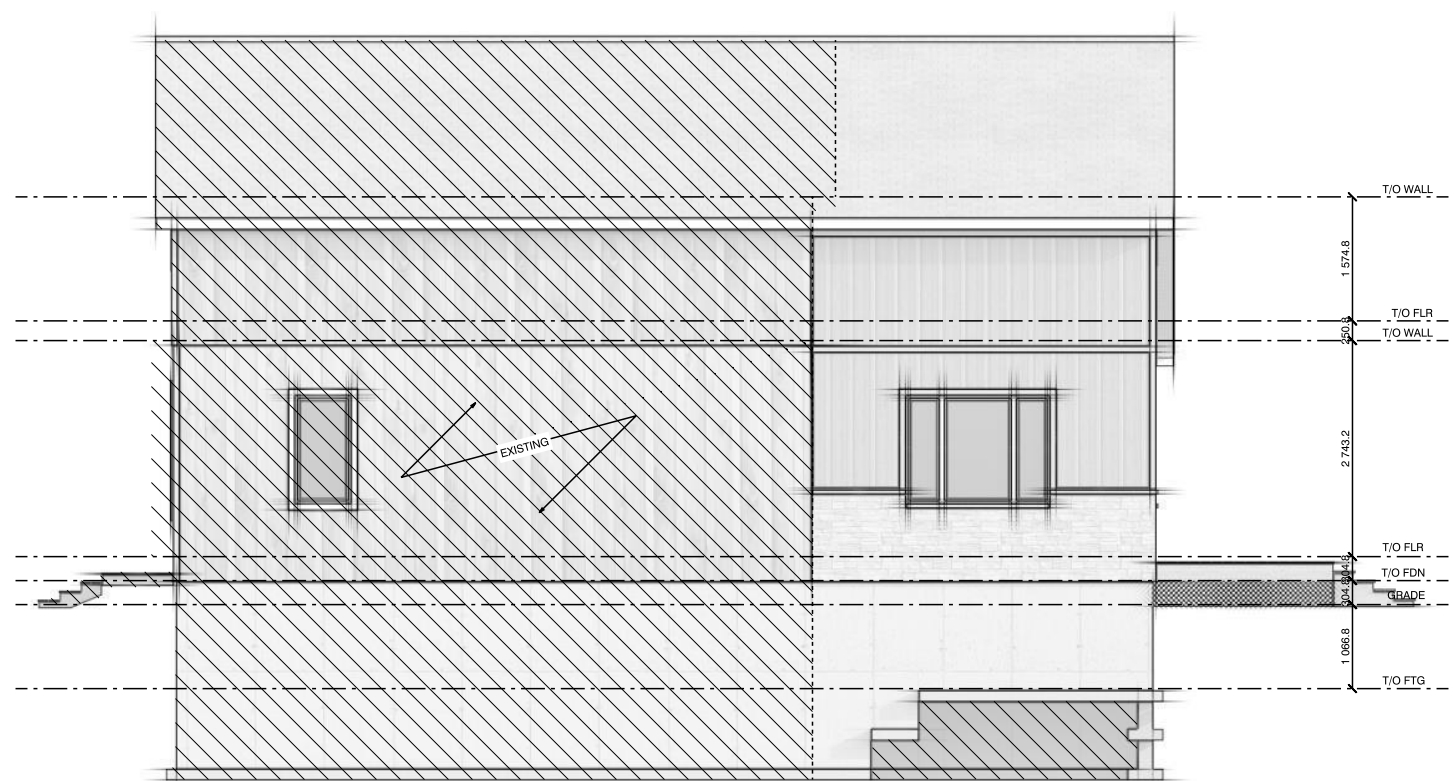
D1 DECK DETAIL

TL

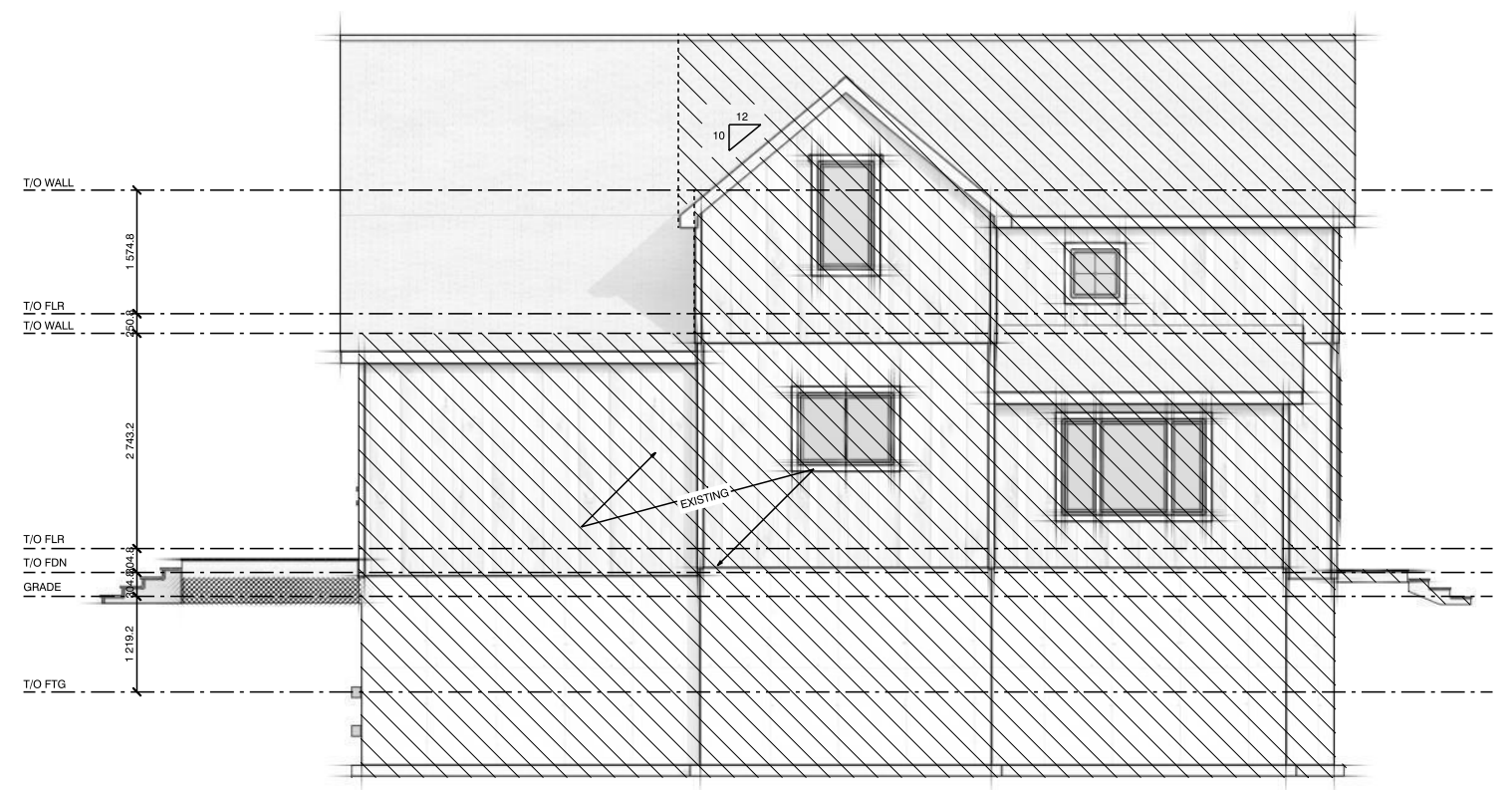
