

1 GENERAL**1.1 SUMMARY**

- 1.1.1 Section includes:
 - .1 Materials and installation of soil gas venting systems.

1.2 RELATED SECTIONS

- 1.2.1 Section 22 05 00 – Common Work Results for Mechanical
- 1.2.2 Refer to Section 22 05 00 – Common Work Results for Mechanical table of Relevant Division References for the following Related Sections:
 - .1 “Submittal Procedures.”
 - .2 “Construction/Demolition Waste Management and Disposal.”
 - .3 “Quality Control”
 - .4 “Closeout Submittals”
 - .5 “Common Product Requirements.”
 - .6 “Cleaning.”
 - .7 “Firestopping”

1.3 REFERENCES

- 1.3.1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - .2 ASTM D2564 – Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
- 1.3.2 Canadian Standards Association (CSA)
 - .1 CAN/CSA B181.2 – PVC Drain, Waste and Vent Pipe and Pipe Fittings.
 - .2 CAN/CSA B182.1 – Plastic Drain and Sewer Pipe and Pipe Fittings.
 - .3 CAN/CSA B602 – Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe.
- 1.3.3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-149.11 – Radon Control Options for New Buildings.
 - .2 CAN/CGSB-149.12 – Radon Mitigation Options for Existing Buildings.
- 1.3.4 Canadian National Radon Proficiency Program (C-NRPP)
- 1.3.5 Underwriters Laboratory of Canada (ULC)

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- .1 CAN/ULC-S102.2 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.
- .2 CAN/ULC-S115 – Standard Method of Fire Tests of Firestop Systems
- .3 CAN/ULC S636

1.3.6 Ontario Building Code (OBC)

1.4 SUBMITTALS

1.4.1 Provide submittals in accordance with “Submittal Procedures.”

1.4.2 Engineering Stamps:

- .1 Shop drawings, as built drawings and compliance letter shall be stamped and sealed by a Professional Engineer registered within the Province of Ontario.

1.4.3 Product Data:

- .1 Provide manufacturer's printed product literature and datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

1.4.4 Shop Drawings:

- .1 Submit complete plans to the Mechanical Consultant and Authority of Jurisdiction for review and approval before commencement of work.
- .2 Shop drawings shall include:
 - .1 Floor Plan Layout of Soil Gas Venting system piping above grade including all relevant installation details.
 - .2 Materials
 - .3 Finishes
 - .4 Supports
 - .5 Accessories

1.4.5 Certificates

- .1 Provide written certification signed and sealed by a Professional Engineer licensed in the Province of Ontario to the Consultant that the system was installed in accordance with the Ontario Building Code, approved plans and specifications.

1.5 QUALITY ASSURANCE

1.5.1 Source Limitations: Obtain piping and fittings from a single manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

1.6.1 Waste Management and Disposal:

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- .1 Separate and recycle waste materials in accordance with “Construction/Demolition Waste Management and Disposal.”
- .2 Collect and separate for disposal, paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

1.7 DELIGATED DESIGN

- 1.7.1 The Mechanical Contractor shall retain an accredited Canadian National Radon Proficiency Program (C-NRPP) Professional to prepare Shop Drawings for the Level 1A rough-in to meet the requirements of CAN/CGSB-149.11-2024.
- 1.7.2 Radon Mitigation shop drawings shall be prepared by the accredited C-NRPP Professional. These Shop Drawings shall be prepared and submitted for review prior to installation.
- 1.7.3 These shop drawings shall be a comprehensive package of required equipment, piping, routing and installation details.
- 1.7.4 Drawings shall be stamped & sealed by a Professional Engineer Registered within the Province of Ontario.
- 1.7.5 Following the completion of the Radon Mitigation installation a compliance letter stamped and sealed by a Professional Engineer registered within the Province of Ontario shall be submitted by the C-NRPP Professional.

2 PRODUCTS**2.1 GENERAL**

- 2.1.1 IPEX RadonX Soil gas venting system is designed to address the need for venting soil gases from buildings and help reduce indoor radon concentrations.

2.2 PVC PIPING AND FITTINGS

- 2.2.1 For below-ground Soil Gas Venting system piping applications:
 - .1 IPEX RadonX Schedule 40 PVC pipe with perforations.
 - .2 RadonX pipe and fittings shall comply to all material and testing requirements of CAN/CSA B181.2.
 - .3 RadonX piping system shall comply to gas leakage, pull out, torque and combustibility test requirements of CAN/ULC S636.
- 2.2.2 For above-ground Soil Gas Vent Stack Piping for Low Buildings:
 - .1 IPEX RadonX Schedule 40 PVC Solid Wall pipe and fittings with a Flame Spread Rating not more than 25.

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- 2.2.3 For above-ground Soil Gas Vent Stack Piping within air plenums (including entry and exit from plenum):
 - .1 IPEX System XFR Schedule 40 PVC Solid Wall pipe and fittings with a Flame Spread Rating not more than 25 and Smoke Developed Classification not more than 50. System XFR used for soil gas venting shall be labeled to identify it as being part of the radon mitigation system.
- 2.2.4 For above-ground Soil Gas Vent Stack Piping in High Buildings:
 - .1 IPEX System XFR Schedule 40 PVC Solid Wall pipe and fittings with a Flame Spread Rating not more than 25 and Smoke Developed Classification not more than 50. System XFR used for soil gas venting shall be labeled to identify it as being part of the radon mitigation system.