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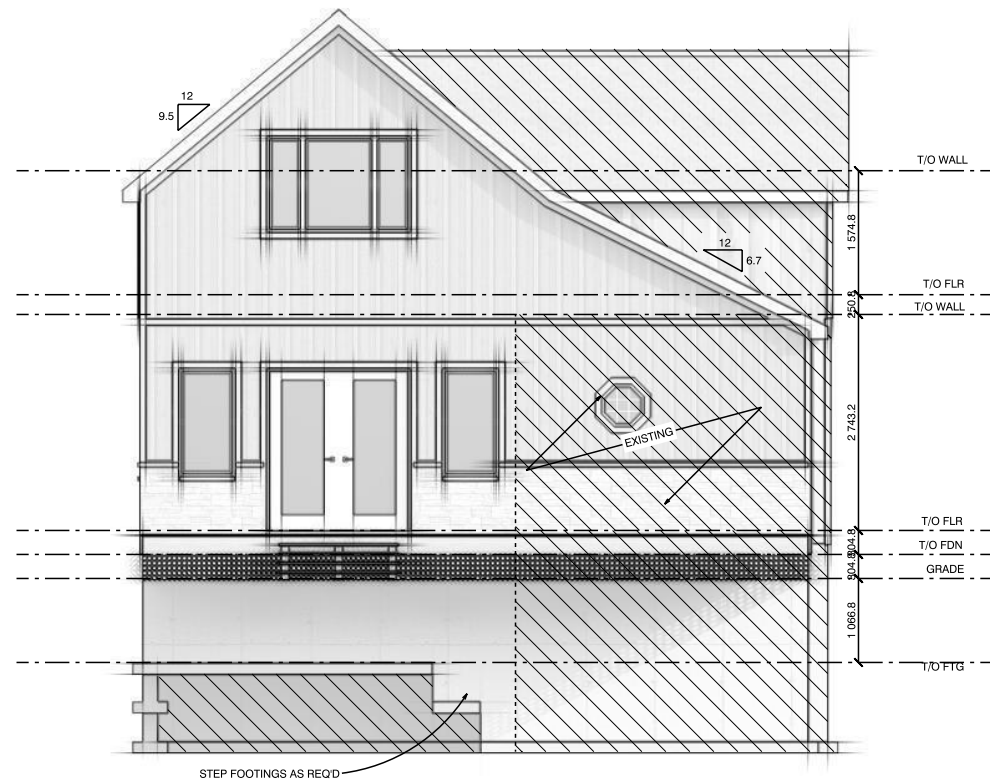
**NORTH ELEVATION**  
SCALE: 1:96



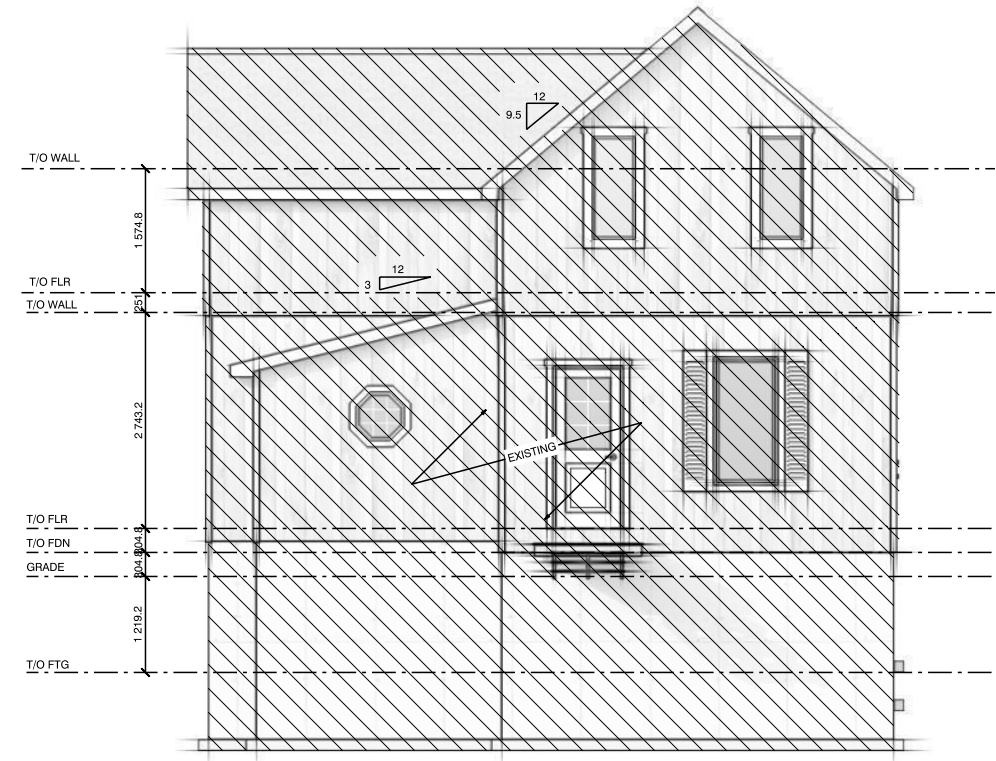
**SOUTH ELEVATION**  
SCALE: 1:96

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**WEST ELEVATION**  
SCALE: 1:96



**EAST ELEVATION**  
SCALE: 1:96

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9.3.1. Concrete

9.3.1.1. General

(1) Except as provided in Sentence (2), unreinforced and nominally reinforced concrete shall be designed, mixed, placed, cured and tested in accordance with the requirements for "R" class concrete stated in Clause 8.13 of CSA A23.1, "Concrete Materials and Methods of Concrete Construction".  
(2) Unreinforced and nominally reinforced site-batched concrete shall be designed, mixed, placed and cured in accordance with Articles 9.3.1.2. to 9.3.1.9.

9.3.1.2. Cement

(1) Cement shall meet the requirements of CAN/CSA-A3001, "Cementitious Materials for Use in Concrete".  
9.3.1.3. Concrete in Contact with Sulfate Soil

(1) Concrete in contact with sulfate soil, which is deleterious to normal cement, shall conform to the requirements in Clause 15.5 of CAN/CSA-A23.1, "Concrete Materials and Methods of Concrete Construction".

9.3.1.4. Aggregates

(1) Aggregates shall,

(a) consist of sand, gravel, crushed rock, crushed air-cooled blast furnace slag, expanded shale or expanded clay conforming to CAN/CSA-A23.1, "Concrete Materials and Methods of Concrete Construction", and

(b) be clean, well-graded and free of injurious amounts of organic and other deleterious material.

9.3.1.5. Water

(1) Water shall be clean and free of injurious amounts of oil, organic matter, sediment or any other deleterious material.

9.3.1.6. Compressive Strength

(1) Except as provided elsewhere in this Part, the compressive strength of unreinforced concrete after 28 days shall be not less than,

(a) 32 MPa for garage floors, carport floors and all exterior flatwork,

(b) 20 MPa for interior floors other than those for garages and carports, and

(c) 15 MPa for all other applications.

(2) Concrete used for garage and carport floors and exterior steps shall have air entrainment of 5 to 8%.

9.3.1.7. Concrete Mixes

(1) For site-batched concrete, the concrete mixes described in Table 9.3.1.7. shall be considered acceptable if the ratio of water to cementing materials does not exceed,

(a) 0.45 for garage floors, carport floors and all exterior flatwork,

(b) 0.65 for interior floors other than those for garages and carports, and

(c) 0.70 for all other applications.

(2) The size of aggregate in unreinforced concrete mixes referred to in Sentence (1) shall not exceed,

(a) 1/5 the distance between the sides of vertical forms, or

(b) 1/3 the thickness of flatwork.

9.3.1.8. Admixtures

(1) Admixtures shall conform to ASTM C260, "Air-Entraining Admixtures for Concrete", or ASTM C494 / C494M, "Chemical Admixtures for Concrete", as applicable.

9.3.1.9. Cold Weather Requirements

(1) When the air temperature is below 5°C, concrete shall be,

(a) kept at a temperature of not less than 10°C or more than 25°C while being placed, and

(b) maintained at a temperature of not less than 10°C for 72 h after placing.

(2) No frozen material or ice shall be used in concrete described in Sentence (1).

9.5.2.3. Stud Wall Reinforcement

(1) If wood wall studs or sheet steel wall studs enclose the main bathroom in a dwelling unit, reinforcement shall be installed to permit the future installation of a grab bar on a wall adjacent to,

(a) a water closet in the location required by Clause 3.8.3.8.(1)(d), and

(b) a shower or bathtub in the location required by Clause 3.8.3.13.(1)(f).

9.7.5.2. Resistance to Forced Entry for Doors

(1) Except for exterior doors to garages and to other ancillary spaces, this Article applies to,

(a) swinging entrance doors to dwelling units,

(b) swinging doors between dwelling units and attached garages or other ancillary spaces, and

(c) swinging doors that provide access directly or indirectly from a storage garage to a dwelling unit.

(2) Doors, frames and hardware that conform to a security level of at least Grade 10 as described in the Annex to ASTM F476, "Security of Swinging Door Assemblies", are not required to conform to Sentences (3) to (7).

(3) Except as provided in Sentence (2), wood doors described in Sentence (1) shall,

(a) be solid core or stile and rail type,

(b) be not less than 45 mm thick, and

(c) if of the stile and rail panel type, have a panel thickness of not less than 19 mm, with a total panel area not more than half of the door area.

(4) Except as provided in Sentence (2), doors described in Sentence (1) shall be provided with a deadbolt lock with a cylinder having no fewer than 5 pins and a bolt throw not less than 25 mm, protected with a solid or hardened free-turning ring or bevelled cylinder housing

(5) Except as provided in Sentence (2), an inactive leaf in double doors used in locations specified in Sentence (1) shall be provided with heavy-duty bolts top and bottom having an engagement of not less than 15 mm.

(6) Except as provided in Sentence (2), hinges for doors described in Sentence (1) shall be fastened to wood doors with wood screws not less than 25 mm long and to wood frames with wood screws such that at least two screws per hinge penetrate not less than 30 mm into solid wood, or shall be fastened to metal doors and metal frames with machine screws not smaller than No. 8 and not less than 10 mm long.