2.3 JOINTS

- 2.3.1 PVC Solvent Weld:
 - .1 RadonX solvent cements shall meet the performance requirements of ASTM D2564.
 - .2 RadonX solvent cements shall be coloured yellow for easy identification.

3 EXECUTION**3.1 INSTALLATION**

- 3.1.1 By certified journeyperson.
- 3.1.2 Install in accordance with Ontario Building Code, CAN/CGSB-149.11, CAN/CGSB-149.12 and local authority having jurisdiction.
- 3.1.3 Installers shall be trained by the pipe manufacturer in the principles of solvent welding prior to installation of IPEX piping.
- 3.1.4 Unless otherwise specified on drawings, slope horizontal vent piping above ground in accordance with the Ontario Building Code, CAN/CGSB-149.11, CAN/CGSB-149.12 and local authority having jurisdiction.
- 3.1.5 Plastic piping installed in a building classified as a "High Building" or installed within a ceiling space used as a "Plenum" shall have a Flame Spread Rating less not more than 25 and Smoke Developed Classification not more than 50.
- 3.1.6 Cleanouts and other service items must be accessible.
- 3.1.7 Penetrations through structure shall be such that structural loads are not transferred to pipes.
- 3.1.8 Provide support of pipe in accordance with requirements of the Ontario Building Code, CAN/CGSB-149.11, CAN/CGSB-149.12 and local authority having jurisdiction.

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- 3.1.9 Provide fire-stop systems for all piping, at all penetrations through fire-rated separations tested and listed in accordance with CAN/ULC-S115.
- 3.1.10 Install buried pipe on 150mm (6") bed of clean sand, shaped to accommodate hubs and fittings, to line and grade as indicated. Clean granular material must be used as the gas permeable layer and aggregate must contain no more than 10% of material that will pass a 4mm (5/32") sieve. The final depth of gas permeable layer should be determined as per the Ontario building Code.
- 3.1.11 For every 46m² of building footprint, a minimum of 3m (10ft) of RadonX perforated gas collection pipe shall be used in the sub-slab area.
- 3.1.12 Each dwelling shall be provided with a separate riser and soil gas collection system.
- 3.1.13 RadonX perforated has collection pipe must be placed on bedding with the print-line displaying on top.
- 3.1.14 All RadonX pipe installed below ground must have at least 1% slope towards the end of the pipe so that any unwanted condensation can drain properly without any pooling.
- 3.1.15 Horizontal runs of utility pipe and conduit within the gas permeable layer shall not interfere with RadonX perforated gas collection pipe and should preferably be installed lower than the RadonX perforated gas collection pipe.
- 3.1.16 Perimeter drainage pipe around the footings must be installed lower than the RadonX perforated gas collection pie.
- 3.1.17 RadonX perforated gas collection pipe shall not be obstructed below slab (eg. Strip footings). If continuous obstructions exists, install piping through footing to ensure communication between two sub-slab areas.
- 3.1.18 Radon X perforated gas collection pipe shall be connected to riser with a RadonX 90 degree elbow. The 90 degree elbow shall be installed at least 1ft away from concrete footings.
- 3.1.19 The riser acting as a suction point shall be made of non-perforated RadonX vent pipe and shall not be less than 15cm (1/2ft) above the finished floor slab.
- 3.1.20 A RadonX permanent cap shall be solvent welded onto the riser before pouring concrete.
- 3.1.21 The RadonX pipe joints on the concrete floor shall be sealed using compatible sealant as required by the Ontario Building Code.
- 3.1.22 To avoid leaning of a riser during concrete our, use 4" pipe clamps with two holes to affix.
- 3.1.23 The piping system shall be installed in accordance with the manufacturers current published installation procedures.

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- 3.1.24 Where piping passes through floor or wall below grade pack and seal in concrete in accordance with specification Section 22 05 00.
- 3.1.25 The termination of the Level 1A rough-in shall be extended a minimum of 300mm above finished floor, sealed at the slab penetration and provided with a permanent cap. The cap shall be labeled.

3.2 MARKINGS AND LABELING

- 3.2.1 In accordance with CGSB/CAN 149.11 and CGSB/CAN 149.12, each length of RadonX pipe and fittings shall be tagged with a warning label.
- 3.2.2 All RadonX fittings shall be tagged with a warning label against the risk of radon gas leak if the system is not installed as per IPEX installation instructions.
- 3.2.3 All RadonX pipe and fittings shall include identification markers to indicate size, material description, product application, complying standards, date of production and manufacturer's name or trademark. The pipe shall include two yellow print-lines located 180 degrees apart.
- 3.2.4 The Level 1A rough-in termination cap located 300mm above finished floor shall be provided with a label from C-NRPP which states: "Radon reduction system rough-in system do not open pipe. This system is not operational. The cap needs to be kept sealed in place until it is converted to a Radon System, discharged to the outside."

END OF SECTION