(7) Except as provided in Sentence (2), strikeplates for deadbolts described in Sentence (4) shall be fastened to wood frames with wood screws that penetrate not less than 30 mm into solid wood, or to metal frames with machine screws not smaller than No. 8 and not less than 10 mm long.

(8) Except for storm doors or screen doors, doors described in Sentence (1) that swing outward shall be provided with hinges or pins so that the doors cannot be removed when they are in the closed position.

(9) Solid blocking shall be provided on both sides at the lock height between the jambs for doors described in Sentence 9.6.8.1.(1) and the structural framing so that the jambs will resist spreading by force.

9.7.5.3. Resistance to Forced Entry for Windows

(1) In dwelling units, windows, any part of which is located within 2 m of adjacent ground level, shall conform to the requirements for resistance to forced entry as described in Clause 5.3.5 of AAMA/WDMA/CSA 101/I.S.2/A440, "NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights".

9.10.13.15. Doors Between Garages and Dwelling Units

(1) A door between an attached or built-in garage and a dwelling unit shall be tight-fitting and weatherstripped to provide an effective barrier against the passage of gases and exhaust fumes and shall be fitted with a self-closing device.

(2) A doorway between an attached or built-in garage and a dwelling unit shall not be located in a room intended for sleeping.

9.10.9.17. Separation of Repair Garages

(4) Where a building containing a repair garage also contains a dwelling unit, an air barrier system conforming to Subsection 9.25.3. shall be installed between the dwelling unit and the suite containing the garage to provide an effective air barrier to gas and exhaust fumes.

(5) Where membrane materials are used to provide the required airtightness in the air barrier system, all joints shall be sealed and structurally supported.

9.20.13.12. Drips Beneath Window Sills

(1) Except for wall openings located less than 150 mm above ground level, where a concealed flashing is not installed beneath window and door sills, such sills shall be provided with an outward slope and a drip located not less than 25 mm from the wall surface.

9.23 Wood Frame Construction

9.23.2.1. Strength and Rigidity

(1) All members shall be so framed, anchored, fastened, tied and braced to provide the necessary strength and rigidity.

9.23.3. Fasteners

9.23.3.1. Standards for Nails and Screws

(1) Unless otherwise indicated, nails specified in this Section shall be common steel wire nails or common spiral nails, conforming to CSA B111, "Wire Nails, Spikes and Staples".

(2) Wood screws specified in this Section shall conform to ANSI/ASME B18.6.1., "Wood Screws (Inch Series)".

9.23.3.2. Length of Nails

(1) All nails shall be long enough so that not less than half their required length penetrates into the second member.

9.23.3.3. Prevention of Splitting

(1) Splitting of wood members shall be minimized by staggering the nails in the direction of the grain and by keeping nails well in from the edges.

9.23.3.4. Nailing of Framing

(1) Except as provided in Sentence (2), nailing of framing shall conform to Table 9.23.3.4.

9.23.16. Wall Sheathing

9.23.16.1. Required Sheathing

(1) Exterior walls and gable ends shall be sheathed when the exterior cladding requires intermediate fastening between supports or if the exterior cladding requires solid backing.

9.23.16.2. Thickness, Rating and Material Standards

(1) Where wall sheathing is required, it shall conform to Table 9.23.16.2.A. or Table 9.23.16.2.B.

9.23.16.5. Joints in Panel-Type Sheathing

(1) A gap of not less than 2 mm shall be left between sheets of plywood, OSB, waferboard or fibreboard.

9.23.15. Roof Sheathing

9.23.15.1. Required Roof Sheathing

(1) Except as provided in Section 9.26., continuous lumber or panel-type roof sheathing shall be installed to support the roofing.

9.23.15.2. Material Standards

(1) Wood-based panels used for roof sheathing shall conform to the requirements of,

(a) CSA O121-M, "Douglas Fir Plywood",

(b) CSA O151, "Canadian Softwood Plywood",

(c) CSA O153-M, "Poplar Plywood",

(d) CAN/CSA-O325.0, "Construction Sheathing", or

(e) CSA O437.0, "OSB and Waferboard".

9.23.15.3. Direction of Installation

(1) Plywood roof sheathing shall be installed with the surface grain at right angles to the roof framing.

(2) OSB roof sheathing conforming to CAN/CSA-O325.0, "Construction Sheathing", or to O-1 and O-2 grades as specified in CSA O437.0, "OSB and Waferboard", shall be installed with the direction of face orientation at right angles to the roof framing members.

9.23.15.4. Joints in Panel-Type Sheathing

(1) Panel-type sheathing board shall be applied so that joints perpendicular to the roof ridge are staggered where,

(a) the sheathing is applied with the surface grain parallel to the roof ridge, and

(b) the thickness of the sheathing is such that the edges are required to be supported.

(2) A gap of not less than 2 mm shall be left between sheets of plywood, OSB or waferboard.

9.23.15.6. Edge Support

(1) Except as permitted in Sentence (2), where panel-type roof sheathing requires edge support, the support shall consist of,

(a) metal H clips, or

(b) not less than 38 mm by 38 mm blocking securely nailed between framing members.

(2) The supports referred to in Sentence (1) are not required when tongued-and-grooved edged panel-type sheathing board is used.

9.23.15.7. Thickness or Rating

(1) The thickness or rating of roof sheathing on a flat roof used as a walking deck shall conform to either Table 9.23.14.5.A. or Table 9.23.14.5.B. for subfloors.

9.26.18.2. Downspouts

(1) Where downspouts are provided and are not connected to a sewer, extensions shall be provided to carry rainwater away from the building in a manner that will prevent soil erosion.

Table 9.23.3.4.  
Nailing for Framing  
Forming Part of Sentence 9.23.3.4.(1)

Item	Column 1 Construction Detail	Column 2 Minimum Length of Nails, mm	Column 3 Minimum Number or Maximum Spacing of Nails
1.	Floor joist to plate - toe nail	82	2
2.	Wood or metal strapping to underside of floor joists	57	2
3.	Cross bridging to joists	57	2 at each end
4.	Double header or trimmer joists	76	300 mm (o.c.)
5.	Floor joist to stud (balloon construction)	76	2
6.	Ledger strip to wood beam	82	2 per joist
7.	Joist to joist splice (See also Table 9.23.13.8.)	76	2 at each end
8.	Header joist end nailed to joists along perimeter	101	3
9.	Tail joist to adjacent header joist (end nailed) around openings	82 101	5 3
10.	Each header joist to adjacent trimmer joist (end nailed) around openings	82 101	5 3
11.	Stud to wall plate (each end) toe nail or end nail	62 82	4 2
12.	Doubled studs at openings, or studs at walls or wall intersections and corners	76	750 mm (o.c.)
13.	Doubled top wall plates	76	600 mm (o.c.)
14.	Bottom wall plate or sole plate to joists or blocking (exterior walls) <sup>(1)</sup>	82	400 mm (o.c.)
15.	Interior walls to framing or subflooring	82	600 mm (o.c.)
16.	Horizontal member over openings in non-loadbearing walls - each end	82	2
17.	Lintels to studs	82	2 at each end
18.	Ceiling joist to plate - toe nail each end	82	2
19.	Roof rafter, roof truss or roof joist to plate - toe nail	82	3
20.	Rafter plate to each ceiling joist	101	2
21.	Rafter to joist (with ridge supported)	76	3
22.	Rafter to joist (with ridge unsupported)	76	See Table 9.23.13.8.
23.	Gusset plate to each rafter at peak	57	4
24.	Rafter to ridge board - toe nail - end nail	82	3
25.	Collar tie to rafter - each end	76	3
26.	Collar tie lateral support to each collar tie	57	2
27.	Jack rafter to hip or valley rafter	82	2
28.	Roof strut to rafter	76	3
29.	Roof strut to loadbearing wall - toe nail	82	2
30.	38 mm x 140 mm or less plank decking to support	82	2
31.	Plank decking wider than 38 mm x 140 mm to support	82	3
32.	38 mm edge laid plank decking to support (toe nail)	76	1
33.	38 mm edge laid plank to each other	76	450 mm (o.c.)

Table 9.23.16.2.B.  
Rating For Wall Sheathing When Applying CAN/  
CSA-O325.0

Forming Part of Sentence 9.23.16.2.(1)

Item	Column 1 Maximum Spacing of Supports, mm	Column 2 Panel Mark
1.	406	W16
2.	508	W20
3.	610	W24

Table 9.23.16.2.A.  
Wall Sheathing Thickness and Specifications  
Forming Part of Sentence 9.23.16.2.(1)

Item	Column 1 Type of Sheathing	Column 2	Column 3	Column 4 Material Standards
		Minimum Thickness, mm <sup>(1)</sup> With Supports 406 mm o.c.	With Supports 610 mm o.c.	
1.	Fibreboard (insulating)	9.5	11.1	CAN/U/LC-S706
2.	Gypsum Sheathing	9.5	12.7	CAN/CSA-A82.27-M ASTM C1177 / C1177M ASTM C1396 / C1396M
3.	Lumber	17.0	17.0	See Table 9.3.2.1.
4.	Mineral Fibre, Rigid Board, Type 2	25	25	CAN/U/LC-S702
5.	OSB, O-2 Grade	6.0	7.5	CSA O437.0
6.	OSB, O-1 Grade, and Waferboard, R-1 Grade	6.35	7.9	CSA O437.0
7.	Phenolic, faced	25	25	CAN/CSG58-51.25-M
8.	Plywood (exterior type)	6	7.5	CSA O121-M CSA O151 CSA O153-M
9.	Polystyrene, Types 1 and 2	38	38	CAN/U/LC-S701
10.	Polystyrene, Types 3 and 4	25	25	CAN/U/LC-S701
11.	Polyurethane and Polyisocyanurate Type 1, faced	38	38	CAN/U/LC-S704
12.	Polyurethane and Polyisocyanurate Types 2 and 3, faced	25	25	CAN/U/LC-S704

9.27.4. Caulking

9.27.4.1. Required Caulking

- (1) Caulking shall be provided where required to prevent the entry of water into the structure.
- (2) Caulking shall be provided between masonry, siding or stucco and the adjacent door and window frames or trim, including sills unless such locations are completely protected from the entry of rain.
- (3) Caulking shall be provided at vertical joints between different cladding materials unless the joint is suitably lapped or flashed to prevent the entry of rain.

9.27.4.2. Materials

- (1) Caulking shall be,
  - (a) a non-hardening type suitable for exterior use,
  - (b) selected for its ability to resist the effects of weathering, and
  - (c) compatible with and adhere to the substrate to which it is applied.
- (2) Caulking shall conform to,
  - (a) CGSB 19-GP-5M, "Sealing Compound, One Component, Acrylic Base, Solvent Curing",
  - (b) CAN/CGSB-19.13-M, "Sealing Compound, One Component, Elastomeric, Chemical Curing",
  - (c) CGSB 19-GP-14M, "Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing", or
  - (d) CAN/CGSB-19.24-M, "Multicomponent, Chemical Curing Sealing Compound".

9.10.19.1. Required Smoke Alarms

- (1) Smoke alarms conforming to CAN/ULC-S531, "Smoke Alarms", shall be installed in each dwelling unit and in each sleeping room not within a dwelling unit.
- (2) Smoke alarms shall have a visual signalling component conforming to the requirements in 18.5.3. of NFPA 72, "National Fire Alarm and Signaling Code"
- (3) The visual signalling component required in Sentence (2) need not,
  - (a) be integrated with the smoke alarm provided it is interconnected to it,
  - (b) be on battery backup, or
  - (c) have synchronized flash rates, when installed in a dwelling unit.
- (4) The luminous intensity for visual signalling components required in Sentence (2) that are installed in sleeping rooms shall be a minimum of 175 cd.

9.10.19.3. Location of Smoke Alarms

- (1) Within dwelling units, sufficient smoke alarms shall be installed so that,
  - (a) there is at least one smoke alarm on each floor level, including basements, and
  - (b) on any storey of a dwelling unit containing sleeping rooms, a smoke alarm is installed,
    - (i) in each sleeping room, and
    - (ii) in a location between the sleeping rooms and the remainder of the storey, and if the sleeping rooms are served by a hallway, the smoke alarm shall be located in the hallway.
- (3) Smoke alarms required in Article 9.10.19.1. and Sentence (1) shall be installed on or near the ceiling.

9.10.19.4. Power Supply

- (1) Except as permitted in Sentence (2), smoke alarms shall be installed by permanent connections to an electrical circuit and shall have no disconnect switch between the overcurrent device and the smoke alarm and in case the regular power supply to the smoke alarm is interrupted, be provided with a battery as an alternative power source that can continue to provide power to the smoke alarm for a period of not less than 7 days in the normal condition, followed by 4 min of alarm.
- (2) Where the building is not supplied with electrical power, smoke alarms are permitted to be battery operated.

9.10.19.5. Interconnection of Smoke Alarms

- (1) Where more than one smoke alarm is required in a dwelling unit, the smoke alarms shall be wired so that the activation of one alarm will cause all alarms within the dwelling unit to sound.

9.10.19.6. Silencing of Smoke Alarms

- (1) A manually operated device is permitted to be incorporated within the circuitry of a smoke alarm installed in a dwelling unit so that it will silence the signal emitted by the smoke alarm for a period of not more than 10 min, after which the smoke alarm will reset and again sound the alarm if the level of smoke in the vicinity is sufficient to reactuate the smoke alarm.

9.10.19.7. Instructions for Maintenance and Care

- (1) Where instructions are necessary to describe the maintenance and care required for smoke alarms to ensure continuing satisfactory performance, they shall be posted in a location where they will be readily available to the occupants for reference.

9.33.4. Carbon Monoxide Alarms

9.33.4.1. Application

- (1) This Subsection applies to every building that,
  - (a) contains a residential occupancy, and
  - (b) contains a fuel-burning appliance or a storage garage.

9.33.4.2. Location of Carbon Monoxide Detectors

- (1) Where a fuel-burning appliance is installed in a suite of residential occupancy, a carbon monoxide alarm shall be installed adjacent to each sleeping area in the suite.
- (2) Where a fuel-burning appliance is installed in a service room that is not in a suite of residential occupancy, a carbon monoxide alarm shall be installed,
  - (a) adjacent to each sleeping area in every suite of residential occupancy that is adjacent to the service room, and
  - (b) in the service room.
- (3) Where a storage garage is located in a building containing a residential occupancy, a carbon monoxide alarm shall be installed adjacent to each sleeping area in every suite of residential occupancy that is adjacent to the storage garage.
- (4) Where a storage garage serves only the dwelling unit to which it is attached or built in, a carbon monoxide alarm shall be installed adjacent to each sleeping area in the dwelling unit.

9.33.4.3. Installation and Conformance to Standards

- (1) The carbon monoxide alarm required by Article 9.33.4.2. shall,
  - (a) be permanently connected to an electrical circuit and shall have no disconnect switch between the overcurrent device and the carbon monoxide alarm,
  - (b) be wired so that its activation will activate all carbon monoxide alarms within the suite, where located within a suite of residential occupancy,
  - (c) be equipped with an alarm that is audible within bedrooms when the intervening doors are closed, where located adjacent to a sleeping area, and
  - (d) conform to,
    - (i) CAN/CSA-6.19, "Residential Carbon Monoxide Alarming Devices", or
    - (ii) UL 2034, "Single and Multiple Station Carbon Monoxide Alarms".

9.34.2.6. Garages and Carports

- (1) A lighting outlet with fixture shall be provided for an attached, built-in or detached garage or carport.
- (2) Except as provided in Sentence (3), lighting outlets required in Sentence (1) shall be controlled by a wall switch near the doorway.
- (3) Where the lighting outlet and fixture required in Sentence (1) are ceiling mounted above an area not normally occupied by a parked car; or are wall mounted, a fixture with a built-in switch is permitted to be used.
- (4) Where a carport is lighted by a light at the entrance to a dwelling unit, additional carport lighting is not required.

9.15.3.9. Step Footings

- (1) Where step footings are used,
  - (a) the vertical rise between horizontal portions shall not exceed 600 mm, and
  - (b) the horizontal distance between risers shall be not less than 600 mm.

9.15.4.6. Extension above Ground Level

- (1) Exterior foundation walls shall extend not less than 150 mm above finished ground level.

9.15.4. Foundation Walls

9.15.4.2. Foundation Wall Thickness and Required Lateral Support

- (1) Except as required in Sentence (2), the thickness of foundation walls made of unreinforced concrete block or solid concrete and subject to lateral earth pressure shall conform to Table 9.15.4.2.A. for walls not exceeding 2.5 m in unsupported height.
- (4) Where average stable soils are encountered and wind loads on the exposed portion of the foundation are no greater than 0.70 kPa, the thickness and reinforcing of foundation walls made of reinforced concrete block and subject to lateral earth pressure shall conform to Table 9.15.4.2.B. and Sentences (5) to (10).
- (5) For concrete block walls required to be reinforced, continuous vertical reinforcement shall,
  - (a) be provided at wall corners, wall ends, wall intersections, at changes in wall height, at the jambs of all openings and at movement joints,
  - (b) extend from the top of the footing to the top of the foundation wall,
  - (c) where foundation walls are laterally unsupported at the top, have not less than 600 mm embedment into the footing, and
  - (d) where foundation walls are laterally supported at the top, have not less than 50 mm embedment into the footing, if the floor slab does not provide lateral support at the wall base.
- (6) Where foundation walls are laterally unsupported, the footing shall be designed according to Part 4 to resist overturning and sliding, if the maximum height of finished ground above the basement floor or crawl space ground cover exceeds 1.50 m.
- (7) At the base of concrete block walls required to be reinforced and where the height of finished ground above the basement floor or crawl space ground cover exceeds 2.0 m, not less than one 15M intermediate vertical bar reinforcement shall be installed midway between adjacent continuous vertical reinforcement, and shall,
  - (a) extend to not less than 600 mm above the top of the footing, and
  - (b) have not less than 50 mm embedment into the footing, if the floor slab does not provide lateral support at the wall base.
- (8) For concrete block walls required to be reinforced, a continuous horizontal bond beam containing at least one 15M bar shall be installed,
  - (a) along the top of the wall,
  - (b) at the sill and head of all openings greater than 1.20 m in width, and
  - (c) at structurally connected floors.
- (9) In concrete block walls required to be reinforced, all vertical bar reinforcement shall be installed along the centre line of the wall.
- (10) In concrete block walls required to be reinforced, ladder or truss type lateral reinforcement not less than 3.8 mm (No. 9 ASWG) shall be installed in the bed joint of every second masonry course.

9.15.4.3. Foundation Walls Considered to be Laterally Supported at the Top

- (1) Sentences (2) to (4) apply to lateral support for walls described in Sentence 9.15.4.2.(1).
- (2) Foundation walls shall be considered to be laterally supported at the top if,
  - (a) such walls support solid masonry superstructure,
  - (b) the floor joists are embedded in the top of the foundation walls, or
  - (c) the floor system is anchored to the top of the foundation walls with anchor bolts, in which case the joists may run either parallel or perpendicular to the foundation walls.
- (3) Unless the wall around an opening is reinforced to withstand earth pressure, the portion of the foundation wall beneath an opening shall be considered laterally unsupported, if,
  - (a) the opening is more than 1.2 m wide, or
  - (b) the total width of the openings in the foundation wall constitutes more than 25% of the length of the wall.
- (4) For the purposes of Sentence (3), the combined width of the openings shall be considered as a single opening if the average width is greater than the width of solid wall between them.

9.15.4.3. Foundation Walls Considered to be Laterally Supported at the Top

- (1) Sentences (2) to (4) apply to lateral support for walls described in Sentence 9.15.4.2.(1).
- (2) Foundation walls shall be considered to be laterally supported at the top if,
  - (a) such walls support solid masonry superstructure,
  - (b) the floor joists are embedded in the top of the foundation walls, or
  - (c) the floor system is anchored to the top of the foundation walls with anchor bolts, in which case the joists may run either parallel or perpendicular to the foundation walls.
- (3) Unless the wall around an opening is reinforced to withstand earth pressure, the portion of the foundation wall beneath an opening shall be considered laterally unsupported, if,
  - (a) the opening is more than 1.2 m wide, or
  - (b) the total width of the openings in the foundation wall constitutes more than 25% of the length of the wall.
- (4) For the purposes of Sentence (3), the combined width of the openings shall be considered as a single opening if the average width is greater than the width of solid wall between them.

9.15.6. Parging and Finishing of Foundation Walls

9.15.6.1. Foundation Walls Below Ground

- (1) Concrete block foundation walls shall be parged on the exterior face below ground level as required in Section 9.13.

9.15.6.2. Foundation Walls Above Ground

- (1) Exterior surfaces of concrete block foundation walls above ground level shall have tooled joints, or shall be rendered, parged or otherwise suitably finished.

9.25.3.2. Air Barrier System Properties

- (1) Sheet and panel type materials intended to provide the principal resistance to air leakage shall have an air leakage characteristic not greater than 0.02 L/(s·m<sup>2</sup>) measured at an air pressure differential of 75 Pa.
- (2) Where polyethylene sheet is used to provide the air-tightness in the air barrier system, it shall conform to CAN/CGSB-51.34-M, "Vapour Barrier, Polyethylene Sheet for Use in Building Construction".

9.25.3.3. Continuity of the Air Barrier System

- (1) Where the air barrier system consists of an air-impermeable panel-type material, all joints shall be sealed to prevent air leakage.
- (2) Where the air barrier system consists of flexible sheet material, all joints shall be,
  - (a) sealed with compatible material such as tape or flexible sealant, or
  - (b) except as required by Sentence (3), lapped not less than 100 mm and clamped, such as between framing members, furring or blocking and rigid panels.
- (3) Where an air barrier system consisting of flexible sheet material is installed at locations where it is not supported by an interior finish, such as a behind a bath tub, shower enclosure or fireplace, the continuity of the air barrier shall be maintained by sealing its joints.
- (4) Where an interior wall meets an exterior wall, ceiling, floor or roof required to be provided with an air barrier protection, the air barrier system shall extend across the intersection and shall be sealed in accordance with Sentences (1) and (2).
- (5) Where an interior wall projects through a ceiling or extends to become an exterior wall, spaces in the wall shall be blocked to provide continuity across those spaces with the air barrier system in the abutting walls or ceiling by,
  - (a) sealing each air barrier to the blocking, or
  - (b) wrapping each air barrier around the transition and sealing in accordance with Sentences (1) and (2).
- (6) Where an interior floor projects through an exterior wall or extends to become an exterior floor, continuity of the air barrier system shall be maintained from the abutting walls across the floor assembly.
- (7) Where an interior floor projects through an exterior wall to become an exterior floor,
  - (a) the air barrier of the wall under the floor shall be continuous with or sealed to the subfloor or the air barrier on the underside of the floor,
  - (b) the air barrier of the wall above the floor shall be continuous with or sealed to the subfloor or the air barrier on the top of the floor, and
  - (c) the spaces between floor joists shall be blocked and sealed.

- (8) Where a header wrap is used as an air barrier, it shall be sealed or lapped to the wall air barrier above and below in accordance with Sentences (1) and (2).
- (9) Penetrations of the air barrier system, such as those created by the installation of electrical wiring, electrical boxes, piping or ductwork, shall be sealed with compatible material such as tape or caulking to maintain the integrity of the air barrier system over the entire surface.
- (10) Penetrations of the air barrier system, such as those created by the installation of doors, windows and other fenestration shall be sealed to maintain the integrity of the air barrier system over the entire surface.

- (11) Where an interior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with,
  - (a) compatible tape, or
  - (b) spray foam insulation.
- (12) Where an exterior air barrier is penetrated by doors, windows and other fenestration, the air barrier shall be sealed to the door frame or window frame with,
  - (a) compatible flexible flashing material,
  - (b) caulking, or
  - (c) spray foam insulation.

- (13) An access hatch installed through an assembly constructed with an air barrier system shall be weatherstripped around the perimeter to prevent air leakage.
- (14) Clearances between chimneys or gas vents and the surrounding construction that would permit air leakage from within the building into a wall or attic or roof space shall be sealed by noncombustible material to prevent such leakage and shall be sealed to the air barrier with tape or another compatible material, and to the vent with high temperature caulking in accordance with the manufacturer's installation instructions.

- (15) Where the foundation wall and floor slab are used as an air barrier, they shall be caulked at all joints, intersections and penetrations.
- (16) Sump pit covers shall be sealed.

9.25.3.4. Vapour Barriers Used as Air Barriers

- (1) A vapour barrier used as an air barrier shall comply with the requirements of this Subsection.

9.29.5. Gypsum Board Finish (Taped Joints)

9.29.5.1. Application

- (1) The requirements for application of gypsum board in this Subsection apply to the single layer application of gypsum board to wood furring or framing using nails or screws.
- (2) Gypsum board applications not described in this Subsection shall conform to CSA A82.31-M, "Gypsum Board Application".

9.29.5.2. Materials

- (1) Gypsum products shall conform to,
  - (a) CAN/CSA-A82.27-M, "Gypsum Board",
  - (b) ASTM C1178 / C1178M, "Glass Mat Water-Resistant Gypsum Backing Panel",
  - (c) ASTM C1396 / C1396M, "Gypsum Board".
- (2) Maximum Spacing of Supports
  - (1) Maximum spacing of supports for gypsum board applied as a single layer shall conform to Table 9.29.5.3.
- (3) Support of Insulation
  - (1) Gypsum board supporting insulation shall be at least 12.7 mm thick.
- (4) Length of Fasteners
  - (1) The length of fasteners for gypsum board shall conform to Table 9.29.5.5., except that lesser depths of penetration are permitted for assemblies required to have a fire-resistance rating provided it can be shown, on the basis of fire tests, that such depths are adequate for the required rating.

9.29.5.3. Maximum Spacing of Supports

- (1) Maximum spacing of supports for gypsum board applied as a single layer shall conform to Table 9.29.5.3.

9.29.5.4. Support of Insulation

- (1) Gypsum board supporting insulation shall be at least 12.7 mm thick.

9.29.5.5. Length of Fasteners

- (1) The length of fasteners for gypsum board shall conform to Table 9.29.5.5., except that lesser depths of penetration are permitted for assemblies required to have a fire-resistance rating provided it can be shown, on the basis of fire tests, that such depths are adequate for the required rating.

9.29.5.6. Nails

- (1) Nails for fastening gypsum board to wood supports shall conform to CSA B111, "Wire Nails, Spikes and Staples".

9.29.5.7. Screws

- (1) Screws for fastening gypsum board to wood supports shall conform to ASTM C1002, "Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs".

9.29.5.8. Spacing of Nails

- (1) For single-layer application on ceilings, nails shall be spaced,
  - (a) not more than 180 mm o.c. on ceiling supports, or
  - (b) every 300 mm o.c. along ceiling supports, in pairs about 50 mm apart.
- (2) Where the ceiling sheets are supported by the wall sheets around the perimeter of the ceiling, this support may be considered as equivalent to nailing at this location.
- (3) Except as required by Sentence (4), for single-layer application on walls, nails shall be spaced,
  - (a) not more than 200 mm o.c. on vertical wall supports, or
  - (b) every 300 mm o.c. along vertical wall supports, in pairs about 50 mm apart.
- (4) For single-layer application on walls, where gypsum board is required to provide bracing, lateral support or fire protection, nails shall be spaced not more than 200 mm o.c. on,
  - (a) vertical wall supports, and
  - (b) top and bottom plates.
- (5) The uppermost nails on vertical wall supports shall be not more than 200 mm below the ceiling.
- (6) Nails shall be located not less than 10 mm from the side or edge of the board.
- (7) Nails shall be driven so that the heads do not puncture the paper.

9.29.5.9. Spacing of Screws

- (1) For single-layer application on a ceiling, screws shall be spaced not more than 300 mm o.c. on ceiling supports.
- (2) Where the ceiling sheets are supported by the wall sheets around the perimeter of the ceiling, this support may be considered as equivalent to screwing at this location.
- (3) Except as required by Sentence (4), for single-layer application on walls, screws shall be spaced,
  - (a) not more than 300 mm o.c. on vertical wall supports where the supports are more than 400 mm o.c., or
  - (b) not more than 400 mm o.c. on vertical wall supports where the supports are not more than 400 mm o.c.
- (4) Except as required by Sentence (5), for single-layer application on walls, where gypsum board is required to provide bracing, lateral support or fire protection, screws shall be spaced not more than 300 mm o.c. on,
  - (a) vertical wall supports, and
  - (b) top and bottom plates.
- (5) Where a fire-resistance rating is determined based on Supplementary Standard SB-3, Sentence (4) need not apply for the purpose of fire protection.
- (6) Screws shall be located not less than 10 mm from the side or edge of the board.
- (7) Screws shall be driven so that the heads do not puncture the paper.

9.29.5.10. Low Temperature Conditions

- (1) In cold weather, heat shall be provided to maintain a temperature of not below 10°C for 48 h prior to taping and finishing and maintained for not less than 48 h after that.